



OMB No. 1660-0022
Expires: March 31, 2020

National Flood Insurance Program Community Rating System

Coordinator's Manual

FIA-15/2017



FEMA

The photograph on the cover represents the ultimate floodplain, from a community's perspective: Nature follows its course with no threat to life or property. The waterfront is a community asset where people can relax and enjoy the view.

Cover photo courtesy of John Kinley

Burden Disclosure

Public reporting burden for this application is estimated to average 45 hours per response for the application process, 1.6 hours for the environmental and historic preservation certifications, and 4 hours for annual recertification. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and submitting the application and/or forms. This collection of information is voluntary. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street., S.W., Washington, D.C. 20472, Paperwork Reduction Project (1660-0022).

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FOREWORD

The Community Rating System (CRS) is a national program developed by the Federal Emergency Management Agency (FEMA). The *CRS Coordinator's Manual* spells out the credits and credit criteria of the CRS for community activities and programs that go above and beyond the minimum requirements for participation in FEMA's National Flood Insurance Program. The *Coordinator's Manual* is available in Adobe pdf format at www.CRSresources.org.

Using the *CRS Coordinator's Manual*

The *Coordinator's Manual* is the guidebook for the CRS. It explains how the program operates, what is credited, and how credits are calculated. Although it is primarily a reference for CRS activities and credits, it can also help guide communities that want to design or improve their floodplain management programs.

If you want to know how the CRS works and how your community can benefit from participating in the program and reduce flood insurance premiums,

- Start with Section 110 for an overview of the program.
- Section 200 describes the procedures for applying, required activities, calculating credits, and advancing in the program. Be sure to review the prerequisites for participation in Section 211.

If you want to develop a comprehensive community floodplain management program,

- Start with the CRS Community Self Assessment, Section 240, to help evaluate your existing flood problems and identify potential future flood problems, and to identify appropriate measures to address them.
- Use the results of the CRS Community Self Assessment to determine what additional data you need about your flood problem areas. Developing new data can be credited under Activity 410 (Flood Hazard Mapping).
- Review how to prepare a floodplain management plan, following the 10-step process described in Activity 510 (Floodplain Management Planning). If you have developed a multi-hazard mitigation plan, Activity 510 can still assist you in developing a more comprehensive plan for flood damage reduction.
- To develop an overall public information program, see the section on the Program for Public Information in Activity 330 (Outreach Projects).

If you want to improve a specific aspect of your existing floodplain management efforts, the CRS has 19 credited activities and additional sections and appendices that provide supplementary guidance and references. Here is a guide to what they cover.

- Assessing your community's flood problem: Section 240
- Mapping and flood data
 - Developing new maps and data: Activity 410
 - Maintaining and providing maps and data: Activity 440 and Activity 320
 - Providing the data to people: Activity 320
 - Mapping special flood-related hazards (e.g., tsunamis, migrating stream channels, coastal erosion): Activity 320 and Activity 410.
- Managing new development to minimize future damage
 - Preserving open space: Activity 420
 - Protecting natural floodplain functions: Activity 420 and Activity 510
 - Regulating development in the floodplain: Activity 430 and Activity 310
 - Regulating development in the watershed: Activity 450
 - Managing special flood-related hazards (e.g., tsunamis, migrating stream channels, coastal erosion): Activity 420 and Activity 430.
- Developing a floodplain management plan for your community: Activity 510
- Reducing flood losses to existing development
 - Acquiring or relocating flood-prone buildings out of harm's way: Section 501, Activity 520, and Activity 530
 - Protecting flood-prone buildings in place: Activity 530
 - Improving your drainage system maintenance efforts: Activity 540
 - Addressing repetitively flooded properties: Activity 520 and Activity 530
- Improving emergency preparedness and response
 - Flood warning and response planning: Activity 610
 - Warning and response for areas protected by a levee: Activity 620
 - Warning and response for areas downstream of a dam: Activity 630
- Implementing public information activities
 - Developing a master public information program: Activity 330
 - Reaching out to people about floods and flood protection: Activity 330
 - Providing detailed information on the potential for flooding and protecting against flood damage: Activity 320, Activity 350, and Activity 360

- Libraries: Activity 350
- Websites: Activity 350
- Disseminating information on flood insurance: Activity 370 and Activity 330
- Assisting with real estate disclosure: Activity 340.

More about the *Coordinator's Manual*

This document uses some technical terms and acronyms. The terms are defined in the Glossary, Section 120. The acronyms are listed in Appendix A. The most common acronyms are

NFIP	National Flood Insurance Program.
FEMA	The Federal Emergency Management Agency, part of the Department of Homeland Security. Most of the NFIP field work and community coordination is done by the 10 Regional Offices of FEMA.
CRS	Community Rating System.
FIRM	Flood Insurance Rate Map; published by FEMA and provided to communities.
SFHA	Special Flood Hazard Area; the floodplain delineated on the FIRM as A Zones and V Zones.

Communities and other floodplain management professionals are encouraged to make suggestions on both the content and the form of the CRS. Send them to

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100 INTRODUCTION

This series presents an overview of the purpose, goals, and contextual background of the Community Rating System (CRS), the benefits of the program, and the community's role and responsibilities. The activities that are credited under the CRS are listed here, along with the points that may be obtained for each activity, and a description of how those points are translated into CRS classifications and premium reductions. The last part of this series (Section 120) is a glossary of terms used throughout the *CRS Coordinator's Manual*.

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110 PROGRAM OVERVIEW

111 Background

The National Flood Insurance Program (NFIP) provides federally backed flood insurance within communities that enact and enforce floodplain regulations. Since its inception in 1968, the NFIP has been very successful in helping flood victims get back on their feet. As of October 1, 2016, there were 5.1 million residential and commercial policies in force, with \$1.25 trillion in written coverage with annual premiums of about \$3.6 billion. From 1978 through March 2016, over 2.2 million losses were paid, totaling over \$54 billion.

To be covered by a flood insurance policy (for the structure and/or its contents), a property must be in a community that participates in the NFIP. To qualify for the NFIP, a community adopts and enforces a floodplain management ordinance to regulate development in flood hazard areas. The objective of the ordinance is to minimize the potential for flood damage to future development. Today, over 22,200 communities in 56 states and territories participate in the NFIP.

The NFIP has been effective in requiring new buildings to be protected from damage by a 1% chance flood, also known as the 100-year or base flood. However, flood damage still results from floods that exceed the base flood, from flooding in unmapped areas, and from flooding that affects buildings constructed before the community joined the NFIP.

Under the Community Rating System (CRS), communities can be rewarded for doing more than simply regulating construction of new buildings to the minimum national standards. Under the CRS, the flood insurance premiums of a community's residents and businesses are discounted to reflect that community's work to reduce flood damage to existing buildings, manage development in areas not mapped by the NFIP, protect new buildings beyond the minimum NFIP protection level, preserve and/or restore natural functions of floodplains, help insurance agents obtain flood data, and help people obtain flood insurance.

112 Goals

The goals of the NFIP are to provide flood insurance to property owners, to encourage flood loss reduction activities by communities, and to save taxpayers' money. As a part of the NFIP, the CRS provides both incentives and tools to further these goals.

The CRS recognizes, encourages, and rewards—by the use of flood insurance premium adjustments—community and state activities that go beyond the minimum required by the NFIP to

- Reduce and avoid flood damage to insurable property,
- Strengthen and support the insurance aspects of the NFIP, and
- Foster comprehensive floodplain management.

The purpose of the CRS is to support the NFIP. To do this, the CRS provides flood insurance premium rate reductions to policyholders in recognition of the fact that their communities implement activities that exceed the minimum NFIP requirements and that work toward the three goals of the CRS. Included in this support are measures that credit protection to life and property during a flood. A closer look at how communities can implement these three goals follows.

Goal 1. Reduce and avoid flood damage to insurable property.

The CRS supports the NFIP by working to minimize flood losses nationwide, both inside and outside of mapped floodplains. Communities are encouraged to reduce the exposure of existing buildings (and their contents) to flood damage, especially properties that are subject to repetitive flood losses. New buildings and their contents should be protected from known and future local flood hazards. Standards higher than those set out in the minimum criteria of the NFIP may be needed to accomplish these tasks. The CRS encourages communities to map and provide regulatory flood data for all their flood hazards. The data should be used in their regulatory programs and shared with all users and inquirers.

Goal 2. Strengthen and support the insurance aspects of the NFIP.

The CRS recognizes communities whose activities generate and contribute data that enable accurate actuarial rating of flood insurance. Communities are encouraged to implement mapping and information programs that help assess individual property risk and reduce repetitive flood losses. To help expand the policy base, communities should make their residents aware of their flood risk so that they purchase and maintain flood insurance policies.

Goal 3. Foster comprehensive floodplain management.

The CRS encourages communities to use all available tools to implement comprehensive local floodplain management programs, which ordinarily have concerns beyond the protection of insurable property. The CRS recognizes local efforts that protect lives; further public health, safety, and welfare; minimize damage and disruption to infrastructure and critical facilities; preserve and restore the natural functions and resources of floodplains and coastal areas; and ensure that new development does not cause adverse impacts elsewhere in the watershed or on other properties.

A community's staff should understand the physical and biological processes that form and alter floodplains and watersheds and take steps to deal with flooding, erosion, habitat loss, water quality, and special flood-related hazards. A comprehensive approach includes planning, public information, regulations, financial support, open space protection, public works activities, emergency management, and other appropriate techniques.

113 Credit Points and Credited Activities

To be recognized in the insurance rating system, local floodplain management activities must be described, measured, and evaluated by the CRS. The basic document detailing the program is the *CRS Coordinator's Manual*. It sets forth the procedures, creditable activities, and the credit points assigned to each activity, and gives examples of activities and how their credit is calculated.

113.a. Credit Points and Classification

A community receives a CRS classification based upon the total credit for its activities. There are 10 CRS classes. Class 1 requires the most credit points and gives the greatest premium reduction or discount. A community that does not apply for the CRS, or does not obtain the minimum number of credit points, is a Class 10 community and receives no discount on premiums. The qualifying community total points, CRS classes, and flood insurance premium discounts are shown in Table 110-1.

Table 110-1. CRS classes, credit points, and premium discounts.

CRS Class	Credit Points (cT)	Premium Reduction	
		In SFHA	Outside SFHA
1	4,500+	45%	10%
2	4,000–4,499	40%	10%
3	3,500–3,999	35%	10%
4	3,000–3,499	30%	10%
5	2,500–2,999	25%	10%
6	2,000–2,499	20%	10%
7	1,500–1,999	15%	5%
8	1,000–1,499	10%	5%
9	500–999	5%	5%
10	0–499	0	0

SFHA: Zones A, AE, A1–A30, V, V1–V30, AO, and AH

Outside the SFHA: Zones X, B, C, A99, AR, and D

Preferred Risk Policies are not eligible for CRS premium discounts because they already have premiums lower than other policies. Preferred Risk Policies are available only in B, C, and X Zones for properties that are shown to have a minimal risk of flood damage.

Some minus-rated policies may not be eligible for CRS premium discounts.

Premium discounts are subject to change.

The flood insurance premium discount is based on whether a property is in or out of the Special Flood Hazard Area (SFHA), i.e., the zones beginning with the letter A and V as shown on the community's Flood Insurance Rate Map (FIRM). The premium discount for properties in the SFHA increases according to the community's CRS class. A community's classification is based on the community total points (symbolized as cT in the CRS calculations).

The discount for properties outside the SFHA is lower for Class 1–8 communities because premiums in these areas are already relatively low and can be lowered further through the Preferred Risk Policy. Also, most activities undertaken to qualify for those classes are implemented only in the floodplain. Because areas designated as A99 and AR Zones already receive an insurance premium reduction, these zones get the same premium reduction as non-SFHA areas.

113.b. Credited Activities

There are 19 creditable activities, organized under four categories, which are presented in the 300–600 series of the *Coordinator's Manual*. The *Coordinator's Manual* assigns credit points based upon the extent to which an activity advances the three goals of the CRS.

Public Information Activities (300 Series)

This series credits programs that advise people about the flood hazard, encourage the purchase of flood insurance, and provide information about ways to reduce flood damage. These activities also generate data needed by insurance agents for accurate flood insurance rating. They generally serve all members of the community.

Mapping and Regulations (400 Series)

This series credits programs that provide increased protection to new development. These activities include mapping areas not shown on the FIRM, preserving open space, protecting natural floodplain functions, enforcing higher regulatory standards, and managing stormwater. The credit is increased for growing communities.

Flood Damage Reduction Activities (500 Series)

This series credits programs for areas in which existing development is at risk. Credit is provided for a comprehensive floodplain management plan, relocating or retrofitting flood-prone structures, and maintaining drainage systems.

Warning and Response (600 Series)

This series provides credit for measures that protect life and property during a flood, through flood warning and response programs. There is credit for the maintenance of levees and for state regulatory programs for dams, as well as for programs that prepare for the potential failure of levees and dams.

Some CRS activities may be implemented by the state or a regional agency rather than by the community. For example, some states have hazard disclosure laws that are creditable under Activity 340 (Flood Hazard Disclosure). A community in those states will receive those credit points when it applies for CRS credit and demonstrates that the law is effectively implemented within its jurisdiction. See also Section 231.c.

113.c. Activity Credit Points

The 19 activities and their credit points are shown in Table 110-2. Each activity has one or more elements. Elements are the basic credit level for the CRS. The element and activity scoring process is covered in Activity 220 (Credit Calculation).

The maximum credit points for each activity are shown in the second column. The maximum credit can be earned when all elements within an activity are being implemented and all credit criteria are met. In some activities, maximum credit cannot be provided unless credit has been earned in other activities. For example, additional credit is provided in some activities if the community has adopted a Program for Public Information under Activity 330 (Outreach Projects).

The third column and fourth columns in Table 110-2 show the estimated maximum credit and average credit points using a conservative model to convert the points received under the 2007 *Coordinator's Manual* to the new scoring in the 2013 and 2017 *Coordinator's Manuals*. The maximums and averages are based upon the number of applicants for each activity, not the total number of applicants for the CRS. The fifth column shows the percentage of all CRS communities that received credit for each activity as of May 2013.

Communities should note the average credits for these activities. They provide a better indication of what an applicant can expect for an activity than do the maximum points available.

A community must have at least 500 verified credit points to become a Class 9 or better. It must also meet the prerequisites for certain classes, as described in Section 211. As explained in Activity 230 (Verification), the final, or verified, credit is calculated by the ISO/CRS Specialist after a review of the documentation provided by the community and the community's implementation of its activities at the verification visit (explained in Section 232).

The CRS "Quick Check" is a tool that a community can use to assess its potential for receiving CRS credit for activities it is undertaking. The Quick Check can be found at www.CRSresources.org/200.

The Quick Check does not estimate credit for a community. However, by reviewing each element and going through the steps explained in Section 220, a community can assess its potentially creditable activities.

Table 110-2. Credit points awarded for CRS activities.*

Activity	Maximum Possible Points	Maximum Points Earned	Average Points Earned	Percentage of Communities Credited
300 Public Information Activities				
310 Elevation Certificates	116	116	38	96%
320 Map Information Service	90	90	73	85%
330 Outreach Projects	350	350	87	93%
340 Hazard Disclosure	80	62	14	84%
350 Flood Protection Information	125	125	38	87%
360 Flood Protection Assistance	110	100	55	41%
370 Flood Insurance Promotion ⁵	110	110	39	4%
400 Mapping and Regulations				
410 Flood Hazard Mapping	802	576	60	55%
420 Open Space Preservation	2,020	1,603	509	89%
430 Higher Regulatory Standards	2,042	1,335	270	100%
440 Flood Data Maintenance	222	249	115	95%
450 Stormwater Management	755	605	132	87%
500 Flood Damage Reduction Activities				
510 Floodplain Mgmt. Planning	622	514	175	64%
520 Acquisition and Relocation	2,250	1,999	195	28%
530 Flood Protection	1,600	541	73	13%
540 Drainage System Maintenance	570	454	218	43%
600 Warning and Response				
610 Flood Warning and Response	395	365	254	20%
620 Levees	235	207	157	0.5%
630 Dams	160	99	35	35%

* Figures are based on communities that have received verified credit under the 2013 *CRS Coordinator's Manual* (about 43% of CRS communities), as of October 2016. The maximum possible points are based on the 2013 *Coordinator's Manual*. Growth adjustments are not included.

There are three important things to note when estimating credit:

1. Moving to a Class 6, 4, or 1 depends on both having adequate points AND meeting class prerequisites, as explained in Section 211.
2. Many CRS activities have an impact adjustment associated with them. An impact adjustment means that CRS credit is provided for the portion of the regulatory floodplain to which the creditable element is applied. For example, even though 1,450 maximum points are available for open space preservation (OSP), if a community has 20% of the regulatory floodplain as open space, then the credit will be 20% of the allowable credit, or 290 points. See Section 222.
2. Only the final, verified credit calculated by the ISO/CRS Specialist after the verification visit determines a community's total points. It is important that the community provide correct and complete materials to document its activities. Only through a review of the community's documentation can the ISO/CRS Specialist determine the credit points that should be provided.

A community should apply only for those activities it is actively undertaking and those it knows it can implement in accordance with the *Coordinator's Manual*. For example, no credit is provided for draft ordinances—regulations must have been enacted and enforced. Also, a community should not be overly ambitious in undertaking new activities for CRS credit at the risk of losing the credit later (at annual recertification or cycle verification visits) for activities it is unable to implement or continue.

113.d. Activities not Listed

The CRS activities are not design standards for local floodplain management. The *Coordinator's Manual* is an insurance tool that describes methods of calculating credit points for various community activities. The fact that the *Coordinator's Manual* does not list a specific credit for some activities does not mean that they should not be implemented by communities that need them.

An activity may deserve credit even if the *Coordinator's Manual* does not include it. The *Coordinator's Manual* cannot predict or list everything that can be done to support the goals of the CRS. Communities are always welcome to request credit for alternate approaches or innovations that are not included in the *Coordinator's Manual*. Similarly, communities can submit alternative approaches to the class prerequisites listed in Section 211.

Requests should be submitted to the ISO/CRS Specialist and should include documentation to support how the alternative approach or innovation meets the intent of, or is equivalent to, the prerequisite or the element and/or activity credited in the *Coordinator's Manual*.

Note that some activities are not directly recognized by the CRS for one of three reasons:

1. They do not directly affect buildings that can be insured under the NFIP (e.g., uninsurable items such as streets and land value);

2. They are recognized by other aspects of the flood insurance rating program (e.g., flood control projects that result in revised FIRMs reduce flood insurance premiums in protected areas); or
3. The impact of an activity cannot be measured for CRS credit (e.g., preserving floodplains for aesthetic reasons).

Credit criteria will change over time as experience is gained in implementing, observing, and measuring the activities and as new concepts in floodplain management come into common practice. As innovations arise, they will be considered for recognition under the CRS.

114 The Community's Role

114.a. Community Participation

Community participation in the CRS is voluntary. Any community in full compliance with the rules and regulations of the NFIP may apply for a CRS classification better than Class 10. A community may apply to participate in the CRS at any time.

The application procedures are simple: the community submits a letter of interest and shows that it is implementing activities that would receive at least 500 credit points. The documents go to the ISO/CRS Specialist for that state. The Regional Office of the Federal Emergency Management Agency (FEMA) must approve the submittal to ensure that the community is in full compliance with the minimum floodplain management criteria of the NFIP. See also Section 212.

Upon receiving FEMA approval, a community verification visit is scheduled by the ISO/CRS Specialist. At this verification visit, the ISO/CRS Specialist reviews all of the community's activities that may deserve credit, even those not in the community's submittal. All CRS credit is verified according to the credit criteria in the *Coordinator's Manual* in effect at the time of the visit. The verification process is discussed in Activity 230.

The ISO/CRS Specialist is an employee of Insurance Services Office, Inc. (ISO), FEMA's CRS management contractor. ISO has many years of experience collecting and processing data for more than 1,000 insurance companies. Among other services, ISO develops and provides advisory classifications for community fire protection and building code programs. ISO reviews CRS submittals, verifies communities' credit points, and performs program improvement tasks for FEMA.

After the verification visit, ISO submits its findings to FEMA. FEMA sets the CRS credit to be granted and notifies the community, the state, insurance companies, and other appropriate parties. The classification is effective on either May 1 or October 1, whichever comes first, after the community's activities are verified.

Each year the community must recertify that it is continuing to perform the activities for which it is receiving CRS credit. Recertification is an annual activity that includes progress reports for certain activities (see Section 213). A “cycle verification visit” takes place every few years and is conducted in the form of another verification visit to the community (see Section 232).

If a community is not properly or fully implementing the credited activities, its credit points, and possibly its CRS classification, will be revised. A community may add credited activities in order to improve its CRS classification. This is called a modification and is explained in Section 214.

Communities are encouraged to call on their ISO/CRS Specialist for assistance at any time. This can be especially helpful when they are considering a change to a credited activity or implementing a new program.

A week-long CRS course for local officials is offered free at FEMA’s Emergency Management Institute and has been field deployed to many states. The ISO/CRS Specialist, NFIP State Coordinator, and FEMA Regional Office have more information on this course, state workshops, and other CRS training opportunities.

114.b. Community Responsibilities

Once a community receives its initial classification in the CRS, it must continue to implement its credited activities to keep its classification. Specifically, a community is responsible for

- Designating a community CRS Coordinator—someone who is familiar with the community offices that implement CRS activities;
- Cooperating with the ISO/CRS Specialist and the verification procedures (Section 230);
- Recertifying each year that it is continuing to implement its activities (Section 213);
- Advising FEMA and its ISO/CRS Specialist of modifications to its activities (Section 214);
- Keeping elevation certificates, old FIRMs, and old Flood Insurance Studies for as long as the community is in the CRS;
- Keeping the records iterated in the activities’ documentation sections until they are reviewed at the verification visit;
- Ensuring that flood protection projects and drainage system maintenance activities are compliant with federal environmental and historic preservation requirements (Section 507); and
- Participating in the cycle verification process (Section 232).

Communities will receive periodic updates to the *Coordinator's Manual* and other CRS materials. They are encouraged to order the background publications (see Appendix C), attend CRS workshops, and ask their ISO/CRS Specialists for help understanding the CRS credit criteria for their current and planned activities.

115 Costs and Benefits

Communities should prepare and implement those activities which best deal with their local problems, whether or not they are creditable under the CRS. Few, if any, of the CRS activities will produce premium reductions equal to or greater than the cost of their implementation. In considering whether to undertake a new floodplain management activity, a community must consider all of the benefits the activity will provide (not just insurance premium reductions) in order to determine whether it is worth implementing.

115.a. Costs

No fee is charged for a community to apply for participation in the CRS. The only costs the community incurs are those of implementing creditable floodplain management activities and the staff time needed to document those activities and prepare for and participate in the recertification process and verification visits.

115.b. Benefits

There are many benefits to participating in the CRS. Most of them cannot be measured in direct dollar terms, so it is impossible to conduct a strict numerical comparison of the benefits with the costs of implementing the credited activities. Listed here are the benefits more commonly mentioned by community officials.

- (1) The benefit that attracts people to the CRS the most is the reduction in flood insurance premiums for their residents and businesses. The dollar savings varies according to the CRS class, the number of policies, and the amount of coverage. A community can obtain the current and potential dollar savings for all 10 classes from its ISO/CRS Specialist. These are known as the "what if" tables (see Figure 110-1).
- (2) Although the premium reduction attracts interest in the CRS, the most important benefits are the enhanced public safety, reduction in damage to property and public infrastructure, avoidance of economic disruption and losses, reduction in human suffering, and protection of the environment provided by the credited activities. Community officials agree that these programs are improved when changes are made to meet the CRS credit criteria.
- (3) Through the CRS a community can evaluate the effectiveness of its flood program against state and nationally recognized benchmarks.
- (4) Training and technical assistance in designing and implementing credited flood protection activities are available through the CRS at no charge.

Community:	WATSONVILLE, CITY OF	State:	CALIFORNIA
County:	SANTA CRUZ COUNTY	CID:	060357
Current CRS Class = 7 [Printable Version]			
	TOTAL	SFHA *	X- STD/AR/A99 **
PIF	968	852	66
PREMIUM	\$1,013,842	\$939,534	\$58,120
AVERAGE PREMIUM	\$1,047	\$1,103	\$881
			\$324
CRS Class			
09	Per Policy	\$60	\$65
	Per Community	\$58,326	\$55,267
08	Per Policy	\$117	\$130
	Per Community	\$113,592	\$110,533
07	Per Policy	\$174	\$195
	Per Community	\$168,859	\$165,800
06	Per Policy	\$235	\$259
	Per Community	\$227,185	\$221,067
05	Per Policy	\$292	\$324
	Per Community	\$282,451	\$276,333
			\$6,118
			\$0

Figure 110-1. The “what if” table.

The table shows the community's current and potential dollar savings in flood insurance premium reductions for various CRS classes. As a Class 7 community, Watsonville officials are saving their flood insurance policy holders nearly \$200 each year.

“PIF” means “policies in force”

- (5) Many communities initiate new public information activities when they join the CRS. These build a knowledgeable constituency within the community—people who become more interested in protecting themselves from flooding and in supporting the community's floodplain management efforts.
- (6) Keeping its CRS credits has proven to be an effective motivator to continue implementing flood protection programs during the “dry years.” The fact that the community's CRS status could be affected by the elimination of a flood-related activity or a weakening of the regulatory requirements for new development has been taken into account by many governing boards when considering such actions.
- (7) There is mutual support among CRS participants. Communities that participate in the CRS are joining the ranks of localities that have demonstrated a serious commitment to the health, safety, and welfare of their residents—and their floodplain and coastal resources. Across the nation, “CRS users groups” of representatives of counties, communities, and regional entities have formed to share

their experiences, support each other in advancing their floodplain management programs, and encourage other communities to participate in the program.

116 Other Program Priorities

116.a. Natural Floodplain Functions

Floodplains in riverine and coastal areas perform natural functions that cannot be replicated elsewhere. The CRS provides special credit for community activities that protect and/or restore natural floodplain functions, even though some of the activities may not directly reduce flood losses to insurable buildings. There are many reasons to protect floodplains in their natural state.

When kept open and free of development, floodplains provide the necessary flood water conveyance and flood water storage needed by a river or coastal system. When the floodplain is allowed to perform its natural function, flood velocities and peak flows are reduced downstream. Natural floodplains reduce wind and wave impacts and their vegetation stabilizes soils during flooding.

Floodplains in their natural state provide many beneficial functions beyond flood reduction. Water quality is improved in areas where natural cover acts as a filter for runoff and overbank flows; sediment loads and impurities are also minimized. Natural floodplains moderate water temperature, reducing the possibility of adverse impacts on aquatic plants and animals.

Floodplains can act as recharge areas for groundwater and reduce the frequency and duration of low flows of surface water. They provide habitat for diverse species of flora and fauna, some of which cannot live anywhere else. They are particularly important as breeding and feeding areas.

The CRS encourages state, local and private programs and projects that preserve or restore the natural state of floodplains and protect these functions. The CRS also encourages

Some Natural Functions of Floodplains

WATER RESOURCES

Natural Flood and Erosion Control

- Provide flood storage and conveyance
- Reduce flood velocities
- Reduce peak flows
- Reduce sedimentation

Water Quality Maintenance

- Filter nutrients and impurities from runoff
- Process organic wastes
- Moderate temperature fluctuations

Groundwater Recharge

- Promote infiltration and aquifer recharge
- Reduce frequency and duration of low surface flows

BIOLOGICAL RESOURCES

Biological Productivity

- Rich alluvial soils promote vegetative growth
- Maintain biodiversity
- Maintain integrity of ecosystems

Fish and Wildlife Habitats

- Provide breeding and feeding grounds
- Create and enhance waterfowl habitat
- Protect habitats for rare and endangered species

*- A Unified National Program for Floodplain Management
FEMA-248 (1994)*

communities to coordinate their flood loss reduction programs with other public and private activities that preserve and protect natural and beneficial floodplain functions. Credits for doing this are found in the following activities:

- Activity 320 (Map Information Service)—Credits advising people about areas that should be protected because of their natural floodplain functions.
- Activity 330 (Outreach Projects)—Credit is provided for outreach projects that include descriptions of the natural functions of the community's floodplains.
- Activity 350 (Flood Protection Information)—Credit points are available for a website that provides detailed information about local areas that should be protected for their natural floodplain functions and how they can be protected.
- Activity 420 (Open Space Preservation)—Extra credit is provided for open space areas that are preserved in their natural state; have been restored to a condition approximating their pre-development natural state; or have been designated as worthy of preservation for their natural benefits, such as being designated in a habitat conservation plan.
- Activity 430 (Higher Regulatory Standards)—Regulations that protect natural areas during development or that protect water quality are credited.
- Activity 440 (Flood Data Maintenance)—Adding layers to the community's geographic information system (GIS) with natural floodplain functions (e.g., wetlands, designated riparian habitat, flood water storage areas) is credited.
- Activity 450 (Stormwater Management)—Erosion and sediment control, water quality, and low-impact development techniques minimize the impacts of new development. These measures are credited, along with regulations that require the maintenance of natural flow regimes.
- Activity 510 (Floodplain Management Planning)—Extra credit is provided for plans that address the natural resources of floodplains and recommend ways to protect them.
- Activities 520 (Acquisition and Relocation), 530 (Flood Protection), and 540 (Drainage System Maintenance) credit flood loss reduction measures such as capital improvement programs and drainage improvement projects. No such programs or projects can be credited unless a thorough environmental review is conducted and documented.

116.b. All-Hazards Mitigation

All communities are threatened by a variety of natural and technological hazards. The staff and programs that address flooding may also be responsible for protecting the community from damage due to earthquakes, hurricanes, landslides, drought, hazardous materials incidents, and terrorism. Similarly, the staff members that work in programs related to other hazards may be implementing activities that could support floodplain management

programs. Floodplain management programs are synonymous with flood mitigation programs.

FEMA supports an all-hazards approach to mitigation, as does the CRS. It makes economic sense that mitigation programs address as many hazards as are appropriate. An all-hazards approach also ensures that staff, programs, construction standards, and public information messages are consistent and mutually supportive.

The CRS has become an important tool for mitigation as well as a mechanism for integrating mitigation with flood insurance. This is consistent not only with grading systems that have been successfully employed for many years in the insurance industry, but also with industry initiatives for relating insurance premiums to local efforts to reduce losses due to natural hazards. For example, adoption and enforcement of strong building codes as measured by the insurance industry's Building Code Effectiveness Grading Schedule integrates building code enforcement into the industry's premium rates.

The CRS has served as a model for all-hazards, pre-disaster mitigation. Local officials have reported that the CRS was the blueprint for organizing their program to build a more disaster-resistant community.

This edition of the *Coordinator's Manual* highlights many opportunities for expanding a flood-only orientation to address other hazards.

- The 300 series of public information activities credits advising people about the risk of flooding and other hazards and the mitigation measures they can take to protect their property;
- Under Activity 340 (Hazard Disclosure), disclosure of other hazards (DOH) credits advising potential purchasers of property that there may be other hazards that could affect the property, such as erosion, subsidence, or flooding from a dam failure (Section 342.d);
- Section 401 has an overview of the additional credits that are provided for managing seven special flood-related hazards:
 - Uncertain flow paths (alluvial fans, moveable bed streams, and other floodplains within which the channel moves during a flood);
 - Closed-basin lakes;
 - Ice jams;
 - Land subsidence;
 - Mudflow hazards;
 - Coastal erosion; and
 - Tsunamis.
- Activity 420 (Open Space Preservation) encourages communities to keep hazardous areas open and undeveloped;

- Credit is provided for the International Series of building codes (which have improved protection standards for flooding, wind, and other hazards over previous model codes) in Activity 430 (Higher Regulatory Standards), Section 432.h;
- Activity 430 (Higher Regulatory Standards) also credits extending V-Zone standards for coastal storm surge and wind protection farther inland to include coastal A Zones (Section 432.k);
- In Activity 440 (Flood Data Maintenance), additional credit is provided for showing areas subject to other natural hazards, such as landslides and stream migration in the GIS or data base management program;
- Under Activity 450 (Stormwater Management), management of runoff, erosion and sediment control, and water quality and low impact development requirements to minimize the impacts of new development are credited.
- More credit is available for including other hazards in a mitigation plan that qualifies for a floodplain management plan under Activity 510 (Floodplain Management Planning); and
- Local warning and public information activities directed toward storms and tsunamis are credited under the StormReady and TsunamiReady elements in Activity 610 (Flood Warning and Response).

116.c. Future Conditions and Impacts of Climate Change

The CRS recognizes that floodplains and watersheds change over time, driven by many natural and manmade changes. Good floodplain management acknowledges this, and includes thinking about how floodplains might look in the future under different scenarios. Increased impervious surfaces in developing watersheds, new fill in floodways, rising sea levels, changes in natural functions, and many other factors contribute to the character of the future with which floodplain managers must cope.

The *Coordinator's Manual* incorporates additional acknowledgement of—and credit for—community efforts to anticipate the future insofar as it relates to flood risk and natural floodplain functions and climate resilience, and to take actions that can mitigate any adverse impacts that could materialize.

- Credit is provided in Section 322.c for communities that provide information about areas (not mapped on the FIRM) that are predicted to be susceptible to flooding in the future because of climate change or sea level rise.
- To become a Class 4 or better community, a community must (among other criteria) demonstrate that it has programs that minimize increases in future flooding.
- To achieve CRS Class 1, a community must receive credit for using regulatory flood elevations in the V and coastal A Zones that reflect future conditions, including sea level rise.

- Credit is provided in Section 342.d when prospective buyers of a property are advised of the potential for flooding due to climate changes and/or sea level rise.
- Credit is provided in Section 412.d when the community's regulatory map is based on future-conditions hydrology, including sea level rise.
- Credit is provided in Section 432.k when a community accounts for sea level rise in managing its coastal A Zones.
- Credit is provided in Section 452.a if a community's stormwater program regulates runoff from future development.
- Credit is provided in Section 452.b for a community whose watershed master plan manages future peak flows so that they do not exceed present values.
- Credit is provided in Section 452.b for a coastal community whose watershed master plan addresses the impact of sea level rise.
- Credit is provided in Section 512.a, Steps 4 and 5, for flood hazard assessment and problem analysis that address areas likely to flood and flood problems that are likely to get worse in the future, including (1) changes in floodplain development and demographics, (2) development in the watershed, and (3) climate change or sea level rise.

Guidance on the sea level rise projections that are to be used for the purpose of CRS credit can be found in Section 404.

120 GLOSSARY

Unless otherwise noted, all terms used by the Community Rating System (CRS) are the same as those defined in the National Flood Insurance Program Rules and Regulations (44 *Code of Federal Regulations* §59.1).

A Zone: See “Zone A.”

Activity: A floodplain management activity for which Community Rating System credit has been established.

Allowable surcharge: The acceptable limit of increased flood elevation in the floodway due to obstruction of the floodway fringe.

Alluvial fan: An area at the base of a valley where the slope flattens out, allowing the flood water to decrease in speed and spread out, dropping sediment over a fan-shaped area. Credit for managing alluvial fan hazards is discussed in Section 400.

B Zone: See “Zone B.”

Base flood: The flood having a 1% chance of being equaled or exceeded in any given year, also known as the “100-year” or “1% chance” flood. The base flood is a statistical concept used to ensure that all properties subject to the National Flood Insurance Program are protected to the same degree against flooding.

BFE: Base flood elevation. The elevation of the crest of the base or 1% annual chance flood (also known as the 100-year flood).

Building: For CRS purposes, the definition of what constitutes a building is based on whether the structure is insurable. It must meet the following criteria, which are taken from the definition in the National Flood Insurance Program’s *Flood Insurance Manual* for insurance agents. A “building” is

A structure with two or more outside rigid walls and a fully secured roof, that is affixed to a permanent site; or

A manufactured home (a “manufactured home,” also known as a mobile home, is a structure built on a permanent chassis, transported to its site in one or more sections, and affixed to a permanent foundation); or

A travel trailer without wheels, built on a chassis and affixed to a permanent foundation, that is regulated under the community’s floodplain management and building ordinances or laws.

“Building” does not mean a gas or liquid storage tank or a recreational vehicle, a park trailer, or other similar vehicle, except as described above.

C Zone: See “Zone C.”

CBRA: The Coastal Barrier Resources Act of 1982 (pronounced “cobra”).

CEO: The Chief Executive Officer of a community, i.e., the official who is charged with the authority to implement and administer laws, ordinances, and regulations for the community. The CEO may be a mayor, city or county manager, county executive, chair or president of a county council, etc. The head of a department is not considered a CEO.

Coastal: Relating to the coastlines and bays of the tidal waters of the United States or the shorelines of the Great Lakes. Under the Community Rating System, there are five coastal areas eligible for creditable coastal activities: the coastlines and bays of the Arctic Ocean, Atlantic Ocean, Pacific Ocean, Gulf of Mexico, Bering Sea, and Great Lakes. The term does not include riverine areas.

Coastal A Zone: Those parts of a community’s coastal floodplain that are subject to waves with heights of between 1.5 and 3 feet during a 1% annual chance storm. The exact boundary of a Coastal A Zone is determined by the community, as described in Section 432.k, although the Federal Emergency Management Agency may provide a proposed boundary or “limit of moderate wave action” (LiMWA) on Flood Insurance Rate Maps.

Coastal Barrier Resources System: A set of “undeveloped coastal barriers” and “otherwise protected areas” along the U.S. coast (including the Great Lakes) designated by Congress under the Coastal Barrier Resources Act of 1982 (CBRA). Most expenditures of federal funds are prohibited within the Coastal Barrier Resources System.

Coastal erosion: Coastal erosion is the wearing away of land masses caused primarily by waves on the two oceans, the Gulf of Mexico, the Bering Sea, or the Great Lakes, and major embayments to these bodies of water.

Coastal erosion-prone area: The coastal areas within which waves are anticipated to cause significant erosion and shoreline retreat within the next 60 years.

Coastal high hazard flooding: A condition of flooding subject to high velocity waters, including, but not limited to, hurricane wave wash or tsunamis. Coastal high hazard flooding is mapped as a Zone V or “limit of moderate wave action” on a Flood Insurance Rate Map. Coastal flooding without the high velocity hazard is mapped as a Zone A.

Community: A city, village, town, county, township, parish, borough, Indian tribe or authorized tribal organization, Alaska Native village or authorized native organization, or other local government with the statutory authority to enact floodplain regulations and participate in the National Flood Insurance Program.

Contour: A line of equal elevation on a topographic (contour) map.

Conveyance system: For purposes of the CRS, the conveyance system includes the channels that need to be maintained in order to prevent damage to buildings or roads and

other infrastructure from smaller, more frequent storms. Components of the conveyance system include the structures and the channel segments throughout the system (e.g., bridges, culverts, and segments of open channel) through which water flows.

Critical facility: A structure or other improvement that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired. Critical facilities include health and safety facilities, utilities, government facilities, and hazardous materials facilities. For the purposes of a local regulation, a community may also use the International Codes' definition for Category III and IV buildings.

CRS: Community Rating System.

CRS classification: A rating of a community's floodplain management program according to the *CRS Coordinator's Manual*. The premium rate credits for each class are listed in Table 110-1. A community that has not applied for Community Rating System classification is a Class 10 community.

CRS Coordinator: A local official designated by the community's Chief Executive Officer to coordinate the community's Community Rating System activities and work with FEMA and the Insurance Services Office, Inc. to document and verify the community's program.

CRS Coordinator's Manual: A publication for local officials that describes the procedures, credit criteria, and activities credited by the Community Rating System. It is available from FEMA or Insurance Services Office, Inc.

Cycle: A periodic review, scoring, and verification of a community's Community Rating System activities, normally done on a 3- or 5-year cycle.

D Zone: See "Zone D."

Datum: A reference surface used to ensure that all elevation records are properly related. Many communities have their own datum, developed before there was a national standard. The National Flood Insurance Program previously used the National Geodetic Vertical Datum (NGVD) of 1929, but all recent Flood Insurance Rate Maps have used the North American Vertical Datum (NAVD) of 1988. Both datum planes express elevations in relation to sea level. The Flood Insurance Rate Map indicates the datum that applies to the community.

Debris: Trash, junk, litter, discarded remains of something destroyed, landscape waste, or vegetation that may reduce the conveyance capacity of a channel or the storage or infiltration capacity of a basin.

Development: Any manmade change to improved or unimproved real estate including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation, drilling operations, or storage of equipment or materials.

Digital Flood Insurance Rate Map (DFIRM): All new FIRMs are prepared as a GIS-based map of a community's flood hazards. All new maps are based upon this digital platform and communities may use these maps instead of paper maps for regulatory purposes. See FIRM.

Discharge: The amount of water that passes a point in a given period of time. Rate of discharge is usually measured in cubic feet per second (cfs).

Drainage system: For the purposes of the CRS, a community's drainage system consists of all natural and manmade watercourses, conduits, and storage basins that must be maintained in order to prevent flood damage to buildings from smaller, more frequent storms.

Element: A discrete piece of a floodplain management program that is credited as part of a Community Rating System activity.

FEMA: The Federal Emergency Management Agency. Most of the National Flood Insurance Program field work and community coordination is done by the 10 FEMA Regional Offices, which are listed at <https://www.fema.gov/fema-regional-contacts>.

FIRM: Flood Insurance Rate Map. An official map of a community, on which FEMA has delineated both the Special Flood Hazard Areas and the risk premium zones applicable to the community. Most FIRMs include detailed floodplain mapping for some or all of a community's floodplains. In most cases, the date of the first FIRM issued to a community is the date the community entered the Regular Program of the National Flood Insurance Program.

Flood Insurance Study: A report published by FEMA for a community in conjunction with the community's Flood Insurance Rate Map. The study contains such background data as the base flood discharges and water surface elevations that were used to prepare the FIRM. In most cases, a community FIRM with detailed mapping will have a corresponding flood insurance study.

Floodplain: Any land area susceptible to being inundated by flood waters from any source. A Flood Insurance Rate Map identifies most, but not necessarily all, of a community's floodplain as the Special Flood Hazard Area.

Floodproofing: Protective measures added to or incorporated in a building that is not elevated above the base flood elevation to prevent or minimize flood damage. "Dry floodproofing" measures are designed to keep water from entering a building. "Wet floodproofing" measures minimize damage to a structure and its contents from water that is allowed into a building.

Floodway: The channel of a river and the portion of the overbank floodplain that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation by a designated height. The National Flood Insurance Program regulations allow construction in the floodway provided that it does not obstruct flood flows or increase flood heights.

Floodway fringe: The portion of the Special Flood Hazard Area lying outside of the floodway.

Freeboard: A margin of safety added to the base flood elevation to account for waves, debris, miscalculations, lack of data, or changes in climate.

Green infrastructure: Because of the wide interpretation given to this term, the CRS does not use the words “green infrastructure” in its credit criteria. However, the CRS does provide credit for designated open space corridors or connected networks of wetlands, woodlands, wildlife habitats, wilderness, and other areas that support native species, maintain natural ecological processes, and sustain air and water resources. In some areas, these features are called “green infrastructure.”

High-hazard-potential dam: Dams assigned the high-hazard-potential classification are those whose failure or mismanagement will probably cause loss of human life.

Hydrology: The science dealing with the waters of the earth. A flood discharge is developed by a hydrologic study.

I-Codes: The series of building codes published by the International Code Council.

ICC: Increased Cost of Compliance coverage, a flood insurance claim provision that helps fund the cost of bringing a flood-damaged building into compliance with floodplain management standards.

ISO: The Insurance Services Office, Inc., a corporation that conducts verification of community CRS credit and program improvement tasks for FEMA.

ISO/CRS Specialist: An Insurance Services Office, Inc., technician responsible for reviewing community requests for Community Rating System classification and verifying implementation of activities credited by the CRS. The name and telephone number of the ISO/CRS Specialist for a state can be found at www.CRSresources.org/100.

ISO/CRS Technical Reviewer: An Insurance Services Office, Inc. technician or contractor responsible for reviewing community requests for Community Rating System credit for select activities. The reviews conducted by the ISO/CRS Technical Reviewer are provided to the ISO/CRS Specialist.

Levee: A manmade structure, usually an earthen embankment, designed and constructed using sound engineering practices to contain, control, or divert flood waters in accordance with a designated risk reduction level.

Levee system: The levee structure itself, plus all appurtenant facilities, such as pump stations, closure devices, etc., that are needed to contain, control, or divert flood waters in accordance with a designated risk reduction level. For CRS purposes, credit is based on local activities related to the entire levee system, not just to the levee structure.

Limit of moderate wave action: The inland limit of the area affected by waves greater than 1.5 feet (also known as “LiMWA”). The LiMWA is determined based on the landward limit of the 1% annual chance coastal flood that can support a 1.5-foot wave. New coastal FIRMs will show the LiMWA as an informational layer on the FIRM. The area between this inland limit and the V-Zone boundary is also known as the Coastal A Zone. It is typically those parts of a community’s coastal floodplain, inland from the mapped V Zone (or shoreline if there is no mapped V Zone), that are subject to the damaging effects of waves, velocity flows, erosion, scour, or combinations of these forces. The area may be delineated on a Flood Insurance Rate Map.

Low-impact development (LID): According to the U.S. Environmental Protection Agency, “an approach to land development (or re-development) that works with nature to manage stormwater as close to its source as possible and treat stormwater as a resource rather than a waste product. LID practices include bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. Applied on a broad scale, LID can maintain or restore a watershed's hydrologic and ecological functions.”
[\(www.epa.gov/owow/NPS/lid/\)](http://www.epa.gov/owow/NPS/lid/)

NAVD: North American Vertical Datum of 1988. The national datum that is replacing NGVD to set flood and ground elevations for the Flood Insurance Rate Maps.

Natural floodplain functions:

- a. The functions associated with the natural or relatively undisturbed floodplain that moderate flooding, retain flood waters, reduce erosion and sedimentation, and mitigate the effects of waves and storm surges from storms; and
- b. Other significant beneficial functions, which include maintenance of water quality, recharge of groundwater, and provision of fish and wildlife habitat.

NFIP: National Flood Insurance Program.

NGVD: National Geodetic Vertical Datum of 1929, the national datum previously used by the National Flood Insurance Program. It was known formerly as the “Mean Sea Level Datum of 1929 (MSL).”

Ponding: A flooding condition in low-lying areas caused when runoff drains to a location that has no ready outlet. Ponded water usually remains until it evaporates, seeps into the ground, or is pumped out.

Post-FIRM building: For insurance rating purposes, a post-FIRM building is one that was constructed or substantially improved after December 31, 1974, or after the effective date of the initial Flood Insurance Rate Map of a community, whichever is later. A post-FIRM building is required to meet the National Flood Insurance Program's minimum Regular Program flood protection standards.

Pre-FIRM building: For insurance rating purposes, a pre-FIRM building is one that was constructed or substantially improved on or before December 31, 1974, or before the effective date of the initial Flood Insurance Rate Map of the community, whichever is later. Most pre-FIRM buildings were constructed without taking the flood hazard into account.

Registered design professional: An individual who is registered or licensed to practice his or her respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed. The CRS considers "registered design professionals" to include licensed professional engineers, structural engineers and architects, and registered land surveyors.

Regular Program: Also called the Regular Phase. The phase of community participation in the National Flood Insurance Program that begins on the effective date of the community's first Flood Insurance Rate Map or when the community adopts an ordinance that meets the minimum requirements of the NFIP and adopts the technical data provided with the FIRM, whichever is earlier. Nearly all communities participating in the NFIP are in the Regular Program.

Regulatory floodplain: For purposes of the Community Rating System, the regulatory floodplain is the flood-prone land area that is subject to a community's floodplain development or floodplain management regulations. The regulatory floodplain includes, at a minimum, the Special Flood Hazard Area (SFHA) (see definition), but may also incorporate other areas outside the SFHA that are also subject to a community's floodplain development or floodplain management regulations.

Repetitive loss community: For purposes of the Community Rating System, a community with one or more repetitive loss properties.

Repetitive loss property: A property for which two or more National Flood Insurance Program losses of at least \$1,000 each have been paid within any 10-year rolling period since 1978.

Retrofitting: Modifications made to an existing building or nearby grounds to protect it from flood damage. Retrofitting techniques include elevation, dry and wet floodproofing, and protection from sewer backup.

Riparian ecosystem: A distinct association of flora, fauna, and soil occurring along a river, stream, lake, ocean, or other body of water and dependent upon high water tables and occasional flooding to maintain its viability. These areas often exhibit high biological productivity and species diversity. Although riparian ecosystems are closely associated with a body of water, they may extend beyond the Special Flood Hazard Area.

Riverine: Of or produced by a river or stream. Riverine floodplains have readily identifiable channels. Floodway maps can only be prepared for riverine floodplains.

Sand dunes: Naturally occurring accumulations of sand that form ridges or mounds landward of a beach.

Sensitive area: An area defined by state or local regulations as deserving special protection because of its unique natural features or its value as habitat. A sensitive area is subject to more restrictive development regulations than other floodplains or wetlands. Although sensitive areas are often closely associated with a body of water, they may extend beyond the Special Flood Hazard Area.

Severe Repetitive Loss property: As defined in the Flood Insurance Reform Act of 2004, those 1–4 family properties that have had four or more claims of more than \$5,000 or two to three claims that cumulatively exceed the building's value. For the purposes of the CRS, non-residential buildings that meet the same criteria as for 1–4 family properties are considered Severe Repetitive Loss properties.

SFHA: Special Flood Hazard Area (see definition).

Sheet flow: A condition of flooding where there is moving water but no identifiable channel. Flooding depths are usually shallow (less than 3 feet). Sheet flow may have a high velocity, as on alluvial fans.

Special Flood Hazard Area (SFHA): The base floodplain delineated on a Flood Insurance Rate Map that a community must regulate under the requirements of the National Flood Insurance Program. The SFHA is mapped as a Zone A (see definition). In coastal situations, Zone V (see definition) is also a part of the SFHA. The SFHA is included in a community's regulatory floodplain (see definition).

Special flood-related hazards: For the purposes of the Community Rating System, the term includes terrain features or special hazards that accompany or aggravate flooding, as listed in Section 401.

Stakeholders: Floodplain residents, business leaders, insurance agents, civic groups, academia, non-profit organizations, major employers, managers of critical facilities, farmers, landowners, developers, and others who are affected by flooding or whose actions can help prevent or reduce flood losses.

Storage basins: For the purposes of the CRS, storage basins include all constructed storm-water runoff detention or retention facilities located on public or private property. These include onsite detention, retention, or infiltration facilities that are required for new development.

Substantial damage: Damage of any origin sustained by a building whereby the cost of restoring the building to its before-damage condition would equal or exceed 50% of the market value of the building before the damage occurred.

Substantial improvement: Any reconstruction, rehabilitation, addition, or other improvement to a building, the cost of which equals or exceeds 50% of the market value of the building before the start of construction of the improvement.

Surcharge: An increase in flood elevation due to obstruction of the floodplain that reduces its conveyance capacity.

Tsunami: A wave caused by an underwater earthquake, landslide, or volcano that can raise water levels on the ocean shore to levels higher than the base flood elevation. Tsunamis are discussed in more detail in Section 401.

Uncertain flow paths: Channels that move during a flood, including alluvial fans and moveable bed streams. They are discussed in more detail in Section 400.

V Zone: See “Zone V.”

Variable: A term used in the formulae for calculating Community Rating System credit. For each element, there are one or more variables, which often include the acronym for the element.

X Zone: See “Zone X.”

Zone A: The Special Flood Hazard Area (except coastal V Zones) shown on a community’s Flood Insurance Rate Map. There are seven types of A Zones:

A: SFHA where no base flood elevation is provided.

A#: Numbered A Zones (e.g., A7 or A14), SFHA where an older FIRM shows a base flood elevation in relation to a national datum.

AE: SFHA where base flood elevations are provided. AE-Zone delineations are used on newer FIRMs instead of A# Zones.

AO: SFHA with sheet flow, ponding, or shallow flooding. Base flood depths (feet above grade) are provided.

AH: Shallow flooding SFHA. Base flood elevations in relation to a national datum are provided.

AR: A temporary designation for an area where a flood control system that no longer provides protection from the base flood is expected to be improved so it will provide protection to the base flood again in the future. This zone is considered part of the Special Flood Hazard Area or “regulatory floodplain,” but properties in this zone do not receive the “in SFHA” CRS premium discount (see Table 110-1).

A99: A mapped floodplain that will be protected by a federal flood protection system where construction has reached specified statutory milestones. This zone is considered part of the Special Flood Hazard Area or “regulatory floodplain,” but properties in this zone do not receive the “in SFHA” CRS premium discount (see Table 110-1).

Zone B: Area of moderate flood hazard, usually depicted on older Flood Insurance Rate Maps as between the limits of the base and 500-year floods of the primary source of flooding. B Zones may have local, shallow flooding problems. B Zones are also used to designate areas protected by levees and base floodplains of little hazard, such as those with average depths of less than 1 foot.

Zone C: Area of minimal flood hazard, usually depicted on older Flood Insurance Rate Maps as above the 500-year flood level of the primary source of flooding. C Zones may have local, shallow flooding problems that do not meet the criteria to be mapped as a Special Flood Hazard Area, especially ponding and local drainage problems.

Zone D: Area of undetermined but possible flood hazard.

Zone V: The Special Flood Hazard Area subject to coastal high hazard flooding. There are three types of V Zones: V, V#, and VE, and they correspond to the A-Zone designations.

Zone X: Newer Flood Insurance Rate Maps show Zones B and C (see above) as Zone X. The shaded Zone X corresponds to a Zone B and the unshaded Zone X corresponds to a Zone C.

200 PROCEDURES

This series covers the procedures for applying for a Community Rating System (CRS) classification and the steps for calculating and verifying a community's CRS credit. It also covers annual recertification, modifications to the community's CRS credit, and cycle verification.

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210 REQUESTING CRS CREDIT—Summary

211 Program Prerequisites

A community must meet the current prerequisites at each verification visit.

- a. **Class 9 Prerequisites:** There are six prerequisites to become and stay a Class 9 or better community. They include being in full compliance with the minimum requirements of the National Flood Insurance Program (NFIP), receiving credit for maintaining FEMA Elevation Certificates, and meeting repetitive loss criteria.
- b. **Class 6 Prerequisite:** To become a Class 6 or better community, a community must have received a classification of 5/5 or better under the Building Code Effectiveness Grading Schedule.
- c. **Class 4 Prerequisites:** To become a Class 4 or better community, a community must demonstrate that it has programs that minimize flood losses, minimize increases in future flooding, protect natural floodplain functions, and protect people from the dangers of flooding.
- d. **Class 1 Prerequisites:** To become a Class 1 community, a community must have had a successful Community Assistance Visit conducted by FEMA within the previous 12 months and demonstrate that it has a “no adverse impact” program by receiving a certain number of points for designated activities.

212 Application Procedures

The documentation and procedures for joining the Community Rating System (CRS) are listed. Most of what is needed is collected at the initial verification visit.

213 Recertification

Each year, the community’s chief executive officer must recertify that the community is continuing to implement the activities for which credit has been provided.

214 Modifications

A community may modify its CRS classification by applying for credit for new elements or activities, dropping one or more elements or activities, or submitting revised versions of materials.

215 Changes in CRS Credit

A community’s credit points can change when it changes its activities, when the *CRS Coordinator’s Manual* is revised, when its floodplain map is revised, and/or if it allows more development in the floodplain.

210 REQUESTING CRS CREDIT

211 Program Prerequisites

A community must meet the current *CRS Coordinator's Manual*'s prerequisites at the time of each verification visit. An initial verification visit is conducted in response to a community's request to join the Community Rating System (CRS). Subsequent visits are conducted every few years on a set schedule and are called "cycle verification visits." Verification visits are explained in Section 230.

No new requirements, including annual recertification requirements, affect a participating CRS community until the ISO/CRS Specialist reviews them at the cycle verification visit conducted with the community after the new criteria take effect.

211.a. Class 9 Prerequisites

In order to become and continue to be a Class 9 or better, a community must demonstrate that it has enough points to warrant the class AND meet the following six prerequisites.

- (1) The community must have been in the Regular Phase of the NFIP for at least one year.
- (2) The community must be in full compliance with the minimum requirements of the NFIP. There must be correspondence from the Regional Office of the Federal Emergency Management Agency (FEMA) stating that the community is in full compliance with the NFIP. The correspondence must have been sent within six months of the initial CRS verification visit. The FEMA Regional Office or State NFIP Coordinator may need to conduct a Community Assistance Visit if neither has been in the community recently. If a community is determined at any time to be in less-than-full compliance, it will retrograde to a CRS Class 10.
- (3) The community must maintain FEMA Elevation Certificates on all new buildings and substantial improvements constructed in the Special Flood Hazard Area (SFHA) after the community applies for CRS credit. This is explained in Activity 310 (Elevation Certificates).
- (4) If there are one or more repetitive loss properties in the community, the community must take certain actions as specified in Sections 501–504. These include reviewing and updating the list of repetitive loss properties, mapping repetitive loss areas, describing the causes of the losses, and sending an outreach project to those areas each year. A community with 50 or more repetitive loss properties (a "Category C" community) must also prepare a repetitive loss area analysis or floodplain management plan that addresses its repetitive flood problem.
- (5) The community must maintain all flood insurance policies that it has been required to carry on properties owned by the community. The community's chief executive officer

(CEO) signs the verification visit cover sheet, which includes a statement that the signer certifies that the community has all the flood insurance policies that it has been required to maintain on properties owned by the community. This is discussed further in Figure 210-1.

- (6) If a coastal community receives a draft Flood Insurance Rate Map (FIRM) that delineates the Limit of Moderate Wave Action (LiMWA), the community must agree to show the LiMWA on its final published FIRM. Although showing a LiMWA on a FIRM is voluntary for non-CRS communities, it is a prerequisite for CRS participation. The LiMWA delineation is for informational purposes only. There is no CRS requirement to regulate the area differently, but the series of International Codes has special construction requirements in areas subject to breaking waves of 1.5 feet or higher. Communities are encouraged to meet the criteria for Coastal A Zone credit (CAZ) in Activity 430 (Higher Regulatory Standards).

As part of the verification documentation, the community's chief executive officer must certify that the community has all the flood insurance policies it has been required to have. The CRS is not concerned with past lapses in flood insurance coverage. Flood insurance must be in effect at the time of the verification visit and must be kept in the future. The CRS Coordinator should make every effort to determine the community's legal requirement to purchase flood insurance.

Congress has taken steps to encourage public agencies and private property owners to purchase flood insurance instead of relying exclusively on disaster assistance for help after a flood. Therefore, disaster assistance for a community-owned building will be reduced by the amount of NFIP flood insurance coverage (structure and contents) the community should be carrying on the building—regardless of whether the community is actually carrying a policy.

In effect, disaster assistance for a public agency has a very large deductible equal to the flood insurance policy the agency should carry. The law expects public agencies to be appropriately insured as a condition of receiving federal disaster assistance.

There have also been recent cases in which communities were underinsured. Some communities have purchased only the required amount of coverage (e.g., coverage equal to the amount of a previous federal grant). The disaster assistance rule requires that a flood-damaged community fund all repairs up to the amount of flood insurance that it could have purchased.

Whether there was a requirement to purchase and maintain flood insurance as a condition of a previous federal grant or not, the community's risk manager or other appropriate official should ensure that all community-owned buildings exposed to flooding are insured for flood damage. Some communities have found out too late that their all-risk insurance policies did not cover flooding.

Figure 210-1. The CRS flood insurance prerequisite.

211.b. Class 6 Prerequisites

In order to be a Class 6 or better, a community must demonstrate that it has enough points to warrant the class AND meet the following two prerequisites.

- (1) The community must meet all the Class 9 prerequisites.
- (2) The community must have received and continue to maintain a classification of 5/5 or better under the Building Code Effectiveness Grading Schedule (BCEGS). Both BCEGS classifications (residential/ personal and commercial) must be a class 5 or better. When communities submit a modification or undergo a cycle verification, they must meet the BCEGS prerequisite in order to achieve or remain a CRS Class 6 or better.

The BCEGS program measures a community's building code adoption and enforcement as they relate to natural hazards mitigation. More information on the program can be found at www.isomitigation.com/bcegs/iso-s-building-code-effectiveness-grading-schedule-bcegs.html. Credit is also provided for BCEGS classifications of 5/5 or better under the building code credit (BC) in Section 432.h.

In accordance with Section 113.d, communities may propose alternative approaches to meet the objectives of a prerequisite. For example, communities that are prohibited by state law from adopting and enforcing building codes may submit comprehensive building construction regulations and administration and inspection procedures for review to determine the equivalent BCEGS classification. Such regulations must be enforced throughout the community, not just in the floodplain.

211.c. Class 4 Prerequisites

A Class 4 or better community must demonstrate that it has programs that minimize flood losses, minimize increases in future flooding, protect natural floodplain functions, and protect people from the dangers of flooding. Even though it may have enough points, a community that cleared most of the buildings from its floodplain with disaster assistance funds after a flood cannot be a Class 4 or better if it does not have an effective regulatory program to prevent a recurrence of the problem.

In order to be a Class 4 or better, a community must demonstrate that it has enough points to warrant the class AND meet the following prerequisites.

- (1) The community must meet all the Class 6 prerequisites.
- (2) The community must have received and continue to maintain a classification of 4/4 or better under the BCEGS.
- (3) The community must demonstrate that it has taken appropriate steps to eliminate or minimize future flood losses. To do this, a Class 4 or better community must receive credit for the following CRS activities.

- (a) Activity 430 (Higher Regulatory Standards)—The community must show that it enforces higher regulatory standards to manage new development in the floodplain.
- (i) The community must adopt and enforce at least a 1-foot freeboard requirement (including equipment or mechanical items) for all buildings constructed, substantially improved and/or reconstructed due to substantial damage, and buildings allowed to be floodproofed, throughout its SFHA, except those areas that receive OSP credit under Activity 420 (Open Space Preservation). In unnumbered A, AO, and V Zones, the community must first determine a base flood elevation consistent with the techniques credited under Activity 410 (Flood Hazard Mapping).
- (ii) The community must receive at least 700 points (after the impact adjustment) under the other elements of Activity 430 and under Sections 422.a, e, and f under Activity 420 (Open Space Preservation).
- (b) Activity 450 (Stormwater Management)—The community must receive the following credits for its watershed management plan(s) (WMP) under Section 451.b:
- (i) WMP1: 90 points (before the impact adjustment) for meeting all of the credit criteria for WMP,
- (ii) WMP2: 30 points (before the impact adjustment) for managing the runoff from all storms up to and including the 100-year event to ensure that flood flows downstream of new development do not increase due to the development, and
- (iii) An impact adjustment value of $rWMP = 0.5$ or more. Alternatively, the community may show that at least 50% of the watershed area where future growth is expected is covered by one or more credited watershed management plans.
- (c) Activity 510 (Floodplain Management Planning)—The community must have adopted and be implementing a floodplain management plan that receives at least 50% of the maximum credit under Activity 510, calculated after the impact adjustment. This 50% of the maximum credit must include at least 50% of the available points in each of planning steps 2, 5, and 8.
- (4) Obtain a minimum total credit of 100 points (after the impact adjustment) from one or a combination of the following elements that credit protecting natural floodplain functions:
- 420—Natural functions open space (NFOS),
 - 420—Natural shoreline protection (NSP),
 - 430—Prohibition of fill (DL1),
 - 440—Additional map data (AMD12) natural functions layer,
 - 450—Managing the volume of stormwater runoff (SMR, DS),
 - 450—Low impact development (LID),

- 450—Watershed management plan (WMP), credit point items 3, 5, 6, and 7,
- 450—Erosion and sediment control (ESC),
- 450—Water quality (WQ), and
- 510—Natural floodplain functions plan (NFP).

(5) Document the following life safety measures:

- (a) Obtain some credit under Activity 610 (Flood Warning and Response).
- (b) Have a map of all levees and all areas protected by levees, and an inventory of the types of buildings (residential, commercial, etc.) and the critical facilities that would be exposed to flooding should the levee(s) be overtopped or fail. This is the same as activity credit criterion (3) under Activity 620 (Levees), Section 621.b.
- (c) Have a description of the dam failure threat, including a map of all areas that would be flooded by the failure of each high-hazard-potential dam that affects the community, and the types of buildings (residential, commercial, etc.) and critical facilities that would be flooded. This is the same as activity credit criteria (2) under Activity 630 (Dams), Section 631.b.

In accordance with Section 113.d, the community may propose alternative approaches to these prerequisites that are more appropriate for local conditions.

211.d. Class 1 Prerequisites

In order to be a Class 1, a community must demonstrate that it has enough points to warrant the class, AND meet the following prerequisites.

- (1) Meet all the Class 4 prerequisites.
- (2) Meet the minimum standards of the NFIP as determined by a Community Assistance Visit conducted by FEMA within the previous 12 months.
- (3) Promote flood insurance as a vital way to protect residents and businesses from the financial impact of a flood. This is demonstrated by having at least 50% of the buildings in the community's SFHA covered by a flood insurance policy or obtaining at least 50% of the maximum points under Activity 370 (Flood Insurance Promotion).
- (4) Demonstrate that it has a “no adverse impact” approach to floodplain management. A no adverse impact approach is one in which the action of one property owner or community does not adversely affect the flood risks for other properties or communities. “Adverse impact” is measured by increased flood stages, increased flood velocity, increased flows, or the increased potential for erosion and sedimentation. The “no adverse impact” concept is explained in more detail in papers published by the Association of State Floodplain Managers, which can be accessed at www.floods.org.

This prerequisite is demonstrated by receiving credit under the following:

(a) For all of the floodplains in the community:

- (i) The community must be enforcing regulations that discourage development in the floodplain. This is demonstrated by receiving a combined total of at least 150 points under open space incentives (OSI) in Section 422.e and development limitations (DL) in Section 432.a.
- (ii) All new critical facilities must be protected to the 500-year flood level. This is demonstrated by receiving credit under protecting critical facilities (PCF) in Section 432.f in Activity 430 (Higher Regulatory Standards) and by enforcing the regulations throughout the 500-year floodplain.
- (iii) The community must have mapped and be enforcing regulations appropriate for all flood-related hazards within its jurisdiction. This is demonstrated by receiving credit under Activities 410 and 430 for all special flood-related hazards that are identified in the community's floodplain management or hazard mitigation plan credited under Activity 510 (Floodplain Management Planning).

(b) In the community's riverine floodplains:

- (i) The community's program must address potential increases in riverine flood elevations caused by new development. This is demonstrated by receiving the following credits:
 - ((1)) Activity 450 (Stormwater Management)—an impact adjustment value of rWMP = 0.75 or more. As an alternative, the community may show that at least 75% of the watershed area where future growth is expected is covered by one or more credited watershed management plans; AND
 - ((2)) All riverine floodplains must be mapped using future conditions hydrology as credited under the higher study standard credit (HSS) in Section 412.d.

(c) In the community's coastal floodplains:

- (i) The community must receive credit for regulating new development in coastal A Zones under CAZ in Section 432.k.
- (ii) The community must receive credit for using regulatory flood elevations in the V Zones and coastal A Zones that reflect future conditions, including sea level rise. This is demonstrated by receiving credit for future-conditions hydrology under the higher study standard credit (HSS) in Section 412.d.
- (iii) The community must receive credit for regulating new development in areas subject to erosion (CER) under Activity 430 (or demonstrate that it does not have a coastal erosion problem).

(5) Have a commitment to mitigate its repetitive loss problem as well as problems caused by other natural hazards.

- (a) Section 501 (Repetitive Loss List): The community must demonstrate that at least 25% of the properties on its current FEMA repetitive loss list have been protected from damage from repetitive flooding through acquisition, retrofitting, or structural flood control projects.
 - (b) Activity 510 (Floodplain Management Planning): The community must have a multi-hazard mitigation plan that has been approved by FEMA as meeting all of the requirements outlined under 44 CFR §201.6.
- (6) Protect natural floodplain functions. This is demonstrated by having a total credit of at least 150 points (after the impact adjustment) from one or a combination of the elements listed under the Class 4 prerequisite in Section 211.c(4).
- (7) Have a program to address the threat to life safety that flooding poses to the residents of the community. This is demonstrated by receiving the following credits:
- (a) The community must obtain some credit under all the elements in Activity 620 (Levees) for all levees mapped and identified in the inventory prepared for the Class 4 prerequisite in Section 211.c(5)(b).
 - (b) The community must obtain some credit under all the local elements in Activity 630 (Dams) for all areas mapped and identified as subject to dam failure flooding in the inventory prepared for the Class 4 prerequisite in Section 211.c(5)(c). The credit for the state's program (SDS) is not counted toward this prerequisite.

In accordance with Section 113.d, the community may propose alternative approaches to these prerequisites that are more appropriate for local conditions.

212 Application Procedures

212.a. Application Request

Application for a CRS classification is voluntary. A community can request a CRS classification at any time.

A community can request a CRS classification for any activities and elements, provided that

- The credit points add up to at least 500 points, enough to become a Class 9; and
- The community can meet all of the Class 9 prerequisites (Section 211.a).

The following documentation is needed to request a CRS classification. Both items can be submitted digitally to NFIPCRS@ISO.com (letters needing signatures should be scanned and sent as PDF files).

- (1) A letter of interest sent to the FEMA Regional Office that
 - States that the community is interested in joining the CRS,
 - Designates the community's CRS Coordinator,
 - States that the community will cooperate with the verification process, and
 - States that the community understands that approval from the FEMA Regional Office is needed for the ISO/CRS Specialist to visit the community and verify the creditable activities.

The letter is signed by the community's CEO and is sent to the FEMA Regional Office. Copies of the letter are also sent to the State NFIP Coordinator and the Insurance Services Office, Inc. (ISO).

Example language can be obtained from the ISO/CRS Specialist for the community's area. An example letter is included in the "Community Rating System (CRS) Application Letter of Interest and CRS Quick Check," available at www.CRSresources.org/200.

- (2) Documentation showing that the community is implementing activities that warrant at least 500 points to be at least a CRS Class 9. This can be done by using the CRS Quick Check, available at www.CRSresources.org/200, a state-specific equivalent recommended by the ISO/CRS Specialist, or another method that shows each creditable element that the community can document as meeting the credit requirements.

If the community's submittal is complete and shows that 500 or more credit points are likely, the ISO/CRS Specialist will contact the FEMA Regional Office for approval to conduct an initial verification visit with the community. This is only approval for ISO to commence the application process. As described in Section 211.a (2), communities must meet the minimum standards of the NFIP as determined by a Community Assistance Visit conducted by FEMA within six months of the verification visit. Therefore, the Regional Office (or State NFIP Coordinator) may opt to conduct the Community Assistance Visit before giving approval for the verification visit.

CRS People

Chief executive officer (CEO)—The official who is charged with the authority to implement and administer laws, ordinances, and regulations for the community. The CEO may be a mayor, city or county manager, or chair of a county board.

CRS Coordinator—The local official designated by the CEO to coordinate the community's CRS activities. The CRS Coordinator is the community's point of contact for verification and recertification.

ISO/CRS Specialist—An employee of Insurance Services Office, Inc. (ISO). ISO is under contract with FEMA to conduct field work for the Community Rating System. The ISO/CRS Specialist is the community's main contact with the program. The names and territories of the Specialists can be found at www.CRSresources.org/100.

When approval is received, the ISO/CRS Specialist will contact the community to schedule the initial verification visit. At the visit, the CRS is explained and each activity likely to receive credit is reviewed. The conduct of the verification visit is explained in Section 230.

212.b. Application Documentation

The ISO/CRS Specialist schedules the initial verification visit to review the community's programs and activities. The ISO/CRS Specialist collects the needed materials from community staff. Before the materials can be processed, the ISO/CRS Specialist must have the following five items. Some of the documentation can be provided digitally.

- (1) Correspondence from the FEMA Regional Office stating that the community is in full compliance with the minimum requirements of the NFIP (see Section 211.a(2)).
- (2) The CRS Program Data Table, with lines 6 and 13 completed (see Figure 210-2). The CRS Program Data Table is the second page of the "CC-213 Recertification" form. The CRS Community Certifications are included in Appendix E and also are available at www.CRSresources.org/200. For a community's initial application to the CRS, only the second page of the CC-213 Recertification is required (page CC-213-2).
- (3) Documentation for each element for which credit is desired. Sections 310–630 have documentation sections that itemize what is needed. The ISO/CRS Specialist reviews these with the community during the visit and collects what is needed. Section 231 reviews how documentation should be provided by the community.
- (4) A certification signed by the community's CEO that says

I hereby certify that _____ [community name] is implementing the following activities (check the ones that apply). We will continue to implement these activities and will advise FEMA if any of them are not being conducted in accordance with this certification. We will cooperate with the ISO/CRS Specialist's verification visit and will submit the documentation and annual recertification needed to validate our program.

The certification is included in the "CC-230 Verification Certification" form, which is the verification cover page provided by the ISO/CRS Specialist. The CRS Community Certifications are included in Appendix E and are available at www.CRSresources.org/200. Figure 230-1 shows a sample CC-231. The community may propose alternative language.

- (5) A certification signed by the community's CEO that says

I hereby certify that to the best of my knowledge and belief, we are maintaining in force all flood insurance policies that have been required of us as a condition of federal financial assistance for insurable buildings owned by us and located in the Special Flood Hazard Area shown on our Flood Insurance Rate Map. I further understand that disaster assistance for any community-owned building located in the Special Flood Hazard Area is reduced by the amount of NFIP flood insurance coverage (structural and contents)

that a community should be carrying on the building, regardless of whether the community is carrying a policy.

The flood insurance prerequisite is explained in more detail in Figure 210-1. The certification is included in a cover sheet provided by the ISO/CRS Specialist. This certification is also included in the “CC-230 Verification Certification” form. The community may propose alternative language.

212.c. Verification Processing

After the verification visit is done and all needed documentation has been received, the ISO/CRS Specialist produces a verification report. FEMA and ISO need several months to review, double check, and confirm the ISO/CRS Specialist’s verification report. FEMA makes the final decision on the community’s credit and classification.

Once FEMA confirms the community’s classification, it must give the insurance companies a four-month advance notice, so they can advise their agents of the rating change before policies are renewed. Therefore, a community’s classification will take effect on the May 1 or October 1 about 8–12 months after the verification visit.

212.d. Reinstating Previous CRS Communities

If a CRS community retrograded to a Class 10 for whatever reason, it may apply to be reclassified as a Class 9 or better community. Such a community must submit a complete new application according to the *Coordinator’s Manual* currently in effect. It may not submit a modification or documentation just to correct the problem activities.

213 Recertification

Each year, a community must recertify that it is continuing to meet the prerequisites for its class and to implement the activities for which it has earned credit. The ISO/CRS Specialist sends the community a list of its credited activities, and it is the community’s responsibility to respond by the deadline provided with its annual recertification package. The community must note whether it is still implementing each item on the list. The community’s recertification package can be submitted digitally to the ISO/CRS Specialist (documents needing signatures, such as CC-213 Recertification, should be scanned and sent as PDF files).

As noted in their credit documentation sections, some activities have additional requirements that must be submitted with the annual recertification. These are also noted on the list that is sent to the community. Examples of additional documentation are a copy of an annual report or a copy of an outreach project sent out during the previous year.

A COMMUNITY THAT FAILS TO RECERTIFY WILL RETROGRADE TO A CLASS 10.

- Failure to submit the listed items or to certify that all prerequisites are being met will result in loss of credit for those activities. It is possible that a community could lose enough points to cause a change in its CRS classification.
- A repetitive loss community that fails to submit a copy of its annual outreach project or a Category C repetitive loss community that fails to submit its annual progress report as required by Activity 510 (Floodplain Management Planning) will retrograde to a Class 10.

213.a. Program Data Table

A Program Data Table is included with the annual recertification materials sent by the ISO/CRS Specialist. The table is the second page of the CC-213 Recertification form (page CC-213-2), and is shown in Figure 210-2. Communities must include updated data with every annual recertification. The Program Data Table is also required at cycle verification visits and is the third page of the CC-230 Verification form (page CC-230-3).

The data help both FEMA and the community track floodplain development and mapping changes. The table is used by FEMA to help schedule assistance activities and set mapping priorities. The numbers are also used to determine the impact adjustments needed to calculate activity credit.

214 Modifications

A community may modify its CRS classification by applying for credit for new elements or activities, dropping one or more elements or activities, or submitting revised versions of materials.

214.a. Modification Criteria

Modifications are processed and verified in the same manner as cycle verification visits, although a visit may not be necessary if everything can be verified remotely.

The following provisions apply to modifications.

- (1) A cover letter and the documentation needed for the credit are submitted to the ISO/CRS Specialist.
- (2) The community must use the credit criteria of the *Coordinator's Manual* in effect at the time the modification is submitted.
- (3) A community's CRS classification cannot change more than once a year. Therefore, only one modification can be processed over a 12-month period.

CRS Program Data	A. In the SFHA	B. In a regulated floodplain outside the SFHA	C. In the rest of the community
1. Last report's number of buildings in the SFHA (bSF) (line 6, last report)			
2. Number of new buildings constructed since last report	+		
3. Number of buildings removed/demolished since last report	-		
4. Number of buildings affected by map revisions since last report (+ or -)			
5. Number of buildings affected by corporate limits changes (+ or -)			
6. Current total number of buildings in the SFHA (bSF) (total lines 1-5)			
7. Number of substantial improvement/damage projects since last report			
8. Number of repetitive loss properties mitigated since last report			
9. Number of LOMRs and map revisions (not LOMAs) since last report			
10. Acreage of the SFHA (aSFHA) as of the last report (line 13, last report)			
11. Acreage of area(s) affected by map revisions since last report (+ or -)			
12. Acreage of area(s) affected by corporate limits changes (+ or -)			
13. Current acreage of the SFHA (aSFHA) (total lines 10-12)			
14. Primary source for building data:			
15. Primary source for area data:			
16. Period covered: From _____ To _____		Current FIRM date:	
<i>If available, the following data would be useful:</i>			
17. Number of new manufactured homes installed since last report			
18. Number of other new 1 - 4 family buildings constructed since last report			
19. Number of all other buildings constructed/installed since last report			
Notes: Lines 1-8 deal with "buildings." Section 301 has more information about what qualifies as "buildings" and how they are counted for CRS purposes. Numbers in column A are for the Special Flood Hazard Area. If the community also regulates floodplain development outside the SFHA, Column B is completed (and the community may deserve credit under Activity 410 (Flood Hazard Mapping)). The data in Column C help relate what happens in the floodplain to what is happening in the rest of the community.			

Figure 210-2. The CRS Program Data Table (CC-213 Recertification).

Instructions for completing the Program Data Table are included in the annual recertification materials sent to communities by their ISO/CRS Specialists each year. They can also be viewed at www.CRSresources.org/200.

- (4) If a community is modifying an activity previously applied for, its submittal must include documentation for both the new elements of the activity and those that were previously credited, if they are still being implemented.
- (5) The ISO/CRS Specialist verifies only the activity(ies) being modified and reviews the rest at the next cycle verification visit. There are two exceptions to this, as noted under (6) and (7), below.
- (6) The ISO/CRS Specialist will automatically update the community's credit points for
 - (a) The community's BCEGS classification (a Class 6 and Class 4 prerequisite and credited in Section 432(h));
 - (b) The community's credit for the state dam safety credit (Section 632.a); and
 - (c) The county growth adjustment (Section 710). If the growth adjustment is changed, the total points for all affected activities in the 400 series will reflect the new factor.
 - (d) If the community's repetitive loss category has changed since the previous cycle verification, the community must comply with Section 502.a, as applicable.
- (7) The community's entire program is verified with a verification visit under the following circumstances:
 - (a) If the modification will result in a two-class improvement, or
 - (b) If the *Coordinator's Manual* has substantially changed most of the rest of the community's credits.

In these situations, the verification visit counts as a cycle verification visit and the community's cycle schedule starts over.

214.b. Courtesy Reviews

Communities are encouraged to submit materials at any time for the ISO/CRS Specialist to review. A courtesy review advises the community about the impact of new programs or revisions to existing activities on its CRS credit.

Courtesy review materials are returned to the community with comments. They are not credited to the community's program. The only way a community's credit points may be changed is by submitting a modification with enough points to result in a class change.

If the community submits a modification that does not have sufficient credit points to result in a class change, it is treated as material for a courtesy review.

215 Changes in CRS Credit

215.a. Changes Initiated by the Community

A community's credit points can change due to the following actions initiated by the community:

- (1) The community may request a modification to improve a class at any time (Section 214).
- (2) The community may gain or lose points during the cycle verification visit, if it adds or drops activities, or if it cannot submit the materials needed to document the credit.
- (3) The community will lose points if it fails to recertify that it is continuing to meet the prerequisites and implement all the activities for which it was receiving credit (Section 213).
- (4) If credit points are dependent upon another agency or organizations (see Section 231.d), the community may gain or lose points based on the other agency's or organization's actions. An example of this is the credit for the state's dam safety program (SDS) under Activity 630 (Dams).

215.b. Changes in the *CRS Coordinator's Manual*

From time to time, the *Coordinator's Manual* is revised. Revisions are made with an eye toward minimizing loss of credit for communities already participating in the CRS. Revisions are normally limited to once every three years.

Communities keep their credit points by continuing to meet the specifications of the *Coordinator's Manual* that was in effect at their last verification visit, including the requirements for the annual recertification. At a community's first cycle verification visit AFTER the new *Coordinator's Manual* goes into effect, local program credits are recalculated according to the new *Coordinator's Manual*.

215.c. Changes in the Floodplain Map

A community's credit points can be affected by annexations or flood control projects that change the floodplain boundaries. These changes can affect the areas or buildings credited under several activities and the impact adjustment calculations. If a project or annexation is contemplated, the CRS Coordinator should contact the ISO/CRS Specialist to review its impact on the community's credit points.

Example 215.c-1.

A flood control project results in a map revision that removes 100 buildings from the SFHA. Twelve of the buildings had been retrofitted and were credited under Activity 530 (Flood Protection). Those buildings are no longer eligible for retrofitting credit because Activity 530 only credits retrofitted buildings that are in the regulatory floodplain.

Example 215.c-2.

A community annexes an area that includes a large amount of floodplain. The result doubles the size of the community's SFHA. The community will lose credit points under Activity 420 (Open Space Preservation) if the open space now makes up a smaller portion of the SFHA.

Conversely, if the annexed area includes a large amount of preserved open space, the community's credit under Activity 420 could increase.

215.d. New Development

A community's credit points can be affected by new development. Several activities' credits are modified by an impact adjustment based on the number of buildings in the SFHA. An example is Activity 520 (Acquisition and Relocation), which adjusts the credit based on the ratio of the number of buildings cleared out of the regulatory floodplain to the number of buildings remaining in the SFHA. If the community permits more new buildings in the floodplain, the number of buildings in the SFHA increases and the total credit for Activity 520 would decrease.

New development in the county will also affect the county growth adjustment (CGA, explained in Section 710). A growing county will mean an increase in points in the 400 series. If the growth rate declines over time, the total points could decrease.

220 CREDIT CALCULATION—Summary

Calculating the Community Rating System (CRS) classification for a community is done in five steps as explained in Sections 221–225. Four terms are used throughout the *CRS Coordinator's Manual*.

- The CRS is divided into four **SERIES** of activities: “Public Information Activities,” “Mapping and Regulation,” “Flood Damage Reduction Activities,” and “Warning and Response.”
- Within each series, there are three to seven **ACTIVITIES**.
- Within each activity, there are one or more **ELEMENTS**.
- For each element, there are one or more **VARIABLES**. These variables often include the acronym for the element. The variables are needed for the formulae that are used to calculate the credit points for each element.

221 Step 1. Element Credit Points

Each activity has a section entitled “Credit Criteria” and/or “Credit Points.” Each element has a maximum number of credit points, which can be earned if the element meets the listed credit criteria.

222 Step 2. Impact Adjustment

The credit points earned in Step 1 need to be adjusted to reflect the impact of the community’s activity on floodplain development and on the community’s flood insurance premium base.

223 Step 3. Credit Calculation

The last step listed for each activity is to compute its credit by multiplying the element’s credit points by the impact adjustment. The credits for each element are totaled to compute the activity’s credit points.

224 Step 4. County Growth Adjustment

The points for the five mapping and regulatory activities in the 400 series are adjusted to reflect the county’s growth rate.

225 Step 5. Community Classification

The points for all the activities are totaled to calculate the community’s CRS classification.

220 CREDIT CALCULATION

Calculating the Community Rating System (CRS) credit points and determining the CRS classification for a community is done in five steps:

- Step 1. Element Credit Points,
- Step 2. Impact Adjustment,
- Step 3. Credit Calculation,
- Step 4. County Growth Adjustment, and
- Step 5. Community Classification.

The steps are explained in Sections 221–225. The ISO/CRS Specialist calculates the community's credit points after each verification visit. A community may also use the Quick Check to estimate its credits, and work with the ISO/CRS Specialist to more accurately calculate credit points.

All credit points calculated by a community are unofficial and are verified by the ISO/CRS Specialist. The final, verified, points are determined by the ISO/CRS Specialist.

Four terms are used throughout the *Coordinator's Manual*: (1) series, (2) activity, (3) element, and (4) variable. These divisions direct communities to the credits for which they qualify, and divide the program logically into easily understood pieces.

Series

The CRS activities are divided into four series:

- 300 Series – Public Information Activities,
- 400 Series – Mapping & Regulations,
- 500 Series – Flood Damage Reduction Activities, and
- 600 Series – Warning and Response.

These series are the subject of the four main sections of the *Coordinator's Manual* and recognize community efforts to inform the public, prevent future flood damage, address existing flood problems, and prepare for flood emergencies.

Activities

Each series has from three to seven activities. Within the four series, there are 19 CRS activities. Each activity has a title, such as “Flood Hazard Mapping” or “Acquisition and Relocation.” The titles are mostly self-explanatory, but they may include components that are not specifically named in the title. A summary page at the beginning of each activity lists that activity’s elements.

A community may select which activities it wants credit for, with three exceptions:

- (1) Activity 310 (Elevation Certificates) is a prerequisite for all communities for participation in the program (see Section 211.a).
- (2) Activity 510 (Floodplain Management Planning) is a prerequisite for Category C repetitive loss communities (see Section 503).
- (3) If a community wants to become a Class 6 community, it must have received and continue to maintain a classification of 5/5 or better under the Building Code Effectiveness Grading Schedule (BCEGS).
- (4) If a community want to become a Class 1–4 community, it must have credit from certain activities to show that it has a program that addresses all the goals of the CRS (see Section 211.c and d), and it must have received and continue to maintain a classification of 4/4 or better under the BCEGS).

At the end of the credit calculation process, the credits for all activities are added together to get the community’s total credit (see Section 225).

Elements

Within each activity, there are one or more elements. These are discrete pieces of a community’s floodplain management program, and each receives a certain number of credit points.

Each element has an acronym that is used in the calculation formulae. Some elements have subelements that are numbered.

Example 220.c-1.

The elements and their acronyms in Activity 310 (Elevation Certificates) are

- EC, credit for Elevation Certificates since CRS application;
- ECPO, credit for post-FIRM Elevation Certificates; and
- ECPR, credit for pre-FIRM Elevation Certificates

The elements and their acronyms in Activity 320 (Map Information Service) are

- MI1, credit for providing basic FIRM information
- MI2, credit for providing additional FIRM information
- MI3, credit for showing problems not shown on the FIRM
- MI4, credit for providing flood depth data
- MI5, credit for advising inquirers about special flood-related hazards
- MI6, credit for providing historical flood information
- MI7, credit for advising inquirers about natural floodplain functions

A community need not apply for all of the elements in an activity in order to receive credit points for the activity. However, in some cases, one element may be required in order to obtain any credit. For example, EC is a prerequisite for any credit for Activity 310 and MI1 is a prerequisite for any Activity 320 credit. These requirements are shown in the “Credit Criteria” section of the activity or element.

Variables

Each element’s acronyms are used in the formulae to calculate the credit points. These acronyms are listed alphabetically in Appendix A. The acronyms or variables for basic scoring elements are capitalized, as in “ECPO,” the variable that represents Elevation Certificates for post-FIRM buildings.

For each element, there are one or more additional variables used in the calculation formulae. Most of these have a lower-case letter preceding the acronym for the element.

Example 220.d-1.

The variables associated with post-FIRM Elevation Certificates are

- ECPO, the initial points for the element;
- bECPO, the number of post-FIRM buildings with Elevation Certificates;
- rECPO, the impact adjustment ratio for the element; and
- cECPO, the credit for the element, after the impact adjustment.

221 Step 1. Element Credit Points

The first step is to determine the credit points for each element for which the community requests credit. Under each activity is a section entitled “Credit Criteria.” For some activities there is a single “Activity Credit Criteria” and for other activities there is a separate credit criteria section under each element. These sections need to be reviewed to ensure that the community’s program qualifies for credit.

Each activity also has a “Credit Points” section. Each element has a maximum number of credit points that can be earned if the element is being implemented in accordance with the credit criteria. A community will receive less than the maximum points if its program does not include all the items listed in the Credit Points section.

Example 221-1.

Freeboard (FRB) is an element under Activity 430 (Higher Regulatory Standards). Freeboard can receive up to 500 points, depending on how high it is and whether fill is regulated. The points for FRB are listed in a table. The value for a freeboard not listed, such as 1.5 feet, can be interpolated from the table.

Credit Points				
FRB = as shown in the following table, based on the required freeboard				
Freeboard	No filling restrictions	Compensatory storage required	Fill prohibited	
1 foot	100	110	120	
2 feet	225	250	280	
3 feet	375	440	500	

For this series of examples, a community has a freeboard requirement of one foot above the base flood elevation and it requires compensatory storage if fill is used to elevate the building.

$$\text{FRB} = 110$$

Credit for Activities not listed in the Coordinator’s Manual

The CRS cannot prescribe credit criteria for every possible scenario of effective floodplain management in the country. The community may make reasonable interpretations that its program is in line with the intent of the element credit. However, it is recommended that whenever a community has trouble fitting its program into the credit criteria, it contact the

ISO/CRS Specialist. It may be that the *Coordinator's Manual* is being misunderstood or misinterpreted and that things are simpler than they first appear.

In accordance with Section 113.c, a community may submit alternative approaches to the listed elements. They will be considered by the Insurance Services Office, Inc., (ISO) and the Federal Emergency Management Agency (FEMA). In instances in which the approach is difficult to apply to the existing formula, the applicant should demonstrate its impact on the objective of the activity. Where a state or regional approach is different, it would be appropriate for the state or regional agency to demonstrate the impact on behalf of its communities and have the approach credited under Section 231.d.

Activity 430 (Higher Regulatory Standards) provides an example for this. Because there are so many ways to exceed the regulatory standards of the National Flood Insurance Program (NFIP), one of the elements is “other higher standards” (OHS). OHS allows for higher local regulatory standards not listed under Activity 430 to be considered for credit.

222 Step 2. Impact Adjustment

The credit points need to be adjusted to reflect the activity’s impact on the community’s flood insurance premium base, which can include more policies than are actually in the area affected by the activity. For example, 100% of the buildings in the Special Flood Hazard Area (SFHA) will benefit from the CRS’s insurance premium credit even if only 50% of the SFHA is subject to higher regulatory standards or other activities. Therefore, this Step 2 adjustment also serves to adjust credits so that the dollar impact of any discounts is spread over the community’s entire premium base.

A community that has preserved most of its floodplain as open space should receive more credit under Activity 420 (Open Space Preservation) than one that has only a small area preserved. Therefore, the element credit points determined in Step 1 need to be adjusted to reflect the impact of the community’s program on the objective of the activity.

There are two bases for most impact adjustments:

- (1) The number of BUILDINGS that are affected compared to the number of buildings in the SFHA. For example, if a community wants credit for having Elevation Certificates on 25 post-FIRM buildings and it has 100 post-FIRM buildings in its SFHA, then it gets $25 \div 100 = 0.25$ or 25% of the maximum credit. Impact adjustments based on buildings is covered in more detail in Sections 301–302.
- (2) The AREA of the floodplain that is affected compared to the area of the SFHA. If a community has 1,000 acres of SFHA and 200 acres are preserved as open space, it gets $200 \div 1,000 = 0.2$ or 20% of the maximum credit. Area is used to adjust credits in the 400 series of mapping and regulatory activities, because the impact is on new development, not existing buildings. Impact adjustments based on area are covered in more detail in Sections 402–404.

Some elements do not lend themselves to building or area measurements. For natural shoreline protection (NSP) under Activity 430 (Higher Regulatory Standards), for example, the length of shoreline is used.

Most of the activities have a section entitled, “Impact Adjustment.” The impact adjustment sections describe one or more “r” variables. The impact adjustment ratios (“r” variables) usually have a range of 0 to 1. They are the result of a formula that divides the number of buildings or area affected by the total number of buildings or area of interest. In most cases the area of interest is the SFHA, but in the stormwater management elements, for example, the area of interest is the watershed that drains into the community.

In all CRS calculation formulae, numbers are rounded to two decimal points at each step. Numbers of 0.005 or higher are rounded up to the next 100th and numbers below 0.005 are rounded down. Final credit points for each activity are rounded to the nearest whole number.

Example 222-1.

The impact adjustment ratios for the elements in Activity 430 are established in an “Impact Adjustment” section for each element. For freeboard, the formula is:

$$r_{FRB} = \frac{a_{FRB}}{a_{SFHA}}, \text{ where}$$

a_{FRB} = the size of the area(s) that qualify for FRB credit, and

a_{SFHA} = the size of the community’s SFHA

The community in Example 221-1 does not require freeboard throughout its SFHA. It only enforces its freeboard requirement where there is a base flood elevation. Therefore, this higher regulatory standard has no impact in approximate A Zones, where there are no base flood elevations shown on the FIRM.

The area where freeboard has an impact (a_{FRB}) is the area of all the SFHA with base flood elevations, i.e., AE and VE Zones. In this community’s case, that is 744 acres. The SFHA is 932 acres.

$$a_{FRB} = 744$$

$$a_{SFHA} = 932$$

$$r_{FRB} = \frac{a_{FRB}}{a_{SFHA}} = \frac{744}{932} = 0.809012875 = 0.81 \text{ (rounded to two decimal points)}$$

Some activities and elements have no impact adjustment section because they must cover the entire floodplain or the entire community for credit. For example, most of the public information programs benefit all residents in the community, so they do not have an impact adjustment step.

223 Step 3. Credit Calculation

223.a. Element Calculation

The last step for each element is to multiply the element's credit points by its impact adjustment. The result is shown in the formulae with a lower case "c" before the element's acronym. These formulae appear in the "Credit Calculation" sections of the elements or in a single "Credit Calculation" section for the activity.

Example 223.a-1.

For the community with one foot of freeboard enforced only in AE and VE Zones, the formula is

$$cFRB = FRB \times rFRB = 110 \times 0.81 = 89.10$$

If there is more than one iteration of an element, the formulae are repeated. For example, a community may have a two-foot freeboard requirement in V Zones and a one-foot freeboard requirement in riverine areas. Such situations are represented with a "#1" for the first iteration, a "#2" for the second one, etc., as in FRB#1, FRB#2, etc. $cFRB = cFRB\#1 + cFRB\#2 + \text{etc.}$

Where more than one iteration of an element is the norm, the formula will show the summation of the total with the mathematical symbol sigma, " \sum ."

Example 223.a-2.

Credit for low density zoning (LZ) in Activity 420 (Open Space Preservation) assumes that the community has several zoning districts, each with a different allowed density (represented by "s" for lot size). The credit calculation formula for low density zoning is:

$$cLZ = \sum(LZ\#s \times rLZ\#s)$$

223.b. Activity Calculation

Each activity has a “Credit Calculation” section, in which the element credits are totaled. This is done by means of a formula that uses the prefix “c” to represent the total credit points for the activity. The total is rounded off to the nearest whole number.

Example 223.b-1.

The total credit for Activity 430 (Higher Regulatory Standards):

$$\begin{aligned} c430 &= cDL + cFRB + cFDN + \dots \\ &= 0 + 89.10 + 30.60 + \dots = 119.70, \text{ rounded to 120} \end{aligned}$$

This is the last step for activities in the 300, 500, and 600 series.

224 Step 4. County Growth Adjustment

The credit points for the five activities in the 400 Series (Mapping and Regulations) are adjusted to reflect the county’s growth rate. The faster an area grows, the more important it is to regulate development to prevent flood losses. The county growth adjustment multiplier is included in the final calculations of the community’s credit in Section 720. The value to enter is determined in Section 710 (County Growth Adjustment).

Example 224-1.

The county growth adjustment (CGA) for the community in the earlier examples is 1.18, i.e., it has an average annual growth rate of 1.8%. In Section 720, Community Total Points, CGA is multiplied by the value for each of the 400 Series activities.

$$c430 = c430 \times CGA = 120 \times 1.18 = 141.60$$

The credit for Activity 430 is increased by 18%, or 21.60 points.

Note that the credit required for program prerequisites (Section 211) is considered before the calculation for the county growth adjustment.

225 Step 5. Community Classification

At Step 5, the points for all the activities are totaled to obtain the community's total points (cT). The total points determine the community CRS classification, assuming all prerequisites have been met. The conversion of total points to a CRS class is shown in Table 110-1. An example of Step 5 is shown in Section 720.

230 VERIFICATION—Summary

231 Documentation Provided by the Community

- a. **Certifications and Checklists:** Communities must certify that they have or are conducting certain credited activities and that they have complied with environmental and historic preservation requirements. Checklists are available to assist in carrying out and documenting activities.
- b. **Digital Documentation:** Communities are encouraged to provide the needed documentation in digital form.
- c. **Ordinances:** This section explains the criteria for submitting regulatory language.
- d. **State-based Credit:** A community may receive credit for an activity that is implemented by a state or regional agency.
- e. **Maps:** Several activities require a map as documentation and many activities need impact adjustment maps.

232 Verification Visit

- a. **Visit Scheduling:** The ISO/CRS Specialist schedules a verification visit with the community.
- b. **Cycle Scheduling:** Cycle verifications are conducted periodically after the original application date for most Community Rating System communities
- c. **Conduct:** A verification visit usually takes one or two days, depending on the number of activities for which the community is requesting credit.
- d. **Verification Thresholds:** If the visit reveals that any credited activities are not being fully implemented, then the credit points are adjusted.

233 Post-visit Actions

The materials collected during the visit are reviewed by the ISO/CRS Specialist, ISO/CRS Technical Reviewers, and the Insurance Services Office, Inc., (ISO) Program Coordinator before they are submitted to FEMA for approval.

230 VERIFICATION

The Community Rating System (CRS) application process is discussed in Section 212. Calculating the credit points is covered in Section 220. This section summarizes the other parts of the verification process. In order to receive credit points for its activities, a community's program must be verified. This work is done by the ISO/CRS Specialist, who

- Reviews the community's submitted documentation;
- Visits the community to review files, permit records, etc.;
- Visits field sites to review implementation on the ground;
- Determines if the class and activity prerequisites are met;
- Calculates the appropriate credit points; and
- Ensures that the community file is processed for FEMA's decision.

The names and territories of the ISO/CRS Specialists can be found at www.CRSresources.org/100.

231 Documentation Provided by the Community

The verification of applications, recertifications, and modifications requires documentation. The ISO/CRS Specialist must collect materials on the credited activities. The materials are used to prepare a file that is available for internal review and for the Federal Emergency Management Agency (FEMA).

Each activity or element has a section titled "Documentation Provided by the Community," which itemizes what is needed for verification or recertification. This section covers some standard documentation protocols.

231.a. Certifications, Checklists, and Examples

Most documents that are needed to verify CRS credits are copies of the ordinances, permit files, and records maintained by the community during its normal course of business. The CRS is designed to credit what the community is doing, so to the extent possible, locally developed documentation is preferred. However, there are a few documents that usually are not kept by a community, but are needed for the CRS or have proven useful in obtaining CRS credit.

Certifications

Certifications are statements signed by a community official, attesting that a certain thing was or will be done. An example is the Chief Executive Officer's assurance that the community will continue to implement the activities for which it has requested credit. To

facilitate local documentation and to obtain national standardization, four “Community Certifications” are provided in Appendix E:

- CC-213 Recertification
- CC-230 Verification
- CC-RL The Repetitive Loss List
- CC-530 Retrofitted Buildings.

Other certification forms document that a community’s programs comply with local, state, and federal environmental laws and regulations. They are provided in Appendix F. These environmental and historic preservation (EHP) certifications are needed if the community applies for credit under the activities listed below. These are activities that could have an adverse effect on the environment or on historic properties or areas.

- Activity 520 (Acquisition and Relocation)
- Activity 530 (Flood Protection)
- Activity 540 (Drainage System Maintenance)
- Activity 620 (Levees).

All Community Certifications have been reviewed and approved by the Office of Management and Budget, in compliance with the Paperwork Reduction Act. Their use is required, although a community may prepare alternative language, subject to approval by FEMA.

Checklists

The CRS has developed checklists to help the CRS Coordinator or other local official assemble all documentation needed for CRS credit. Use of these is voluntary, but they do help both the local official and the Insurance Services Office, Inc., (ISO) reviewers ensure that all needed materials are being provided.

Checklists are not official FEMA publications and they may change over time. They are noted in the “Documentation Provided by the Community” sections and can be downloaded from the CRS website, www.CRSresources.org.

Examples

Many communities use the CRS to identify new floodplain management activities that they could be doing. These communities request guidance on how to implement the new programs. Accordingly, there are many examples provided in the *CRS Coordinator’s Manual*. Cases in point are the example map information log and map information letter in Figures 320-1 and Figure 320-2. Communities are not required to use these examples. If they are used, communities are encouraged to tailor them to local conditions and circumstances.

Examples are not official FEMA publications and may change over time. All of the examples in the *Coordinator's Manual* can be found on the CRS website, www.CRSresources.org, in Microsoft Word® or Excel®. The website also has examples that have been or are being used by CRS communities.

231.b. Digital Documentation

Communities are encouraged to provide documentation in digital form. This can greatly reduce the paper files maintained by the community and the amount of paper documentation provided to the ISO/CRS Specialist for the community's verification.

There are two primary ways to provide digital documentation:

- (1) Ordinances, codes, regulations, plans, and other documents may be available on the community's website. In this case, the only documentation required is the Universal Record Locator (URL) for the document and a note that states where within that document the specific language is located. For example, if a community has its floodplain management ordinance on its website and wants credit for freeboard for new buildings in the floodplain, it would provide the ISO/CRS Specialist with the URL for the ordinance and identify the section(s) of the ordinance containing the freeboard requirement(s).
- (2) In other cases, the community may have a document in digital form, but not on its website. In that case, the document can be provided to the ISO/CRS Specialist on a USB drive, a compact disk (CD), via e-mail, or by posting it on a File Transfer Protocol (FTP) site. Again, there must be a note that explains where the appropriate language is within the digital document.

Digital documents not directly viewable on a website must be provided in common file formats. Acceptable file types include PDFs, normal graphic formats (jpg, gif, png, etc.), and those viewable in Microsoft Word and Excel. Files that require other software, such as GIS files, cannot be used. Therefore, due to map scales and viewing limitations, hard copy maps may still be necessary.

231.c. Ordinances

Ordinances, by-laws, and regulations are documented as follows.

- (1) The regulatory language must have the force of law and be in a document adopted by the community's governing body.
- (2) The language must clearly explain what is required. The following are not acceptable:
 - Statements of purpose and other discussions that are not specific regulatory requirements;

- Plans and other documents that do not have final regulatory authority over development; and
 - Language that does not have a clear and consistent requirement, such as “to the extent practical,” “unless exempted by the City Engineer,” or “the building official may require . . .”
- (3) In addition to the regulatory language submitted for credit, the submittal needs to include related sections on enforcement, such as where the regulation applies and any exemptions that may be allowed.
- (4) If the legal authority for the regulatory language is not clear, the ISO/CRS Specialist may request a letter from the community’s legal counsel that confirms that he/she will defend the regulation in court should there be a challenge.
- (5) For CRS credit, the regulatory language must be adopted and in full force at the time of the verification visit.
- (6) Regulations adopted by a county, regional agency, or state that are enforced within the community can be credited. Their implementation is verified in the same manner as a community regulation and it is expected that the community will assist in that verification. See also Section 231.d on state-based credit.
- (7) A photocopy of the appropriate page(s) of the ordinance is sufficient. It must be marked to show where the regulatory provision appears (e.g., with the credit’s acronym in the margin). An alternative to a photocopy is a digital copy (see Section 231.b). If a digital copy is submitted, the community must identify the specific section number(s) where the qualifying language appears.
- (8) No separate certification of the ordinance copy is needed. The community’s chief executive officer’s (CEO’s) certification that the community is implementing the activities (Section 212.b(4)) is considered certification that the ordinance has been adopted and is being enforced.

231.d. State-based Credit

A community may receive credit for an activity that is implemented by a state or regional agency. For example, a state law may require the disclosure of a flood hazard before the sale of real estate.

“State-based credit” can be provided to the affected communities. “State-based” means that all communities in the affected area receive the same credit (minimum credit), as verified by a state agency or through ISO, but if a community does additional work or has a higher regulatory standard in all or part of the affected area, the community can document that it deserves higher credit.

A summary of state-based credits is published for each state and can be found at www.CRSresources.org/200. The publication may include credits that are automatic for all communities (such as a state-enforced statute on real estate disclosure) or credits that need additional materials to document that the activity is being implemented in the community (such as a state required freeboard—the ISO/CRS Specialist would still need copies of Elevation Certificates to verify that it is being enforced locally).

In some cases, the ISO/CRS Specialist can work with the state or regional agency to collect the needed documentation. In others, it is expected that the community will obtain the additional documentation that may be needed.

231.e. Maps

Several activities require a map as documentation and many activities need impact adjustment maps. Maps must meet the following criteria:

- (1) They need to be drawn or printed to scale, have a “north” arrow, and include a legend.
- (2) Areas affected by an activity or element need to be clearly labeled. The element’s acronym is acceptable labeling.
- (3) Digital maps are encouraged, but they must be in a common graphic format (pdf, jpg, gif, etc.). Files that require other software, such as GIS files, cannot be used.

232 Verification Visit

232.a. Visit Scheduling

After the application review concludes that the community could receive at least a Class 9 classification, and approval has been received from the FEMA Regional Office, the ISO/CRS Specialist schedules a verification visit with the community. After a date is agreed upon, the ISO/CRS Specialist sends correspondence confirming the date and describing what will happen during the visit. If a community is unable to participate in the verification visit, it will remain a Class 10.

Visits can also be conducted when FEMA learns of problems in a community that shed doubt on whether it is fully implementing its activities. For example, if there was a flood and it appeared that flood warnings were not disseminated or there are a large number of new “submit for rating” flood insurance policies on buildings that do not appear to be properly elevated.

Visits may also be conducted to verify a modification that will change the community’s class (see Section 214).

232.b. Cycle Scheduling

A community keeps its classification for three or five years after its effective date. Cycle verifications are conducted every five years after the original application date for most CRS communities. Communities with larger total premium discounts and/or better classes may be visited on a three-year cycle.

The year before its classification lapses, the ISO/CRS Specialist will contact the community to schedule a cycle verification visit. Cooperation by the community in scheduling and conducting the visit is vital in order to process the cycle verification in time.

The cycle verification is based on the version of the *CRS Coordinator's Manual* currently in effect, not the one used for the original application or the last cycle visit.

The cycle verification visit may be scheduled before or after the three- or five-year cycle. Some reasons for variation from this cycle include

- If the community has a new CRS Coordinator,
- If there has been a major flood or other disaster,
- When there is reason to believe that the community is no longer implementing all of its credited activities, and
- If time and costs can be substantially saved by combining the cycle verification visit with visits to neighboring communities.

232.c. Conduct of Verification Visit

A verification visit involves a detailed review of all credited activities and may be a multi-day event. More time is spent with the communities that have very large flood insurance premium discounts or large numbers of credited activities. Representatives from the FEMA Regional Office and/or the State NFIP Coordinator's office may also attend the verification visit.

During the visit, the ISO/CRS Specialist reviews changes in the *Coordinator's Manual* since the last visit. The community's activities and the class prerequisites are reviewed and documented. New activities and elements are explained and may be verified.

The CRS Coordinator needs to be present for the entire visit. The Coordinator and the ISO/CRS Specialist can agree on a schedule that minimizes the amount of time that other community staff need to be present.

Preparation

The documentation that is needed for the verification visit is listed in the "Documentation Provided by the Community" section for each element or activity. The ISO/CRS Specialist will send a list of typical documentation with the meeting confirmation letter.

Also before the visit, the ISO/CRS Specialist will request copies of all Elevation Certificates (required for Activity 310 credit) collected since the last visit and other documentation that needs to be reviewed before the visit. These are reviewed before the visit and the findings are discussed at the visit. Other documentation is collected during the visit and either reviewed then or taken by the ISO/CRS Specialist to review later.

Office Review

The ISO/CRS Specialist will discuss office procedures and similar topics with the appropriate staff. Samples of records, such as permits, map information logs, and inspection papers are reviewed.

If the required documentation is missing or otherwise deficient, credit cannot be verified for that element. However, the community will be allowed time after the visit to assemble other material necessary to verify the activities for which credit was requested.

New Activities

A community can receive credit for any activity that is verified at the visit, even if it was not included with the application or the activity was not implemented at the time of the last visit, provided that the credit criteria and documentation requirements are met.

Credit cannot be provided for activities that were STARTED AFTER the verification visit. For example, credit is not provided for an ordinance provision that was not adopted or officially approved by the local governing body before the verification visit.

Field Verification

For some elements, the ISO/CRS Specialist verifies credit in the field. The CRS Coordinator and/or other community staff members are encouraged to accompany the ISO/CRS Specialist on the field verification. What might look like a problem to the ISO/CRS Specialist may be easy to explain by someone familiar with the situation.

Exit Interview

When the visit is completed, the ISO/CRS Specialist will offer to speak to the CEO, or the highest ranking person available, to discuss the results, the approximate points, the community's expected CRS Class, and the need to keep implementing the credited activities. It is recommended that the CRS Coordinator take advantage of this opportunity to brief his or her superiors on the program.

The community's CEO is asked to certify the community's verified program by signing Community Certification CC-230. If the CEO cannot sign the CC-230 during the visit, a signed copy must be submitted to the ISO/CRS Specialist within 30 days of the visit. An example of a completed CC-230 is in Figure 230-1.

232.d. Verification Thresholds

If the visit reveals that any credited activities are not being fully implemented, then the credit points are adjusted.

If the ISO/CRS Specialist finds that implementation of an element has fallen below a certain threshold, credit is not provided for that element. Activities vital to good floodplain management and for National Flood Insurance Program compliance have higher thresholds. The thresholds are

- Activity 310 (Elevation Certificates): 90%;
- Floodplain and stormwater management regulations in the 400 series: 80%; and
- All others: 50%.

Example 232.d-1.

In an office review of inspection records to verify channel debris removal (CDR) under Activity 540 (Drainage System Maintenance), the ISO/CRS Specialist finds that 72% of the sites appear to be inspected annually, but 28% are not. The community's verified credit will be 72% of the credit for the element. If fewer than 50% of the sites had been properly maintained, the community would have received no credit for CDR.

Example 232.d-2.

The ISO/CRS Specialist reviews a number of Elevation Certificates to verify freeboard and finds that only 72% of them show the building elevated to or above the freeboard level. Because the results are below the 80% threshold for floodplain management regulations in the 400 series, the community will receive no credit for freeboard.

Credit for any element is prorated if the sampling finds instances in which the element is not fully implemented. It does not matter why it is not fully implemented. For example, if the lack of freeboard in the previous example was due to legally-issued variances, the credit is still prorated (or denied if the verification threshold is not met).

Verification

Community <u>West Bay</u>	State <u>MS</u>	CID <u>280252</u>																										
<small>OMB No. xxxxxxxxx Expires: xxxxxxxxxxxx</small>																												
CC-230 Verification																												
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<p>I hereby certify that <u>the town of West Bay</u> [community name] is implementing the following activities [check the ones that apply]. We will continue to implement these activities and will advise FEMA if any of them are not being conducted in accordance with this certification. We will cooperate with the ISO/CRS Specialist's verification visit and will submit the documentation and annual recertification needed to validate our program.</p>																												
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<p>I hereby certify that, to the best of my knowledge and belief, we are maintaining in force all flood insurance policies that have been required of us as a condition of Federal financial assistance for insurable buildings owned by us and located in the Special Flood Hazard Area shown on our Flood Insurance Rate Map. I further understand that disaster assistance for any community-owned building located in the Special Flood Hazard Area is reduced by the amount of National Flood Insurance Program flood insurance coverage (structural and contents) that a community should be carrying on the building, regardless of whether the community is carrying a policy.</p>																												
<p>Signed <u>Rachel Isler</u> (Chief Executive Officer)</p>																												

Figure 230-1. An example of a completed verification cover page (CC-230).

233 Post-visit Actions

Technical Reviews

For some activities, the verification reviews are performed by ISO/CRS Technical Reviewers other than the ISO/CRS Specialist. For example, the documentation for Activities 410 (Flood Hazard Mapping) and 450 (Stormwater Management) are sent to engineers for review.

Technical review activities may have separate checklists for the community's CRS Coordinator to give to the staff person responsible for that activity. The checklists include contact information for that person, so the ISO/CRS Technical Reviewer can talk directly to the local expert if more information is needed.

Verification Review

Once the ISO/CRS Specialist has all the materials from the community and the technical review findings, the community file is sent to an ISO Program Coordinator for a second review. Technical reviews may get a second review from another ISO/CRS Technical Reviewer at this time as well.

When the ISO Program Coordinator confirms all credits for the community are correct, the ISO/CRS Specialist prepares a verification report. This report summarizes the findings, the status of class prerequisites, and the points for each activity. The report is then sent to the community with a note that it is a draft and still subject to FEMA approval. The community should be aware that the verification report may be revised later.

Once all credits and the appropriate classification are confirmed, the information is given to FEMA. This is done twice per year. FEMA reviews the recommendations and sends the community the official notice of its verified CRS classification and a copy of the final verification report.

Reconsideration

If the community believes that something was missed or misinterpreted during the verification visit, it may request a reconsideration of its CRS classification. A request for reconsideration must be submitted to the FEMA Regional Office, Attn: Director, Mitigation Division, within 30 days of receipt of the final verification report from FEMA.

A request for reconsideration must be based upon the activities reviewed at the verification visit. The request must include a description of how the community would credit the activity and must reference the sections of the *Coordinator's Manual* that support the community's position. A request to change a community's credit points that does not contain sufficient points to change its CRS classification will not be granted.

The 30-day deadline ensures that the classification is determined as quickly as possible. FEMA will review requests for reconsideration and discuss them with the ISO/CRS

Verification

Specialist. A meeting may be held, depending upon the need for additional communication. FEMA will provide a written response to the community.

Reconsideration does not include activities implemented after the verification visit or if the ISO/CRS Specialist was not made aware of them at the visit. Such activities may be included as a modification in a succeeding year. If the community feels that there is an error that does not result in a change in CRS classification, it should include its evidence with its next recertification. Corrections will be made during the next verification visit.

Recertification

A community must recertify each year that it is continuing to meet the prerequisites for its class and continuing to implement the activities for which it has earned credit. Recertification is discussed in Section 213.

240 CRS COMMUNITY SELF ASSESSMENT

The OBJECTIVE of this tool is to help communities better understand the risks and benefits inherent in their floodplains. This information will help communities identify which Community Rating System (CRS) activities would most benefit them.

There are many ways to reduce flood losses and protect natural floodplain functions, so it can be difficult for communities to know where to begin. An ideal first step for many communities may be to do a detailed and thorough analysis of their flood risks and natural floodplain functions as part of creating a comprehensive floodplain management plan (see Activity 510).

Other communities, though, may not have the immediate option of such an involved process. The CRS Community Self Assessment is designed to be a quick and simple way for communities to (1) gain a basic understanding of their floodplains, and (2) determine where to best direct their efforts to most effectively reduce their flood exposure. It should be especially helpful for new staff and communities new to the CRS program. It does NOT replace the benefits of preparing a more comprehensive floodplain management plan. But it may be a useful early component of that process.

The CRS Community Self Assessment is available online at www.CRSresources.org/200. To complete it, communities work their way through five steps.

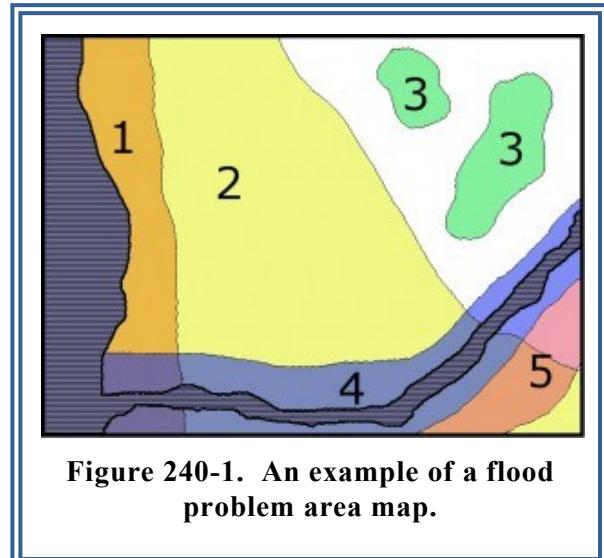
Step 1: Take an inventory of the floodplain. This step asks a series of questions designed to help a community look at its flood risk holistically. It includes questions about what structures are in the floodplain and what natural functions the local floodplain offers.

Step 2: Describe and map the hazards. This step walks communities through the process, hazard by hazard, of creating a map of the flood exposure and natural floodplain functions.

Step 3: Identify specific flood problem areas. Here, the community uses the map it created in Step 2 to outline specific areas where it may want to reduce flood risk and/or protect natural functions. An example is in Figure 240-1.

Step 4: Analyze flood problem areas. In this step, the community analyzes each flood problem area to determine its resources and assets.

Step 5: Assess hazards, exposures, and activities. In this final step, the community returns to a broader, community-wide focus to characterize its floodplain, assess its challenges, and explore possible means of reducing its flood risk.



The CRS Community Self Assessment is designed to take a person less than a day to complete. The amount of time required will depend on a number factors, including the size of the community, the types and scope of its flood risks, the familiarity of the person completing the assessment with the community's problems and assets, and the general availability of information. However, communities are encouraged to complete the five steps at whatever pace they wish.

NOTE: The CRS Community Self Assessment is intended to help communities step back, and take a big-picture look at the benefits and risks offered by their floodplain. Although the site may make suggestions on ways that communities can reduce their flood exposure, the recommendations are designed to provoke thought, and do not replace the need for a more thorough analysis.

The CRS Community Self Assessment is voluntary, and not a credited activity. However, some activities and elements require an assessment be conducted for certain credit. If there is no more detailed assessment, such as in a floodplain management plan or other document, the CRS Community Self Assessment will satisfy this requirement for

- Developing a Program for Public Information (PPI) under Activity 330 (Outreach Projects),
- The flood insurance coverage assessment (FIA) under Activity 370 (Flood Insurance Promotion), and
- The documentation to meet the credit criteria for Activities 610 (Flood Warning and Response), 620 (Levees), and 630 (Dams).

The Self Assessment can also help with the hazard and problem assessments (steps 4 and 5) when developing a floodplain management plan, credited under Activity 510.

300 PUBLIC INFORMATION ACTIVITIES

The Community Rating System (CRS) credits local activities that advise people about the flood hazard, flood insurance, and flood protection measures. The activities can be directed toward floodplain residents, property owners, insurance agents, real estate agents, or other segments of the local populace. One activity, 310 (Elevation Certificates), is mandatory for CRS classification.

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301 Impact Adjustments for Buildings

Many Community Rating System (CRS) activities are not implemented the same way throughout the floodplain. Therefore, their credit points need to be adjusted to reflect how much of the floodplain they cover. In CRS credit calculations, this is called the “impact adjustment” (see Section 222).

Some activities are adjusted based on the number of buildings affected and some are adjusted based on the area of land that is affected. This section reviews how activity and element credits are adjusted to reflect their impact on the community’s flood-prone buildings. Section 401 covers impact adjustments based on land areas.

Most elements in the activities listed in Table 302-1 do not affect all of the buildings that could benefit from them. Credit for these elements is adjusted according to the number of buildings that are actually benefited. In order to measure the impact of these activities, the community must determine the portion of its flood-prone buildings that is affected by each element.

Some activities and elements do not have the impact adjustment step as part of calculating the total credit points. These activities and elements are assumed to be effective throughout the community. In some cases, credit is provided only if they are implemented throughout the community. For example, under Activity 340 (Hazard Disclosure), credit is provided for disclosing the hazards for all properties in the community. Because the information must be provided throughout the community, there is no impact adjustment for Activity 340.

301.a. Definition of “Building”

For CRS purposes, a structure qualifies as a building based on whether it is insurable. The structure must meet the following criteria, which are taken from the definition in the National Flood Insurance Program’s (NFIP’s) *Flood Insurance Manual* for insurance agents. A “building” is

- A structure with two or more outside rigid walls and a fully secured roof and that is affixed to a permanent site; or
- A manufactured home (also known as a mobile home) is a structure built on a permanent chassis, transported to its site in one or more sections, and affixed to a permanent foundation; or
- A travel trailer without wheels, built on a chassis and affixed to a permanent foundation, that is regulated under the community’s floodplain management and building ordinances or laws.

“Building” does not mean a gas or liquid storage tank, a recreational vehicle, a park trailer, or other similar vehicle, except as described above.

Examples of structures that are NOT counted as buildings include open pavilions for picnic tables, bleachers, carports with open sides, underground pumping stations, and sheds on skids that are moved to different construction sites.

301.b. Pre- and Post-FIRM buildings

A “pre-FIRM building” is a building constructed or substantially improved on or before December 31, 1974, or before the effective date of the community’s initial Flood Insurance Rate Map (FIRM), whichever is later.

A “post-FIRM building” is a building constructed or substantially improved after December 31, 1974, or after the effective date of the community’s initial FIRM, whichever is later.

The date of the initial FIRM can be found in the FIRM’s legend under “Flood Insurance Rate Map Effective.” It usually is not the same as the “initial identification” date, which is the date of the community’s first Flood Hazard Boundary Map. Post-FIRM buildings are required to meet the minimum flood protection standards of the NFIP’s Regular Program.

302 Impact Adjustment Ratio

Impact adjustments are calculated by multiplying the points for an element by a ratio that represents how much of the flood problem is being addressed by the element. Impact adjustment ratios are variables with a lower case “r” preceding the acronym for the element.

The value of an impact adjustment ratio is determined by dividing the number of buildings affected by an element (the numerator) by the appropriate denominator. The number of buildings is designated by a lower case “b.”

The denominator for the elements in each activity is specified in the Impact Adjustment section for the element. In most cases, it is the number of buildings in the Special Flood Hazard Area (SFHA), or “bSF.”

Example 302-1.

Under Activity 610 (Flood Warning and Response), the credit for emergency warning dissemination is adjusted based on its impact, i.e., how much of the SFHA that is reached by the warning program. This is calculated by multiplying the credit by the impact adjustment. The acronym for emergency warning dissemination is “EWD.” The impact adjustment ratio for EWD is “rEWD.”

rEWD is the number of buildings that are reached by the warning program (bEWD) divided by the number of buildings in the SFHA (bSF). The formula is

$$rEWD = \frac{bEWD}{bSF}$$

For example, a community has a coastal flood warning system that does not cover buildings subject to riverine flooding. The coastal warning system reaches 1,350 buildings. bEWD = 1,350

There are 1,890 buildings in the SFHA. bSF = 1,890

$$rEWD = \frac{1,350}{1,890} = 0.71$$

The community receives 71% of the credit because 71% of the buildings in the SFHA are affected by the warning system.

Table 302-1. Impact adjustments for buildings.

Activity	Element	Denominator
310 (Elevation Certificates)	ECPO	Number of post-FIRM buildings (bPO)
	ECPR	Number of pre-FIRM buildings (bPR)
510 (Floodplain Management Planning)	RLAA	Number of buildings in all repetitive loss areas
520 (Acquisition and Relocation)	All	bSF + number of credited buildings
530 (Flood Protection)	All	bSF
610 (Flood Warning and Response)	FTR, EWD, FRO, CFP	bSF
620 (Levees)	All	Number of buildings affected by levee failure (bLF)
630 (Dams)	DFR, DFW, DFO, DCF	Number of buildings inundated by a dam failure flood (bDF)

Elements not listed do not have an impact adjustment calculation

302.a. Counting Buildings

For each element with an impact adjustment ratio based on buildings, the numerator is the number of buildings affected by the element, and is designated by a lower case “b” followed by the acronym for that element. The denominator is the total number of buildings that could be affected by the element.

What is counted as a “building” is defined in Section 301.a.

Accessory structures are not included when counting buildings for calculating impact adjustments. For example, a house with a detached garage and shed is counted as one building. The flood insurance policy is based on the elevation of the house. However, if a lot has several principal buildings, each is counted separately because each normally is insured under a separate policy. For example, a motel with three principal buildings counts as three buildings. If one of the three buildings is an unheated bathhouse for the swimming pool and houses only showers and supplies, then the motel would be counted as two buildings.

To determine building counts, communities may use any method that yields reasonably good estimates of the number of buildings. Building counts should be accurate so they will provide the most useful information for both CRS and community planning. Acceptable methods include

- Using geographic information system- (GIS-) based building footprints,
- Reviewing aerial photographs,
- Using U.S. Census tract data, and
- Using the number of utility connections in an area.

Communities are required to document how they obtained their building counts or estimated building counts.

302.b. bSF (buildings in the SFHA)

“bSF” is the acronym for the number of buildings within the Special Flood Hazard Area (SFHA). This number is needed for the impact adjustment in several activities (see Table 302-1). Knowing the number of buildings in the SFHA is a requirement for participation in the CRS, as noted in Section 213.a. The only extra work for an impact adjustment is to determine how many of those buildings are affected by the credited element.

For CRS purposes, a community may determine bSF in one of two ways.

(1) bSF = the number of buildings in the community’s Special Flood Hazard Area as of the verification visit; or

(2) $bSF = bPR + (0.60 \times bPO)$, where

bPR = the number of pre-FIRM buildings in the SFHA, and

bPO = the number of post-FIRM buildings in the SFHA.

This approach more accurately reflects the activity’s influence on the pre-FIRM and post-FIRM flood insurance premium bases in the community.

Communities with a small number of post-FIRM buildings will probably find it easier to use the first formula for bSF, i.e., all buildings in the SFHA are counted the same.

Communities with a lot of recent development and a high percentage of post-FIRM buildings will find that the second formula results in a smaller bSF. This will yield more points for the activities that use bSF in the impact adjustment.

bSF does not include buildings located outside of the SFHA as shown on the FIRM in effect on the date of the verification visit. It does not include buildings located in the B, C, D, or X Zones, even though the community may be regulating flood problem areas in those zones. It does include buildings in A99 and AR Zones.

bSF is the number of buildings in the SFHA at the time of the verification visit, not the number on the original map. Therefore, the value for bSF is recalculated at each cycle visit. The value can change if there is a new map or if the community annexed land that includes more SFHA.

310 ELEVATION CERTIFICATES—Summary

Maximum credit: 116 points

312 Elements

- a. **Maintaining Elevation Certificates (EC):** Up to 38 points for maintaining Federal Emergency Management Agency (FEMA) Elevation Certificates on all buildings built in the Special Flood Hazard Area (SFHA) after the date of application to the Community Rating System (CRS). All communities applying to the CRS must apply for this element. The community must make copies of the certificates available to all inquirers.
- b. **Maintaining Elevation Certificates for post-FIRM buildings (ECPO):** Up to 48 points for maintaining Elevation Certificates on buildings built before the date of application to the CRS but after the initial date of the Flood Insurance Rate Map (FIRM).
- c. **Maintaining Elevation Certificates for pre-FIRM buildings (ECPR):** Up to 30 points for maintaining Elevation Certificates on buildings built before the initial date of the FIRM.

Credit Criteria

All three elements of this activity have the same credit criteria, described in Section 311.b.

- a. The community must maintain completed Elevation Certificates showing the “finished construction” elevations for all buildings constructed or substantially improved in the SFHA during the period credited.
- b. For floodproofed buildings, a FEMA Floodproofing Certificate is needed instead of an Elevation Certificate. Other certificates may be needed in coastal high hazard areas and for floodproofed residential basements.
- c. The community must ensure that the certificates are complete and the information correct.
- d. The community must make copies of Elevation Certificates readily available to anyone upon request.

Impact Adjustment

There is no impact adjustment for EC. The credit for ECPO and ECPR are adjusted based on the number of post-FIRM and pre-FIRM buildings in the community.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

310 ELEVATION CERTIFICATES

The OBJECTIVE of this activity is to maintain correct Federal Emergency Management Agency (FEMA) Elevation Certificates and other needed certifications for new and substantially improved buildings in the Special Flood Hazard Area (SFHA).

311 Background

According to insurance agents, one of the greatest impediments to selling flood insurance is the difficulty of obtaining accurate data on the flood insurance rating zone and building elevation. All of the technical data an agent needs should be recorded on the FEMA Elevation Certificate. Communities are required to maintain a record of the elevation of the lowest floor of any new building or substantial improvement built in the SFHA (see the *Code of Federal Regulations* (44 CFR §60.3(b)(5)(iii))).

In 44 CFR §59.22(a)(9)(iii), the National Flood Insurance Program (NFIP) also requires that communities make their elevation and related building information available for public inspection and flood insurance rating. The NFIP requires insurance agents to use the FEMA Elevation Certificate form when processing an application for an insurance policy. The application data are usually more accurate when the FEMA Elevation Certificate form is prepared at the time of construction by someone who is familiar with the NFIP and when the form is readily available from the local building department.

This activity requires communities to obtain and review Elevation Certificates and other certifications on new construction and to ensure that they are filled out completely and correctly. This should be done as soon as construction is complete and before the certificate of occupancy or certificate of use is issued. It is vital to get an accurate Elevation Certificate filed while the community still has some authority to get any needed corrections made.

The CRS considers accurately completed Elevation Certificates to be evidence of a community's full compliance with the minimum requirements of the NFIP. Therefore, Elevation Certificates that are not accurately completed are taken as an indication that the community may not be in full compliance, and continued participation in the CRS may become an issue.

311.a. Activity Description

The maximum credit for Activity 310 is 116 points.

Credit is provided if the community maintains FEMA Elevation Certificates for new and substantially improved construction. To participate in the CRS, a community must maintain completed FEMA Elevation Certificates on all buildings constructed, substantially improved, or placed in the SFHA after the community's initial date of application for the CRS. The community must review the certificates to ensure accuracy, and make copies available to any inquirer.

Copies of all final certificates for new and substantially improved buildings must be made available to inquirers and provided to the CRS for review. It is recommended that the community establish a separate file and place a copy of each new certification in this file. If the community maintains digital copies of building permit records, digital copies of the certificates should be separated from the rest of the file so that they can easily be collected to meet this requirement. The community may charge a reasonable fee to cover the cost of copying the certificates for inquirers.

All discussions here in the *CRS Coordinator's Manual* about Elevation Certificates also apply to the other specialized certifications described in the next section.

Required Certificates

Almost all buildings constructed to meet NFIP criteria are raised so that the lowest floor is at or above the base flood elevation. The appropriate record that shows that the building meets the code requirement is the FEMA Elevation Certificate (FEMA Form 086-0-33).

Because most building data are recorded on Elevation Certificates, this activity is called "Elevation Certificates." However, full credit for this activity requires that the community also use the following where appropriate:

- Floodproofed non-residential buildings require FEMA's Floodproofing Certificate for Non-Residential Structures (FEMA Form 086-0-34). A separate Elevation Certificate is not needed for these buildings. The 2015 Floodproofing Certificate requires elevations based on finished construction.
- In addition to an Elevation Certificate, a V Zone Design Certificate is needed for new and substantially improved buildings in coastal high hazard areas (V Zones and coastal A Zones, where credited). These are required for buildings constructed or substantially improved after the community's first verification visit under the 2013 *Coordinator's Manual*.
- The V Zone Design Certificate is found in FEMA's *Home Builder's Guide to Coastal Construction*, Technical Fact Sheet No. 1.5. It is shown in Figure 310-1 and can be found at <http://www.fema.gov/residential-coastal-construction>. Communities with alternative forms or certifications may submit them to their ISO/CRS Specialists to see if they meet this activity's criteria.
- Communities that have received a residential basement floodproofing exception must use FEMA's Residential Basement Floodproofing Certificate (FEMA Form 086-0-24) where applicable.

Copies of the FEMA Elevation Certificate and the FEMA Floodproofing Certificate are available free in quantity from FEMA and can be downloaded from FEMA's website at <http://www.fema.gov/national-flood-insurance-program-2/elevation-certificate>. Instructions are included with the forms.

For new construction, only the current FEMA forms are acceptable. A community may receive credit by transferring data from other forms onto a FEMA certificate.

V ZONE DESIGN CERTIFICATE

Name _____ Policy Number (Insurance Co. Use) _____

Building Address or Other Description _____

Permit No. _____ City _____ State _____ Zip Code _____

SECTION I: Flood Insurance Rate Map (FIRM) Information

Community No. _____ Panel No. _____ Suffix _____ FIRM Date _____ FIRM Zone(s) _____

SECTION II: Elevation Information Used for Design

[NOTE: This section documents the elevations/depths used or specified in the design – it does not document surveyed elevations and is not equivalent to the as-built elevations required to be submitted during or after construction.]

1. FIRM Base Flood Elevation (BFE) feet*
2. Community's Design Flood Elevation (DFE) feet*
3. Elevation of the Bottom of Lowest Horizontal Structure Member feet*
4. Elevation of Lowest Adjacent Grade feet*
5. Depth of Anticipated Scour/Erosion used for Foundation Design feet
6. Embedment Depth of Piling of Foundation Below Lowest Adjacent Grade feet

* Indicate elevation datum used in 1-4: NGVD29 NAVD88 Other _____

SECTION III: V Zone Design Certification Statement

I certify that: (1) I have developed or reviewed the structural design, plans, and specifications for construction of the above-referenced building and (2) that the design and methods of construction specified to be used are in accordance with accepted standards of practice** for meeting the following provisions:

- The bottom of the lowest horizontal structural member of the lowest floor (excluding piles and columns) is elevated to or above the BFE.
- The pile and column foundation and structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of the wind and water loads acting simultaneously on all building components. Water loading values used are those associated with the base flood***. Wind loading values used are those required by the applicable State or local building code. The potential for scour and erosion at the foundation has been anticipated for conditions associated with the base flood, including wave action.

SECTION IV: Breakaway Wall Design Certification Statement

[NOTE: This section must be certified by a registered engineer or architect when breakaway walls are designed to have a resistance of more than 20 psf (0.96 kN/m²) determined using allowable stress design]

I certify that: (1) I have developed or reviewed the structural design, plans, and specifications for construction of breakaway walls to be constructed under the above-referenced building and (2) that the design and methods of construction specified to be used are in accordance with accepted standards of practice** for meeting the following provisions:

- Breakaway wall collapse shall result from a water load less than that which would occur during the base flood***.
- The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (see Section III).

SECTION V: Certification and Seal

This certification is to be signed and sealed by a registered professional engineer or architect authorized by law to certify structural designs. I certify the V Zone Design Certification Statement (Section III) and _____ the Breakaway Wall Design Certification Statement (Section IV, check if applicable).

Certifier's Name _____ License Number _____

Title _____ Company Name _____

Address _____

City _____ State _____ Zip Code _____

Signature _____ Date _____ Telephone _____

Note: The V Zone design certificate is not a substitute for the NFIP Elevation Certificate (see Fact Sheet No. 1.4, Lowest Floor Elevation), which is required to certify as-built elevations needed for flood insurance rating.

Figure 310-1. The V Zone Design Certificate (from FEMA's *Home Builder's Guide to Coastal Construction*, Technical Fact Sheet No. 1.5).

CRS Participation Requirement

As noted earlier, properly completed FEMA Elevation Certificates are a key indicator of community compliance with the requirements of the NFIP. Therefore, obtaining, reviewing, and maintaining elevation and the other certificates is a minimum requirement of participation in the CRS (see also Section 211.a).

The community is required to maintain certificates on all new SFHA buildings and substantial improvements permitted after the community applies for CRS credit, as credited under Section 312.a. Communities applying to the CRS may receive 38 points for EC under Section 312.a, provided that Elevation Certificates are provided with each annual recertification for new buildings and substantial improvements within the SFHA.

Those few NFIP communities that have no SFHA may not receive credit for this activity. However, if such a CRS community with no SFHA later receives a FIRM from FEMA that includes areas of SFHA or annexes an area with an SFHA, it must begin maintaining Elevation Certificates on the date of the FIRM or annexation or it will lose its credit.

Some communities require FEMA Elevation Certificates for new construction in flood-prone areas that are outside of the SFHA but are regulated by the community. This is encouraged as a good floodplain management practice. However, because the certificates are not used in flood insurance rating, there is no requirement under this activity that they be maintained or submitted for review. The documentation requirement is limited to Elevation Certificates for new construction or substantial improvements in the SFHA.

311.b. Activity Credit Criteria

- (1) The community must maintain completed FEMA Elevation Certificates showing the “finished construction” elevations for all buildings constructed or substantially improved in the SFHA during the period credited. “Buildings” are defined in Section 301.a.
- (2) If the building was floodproofed, a FEMA Floodproofing Certificate is needed instead of an Elevation Certificate. Other certificates may be needed in coastal high hazard areas and for floodproofed residential basements (see “Required Certificates,” above).
- (3) The community must review the certificates to ensure that they are complete and that the information is correct. This is described in more detail under “Elevation Certificate Checklist” and “Getting Correct Certificates,” below.
- (4) The community must make copies of Elevation Certificates readily available to anyone upon request. If a community receives credit for having Elevation Certificates from

Elevation Certificates Completed by the Community

Elevation Certificates can be completed by a local official who is authorized by law or ordinance to administer the community’s floodplain management program, provided that the original surveyed elevations in Section C were obtained by a registered design professional.

A community can transfer data from a surveying project to the FEMA Elevation Certificate form if it can demonstrate that the source of the data was appropriate and if the source is described in Section G of the certificate.

before it applied to the CRS, it must be able to retrieve those certificates, including those from projects whose permit files may have been archived or discarded.

Elevation Certificate Checklist

As noted in “Activity Credit Criteria,” above, the community must review the certificates to ensure that the information is correct. The ISO/CRS Specialist collects all Elevation Certificates for which the community requests credit and checks them for specific items. The CRS checklist for the 2006, 2009, 2012, and 2015 Elevation Certificate forms is shown in Figure 310-2. There is also a form with the checklist items highlighted available at www.CRSresources.org/300. The ISO/CRS Specialist can provide similar checklists for earlier versions of the FEMA forms.

If any of the items on the checklist are not completed or are incorrect, the ISO/CRS Specialist will reduce the element’s credit points as explained in Section 311.c.

Note that, although Item A6. of the instructions to the Elevation Certificate form requires photos of the structure, the photos are only required for purchasing flood insurance. Photos are not required for the community’s permit records nor are they required for CRS credit. However, photos are encouraged and credited as part of the three inspections under Regulations Administration (RA) in Section 432.o.

Checklists for the Floodproofing Certificate, V Zone Design Certificate, and the Residential Basement Floodproofing Certificate can be found at www.CRSresources.org/300.

Getting Correct Certificates

It is the community’s responsibility to ensure that the certificates it maintains have been completed correctly. Certificates provided by surveyors must be proofread and corrected if there are errors or omissions. Although the surveyed elevations are likely to be correct, it is not unusual for surveyors to enter the wrong FIRM date or diagram number or fail to complete all the entries in Section C of the Elevation Certificate form.

If there are certificates that have items on the checklist omitted or incorrectly filled out, the community has the following options:

- (1) For any inaccurate or incomplete information in Section C2, the local official should request a new certificate.
- (2) If incomplete or inaccurate information is found in the other sections, the local official can do the following. Note that in some states, the local official SHOULD NOT mark up a signed and sealed form.
 - The forms may be returned to the surveyor with instructions on what needs to be changed or corrected;
 - The local official can prepare a separate memo with the correct information and attach the memo to the form (see Figure 310-3). When the certificate is provided to an inquirer, the memo must be included with it; or
 - The local official can note the changes or corrections in Section G.

SECTION A—PROPERTY INFORMATION

A2 and A3

Complete street address or property description. In either case, the city, state, and zip code must be listed.

A6

Photographs: Photographs are not required for CRS credit. However, they are required for writing a flood insurance policy and they can be very helpful for compliance records.

A7

Building diagram number.

A8

a), b), and c) Enclosure and crawl space information for buildings that are diagram 6, 7, 8, or 9.

A9

a), b), and c) Attached garage information. If there is no attached garage, enter "N/A" in all three spaces. If there is an attached garage and there are no openings, the correct entry is "zero," even if the garage is above the BFE.

A8 and

A9

If the square footage of the crawlspace or garage is larger than the square inches of the openings AND "(d) Engineered flood openings" is checked "yes," then there must be a certification by a registered design professional or a copy of the ICC Evaluation Service report.

SECTION B—FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1

NFIP community name/community number.

B4

Map AND panel number.

B5

Panel number and suffix.

B7

FIRM panel effective/revised date.

B8

Flood zone(s) in which the building is located.

B9

Base flood elevation(s).

B10

The source of the base flood elevation data or base flood depth entered in B9.

B11

The elevation datum used for the base flood elevation in B9.

B12

Whether the building is located in a Coastal Barrier Resources System area or Otherwise Protected Area.

SECTION C—BUILDING ELEVATION INFORMATION (when a survey is required)

C1

Basis for building elevations: Note: "Finished construction" must be checked unless the building is still under construction. The ISO/CRS Specialist will not review Elevation Certificates for buildings still under construction, unless requested to by the community.

C2

Elevations. The benchmark utilized and vertical datum entries must be completed. Items a) through g) must have an entry.

Elevation items a), f), and g) must be recorded on every certificate. If an item does not apply, enter "N/A" in the fields where no data are being supplied.

Items b) and c) must be completed with an elevation if they are applicable and if that letter appears on the diagram on pages 7–9 of the instructions.

If there is an attached garage, an elevation must be entered for item d), otherwise the entry is "N/A." If there is machinery and/or equipment that service the building, an elevation must be entered for item e), otherwise the entry is "N/A."

Figure 310-2. CRS Checklist for the 2006, 2009, 2012, and 2015 FEMA Elevation Certificate forms.

SECTION D—CERTIFICATION BY A REGISTERED DESIGN PROFESSIONAL

Certifier's name and license number

Certifier's signature

Date

If there is a signature and/or date in the box, there does not have to be a separate signature or date on the line.

SECTION E—BUILDING ELEVATION INFORMATION (when a survey is not required in a Zone AO or a Zone A without a base flood elevation)

- E1 a) and b) Enter the difference between the top of the bottom floor and the highest and lowest adjacent grade.
- E2 For Building Diagrams 6—9 with openings, enter the difference between the top of the next higher floor and the highest adjacent grade.
- E3 Enter the difference between the top of the garage slab and the highest adjacent grade.
- E4 Enter the difference between the top of the platform for machinery or equipment and the highest adjacent grade.
- E5 Zone AO (only) Elevation of bottom floor complies with the ordinance (if there is no base flood depth provided).

Note: If Section E is used, then Sections F or G must be completed.

SECTION F—PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

This section is used if Section E is completed by the owner or owner's representative. If used, this section must include the property owner's or representative's name in the first line and the signature in the third line.

SECTION G—COMMUNITY INFORMATION

If G1 or G2 is checked, then the first and third lines after G10 (the local official's name and signature) must be completed.

NOTE: If a local official authorized by law to complete an Elevation Certificate fills out ALL the information (including elevation data), then G8, G9, and the signature block must be completed.

Figure 310-2 (cont.). CRS Checklist for the 2006, 2009, and 2012 FEMA Elevation Certificate forms.

One way communities have improved the quality of their Elevation Certificates is by completing Sections A and B at the time of the permit application. The partially completed form then is given to the applicant or to the surveyor who then can focus on completing the surveyed information in Section C. This has been shown to reduce many of the more common errors.

[Community letterhead]**Memo of Review for Accuracy and Completion**

The attached FEMA Elevation Certificate has been reviewed by this office. The items noted below are not correct on the attached form and should read as entered on this page.

SECTION A – PROPERTY INFORMATION		FOR INSURANCE COMPANY USE			
A1. Building Owner's Name	Policy Number:				
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.	Company NAIC Number:				
City	State	ZIP Code			
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)					
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.)					
A5. Latitude/Longitude: Lat. _____ Long. _____		Horizontal Datum: <input type="checkbox"/> NAD 1927 <input type="checkbox"/> NAD 1983			
A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.					
A7. Building Diagram Number _____					
A8. For a building with a crawlspace or enclosure(s): a) Square footage of crawlspace or enclosure(s) _____ sq ft b) No. of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade _____ c) Total net area of flood openings in A8.b _____ sq in d) Engineered flood openings? <input type="checkbox"/> Yes <input type="checkbox"/> No		A9. For a building with an attached garage: a) Square footage of attached garage _____ sq ft b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____ c) Total net area of flood openings in A9.b _____ sq in d) Engineered flood openings? <input type="checkbox"/> Yes <input type="checkbox"/> No			
SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION					
B1. NFIP Community Name & Community Number	B2. County Name	B3. State			
B4. Map/Panel Number	B5. Suffix	B6. FIRM Index Date	B7. FIRM Panel Effective/Revised Date	B8. Flood Zone(s)	B9. Base Flood Elevation(s) (Zone AO, use base flood depth)
B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9: <input type="checkbox"/> FIS Profile <input type="checkbox"/> FIRM <input type="checkbox"/> Community Determined <input type="checkbox"/> Other/Source: _____					
B11. Indicate elevation datum used for BFE in Item B9: <input type="checkbox"/> NGVD 1929 <input type="checkbox"/> NAVD 1988 <input type="checkbox"/> Other/Source: _____					
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? <input type="checkbox"/> Yes <input type="checkbox"/> No Designation Date: _____ / _____ / _____ <input type="checkbox"/> CBRS <input type="checkbox"/> OPA					
SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)					
C1. Building elevations are based on: <input type="checkbox"/> Construction Drawings* <input type="checkbox"/> Building Under Construction* <input type="checkbox"/> Finished Construction					
*A new Elevation Certificate will be required when construction of the building is complete.					
Local Official's Name _____			Title _____		
Community Name _____			Telephone _____		
Signature _____			Date _____		
Comments _____					

Figure 310-3. An example of a cover sheet for a correction to an Elevation Certificate.

Some communities use a “correction form” like this one when an error or omission is found that can be corrected by the local official. It is stapled to the certificate that is made available to inquirers. It should be noted that the community assumes responsibility for the accuracy of the changes it makes.

311.c. Credit Verification

Two months before each verification visit, the community sends the ISO/CRS Specialist a list of all new buildings and substantial improvements constructed in the SFHA since the last cycle verification visit. See the information that should be included on the list in Section 312.a, “Documentation for EC Provide by the Community.” The community also sends copies of the Elevation Certificates (and/or V Zone, Floodproofing Certificates, etc., as appropriate) for those buildings and substantial improvements.

The Insurance Services Office, Inc., (ISO) reviews the certificates in accordance with the checklist and brings the findings to the visit. The community’s credit for the first element, EC, will be based on this review. For example, if the community has 20 certificates and only 12 have no problems listed on the checklist, the community’s credit will be

$$EC = 38 \times \frac{12}{20} = 22.80 \text{ points}$$

The community is given feedback on all the certificates. To stay in the CRS, at least 90% of the community’s certificates must be correct, i.e., have no problems. If less than 90% of the certificates pass (as in the example above), the community must correct them in order to stay in the CRS.

The credit for EC is based on the review of certificates submitted for the verification visit. It will not change after the community makes the needed corrections, but EC will be rescored at the next visit based on a review of the next batch of certificates.

The certificates for ECPO and ECPR credit are reviewed in the same way and the 90% threshold applies to them as well. However, if the certificates with problems are corrected, they can be reviewed again and the community will receive a revised credit. The number of pre- and post-FIRM buildings is relatively static. Because EC reflects new construction, it needs to be rescored at every verification visit.

At each annual recertification, the community again provides the list of new buildings and substantial improvements constructed in the SFHA during the previous year and copies of the elevation and other certificates for those buildings. These are reviewed and feedback on the findings is given to the community.

There is no change to the community’s credit based on the recertification findings, but those Elevation Certificates will be reviewed at the next cycle verification visit. Therefore, it is in the community’s best interest to correct the Elevation Certificates as soon as possible so the EC credit is not lowered at the community’s next verification visit.

At the next verification visit, the ISO/CRS Specialist will review all certificates collected since the previous visit (or, at the community’s option, only those submitted at the annual recertification that had problems plus all certificates collected by the community since the last recertification). Credit for EC will be revised, based on this review. Because the community will have had most of the certificates reviewed and critiqued after each annual

recertification, the community should have had adequate time to assemble a corrected set of Elevation Certificates for the next verification visit.

Example 311.c-1.

A coastal county's cycle verification visit was in 2014. Two months before the visit, the building department provided the ISO/CRS Specialist with a list of all new buildings and substantial improvements that were built in the SFHA since the last visit. There are 134 such projects. The department also provides 133 Elevation Certificates, one Floodproofing Certificate, and six V Zone Design Certificates, for a total of 140 forms.

ISO reviewed all of the forms and found 16 buildings with problem forms and 118 buildings with correct forms. The verified credit for EC for the county was $38 \times 118 \div 134 = 38 \times 0.88 = 33.44$. However, the county needed 121 forms with no problems to meet the 90% verification threshold ($134 \times 90\% = 121$). The ISO/CRS Specialist gave the county a deadline to correct at least three certificates. If this was not done, the county would have been converted to a CRS Class 10.

The county staff made the corrections and submitted them to the ISO/CRS Specialist. The county met the verification threshold and the county's credit for EC remained at 33.44 until the next cycle verification visit.

At each annual recertification, the county submits the list of permits and copies of all of the certificates collected during the previous year. They are reviewed and the county is advised of any problems that are found. At the next verification visit, the ISO/CRS Specialist collects the list of permits. The community has the option of providing copies of all the certificates collected by the county since the 2014 visit or just those that the ISO/CRS Specialist has not seen (i.e., since the last annual recertification submittal), plus the corrected certificates that had problems in the previous year or years.

This time, the list has 508 permits and the building department provides 483 Elevation Certificates, five Floodproofing Certificates, 22 V Zone Design Certificates, and an explanation that 20 permitted projects are still under construction, for a total of 488 building with certificates. A technical review finds that 478 (98%) buildings have correct certificates and the county meets the verification threshold. The credit for EC is based on the latest visit's findings, so $EC = 38 \times (478 \div 488) = 37.24$. The county is encouraged to correct the five certificates with problems, but the credit will remain at 37.24 until the next visit.

312 Elements

312.a. Maintaining Elevation Certificates (EC)

The maximum credit for this element is 38 points.

EC credit is provided if the community maintains Elevation Certificates for all new buildings and substantial improvements constructed in the SFHA since the date of application to the CRS.

EC is adjusted to less than 38 points if the verification findings warrant such a reduction. The credit points are reduced if incorrect or incomplete information appears on the Elevation Certificate forms checked during the verification process.

As described in the Section 311.c, the community must have at least 90% of its elevation and other certificates correct in order to meet one of the prerequisites to be in the CRS. This prerequisite only applies to element EC, i.e., certificates on buildings built or substantially improved after the community applied to join the CRS, not to ECPO or ECPR.

If no buildings have been built or substantially improved in the SFHA since the CRS application date, the community receives full credit for EC. The CRS prefers to see no buildings in the floodplain rather than provide credit for records on those that have been built.

Credit Criteria for EC

The activity credit criteria in Section 311.b must be met.

Credit Points for EC

EC = a maximum of 38 points for maintaining Elevation Certificates,

and

EC = $38 \times \frac{\text{reviewed and correct Elevation Certificates}}{\text{all reviewed Elevation Certificates}}$

Impact Adjustment for EC

There is no impact adjustment because communities must require, review, and maintain copies of Elevation Certificates on ALL new construction. There is no credit under this activity for having Elevation Certificates on only some of the buildings constructed or substantially improved since the community's CRS application.

Documentation for EC Provided by the Community

(1) At least two months before each verification visit,

- (a) A list of all permits issued for new buildings and substantial improvements in the SFHA since the last cycle verification visit. The list needs to include the address of

each building; the type of building (e.g., residential, commercial, or other term used in Section A4 of the FEMA Elevation Certificate form); FIRM zone (AE, A, VE, etc.); whether it is a new building or substantial improvement; the date of the permit; and whether the permit is final.

- (b) Copies of Elevation Certificates (and/or V Zone and Floodproofing Certificates, as appropriate) for all new buildings and substantial improvements in the SFHA that have been collected since the last visit.
- (c) If the community is applying for or receiving credit for regulating areas outside the SFHA, the ISO/CRS Specialist will advise whether the list of permits and copies of Elevation Certificates in (a) and (b) should include properties in those non-SFHA areas.

The list and certificates can be provided in paper or digital format. Certificates on detached garages, non-substantial improvements, and properties not in the SFHA are not needed for this activity's credit. If they are needed to verify another activity, they should be submitted with the documentation for the other activity.

Note that it is acceptable that there are permits issued for buildings that do not yet have Elevation Certificates because construction has not been completed. Likewise, it is acceptable that there are Elevation Certificates on buildings not on the current permit list because the permits were issued before the last visit.

If there have been no new buildings or substantial improvements in the SFHA since the last submittal, a letter or memo to that effect is needed, signed by the permit official.

- (2) At each verification visit,
 - (a) A description of how the community maintains, stores, and provides copies of certificates to inquirers.
- (3) With the annual recertification,
 - (a) A list of all permits issued for new buildings and substantial improvements in the SFHA since the last recertification submittal, and
 - (b) Copies of all Elevation Certificates (and/or V Zone and Floodproofing Certificates, as appropriate) for new buildings and substantial improvements in the SFHA that have been collected since the last submittal.

The list and certificates can be provided in paper or digital format. If there have been no new buildings or substantial improvements in the SFHA since the last submittal, a letter or memo to that effect is needed, signed by the permit official.

312.b. Maintaining Elevation Certificates for post-FIRM buildings (ECPO)

The maximum credit for this element is 48 points.

ECPO credit is provided if completed and correct certificates are maintained for all buildings built or substantially improved in the SFHA between the date of the effective FIRM at the time of construction and the date of the community's application to the CRS.

If there are no post-FIRM buildings in the SFHA, the community receives full credit for ECPO because there are no post-FIRM buildings or substantial improvements without Elevation Certificates. The CRS would prefer to see no buildings in the floodplain rather than provide credit for records on those that have been built. However, if the community annexes lands that include buildings in the SFHA constructed since the date of its initial FIRM, the credit is based on how many of those buildings have Elevation Certificates.

Credit Criteria for ECPO

The activity credit criteria in Section 311.b must be met.

Credit Points for ECPO

ECPO = up to 48 points, for maintaining Elevation Certificates for post-FIRM buildings

Impact Adjustment for ECPO

If the community only has certificates for some of its post-FIRM buildings, then the value for ECPO is adjusted.

$$rECPO = \frac{bECPO}{bPO}, \text{ where}$$

bECPO = the number of post-FIRM buildings with Elevation Certificates, and

bPO = the number of buildings built or substantially improved in the community's SFHA between the initial FIRM effective date and the date the community applied to the CRS

Section 301 describes how to count buildings for the impact adjustment and has an alternative way to calculate bPO that favors post-FIRM, i.e., compliant, buildings in the SFHA.

If no buildings have been built or substantially improved in the SFHA since the community entered the Regular Program of the NFIP, then bPO = 0. As noted above, the community would still receive full credit for this element because the CRS would prefer to see no buildings in the floodplain rather than provide credit for records on those that have been built.

Example 312.b-1.

A community's CRS credit was verified by its ISO/CRS Specialist during the spring of 2004. Its initial FIRM effective date is May 15,

1980. Between then and when it applied to the CRS in 2003, 22 buildings were built or substantially improved. bPO = 22

The community began using FEMA's Elevation Certificates after FEMA conducted a community assistance visit in 1986. It has completed certificates for all buildings built since then. There are 10 buildings with correct Elevation Certificates. bECPO = 10

$$rECPO = \frac{10}{22} = 0.45$$

Documentation for ECPO Provided by the Community

(1) At each verification visit,

- (a) Copies of Elevation Certificates (and/or V Zone and Floodproofing Certificates and other certificates, as appropriate) for new buildings and substantial improvements constructed between the date of the community's initial FIRM and the date of application to the CRS.
- (b) Demonstration that the community still has access to all the credited certificates and provides them to inquirers.
- (c) Documentation showing how bPO was determined. Note that this number can change if the community annexes areas in the SFHA or a FIRM revision changes the number of post-FIRM buildings in the SFHA.

312.c. Maintaining Elevation Certificates for pre-FIRM buildings (ECPR)

The maximum credit for this element is 30 points.

ECPR credit is provided if completed and correct certificates are maintained for buildings that were constructed in the SFHA before the date of the initial FIRM of the community in which the building was constructed.

Although most communities did not keep elevation records before they joined the Regular Program of the NFIP (which is usually the same date as their initial FIRM), lowest floor elevations may have been determined for a flood protection study. If the data are transferred to the FEMA forms, credit can be provided under ECPR. ECPR is adjusted in the same manner as ECPO, as described in the Impact Adjustment section.

If there are no pre-FIRM buildings in the SFHA, the community receives full credit for ECPR because there are no pre-FIRM buildings without Elevation Certificates. However, if the community annexes lands that include buildings that were constructed in the SFHA before the date of its initial FIRM, the credit will be based on how many of those buildings have Elevation Certificates.

Credit Criteria for ECPR

The activity credit criteria in Section 311.b must be met.

Credit Points for ECPR

ECPR = up to 30 points, for Elevation Certificates for pre-FIRM buildings

Impact Adjustment for ECPR

If the community only has certificates for some of its pre-FIRM buildings, then the value for ECPR is adjusted.

$$rECPR = \frac{bECPR}{bPR}, \text{ where}$$

bECPR = the number of pre-FIRM buildings with correct Elevation Certificates, and

bPR = the number of pre-FIRM buildings in the community's SFHA

Section 301 describes how to count buildings for the impact adjustment.

Example 312.c-1.

A community has 250 pre-FIRM buildings. bPR = 250

As part of a flood control study, the U.S. Army Corps of Engineers surveyed the first-floor elevations of all buildings in one of the community's floodplains. Because there are no basements in the community, the first floor is the same as the lowest floor. [*NOTE: This is not always the case. Other sources of elevation data must be carefully checked to ensure that the records are for the lowest floor.*] The study provided correct elevations for 122 of the community's 250 pre-FIRM buildings, and the community subsequently recorded the data on FEMA's Elevation Certificates. bECPR = 122

$$rECPR = \frac{122}{250} = 0.49$$

Documentation for ECPR Provided by the Community

(1) At each verification visit,

- (a) Copies of Elevation Certificates (and/or V Zone and Floodproofing Certificates and other certificates, as appropriate) for buildings and substantial improvements constructed before the date of the community's initial FIRM.

- (b) Demonstration that the community has access to all the credited certificates and provides them to inquirers.
- (c) Documentation showing how bPR was determined. Note that this number can change if the community annexes areas in the SFHA or a FIRM revision changes the number of pre-FIRM buildings in the SFHA.

313 Credit Calculation

$$c310 = cEC + cECPO + cECPR, \text{ where}$$

cEC = the verified credit for the element EC based on the number of correct certificates,

$cECPO = ECPO \times rECPO$, and

$cECPR = ECPR \times rECPR$

Example 313-1.

After the initial review of Elevation Certificates at a community's cycle verification visit, only five of the seven new Elevation Certificates for new and substantial improvements are correct.

$$cEC = 38 \times (5 \div 7) = 38 \times 0.71 = 26.98$$

Note that the community must correct the two Elevation Certificates with problems in order to meet the 90% requirement. If this is not done, the community will be reclassified as a CRS Class 10 community.

The community has correct Elevation Certificates for 10 of its 22 post-FIRM buildings. As discussed above, $rECPO = 0.45$.

$$cECPO = 48 \times 0.45 = 21.60$$

The community has Elevation Certificates for 122 of its 250 pre-FIRM buildings. As discussed above, $rECPR = 0.49$.

$$cECPR = 30 \times 0.49 = 14.70$$

$$c310 = cEC + cECPO + cECPR$$

$$c310 = 26.98 + 21.60 + 14.70 = 63.28, \text{ which is rounded to } 63$$

314 For More Information

- a. Additional information, reference materials, and examples can be found at www.CRSresources.org/300.
- b. The FEMA Elevation and Floodproofing Certificates include detailed instructions for completing them. The latest version can be downloaded from FEMA's website at <http://www.fema.gov/national-flood-insurance-program-2/elevation-certificate>. The FEMA Regional Office and State NFIP Coordinating Office can provide help in completing and maintaining the certificates.
- c. *Elevation Certificate*, FEMA's Floodplain Management Bulletin 467-1, provides questions and answers on completing the form and using the Elevation Certificate to verify building compliance. The bulletin can be downloaded from www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&id=1727.
- d. Instructions on completing the V Zone Design Certificate can be found in FEMA's *Home Builder's Guide to Coastal Construction* Technical Fact Sheets 1.4, 1.5, and 8.1 at <http://www.fema.gov/residential-coastal-construction>.

315 Related Activities under the Community Rating System

- Elevation Certificate data can be very helpful when estimating flood depths under Activity 320 (Map Information Service). The base flood elevation can be compared to the lowest floor or garage elevation to give the inquirer a good idea of how deep the base flood would be. Even if there is no Elevation Certificate on the property in question, describing the flood depth on a neighboring property can still be useful.
- If the community develops a Program for Public Information (credited under Activity 330 (Outreach Projects)), the PPI committee should discuss how insurance agents and property owners can learn about the availability of Elevation Certificate data.
- Providing building elevation data on a website is credited under Activity 350 (Flood Protection Information) and having it in the community's geographic information system (GIS) or other property data base is credited under Activity 440 (Flood Data Maintenance).
- Elevation Certificate data can also be helpful when advising an inquirer about flood protection alternatives, credited under Activity 360 (Flood Protection Assistance) and flood insurance rating, credited under Activity 370 (Flood Insurance Promotion).
- Elevation Certificates are used by the ISO/CRS Specialist to verify some regulatory credits, such as development of new base flood elevations (NS) under Activity 410 (Flood Hazard Mapping) and freeboard (FRB) under Activity 430 (Higher Regulatory Standards).

320 MAP INFORMATION SERVICE—Summary

Maximum credit: 90 points

322 Elements

- a. **Basic FIRM information (MI1):** 30 points for providing basic information found on a Flood Insurance Rate Map (FIRM) that is needed to write a flood insurance policy.
- b. **Additional FIRM information (MI2):** 20 points for providing information that is shown on most FIRMs, such as protected coastal barriers, floodways, or lines demarcating wave action.
- c. **Problems not shown on the FIRM (MI3):** Up to 20 points for providing information about flood problems other than those shown on the FIRM.
- d. **Flood depth data (MI4):** Up to 20 points for providing information about flood depths.
- e. **Special flood-related hazards (MI5):** Up to 20 points for providing information about special flood-related hazards, such as erosion, ice jams, or tsunamis.
- f. **Historical flood information (MI6):** Up to 20 points for providing information about past flooding at or near the site in question.
- g. **Natural floodplain functions (MI7):** Up to 20 points for providing information about areas that should be protected because of their natural floodplain functions.

Credit Criteria

Credit criteria for this activity are described in Section 321.b. Each element has additional criteria specific to that element.

Impact Adjustment

There is no impact adjustment for this activity.

Documentation Provided by the Community

The documentation needed for this activity is described in Section 325.

320 MAP INFORMATION SERVICE

The OBJECTIVE of this activity is to provide inquirers with information about the local flood hazard and about flood-prone areas that need special protection because of their natural functions.

321 Background

Maps are an effective method of communicating information about flood hazards. Residents and businesses that are aware of potential flood hazards can take steps to avoid problems and/or reduce their exposure to flooding. Communities are the best source of map information because they can often supplement and clarify the Flood Insurance Rate Map (FIRM) with complementary maps, and with information on additional hazards, flooding outside mapped areas, development regulations that affect floodplain properties, flood insurance, natural floodplain functions, and property protection measures.

A map information service can greatly help a community's residents as well as its banks, insurance agents, real estate agents, and anyone else who needs flood hazard information. This public service is particularly helpful to those who have trouble reading maps, people from out of town, and those who do not have access to the latest maps or all the hazard information available in the community.

This activity is also intended to bring other available community resources to bear on each individual situation. Such resources include local topographic, planning, road, and utility maps; geographic information systems (GISs); maps of special flood-related hazard areas; permit records; and subdivision plats. Where they are available, these other resources can complement the FIRM as sources of additional flood data or more detailed map information.

The FIRM and Mandatory Purchase of Flood Insurance

For compliance with the mandatory purchase requirements of the National Flood Insurance Program, the current Flood Insurance Rate Map (FIRM) (or Letter of Map Change) is the only legal document allowed to be used by lenders or third-party vendors.

321.a. Activity Description

The maximum credit for Activity 320 is 90 points.

Credit is provided for providing inquirers with information from the community's FIRM and other sources of information about the local flood hazard and natural floodplain functions.

There are seven elements. The first, providing basic information from the FIRM that is needed to write a flood insurance policy, is a prerequisite for the rest of the elements. Credit for the other elements is dependent upon what information the community has and what information it believes its residents and businesses need. If the community conducted the CRS Community Self Assessment described in Section 240, it would have a good list of

available map information. Note that certain information about private property may not be released to the public (see the box on flood insurance data and the Privacy Act).

The maximum points for each element are noted in Sections 322.a through 322.g. If only partial information is provided or only part of the community is covered by elements MI3 through MI7, the points can be prorated. There is no proration of MI1 or MI2, because for those elements the community must provide all the information needed from the entire FIRM.

The information provided by the service should be located on a map or GIS layer so the person responding to the inquiries has an accurate source of information.

The community may provide the service via telephone, written or e-mailed inquiry, or a website or computer terminal. To avoid errors in property location, the community may request from the inquirer a street map locating the property.

To cover staff time and office overhead , the community may charge a reasonable fee for providing map information. This service should not include surveying or similar costs to collect new data, such as ground elevations.

The community may enter into an agreement with another agency, such as a regional planning commission, to provide the map information service. To receive credit under the Community Rating System (CRS), there must be a written agreement that clarifies that the agency providing the service will respond to all inquirers and will allow the ISO/CRS Specialist to verify its work. The service must meet all the prerequisites and documentation requirements, including publicity and records of inquiries.

321.b. Activity Credit Criteria

- (1) MI1, providing information from the FIRM needed to write a flood insurance policy, is a prerequisite to receiving other credit under this activity.
- (2) The map information service must be able to locate a property based on a street address. There is no credit if an inquirer is given a map to read. One of the reasons for this credit is that some people have difficulty reading maps.
- (3) All available information must be provided to the inquirer for each element (MI1 through MI7) for which the community is requesting credit. For example, a person inquiring about a property that is located in a Special Flood Hazard Area (SFHA) needs to be told about the mandatory flood insurance purchase requirement. If the community

The Privacy Act

Flood insurance data about private property, including repetitive loss properties, are protected under the Privacy Act. Personally identifiable Information such as the names or addresses of specific properties, whether they are covered by flood insurance or not, whether they have received flood insurance claims, or the amounts of such claims may not be released outside of local government agencies or to the public or used for solicitation or other purposes. Such information should be marked "For internal use only. Protected by the Privacy Act of 1974."

General or aggregated information, such as total claims paid for a community or an area or data not connected to a particular property may be made public.

also requests credit for MI6, historical flood information, the same inquirer must also be told whether the area has been flooded in the past, even if he or she did not ask.

- (4) The service must include an opportunity for personal contact. One value of the map information service is that it gives the staff person responding to the inquiry a chance to determine whether all of the inquirer's questions have been answered and to supply additional information on related topics, such as permit requirements.

If the service is provided remotely, such as through a website, contractor, or by taking written or faxed requests, the annual publicity and the response to the inquirer must include a telephone number that can be called so that the inquirer can pose further questions about map information and about the community's floodplain management program.

- (5) The inquiry must be responded to within a reasonable amount of time.

- (6) The service must be publicized at least once a year. There are three publicity options:

- (a) An annual notice that reaches everyone in the community, such as an article in a newsletter or a stuffer in a utility bill that goes to all properties;
- (b) An annual notice directed to the most common users of the service: lenders (banks, credit unions, etc.), insurance agents, and real estate agents. This can be a mailing directly to these offices or articles in the newsletters of professional associations that reach these offices (e.g., the newsletters of the Board of Realtors® or the chamber of commerce); or
- (c) An annual outreach project developed as part of a Program for Public Information (PPI) credited under Activity 330 (Outreach Projects), provided that the PPI document identifies the audience for the service and discusses the best way to reach that audience.

Whichever option the community selects, the publicity must

- Describe the service(s) provided with a few words on each of the topics in MI1 through MI7 that the community wants credited (e.g., the community will provide information about the flood hazard, flood insurance rating data, and areas with natural floodplain functions that should be protected);
- Be distributed at least once a year;
- Explain how to access the service, i.e., what telephone number to call, or what internet address to use to access the website; and
- Provide a telephone number for more information about flood maps and the community's floodplain management program (if different from the number to call for the map information service).

- (7) The maps used for MI1 and MI2 must be kept updated at least annually to reflect new studies, subdivisions, annexations, flood insurance restudies, map revisions, and map amendments (including Letters of Map Amendment (LOMAs) and Letters of Map

Revision (LOMRs)). This may mean plotting every LOMA and LOMR or noting on the paper FIRM that LOMAs and LOMRs have been issued.

- (8) The community must maintain copies of earlier FIRMs that have been in effect since 1999.
- (9) Records of the service must be kept and provided for credit documentation (see Section 325).

The record must note

- The date of the inquiry,
- The address or location of the property in question,
- The FIRM zone, and
- Whether the inquirer was advised of the items to be credited. For example, for MI1, there must be a note for properties in the SFHA that the inquirer was told about the rules on mandatory flood insurance purchase.

A log is required if information is given orally or on the telephone. A sample log is shown in Figure 320-1. Copies of letters will suffice for documentation if the information was provided in writing. A sample of such a letter is shown in Figure 320-2. Copies of the log or letters are also required if another agency or organization provides the map information.

Log of Walk-in and Telephone Map Information Inquiries										
Date	Type	Address	Panel	Zone	BFE	Insurance Information Given	Coastal A Zone or CBRS	Past flood or Depth of BFE	Rep loss Area?	Sensitive or wetland
8/3	W	201 W. Main	0001B	AE	734	7	No	4.5'	No	Yes .
8/4	T	309 W. Mumford	0001B	X	NA	NA	No	NA	No	No .
8/4	T	907 S. Basay	0002B	AE	727	V	No	2.0'	No	No .
8/5	L	408 E. Marion	0001B	A	NA	7	No	NA	Yes	No .
8/5	W	3rd & State	0002B	AE	730	7	No	<1'	No	Yes .
Codes: W - walk in H - gave handout CBRS - Coastal Barrier Resources System			T - telephone request V - told verbally			L – letter or written request N/A - not applicable				
NOTE: If all of the map information comes from the same FIRM, the community number is not logged. The community in this example has only one FIRM based upon NAVD, so the FIRM date and datum are not included in the log. Also, the panel number logged includes the suffix. The community has all of the data needed to document MI 1, MI 2, MI 4, MI 6, and MI 7 in this log.										

Figure 320-1 A sample log for a map information service.

[Community Letterhead]

Date: _____

RE: Flood Hazard Information

TO WHOM IT MAY CONCERN:

The property located at: _____, also known as _____
[legal description if needed] has been located on the city's Flood
Insurance Rate Map (FIRM). The following information is provided:

Community ID or NFIP number: 123456

The property is located on panel number: _____, Suffix: _____

The date of the FIRM index: May 15, 2005.

The property is located in FIRM zone: _____

The main building on the property:

____ IS located in a Special Flood Hazard Area. The base flood elevation at the property
is _____, NAVD. Federal law requires that a flood zone determination be done as a
condition of a federally backed grant or loan to determine if the structure is in an SFHA and if
so, to require flood insurance. This letter is not to be considered a flood zone determination. It is
up to the lender to determine whether flood insurance is required for a property.

____ IS NOT located in a Special Flood Hazard Area. However, the property may still be subject to
local drainage problems or other unmapped flood hazard. Flood insurance from the National
Flood Insurance Program (NFIP) is available at non-floodplain rates. A flood insurance policy
can still be required by a lender.

____ A decision about the building's exact location cannot be made on the FIRM. A copy of the FIRM
is attached for your information.

Flood insurance from the NFIP is available for any property in this city. More information on flood
insurance is attached. This office has copies of FEMA Elevation Certificates for all buildings
constructed in the SFHA since 1990. Questions about this letter or about the City's floodplain
management program are welcome at this office by calling 555-123-1234.

NOTE: This information is based on the Flood Insurance Rate Map for the City. This letter does not
imply that the referenced property will or will not be free from flooding or damage. A property not in a
Special Flood Hazard Area may be damaged by a flood greater than that predicted on the FIRM or
from a local drainage problem not shown on the map.

Building Official

Figure 320-2. A sample map information record for MI1.

Challenging the Lender's Map Determination

Communities should be aware that the ultimate decision on whether flood insurance is required rests with the lender. Lenders are permitted to rely on third-party vendors for flood zone determinations provided that those vendors guarantee the accuracy of their determinations. Communities are not considered third-party vendors nor are they expected to assume the lender's responsibility. See also Figure 320-3

However, if there is a flood zone discrepancy among the parties involved, community officials often are contacted to provide assistance and documentation to clarify the flood zone for the building in question. The CRS encourages communities to help their residents. The community staff that provides the map information service should be familiar with the mandatory purchase requirements and the following processes available to property owners to resolve a flood zone dispute.

- 1) Talk to the lender—The first step should always be to talk to the lender and demonstrate that the building is not in the Special Flood Hazard Area (SFHA). The community can help, by supplying a printout of the FIRM showing the building's location. If the lender's decision is based on information from a flood zone determination company, the inquirer can ask the lender to request a manual determination. Often determinations are made by a computer, so a manual determination may result in a different finding.
- 2) Letter of Map Amendment—Out as Shown (LOMA—OAS)—Occasionally, a parcel or individual structure may be incorrectly determined to be located within the SFHA because of imprecise map delineations. A property owner may submit property and elevation materials to FEMA in support of a request for a LOMA. Where the FIRM is based on an aerial photograph and the building is clearly shown as outside the SFHA, this can be a relatively simple approach.
- 3) Letter of Determination Review (LODR)—This process is meant to be used to determine whether the FIRM was read correctly. The borrower and lender can jointly submit a review request to FEMA during the 45-day period after the borrower is notified that flood insurance is required.

After reviewing the required supporting technical documentation, within 45 days after receiving the completed package, FEMA will issue a written determination, a LODR, indicating its concurrence or disagreement with the original determination made by the lender or third party, and stating whether the FIRM indicates that the subject building is in the SFHA. FEMA will assess a flat fee to cover the costs of this review.

- 4) Letter of Map Amendment (LOMA)—Sometimes the flood map will show a structure as clearly being within an SFHA, even though the building on the property is on ground that is above the base flood elevation. FIRMs may not reflect every rise in terrain, so there may be instances of "natural islands" of high ground that are inadvertently included in the SFHAs. A property owner may submit property and elevation materials in support of a request for a LOMA to remove the property from the SFHA.

More details about these letters can be found at www.fema.gov/letter-map-amendment-letter-map-revision-based-fill-process.

322 Elements

322.a. Basic FIRM information (MI1)

The maximum credit for this element is 30 points.

MI1 credits providing basic information found on a FIRM that is needed to write a flood insurance policy.

Credit Criteria for MI1

- (1) The activity credit criteria in Section 321.b must be met.
- (2) The community must provide all of the following FIRM information to inquirers:
 - (a) Whether the property is in an SFHA,
 - (b) The community number,
 - (c) The panel number and suffix,
 - (d) The date of the FIRM's index (cover panel),
 - (e) The FIRM zone, e.g., A, C, X, V, AE, A2, AO, etc.,
 - (f) The base flood elevation (the depth in AO Zones) where shown on the FIRM, and
 - (g) The elevation datum used on the FIRM, if other than NGVD.

These items provide what is needed to complete most of Section B of the FEMA Elevation Certificate form (see Activity 310 (Elevation Certificates)). A copy of the Elevation Certificate for the property, if available, can suffice for the minimum requirements of this element. There is no prorating for providing only some of the needed map information.

The community need only supply the insurance rating data requested. If the inquirer only wants to know if a building is in a floodplain, then advising whether it is in an SFHA as shown on the FIRM is sufficient.

- (3) If a property is too close to the SFHA boundary to determine the building's FIRM zone, the community may give the inquirer a copy of the FIRM and advise that the FIRM zone cannot be determined based on the map information available.
- (4) The community is not required to provide data that do not appear on the FIRM, such as base flood elevations in unnumbered A Zones, but providing additional information from other maps and sources of flood hazard and flood protection information is encouraged and may be credited under elements MI2 through MI7.
- (5) If the property is in an SFHA, the community must inform the inquirer of the mandatory flood insurance purchase requirement, as appropriate. This may be done by advising the inquirer that flood insurance may be required because of the property's location or by providing a written summary of the requirement (e.g., the example in Figure 320-3).

About the Mandatory Purchase of Flood Insurance

The NFIP: The National Flood Insurance Program (NFIP) is a federal program enabling property owners in participating communities to purchase flood insurance on eligible buildings and contents, whether they are in or out of a floodplain. This community participates in the NFIP, making federally backed flood insurance available to its property owners.

The NFIP insures most walled and roofed buildings that are principally above ground on a permanent foundation, including mobile homes, and buildings in the course of construction. Property owners can purchase building and contents coverage from any local property and casualty insurance agent. To find a local insurance agent that writes flood insurance in your area visit <https://www.fema.gov/national-flood-insurance-program>.

Mandatory Purchase Requirement: Pursuant to the Flood Disaster Protection Act of 1973 and the National Flood Insurance Reform Act of 1994, the purchase of flood insurance is mandatory for all federal or federally related financial assistance for the acquisition and/or construction of buildings in Special Flood Hazard Areas (SFHAs). An SFHA is defined as any A or V flood zone on a Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM).

The mandatory purchase requirement also applies to secured loans from such financial institutions as commercial lenders, savings and loan associations, savings banks, and credit unions that are regulated, supervised, or insured by federal agencies, such as the Federal Reserve, the Federal Deposit Insurance Corporation, the Comptroller of Currency, the Farm Credit Administration, the Office of Thrift Supervision, and the National Credit Union Administration. It further applies to all loans purchased by Fannie Mae or Freddie Mac in the secondary mortgage market.

Federal financial assistance programs affected by the laws include loans and grants from agencies such as the Department of Veterans Affairs, Farmers Home Administration, Federal Housing Administration, Small Business Administration, and FEMA disaster assistance.

How it Works: When making, increasing, renewing, or extending any type of federally backed loan, lenders are required to conduct a flood zone determination using the most current FEMA FIRM to determine if any part of the building is located in an SFHA. If the building is in an SFHA, the federal agency or lender is required by law to provide written notification to the borrower that flood insurance is mandatory as a condition of the loan. Even though a portion of real property on which a building is located may lie within an SFHA, the purchase and notification requirements do not apply unless the building itself, or some part of the building, is in the SFHA. However, lenders, on their own initiative, may require the purchase of flood insurance even if a building is located outside an SFHA. Up to 25% of all NFIP flood losses arise from outside SFHAs (B, C, and X Zones).

Under federal regulations, the required coverage must equal the amount of the loan (excluding appraised value of the land) or the maximum amount of insurance available from the NFIP, whichever is less. The maximum amount of coverage available for a single-family residence is \$250,000 and for non-residential (commercial) buildings is \$500,000. Federal agencies and regulators, including government-sponsored enterprises, such as Freddie Mac and Fannie Mae, may have stricter requirements.

Figure 320-3 A handout about the mandatory purchase of flood insurance.

Credit Points for MI1

MI1 = 30 points, for providing all the basic information found on a FIRM that is needed to write a flood insurance policy

The community must provide all the information needed from the entire FIRM.

322.b. Additional FIRM information (MI2)

The maximum credit for this element is 20 points.

MI2 credit is for providing information that is shown on the community's FIRM that is not needed for insurance rating. This can include information about protected coastal barriers, floodways, or lines demarcating wave action.

Credit Criteria for MI2

- (1) The activity credit criteria in Section 321.b must be met.
- (2) The additional information must include whether the property is in an “undeveloped coastal barrier” or “otherwise protected area” of the Coastal Barrier Resources System. If so, the community must advise the inquirer that flood insurance, federal disaster assistance, and other types of federal financial assistance are not available for buildings constructed or substantially improved after the effective date of designation, as shown on the FIRM. More information on the Coastal Barrier Resources System can be found at www.fws.gov/CBRA.
- (3) The additional information must include whether the property is located seaward of the Limit of Moderate Wave Action (LiMWA), if shown on the FIRM. If it is, the inquirer must be advised that waves and velocity from coastal storms and hurricanes can cause significant damage to a structure that is not properly elevated on an open foundation and protected from erosion and scour.
- (4) The additional information must include whether the property is located in a floodway. If it is, the community must explain the regulatory requirements for developing in a floodway.

If the community's FIRM does not show any Coastal Barrier Resources System areas, LiMWAs, or floodways, there is no credit for MI2.

Credit Points for MI2

MI2 = 20 points, for providing non-insurance rating information that appears on the community's FIRM

322.c. Other flood problems not shown on the FIRM (MI3)

The maximum credit for this element is 20 points.

MI3 credit is for providing information about flood problems other than those shown on the FIRM. Note that providing information about historical flooding is credited under MI6.

Credit Criteria for MI3

- (1) The activity credit criteria in Section 321.b must be met.
- (2) The other flood problem information provided must be about a flood hazard not shown on the community's FIRM. Examples include, but are not limited to
 - Areas predicted to be flooded in the future because of climate change or sea level rise;
 - Local drainage problems;
 - Areas mapped and regulated outside the SFHA (e.g., in watersheds smaller than FEMA's mapping threshold) (note that such mapping can receive credit under Activity 410 (Flood Hazard Mapping)); and
 - A levee or dam failure inundation zone (note that such mapping is needed for credit under Activities 620 (Levees) and 630 (Dams)).

Credit Points for MI3

MI3 = 20 points, for providing information about flood problems other than those shown on the FIRM

322.d. Flood depth data (MI4)

The maximum credit for this element is 20 points.

MI4 credit is for providing information about how deep flood waters can be anticipated to be in given areas of the community. The depth of expected flooding gives the inquirer a better concept of the flood hazard than does the base flood elevation alone.

Credit Criteria for MI4

- (1) The activity credit criteria in Section 321.b must be met.
- (2) Depth data must be conveyed to inquirers. There are usually two ways to provide flood depth data. Either one is acceptable for credit.
 - (a) Staff can provide information from a map that shows the depth of flooding at different flood recurrence levels. An example is shown in Figure 320-4.
 - (b) Staff can provide data on both the flood elevation and the ground or building elevation at a site. This could be obtained from the FIRM or flood elevation profile and a topographic base map or Elevation Certificate. Where there is no elevation data for the property in question, data from a neighboring building's Elevation Certificate are acceptable to convey the flood depth in the area.

Credit Points for MI4

MI4 = 20 points, for providing information about flood depths

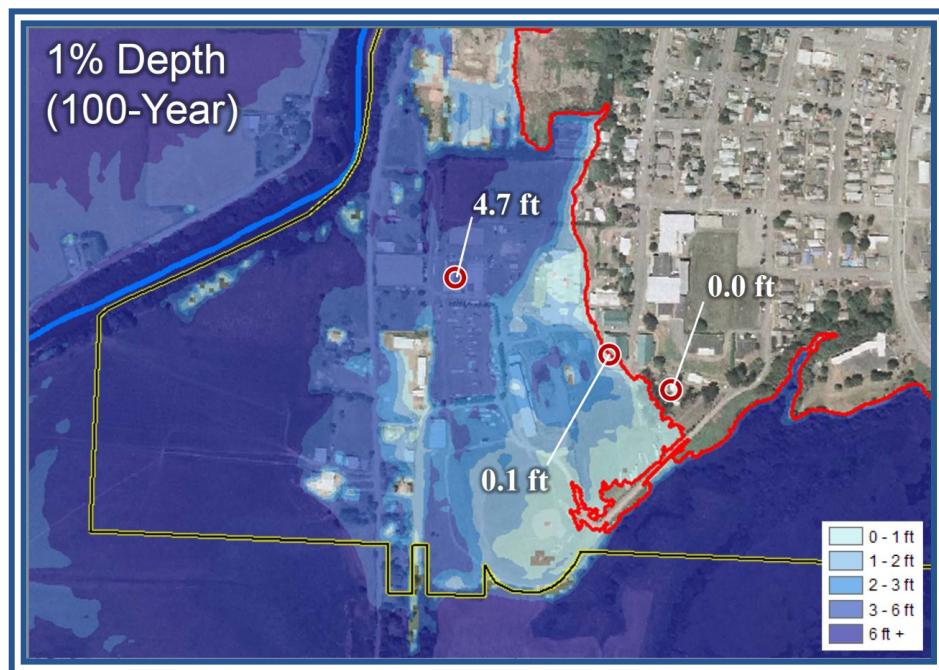


Figure 320-4. A flood depth map, one of the Risk MAP products.

322.e. Special flood-related hazards (MI5)

The maximum credit for this element is 20 points.

MI5 credit is for providing information about special flood-related hazards in the community. If the community is receiving CRS credit for regulating one of the special flood-related hazard areas described in Section 401 or credited elsewhere, inquirers should be advised whether the property falls within a special flood-related hazard area and of any additional regulatory requirements the community may have for developing properties in that area.

Creditable special flood-related hazards include, but are not limited to

- Uncertain flow paths—alluvial fans, moveable bed streams, and other floodplains where the channel moves during a flood.
- Closed basin lakes—lakes that have a small or no outlet that may stay above flood stage for weeks, months, or years.
- Ice jams—flooding caused when warm weather and rain break up a frozen river. The broken ice floats downriver until it is blocked by an obstruction, such as a bridge or shallow area, creating a dam.
- Land subsidence—lowering of the land surface caused by withdrawal of subsurface water or minerals or by compaction of organic soils.
- Mudflow hazards—a river, flow, or inundation of liquid mud down a hillside, usually as a result of the loss of brush cover and the subsequent accumulation of water on the ground, preceded by a period of unusually heavy or sustained rain.
- Coastal erosion—areas subject to the wearing away of land masses caused primarily by waves on the oceans, Gulf of Mexico, or the Great Lakes.
- Tsunamis—large ocean waves caused by an underwater earthquake or volcano.
- Coastal A Zones credited under Activity 430 (Higher Regulatory Standards), Section 432.k.

Credit Criteria for MI5

(1) The activity credit criteria in Section 321.b must be met.

(2) The affected area must be mapped for this credit, but does not have to be regulated. If there are no regulations, the inquirer must be told what precautions should be taken when developing or improving the property.

Credit Points for MI5

MI5 = 20 points, for providing information about a special flood-related hazard that does not appear on the FIRM

322.f. Historical flood information (MI6)

The maximum credit for this element is 20 points.

MI6 credits providing information about past floods that have occurred at or near the site in question. This can include, but is not limited to

- Whether and when the area has been flooded in the past,
- Historic flood levels or the location of a nearby high-water mark,
- Whether the property is in a mapped repetitive loss area, or
- Photographs of past flooding at sites around the community.

Credit Criteria for MI6

(1) The activity credit criteria in Section 321.b must be met.

(2) Information on historical flooding must be provided.

Relevant available information should be provided, such as the dates of past flooding in the area, whether people were killed or injured, and the amount of warning time. Some of this information may be available from the community's floodplain management or hazard mitigation plan or the community's CRS Self Assessment conducted under Section 240.

Credit Points for MI6

MI6 = 20 points, for providing information about past flooding at or near the site in question

322.g. Natural floodplain functions (MI7)

The maximum credit for this element is 20 points.

MI7 credit is for providing information about areas that should be protected because of their natural floodplain functions. Many types of maps show such areas, including, but not limited to

- Areas mapped in the National Wetlands Inventory, available at www.fws.gov/wetlands/Data/Mapper.html;
- Areas mapped as critical habitat by the U.S. Fish and Wildlife Service, available at <http://criticalhabitat.fws.gov/crithab/>;
- Areas identified in state or regional programs, such as the Colorado Natural Heritage Program maps of existing and potential conservation areas, available at www.cnhp.colostate.edu/download/gis.asp;
- Areas receiving natural floodplain functions credit under Activity 420 (Open Space Preservation); and
- Areas identified in a natural floodplain functions plan credited under NFP in Activity 510 (Floodplain Management Planning).

Credit Criteria for MI7

(1) The activity credit criteria in Section 321.b must be met.

(2) Information must be provided about any natural floodplain functions the area provides.

Credit Points for MI7

MI7 = 20 points, for providing information about areas that should be protected because of their natural floodplain functions

323 Impact Adjustment

There is no impact adjustment for this activity.

324 Credit Calculation

c320 = MI1 + MI2 + MI3 + MI4 + MI5 + MI6 + MI7
up to the maximum of 90 points

325 Documentation Provided by the Community

- a. At each verification visit,
 - (1) Documentation that shows how the community publicizes the service each year (see Section 321.b, activity credit criterion (6)).

If the community publicizes this service through an annual outreach project credited under Activity 330, the publicity materials may be included with the documentation for Activity 330. There must be a notation (e.g., “320”) in the margin of the portion of the outreach project where the map information service is addressed.

If a Program for Public Information is used to determine the appropriate publicity mechanism, it must identify the audience(s) for the service and discuss the best way to publicize the map information service to the intended audience(s).

Example 325.a-1.

City gives Answers to Floodplain Questions

If you want to know if a property is in the Special Flood Hazard Area, check our website at www._____org/flood/mapinfo. You'll find a wealth of information about the City's Flood Insurance Rate Map, coastal high hazard areas, flood depths at your property, natural conservation areas and wetlands, flood insurance, special rules for building in the floodplain, and ideas for protecting your property from flood damage. Or you can call the Building Department with all of your floodplain questions at 555/123-4567.

- (2) An explanation of how the community keeps the FIRM updated (Section 321.b, activity credit criterion (7)). This may be a verbal explanation at the time of the verification visit.
- (3) Copies of all FIRMs that have been in effect since 1999 (Section 321.b, activity credit criterion (8)).
- (4) A record, copies of letters, or log of the service (Section 321.b, activity credit criterion (9)).
- (5) If another agency or organization provides map information, documentation that the agency has agreed to provide the service to all inquirers and will allow the ISO/CRS Specialist to verify its work.

- b. With the annual recertification,
 - (1) A copy of material showing how the community publicized the service during the year.
 - (2) A page from the log of the service or copies of three letters that were completed during the year (Section 321.b, activity credit criterion (9)).

326 For More Information

- a. Additional information, reference materials, and examples can be found at www.CRSresources.org/300.
- b. Copies of the following booklets are available free, singly and in quantity (see Appendix C).

Answers to Questions about the National Flood Insurance Program, FEMA-084. This is also available from FEMA's website at www.fema.gov/th/media-library/assets/documents/272.

See also FEMA's flood hazard mapping website at www.fema.gov/national-flood-insurance-program-flood-hazard-mapping.

Information on FEMA's FIRMs can be found at www.fema.gov/national-flood-insurance-program-2/flood-insurance-rate-map-firm.

- c. Assistance in determining whether a “too-close-to-call” property is in the Coastal Barrier Resources System can be obtained from the U.S. Fish and Wildlife Service. More information on the CBRS can be found on the U.S. Fish and Wildlife Service's website at www.fws.gov/CBRA/
- d. Communities may check on past FIRMs at www.msc.fema.gov.
- e. The Compendium of Flood Map Changes is a list of all the changes made to the NFIP maps including Physical Map Revisions, Letters of Map Revision, and Letters of Map Amendment during a given six-month period. The list is updated every six months and published in the *Federal Register*. www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/compendium-flood-map-changes.

327 Related Activities under the Community Rating System

- Credit under Activity 320 is provided for explaining map information to the public. Credit for additional map data (AMD) under Activity 440 (Flood Data Maintenance) is provided for maintaining and updating the data. A community can get either credit without getting credit for the other.
- If an inquirer wants to know more about the flood hazard, flood insurance, and/or protecting natural floodplain functions, the community should have resources available to answer those questions. Such resources are credited by the CRS under Activity 350 (Flood Protection Information), Activity 360 (Flood Protection Assistance), and Activity 370 (Flood Insurance Promotion).

- If the community develops a Program for Public Information (credited under Activity 330 (Outreach Projects)), the Program for Public Information committee should discuss what map information to provide and how the service would best be publicized.
- Some communities' map information services help real estate agents find out the flood hazard for a property. Having an objective source of this information can help overcome some agencies' reluctance to disclose the flood hazard and can help the community receive credit under Activity 340 (Hazard Disclosure).

330 OUTREACH PROJECTS—Summary

Maximum credit: 350 points

Although the total of all elements in this activity exceeds 350 points, the maximum credit is 350 points.

332 Elements

- a. **Outreach projects (OP)**: Up to 200 points for designing and carrying out public outreach projects. Credits for individual projects may be increased if the community has a Program for Public Information credited in element PPI.
- b. **Flood response preparations (FRP)**: Up to 50 points for having a pre-flood plan for public information activities ready for the next flood. Credits for individual projects may be increased by the PPI multiplier.
- c. **Program for Public Information (PPI)**: Up to 80 points added to OP credits and up to 20 points added to FRP credits, for projects that are designed and implemented as part of an overall public information program.

***NOTE:** A Program for Public Information can help design an entire public information program, not just outreach projects. A Program for Public Information that covers other types of public information endeavors, such as a website and technical assistance, can result in increased credit under other activities.*

- d. **Stakeholder delivery (STK)**: Up to 50 points added to OP credits for having information disseminated by people or groups from outside the local government.

Credit Criteria

Each element has a separate section describing credit criteria.

Impact Adjustment

There is no impact adjustment for this activity.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

330 OUTREACH PROJECTS

The OBJECTIVE of this activity is to provide the public with information needed to increase flood hazard awareness and to motivate actions to reduce flood damage, encourage flood insurance coverage, and protect the natural functions of floodplains.

331 Background

Research has shown that awareness of the flood hazard is not enough to motivate people to take action to protect themselves and their property. People need to be told repeatedly, through various means, what specific actions to take before they will change their behavior. Research has also shown that a properly run local information program is more effective in bringing about change than are national advertising or publicity campaigns.

Based on these research findings, Activity 330 provides credit to communities that engage in thorough, critical thinking about their public information needs and about what they want people in their communities to know and do with regard to floodplain resources and flood hazards. The activity provides extra credit for communities that develop locally customized strategies to increase awareness and motivate residents to take action.

331.a. Activity Description

The maximum credit for Activity 330 is 350 points, including the extra credit available for communities that design and implement a Program for Public Information. The sum of the maximum credit for all the elements exceeds 350, but a community's score is capped at 350 points.

Two types of outreach projects are credited:

- (1) Outreach projects (element OP) that are distributed every year, and
- (2) Projects that will be distributed when a flood occurs, but are prepared in advance and reviewed and adjusted each year (element FRP).

The credits for these two types of projects are based on three factors:

- (1) What and how many messages are conveyed;
- (2) What type of projects they are (e.g., informational projects that people seek out and read, activities that reach out to people, or projects targeted to a specific audience); and
- (3) How often they are delivered. OP-credited projects must be delivered at least once each year. FRP-credited projects must be delivered at least once during or after a flood.

The credit points for OP and FRP projects can be increased by 40% if they are developed and implemented pursuant to a Program for Public Information credited in element PPI.

The credit for Program for Public Information projects can be increased by an additional 30% if they are delivered by stakeholders, i.e., organizations or agencies other than the community's local government (element STK).

Messages

Messages are the heart of public outreach. Messages are specific statements or directions that the community considers important for its audiences. There are six general topics that are important to the Federal Emergency Management Agency (FEMA) and the Community Rating System (CRS). These are shown in Table 330-1 with some sample messages under each topic.

Activity 330 credits messages that either clearly state what the audience should do (e.g., "Turn around, don't drown" or "Get a floodplain permit from . . .") or that provide some basic information with a note on where to get more information (e.g., "You may live in a floodplain. Find out by calling 555-1234" or "Information on ways to protect your property from flooding can be found at www. . . .").

The messages in Table 330-1 are examples. Several FEMA programs, such as Risk MAP, can provide additional guidance and examples that have been research-tested on several of the topics.

Projects

The same message can and should be conveyed via different, multiple methods. Certain methods or projects are more effective than others at motivating change, so the credit for different types of projects is assigned accordingly. Credit is also based, in part, on the number of times the message is delivered each year. The CRS credits three types of methods or projects.

- (a) **Informational Projects.** These are booklets, brochures, flyers, and similar documents that are made available upon request or are placed in a public location for people to pick up, such as a kiosk in the city hall lobby. Since they do not "reach out" to the public, informational projects do not receive as many points as the other types of projects. They are counted as conveying their messages only once each year. There is credit for a maximum of five informational projects that have the same documents included in them. A few examples follow.
- The building department has several one-page handouts about permit requirements and the substantial improvement/substantial damage rules and brochures on flood insurance. They are available to people who come in to the permit office. This would be counted as one informational project with materials that cover topic 2, Insure your property for your flood hazard and topic 5, Build responsibly.

Table 330-1. CRS topics and example messages.	
Six Priority Topics	Example Messages
1. Know your flood hazard	Your property is subject to flooding by the Roaring River You are in a repetitively flooded area Call 555-1234 to find out the flood hazard for your property
2. Insure your property for your flood hazard <i>NOTE: At least one project must include a message on this topic</i>	Ask your insurance agent if you are covered for flood damage Renters should buy flood insurance for their contents Take advantage of a low-cost Preferred Risk Policy
3. Protect people from the hazard	Turn around, don't drown Know the flood warning signals: one long blast of the siren means a flash flood along Silver Creek Designate a place where your family can rendezvous after an evacuation order is issued
4. Protect your property from the hazard	Replace your flooded furnace with one elevated above the flood level Store your valuables and insurance papers upstairs in a waterproof container We can help you get a grant to elevate your home. Call us at _____
5. Build responsibly	Get a permit from . . . before you build Don't build or grade within 10 feet from the property line so you don't alter the drainage between homes Use only licensed contractors who know the rules
6. Protect natural floodplain functions	Protect our turtle nesting areas: stay off the beach after sunset Report broken silt fences: they help keep our streams clean Don't trash the river—that's where we get our drinking water
<p>* <i>NOTE: All the messages are examples. Communities should develop messages that are pertinent to this flooding conditions.</i></p>	

- Information and links to resources on one or more of the six priority topics is posted on a website. Note that if the website qualifies for credit under Activity 350 (Flood Protection Information), the community would receive more credit there and would not receive double credit under Activity 330.
- (b) **General Outreach Projects.** These are newspaper articles, signs, and presentations that are designed to resonate with an identified general audience. These messages “reach out” to people in general, so they receive more points than informational projects. A few examples follow.
- A regional newspaper has a flood preparedness supplement at the beginning of the flood season.

- A city employee gives a talk about floodplain construction rules to the annual meeting of the local homebuilders association. A handout on permit requirements is given to all attendees.
- (c) **Targeted Outreach Projects.** These are projects directed to a specified audience. Communities must demonstrate that the targeted outreach projects reach or are distributed to all of the members of the priority audience. The message must clearly explain that the recipient is receiving the message because he/she is part of the priority audience. Research has shown these types of projects to be the most effective way to reach people, provided that they address the audience and focus on the audience's concerns. Targeted outreach projects that are repeated to the identified audience (e.g., more than one mailing to the same people each year) are counted as separate projects.

Here are two examples of targeted outreach projects:

- The mayor sends a letter to all residents of the floodplain.
- A presentation is made to a neighborhood meeting attended by at least half of the repetitive loss area's residents. A face-to-face encounter that includes two-way communication and questions and answers is more effective than a mailing. Therefore, having at least 50% of the priority audience present at a meeting receives full credit as a targeted outreach project.

To be most effective, the same messages should be repeated in many projects. Sending out different messages in different projects often dilutes the most important message that should be disseminated. For example, instead of conveying 10 different ways to protect people from the hazard in 10 projects, the community should pick the one message that is most important to it, such as "Turn around, don't drown," or "Know your evacuation route," and repeat that single message in all 10 projects.

Other Credits

The community's Program for Public Information is discussed in Section 332.c. Stakeholder participation is discussed in Section 332.d. See also Section 335 for ideas on how outreach projects and a Program for Public Information can support and receive extra credit under other CRS activities. For example, Activities 610 (Flood Warning and Response), 620 (Levees), and 630 (Dams) have requirements for outreach projects. Those projects can qualify for credit under Activity 330 and receive the extra PPI credit.

331.b. Impact Adjustment

There is no impact adjustment for this activity.

332 Elements

332.a. Outreach projects (OP)

The maximum credit for this element is 200 points. If the community has a PPI that discusses preparation and implementation of the project, it can receive up to 80 extra points. If the project is delivered by a stakeholder (STK), it can receive up to 50 additional extra points.

OP credit is provided for disseminating one or more messages via one or more outreach projects one or more times each year (see Table 330-2). The credit is for projects that convey the messages identified by the community as being important to its residents, businesses, and others.

OP credit is provided for each outreach project that conveys a message under one or more of the six CRS priority topics. The credit is limited to one message per topic, i.e., a maximum of six messages per project. Examples of OP crediting are in Table 330-1.

If the community has adopted a credited Program for Public Information, it can receive credit for up to four additional flood-related messages per project, regardless of the topic(s). Examples of crediting outreach projects under a Program for Public Information are in Table 330-4.

Communities should always develop messages that are most relevant for their flooding conditions and not limit the number or type of messages because of CRS credit.

Credit Criteria for OP

- (1) To receive credit, projects must be disseminated at least annually to the audience.
- (2) At least one project must convey a message on the topic of flood insurance. Note that, under Activity 370 (Flood Insurance Promotion), there is additional credit for outreach projects that promote flood insurance.
- (3) If a community does not have a credited Program for Public Information, only five priority audiences are recognized for outreach project (OP) credit.
 - Floodplain residents and businesses;
 - Repetitive loss area residents and businesses;
 - Residents of areas protected by a levee;
 - Residents of areas subject to flooding if an upstream dam fails; and
 - Residents of areas subject to one of the credited special flood-related hazards described in Section 401.

If a community has a credited Program for Public Information, the community can identify additional priority audiences. These can be people in a specific geographical

area (e.g., downtown businesses, residents or tourists along the coast, residents in an area where most people speak only Spanish, etc.) or a functional group (e.g., insurance agents, building contractors, drivers etc.).

- (4) Training or projects targeted to local government staff, elected officials, or members of advisory bodies are not credited public outreach projects under Activity 330.

Credit Points for OP

$$OP = \sum OP\#1 + OP\#2 + OP\#3 \dots, \text{to the maximum of 200 points}$$

The value for each outreach project (OP#1, OP#2, etc.) is the product of (A) x (B) x (C), where

A = the number of points for the type of project—
informational (1 point), general outreach (2 points),
or targeted outreach (6 points),

B = the number of topics (see the six topics in Table 330-1)
and up to four additional PPI messages covered by the
project, and

C = the number of times the project is delivered each year or
repeated. The maximum value for C is 5. For example,
there is credit for a maximum of five informational
projects that have the same documents included in
them.

The values for each outreach project (OP#1, OP#2, etc.) are
added to determine the total value for OP. A spreadsheet in
Microsoft Excel® is available to help calculate the credit for OP.

General and targeted outreach projects can be repeated several times each year. Repeating a project twice a year is counted the same as two projects a year. For examples, see OP#3, OP#6, and OP#7 in Table 330-2.

Informational projects are counted as conveying their messages only once each year.
However, booklets and brochures set out at three different public locations are counted as
three different projects or as repeating the same project three times each year.

Because repetition is more effective, the CRS provides more credit to a community that
repeats outreach projects. However, to encourage repeating the message from different
sources, the credit for repeating the same project from the same source is capped at five
times per year. This applies to all projects that are at different locations, such as the

same brochure, evacuation signs, high water marks, storm drain stencils, etc. This also applies to other types of outreach projects, such as giving the same presentation more than five times (but giving different presentations to different audiences are counted as different projects).

Table 330-2. Basic scoring of example outreach projects (without a PPI).				
Example Outreach Projects (OP)	A Points for type of project	B # of Topics and PPI Messages*	C # of Times Delivered each Year	(A x B x C) OP = Points per Project
OP#1. Three brochure on flood insurance produced by FEMA are set out in the city hall lobby (informational project—1 point per topic, CRS topic 2).	1	1	1	1
OP#2. Local insurance agents have agreed to advise their clients that flood insurance is a good idea and give them one of the OP#1 brochures (general outreach—2 points per topic, CRS topic 2).	2	1	1	2
OP#3. Presentations are made to five neighborhood associations each year with messages under CRS topics 1, 4, and 5. Two of the OP#1 brochures are handed out to everyone present (topic 2) (general outreach—2 points per message).	2	4	5	40
OP#4. The neighborhood association presentation is taped and shown on the public service cable TV channel. (general outreach—2 points per topic)	2	4	1	8
OP#5. A mailing is sent each year to all residents of the SFHA. It has messages under the first five CRS topics. (targeted outreach—6 points per topic)	6	5	1	30
OP#6. “Do not dump—drains to the river where our fish live” stencils are sprayed next to storm drain inlets. (general outreach—2 points per topic, CRS topic 6, capped at five repetitions)	2	1	5	10
OP#7. The floodplain manager meets twice a year with the home builders association to discuss construction regulations and ways to incorporate flood mitigation into home improvement projects (general outreach—2 points per topic, CRS topics 4 and 5)	2	2	2	8
Total OP =				99
*Not to exceed one message under each of the six CRS priority topics per project (without a PPI)				

NOTE: An outreach project is only credited for one message per topic. For example, a flood safety booklet will get credit for one message under the topic of “protecting people.” It will not get more credit for covering more “protecting people” messages (such as safety in cars, evacuation routes, or warning signals). If the outreach project also has qualifying messages on flood insurance and protecting property, it would be credited for three messages because these are different topics. If the community has a credited Program for Public Information, it can add up to four additional credited messages. The additional PPI messages are credited in the same way as the six CRS priority topics.

There is no limit to the number of projects a community can undertake, but there is a limit of 200 points for OP (not including the extra credit provided by PPI and STK).

Note that extra points are available under the PPI and STK extra credit elements. These are discussed in more detail in Sections 332.c and 332.d, respectively.

Documentation for OP Provided by the Community

(1) At each verification and recertification,

- (a) A copy of the flyers, presentations, brochures, etc., that have been produced and disseminated as outreach projects, marked to show where the credited messages appear. At least one of the submittals must be a project that covers the topic of flood insurance. If an outreach project is a presentation to a group, it can be documented with a copy of the minutes or a memo to the file.
- (b) Documentation that the targeted outreach projects were disseminated to the priority audience, such as a mailing list or a sign-in sheet where a presentation was given.

332.b. Flood response preparations (FRP)

The maximum credit for this element is 50 points. If the community has a Program for Public Information that discusses preparation and implementation of the flood response preparations package, it can receive extra points under element PPI.

FRP credits developing a pre-flood plan for public information projects that will be implemented during and after a flood. A flood response preparations package is a collection of outreach projects prepared in advance, but not delivered until a flood occurs. These materials may include templates and masters of handouts, mailers, press releases, etc. that cover key messages that need to be disseminated before, during, and after a flood. The package must include both the materials that will be needed and the procedures for how they will be used.

Flood response preparations projects are credited in element FRP the same way as outreach projects credited in element OP, so the activity credit criteria on messages and projects in Section 331 also apply to FRP. The same three components of scoring are used: the number of topics with flood response or recovery messages, the type of project delivering the messages, and the number of times the project is delivered. The topics that can be credited are listed in Table 330-1. Examples of FRP projects are shown in Figure 330-1.

Using High Water Marks for Public Outreach

Floodville has posted five high water mark signs along Richland Creek, noting the height of the flood of record. The high water mark signs convey a creditable message under Topic 1, "Know your flood hazard" as it clearly shows the depth of a past flood at the site.

The sign also states where to get more information on flood safety. This is a creditable message under Topic 3, "Protect people from the hazard."

The credit for one of these high water mark signs is 2 points per topic for a general outreach project, times 2 topics, for a total of 4 points.

Because there are five such signs along Richland Creek, the scoring is for five repetitions of the messages. This is recorded as five times per year. The resulting total is $2 \times 2 \times 5 = 20$ points. These signs are designated as **OP#1** in the City's documentation for outreach project (OP) credit.

The credit criteria for OP encourages communities to repeat the message through different media and sources. Here are some examples of how Floodville does this and receives increased credit:

OP#2: The following message appears every quarter in the city's newsletter to its residents: "The highest flood of record on Richland Creek occurred on May 2, 2010. Call the Building Department at 555-1234 to see if your property was affected." The newsletter is a general outreach project with 2 points per topic. Credit is for the one message under Topic 1, Know your flood hazard. The message is repeated four times each year. The credit is 2 points/ message x 1 message x 4 times per year: $2 \times 1 \times 4 = 8$ points.



Floodville receives 20 points under MI6 in Activity 320 (Map Information Service) for providing callers with information about past flooding. It also had other articles in other editions of the newsletter that cover other topics and qualify for additional outreach projects.

OP#3: The city issues a news release on May 2 each year that says: "Today is the anniversary of the record flood on Richland Creek. While many homes were damaged, those with flood insurance coverage were repaired and reoccupied within a few weeks. Call the Building Department at 555-1234 to see if your property would be affected by a repeat of the 2010 flood. Call your insurance agent to see how much a flood insurance policy would cost." Credit is for a general outreach project that conveys messages under Topics 1, Know your flood hazard and 2, Insure your property for your flood hazard. 2 points/message x 2 messages x 1 time per year: $2 \times 2 \times 1 = 4$ points.

OP#4: This city prepared a brochure on flooding and flood protection. On the cover is the photo of the high water mark sign. Accordingly, both messages on the sign are repeated via another medium. The brochure has messages on all six CRS priority topics. The brochures are set out at the City Hall, the visitor's center, and Home Depot. The different locations are considered repetition of an informational project, so OP#4 qualifies for six points at each location x 3 locations = $1 \times 6 \times 3 = 18$ points.

OP#5: The brochure is also given out at at least four events each year. As such, it is a general outreach project. $2 \times 6 \times 4 = 48$.

The total OP credit for Floodville's annual high water mark campaign is the sum of OP#1 through OP#5:

$$OP = \sum OP\#1 + OP\#2 + OP\#3 + OP\#4 + OP\#5 = 20 + 8 + 4 + 18 + 48 = 98 \text{ points}$$

Flood Response Preparations

The first part of preparing an FRP package is determining the key messages. As with OP, only one message per topic is credited per project. If the community has a PPI, up to four additional messages can be credited per project, regardless of the topic.

Communities should develop messages keyed to the flood and post-flood situation, which are not necessarily the same messages that are needed for OP projects in a pre-flood situation.

Examples of FRP Messages

CRS Topic 3: Protect people from the hazard—Message 3: “Don’t enter a flooded building until it’s been cleared by an inspector.”

CRS Topic 4: Protect your property from the hazard—Message 4: “If your water heater or furnace needs to be replaced, put the new one in a spot above the flood level, so you won’t have to replace it after the next flood.”

CRS Topic 5: Build responsibly—Message 5: “Get a building permit before you start your repairs.”

PPI Message 8: “Use ICC to help pay to mitigate your substantially damaged building.”

PPI Message 9: “Want to avoid damage the next time it floods? Contact the Building Department for information on mitigation grants at 555-1234.”

Examples of FRP Projects

FRP#1: A media kit with background information for reporters on all five FRP messages

FRP#2: Radio public service announcements that cover FRP messages 3 and 5

FRP#3: Door hangers for flooded homes that explain all five FRP messages

FRP#4: Three handouts on grant programs at the disaster center.

Figure 330-1. Examples of messages and projects creditable in Flood Response Preparations (FRP).

See also Table 330-3 for an example of how these projects are scored.

Flood response preparations should be closely coordinated with the community’s emergency manager. Note that there is also credit under Activity 610 (Flood Warning and Response) if the flood warning and response plan includes instructions that are similar to the FRP messages (FRO6 in Section 612.c).

Flood response preparations projects are credited in element FRP the same way as OP projects: credit is provided for each project that conveys a message under one or more of the six CRS priority topics. The credit is limited to one message per topic, i.e., a maximum of six messages per project. If the community has adopted a credited Program for Public Information, it can receive credit for up to four additional flood-related messages per project, regardless of the topic(s).

Communities should always develop messages that are most relevant for their flooding conditions and not limit the number or type of messages because of CRS credit.

Credit Criteria for FRP

- (1) OP credit is a prerequisite to receiving FRP credit.
- (2) To receive FRP credit each year, the community must either use the flood response preparations package in response to a flood or (if no flood occurs) review it and adjust it as needed.
- (3) The community will not lose OP credit during the year of the flood if implementing the FRP projects diverts resources that would have been used to implement other OP projects. However, the community will lose its FRP credit if it does not implement its FRP projects when there is a flood or if it does not evaluate the FRP projects every year.
- (4) If a community does not have a Program for Public Information, the five priority audiences that are recognized for credit for outreach projects (OP) also apply to FRP. There is also a sixth priority audience for FRP: all properties that were flooded:
- Floodplain residents and businesses,
 - Repetitive loss are residents and businesses,
 - Residents of areas protected by a levee,
 - Residents of areas subject to flooding if an upstream dam fails,
 - Residents of areas subject to one of the credited special flood-related hazards described in Section 401, and
 - 100% of the properties that were flooded. An example of this type of project would be door hangers placed on every door of the flooded area before or soon after people can go back.
- (5) FRP projects must reach their audiences in a timely manner. Mailing a letter with safety and clean-up messages, for example, is not likely to reach people before they already re-entered and started repairing their houses. Such a project would not be credited, but messages through social media would be effective and credited.

Examples of FRP messages include

- “Know your evacuation route,” with a map of evacuation routes,
- “Know where the evacuation shelters are,” with a map of shelter locations,
- “If the street is under water, turn Around Don’t Drown,”
- “Don’t go back to your flooded house until the emergency manager announces that it is safe to do so.”
- “Don’t enter a flooded building until it has been cleared by an inspector,”
- “Get a permit for repairs,” and
- “If your building is substantially damaged, you will need to elevate it above the flood level. Visit this website, [www._____](#) for the substantial damage rules.”

-
- (6) FRP projects and procedures are prepared, reviewed, and adjusted each year. The projects do not have to be implemented until a flood is imminent—at that time, materials would be reproduced and distributed, messages disseminated, notices posted on doors, etc..
- (7) If no flood occurs, credit is still provided, as long as an annual review is conducted to make sure that the information is still current. The review and adjustment could be carried out as a part of an annual flood response drill or exercise (required for credit under Activity 610 (Flood Warning)) or as part of the annual evaluation of the Program for Public Information.

Credit Points for FRP

$FRP = \sum FRP\#1 + FRP\#2 + FRP\#3 \dots$, to the maximum of 50 points

The value for each project, FRP1, FRP2, etc., is the product of (A) x (B) x (C), where

A = the number of points for the type of project—
informational (1 point), general outreach
(2 points), or targeted outreach (6 points)

B = the number of topics (see the six topics in Table 330-1)
and up to four additional PPI messages covered by
the project, and

C = the number of times the project is delivered each year.
The maximum value for C is 5.

The values for each outreach project (FRP#1, FRP#2, etc.) are summed to determine the total value for FRP. A spreadsheet in Microsoft Excel® is available to facilitate calculating the credit for FRP.

FRP can provide up to 50 points. FRP is credited the same as OP. The extra PPI credit can be applied to FRP projects, but STK credit does not apply to FRP. See Section 332.c for a discussion of the PPI. Scoring examples for FRP projects are shown in Table 330-3.

Table 330-3. Scoring of example FRP projects (without a PPI).				
Example Flood Response Projects (FRP) (See Figure 330-1)	A Points for Type of Project	B # of Topics and PPI Messages	C # of Times Delivered each Year	(A x B x C) FRP = Points per Project
FRP#1. Media kit with background information for reporters	2	5	1	10
FRP#2. Eight different radio public service announcements*	2	2	5	20
FRP#3. Door hangers for flooded homes	6	5	1	30
FRP#4. Three handouts on grant programs at the disaster center	1	1	3	3
Total FRP =				50**
* Capped at five projects				
** Although the points per project add up to 63, the maximum credit for FRP is 50				

Documentation for FRP Provided by the Community

(1) At each verification visit,

- (a) A copy of the masters for the handouts, news releases, and other projects prepared as part of the FRP.
- (b) Written procedures that explain how the handouts, news releases, and other projects are to be copied and disseminated.
- (c) Documentation that the FRP materials were reviewed to determine whether they are still current and appropriate. This may be done as part of the annual report on the evaluation of the Program for Public Information.

(2) With the annual recertification,

- (a) Documentation that the FRP materials were reviewed to determine whether they are still current and appropriate. This may be done as part of the annual report on the evaluation of the Program for Public Information.
- (b) Copies of any FRP materials that were revised during the annual review or distributed during or after a flood.

332.c. Program for Public Information (PPI) (extra credit points)

This element is a 40% multiplier that increases the points for each OP and FRP project that is covered in the credited Program for Public Information. The maximum extra credit for this element is 80 points.

The Program for Public Information is an ongoing public information effort to design and transmit the messages that the community determines are most important to its flood safety and the protection of its floodplains' natural functions.

Note that a Program for Public Information should help design a community's entire flood protection public information program, not just outreach projects. A Program for Public Information that covers other types of public information endeavors, such as a website or technical assistance, can yield increased credit under other activities, as noted in Section 335.

Credit Criteria for PPI

For CRS credit, the Program for Public Information must be developed according to a seven-step planning and public involvement process, similar to the process credited under Activity 510 (Floodplain Management Planning). More guidance on the process can be found at www.CRSresources.org/300. Communities are also encouraged to ask questions and send draft documents to their ISO/CRS Specialist for review before the Program for Public Information is finalized.

There are seven steps to preparing a creditable Program for Public Information.

Step 1: Establish a Program for Public Information committee. The community's Program for Public Information must be developed by a committee of people from both inside and outside local government. The number of participants and their identities is determined by the community, but the committee must

- Meet at least twice: once to review the assessment (step 2) and once to review the Program for Public Information document before it is sent to the governing body (step 6). More meetings are recommended to ensure adequate input from the committee members;
- Comprise at least five people;
- Include one or more representatives from the community's floodplain management office;
- Include one or more representatives from the community's public information office, if there is one; and
- Have at least half of its members from outside the local government.

The criteria for the Program for Public Information committee is similar to the criteria for the planning committee credited under Activity 370 (Flood Insurance Promotion) and Activity 510 (Floodplain Management Planning). It is possible for the same committee to meet the credit criteria for all three activities. There is additional guidance on these committees at www.CRSresources.org/300.

A multi-jurisdictional committee can prepare a Program for Public Information for several communities that want to work together. To receive this credit,

- Each community wanting the credit must send at least two representatives to the regional committee,
- At least half of the community's representatives must be from outside the local government, and

- At least half of the representatives must attend ALL the meetings of the regional committee. In effect, there must be a quorum from each community. Remote attendance via a webinar that allows for everyone to talk is permissible. It is recommended that communities use existing committees, such as the floodplain management planning committee credited under Activity 510, when such organizations meet the above criteria.

Step 2: Assess the community's public information needs. There are four substeps to the needs assessment.

(a) **Identify priority areas.** The first substep is to delineate different priority areas within the community, based on different flooding or development conditions. This may have been done as part of the community's floodplain management planning. The Program for Public Information needs to include a description of the different areas.

The CRS Community Self Assessment, described in Section 240, is an online tool that can help identify priority areas.

(b) **Assess flood insurance coverage.** A flood insurance assessment is credited under Activity 370 (Flood Insurance Promotion). It is optional for PPI credit, but if the community wants to incorporate it into the Program for Public Information, it would go here. More information about the flood insurance assessment is found under Activity 370.

(c) **Determine priority audiences.** Priority audiences are those people who need different types of flood hazard and flood protection information. They can be residents or businesses in the priority areas identified in the first substep, above, or they can be other groups of people with a similar flood exposure and need for the same information. Examples could be renters, non-English speakers, tourists or visitors, or driver's education classes. A list of the priority audiences and their information needs must be included in the Program for Public Information document.

(d) **Inventory other public information efforts.** The assessment must also inventory existing public information and outreach efforts being conducted in the community. These must include projects done by the community and projects done by other agencies and organizations, such as utility companies, a flood control district, newspapers, the Red Cross, or environmental organizations. A list of these efforts and the subjects they cover must be included in the Program for Public Information document.

Step 3: Formulate messages. The public information messages needed for each priority audience are determined. The Program for Public Information committee identifies a desired outcome for each message.

The Program for Public Information committee is not limited to messages under the six CRS priority topics listed in Table 330-1. It can identify up to four additional messages for each priority audience.

Example.

The Program for Public Information assessment identifies the Roaring River as especially hazardous, so the committee selected the owners and residents of the Roaring River floodplain properties as a priority audience. It determines that more than one message about protecting lives are needed. The following four messages are decided on:

Message	Outreach Topic	Desired Outcome
“Your property is subject to a flash flood of the Roaring River.”	1. Know your flood hazard	Roaring River floodplain residents take steps to protect themselves.
“Do not drive in a flooded area. Remember: Turn around, don’t drown.”	3. Protect people from the hazard	No cars (or their occupants) are lost in a flood.
“Flash floods can kill. As little as one foot of moving water can sweep people off their feet. Do not walk across a flooded area.”	PPI message #7	Roaring River floodplain residents take the safest route to escape
“A long continuous blast of the fire siren is the warning for a flash flood. When you hear it, immediately walk uphill to high ground.”	PPI message #8	Roaring River floodplain residents take the safest route to escape

The first two messages are credited under CRS priority topics 1 and 3. Because the next two messages are also messages about protecting people, they are identified as PPI messages #7 and #8. This provides additional credit for the additional messages. The community could receive credit for two more messages (#9 and #10) if it wanted to convey more messages under topics 1 or 3.

Different additional PPI messages #7 through #10 can be identified for different priority audiences.

Step 4: Identify outreach projects to convey the messages. The committee considers what media to use to deliver the identified messages to the priority audiences. This may include continuing or revising existing public information and outreach efforts that are already being conducted in the community. Step 4 must produce a list of specific projects and identify who is responsible for them and when they will be implemented. A multi-jurisdictional Program for Public Information must identify which communities benefit from each project.

The Program for Public Information can identify priority audiences for targeted projects in addition to those listed for OP and FRP credit. These can be people in a specific geographical area (e.g., downtown businesses, residents or tourists along the

coast, residents in an area where most people speak only Spanish, etc.) or a functional group (e.g., insurance agents, building contractors, drivers, etc.).

Step 5: Examine other public information initiatives. The Program for Public Information committee looks at other public information activities in addition to outreach projects. This could include how best to set up a website on flood protection (Activity 350), what technical assistance is needed throughout the community (Activity 360), or how to publicize flood protection services (Activities 320, 350, and 360). Additional credit is available under Activities 340, 350, 360, and 540 if the element is described in the Program for Public Information document with specific recommendations on how it should be conducted.

Step 6: Prepare the Program for Public Information document and adopt the Program for Public Information. The committee's work is recorded in a formal document. The Program for Public Information document and the annual report that evaluates the program can be stand-alone documents or they can be sections or chapters in a floodplain management or hazard mitigation plan. The document does not need to be a long, formal report. Much of the key information can be displayed in a spreadsheet, such as the example in Figure 330-2.

For multi-jurisdictional programs, the document must show which communities benefit from which projects. For example, an inland community would not benefit from a project oriented to beachfront property owners, but all communities would benefit from articles in a regional newspaper about flood insurance. This documentation may be in the form of a matrix or table included in, or attached to, the Program for Public Information document.

The PPI must be adopted by the community, through either

- Formal vote by the community's governing body, or
- Formal vote by another body that has the authority and funding to implement the Program for Public Information, such as a flood control district. If this option is used, the Program for Public Information document must still be provided to the community's governing body for informational purposes.

Step 7: Implement, monitor, and evaluate the program. The Program for Public Information committee meets at least annually to monitor the implementation of the outreach projects. The committee assesses whether the desired outcomes were achieved and what, if anything, should be changed. This work is described in an evaluation report that is prepared each year, sent to the governing body, and included in the annual recertification.

The community must update its Program for Public Information at least every five years. This can be a new document or an addendum to the existing document that updates the needs assessment and all sections that should be changed based on evaluations of the projects.

The Program for Public Information update will be reviewed for CRS credit according to the *Coordinator's Manual* currently in effect, not the version used when the community originally requested this credit. The update can qualify as the annual evaluation report for the year it was prepared. The updated Program for Public Information must be adopted following the same process as adoption of the original document.

Credit Points for PPI

$$\text{PPI} = \text{OP}_i \times 0.40$$

AND/OR

$$\text{PPI} = \text{FRP}_i \times 0.40$$

There is no credit for preparing and adopting a Program for Public Information. The credit is based on implementing the Program for Public Information's projects. PPI credit is a multiplier added to each outreach project credited under OP (OP#1, OP#2, etc.) and FRP (FRP#1, FRP#2, etc.) that are described in the Program for Public Information document and evaluated and revised annually by the Program for Public Information committee. There is no PPI bonus for projects that are not included in the Program for Public Information or for messages that are not the same message described in the Program for Public Information. (Such projects and messages can be credited under OP and FRP, but they would not get the PPI bonus.)

The application of the PPI points can be seen in the scoring example in Table 330-4. To ensure that it receives all the credit that is deserved, the community should label each project using the same identification that is used in the Program for Public Information (e.g., "OP#1," "FRP#2," etc.) and mark each project to indicate the credited messages.

PPI Worksheet						
Priority Audience	Message	Outcome	Project(s)	Assignment	Schedule	Stakeholder
Priority Audience 1. Coastal floodplain residents	Topic 1 message: Find out about your flood hazard	Increase in the number of map information inquiries	320 map info service to include info on flood depths, wave heights, and past floods (320)	Floodplain manager	Start as soon as staff has the maps	
			OP 3. Presentations to five neighborhood associations	Floodplain manager	Set up the five presentations by January 31	Neighborhood associations
			OP 4. Cable TV to show the neighborhood association presentation	Floodplain manager and public information officer	Tape the first two presentations and use the best scenes	Neighborhood associations, cable TV company
			OP 5. Mailing sent each year to residents of the SFHA	Floodplain manager and public information officer	Disseminate in May, before hurricane season	
		Increase in number of webpage hits	New website page will show flood depths and LiMWA boundary (350)	Floodplain manager and webmaster	Have on line by May 1 start of hurricane season	
	Topic 2 message: Call your insurance agent to see if you have flood insurance coverage	Increase in the number of people getting tech assistance	Floodplain manager to explain depths, waves, and past floods when providing assistance (360)	Floodplain manager	Start as soon as staff has the maps	
		The total number of SFHA policies increases	OP 1. FEMA brochure on flood insurance	Floodplain manager	Printed and displayed by Feb. 28	FEMA
			OP 2. Local insurance agents advise their clients	Insurance agency representative on the PPI committee	Explain at March 15 insurance assoc. meeting	Insurance agencies
			OP 3. Presentations to neighborhood associations	See OP 3 above	See OP 3 above	See OP 3 above
			OP 4. Presentation on cable TV	See OP 4 above	See OP 4 above	See OP 4 above
			Website to summarize cost of typical policy and have link to the NFIP page (350)	Floodplain manager and webmaster	Have on line by May 1 start of hurricane season	

Figure 330-2. Example spreadsheet for a Program for Public Information.

Priority Audience 2. Residents of repetitive loss areas 3–9 (in X Zone)	Topic 2 message: Call your insurance agent to see if you have contents coverage	Increase in the number of flood insurance policies with contents coverage	OP 2. Local insurance agents advise their clients	See OP 2 above	See OP 2 above	See OP 2 above
			OP 3. Presentations	See OP 3 above	See OP 3 above	See OP 3
			OP 4. Cable TV	See OP 4 above	See OP 4 above	See OP 4
			Website page stresses contents coverage (350)	Floodplain manager and webmaster	Have on line by May 1	
			Floodplain manager to explain need for contents coverage when providing tech assistance (360)	Floodplain manager	Start immediately	
	Topic 4 message 4a: Protect your property from shallow flooding	Increase in the number of permits for retrofitting projects	OP 3. Presentations	See OP 3 above	See OP 3 above	See OP 3
			OP 4. Cable TV	See OP 4 above	See OP 4 above	See OP 4
			OP 7. Meetings with home builders association to explain retrofitting projects	Floodplain manager	Presentations at the January and April meetings	Home builders association
			Website page on how to protect from shallow flooding (350)	Floodplain manager and webmaster	Have on line by May 1	
			Floodplain manager to explain projects when providing advice (360)	Floodplain manager	Start immediately	
	PPI message 7: Don't dump in your ditch	Drainage inspectors report fewer calls and a decrease in the amount of trash removed	OP 3. Presentations	See OP 3 above	See OP 3 above	See OP 3
			OP 4. Cable TV	See OP 4 above	See OP 4 above	See OP 4
			OP 7. Meeting to explain the rules to home builders	See OP 7 above	See OP 7 above	See OP 7
			Website page on drainage maintenance (350)	Floodplain manager and webmaster	Have on line by May 1	
			Floodplain manager to explain owner's responsibilities when providing advice (360)	Floodplain manager	Start immediately	
			OP 3, 4 and 5 to cover dumping regs (540)	See OP 3, 4, and 5	See OP 3, 4, and 5	See OP 3, 4, and 5

Figure 330-2 (cont.). Example spreadsheet for a Program for Public Information.

Documentation for PPI Provided by the Community

In addition to the materials provided for OP and FRP credit:

- (1) At the initial verification visit,
 - (a) A copy of the Program for Public Information document.
 - (b) Minutes of the meetings, sign-in sheets, or other documentation of the committee members' participation.
 - (c) Documentation that the Program for Public Information has been adopted by the community.
- (2) At each annual recertification,
 - (a) Documentation that the Program for Public Information document has been reviewed and adjusted annually. This is in the form of a report, table, or spreadsheet that summarizes each outreach project, what was done, and the outcomes.
 - (b) Minutes of the meetings, sign-in sheets, or other documentation of the committee members' participation in the annual review.
- (3) At subsequent verification visits when a Program for Public Information update is due,
 - (a) Documentation that the Program for Public Information document has been updated. This can be a new document or an addendum to the existing document that updates the needs assessment and all sections that should be changed based on evaluations of the projects. The update must be adopted following the same process as approval of the original document.
 - (b) Minutes of the meetings, sign-in sheets, or other documentation of the committee members' participation in the update.
 - (c) Documentation that the Program for Public Information update has been adopted by the community.

332.d. Stakeholder delivery (STK) (extra credit points)

STK is a 30% multiplier that increases the points for each project credited in elements OP and PPI that is delivered or otherwise endorsed by one or more stakeholder organizations. The maximum extra credit for STK is 50 points for outreach projects (OP). STK points do not apply to FRP projects or to projects not included in the Program for Public Information.

Research has shown that the credibility and visibility of outreach messages are enhanced if they are sent by numerous sources. Since most messages tend to come from the local government, extra credit is provided for messages that are clearly from stakeholders—someone or some group concerned with the community, but not a part of the local government.

Credit Criteria for STK

- (1) This credit is only available to communities with a Program for Public Information. The stakeholder organization or agency must be named in the Program for Public Information document and the associated projects, but the stakeholder does not need to be on the Program for Public Information committee.
- (2) A stakeholder can be any agency, organization, or person (other than the community itself) that supports the message. Stakeholders could be
 - An insurance company that publishes a brochure on flood insurance, even if it is set out at City Hall;
 - A local newspaper that publishes a flood or hurricane season supplement each year;
 - FEMA, if, for example, a FEMA brochure is used in a project;
 - Schools that implement outreach activities;
 - A local newspaper that publishes articles and editorials (although advertisements paid for by the community do not qualify for STK credit, unless other sponsors or supporters are named in the advertisement);
 - A neighborhood or civic association that sponsors and hosts a presentation by a community employee;
 - A utility company that includes pertinent articles in its monthly bills; or
 - Presentations made by state or FEMA staff at meetings held every year.
- (3) It needs to be clear that the message is coming from someone other than the community or is sponsored by or supported by the stakeholder. For example, when stencils are displayed on city storm drains, they send a message that appears to come from the city, even if the stencils were applied by a volunteer group. If the volunteer organization's name were in the message, however, then it would qualify for STK credit.

Credit Points for STK

STK = OPi x 0.30, if the outreach project is delivered, sponsored, or otherwise publicly supported by a stakeholder entity

The application of the STK points can be seen in the scoring example in Table 330-4.

Documentation for STK Provided by the Community

All documentation needed for this element is supplied with the OP and PPI documentation. It should be made clear which projects are delivered by stakeholders and therefore warrant STK credit.

333 Impact Adjustment

There is no impact adjustment for this activity.

334 Credit Calculation

Credit is based on the number of messages, the type of projects, the number of times the messages are repeated, and the extra PPI and STK credit. This makes for a complicated scoring system, best done on a spreadsheet. A sample spreadsheet is shown in Table 330-4.

$$c330 = cOP + cFRP \text{ , where}$$

$$cOP = \sum (OP\#1 + PPI\#1 + STK\#1) + (OP\#2 + PPI\#2 + STK\#2) \\ + (OP\#3 + PPI\#3 + STK\#3) \dots$$

and

$$cFRP = \sum (FRP\#1 + PPI\#1) + (FRP\#2 + PPI\#2) \dots$$

Table 330-4. Scoring examples for PPI and STK.

Outreach Project	A Points for Type of Project	B # of Topics and PPI Messages ^a	C # of times Project Delivered each Year	(A x B x C) OP = Points per Message	PPI OP x 0.4	STK OP x 0.3	Total cOP = OP + PPI + STK
OP#1. FEMA brochures on flood insurance	1	1	1	1	0.40	0.30	1.70
OP#2. Local insurance agents advise their clients	2	1	1	2	0.80	0.60	3.40
OP#3. Presentations to five neighborhood associations	2	5 ^b	5	50	20.00	15.00	85.00
OP#4. The neighborhood association presentation on cable TV	2	5 ^b	1	10	4.00	3.00	17.00
OP#5. Mailing sent each year to residents of the SFHA	6	6 ^b	1	36	14.40		50.40
OP#6. Stencils on storm drains (over 40 locations)	2	1	5	10	4.00		14.00
OP#7. Meetings with home builders association	6 ^c	2	2	24	9.60		33.60
Total				133	50.00	53.20	205.10

a. Not to exceed one message under each of the six CRS priority topics

b. When the PPI added a 7th message, OP#3, OP#4, and OP#5 received more points for including the new message.

c. The PPI also identified building contractors as a priority audience. Because at least 50% of them attend the semi-annual meetings, OP#7 is now considered a targeted outreach project. This is not a simple change of numbers. To continue to receive this higher credit, the PPI committee must track progress towards the desired outcomes, evaluate and revise the project each year as needed, and include its findings in the annual report.

d. A spreadsheet in Microsoft Excel® is available to facilitate calculating the credit for OP, FRP, PPI, STK, and c330.

A spreadsheet in Microsoft Excel® is available to facilitate calculating the credit for all the elements and for c330.

The credit for each element cannot exceed the element's maximum points, and the total credit for Activity 330 cannot exceed 350 points.

335 For More Information

- a. Additional information, reference materials, and examples can be found at www.CRSresources.org/300.
- b. A spreadsheet in Microsoft Excel® is available to facilitate calculating the credit for OP, FRP, PPI, STK, and c330. “Outreach Project Credit Worksheets.xls” can be downloaded from www.CRSresources.org/300.
- c. d. Some state and local emergency management offices have training courses for public information officers. FEMA’s Emergency Management Institute (EMI) offers public information officer courses. EMI courses are tuition free and travel stipends can often be obtained. For more information, contact your state emergency management agency’s training officer.
- e. NFIP flyers, stuffers, and toolkits can be ordered and/or downloaded from <http://www.fema.gov/national-flood-insurance-program>.
- f. The American Red Cross has brochures that can be obtained in bulk, such as tear-sheet pads about flood preparedness and returning to a flooded building. “Preparedness Fast Facts” can be ordered from the Red Cross at www.redcross.org.

336 Related Activities under the Community Rating System

Several activities have publicity requirements that may be met with an outreach project that is credited under this activity. These include Activities 320 (Map Information Service) and 360 (Flood Protection Assistance); technical assistance (TA) under Activity 370 (Flood Insurance Promotion); and stream dumping regulations (SDR) under Activity 540 (Drainage System Maintenance). Outreach projects should be designed with these publicity needs in mind.

The three warning and response activities, Activity 610 (Flood Warning and Response), Activity 620 (Levees), and Activity 630 (Dams), have requirements for outreach projects that can be credited under OP.

A PPI should not be limited to outreach projects. It should look at all the activities a community can pursue to inform people and motivate them to protect life and property, buy insurance, and protect natural floodplain functions. The CRS credits other public information work in addition to that credited under Activity 330 (Outreach Projects). The

Coordinator's Manual provides extra credit in some activities, if they are included in the Program for Public Information:

- Activity 320 (Map Information Service): The priority messages identified in the PPI should be conveyed when inquiries are made. The PPI step 2, Needs Assessment, may identify areas that should be mapped and included in the map information service.
- Activity 340 (Hazard Disclosure): If real estate agencies are represented on the Program for Public Information committee and their disclosure practice(s) and informational brochures are reviewed in the Program for Public Information, then extra credit is provided.
- Activity 350 (Flood Protection Information): As with outreach projects, credit for the website (WEB) is based on the number of topics covered. If there is a Program for Public Information, the community can receive additional credit for covering up to 10 messages, instead of just six.
- Activity 360 (Flood Protection Assistance): The credits for the first three elements, property protection advice (PPA), advice after a site visit (PPV), and financial assistance advice (FAA), all can be increased if the services are reviewed and recommended in the Program for Public Information document.
- Activity 370 (Flood Insurance Promotion): It is recommended that the plan to improve insurance coverage be part of the Program for Public Information and be prepared by the same committee, provided that the committee meets the prerequisites for Activity 370 credit.
- Activity 510 (Floodplain Management Planning): Both element PPI and floodplain management planning (FMP) provide credit for having a committee. The same committee can fulfill both activities' credit criteria. The Program for Public Information can be a part of a floodplain management or hazard mitigation plan.
- Activity 540 (Drainage System Maintenance): An additional five points are available under SDR if the community's Program for Public Information reviewed and recommended how to publicize the regulations that prohibit dumping in streams and ditches.

NOTE: To receive the extra PPI credit, these activities would need to be based on appropriate messages, which have desired outcomes discussed in the PPI. The activities would also need to be evaluated by the committee and reviewed in the annual report.

340 HAZARD DISCLOSURE—Summary

Maximum credit: 80 points

342 Elements

- a. **Disclosure of the flood hazard (DFH)**: Up to 25 points if real estate agents notify those interested in purchasing properties located in the Special Flood Hazard Area (SFHA) about the flood hazard and the flood insurance purchase requirement. An additional 10 points are provided if the disclosure program is part of a Program for Public Information credited under Activity 330 (Outreach Projects).
- b. **Other disclosure requirements (ODR)**: Up to 5 points for each other method of flood hazard disclosure required by law, up to a maximum of 25 points.
- c. **Real estate agents' brochure (REB)**: Up to 8 points if real estate agents are providing brochures or handouts that advise potential buyers to investigate the flood hazard for a property. An additional 4 points are provided if the disclosure program is part of a Program for Public Information credited in Activity 330 (Outreach Projects).
- d. **Disclosure of other hazards (DOH)**: Up to 8 points if the notification to prospective buyers includes disclosure of other flood-related hazards, such as erosion, subsidence, or wetlands.

Credit Criteria

Each element has a separate section discussing credit criteria.

Impact Adjustment

There is no impact adjustment for this activity.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

340 HAZARD DISCLOSURE

The OBJECTIVE of this activity is to disclose a property's potential flood hazard to prospective buyers before the lender notifies them of the need for flood insurance.

341 Background

Most prospective buyers do not take the time (or know how) to investigate whether a property is subject to a hazard. In many cases a property may not be near a stream or shoreline, past flooding may have been minor, or there may be no history of flooding since the area was developed. As a result, many people are caught by surprise when their properties are flooded. One of the best times to advise someone of a flood hazard is when he or she is considering the purchase of property.

Federal regulations enacted pursuant to the Flood Disaster Protection Act of 1973 (as amended by the National Flood Insurance Reform Act of 1994) require only that a lender advise a person of the flood hazard before closing on the loan. This could be well after the buyer has put down earnest money, has lost interest in other properties, or has become committed to purchasing the property without knowing all the facts. In many states a buyer has recourse under consumer protection laws.

Many real estate organizations have disclosure practices. A community should check with its ISO/CRS Specialist to see if neighboring communities are receiving this Community Rating System (CRS) credit. They may already have submitted the needed documentation for real estate agencies that serve the area.

341.a. Activity Description

The maximum credit for Activity 340 is 80 points.

Credit is provided if a community's real estate agents advise prospective floodplain occupants about the flood hazard and the flood insurance purchase requirement. Other disclosure methods may also be credited.

This activity should

- Encourage the purchase of flood insurance,
- Encourage implementation of flood protection measures,
- Prevent victimization of unwary buyers,
- Encourage appropriate use of vacant land,
- Prevent the troubles that can arise from failing to advise potential purchasers of a flood hazard, and
- Protect the real estate agents and sellers from lawsuits.

341.b. Impact Adjustment

There is no impact adjustment for Activity 340. Each element must be implemented throughout the community.

342 Elements

342.a. Disclosure of the flood hazard (DFH)

The maximum credit for this element is 35 points. There are 25 points for DFH, and an additional 10 points are provided if the disclosure program is part of a Program for Public Information, credited under Activity 330 (Outreach Projects).

Credit for DFH relies on real estate agents to inform a potential purchaser whether a property is in a Special Flood Hazard Area (SFHA). A statutory or other legal mandate that real estate agents disclose the hazard is not needed to obtain credit for DFH. The credit is based on documentation that real estate agents ARE disclosing the hazard, not on WHY they are doing it. The best way to implement this activity is with a written notification to potential purchasers. This provides the purchaser with the correct information and provides documentation for the real estate agent and the ISO/CRS Specialist. Notations can be provided on property summary sheets, offer-to-purchase forms, Multiple Listing Service (MLS) forms, or other media. The most common approach is to have a box on the MLS form.

This element can be implemented in conjunction with Activity 320 (Map Information Service). Real estate agents may request that the community assist them with a determination of the flood risk of properties being advertised for sale; however, the real estate agent must be informing people whether a property is in an SFHA. No credit is provided if prospective buyers are sent to the community to find out about a property's potential flood risk.

Credit Criteria for DFH

- (1) The notice must clearly state whether the property is in the floodplain and, if so, that flood insurance is required. If the notice states that a property is in a floodplain or in the SFHA, it must also tell the inquirer that federal law requires the purchase of flood insurance as a condition of acquiring a federally backed mortgage. If the notice states "Flood Insurance Required," the notation that the property is in a floodplain is not needed.
- (2) A property notice that is difficult to interpret, such as "FP: Y/N," or a general statement on all properties, such as "Flood insurance may be required," or "Flood Zone," is not acceptable. The form must clearly state, "Flood insurance is required."

- (3) If the property is in an area designated under the Coastal Barrier Resources Act, the notice must advise that National Flood Insurance Program (NFIP) flood insurance is not available.
- (4) The disclosure must be volunteered by the real estate office. There is no DFH credit if the disclosure is made only in response to someone's inquiry about whether the property is in a floodplain.
- (5) Credit for DFH cannot be based on real estate agents' use of a seller's statement or certificate. The information that is required is notification of whether the property is in an SFHA, not whether the sellers experienced a flood while they owned the property.
- (6) Additional credit is provided if the disclosure program is described in the community's Program for Public Information document credited in element PPI under Activity 330 (Outreach Projects). The document must include a discussion of the disclosure program and have recommendations on how it should be conducted. Continuing to receive this additional PPI-related credit is dependent upon receiving continued credit for the Program for Public Information under Activity 330. In lieu of PPI credit, the extra 10 points can be provided if community staff worked with local real estate agents to develop the disclosure program and the staff meet with real estate agents annually to evaluate and improve the program.

Credit points are provided under ODR, below, for a state or local legal requirement that potential purchasers be advised about the property's known flood history.

Credit is also available under Section 342.c (REB) if real estate agents provide a brochure that advises potential property purchasers to investigate the flood hazard.

Credit Points for DFH

DFH = EITHER

25 points, if real estate agents notify those interested in purchasing properties located in the SFHA about the flood hazard and the flood insurance purchase requirement,

OR

35 points, if the real estate agents disclosure program credited above is described in the community's PPI

Example 342.a-1.

On their property summaries, real estate agents include a notice of flood hazard and whether flood insurance is required. When a seller contracts with a real estate agent, the latter requests map information from the community. The cost is paid by the real estate agent. The Board of Realtors® has provided the community with a description of this procedure.

DFH = 25

Documentation for DFH Provided by the Community

(1) At each verification visit,

- (a) At least one copy of a disclosure notice from at least five real estate agencies that serve the community. If there are fewer than five agencies that serve the community, then at least one notice from each agency must be submitted.

This documentation can be copies of the notations on property summary sheets, offer-to-purchase forms, MLS forms, or other media. If the MLS form is used, a photocopy of a completed MLS form must be submitted as documentation.

Seller's disclosure forms may be sufficient documentation if they clearly state that the property is or is not in the SFHA. Statements that "to the best of the seller's knowledge," or statements regarding whether the property has been flooded are not creditable. However, such statements may be eligible for credit under Section 342.b, (ODR) if they are required by law. Statements that advise the buyer to determine if the property is flood-prone are not creditable, although they may be eligible for credit under Section 342.c (REB).

Blank forms are not acceptable documentation. Copies of actual information shown to prospective buyers are required. Names may be blacked out to preserve confidentiality.

(2) With the annual recertification,

- (a) [Required only for the extra PPI credit] A copy of the annual report prepared by the PPI committee or by the community after meeting with real estate agents.

The report must identify how the credited element worked, how effective it was estimated to be, and what changes were recommended for improving its effectiveness. If the extra credit is based on a credited Program for Public Information, a separate submittal is not needed for this credit.

342.b. Other disclosure requirements (ODR)

The maximum credit for this element is 25 points (5 points per requirement).

The objective of the ODR credit is to provide information to people before they are committed to owning or occupying a piece of property that is subject to a flood hazard.

Credit Criteria for ODR

Credit can be requested for up to five state or local laws or ordinances that require disclosure of a property's exposure to flooding, including but not limited to

- (1) Requiring all sellers to disclose the flood hazard in those cases where a real estate agent is not involved.
- (2) Requiring real estate agents and sellers to advise potential purchasers whether "to the best of their knowledge and belief" the property has ever been flooded.
- (3) Requiring landlords to advise potential renters about the flood hazard.
- (4) Requiring final recorded subdivision plats to display the flood hazard area (see Figure 340-1).
- (5) Requiring that the flood hazard area be shown on individual lot surveys prepared for deed records, property transactions, or mortgages.
- (6) Requiring titles or deed records to show zoning or building permit conditions related to floodplain or drainage regulations, such as a notice about the substantial improvement or substantial damage requirement for floodplain properties.
- (7) Requiring signs posted in subdivisions to advise visitors of the flood hazard.
- (8) Requiring that deeds show the lot or building elevation in relation to sea level and the base or historical flood elevation.
- (9) Requiring all sellers to disclose whether the property is subject to a special flood-related hazard.

This list is not meant to be all-inclusive.

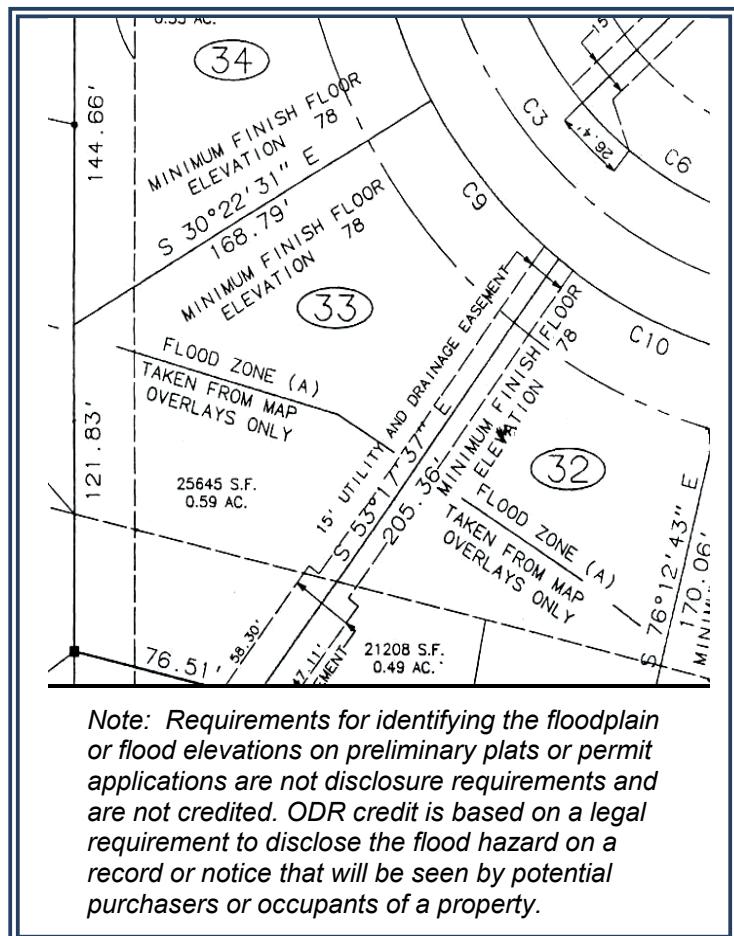


Figure 340-1. An example of hazard disclosure on a final subdivision plat.

Credit Points for ODR

ODR = 5 points for each other method of disclosure required by law or ordinance

Documentation for ODR Provided by the Community

(1) At each verification visit,

- (a) A copy of the law or ordinance language that requires one or more disclosure methods prior to the time of sale or rental of a property. See also Sections 231.b and 231.c on documenting regulatory language.

Example 342.b-1.

A community can receive credit for a state law that requires that, before they are recorded, all subdivision plats are to “include an engineer’s or surveyor’s statement as to which lots, if any, are partially or completely located in an area of special flood hazard identified pursuant to the National Flood Insurance Act of 1968.” [5 points]

A community’s zoning and building codes require that property records show all special requirements that have been imposed as a condition of building in a floodplain: “A record of each variance, special use permit, and conditional use permit, and all conditions and stipulations attached thereto, shall be provided to the County Recorder of Deeds to be filed with the record of the property.” [5 points]

The community’s application includes a photocopy of these two quoted legal requirements with “ODR” marked in the margin.

ODR = 5 + 5 = 10

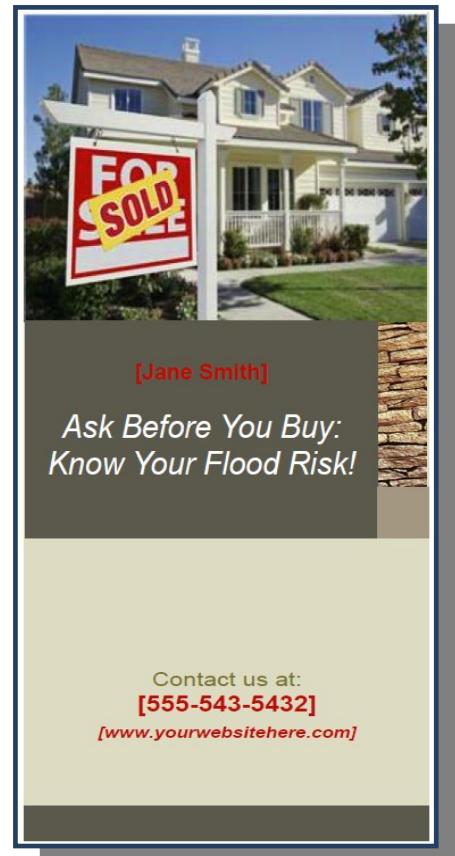
342.c. Real estate agents’ brochure (REB)

The maximum credit for this element is 12 points. There are 8 points for REB, and an additional 4 points are provided if the brochure is described in the community’s Program for Public Information credited under Activity 330 (Outreach Projects).

REB credit is provided if real estate agents give a brochure to all clients that are looking to purchase a property. The brochure does not need to identify which properties are flood-prone, but it must advise the reader to check to see if a property is in a floodplain or has a history of flooding.

Figure 340-2 has language that communities can use to develop their own locally tailored brochure. Sellers, in particular, may appreciate as complete a description as possible, especially if the flooding is shallow and slow-moving and retrofitting or other protective measures would be appropriate and inexpensive. Purchasers of vacant land should be well aware of factors such as the depth, velocity, and warning time of the base flood.

It is recommended that real estate agents or communities provide the brochures to lenders, because they would be valuable to people seeking pre-approval for a mortgage before they start house hunting.



Credit Criteria for REB

- (1) The real estate agents' brochure must advise the reader to check to see if a property is in a floodplain or has a history of flooding.
- (2) Additional credit is provided if the brochure is described in the community's Program for Public Information document credited in element PPI under Activity 330 (Outreach Projects). The PPI document must include a discussion of the brochure. Continued credit for the extra PPI points under this activity is dependent upon receiving continued credit for the Program for Public Information under Activity 330. If the community does not have a credited Program for Public Information, the extra 4 points can be provided if community staff worked with local real estate agents to develop the brochure and the staff meet with real estate agents annually to evaluate and improve it.
- (3) This credit is available even if the community receives no DFH credit in Section 342.a.

Credit Points for REB

REB = EITHER

8 points, if real estate agents are providing brochures or handouts that advise potential buyers to investigate the flood hazard for a property

OR

12 points, if the credited brochure or handout is described in the community's PPI

Flood Hazard: Check Before You Buy

Most everyone knows that coastal properties are subject to flooding and wind damage from hurricanes. There are maps that show areas predicted to flood. To find out more about flood-prone area maps, check with

[office that administers the map information service credited under Activity 320]

However, flooding and other surface drainage problems can occur well away from the coast. If you're looking at a property, it's a good idea to check out the possible flood hazard before you buy. Here's why:

- The force of moving water or waves can destroy a building.
- Slow-moving floodwaters can knock people off their feet or float a car.
- Even standing water can float a building, collapse basement walls, or buckle a concrete floor.
- Water-soaked contents, such as carpeting, clothing, upholstered furniture, and mattresses, may have to be thrown away after a flood.
- Some items, such as photographs and heirlooms, may never be restored to their original condition.
- Floodwaters are not clean: floods carry mud, farm chemicals, road oil, and other noxious substances that cause health hazards.
- Flooded buildings breed mold and other problems if they are not repaired quickly and properly.
- The impact of a flood—cleaning up, making repairs, and the personal losses—can cause great stress to you, your family, and your finances.

Floodplain Regulations: _____ *[name of community]* regulates construction and development in the floodplain to ensure that buildings will be protected from flood damage. Filling and similar projects are prohibited in certain areas. Houses substantially damaged by fire, flood, or any other cause must be elevated to or above the regulatory flood level when they are repaired. More information can be obtained from
_____ *[name, phone number of permit office]*

Check for a Flood Hazard: Before you commit yourself to buying property, do the following:

- Ask the _____ *[name, phone number of permit office]* if the property is in a floodplain; if it has ever been flooded; what the flood depth, velocity, and warning time are; if it is subject to any other hazards; and what building or zoning regulations are in effect.
- Ask the real estate agent if the property is in a floodplain, if it has ever been flooded, and if it is subject to any other hazards, such as sewer backup or subsidence.
- Ask the seller and the neighbors if the property is in a floodplain, how long they have lived there, if the property has ever been flooded, and if it is subject to any other hazards.

Flood Protection: A building can be protected from most flood hazards, sometimes at a relatively low cost. New buildings and additions can be elevated above flood levels. Existing buildings can be protected from shallow floodwaters by regrading, berms, or floodwalls. There are other retrofitting techniques that can protect a building from surface or subsurface water.

Flood Insurance: Homeowners insurance usually does not include coverage for a flood. One of the best protection measures for a building with a flood problem is a flood insurance policy under the National Flood Insurance Program, which can be purchased through any licensed property insurance agent. If the building is located in a floodplain, flood insurance will be required by most federally backed mortgage lenders. Ask an insurance agent how much a flood insurance policy would cost.

Figure 340-2. A template for a real estate agents' brochure

Documentation for REB Provided by the Community

- (1) At each verification visit,
 - (a) A copy of the brochure or other document that real estate agents make available to interested parties.
- (2) With the annual recertification,
 - (a) [Required only for the extra PPI credit] A copy of the annual report prepared by the Program for Public Information committee or by the community after meeting with real estate agents. The report must identify how the credited element worked, how effective it was estimated to be, and what changes were recommended for improving its effectiveness. If the extra credit is based on a credited Program for Public Information, a separate submittal is not needed.

Example 342.c-1.

The California Department of Water Resources has produced a model brochure for prospective purchasers of flood-prone property that provides them with information about flood hazards. California communities that adapt the brochure for their local flood conditions can receive 8 points, provided it is distributed by local real estate agents. It is available as a template at http://www.water.ca.gov/floodmgmt/lrafmo/fmb/fas/nfip/crs/300series_publicinformation.cfm.

342.d. Disclosure of other hazards (DOH)

The maximum credit for this element is 8 points.

DOH provides credit for providing information to inquirers about other flood-related hazards. Potential property purchasers should be advised of other hazards that have been identified for specific sites. These include

- Coastal wave hazards (as mapped as V Zones, Limit of Moderate Wave Action (LiMWA), or coastal A Zones);
- Coastal and channel erosion;
- Subsidence;
- Dam failure and levee failure;
- Areas subject to increased flooding due to climate change or sea level rise; and
- Tsunamis and the other special flood-related hazards listed in Section 401.

Disclosing areas subject to non-flood-related hazards, such as volcanoes, landslides, and wildfire, is encouraged, but not credited by the CRS.

Credit Criteria for DOH

DFH credit is a prerequisite to receiving DOH credit. The disclosure of other hazards must be included in the materials used for DFH credit.

Credit Points for DOH

DOH = 8 points, if the notification to prospective buyers credited in Section 342.a includes disclosure of other flood-related hazards

Documentation for DOH Provided by the Community

- (1) At each verification visit,
- The documentation submitted for credit under Section 342.a (DFH), marked to show how the other flood-related hazards are disclosed.

343 Impact Adjustment

There is no impact adjustment for this activity.

344 Credit Calculation

$$c340 = DFH + ODR + REB + DOH$$

345 For More Information

- Additional information, reference materials, and examples can be found at www.CRSresources.org/300.
- Copies of the following booklet are available free, singly or in quantity (see Appendix C or www.CRSresources.org).

Answers to Questions about the National Flood Insurance Program, FEMA F-084, Federal Emergency Management Agency (2011). This is also available from FEMA's website at www.fema.gov/th/media-library/assets/documents/272.

346 Related Activities under the Community Rating System

- Some communities' map information services (credited under Activity 320 (Map Information Service)) help real estate agents determine the flood hazard for a property. Having an objective source of this information can help overcome some agencies' reluctance to disclose the flood hazard and can help the community receive credit under this activity.
- The Program for Public Information credited under Activity 330 (Outreach Projects) can be an effective way to start involving real estate staff in community public information activities. Their participation in the Program for Public Information can result in more points for DFH and REB under Activity 340.
- Some credited regulations require filing a provision with the property records. For example, subdivision plat limitations credited by open space incentives (OSI) in Activity 420 (Open Space Preservation) and nonconversion agreements credited under ENL in Activity 430 (Higher Regulatory Standards) are filed with the recorder of property records so future owners are made aware of the restrictions. Such regulations are also eligible for credit under ODR in this activity.

350 FLOOD PROTECTION INFORMATION—Summary

Maximum credit: 125 points

352 Elements

- a. **Flood protection library (LIB):** 10 points for having nine Federal Emergency Management Agency publications on flood protection topics housed in the public library.
- b. **Locally pertinent documents (LPD):** Up to 10 points for having additional references on the community's flood problem or local or state floodplain management programs housed in the public library.
- c. **Flood protection website (WEB):** Up to 77 points for providing flood protection information via the community's website. An additional 28 points are provided if the website is part of a Program for Public Information (credited under Activity 330 (Outreach Projects)). There are three ways to receive credit under this element:

WEB1: for providing more information on the messages conveyed in the community's outreach projects credited under Activity 330 (Outreach Projects).

WEB2: for posting or linking real-time gage information so users can see current water levels and, where available, flood height predictions.

WEB3: for posting Elevation Certificates or the data from Elevation Certificates.

Credit Criteria

Each element has a separate section discussing credit criteria.

Impact Adjustment

There is no impact adjustment for this activity.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

350 FLOOD PROTECTION INFORMATION

The OBJECTIVE of this activity is to provide the public with information about flood protection that is more detailed than that provided through outreach projects.

351 Background

As noted in Activity 330, research has shown that people become interested in a subject when they receive repeated messages from different sources. When they do become interested, they need more information than what usually is covered in brief outreach projects. This activity credits providing that more detailed information. It also credits supplying additional information, such as real-time gage data, that can be disseminated effectively via websites.

The community library and community websites are obvious places for residents to look for detailed information about flooding and flood protection. These locations can contain a great deal of information and they offer alternatives for people who are hesitant to go to City Hall or talk to a local regulatory official about their flood problem or flood concerns.

Libraries are best for providing guidebooks and handbooks to the public since they are typically costly to mail or are often too lengthy to be presented on a website. They are also a good source of materials for people who do not use the internet.

Websites have become the primary source of detailed information for more and more people. For some types of information, such as maps and current information on flooding, a website can be the most effective and efficient source. A website also allows links to other, more detailed information that is kept current by the agency or organization that is most familiar with it.

351.a. Activity Description

The maximum credit for Activity 350 is 125 points.

This activity credits providing the public with more detailed information about flood protection measures. The flood protection information provided in this activity supports the messages presented under Activity 330's outreach projects. It also credits supplying community-specific documents and additional information, such as real-time gage data, that can be disseminated effectively via websites. The more detailed information is intended to help the public take steps to protect themselves and their property from the impact of flooding.

Two main sources of information are credited under this activity: libraries and websites.

Library: Two elements give credit for having references in the community's public library:

- Flood protection library (LIB) provides 10 points for the public library's having all nine Federal Emergency Management Agency (FEMA) publications on flood protection topics that are listed in Figure 350-1.
- Locally pertinent documents (LPD) provides up to 10 more points for the library's having additional references on the community's flood problem or local or state floodplain management programs.

Website: More points are provided under the flood protection website (WEB) element because more people use websites, more information can be provided quickly through that outlet, and the information can be accessed 24 hours a day. The maximum credit for WEB is 77 points. An additional 28 points are provided if the website is part of a Program for Public Information credited in element PPI under Activity 330 (Outreach Projects).

For both the library and the website, the material must be kept up to date. In both cases, the community can make use of other organizations' programs, such as a county library system or links to other agencies' websites, to provide the detailed information to its residents.

351.b. Impact Adjustment

There is no impact adjustment for Activity 350.

352 Elements

352.a. Flood protection library (LIB)

The maximum credit for this element is 10 points.

LIB credit is provided for having the latest versions of the nine FEMA publications listed in Figure 350-1 cataloged and available in the community's library. If the state, region, community, or other entity has published documents that are more appropriate to the community's situation, then those may be substituted. References that are not relevant (e.g., the community has no coastal floodplain or manufactured homes) do not have to be included.

All of the publications are available free, singly or in quantity (see Appendix C or www.CRSresources.org). Although only one

1. *Above the Flood: Elevating Your Floodprone House*, FEMA-347 (2000)
2. *Answers to Questions About the National Flood Insurance Program*, F-084 (2011)
3. *Coastal Construction Manual*, FEMA-P-55, (2011)
4. *Elevated Residential Structures*, FEMA-54 (1984)
5. *Protecting Manufactured Homes from Floods and Other Hazards*, FEMA P-85 (2009)
6. *Mitigation of Flood and Erosion Damage to Residential Buildings in Coastal Areas*, FEMA-257 (1994)
7. *Protecting Building Utilities From Flood Damage*, FEMA-P-348 (1999)
8. *Protecting Floodplain Resources*, FEMA-268 (1996)
9. *Reducing Damage from Localized Flooding*, FEMA 511 (2005)

Figure 350-1. Publications credited under element LIB.

copy of each publication is required for credit, it is expected that the library will keep sufficient copies to meet the demand.

Note that there are many other appropriate and relevant national publications on flood protection from agencies and organizations like the U.S. Army Corps of Engineers and the American Red Cross. Communities are encouraged to include these references in their library for their citizens, but they are not required for LIB credit.

A library may receive credit for digital copies provided that they can be checked out or there is a computer terminal or other machine in the library that people may use to read them. Digital versions must be located in the library or the library's system and not be dependent on links to an outside source.

Credit Criteria for LIB

(1) The nine publications listed in Figure 350-1 must be cataloged and maintained in the public library that is most accessible and most widely used by residents of the community.

- In a community with branch libraries or where there is a multi-community library system, the publications must be available to all branches, although it is not necessary for each branch to maintain a full set.
- If a small community does not have a library, but an adjacent large community does, the small community may receive credit for this activity if it documents that its residents have ready access to the library in the adjacent community.

No credit is provided for documents kept in an office that is not a local public library.

(2) The documents must be entered into the library's card catalog or similar system that allows patrons to find publications related to flooding and flood protection. Some libraries place these documents in a reference library that contains uncataloged items. In such cases, the card catalog still needs an entry under "flood," which could read, "See Reference Librarian for materials on flooding and flood protection."

Credit Points for LIB

LIB = 10 points, if the publications are cataloged and maintained in the community's public library

Documentation for LIB Provided by the Community

(1) At each verification visit,

- (a) A list of the publications that have been cataloged in the community's library or library system. The list may be digital or hard copy. If the catalog is available for review on line, the URL may be provided in lieu of a list.

352.b. Locally pertinent documents (LPD)

The maximum credit for this element is 10 points.

LPD credit is provided for having documents in the community's local public library that cover flood hazards, flood protection, and natural floodplain functions and also are keyed to local conditions or to the topics credited under Activity 330 (Outreach Projects). Examples of such documents are

- A city handbook on how to protect a building from flood damage,
- A state booklet on floodplain regulation requirements,
- The community's floodplain management ordinance,
- An environmental organization's guide to local aquatic and riparian habitats,
- The community's Flood Insurance Rate Map (FIRM),
- A reconnaissance report or flood control plan for a stream in the community, published by the U.S. Army Corps of Engineers,
- The community's Flood Insurance Study,
- The county's floodplain management or hazard mitigation plan, or
- Local resource management plans that are related to floodplains, such as a beach management plan or fish habitat restoration plan.

Credit Criteria for LPD

(1) The community must receive credit for LIB in Section 352.a.

(2) The documents must be entered into the library's card catalog or similar system that allows patrons to find publications related to flooding and flood protection. Some libraries place these documents in a reference library that contains uncataloged items. In such cases, the card catalog still needs an entry under "flood," with a reference to where the items can be found (e.g., "See Reference Librarian for local materials on flooding and flood protection").

Credit Points for LPD

LPD = 1 point for each locally pertinent document that is cataloged in the community's public library, up to a maximum of 10 points

Documentation for LPD Provided by the Community

(1) At each verification visit,

- (a) A list of the publications that have been cataloged in the community's library or library system. This may be digital or hard copy. If the catalog is available for review on line, the URL may be provided in lieu of a list.

352.c. Flood protection website (WEB)

The maximum credit for this element is 77 points.

WEB credit is for providing flood protection information via the community's website. An additional 28 points are provided if the website is part of a Program for Public Information credited under Activity 330 (Outreach Projects).

A community can receive credit for a county or regional website, provided that there is a link from the community's website and that the information is locally pertinent (see Example 352.c-1).

There are three sub-elements for WEB:

- (1) WEB1—Providing detailed information on the flood protection messages conveyed in outreach projects that are credited under Activity 330 (Outreach Projects) (up to 47 points, and up to 75 points if the additional PPI messages are also covered in the website).
- (2) WEB2—Posting real-time gage information so users can see current water levels and, where available, flood height predictions (up to 10 points).
- (3) WEB3—Posting Elevation Certificates or data from Elevation Certificates (up to 20 points).

Credit Criteria for WEB

To receive any WEB credit, the community's website must meet the following criteria.

- (1) There must be a flood information home page that is readily found by either (1) having it listed and linked on the community website's home page, or (2) using the website's search feature. When using the website's search feature, the flood information home page must be the first or second item listed when "flood" or a similar term is entered. There is no credit if the search engine lists numerous possible sites and the user must wade through them to find the flood information home page.
- (2) The flood information home page must have a directory of the flood protection information provided, along with links to the appropriate pages. There is no credit for items that are not connected to this flood information home page. Examples of creditable home pages can be found at www.CRSresources.org/300.
- (3) The links to the flood protection information pages may be to pages on the community's own website or on other websites. Other websites' links may include sites operated by FEMA; the state; the regional flood, water resources, or sewer district; universities; or any agency or organization with information related to the credited topics. However, the other sites must have information pertinent to the community's flood conditions (e.g., a riverine community should not refer users to a coastal website).

Example 352.c-1.

One of the best sources of information about protecting a house from flooding is the Floods and Hurricanes site administered by the Louisiana Cooperative Extension Service (www.lsuagcenter.com/topics/family_home). Communities with slab-on-grade foundations (even communities not in Louisiana) could refer web users to this site via a link.

- (4) There must be a link to FloodSmart (www.floodsmart.gov) or to FEMA's flood insurance page at www.fema.gov/business/nfip.
- (5) The community must check the website's links at least monthly, and fix those that are no longer accurate. (There is free or low-cost software that can identify broken links automatically.) At least annually, the community must review the content to ensure that it is still current and pertinent (e.g., make sure names, addresses, phone numbers, and other contact information are still correct; update any ordinance changes; etc.). For more information on how this can be done, see the Activity 350 website information at www.CRSresources.org/300.
- (6) Additional credit is provided for WEB1 if the website content is described in the community's PPI credited under Activity 330 (Outreach Projects).

Credit Points for WEB

WEB = the total of the points for the three sub-elements:

$$\text{WEB} = \text{WEB1} + \text{WEB2} + \text{WEB3}$$

(a) WEB1 =

up to 7 points per topic for detailed coverage of CRS priority topics 1, 2, 4, 5, and 6 credited under Activity 330 (Outreach Projects) and

up to 12 points for detailed coverage of CRS priority topic 3, Protect people from the hazard, credited under Activity 330 (Outreach Projects), and

up to 7 points per topic for detailed coverage of up to four additional messages in the community's Program for Public Information, credited under Activity 330 (Outreach Projects).

The maximum credit for WEB1 is 47 points for coverage of the six priority CRS topics, unless the community has additional messages in its Program for Public Information, in which case the maximum credit is 75 points.

- (a) The maximum credit for WEB1 is 47 points for coverage of the six priority CRS topics listed in Table 330-1, even if the community is not receiving credit under Activity 330.
- (b) If the community has a Program for Public Information, it may cover more than six topics, in which case it can receive up to an additional 7 points for more detailed information on each of those additional messages. The Program for Public Information document must include a discussion of the website and have recommendations on what should be included on the website. Continued credit for the additional topics is dependent upon receiving continued credit for the Program for Public Information in element PPI under Activity 330.
- (c) To receive the full 7 or 12 points for a topic, there must be thorough coverage of the topic. This can be provided with a detailed discussion on the community's website or via a link to a reference or other site that provides a detailed discussion. If the written portion of an outreach project is posted on the website without more detailed information, then credit will be up to 2 points. The objective is to provide more in-depth information than that provided in the outreach projects.

Example 352.c-2.

The University of New Orleans Center for Hazard Assessment, Reduction, and Technology maintains a website to help repetitive loss communities, <http://floodhelp.uno.edu/Portal.aspx>. Note that portions of the website are not relevant for some flooding situations, such as coastal V Zones and mountainous flash flooding. A community that finds the information relevant to its situation may link to the website or to selected pages. Credit can be provided for the six topics as noted in the table below.

Topic	Coverage on UNO's Site	Points
1. Know your flood hazard	There is no credit because the University's site does not discuss local hazards	0
2. Insure your property for your flood hazard	Flood Insurance link on the home page	7
3. Protect people from the hazard	Protecting Yourself link on the home page	12
4. Protect your property from the hazard	Protecting Your Home link	7
5. Build responsibly	Protecting Your Home, Construction Rules	7
6. Protect natural floodplain functions	There is no credit because the site does not discuss local natural floodplain functions	0
	WEB1 =	33

-
- (b) WEB2 = up to 10 points, for posting real-time gage information so users can observe current water levels and, where available, flood height predictions
-

WEB2 credit is provided for linking to real-time reporting gages. They can be the community's gages or gages managed by the National Weather Service, the U.S. Geological Survey, or a state or other agency. Full credit is dependent upon posting information for all available gages and an explanation of the site.

If a local gage-stage datum is used, the gage data must relate to sea level, NAVD, or NGVD, as appropriate locally; to recent flooding; or a local landmark (e.g., "one foot below the 2006 flood," "two feet over the Route 30 bridge," or "four feet deep at the Pettaway Park parking lot"). See also the example in Figure 350-2.

Little Calumet River Flood Levels		
<u>Stage</u>	<u>Elevation</u>	<u>Event</u>
20.2 --	-- 595.2	6/14/81
20.1 --	-- 595.1	7/14/57
20.0 --	-- 595.0	7/20/96
19.6 --	-- 594.6	12/3/82
19.4 --	-- 594.4	10-year flood
19.2 --	-- 594.2	4/6/47
19.1 --	-- 594.1	2/21/97
19.0 --	-- 594.0	Water reaches buildings on Drexel
18.6 --	-- 593.6	6/2/89
18.2 --	-- 593.3	10/10/54
18.0 --	-- 593.0	Thorn Creek begins to cover 170th Street
17.9 --	-- 592.9	2/24/85, Water covers Riverview and Drexel
17.7 --	-- 592.7	12/27/65
17.0 --	-- 592.0	Flood warning issued
16.0 --	-- 591.0	Flood watch starts
15.0 --	-- 590.0	Water enters Veterans Park

Flood heights have been recorded since 1947 on a river gage that is currently located at the Cottage Grove Avenue bridge over the Little Calumet River. Recorded flood heights can be shown in stage or in elevation. Stage is measured in feet above an arbitrary starting point that was set when the gage was first installed. Elevations are in feet above sea level. Stage of zero on this gage is the same as an elevation of 575.0 feet above sea level.

"Flood stage" is the elevation where the rising river starts to damage property. Yards and parks are flooded when the river reaches an elevation of approximately 590 feet above sea level. Buildings are affected at approximately 593 feet.

In 2005, the National Weather Service issued a new "flood stage" level – 16.5 feet or an elevation of 591.5. The Weather Service also provides real-time stage data for the upstream river gauges on the Little Calumet River at South Holland, and on Thorn Creek at Thornton.

**Figure 350-2. Example explanation of gage data.
From www.southholland.org/.**

-
- (c) WEB3 = up to 20 points, for posting Elevation Certificates or the data from Elevation Certificates on the website
-

Either the Elevation Certificates must be posted on the website, or the site may provide a list of addresses for which the community has Elevation Certificates. If the addresses are posted, then the website must include information on how to obtain a copy of the Elevation Certificate.

Full credit is provided for WEB3 if all the Elevation Certificates maintained by the community are posted (or all the addresses are posted) on the website. For example, if the community has 100 Elevation Certificates, but only 50% are posted on the website, then $WEB3 = 20 \times 0.5 = 10$ points.

Documentation for WEB Provided by the Community

This element is verified by checking the community's website online. If the reviewer cannot find the website or the flood protection home page, there is no credit.

(1) At each verification visit and with the annual recertification,

- (a) A statement that the community has checked the website, fixed any broken links, and confirmed that the content is still current and pertinent (Section 352.c, credit criterion (6)).
- (b) [Required only for the extra PPI credit] The annual report prepared by the Program for Public Information committee that evaluates the service. This is provided with the recertification documentation for Activity 330 (Outreach Projects).

The report must identify how the credited element worked, how effective it was estimated to be, and what changes were recommended for improving its effectiveness.

353 Impact Adjustment

There is no impact adjustment for this activity.

354 Credit Calculation

$$c350 = LIB + LPD + WEB$$

355 For More Information

- a. Additional information, reference materials, and examples can be found at www.CRSresources.org/300.

356 Related Activities under the Community Rating System

This credit is closely related to Activity 330 (Outreach Projects). The objective of outreach projects is to pique the reader's interest in a topic, such as flood insurance or property protection. Some readers will want to know more, so Activity 350 credits providing that additional information through the local library or the community's website. WEB1 is directly tied to the messages that are disseminated in the projects credited under Activity 330, and those credit points can be increased to a maximum of 60 if the messages also are part of the community's Program for Public Information (credited under Activity 330).

The flood protection website can also advise users of other community services, such as

- Providing copies of Elevation Certificates (credited under Activity 310),
- Reading maps for people (Activity 320),
- Providing technical assistance on property protection (Activity 360),
- Providing technical assistance on flood insurance (Activity 370),
- Administering the permit requirements for construction and development in the floodplain (Activity 430 and Activity 450), and
- Maintaining the drainage system and carrying out related procedures and responsibilities (Activity 540).

It should be noted that posting information about these services using a website does not fulfill the publicity prerequisite for these activities, unless website-based publicity is discussed in the Program for Public Information document and demonstrated to be the best medium to use.

The real-time gage information and flood warning information should be coordinated closely with the flood warning and response planning in the 600 series of CRS activities and with the outreach project prerequisites for those activities.

360 FLOOD PROTECTION ASSISTANCE—Summary

Maximum credit: 110 points

362 Elements

- a. **Property protection advice (PPA):** Up to 25 points for providing one-on-one advice about property protection (such as retrofitting techniques and drainage improvements). An additional 15 points are provided if the assistance program is part of a Program for Public Information credited under Activity 330 (Outreach Projects).
- b. **Protection advice provided after a site visit (PPV):** Up to 30 points if the property protection advisor makes a site visit before providing the advice. An additional 15 points are provided if the site visit procedures are part of a Program for Public Information credited under Activity 330 (Outreach Projects).
- c. **Financial assistance advice (FAA):** 10 points for providing advice on financial assistance programs that may be available. An additional 5 points are provided if the financial assistance advisory service is part of a Program for Public Information credited under Activity 330 (Outreach Projects).
- d. **Advisor training (TNG):** 10 points if the person providing the advice has graduated from the EMI courses on retrofitting or grants programs.

Credit Criteria

Each element has a separate section discussing credit criteria.

Impact Adjustment

There is no impact adjustment for this activity.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

360 FLOOD PROTECTION ASSISTANCE

The OBJECTIVE of this activity is to provide one-on-one help to people who are interested in protecting their property from flooding.

361 Background

People can become informed most effectively through direct, one-on-one communication with an expert. Research has found that people are more likely to undertake activities to reduce the flood hazard to their property if they can get reliable information right in their own community. Localized information and advice could be for taking care of drainage problems, retrofitting existing structures, or properly locating and building new structures.

Research has also found that property owners are much more likely to implement appropriate mitigation measures if they have financial support for doing so.

There are many ways to protect a property from flood damage, including, but not limited to, those listed in Figure 360-1. Note that the list does not include major structural flood control projects, such as building an upstream reservoir.

Different measures are appropriate for different flood hazards, building types, and building conditions. The objective of this activity is to have a knowledgeable person directly advise a property owner about whether one or more of these measures would be appropriate for the owner's situation.

To protect property from flood damage . . .

- Demolish the building or relocate it out of harm's way.
- Elevate the building above the flood level.
- Elevate damage-prone components, such as the furnace or air conditioning unit.
- Dry floodproof the building so water cannot get into it.
- Wet floodproof portions of the building so water won't cause damage.
- Construct a berm or redirect drainage away from the building.
- Maintain nearby streams, ditches, and storm drains so debris does not obstruct them.
- Correct sewer backup problems.

Figure 360-1. Typical property protection measures.

361.a. Activity Description

This activity credits telling individuals what they can do to protect their own properties from flood damage. For full credit, the advice must include the types of protection measures listed in Figure 360-1 and sources of financial assistance. The maximum credit for this activity is 110 points.

Under this activity, a qualified person must be willing and able to talk to inquirers about the flood hazard, flood protection measures, and/or possible financial assistance. The availability of this service must be publicized at least annually. As long as the service is publicized and provided to inquirers, credit is provided regardless of how many people take advantage of it.

The following should be considered when providing the advice:

- The advice should include specific recommendations, such as “elevate well above the base flood elevation,” or “don’t try to dry floodproof a basement,” but does not need to include detailed construction specifications.
- This credit is not intended to provide a public service that competes with local engineers, architects, or contractors. Where appropriate, the technical advisor would still recommend things like soils analyses, structural studies, engineering design, and/or competitive bids.
- The advice can be a review of an existing problem or it can be providing advice to someone who is contemplating developing or improving a property. In the latter case, the advice should encourage the inquirer to exceed the community’s minimum requirements, such as recommending not building in the floodplain in the first place.
- This activity does not give credit for floodplain ordinance enforcement activities that are routinely conducted by a building department, such as making site visits and/or reviewing plans to ensure that they comply with the building code.
- Responding to stream dumping or drainage maintenance complaints is credited under Activity 540 (Drainage System Maintenance).

361.b. Impact Adjustment

There is no impact adjustment for Activity 360.

Local Flood Proofing Programs



US Army Corps of Engineers
National Nonstructural Flood Proofing Committee

February 2005



This Corps of Engineers reference is a good resource for communities that are starting a flood protection assistance program. It can be found at www.CRSresources.org/300.

362 Elements

362.a. Property protection advice (PPA)

The maximum credit for this element is 40 points. There are 25 points for PPA and an additional 15 points if the advisory program is part of a Program for Public Information credited in element PPI under Activity 330 (Outreach Projects).

PPA credits ONE-ON-ONE advice and/or assistance about property protection, i.e., the types of projects listed in Figure 360-1.

Credit Criteria for PPA

- (1) The community must identify at least one person to provide the flood protection advice and assistance. The person(s) could be the city engineer, building inspector, consultant, employee of a county or regional flood control district, Natural Resources Conservation Service District Conservationist, etc. It need not be local staff if other agencies have agreed to answer inquiries.
- (2) The person(s) providing the advice and assistance must be familiar with structural and non-structural flood protection and mitigation measures, including flood insurance. Assistance can be provided by a combination of offices to secure a range of expertise, such as a building official who knows retrofitting measures and a public works employee who understands drainage.
- (3) The advice must be provided one-on-one, i.e., by talking directly to the person making the inquiry, either face-to-face or over a telephone. There is no credit for simply handing an inquirer materials or references or referring people to a website.
- (4) The service must be publicized at least once a year. There are three publicity options:
 - (a) An annual notice that reaches everyone in the community, such as an article in a newsletter or stuffer in a utility bill that goes to all properties.
 - (b) An annual notice directed to the areas with flooding and drainage problems, such as a mailer to all properties in the floodplain.
 - (c) An annual outreach project developed as part of a Program for Public Information, credited as element PPI under Activity 330 (Outreach Projects), provided that the program document identifies the audience for the service and discusses the best way to reach that audience.
- (5) Records of the service must be kept and provided for credit documentation.
- (6) Additional credit is provided if the flood protection assistance service is described in the community's Program for Public Information Program credited under Activity 330 (Outreach Projects). The Program for Public Information document must include a discussion of the service and have recommendations on how it should be conducted. Continued credit for the extra PPI points is dependent upon receiving continued credit for the Program for Public Information under Activity 330.

Credit Points for PPA

PPA = EITHER:

Up to 25 points, if the community provides one-on-one advice

OR

Up to 40 points, if the property protection advisory service is described in the PPI-credited document

Full credit is dependent upon providing the service to all properties with known flooding, drainage, and sewer problems. If the community only addresses selected problems, such as sewer backup, and does not assist property owners who are subject to other flood-related hazards, then the credit is prorated.

Documentation for PPA Provided by the Community

(1) At each verification visit,

- (a) If the person providing the advice is not a community employee, a letter stating that the person and/or agency has agreed to do the work (Section 362.a, credit criterion (1)). If the service provider covers several jurisdictions (e.g., a county flood control agency), a letter or memo stating that the service is provided throughout its jurisdiction is sufficient.
- (b) A description of the technical qualifications of all persons who are providing the service (Section 362.a, credit criterion (2)). A resume that includes training or other qualifications that directly relate to the person's knowledge of the topic will suffice. A job description is not creditable.
- (c) Documentation that shows how the community publicizes the service each year (Section 362.a, credit criterion (4)). The publicity must
 - Describe the service(s) provided;
 - Be distributed at least once a year; and
 - Explain how to access the service, e.g., what telephone number to call.

If the community publicizes this service through an annual outreach project credited under Activity 330, the publicity materials may be included with the documentation for Activity 330. There must be a notation (e.g., "360-PPA") in the margin of the outreach project where the flood protection assistance service is addressed.

If a Program for Public Information is used to determine the appropriate publicity mechanism, it must identify the audience(s) for the service and discuss the best way to publicize the service to the intended audience(s).

- (d) Records of the service must be kept and provided for credit documentation (Section 362.a, credit criterion (5)). These can be copies of written reports, memos, emails,

work orders, letters to the property owners, etc. The records must include the date and type of assistance given, the details of the findings, and the recommendations provided to the inquirer.

(2) With the annual recertification,

- (a) A copy of how the community publicized the service during the year.
- (b) Copies of three written reports or other material that documents providing the service (Section 362.a, credit criterion (5)). If there have been fewer than three requests for the service during the year, copies of documentation of all the requests are needed.
- (c) [Required only for the extra PPI credit] The annual report prepared by the Program for Public Information committee that evaluates the service. This is provided with the recertification documentation for Activity 330 (Outreach Projects).

The report must identify how the credited elements worked, how effective they were estimated to be, and what changes were recommended for improving their effectiveness

362.b. Protection advice provided after a site visit (PPV)

The maximum credit for this element is 45 points. There are 30 points for PPV and an additional 15 points if the site visits are described in the community's Program for Public Information credited in element PPI under Activity 330 (Outreach Projects).

If the community receives credit for PPA, additional PPV points are available for making SITE VISITS to review flooding, drainage, and sewer problems, and providing one-on-one advice to the property owner about protection of the property.

This service must provide advice to the inquirer and must be more than a determination of whether the flood problem is a community responsibility or whether the community will construct a drainage improvement project. The site visit must include advice on how to protect the property from the flood hazard, as explained in the previous section on property protection advice (PPA).

Credit Criteria for PPV

- (1) The community must receive credit for PPA. PPV credit for site visits is an additional credit as part of the community's provision of property protection advice.
- (2) The publicity for the service must include a note that a community representative will visit the site in question and review the problem with the inquirer.
- (3) Additional credit is provided if the flood protection assistance service is described in the community's Program for Public Information credited under Activity 330 (Outreach Projects). The Program for Public Information document must include a discussion of the site visits and have recommendations on how they should be conducted. Continued credit for the extra PPI points is dependent on receiving continued PPI credit under Activity 330.

Credit Points for PPV

PPV = EITHER:

Up to 30 points, if the community includes site visits before providing advice

OR

Up to 45 points, if the property protection visit service is described in the PPI-credited document

Full credit is dependent upon providing the service to all properties with known flooding, drainage, and sewer problems. If the community only addresses selected problems, such as sewer backup, and does not assist property owners subject to other flood-related hazards, then the credit is prorated.

Documentation for PPV Provided by the Community

(1) At each verification visit,

- (a) Along with PPA documentation items (1)(a) and (1)(b), the names and titles of the person(s) conducting the site visits.
- (b) Along with the PPA publicity documentation (item (1)(c)), a note that a community representative will visit the site if requested.
- (c) Records of the site visits and the advice provided must be kept (PPA documentation item (1)(d)).

(2) With the annual recertification,

- (a) The materials provided with the recertification for PPA, which must include the appropriate PPV references.

362.c. Financial assistance advice (FAA)

The maximum credit for this element is 15 points. There are 10 points for FAA, and an additional 5 points if the financial assistance advice is part of a Program for Public Information credited in element PPI under Activity 330 (Outreach Projects).

Research has shown that property owners are more likely to implement mitigation measures if they have financial support. Telling people about both pre-flood and post-flood help is useful because they may not be fully motivated to act until they are flooded again.

This element credits providing advice and/or assistance about financial help for undertaking property protection measures, such as those sources listed in Figure 360-2.

Credit Criteria for FAA

- (1) The community must identify at least one person to provide the financial assistance advice. It need not be local staff if other agencies have agreed to answer inquiries.
- (2) The service must be publicized at least once a year. Although PPA credit is not a prerequisite, to receive credit for FAA the financial assistance advisory service must be publicized in the same manner described in PPA credit criterion (3). If the community provides PPA advice, then the publicity for FAA should be part of the PPA publicity.
- (3) Full credit is dependent upon providing information on all available sources of financial assistance. There must be a documented check of the sources of assistance listed in Figure 360-2 to determine which ones may be available and appropriate for the community. No credit is provided if the advice covers only flood insurance or Federal Emergency Management Agency (FEMA) mitigation grants. Saying that there is no assistance is not credited.

Financial Assistance for Property Protection Measures

Pre-flood Assistance

- Projects fully or partially funded by a local agency. For example, some metropolitan sewer agencies fund part or all of a project to stop sewer backup and some communities have their own rebate, financial assistance, or construction programs;
- FEMA mitigation grants;
- State or local programs, such as grants, loans, and rebates;
- Housing improvement assistance programs;
- The U.S. Department of Agriculture's rural development grants and loans for mitigation;
- The potential to reduce flood insurance premiums for certain mitigation projects (e.g., elevating the building above the base flood elevation); and
- Exempting the improvements from property tax increases.

Post-flood Assistance

- Flood insurance;
- Flood insurance's Increased Cost of Compliance benefit for substantially damaged structures;
- FEMA's Hazard Mitigation Grant Program; and
- The U.S. Small Business Administration's post-flood mitigation loans.

See www.CRSresources.org/300 for more information on these financial assistance programs.

Figure 360-2. A selection of potential sources of financial assistance for property protection.

- (4) The advice must be provided one-on-one, i.e., by talking directly to the person making the inquiry, either face-to-face or over a telephone. Written materials may be used to help explain the programs, but there is no credit for simply handing an inquirer materials or references or referring people to a website.
- (5) Records of the service must be kept and provided for credit documentation.
- (6) Additional credit is provided if financial assistance advice is described in the community's Program for Public Information credited in element PPI under Activity 330 (Outreach Projects). The Program for Public Information document must include a discussion of the service and have recommendations on how it should be conducted. Continued credit for the extra PPI points is dependent upon receiving continued PPI credit under Activity 330.

Credit Points for FAA

FAA = one of the following:

10 points, if the information on financial assistance programs is provided during one-on-one discussions with an inquirer, such as is credited under PPA

OR

15 points, if the information on financial assistance programs is provided during one-on-one discussions with an inquirer, such as is credited under PPA, and if the financial assistance advisory service is described in the Program for Public Information document credited under Activity 330

OR

5 points, if the community only covers the above-listed financial assistance programs on its website and the website meets the credit criteria for in Section 352.c of Activity 350 (Flood Protection Information)

Documentation for FAA Provided by the Community

- (1) At each verification visit,
 - (a) If the person providing the advice is not a community employee, a letter stating that the person and/or agency has agreed to do the work (Section 362.c, credit criterion (1)). If the service provider covers several jurisdictions (e.g., a county flood control agency), a letter or memo stating that the service is provided throughout its jurisdiction is sufficient.
 - (b) A copy of how the service is publicized (Section 362.c, credit criterion (2)).

- (c) A record or memo to the files that reviews the above list of sources of assistance (see Figure 360-2) to determine which ones may be available and appropriate for the community (Section 362.c, credit criterion (3)).
 - (d) Copies of the materials used to explain the financial assistance programs, if any are used (Section 362.c, credit criterion (4)). These may be digital, hard copy, or website references.
 - (e) Records of the service provided (Section 362.c, credit criterion (5)). These can be copies of written reports, memos, emails, letters to the property owners, etc.
- (2) With the annual recertification,
- (a) A copy of how the community publicized the service during the year.
 - (b) Copies of three written reports or other documentation of providing the service (Section 362.c, credit criterion (5)). If there have been fewer than three requests for the service during the year, copies of documentation of all requests are needed.
 - (c) [Required only for the extra PPI credit] The annual report prepared by the Program for Public Information committee that evaluates the service. This is provided with the recertification documentation for Activity 330 (Outreach Projects).
- The report must identify how the credited element worked, how effective it was estimated to be, and what changes were recommended for improving its effectiveness.

362.d. Advisor training (TNG)

The maximum credit for this element is 10 points.

One of the best ways to ensure a quality service is to send the advisors to the latest FEMA training on property protection and financial assistance. TNG provides credit if the person(s) providing advice on flood protection and financial assistance attends those classes.

Credit Criteria for TNG

- (1) Credit for property protection advice (PPA) and/or financial assistance advice (FAA) are prerequisites for TNG credit. The person credited for the training must be the one providing the relevant advice for PPA and/or FAA credit.
- (2) This credit is related to classes that are provided by the Emergency Management Institute (EMI). A community may submit an equivalent field-deployed or home-study course for possible scoring.

The Emergency Management Institute (EMI) is a FEMA training center located in Emmitsburg, Maryland. It offers a four-day course on retrofitting techniques oriented to engineers and experienced building professionals as well as courses on FEMA financial assistance programs, including application procedures and benefit/cost analyses. Stipends to cover travel, registration, and rooms are usually available from FEMA for federal, state, and local officials. For many of its topics, EMI also offers field-deployed and independent study versions, which are also free.

For more information, see
<http://training.fema.gov/EMIWeb>.

Credit Points for TNG

TNG = The sum of the following, up to 10 points:

- (1) The sum of the following, not to exceed 5 points:

4 points, if the person providing property protection advice (PPA) has graduated from EMI's 4-day resident or field deployed retrofitting class (E279 or L279)

1 point, for each person providing property protection advice (PPA) who has graduated from EMI's independent study retrofitting class (IS-279)

- (2) The sum of the following, not to exceed 5 points:

4 points, if the person providing financial assistance advice has graduated from EMI's 4-day resident or field-deployed class on the Unified Hazard Mitigation Assistance Program (E212 or L212)

3 points, if the person providing financial assistance advice has graduated from EMI's 3-day resident or field-deployed class on benefit/cost analysis (E276 or L276)

1 point, for each person providing financial assistance advice who has graduated from either independent study class (IS-212 or IS-30)

The different points for FAA are based on the length of the classes. The independent study classes take approximately one day.

NOTE: Periodically, EMI introduces new courses. Check www.CRSresources.org/300 for the latest list of creditable resident, field-deployed, and independent study classes on flood protection and financial assistance.

Documentation for TNG Provided by the Community

- (1) At each verification visit,

- (a) A copy of the certificate of course attendance.

363 Impact Adjustment

There is no impact adjustment for this activity.

364 Credit Calculation

$$c360 = PPA + PPV + FAA + TNG$$

365 For More Information

- a. Additional information, reference materials, and examples can be found at www.CRSresources.org/300.
- b. The FEMA references on property protection in Figure 350-1 are good resources for the flood protection advisor.
- c. The following are U.S. Army Corps of Engineers references on property protection. They can be found at www.usace.army.mil/Missions/CivilWorks/ProjectPlanning/nfpc.aspx.
 - *Flood Proofing Performance—Successes & Failures*, 1998
 - *Flood Proofing Techniques, Programs and References*, 1996
 - *Raising and Moving The Slab-On-Grade House*, 1990
 - *Local Flood Proofing Programs*, 2005
 - *A Flood Proofing Success Story*, 1993
 - *Flood Proofing: How to Evaluate Your Options*, 1993
 - *Flood Proofing Technology in the Tug Fork Valley*, 1994.
- d. Information on financial assistance programs includes
 - FEMA grants: www.fema.gov/hazard-mitigation-assistance
 - Flood insurance: www.fema.gov/business/nfip
 - Increased Cost of Compliance: www.fema.gov/national-flood-insurance-program-2/increased-cost-compliance-coverage
 - SBA mitigation loans: www.sba.gov/content/disaster-loan-program
 - A good overall guide on state and local funding programs, such as rebates and tax exemptions, can be found in the Corps' *Local Flood Proofing Programs* at www.CRSresources.org/300.

366 Related Activities under the Community Rating System

- The credits for the first three elements, PPA, PPV, and FAA, can be increased if the services are described in the Program for Public Information credited in element PPI under Activity 330 (Outreach Projects).
- Activity 330 gives basic information on property protection and flood insurance. Outreach projects should publicize that the community can provide more advice and assistance to interested people. The publicity requirement for PPA, PPV, and FAA should be coordinated with, and be part of, the outreach projects.
- Similarly, the website credited under Activity 350 (Flood Protection Information) could advise users of this service. However, using a website does not fulfill the publicity prerequisite for these activities, unless the Program for Public Information document explains why a website is the best medium to use.
- Activity 360 credits encouraging property owners to build or install property protection measures, such as those listed in Figure 360-1. If an owner implements a recommended project, the community can receive additional credit under Activity 530 (Flood Protection). If the owner relocates the building or obtains financial assistance to sell it to a public agency, credit could be provided under Activity 520 (Acquisition and Relocation).
- One common source of a local drainage problem is a blocked drainageway. Advising property owners about good drainage maintenance can result in reduced work for the community's drainage maintenance program. That program and regulations to prohibit dumping in drainageways are credited under Activity 540 (Drainage System Maintenance).

370 FLOOD INSURANCE PROMOTION—Summary

Maximum credit: 110 points

372 Elements

- a. **Flood insurance coverage assessment (FIA):** Up to 15 points for assessing the community's current level of coverage and identifying shortcomings.
- b. **Coverage improvement plan (CP):** Up to 15 points for a plan prepared by a committee that has representation from local insurance agents.
- c. **Coverage improvement plan implementation (CPI):** Up to 60 points for implementing the projects in the CP plan.
- d. **Technical assistance (TA):** Up to 20 points for providing advice about flood insurance.

Credit Criteria

Each element has a separate section discussing credit criteria.

Impact Adjustment

There is no impact adjustment for this activity.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

370 FLOOD INSURANCE PROMOTION

The OBJECTIVE of this activity is to improve flood insurance coverage in the community.

371 Background

Flood insurance is a wise investment. Floods are the number-one natural disaster in the United States. Wherever rain falls, snow melts, or coastal storms rage, there can be flooding. Just a few inches of water can cause tens of thousands of dollars in damage. Flood damage is not covered by most standard homeowner or business insurance policies. Disaster assistance, if it is available, is typically a loan that must be repaid with interest.

As noted by the Association of State Floodplain Managers (ASFPM),

The simple truth is that residents and business owners with adequate flood insurance rebuild and recover faster and return to normal faster than people without. This means faster and more complete community recovery.... Experience has shown that an insured community is a better prepared community....

For communities, the lesson is clear: preparing for flooding and pursuing flood mitigation strategies are important, however, it is equally critical to prepare for the financial burdens which will be placed on the community and its residents and businesses when the next flood occurs.... Self-reliant communities know that flood insurance is the only guaranteed vehicle to assure a smooth and complete recovery for everyone affected.

—ASFPM News & Views, October 2010

Many people are not aware that flood insurance is available, and many of those who are aware do not see a need to insure their property. As a method of protecting people from the consequences of flooding, promoting flood insurance should be as much a community responsibility as building flood control projects or regulating new development in the floodplain. Communities in the Community Rating System (CRS) have a special opportunity to promote the availability of flood insurance and its importance as a preparedness measure.

371.a. Activity Description

The maximum credit for this activity is 110 points.

As noted in Activity 330 (Outreach Projects), one of the most effective ways to get a message across is to have it tailored to local audiences and repeated by different sources. This activity credits a similar approach to improve flood insurance coverage in a community.

This activity provides credit for a three-step process that allows communities to assess their own needs and receive credit for improving their coverage:

Step 1: Flood insurance coverage assessment (FIA). This credit is provided for assessing the community's current level of coverage and identifying shortcomings. The maximum credit for FIA is 15 points.

Step 2: Coverage improvement plan (CP). The plan is prepared by a committee that has representation from local insurance agents. The maximum credit for CP is 15 points.

Step 3: Implementation of the coverage improvement plan (CPI). The plan's projects are implemented. The maximum credit for CPI is 60 points.

Credit for the three steps or elements is provided incrementally. That is, a community may prepare an assessment and circulate it for review (FIA) (Section 372.a) before it decides whether to proceed with a coverage improvement plan. Credit is next provided for the development of a coverage improvement plan (CP) that is submitted to the governing body (Section 372.b). Credit for implementing the projects described in the coverage improvement plan is provided in "coverage improvement plan implementation (CPI)," in Section 371.c.

Credit is also available in this activity for **Technical Assistance (TA)**, i.e., providing advice about flood insurance similar to the flood protection assistance service credited under Activity 360 (Flood Protection Assistance). The maximum credit for TA is 20 points.

371.b. Impact Adjustment

There is no separate impact adjustment for Activity 370. It is expected that the community will evaluate flood insurance needs for all properties that are exposed to flooding.

372 Elements

372.a. Flood insurance coverage assessment (FIA)

The maximum credit for this element is 15 points.

FIA credit is provided for the first step in the flood insurance promotion process—assessing the community's current level of flood insurance coverage and identifying where coverage needs to be improved. Incorporating this element into the assessments needed for a Program for Public Information credited in element PPI under Activity 330 (Outreach Projects) or floodplain management plan credited in Activity 510 (Floodplain Management Planning) is recommended, but not required.

Several separate documents are available to help communities with outreach projects, planning committees, the Program for Public Information, assessing flood insurance coverage, and other aspects of this activity. They include additional details, suggestions, and examples, and can be found at www.CRSresources.org/300.

Credit Criteria for FIA

For FIA credit, the flood insurance coverage assessment must follow these steps:

- (1) **Collect flood insurance information.** Flood insurance policy information from the National Flood Insurance Program (NFIP) is available to local government agencies as general (or aggregate) data or as detailed (or property-specific) data.

The general data contain no specific policy holder name or address information and can be shared with the public. The detailed policy information that includes policy holder addresses and names is protected under the Privacy Act of 1974 and cannot be shared with the public. This means that detailed policy data can only be seen by local government staff and cannot be provided to individuals or organizations, including a floodplain management planning committee, Program for Public Information committee, governing bodies, the media, or the public.

(a) Use of general flood insurance data: For FIA, communities are required to, at a minimum, obtain and use the “Insurance Zone” and “Insurance Occupancy” information from the NFIP Community Information System (CIS). The CIS data can be obtained through the ISO/CRS Specialists. Note that the FEMA Regional Offices and most State NFIP Coordinators also have access to the CIS and may be able to provide it to CRS communities.

(b) Use of detailed or property-specific flood insurance data: Detailed flood insurance policy information is made available to CRS repetitive loss communities with the condition that the community official accepting the data agrees to follow the requirements of the Privacy Act. Detailed flood insurance policy information can also be requested from the FEMA Regional Office. Using detailed policy data that is up to one year old is adequate for credit for this activity.

The detailed data include the address and amount of coverage for each policy listed under the community’s NFIP number. Such detailed data may only be used in the development of FIA and shared with the committee formed for the development of the coverage improvement plan (credited in the next section) if it is first modified into a generalized or aggregated form so that individual names and addresses are not provided and cannot be inferred. For example, the aggregated data could be presented in tabular format or on a map by block or neighborhood.

- (2) **Determine level of flood insurance coverage.** The level of flood insurance coverage is determined. Level of coverage is measured in two ways:

(a) The number of buildings with insurance coverage can be compared to the number of buildings exposed to the flood hazard. Note that the number of buildings in the

The Privacy Act of 1974

Flood insurance data about private property, including repetitive loss properties, are protected under the Privacy Act. Personally identifiable information such as the names or addresses of specific properties, whether they are covered by flood insurance or not, whether they have received flood insurance claims, or the amounts of such claims MAY NOT be released outside of local government agencies or to the public or used for solicitation or other purposes. Such information should be marked “For internal use only. Protected by the Privacy Act of 1974.”

General or aggregated information, such as total claims paid for a community or an area or data not connected to a particular property MAY be made public.

floodplain is tallied and updated each year for the community's Program Data Table (Section 213.a). This comparison should be done by FIRM Zone, such as Unnumbered A Zone or V Zone, and by occupancy type (e.g., single family homes and non-residential).

- (b) The average amount of coverage ("insurance in force") by FIRM zone and occupancy type can be compared to the amount of expected flood damage from a base flood. For example, many people may only have coverage equal to the remaining balance of their mortgage, which may not be sufficient to cover the amount of damage that could result from a 100-year flood. Many communities have used Hazus-MH, which is a tool that can help estimate expected flood damage (see www.fema.gov/hazus).

For local government officials using detailed data to do this step:

- If the assessment identifies errors in the policy data, such as an inaccurate address or the wrong community identification number, the correct data should be submitted to the ISO/CRS Specialist.
- If the assessment finds that a grandfathered X-Zone policy is actually in the SFHA, it should be counted as a policy in the SFHA for the purposes of this assessment.

Community staff are encouraged to examine the level of coverage in the priority areas identified in a floodplain management plan (Activity 510), Program for Public Information (Activity 330), or CRS Community Self Assessment (Section 240).

(3) Prepare the document. An assessment document is prepared that

- (a) Explains the process followed;
- (b) Provides summary data, such as a table with the coverage numbers for each FIRM zone and occupancy type. If the community used detailed policy data, summary data by priority area would be useful; and
- (c) Concludes with a narrative summary of the current coverage and recommendations about where improvements would help. Examples of improvements include, but are not limited to
 - Increasing the number of buildings insured in one or more areas or FIRM zones,
 - Increasing the number of buildings insured by occupancy type,
 - Having higher levels of coverage where the expected amount of damage from a base flood is more than the average amount of coverage, or
 - Increasing the number of Preferred Risk Policies in areas remapped from A Zones to an X Zone.

The assessment document may be a stand-alone document or it may be prepared and published as part of a flood insurance coverage improvement plan (credited in the next section), a Program for Public Information (credited in element PPI under Activity 330),

or a floodplain management plan (credited under Activity 510). A multi-jurisdictional plan must include this information for each of the participating communities.

- (4) **Submit to the governing body.** The assessment document (containing only general or aggregated data or maps) is submitted to the community's governing body. In the case of a multi-jurisdictional plan, each community seeking this credit must submit the document to its governing body. No action needs to be taken by the governing body for FIA credit.
- (5) **Reassess.** Updated flood insurance data must be obtained five years after the assessment was done. The new information is used to update the level of coverage and the recommendations. The document is revised accordingly and submitted to the community's governing body.

Communities are to keep track of their building counts as part of their annual recertification (see Section 213.a), so the data needed to update the assessment should be readily available.

An updated FIA can be a new document or an addendum to the existing document. The FIA update will be reviewed for CRS credit according to the *Coordinator's Manual* currently in effect, not the version used when the community originally requested this credit. The updated FIA must be developed, reviewed, and submitted to the governing body following the same process used when the original document was submitted.

Credit Points for FIA

FIA = 15 points, for preparing the assessment document and submitting it to the community's governing body.

Documentation for FIA Provided by the Community

If the flood insurance coverage assessment is part of the community's Program for Public Information that receives PPI credit under Activity 330, no additional documentation is needed. The documentation listed below is needed only if the assessment is not part of a credited Program for Public Information.

- (1) At each verification visit,
- The current flood insurance coverage assessment document, and
 - Documentation that the document was submitted to the community's governing body (e.g., a cover memo or a note in the governing body's minutes).

372.b. Coverage improvement plan (CP)

The maximum credit for this element is 15 points.

CP credit is provided for the second step in the flood insurance promotion process—preparing a plan to improve the coverage needs found in the FIA assessment. As with the assessment, incorporating the coverage improvement plan into a Program for Public

Information credited under Activity 330 (Outreach Projects) is recommended, but not required.

Several separate documents are available to help communities with outreach projects, planning committees, the Program for Public Information, assessing flood insurance coverage, and other aspects of this activity. They include additional details, suggestions, and examples, and can be found at www.CRSresources.org/300.

Credit Criteria for CP

- (1) The community must receive credit for the flood insurance coverage assessment (FIA).
- (2) The plan must be prepared by a committee of people from both inside and outside the local government. The number of participants and their identities is determined by the community, but the committee must
 - Comprise at least five people;
 - Include one or more representatives from the community's floodplain management office;
 - Include one or more representatives from the community's public information office, if there is one;
 - Have at least half of its members from outside the local government; and
 - Include one or more representatives from a local insurance agency.

See Step 1 in Section 332.c. The community's Program for Public Information committee or floodplain management planning committee can suffice for this committee, provided it includes one or more representatives from a local insurance agency.

Communities are encouraged to have a larger group of stakeholders, especially residents from floodprone areas on their committees. If there are no insurance agencies in town, the community can document participation by one or more out-of-town agencies that normally do business in the community.

If the committee is a multi-jurisdictional planning group, it must meet the same criteria as for a multi-jurisdictional Program for Public Information committee, found in Step 1 in Section 332.b. Having one insurance agency represented on the multi-jurisdictional planning group is acceptable.

- (3) The committee must prepare and recommend a coverage improvement plan. The plan document must include the following:
 - (a) A list of the members of the committee and their affiliations;
 - (b) The flood insurance coverage assessment credited under FIA, with aggregate insurance data, in accordance with the Privacy Act. A separate assessment does not have to be published and provided to the governing body if it is included in the coverage improvement plan or the Program for Public Information document;

- (c) Current activities being implemented within the community to promote flood insurance, including activities by state and local agencies and insurance companies. This could be prepared as part of Step 2 of the Program for Public Information process;
- (d) Desired outcomes for coverage improvement. The community may want to set priorities and address one or two first. This could be prepared as part of Step 3 of the Program for Public Information process;
- (e) A description of each project designed to increase coverage, who will do it, and when it will be done. Projects can encourage people to maintain their coverage. This could be prepared as part of Step 4 of the Program for Public Information process;
- (f) At least one project must demonstrate that the community's elected leadership encourages people to purchase or increase their flood insurance coverage. Examples of such a project include a public forum or event involving the community's governing body or a document sent to all residents and signed by the mayor. Statements at a regular meeting of the governing body are not sufficient;
- (g) The process that will be followed to monitor and evaluate the projects, including a reporting procedure or other technique by which the committee will make sure the projects are done. This could be prepared as part of Step 7 of the Program for Public Information process; and
- (h) A copy of the draft plan must be sent to the FEMA Regional Office's flood insurance liaison. The liaison does not approve the plan. The purpose of the submittal is to see if the Regional Office can provide assistance or useful information.

The plan can be included in the community's Program for Public Information or floodplain management plan, instead of being a separate document. If the community's Program for Public Information or floodplain management plan is a multi-jurisdictional plan, it must include this information for each of the communities.

FEMA can provide information on national efforts to promote flood insurance and can provide materials to explain flood insurance. For more information see www.FloodSmart.gov.

- (4) The plan document must be submitted to the community's governing body. In the case of a multi-jurisdictional plan, each community seeking this credit must submit the document to its own governing body. No action needs to be taken by the governing body unless the community wants credit for implementing the plan (CPI). In that case, the plan would need to be adopted by following the same adoption criteria used for PPI credit under Activity 330.
- (5) Continuation of this credit is dependent on preparation of an annual evaluation report, similar to the annual report needed for a Program for Public Information or floodplain management plan. As with those reports, the annual report evaluating the coverage improvement plan must be submitted to the governing body and included in the annual CRS recertification package.

-
- (6) The plan must be updated on a five-year cycle, using data from the updated assessment (see step 5 in the FIA assessment in the previous section). Preparation of the updated plan follows the same process as the original plan, including sending a draft to the flood insurance liaison in the FEMA Regional Office.

Credit Points for CP

CP = 15 points, for preparing the coverage improvement plan and submitting it to the governing body

Documentation for CP Provided by the Community

If the flood insurance coverage improvement plan is part of the community's Program for Public Information credited in element PPI under Activity 330, no additional documentation is needed. The documentation listed below is needed only if the plan is not part of a credited Program for Public Information.

- (1) At each verification visit,
 - (a) The current flood insurance coverage improvement plan (Section 372.b, credit criteria (3) and (7)).
 - (b) Documentation that the plan was submitted to the governing body (e.g., a cover memo or a note in the governing body's minutes) (Section 372.b, credit criterion (4)).
- (2) With each annual recertification,
 - (a) A copy of the annual evaluation report (Section 372.b, credit criterion (6)).
 - (b) Documentation that the annual evaluation report was submitted to the governing body (e.g., a cover memo or a note in the governing body's minutes) (credit criterion (5)).

372.c. Coverage improvement plan implementation (CPI)

The maximum credit for this element is 60 points.

CPI credit is provided for the third step in the flood insurance promotion process—implementing the plan to improve coverage. As with the previous elements, including the coverage improvement projects in the Program for Public Information that is credited in element PPI under Activity 330 (Outreach Projects) is recommended, but not required.

Several separate documents are available to help communities with outreach projects, planning committees, the Program for Public Information, assessing flood insurance coverage, and other aspects of this activity. They include additional details, suggestions, and examples, and can be found at www.CRSresources.org/300.

Each CPI project is scored the same way as are outreach projects (OP) in Activity 330 (Outreach Projects) with two exceptions. First, only the topic of flood insurance is credited

here. Second, because the community does a special evaluation of flood insurance coverage needs and of the appropriate public information projects dealing with flood insurance, it is expected that the Activity 370 outreach projects will be more effective. Therefore, they receive twice the credit as projects under Activity 330. Coverage of the topic of flood insurance in the same project cannot be credited under both activities. If a project implemented pursuant to the CPI covers several topics, the topic of flood insurance should be scored only under Activity 370, while the other topics can be scored under Activity 330.

Credit Criteria for CPI

- (1) The community must receive credit for the flood insurance coverage assessment (FIA) and credit for the adopted coverage improvement plan (CP). The criteria for adoption of the plan is the same as the criteria for adopting a Program for Public Information (PPI) as stated in Step 6 in Section 332.c. If the coverage improvement plan is incorporated in a credited Program for Public Information, adoption of the Program for Public Information document is sufficient.
- (2) The projects implemented for CPI credit must be listed in the coverage improvement plan (or the Program for Public Information document, if the coverage improvement plan is incorporated into the Program for Public Information).
- (3) The community must implement at least one project each year that demonstrates that the community's elected leadership encourages people to purchase or increase their flood insurance coverage (see CP credit criterion (3)(f) in Section 372.b).

Credit Points for CPI

A maximum of 60 points is available for this element.

$$\text{CPI} = \sum \text{CPI}\#1 + \text{CPI}\#2 + \text{CPI}\#3 \dots$$

The value for each coverage project implemented, CPI#1, CPI#2, etc., is the product of (A) x (B), i.e.,

(A) The number of points per flood insurance message identified in the coverage improvement plan, which is based on the type of project: informational (2 point), general outreach (4 points), or targeted outreach (12 points)

multiplied by

(B) The number of times the project is delivered each year

A spreadsheet in Microsoft Excel® is available to help in calculating this credit.

The values for each coverage project implemented (CPI#1, CPI#2, etc.) are added to determine the total value for CPI.

Each project that is implemented on the flood insurance topic receives twice the points that it would if it were scored as an outreach project (OP) under Activity 330 (Outreach Projects). If the community has a credited Program for Public Information that includes the CPI project, the 40% PPI bonus is added. The 30% stakeholder bonus (element STK under Activity 330) can also be added. However, the maximum credit for CPI is 60 points, including any PPI and STK bonuses.

Credit points for CPI are separate from the points for OP, PPI, and STK under Activity 330. If a community is implementing enough projects, it can obtain the maximum points available for Activity 330 and receive up to 60 more points for CPI. A community can receive credit for different projects that promote flood insurance under both Activity 330 and Activity 370. However, the topic of flood insurance cannot be credited under both activities for the same project. The part on flood insurance can receive higher points under CPI, while the other topics are scored as an Activity 330 project.

Example 372.c-1.

A community's coverage improvement plan identifies two messages related to flood insurance coverage. It recommends four presentations to neighborhood associations to discuss flood protection and convey the coverage improvement plan's two flood insurance messages.

$CPI\#1 = 2 \times 4 \times 4 = 32$ (2 messages at 4 points per message delivered 4 times a year through general outreach). Messages on the other topics covered during the presentation are credited as outreach projects, OP, under Activity 330.

If the coverage improvement plan is part of a Program for Public Information, the presentations would also receive a 40% bonus for being part of the Program for Public Information.

Because the presentations are sponsored by the neighborhood associations, they would receive an additional 30% bonus for stakeholder delivery. In that case,

$$CPI\#1 = 2 \times 4 \times 4 \times 1.40 \times 1.30 = 58.24$$

The coverage improvement plan also calls for the annual letter from the mayor to all floodplain residents to include the two messages.

$CPI\#2 = 2 \times 12 \times 1 \times 1.40 = 33.6$ (two messages at 12 points per message for the targeted project to all floodplain properties, delivered once a year. The project is described in the PPI for the 40% PPI bonus. The project is delivered by the community, so there is no stakeholder (STK) bonus.)

$$CPI = CPI\#1 + CPI\#2 = 58.24 + 33.60 = 91.84.$$

The maximum points for this element are 60, so the community receives 60 points.

Documentation for CPI Provided by the Community

(1) At each verification and recertification,

- (a) Copies of flyers, presentations, brochures, etc. that have been produced and disseminated as outreach projects. If an outreach project is a presentation to a group, it can be documented with a copy of the meeting's minutes or a memo to the file.

372.d. Technical assistance (TA)

The maximum credit for this element is 20 points.

TA credit is provided for advising people who have questions about flood insurance. This credit is modeled on the credit criteria for providing financial assistance advice (FAA) under Activity 360 (Flood Protection Assistance).

This credit is separate from FIA, CP, and CPI. The community does not need to prepare a flood insurance assessment or coverage improvement plan for this credit. However, the coverage improvement plan should discuss providing this technical assistance as a way to encourage people to purchase, maintain, or improve their coverage. If the service is credited under TA, it cannot also be credited as a CI or OP project.

The advice and assistance on flood insurance provided for TA credit can be administered in the same way as advice and assistance on property protection credited in Activity 360. The community may have the same person(s) provide both types of assistance and may publicize and document them together. The community would still receive credit for the two different services under each activity.

Credit Criteria for TA

(1) The community must identify at least one person, office, or agency to provide flood insurance advice. The person(s) could be a city employee, consultant, employee of a county or regional flood control district, or an insurance agent. It need not be local staff if another agency or organization has agreed to answer inquiries.

(2) The service must be publicized at least once a year. There are three publicity options:

- (a) An annual notice that reaches everyone in the community, such as an article in a newsletter or stuffer in a utility bill that goes to all properties;
- (b) An annual notice directed to the areas with flooding and drainage problems, such as a mailer to all properties in the floodplain; or
- (c) An annual outreach project developed as part of a Program for Public Information credited in element PPI under Activity 330, provided that the program document identifies the audience for the service and discusses the best way to reach that audience. There are no credit points under Activity 330 for simply publicizing the service, but there is credit for explaining flood insurance (topic #2), and a notice of the service would be useful as a part of that explanation.

(3) Records of the service must be kept and provided for credit documentation.

Credit Points for TA

TA = the total of the following:

15, for providing the technical assistance service,

plus

5, if the service is provided by an Associate in National Flood Insurance (ANFI™)

More information on the ANFI® certificate can be found at www.aicpcu.org/anfi.

Documentation for TA Provided by the Community

(1) At each verification visit,

- (a) If the person is not a community employee, a letter stating that the person and/or agency has agreed to do the work (Section 372.d, credit criterion (1)). If the service provider covers several jurisdictions (e.g., a county flood control agency), a letter or memo stating that the service is provided throughout its jurisdiction is sufficient.
- (b) A copy of how the service is publicized (Section 372.d, credit criterion (2)).
- (c) Records of the service provided (Section 372.d, credit criterion (3)). These can be copies of written reports, memos, emails, letters to inquirers, etc.

(2) With the annual recertification,

- (a) A copy of material showing how the community publicized the service during the year.

373 Impact Adjustment

There is no impact adjustment for this activity.

374 Credit Calculation

c370 = FIA + CP + CPI + TA

375 For More Information

- a. Additional information and examples can be found at www.CRSresources.org/300, including a spreadsheet in Microsoft Excel® ("330-370 Spreadsheets.xls") to facilitate calculating the credit for this activity.
- b. Details on flood insurance can be found in the manual for insurance agents, found at www.fema.gov/library/viewRecord.do?id=6393.

- c. Information on the Associate in National Flood Insurance (ANFI[®]) can be found at www.aicpcu.org/anfi. One does not have to be a licensed insurance agent to take the tests and qualify for ANFI[®].
- d. National Flood Insurance training is available for all NFIP stakeholders nationwide. Check the following sources for online and classroom training:
 - NFIP state coordinating agencies (for example, the Department of Water Resources);
 - The Association of State Floodplain Managers at www.floods.org;
 - State floodplain management associations;
 - NFIP Insurance Agent, Lender, and Adjuster Training at www.nfipiservice.com/training; and
 - The Emergency Management Institute at <http://training.fema.gov/EMI>. The course, Advanced Floodplain Management Concepts II (E282), has a full day module on flood insurance.

376 Related Activities under the Community Rating System

- Activity 310 (Elevation Certificates) encourages the community to collect and maintain FEMA Elevation Certificates on properties in the SFHA and Activity 320 (Map Information Service) encourages communities to provide data from the Flood Insurance Rate Map (FIRM) to inquirers. Both of these services can provide the kind of data needed to help an advisor explain to an inquirer how flood insurance policies are rated.

These two services can also help insurance agents write policies. Such assistance could encourage them to promote flood insurance among their customers.
- Activity 330 (Outreach Projects) credits messages about flood insurance. The coverage improvement plan should be part of the Program for Public Information credited in element PPI under Activity 330.
- Projects should publicize the community's willingness to provide additional advice and assistance to interested people. The publicity requirement for technical assistance (TA) should be coordinated with, and be part of, the community's Activity 330 outreach projects.
- Similarly, the website credited in Activity 350 (Flood Protection Information) could promote flood insurance, give links to more information about flood insurance, and advise users about the technical assistance (TA) service.
- Activities 610 (Flood Warning and Response), 620 (Levees), and 630 (Dams) have outreach project prerequisites. The residents in areas threatened by floods, levee overtopping, and dam failures would benefit by having flood insurance. The project for Activity 620 (Levees) requires a discussion of insurance.

400 MAPPING AND REGULATIONS

The Community Rating System (CRS) provides credit to communities that enact and enforce regulations that exceed the National Flood Insurance Program's (NFIP's) minimum standards, so that more flood protection is provided for new and existing development.

The activities in this series affect only certain portions of the community and, in some cases, only portions of the delineated Special Flood Hazard Area (SFHA). Therefore, the credit points are adjusted to reflect the area affected. These activities are also adjusted to reflect the community's growth rate as explained in Section 710.

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401 Special Flood-related Hazard Areas

The Federal Emergency Management Agency (FEMA) and many communities in the United States have long recognized that the mapping and regulatory standards of the NFIP do not adequately address all of the flood problems in the country. There are many special localized situations in which flooding or flood-related problems do not fit the national norm for riverine and coastal floodplain management. Therefore, there are situations in which the minimum NFIP requirements do not adequately protect property from flood damage.

To encourage communities to address these hazards, the CRS provides credit throughout the *CRS Coordinator's Manual* for preserving open space and regulating new development in areas subject to seven special flood-related hazards:

1. Uncertain flow paths: alluvial fans, moveable bed streams, channel migration, and other floodplains where the channel shifts during a flood.
2. Closed basin lakes: lakes that have a small or no outlet that may stay above flood stage for weeks, months, or years.
3. Ice jams: flooding caused when warm weather and rain break up a frozen river. The broken ice floats down river until it is blocked by an obstruction, such as a bridge or shallow area, creating a dam.
4. Land subsidence: lowering of the land surface caused by withdrawal of subsurface water or minerals or by compaction of organic soils.
5. Mudflow hazards: a river, flow, or inundation of liquid mud down a hillside, usually as a result of a dual condition of loss of brush cover and the subsequent accumulation of water on the ground, preceded by a period of unusually heavy or sustained rain.
6. Coastal erosion: areas subject to the wearing away of land masses caused primarily by waves on the oceans, Gulf of Mexico, and the Great Lakes.
7. Tsunamis: large ocean waves typically caused by an earthquake, landslide, or underwater volcano.

The credit points for preserving open space and regulating new development in areas affected by these special flood-related hazards are found under Activity 420 and Activity 430. Credit points for mapping coastal erosion and/or tsunami hazards are found under Activity 410.

402 Impact Adjustment for Areas

Many CRS activities are not implemented the same way throughout the floodplain. Therefore, their credit points need to be adjusted to reflect how much of the floodplain they do cover. In CRS credit calculations, this is called the “impact adjustment” (see Section 222).

Some activities are adjusted based on the number of buildings that are affected and some are adjusted based on the size of the area affected. This section reviews how the activity and element credits are adjusted to reflect their impact on the area affected. Section 301 covers impact adjustments based on the number of buildings affected.

Most elements in the activities listed in Table 403-1 (see below) do not affect all of the buildings that could benefit from them. For example, freeboard is often enforced only in areas for which base flood elevations have been determined. A community’s credit for freeboard and other elements is adjusted based on how much of the SFHA is affected. In order to measure the impact of these activities, the community must determine the area affected by each element and the area of the SFHA.

Some activities and elements do not have the impact adjustment step as part of calculating the total credit points. These activities and elements are assumed to be effective throughout the community. In some cases, credit is provided ONLY if they are implemented everywhere within the community. For example, in Activity 450 (Stormwater Management) there is no credit for ESC (erosion and sediment control regulations), or WQ (water quality) unless those measures are enforced throughout the entire community.

402.a. Impact Adjustment Ratio

Impact adjustments are calculated by multiplying the points for an element by a ratio that represents how much of the flood problem within the community is being addressed by the element. Impact adjustment ratios are variables with a lower case “r” preceding the acronym for the element.

The value of an impact adjustment ratio is determined by dividing the number of buildings or the total area affected by an element (the numerator) by the appropriate denominator. The number of buildings is designated by a lower case “b,” and the area affected is designated by a lower case “a.”

The denominator for the elements in each activity is specified in the Impact Adjustment section for the element. In most cases, it is the area of the community’s Special Flood Hazard Area or “aSFHA.”

NOTE: *The community’s aSFHA should be reviewed and updated each year for the Program Data Table that is included in the annual recertification (see Section 213.a).*

Example 402.a-1.

In Activity 420 (Open Space Preservation), the credit for preserving open space is adjusted based on its impact, i.e., how much of the SFHA is preserved as open space. This is calculated by multiplying the credit by the impact adjustment. The acronym for open space preservation is “OSP.” The impact adjustment ratio for OSP is rOSP.

rOSP is the total area of the parcels that qualify for OSP credit (aOSP) divided by the area of the community’s SFHA (aSFHA). The formula is

$$rOSP = \frac{aOSP}{aSFHA}$$

For example, in a community with several parks and other properties that qualify as preserved open space:

The total area of the qualifying parcels is 154 acres. aOSP = 154

The total area of the SFHA is 598 acres. aSFHA = 598

$$rOSP = \frac{154}{598} = 0.26$$

The community receives 26% of the maximum possible credit for OSP because 26% of its SFHA is preserved as open space.

In some elements in Activities 410, 420, and 430, it is possible to receive an impact adjustment ratio of up to 1.5. An example would be a community that enforces a higher regulatory standard throughout its “regulatory floodplain” (see Section 120 (Glossary)) that includes the SFHA and flood-prone areas outside the SFHA. Another example is the case in which a community enforces the freeboard requirement throughout the SFHA and on parcels that are partially within the SFHA. These communities may have numerators that are larger than the area of the SFHA, so their impact adjustment ratios would be greater than 1.0.

Although the impact adjustment for Activity 420 can be as much as 1.5 and the impact adjustment for Activity 430 can go up to 1.5, the sum of the impact adjustments for Activities 420 and 430 cannot exceed 1.5.

402.b. Optional Minimum Value

Some elements and activities have an optional minimum value that can be used in place of a calculated impact adjustment ratio. In most cases the value is 0.1 or 10% of the maximum possible. Using this minimum value is optional. It is normally used if

- The community does not want to develop the data needed to determine the numerator or denominator in the impact adjustment ratio, or
- The calculated impact adjustment ratio is less than 0.1. In this case, the community will receive more credit by using the optional minimum.

The activities that use areas for their impact adjustments and the optional minimum value that can be used are listed in Table 403-1, below.

402.c. Regulating Areas Preserved as Open Space

If a community applies for credit for Activity 420 (Open Space Preservation), it means that certain areas are preserved from development. Higher regulatory standards have no impact in those open space areas. Therefore, the impact adjustment ratios for the elements in Activity 430 (Higher Regulatory Standards) cannot be 1.0 if the community regulates only the SFHA and receives credit for open space preservation in Activity 420.

In other words, a community that applies for credit in both Activities 420 and 430 cannot have the maximum impact adjustment ratio for either activity. The numerator in the impact adjustment ratio formula for Activity 430 elements must account for this by excluding the area of preserved open space (aOSP).

Example 402.c-1.

The community in Example 402.a-1 has a freeboard requirement (FRB) for development throughout its SFHA. It can only receive FRB credit for the areas where development may occur, i.e., areas that are not counted toward preserved open space (OSP).

$$r_{FRB} = \frac{a_{FRB}}{a_{SFHA}} = \frac{a_{SFHA} - a_{OSP}}{a_{SFHA}} = \frac{598 - 154}{598} = \frac{444}{598} = 0.74$$

The community receives 74% of the maximum possible credit for freeboard because there will be no new buildings in the areas preserved as open space. The freeboard regulation has no impact in the 26% of the SFHA that is preserved as open space, which is reflected in the impact adjustment.

403 Impact Adjustment Map

An “impact adjustment map” is needed to document and calculate the numerators and denominators in the community’s impact adjustment ratios for certain CRS activities. All appropriate areas for numerators and denominators for impact adjustment ratios must be included with the impact adjustment map. The denominator is usually aSFHA (Table 403-1), and the numerator is the area where each element is effective. For the 600 series of warning and response activities, impact adjustment maps delineate the areas affected by the elements, but the impact adjustments are based on the number of buildings in those areas.

Table 403-1. Impact adjustment maps.

Activity	Affected Elements	Denominator	Optional Minimum
410 (Flood Hazard Mapping)	NS, SR, HSS, FWS	aSFT	0.10
420 (Open Space Preservation)	OSP, DR, NFOS, LZ	aSFHA	none
	OSI	aSFHA	0.10
	NSP	total length of shoreline	0.10
430 (Higher Regulatory Standards)	DL, FRB, FDN, CSI, LSI, ENL, OHS	aSFHA	0.10
	PCF	a500	none
	CAZ	aSFHA	0.5 / 0.1
440 (Flood Data Maintenance)	AMD	aSFHA	0.10
450 (Stormwater Management)	SMR, WMP	area of the watershed	0.15
540 (Drainage System Maintenance)	CDR, PSM, CIP	number of drainage components	0.10
	SBM	number of storage basins	0.10
610 (Flood Warning and Response)	FTR, EWD, FRO	number of buildings in the SFHA (bSF)	none
620 (Levees)	LM, LFR, LFW, LFO	number of buildings affected by a levee failure (bLF)	none
630 (Dams)	DFR, DFW, DFO	number of buildings affected by a dam failure (bDF)	none

aSFT is the area of the SFHA for the community at the time of adoption of a study.

Elements not listed do not have an impact adjustment calculation.

There is no optional minimum value for an impact adjustment for preserved open spaces or for impact adjustments based on building counts.

An impact adjustment map may be prepared on any convenient base map or in a geographic information system (GIS), as long as the scale is suitable for the determination of the areas. If the Flood Insurance Rate Map (FIRM) or other floodplain map is not used as the base map, the boundaries of the SFHA and the areas covered by each element must be drawn on the map with sufficient accuracy that the area calculations can be verified.

No new studies are required to produce an impact adjustment map. The areas are identified and marked on the map based upon the areas under the jurisdiction of the community's regulatory programs. Many communities have produced maps that do this for their own management purposes.

Some communities have found the impact adjustment map they developed for CRS credit helpful as a visual presentation of their floodplain management programs. It identifies where the problems are and where the community is dealing with those problems. If the community completed the CRS Community Self Assessment (see Section 240), the impact adjustment map should be compared to the map(s) developed during the Self Assessment.

403.a. Selecting a Base Map

Selection of an appropriate base map for an impact adjustment map depends on the size of the community and the elements for which it is requesting credit.

- If a community has a GIS that includes its flood data, it is encouraged to produce maps and calculate areas using that system. Many communities now use their GIS to store the data, perform the calculations, and prepare the maps necessary for credit calculation.
- If a community is relatively small, a copy of the FIRM may be the best base map.
- If a community is large in geographic area and its FIRM includes many panels, it may use a base map that fits on one sheet. The SFHAs may already be drawn on the base map (e.g., a zoning map with the regulated areas shown), or they may have to be shown on the base map.
- If the community is requesting credit for mapping or regulating areas outside the SFHA shown on its FIRM, these areas must be shown on the impact adjustment map.
- If a community is large and has different standards for urban and rural areas, maps of differing scales may be needed.
- A community applying for credit under a number of different elements may choose to use overlays or GIS layers to display the elements separately.

If a GIS is not used, choosing base maps depends upon the detail required and the overall bulk of the maps. If maps other than the FIRM are used as bases, all appropriate NFIP zones should be transferred from the FIRM to the base maps.

All base maps must include the scale of the map and a legend for all information provided on the map.

403.b. Mapping aSFHA

The impact adjustment map must show the SFHA. If the FIRM or other floodplain map is not used as the base map, the boundaries of the SFHA must be drawn on the map with sufficient accuracy that the area calculations can be verified.

In general, it is to the community's advantage to have a smaller denominator, or aSFHA, for the impact adjustment calculation (the impact adjustment ratio will be bigger if the denominator is smaller). Although the area of a community's SFHA is a specific area (i.e., acres or square miles), some areas are not included in aSFHA.

Three types of areas within the SFHA—open waters, federally owned lands, and areas beyond the community's regulatory jurisdiction—need to be reviewed and adjustments made to calculate aSFHA.

1. Open water areas larger than 10 acres, such as lakes, bays, and large rivers, must be subtracted from the area of the SFHA. To determine the extent of large water bodies, the shoreline shown on the FIRM may be used. For large rivers, reaches where the average bank-to-bank width shown on the FIRM exceeds 500 feet must be excluded.
2. Areas larger than 10 acres that are either owned by the federal government (e.g., military installations or national parks), are Tribal lands, or are sites on which development is prohibited by the federal government, must be subtracted from the area of the SFHA. Federal land leased to private property owners with the stipulation that the lessees obtain all required local permits are not excluded.
3. At the community's option, areas beyond the regulatory jurisdiction may be subtracted. The community may include or exclude non-federal areas it does not have the authority to regulate, including land owned by the state or another community. These lands must be treated consistently. If they are included in the SFHA for open space credit, they must be included in the SFHA for all activities. If they are open space, the community usually will receive more credit if they are included.

The impact adjustment map must show the areas of the SFHA that the community has excluded from its impact adjustment calculations. These areas should be identified with a distinctive shading or color.

Excluding water bodies and land over which the community has no regulatory control usually will increase the community's CRS credit because the denominator will be reduced. However, if a community can document that non-federal land over which it has no regulatory jurisdiction is eligible for CRS credit, it may include such areas. An example of this would be a state park eligible for credit under Activity 420 (Open Space Preservation).

Large areas of federal lands and some Tribal lands are usually shown on a FIRM as "Areas Not Included." If these areas are shown with mapped SFHAs, and if they are larger than 10 acres, they may be excluded from the impact adjustment map. Smaller parcels need not be excluded—it is the community's option, but the extra work probably will not significantly affect the measurements or the credits.

Example 403.b-1.

West Bay is a fictitious community used for CRS examples. It is a coastal town on the west side of Biloxi Bay. It is 100% flood-prone. The County GIS office provides each community with a digital map that shows streets and FIRM zones (see Figure 400-1).

West Bay's corporate limits go to the middle of Biloxi Bay. Because that area is larger than 10 acres, the Bay shoreline is used as the eastern limit of the SFHA for impact adjustment purposes. A note to that effect is put on the impact adjustment map.

There is also a small state park with a beach in the town. The CRS Coordinator concluded that there would be more credit if the state park were counted as preserved open space than if it were excluded from the area calculated as SFHA. Therefore, it is considered in the SFHA for impact adjustment purposes.

403.c. Marking an Impact Adjustment Map

An impact adjustment map must show the areas affected by each element for which CRS credit is requested. These are areas to be included in the numerator of the impact adjustment calculations. Each area should be outlined or shaded, and labeled (e.g., with the acronym for that element). However, in some cases, a note on the map or in the legend may be simpler and clearer than shading. For example, if a community regulates all of its SFHA for freeboard (FRB), it could use the note “aFRB = aSFHA.”

For many communities, the SFHA is the regulatory floodplain. Communities that regulate other flood-prone areas outside the SFHA, in addition to the SFHA, should delineate the area of the regulatory floodplain on the impact adjustment map.

Example 403.c-1.

See Figure 400-1 for an example of an impact adjustment map that is marked to show areas of preserved open space (credited under Activity 420 (Open Space Preservation)) and areas subject to coastal A-Zone regulations (credited under Activity 430 (Higher Regulatory Standards)). It also has a note that the Biloxi Bay portion of the SFHA shown on the FIRM is not counted as part of the town’s SFHA for impact adjustment purposes.

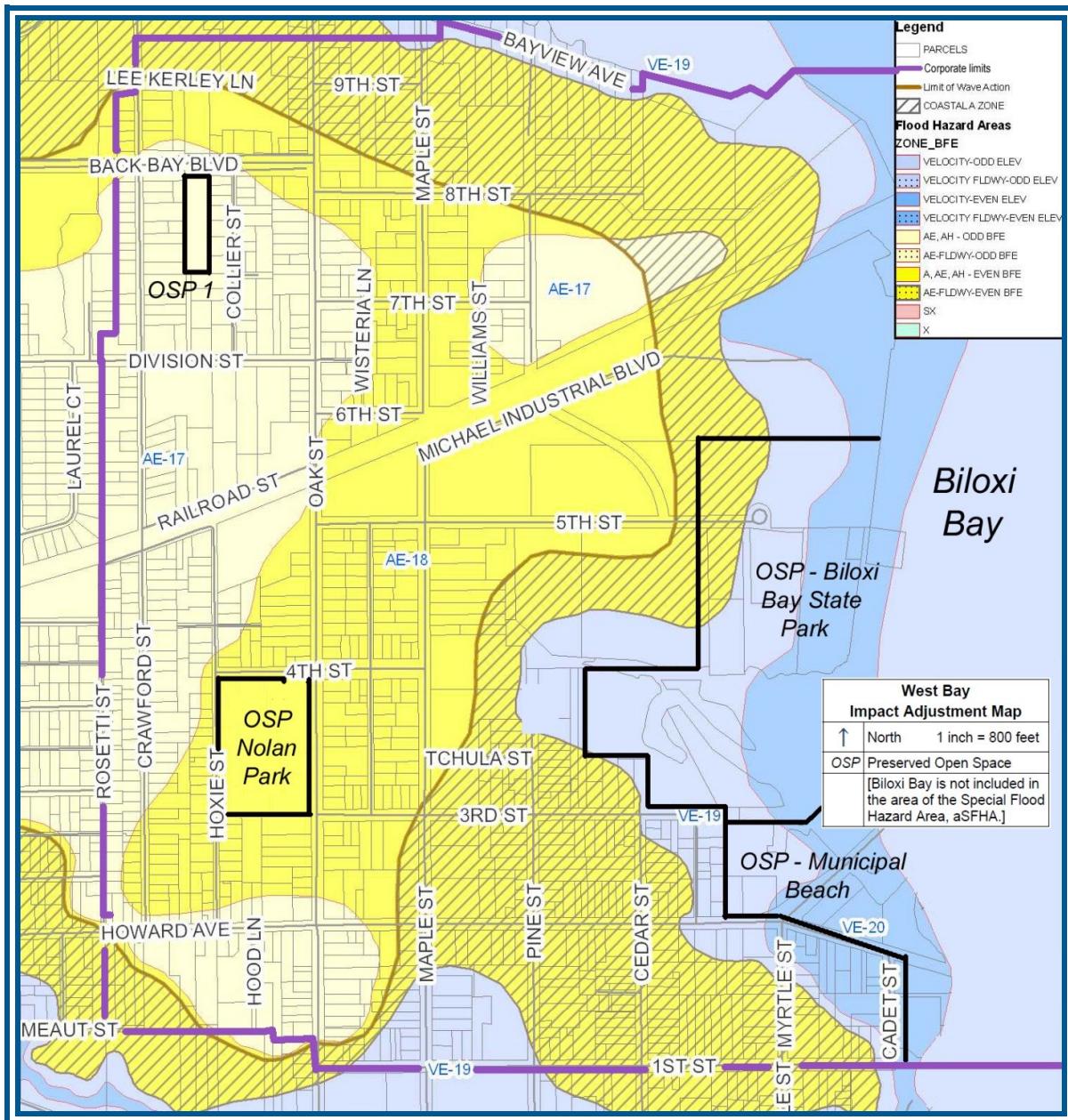


Figure 400-1. West Bay's impact adjustment map.

403.d. Watershed Impact Adjustment Map

For credit for stormwater management regulations (SMR) and watershed master plan (WMP), under Activity 450 (Stormwater Management), a watershed impact adjustment map must be prepared. This map shows the area affected by the stormwater management program and the watersheds that affect the community. This map and the information needed to develop it are discussed in Section 452.a.

403.e. Calculating Areas

The size of areas delineated on the impact adjustment map(s) may be determined by any method that yields reasonably accurate measurements. The community must document the method or methods it used to determine the areas.

The areas will be recalculated at each cycle verification visit because the numbers can change when there is a new map or if the community annexes land mapped as SFHA. This is done in conjunction with updating the floodplain data table (see Section 214.a).

Calculation Approaches: The community should not spend an inordinate amount of time measuring areas solely for determination of CRS impact adjustment ratios. The following approaches are acceptable:

- Geographic information systems;
- Mechanical or computerized planimetry;
- Areas computed by HEC-2 or other standardized step-backwater methods;
- Known property dimensions, such as those for a city park; or
- Use of a grid overlay. This is technique whereby a transparent grid is placed on the map, the grid squares within an area are counted, and the map scale is used to determine the actual area. Instructions on this approach can be found at www.CRSresources.org/400.

Units of Measure: All area calculations must use the same units, either acres or square miles.

Smaller communities will probably find it easier to measure in acres, while a larger community, such as a county, may prefer to use square miles. The following formulae may be helpful:

- To convert acres to square miles, divide the number of acres by 640.
- To convert square miles to acres, multiply the number of square miles by 640.
- To convert square feet to acres, divide the number of square feet by 43,560.
- To convert square feet to square miles, divide the number of square feet by 27,878,400 (that is, $5,280^2$).

Example 403.e-1.

$$32 \text{ acres} = \frac{32}{640} = 0.05 \text{ square miles}$$

$$2.20 \text{ square miles} = 2.20 \times 640 = 1,408 \text{ acres}$$

$$2,500 \text{ feet} \times 3,600 \text{ feet} = 9,000,000 \text{ square feet}$$

$$\frac{9,000,000}{43,560} = 206.61 \text{ acres}$$

$$1,000 \text{ feet} \times 2,142.50 \text{ feet} = 2,142,500 \text{ square feet} =$$

$$\frac{2,142,500}{27,878,400} = 0.077 \text{ or } 0.08 \text{ square miles}$$

403.f. Example Impact Adjustment Map

The following example discusses how the fictitious community of West Bay developed its impact adjustment map for Activity 420 (Open Space Preservation). It shows how the community selected a base map and used various methods to determine the areas affected by the activity.

Example 403.f-1.

West Bay is a fictitious community used for CRS examples. It is a coastal town on the west side of Biloxi Bay. The county GIS office provides each community with a digital map that shows streets and FIRM zones (see Figure 400-1).

The CRS Coordinator makes sure that the base map shows the corporate limits and the SFHA. Because the town is applying for credit for open space preservation and coastal A-Zone regulations, the impact adjustment map shows the areas that qualify for preserved open space and the coastal A Zone.

The CRS Coordinator used a grid overlay to calculate the area of SFHA within the city (aSFHA, excluding Biloxi Bay) and the area of the coastal A Zone, delineated by the slanted lines on the map in Figure 400-1.

$$aSFHA = 395.30 \quad \text{and} \quad \text{area of the coastal A Zone} = 116.60$$

The CRS Coordinator obtained the acreage of the four open space areas from the town parks department and the state park. Because they are all entirely in the SFHA, their areas all qualify for OSP. These figures are recorded in the table below.

Area	Acreage
OSP#1: open area preserved by the developer	1.2
Nolan Park	6.9
Biloxi Bay State Park	33.1
Municipal Beach	11.4
Total area of OSP (aOSP)	52.6

When the impact adjustment for open space preservation is calculated for Activity 420 (Open Space Preservation), the area of preserved open space (aOSP) is divided by the area of the SFHA (aSFHA). For West Bay, the formula would be

$$rOSP = \frac{aOSP}{aSFHA} = \frac{52.60}{395.30} = 0.13$$

The resulting ratio (represented by the lower case "r") means that 13% of West Bay's SFHA is preserved as open space. This impact adjustment ratio is used in the final step of calculating the credit.

Coastal A Zone regulations (CAZ) have no impact in areas preserved as open space where no new buildings are allowed (see Section 402.c). Therefore, the area where CAZ regulations have an impact is the area of the coastal A Zone minus the area of open space (OSP) in the coastal A Zone. A portion of Bay State Park (4.7 acres) is in the coastal A Zone, so for credit purposes, aCAZ = 116.60 – 4.70 = 111.90 acres.

When the impact adjustment for coastal A Zone regulations (CAZ) is calculated for credit under Activity 430 (Higher Regulatory Standards), the regulated area (aCAZ) is divided by the area of the SFHA (aSFHA). For West Bay, the formula would be

$$rCAZ = \frac{aCAZ}{aSFHA} = \frac{111.90}{395.30} = 0.28$$

404 Sea Level Rise Projections and the CRS

The CRS incorporates the consideration of sea level rise into a number of elements, including HSS, Higher study standards under Activity 410 (Flood Hazard Mapping); CAZ, Coastal A Zone (CAZ) credit under Activity 430 (Higher Regulatory Standards); and WMP, Watershed master plan under Activity 450 (Stormwater Management). Including sea level rise in WMP is required for coastal communities to meet the Class 4 prerequisite, and HSS credit for future-conditions hydrology is a Class 1 prerequisite. CRS prerequisites are described in Section 211.

Recognizing that there is uncertainty inherent in estimating future sea levels, the CRS has adopted a base minimum projection for sea level rise for the purposes of CRS credit and meeting CRS prerequisites. The "intermediate-high" projection for 2100, as included in the report *Global Sea Level Rise Scenarios for the United States National Climate Assessment*

(National Oceanic and Atmospheric Administration, 2012, https://scenarios.globalchange.gov/sites/default/files/NOAA_SLR_r3_0.pdf), is the minimum projection that must be used for CRS purposes. Communities may use other projections provided that they are equal to or greater to NOAA’s “intermediate-high” projection for 2100.

Because sea levels are changing at different rates in different parts of the country, global projections must be adjusted to take local conditions into consideration. For this, the CRS uses and recommends the U.S. Army Corps of Engineers “Sea-Level Change Curve Calculator,” an online-tool available at <http://www.corpsclimate.us/ccaceslcurves.cfm>. The CRS anticipates that updates to the National Climate Assessment report will be incorporated into the Sea-Level Change Curve Calculator. If not, then the CRS will provide further guidance to communities, as needed.

See www.CRSresources.org/200 for further details.

410 Flood Hazard Mapping—Summary

Maximum credit: 850 points

412 Elements

Flood hazard mapping (MAP) credit is based on

- a. **New study (NS):** Up to 350 points for new flood studies that produce base flood elevations or floodways.
- b. **Leverage (LEV):** The points for NS are multiplied by a ratio that reflects how much of the study was financed by non-Federal Emergency Management Agency (FEMA) funds.
- c. **State review (SR):** Up to 60 points for flood studies reviewed and approved by a state or regional agency.
- d. **Higher study standards (HSS):** Up to 200 points if the new study was done to one or more standards that exceed the FEMA mapping criteria.
- e. **More restrictive floodway standard (FWS):** Up to 140 points, based on the allowable floodway surcharge used in the study.
- f. **Mapping of special flood-related hazard areas (MAPSH):** Up to 100 points if the community maps and regulates coastal erosion or tsunami hazard areas.

Credit Criteria

Credit criteria for this activity are described in Section 411.b. Each element has additional criteria specific to that element.

- a. The area to be credited must be displayed on a map.
- b. The community must use the new flood hazard map or data in its floodplain development regulations.
- c. The study must be based on a technique approved by FEMA or specifically approved by the ISO/CRS Technical Reviewer.
- d. A study or data that affects a length of stream or shoreline must be submitted to FEMA so that the local FIRM may be revised.

Impact Adjustment

The impact adjustment for this activity is described in Section 413.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

410 FLOOD HAZARD MAPPING

The OBJECTIVE of this activity is to improve the quality of the mapping that is used to identify and regulate development at risk from flood hazards.

411 Background

Development regulations need thorough and accurate mapping of Special Flood Hazard Areas (SFHAs) and related flood hazard data. Most communities in the National Flood Insurance Program (NFIP) have a Flood Insurance Rate Map (FIRM) provided by the Federal Emergency Management Agency (FEMA). Most FIRMs have detailed data but some communities still have flood problem areas for which detailed data were not provided by FEMA. As a result, new development in those areas is often not well-protected from flood damage.

Other communities have data not shown on their FIRM, want to prepare new maps for unmapped areas or to a higher standard, or want to replace maps that no longer show the current hazard. This activity encourages these communities to prepare new maps.

411.a. Activity Description

This activity provides credit for developing regulatory maps and flood data for flood risk management purposes, including coastal erosion and tsunamis, in areas where FEMA did not provide such data, or for mapping to a higher standard than that required by FEMA, as well as credit for regulating areas based on flood data not provided with the community's FIRM or for a flood study conducted to a higher standard than FEMA's Flood Insurance Study criteria. Credit is also provided if the community shared in the cost of a Flood Insurance Study.

Three types of areas are shown on FIRMs:

- Areas with detailed mapping of the SFHA (shown as AE, VE, etc., Zones)
- Areas with approximate mapping of the SFHA (shown as A, V, etc. Zones), and
- Areas shown as being outside the SFHA (depicted as B, C, D and X Zones).

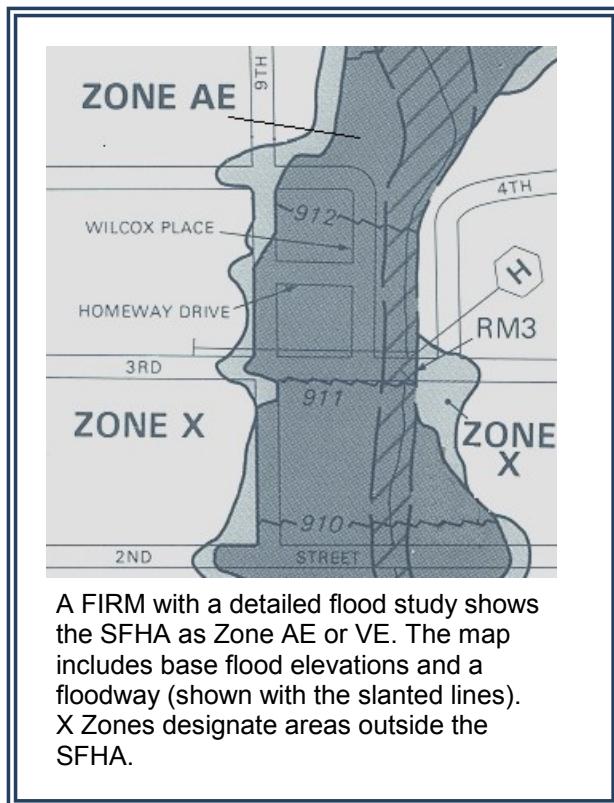


Figure 410-1. FIRM terminology.

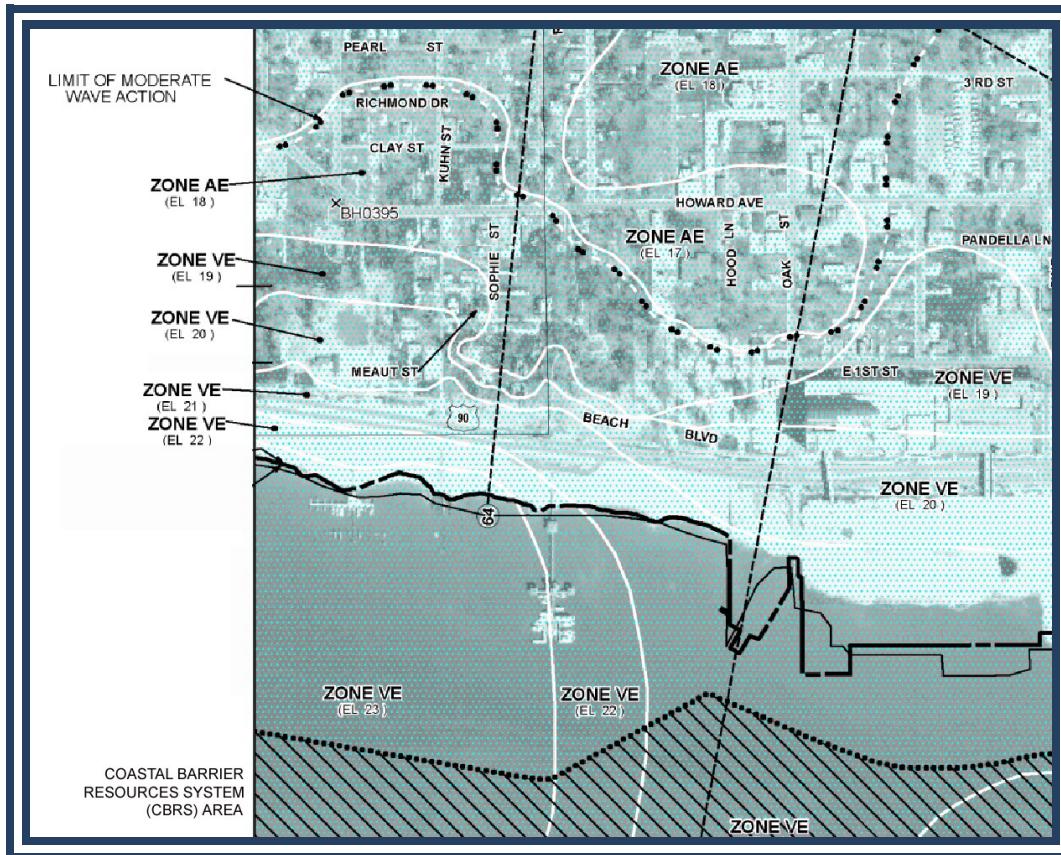


Figure 410-2. An example of a coastal FIRM.

The difference between detailed mapping and approximate mapping for FIRMs is that detailed maps include the base flood elevations needed to set minimum protection levels for new buildings. In most riverine situations, NFIP detailed mapping also includes floodway delineations (Figure 410-1). In coastal areas, detailed mapping may include delineation of a velocity or VE Zone (Figure 410-2). The maps in Figures 410-2 and 410-4 provide examples of detailed, digital FIRMs (DFIRMs).

The NFIP's regulations for areas with approximate mapping, also known as "A Zones" or "V Zones," are not as effective in reducing flood damage as the regulations for areas with detailed map data (Figure 410-3). Because no base flood elevations have been developed for areas with approximate mapping, many of the regulatory requirements are left to the judgment of community officials. Flood elevations are required only for large subdivisions or in areas for which a flood study has already been done. These areas are often on the urban fringe and therefore can be subject to development before FEMA can provide the needed data.

Flood hazard areas that were not mapped as SFHAs during the preparation of the community's FIRM (i.e., B, C, D, and X Zones) have no floodplain management requirements under the NFIP. Additional mapping may have been prepared by or for the community for several reasons:

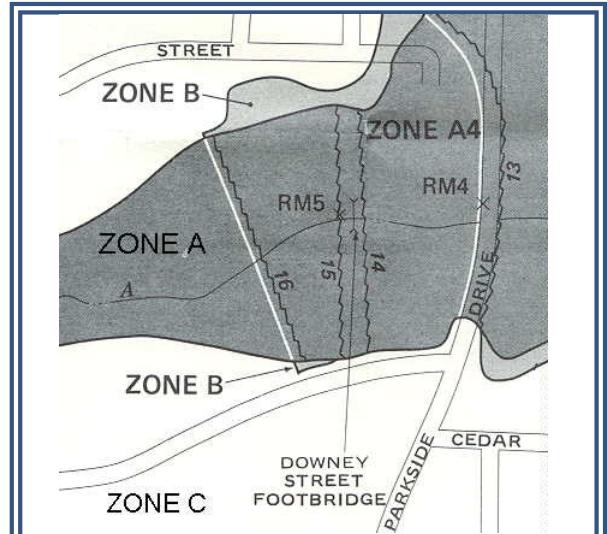
- New delineations were necessary because conditions changed since the Flood Insurance Study was done; or
- The community wanted to regulate areas that were not mapped by FEMA because they did not meet the NFIP mapping criteria (e.g., the drainage area was less than 1 square mile); or
- Areas that may or may not have been mapped as part of the Flood Insurance Study have hazards that were not adequately mapped (e.g., alluvial fans or areas subject to subsidence).

This activity credits the adoption of new maps or flood hazard data that are not provided under the normal activities of the NFIP. These may include areas subject to land subsidence, riverine erosion, mudflows, or coastal hazards. This activity neither credits nor supplants the minimum requirement of the NFIP that a participating community submit new or revised map information to FEMA when it becomes available (such as for a bridge replacement), as required by 44 CFR §65.3.

The regulation at 44 CFR §65.3 requires a community to submit a request for a Letter of Map Revision (LOMR) any time it undertakes or permits a project that changes the limits of the SFHA, the base flood elevations, or the floodway limits. Therefore, a LOMR or physical map revision submitted to comply with the above requirement (e.g., bridge replacements or channel modifications) is not credited under this activity.

All higher-standard mapping receives credit, even if it is included in the community's FIRM. For example, several states require that floodway regulations be based on criteria more restrictive than the NFIP mapping standard. In those states, any Flood Insurance Study that meets the state requirements and the higher-standard mapping can be credited under this activity (see Section 411.d).

Credit is calculated for this activity based on the areas of the SFHA that are mapped and managed to higher standards than those required by the NFIP. Each flood hazard mapping (MAP) area that receives Activity 410 credit is marked on an impact adjustment map and designated "MAP#1," "MAP#2," etc. This is explained more fully in Sections 402 and 412.

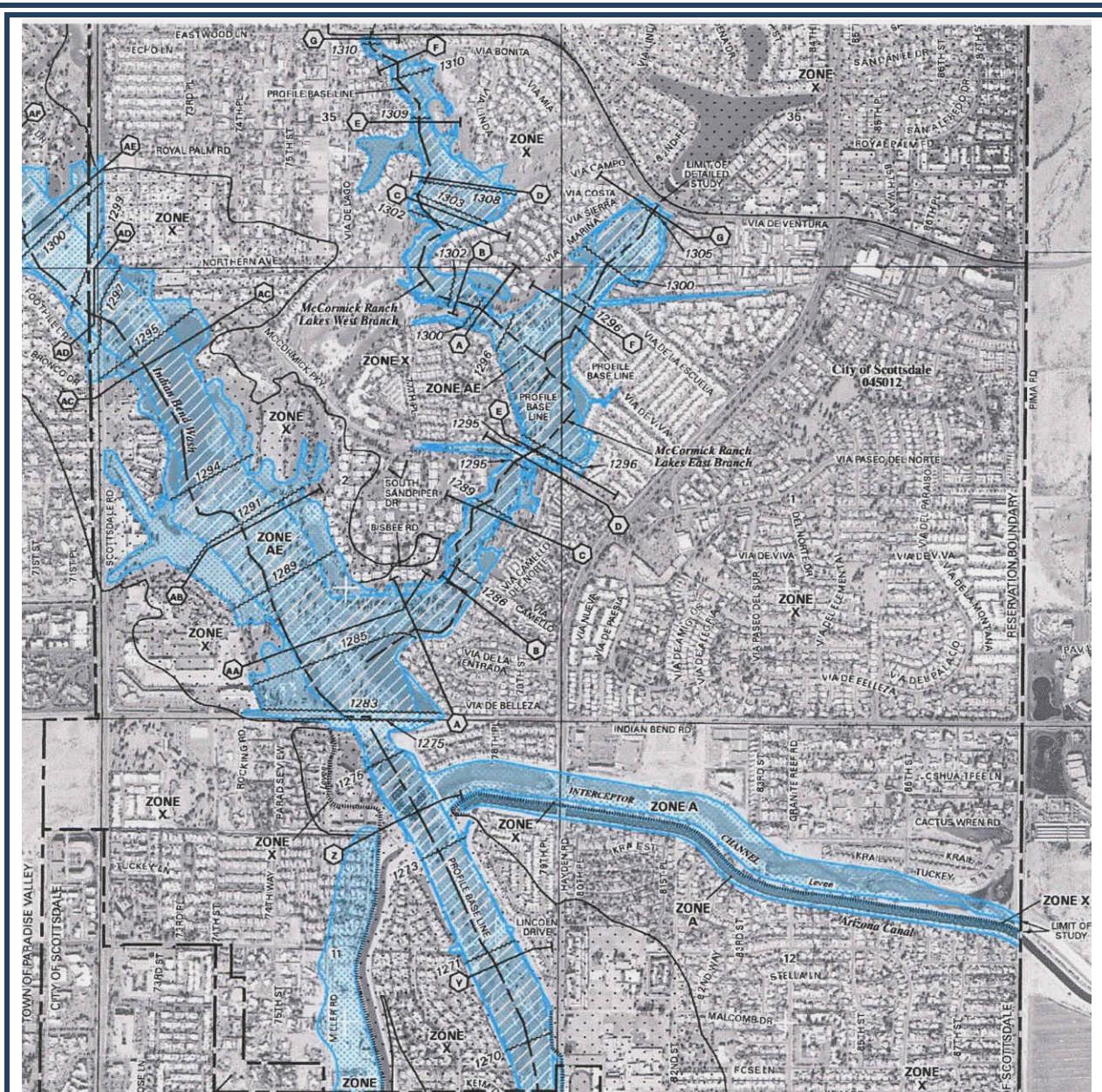


FIRMs do not provide base flood elevations in B, C, D, X and approximate or "unnumbered" A Zones. This CRS activity provides credit to encourage communities to obtain flood elevations in those areas and ensure that new development is protected from the base flood.

Figure 410-3. FIRM terms for areas without base flood elevations.

The regulation at 44 CFR §65.3 states:

A community's base flood elevations may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, a community shall notify the Administrator of the changes by submitting technical or scientific data in accordance with this part. Such a submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and flood plain management requirements will be based upon current data.



South Scottsdale is a fictitious community used for CRS examples. There are no mapped flood hazards in the north, so this map only shows the southern part of the city. The DFIRM shows four different Special Flood Hazard Areas (SFHAs):

AE Zone: Indian Bend Wash flows from the northwest to the south corporate limits

AE Zone: McCormick Creek flows from the northeast to Indian Bend Wash.

A Zone: Tributary A flows from the southeast to Indian Bend Wash.

A Zone: Tributary A flows from the southeast to Indian Bend Wash

The aerial photo base map is helpful for locating and counting buildings and other features. However, to simplify the presentation, the CRS Coordinator uses a GIS-based map that shows the SFHA and street layers for the rest of the South Scottsdale mapping examples (see Figure 410-5).

Figure 410-4. South Scottsdale's DFIRM.

Credit is provided as long as the community regulates based on the study's data until the study is superceded by a more up-to-date analysis. If a new FEMA-funded study produces a lower base flood elevation, the community has the option of adopting it or keeping its higher regulatory flood elevations. If it adopts the new study, it loses its 410 credit. If it keeps enforcing its own higher elevations, it keeps the credit.

Example 411.a-1.

Examples of areas that could be identified on the impact adjustment map and marked "MAP#1," "MAP#2," etc. include the following.

- Unnumbered A or V Zones for which the community has base flood elevations and regulates new construction using those elevations.
- A riverine SFHA where FEMA did not define a floodway, but the community has mapped and adopted one.
- Unnumbered A or V Zones within which the community calculates or requires all developers to calculate base flood elevations and/or floodways for their sites as a condition for all floodplain permit approvals.
- A special flood hazard area in a B, C, D, or X Zone that the community has mapped and regulates using base flood elevations.
- Areas covered by studies that have been reviewed and approved by the state.
- A floodplain mapped on the FIRM with a technique that exceeds FEMA's guidelines, e.g., using future-conditions hydrology.
- Any flood hazard data that are based on a technique that results in regulations more restrictive than FEMA's minimum standards, e.g., a floodway based on a smaller surcharge than FEMA's one-foot standard, or a regulatory flood elevation based on high-water marks from the flood of record where it is higher than the base flood elevation shown on the FIRM.
- An SFHA mapped on the FIRM, if the community helped pay for the mapping.

MAP is the sum of the points for the elements in Activity 410. The points are based on

- The scope of the new study (element NS, scored in Section 412.a),
- The original FIRM zone where the new study was conducted (element NS, scored in Section 412.a),
- Whether a riverine study included a floodway delineation or a coastal study included a velocity zone (element NS, scored in Section 412.a),

- How much of the study costs were provided by non-FEMA funding sources (element LEV, scored in Section 412.b),
- Whether the study received an independent quality control review by a state agency (element SR, scored in Section 412.c),
- Whether the study was conducted using a higher study standard than required by FEMA (element HSS, scored in Section 412.d),
- The floodway mapping standard used (element FWS, scored in Section 412.e),
- Whether the study mapped coastal erosion or tsunami hazards (element MAPSH, scored in Section 412.f), and
- How much of the community's SFHA is affected by the new study (scored in Section 413, Impact Adjustment).

411.b. Activity Credit Criteria

To receive any credit under this activity, the community must meet the credit criteria below. These criteria ensure that the Community Rating System (CRS) credits flood hazard maps and data that are properly prepared and are used in the community's regulatory program.

- (1) All studies and data that the community requests for credit must be displayed on a map. This map may be digital or paper. This criterion does not apply to studies done for a single site at the time of development.
- (2) The community must use the flood hazard map and data for which credit is requested in its floodplain development regulations. The community either must have
 - (a) Amended its floodplain regulations to adopt the new flood hazard map or data, or
 - (b) Authorized a local official, such as the community's engineer, to approve new maps or data in unstudied areas. There must be a record showing that the new study has been approved and utilized by the official.

A study that has no impact on floodplain development is not credited. The CRS does not credit studies conducted for drainage improvements or the design of a flood control project if they are not used for regulatory purposes.

- (3) The study must be based on a FEMA-approved technique or specifically approved by the ISO/CRS Technical Reviewer.
- (4) If the study affects a length of stream or shoreline, it must be MADE AVAILABLE to FEMA to revise the community's FIRM. This criterion can be met even if FEMA does not immediately publish the map revision.

The criterion does not apply to studies done for a single site at the time of development and similar small-scale studies. However, studies that would revise existing base flood

elevations, floodways, or FIRM zone boundaries must be submitted for a FIRM revision as required by 44 CFR §65.3.

412 Elements

There are six elements in this activity. Some elements have impact adjustments, so each flood hazard mapping (MAP) area for which the community requests credit must be marked on an impact adjustment map and designated “MAP#1,” “MAP#2,” etc. MAP is the sum of the points for each designated MAP area. The points depend upon how the map was prepared and the community’s level of participation in the map preparation.

412.a. New study (NS)

The maximum credit for this element is 350 points.

The total NS credit varies according to two factors: the study scope and the previous flood zone as shown on the community’s FIRM in effect at the time the new study was adopted (see the table in the Credit Points section, below). Different levels of credit are provided for each of four levels of detail in a flood study.

- (1) The first level is for delineating an approximate A or V Zone in a B, C, D, or X Zone. This would designate a regulatory floodplain where the FIRM does not show one. For approximate A and V Zones, base flood elevations are not provided. Credit is also provided if an approximate A or V Zone is remapped using better topography without the publication of base flood elevations.
- (2) More points are provided if the community ensures that flood elevations are obtained for a single site at the time of development for all development. Many SFHAs without base flood elevations have low development potential and do not warrant extensive, detailed studies. Many communities regulate these areas by requiring developers to perform an engineering analysis to calculate a flood elevation for the site at the time of application for a development permit. Simplified techniques, such as contour interpolation as described in FEMA-265, are not acceptable for credit in this activity.

Some communities will require a new regulatory flood elevation to be determined using higher standards for areas that already have a base flood elevation provided by FEMA. These requirements are also eligible for HSS credit, provided that the new flood elevations are higher than the elevations on the FIRM.

NS credit for flood elevations at the time of development is based upon the regulatory requirement. If the appropriate language is in the community’s ordinance, and is being enforced, the credit is provided, even if the areas have not yet been studied. What counts is that a regulatory flood elevation will be provided before the areas are developed. Additional credit is available if the community’s ordinance requires a floodway analysis to be performed in addition to the determination of flood elevations at the time of development.

The calculations may be done by the community, another agency, or the developer, as long as a regulatory flood elevation becomes available in time to have new buildings protected to a level at or above the base flood elevation. In some cases the community has the developer provide some data, such as a topographical survey, and then a municipal engineer or other person calculates the base flood elevation for the site. This is a creditable approach.

There is no credit for meeting the minimum NFIP requirements to “. . . obtain, review and reasonably utilize available data . . .” or for requiring developers of subdivisions larger than 5 acres or 50 lots to provide flood elevation data. These are minimum requirements of the NFIP (44 CFR §60.3(b)(3) and (4)). To receive credit for NS, the ordinance must require the data for all development permits to build or substantially improve buildings in the regulated floodplain.

- (3) More points are obtained if the elevations are provided for a large area in advance of development. This provision typically would be in the form of a profile prepared for a relatively long reach of a stream, elevations for a length of shoreline, depths for AO Zones, and elevations for AH Zones. For this credit, the area is studied before an application for a development permit and the study covers a larger area.

To receive this higher credit, the community must adopt the study and regulate development to the same standards as in an SFHA for which FEMA provided base flood elevations (e.g., as if the area were an AE or VE Zone, or numbered A, V, or AO Zone) and provide the data to FEMA.

- (4) There is approximately a 30% increase in the credit for the development of a profile when the study includes the delineation of a floodway. If the floodway delineation is based on a higher standard than the NFIP’s one-foot allowable surcharge, then additional credit is provided in Section 412.e. There is a similar increase in credit if a coastal study includes a coastal high hazard area, such as a V Zone.

Studies not credited. The following studies are not eligible for credit under NS:

- Studies done to meet the minimum requirements of the NFIP, even if they result in a LOMR or map revision, including
 - When required for developments greater than 50 lots or 5 acres;
 - When done in response to the requirement to “obtain, review and reasonably utilize” available base flood elevation and floodway data; or
 - When done to prepare a certificate of no-rise or maximum one-foot cumulative rise.
- When the base flood elevations, mapping boundaries, or floodway are not adopted for regulatory purposes;

- When there is no engineering study or data to include an area as regulatory floodplain; and
- When a new study produces a base flood elevation lower than the base flood elevation shown on the FIRM (see credit criterion (3), below).

Credit Criteria for NS

- (1) The activity credit criteria in Section 411.b must be met.
- (2) If the credit is for a small-scale study (such as for a single lot) at the time of development, the study must be based on a FEMA-approved technique or specifically approved by the ISO/CRS Technical Reviewer and it must produce regulatory flood elevations where there are none, or elevations higher than those shown on the FIRM in effect at the time of the study.
- (3) In order to receive NS credit, studies must
 - (a) Produce a base flood elevation in a B, C, D, X, approximate A Zone, or approximate V Zone where there was no elevation shown on the FIRM at the time of the study; or
 - (b) In AE and VE Zones and numbered A and V Zones, produce a base flood elevation higher than that shown on the FIRM in effect at the time of the study.

Criterion (3)(b) prevents the duplication of flood insurance premium reductions that can result from new flood studies that lower the base flood elevation. Properties in areas that are remapped so the new FIRM shows them outside the SFHA benefit twice from the flood insurance rating system. First, they do not have a mandatory NFIP insurance purchase requirement. Further, if the owners choose to purchase NFIP insurance, the premiums are based on the lower X-Zone rates. Therefore, the CRS does not provide a duplicate premium reduction.

The new study must either provide flood elevations where there are none shown on the FIRM or provide higher regulatory flood elevations than shown on the FIRM. There may be cases in which a new profile is higher than the old base flood elevations in some areas and lower in others. In such cases, the reaches that qualify for credit must be identified on the impact adjustment map and scored accordingly. The reaches with new base flood elevations that are lower than the old ones are not credited under NS or SR.

Credit Points for NS

NS = as shown in the following table, based on the study scope and the original FIRM zone, not to exceed the maximum of 350 points for this element

Study Scope	Original FIRM Zone		
	B, C, D, or X	A or V	AE, VE, A#
1. Delineation or redelineation of an approximate A or V Zone	70	60	-
2. a. Flood elevations for a site at time of development	120	95	60
b. Flood elevations and floodway for a site at time of development	160	125	80
3. New profile or length of shoreline, base flood elevations/depths in AH and AO Zones.	260	205	130
4. New profile with floodway, length of shoreline with coastal velocity zone delineation, or converting coastal A Zones to V Zones	350	270	175

Example 412.a-1.

South Scottsdale is a fictitious community used for CRS examples (see Figure 410-5). The City received its first FIRM in 1978. At that time only the largest stream, Indian Bend Wash, had a detailed study, with base flood elevations and a floodway delineation. Because the Indian Bend Wash study was funded by FEMA, there is no CRS credit.

The City knew it had flood hazard problems along McCormick Creek. With funding from the state, it conducted a detailed study of that area. The resulting floodplain and floodway delineation were used by FEMA when the FIRM was revised in 2004. That study is marked as MAP#1 in Figure 410-5 and is designated as New Study #1 for 410 credit.

NS#1: New study, with base flood elevations and floodway delineation, when the original FIRM zone was an X Zone.
NS#1 = 350

There are two approximate A-Zone areas known as Tributaries A and B. In these areas, the City requires applicants for permits to conduct a study to develop a base flood elevation. Since both tributary areas have the same study standard, they are both marked as MAP#2 in Figure 410-5. They are both designated NS#2 for 410 credit.

NS#2: Flood elevations for a site at time of development when the original FIRM zone was an approximate A Zone. NS#2 = 95

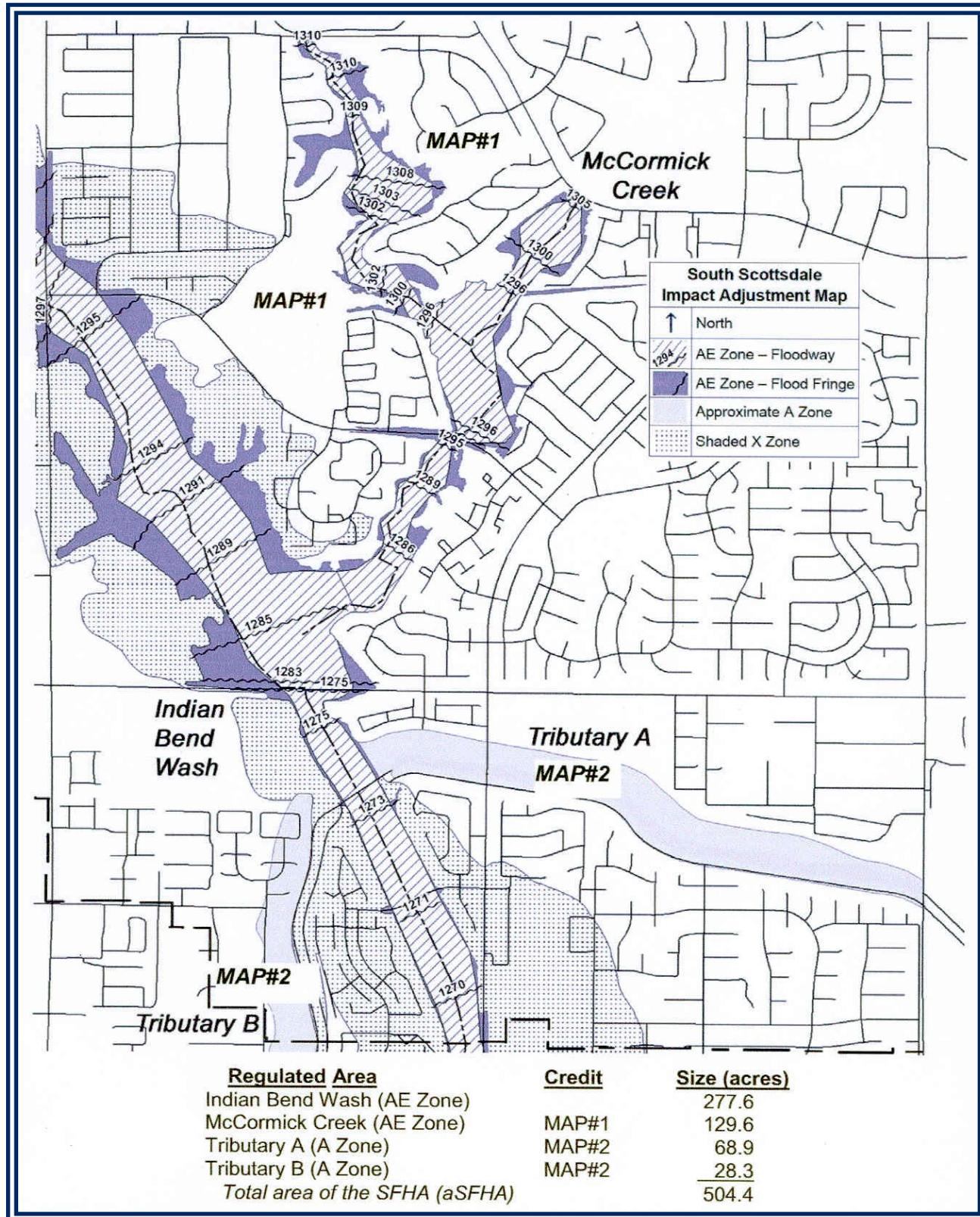


Figure 410-5. South Scottsdale's impact adjustment map for Activity 410.

Impact Adjustment for NS

The impact adjustment is calculated based on the size of the area to which the MAP study applies as a percentage of the area of the SFHA in the community at the time of adoption of the study. The impact adjustment for this activity is described in Section 413.

Documentation for NS Provided by the Community

- (1) At each verification visit,
 - (a) A copy of the study and the study's flood hazard map. The ISO/CRS Specialist should be advised whether these are available online or in a published Flood Insurance Study or FIRM.
 - (b) The local law or ordinance that adopts the flood study for regulatory purposes or that requires site-specific flood elevation or floodway studies to be conducted at the time of the permit application.
 - (c) Permit records and/or Elevation Certificates showing how the new data are used when the data have not been added to the FIRM or showing enforcement of the requirement for site-specific studies.
 - (d) The map showing the area covered by each NS study with the appropriate MAP acronym ("MAP#1," "MAP#2," etc.) marking the area affected by the new study. The impact adjustment map is explained in Section 413. Different areas mapped to the same standards may all be marked with the same acronym.
 - (e) [For Credit Points lines 1, 3, and 4] Evidence that the study, if done for a length of stream or shoreline, has been submitted to FEMA or FEMA is aware that the study is available. This may be a copy of the Flood Insurance Study, a LOMR, or a letter from FEMA.
 - (f) [For Credit Points line 2a and 2b, flood elevations and floodway delineation for a site at time of development] A statement that the technique used in the study or the ordinance language was listed as acceptable in *Guidelines and Specifications for Flood Hazard Mapping Partners*, or is currently referenced on FEMA's "Guidance Documents & Other Published Resources" page (<http://www.fema.gov/guidance-documents-other-published-resources>). As an alternative to this statement, the community may submit a description of the technique for the ISO/CRS Technical Reviewer to determine whether it is equivalent to an acceptable technique.
 - (g) Documentation showing how the area of the SFHA at the time of adoption of the study (aSFT) and the areas of NS were calculated.

The ISO/CRS Specialist may review a sample of permit records or Elevation Certificates and/or visit some new building sites to verify use of the new study data in the floodplain management regulations.

412.b. Leverage (LEV)

To determine the community's cost share or level of participation in the flood study, not counting the review done by FEMA, a multiplier known as "LEV" is used.

LEV is a ratio with a range of 0 to 1.00. If the study was funded entirely by non-FEMA resources, LEV = 1.00. Non-FEMA resources include the community, the state, a regional agency, the property owner, a developer, the U.S. Army Corps of Engineers, the Natural Resources Conservation Service, or any agency or organization other than FEMA or a FEMA-funded program.

If the community is a Cooperating Technical Partner, there should be readily available figures on what the study cost and what amounts were paid by FEMA, the community, and other involved agencies. If the Cooperating Technical Partner agreement is for the community to contribute 30% of the cost of a new study, then LEV = 0.3 for the new study if appropriate documentation is provided.

If the community, state, or other agency made an in-kind contribution, such as an old but still valid study, or base maps, it can be converted to a dollar value using the FEMA "Blue Book" values. If the effort cannot be converted to dollars, then LEV = 0.27 for providing the topography used in the study or 0.22 for other significant contributions, such as providing the digital base mapping. If the documented dollar value results in a ratio lower than the above, then the pertinent value above can be used.

Flood Insurance Studies or restudies cost shared with a state agency, the Corps, the Tennessee Valley Authority, the Natural Resources Conservation Service, or other federal agency are credited, provided that FEMA did not pay the agency for the work. However, many studies are conducted by a state or federal agency under contract to FEMA, and in such cases LEV = 0, and there is no credit for NS.

Credit Criteria for LEV

(1) To receive LEV, the community must receive NS credit.

Credit Points for LEV

This element is a multiplier of the new study credit (NS) to determine the community's share of the flood hazard mapping study.

LEV = EITHER

0, if the study was fully funded by FEMA

OR

LEV = $\frac{\text{Non-FEMA share of the study cost}}{\text{Total cost of the study}}$,

provided that the community has data on the study costs

OR

LEV = the total of the following:

- (a) 0.27, if all the topographic data were contributed to the study effort
 - (b) 0.22, if other significant contributions were made to the study effort, if the community does not have financial data on the study costs
-

Communities do not receive NS or LEV credit for Flood Insurance Studies and FIRMs that are fully funded by FEMA.

Topographic mapping can be LiDAR mapping or contour maps with a smaller contour interval than used by FEMA in the previous study or other data that meet FEMA standards at the time of the new study.

- If the study used the topographic mapping in the hydraulic analysis, then LEV credit is provided.
- If the study used better topographic mapping than that provided by FEMA to plot more accurate floodplain boundaries using flood elevations or a profile from an earlier study, then only HSS credit is provided. There is no new study (NS) for LEV to modify.

Example 412.b-1.

One-half of the cost of the McCormick Creek study was paid by South Scottsdale and one half was cost shared with the state. There were no FEMA funds involved in the study.

LEV#1 = 1.00 because there was no FEMA funding involved

Developers pay for calculating base flood elevations in the A Zones along Tributaries A and B.

LEV#2 = 1.00

Example 412.b-2.

A community signed a Cooperating Technical Partner agreement with FEMA to restudy a river. The agreement states that the community is funding \$50,000 toward the study and contributing its GIS contour map.

These contributions are calculated to equal \$300,000. The total cost of the study is \$500,000.

$$\text{LEV} = \frac{\$ 300,000}{\$ 500,000} = 0.60$$

The community's efforts equate to 60% of the cost of the river restudy. The values for NS for this study are multiplied by 0.60, resulting in 60% of the credit for those elements. Note that the community will not receive this credit for the restudy until it is completed and adopted in the community's floodplain management regulations.

Impact Adjustment for LEV

The impact adjustment for this activity is described in Section 413.

Documentation for LEV Provided by the Community

(1) At each verification visit,

- (a) A copy of the community's determination of how LEV was determined. This may be a Cooperating Technical Partner agreement and documentation that the agreement has been completed. Note that many flood insurance studies and restudies were conducted by federal agencies and private consulting firms under contract to FEMA. LEV credits only the share of a study that FEMA did not fund.

412.c. State review (SR)

The maximum credit for this element is 60 points.

Under SR, a study receives additional credit when an independent quality assurance review, typically by a state agency as required by a state law, has been completed.

The types of reviews that qualify for SR credit include a review by a state or regional organization whose review program has been designated as qualifying for CRS credit. Note that the existence of an approved review program does not mean the community will automatically receive this credit. Each study credited must have been reviewed and approved by the review program, and the review must not be paid for by FEMA. There may be studies that were conducted before the program began and there may be some types of studies that the state or regional agency does not review.

Some states already have review procedures that are eligible for SR credit.

New Jersey—Full credit for riverine studies, partial for coastal

Indiana—Full credit for riverine studies, partial for coastal

Michigan—Full credit for riverine studies, partial for coastal

Minnesota—Full credit for all studies

Wisconsin—Full credit for all studies

Illinois—The northeast portion of the state receives full credit for river and partial for coastal, and the rest of the state receives partial credit.

To obtain credit if elevations are provided for a single site at the time of development, either each study must be reviewed and approved or the study technique must have been reviewed and approved.

There are three possible quality assurance/quality control reviews: hydrology, hydraulics, and mapping. As shown in the table below, the credit for a study that has passed all of these reviews is approximately 17% of the credit for a new study. If only part of the study process was reviewed (e.g., the state review only approves the hydrology), the credit for SR is prorated.

Credit Criteria for SR

The activity credit criteria in Section 411.b must be met. There are no additional credit criteria for this element.

Credit Points for SR

SR = as shown in the following table, based on the study scope and the original FIRM zone, not to exceed the maximum of 60 points for this element

Study Scope	Original FIRM Zone		
	B, C, D, or X	A or V	AE, VE, A#
1. Delineation of an approximate A Zone	-	-	-
2. Flood elevations for a site at time of development	20	20	10
3. New profile or length of shoreline, base flood elevations/depths in AH and AO Zones.	45	35	20
4. New profile with floodway, length of shoreline with coastal velocity zone delineation, or converting coastal A Zones to V Zones	60	45	25

Impact Adjustment for SR

The impact adjustment for this activity is described in Section 413.

Documentation for SR Provided by the Community

(1) At each verification visit,

- (a) Documentation that the state or other agency reviewed and accepted the results of the study for which credit is being requested. This will usually be a letter from the responsible agency, stating that the review was done and/or that the data were approved.

412.d Higher study standards (HSS)

The maximum credit for HSS is 200 points.

HSS credits the use of study standards higher than those required by FEMA at the time of the study. A community may receive credit for HSS in areas where it does not receive credit for NS. For example, credit can be provided if the FIRM (or a later map adopted for regulatory purposes) was based on future-conditions hydrology, provided that the community's floodplain development regulations use base flood elevations based on future conditions.

HSS credit is provided for the following higher study standards.

(1) Using a factor of safety when calculating the 100-year discharge: Hydrologic studies produce "estimates" of peak flows. The estimates used are the "best" estimates, meaning they are high 50% of the time and low 50% of the time. Using a factor of safety means that the estimates will be too high more often and too low less often. To receive this credit, the predicted 100-year discharge used in the study must be increased by a minimum factor of safety of 25%, or one standard error for a statistical analysis, sometimes called the 1% plus flow.

For example, the State of New Jersey requires riverine flood studies to use a factor of safety of 25%. Communities in New Jersey need to show that their studies were completed using that standard in order to receive this credit.

(2) Using future-conditions hydrology (land use changes): Future-conditions hydrology means that flood discharges associated with a fully developed watershed are used. These discharges are created without consideration of projected future construction of flood detention structures or hydraulic modifications within a stream or other waterway, such as bridge and culvert construction, fill, or excavation. When the hydrologic study is based on future land use conditions, creditable discharges will be higher than those from a study based on current development conditions.

(3) Using future-conditions hydrology (climate): To receive this credit for coastal studies, the community must use an estimate of the anticipated sea level rise that is at least as high as the NOAA "intermediate–high" projections for 2100. Guidance on sea level rise projections for CRS purposes can be found in Section 404.

(4) Mapping the base flood elevation plus freeboard: This credit is for providing a map that shows the area inundated by a flood that would reach the base flood elevation plus the community's freeboard, when the freeboard requirement is at least one foot.

Additional higher study standards may be submitted by the community. The ISO/CRS Technical Reviewer will determine whether they warrant credit for HSS.

The use of unsteady or two-dimensional flow models is not credited because these are commonly used by FEMA when warranted.

Credit Criteria for HSS

(1) HSS credit is provided for the following higher study standards:

- (a) Using a factor of safety of at least 25% when calculating the 100-year discharge,
- (b) Using future-conditions hydrology (land use changes);
- (c) Using future-conditions hydrology (climate, including sea level rise and changing precipitation, as appropriate); and
- (d) Mapping the area encompassed by the base flood elevation plus the community's freeboard when freeboard is at least one foot.

Credit Points for HSS

HSS = as shown in the following table, based on the study scope and the original FIRM zone. Credit is cumulative for each applicable higher study standard (credit criterion (2)), not to exceed the maximum of 200 points for this element

Study scope	Original FIRM Zone			Max per Study
	B, C, D, or X	A or V	AE, VE, A#, V#	
1. Delineation of an approximate A Zone	25	15	-	75
2. Flood elevations for a site at time of development	40	25	20	110
3. New profile or length of shoreline	100	75	50	200

The points for HSS are cumulative for up to three higher study standards, provided that the maximum credit in the "Max per Study" column for the study scope is not exceeded.

For example, a new profile (line 3) in an X Zone that used future-conditions hydrology (land use) and future-conditions hydrology (climate) would receive $100 + 100 = 200$ points for HSS. If the study also developed and mapped boundaries for the base flood elevation plus freeboard area, the total for HSS would exceed the maximum allowed per study and the points would be capped at 200. However, where flood elevations are currently provided, if a new profile were developed using future-conditions hydrology (land use) and future-conditions hydrology (climate), the community would receive $50 + 50 = 100$ points, because it performed two eligible activities and did not exceed the maximum credit allowed per study.

Example 412.d-1.

(See Figure 410-5.) Because South Scottsdale expected that a large proportion of its drainage areas would be urbanized, its McCormick Creek study (MAP#1) used a base flood discharge based on full watershed development (future-conditions hydrology). Credit is based on line 3 and the original FIRM zone was "X." HSS#1 = 100 points.

The City's floodplain management ordinance requires developers in approximate A Zones (MAP#2) to use future-conditions hydrology. Credit is based on line 2 and the original FIRM zone was "A." HSS#2 = 25 points

Impact Adjustment for HSS

The impact adjustment for HSS is calculated in the same manner as the impact adjustment for NS. It is based on the size of the area to which the MAP study applies as a percentage of the area of the SFHA at the time of adoption of the study. The impact adjustment for this activity is described in Section 413.

Documentation for HSS Provided by the Community

(1) At each verification visit,

- (a) EITHER a copy of the relevant text from the community's Flood Insurance Study describing the higher study standard if the information was utilized by FEMA, OR the ordinance adopting the higher standard and examples of the data created by using the higher standard.
- (b) The map showing the area covered by the HSS study with the appropriate MAP acronyms marking the areas affected by the higher study standard. The impact adjustment map is explained in Section 413. Separate areas mapped to the same standards may all be marked with the same acronym.

412.e. More restrictive floodway standard (FWS)

The maximum credit for this element is 140 points.

Figure 410-6 shows the standard approach to determining the mapping limits of a floodway. Many times a floodway study prepared according to the minimum NFIP guidelines produces a floodway surcharge of less than 1.0 foot at some cross sections. The fact that the average floodway surcharge is less than one foot does not qualify the community for FWS credit. The floodway surcharge must be reduced by a mapping standard that can be documented by the community. In most cases this will be a state-mandated standard.

NOTE: Credit for FWS should not be confused with the minimum NFIP requirement that new development in the floodway may not result in any increase in flood heights. The FWS credit is for using a more restrictive standard to delineate and map the floodway.

If the floodway was based on the FEMA surcharge standard of 1.0 foot, then there is no credit for this element no matter what increase is shown on the floodway data table. If a floodway map is based on some other standard (such as a limitation on velocity or a change in velocity) to determine more restrictive floodways, the community must determine the actual reduction in floodway surcharge that results. Since floodway analysis is almost always performed by the step-backwater method, the data provided for each cross section should be used to determine the actual average floodway surcharge.

Because the entire SFHA benefits from the implementation of a more restrictive floodway surcharge, aFWS includes the entire width of that reach of the SFHA, not just the area of the floodway. A higher floodway standard helps prevent development within the SFHA, thereby reducing increases in flood elevations on existing structures. FWS credit is only provided for a floodway that has been mapped and adopted.

“No rise” floodways: FWS credit is only provided for a floodway that has been mapped and adopted. If the mapping standard was zero rise, then FWS = 140. FWS credit is not provided for an ordinance requiring each development to conduct a no-rise floodway analysis as a condition of receiving a permit.

Credit Criteria for FWS

The activity credit criteria in Section 411.b must be met.

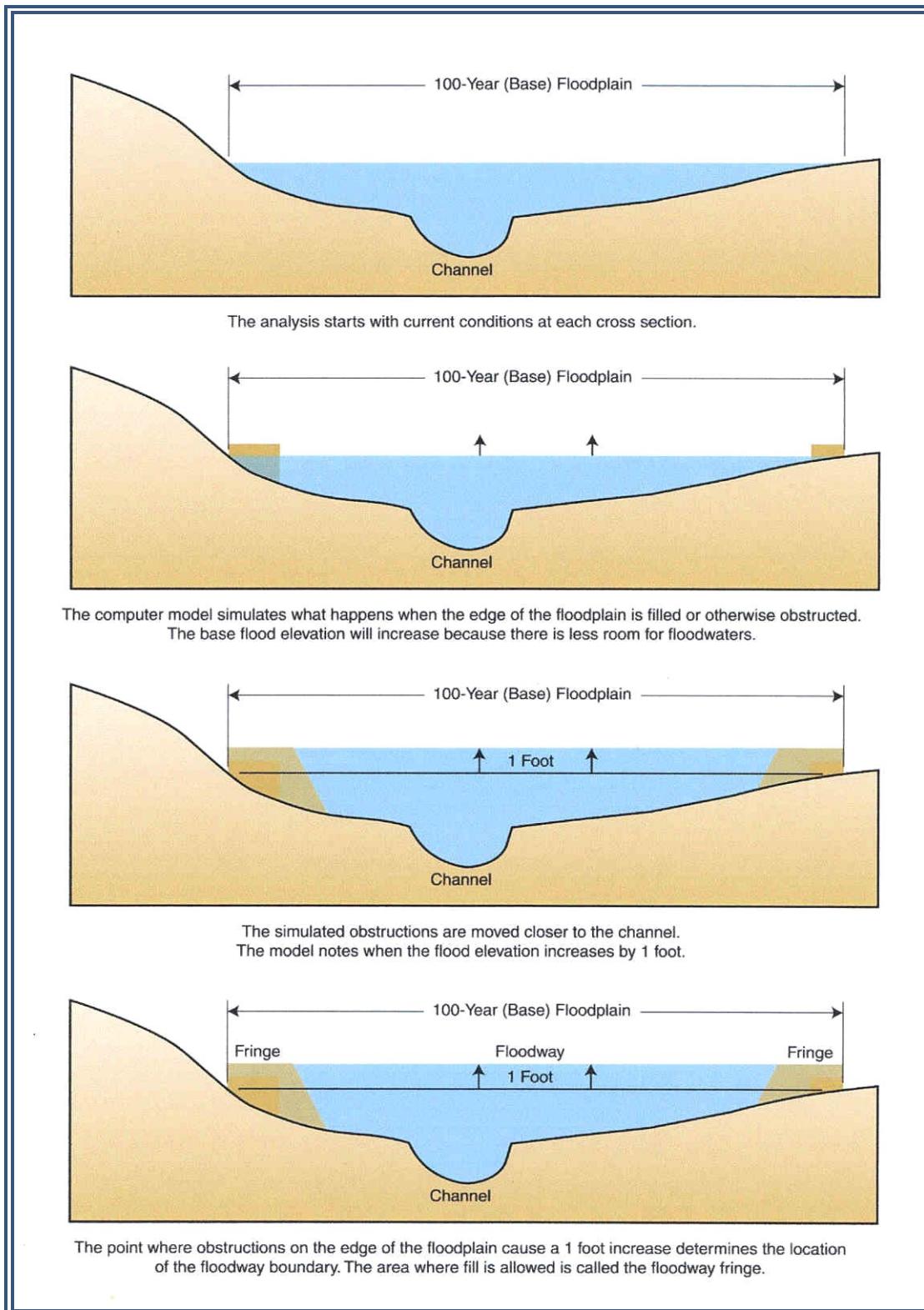


Figure 410-6. The standard approach to floodway determination.

Credit Points for FWS

FWS = 140, if the floodway delineation was based on less than 0.11 feet of rise in the base flood elevation, OR

FWS = 105, if the allowable rise was from 0.11 to 0.25 feet, OR

FWS = 60, if the allowable rise was from 0.26 to 0.50 feet, OR

FWS = 30, if the allowable rise was from 0.51 to 0.99 feet

FWS credit is based on the allowable floodway surcharge used to prepare the floodway map. Currently eight states have floodway standards more restrictive than those of the NFIP. In these states, riverine studies in which floodways were delineated to the state standards are eligible for this CRS credit:

Montana, New Jersey, and Colorado: 60 points

Indiana: 105 points

Illinois, Michigan, Minnesota, and Wisconsin: 140 points

Studies done in other states may be eligible for credit and should be submitted so that the ISO/CRS Technical Reviewer can assess them.

Example 412.e-1.

Wisconsin's state law requires that all floodway delineations be based on a 0.01-foot allowable floodway surcharge. In areas with floodways delineated according to this standard, FWS = 140.

This standard was used in the study for the Rock River in Janesville (MAP#1). FWS#1 = 140

Example 412.e-2.

(See Figure 410-5.) South Scottsdale's ordinance requires site-specific analyses to calculate base flood elevations in approximate A Zones (MAP#2). The permit applicant must also conduct an encroachment study to see if the applicant's project (and all similar projects) will increase flood heights more than 0.10 foot. FWS#2 = 140

Impact Adjustment for FWS

The impact adjustment for this activity is described in Section 413.

Documentation for FWS Provided by the Community

(1) At each verification visit,

- (a) A copy of the appropriate floodway data table and text from the community's current Flood Insurance Study or other regulatory floodplain study describing the standards used for delineating the floodway.

If the study and map used for regulation are not included in the current Flood Insurance Study, the community must provide the map, the standard, the ordinance establishing the standard, and the ordinance adopting the standard.

412.f. Mapping for special coastal flood-related hazards (MAPSH)

The maximum credit for MAPSH is 100 points. It has two sub-elements: MCE (mapping coastal erosion hazard areas) and MTS (mapping tsunami hazards).

Sub-elements

(1) Mapping coastal erosion hazard areas (MCE):

Up to 50 credit points are provided for mapping coastal erosion (MCE) hazard areas or conducting erosion rate analyses for management. Credit for the regulation of new development in mapped coastal erosion areas is provided in element CER in Section 432.n. Areas for which coastal erosion hazards mapping credit is requested may extend outside of the SFHA.

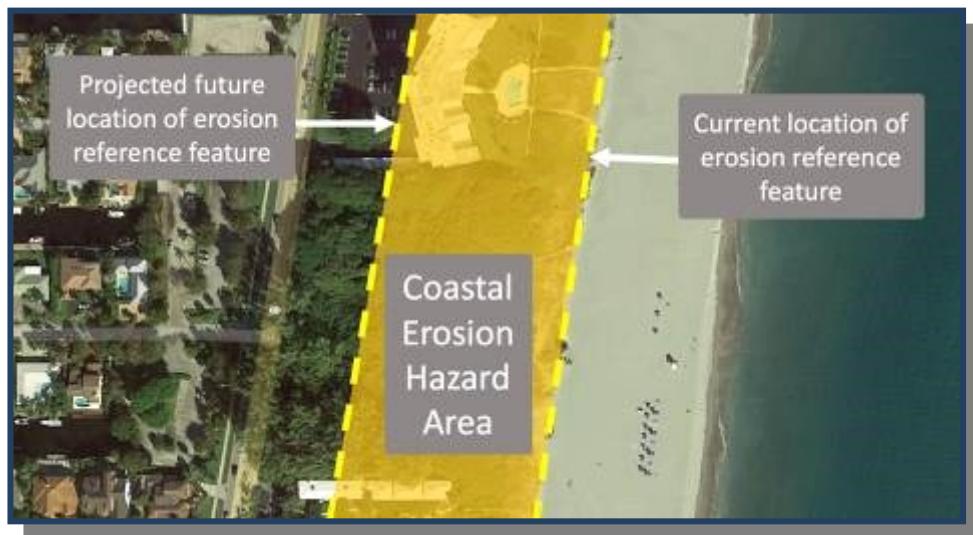
Credit Criteria for MCE

(a) The activity credit criteria in Section 411.b must be met.

(b) The area mapped must be subject to regulations designed to minimize future exposure to erosion damage. The community must receive at least 20 points (before the impact adjustment) for regulations credited in Section 432.n.

The “coastal erosion hazard area” must be identified. The coastal erosion hazard area is the area between the current location of the community’s erosion reference feature and the projected location of that erosion reference feature 30 to 100 years into the future. Erosion reference features are generally set by states’ coastal management programs, and commonly include first lines of vegetation, crests or toes of dunes, edges of bluffs, or mean high water lines. See the example below.

(c) The coastal erosion hazard area must be identified based on mapping or erosion rates that meet FEMA’s minimum mapping standards. In the absence of FEMA standards, the mapping must be consistent with state coastal mapping standards.

**Credit Calculation for MCE**

Up to 50 credit points are provided for mapping coastal erosion hazards (MCE).

MCE =

- (1) 50 points, for mapping the annual erosion rates of the community's entire shoreline subject to erosion
 - (2) 25 points, if the community requires a site-specific erosion rate analysis to be done at the time of application for development permits within 600 feet of a shoreline that is subject to erosion
 - (3) 10 points if the community adopts a regulatory map delineating the areas expected to be affected by erosion over the next 30 years but without showing specific erosion rates
 - (4) 25 points, if the community adopts a regulatory map delineating the areas expected to be affected by erosion over the next 100 years but without showing specific erosion rates
-

(2) Mapping tsunami hazard areas (MTS):

Local decision makers need to understand their risk in order to make informed planning decisions. Tsunami waves generated from near-source or nearshore earthquakes or underwater landslides may vary in impact from those generated by distant subduction zone earthquakes. Because they are intended for emergency and evacuation planning, inundation projections are typically based on worst-case scenarios so that conflict over tsunami origin is avoided.

Inundation maps save lives by providing information ahead of time about the potential for tsunami impact in certain areas. They enable communities to better plan safe egress routes. The maps may also serve as a catalyst for thought about placing future development, especially critical facilities, in projected inundation areas.

Credit for mapping tsunami hazard areas for management purposes is provided under this sub-element. Credit for the regulation of new development in mapped tsunami areas is provided in element TSR in Section 432.m.

Areas subject to tsunami hazards for which credit is requested may be within the SFHA or outside of it. There is no mapping credit without relevant regulations and/or an appropriate tsunami warning and response program (see Figure 410-7). The impact adjustment is based on the amount of the community's coastline that is mapped.

Credit Criteria for MTS

- (a) The area mapped must be subject to tsunami-related development regulations that receive a TOTAL of at least 20 points (before the impact adjustment) for TSR in Section 432.m or have an appropriate tsunami warning and response program.
- (b) The map must have been prepared based on a scientific study to determine the level of tsunami flooding.



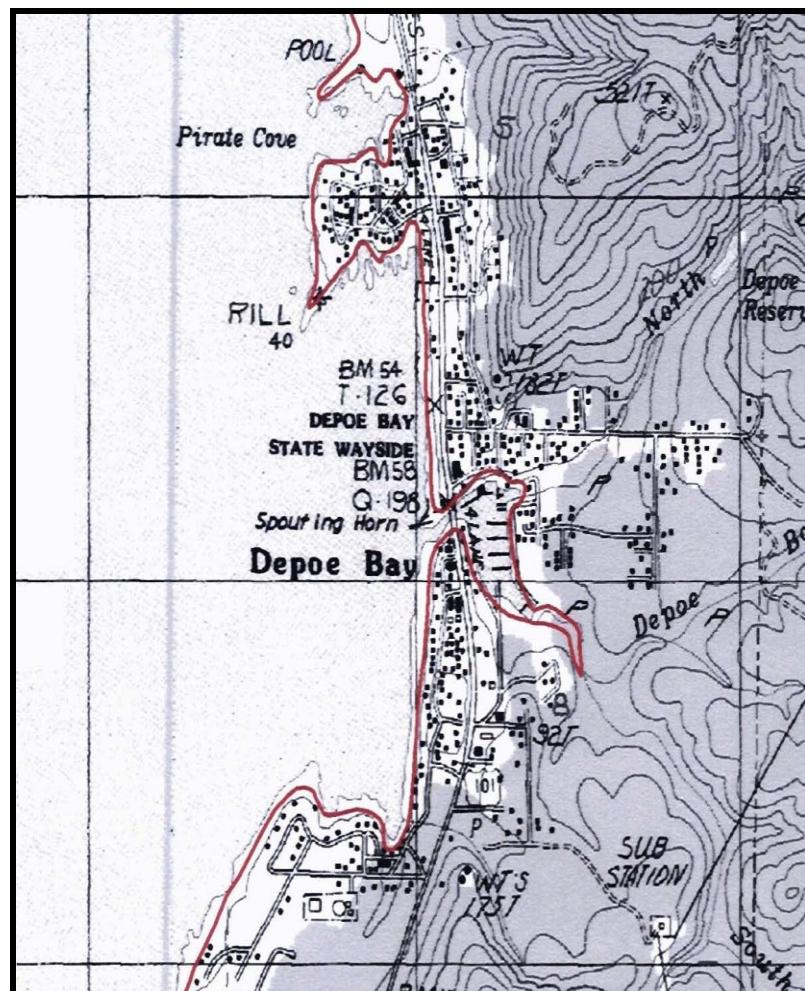
**Figure 410-7. A low-lying area in Washington's San Juan Islands, with tsunami warning sign.
[Photo courtesy Wesley Shaw.]**

Tsunami Hazard Mapping in Oregon

The five Pacific states have undertaken tsunami mapping projects. The Oregon project was undertaken to help implement Senate Bill 379 passed in 1995. The statute limits construction of new essential facilities and special occupancy structures in tsunami flooding zones. A line marking inundation from the highest runup, which was also most consistent with the prehistoric tsunami data, was adopted to implement the statute. The regulatory maps are based on scientific knowledge available in 1995.

Since then, the state has since been working to augment these regulatory maps with more detailed and better-modeled inundation maps: this process is ongoing at the time of this publication, but current maps can be found at <http://j.mp/Zn5bcO>. The state encourages communities to use the newer maps for planning evacuation routes.

This map is from *Tsunami Hazard Map of the Depoe Bay Quadrangle, Lincoln County, Oregon*, by George R. Priest. 1995. Open File Report O-95-27. Portland, OR: Oregon Department of Geology and Mineral Industries.



Credit Calculation for MTS

Up to 50 credit points are provided for mapping tsunami-prone areas (MTS).

MTS = EITHER:

50 points, for mapping tsunami runup areas outside of the SFHA,

OR

50 points, for mapping areas in the SFHA where the tsunami regulatory elevation is higher than the base flood elevation on the FIRM

Impact Adjustment for MAPSH

The impact adjustment for MAPSH is based on the percentage of the shoreline that has been mapped.

$$rMCE = \frac{\text{length of coastline mapped}}{\text{length of total coastline in the community}}$$

$$rMTS = \frac{\text{length of coastline mapped}}{\text{length of total coastline in the community}}$$

Credit Calculation for MAPSH

cMAPSH = cMCE + cMTS, not to exceed 100 points, where

cMCE = rMCE x MCE, and

cMTS = rMTS x MTS

Documentation for MAPSH Provided by the Community

(1) At each verification visit,

- (a) A map that shows the areas subject to tsunami hazard and the other coastal SFHAs in the community. If only a small area of the community is mapped for special coastal flood-related hazards, only the SFHA in that area need be shown on the map.
- (b) If the mapping was not prepared by a federal or state agency, a description of the method used for the mapping that shows that it reasonable delineates areas subject to tsunami or erosion hazards. The mapping technique must be approved by the ISO/CRS Technical Reviewer.
- (c) Credit for MCE in Section 412.f(1) is provided only if the mapping is used for land use regulation to prevent damage from coastal erosion hazards. The documentation required for CER in Section 432.n will meet this requirement.

-
- (d) If credit for mapping on a case-by-case approach for MCE is requested, a description of the local government's enforcement procedures
 - (e) Credit for MTS in Section 412.f(2) is only provided if the mapping is used for land use regulation to prevent damage from the special flood-related hazard or have an appropriate tsunami warning and response program. The documentation required for Activity 420TS (open space preservation based on regulations) or Activity 430TS will suffice for this prerequisite

Example 412.f-1.

Appropriate adoption language could read:

The areas of coastal erosion subject to the management requirements of this ordinance shall be as shown on the Coastal Erosion Maps produced by the State Department of Coastal Zone Management and dated July 17, 2016.

413 Impact Adjustment

Credit for flood hazard mapping (MAP) is adjusted according to the portion of the SFHA at the time of the adoption of the study covered by each element (aSFT).

$$rMAP_i = \frac{aMAP_i}{aSFT}, \text{ where}$$

$aMAP_i$ = the size of the area to which the MAP_i study applies,
and

$aSFT$ = the area of the SFHA for the community at the time of
adoption of the study

The impact adjustment is the ratio of aMAP to the area of the SFHA (aSFT) before the development of the new data.

If the total calculated impact adjustment for all studies is less than 0.10, then 0.10 may be used to calculate the credit, but only for one new study area. If there is more than one set of standards for MAP, the community should choose the area with the highest value if it does not want to take the time to prepare an impact adjustment map or if it estimates that it would receive more points by using the optional minimum value of 0.10.

Preparing an impact adjustment map is explained in Section 403. If there is more than one area, each done to a different mapping standard, each area is marked separately, i.e., MAP#1, MAP#2, etc. If several areas were mapped or studied to identical standards, they are marked with the same acronym and number (see Figures 410-4 and 410-5).

The area of the SFHA at the time of the adoption of the study (aSFT) is calculated based on the SFHA of the FIRM in effect at the time the study was adopted. aSFT may be different for different credits. For example, MAP#1 may be for a study conducted in 1995. aSFT#1 would be the area of the SFHA on the FIRM in effect in 1995. If FEMA used the new study in the next FIRM revision, the impact adjustment for next new study (e.g., MAP#2) would be based on the area of the SFHA in effect on the revised FIRM (aSFT#2).

The maximum value for the sum of all rMAPi = 1.5. $\Sigma rMAP_i$ stands for the sum of all of the impact adjustment ratios for MAP (i.e., $rMAP#1 + rMAP#2 + rMAP#3 + \dots$). The sum of all rMAPi cannot be greater than 1.5. In this activity, an impact adjustment ratio greater than 1.0 reflects the fact that the community has mapped and is regulating floodplain development areas not identified on the original FIRM. It is presumed that this will provide significant savings in future flood damage and NFIP claims, so the impact adjustment ratio for this activity may go up to 1.5.

NOTE: All areas marked MAPi must be mutually exclusive. If the community does not regulate outside of the SFHA in effect at the time of adoption of the study, then $\Sigma rMAP_i$ cannot be greater than 1.0.

Example 413-1.

The SFHA for the McCormick Creek flood study is marked as “MAP#1” on the city’s impact adjustment map shown in Figure 410-5.

The approximate A Zones for Tributaries A and B are marked as “MAP#2.”

South Scottsdale’s CRS Coordinator used the community’s GIS to determine the areas affected (in acres):

$$aMAP#1 = 129.60 \quad aMAP#2 = 97.20$$

The denominator for the impact adjustment is based on the SFHA at the time of the study (aSFT). When the McCormick Creek flood study was conducted, the area was mapped as X Zone. The SFHA at the time consisted only of the floodplains of Tributary A, Tributary B, and Indian Bend Wash.

$$aSFT#1 = 97.20 + 277.60 = 374.80 \text{ acres}$$

The studies for MAP#2 are conducted when a person applies for a permit. Therefore, the denominator, aSFT#2 is the current SFHA.

$$aSFT#2 = aSFHA = 504.40$$

The impact adjustment ratios are calculated by dividing the area affected (aMAP) by the area of the SFHA at the time of the study (aSFT).

$$rMAP\#1 = \frac{aMAP\#1}{aSFT\#1} = \frac{129.60}{374.80} = 0.35$$

$$rMAP\#2 = \frac{aMAP\#2}{aSFT\#2} = \frac{97.20}{504.40} = 0.19$$

The total of the impact adjustment ratios cannot exceed 1.50.

$$\sum rMAP_i = rMAP\#1 + rMAP\#2 = 0.35 + 0.19 = 0.54$$

414 Credit Calculation

c410 = $\sum MAP_i + \sum MAPSH_i$, where

$MAP_i = ((NS_i \times LEV_i) + SRI + HSSI + FWSi) \times rMAP_i$, and

$MAPSH_i = (MAPCE_i \times rMAPCE_i) + (MAPTS_i \times rMAPTS_i)$, not to exceed 50 points

Example 414-1.

(See Figure 410-5.) As seen in earlier examples, South Scottsdale receives credit for the new study on McCormick Creek (MAP#1) and for requiring base flood elevations in the approximate A Zones of Tributaries A and B (MAP#2). The new studies are scored as NS#1 and NS#2.

$$NS\#1 = 350 \quad NS\#2 = 95$$

The NS#1 new study was funded by the City and the state and the NS#2 studies are funded by permit applicants. Because FEMA funds were not involved, LEV#1 = 1.00 LEV#2 = 1.00

Both new studies receive credit for future-conditions hydrology. The values are different because the study scope and original FIRM zones are different. HSS#1 = 100 HSS#2 = 25

The MAP#1 McCormick Creek study used FEMA's floodway encroachment standard of 1.0 foot, so there is no FWS credit for MAP#1. The MAP#2 studies must use a higher encroachment standard, 0.10 foot. FWS#2 = 140

The impact adjustment ratios were calculated in Example 413-1.

$$rMAP\#1 = 0.35 \quad rMAP\#2 = 0.19$$

Neither study receives credit for state review (SR). The first step in the final credit calculation is to compute the total value for each study.

MAP#1

$$\begin{aligned} &= ((NS\#1 \times LEV\#1) + SR\#1 + HSS\#1 + FWS\#1) \times rMAP\#1 \\ &= ((350 \times 1.00) + 0 + 100 + 0) \times 0.35 \\ &= 450 \times 0.35 = 157.50 \end{aligned}$$

MAP#2

$$\begin{aligned} &= ((NS\#2 \times LEV\#2) + SR\#2 + HSS\#2 + FWS\#2) \times rMAP\#2 \\ &= ((95 \times 1.00) + 0 + 25 + 140) \times 0.19 \\ &= 260 \times 0.19 = 49.4 \end{aligned}$$

The second step is to add the totals for each MAP and the remaining credited elements. South Scottsdale does not have credit for any special flood-related hazards (MAPSH).

$$\begin{aligned} c410 &= \sum MAP_i + MAPSH \\ &= MAP\#1 + MAP\#2 + MAPSH \\ &= 157.50 + 49.40 + 0 + 0 = 206.90 \end{aligned}$$

415 For More Information

- a. Additional information, reference materials, and examples can be found at www.CRSresources.org/400.
- b. More information on FEMA mapping criteria can be found on the FEMA website, <https://www.fema.gov/media-library/resources-documents/collections/361>.
- c. The following publications may be obtained from the FEMA website:
Guidelines and Specifications for Flood Hazard Mapping Partners (current and previous versions), www.fema.gov/media-library/assets/documents/13948).
Use of Flood Insurance Study (FIS) Data as Available Data, FEMA Floodplain Management Bulletin 1-98 (1998), www.fema.gov/library/viewRecord.do?id=2231.)
Estimating the Value of Partner Contributions to Flood Mapping Projects “Blue Book,” www.fema.gov/library/viewRecord.do?id=2473.
FEMA’s “Numerical Models Meeting the Minimum Requirement of the NFIP” can be found at www.fema.gov/guidance-documents-other-published-resources.

The following can provide guidance on technical standards for studies in areas where base flood elevations were not provided with the FIRM:

Managing Floodplain Development in Approximate Zone A Areas, FEMA-265 (1995).

(Also available from FEMA's website at

www.fema.gov/library/viewRecord.do?id=1526.)

- d. Communities may check on past FIRMs and obtain background data by calling 1-877-FEMA MAP. They can also submit a written inquiry to FEMA's Flood Map Service Center at <https://msc.fema.gov>.
- e. Rural communities can request help on this activity from the U.S. Natural Resources Conservation Service. Requests should be submitted to the local soil and water conservation district, which is usually located in the county seat.

416 Related Activities under the Community Rating System

- If a community maps other flood-related special hazards and receives credit in Activity 410, it should also be receiving credit under Activity 420 (Open Space Preservation) and/or Activity 430 (Higher Regulatory Standards). The maps must be adopted and the area regulated in order for the community to get the MAPSH credits.
- If a community uses future-conditions flood flows to map its flood hazard, it may be eligible for credit under Activity 450 for managing stormwater if it prepared a watershed management plan, under Activity 420 if some of the area is preserved open space, or under Activity 430 for regulating areas outside of the adopted SFHA.
- Maps credited in this activity should be available for credit in Activity 440, and can be used for outreach in Activity 330. These maps are commonly used in Activity 510 and Activity 610 for planning purposes. In addition, they can be useful for determining credit for the entire 600 series.
- If a flood control project results in lower base flood elevations in an AE or VE Zone, there is no Activity 410 credit. However, the community may be eligible for credit for reducing the flood hazard under Activity 530 (Flood Protection).

420 Open Space Preservation—Summary

Maximum credit: 2,870 points

Note that OSI and LZ are not counted toward the maximum credit because these two elements and OSP are mutually exclusive.

422 Elements

- a. **Open space preservation (OSP)**: Up to 1,450 points for keeping land vacant through ownership or regulations.
- b. **Deed restrictions (DR)**: Up to 50 points extra credit for legal restrictions that ensure that parcels credited for OSP will never be developed.
- c. **Natural functions open space (NFOS)**: Up to 350 points extra credit for OSP-credited parcels that are preserved in or restored to their natural state.
- d. **Special flood-related hazards open space (SHOS)**: Up to 150 points if the OSP-credited parcels are subject to one of the special flood-related hazards or if areas of special flood-related hazard are covered by low-density zoning regulations.
- e. **Coastal erosion open space (CEOS)**: Up to 750 points if the OSP-credited parcels are subject to coastal erosion.
- f. **Open space incentives (OSI)**: Up to 250 points for local requirements and incentives that keep flood-prone portions of new development open.
- g. **Low-density zoning (LZ)**: Up to 600 points for zoning districts that require lot sizes of 5 acres or larger.
- h. **Natural shoreline protection (NSP)**: Up to 120 points for programs that protect natural channels and shorelines.

Credit Criteria

Each element has a separate section discussing credit criteria.

Impact Adjustment

Each element has a separate section describing the impact adjustment.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

420 OPEN SPACE PRESERVATION

The OBJECTIVES of this activity are to

- (1) Prevent flood damage by keeping flood-prone lands free of development, and
- (2) Protect and enhance the natural functions of floodplains.

421 Background

Floods are natural processes and floodplains are necessary to every river and coastal system. A floodplain has been defined as any land susceptible to being inundated by flood waters. Floodplains can also be regarded as the land needed by a river or stream to convey and store flood waters or the coastal areas subject to inundation during a storm.

Preserving the floodplain as open space allows it to serve these primary natural functions and many other important functions. Keeping the floodplain free of development—free of buildings and infrastructure—means that there will be no flood insurance claims, no closed businesses, no homeless residents, no damaged infrastructure, and that the community can return to normal quickly after flooding occurs.

421.a. Activity Description

The maximum credit for Activity 420 is 2,020 points.

Credit is given for areas in a regulated floodplain that are permanently preserved as open space. Additional credit is given for parcels of open space that are protected by deed restrictions or that have been preserved in or restored to their natural state. Credit is also given for measures that require or encourage less development in floodplains, and for the protection of natural channels and shorelines.

The first five elements provide credit for parcels that qualify as preserved open space. The credit can be based on development restrictions placed by the property owners or those found in local regulations.

- (1) Open space preservation (OSP) provides credit for keeping vacant lands vacant through ownership by a public agency, non-profit organization (such as a church camp), or restrictive regulations. To qualify, a property must be open, meaning there are no buildings, filling, or storage of materials.
- (2) Deed restrictions (DR) provides extra credit for ensuring that parcels credited for OSP will never be developed. This is done via a legal restriction that prevents subsequent owners from changing the use of the property.
- (3) Natural functions open space (NFOS) provides extra credit for parcels credited for OSP that are preserved in or restored to their natural state. There are bonus credits for additional attributes of the parcel.

Two elements provide credit for the protection of areas subject to special flood-related hazards and coastal erosion.

- (4) Special flood-related hazard open space (SHOS) provides extra credit for OSP-credited parcels that are in areas subject to a special flood-related hazard.
- (5) Coastal erosion open space (CEOS) credits a community for protecting areas most at risk from coastal erosion.

The next two elements credit local regulations that encourage minimal floodplain development.

- (6) Open space incentives (OSI) credits a community for having requirements and/or incentives that keep flood-prone portions of new developments open through techniques such as density transfers.
- (7) Low-density zoning (LZ) provides credit for zoning districts that require lot sizes of 5 acres or larger, resulting in fewer buildings constructed in the floodplain.

The eighth element credits programs that protect natural channels and shorelines. As with the first five elements, this credit can be based on shoreline protection practices put in place by public property owners or on protection requirements embodied in local regulations.

- (8) Natural shoreline protection (NSP) credits programs that protect natural channels and shorelines, the areas most valuable for protecting the natural functions of floodplains. The programs can be local policies that are adhered to on public lands and/or regulations that govern development on private lands.

At the time of the verification visit, the ISO/CRS Specialist will review the documentation and visit a sample of the parcels in the field.

422 Elements

422.a. Open space preservation (OSP)

The maximum credit for this element is 1,450 points.

OSP credits preserved open space in the floodplain. The objective of open space preservation is to prevent or minimize development in the regulatory floodplain that obstructs floodwaters; exposes insurable buildings to damage; is subject to erosion or other flood-related hazards; or adversely affects water quality, water quantity, or other floodplain functions.

Several different methods of preserving floodplain lands as open space (OSP) are recognized. To be

NOTE: A community does not need to prohibit all use of private property to obtain CRS credit. Communities are advised to have their attorneys or corporation counsels ensure that their regulations that prevent construction of buildings or the placement of fill in hazardous areas do not constitute a taking of private property.

termed “open space,” the land must be free from buildings, filling, significant pavement, or other encroachment to flood flows. To be considered “preserved,” there must be a signed statement from a public or creditable private owner or regulations that prohibit buildings, filling, or other encroachments on flood flows.

Each parcel that qualifies as preserved open space is plotted on a map. The area of the parcel within the regulatory floodplain portion is calculated. The total area of preserved open space is divided by the total area of the Special Flood Hazard Area (SFHA) in the impact adjustment step. The result is a ratio that is used to determine the total credit for OSP.

Credit Criteria for OSP

- (1) The parcel must be located in the community’s regulatory floodplain, which means that the parcel is located in either
 - (a) The SFHA as shown on the community’s Flood Insurance Rate Map (FIRM), or
 - (b) A floodplain outside the SFHA where the community enforces development regulations similar to those enforced for new development in the SFHA. The community must map the area and document its floodplain management regulations.
- (2) The parcel must be “open space,” meaning there are no buildings, storage, filling, significant pavement, or other encroachment to flood flows. Simply having vacant land in the floodplain does not qualify for open space credit. Six types of properties in particular are NOT counted for this activity:
 - (a) Properties not counted in any calculations for the 400 series of Community Rating System (CRS) activities. This includes large bodies of water, federal lands, and other types of property as explained in Section 403. When plotting open space lands, these excluded areas should be marked on the impact adjustment map to ensure that they are not mistakenly included in the calculations. See Section 403 for more information.
 - (b) Areas with impervious surfaces. Parking lots and streets do not qualify. For example, if a parcel such as a park has a parking lot, a paved tennis court, and a paved road, those areas must be excluded from the area calculations in the impact adjustment. Minor areas, such as sidewalks, trails, or pervious pavements, do not need to be excluded.
 - (c) Areas with buildings on them. See Section 301 for a discussion of “buildings.” Insurable buildings on parcels larger than 10 acres will not disqualify a lot, provided that the building is “a necessary appurtenance” of the open space use. Open pavilions and similar structures are not insurable buildings as defined in Section 301 and they do not disqualify a parcel for this credit. However, their roofs are impervious surfaces and their area must be deducted from the parcel’s area calculations.

Example 422.a-1.

1. If a large city park has a swimming pool, the park can be counted as open space even though it may have a building with restrooms, lockers, and clothes-changing areas. If it has a paved parking lot, however, the area of that impervious surface must be deducted from the credited area of open space.
2. A 12-acre park that includes the first settler's home or other historical building that is an integral part of the park can still be considered OSP.
3. A ranger's cabin will not disqualify a state forest for OSP credit.
4. A school playing field can be credited if there are no insurable buildings on it. Structures like bleachers or fences are not "buildings" as defined in Section 301. The areas of any impervious surfaces, such as a basketball court and parking lot, are deducted from the total area of creditable open space.

(d) Parcels on which fill or other encroachments may be placed. One of the objectives for preserving open space is to prevent increased flood damage from future development. Even though insurable buildings may not be allowed, filling, dumping, or storage on a lot can aggravate flood problems on other properties.

For example, an open area that is used for temporary storage of rock or construction materials does not qualify as open space. Plowing and other alterations of the ground are not counted as filling, provided that they do not create obstructions to the flow or loss of storage of flood waters.

Certain types of fill related to flood protection can be allowed without losing the OSP credit. Examples include construction of sand dunes, beach nourishment, and habitat restoration projects. However, with the exception of habitat restoration projects, the properties on which these activities take place would not be eligible for natural functions open space credit (NFOS).

(e) Streets, pavement, parkway, railroad, levee, canal, ditch, and channel rights of way. Such narrow, linear strips of utility easements or publicly owned property are excluded from consideration as open space because they are necessary to serve the development or use of an area.

Such properties with pervious surfaces may be included in the open space calculation if they are an integral part of a larger open space area or a designated public greenway. Narrow greenways that parallel a river or shoreline may be counted as open space provided that they allow public access, even if they are recorded or

considered as drainage easements or channel rights of way. The CRS encourages programs that bring people closer to the water so they learn to appreciate floodplains and their natural functions.

- (f) Publicly owned property that is not intended for open space use, such as a vacant lot in an industrial park. One of the keys to the open space credit is the fact that the area will remain open space, not just that it is owned by a public agency. Therefore, areas set aside by a developer or a public agency only until future economic or other conditions allow it to be developed, are excluded.
- (3) The parcel must be “preserved” as open space. This criterion may be met in one of three ways:
- (a) Public land, such as state and local parks and easements, can qualify if the owning agency states in writing that the lands are intended to be kept as open space. As noted in Section 403, there is no open space credit for federal lands. Examples of such creditable open space parcels include, but are not limited to
- City and county parks and forest preserves,
 - State parks and state forests,
 - Publicly owned beaches or natural areas,
 - School playing fields, and
 - Floodplain easements dedicated to the community by developers.
- (b) Private wildlife or nature preserves that are maintained for open space purposes can qualify if the owner states in writing that they are intended to be kept as open space. Examples of such creditable open space parcels include, but are not limited to
- Church retreats,
 - Hunting club lands,
 - Golf courses owned by nonprofit associations,
 - Audubon Society preserves, and
 - Boy Scout or Girl Scout camping areas.
- A parcel set aside by a developer as a temporary “preserve” until the area develops is not considered preserved open space.
- (c) Open space areas subject to land development regulations that prohibit buildings and filling can qualify for OSP. The credit criteria are the following:
- The regulations must prohibit construction of new buildings;
 - The regulations must prohibit filling, grading, or other activities that obstruct flood flows or remove flood storage in areas subject to riverine flooding;
 - The area where the regulations are in effect must be mapped or defined by lots or a legal description so it can be mapped. For example, a wetlands regulation

that is dependent upon site analysis to define whether a property is a wetland is not acceptable;

- The maintenance of existing levees and engineered dune and beach nourishment programs within the area is permissible;
- Credit is only given for such regulated lands that are vacant at the time of application for CRS credit; and
- If an ordinance prohibits residential development in the V Zone, floodway, or other portion of the regulatory floodplain, the community may request OSP credit for all areas that are zoned for residential use only.

Examples of such regulations include, but are not limited to

- State or local regulations that prohibit buildings and filling in the floodway,
- State or local regulations that prohibit buildings and filling in wetlands or other designated natural areas,
- Coastal construction setback lines that prohibit buildings, and
- Streamside buffers and setback regulations (provided that they prohibit buildings and filling).

Below are some examples of regulations that would NOT qualify for credit. This is not a comprehensive list.

- The Coastal Barrier Resources Act is not acceptable because it does not prevent construction of buildings; it only denies federal support for new development.
- Florida's Coastal Construction Control Line does not qualify because it does not prohibit buildings, it only requires a state permit for buildings. However, more restrictive local regulations could qualify.
- Ordinance language prohibiting structures that may cause obstructions in the floodway is not credited because such a prohibition is a requirement of the National Flood Insurance Program (NFIP). Most floodway regulations allow buildings in the floodway if the applicants can show that they cause no obstruction or if a Conditional Letter of Map Revision (CLOMR) or Letter of Map Revision (LOMR) is obtained.

Open space subdivision design, cluster development, transfers of development rights, and planned unit developments are regulatory approaches that can require or encourage developers to set aside floodplains and other areas as dedicated open space. Unless the regulations specifically identify certain undeveloped floodplains and mandate that they be set aside, there is no OSP credit for these regulations because there is no assurance that the developer will set aside specific areas. However, such regulations are credited under Section 421.e, open space incentives (OSI). Once the parcel is set aside and preserved as open space, it may qualify for OSP credit as publicly owned land.

Example 422.a-2.

In a strip of single-family lots along a stream, each lot has a house situated in the floodplain fringe. There are no buildings in the floodway, and the community's regulations prohibit fill, paving, storage, and the placement of new buildings in the floodway. The open space area, the floodway, is currently vacant and the regulations will keep it open, so it can be credited.

Credit Points for OSP

OSP = 1,450 points, based on the amount of the SFHA that is preserved as open space

Impact Adjustment for OSP

OSP credit is adjusted based on the ratio of preserved open space areas in the regulatory floodplain to the area of the SFHA. Section 403 has additional information on impact adjustments for areas. The areas qualifying for OSP need to be marked on an impact adjustment map.

$$rOSP = \frac{aOSP}{aSFHA}, \text{ where}$$

aOSP = the size of the area(s) preserved as open space (OSP) in the regulatory floodplain, and

aSFHA = the size of the community's SFHA shown on its FIRM

Because OSP can include areas of the community's regulatory floodplain that are outside the SFHA, it is possible that aOSP can be greater than aSFHA. In those cases, rOSP can be as large as 1.5. Note that studies done to delineate those regulated floodplains outside the SFHA can generally be credited under Activity 410 (Flood Hazard Mapping).

NOTE: *The community's aSFHA should be reviewed and updated each year for the Program Data Table that is included in the annual recertification (see Section 213.a).*

Example 422.a-3.

South Scottsdale is a fictitious community used for CRS examples (see Figure 420-1). The City has three areas that qualify for OSP:

1. Much of the north part of the Indian Bend Wash floodplain has been purchased and cleared to form a string of parks. The property boundaries of the park have been outlined in green and the areas in the floodway and flood fringe are shaded in green on the map in Figure 420-1.
2. The area along the south part of Indian Bend Wash was owned by a large development corporation. When the corporation wanted to develop a 640-acre tract in another part of the City, the City offered to allow a higher density of development on that tract if the corporation set aside its Indian Bend Wash holdings. The corporation agreed. It deeded the floodplain portion to the country club to which most of the board members belonged. There is a deed restriction that the area must forever remain as a golf course. The corporation then developed the areas to the east and west and received a higher price for the lots that backed up on the golf course than it could have received for lots if the floodplain had been developed.
3. Ten years ago, the City amended its floodplain management regulations to prohibit new buildings, critical facilities, filling, or storage of materials in the regulatory floodway. The areas that were not developed at the time of the amendment are shaded in green on the map in Figure 420-1. Most of these areas are along McCormick Creek.

All three types of preserved open space qualify for OSP credit. The table shows South Scottsdale's open space, and the spaces are shown in Figure 420-1.

Location	Parcel Owner	Land Use	Total Open Space (acres)	Acres in the Regulatory Floodplain (OSP)	Acres Deed Restricted (DR)	Acres of Natural Functions Open Space (NFOS)
City Parks	City	Public parks	236	143.2		
Country Club	South Scottsdale Country Club	Golf course	73	55.3	55.3	
Indian Bend Wash Floodway	Private	Residential/commercial	29.1	29.1		
McCormick Creek Floodway	Private	Residential	15.3	15.3		
TOTALS				242.9	55.3	
Tributary A	OSI4		88.7			
Tributary A	OSI5		88.7			

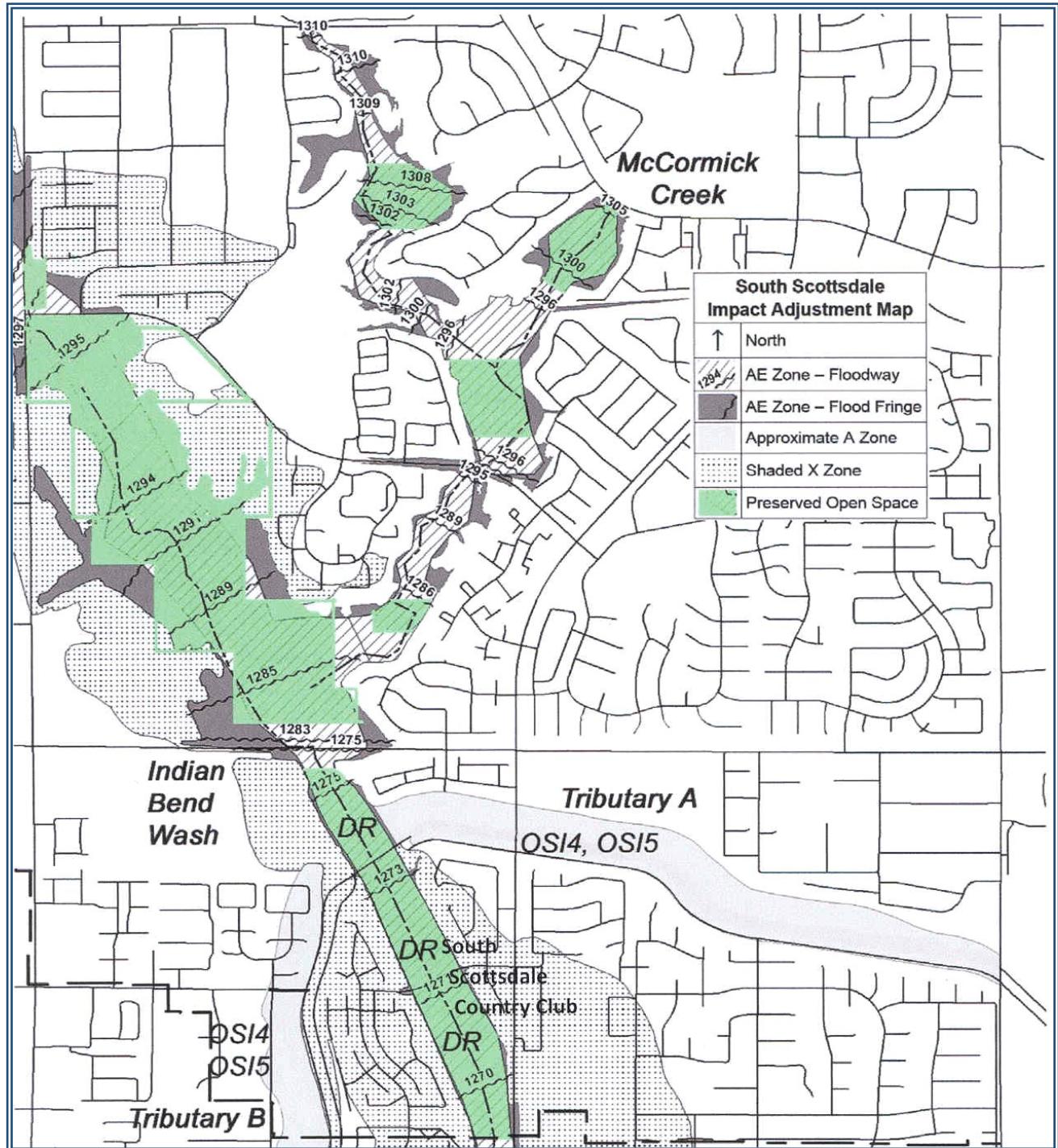


Figure 420-1. South Scottsdale's impact adjustment map for Activity 420.

OSP = 1,450 (before the impact adjustment)

$$aOSP = 143.20 + 55.30 + 44.40 = 242.90 \text{ acres}$$

$$aSFHA = 504.40 \text{ acres (see Figure 410-5)}$$

$$rOSP = \frac{aOSP}{aSFHA} = \frac{242.90}{504.40} = 0.48$$

The formula in Section 423, Credit Calculation, calls for multiplying the value for preserving open space (1,450) by the ratio for rOSP, 0.48. The credit for South Scottsdale's open space, cOSP, is 48% of 1,450.

Note that if South Scottsdale enforced floodplain management regulations throughout the SFHA and the shaded X Zone, then the area calculations for the parks would include the X-Zone portions. This would provide a larger numerator (aOSP), but the denominator (aSFHA), would not change. The result would be a larger ratio and, therefore, more points.

Documentation for OSP Provided by the Community

(1) At each verification visit,

- (a) A map (or set of maps) and a list of parcels that notes which parcels qualify for OSP, DR, NFOS, SHOS, or CEOS credit. The map(s) and list must correspond to each other. Each parcel or group of parcels must be labeled on the map. The list must include, at a minimum, parcel owner, land use designation, acreage of parcel, and acreage of the parcel within the SFHA. If a community regulates outside of the SFHA, the acreage of the parcel in the regulatory floodplain and the flood zone of the parcel must also be included. This means that parcels located in the X Zone should not be included unless the regulatory floodplain is greater than the SFHA. An Excel spreadsheet list is preferred.
- (b) For each parcel that is preserved as open space because of ownership (Section 422.a, credit criterion (3)(a) or (b)), documentation that the owner will keep the parcel open.
- (c) For each parcel that is preserved as open space because of a regulatory requirement (Section 422.a, credit criterion (3)(c)), the ordinance language that prohibits structures and fill in part or all of the regulatory floodplain. See also Sections 231.b and c on documenting regulatory language.
- (d) For each parcel that is preserved as open space outside the SFHA, documentation showing that floodplain regulations are in effect in the area.
- (e) An impact adjustment map.

The ISO/CRS Specialist may visit a sample of the sites to verify that they meet the element's credit criteria.

Documentation can be digital or hard copy.

422.b. Deed restrictions (DR)

The maximum credit for this element is 50 points.

Just because an open space parcel is a city park today, that does not necessarily mean that there is any legal restriction that keeps a city council from building on it or selling it for development. This element provides additional credit for areas of the regulatory floodplain that have the assurance that the parcel will always remain open: a deed restriction (DR).

Credit Criteria for DR

- (1) All areas to be credited for DR must first qualify for OSP credit. If only a portion of a parcel qualifies for OSP, only that portion can qualify for DR.
- (2) There must be language attached to the deed for the parcel that prohibits new buildings. The exact language for a legal arrangement or deed restriction will vary from state to state and should be prepared by a local attorney. It should include three features:
 - (a) No new buildings may be allowed on the property;
 - (b) The restriction runs with the land; and
 - (c) The restriction cannot be changed by a future owner; rather, it can only be amended by a court for just cause.

More common examples of deed restrictions include, but are not limited to

- Property donated by a person or family for park purposes often has the stipulation that it be used only for public recreation;
- Properties purchased with funds from the Federal Emergency Management Agency's (FEMA's) mitigation grant programs qualify for this credit because the titles have a deed restriction that prohibits construction of buildings on the parcel in the future;
- Public lands that were improved with assistance from a state or federal open space or recreational program often have a deed restriction requirement as a condition of funding; and
- A community, other agency, organization, or owner may attach such a restriction to its existing parks and other public open areas in order to receive the deed restriction credit.

Regulatory requirements for easements or other dedications do not qualify for DR credit. DR credit is for a requirement that is filed or recorded with the deed, and cannot be removed by ordinance or other action except by a court order. Although a subdivision ordinance requirement may qualify for OSI, to be eligible for DR credit, the parcel must have been platted and the restrictions on developing it recorded.

After a subdivision is platted, some parcels may be set aside as a park, an easement, retention basin, or other open space purpose. This does not automatically receive DR credit.

Documentation is needed that shows that the community or property owner (e.g., the homeowners association) is not free to sell or build on the property.

Credit Points for DR

DR = 50 points

Up to 50 points are provided for this element, based on the amount of the SFHA that is preserved as open space with deed restrictions. Note that every parcel for DR credit must have already qualified for OSP credit.

Impact Adjustment for DR

DR credit is adjusted based on the ratio of preserved open space areas with deed restrictions to the area of the SFHA. The areas qualifying for DR need to be marked on the impact adjustment map prepared for OSP. Note that every parcel for DR credit must already qualify for OSP credit.

$$rDR = \frac{aDR}{aSFHA}, \text{ where}$$

aDR = the size of the area(s) that qualify for deed restriction credit (DR), and

aSFHA = the size of the community's SFHA shown on its FIRM

rDR cannot be greater than rOSP

Example 422.b-1.

The South Scottsdale Country Club was deeded floodplain property owned by a large development corporation. There is a deed restriction specifying that the area must forever remain as a golf course. The area qualifies for both OSP and DR.

DR = 50 (before the impact adjustment)

The area of the floodplain portion of the South Scottsdale Country Club is

aDR = 55.3 acres

aSFHA = 504.4 acres (see Figure 410-5)

$$rDR = \frac{aDR}{aSFHA} = \frac{55.30}{504.40} = 0.11$$

According to Section 423, Credit Calculation, the value for deed restrictions (50) is multiplied by the ratio for rDR, 0.11.

Documentation for DR Provided by the Community

(1) At each verification visit,

- (a) A list of the parcels that have qualifying deed restrictions, and copies of the deeds that are requested for review. The language that qualifies must be marked. DR credit can only be documented with a copy of the actual deed restriction. An ordinance requiring deed restrictions or dedication of easements is not adequate documentation that there is a permanent legal restriction that prevents future owners from developing that property.
- (b) The impact adjustment map used for OSP credit, with “DR” marked on the qualifying areas.

422.c. Natural functions open space (NFOS)

The maximum credit for this element is 350 points.

The more commonly considered natural floodplain functions are listed in the box. There are three reasons why preserving open spaces that support these functions warrant the additional credit available under this element.

- (1) More and more studies are showing that natural open space can be more effective at controlling or attenuating flooding and is less expensive over the long run than traditional manmade flood control structures.
- (2) Local officials and their constituents who are aware of the benefits that naturally functioning floodplains provide to their communities want to protect them. This can generate a continuous level of interest to protect floodplains in order to support local economies or improve recreational opportunities. This interest level persists between infrequent floods, adding to the attention and resources available for flood loss reduction efforts.
- (3) Disrupting natural features has adverse impacts on the flooding regime.

Some Natural Functions of Floodplains

WATER RESOURCES

Natural Flood and Erosion Control

- Provide flood storage and conveyance
- Reduce flood velocities
- Reduce peak flows
- Reduce sedimentation

Water Quality Maintenance

- Filter nutrients and impurities from runoff
- Process organic wastes
- Moderate temperature fluctuations

Groundwater Recharge

- Promote infiltration and aquifer recharge
- Reduce frequency and duration of low surface flows

BIOLOGICAL RESOURCES

Biological Productivity

- Promote vegetative growth through rich alluvial soils
- Maintain biodiversity
- Maintain integrity of ecosystems

Fish and Wildlife Habitats

- Provide breeding and feeding grounds
- Create and enhance waterfowl habitat
- Protect habitats for rare and endangered species

*– A Unified National Program for Floodplain Management
FEMA-248 (1994)*

Accordingly, NFOS credits areas preserved as open space (OSP) where the natural floodplain functions are also preserved or restored. NFOS credit is in addition to OSP. Note that other programs to support natural floodplain functions in the watershed (outside the floodplain), such as low impact development and preserving natural flood storage areas, such as wetlands, can be credited under Activity 450 (Stormwater Management).

Credit Criteria for NFOS

(1) For all NFOS credit:

- (a) All areas to be credited for NFOS must first qualify for OSP credit; If only a portion of a parcel qualifies for OSP, only that portion can qualify for NFOS.
- (b) Credit for NFOS1 is a prerequisite for the rest of the credits;
- (c) The property must be managed to stay in the natural state or otherwise managed to keep its designation; and
- (d) The areas qualifying for each credit need to be marked on the impact adjustment map prepared for Activity 420 .

(2) NFOS1: Credit is provided if parcels with OSP credit are in an undeveloped natural state or have been restored to a natural state.

The following types of open space in a community's regulatory floodplain can receive NFOS1 credit.

- Areas in their undeveloped natural state (i.e., areas that have not been built on, graded, or farmed).
- Areas that have been farmed or otherwise developed but have been restored to a state approximating their natural, pre-development conditions. This includes restoration work, such as bioengineered channel stabilization, removal of seawalls to allow beach erosion, living shorelines, wetland or riparian habitat restoration, and moving levees back to allow channel meandering.
- Areas designated as worthy of preservation for their natural functions by a federal, state, or nationally recognized private program. Examples of such programs include, but are not limited to
 - State sensitive-areas programs that place development restrictions on designated properties;
 - The Nature Conservancy's Heritage Program Inventory; and

Surface waters, their floodplains, and watersheds are parts of a broader, single system. This interaction of land and water exists in a state of dynamic equilibrium. If a component of the natural system is disturbed, the entire system works to readjust towards a new equilibrium. This is true of riverine and coastal systems alike. The effects of a system's readjustment are often felt far from the original site of the disturbance and can last for decades.

—The Natural and Beneficial Functions of Floodplains: Reducing Flood Losses by Protecting and Restoring the Floodplain Environment, FEMA-409 (2002)

- The U.S. Fish and Wildlife Service's Threatened and Endangered Species' Critical Habitat Designations (some designations may also qualify the parcel for credit under NFOS3).

The following types of open space usually would NOT receive NFOS1 credit, unless additional information was supplied that showed that the above criteria are met.

- Areas designated only as "scenic," as historically significant, or as outstanding canoeing or boating streams.
- Areas developed and maintained for recreational uses, such as golf courses, groomed beaches, and zoos.
- Forests where unrestricted commercial clear cutting is allowed (sustainable forestry practices that preserve natural functions may be recognized).
- Dune and beach nourishment projects that involve filling, snow fences, or other artificial constraints on natural dune migration or beach erosion.

(3) NFOS2: Credit is provided if parcels credited as NFOS1 are also designated in a plan to protect natural functions. The plan must meet the criteria for a natural floodplain functions plan (NFP) credited in Activity 510 (Floodplain Management Planning).

(4) NFOS3: Credit is provided if parcels credited as NFOS1 are designated as critical habitat for threatened or endangered species or if the species is present. "Threatened or endangered species" include those already on a federal or state list and those on an official federal or state list of "species of concern."

(5) NFOS4: Credit is provided if parcels credited as NFOS1 are also in a designated open space corridor or connected network. This credits a designated open space corridor or connected network of wetlands, woodlands, wildlife habitats, wilderness, and other areas that support native species, maintain natural ecological processes, and sustain air and water resources. "Designated open space corridor" means the property has been identified for its corridor or network value in an approved plan. Such a network sometimes is called "green infrastructure."

Credit Calculation for NFOS

NFOS = the sum of the following

NFOS1 = 190 points, for having parcels that qualify as OSP in or restored to their undeveloped natural state

NFOS2 = 50 points, for having parcels that qualify as NFOS1 designated in a natural floodplain functions protection plan

NFOS3 = 50 points, for having parcels that qualify as NFOS1 designated as critical habitat for threatened or endangered species

NFOS4 = 60 points, for having parcels that qualify as NFOS1 also in a designated open space corridor

Impact Adjustment for NFOS

NFOS credit is adjusted based on the ratio of preserved open space areas that qualify for each sub-element (NFOS1, NFOS2, etc.) to the area of the SFHA.

$$rNFOS\# = \frac{aNFOS\#}{aSFHA}, \text{ where}$$

$aNFOS\#$ = the size of the area(s) that qualifies for NFOS credit (aNFOS1 is the area of all parcels that qualify for NFOS1 credit, etc.) and

$aSFHA$ = the size of the community's SFHA shown on its FIRM

$rNFOS\#$ cannot be greater than rOSP

Documentation for NFOS Provided by the Community

(1) At each verification visit,

- (a) For each parcel, documentation that supports credit under NFOS1 and any additional credit requested. The document must describe the natural floodplain functions of the parcel. The document can be
 - (i) A report or plan prepared by a qualified agency, such as a habitat conservation plan, a natural areas inventory, green infrastructure plan, etc., that includes the property to be credited, or
 - (ii) A memo or letter signed by a professional in a natural science such as botany, biology, forestry, or landscape architecture. The sample natural floodplain functions form shown in Figure 420-2 can also be used.
- (b) [For NFOS2] A copy of the plan and the resolution or other formal adoption action. This is not needed if the plan is submitted for NFP credit under Activity 510 (Floodplain Management Planning).
- (c) [For NFOS3] Documentation of which endangered or threatened species are present and documentation from a federal or state wildlife agency that the species has been listed.
- (d) [For NFOS4] A copy of the appropriate open space corridor plan.
- (e) The impact adjustment map and inventory used for OSP credit, with "NFOS#" marked on the qualifying areas.

The ISO/CRS Specialist may visit a sample of the sites to verify that they meet the element's credit criteria.

Natural Floodplain Functions Form	
Property name	Pettaway County Park
Property location	1 mile northeast of Frenchford, on the Pettaway River
Summary of the habitat or natural benefits provided at this property	<p>Pettaway Park was created in 1954 in order to protect the area from the booming logging industry. The area has never been developed or farmed.</p> <p>It lies at the headwaters of the Pettaway River and consists of bottomlands, ravines, white-oak forest interspersed with marsh and meadows. It is a stop on the Mississippi Flyway for migrating birds, including sandhill cranes. In 2002, a white winged wood duck (<i>Cairina scutulata</i>), an endangered species, was spotted in the park.</p> <p>The park's Nature Center houses a variety of exhibits, nature displays, maps, photographic studies, and a research library. The Nature Center also offers a variety of nature-oriented programs for families and adults such as owl prowls and astronomy programs.</p>
Name of person completing this form	Jonathon Richards, ASLA
Signature	<i>Jonathon Richards</i>
Degree or other qualifications	<p>Bachelor of arts from Wall State University in landscape architecture, 1990.</p> <p>Registered landscape architect.</p> <p>Planner and then Director of natural area programs for Delaware County since 1994.</p>

Figure 420-2. An example of a form to inventory natural floodplain functions.

422.d. Special flood-related hazards open space (SHOS)

The maximum credit for this element is 150 points.

The CRS offers credit for open space preservation and low-density zoning in areas subject to the following special flood-related hazards:

1. Uncertain flow paths (alluvial fans and channel migration);
2. Closed basin lakes;
3. Ice jams;
4. Land subsidence;
5. Mudflows; and
6. Tsunamis.

Credit Criteria for SHOS

- (1) The area must qualify for OSP credit.
- (2) The area must be included in a special hazard area map.
- (3) The area must be subject to special hazard-specific regulations credited under Activity 430 of at least 20 points before the impact adjustment.

Credit Calculation for SHOS

$$cSHOS = \frac{aSHOS}{aSFHA} \times 150, \text{ where}$$

aSHOS = the area of special hazards-prone open space, and

aSFHA = the size of the community's SFHA shown on its FIRM

Note that aSHOS may be extended into areas outside the aSFHA, therefore aSHOS divided by aSFHA may exceed 1.0. However aSHOS plus aSHR (under Activity 430) divided by aSFHA may not exceed 1.5.

Documentation for SHOS Provided by the Community

- (1) At each verification visit,
 - (a) Documentation that shows that the area meets OSP requirements;
 - (b) Documentation that the area for which open space credit is requested lies within the mapped special hazard.
 - (c) A copy of the special hazards regulations that would apply to the area if it were not open space.

422.e. Coastal erosion open space (CEOS)

The maximum credit for this element is 750 points.

The CRS offers credit for open space preservation of areas subject to coastal erosion.

Up to 750 points are provided for the preservation of open space within a community's mapped coastal erosion hazard area. Qualifying areas must be landward of a coastline eroding at a rate greater than or equal to 1.5 feet per year and qualify for OSP credit.

Designated open space may include areas protected by coastal construction setbacks, but creditable setbacks must prohibit all buildings or other encroachments. Regulations merely requiring permits for construction in certain areas are not sufficient for CEOS credit.

Dune and beach areas preserved in their natural undeveloped state may also qualify for natural functions open space (NFOS) and natural shoreline protection (NSP) credit.

Credit Criteria for CEOS

- (1) The area must be seaward of an area that is eroding at a rate greater than or equal to 1.5 feet per year.
- (2) The area must qualify for OSP credit.
- (3) The community must earn at least 25 points for mapping coastal erosion hazard areas (MCE) in Section 412.f.
- (4) The community must receive at least 10 points for keeping maps updated (EDM) in Section 442.d.
- (5) The community must receive at least 20 points for its coastal erosion regulations (CER) in Section 432.n.

Credit Calculation for CEOS

$$cCEOS = \frac{aCEOS}{aCE} \times \frac{LCE}{LC} \times \frac{(year (projected) - year (current))}{100} \times CFSL \times 500,$$

where

aCEOS = the size of the area(s) that qualifies for CEOS,

aCE = the size of the community's coastal erosion hazard area,

LCE = the length of coastline eroding at ≥ 1.5 feet per year,

LC = the total length of the coastline,

year (projected) = the year to which the location of the erosion reference feature is projected,

year (current) = the year the credit is requested or verified, and

CFSL = the multiplier for consideration of future sea level

The multiplier CFSL is:

1.2, for using the NOAA “intermediate-high” projection for the year 2100 and

1.5, for using the NOAA “high” projection for 2100

See Section 404 for guidance on using sea level rise projections for CRS purposes.

Documentation for CEOS Provided by the Community

(1) At each verification visit,

- (a) A map identifying the coastal erosion hazard areas.
- (b) A map showing open space with the coastal erosion hazard areas and the size of each.
- (c) Documentation that the area meets OSP requirements.
- (d) Documentation that the community received at least 25 points for MCE in Section 412.f, 20 points for CER under Section 432.n, and 10 points for EDM in Section 442.d.

422.f. Open space incentives (OSI)

The maximum credit for this element is 250 points.

Most communities have undeveloped areas that are not preserved as open space through one of the means recognized under OSP. The CRS recognizes that there are many tools that can encourage the owners to keep the floodplain open when a site is developed. These can include

- Density transfers,
- Transfers of development rights (TDRs),
- Bonuses for avoiding the floodplain or other sensitive areas,
- Planned unit developments (PUDs),
- Cluster development,
- Greenway and setback rules, and
- Open space ratio credits for open space in the floodplain.

The end results of these different approaches are similar. Examples are shown in Figure 420-3.

A community can receive OSI credit for regulations that encourage developers to set aside flood-prone areas as flowage easements and then, once a parcel is appropriately deeded, the community can receive credit under OSP (and possibly DR and/or NFOS) for that site.

These regulations do not have to be enacted for floodplain management purposes. Many communities have adopted them for farmland preservation, protection of sensitive areas, and even for economic reasons. For example, developments such as the example cluster plan in Figure 420-3 have shorter streets, resulting in lower maintenance, cleaning, and snow plowing costs for the community.

If a community's program uses an approach to minimize development or disturbance in the floodplain that is not described here, it should be submitted for scoring in accordance with Section 113.d.

Most of the regulations credited for OSI address subdivisions and larger developments, where the developer has the option of leaving some of the land vacant. If a community's regulatory program effectively prohibits all new buildings from the floodplain, the community should apply for open space preservation credit under OSP.

Credit Criteria for OSI

- (1) For full credit for OSI, regulations must clearly apply to both new development and redevelopment, and there must be undeveloped areas within the community's regulatory floodplain. OSI credit is prorated if the regulations do not apply to redevelopment.
- (2) If a community has no vacant land suitable for a subdivision or other large development, OSI credit will be prorated. If the regulations do not clearly state that they apply to redevelopment projects, then the community must provide a statement from its attorney that the regulations apply to redevelopment projects in order to receive OSI credit.
- (3) OSI1: Credit is provided if the regulations set aside all of the regulatory floodplain in a subdivision as open space (such as drainage or flowage easements or back yards) or otherwise keep them free from development. Regulations that meet OSI1 criteria do not qualify for OSP credit. However, after a subdivision's final plat is recorded, the areas set aside could qualify for OSP credit.

Some variations to this credit include

- The credit can be prorated if smaller areas are set aside;
- If the community requires that 50% of the floodplain be kept open, then 50% of the area is credited; and
- If the requirement is limited to one or two zoning districts, the credit can be prorated accordingly.

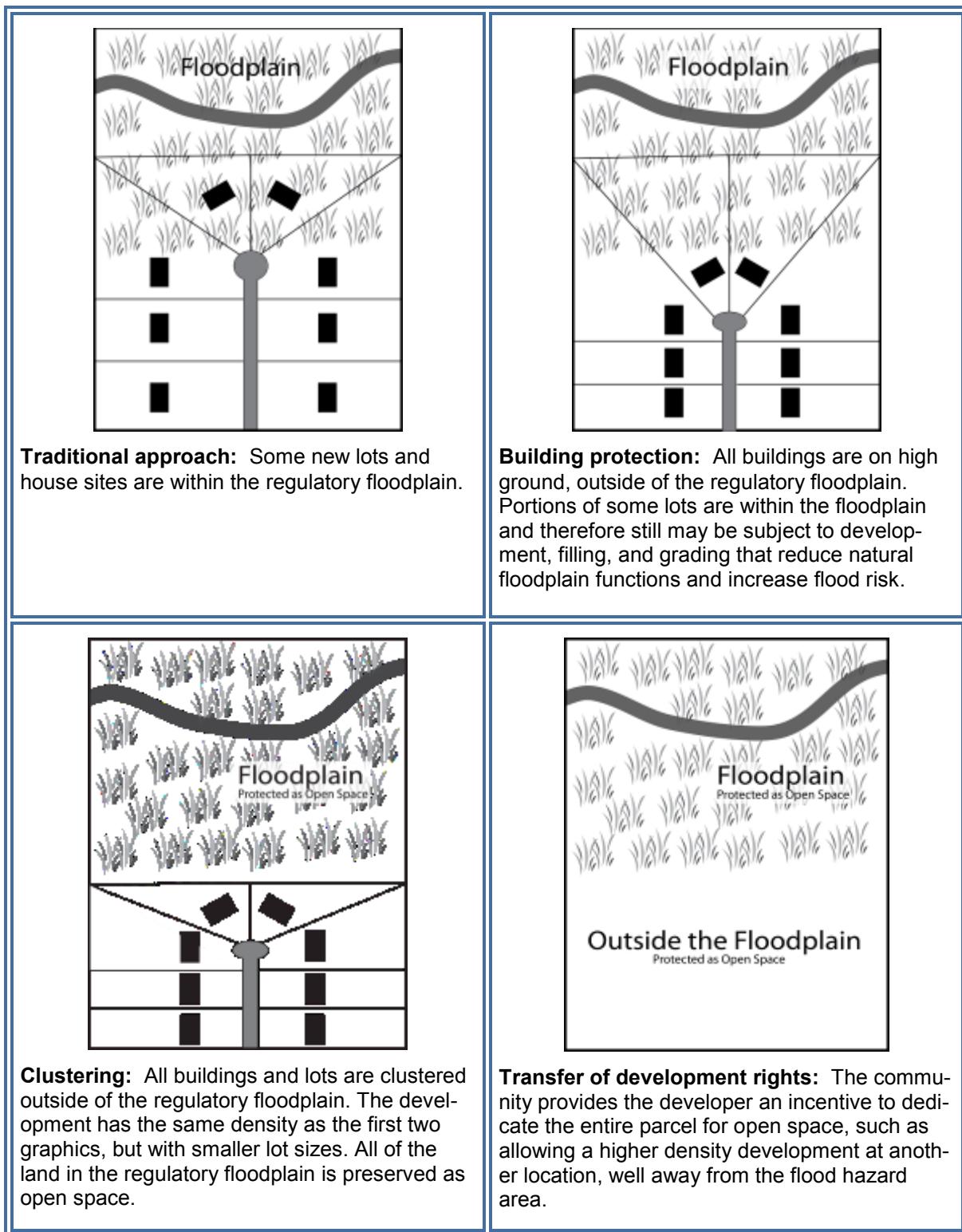


Figure 420-3. Alternative ways to develop a property that is partially flood-prone.

- (4) OSI2: Credit is provided if the regulations require that each lot in a new subdivision provide a building site that is on natural high ground, out of the regulatory floodplain. This credit is not provided if filling the floodplain (or cutting and filling) is allowed to meet the building site requirement or if a Letter of Map Revision based on Fill (LOMR-F) is required.

Example 422.f-1.

Ordinance language might read:

If a parcel has a buildable site outside the Regulatory Floodplain, it shall not be subdivided to create a new lot, tract, or parcel with a building site plan that does not have a buildable site outside the Regulatory Floodplain. This provision does not apply to lots set aside from development and preserved as open space.

- (5) OSI3: Credit is provided if the regulations state that TO THE EXTENT POSSIBLE, each lot in a new subdivision must provide a building site that is on natural high ground, out of the regulatory floodplain. If a lot does not have a buildable site out of the regulatory floodplain, all new structures, pavement, and other development must be sited where they have the least impact on habitat. This can be done by locating the structures as far from the water body as possible or placing the structures on the highest land on the lot.
- (6) OSI4: Credit is provided if the regulations include transfer of development rights language or a density bonus to encourage staying away from the floodplain. Fewer points are provided for transfer of development rights or a density bonus within the same development.

Example 422.f-2.

Ordinance language might read:

The proposed subdivision should have one or more new lots in the Regulatory Floodplain set aside for open space use through deed restriction, easement, subdivision covenant, or donation to a public agency. The density of the development in the portion of the development outside the Regulatory Floodplain may be increased to compensate for the amount of land in the Regulatory Floodplain preserved as open space in accordance with _____(section of the community's zoning or other development ordinance that allows PUDs and/or transfers of development rights).

- (7) OSI5: Credit is provided for regulations that allow cluster development through a planned unit development (PUD) or otherwise.
- (8) OSI6: Credit is provided for a program that provides tax incentives to keep land open, such as keeping farmland tax rates low when the owner signs an agreement to not develop it or not to sell it for development. If the program results in permanent preservation of open space, each qualifying parcel should be credited under OSP and, if appropriate, DR.
- (9) OSI7: Credit is provided if the community's land use plan recommends open space use or low-density development of flood-prone areas.

Credit Points for OSI

OSI1 = 250 points, for regulations that set aside all of the regulatory floodplain in a subdivision as open space

OSI2 = 150 points, for regulations that REQUIRE each lot in a new subdivision to provide a building site that is on natural high ground, out of the regulatory floodplain

OSI3 = 65 points, for regulations that require that, TO THE EXTENT POSSIBLE, each lot in a new subdivision provide a building site that is on natural high ground, out of the regulatory floodplain, or that otherwise does not adversely affect natural floodplain functions

OSI4 = 70 points, for having regulations that provide for transfers of development rights or density bonuses to encourage staying out of the regulatory floodplain. This credit can be up to 50 points if the bonus allows increased density within the same development

OSI5 = 25 points, for regulations that allow cluster development through PUDs or other means

OSI6 = 25 points, for a program that provides tax incentives to keep land open

OSI7 = 10 points, if the community's land use plan recommends open space use or low-density development of flood-prone areas

Impact Adjustment for OSI

OSI credit is adjusted based on the ratio of the area affected by the OSI regulation to the area of the SFHA.

- (1) The areas covered by the regulation(s) need to be marked on the impact adjustment map prepared for OSP.
 - (2) The first four sub-elements (OSI1, OSI2, OSI3, and OSI4) are mutually exclusive. That is, a community can only receive one of these credits for an area. However, a community could receive credit for one of these four plus OSI5, OSI6, and/or OSI7 in the same area.
 - (3) There is no impact adjustment for OSI7.
-

$$rOSI\# = \frac{aOSI\#}{aSFHA}, \text{ where}$$

$aOSI\#$ = the size of the area(s) that qualify for OSI# credit
($aOSI1$ is the size of the area that qualifies for OSI1 credit, etc.), and

$aSFHA$ = the size of the community's SFHA shown on its FIRM

Note that $aOSI$ cannot include areas that are credited under OSP.

Example 422.f-3.

A coastal county's OSI4 regulations allowing the transfer of development rights only affect inland riverine floodplains. This area is calculated to be 14.64 square miles. The total area of the County's SFHA is 17.42 square miles.

$$rOSI4 = \frac{aOSI4}{aSFHA} = \frac{14.64}{17.42} = 0.84$$

If the county receives credit for a provision under OSI5 or OSI6, the impact adjustment is calculated separately.

Example 422.f-4.

South Scottsdale has a provision to transfer development rights in order to preserve natural, sensitive, and flood-prone areas. This provision proved very successful when developable land was set aside as the South Scottsdale Country Club (see Examples 422.a-3 and 422.b-1).

$$OSI4 = 70$$

The City's code also authorizes cluster development.

$$\text{OSI5} = 25$$

The city's comprehensive plan calls for preserving all flood-prone areas as open space, to the extent possible with a minimum of City funding.

$$\text{OSI7} = 10$$

The application of OSI4 and OSI5 is limited to undeveloped lands that are not already preserved as open space. There are only two such areas left in South Scottsdale—the floodplain for Tributary A and the southern portion of Tributary B's floodplain. They are so marked on the impact adjustment map in Figure 420-1.

Area of Tributary A floodplain: 68.90 acres

Area of south part of Tributary B floodplain: 19.80 acres

$$a\text{OSI4} = a\text{OSI5} = 68.90 + 19.8 = 88.70 \text{ acres}$$

aSFHA = 504.40 acres (see Figure 410-5)

$$r\text{OSI4} = \frac{a\text{OSI4}}{a\text{SFHA}} = \frac{88.70}{504.40} = 0.18$$

$$r\text{OSI5} = \frac{a\text{OSI5}}{a\text{SFHA}} = \frac{88.70}{504.40} = 0.18$$

According to Section 423, Credit Calculation, the values for OSI4 and OSI5 are multiplied by their ratios, 0.18.

There is no impact adjustment for OSI7.

Documentation for OSI Provided by the Community

(1) At each verification visit,

- (a) For each regulatory requirement, the ordinance language (see also Section 231.c on submitting ordinance language as documentation), and letters from the community's attorney as required under credit criterion (2).
- (b) The impact adjustment map used for OSP credit, with "OSI" marked on the qualifying areas. It must show areas that are currently vacant and areas that are credited for open space preservation (OSP).
- (c) For extra credit for regulating flood-prone areas outside the SFHA, documentation showing that floodplain regulations are in effect in these areas.
- (d) During the verification visit, the ISO/CRS Specialist will need to see site plans and final plats that will document how the regulation has been applied.

The ISO/CRS Specialist may visit a sample of new developments to verify that they have been constructed in accordance with the approved plans.

422.g. Low-density zoning (LZ)

The maximum credit for this element is 600 points. There is additional credit for low-density zoning in areas subject to special flood-related hazards.

Credit is provided for zoning areas of the regulatory floodplain to keep them substantially open. Zoning an area for agriculture, conservation, or large residential lots preserves more open space than allowing more intensive development.

LZ credit is available for undeveloped land within low-density zoning districts, as well as for areas developed in accordance with the density requirements within the regulatory floodplain. “Low-density” means that that size of the lots is at least 5 acres. For this element, it does not matter why an area is zoned for low density; what counts is the minimum lot size and lot coverage allowed in the zoning district.

The credit for low-density zoning is based upon the traditional zoning approach of setting minimum lot sizes for different zoning districts. The bigger the lot size, the less dense the floodplain development and the more credit provided. The credit also factors in lot coverage for non-residential zones.

Credit Criteria for LZ

- (1) The community must have a zoning ordinance that identifies different development criteria and densities for different areas. Other types of regulations are not credited. For example, a health ordinance that requires a minimum lot size to accommodate a septic field is not credited. The area may be developed to a higher density if a sanitary sewer is installed in the future.
- (2) The lands to be credited for LZ must not qualify for OSP credit.

Credit Points for LZ

LZ = up to 600 points, for zoning regulations

LZ#s = 60 points x s, where

s = the minimum lot size in acres

- (1) For the credit calculation, density is measured in terms of acres per building. A zoning district with a minimum lot size of 5 acres allows a density of 5 acres per building. For this area, s = 5, and the area would be designated “LZ#5” on the impact adjustment map used for OSP credit.

“s” may have any value from 5.00 to 10.00. The highest allowable density is a five-acre lot ($s = 5.0$), and minimum lot sizes larger than 10 acres are credited as 10 acres ($s = 10.00$).

Example 422.f-1.

In a “rural estates” zoning district, the density is one unit per 5 acres.

$$s = 5, LZ\#5 = 60 \times 5 = 300 \text{ points (before the impact adjustment)}$$

- (2) For residential zones, density is based on the minimum lot size for one unit. Where multi-family residential buildings are allowed, “s” is based on the number of units allowed per parcel. For example, if duplexes are allowed in a district with a minimum lot size of 10 acres, the density is credited as one unit per 5 acres, or $s = 5.00$.
- (3) For non-residential zones, density is also based on the lot coverage allowed. For five-acre lots, the maximum allowable lot coverage credited is 10%. For 10-acre or larger lots, the maximum allowable lot coverage credited is 5%. Credited lot coverage is prorated for other lot sizes.
- (4) Different zoning districts with the same density requirement can be counted together as one LZ#s.
- (5) Where minimum lot sizes are in units other than acres, they must be converted to acres to calculate the credit for this element.

Impact Adjustment for LZ

LZ credit is adjusted based on the ratio of the area affected by the zoning district within the regulatory floodplain to the area of the SFHA. The areas covered by each low-density zoning district need to be marked on the impact adjustment map prepared for OSP. Note that all areas for which LZ credit is requested must not qualify for OSP credit.

$$rLZ\# = \frac{aLZ\#}{aSFHA}, \text{ where}$$

$aLZ\#$ = the size of the area(s) that qualify for LZ# credit within the regulatory floodplain ($aLZ\#5$ is the size of the area that qualifies for LZ#5 credit, etc.), and

$aSFHA$ = the size of the community’s SFHA shown on its FIRM

Note that aLZ cannot include areas credited under OSP

Documentation for LZ Provided by the Community

(1) At each verification visit,

- (a) For each LZ value, the zoning ordinance language that explains the density requirement.
- (b) The impact adjustment map used for OSP credit, with “LZ#” marked on the qualifying areas. It must show the areas to be credited for LZ, areas that are credited for open space preservation (OSP), and the SFHA. Only the portion that covers the SFHA is needed.
- (c) For extra credit for low-density zoning in flood-prone areas outside the SFHA, documentation showing that floodplain regulations are in effect in these areas.

The ISO/CRS Specialist may visit a sample of new developments to verify that they have been developed in accordance with the required density.

422.h. Natural shoreline protection (NSP)

The maximum credit for this element is 120 points.

Natural channels and shorelines are the areas most valuable for protecting natural floodplain functions. They are important places for aquatic and riparian habitat. NSP credit is for allowing these areas to follow their natural processes, such as channel meandering and beach erosion, and to encourage natural shorelines that provide water quality benefits for runoff.

Note that a setback or buffer that prohibits buildings and filling can qualify as OSP but are not sufficient for NSP.

Programs to protect channels and shorelines in their natural state are credited in NSP. These include

- Regulations that govern development and construction, such as an ordinance or regulation that governs public and private construction activities; and
- Local policies followed on public lands, such as a written community policy that covers shorelines in city parks.

Protection credit is only available for channels or shorelines that are currently in their approximate natural state, i.e., there is no concrete, rip rap, levees, armoring, beach nourishment, dams, or other human intervention that constrains the natural processes of the shoreline of the river, stream, lake, or ocean.

Credit Criteria for NSP

(1) The regulation or program to protect natural shorelines must prohibit

- In channels and channel banks in riverine areas: Rip rap or armoring, channel alterations, dredging, filling, grubbing, and removal of vegetation; and

- On shorelines of lakes or oceans: The filling of or other alterations to a beach, including beach nourishment projects; alterations to sand dunes; and construction of seawalls, bulkheads, armoring, or other shoreline stabilization structures.
- (2) The regulation or program may allow human alterations that benefit natural floodplain functions, such as removing a levee, restoring habitat, or planting to preserve sand dunes, provided that the projects do not prevent channel or shoreline movement or reduce other natural floodplain functions.

Credit Points for NSP

NSP = up to 120 points, based on the length of the community's shorelines that are affected by the natural shoreline protection regulations or programs

Impact Adjustment for NSP

- (1) The impact adjustment is not related to the areas of the SFHA or channels in the SFHA. It is based on the length of protected shorelines divided by the total length of all the shorelines in the community. Each channel has two shorelines, one on each side. It is possible that only one side would qualify for NSP credit, so they are measured and counted separately.
- (2) Credit is provided in developed areas, undeveloped areas, and areas credited as preserved open space (OSP). Communities are encouraged to take steps to protect shorelines in parks and other public lands. Credit is provided even if the only creditable activity is a community policy for parks and other public lands.
- (3) The community must prepare an impact adjustment map showing all streams, ditches, and ocean or lake shorelines in the community. The length of these features is the value for aSL. Armored or concrete channels, manmade ditches, hardened shorelines, etc., are counted toward aSL, but not toward aNSP.

The map must be consistent with the impact adjustment map used for channel debris removal (CDR) under Activity 540 (Drainage System Maintenance). Unlike the map for CDR, however, the impact adjustment map prepared for NSP must show all streams in both developed and undeveloped areas.

$$rNSP = \frac{aNSP}{aSL}, \text{ where}$$

aNSP = the length of shoreline affected by the program, and

aSL = the total length of shoreline in the community

If less than 10% of all the community's shorelines are affected by the regulations or programs or the community does not prepare an impact adjustment map, the value of rNSP = 0.1 can be used.

Documentation for NSP Provided by the Community

(1) At each verification visit,

- (a) [For credit for protection of natural shorelines] A copy of the regulations or policy on which the credit is based.
- (b) An impact adjustment map (not needed if the community is using the optional minimum impact adjustment value of 0.1).

The ISO/CRS Specialist may visit a sample of shoreline sites to verify that they qualify for the credit.

423 Credit Calculation

$$c420 = (OSP \times rOSP) + (DR \times rDR) + cNFOS + \\ cSHOS + cCEOS + cOSI + cLZ + (NSP \times rNSP), \quad \text{where}$$

$$cNFOS = (NFOS1 \times rNFOS1) + (NFOS2 \times rNFOS2) + \\ (NFOS3 \times rNFOS3) + (NFOS4 \times rNFOS4), \text{ and}$$

$$cOSI = (OSI1 \times rOSI1) + (OSI2 \times rOSI2) + (OSI3 \times rOSI3) + \\ (OSI4 \times rOSI4) + (OSI5 \times rOSI5) + \\ (OSI6 \times rOSI6) + OSI7, \text{ and}$$

$$cLZ = LZ\#s \times rLZ\#s$$

Example 423-1.

South Scottsdale calculates its credit for Activity 420.

$$OSP = 1,540 \quad rOSP = 0.48$$

$$DR = 50 \quad rDR = 0.11$$

$$OSI4 = 70 \quad rOSI4 = 0.18$$

$$OSI5 = 25 \quad rOSI5 = 0.18$$

$$OSI7 = 10$$

$$\begin{aligned}
 cOSI &= (OSI4 \times rOSI4) + (OSI5 \times rOSI5) + OSI7 \\
 &= (70 \times 0.18) + (25 \times 0.18) + 10 = 12.60 + 4.50 + 10 \\
 &= 27.10
 \end{aligned}$$

cSHOS = 0, cLZ = 0, cNSP = 0

$$\begin{aligned}
 c420 &= (OSP \times rOSP) + (DR \times rDR) + cNFOS + cSHOS + cOSI + \\
 &\quad cLZ (NSP \times rNSP)
 \end{aligned}$$

$$\begin{aligned}
 c420 &= (1,450 \times 0.48) + (50 \times 0.11) + 0 + 0 + 27.10 + 0 + 0 \\
 &= 696.00 + 5.50 + 27.10 = 728.60
 \end{aligned}$$

This is rounded to the nearest whole number. c420 = 729

424 For More Information

- a. Additional information, reference materials, and examples can be found at www.CRSresources.org/400.
- b. More information on planning and regulatory techniques to preserve floodplain open space can be found in *Subdivision Design and Flood Hazard Areas*, (2015), Planning Advisory Service Report #584. It can be downloaded from the American Planning Association's website at <https://www.planning.org/nationalcenters/hazards/subdivisiondesign/>.

425 Related Activities under the Community Rating System

- Activity 320 (Map Information Service) credits providing information about natural and sensitive areas (MI7) and Activity 440 (Flood Data Maintenance) credits having a data base or GIS layer of such areas. These should include the areas credited for NFOS.
- Activity 410 (Flood Hazard Mapping) provides credit for mapping and regulating areas outside the SFHA. If such areas include parks or other qualifying preserved open space, those areas can be credited in this activity.
- The first element under Activity 430 (Higher Regulatory Standards), development limitations (DL), provides credit for regulations that prohibit filling, buildings, and/or storage of materials. If a community's regulations do not qualify for OSP, they may qualify for DL credit.
- A prerequisite for Activity 520 (Acquisition and Relocation) credit is that the property that has been cleared must meet the OSP criteria for preserved open space. All such properties should receive OSP credit. If the properties were cleared with FEMA mitigation funds, they should also qualify for deed restriction (DR) credit. Many other federal and state funding programs have similar deed restriction requirements.

430 Higher Regulatory Standards—Summary

Maximum credit: 2,462 points

Credit for FRB, FDN, ENL, and CAZ are not counted toward this total because those elements and DL credit are mutually exclusive.

432 Elements

- a. **Development limitations (DL)**: Up to 1,330 points for prohibiting fill, buildings, and/or storage of materials in the SFHA.
- b. **Freeboard (FRB)**: Up to 500 points for a freeboard requirement.
- c. **Foundation protection (FDN)**: Up to 80 points for engineered foundations.
- d. **Cumulative substantial improvements (CSI)**: Up to 90 points for counting improvements cumulatively.
- e. **Lower substantial improvements (LSI)**: Up to 20 points for a substantial improvement threshold lower than 50%.
- f. **Protection of critical facilities (PCF)**: Up to 80 points for protecting facilities that are critical to the community.
- g. **Enclosure limits (ENL)**: Up to 390 points for limiting enclosures below the base flood elevation.
- h. **Building code (BC)**: Up to 100 points for adopting and enforcing the International Code Series.
- i. **Local drainage protection (LDP)**: Up to 120 points for ensuring that new buildings are protected from shallow flooding.
- j. **Manufactured home parks (MHP)**: Up to 15 points for removing the elevation exemption for manufactured homes placed in existing manufactured home parks.
- k. **Coastal A Zones (CAZ)**: Up to 500 points for enforcing V-Zone rules inland from the V-Zone boundary.
- l. **Special flood-related hazards regulations (SHR)**: Up to 100 points for enforcing appropriate construction standards in areas subject to a special flood-related hazard.
- m. **Tsunami hazard regulations (TSR)**: Up to 50 points for enforcing appropriate construction standards in areas subject to a tsunami.
- n. **Coastal erosion hazard regulations (CER)**: Up to 370 points for enforcing appropriate construction standards and setbacks in areas subject to significant coastal erosion.
- o. **Other higher standard (OHS)**: Up to 100 points for other regulations.
- p. **State-mandated regulatory standards (SMS)**: Up to 20 bonus points if a regulatory standard is required by the state.
- q. **Regulations administration (RA)**: Up to 67 points for having trained staff and administrative procedures that meet specified standards.

Credit Criteria

Credit criteria for this activity are described in Section 431.b. Each element has additional criteria specific to that element.

Impact Adjustment

There is no impact adjustment for BC, LDP, MHP, SMS, or RA. The credit for all other elements is adjusted and explained in Section 431.c. For some elements, additional details are described in separate sections.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

430 HIGHER REGULATORY STANDARDS

The OBJECTIVE of this activity is to credit regulations to protect existing and future development and natural floodplain functions that exceed the minimum criteria of the National Flood Insurance Program (NFIP).

431 Background

Although the NFIP minimum standards provide a great deal of flood protection, damage can still result for many reasons:

- Estimates of flood heights are subject to various errors;
- Changes in weather patterns may alter flood-heights;
- Buildings may be damaged by floods that exceed the predicted 100-year flood;
- Urbanization and other changes in the watershed can increase the flood hazard and flood frequency;
- Filling and other development in the floodplain can reduce storage and conveyance capacity, increasing flood hazards; and
- Filling and construction practices can damage or destroy valuable natural floodplain functions.

For these reasons, and the fact that local situations vary, many communities adopt development standards that are higher than or supplement the minimum NFIP criteria.

This activity provides credit for those regulatory standards.

Current NFIP standards for regulation of development in riverine areas require that new residential buildings in the Special Flood Hazard Area (SFHA) have their lowest floor at or above the base flood elevation. Non-residential buildings may be floodproofed to the base flood elevation. NFIP coastal rules require that new buildings be above the base flood elevation and, in V (velocity) Zones, be built on engineered piles or columns. If an existing building is improved or reconstructed and the value of the project exceeds 50% of the building's value, the building must be brought up to the same standards applied to new construction.

431.a. Activity Description

Under this activity, numerous higher regulatory approaches are credited that provide more protection to new development, redevelopment, and existing development. Examples of higher standards and the benefits that they can provide include

- Prohibiting fill and other ground-altering measures can protect existing development and habitat, improve water quality, and maintain the flood attenuating benefits of natural areas (credited under DL1a);
- Requiring compensatory storage preserves areas of the floodplain that can store flood water and minimizes increases in flood heights due to development (credited under DL1b);
- Requiring the lowest floors of residences to be higher than the base flood elevation protects buildings from higher floods (credited under FRB);
- Protecting foundations reduces damage that results from scour and settling (credited under FDN);

- Requiring full compliance with floodplain management regulations when proposed improvements or repairs are less than 50% of a building's value brings more nonconforming buildings up to current flood protection standards (credited under CSI and LSI);
- Protecting critical facilities to higher levels reduces damage to those facilities and improves the community's ability to respond to the needs of citizens during a disaster (credited under PCF);
- Adopting and enforcing a building code improves the quality of construction of new buildings and provides more staff support for floodplain management regulations (credited under BC);
- Standards for protecting buildings from local drainage problems reduce flood losses and flood insurance claims, especially outside the floodplain (credited under LDP);
- Requiring new manufactured housing in existing manufactured housing parks to meet the same level of protection as is required for other new buildings reduces flood losses and flood insurance claims (credited under MHP);
- Requiring new construction in the coastal A Zone to meet the same standards as V-Zone buildings protects it from a known breaking wave hazard (credited under CAZ);
- Adopting and enforcing construction rules tailored to special flood-related hazards, such as riverine erosion and alluvial fan flooding, provides protection in ways that the NFIP's national minimum criteria do not (credited under SHR);
- Adopting and enforcing regulations addressing tsunami hazards protects people and structures from the impacts of a tsunami (credited under TSR);
- Adopting and enforcing regulations addressing long-term coastal erosion can reduce the loss of structures caused by the erosion of beaches, dunes, and bluffs (credited under CER); and
- Having Certified Floodplain Managers (CFM[®]) and high-quality administrative procedures and inspections can reduce errors and minimize problems during construction (credited under RA).

A community should not amend its ordinances solely to earn Community Rating System (CRS) credit points, nor should it necessarily adopt the examples used in the *CRS Coordinator's Manual*. Ordinance language should be carefully written to support the community's own goals and the purposes of its regulatory program. All such language should be reviewed by the community's legal counsel before it is adopted.

The element OHS (other higher standards), provides credit for regulations not listed in this or other activities. As noted in Section 113.d, communities are invited and encouraged to submit other regulatory provisions that are not part of the NFIP's minimum criteria and/or alternative approaches to the credits listed here.

431.b. Activity Credit Criteria

For all the elements except RA (regulations administration, Section 431.q), the community must provide a legally enforceable regulation. In most cases, this will be in the form of an ordinance adopted by the community's governing body and incorporated into its municipal code.

- (1) Regulations adopted by a county, regional agency, or state that are enforced within the community can be credited. Their implementation is verified in the same manner as a community regulation and it is expected that the community will assist in the verification.
- (2) Regulations must have the force of law and meet the requirements of Section 231.b.
- (3) If the legal authority for the regulatory language is not clear, the ISO/CRS Specialist may request a letter from the community's legal counsel that confirms that he/she will defend the regulation in court if it is challenged.
- (4) For CRS credit, the regulatory language must be adopted and in full force at the time CRS credit is requested, e.g., at the verification visit.
- (5) If the community approves Conditional Letters or Letters of Map Revision based on Fill (CLOMR-Fs or LOMR-Fs) by signing a "Community Acknowledgment Form" (MT-1 Form 3), the credit will be adjusted or prorated.
- (6) Credit for any element is prorated if the sampling done during verification finds instances in which the element is not fully implemented. It does not matter why it is not fully implemented. For example, if a review of Elevation Certificates finds that some new buildings did not have the required freeboard because of legally issued variances, the credit is prorated.

See also Section 231 on documentation of regulations for CRS credit.

431.c. Activity Impact Adjustment

Impact adjustment ratios are part of the calculations for all elements in Activity 430 except BC, LDP, MHP, SMS, and RA. They are explained in Sections 402–403.

Impact Adjustment Maps

An impact adjustment map must be prepared when

- (1) The areas qualifying for Activity 430 credit need to be determined for the impact adjustment ratio, or
- (2) The regulations are enforced outside the Special Flood Hazard Area (SFHA) (so that the impact adjustment ratio can be greater than 1.0).

When preparing an impact adjustment map, note that

- (1) The areas affected by the regulation(s) must be marked on an impact adjustment map. Marking each area with the appropriate acronym is a convenient shorthand. Section 402 has additional information about determining impact adjustments for areas.
- (2) Areas to be credited for a higher regulatory standard must not include areas preserved as open space (OSP) in Activity 420 (Open Space Preservation). Therefore, OSP credited areas must be shown on the impact adjustment map used for Activity 430. There is no Activity 430 credit for higher standards for fill or buildings in areas where fill and buildings are not allowed (i.e., areas preserved as open space). This is explained in Section 402.c.
- (3) An impact adjustment map does not need to be prepared when a regulatory standard is enforced throughout the entire SFHA and there is no creditable open space. The impact adjustment ratio in that case is 1.0. However, the community must be certain that a regulation is enforced throughout the regulatory floodplain. For example, the ordinance may say that all new buildings must be built to a freeboard level, but that rule may only apply in flood zones where a base flood elevation is provided. In such cases, an impact adjustment map would be needed to delineate and calculate the areas affected by the freeboard standard.
- (4) An impact adjustment map does not need to be prepared when a regulatory standard is enforced throughout the entire SFHA, but the map must show those areas for which the community is requesting or receiving credit for preserving open space (OSP) under Activity 420 (Open Space Preservation). If the only adjustment to the impact of an element is for OSP, the impact adjustment ratio for the 430 element is the complement of the impact adjustment for OSP.

Example 431.c-1.

A community has 22% of its SFHA preserved as open space.
 $r_{OSP} = 0.22$. The community enforces its freeboard requirement throughout the rest of the SFHA.

$$r_{FRB} = 1 - r_{OSP} = 1 - 0.22 = 0.78$$

There is no need for a separate impact adjustment map for Activity 430 in this instance.

- (5) If less than 10% of the community's SFHA is affected by the regulations or if the community does not prepare an impact adjustment map, an impact adjustment ratio of 0.1 can be used (up to 0.5 for CAZ).
- (6) When regulations are enforced outside the SFHA, the impact adjustment ratio can be greater than 1.0, the community will receive more points than the maximum listed for the element. The maximum ratio for this is 1.5 (i.e., the area regulated is 50% (or more) larger than the SFHA) less the impact adjustment in Activity 420 for OSP.

The maximum total impact adjustment for any element in 430 combined with the impact adjustment for 420 OSP cannot exceed 1.5.

Sections 402–403 provide guidance on impact adjustments and impact adjustment maps. Additional criteria and clarifications may be included under each activity's impact adjustment section.

431.d. Activity Documentation Provided by the Community

Most elements in this activity have the same documentation needs at the verification visit:

- (1) The state or local law or ordinance language that adopts the regulatory standard that is being enforced in the community. See also Sections 231.b and 231.c on documenting regulatory language.
- (2) The impact adjustment map. See Section 431.c.
- (3) [For credit for regulating flood-prone areas outside the SFHA] Documentation that shows that regulations are in effect outside the SFHA (i.e., the regulatory floodplain).
- (4) Development plans and/or permit records that document how the regulation has been applied.

The ISO/CRS Specialist may visit a sample of sites in the field to verify that the land has been developed and/or buildings have been constructed in accordance with the approved plans.

Some elements have additional or different documentation requirements, as noted in the separate documentation sections, below.

432 Elements

432.a. Development limitations (DL)

The maximum credit for this element is 1,330 points.

This element has three parts, crediting different aspects of the regulation of floodplain development:

- (1) Prohibition of fill (DL1) (maximum credit: 280 points). The use of fill to elevate buildings has advantages that make it desirable for developers and homeowners. However, there are problems with using fill: it reduces floodplain storage capacity, can deflect waves onto neighboring property, and it has an adverse impact on native vegetation, wetlands, drainage, and water quality.

The benefits of using fill accrue to the developer and to the property owner. Conversely, the problems accrue to neighbors, taxpayers, the community, the NFIP, or the environment. Because filling is not a desirable floodplain management activity, this element credits communities that prohibit fill.

One method to offset the impacts of the use of fill is to require compensatory storage, but compensatory storage does not compensate for the adverse impact on other natural floodplain functions. Therefore, it is worth approximately half the credit. This credit is for regulations that require new developments to provide compensatory storage at hydrologically equivalent sites up to a ratio of 1.5 to 1.

- (2) Prohibition of buildings (DL2) (maximum credit: 1,000 points). If the regulations prohibit only certain types of buildings, such as residences, the points can be prorated.
- (a) Prohibition of all buildings (DL2a): Full credit for DL2 is for prohibiting all buildings and LOMR-Fs.
 - (b) Prohibition of all buildings (DL2b): Partial credit is provided if the community allows LOMR-Fs.
- (3) Prohibition of outdoor storage of materials (DL3) (maximum credit: 50 points). Credit can be received under three sub-elements:
- (a) Prohibition of all materials (DL3a): Full credit for DL3 is for prohibiting outdoor storage of all materials in the SFHA.
 - (b) Prohibition of hazardous materials (DL3b): Partial credit is provided if only hazardous materials are prohibited (indoors or outdoors).
 - (c) Storage of hazardous materials (DL3c): Credit is provided if hazardous materials are allowed to be stored indoors in the floodplain, but must be elevated above the base flood elevation.

If all three items (DL1, DL2, and DL3) are included in the community's regulations and there are still vacant areas in the regulatory floodplain, those areas would be effectively preserved as open space. The community should submit those areas for the higher credit for OSP in Activity 420 (Open Space Preservation). See Section 422.a(3)(c).

These regulations have their full impact in undeveloped areas. Therefore, the impact adjustment map must identify areas credited for open space preservation (OSP) and areas that are undeveloped, i.e., where there are no buildings on the parcels or the area is zoned for conservation or agriculture with a minimum lot size of 10 acres or larger.

Credit Criteria for DL

(1) Prohibition of fill (DL1):

- (a) Prohibition of all fill (DL1a): This credit is for prohibiting all filling in the regulatory floodplain.

This includes the community's NOT approving Conditional Letters or Letters of Map Revision based on Fill (CLOMR-F or LOMR-F). If a CLOMR-F or LOMR-F is issued for a property in the community, then DL1 credit will be denied. This applies to CLOMRs and LOMRs that include filling as part of the reason for requesting a map change.

Minor filling may be allowed where needed to protect or restore natural floodplain functions, such as a part of a channel restoration project.

The following regulatory approaches do not warrant credit for DL1:

- Regulations that prohibit loss of storage only if it adversely affects flood heights on other properties. This credit is for prohibiting all filling, particularly because of its adverse effect on natural floodplain functions.
- Subdivision regulations that do not apply to all new development.
- Regulations that apply to buildings or private development, but not to bridges, highways, parking lots, and other floodplain uses.
- The standard NFIP language that prohibits increases in flood heights in floodways. That standard does not prohibit fill—it allows filling that can be shown by an engineering study not to increase flood levels. It reads

Prohibit encroachments, including fill, new construction, substantial improvements and other developments unless certification (with supporting technical data) by a registered professional engineer is provided demonstrating that encroachments shall not result in any increase in flood levels during occurrence of the base flood discharge; . . .

(b) Compensatory storage (DL1b): This credit is for regulations that require new development to provide compensatory storage at hydraulically equivalent sites up to a ratio of 1.5:1. Credit is not provided for

- Compensatory storage requirements in floodways only or in V Zones only, or
- Stormwater management regulations that require a developer to compensate for any increase in runoff created by the development. This is credited under Activity 450.

(2) Prohibition of buildings (DL2): Full credit for DL2 is for prohibiting all new buildings in the SFHA.

This includes not approving CLOMR-Fs or LOMR-Fs. When a CLOMR-F or LOMR-F is applied for, the community is required by the Federal Emergency Management Agency (FEMA) to sign a Community Acknowledgment Form that states, in part, “the completed or proposed project meets or is designed to meet all of the community floodplain management requirements . . .” If a CLOMR-F or LOMR-F is issued for a property in the community, then DL2 credit will be adjusted. This applies to CLOMRs and LOMRs that include filling as part of the reason for requesting a map change.

If the regulations only prohibit certain types of buildings, such as residences, the points will be prorated. If buildings are prohibited in parts of the SFHA, such as the floodway, the impact adjustment will adjust the points. Prohibiting critical facilities is credited in Section 432.f, Protection of critical facilities, not under DL2.

(3) Prohibitions on storage of materials (DL3) has no additional criteria.

Credit Points for DL

(1) DL1 = EITHER:

- (a) 280 points, for regulations that prohibit fill within floodplains, including construction of buildings on fill,

OR

- (b) 130 points x the ratio of compensation, for regulations that require new development to provide compensatory storage at hydraulically equivalent sites up to a maximum of 195 for a ratio of 1.5:1 or greater
-

Example 432.a-1.

A community requires that for each cubic foot of fill placed in the regulatory floodplain, the builder must remove a cubic foot of fill from a hydraulically equivalent location. The compensation ratio is 1:1, so DL1b = $130 \times 1 = 130$.

Gulf Beach County requires that for each cubic foot of fill placed in the regulatory floodplain, the builder must remove 1.25 cubic feet of fill from a hydraulically equivalent location. The compensation ratio is 1.25:1, so DL1b = $130 \times 1.25 = 162.50$.

(2) DL2 = 1,000 points, for regulations that prohibit buildings within the regulatory floodplain and when CLOMR-Fs and LOMR-Fs are neither recognized nor approved by the community,

OR

DL2 = 100 points, for regulations that prohibit buildings within the regulatory floodplain and when the community approves CLOMR-Fs and LOMR-Fs

If the regulations only prohibit certain types of buildings, such as residences, the points will be prorated.

(3) DL3 = one of the following:

- (a) 50 points, for regulations that prohibit outdoor storage of materials within the regulatory floodplain,

OR

- (b) 20 points, for regulations that prohibit storage of hazardous materials anywhere in the floodplain,

OR

- (c) 10 points, for regulations that require hazardous materials to be stored indoors, above the base flood elevation
-

DL3 credit is not cumulative. If the regulations govern storage of only certain kinds of materials, the points will be prorated.

Impact Adjustment for DL

DL credit is adjusted based on the ratio of the area affected by the DL regulation to the area of the SFHA. See Section 431.c on calculating an impact adjustment. The following additional criteria apply:

- (1) The areas affected by the DL regulation(s) must be marked on an impact adjustment map that meets the criteria in Section 431.c. In addition to showing areas credited under OSP, the impact adjustment map must also show developed and undeveloped areas. “Undeveloped” means that there are no buildings on the parcels or that the area is zoned for conservation or agriculture with a minimum lot size of 10 acres (these areas may also qualify for LZ credit).
 - (2) Areas credited for DL credit must exclude areas credited for OSP. However, if the DL regulations are sufficient, vacant areas may qualify for OSP and the community should receive the higher points under OSP (see Section 422.a(3)(c)).
 - (3) Only undeveloped areas are eligible for DL1a and DL2 credit, unless the regulations clearly state that they apply to developed areas. For example, if DL2 regulations are enforced in areas already developed and a building is substantially damaged, it cannot be replaced and the site must be cleared and kept vacant. Note that if a DL2 regulation prohibits all new buildings except farm structures, the value for DL2 can be prorated and the credit can be applied to areas with farm structures.
 - (4) DL1b, compensatory storage, and DL3, prohibitions on storage of materials, can be credited in developed areas.
-

$$rDL\# = \frac{aDL\#}{aSFHA}, \text{ where}$$

$aDL\#$ = the size of the area(s) that qualify for DL# credit
($aDL1a$ is the size of the area that qualifies for
DL1a credit, etc.), and

$aSFHA$ = the size of the community's SFHA

$$cDL = (DL1 \times rDL1) + (DL2 \times rDL2) + (DL3 \times rDL3)$$

Documentation for DL Provided by the Community

(1) The activity documentation requirements listed in Section 431.d must be met.

432.b. Freeboard (FRB)

The maximum credit for this element is 500 points.

The NFIP requires that the lowest floor of residential structures be elevated to or above the base flood elevation and that non-residential structures be elevated or floodproofed to or above the base flood elevation. Attached garages and utilities (including electrical, heating, ductwork, ventilating, plumbing, and air conditioning equipment) must also be protected to the base flood elevation (*44 Code of Federal Regulations (CFR) §60.3(a)(3)*). This can be done by elevating them or using flood-resistant materials during construction.

A freeboard requirement adds height above the base flood elevation to provide an extra margin of protection to account for waves, debris, miscalculations, changing weather patterns, or lack of data. A freeboard requirement of one foot means that the level of protection for the lowest floor (or lowest horizontal structural member in V Zones), machinery and equipment, etc. is one foot above the base flood elevation.

Credit Criteria for FRB

(1) Lowest floor, utilities, and garages: For FRB credit, freeboard must be applied to the elevation of the lowest floor (or lowest horizontal structural member in V Zones) of the building or to the elevation to which a non-residential building is dry floodproofed, and to all components of the building, including all utilities, ductwork, and attached garages. All portions of the building below the freeboard level must be constructed using flood-damage-resistant materials. If the garage floor is below the freeboard level, the garage must meet the opening and wet floodproofing requirements for enclosures.

Two references on these requirements are *Protecting Building Utilities from Flood Damage*, FEMA-348, and *Flood Damage-Resistant Materials Requirements*, Technical Bulletin 2 (2008).

(2) The amount of freeboard is measured according to the following criteria:

- (a) In A Zones, freeboard is measured from the top of the lowest floor. In V Zones, it is measured from the bottom of the lowest horizontal structural member. If the ordinance uses “lowest horizontal structural member” or similar language instead of “lowest floor” in areas outside of the V Zone or coastal A Zones where CAZ credit applies, 1 foot is added to the amount of freeboard credited. For example, if the community’s ordinance requires that buildings in the A Zones be elevated so the bottom of the floor joists is at least 1.0 feet above the base flood elevation, the ordinance is scored as requiring 2.0 feet of freeboard.
- (b) For the purpose of calculating CRS credit for freeboard, the 500-year flood elevation is considered to be one foot higher than the base flood elevation, unless the community demonstrates that it is higher. For example, if the community’s ordinance requires that the building be protected to at least the 500-year flood elevation, the ordinance is scored as requiring 1.0 feet of freeboard.

(c) In AO Zones, base flood depths are provided instead of base flood elevations. Where depths are not provided, the NFIP regulations require new buildings to be elevated 2 feet above the highest adjacent grade. Some communities misinterpret this requirement as two feet of freeboard. Elevating 2 feet above the highest adjacent grade in an AO Zone where no base flood depth is provided is a minimum requirement of the NFIP and is not eligible for credit.

However, in AO Zones with depth numbers, the NFIP requires elevation above that depth. Going higher than the specified depth warrants FRB credit, which is scored the same as in an AE Zone.

(d) “Stem wall” construction involves constructing the foundation walls above grade, filling the interior area, and pouring a slab over the fill. From the outside, the building looks as though it is elevated on a crawlspace, but openings are not required. Such buildings are categorized as Diagram 1.b in the FEMA Elevation Certificate. This construction practice does not prohibit fill, but it limits the amount of fill to the building footprint. If the regulations prohibit fill for new buildings, but allow for stem wall construction, the credit is the average of the values in the “No filling restrictions” and “Compensatory storage required” columns in the table in the Credit Points section, below.

(e) If the ordinance uses the encroached elevation using FEMA’s standard allowable maximum rise of one foot, add 0.5 feet to the amount of freeboard. Detailed riverine flood studies that produce a floodway provide a flood elevation based upon the floodway encroachment. In a Flood Insurance Study, these elevations are listed in the “With Floodway” column in the Floodway Data Table. They are generally higher than the “Without Floodway” or “Regulatory” flood elevations. For example, if the community’s ordinance requires that the building be protected to at least one foot above this encroached elevation, the ordinance is scored as requiring 1.5 feet of freeboard.

(f) Many communities have focused on elevating the top of the lowest floor, but have allowed utilities (especially ductwork) to hang below the floor joists, where it can be flooded. Flooded ductwork can add thousands of dollars to an insurance claim. This is primarily a concern for buildings on crawlspaces. Buildings on slab foundations, on pilings, and in V Zones typically have the utility facilities waterproofed or elevated to a sufficient height.

To receive full credit for this element, electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities (including ductwork) must be elevated or waterproofed to the base flood elevation plus freeboard. If the community requires that electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities (including ductwork) be elevated or made of flood-resistant materials above the base flood elevation, but does not require these facilities to be elevated or protected to the freeboard level, then the value for freeboard in the table is considered to be 75% of the elevation requirement.

If utilities and ductwork are not required to be elevated, floodproofed, or otherwise protected to the base flood elevation, there is no credit for FRB.

Credit Points for FRB

FRB = as shown below, based on the required freeboard

Freeboard	No filling restrictions	Compensatory storage required	Fill prohibited
1 foot	100	110	120
2 feet	225	250	280
3 feet	375	440	500

- (1) More points are provided if the community prohibits buildings on fill (e.g., they must be constructed on piers, pilings, or flow-through crawlspaces) or requires compensatory storage if filling is used.
- (2) The values for freeboard levels not shown are interpolated from the credit points table. For example, the value for 1.5 feet of freeboard where compensatory storage is required is the average of the values for 1.0 foot and 2.0 feet: $(110 + 250) \div 2 = 180$ points.
- (3) If a community has more than three feet of freeboard, the regulations will be reviewed for special credit higher than the points shown in the credit points table, above. The community will need to provide additional information to warrant the higher credit, such as a demonstrated expectation of new growth in the area.
- (4) Other adjustments to the scoring are explained in the section on credit criteria, above.

Impact Adjustment for FRB

FRB credit is adjusted based on the ratio of the area affected by the freeboard requirement to the area of the SFHA. See Section 431.c on calculating an impact adjustment. The following additional criteria apply.

- (1) Areas requested for FRB credit must exclude areas credited for OSP or DL2.
- (2) There are instances in which a community may have different freeboard requirements in different areas, such as
 - The community does not require freeboard where there are no base flood elevations, such as in approximate A Zones and AO Zones;
 - Freeboard is only required for elevated buildings (non-residential buildings may be floodproofed to the base flood elevation without freeboard);
 - Manufactured homes have a different elevation requirement; or
 - There is higher freeboard in a V Zone or a floodplain subject to deeper flooding.

In these cases, the formulae should use FRB#1, FRB#2, etc. to calculate the appropriate values for the different areas.

$$rFRB = \frac{aFRB}{aSFHA}, \text{ where}$$

aFRB = the size of the area(s) that qualifies for FRB credit, and

aSFHA = the size of the community's SFHA

Example 432.b-1.

South Scottsdale is a fictitious community used for CRS examples (see Figure 430-1). The City requires that all new buildings and substantial improvements be elevated two feet above the base flood elevation. To minimize floodplain encroachments, the City also requires that all new buildings be constructed either (1) without fill on flow-through foundations, such as piers or crawlspaces with sufficient openings, or (2) on slab foundations with compensatory storage required for any filling.

$$FRB = 250$$

These regulations apply throughout the SFHA. In the approximate A Zones of Tributaries A and B, buildings must be elevated two feet above the base flood elevation calculated by the permit applicant (which is credited in Activity 410 (Flood Hazard Mapping)).

These regulations only have an impact where new buildings and substantial improvements can be constructed. As noted in Section 431.c(4), areas set aside from development as preserved open space are excluded from the impact adjustment calculations.

aFRB = the size of the area(s) that qualify for FRB credit, i.e., the SFHA not credited for OSP under Activity 420 (Open Space Preservation)

$$aSFHA = 504.40$$

$$aOSP = 242.90$$

$$aFRB = aSFHA - aOSP = 504.40 - 242.90 = 261.50$$

$$rFRB = \frac{aFRB}{aSFHA} = \frac{261.50}{504.40} = 0.52$$

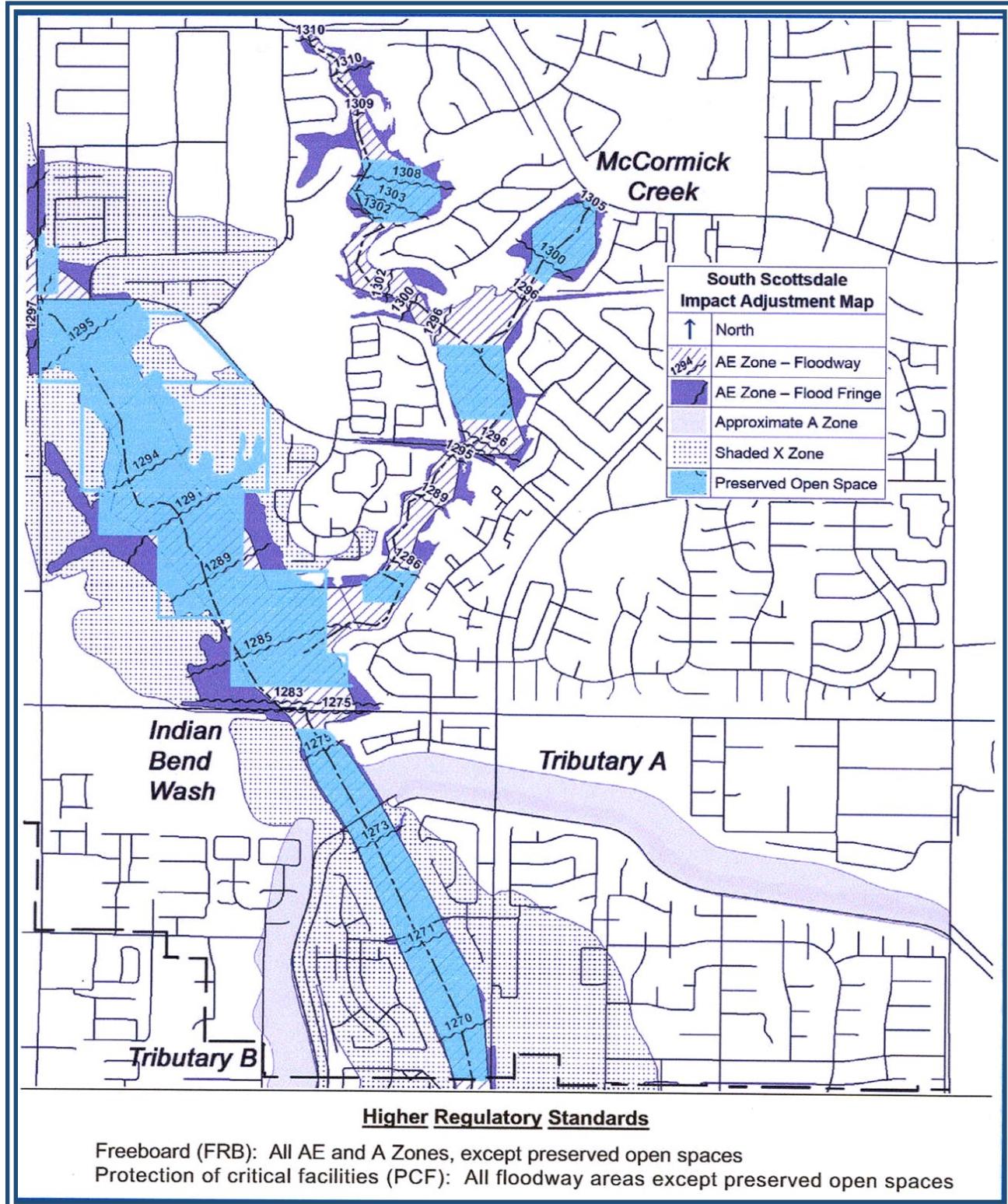


Figure 430-1. South Scottsdale's impact adjustment map for Activity 430.

According to Section 433, Credit Calculation, the value for two feet of freeboard with compensatory storage (250) is multiplied by the ratio for rFRB, 0.52. The total credit for South Scottsdale's freeboard requirement, cFRB, is 52% of 250.

Documentation for FRB Provided by the Community

(1) The activity documentation requirements in Section 431.d must be met.

432.c. Foundation protection (FDN)

The maximum credit for this element is 80 points.

The element FDN credits protection against differential settling as well as scour and erosion.

See also *Ensuring that Structures Built on Fill in or near Flood Hazard Areas are Reasonably Safe from Flooding*, FIA-TB-10, 2001 (also available at www.fema.gov/library/viewRecord.do?id=1723).

Credit Criteria for FDN

- (1) For FDN1 credit, ALL new buildings in the regulatory floodplain
 - (a) Must be constructed on foundations that are designed and sealed by a registered design professional as complying with the requirements of the International Building Code, the International Residential Code, or ASCE 24, and
 - (b) Must not be constructed on fill.
- (2) For FDN2 credit, ALL new buildings constructed on fill in the regulatory floodplain
 - (a) Must be constructed on properly designed and compacted fill (e.g., fill that meets the criteria of (1) Section 1803.5.8 and Section 1804.4 of the International Building Code, (2) Section 2.4 of ASCE 24, or (3) their equivalent);
 - (b) Must be on fill that has appropriate protection from erosion and scour; and
 - (c) Must meet a compensatory storage requirement (for the building and fill) that meets the credit criteria of Section 432.a., Development Limitations (DL1b).

FDN1 requires foundations to be “designed and sealed by a registered design professional.” This is a higher standard than that specified in the minimum NFIP criteria.

Many ordinances have language like the following, which are minimum NFIP criteria and DO NOT qualify for FDN credit:

“Certificate from a registered design professional that the non-residential floodproofed building will meet the ordinance’s floodproofing criteria”

“Requirements for an engineering certificate for foundations in V Zones”

“Having an engineer certify opening standards that differ from the one square inch per one square foot of floor area.”

- (3) For FDN3 credit, all new buildings built on fill in the regulatory floodplain
- (a) Must be constructed on properly designed and compacted fill (e.g., fill that meets the criteria of (1) Section 1803.5.8 and Section 1804.4 of the International Building Code, (2) Section 2.4 of ASCE 24, or (3) their equivalent), and
 - (b) Must be on fill that has appropriate protection from erosion and scour.

Credit Points for FDN

FDN = one of the following. These points are not cumulative.

- (a) FDN1 = 80 points, for engineered foundations and no buildings on fill
- OR
- (b) FDN2 = 60 points, for buildings on compacted fill, protected from erosion and scour, with compensatory storage
- OR
- (c) FDN3 = 35 points, for buildings on compacted fill, protected from erosion and scour, but no compensatory storage
-

Impact Adjustment for FDN

FDN credit is adjusted based on the ratio of the area affected by the foundation protection regulation to the area of the SFHA. See Section 431.c on calculating an impact adjustment. The following additional criteria apply:

- (1) Areas delineated for FDN credit must exclude areas credited for OSP or DL2.
- (2) There is no credit for FDN in V Zones because the NFIP requires all new buildings in V Zones to have engineered foundations (44 CFR §60.3(e)(4)) and prohibits fill from being used for structural support (see §60.3(e)(6)). Therefore, V Zones must be excluded from aFDN unless the community has higher foundation protection standards than those in §60.3(e).

$$rFDN = \frac{aFDN}{aSFHA}, \text{ where}$$

aFDN = the size of the area(s) that qualify for FDN credit, and

aSFHA = the size of the community's SFHA

Documentation for FDN Provided by the Community

(1) The activity documentation requirements in Section 431.d must be met.

432.d. Cumulative substantial improvements (CSI)

The maximum credit for this element is 90 points.

The NFIP allows improvements valued at up to 50% of the building's pre-improvement value to be permitted without meeting the flood protection requirements for buildings located in the SFHA. Over the years, a community may issue a succession of permits for different repairs or improvements to the same structure. This can greatly increase the overall flood damage potential to that building as well as the insurance liability to FEMA.

CSI provides credit to a community that ensures that the total value of all improvements or repairs permitted OVER TIME does not exceed 50% of the value of the structure. When the total value does exceed 50%, the original building must be protected according to the ordinance requirements for new buildings.

Under some circumstances the NFIP flood insurance policy may pay a portion of the cost of bringing a substantially flood-damaged building into compliance with the community's floodplain management ordinance. If the community has a more restrictive definition of substantial damage, the provision may still apply. More information on Increased Cost of Compliance coverage can be found at www.CRSresources.org/400.

If a community does not regulate for cumulative substantial improvements, it may still receive credit for regulation of additions. Additions within the footprint of the original building would have to be to a floor above the base flood elevation. Additions outside the footprint of the original building would have to be elevated (non-residential structures could be floodproofed) above the base flood elevation.

Credit Points for CSI

Up to 90 points are provided for tracking improvements cumulatively.

CSI = the total of the following points, not to exceed 90 points

(1) EITHER:

- (a) 40 points, if the regulations require that improvements, modifications, and additions to existing buildings are counted cumulatively for at least 10 years

OR

- (b) 20 points, if the regulations require that improvements, modifications, and additions to existing buildings are counted cumulatively for at least 5 years

(2) EITHER:

- (a) 40 points, if the regulations require that reconstruction and repairs to damaged buildings are counted

cumulatively for at least 10 years

OR

- (b) 20 points, if the regulations require that reconstruction and repairs to damaged buildings are counted cumulatively for at least five years
- (3) 20 points, if the community adopts regulatory language that qualifies properties for Increased Cost of Compliance insurance coverage for repetitive losses
- (4) 20 points, if the regulations require that any addition to a building be protected from damage from the base flood

Impact Adjustment for CSI

CSI credit is adjusted based on the ratio of the area affected by the cumulative substantial improvement regulation to the area of the SFHA. See Section 431.c on calculating an impact adjustment.

$$rCSI = \frac{aCSI}{aSFHA}, \text{ where}$$

aCSI = the size of the area(s) that qualify for CSI credit, and

aSFHA = the size of the community's SFHA

Documentation for CSI Provided by the Community

(1) The activity documentation requirements in Section 431.d must be met.

(2) At each verification visit,

- (a) A list of all permits for building improvements or repairs in the regulatory floodplain that have been issued since the last visit. The list must include both substantial improvements and permitted projects that were not substantial improvements.

The ISO/CRS Specialist will review permit records that document how the regulation has been applied. The records need to track permits by parcel number or address, so that the history of improvements or repairs to a particular structure is checked before the next permit is issued.

432.e. Lower substantial improvements threshold (LSI)

The maximum credit for this element is 20 points.

The NFIP allows improvements valued at up to 50% of the building's pre-improvement value to be permitted without meeting the flood protection requirements for buildings located in the SFHA. LSI credits having a threshold that is lower than 50%.

LSI has the effect of requiring more structures to come into compliance if the owners want to improve them or if they are damaged. Since any community that participates in the NFIP already has a threshold (50%), it is only necessary for the community to change the number specified in its ordinance or regulations. A community must be sure that a minimum threshold is not set by state law before it adopts a different standard.

There are alternative ways to receive credit under item (2) in Credit Points, below:

- (a) Instead of basing the substantial improvement determination on the value of the building and the cost of the project, half credit is provided for limiting expansions of the building to no more than 25% of the square footage of the lowest floor.
- (b) Half credit is provided if the lower threshold applies to either improvements or to repairs to damaged buildings, but not both. Full credit is provided under (1) for both.

Under some circumstances the NFIP flood insurance policy may pay a portion of the cost of bringing a substantially flood-damaged building into compliance with the community's floodplain management ordinance. If the community has a more restrictive definition of substantial damage, the provision may still apply. More information on Increased Cost of Compliance coverage can be found at <http://www.fema.gov/increased-cost-compliance-coverage>.

Credit Points for LSI

LSI = EITHER:

- (1) 20 points, if the regulatory threshold for determining if a building is substantially improved or substantially damaged is less than 50%
- OR
- (2) 10 points, if EITHER
 - (a) The regulatory threshold is no more than 25% of the square footage of the building's lowest floor, OR
 - (b) The regulatory threshold applies to either improvements, modifications, and additions or reconstruction and repairs, but not both

Impact Adjustment for LSI

LSI credit is adjusted based on the ratio of the area affected by the lower substantial improvement threshold to the area of the SFHA. See Section 431.c on calculating an impact adjustment.

$$rLSI = \frac{aLSI}{aSFHA}, \text{ where}$$

$aLSI$ = the size of the area(s) that qualify for LSI credit, and

aSFHA = the size of the community's SFHA

Documentation for LSI Provided by the Community

(1) The activity documentation requirements in Section 431.d must be met.

(2) At each verification visit,

- (a) A list of all permits for building improvements or repairs in the regulatory floodplain that have been issued since the last visit. The list must include both substantial improvements and permitted projects that were not substantial improvements.

The ISO/CRS Specialist will review permit records that document how the regulation has been applied.

432.f. Protection of critical facilities (PCF)

The maximum credit for this element is 80 points.

For CRS credit purposes, critical facilities are defined in Section 120. There are usually two kinds of critical facilities that a community should address:

- Facilities that are vital to flood response activities or critical to the health and safety of the public before, during, and after a flood, such as a hospital, emergency operations center, electric substation, police station, fire station, nursing home, school, public works, vehicle and equipment storage facility, or shelter.
- Facilities that, if flooded, would make the flood problem and its impacts much worse, such as a hazardous materials facility, power generation facility, water utility, or wastewater treatment plant.

PCF credit is provided for regulations that either prohibit critical facilities in the 500-year floodplain or set higher standards for protecting them from flood damage. Full credit is for a prohibition on new critical facilities in the 500-year floodplain.

It may not be feasible for some communities to locate critical facilities outside the 500-year floodplain, but they may be able to take some steps towards reducing future risk to these facilities, so partial credit is provided for regulations that allow new facilities in the 500-year floodplain, but set higher protection standards for them. If the standards only apply to some facilities or some parts of facilities, the credit will be prorated. For example, partial credit would be provided if the regulations addressed only one type of critical facility, such as hazardous materials sites or critical facilities owned and managed by the community.

Credit Criteria for PCF

(1) Credit is provided only if there is regulatory language that protects critical facilities.

The fact that there are currently no critical facilities in the regulated floodplain may indicate community policy, but adopted regulations are required for PCF credit.

- (2) To receive full credit for this element, the regulations must be enforced in the 500-year floodplain (note that the 500-year floodplain includes the entire SFHA plus other land that is lower than the 500-flood elevation). On newer Flood Insurance Rate Maps (FIRMs) with AE and X Zones, the 500-year floodplain is shown as the SFHA plus the shaded X Zone.
- (3) The impact adjustment is based on the area of 500-year floodplain rather than aSFHA, the area of the SFHA.

Credit Points for PCF

(1) PCF = 80 points, where new critical facilities are prohibited from the 500-year floodplain

OR

(2) PCF = 40 points, where new critical facilities are protected to at least one foot above the 500-year flood level

Partial credit for PCF is provided for regulations that allow new facilities in the 500-year floodplain, but set higher protection standards. If the standards only apply to some facilities or some parts of facilities, the credit will be prorated.

Impact Adjustment for PCF

PCF credit is adjusted based on the ratio of the area affected by the PCF regulation to the area of the 500-YEAR FLOODPLAIN. See Section 431.c on calculating an impact adjustment.

$$rPCF = \frac{aPCF}{a500}, \text{ where}$$

aPCF = the size of the area(s) that qualifies for PCF credit,
and

a500 = the size of the community's 500-year floodplain

If there is no available map that shows the 500-year floodplain, the SFHA is considered to be 70% of the 500-year floodplain. Therefore, if the regulation credited under PCF is enforced throughout the SFHA, rPCF = 0.7.

Example 432.f-1.

South Scottsdale prohibits new buildings, critical facilities, and substantial improvements in the floodway. The ordinance specifically includes critical facilities so facilities other than buildings, like pumping stations, cell towers, and electrical substations, are also prohibited.

PCF = 80

Full credit for PCF is dependent on enforcement throughout the 500-year floodplain. South Scottsdale's regulation is only enforced in the floodway. Credit is limited to those portions of the floodway that are not credited as preserved open space (OSP) (see Section 431.c(4)).

The area affected by the critical facilities prohibition, aPCF, is the area of the floodway minus the areas credited as OSP. The City's GIS office provided the area calculations. The area of the floodway is 287.20 acres, of which 208.30 are credited as OSP. Therefore

$$aPCF = 287.20 - 208.30 = 78.90$$

The area of the 500-year floodplain is the area of the SFHA (504.4 acres) plus the area of the shaded X Zone (440.3 acres).

$$a500 = 504.40 + 440.30 = 944.70$$

$$rPCF = \frac{aPCF}{a500} = \frac{78.90}{944.70} = 0.080$$

According to Section 433, Credit Calculation, the value for prohibiting critical facilities (80) is multiplied by the ratio for rPCF, 0.08. The total credit for South Scottsdale's requirement, cPCF, is 8% of 80. In other words, only 8% of the 500-year floodplain is affected by this regulation. The regulation is limited to the mapped floodway and most of that is already preserved as open space.

Documentation for PCF Provided by the Community

- (1) The activity documentation requirements in Section 431.d must be met.
- (2) At each verification visit,
 - (a) An impact adjustment map, showing the 500-year floodplain.
 - (b) [For extra credit for regulating floodprone areas outside the 500-year floodplain] Documentation that shows that floodplain regulations are in effect in these areas.

432.g. Enclosure limits (ENL)

The maximum credit for this element is 390 points.

Regulations to limit enclosures below the base flood elevation have two objectives. First, they protect the structural integrity of the building from wave action or hydrostatic pressure. Second, they discourage property owners from finishing the area below the base flood elevation and storing valuable or hazardous items in that area.

These regulations are particularly useful in V Zones and other coastal areas subject to wave damage and in places where projected flood depths result in lowest floors constructed 8 feet or more above grade. For the second objective, over time there is a tendency on the part of

property owners to enclose the lower areas and convert them to bedrooms, family rooms, or other finished areas, in violation of floodplain management regulations.

ENL credits regulatory standards that prohibit the enclosure of the building's area that lies below the base flood elevation. Credit is also available for communities that execute nonconversion agreements, whereby owners agree not to modify the enclosed area to make it more susceptible to flood damage.

Credit Criteria for ENL

- (1) Breakaway walls are enclosures and must be prohibited in order to receive full credit. Screening and open lattice-work are not considered enclosures. Some communities have language to require that there be "no obstruction" in the lower level of a building. Such language might allow breakaway walls or slanted louvers. This does not qualify for ENL credit. What counts for ENL credit is whether one can SEE THROUGH the lower part of the structure from the street. Lattice-work and insect screening are permitted, as long as the line of sight is not blocked.
- (2) The community may opt to enforce these enclosure limits only where the lowest floor is more than four feet high. Where the lowest floor is less than four feet high, a crawlspace with the proper openings may be more appropriate than an open area elevated on columns or piles. With less than four feet of height, the lower area is not likely to be improved or modified into a livable space, so the enclosure limits are not needed.
- (3) Partial credit is provided for a nonconversion agreement whereby the owner agrees not to modify the enclosed area in a way that would make it more susceptible to flood damage. Because this area is not visible from the street, the full credit of 90 points (under credit points (3), below) is provided only if the agreement allows the community the right to enter the property and inspect the inside of the enclosure periodically.

The nonconversion agreement must be filed with the deed and other property records, so that it will be effective as ownership of the property changes in the future. A sample nonconversion agreement is posted at www.CRSresources.org/400. As with all legal documents, the community should have such an agreement approved by its attorney before it is used.

Credit Points for ENL

ENL = EITHER (1) OR the total of (2) + (3)

- (1) 240 points, if regulations prohibit any building enclosures, including breakaway walls, below the base flood elevation,
OR
- (2) 100 points, if regulations prohibit breakaway walls and enclosures of areas of greater than 299 square feet below the base flood elevation, and/or
- (3) If regulations require that the owner of a building sign a

nonconversion agreement that is filed with the deed and other property records, then

- (a) 90 points, if the community will inspect the enclosed area at least once a year, OR
- (b) 60 points, if the community is granted the right to inspect the enclosed area at any time, OR
- (c) 30 points, if the agreement does not mention inspections

CAZ and V-Zone ENL Bonus Credit (ENL_{CAZ})

If a community receives CAZ credit under this activity and enforces creditable ENL regulations in the area that received CAZ credit, the community may earn additional credit as follows.

ENL_{CAZ} = EITHER:

- (1) 150 points, if regulations prohibit any building enclosures, including breakaway walls, below the base flood elevation throughout the community's credited coastal A Zone
OR
- (2) 50 points, if regulations prohibit breakaway walls and enclosures of areas of greater than 299 square feet below the base flood elevation throughout the community's credited coastal A Zone

Impact Adjustment for ENL and ENL_{CAZ}

ENL credit is adjusted based on the ratio of the area affected by the enclosure limitation to the area of the SFHA. See Section 431.c on calculating an impact adjustment. The following additional criterion applies:

- (1) Areas requested for ENL credit must exclude areas credited for OSP or DL2.

$$\text{rENL} = \frac{\text{aENL}}{\text{aSFHA}}, \text{ where}$$

aENL = the size of the area(s) that qualify for ENL credit,
and

aSFHA = the size of the community's SFHA

ENLCAZ credit is adjusted based on the ratio of the area affected by the enclosure limitation to the area of the community's credited coastal A Zone.

$$rENL_{CAZ} = \frac{aENL_{CAZ}}{aCAZ}, \text{ where}$$

$aENL_{CAZ}$ = the size of the area(s) that qualify for ENL_{CAZ} credit, and

$aCAZ$ = the size of the community's credited coastal A Zone

Documentation for ENL Provided by the Community

(1) The activity documentation requirements in Section 431.d must be met.

(2) At each verification visit,

- (a) Elevation certificates, copies of nonconversion agreements, and other permit records that document how the regulation has been applied.
- (b) [For credit for (3)(a) and (3)(b)] Copies of inspection records.

432.h. Building code (BC)

The maximum credit for this element is 100 points.

Many communities meet their NFIP obligations through a stand-alone floodplain management ordinance that may be administered by the zoning, planning, engineering, or other office, separate from the building department and the building code. A floodplain management program can work without a building code, but implementation of the construction requirements may not be as effective.

The International Code Series (I-Codes) includes provisions that incorporate all NFIP minimum floodplain construction requirements and a number of provisions that exceed the NFIP minimum requirements. The NFIP requirements related to the actual construction of buildings are contained in the bodies of the International Building Code and International Residential Code. Requirements related to building utilities are contained in these codes and in the International Plumbing Code, International Mechanical Code, International Fuel Gas Code, and International Private Sewage Disposal Code.

The other NFIP requirements, such as administrative provisions and requirements that apply to floodways, subdivisions, and manufactured homes, are contained in Appendix G of the International Building Code. Communities that adopt the I-Codes have the option of either adopting Appendix G or addressing these other requirements through a companion ordinance or regulation. Note that floodplain land use regulations (e.g., avoiding construction in the regulatory floodplain) are not included in the I-Codes, therefore it is important that community floodplain managers and the building officials coordinate their efforts.

Coordinating floodplain management with a local building code has several advantages. Some, but not all, of those are listed below.

- There is better coordination with permitting the construction of new buildings and repairs and improvements to existing buildings;
- More staff and more knowledgeable staff can better enforce floodplain building construction standards, such as foundation protection and placement of mechanical equipment;
- Experienced inspectors can check compliance in the field; and
- There is more frequent observation of construction progress and quality of construction.

Building codes help reduce losses from other natural hazards, which is one of FEMA's prime objectives. For more information on the links between the I-Codes, the NFIP, other natural hazards, and CRS credit, see *Reducing Flood Losses Through the International Code Series* at www.fema.gov/library/viewRecord.do?id=2094.

Because of these advantages, the CRS provides credit for building codes in two ways:

- BC1 recognizes those communities that have adopted the current editions of the appropriate codes, and
- BC2 credits the community's Building Code Effectiveness Grading Schedule (BCEGS) classification.

BCEGS was initiated by the insurance industry after determining that the catastrophic losses from Hurricane Andrew were compounded by poor building code enforcement. It was developed by the Institute for Building and Home Safety, the three legacy code groups, the insurance industry, and the Insurance Services Offices, Inc. (ISO). The program is administered by ISO.

BCEGS assesses the building codes in effect in a community and how a community enforces them, with special emphasis on mitigation of losses from natural disasters. The insurance goal is that the prospect of lessening catastrophe-related damage (and ultimately lower insurance costs) provides an incentive for communities to enforce their building codes more rigorously.

In BCEGS, each community is assigned a grade of 1 (best) to 10. A class of 99 indicates that the community does not qualify for the BCEGS program. Ratings are based on community answers to an extensive mailed questionnaire and a follow-up community verification visit with the building department by an ISO-trained field representative.

More information on BCEGS can be obtained from the ISO/CRS Specialists.

Credit Criteria for BC

(1) The building code must be enforced throughout the community, not just the SFHA.

(2) I-Codes (BC1):

(a) To receive full credit, the entire I-Code must be adopted by the community. If the following sections are not adopted or are adopted with amendments, the language will be reviewed to determine the credit:

- International Building Code: Chapters 3–7, 14–18, and 21–24.
- International Residential Code: Chapters 3–6, 8, and 9.

In some states, communities are required to adopt state codes or state versions of the I-Codes. In those cases, the provisions of the mandated code will be compared to the I-Codes and scored appropriately. The same provisions apply to the National Fire Protection Association (NFPA) codes. If they are adopted with amendments, the language will be reviewed to determine the credit.

(3) BCEGS (BC2): The credit for BC2 is based on the community's BCEGS classification.

There are two BCEGS ratings for each jurisdiction: personal (residential) and commercial. If they are different, the CRS prerequisite and this element's credit are based on the higher number of the two ratings. For example, if a community has a class 6 residential BCEGS rating and a class 5 commercial rating, the CRS considers it a class 6 BCEGS community.

BCEGS ratings are provided for all communities that do code enforcement, whether it be for themselves or for smaller jurisdictions. When a community's code enforcement program is administered by another jurisdiction or a third-party agency, the serviced community will receive the provider's classification.

If a community is in a state that does not have a formal BCEGS program, a courtesy review may be conducted to obtain an equivalent BCEGS class for CRS purposes.

Note that a community must have a BCEGS classification of 5/5 or better to qualify for a CRS class 6 or better (see Sections 211.b and c).

Credit Points for BC

$$BC = BC1 + BC2$$

(1) BC1 = the sum of the following:

- (a) 20 points, for adoption and enforcement of the International Building Code or its equivalent
- (b) 20 points, for adoption and enforcement of the International Residential Code or its equivalent
- (c) 3 points, for adoption and enforcement of the

International Plumbing Code or its equivalent

- (d) 3 points, for adoption and enforcement of the International Mechanical Code or its equivalent
 - (e) 2 points, for adoption and enforcement of the International Fuel Gas Code or its equivalent
 - (f) 2 points, for adoption and enforcement of the International Private Sewage Disposal Code or its equivalent. If the community is fully sewerized, it can still receive this credit because a sewerized community is healthier than one dependent on septic systems.
- (2) BC2 = one of the following. These points are not cumulative.
- (a) 10 points, for a BCEGS classification of 5/5, OR
 - (b) 20 points, for a BCEGS classification of 4/4, OR
 - (c) 30 points, for a BCEGS classification of 3/3, OR
 - (d) 40 points, for a BCEGS classification of 2/2, OR
 - (e) 50 points, for a BCEGS classification of 1/1
-

If a community has two different BCEGS classes, the higher number is used to calculate the CRS credit.

Example 432.h-1.

South Scottsdale has adopted of all the International Codes (BC1 = 50) and has a BCEGS class of 3/3 (BC2 = 30).

$$\text{BC} = 50 + 30 = 80$$

Impact Adjustment for BC

There is no impact adjustment for BC. The building codes must be enforced throughout the community.

Documentation for BC Provided by the Community

- (1) The activity documentation requirements in Section 431.d must be met.
- (2) At each verification visit,
 - (a) [For BC1 credit]

- (i) The state or local law or ordinance language that adopts the building code. See also Sections 231.b and c on documenting regulatory language.
 - (ii) Permit records that will document that the code is being enforced.
- (b) [For BC2 credit] No documentation is required. The ISO/CRS Specialist will obtain the community's BCEGS classification directly from the ISO BCEGS office.

432.i. Local drainage protection (LDP)

The maximum credit for this element is 120 points.

Approximately 20% of NFIP claims are for properties located outside the SFHA. Some of these claims are from flooding caused by local drainage problems. LDP credit is for ensuring that new buildings are well above the street level or otherwise protected from shallow drainage flooding.

The regulatory language is usually found in the building code or land development code, rather than in the floodplain or stormwater management regulations. Sections 1803.3 and 1805 of the International Building Code, for example, have a positive-drainage requirement that would receive some credit.

Credit Criteria for LDP

- (1) Credit is for regulations that ensure that every new building will be built so that it is protected from local drainage flooding.
- (2) A regulation that only addresses drainage plans in new subdivisions is not credited. The key to this credit is that every building will meet some drainage protection standard at the time of construction.

Credit Points for LDP

$$\text{LDP} = (\text{LDP1 or LDP2 or LDP3}) + \text{LDP4}, \text{ up to the maximum of 120 points}$$

Items 1, 2, and 3 are not cumulative. Item 4 can be credited alone or added to the points for items 1, 2, or 3, not to exceed the maximum points.

-
- (1) $\text{LDP1} = 40 \times \text{the number of feet that the lowest floor (including basement) must be above the crown of the nearest street or the highest grade adjacent to the building}$
-

For example, if the community requires the lowest floor to be 18 inches above the crown of the street, $\text{LDP} = 40 \times 1.5 = 60$. The highest adjacent grade or other datum may be used as an alternative to the crown of the nearest street. If the street gutter is used, 0.5 feet is subtracted from the elevation requirement.

(2) LDP2 = 40 points, if the regulations require that, as a condition of receiving a building permit, the applicant must prepare a site plan that (a) accounts for street flooding and local drainage from and onto adjoining properties, and (b) protects the building from local drainage flows

(3) LDP3 = EITHER:

20 points, if the regulations require the applicant to provide positive drainage away from the building site to an approved point of collection that does not create a hazard or problem on neighboring properties

OR

10 points, if the regulations require that the applicant provide positive drainage away from the building site

The 10-point credit noted above is provided for enforcing the positive drainage provisions of the International Building Code and the International Residential Code (I-Codes), provided that the community can document of its enforcement.

(4) LDP4 = 20 points, if the regulations require that the increased volume of runoff due to the development (from the 100-year storm) is kept on site, such as via a low-impact development measure

LDP4 credit is prorated if the regulations are limited to smaller storms.

Impact Adjustment for LDP

There is no impact adjustment for LDP because it must be enforced throughout either the entire community or throughout all the B, C, D, and X Zones.

Documentation for LDP Provided by the Community

(1) The activity documentation requirements in Section 431.d must be met.

432.j. Manufactured home parks (MHP)

The maximum credit for this element is 15 points.

An “existing manufactured home park or subdivision” is a park or subdivision that was established before the community adopted floodplain management regulations. The NFIP regulations (44 CFR §60.3(c)(12)) allow communities to site manufactured homes in existing manufactured home parks or subdivisions on reinforced piers or other foundation elements that are not less than 36 inches above grade. In some cases this results in manufactured homes’ being elevated above the base flood elevation, but where flooding is deeper than three feet, it exposes them to substantial damage.

MHP credits regulations that do not differentiate between manufactured homes and conventional “stick built” buildings or between existing and new manufactured home parks and subdivisions. However, this credit is limited to those communities that have existing manufactured home parks where the base flood is GREATER than three feet deep. In other words, the credit is limited to those communities where these regulations will have an impact. Because of this, there is no impact adjustment for this element.

This ordinance language was a requirement of the NFIP before 1989. When communities were given the option of the 36-inch standard, many kept the higher standard and did not revise their regulations. The creditable language is also included in the new I-Codes. Therefore, it is possible that a community’s current ordinance already has the language that is credited by this element.

Credit Criteria for MHP

- (1) The community must have regulatory language that is enforced in manufactured home parks or subdivisions.
- (2) The community must have one or more existing manufactured home parks or subdivisions in its regulatory floodplain where the base flood elevation is more than three feet above grade.

Credit Points for MHP

MHP = 15 points, for mobile home park regulations

Impact Adjustment for MHP

There is no impact adjustment for MHP.

Documentation for MHP Provided by the Community

- (1) The activity documentation requirements in Section 431.d must be met.
- (2) At each verification visit,
 - (a) Elevation certificates and anchoring records that document how the regulation has been applied.
 - (b) Documentation that shows that at least one manufactured home park has a regulatory flood depth greater than three feet above grade (Section 432.j, credit criterion (2)).

432.k. Coastal A Zones (CAZ)

The maximum credit for this element is 500 points.

FEMA has concluded that its criteria for construction in A Zones do not provide adequate protection in coastal A Zones, which are subject to wave effects, velocity flows, erosion, scour, or combinations of these forces. Wave tank studies have shown that breaking waves lower than the three-foot criterion used to designate VE Zones can cause considerable

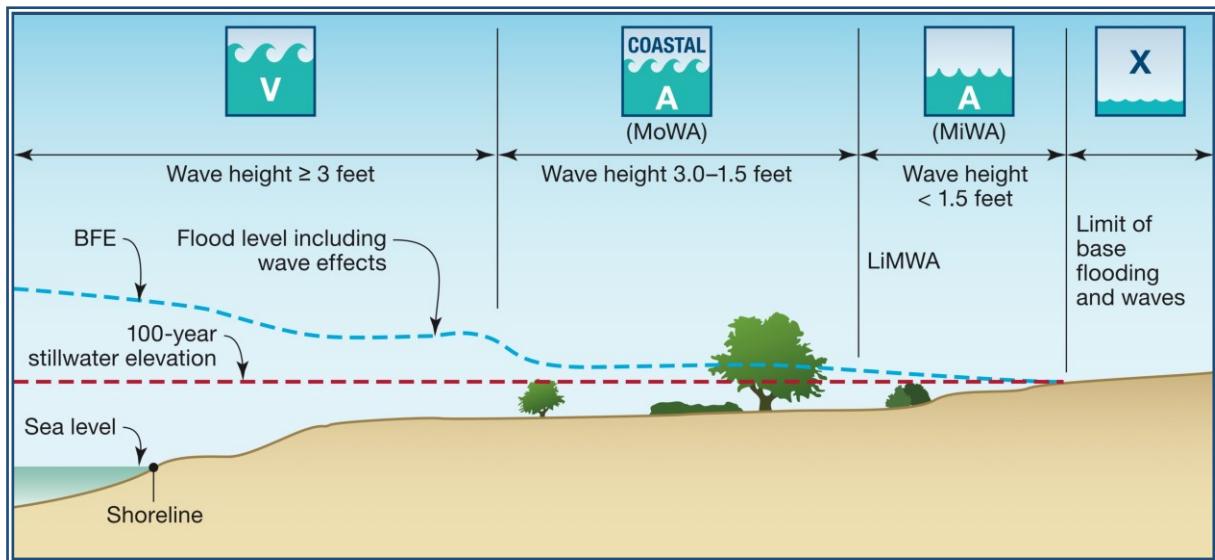


Figure 430-2. A schematic of coastal flood zones
 (from “Importance of the Limit of Moderate Wave Action (LiMWA),” FEMA Fact Sheet,
<https://www.fema.gov/media-library/assets/documents/96413>).

damage. Post-disaster evaluations and insurance claims data also support this conclusion, particularly for those buildings with enclosures below the elevated floor.

The term “Coastal A Zone” refers to that portion of the SFHA that is subject to waves with heights of between 1.5 and 3 feet during a 1% annual chance storm (see Figure 430-2). On newer FIRMs, this is the area landward of the V Zone and seaward of the line known as the Limit of Moderate Wave Action (LiMWA). A community may map its own coastal A Zones as long as FEMA’s mapping standards are met. There is extra credit available if the community maps based on models that consider future conditions, including sea level rise. Additional technical guidance on mapping coastal A Zones can be found in *Design and Construction in Coastal A Zones*, at www.fema.gov/pdf/rebuild/mat/coastal_a_zones.pdf.

CAZ credit is provided to coastal communities that enforce V-Zone regulations in their coastal A Zones.

Credit Criteria for CAZ

- (1) The community must have a coastal floodplain on the Atlantic Ocean, Gulf of Mexico, Pacific Ocean, Bering Sea, or Great Lakes.
- (2) To receive CAZ1 credit a community must have either a FEMA-mapped LiMWA or an equivalent created with the same mapping criteria.
- (3) CAZ credit is not available in V Zones because they are minimum NFIP requirements in V Zones.
- (4) Credit is only available in areas with buildable lots. If the CAZ is too narrow to be developed, this section of the coast must be removed from the credited area.

Credit Points for CAZ

CAZ = 500 points, if all new buildings in the FEMA-mapped Coastal A Zone must meet the requirements for buildings in V Zones and for openings in A Zones (44 CFR §60.3(e) and §60.3(c)(5))

If all new buildings in the community's coastal A Zone must meet the requirements for buildings in V Zones and for openings in A Zones (44 CFR §60.3(e) and §60.3(c)(5)), then CAZ = 500. If only some of the V-Zone regulations are enforced in the coastal A Zone, the points are prorated as follows:

-
- (a) 225 points, if all of the following V-Zone foundation standards (44 CFR §60.3(e)) are required by the community:
 - New construction and substantial improvements are elevated on piles and columns (§60.3(e)(4));
 - The pile or column foundation and the structure attached thereto are anchored to resist floatation, collapse, and lateral movement due to the effects of wind and water loads (§60.3(e)(4)(ii));
 - New construction and substantial improvements have the space below the lowest floor free of obstruction or enclosed with non-supporting breakaway walls, open wood lattice-work, or insect screening (§60.3(e)(5)), and have openings (§60.3(c)(5)); and
 - Use of fill for structural support is prohibited (§60.3(e)(6)).
 - (b) 100 points, if the bottom of the lowest horizontal structural member and the electrical and mechanical equipment servicing the building must be elevated to or above the base flood elevation (§60.3(e)(4)(i))
 - (c) 125 points, if a registered design professional must develop or review the structural design, specifications, and plans and certify that the designs and methods of construction to be used meet accepted standards of practice for meeting the provisions of §60.3(e)(4)(ii) and breakaway walls (§60.3(e)(5))
 - (d) 25 points, provided all new construction is located landward of the reach of mean high tide (§60.3(e)(3)). These points are available only if the designated area includes shoreline.

-
- (e) 25 points, if the community prohibits human alteration of any sand dunes or mangroves that would increase flood damage (§60.3(e)(7)). These points are available only if the designated areas include sand dunes or mangroves
-

Impact Adjustment for CAZ

CAZ credit is adjusted based on the ratio of the area affected by the CAZ regulations enforced and the portion of the SFHA where they're applied. See Section 431.c on calculating an impact adjustment. There is an additional bonus available for considering future sea levels when calculating the area of a community-defined CAZ. The following additional criteria apply:

- (1) Areas requested for CAZ credit must exclude areas credited for OSP or DL2.
- (2) The credit criteria for CAZ1 are minimum NFIP requirements in V Zones. Therefore, these credits are not available in a V Zone.
- (3) If the regulations apply to a community-defined coastal A Zone that extends beyond FEMA's mapped LiMWA, credit is calculated as follows:

$$cCAZ = (cCAZ_{fema} + cCAZ_{community}) \times CFSL \text{ (750 points max),}$$

where

$$cCAZ_{fema} = 0.50 \times CAZ \text{ (250 points maximum), and}$$

$$cCAZ_{community} = \frac{CAZ \times (aCAZ_{community} - aCAZ_{fema} - aVZ)}{aSFHA - aCAZ_{fema} - aVZ} \text{ (250 points maximum),}$$

and

$aCAZ_{fema}$ = the area of FEMA's mapped Coastal A Zone (between V Zone and LiMWA), and

$aCAZ_{community}$ = the area of the community's mapped coastal A Zone, and

aVZ = the area of the community's V Zone(s), and

CFSL = consideration of future sea level multiplier, as follows.

1.00, for no consideration of future sea levels, or

1.20, for using at least the NOAA "intermediate-high" projection for 2100, or

1.50, for using at least the NOAA "high" projection for 2100

See Section 404 for guidance on using sea level rise projections for CRS purposes.

Example 432.k-1.

West Bay is a fictitious coastal community used for CRS examples. Its DFIRM has a LiMWA delineated and the GIS map in Figure 430-3 shows the coastal A Zone, i.e., the area between the LiMWA and the V Zone. In addition, the community has mapped the area expected to become coastal A Zone by 2100 (using NOAA's "intermediate-high" sea level rise projections) and added this to the community's regulatory coastal A Zone, too.

West Bay has opted to enforce all V-Zone regulatory standards (and the A-Zone opening requirement) in the delineated coastal A Zone.

$$\text{CAZ} = 500$$

West Bay's CRS Coordinator calculates the area of the coastal A Zone, minus the portion that is in the Biloxi Bay State Park (there is no credit for CAZ standards for new construction in areas preserved as open space, i.e., where new construction is prohibited). This area is calculated to be 111.9 acres. Their future conditions mapping adds another 40.6 acres after subtracting OSP-credited areas. The community has 5.3 acres of V Zone.

$$c\text{CAZ} = (c\text{CAZ}_{fema} + c\text{CAZ}_{community}) \times \text{CFSL}$$

$$c\text{CAZ}_{fema} = 0.50 \times \text{CAZ} = 250$$

$$c\text{CAZ}_{community} = \text{CAZ} \times \frac{(a\text{CAZ}_{community} - a\text{CAZ}_{fema} - aVZ)}{(aSFHA - a\text{CAZ}_{fema} - aVZ)}$$

$$= 500 \times \frac{40.60}{395.30 - 111.90 - 5.30}$$

$$= 73$$

$$c\text{CAZ} = (250 + 73) \times 1.20 = 387.60 \text{ points}$$

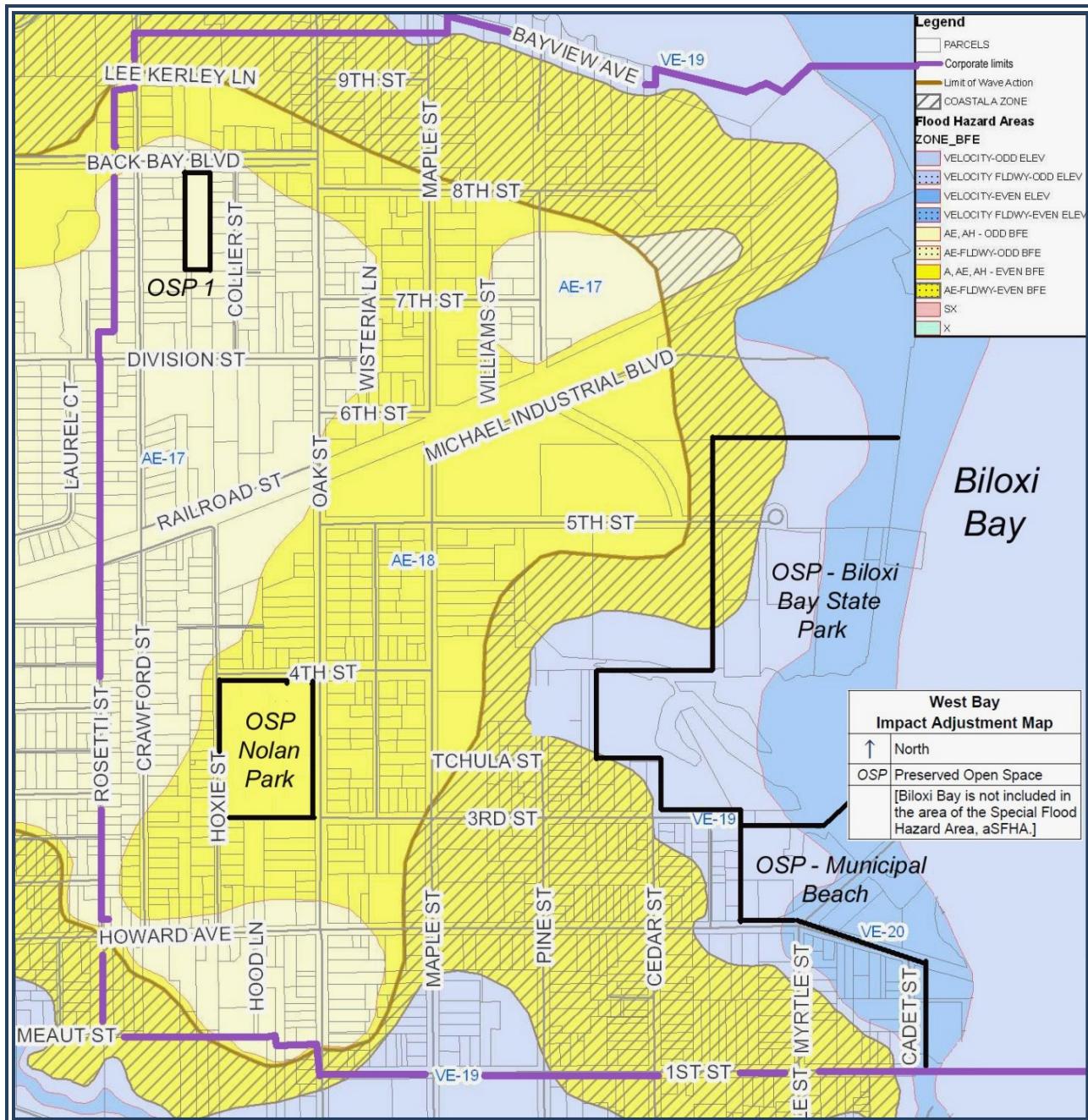


Figure 430-3. West Bay's impact adjustment map.

Documentation for CAZ Provided by the Community

- (1) The activity documentation requirements in Section 431.d must be met.
- (2) At each verification visit,
 - (a) An impact adjustment map. The map is not needed if the community uses the impact adjustment approach listed under Impact Adjustment items (4) or (5), above. If a community-derived LiMWA is used, the data supporting the delineation must be supplied to the ISO/CRS Technical Reviewer for approval.
 - (b) A copy of the relevant regulations.

432.I. Special flood-related hazards regulations (SHR)

The maximum credit for this element depends on the hazard. The maximum SHR credit for higher regulatory standards in areas subject to riverine hazards is 100 points.

SHR credit for higher regulatory standards in areas subject to special flood-related hazards is described below.

In areas where it is not feasible to restrict land to open space uses, other land use planning measures can be used to minimize flood damage. These include strategically controlling the type of development and uses allowed in hazard areas, and avoiding high-value and high-occupancy uses as much as possible.

Credit is provided for regulating special flood-related hazard areas in a manner that recognizes those elements of the hazard not addressed by the NFIP minimum standards for floodplain management. This credit is in addition to credit provided for other regulatory standards under Activity 430.

Credit Criteria for SHR

- (1) The community must have a map of the area to be regulated using standards approved by FEMA, or if FEMA has no approved standards then standards approved by the ISO/CRS Technical Reviewer.
- (2) The community must adopt and enforce regulatory standards that address the special flood-related risks associated with these hazards.

Credit Points for SHR

- (1) Prohibition of buildings (SHDL2)

SHDL2 = 100 points for prohibition of buildings within the special flood-related hazard area

- (2) Ice jam regulations (IJR) (Maximum credit: 80 points)

IJR = the sum of the following:

- (a) 50 points, for requiring new structures to be constructed on engineered fill or engineered pilings at or above the ice jam regulatory flood elevation
 - (b) 10 points x freeboard above the ice jam regulatory flood elevation (in feet) (maximum credit = 30 points for 3 feet of freeboard)
-

Regulation of areas subject to ice jam flood hazards should include protecting buildings from both the hazard from higher flood elevations and the hazard associated with moving ice floes. These regulations may include higher minimum floor elevations and structural requirements for buildings so that they are not damaged or destroyed by moving ice. There may also be special requirements for infrastructure in areas subject to ice jam hazards.

Example 432.I-1.

North County prohibits development in the reach of the floodway affected by ice jam flooding. IJR1 = 50 + 14 = 64. In the reaches regulated for ice jam hazards outside the floodway, IJR2 = 50.

(3) Closed basin lake hazard regulations (CBR) (Maximum credit: 80 points)

CBR = the sum of the following:

- (a) 40 points, if new structures are required to be built on fill at or above the regulatory flood elevation for closed basin lakes
 - (b) 10 points, if access is required at the regulatory flood elevation
 - (c) 10 points, if all utilities are required to be protected to the regulatory flood elevation and functional during the regulatory event
 - (d) 15 points, if all utilities and basements within 1,000 feet of the shoreline established by the regulatory flood elevation are required to be floodproofed to the regulatory flood elevation unless it can be demonstrated that the water table under the proposed development will not be affected by lake elevations
-

-
- (e) 5 points, if new wells constructed within the hazard area are required to be floodproofed to the regulatory flood elevation, and all existing wells that are to be abandoned are required to be sealed to eliminate the mixing of groundwater and lake water
-

CRS credit for regulation of areas subject to closed basin lake flood hazards should anticipate both the flood elevation and the long duration of high water surface elevations. It is important to protect utilities and infrastructure from long periods of inundation and to ensure access to buildings at the highest anticipated lake level. There is credit for land development criteria that reduce development adjacent to closed basin lakes, such as density trades, and for low density zoning in these areas.

Example 431.I-2

Lake City requires buildings on land between 1,010 feet and 1,012 feet (above mean sea level) to be elevated on fill to 1,012 feet. No septic tanks or wells are allowed in areas where the land elevation is below 1,012. CBR = 45

(4) Mudflow hazard regulations (MFR) (Maximum credit: 35 points)

MFR = the sum of the following:

- (a) 25 points, if a study by a soils engineer and/or an engineering geologist is required for any hillside grading where stability will be lessened by the grading, and at historic or prehistoric mudflow and landslide sites
 - (b) 5 points, if where buildings are to be supported on stilts over a fill slope with a slope greater than two horizontal to one vertical, footings must extend at least 3 feet into the underlying bedrock, but not less than the depth required to resist the lateral load
 - (c) 5 points, if drainage from impervious surfaces must be collected and conducted to the street in a non-erosive manner
-

Maps of mudflow hazard areas are usually based on relatively large-scale map analysis, so most regulations require an engineering study, a geologic study, or both. The intent is that some of the area mapped as mudflow hazard may actually not have such a hazard, but it is the developer's responsibility to determine the true hazard.

(5) Land subsidence regulations (SUR) (Maximum credit: 80 points)

SUR = the sum of the following:

- (a) Credit is provided for regulating development in the floodprone areas subject to land subsidence based upon the regulatory flood elevation, considering projected subsidence. Credit for SUR is the sum of (1) and (2):
 - (1) 60 points, if all new buildings must be built on engineered foundations with pilings that will prevent the building from sinking as subsidence continues;
 - (2) 20 points, if all new public facilities and utilities are required to be designed for the subsidence hazard
 - (b) If the community does not apply for regulation of development (SUR1) under the above section, credit is provided for activities intended to reduce future land subsidence. If the community has mapped current subsidence, and if that subsidence is greater than 1.0 foot, and if the community is implementing a scientific plan to reduce future subsidence, SUR2 = 40
-

Regulation of the activities that cause subsidence is the most direct approach to mitigating it. Techniques for preventing or controlling subsidence vary according to the type of subsidence. In the case of resource extraction, they range from banning extraction to controlling how materials are removed. For land development that causes subsidence, they range from banning development to regulating construction practices.

(6) **Uncertain flow path regulations (UFR).** A community may receive credit for regulation of areas subject to two types of uncertain flow path hazards: alluvial fans, and migrating stream channels. However, at any given area or stream reach, credit will be allowed for only one type of uncertain flow path hazard. For each stream reach or area, the community should seek credit for the one that gives the highest credit for UFR.

(a) Regulating development in areas subject to alluvial fan hazards (UFR1) (Maximum credit: 80 points)

UFR1 = the sum of the following:

- (1) 60 points, if all new structures are required to be engineered to be protected from alluvial fan hazards
 - (2) 10 points, if all utilities are required to be designed to function and minimize damage during the 100-year event
 - (3) 10 points, if access is required during the 100-year event
-

Example.

Maricopa County, Arizona, has separate management schemes for “High Hazard,” “Uncertain Flow Distribution Area,” and “Approximate” alluvial fan areas. Development is required to be elevated two feet above grade. Alluvial fan areas are designated as “Administrative Floodways,” with management similar to that required by the NFIP for floodways.

From the “Floodplain Regulations for Maricopa County” as amended November 2011:

Section 611. Zone A Alluvial Fan High Hazard Area
Administrative Floodway.

Development within an Alluvial Fan High Hazard Area, as determined using the Piedmont Assessment Manual shall be regulated in a manner similar to a floodway as described in Article Six, Sections 602 of these Regulations. Additional Development Standards for Zone A Alluvial Fan High Hazard Area Administrative Floodway are:

Only major engineering measures as outlined in the Piedmont Manual may be used to mitigate the alluvial fan flood hazard in these areas.

Example.

Whatcom County, Washington, has mapped alluvial fans as one of several geologic hazards. The ordinance states, “No critical facilities shall be constructed or located in geologically hazard areas without fully mitigating the hazard.” Also, “All projects on an alluvial fan must be engineered and constructed to withstand alluvial fan hazards and/or flooding equivalent to the largest known event evident on the fan as determined by professional assessment” (Whatcom County, 1997).

- (b) Regulating development in areas subject to moveable bed stream hazards (UFR2)
(Maximum credit: 80 points).

For stream reaches where there is a history or geologic evidence of channel migration, floodplain management to reduce future flood damage must consider the possibility of future channel migration. The State of Washington has published guidelines on the determination of channel migration zones (Rapp and Abbe, 2003). Zones determined with these methods have been declared critical habitat for endangered salmon by the National Marine Fisheries Service (2008) and now receive additional protection. Mapping completed using this guidance is eligible for CRS credit.

Credit for moveable bed streams is exclusive of alluvial fan areas.

UFR2 = one of the following:

- (1) 80 points, if a detailed study of the migration potential has been mapped, and if all public and private developments are prohibited within the zone; OR
 - (2) 65 points, if all public and private developments are required to be located and designed to be safe from channel migration; OR
 - (3) 40 points, if a standard setback is mapped, and all public and private development is permitted only after a detailed study of the channel migration hazard
-

Example.

King, County, Washington, has established setback lines along several rivers based on a study of historic and potential channel migration. Recent studies have been based upon the Framework published in 2003 by the Department of Ecology.

Example.

In 2008 the State of Vermont published the *Municipal Guide to Fluvial Erosion Hazard Mitigation* (Dolan, et al., 2008) which details risk assessment and mapping methods for risk due to unstable channels. Standards for construction within those areas also have been developed. These standards were used during the reconstruction of state highways after the floods of 2011.

Example.

Pima County and Tucson, Arizona, have established setback lines along all watercourses based on recent experience and an examination of selected floodplains. In Pima County, a developer must provide a detailed study, including a sediment transport analysis, in order to develop inside the setbacks. Setbacks range from 50 feet on minor washes to as much as 500 feet. The setback is from the channel bank or the 100-year floodplain, whichever is wider (Pima County, 2010).

Example.

In San Diego County, California, a Resource Protection Ordinance requires a setback of 100 feet or 15% of the floodway width, whichever is less, from the floodway boundary. Where erosion/sedimentation hazards are identified, no development is allowed. Also, the floodway is established using a maximum increase in flood elevation of 0.2 feet, and floodways are limited to velocities of 6 feet per second, which increases the floodway width in many steep floodplains. Although it is not quantifiable, these floodway restrictions should provide more protection than floodways delineated using the standard FEMA criteria of an allowable 1.0 foot rise with no consideration of velocity.

Impact Adjustment for SHR

The area affected by the special regulations must exclude areas designated as open space that are receiving Open Space (OS) credit under Activity 420 (Open Space Preservation), areas that receive credit for TSR and areas receiving credit for CER.

The impact adjustment for each sub-element of SHR is calculated separately. No sub-element's impact adjustment, when combined with the impact adjustment for 420 OSP, may exceed 1.5 (see Section 431.c(6)).

$$(a) rSHDL2 = \frac{aSHDL2}{aSFHA}, \text{ where}$$

aSHDL2 = the size of the area(s) that qualify for SHDL2 credit,

and

aSFHA = the size of the community's SFHA

$$(b) rIJR = \frac{aIJR}{aSFHA}, \text{ where}$$

aIJR = the size of the area(s) that qualify for IJR credit,

and

aSFHA = the size of the community's SFHA

$$(c) rCBR = \frac{aCBR}{aSFHA}, \text{ where}$$

aCBR = the size of the area(s) that qualify for CBR credit,

and

aSFHA = the size of the community's SFHA

(d) $rCIJ = \frac{aCIJ}{aSFHA}$, where

aCIJ = the size of the area(s) that qualify for
CIJ credit,

and

aSFHA = the size of the community's SFHA

(e) $rSUR = \frac{aSUR}{aSFHA}$, where

aSUR = the size of the area(s) that qualify for
SUR credit,

and

aSFHA = the size of the community's SFHA

(f) $rUFR = \frac{aUFR}{aSFHA}$, where

aUFR = the size of the area(s) that qualify for
UFR credit,

and

aSFHA = the size of the community's SFHA

In all cases, if $rXXX < 0.10$, use 0.10

Credit Calculation for SHR

cSHR = cSHDL2 + cIJR + cCBR + cMFR + cSUR + cUFR, up to a
maximum of 100 points

where

cSHDL2 = SHDL2 x rSHDL2, and

cIJR = IJR x rIJR, and

cCBR = CBR x rCBR, and

cMFR = MFR x rMFR, and

cSUR = SUR x rSUR, and

cUFR = (UFR1 x rUFR1) + (UFR2 x rUFR2)

If cSHR ≥ 100, then cSHR = 100

Documentation for SHR Provided by the Community

(1) The activity documentation requirements in Section 431.d must be met.

432.m. Tsunami special hazards regulations (TSR)

The maximum credit for this element is 50 points.

Credit is provided for regulating tsunami flood-related hazard areas in a manner that recognizes those elements of the hazard not addressed by the NFIP minimum standards for floodplain management. This credit is in addition to credit provided for other regulatory standards under Activity 430.

When possible, critical facilities should be kept out of tsunami hazard areas. When critical facilities must be located in tsunami hazard areas, they should be designed or retrofitted to survive tsunami damage.

Design and construction of new buildings in tsunami hazard areas should address forces associated with water pressure, buoyancy, currents and waves, debris impact, scour, and fire. Guidance for architects and engineers in the design for tsunami forces is included in FEMA's *Guidelines for Design of Structures for Vertical Evacuation from Tsunami* (FEMA, 2008). Community officials may also want to read *Vertical Evacuation from Tsunamis: A Guide for Community Officials* (FEMA, 2009). The links for both publications are given in Section 434, below.

Credit Criteria for TSR

(1) Creditable regulations must be based on an approved tsunami hazard map credited in Section 412.f(2).

Credit Calculation for TSR

Up to 50 points are provided for regulations for tsunami hazard areas (TSR).

cTS = TSR x rTSR

The credit points and impact adjustment are calculated as follows.

TSR = the total of the following, not to exceed 50 points

- (1) 50 points, if new structures are required to be built on natural ground at or above the tsunami flood elevation, provided that the tsunami flood elevation is higher than the base flood elevation
 - (2) 15 points, if regulations prohibit new critical facilities in tsunami hazard areas, unless
 - (a) the design can mitigate the vulnerability to such an extent that the resulting facility will perform as needed; and
 - (b) the risk is reduced through emergency response measures;
 - (3) 30 points, for adopting tsunami construction requirements from *Guidelines for Design of Structures for Vertical Evacuation from Tsunamis* for new buildings in tsunami hazard areas;
 - (4) 15 points, if regulations require buildings in tsunami areas to be inspected by a licensed professional engineer for compliance with tsunami construction standards;
 - (5) 15 points, if regulations require substantially improved buildings and additions to existing buildings in the tsunami area to meet tsunami construction codes;
 - (6) 15 points, if storage of hazardous materials are prohibited.
-

The credit points must be adjusted to exclude areas that are receiving open space (OS) credit under Activity 420 (Open Space Preservation) and Coastal Erosion Regulations (CEOS), according to the following formula:

$$rTSR = 1.00 - rOSP - rCER, \text{ if new development within the entire area of the tsunami hazard is subject to the regulations, and credit was requested for OS under Activity 420}$$

If the tsunami regulations cover less than 10% of the tsunami hazard area, the community may elect to use an impact adjustment ratio of 0.1, except where $rTSR + rOS + rLZ > 1.0$.

$$rTSR = \frac{aTSR}{aTS}$$

Documentation for TSR Provided by the Community

(1) At each verification visit,

- (a) The regulatory standard. The acronym TSR must be marked in the margin of the sections of the ordinance that apply to this activity.

A digital copy or photocopy of the appropriate pages of the ordinance and all exemptions is sufficient and should be attached. The community's CEO's CRS application certification is considered to certify as well that the ordinance or statute has been enacted into law and is being enforced (see Section 212.a in the *Coordinator's Manual*).

(2) The community must have the following documentation available to verify implementation of this activity:

- (a) An impact adjustment map prepared in accordance with Section 403 must be provided.

- (b) An explanation of the procedures followed for enforcement.

The ISO/CRS Specialist will ask to see permit records for development in the tsunami hazard area to verify that the regulations are enforced.

432.n. Coastal erosion hazard regulations (CER)

The maximum credit for this element is 370 points.

Local governments have used a variety of ordinances to reduce the risk of damage from coastal erosion. Credit is provided for regulatory standards that mitigate the effects of erosion within coastal erosion hazard areas beyond what is required by the NFIP. Up to 370 points are provided for coastal erosion management regulations (CER1) and dune and beach regulations (CER2) that prohibit construction within mapped erosion, dune, and beach areas. Credit is based on the erosion protection level, in years. This credit is in addition to credit provided for other regulatory standards under Activity 430.

Setback Regulations

Coastal construction standards of the NFIP emphasize the elevation of structures rather than horizontal displacement of them. The NFIP only requires horizontal displacement in V Zones to the extent that buildings must be "located landward of the reach of mean high tide" and must not alter frontal dunes or mangrove stands (44 CFR §60.3(e)). These requirements do not apply in coastal A Zones, despite the possibility that such areas may be experiencing erosion.

Setbacks based on maximizing the distance between the shoreline and the oceanfront side of a structure can be extremely effective in delaying damage from erosion. The safest approach in eroding areas is to site the structures in a way that will avoid erosion risks over the anticipated life of the structure.

Some states use a calculated "average annual erosion rate" to establish the minimum setback for new construction. Recognizing that larger structures usually pose a greater

economic risk and are more difficult to move, these calculations may include consideration of the size of the proposed building, with larger buildings required to be set back farther than smaller ones. North Carolina, for example, requires a minimum setback of 60 feet or 30 times the annual shoreline erosion rate (whichever is greater) for buildings of less than 5,000 square feet, but 180 feet or 90 times the shoreline erosion rate for structures larger than 100,000 square feet.

Credit Criteria for CER

- (1) The regulations must be based on coastal erosion mapping developed in accordance with the criteria of element MCE in Section 412.f(2), and
- (2) At a minimum, the regulations must prohibit all parts of all new buildings—including attached porches and similar structures—in the 30-year erosion-prone area. Setback calculations must NOT incorporate beach nourishment projects.

Impact Adjustment for CER

There are three options for calculating the impact adjustment for CER.

Option 1

If development along the entire shoreline is regulated for coastal erosion protection, rCER = 1.00

Option 2

If development along only a portion of the shoreline is regulated as an erosion hazard, a default value of 0.25 may be used for the impact adjustment ratio (rCER = 0.25).

If Option 2 is used, credit for more than one special hazard will be granted only if the hazards cover different geographic areas.

Option 3

rCER: The size of the area subject to coastal erosion regulations must be determined in order for the credit points to reflect the impact of the regulations. This impact adjustment is the ratio of the shoreline regulated for coastal erosion protection to the length of the entire shoreline.

$$\text{rCER} = \frac{\text{Length of shoreline subject to erosion regulation}}{\text{Length of the community's entire shoreline}}$$

Credit Calculation for CER

Credit is provided for coastal erosion regulations (CER1) and dune and beach regulations (CER2) that prohibit new building within mapped erosion, dune, and beach areas. Credit is based on the type of regulations and on the erosion protection level, in years.

cCER = (CER1 x rCER) + CER2, where

CER1 = the total of the following points:

- (a) The erosion protection level, in years, where new buildings are prohibited. CER has a range of from 30 to 100. The minimum value for CER is 30, i.e., the regulations meet the prerequisites listed above. The maximum value for CER is 100, i.e., the regulations prohibit all new buildings in at least the 100-year erosion-prone area.
- (b) 0.50 x the number of years of erosion protection required by the setback regulations for structures that are substantially improved
- (c) 0.50 x the number of years of erosion protection required by the setback regulations for structures that are substantially damaged
- (d) 20 points, if large buildings are required to meet a 60-year setback standard (credit available only when the community setback is 50 years or less)
- (e) 1 x the number of feet that the community adds as a buffer beyond the calculated erosion setback. If a community requires a 20-foot buffer landward of the 30-year setback, credit would be 20 points to a maximum of 50 points.
- (f) 75 points, if erosion-threatened structures must be removed within two years of such designation by the state or local government. The regulation must
 - (i) require the structure to be moved within two years of receiving the erosion-threatened designation;
 - (ii) identify erosion-threatened structures as those where any portion of the foundation sits within a zone of imminent collapse measured from a reference feature such as the first line of natural vegetation, or the normal high tide; and
 - (iii) define the landward boundary of the zone as being measured from the reference feature a distance of at least five times the average annual long-term erosion rate for the site, plus 10 feet. Credit will only be awarded where a state or local government can show that the regulation has been upheld in court.
- (h) 25 points, if all new structures must be set back at least

60 feet for the entire shoreline, including areas with
accretion.

To receive credit for CER, the regulations must prohibit all new buildings from the area expected to erode over the next 30 years. If that is the only coastal erosion regulation enforced in the community, then CER = 30. Credit is provided for either local or state erosion management regulations as long as they are enforced within the community.

Additional credit is provided where regulations require substantially improved and/or substantially damaged structures to be set back at least 30 times the average annual erosion rate at the building site. The amount of credit is based on the number of years of erosion protection identified in the setback regulation. Credit is calculated by multiplying the number of years of protection by 0.5.

There is additional credit if a community requires all new and substantially improved large buildings (i.e., over 5,000 square feet) to be set back beyond the 60-year erosion protection line.

Communities that require the removal of erosion-threatened structures from the shoreline may receive 75 points. This regulation must specify how erosion-threatened structures will be designated and that upon such designation the property owner must move or demolish the structure within two years. Structures with any portion of the foundation in a zone of imminent collapse are considered to be erosion-threatened structures. The zone of imminent collapse extends landward from a reference feature identified in the regulation, usually the first line of natural vegetation, line of escarpment, or normal high tide line. At a minimum, the landward boundary of the zone must extend from the reference feature a distance of five times the average annual long-term erosion rate for the site plus 10 feet. For example, if the erosion rate is 2 feet per year, the building must be moved if it is located closer to the reference feature than 20 feet [$(5 \times 2 \text{ feet}) + 10 \text{ feet} = 20 \text{ feet}$]. Credit will be awarded only if a state or local government can show that the regulation has been upheld in court.

Permanent shoreline stabilization projects, such as groins, jetties, bulkheads, seawalls, revetments, and large sandbags, may cause the loss of the public beach by increasing erosion of the seaward beach. They may also increase erosion at adjacent properties by interrupting natural sand migration patterns. Communities that prohibit these types of hardened structures receive up to 120 points for NSP under Activity 420.

(2) CER2 = the total of the following:

- (a) 20 points, for regulations that prohibit vehicular and pedestrian traffic on sand dunes except on appropriate access structures
- (b) 10 points, for regulations that prohibit development seaward (or lakeward) of existing buildings on waterfront properties. This includes new buildings, additions, decks, swimming pools, pavilions, septic tanks,

bulkheads, seawalls, and similar structures that can become debris in a storm and damage buildings.

Sand dunes are important in providing protection to buildings along the coast. They act as natural barriers to dissipate waves and protect back-lying areas from flooding and erosion. Pedestrian access between a coastal building and the shoreline is often overlooked when siting decisions and plans are made. Experience shows, however, that uncontrolled pedestrian access can damage coastal vegetation and landforms, providing weak points upon which storm forces act. Dune blowouts and breaches during storms often result, and buildings landward of the weak points can be subject to increased flood, wave, erosion, or overwash effects.

Documentation for CER Provided by the Community

(1) At each verification visit,

- (a) Application for credit for Section 410MCE for the coastal erosion hazard.
- (b) A copy of the adopted regulatory standard. The appropriate acronym (CER1 or CER2) must be marked in the margin of the sections of the ordinance that apply to this activity.
- (c) An explanation of the procedures followed for enforcement of the regulatory standard.
- (d) An impact adjustment map showing the erosion rates or areas and the regulations applicable to the shoreline.
- (e) Development plans and/or permit records that document how the regulation has been applied. This will vary from state to state. The ISO/CRS Technical Reviewer can clarify precisely what is needed for each state.

A photocopy of the appropriate pages of the ordinance is sufficient and should be attached to the activity worksheet. The Chief Executive Officer's (CEO's) application certification is considered to include a certification that the ordinance or statute has been enacted into law and is being enforced (see Section 212.a in the *Coordinator's Manual*).

If the regulations are enforced throughout the area mapped and credited under Section 410MCE, the map for Section 410MCE can be used as the impact adjustment map.

432.o. Other higher standards (OHS)

The maximum credit for this element is 100 points.

OHS provides CRS credit for regulatory approaches and standards that are not addressed in the other elements of this or other activities. Each submittal for credit is individually reviewed and scored. Examples of past credits include, but are not limited to

- Prohibiting floodproofing as a flood protection measure for any new building (i.e., requiring all new buildings, including non-residential buildings, to be elevated);
- Prohibiting installation of new septic systems in the floodplain;
- Requiring new streets in the floodplain to be at or above the base flood elevation to provide access for emergency vehicles during a flood;
- Requiring all new multi-family and commercial buildings to provide access to dry land; and
- Requiring an evacuation plan for new residential subdivisions that exceed a certain number of units.

Credit Criteria for OHS

Each regulation that has a higher standard than the NFIP criteria and that is not credited elsewhere is submitted for review. The actual determination of the credit provided is made by FEMA.

Credit Points for OHS

OHS = up to 100 points for higher regulatory standards that prevent flood losses or protect natural and beneficial floodplain functions that are not otherwise credited in another element. Communities have received from 5 points to 100 points.

Impact Adjustment for OHS

OHS credit is adjusted based on the ratio of the area affected by the OHS regulation to the area of the SFHA. See Section 431.c on calculating an impact adjustment.

$$rOHS = \frac{aOHS}{aSFHA}, \text{ where}$$

aOHS = the size of the area(s) that qualify for OHS credit,
and

aSFHA = the size of the community's SFHA

Documentation for OHS Provided by the Community

(1) The activity documentation requirements in Section 431.d must be met.

432.p. State-mandated regulatory standards (SMS)

The maximum credit for this element is 20 points.

This element recognizes the benefit received by the NFIP for a state-required measure that is implemented in both CRS and non-CRS communities in that state. State-mandated regulations also benefit from better staff training and state oversight than other regulatory provisions.

A community should contact the ISO/CRS Specialist to obtain its SMS credit. The credit may apply differently to different communities within a state, depending on the requirement. For example, only coastal communities receive SMS credit for a state requirement for a coastal setback line. See also Section 231.d on state-based credit.

Examples of past credits include, but are not limited to

- State floodway mapping standards (additional credit for FWS under Activity 410 (Flood Hazard Mapping));
- State coastal setback regulations (additional credit for OSP under Activity 420 (Open Space Preservation));
- State-mandated freeboard (additional credit for FRB);
- State-mandated building code (additional credit for BC1); and
- State-mandated erosion and sedimentation control regulations (additional credit for ESC under Activity 450 (Stormwater Management)).

Credit Criteria for SMS

- (1) Credit is added to the community's credit for a regulation credited in the 400 series.
- (2) The community's credited element is verified locally and the community must receive credit for the element before it gets the SMS bonus points. For example, if there is state-mandated freeboard, but a review of the community's Elevation Certificates shows that the community does not get freeboard credit, then it does not receive the 10% SMS bonus for the state-mandated freeboard.
- (3) SMS credit for state-mandated erosion and sedimentation control regulations (ESC) or water quality regulations (WQ) under Activity 450 (Stormwater Management) is provided only if the state mandate exceeds the requirements for a NPDES permit.

Credit Points for SMS

The credit is 10% of the credit for an element credited in the 400 series, up to a maximum of 20 points.

SMS = 0.10 x the equivalent credit for each state-mandated regulation credited in the 400 series of CRS activities. The credit is calculated after the impact and growth adjustments. The maximum value for SMS is 20 points.

Impact Adjustment for SMS

There is no impact adjustment for SMS.

Documentation for SMS Provided by the Community

No documentation is needed from the community. The ISO/CRS Specialist works with the State NFIP Coordinator to identify credited standards. Once they are confirmed and the community's credit for the element is verified, the SMS bonus credit is provided.

432.q. Regulations administration (RA)

The maximum credit for this element is 67 points.

This element provides credit for the community's procedures for administering its floodplain management regulations. Credit can be provided even if the community receives no other credit under Activity 430. There are five elements.

Credit Criteria for RA

(1) Staff training (RA1) provides credit for trained regulatory staff members.

- (a) Credit for training is provided for each
 - Certified Floodplain Manager (CFM®);
 - Graduate of an approved four-day class conducted at, or field deployed by, FEMA's Emergency Management Institute (EMI). The credited classes are listed in the box; and
 - Graduate of a home study version of these classes or other equivalent training.
 - (b) Regulatory staff members may be employees or contract permit officials who administer the community's floodplain management permits. An exception is that credit for graduating from the CRS class (E278) is provided for any community employee, regardless of the office in which he or she works.
 - (c) The credit for training is based on the number of courses taken. If two people take the "Managing Floodplain Development" course, it is counted two times. The same credit is provided if one person took both the "Managing Floodplain Development" and "Coastal Construction" courses. If a CFM® took the Coastal Construction course, it is counted two times.
 - (d) There is no double credit for being both a CFM® and a graduate from the basic NFIP course (E273). This is counted once.
 - (e) This credit is removed if the staff person leaves the community or does not maintain his or her certification.
- (2) IAS accreditation (RA2): IAS is the International Accreditation Service, an arm of the International Code Council. It has a program that reviews and accredits building departments. The program is explained at www.iasonline.org/Building_Department_Program.

EMI Classes Credited for RA1 Credit

- | |
|---|
| E273—Managing Floodplain Development through the NFIP |
| E194—Advanced Floodplain Management Concepts I |
| E282—Advanced Floodplain Management Concepts II |
| E284—Advanced Floodplain Management Concepts III |
| E278—The Community Rating System |
| E386—Residential Coastal Construction |
- For more information, see
<http://www.training.fema.gov/emi>

A BCEGS classification of 5/5 or better is a prerequisite for RA2 credit. This ensures that the community's building department has a program that addresses natural hazards.

- (3) Detailed inspections (RA3): Credit is for conducting three detailed inspections for each new building in the regulatory floodplain. Figure 430-4 explains what is needed for this credit. There is no partial credit for two inspections or for doing less than what is listed.
- (4) Reinspections (RA4), i.e., inspecting buildings when they are sold or rented to a new tenant or application is made for a home improvement permit. For CRS credit, the regulations must clearly state that the community's inspector has the right to enter the building at the designated occurrences (e.g., sale of the property) and will inspect for compliance with the floodplain management permit that was previously issued. Documentation of the inspections is needed at verification.
- (5) Off-site record storage (RA5): In the past, hurricanes, fires, floods, and other disasters have destroyed local permit offices and their files. This credit encourages communities to safeguard their floodplain management permit records. Credit is given if copies of such documents (in digital, scanned, or paper format) are stored at a site out of the floodplain and at least one mile away. The records must be transferred or copied to the off-site storage location at least once each year.

A "secure location" means a site protected from fire, theft, and natural hazards (including a category 5 hurricane). The site must not be subject to a flood hazard, i.e., it cannot be in a mapped SFHA, an X-Zone location subject to local drainage problems, or a basement with a known sewer backup problem. The community may submit a site that does not meet all of these criteria (e.g., it is less than one mile away) if it can demonstrate that the site is secure from fire, theft, flood, and other natural hazards.

Credit Points for RA

RA = the total of the following:

- (1) RA1 = EITHER
 - (a) 5 points, for each CFM® or graduate of an approved EMI class (up to 25 points for each CFM® and/or class graduate), OR
 - (b) 25 points, if all proposed development projects in the floodplain and all final inspections and project approvals are reviewed and approved by a CFM®. The credit is provided as long as no new floodplain development project is used or occupied without the review and approval of a CFM®
- (2) RA2 = 5 points, if the community's building department has been accredited by the IAS
- (3) RA3 = 16 points, if the community conducts inspections in accordance with the criteria in Figure 430-4.

Credit for Inspections under Regulations Administration (RA3)

There is no partial credit for two inspections or for doing less than what is listed here.

For credit, the community must conduct at least three inspections for each permitted development project in the regulatory floodplain according to the following criteria:

1. The permit application records must include a site plan that shows
 - a. The site plan's scale and north orientation arrow;
 - b. The parcel boundaries and the location and names of adjacent streets;
 - c. All watercourses on the parcel;
 - d. All floodplain, V-Zone, Coastal A-Zone, and floodway boundaries that run through the parcel;
 - e. All required buffer or setback lines from shorelines or channel banks;
 - f. All drainage and utility easements;
 - g. All areas to be cleared, cut, graded, or filled; and
 - h. The location of all existing and proposed fences, walls, and other structures.
2. If the permit includes a new building or an expansion of an existing building,
 - a. The site plan must show the footprint of all existing and proposed buildings and building additions.
 - b. The permit application papers must include
 - o The elevation of the lowest floor of the building (or addition) and of an attached garage, including the elevation of the interior grade or floor of a crawlspace;
 - o The location and elevation of all mechanical and utility equipment servicing the building; and
 - o For buildings with solid foundation walls and buildings with enclosures below the base flood elevation, the total area of each enclosed area (in square feet) measured on the outside, the location and specifications of all flood openings, and either the total net open area (in square inches) of flood openings below the base flood elevation, accounting for screens, louvers, faceplates, and grilles; or a statement of certification if engineered openings are specified (see NFIP Technical Bulletin #1).
3. The first inspection is conducted when the site is staked out or otherwise marked. The inspector checks that areas subject to special requirements are clearly marked on the ground. For example, if the floodway, Coastal A-Zone, or V-Zone line goes through the parcel or there is a natural area that is not to be disturbed, it could be staked out. If there are no such areas, then this inspection does not need to be conducted for CRS credit (however, it is still a good idea to place stakes or other markings to show the building footprint in order to verify setbacks and other code requirements).
4. The second inspection is conducted when the lowest floor is built for a building or building addition. The builder provides the community with documentation of the surveyed lowest floor elevation. The inspector checks that
 - a. The foundation or forms for the structure are correctly located on the site;

[continued on next page]

Figure 430-4. Credit for inspections under regulations administration (RA3).

- b. Where buildings have foundation walls or other enclosures below the base flood elevation, the location and size of the openings are as specified on the approved plans; and
- c. In coastal high hazard areas (V Zones) and coastal A Zones, slabs placed under the building are not connected to the foundation.

The inspection records must include a record that the elevation of the lowest floor was surveyed and found to be compliant. This could be, but does not have to be, a FEMA Elevation Certificate. At this point the inspector verifies that the lowest floor will be at or above the required elevation. This inspection is not needed if the project does not involve construction of a new building or a substantial improvement.

- 5. The third inspection is conducted when the project is finished, the Elevation Certificate is submitted, and before or during the final building inspection. The inspector checks that
 - a. The foundation and floor elevation have not been altered since the second inspection;
 - b. All areas below the required elevation are constructed with materials resistant to flood damage;
 - c. All required manufactured home tie downs are in place;
 - d. Where buildings have foundation walls or other enclosures below the base flood elevation, the location and size of the openings are as specified on the approved plans and recorded on the Elevation Certificate;
 - e. All electrical, heating, ventilation, plumbing, air conditioning, ductwork, and other equipment is located, elevated, or protected as specified on the approved plans and recorded on the Elevation Certificate;
 - f. There has been no alteration of the ground since the second inspection OR the ground has been graded according to the approved plans (e.g., the lowest floor is at the correct height above the highest adjacent grade);
 - g. V-Zone and breakaway wall certificates have been obtained, as appropriate, for new and substantially improved buildings in V-Zone and coastal A Zone areas; and
 - h. Buildings with enclosures in coastal A Zones meet the A-Zone vent requirements.
- 6. The inspection records must include
 - a. A completed FEMA Elevation or Floodproofing Certificate, as appropriate, that has been checked by the community for completeness and accuracy;
 - b. Photographs of all sides of the structure;
 - c. Close-up photographs of typical openings; and
 - d. Photographs of all mechanical and utility equipment located outside the building showing (1) its relation to the building and ground and (2) its required anchoring.

Figure 430-4 (cont.). Credit for inspections under RA3.

- (4) RA4 = 16 points, if the community conducts reinspections of buildings to ensure that they still comply with the floodplain management requirements of their earlier permits
 - (5) RA5 = 5 points, for storing key floodplain management permit records at a safe and secure site
-

Example 431.n-1.

A small town has one person handling all floodplain management activities. That person becomes and stays certified. RA1 = 25

Example 431.n-2.

A coastal county has five people involved in building and development permitting. Two are certified. One CFM® has been to the EMI coastal construction course. A third employee has been to the EMI Managing Floodplain Development class. Any of the five people can issue floodplain permits. RA1 = $5 \times 4 = 20$

Example 431.n-3.

All floodplain permits in South Scottsdale are reviewed, inspected, and permitted by a CFM®. (RA1 = 25), the City conducts all the inspections needed for RA3 credit (RA3 = 16), and the City scans all permit records and backs them up weekly (RA5 = 5). RA = $25 + 16 + 5 = 46$

Impact Adjustment for RA

There is no impact adjustment for RA.

Documentation for RA Provided by the Community

- (1) At each verification visit,
 - (a) [For RA1 credit for having a graduate from an EMI class] A copy of the certificate of course attendance.
 - (b) [For credit for RA3 or RA4] Inspection records that show how each item was checked. For RA3, the records must include copies of the photographs and elevation surveys.

- (c) [For CFM® and IAS accreditation] No documentation is needed from the community. The status is verified by checking the names on the websites of the Association of State Floodplain Managers and of the IAS.

433 Credit Calculation

$$\begin{aligned} c430 = & \text{cDL} + (\text{FRB} \times r\text{FRB}) + (\text{FDN} \times r\text{FDN}) + (\text{CSI} \times r\text{CSI}) \\ & + (\text{LSI} \times r\text{LSI}) + (\text{PCF} \times r\text{PCF}) + (\text{ENL} \times r\text{ENL}) \\ & + \text{BC} + \text{LDP} + \text{MHP} + (\text{CAZ} \times r\text{CAZ}) + \text{SHR} \\ & + (\text{TSR} \times r\text{TSR}) + (\text{CER} \times r\text{CER}) + (\text{OHS} \times r\text{OHS}) + \text{SMS} \\ & + \text{RA}, \text{ where} \end{aligned}$$

$$\text{cDL} = (\text{DL1} \times r\text{DL1}) + (\text{DL2} \times r\text{DL2}) + (\text{DL3} \times r\text{DL3})$$

NOTE: The total points for FRB, FDN, ENL, and CAZ (after the impact adjustment) cannot exceed 1,000 points, the value for DL2. The CRS does not provide more points for applying higher standards to new buildings than it does for prohibiting buildings in the floodplain.

Example 433-1.

South Scottsdale has the following credits:

Two feet of freeboard:

$$\text{FRB} = 250, \quad r\text{FRB} = 0.52$$

Prohibition of critical facilities in the floodway:

$$\text{PCF} = 80, \quad r\text{PCF} = 0.08$$

Adoption of all the I-Codes (BC1 = 50) and a BCEGS class of 3/3 (BC2 = 30)

$$\text{BC} = 50 + 30 = 80$$

All floodplain permits are reviewed, inspected, and permitted by a CFM® (RA1 = 25), the City conducts all the inspections needed for RA3 credit (RA3 = 16), and the City scans all permit records and backs them up weekly (RA5 = 5).

$$\text{RA} = 25 + 16 + 5 = 46$$

$$\begin{aligned}
 c430 &= cDL + (FRB \times rFRB) + (FDN \times rFDN) + (CSI \times rCSI) \\
 &\quad + (LSI \times rLSI) + (PCF \times rPCF) + (ENL \times rENL) \\
 &\quad + BC + LDP + MHP + (CAZ \times rCAZ) + SHR \\
 &\quad + (OHS \times rOHS) + SMS + RA \\
 &= 0 + (250 \times 0.52) + 0 + 0 + 0 + (80 \times 0.08) + 0 + 80 + 0 + 0 \\
 &\quad + 0 + 0 + 0 + 0 + 46 \\
 &= 130.00 + 6.40 + 80 + 46 = 262.40
 \end{aligned}$$

This value is rounded to the nearest whole number, so $c430 = 262$

434 For More Information

- a. Additional information, reference materials, checklists, and examples can be found at www.CRSresources.org/400.
- b. Most state NFIP coordinating offices have prepared model ordinances with provisions that exceed the minimum NFIP standards. Additional help on regulatory provisions may be available from state planning or community affairs agencies and regional planning commissions.
- c. FEMA has numerous publications on regulatory standards and administering floodplain management regulations. See <http://www.fema.gov/floodplain-management>.

Guidelines for Design of Structures for Vertical Evacuation from Tsunami, 2008, FEMA P646. See <https://www.fema.gov/media-library-data/20130726-1641-20490-9063/femap646.pdf>.

Vertical Evacuation from Tsunamis: A Guide for Community Officials, 2009, FEMA P646A. See https://www.fema.gov/media-library-data/20130726-1719-25045-1822/fema_p646a.pdf.

- d. The Emergency Management Institute (EMI) is a FEMA training center located in Emmitsburg, Maryland. Stipends to cover local officials' travel, registration, and rooms are usually available from FEMA. EMI also sponsors field-deployed and home-study or "independent study" courses. For more information, contact the state emergency management agency's training office or visit the EMI website at <http://training.fema.gov/emi/>.
- e. More information on the I-Codes can be obtained from the International Code Council at www.iccsafe.org.

Reducing Flood Losses Through the International Code Series (2006 I-Codes with 2007 Supplement), 2000, was published jointly by the model code organizations, FEMA, the Association of State Floodplain Managers, and the American Society of Civil Engineers. See www.fema.gov/library/viewRecord.do?id=2094.

- f. For more information on floodplain manager certification, contact the Association of State Floodplain Managers at (608) 828-3000 or see www.floods.org.

- e. National Marine Fisheries Service, 2008. *2008 Status of U.S. Fisheries*. U.S. Department of Commerce, National Oceanic and Atmospheric Administration. Available at http://www.nmfs.noaa.gov/sfa/statusoffisheries/2008/StatusFisheries_2008.pdf.
- f. Rapp, Cygnia F. and Timothy B. Abbe, 2003. *A Framework for Delineating Channel Migration Zones*. Ecology Publication #03-06-027. Washington State Department of Ecology. Available at <https://fortress.wa.gov/ecy/publications/documents/0306027.pdf>.

435 Related Activities under the Community Rating System

- If certain areas are subject to special regulations (such as the coastal A Zone), people should be advised of the regulations when they make map information inquiries (Activity 320 (Map Information Service)).
- Explaining permit requirements and regulatory standards is a credited topic for outreach projects (OP and FRP) under Activity 330 (Outreach Projects) and for website pages (Activity 350 (Flood Protection Information)).
- Requirements that are filed with a property's records, such as a nonconversion agreement (ENL), are eligible for credit as other disclosure requirements (ODR) in Activity 340 (Hazard Disclosure).
- Regulatory requirements should be part of any discussion of property protection measures (Activity 360 (Flood Protection Assistance)). For example, the community's substantial improvement rules should be explained, especially when Increased Cost of Compliance is discussed.
- If regulations are enforced in the regulatory floodplain outside the SFHA, there may be some credit available under Activity 410 (Flood Hazard Mapping).
- If the standards for development limitations (DL) are restrictive enough, the areas affected could qualify for preserved open space (OSP) under Activity 420 (Open Space Preservation).

440 FLOOD DATA MAINTENANCE—Summary

Maximum credit: 222 points

442 Elements

- a. **Additional map data (AMD)**: Up to 160 points for implementing digital or paper systems that improve access, quality, and/or ease of updating flood data within the community.
- b. **FIRM maintenance (FM)**: Up to 15 points for maintaining copies of all Flood Insurance Rate Maps (FIRMs) that have been issued for the community.
- c. **Benchmark maintenance (BMM)**: Up to 27 points for a program that maintains benchmarks so surveyors can find them and can depend on them to be accurate.
- d. **Erosion data maintenance (EDM)**: Up to 20 points for maintaining coastal erosion data.

Credit Criteria

Each element has a separate section discussing credit criteria.

Impact Adjustment

The impact adjustment for AMD is discussed in Section 442.a, and the impact adjustment for BMM is discussed in Section 442.c. There are no impact adjustments for FM or EDM.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

440 FLOOD DATA MAINTENANCE

The OBJECTIVE of this activity is to make community floodplain data more accessible, current, useful, and/or accurate so that the information contributes to the improvement of local regulations, insurance rating, planning, disclosure, and property appraisals.

441 Background

Outdated mapping hinders sound floodplain management. The map a community uses for floodplain management can and should be updated frequently to account for annexations, new subdivisions, site-by-site analyses, better ground elevation data, and incorporation of new hazard data. To make the map more useful and easier to use, it should include detailed topography, building footprints, natural features, and other data that can help relate the floodplain information to conditions on the ground and to other programs.

The most important map to the National Flood Insurance Program (NFIP) is the Flood Insurance Rate Map (FIRM). Many communities dispose of old FIRMs when new ones are issued. However, old FIRMs, if they are made available, can enable some communities and floodplain residents to review the history of the property (e.g., whether it was identified as floodprone when it was purchased) and to verify whether a building had to meet flood protection criteria when it was built.

Maintenance of benchmarks and support of global positioning system (GPS) surveying techniques makes it easier and less expensive for developers and property owners to determine ground, floor, and base flood elevations for construction and flood insurance purposes. Maintenance of erosion data helps property owners and the potential buyers of coastal property better understand their risk and improves coastal floodplain management.

441.a. Activity Description

Under this activity, credit is provided for putting the FIRM and Flood Boundary and Floodway Map delineations on a digitized mapping system or other method that allows for quick revision, review, and reprinting of a flood map (Section 442.a, AMD). This activity also includes credit for adding or overlaying additional data, such as sensitive areas, zoning districts, assessor data, and other map layers used regularly by the community's staff.

A computerized parcel system or geographic information system (GIS) is often easier to use than a paper map. With a computerized system, a building official, real estate agent, or anyone interested in the flood hazard can quickly find information such as the

Note that this activity only credits maintenance of the community's special flood hazard data. The FIRM published by the Federal Emergency Management Agency (FEMA) is still the document used for flood insurance rates and the mandatory purchase requirement. However, if the community's flood data maintenance program finds an error in the FIRM, it should be reported to FEMA so it can be included in the next map revision

flood zone, flood elevations, or the lowest floor elevation for parcels or buildings within or near the floodplain.

Credit is also provided in this activity for

- Keeping old FIRMs and making them available (Section 442.b, FM),
- Maintaining accurate ground elevation data (Section 442.c, BMM),
- Replacing damaged or moved benchmarks (Section 442.c, BMM),
- Supporting GPS surveying systems (Section 442.c, BMM), and
- Erosion data maintenance in coastal areas (Section 442.d, EDM).

442 Elements

442.a. Additional map data (AMD)

The maximum credit for this element is 160 points.

AMD credits digital or other systems that improve access, quality, and/or ease of updating flood and FIRM data.

Three different types of flood data maintenance systems are usually eligible for credit:

- A GIS or other digitized system that updates information electronically and can display or print a current map.
- A data base management program for parcel records that maintains the appropriate flood data for each property. Some communities have master parcel record systems that can be accessed for building permit records, property tax information, FIRM data, and other purposes. Sometimes these systems are tied into a GIS. Credit is given if parcels in this system are designated as “in” or “out” of the floodplain.
- Map overlays, such as overlaying the Special Flood Hazard Area (SFHA) on the zoning map, aerial photograph, or more detailed street map; or using clear plastic sheets over the FIRM to record map changes.

Data available from any of these three systems improve the community’s administration of its floodplain management program. Note that certain information about private property may not be released to the public (see the box on flood insurance data and the Privacy Act).

Most of the credited items are important to provide the regulatory staff with the latest flood hazard data and other information for a property. Users of the community’s system, including tax assessors and property appraisers, should be encouraged to access the data to be more aware of the flood hazard.

Credit Criteria for AMD

- (1) AMD1 credit is a prerequisite for any other AMD credit.
- (2) The map or data base must be used regularly by the community's regulatory staff. There is no credit for a map system that is used only for planning drainage projects or other non-regulatory purposes. Using the system to provide map determinations for the permit office is considered a regulatory purpose.
- (3) New data, including annexations, new subdivision maps, flood insurance restudies, Letters of Map Revision, Letters of Map Amendment, and studies performed for site-specific analyses must be added at least annually to the data base or overlay map.
- (4) Data from a digitized mapping or parcel system must be made available annually to the Federal Emergency Management Agency (FEMA) at no cost (if requested). A fee may be charged to other requestors based on the actual cost of retrieval or reproduction.

Credit Points for AMD

The Privacy Act

Flood insurance data about private property, including repetitive loss properties, are protected under the Privacy Act. Personally identifiable information such as the names or addresses of specific properties, whether they are covered by flood insurance or not, whether they have received flood insurance claims, or the amounts of such claims MAY NOT be released outside of local government agencies or to the public or used for solicitation or other purposes. Such information should be marked "For internal use only. Protected by the Privacy Act of 1974."

General or aggregated information, such as total claims paid for a community or an area or data not connected to a particular property may be made public.

AMD = the total of the following, based on the types of data included in the data maintenance system

AMD1 = 20 points, for showing the SFHA boundaries, corporate limits, streets, and parcel or lot boundaries (a data base management program must show whether a parcel is in the SFHA)

AMD2 = 26 points, for a GIS layer that shows buildings, building outlines, or building footprints (a data base management program must show whether the primary building on the lot is in the SFHA), and the building information is kept up to date to reflect new construction

AMD3 = 12 points, for showing floodways or coastal high hazard areas (a data base management program must show whether either the parcel or the primary building is in the floodway or coastal high hazard area)

AMD4 = 12 points, for showing base flood elevations

AMD5 = 10 points, for including FIRM zone attributes (e.g., A3, VE, etc.)

AMD6 = 10 points, for showing the 500-year floodplain elevations or boundaries (a data base management program must show whether the parcel is in the 500-year floodplain)

AMD7 = 12 points, for showing areas of the community subject to other natural hazards, such as landslides, subsidence, stream migration, and soils unsuitable for septic fields (a data base management program would show whether the parcel is subject to another hazard)

AMD8 = EITHER:

(a) 8 points, if the community's GIS includes topographic contour lines,

OR

(b) 10 points, if the system includes topographic contour lines at a smaller contour interval than that provided on available U.S. Geological Survey digital orthophoto quarter quads (DOQQ). In those areas where there are no DOQQs, the credit is provided if the contour interval is smaller than that on the area's USGS quadrangle maps

AMD9 = 6 points, for including updated floodplain data in the tax assessment data base

AMD10 = 6 points, for including overlays or layers for all FIRMs in effect after the date of the community's application to the Community Rating System (CRS)

AMD11 = 8 points, for other overlays or data bases used for regulation or mitigation programs, including incorporating and maintaining layers from Hazus-MH (see Figure 510-2) and the community's repetitive loss areas (see Section 503)

AMD12 = 14 points, for areas with natural floodplain functions (e.g., wetlands, designated riparian habitat)

AMD13 = 14 points, for including building elevation data. The data must be in digital format, not scanned pictures of Elevation Certificates. The points are prorated in the same manner as Elevation Certificates are prorated in WEB4 (Section 352.c)

Example 442.a-1.

Pierce County, Washington, has a GIS that is used for regulatory, development, and building permit purposes. The GIS contains numerous layers for land development, zoning, critical areas, shoreline review, and other data sets. They include the following information, which can be credited:

- (1) The SFHA boundaries, corporate limits, streets, and parcel boundaries (AMD1);
- (2) Building footprints (AMD2);
- (3) Floodways and coastal high hazard areas (AMD3);
- (4) Base flood elevations (AMD4);
- (5) FIRM zone attributes (e.g., A3, VE, etc.) (AMD5);
- (6) The 500-year floodplain elevations and boundaries (AMD6);
- (7) Channel migration zones, landslides, and lahars (AMD7);
- (8) Contour lines created from a LiDAR data base (AMD8);
- (10) All FIRMs in effect after the date of the community's application to the CRS (AMD10); and
- (12) Fish and wildlife areas and wetlands (AMD12).

All of the above items are used by the County for various floodplain management and other community development programs.

$$\begin{aligned} \text{AMD} &= 20 + 26 + 12 + 12 + 10 + 10 + 12 + 10 + 0 + 6 + 0 + 14 + 0 \\ &= 132 \end{aligned}$$

Impact Adjustment for AMD

The impact adjustment is calculated by dividing the area of the community's SFHA for which data have been entered into the computer (or added to the overlay map) by the total area of the community's SFHA (aSFHA):

$$rAMD = \frac{aAMD}{aSFHA}, \text{ where}$$

aAMD = the area within the SFHA that is covered by the additional map data, and

aSFHA = the area of the community's SFHA

The areas for aAMD and aSFHA must be in the same measurement—acres or square miles. If the calculated value of rAMD is less than 0.10, then 0.10 may be used for rAMD.

NOTE: *The community's aSFHA should be reviewed and updated each year for the Program Data Table that is included in the annual recertification (see Section 213.a).*

Example 442.a-2.

Pierce County's GIS covers the entire county and all its floodplains.

$$\text{rAMD} = 1.00$$

If a community has different digital mapping or data base systems for different areas of the community, it should designate and score each one separately and the total credit points will be corrected through the impact adjustment.

Example 442.a-3.

Gulf Beach County has a GIS for the developed area along the coast. For inland rural areas, the staff refers to map overlays. The GIS would be designated "AMD1" and the area not covered by the GIS would be "AMD2." The two systems would be scored and, if together they covered the entire county, rAMD1 plus rAMD2 would equal 1.00.

Documentation for AMD Provided by the Community

(1) At each verification visit,

- (a) Copies of the maps or examples from the data base that clearly show the items to be credited. For example, printouts of some GIS screens could show all the attributes to be credited.
- (b) [If the community calculates impact adjustment ratios for element AMD] The impact adjustment map discussed in Section 403. Each area listed in Section 442.a for which credit is being requested must be shown on the impact adjustment map.

442.b. FIRM maintenance (FM)

The maximum credit for this element is 15 points.

Having old FIRMs on hand can help with tracking substantial improvement requirements, compliance, and eligibility for grandfathered flood insurance premiums. Old maps can be hard to obtain, so a community that keeps them provides a valuable service to its residents.

FM credit is provided for maintaining earlier editions of flood insurance maps. The maps must be readily available and the community must allow inquirers access to them. Copies of old FIRMs and Flood Boundary and Floodway Maps may be available from the FEMA Map Service Center (<https://msc.fema.gov/>).

Credit Criteria for FM

- (1) Copies of the maps produced by the NFIP must be maintained. Under this element, credit is provided for maintaining copies of ALL FIRMs, Flood Insurance Studies, and Flood Boundary Floodway Maps. “All FIRMs” means every panel for every FIRM that appears on the list of FIRM revisions in the legend of the current FIRM. If the community has only been issued one FIRM, no credit is available under this element, because keeping the community’s current FIRM is a minimum requirement of the NFIP. Note also that maintaining copies of old FIRMs that have been in effect since 1999 is a prerequisite for credit under Activity 320 (Map Information Service). The FM credit is for maintaining ALL FIRMs, not just those issued since 1999.
- (2) Additional credit is provided for maintaining copies of the Flood Hazard Boundary Maps, i.e., the FEMA maps published before the community received its first FIRM.
- (3) The maps and documents can be maintained in paper, microfilm, or electronic format. They do not have to be part of the system credited under Section 442.a (AMD), but they must be in the possession of the community and made available to the public when asked.

Credit Points for FM

FM = the total of the following:

-
- (1) 12 points, for maintaining copies of all FIRMs, Flood Insurance Studies, and Flood Boundary Floodway Maps that have been issued for the community
 - (2) 3 points, for maintaining copies of all Flood Hazard Boundary Maps that were issued for the community
-

There is no credit if the FIRM has never been revised.

Impact Adjustment for FM

There is no impact adjustment for FM.

Documentation for FM Provided by the Community

(1) At each verification visit,

- (a) The indexes from all past FIRMs and Flood Boundary and Floodway Maps, and the cover of each past Flood Insurance Study.

442.c. Benchmark maintenance (BMM)

The maximum credit for this element is 27 points.

BMM1 credits a program that maintains benchmarks so surveyors can find them and can depend on them to be accurate. BMM2 credits a program that maintains a network of stations that support GPS surveying.

Benchmarks: Accurate benchmarks are critical to surveyors when they are completing Elevation Certificates or performing land surveys before a new structure is built. If the benchmarks are not accurate, structures can be built too low, or perhaps even in the wrong location.

The National Spatial Reference System (NSRS) is maintained by the National Geodetic Survey (NGS) in the U.S. Department of Commerce. It is a compendium of vertical and horizontal benchmarks for the country. This element provides credit if the community has a sufficient number and density of benchmarks to meet the NSRS prerequisites. If the community does not, it is encouraged to either survey new ones or submit the data necessary to add qualifying existing benchmarks to the national system.

Any surveyor can create a NSRS benchmark. Surveyors must follow the guidelines of the NGS for the type of monument set and the accuracy of the survey that establishes the monument. After review by the NGS, these benchmarks are added to the NSRS data base, which is available to surveyors and the public at <http://geodesy.noaa.gov/>.

GPS support: The NGS manages a network of Continuously Operating Reference Stations (CORS) that provide Global Navigation Satellite System data in support of three-dimensional positioning and geophysical applications throughout the United States.

Surveyors, GIS users, engineers, scientists, and others who collect GPS data can use CORS data to improve the precision of their positions. CORS-enhanced, post-processed coordinates are accurate to within a few centimeters relative to NSRS coordinates, both horizontally and vertically.

The CORS sites are independently owned and operated. Each agency shares its data with the NGS, and the NGS in turn analyzes and distributes the data free of charge. As of August 2015, the CORS network contained almost 2,000 stations, contributed by over 200 different organizations, and the network continues to expand.

Having at least three CORS within 30 miles enables surveyors with portable GPS stations to obtain elevations accurate enough for FEMA Elevation Certificates in near-real time. The NGS provides a current map of CORS on its website (<http://geodesy.noaa.gov/CORS/>). This map provides the distance to the three nearest CORS from any point on the map. A community can use this map to see if it qualifies for BMM2 credit.

Credit Criteria for BMM

(1) There must be a list of the benchmarks and/or CORS and a description of the benchmark and/or CORS locations.

(2) To receive credit, each benchmark must meet all of the following criteria:

(a) It must be a benchmark that is either in the NSRS data base, or a permanent monument with key data posted in a reference system readily available to local surveyors, such as a published book or the community's website. The local system must include key data, such as the location and description of the benchmark, the elevation and datum, and when the benchmark was last recovered.

Some areas may not have any NSRS benchmarks. If the community has a network of quality benchmarks that are permanent monuments but are not entered into the NSRS, it must provide a statement, signed by a licensed surveyor, that each benchmark for which credit is requested is a monument that would qualify for addition to the NSRS if it were submitted to the NGS.

Permanent Monuments

"Permanent monuments" are engraved metal discs at least 2 inches in diameter or similar markers that are recognizable, durable, and immovable, and set in concrete or on steel rods driven to resistance. Chiseled squares in sidewalks, parts of fire hydrants, nails in telephone poles, "PK nails" in pavement, etc., are NOT "permanent monuments."

(b) There must be a note that the benchmark has been recovered within the last five years. "Recovered" means that the benchmark has been located and that it appears to be undisturbed. If a benchmark has not been recovered in the last five years, a local official or surveyor can locate the monument and report that it has been recovered. A recovery note must be filed in the NSRS or where it can be accessed by local surveyors.

In some cases, the community or local surveyors may need to recover all credited benchmarks to maintain this credit at each cycle verification visit. Recovery can be reported by any local official—it does not have to be a licensed surveyor. Recovery can also be reported by surveyors in the private sector if the community maintains the recovery notes. The NSRS website explains the process to report recovery.

(c) The benchmark must be a first- or second-order vertical control benchmark. The "order" tells how close the results were when the surveyor who set the benchmark completed a circuit back to the starting point. Lower-order vertical benchmarks are not as precise in elevation.

(d) It must have a stability rating of A or B. The NSRS describes whether a benchmark is likely to move over time with the following system:

- A = most reliable and expected to hold an elevation (e.g., bedrock);
- B = probably will hold an elevation well (e.g., a massive bridge pier);
- C = may hold, but of a type commonly subject to ground movement (e.g., a building foundation); and
- D = mark of questionable or unknown stability.

Some areas may not have any benchmarks rated A or B. If the community has an alternative way to provide dependable elevation data, it may submit a description of its alternative. An example would be a program that resurveys benchmarks every few years. The community must demonstrate that its alternative method achieves consistently accurate elevations over time.

- (e) It must be within one mile of some part of the community's SFHA. The community must submit a map showing the location of the qualifying benchmarks and the portion of the SFHA within one mile of a qualifying benchmark. Areas mapped as approximate A Zones without elevations do not need to be included as part of the SFHA unless the community is asking for credit under Activity 410 for flood elevations for a site at the time of development.
- (3) Credit can be provided for CORS as an alternative or in addition to the benchmarks that meet credit criterion (2). There must be at least three free CORS within 30 miles of the credited portion of the SFHA. There is no credit for areas covered by only one or two CORS.
- (4) An impact adjustment map is required that shows the community's SFHA, the locations of the listed benchmarks or CORS, and the portion of the SFHA that is within one mile of a qualifying benchmark or within 30 miles of a qualifying CORS.

Credit Points for BMM

BMM = BMM1 + BMM2, provided that the areas covered do not overlap

BMM1 = 27 points, if the community has one or more benchmarks that meet credit criterion (2)

BMM2 = 27 points, if there are three CORS within 30 miles (50 km) of the credited portion of the SFHA

If a community has benchmarks for some areas of the community and CORS for others, it should designate and score each one separately and the total credit points will be calculated through the impact adjustment and credit calculation formula (Section 443).

Impact Adjustment for BMM

The impact adjustment for BMM1 is based on the area of the community's SFHA that is within one mile of the benchmarks and the total area of the community's SFHA.

$$rBMM1 = \frac{aBMM1}{aSFHA}, \text{ where}$$

$aBMM1$ = the area of the SFHA within one mile of a qualifying benchmark and not counted as a part of $aBMM2$, and

$aSFHA$ = the area of the community's SFHA, in square miles

The impact adjustment for BMM2 is based on the area of the community's SFHA that is within 30 miles of at least three CORS and the total area of the community's SFHA.

$$rBMM2 = \frac{aBMM2}{aSFHA}, \text{ where}$$

$aBMM2$ = the area of the SFHA within 30 miles of at least three CORS and not counted as a part of $aBMM1$, and

$aSFHA$ = the area of the community's SFHA, in square miles

Documentation for BMM Provided by the Community

(1) At each verification visit,

(a) The list of the benchmarks and/or CORS.

(b) The data for the creditable benchmarks that are in the NSRS or the community's publicly accessible data base. This must include key data, such as the location and description of the benchmarks, their order and stability, the elevation and datum, and when the benchmarks were last recovered.

The documentation can be in the form of either

(i) A printout of the NSRS datasheets, a photocopy of the relevant pages of the community's benchmark book, or the URL for the website data base, or

(ii) For those benchmarks that are not in the NSRS, a statement signed by a licensed surveyor that states that they meet all five of this element's prerequisites. The surveyor's statement does not need to be certified or sealed, but does need to include the signatory's license number.

(c) An impact adjustment map (see credit criterion (4)). See Section 403 on impact adjustment maps. The BMM impact adjustment must show those SFHAs where base flood elevations are available, the locations of the benchmarks (for BMM1 credit), or

the locations of the CORS (for BMM2 credit). The NSRS retrieval maps do not qualify because they do not show or name a sufficient number of features.

Example 442.b-1.

A small community has two vertical control benchmarks that meet the prerequisites. One is listed in the NSRS and the other is posted on the city engineering department's website. All parts of the SFHA are within one mile of one or the other benchmark.

The area of its SFHA is 396 acres or 0.62 square miles.

$$rBMM\ 1 = \frac{aBMM}{aSFHA} = \frac{0.62}{0.62} = 1.0$$

442.d. Erosion data maintenance (EDM)

The maximum credit for element EDM is 20 points.

EDM credit is for updating the rate of coastal erosion and the rates used for regulating building setbacks.

NOTE: Related CRS credit is provided separately under element AMD3 in Section 442.a. That credit is for including coastal erosion-related hazard areas in a geographic information system (GIS), in a digitized parcel system, or on an overlay map.

Credit Criteria for EDM

- (1) The community must update the erosion data on at least a five-year cycle.
- (2) The community must receive credit for regulating development in erosion-prone areas under Section 430CER.

Credit Points for EDM

The credit points for EDM are calculated as shown below.

Erosion data maintenance (EDM) (Maximum credit: 20 points)

EDM = 20, if a state or local agency maintains reference marks spaced no more than $\frac{1}{2}$ mile apart and records shoreline erosion in relation to those reference marks at least every five years, OR

EDM = 10, if a state or local agency takes new aerial

photographs at least every five years to update its shoreline erosion rates.

Impact Adjustment for EDM

All of the shoreline must be included in the erosion study. Therefore, there is no impact adjustment for this element.

Documentation for EDM Provided by the Community

(1) At each verification visit,

- (a) A description of the method used to update mapped erosion rates or regulatory maps.
- (b) A certification that the rates or maps are updated and adopted on at least a five-year cycle.

443 Credit Calculation

$$c440 = cAMD + FM + cBMM + EDM, \text{ where}$$

$$cAMD = AMD \times rAMD, \text{ and}$$

$$cBMM = (BMM1 \times rBMM1) + (BMM2 \times rBMM2)$$

444 For More Information

- a. Additional information, reference materials, checklists, and examples can be found at www.CRSresources.org/400.
- b. FEMA's guidelines and standards for flood risk analysis and mapping to meet NFIP requirements, along with accompanying technical references (current and previous), are available at FEMA's webpage, Guidelines and Standards for Flood Risk Analysis and Mapping, at <https://www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping>.
- c. Rural communities can request help on this activity from the U.S. Natural Resources Conservation Service. Requests should be submitted to the local soil and water conservation district, which usually is located in the county seat.
- d. The U.S. Army Corps of Engineers can provide assistance with benchmarks and mapping issues. Requests for assistance should be submitted to the Flood Plain Management Services Coordinator at the appropriate District Office of the Corps.
- e. Communities may check on past FIRMs and obtain background data by calling 1-877-FEMA MAP. They can also find many of their old maps through <https://msc.fema.gov>, under Product Catalog and Historic Flood Maps.

- f. Information on the National Spatial Reference System (NSRS) can be found at www.ngs.noaa.gov. Benchmarks entered into the system are recorded on data sheets at <http://geodesy.noaa.gov/datasheets/>.

445 Related Activities under the Community Rating System

This activity directly supports floodplain management to comply with the minimum NFIP requirements, but it also supports a number of CRS activities.

- Activity 320 (Map Information Service)—Having copies of existing and old FIRMs in an easily accessible format can facilitate credit under this activity. If more layers are available, then information can also be provided for additional hazards.
- Activity 330 (Outreach Projects)—Maps of the existing SFHA, showing all the additional detail credited in Activity 440, allow for a higher-quality outreach program that addresses the specific issues in each neighborhood. Additional hazard data and information on natural functions also help inform the outreach process and help educate the public. If the community has a GIS or a data base management program for parcel records, it should be able to prepare a printout or a disk with the addresses of all the properties in the floodplain. This will facilitate mailing an outreach project to floodplain residents.
- Activity 340 (Hazard Disclosure)—Provision of good map data to insurance agents and others allows them to better and more easily inform their clients about existing hazards and natural resources and functions.
- Activity 360 (Flood Protection Assistance)—The more information the community has in its system, the more support the community can offer quickly and easily.
- Activity 370 (Flood Insurance Promotion)—Digital copies of maps, particularly containing parcel and structure data, can help the community target its program to promote the purchase of flood insurance by its residents. Structures for which insurance is required can be identified and, if first-floor information is available, estimates of the cost of flood insurance can be developed for the owners. If repetitive loss areas are included, then they can be targeted by additional outreach or prioritized within the program.

- Activity 410 (Flood Hazard Mapping)—Integration of floodplain map information provided by the community with FIRM map information and LOMRs can be facilitated by having all of the information in a single data system, like a GIS.
- Activity 420 (Open Space Preservation)—Creating all the overlays or data bases for a GIS can provide the information necessary to identify and calculate credit for open space, including the bonus credit for natural functions.
- Activity 430 (Higher Regulatory Standards)—Having map and parcel data in one system can facilitate rapid and accurate decisions about many community regulations, including freeboard, enclosure limits, and coastal A-Zone standards. Having first-floor elevations available and mapped for credit can help verify that the community is properly implementing its freeboard requirements. The maps also can be used to determine the impact adjustment required for each element within this activity and Activity 420. Benchmarks are needed to ensure that structures are properly elevated and having the benchmarks easily located is important.
- Activity 450 (Stormwater Management)—Having accurate topography available is important for determining watershed boundaries and flow paths to ensure that new developments are properly implementing stormwater management requirements. Mapping of other sensitive areas can be credited under watershed master planning and additional credit can be obtained if the maps are part of the system used for regulation under this activity.
- Activity 510 (Floodplain Management Planning)—Planning requires good data. Having all the data in an easily visible format is critical to good planning. Data credited in 440 should be used during development of a community's flood hazard management plan, and any additional data developed during the process could add to the credit in 440 if the layer was not previously available.
- Activity 520 (Acquisition and Relocation)—Having older maps showing parcel and structure data can help target structures for acquisition or relocation and also contribute to documenting completion of the project.
- Activity 530 (Flood Protection)—Having first-floor data available is important for grant opportunities. When a community has all or most of the information credited in this activity, it can identify which structures are of highest priority for retrofitting or elevation. Once a project is completed, the maps can be used to verify the activity.
- Activity 540 (Drainage System Maintenance)—Mapping of natural functions and structures can help a community decide where to target its channel maintenance activities. Having all drainage facilities incorporated as part of its data base allows for better planning for new development, better maintenance, and a way to determine what maintenance standards should be required.
- Activity 610 (Flood Warning and Response)—Maps of the SFHA, structures, evacuation routes, other natural hazards, building elevations, and ground elevations help the community determine how it will respond during a flood.

- Activity 620 (Levees)—Maps of areas that can be inundated after a levee fails are crucial to planning how to respond. Maps of the SFHA, the 500-year inundation boundaries, buildings and their first floors, and topography help with this planning.
- Activity 630 (Dams)—A community needs maps of areas that can be inundated after a dam fails in order to plan how to respond. Maps of the SFHA, the 500-year inundation boundaries, structures and their first floors, and topography help with this planning.

450 STORMWATER MANAGEMENT—Summary

Maximum credit: 755 points

452 Elements

- a. **Stormwater management regulations (SMR):** Up to 380 points for regulating development on a case-by-case basis to ensure that the peak flow of stormwater runoff from each site will not exceed the pre-development runoff. SMR credit is the sum of four sub-elements:
 - (1) Size of development regulated (SZ): Up to 110 points.
 - (2) Design storms used in regulations (DS): Up to 225 points.
 - (3) Low-impact development (LID): Up to 25 points.
 - (4) Public maintenance of required facilities (PUB): Up to 20 points.
- b. **Watershed master plan (WMP):** Up to 315 points for regulating development and redevelopment according to a watershed management master plan. WMP is the total of eight sub-elements.
- c. **Erosion and sedimentation control regulations (ESC):** Up to 40 points for regulations to minimize erosion from land disturbed due to construction.
- d. **Water quality regulations (WQ):** 20 points for regulations that improve the quality of stormwater runoff.

Credit Criteria

Each element has a separate section discussing credit criteria.

Impact Adjustment

The credit points for SMR and WMP are adjusted by ratios reflecting the proportion of the watersheds affected by the regulations or the plan. There is no impact adjustment for elements ESC or WQ.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

450 STORMWATER MANAGEMENT

The OBJECTIVE of this activity is to prevent future development from increasing flood hazards to existing development, to protecting existing hydrologic functions within the watershed, and to maintain and improve water quality.

451 Background

When unmanaged, stormwater runoff from new development and redevelopment throughout a watershed increases flood hazards by causing more frequent flooding, greater flood depths, and longer-lasting floods. As forests, fields, and farms are covered by impermeable surfaces, such as streets, rooftops, and parking lots, more of the rain runs off and it runs off at a faster rate. When an area is urbanized, the rate of runoff and the volume of runoff can increase five-fold or more.

This problem is compounded by

- Changes in the surface drainage system. Stormwater runoff travels faster on streets and in storm drains than it did under pre-development conditions;
- Armoring of channels, which increases the velocity of flows and remove habitat that is essential to many riparian species; and
- Sediment from disturbed ground, which can reduce the capacity of the drainage system, adversely affect water quality, and destroy habitat for many species of insects and the fish that depend on them.

People, buildings, and infrastructure are affected by these changed conditions. Communities are affected by development that takes place in communities upstream in their watershed, and the community's own development in turn can have an impact on downstream communities. Consequently, watershed-based agencies have been created around the country to address these issues on a broader scale. Communities are encouraged to cooperate with adjacent communities to manage stormwater.

It is very important to regulate new development to ensure that the peak flow and volume of stormwater runoff that leaves a development site will be no greater than the runoff from the site before it was developed. Restrictions on individual developments can address many watershed development problems, but to prevent unwanted consequences from development as a whole, communities should plan on a watershed-wide basis.

By completing watershed master plans, communities can examine the potential impact of unmitigated development on streams and structures throughout the watershed. Once these impacts are known, a comprehensive program, including more specific development regulations, can be created to prevent adverse impacts. This will prevent an increase in flood damage or stream erosion, reductions in groundwater recharge or water quality, and loss of habitat.

451.a. Activity Description

This activity credits four approaches to managing new development in the watershed.

- (1) **Stormwater management regulations (SMR):** Regulating development on a case-by-case basis to ensure that the peak flow and volume of stormwater runoff from each site will be no greater than the runoff from the site before it was developed or redeveloped. Other development regulations requiring developers to maximize a site's ability to absorb site runoff can be credited.
- (2) **Watershed master planning (WMP):** Developing and implementing a watershed management master plan that analyzes the combined effects of existing and expected development and redevelopment on drainage throughout the watershed and also includes a plan of action to address current and expected problems. A stormwater management regulation credited under Section 452.a (SMR) helps to manage increased runoff from a developing watershed, but it does not solve the problem entirely. The flood peak at a point downstream in a watershed is a result of both the quantity of upstream runoff and the time it takes for water to travel down the watershed. Development within the watershed usually has an impact on both of these characteristics.

The objective of watershed master planning under Section 452.b (WMP) is to provide the community with a tool it can use to make decisions that will reduce the increased flooding from development on a watershed-wide basis and address existing flood problems. Most communities have some way of dealing with drainage problems, through a capital improvement plan, planned flood control structures, or perhaps just by responding to complaints as they arise. A watershed master plan, like other community plans, allows communities within the watershed to consider future development as they work on current problems and ensure that future development does not aggravate existing problems.

- (3) **Erosion and sediment control (ESC):** Regulating activities throughout the watershed to minimize erosion on construction sites that result could in sedimentation and water pollution.
- (4) **Water quality (WQ):** Requiring new developments' stormwater management facilities to improve the quality of stormwater runoff.

452 Elements

452.a. Stormwater management regulations (SMR)

The maximum credit for this element is 380 points.

SMR credits the regulations used by the community and its neighbors in the watershed to manage runoff from future development onsite. SMR credit is provided if new development is required to prevent or reduce the increase in runoff that results from urbanization. SMR credit is only provided for regulation of runoff from a 10-year storm or larger. Additional credit is available if the community addresses larger storms, and controls the total volume of runoff from new development.

Because development typically results in an increase in the amount of runoff, stormwater management usually requires that a volume of flood water be stored onsite during the storm to prevent increased frequency and severity of flooding. It is released after the runoff subsides (stormwater DETENTION). A developer may store this excess runoff for a short time so that it may be used for irrigation or groundwater recharge or to reduce pollution (stormwater RETENTION). When retention is used for stormwater management, the retained runoff is not discharged to the stream system.

Detention does not reduce the amount of water flowing downstream; rather, it simply lets it out over a longer period of time to reduce the peak flow immediately downstream of the site. This can still cause flooding problems farther downstream and the additional volume of water can destabilize channel banks and cause other problems. Therefore, stormwater retention or extended detention is preferable to simple detention for peak flows. If stormwater retention is used, the community must ensure that adequate storage is again available within a reasonable time in case another storm occurs.

Other approaches, such as low-impact development regulations, can be used to reduce the total runoff that leaves a site as well as peak flows. These techniques help preserve a site's ability to absorb its runoff. Credit may be provided for other approaches to managing the impact of development on runoff, if the community can show that there is no increase in flood risk or erosion downstream.

Maintenance of these required facilities is vital—if they silt in or become clogged, they provide no flood protection benefits. Therefore, there are separate credits under Activity 540 for maintaining storage facilities.

SMR credit is the sum of the credit for four sub-elements:

- Size of development (Section 452.a(1), SZ),
- Design storm used (Section 452.a(2), DS),
- Low-impact development regulations (Section 452.a(3), LID), and
- Public agency authority to inspect and maintain, at the owner's expense, private facilities constructed to comply with the ordinance (Section 452.a(4), PUB).

Communities are encouraged to check with their regional stormwater management agency to see if they can apply for credit based on the stormwater management program implemented by the regional agency.

Credit Criteria for SMR

- (1) A portion of the watershed must be subject to a regulation that requires the peak runoff from new development to be no greater than the runoff from the site in its pre-development condition.
- (2) A community must have credit for size of development (SZ) and design storm (DS) in order to receive credit for SMR.
- (3) For SZ credit, the community must, at a minimum, regulate development of 5 acres or more or increases in impervious area of 20,000 square feet or more.
- (4) For DS credit, the community must require onsite management of at least a 10-year storm. A regulation designed to retain or detain only the “first flush,” the first inch of rainfall, or less than a 10-year storm, is not credited under SMR. However, it may qualify as a water quality regulation (WQ) and be credited under Section 452.d. Design standards for channels, culverts, and bridges are not credited.
- (5) For DS credit, the community’s regulations must require pre- and post-development hydrology calculations and post-development runoff from the development or redevelopment site must be limited to pre-development levels.

Sub-elements

- (1) **Size of development (SZ):**

The maximum credit for this sub-element is 110 points.

Maximum credit for SZ is provided if the regulations clearly state that all development, including single-family residences, is subject to the regulations. However, some SZ credit can be provided for different types of development; for example, if the community regulates commercial developments that are larger than one-half acre (SZ1 = 90 points) and residential developments larger than 5 acres (SZ2 = 15 points). An impact adjustment must be used to reflect the percentage of land in each category.

Credit Points for SZ

-
- (1) SZ = one of the following, based upon the minimum size of areas regulated:
 - (a) SZ = 110 points, if all development is regulated, or
 - (b) SZ = 90 points, if all development is regulated except for single-family residences, parcels of one-half acre or less, or increases in impervious area of 5,000 square feet or less, or

- (c) SZ = 60 points, if all development is regulated except for parcels of 1 acre or less or increases in impervious area of 10,000 square feet or less, or
 - (d) SZ = 15 points, if all development is regulated except for parcels of 5 acres or less or increases in impervious area of 20,000 square feet or less
-

If the regulations only affect development of parcels LARGER than 5 acres (e.g., 10-acre developments) or increases in impervious area of more than 20,000 square feet, there is no credit for SZ or credit for SMR.

Credit may be provided for requiring developers to pay fees in lieu of constructing facilities, if the fees collected go toward construction of the necessary facilities and the facilities are constructed before development.

Example 452.a-1.

As a condition of subdivision, planned-unit development, or other permit approval, the community requires that all land disturbances larger than 1 acre ensure that the post-development stormwater discharge from the site will not exceed the amount of runoff under pre-development conditions.

SZ = 60

(2) Design storms used in regulations (DS):

The maximum credit for this sub-element is 225 points, including the bonus for controlling the total volume of runoff.

Although the 100-year flood is the typical basis for floodplain management, many communities use a lesser standard for stormwater management. A lower standard may meet many community needs, but management of smaller storms does not necessarily result in reduced peak flows or volume from a major storm. DS credit is based on the size of the storm that is managed onsite by the community's program—more points are provided for managing larger storms.

The maximum DS credit is provided if the regulation clearly states that all discharges up to and including that from the 100-year storm must be released at rates not exceeding the pre-development peak discharge. Bonus credit for controlling the volume of runoff is provided (up to 75 more points) when the regulations require retention of all runoff. The additional credit is also provided if the total volume of water released, measured above half of the 2-year flow rate is no more than the pre-development volume.

As an alternative to such a performance standard, the language may be based on criteria designed to produce the same result on a regional basis (e.g., a standard allowable discharge per acre based on a regional study). If such language is used, the community must provide an estimate of the design storm controlled and a comparison of the pre-development runoff and the permitted discharge. Note that if this is based on a regional study, this may already have been documented by the regional agency or another Community Rating System (CRS) community in the region.

Example 452.a-2.

Language for a volume control ordinance could read:

All new development within the Little River watershed shall be designed to prevent any increase in peak flow, velocity, or total runoff volume during the 5-year and 100-year rainfall events. Before development, the developer must submit hydrologic and hydraulic studies showing the nature and extent of runoff under present conditions and with the proposed development for those two rainfall events.

Credit Points for DS

- (2) DS = the total of the following for the storms used to measure the impact of new development:
 - (a) DS1 = EITHER 14 points, if detention is designed for a 10-year storm, OR
21 points, if the volume is also controlled
 - (b) DS2 = EITHER 36 points, if detention is designed for a storm larger than the 10-year but smaller than the 100-year storm, OR
54 points, if the volume is also controlled
 - (c) DS3 = EITHER 100 points, if detention is designed for the peak flow of the 100-year storm, OR
150 points, if the volume is also controlled
-

The regulations must require pre- and post-development hydrology calculations and post-development runoff must be limited to pre-development levels at the site boundary (credit criterion (5)). The standard used may be peak flow, volume, or a combination of the two. If the volume of runoff is controlled by retaining the runoff on site, infiltrating the runoff, or ensuring that the volume of runoff during all storms greater than half of the 2-year event remains constant, the credit is increased by 50%.

Example 452.a-3.

A community's stormwater management ordinance requires control of the 2- and 10-year storms onsite to prevent increases in runoff. Under that ordinance, DS1 = 14, DS2 = 0, and DS3 = 0. Similarly, if the ordinance had been based on the 25- and 50-year storms, DS1 would be 0, DS2 = 36 and DS3 = 0.

The community adopted an ordinance that requires determination of a proposed development's effects on the 10- and the 100-year storms to ensure that peak flows leaving the site or within two miles downstream are not increased. Now, DS1 = 14, DS2 = 0 and DS3 = 100.

$$DS = DS1 + DS2 + DS3 = 14 + 0 + 100 = 114$$

Example 452.a-4.

A Florida county has sandy soils and requires all new development within closed basins of concern (watersheds that do not drain to the ocean) to retain on site the runoff from all storms up to and including the 100-year storm.

$$DS = DS1 + DS2 + DS3 = 21 + 54 + 150 = 225$$

(3) Low-impact development (LID):

The maximum credit for this sub-element is 25 points.

LID credits the community's regulatory language that requires the implementation of LID techniques to the maximum extent feasible to control peak runoff when new development occurs. LID techniques can significantly reduce or eliminate the increase in stormwater runoff created by traditional development, encourage aquifer recharge, and promote better water quality. Communities are encouraged to use these techniques to minimize the need for more traditional stormwater management.

The U.S. Environmental Protection Agency (EPA) defines LID as

... an approach to land development (or re-development) that works with nature to manage stormwater as close to its source as possible. LID employs principles such as preserving and recreating natural landscape features and minimizing effective imperviousness to create functional and appealing site drainage that treats stormwater as a resource rather than a waste product.

Many practices have been used to adhere to these principles, such as bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. By implementing LID principles and practices, water can be managed in a way that reduces the impact of built areas and promotes the natural movement of water within an ecosystem or watershed. Applied on a broad scale, LID can maintain or restore a watershed's hydrologic and ecological functions.

Communities that require new development and redevelopment to implement LID techniques in all cases can receive up to 25 points.

Credit for LID is also provided if the community's stormwater management ordinance requires the use of "soft" techniques to reduce runoff to the maximum extent possible before using detention. This can be thought of as a requirement to mimic natural hydrologic runoff and minimize the impact of land development on water resources to the maximum extent possible. The developers are required to control the runoff, but detention ponds are discouraged in favor of on-site infiltration.

A community can receive partial LID credit for a stormwater management ordinance that requires that development of a certain size (e.g., all development except a single-family residence) minimize runoff using these techniques.

Low-impact Development (LID)

The term low impact development (LID) refers to systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration, or use of stormwater in order to protect water quality and associated aquatic habitat. The EPA currently uses the term "green infrastructure" to refer to the management of wet weather flows using these processes, and to refer to the patchwork of natural areas that provide habitat, flood protection, cleaner air, and cleaner water.

At the both the site and regional scale, LID and green infrastructure practices aim to preserve, restore, and create green space using soils, vegetation, and rainwater harvest techniques.

(<http://www.epa.gov/polluted-runoff-nonpoint-source-pollution/urban-runoff-low-impact-development>)

Credit Points for LID

(3) LID = one of the following:

- (a) LID = 25 points, if all development (SZ = 110) is required to use low-impact development techniques (instead of pipes, channels, or detention) to control the impacts of development on runoff to the maximum extent feasible; OR
 - (b) LID = 20 points if SZ = 90; OR
 - (c) LID = 15 points if SZ = 60; OR
 - (d) LID = 10 points if SZ = 15.
-

Example 452.a-5.

The following language is from Section 4.2 of the Stormwater Management and Sediment and Erosion Control Ordinance for Berkeley County, West Virginia, and would receive LID credit.

Small scale stormwater management practices, non-structural techniques, and better site planning to mimic natural hydrologic runoff characteristics and minimize the impact of land development on water resources must be implemented. Only when it is absolutely necessary is the use of a structural BMP warranted.

LID = 25

The full ordinance can be found at
www.berkeleycountymw.org/pdf/planning/swmdraft.pdf.

(4) Public maintenance of required facilities (PUB):

The maximum credit for this sub-element is 20 points.

PUB credit is provided for establishing maintenance procedures, for requiring that owners of the new facilities abide by them, and for the community's having the authority to inspect and perform maintenance should the owners not comply with their responsibilities. A community can receive PUB credit in one of two ways.

- (a) If the community requires the owners of all new facilities to allow the community to inspect their facilities. If problems are found, the owners must perform the necessary maintenance. If the owner fails to perform the required maintenance, the community

(or agency) must have the authority to perform the maintenance and bill the owner for the work performed.

- (b) All stormwater management facilities constructed after the date of adoption of the regulation (including basins built by private developers) are required to be deeded to the community (or other stormwater management agency).

Whichever approach is used, it must be supported by an ordinance or other regulatory authority. For example, holding the owner responsible for maintenance must be based on clear legal authority, such as the subdivision ordinance, that was known to the developer at the time of construction of the stormwater facility. Credit is not provided for a policy or a statement that the community “has been able to get compliance in the past” if there is no clear legal authority.

Credit Points for PUB

-
- (4) PUB = 20 points, for requiring the inspection and maintenance of stormwater management facilities
-

Impact Adjustment for SMR

The impact adjustment for SMR is based on the area of the watershed that is regulated by the SMR regulations (aSMR) and the total area of the watershed (aW). See Sections 402 and 403 on calculating an impact adjustment.

In order to determine aSMR the community must prepare a watershed impact adjustment map (see Section 403.d) and calculate the area of the watershed and the area subject to the regulations. The base map for the watershed impact adjustment map should be a small-scale map that shows all of the watersheds affecting the community. The entire watershed for each watercourse draining into or through the community should be shown on the map (except those with drainage areas over 50 square miles at the point at which they enter the community, because they are excluded from the calculations). The total area of these watersheds is represented by aW.

Many communities are part of very large watersheds, which can mean they account for only a tiny portion of it. With appropriate documentation, aW may be reduced in three ways.

- (1) If the area of a watershed exceeds 50 square miles at the point where it enters the community, the community should exclude the upstream portion. If such large watersheds are outside the community’s jurisdiction, or are not regulated, the community will receive more credit by excluding them. If they are regulated, the community may receive more credit by including them. The extent of the applicability of each set of regulations enforced within each watershed, if there is more than one, must be shown and the area calculated.
- (2) If upstream watersheds are effectively reduced by flood control structures that control the base flood, the size of aW is reduced accordingly. Only structures designed to

control the base flood and credited as such by the Federal Emergency Management Agency (FEMA) can be used for this type of adjustment to aW.

- (3) If, because of their ownership, portions of the watersheds are unlikely to be developed, those portions may be excluded from aW. Areas that could be excluded are national forests, state parks, or privately owned land dedicated to open space use.

Communities are encouraged to cooperate with adjacent communities to manage stormwater. If a community only has regulatory jurisdiction over a portion of its watersheds, it cannot ensure that properties will be safe from increased runoff in the future, because of upstream development. However, if upstream communities also manage future development, either independently or through county-wide or watershed regulations, all communities can benefit. Therefore, if a community can demonstrate that upstream communities have similar watershed management programs for the upper portions of their watersheds, it can include those areas in aSMR and receive credit.

If the community does not regulate development within all of the watersheds that affect it and wants an impact adjustment ratio greater than 0.15, it needs to develop a watershed impact adjustment map to determine the areas required to calculate rSMR for each area with creditable regulations.

$$rSMR = \frac{aSMR}{aW}, \text{ where}$$

aSMR = the area subject to stormwater management regulation,
and

aW = the area of all watersheds affecting the community

If the total calculated impact adjustment is less than 0.15, or the community does not prepare a watershed impact adjustment map, then rSMR = 0.15.

Example 452.a-6.

A community regulates all watersheds within its corporate limits. However, areas outside the corporate limits are not regulated. The staff calculates that the area of the community's jurisdiction is 13% of all the land within the watersheds that drain to the community. Therefore, 0.15 is used for rSMR, since it is greater than the value calculated by the community.

Documentation for SMR Provided by the Community

(1) At each verification visit,

- (a) The needed documentation is assembled by the ISO/CRS Specialist and provided to the technical reviewer for this activity. There is a checklist to help the stormwater manager identify all the needed documentation, available at www.CRSresources.org/400.
- (b) A copy of the regulation requiring management of surface water runoff from new development in the watershed. For SMR credit, the language must require that peak runoff from new development be no greater than the runoff from the site in its pre-development condition. The point at which this appears in the ordinance must be marked, e.g., "SMR."

The language submitted must include those factors that are credited: size of development regulated, design storms to be used, low impact development criteria, and how the maintenance of required facilities is handled.

For CRS credit, the regulations must be legally enforceable. Policies and guidelines are not acceptable unless the community's legal counsel provides a letter stating that the policies or guidelines are enforceable.

- (c) Drainage reports that demonstrate enforcement of the regulations. The ISO/CRS Specialist determines how many records are needed to obtain a representative sample.
- (d) [If the community determines the area covered by stormwater management regulations (aSMR) to include watershed areas regulated by other communities] Documentation that watersheds outside the jurisdiction of the community are regulated to standards similar to those within the community.
- (e) An impact adjustment map showing watershed boundaries and stormwater management jurisdictions and calculated areas.

The ISO/CRS Specialist may visit a sample of sites in the field to verify that stormwater management facilities have been constructed in accordance with the approved plans.

Credit Calculation for SMR

$$\text{SMR} = \text{SZ} + \text{DS} + \text{LID} + \text{PUB}$$

$$\text{cSMR} = \text{SMR} \times \text{rSMR}$$

452.b. Watershed master plan (WMP)

The maximum credit for this element is 315 points.

WMP credit is provided if the community implements stormwater management regulations through an adopted watershed master plan. Credit is also provided for watershed master plans that

- Evaluate future conditions and long-duration storms,
- Evaluate the impact of sea level rise and climate change
- Identify wetlands and natural areas,
- Address the protection of natural channels, and
- Provide a dedicated funding source for implementing the plan.

The objective of watershed master planning is to provide the community with a tool it can use to make decisions that will reduce the increased flooding from future conditions that include new development, redevelopment, and the impact of climate change and sea level rise, throughout a watershed or community. Although there is no doubt that stormwater management regulations reduce the future flood threat from a developing area, a watershed master plan goes much further in locating and dealing with existing problems and identifying potential future problems. An understanding of the watershed's behavior is necessary to ensure that established or enhanced stormwater management regulations requiring onsite control will prevent flood damage due to future development.

The only way to completely understand watershed behavior (how a watershed responds to rainfall) is to do a relatively detailed study of runoff under both present and future (fully developed) conditions. Hydrologic models simulate various rainstorms over a watershed and, based on the nature of the watershed's land cover, soils, and topography, determine the timing and total volume of peak flows. Hydrologic studies can be used to determine the appropriate amount of detention or retention necessary to prevent an increase in runoff as development occurs.

In addition to the present- and future-conditions hydrology studies, a watershed master plan should include mitigation recommendations that are appropriate for the community. These recommendations should include the entire range of mitigation activities—regulations, public information, structural control of runoff, non-structural programs (including stormwater management regulations), protection of sensitive natural areas, and acquisition of flood-prone properties.

For CRS credit, a watershed master plan must, at a minimum, address future development (new development and/or redevelopment) within the watershed and the impact of development on flows during a 100-year event. The modeling may show that different standards are needed for different watersheds, or for different parts of the watershed. Communities may also find as a result of their modeling that their existing stormwater management regulations are adequate or they may decide to make them more stringent to prevent development from increasing the frequency and severity of existing problems.

One of the prerequisites for a CRS Class 4 (see Section 211.c) is that the community receive credit for managing the impacts of a 100-year storm and/or sea level rise, where applicable, based on a watershed master plan. Most communities use various return frequencies for different design and management purposes, including onsite controls. Development of a watershed master plan does not have to change that, but it is important to understand the impact of development on runoff from the 100-year storm.

For CRS credit, development of a watershed master plan does not imply that a community must immediately address its future problems through capital drainage projects. The plan should be considered a tool to help the community identify opportunities to address problems before and as they arise.

Credit Criteria for WMP

- (1) The community must have adopted a watershed master plan that
 - (a) Evaluates the impact of future conditions for at least one watershed that drains into the community for multiple storm events, including the 100-year storm. The plan must identify the natural drainage system and constructed channels; or
 - (b) Evaluates the future conditions, including the impacts of a median projected sea level rise (based on the National Oceanic and Atmospheric Administration's (NOAA's) "intermediate-high" projection for the year 2100) on the local drainage system during multiple rainfall events, including the 100-year rainfall event. This option is for coastal communities with no natural or constructed channels. Guidance on sea level rise projections for CRS purposes can be found in Section 404.
- (2) The community must have adopted regulatory standards that require onsite management of runoff from all storms up to and including the 25-year event that receive credit under SMR in Section 452.a. The adopted regulatory standards must manage future peak flows so that they do not increase over present values. "All storms" includes at a minimum the 10-year storm in addition to the 25-year event. Management of a 2-year storm is also recommended.
- (3) For any plan that is more than five years old, the community must evaluate the plan to ensure that it remains applicable to current conditions. The evaluation must address whether the data used for the plan are still appropriate and whether the plan effectively manages stormwater runoff. The community must update a watershed master plan that become obsolete, or the WMP credit will be revised accordingly.
- (4) WMP1 credit must be received in order to receive credit for any of the other items.

Credit Points for WMP

WMP = the total of the following:

WMP1 = 90 points, if the watershed master plan meets all of the criteria listed in Section 452.b

WMP2 = 30 points, for managing the runoff from all storms up to and including the 100-year event to ensure that flood flows downstream of new development do not increase due to the development

“All storms” includes at a minimum the 10-year storm, the 25-year or the 50-year storm, and the 100-year storm.

WMP3 = 55 points, if the plan provides onsite management of future peak flows and volumes so that they do not increase over present values

If the community’s onsite development standards prevent all increases in downstream flood peaks AND VOLUMES, regardless of their location within the watershed, it will receive this credit. A community can receive the maximum credit if it requires retention of runoff from a 100-year or larger storm and discharges it to groundwater or irrigation or if it detains the runoff long enough to discharge it after the peak flow in the receiving body has subsided, so that the discharge will not increase downstream peak flows anywhere in the receiving stream.

WMP4 = 35 points, if the plan manages the runoff from all storms up to and including the 5-day event

If a community can demonstrate that an event shorter than five days is the locally appropriate “worst-case” runoff event for stormwater management, it may receive this credit if it uses that event for its regulatory standard. In some areas this may require continuous-simulation modeling. If a community, regional, state, or federal agency can demonstrate that, for example, the 72-hour event provides the “worst case” runoff for a watershed, the 72-hour event would be credited for communities in that area.

The following three credits recognize communities that preserve their remaining “natural” channels, floodplains, or upland wetlands for stormwater conveyance or storage. “Soft” or “green” approaches are encouraged, rather than “hard” or concrete measures.

WMP5 = 30 points, if the plan identifies existing wetlands or other natural open space areas to be preserved from development so that natural attenuation, retention, or detention of runoff is provided

WMP6 = 25 points, if the plan recommends prohibiting development, alteration, or modification of existing natural channels and the community has adopted a qualifying ordinance

WMP7 = 25 points, if the plan recommends that channel improvement projects use natural or “soft” approaches rather than gabions, rip rap, concrete, or other “hard” techniques, and the community has adopted appropriate design standards or ordinances

WMP8 = 25 points, if the community has a funding source dedicated to implementing the plan’s recommendations.

A community with a local funding source dedicated to implementation of the adopted watershed master plan is more likely to complete the projects and can receive additional credit. Common sources of funding include a real estate excise tax, stormwater utilities, drainage district fees, or other dedicated taxes. Developer impact fees are an uncertain source of funding and are not credited here.

Impact Adjustment for WMP

The watershed impact adjustment map for WMP is prepared, and the affected areas are calculated, in the same manner as for SMR in Section 452.a. The area covered by the credited watershed master plan (aWMP) must be the same or smaller than the area covered by the SMR regulations (aSMR).

$$rWMP = \frac{aWMP}{aW}, \text{ where}$$

aWMP = the area covered by a watershed master plan

If the total calculated impact adjustment is less than 0.15 or the community does not prepare a watershed impact adjustment map, then rWMP = 0.15.

Documentation for WMP Provided by the Community

(1) At each verification visit,

- (a) The needed documentation is assembled by the ISO/CRS Specialist and provided to the technical reviewer for this activity. There is a checklist to help the community identify all the needed documentation, available at www.CRSresources.org/400.
- (i) Documentation that the plan has been adopted by the community. “Adopted by the community” means either formal approval by the community’s governing body or formal approval by another body or office of the community that has the authority and funding to implement the plan, such as a flood control district.
- (ii) A copy of the watershed master plan(s) that shows where it meets the minimum criteria and the items to be credited. This should be an electronic copy of the plan with a description of the items to be credited and where they can be found in the plan.
- (iii) The regulations credited under SMR in Section 452.a, (Section 452.b, credit criterion (2)).
- (iv) [For WMP8] A copy of the ordinance adopting the dedicated funding source and a budget describing how the money was spent during the past fiscal year.
- (v) If the plan(s) is more than five years old, an evaluation report that addresses whether the plan(s) is still based on appropriate data and effectively manages stormwater runoff. In lieu of a formal report, the community may submit a letter signed by a licensed professional engineer that addresses the following issues:
 - The “future conditions” at the time the plan was completed: Do these conditions still reasonably reflect the actual watershed conditions today?
 - The precipitation data used for the plan’s hydrology: Does the community or agency still use the same precipitation data that were used in the report?
 - Method used for the plan(s): Is the method used to develop the plan(s) considered appropriate by the agency today?
 - Construction: Has construction of stormwater infrastructure altered actual conditions in ways that make the plan(s) obsolete?
 - Other factors: Are there other aspects of the plan(s) that make it obsolete or otherwise of questionable applicability?
- (vi) The watershed impact adjustment map.
- (vii) [If the community determines the area covered by the watershed master plan (aWMP) to include watershed areas regulated by other communities] Documentation that watersheds outside the jurisdiction of the community are regulated to similar standards or are subject to the same plan as those within the community.

452.c. Erosion and sedimentation control regulations (ESC)

The maximum credit for this element is 40 points.

ESC credit is provided if the community requires that erosion and sediment control measures be taken on land that is disturbed during development. ESC credit is based upon the size of the areas subject to the regulation. Drainage systems cannot perform to their design standards if they are choked with eroded soil that has been captured in stormwater. Sediment control is especially important in watersheds where land is being disturbed by construction. Sedimentation has been called the largest source of water pollution in the country.

Credit Criteria for ESC

- (1) To receive ESC credit, the community's regulations must apply to all construction sites within the community. An erosion and sedimentation control regulation that is part of a floodplain ordinance or a building code and does not affect ALL construction sites in the community does not receive credit under this element.

“All construction sites” in the subsections below means all sites in the community subject to construction of buildings, roads, etc., regrading, or other non-agricultural land-disturbing activity.

Credit Points for ESC

ESC = one of the following:

- (1) 40 points, if regulations control erosion and soil loss from any disturbed land greater than 1,000 square feet; OR
 - (2) 30 points, if regulations control erosion and soil loss from any disturbed land greater than 0.5 acre; OR
 - (3) 10 points, if regulations control erosion and soil loss from any disturbed land greater than 1 acre.
-

Impact Adjustment for ESC

There is no impact adjustment for element ESC. These rules must be enforced throughout the entire community.

Documentation for ESC Provided by the Community

- (1) At each verification visit,
 - (a) The needed documentation is assembled by the ISO/CRS Specialist. There is a checklist to help the stormwater manager identify all the needed documentation, available at www.CRSresources.org/400.

- (i) The regulation that requires developers or property owners to use techniques that prevent erosion and soil loss from exposed land. The ordinance(s) or law must designate an office or official responsible for receiving complaints and monitoring compliance and it must include enforcement and abatement provisions.
- (ii) Development and building permit records that demonstrate enforcement of the regulation. The ISO/CRS Specialist determines how many records are needed to obtain a representative sample.

The ISO/CRS Specialist may visit a sample of sites in the field to verify that stormwater management facilities have been constructed in accordance with the approved plans.

Example 452.c-1.

An appropriate regulation might read:

Before any grading or other earthwork that affects a land area larger than 500 square feet, the person performing such earthwork shall submit an erosion control plan. The plan shall be designed to prevent sediment from leaving the site during storms up to and including the 100-year storm and recover the ground after construction or other work to prevent or minimize erosion. ESC = 40

or

Application for any grading and/or building permit (except for single-family dwellings on existing platted lots) must include an erosion control plan designed to prevent sediment from leaving the site during all storms up to and including the 100-year storm and recover the ground after construction to prevent or minimize erosion. ESC = 30

452.d. Water quality regulations (WQ)

The maximum credit for this element is 20 points.

WQ credit is provided for implementing best management practices to protect water quality within the community. Stormwater runoff picks up dirt, road oil, salt, farm chemicals, and other substances. Unlike sewage, stormwater is not treated before it enters rivers, lakes, estuaries, and other receiving bodies of water. Regulations that require developers to install or implement measures that improve the quality of stormwater are credited.

Most states' environmental protection or pollution control offices have recommended best management practices (BMPs) appropriate for that state. Best management practices may

include grass filter strips at retention basin inlets or outlets, velocity dissipators and baffles, basin dimensions that encourage settling of suspended solids, aeration, infiltration trenches, skimmers, vegetated swales, and other techniques that clean stormwater. It should be noted that this credit is not for BMPs required during the course of construction, but rather for measures that are permanently incorporated in the development's stormwater management facilities.

Credit Criteria for WQ

- (1) To receive WQ credit, the community's stormwater management regulations must either specify one or more measures or refer to BMPs as published in an official government reference. A mention of water quality or reduction of nonpoint sources of pollution in the "purpose" section of the regulations is not sufficient for credit.

Credit Points for WQ

WQ = 20 points, if regulations require new developments of one acre or more to include in the design of their stormwater management facilities appropriate "best management practices" that will improve the quality of surface water

Example 452.d-1.

Falls Church, Virginia, lies within the Chesapeake Bay watershed. Because of its location within the watershed, the city requires all development to provide permanent water quality facilities. WQ = 20

Impact Adjustment for WQ

There is no impact adjustment for element WQ. The requirements must be enforced throughout the entire community.

Documentation for WQ Provided by the Community

- (1) At each verification visit,
- (a) The needed documentation is assembled by the ISO/CRS Specialist and provided to the technical reviewer for this activity. There is a checklist to help the stormwater manager identify all the needed documentation, available at www.CRSresources.org/400.
 - (i) The regulation that requires new development to implement appropriate best management practices to improve water quality.

- (ii) Development and building permit records that demonstrate enforcement of the regulation. The ISO/CRS Specialist determines how many records are needed to obtain a representative sample.

453 Credit Calculation

$$c450 = cSMR + cWMP + ESC + WQ \text{ , where}$$

$$cWMP = WMP \times rWMP$$

454 For More Information

- a. Additional information, reference materials, checklists, and examples can be found at www.CRSresources.org/400.
- b. Rural communities can request help on this activity from the U.S. Natural Resources Conservation Service. Requests should be submitted to the local soil and water conservation district, which usually is located in the county seat.
- c. Most states' environmental protection or pollution control offices have recommended best management practices (BMPs) appropriate for that state. The U.S. Environmental Protection Agency has developed BMPs for coastal areas that are appropriate throughout the country.

Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, 840-B-92-002, 1993, can be found at
<http://water.epa.gov/polwaste/nps/czara/index.cfm>.

- d. References on low-impact development are available from EPA and many states. One example is listed below.

“Low Impact Development Technical Guidance Manual for Puget Sound,” Puget Sound Action Team and Washington State University Pierce County Extension (2005). Available at www.psp.wa.gov/downloads/LID/LID_manual2005.pdf.

455 Related Activities under the Community Rating System

- Activity 330 (Outreach Projects) can be used to promote the benefits of WQ and ESC for both flood protection and preservation of water quality and habitat.
- The element MAP under Activity 410 (Flood Hazard Mapping) credits the provision of maps that identify future-conditions floodplains. SMR and WMP can reduce the need for these kinds of maps.
- Activity 420 (Open Space) reduces the need for channel hardening. In addition, watershed master plans can identify those areas within the watershed that provide benefits to the drainage system in their natural state and therefore should be preserved. Additional credit may be granted in Activity 420 if they are preserved.
- Having Activity 440 (Additional Map Data) mapping of sensitive areas and maintaining them on the community's data base can result in credit and be useful in both watershed and floodplain planning.
- Activity 540, element SBM, is dependent upon receiving credit in Activity 450 for PUB.

500 FLOOD DAMAGE REDUCTION ACTIVITIES

This series of activities focuses on reducing flood damage to existing buildings. It complements the previous series, which dealt with preventing damage to new development. Damage reduction measures that are recognized under this series include acquiring, relocating, or retrofitting existing buildings; maintaining and improving natural channels and storage basins; and planning for the best ways to implement these and other loss prevention and reduction activities.

Credit points for Activities 510, 520, and 530 are adjusted according to the number of buildings affected by the damage reduction measure. See Sections 301 through 302 for a discussion of impact adjustment ratios based on building counts.

Sections 501 through 503 and Activity 510 (Floodplain Management Planning) are mandatory for some or all repetitive loss communities. See Sections 501 and 502 for a discussion of the applicability of these requirements.

Section 507 discusses community compliance with applicable environmental and historic preservation laws and executive orders before implementation of a project or activity.

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501 The Repetitive Loss List

501.a. Repetitive losses

Repetitive loss properties are those properties for which two or more claims of more than \$1,000 have been paid by the National Flood Insurance Program (NFIP) within any 10-year period since 1978 (e.g., two claims during the periods 1978–1987, 1979–1988, etc.).

Over \$9 billion have been paid to repetitive loss properties, about one-fourth of all NFIP payments since 1978. Although the NFIP has resulted in almost 50 years of successful floodplain management, and many of these structures are no longer insured, repetitive loss properties are still a drain on the NFIP. Currently, 1.3% of all policies cover repetitive loss properties, but those properties are expected to account for 15% to 20% of future losses. NFIP actuaries have reported that repetitive loss is the single most important factor that affects the stability of the National Flood Insurance Fund.

501.b. The Repetitive Loss List

Each year, the Federal Emergency Management Agency (FEMA) maintains a list of repetitive loss properties for communities in or interested in the Community Rating System (CRS). Before applying for the CRS and at each verification cycle, a community must determine its repetitive loss category (see next section).

The list includes the property address, the dates of the claims, and, usually, the current insured's and/or previous owner's name.

The list and the individual worksheet pages (Repetitive Loss Update Worksheet (AW-501)) can be ordered through the ISO/CRS Specialist.

Each year, communities can obtain updated data that reflects the community's previously submitted changes, new properties that have been added as a result of recent floods, and changes resulting from other communities' updates. Except during cycle verification and as specified in Section 502.b, a community is not required under the CRS to respond to each year's new list. However, the list can be a valuable planning tool and source of information

Repetitive Flood Loss Properties

In the United States there are over 195,000 **repetitive loss properties**, i.e., properties that have had two or more claims of more than \$1,000 paid by the NFIP within any 10-year period since 1978. Although some of these properties have had mitigation measures applied to them, most remain at risk of flooding.

To focus resources on those properties that represent the best opportunities for mitigation, Congress defined a subset called "**Severe Repetitive Loss Properties**" when it passed the Flood Insurance Reform Act of 2004. Severe Repetitive Loss Properties are those 1–4 family properties that have had four or more claims of more than \$5,000 or two to three claims that cumulatively exceed the building's value.

FEMA is directed by the Act to define Severe Repetitive Loss Property for multi-family buildings. For the purposes of the CRS, the Severe Repetitive Loss Property subset also includes non-residential buildings that meet the same criteria as for 1–4 family properties. The flood insurance policies on these properties are serviced by a separate Special Direct Facility and not by individual Write Your Own insurance companies.

about the location and extent of flooding within the community. Communities are encouraged to submit any known updates every year.

501.c. Updating the List

As part of its application and cycle verification obligations, the community must review the list for accuracy, for correct addresses, to determine whether the properties are actually in the community's corporate limits, and to determine whether the insured buildings have been removed, retrofitted, or otherwise protected from the cause of the repetitive flooding. The result of this review is recorded on a Repetitive Loss Update Worksheet (AW-501). See the example in Figure 500-1.

A community with repetitive losses must sign the Repetitive Loss List Community Certification, CC-RL, certifying that each address has been checked (see the example in Figure 500-2). If there are updates, the submittal must include corrected Repetitive Loss Update Worksheets (AW-501) with any required supporting documentation. If no updates are needed, only the CC-RL is submitted. The CC-RL can be found in Appendix E.

This review is a minimum requirement for participation in the CRS. If the community does not conduct the review of the list at cycle verification, it will lose its CRS credit for addressing its repetitive loss properties, which can result in a reversion to a Class 10.

The community must note the following situations in which the form should be updated:

- The property is not located in the community's jurisdiction. The property may be outside the community's corporate limits, it may be in another city, or it may have been annexed by another community. If it can be determined in which community the property belongs, the property will be reassigned to the correct community. If a property is not in the community, it will not be reassigned unless the community in which the property does belong can be definitely identified.
- There was an error in the repetitive loss data base, such as a duplicate listing or an incorrect address.
- The property has subsequently been protected from the types of events that caused the losses. Buildings that have been acquired, relocated, retrofitted, or otherwise protected from the types of frequent floods that caused the past damage are not counted in determining the community's CRS requirements.
- The property is protected from damage by the base flood shown on the current Flood Insurance Rate Map (FIRM). For example, the community may demonstrate that the building is elevated or floodproofed above the base flood elevation but was flooded by a higher level. If the property is outside the Special Flood Hazard Area (SFHA), the community may show that all of the repetitive losses were caused by events with recurrence intervals of over 100 years (e.g., two 200-year storms).

		OMB Control Number: 1660-0022 Expiration: xxxx, xxxx
<p>Federal Emergency Management Agency</p> <p>National Flood Insurance Program</p> <p>NFIP REPETITIVE LOSS UPDATE WORKSHEET (AW-501)</p>		
THE INFORMATION ON THIS FORM IS BASED ON CLAIMS ON OR BEFORE: 01/31/2011		
REPETITIVE LOSS NUMBER: 0987654		
<i>Internal use only</i> <input checked="" type="checkbox"/> A <input type="checkbox"/> N/A <input type="checkbox"/> FRR		
NFIP Community Name: BALDWIN COUNTY		CID#: 015000
Local Property Identifier: 56-09-29-999-000		
Current Property Address 12345 MEMORY LANE FAIRHOPE, AL 36532-5963		Previous Property Address/Community ID# -----
Last Claimant:		Last Claimant:
Insured: Yes	Name Insured: ELMER FLOOD	
Date of Losses: 20040916 19980927		Total Number of Losses for Property: 2
REQUESTED UPDATES		
MARK ALL UPDATES BELOW THAT APPLY (IMPORTANT - SEE INSTRUCTIONS)		
1. <input type="checkbox"/> INFORMATION PROVIDED NOT SUFFICIENT TO IDENTIFY PROPERTY. Choose this update if all attempts to locate the property fail. Please describe the steps you took to locate the property in the comments section below.		
2. <input type="checkbox"/> COSMETIC CHANGES REQUIRED TO THE ADDRESS: Update the address shown above and/or add our local alternative property identifier such as a Tax Assessor #. <div style="border: 1px solid black; width: 100%; height: 30px; margin-top: 5px;"></div>		
3. <input type="checkbox"/> PROPERTY NOT IN OUR COMMUNITY OR JURISDICTION: Choose this update if you have positively determined that the property shown is not located in your community. Please provide the correct NFIP community name and if known the NFIP community ID Number. If available, please attach a map showing the property location. ASSIGN TO NFIP COMMUNITY NAME: _____ NFIP COMMUNITY ID#: _____		
4. <input checked="" type="checkbox"/> FLOOD PROTECTION PROVIDED. Choose this update only if some type of structural intervention has occurred to the building, property or the source of flooding that protects the building from future events similar to those that occurred in the past. The update must be supported by documentation such as an Elevation Certificate and the Mitigation action and funding below must be provided. (Mitigation Action 1.) (Source of Primary Mitigation Funding 3.) (Secondary Source of Funding 3.)		
CC-RL-2 (AW-501-1)		<i>[continued on next page]</i>

Figure 500-1. An example of an AW-501, first page.
[NOTE: This address is fictitious. The Privacy Act prohibits publication of a real AW-501.]

Flood Damage Reduction Activities

OMB Control Number: 1660-0022
Expiration: xxxx, xxxx

5. **NO BUILDING ON PROPERTY.**

Choose this update only if the property in question can be positively identified as the site of the previously flooded building and documentation is available to support that an insurable building no longer exists at this site. The update must be supported by documentation such as a Demolition or Relocation Permit and the Mitigation action and funding information below must be provided.

(Mitigation Action 2.)

(Source of Primary Mitigation Funding 3.)

(Secondary Source of Funding 3.)

6. **DUPLICATE LISTING WITH RL NUMBER:**

COMBINE AS ONE LISTING.

Choose this update to identify two or more separate listings that are for the same building. List all other RL numbers that are duplicates to this property. Please indicate which address shown is the correct address to use.

7. **HISTORIC BUILDING:**

Choose this update if you know the building is or would be eligible to be listed on a State or National Historic Registry.

COMMENTS SECTION:

Previously updated. This property is no longer considered a RL property.

Updated as --Flood protection provided -- on 11/05/2009

A signed RL transmittal sheet must accompany this form for approval of the update!

CC-RL-3 (AW-501-2)

Figure 500-1 (cont.). An example of an AW-501, second page.

[NOTE: This address is fictitious. The Privacy Act prohibits publication of a real AW-501.]

OMB Control Number: 1660-0022 Expiration: xxxx, xxxx																
Community _____ State _____ CID _____ (6-digit NFIP Community Identification Number)																
<p>CC-RL The Repetitive Loss List</p> <p>(See Section 501 in the <i>CRS Coordinator's Manual</i>).</p> <p> <input type="checkbox"/> We have reviewed the repetitive loss list dated: _____, 20_____, and [check one] <input type="checkbox"/> Attached are updated Repetitive Loss Update Certifications, AW-501; or <input type="checkbox"/> There are no changes to FEMA's repetitive loss list. </p> <p>As the current CRS Coordinator for _____ [community name], I have examined the repetitive loss data provided for each of our _____ [number] assigned repetitive loss properties. For each property in need of update, I have attached an AW-501 that reflects the current and accurate address, the correct National Flood Insurance Program (NFIP) community identification number, and all known mitigation actions with the primary source of funding noted. To the best of my knowledge and belief, any AW-501 not updated and submitted as part of this application has been checked and is not in need of update at this time.</p> <p>Signature _____ (Community CRS Coordinator)</p> <p>To facilitate verification, please provide the names of the CRS Coordinator and local repetitive loss contact person, if other than the CRS Coordinator</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; padding: 5px;">CRS Coordinator</th> <th style="text-align: center; padding: 5px;">Repetitive Loss Contact</th> </tr> </thead> <tbody> <tr> <td style="height: 40px; vertical-align: top; padding: 5px;">Name</td> <td style="height: 40px; vertical-align: top; padding: 5px;"></td> </tr> <tr> <td style="height: 40px; vertical-align: top; padding: 5px;">Title</td> <td style="height: 40px; vertical-align: top; padding: 5px;"></td> </tr> <tr> <td style="height: 40px; vertical-align: top; padding: 5px;">Phone number</td> <td style="height: 40px; vertical-align: top; padding: 5px;"></td> </tr> <tr> <td style="height: 40px; vertical-align: top; padding: 5px;">Fax number</td> <td style="height: 40px; vertical-align: top; padding: 5px;"></td> </tr> <tr> <td style="height: 40px; vertical-align: top; padding: 5px;">Address</td> <td style="height: 40px; vertical-align: top; padding: 5px;"></td> </tr> <tr> <td style="height: 40px; vertical-align: top; padding: 5px;">E-mail address</td> <td style="height: 40px; vertical-align: top; padding: 5px;"></td> </tr> </tbody> </table> <p>Comments:</p> <div style="border: 1px solid black; height: 100px; width: 100%;"></div>			CRS Coordinator	Repetitive Loss Contact	Name		Title		Phone number		Fax number		Address		E-mail address	
CRS Coordinator	Repetitive Loss Contact															
Name																
Title																
Phone number																
Fax number																
Address																
E-mail address																
CC-RL-1																

Figure 500-2. The Repetitive Loss List Community Certification (CC-RL).

502 Repetitive Loss Category

Every CRS community with one or more unmitigated repetitive loss property on FEMA's current list must keep the list updated and submit a Repetitive Loss List Community Certification (CC-RL) at each verification visit.

Additional requirements depend on the community's repetitive loss category, which is determined by the number of repetitive loss properties without mitigation measures AFTER the community has updated the repetitive loss property information and submitted it for approval. Properties that have been mitigated or that are shown to be in another community are not counted when determining the repetitive loss category.

502.a. The Categories

For CRS purposes, there are three categories of repetitive loss communities based on the number of properties on the community's UPDATED repetitive loss list (i.e., after AW-501s have been completed (see Section 501).

- (1) Category A: A community that has no repetitive loss properties, or whose repetitive loss properties all have been mitigated. A Category A community has no special requirements except to submit information to update its repetitive loss list, as needed.
- (2) Category B: A community with at least one, but fewer than 50, repetitive loss properties that have not been mitigated. At each verification visit, a Category B community must
 - (a) Prepare a map of the repetitive loss area(s) (see Section 503),
 - (b) Review and describe its repetitive loss problem,
 - (c) Prepare a list of the addresses of all properties with insurable buildings in those areas, and
 - (d) Undertake an annual outreach project to those addresses (see Section 504). A copy of the outreach project is submitted with each year's recertification.
- (3) Category C: A community with 50 or more repetitive loss properties that have not been mitigated. A Category C community must
 - (a) Do the same things as a Category B community, AND
 - (b) Prepare and adopt a repetitive loss area analysis for all repetitive loss areas, or prepare and adopt a floodplain management plan that includes full credit for planning Step 5(c). Repetitive loss area analyses and floodplain management plans are described under Activity 510 (Floodplain Management Planning).

502.b. Effective Dates

A community's repetitive loss category may change over time as a result of flood damage reduction measures implemented by the community, floods that add new insurance losses to the FEMA list, or data updates. A CRS community has no immediate need to take action as a result of a change in its repetitive loss category except as follows:

- (1) When it applies for or modifies its credit for Activity 510 (Floodplain Management Planning);
- (2) When it submits a modification that will result in an increase in its CRS classification; and
- (3) When it is slated for a complete cycle verification of its program.

The last two situations are explained in more detail in Sections 214 and 232. They require that a community submit documentation for all of its activities, including Activity 510.

If a community becomes a Category B community during the year of its cycle verification (see Section 232), it must begin the required outreach project during the following year.

If a community becomes a Category C community during the year of its cycle verification, it has until October 1 of the following year to prepare to adopt the required floodplain management plan or area analyses for its repetitive loss areas. (However, all updates to its repetitive loss list must be submitted with the rest of the cycle verification materials.)

503 Repetitive Loss Areas

At each verification visit, a Category B or C community must submit

- (1) AW-501s (if needed);
- (2) A signed CC-RL;
- (3) A map of its repetitive loss areas. The repetitive loss areas must include the properties on the repetitive loss list obtained from FEMA and all nearby properties with the same or similar flooding conditions. The map is needed for the outreach project described in the next section and for planning purposes in Activity 510 (Floodplain Management Planning);
- (4) A description of the cause(s) of the repetitive flooding; and
- (5) A list of the addresses of all properties with insurable buildings in the repetitive loss area(s) and the number of buildings in the repetitive loss area(s), bRLA.

503.a. The Map

The community must plot all the properties on FEMA's repetitive loss list and define all repetitive loss areas. In some cases, such as those in which the address consists of a rural route or box number, a property will be unplottable. However, local officials can often identify a property by the name of the insured, especially if the last flood was recent. All that is needed is for the general area of the property to be located, e.g., the 400 block of a street.

***NOTE:** All information on individual flood insurance policies and flood insurance claims is subject to the Privacy Act (see box.)*

The community then defines its repetitive loss AREAS. The repetitive loss areas include buildings on FEMA's list and nearby buildings that are subject to the same flood hazard. It is important to note that the only reason a property appears on FEMA's list is because the structure had flood insurance and received two or more claims of at least \$1,000 during any given 10-year period. These properties are merely representative of the community's overall repetitive flooding problem.

Other structures near the ones listed by FEMA may have been uninsured during the floods, may have had single flood insurance claims, or may have had multiple claims under different policies that the system did not recognize as being the same repetitively flooded address. From a community perspective, it is not fair to single out those properties that happen to be on FEMA's list. All properties with the same exposure to repeated flood damage should be addressed.

A separate CRS handout gives further instructions on how to map a repetitive loss area that includes both the properties on FEMA's list and neighboring properties with the same exposure to repetitive flooding. See www.CRSresources.org/500.

503.b. Causes of Repetitive Flooding

Once the areas are determined, the community can summarize what caused the repetitive flooding. This can be one or two sentences, such as "overbank flooding in May 1994 and June 2001" or "The drainage ditch was built to carry smaller flows. Upstream development has increased runoff and heavy storms overload the ditch roughly every other year." See also Chapter 7 of FEMA-511, *Reducing Damage from Localized Flooding*.

The Privacy Act

Flood insurance data about private property, including repetitive loss properties, are protected under the Privacy Act. Personally identifiable information such as the names or addresses of specific properties, whether they are covered by flood insurance or not, whether they have received flood insurance claims, or the amounts of such claims may not be released outside of local government agencies or to the public or used for solicitation or other purposes. Such information should be marked "For internal use only. Protected by the Privacy Act of 1974."

General or aggregated information, such as total claims paid for a community or an area or data not connected to a particular property may be made public.

For example, a community may publish a map showing a repetitive loss area or a list of addresses in that area, provided that it does not show which individual addresses or parcels received flood insurance claim payments.

503.c. Address List and Building Count

From the repetitive loss area map, the community must prepare an address list of all parcels with insurable buildings in those areas. For CRS purposes, an “insurable building” is defined in Section 301. This list has two purposes: it will be used for the outreach project and it will determine the number of buildings in the community’s repetitive loss areas. Note that the address list includes all properties in each area, including those not on FEMA’s list. Under the Privacy Act, the address list cannot identify which properties are on FEMA’s list or had insurance claims in the past.

The number of buildings currently in the community’s repetitive loss areas is represented by the variable bRLA. This variable is also used in the impact adjustment for repetitive loss area analyses in Section 512. It should not be confused with bRL (number of properties on the FEMA repetitive loss list) in Activity 520, Acquisition and Relocation.

504 Repetitive Loss Area Outreach Project

A Category B or C community must implement an annual outreach project to the properties in the mapped repetitive loss areas that have insurable buildings, and include a copy of the project with its application and annual recertification.

The outreach project must advise the recipient of four things:

- (1) That the property is in or near an area subject to flooding;
- (2) What property protection measures are appropriate for the flood situation;
- (3) What sources of financial assistance may be available for property protection measures; and
- (4) Basic facts about flood insurance.

The outreach project must be delivered to all properties in the repetitive loss AREAS, not just the properties on the FEMA list. This may be done in one of two ways:

- (1) An outreach project that is distributed each year to the properties in the repetitive loss areas that have insurable buildings. This project may also be submitted for credit as a targeted outreach project under Activity 330.
- (2) An annual outreach project developed as part of a Program for Public Information (PPI) credited under Activity 330. The PPI Committee may conclude that there are more effective ways to inform repetitive loss area residents than mailing a notice once a year. The PPI may use a different approach, such as neighborhood meetings, provided the PPI document identifies the priority audience for the service and discusses the best way to reach that audience. For continued PPI credit, the committee must annually evaluate the effectiveness of the outreach projects and revise them as needed.

An example project appears in Figure 500-3. More information on outreach projects can be found in Activity 330 (Outreach Projects). More information on sources of financial assistance can be found in Section 505.

Dear Resident:

You have received this letter because your property is in an area that has been flooded several times. Our community is concerned about repetitive flooding and has an active program to help you protect yourself and your property from future flooding, but here are some things you can do:

1. Check with the Building Department on the extent of past flooding in your area. Department staff can tell you about the causes of repetitive flooding, what the City is doing about it, and what would be an appropriate flood protection level. The staff can visit your property to discuss flood protection alternatives.
2. Prepare for flooding by doing the following:
 - Know how to shut off the electricity and gas to your house when a flood comes.
 - Make a list of emergency numbers and identify a safe place to go.
 - Make a household inventory, especially of basement contents.
 - Put insurance policies, valuable papers, medicine, etc., in a safe place.
 - Collect and put cleaning supplies, camera, waterproof boots, etc., in a handy place.
 - Develop a disaster response plan. See the Red Cross' website at www.redcross.org for information about preparing your home and family for a disaster.
 - Get a copy of *Repairing Your Flooded Home*. We have copies at the Public Works Department or it can be found on the Red Cross' website, too.
3. Consider some permanent flood protection measures.
 - Mark your fuse or breaker box to show the circuits to the floodable areas. Turning off the power to the basement before a flood can reduce property damage and save lives.
 - Consider elevating your house above flood levels.
 - Check your building for water entry points, such as basement windows, the basement stairwell, doors, and dryer vents. These can be protected with low walls or temporary shields.
 - Install a floor drain plug, standpipe, overhead sewer, or sewer backup valve to prevent sewer backup flooding.
 - More information can be found at FEMA's website, www.ready.gov/floods.
 - Note that some flood protection measures may need a building permit and others may not be safe for your type of building, so be sure to talk to the Building Department.

Figure 500-3. An example of an outreach project to a repetitive flood loss area.

4. Talk to the Building Department for information on financial assistance.
 - The City administers a flood protection rebate program that will pay 25% of approved projects, up to a total of \$2,500. This program has funded low floodwalls, overhead sewers, sewer backup valves, and relocation of utilities to higher levels.
 - If you are interested in elevating your building above the flood level or selling it to the City, we may apply for a Federal grant to cover 75% of the cost.
 - Get a flood insurance policy – it will help pay for repairs after a flood and, in some cases, it will help pay the costs of elevating a substantially damaged building.
5. Get a flood insurance policy.
 - Homeowner's insurance policies do not cover damage from floods. However, because our community participates in the National Flood Insurance Program, you can purchase a separate flood insurance policy. This insurance is backed by the Federal government and is available to everyone, even properties that have been flooded. Because our community participates in the Community Rating System, you will receive a reduction in the insurance premium.
 - Because your area is not mapped as a Special Flood Hazard Area, you may qualify for a lower-cost Preferred Risk Policy.
 - Some people have purchased flood insurance because it was required by the bank when they got a mortgage or home improvement loan. Usually these policies just cover the building's structure and not the contents. During the kind of flooding that happens in your area, there is usually more damage to the furniture and contents than there is to the structure. Be sure you have contents coverage.
 - Don't wait for the next flood to buy insurance protection. In most cases, there is a 30-day waiting period before National Flood Insurance Program coverage takes effect.
 - Contact your insurance agent for more information on rates and coverage.

Figure 500-3. (cont.) An example of an outreach project to a repetitive flood loss area

505 Repetitive Loss Mitigation Activities

Sections 501–504 describe the minimum CRS participation requirements for repetitive loss communities. The requirements focus on updating repetitive loss records, identifying the extent of the problem, and providing basic information to owners of properties in the repetitive loss area(s).

The CRS encourages communities to do more to reduce their repetitive flooding problems. Additional credit points are provided in the following activities for actions that address repetitive loss properties or repetitive loss areas:

- Activity 360 (Flood Protection Assistance)—Credit is provided for technical assistance on property protection. Many shallow repetitive flooding problems can be mitigated with a low-cost project paid for by the owner, so technical assistance can sometimes go far to reduce repetitive losses.

- Activity 510 (Floodplain Management Planning)—Credit is given for conducting an analysis of the repetitive loss areas and determining appropriate mitigation measures for these areas (Section 512.b).
- Activity 520 (Acquisition and Relocation)—Bonus points are provided for acquiring or otherwise removing repetitive loss properties, with larger bonuses for Severe Repetitive Loss Properties (Section 522.b and 522.c).
- Activity 530 (Flood Protection)—Bonus points are provided for retrofitting or otherwise protecting repetitive loss properties, with larger bonuses for Severe Repetitive Loss Properties (Section 532.c).

FEMA's Hazard Mitigation Assistance (HMA) program can help communities implement some of these activities. The HMA program can fund a floodplain management plan under Activity 510 (Floodplain Management Planning) and fund mitigation projects such as acquisition, retrofitting, and other flood protection measures that would qualify for credit under Activities 520 and 530. HMA-funded mitigation projects require that an applicant community have a FEMA-approved hazard mitigation plan, as described in Activity 510 (Floodplain Management Planning).

The HMA program is managed by the state, usually by the emergency management agency. The state may set additional priorities for use of the funds. The latest information on FEMA grant programs can be found at www.fema.gov/hazard-mitigation-assistance.

There are other sources of financial assistance:

- Community Development Block Grants are provided to larger cities and counties; smaller communities can apply to the state community development agency.
- The U.S. Army Corps of Engineers will support elevation and flood control projects as part of a larger flood protection program.
- The U.S. Department of Agriculture's Natural Resources Conservation Service can help fund retrofitting and local flood control projects in smaller watersheds.
- Flood insurance claims can include Increased Cost of Compliance funding. This provision provides additional coverage to help underwrite a flood protection project that is required by code as a condition to rebuild the flooded building. It can also be used to help pay the non-federal portion of a cost-shared retrofitting project.
- Many states and regional or county flood control districts have their own funding programs or will help with the non-federal cost share of a federal program.
- Many communities have developed financial assistance programs, especially for sewer backup and local drainage problems, where mitigation projects may be relatively inexpensive.

More information on financial assistance programs to protect individual buildings can be found in *Local Flood Proofing Programs*, U.S. Army Corps of Engineers, 2005, available at www.CRSresources.org/300.

506 National Flood Insurance Reform Act of 1994

This Act requires that, “if a community has received mitigation assistance under Section 1366 [the Flood Mitigation Assistance Program], the credits shall be phased in a manner, determined by the Director, to recover the amount of such assistance provided for the community.”

In general, this is limited to Activity 520 (Acquisition and Relocation) and Activity 530 (Flood Protection), the two activities most likely to be funded. Because the Flood Mitigation Assistance Program provides a 75% grant, a community will receive 25% of the credit for protecting a building under Activities 520 and 530.

NOTE: This is a statutory requirement that only applies to the Flood Mitigation Assistance program, not to other FEMA-funded financial assistance programs.

Example 506-1.

A community applies for credit under Activity 520 (Acquisition and Relocation) for having removed 20 buildings from the floodplain. Five of those buildings were acquired with a 75% grant from the Flood Mitigation Assistance Program.

The ISO/CRS Specialist will calculate the credit based on 25% credit for the five buildings and full credit for the other 15. If the community can demonstrate that there was a higher local cost-share, the points will be adjusted accordingly.

507 Compliance with Provisions for Environmental and Historic Preservation

Federal actions and undertakings, including ongoing programs, must comply with applicable federal environmental and historic preservation laws, implementing regulations, and executive orders. The CRS is a federal program and FEMA has identified certain building or land-altering activities that must meet this requirement if they are to be considered for CRS credit. These include projects undertaken under Activity 520 (Acquisition and Relocation), Activity 530 (Flood Protection), Activity 540 (Drainage System Maintenance), and Activity 620 (Levees).

The level of environmental and historic preservation compliance and documentation required for each project is determined by the type of project and the source of its funding. For CRS purposes, a project falls into one of these two categories:

- Projects funded (in whole or in part) by a federal agency, and

- Projects funded by a state and/or local government.

NOTE: Using any amount of federal or FEMA funding (including using it as a match for a locally sponsored project) has the effect of bringing that project into the “federally funded” category. For any such project, therefore, all of the federal environmental and historic preservation requirements must be met.

Self certification is provided through the completion of Community Certifications of Compliance with Environmental and Historic Preservation Requirements (CC-EHPs). The CC-EHP forms can be found in Appendix F, downloaded from www.CRSresources.org/500, or requested from the ISO/CRS Specialist.

- Certifications are required for all projects in Activity 520 (Acquisition and Relocation) and Activity 530 (Flood Protection) that were permitted or initiated after the implementation of the 2013 *Coordinator’s Manual*.
- Certifications are required at each verification visit for the ongoing maintenance programs credited under Activity 540 (Drainage System Maintenance) and Activity 620 (Levee Maintenance).
- Projects funded by FEMA are considered to meet FEMA’s environmental and historic preservation compliance requirements. A summary of such projects needs to be included in the Community Certifications.

If a community is not able to provide the information needed to certify that compliance occurred before implementation of the project or activity, then CRS credit will not be provided for that project or for that element of a CRS Activity.

507.a. Activity 520 (Acquisition and Relocation) and Activity 530 (Flood Protection)

The CC-EHPs, certifying compliance with the appropriate requirements, are required for all projects credited under Activity 520 or Activity 530 that were implemented AFTER the effective date of the 2013 *Coordinator’s Manual* (April 1, 2013). They are not required for projects that were implemented before the 2013 *Coordinator’s Manual* became effective, including projects that received CRS credit under an earlier *Coordinator’s Manual*.

Projects funded in whole or in part by FEMA are considered to have already complied with FEMA’s environmental and historic preservation requirements. A summary description of these projects needs to be documented in the CC-EHPs.

507.b. Activity 540 (Drainage System Maintenance) and Activity 620 (Levees)

The CC-EHPs certifying compliance with the appropriate requirements must be submitted at the time that CRS credit is requested for projects under Activities 540 or 620. This includes the first time that Activity 540 or Activity 620 credit is requested as well as each subsequent verification visit at which continued credit is requested.

507.c. More Information on Environmental Compliance

The CC-EHPs consist of CC-520EHP, CC-530EHP, CC-540EHP, and CC-620EHP. They can be found in Appendix F, downloaded from www.CRSresources.org/500 and www.CRSresources.org/600, or requested from the ISO/CRS Specialist.

A matrix of the various requirements for environmental and historic preservation compliance as they relate to CRS-credited projects is posted at www.CRSresources.org/500.

Figure 500-4 summarizes the applicable federal requirements for environmental and historic preservation. For more information about FEMA's preservation policies, visit www.fema.gov/environmental-planning-and-historic-preservation-program.

Figure 500-5 gives brief descriptions of applicable federal environmental laws and executive orders, along with links to websites that offer more information.

Communities are encouraged to learn more about federal, state, and other programs for the protection of environmental, cultural, and historic resources. Many of the principles and techniques used by such programs can be incorporated into the community's floodplain management efforts, and thereby help to reduce flood losses and sustain the natural functions of floodprone areas.

Figure 500-4. Summary of FEMA's policy on environmental and historic preservation.

It is FEMA's policy to act with care to ensure that its disaster response and recovery, mitigation and preparedness responsibilities are carried out in a manner that is consistent with all Federal environmental and historic preservation policies and laws. FEMA uses all practical means and measures to protect, restore and enhance the quality of the environment, to avoid or minimize adverse impacts to the environment, and to attain the objectives of

- Achieving use of the environment without degradation or undesirable and unintended consequences;
- Preserving historic, cultural, and natural aspects of national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice;
- Achieving a balance between resource use and development within the sustained carrying capacity of the ecosystem involved; and
- Enhancing the quality of renewable resources and working toward the maximum attainable recycling of depletable resources.

Source: www.fema.gov/environmental-planning-and-historic-preservation-program

Archeological & Historic Preservation Act

Requires federal agencies to take into account the preservation of cultural resources that may be damaged by federal or federally authorized construction activities. Requires that the U.S. Secretary of Interior be notified when unanticipated archeological materials are discovered during construction of a federal undertaking.

Administered by: State Historic Preservation Officer, Tribal Historic Preservation Officer, National Park Service

For more information: www.nps.gov/archeology/tools/Laws/ahpa.htm
www.achp.gov/nhpa.html

Clean Water Act, Section 402

Limits the quantity of pollutants that may be discharged into surface waters. Includes permits for municipal separate storm sewer discharges. National Pollution Discharge Elimination System (NPDES) discharge permits may be required from the U.S. Environmental Protection Agency or the state.

Administered by: State agency for water quality in states with delegated regulatory responsibility; otherwise, U.S. Environmental Protection Agency

For more information: <http://water.epa.gov/lawsregs/guidance/wetlands/section402.cfm>

Clean Water Act, Section 404 (Nationwide Permit 13)

Requires a permit for bank stabilization projects less than 500 feet long and being implemented solely for erosion protection.

Administered by: U.S. Army Corps of Engineers, U.S. Environmental Protection Agency

For more information: www.usace.army.mil/ (see "Regulatory permits—Obtain a permit")
<https://www.epa.gov/cwa-404/section-404-permit-program>

Clean Water Act, Section 404 (Section 404 permit)

Establishes permit requirements for actions to discharge dredge or fill material into waters of the United States, including wetlands. Includes fill for development and for water resources projects such as dams and levees.

Administered by: U.S. Army Corps of Engineers, U.S. Environmental Protection Agency

For more information: www.usace.army.mil/ (see "Regulatory permits—Obtain a permit"),
<https://www.epa.gov/cwa-404/section-404-permit-program>
www.fws.gov/wetlands

Coastal Barrier Resources Act

Prohibits new federal expenditures or financial assistance for development within an established unit or zone of the Coastal Barrier Resources System. Protects ecologically sensitive coastal barriers along the U.S. Atlantic, Gulf, and Great Lakes coasts.

Administered by: U.S. Fish & Wildlife Service field offices

For more information: www.fws.gov/CBRA

(continued on next page)

Figure 500-5. Federal environmental laws and executive orders that may apply to some CRS-credited activities.

Coastal Zone Management Act

Requires federal agencies conducting or supporting projects affecting the coastal zone to conduct and support those activities to the maximum extent possible in a manner consistent with the state's approved coastal management plan. Requires a "consistency determination" for federal actions. Action-taking entities are required to obtain a permit from the state's lead coastal resources management agency or office.

Administered by: State's lead coastal management agency, National Oceanic and Atmospheric Administration

For more information: <https://coast.noaa.gov/czm/about/>

Endangered Species Act

Prevents or requires modification of a project that could jeopardize endangered or threatened species and/or their habitat. Section 7 requires consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service, as applicable.

Administered by: U.S. Fish and Wildlife Service, National Marine Fisheries Service, applicable state agencies for state-protected species and their habitat

For more information: www.fws.gov/endangered/
www.nmfs.noaa.gov/pr/permits

Executive Order 11988—Floodplain Management

Requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains. Requires federal agencies to avoid the direct and indirect support of floodplain development where there is a practicable alternative.

Administered by: Federal Emergency Management Agency

For more information: <https://www.fema.gov/executive-order-11988-floodplain-management>

Executive Order 11990—Protection of Wetlands

Requires federal agencies to minimize, to the fullest extent possible, the destruction, loss, or degradation of wetlands. Requires federal agencies to preserve and enhance the natural and beneficial values of wetlands.

Administered by: U.S. Fish and Wildlife Service

For more information: www.fws.gov/wetlands

Executive Order 12898—Environmental Justice for Low Income and Minority Populations

Requires fair treatment of all ethnic and income groups regarding public health and environmental effects from federal agency laws, regulations, policies, programs, and projects. Requires federal agencies to address disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.

Administered by: All federal agencies

(continued on next page)

Figure 500-5 (cont.). Federal environmental laws and executive orders that may apply to some CRS-credited activities.

Farmlands Protection Policy Act

Requires federal agencies to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses.

Administered by: Natural Resources Conservation Service state office, state agencies for soils (soil and water conservation districts)

For more information: www.nrcs.usda.gov/programs/fppa/

Fish and Wildlife Coordination Act

Requires federal agencies to consider the effects that projects may have on fish and wildlife resources, take action to prevent loss or damage to these resources, and support the development or improvement of these resources. Protects fish and wildlife when federal actions result in the control or modification of natural streams, waterways, water bodies, or associated wetlands.

Administered by: U.S. Fish and Wildlife Service, National Marine Fisheries Service

For more information: www.fws.gov/Landscape-Conservation/index.html
www.habitat.noaa.gov/index.html

National Historic Preservation Act

Section 106 of the NHPA requires federal agencies to take into account the impact of their actions on historic properties listed (or eligible for listing) on the National Register of Historic Places.

Administered by: State Historic Preservation Officer, Tribal Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service

For more information: www.achp.gov/overview.html
www.achp.gov/nhpa.html
www.nps.gov/subjects/historicpreservation/index.htm

Rivers and Harbors Act,-Section 10

Requires a permit for building any structure in the channel or along the banks of navigable waters of the United States that changes the course, conditions, location, or capacity of those waters.

Administered by: U.S. Army Corps of Engineers

For more information: www.usace.army.mil/Missions/Civil-Works/Section408/
www.uscg.mil/hq/cg5/cg551/

Figure 500-5 (cont.). Federal environmental laws and executive orders that may apply to some CRS-credited activities.

510 FLOODPLAIN MANAGEMENT PLANNING—Summary

Maximum credit: 622 points

512 Elements

- a. **Floodplain management planning (FMP):** 382 points for a community-wide floodplain management plan that follows a 10-step planning process:
 - Step 1. Organize
 - Step 2. Involve the public
 - Step 3. Coordinate
 - Step 4. Assess the hazard
 - Step 5. Assess the problem
 - Step 6. Set goals
 - Step 7. Review possible activities
 - Step 8. Draft an action plan
 - Step 9. Adopt the plan
 - Step 10. Implement, evaluate, revise.
- b. **Repetitive loss area analysis (RLAA):** 140 points for a detailed mitigation plan for a repetitive loss area.
- c. **Natural floodplain functions plan (NFP):** 100 points for adopting plans that protect one or more natural functions within the community's Special Flood Hazard Area.

Credit Criteria

Each element has a separate section discussing credit criteria.

Impact Adjustment

The impact adjustments for FMP and RLAA are described in separate sections. There is no impact adjustment for NFP.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

510 FLOODPLAIN MANAGEMENT PLANNING

The OBJECTIVE of this activity is to credit the production of an overall strategy of programs, projects, and measures that will reduce the adverse impact of the hazard on the community and help meet other community needs.

511 Background

Too often flood protection decisions are made quickly, with inadequate or outdated information or without considering all possible mitigation alternatives or the consequences of those alternatives. As a result, the community's resources are not allocated most appropriately, flood problems may not be fully addressed, and natural floodplain functions may suffer.

To remedy this situation, a careful, systematic process of planning is recommended, and may be credited by this activity. The Community Rating System (CRS) does not specify what activities a plan must recommend; rather, it recognizes plans that have been prepared according to the standard planning process explained in this activity.

Benefits: A well-prepared plan will

- Identify existing and future flood-related hazards and their causes;
- Ensure that a comprehensive review of all possible activities and mitigation measures is conducted so that the most appropriate solutions will be implemented to address the hazard;
- Ensure that the recommended activities meet the goals and objectives of the community, are in coordination with land use and comprehensive planning, do not create conflicts with other activities, and are coordinated so that the costs of implementing individual activities are reduced;
- Ensure that the criteria used in community land use and development programs account for the hazards faced by existing and new development;
- Educate residents and property owners about the hazards, loss reduction measures, and the natural and beneficial functions of floodplains;
- Build public and political support for activities and projects that prevent new problems, reduce losses, and protect the natural and beneficial functions of floodplains; and
- Build a constituency that wants to see the plan's recommendations implemented.

Types of plans: This activity credits three kinds of plans:

- Floodplain management planning (FMP): The most credit is for the first element, a community-wide floodplain management plan, but the element can also credit multi-hazard mitigation plans, multi-jurisdictional floodplain management and hazard mitigation plans, and floodplain management plans prepared for the U.S. Army Corps of Engineers. Only one plan may receive credit under this element, and plans may not

be combined as appendices or credited by virtue of internal reference to another plan, because this element credits the process as well as the content of the planning document.

- Repetitive loss area analyses (RLAA): The second element credits more detailed, site-specific plans to reduce flood losses in repetitively flooded areas. It has a narrower scope than a floodplain management plan, and receives fewer credit points.
- Natural floodplain functions plan (NFP): The third element provides credit for plans that address natural floodplain functions in the community.

A Category C repetitive loss community (defined in Section 502) must prepare either a FMP or RLAA area analysis that covers at least all of its repetitive loss areas.

Implementation: Credit is not provided for simply preparing a plan. Continued credit is dependent upon plan implementation. To maintain the credit for Activity 510, every year the community must evaluate its progress toward implementing the projects and programs in the plan, area analysis, or natural floodplain functions plan, and submit a report of that evaluation with its annual CRS recertification. It must update the background information and the recommendations in its floodplain management plans and repetitive loss area analyses at least every five years and in its natural floodplain functions plan(s) every 10 years.

By their very nature as overall guidance for a community's program, plans should be coordinated with other plans and programs as well as the activities of other agencies or offices that have authority over the same area. It is recommended that communities also contact state and regional offices and agencies to review their plans and planning criteria. For example, state planning agencies have requirements for some kinds of plans and state emergency management agencies may have additional elements they would like to see included in a mitigation plan.

NOTE: An ordinance is NOT a plan. *An ordinance sets standards for land development and other activities. Planning may include a review of land development standards and procedures, but it should also cover a much broader range of activities, as noted in Figure 510-4.*

Class 9 Prerequisite: A Category C repetitive loss community (see Section 502) must receive credit under EITHER Section 512.a, floodplain management planning (FMP), with full credit in planning Step 5(c) OR Section 512.b, repetitive loss area analysis (RLAA), with a plan that covers its repetitive loss areas.

512 Elements

512.a. Floodplain management planning (FMP)

The maximum credit for this element is 382 points.

FMP credit is provided for a community-wide floodplain management plan that was prepared by following a standard planning process. To receive any credit under this activity, the planning process must receive some credit under each of the 10 steps listed below. If the plan was approved by the Federal Emergency Management Agency (FEMA) as a multi-hazard mitigation plan and one step is missing, the mitigation plan may receive credit, but FMP credit will be limited to 50 points. If two steps are missing, there is no credit for a multi-hazard mitigation plan.

For some steps, such as Step 1, the community may show that it implemented at least one of the listed credit items. For other steps, specific items are required as a minimum. Required items are noted with “(REQUIRED)” after them.

FEMA’s multi-hazard mitigation planning regulations pursuant to the Disaster Mitigation Act of 2000 are explained at www.fema.gov/plan/mitplanning. The 10-step CRS planning process is consistent with those regulations, which identify four phases of hazard mitigation planning. The 10 CRS steps are aligned with the four phases of mitigation planning requirements in Table 510-1.

The CRS-credited planning process must follow the 10 steps. Although the plan document must discuss and document all 10 steps, the written plan does not need to be organized by these 10 steps. To document CRS credit, the community must identify where these steps were covered in its plan, using the CRS planning credit activity checklist (see Figure 510-1).

Documentation or discussion of all but Steps 3 and 9 must be presented in the plan document. Steps 3 and 9 may be in the plan document or they may be explained in a separate memo from the community or the plan’s author as explained in the documentation section at the end of each step. The community must update the plan at least every five years and document the update by October 1, five years after the plan was adopted.

Note: It is recommended that the planner review all state and FEMA planning program guidelines, including the CRS planning credit checklist for Activity 510. Doing so will ensure that the planning effort will meet all state, FEMA, and CRS criteria. It is the community’s option, but with proper planning, one plan document can fulfill the planning criteria of several FEMA and state programs.

Table 510-1. Planning steps for mitigation and for the CRS.		
Multi-hazard Mitigation Planning	CRS	Maximum
Phase I – Planning process		
§201.6(c)(1)	1. Organize	15
§201.6(b)(1)	2. Involve the public	120
§201.6(b)(2) & (3)	3. Coordinate	35
Phase II – Risk assessment		
§201.6(c)(2)(i)	4. Assess the hazard	35
§201.6(c)(2)(ii) & (iii)	5. Assess the problem	52
Phase III – Mitigation strategy		
§201.6(c)(3)(i)	6. Set goals	2
§201.6(c)(3)(ii)	7. Review possible activities	35
§201.6(c)(3)(iii)	8. Draft an action plan	60
Phase IV – Plan maintenance		
§201.6(c)(5)	9. Adopt the plan	2
§201.6(c)(4)	10. Implement, evaluate, revise	26
Total		382

512.a Floodplain management planning (FMP):	
<input checked="" type="checkbox"/>	(1) Attached is the floodplain management or hazard mitigation plan to be credited.
<input checked="" type="checkbox"/>	Check here if the plan was also approved by FEMA as a hazard mitigation plan
<input checked="" type="checkbox"/>	(2) This CRS planning credit worksheet, completed.
CRS Planning Step	Page/Section
Step 1. Organize to prepare the plan	
(a) Involvement of the office responsible for community planning	Ch. 6, p. 6-2
(b) Planning committee of department staff	Ch. 1, p. 1-3
(c) Process or committee formally created by the community's governing board	
(1) Mark the plan document to show how it was prepared and who was involved in the planning process. Show which people or offices implement which of the six mitigation categories.	
(2) [For item 1.(c)] Attach a copy of the governing body's action or resolution.	

Figure 510-1. An excerpt from a floodplain management planning credit checklist.

Credit Points for FMP

FMP = the total of points credited for Step 1 through Step 10, up to the maximum of 382 points

There are no credit formulae for this activity. The credits for each step are simply added together.

Note that the points listed (Step 1 to Step 10) are maximum possible points. The ISO/CRS Technical Reviewer may determine that one or more items do not warrant full credit.

Step 1. Organize to prepare the plan

The credit for this step is based on how the community organizes to prepare its floodplain management plan.

Credit Points for FMP Step 1

Credit for Step 1 is the total of the following points. (Maximum credit: 15 points)

(a) 4 points, if the office responsible for the community's land use and comprehensive planning is actively involved in the floodplain management planning process. The "office" may be the community's planning or community development department, a consulting firm, or a regional planning agency, provided that it performs regular land use or comprehensive planning duties for the community. This office is usually not the floodplain management or mitigation planner or consultant, because the intention of this credit is to incorporate the floodplain management or mitigation plan into the rest of the community's planning activities. "Actively involved" means that staff regularly attend meetings, assist in the coordination (Step 3), and either write or review draft sections of the plan.

(b) 9 points, if the planning process is conducted through a committee composed of staff from those community departments that implement or have expertise in the activities that will be reviewed in Step 7. One point is provided for each office represented.

Divisions of departments can be counted as separate offices. For smaller communities with fewer departments, full credit is provided if the committee has representation from all offices with expertise in all six categories of activities credited in Step 7.

A planning committee is strongly recommended. By involving those who can contribute and will be most affected when the recommendations are carried out, the community will get a more realistic product that will have a much better chance of being

Step 7 Categories

- Preventive measures (e.g., codes)
- Property protection (e.g., elevation)
- Natural resource protection
- Emergency services
- Structural flood control projects
- Public Information

Also see Figure 510-4.

adopted and implemented. Community departments that could be represented on the committee include, but are not limited to

- Building department/code enforcement,
- Engineering,
- Land use planning/zoning,
- Public works,
- Emergency management/public safety,
- Public information,
- Environmental protection/public health,
- Parks/recreation,
- A city manager or council member, and
- Housing/community development.

If the planning committee includes representatives from the public and other stakeholders (with no attachment to local government), additional credit is provided in Step 2. Note that there is extra credit in Step 10 if the committee continues to meet after the plan is adopted in order to evaluate progress and recommend changes.

No credit is provided for the creation of a planning committee if the committee only meets once or twice. It must meet a sufficient number of times to involve the members in the following key steps of the planning process (e.g., at least one meeting on each step):

- Step 4. Assess the hazard,
- Step 5. Assess the problem,
- Step 6. Set goals,
- Step 7. Review possible activities, and
- Step 8. Draft an action plan.

If the community wants credit for participating in a multi-jurisdictional floodplain management or hazard mitigation planning committee,

- The community must send at least two representatives to the planning committee;
- At least half of the community's representatives must attend all the meetings of the planning committee. In effect, there must be a quorum from each community. Remote attendance, e.g., via a webinar that allows for everyone to talk, is permissible; and
- CRS credit for the multi-jurisdictional planning committee will be based on the representation from offices that implement the activities in Step 7.

Examples

- a. A community has a planning committee with representatives from its planning, zoning, building, emergency management, code enforcement, and public works departments, as well as the city manager's public information person. There is no one at the community level that deals with natural floodplain functions. The community's committee would receive six points, one for each representative.
 - b. A county is preparing a multi-jurisdictional plan for the county and 10 participating cities. This planning committee has 30 members, including two from each city. Among the members are representatives of all six Step 7 categories, e.g., a city engineer, a city public works person, the county planner, and the county soil and water conservation district. The county's committee would receive the full nine points, provided there was a quorum from each community seeking credit.
- (c) 2 points, if the planning process and/or the committee are formally created or recognized by action of the community's governing body.

Two points are provided if the community's governing body (e.g., the city council) formally recognizes the planning process. The preferred method is a formal resolution that designates who is responsible for preparing the plan and specifies a completion deadline. If a committee credited under Step 1(b) or 2(a) is used, the resolution should identify the members and the chair (or how the chair is selected) and how staff support is provided.

If a community participates in a multi-jurisdictional committee, its governing body must act in order for the community to receive this credit. A city will not receive this credit for a county council resolution. Conversely, a city can receive this credit even if there is no county credit.

Step 2. Involve the public

The planning process must include an opportunity for the public to comment on the plan during its development and before its approval. Members of the public may be part of the planning committee created under Step 1 or they may be organized as a separate committee.

For this credit, the term "public" includes residents, businesses, property owners, and tenants in the floodplain and other known hazard areas as well as other stakeholders in the

community, such as developers and contractors, civic groups, environmental organizations, academia, non-profit organizations, major employers, and staff from other governmental agencies, such as a levee district, housing authority, Natural Resources Conservation Service, or the National Weather Service.

Members of an advisory body to the community that does not have any regulatory authority, such as a stormwater advisory board, can be counted as representatives of the public. Community employees and members of a regulatory body, such as a zoning board of appeals that makes final decisions, are not considered “public” or stakeholders and are counted as representatives of the community departments credited under Step 1(b).

As with staff, involving the public and stakeholders brings them fully into the planning process, provides input on the viability of options being considered, and helps them to become concerned about the outcome. The largest number of points is provided for Step 2(a) because a planning committee with public membership has the following advantages:

- The committee can be a forum to both educate the public and also provide a means for public input into the plan.
- The participants recognize that they are involved and will be more willing to commit themselves to the process.
- The participants can do some of the work, especially data gathering, thereby reducing the overall cost of preparing the plan.
- A committee can be an effective forum for discussing alternatives, debating goals and objectives, and matching the technical requirements of a program to local situations.
- The committee members will provide information on the plan and process to their respective constituencies.
- The participants gain a feeling of “ownership” of the plan and its recommendations, which helps build public support for it.
- Committee members form a constituency that will have a stake in ensuring that the plan is implemented.

Note that 50% of the maximum credit for this planning step is a prerequisite for Class 4 or better communities.

The most important partners to assist in the plan development are already within your community: local government officials, community planning and design professionals, business leaders, civic and volunteer groups, emergency services personnel, and interested residents.

. . . Ensuring that your team has an equitable and diverse representation will enhance your planning efforts and help build support for mitigation.

—Planning for a Sustainable Future, FEMA-364

Credit Points for FMP Step 2

The credit for this step is the total of the following points based on how the community involves the public during the planning process. (Maximum credit: 120 points)

(a) Up to 60 points, if the planning process is conducted through a planning committee that includes members of the public and meets the following criteria:

- (1) If the committee includes community staff (e.g., the planning committee credited under Step 1(b)), then at least one-half of the members must be representatives of the public or stakeholders for full credit. The credit is prorated for lower levels of public or stakeholder representation. Note that receiving 50% of the maximum credit for this planning step is a prerequisite for Class 4 or better communities and item (a) is one-half of the credit for Step 2.
- (2) It must meet a sufficient number of times to involve the members in the key steps of the planning process, i.e., it must meet the same meeting criteria specified in Step 1(b).
- (3) All meetings must be open to the public and the meeting schedule must be publicly posted (e.g., on a website).
- (4) If the community wants credit for participating in a multi-jurisdictional floodplain management or hazard mitigation planning committee, it must meet the criteria specified in Step 1(b).
- (5) The formalities of organizing and naming the committee are not as important as the membership and the ability of all members to participate. For example, a community may augment an existing committee with an advisory body of stakeholders. Such an arrangement would be credited, provided the stakeholders were treated as full committee members during the meetings, i.e., they can speak up, vote, and receive all the materials that regular members do.

Note that this planning committee can be (and it is recommended that it be) the same committee that prepares a Program for Public Information under Activity 330 (Outreach Projects). The floodplain management plan document can also be or include the Program for Public Information document and/or the flood insurance coverage improvement plan credited under Activity 370 (Flood Insurance Promotion).

There is extra credit in Step 10 if the committee continues to meet after the plan is adopted in order to evaluate progress and recommend changes, provided that the committee continues to meet the above criteria. Such annual evaluations by a committee are required for some of the credits under Activities 330 and 370.

(b) 15 points, if one or more public information meetings is held in the affected area(s) within the first two months of the planning process to obtain public input on the natural hazards, problems, and possible solutions. The meetings must be held separately from the planning committee meetings credited in item (1).

The intent of the public meeting(s) is to go out to the people to gather input. At a minimum, it must be separate from regular meetings of the planning committee or the

community's governing body. It is recommended that at least one of these public meetings be held in the affected neighborhoods.

- (c) 15 points, for holding one or more public meetings to obtain input on the recommended plan. The meeting(s) must be at the end of the planning process, at least two weeks before submittal of the recommended plan to the community's governing body.

Simply discussing the plan at a regular public meeting of the governing body, just before it is voted on, is not sufficient public input for CRS credit. To receive credit for this item, there must be at least one public meeting at the end of the planning process, at which the plan and its findings and recommendations are explained and people can ask questions and submit their comments for review, consideration, and potential modification of the plan. The CRS does not require public hearings. State and local laws take precedence, however. The community's legal counsel should determine if a public hearing is required.

- (d) 5 points, for each additional public information activity implemented to explain the planning process and encourage input to the planner or planning committee, up to a maximum of 30 points. Examples include, but are not limited to

- A website that explains the planning process and posts the time and place for its meetings, meeting agendas, status reports, and the draft plan, when it is ready for review.
- Conducting a public webcast that explains the planning process and solicits input.
- Questionnaires asking the public for information on their natural hazards, problems, and possible solutions. A questionnaire or survey that is sent to everyone in the floodplain or everyone in the community will receive double credit (10 points).
- Outreach projects, such as those credited in Activity 330 (Outreach Projects), which explain the planning effort and seek comments. These could include brochures, mailers, booths at shopping malls, presentations at civic or neighborhood organizations, etc.

Step 3. Coordinate

Most communities' flood problems have been studied already. There are likely to be existing plans, studies, and reports on flooding that need to be reviewed. There also may be flood protection activities being considered or implemented by other agencies.

This planning step credits incorporating other plans and other agencies' efforts into the floodplain management plan. Other agencies and organizations must be contacted to determine if they have studies, plans, or information pertinent to the floodplain management plan; to determine if their programs or initiatives may affect the community's program; and to see if they could support the community's efforts.

Examples of “other agencies and organizations” include neighboring communities; local, regional, state, and federal agencies; and businesses, colleges, and other private and non-profit organizations affected by the hazards or involved in hazard mitigation or floodplain management.

This credit is for coordinating with other agencies and organizations, particularly those that are not represented on the planning committee credited under Step 1(b) or Step 2(a). No special additional coordination measures are needed for the agencies and organizations on the planning committee, but the planners may want to formally contact the directors and others for the record.

Note that community needs and goals typically are developed during comprehensive planning activities. These goals should be identified in this step, reviewed, and considered during the development of the floodplain management plan. They should be taken into account when the goals for the floodplain management plan are developed in Step 6.

Credit Points for FMP Step 3

The credit for this step is the total of the following points. To receive credit for this step, the coordination must include item (a). (Maximum credit: 35 points)

- (a) 5 points, if the planning includes a review of existing studies, reports, and technical information and of the community’s needs, goals, and plans for the area. (REQUIRED) Where the information from the existing studies and reports is used in the plan, the source(s) should be referenced.

This review needs to include a review of community needs and goals, past flood studies, disaster damage reports, natural areas plans, and other documents that will provide information for the planning process.

- (b) 30 points, for coordinating with agencies and organizations outside the community’s governmental structure. There is no credit for talking to other departments within the city or county government. For this credit, “coordinate” means to

- Contact the agency or organization and keep a record of the contact (a generic announcement or notice on a website is not sufficient);
- Ask for data or information related to the hazard;
- Ask if the agency or organization is doing anything that might affect flooding or properties in flood-prone areas; and
- Offer the agency or organization an opportunity to be involved in the planning effort, such as by attending a committee meeting or commenting on the draft plan.

One point is provided for each agency or organization that is contacted.

Two points are provided for meeting or having a telephone conversation with the agency or organization. Such a coordination meeting or conversation must be separate from attendance at a planning committee meeting.

Coordination with an agency can only be counted once. For example, if a letter to an agency results in a follow-up meeting or telephone conversation, the community receives two points.

Examples of such agencies and organizations include, but are not limited to

- Neighboring communities;
- Local and regional agencies involved in hazard mitigation activities;
- Stakeholder-type organizations that are not represented on the planning committee;
- Local drainage, levee, sanitary, and soil and water conservation districts;
- Regional and metropolitan planning agencies;
- State National Flood Insurance Program (NFIP) Coordinator;
- State water resources agency;
- State coastal zone management agency;
- State emergency management agency;
- FEMA Regional Office;
- National Weather Service;
- U.S. Army Corps of Engineers;
- Natural Resources Conservation Service;
- U.S. Bureau of Reclamation;
- U.S. Fish and Wildlife Service;
- National Oceanic and Atmospheric Administration;
- Native American tribes;
- American Red Cross;
- Local homebuilders association; and
- Local environmental groups.

If the community wants the plan to qualify as a multi-hazard mitigation plan, the plan must identify all stakeholders that are involved or given an opportunity to be involved in the planning process. At a minimum, stakeholders must include

- 1) Local and regional agencies involved in hazard mitigation activities,
- 2) Agencies that have the authority to regulate development, and
- 3) Neighboring communities.

An “opportunity to be involved in the planning process” means that the stakeholders are engaged or invited as participants and given the chance to provide input to affect the plan’s content.

—*Local Mitigation Plan Review Guide, FEMA*

Step 4. Assess the hazard

At this step in the planning process, the planner or committee reviews, analyzes, and summarizes data collected about the natural hazard(s) that the community faces. This step focuses on the sources, frequency, extent, and causes of flooding while Step 5 will address the impact of flooding on people, property, infrastructure, the local economy, and natural floodplain functions.

Under Step 3(a), the community gathers data about the flood hazard. This step involves reviewing, analyzing, and summarizing the data from existing flood studies, including the Flood Insurance Study, drainage problem studies, historical records, and the knowledge and experiences of the planning committee members.

For CRS credit, the community does not need to conduct studies to develop new flood data. However, if this process determines that new maps or data are needed, they should be described for credit under item (d).

The hazard assessment needs to describe the local flood hazard and not be a broad or generic discussion of flooding in general. It needs to discuss how often it floods, the locations of areas that flood, the depth of flooding, and the source or cause of the flooding. Because the most important readers are elected officials and flood-prone residents, the descriptions of the hazards should be in lay terms.

The CRS Community Self Assessment described in Section 240 can help with this step.

Credit Points for FMP Step 4

The credit for this step is the total of the following points based on what the community includes in its assessment of the hazard. (Maximum credit: 35 points)

- To receive CRS credit for this step, the plan must include a flood hazard assessment credited under item (1).
- If the community is a Category B or C repetitive loss community (see Sections 502–503), this step must cover all of its repetitive loss areas.

(a) 15 points, for including an assessment of the flood hazard in the plan. (REQUIRED) Flood hazard areas that require assessment include

- The Special Flood Hazard Area (SFHA) shown on the Flood Insurance Rate Map (FIRM),
- Repetitive loss areas,
- Areas not mapped on the FIRM that have flooded in the past, and
- Other surface flooding identified in other studies.

(1) 5 points, for a map of the flood hazard areas. Area maps are acceptable for multi-jurisdictional plans.

(2) 5 points, for a description of the known flood hazards, including source of water, depth of flooding, velocities, and warning time.

(3) 5 points, for a discussion of past floods.

(b) 10 points, for including an assessment of less-frequent flood hazards in the plan. For this credit, the community must

(1) Identify the hazard, including

- a. Preparing an inventory of levees that would result in a flood of developed areas if they failed or were overtopped during a flood, and/or
- b. Preparing an inventory of dams that would result in a flood of developed areas if they failed, and/or

- c. Identifying any of the flood-related special hazards listed in Section 401 of the *CRS Coordinator's Manual* that may affect the community, and/or
 - d. Identifying the coastal A Zone, i.e., the area where wave heights during the 100-year flood are between 1.5 and 3 feet;
- (2) Map the area(s) affected. (For planning purposes, an approximate affected area is sufficient. No new engineering studies are needed. Area maps are acceptable for multi-jurisdictional plans.) If an engineering study is conducted, it may receive credit under Activity 410; and
- (3) Summarize the hazard(s) in lay terms.

Note that, under Activities 620 (Levees) and 630 (Dams), items (b)(1)a and (b)(1)b are prerequisites for reaching Class 4 or better. Additional guidance on inventorying and mapping the areas affected by levee and dam failures can be found in Section 621.b and Section 631.b, respectively. It is recommended that communities incorporate these inventories into their floodplain management plans.

Item (a) is prorated if part of the “flood hazard” is missing, where applicable. For example, if the community is downstream of a dam, has a levee, and has a coastal A Zone, and the assessment includes only the dam failure hazard, the credit will be less than the full 10 points. If the community does not have a levee, it is reflected in the proration.

Two points are provided if the inventory is conducted and concludes that there are no levees, dams, or special flood-related hazards that threaten the community.

- (c) 5 points, if the assessment identifies areas likely to be flooded and flood problems that are likely to get worse in the future as a result of (1) changes in floodplain development and demographics, (2) development in the watershed, and (3) climate change or sea level rise. The credit is prorated if the assessment does not include all three types of changes.
- (d) 5 points, if the plan includes a description of the magnitude or severity, history, and probability of future events for other natural hazards, such as earthquakes, wildfires, or tornados. The plan should include all natural hazards that affect the community. At a minimum, it should include hazards identified by the state’s hazard mitigation plan.

NOTE: *To qualify as a multi-hazard mitigation plan, the plan must address ALL of the community’s flood and other natural hazards identified in the hazard assessment. Not only does an all-hazards plan help qualify for mitigation funds, but also it will better prepare the community for hazards other than flooding. It is common for communities to focus only on mitigation of flood problems because they occur more often. However, assessing the other hazards when preparing a flood plan can help address what can be done for all hazards, some of which may occur less frequently, but have a greater impact on the community.*

Step 5. Assess the problem

Flooding can be a natural and beneficial occurrence. A floodplain is only a problem area if human development (the built environment) gets in the way of, or exacerbates, the natural flooding process.

The previous step assessed the hazards facing the community. In this step, the community planners or planning committee members collect and summarize data on what is at risk. This step looks at the impact of those hazards on the community.

Note that 50% of the maximum credit for this planning step is a prerequisite for Class 4 or better communities.

Credit Points for FMP Step 5

The credit for this step is the total of the following points, based on what is included in the assessment of the vulnerability of the community to the hazards identified in the previous, hazard assessment, step. (Maximum credit: 52 points)

- To receive credit for this step, the assessment must include items (a) and (c). A plan for a Category B or a Category C repetitive loss community that does not include item (c) may still receive up to 50 points for the plan, provided that no other step is missed.
 - Each credited item must cover all relevant flood-related hazards identified in Step 4.
 - Each credited item must include a description and summary of the problem(s). Simply listing data, such as the names of the critical facilities or the number of flood insurance claims, does not suffice for credit—there must be description of the impact of flooding and what kinds of problems arise, not just raw data.
 - For a multi-jurisdictional plan, each item needs to be described for each community. Tables are acceptable to show the data by community, but there still needs to be a narrative description and summary of the problem(s).
- (a) 2 points, if the plan includes an overall summary of the jurisdiction's vulnerability to each hazard identified in the hazard assessment (Step 4) and the impact on the community. (REQUIRED)
- (b) 25 points, if the plan includes a description of the impact that the hazards identified in the hazard assessment (Step 4) have on the features listed below:
- (1) 5 points, for life safety and the need for warning and evacuating residents and visitors.
 - (2) 5 points, for public health, including health hazards to individuals from flood waters and mold.
 - (3) 5 points, for critical facilities and infrastructure.
 - (4) 5 points, for the community's economy and major employers.
 - (5) 5 points, for the number and types of affected buildings (e.g., residential, commercial, industrial, with or without basements, etc.). For this credit, the

assessment must include an inventory of all buildings owned by the community that are located in flood-prone areas and that identifies which buildings are insured for flood damage.

- (c) 5 points, if the assessment includes a review of historical damage to buildings, including all repetitive loss properties and all properties that have received flood insurance claims payments, and/or an estimate of the potential damage and dollar losses to vulnerable structures, including damage from mold and other flood-related hazards. Vulnerable structures must include all buildings within the community's defined repetitive loss area(s).

Communities must include repetitive loss areas in their problem assessment. (REQUIRED of Category B and C repetitive loss communities (see Sections 502–503))

In order to receive the full credit under item (c), the community reviews ALL the addresses of properties that have received flood insurance claims, not just the repetitive loss properties. Such a list is sent annually to all Category B and C repetitive loss CRS communities. Communities can request more recent lists through their FEMA Regional Office.

Data on building damage usually can be obtained from post-disaster damage assessment reports, flood insurance claims or disaster assistance data, and flood control studies. Particularly in areas that have experienced little or no serious flooding in recent history, a Hazus-MH flood analysis can yield valuable information about the potential for flood damage and loss (Figure 510-2). For best results, the building/structure inventory data bases in Hazus-MH should be augmented with local input.



Hazus-MH is a software program that contains models for estimating potential losses from earthquakes, floods, and hurricane winds. It can be a great help in the Step 5 vulnerability assessment.

Hazus-MH uses geographic information system (GIS) software to map and display hazard data and the results of damage and economic loss estimates for buildings and infrastructure. It also allows users to estimate the impacts of hurricane winds, floods, and earthquakes on populations.

Copies of Hazus-MH are available at no charge from the FEMA Distribution Center. Users can request that a 60-day trial/evaluation copy of ESRI's ArcGIS software be sent with Hazus-MH. Users should be familiar with GIS software. Hazus training is available at FEMA's Emergency Management Institute and elsewhere. Information is at <http://www.fema.gov/hazus/>.

Figure 510-2. About Hazus-MH.

- (d) 5 points, if the assessment describes areas within the floodplain that provide natural functions, such as wetlands, riparian areas, sensitive areas, and habitat for rare or endangered species.

Along with flood protection, comprehensive floodplain management planning should review the unique natural features, natural areas, and other environmental and aesthetic attributes that may be present in the floodplain. Protecting and preserving these natural and beneficial floodplain functions yield flood protection benefits and also help integrate floodplain management efforts with other community goals and objectives. This section should also review existing natural floodplain functions plans, such as those credited under Section 511.c.

- (e) 7 points, if the assessment includes a description of development, redevelopment, and population trends and a discussion of what the future brings for development and redevelopment in the community, the watershed, and natural resource areas.
- (f) 8 points, if the assessment includes a description of the impact of the future flooding conditions described in Step 4(c) on people, property, and natural floodplain functions.

Step 6. Set goals

The goals should set the context for the subsequent review of floodplain management activities and drafting of the action plan (Figure 510-3). They should incorporate or be consistent with other community goals for the affected areas. A multi-hazard mitigation plan should have goals that address all the major hazards that face the community.

Credit Points for FMP Step 6

The points for this step are provided if the plan includes a statement of the goals of the community's floodplain management or hazard mitigation program. The goals must address all flood-related problems identified in Step 5. (Maximum credit: 2 points)

Step 7. Review possible activities

At this step, the plan reviews different activities that could prevent or reduce the severity of the problems described in Step 5. This is a systematic review of a wide range of activities to ensure that all possible measures are explored, not just the traditional approaches of flood control, acquisition, and regulation of land use. The review, including the pros and cons of each activity, must be included in the plan document. Figure 510-4 lists some of the types of activities that could be reviewed under each of the six credited categories.

***NOTE:** This review is separate from Step 8, the selection of projects and activities to pursue. It includes activities that may not be selected and explains why some activities may be appropriate for the community and its flooding conditions and why some may not be appropriate.*

The range of activities should be evaluated for each area affected. While some of them may be quickly eliminated as inappropriate, most deserve careful consideration, especially to ensure full understanding of their costs and benefits.

St. Tammany Parish, Louisiana, Multi-Hazard Mitigation Plan

1. Protect the lives and health of the Parish's residents from the dangers of natural hazards.
 2. Ensure that public services and critical facilities operate during and after a disaster.
 3. Ensure that adequate evacuation routes, streets, utilities and public and emergency communications are maintained and available during and after a disaster.
 4. Protect homes and businesses from damage.
 5. Use new infrastructure and development planning to reduce the impact of natural hazards.
 6. Give special attention to repetitively flooded areas.
-

Gurnee, Illinois, Flood Mitigation Plan

1. Protect existing properties
 - a. Use the most effective approaches to protect buildings from flooding, including acquisition or relocation where warranted.
 - b. Enact and enforce regulatory measures that ensure that new development will not increase flood threats to existing properties.
 - c. Use appropriate measures to mitigate against the danger and damage posed by other natural hazards.
 2. Protect health and safety
 - a. Advise everyone of the safety and health precautions to take against flooding and other natural hazards.
 - b. Improve traffic circulation, during floods and at other times.
 - c. Improve water quality and habitat.
 - d. Do something about the mosquitoes.
 3. Improve the quality of life in Gurnee.
 - a. Preserve and improve the downtown core of businesses and services.
 - b. Ensure that current owners can maintain and improve their properties.
 - c. Use acquisition programs to expand open space and recreational opportunities.
 - d. Maintain an attractive riverfront and other public open spaces.
 4. Ensure that public funds are used in the most efficient manner.
 - a. Prioritize mitigation projects, starting with those sites facing the greatest threat to life, health, and property.
 - b. Utilize public funding to protect public services and critical facilities.
 - c. Utilize public funding for those projects on private property where the benefits exceed the costs.
 - d. Maximize the use of outside sources of funding.
 - e. Maximize owner participation in mitigation efforts to protect their own properties.
 - f. Encourage property-owner self-protection measures.
-
-

Figure 510-3. Two examples of communities' statements of their goals.

1. **Preventive** activities keep flood problems from getting worse. The use and development of flood-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.
 - Floodplain mapping and data
 - Open space preservation
 - Floodplain regulations
 - Erosion setbacks
 - Planning and zoning
 - Stormwater management
 - Drainage system maintenance
 - Building codes
2. **Property protection** activities are usually undertaken by property owners on a building-by-building or parcel basis.
 - Relocation
 - Acquisition
 - Building elevation
 - Retrofitting
 - Sewer backup protection
 - Insurance
3. **Natural resource protection** activities preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are implemented by a variety of agencies, primarily parks, recreation, or conservation agencies or organizations.
 - Wetlands protection
 - Erosion and sediment control
 - Natural area preservation
 - Natural area restoration
 - Water quality improvement
 - Coastal barrier protection
 - Environmental corridors
 - Natural functions protection
4. **Emergency services** measures are taken during an emergency to minimize its impact. These measures are usually the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.
 - Hazard threat recognition
 - Hazard warning
 - Hazard response operations
 - Critical facilities protection
 - Health and safety maintenance
 - Post-disaster mitigation actions
5. **Structural projects** keep flood waters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by public works staff.
 - Reservoirs
 - Levees/floodwalls
 - Diversions
 - Channel modifications
 - Storm drain improvements
6. **Public information** activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of local floodplains. They are usually implemented by a public information office.
 - Map information
 - Outreach projects
 - Real estate disclosure
 - Library
 - Technical assistance
 - Environmental education

Figure 510-4. Categories of floodplain management activities.

Credit Points for FMP Step 7

The credit for this step is the total of the following points based on which floodplain management or hazard mitigation activities are reviewed in the plan. (Maximum credit: 35 points)

This step must describe those activities that were considered. There is no credit for simply listing the various types of projects under each credited category. For each activity, there must be a discussion of why the activity is or is not appropriate for the community and its flood problems.

For an activity that is determined to be appropriate,

- The discussion must also include community's capability to fund and implement the activity.
- If an activity is currently being implemented, the plan must note if it is achieving expectations and, if not, whether it should be modified.
- If the plan is an update of a previously credited plan, each activity recommended by the previous plan must be discussed, along with the status of implementation.

The discussion of each activity needs to be detailed enough to be useful to the lay reader.

Section (a) is required for any credit under this step.

(a) 5 points, if the plan reviews preventive activities, such as zoning, stormwater management regulations, building codes, subdivision ordinances, and preservation of open space, and the effectiveness of current regulatory and preventive standards and programs. (REQUIRED) For this credit, the review must include a discussion of the community's

- Comprehensive or land use plan,
- Building code,
- Zoning ordinance,
- Floodplain management regulations,
- Subdivision ordinance, and
- Stormwater management regulations.

The discussion must review

- How these tools can reduce future flood losses,
- The current standards in the community's plans and regulations, and
- Whether the community should adopt or revise such plans and regulations in light of the Step 5 problem assessment and the goals set in Step 6.

- (b) 5 points, if the plan reviews whether the community's floodplain management regulatory standards are sufficient for current and future conditions, as discussed under Steps 4(c) and 5(f).
- (c) 5 points, if the plan reviews property protection activities, such as acquisition, retrofitting, and flood insurance;
- (d) 5 points, if the plan reviews activities to protect the natural and beneficial functions of the floodplain, such as wetlands protection;
- (e) 5 points, if the plan reviews emergency services activities, such as warning and sandbagging;
- (f) 5 points, if the plan reviews structural projects, such as levees, reservoirs, and channel modifications; and
- (g) 5 points, if the plan reviews public information activities, such as outreach projects and environmental education programs.

Step 8. Draft an action plan

After the review of alternatives during Step 7, an action plan is drafted (Step 8) that selects and specifies those activities appropriate to the community's resources, hazards, and vulnerable properties. The community should strive for a balanced program, selecting measures from more than one category of floodplain management activity. In every case, the community should implement preventive activities both to keep its flood problems from getting worse and also to protect new construction from the effects of natural hazards.

There is no requirement that a floodplain management plan identify expensive or massive structural flood control projects. The plan must include activities that the community can be assured will be implemented through its own resources. If outside funding support is needed for some projects, the funding sources should be identified and researched to ensure that the projects are eligible and the community has a chance of receiving the funds. Many of the activities could receive CRS credit once they are implemented.

Note that 50% of the maximum credit for this planning step is a prerequisite for Class 4 or better communities.

Credit Points for FMP Step 8

The credit points are based on the range of actions that are recommended in the plan, subject to the criteria listed below. (Maximum credit: 60 points)

- For each recommendation, the action plan must identify
 - Who is responsible for implementing the action,
 - When it will be done, and
 - How it will be funded.

“When it will be done” can be specified in terms of a date, a set period of time after another action is complete, after the next flood, etc. “How it will be funded” could state that funding will be dependent on a grant, provided the project is eligible for the grant program.

- The actions must be prioritized. When prioritizing mitigation actions, the planners need to consider the benefits that would result from the mitigation actions and projects versus the cost of those actions. Note that this is not a requirement for a cost-benefit analysis for every action item. However, an economic evaluation is essential for selecting one or more actions from among many competing ones.
 - There must be an action item for each goal in Step 6. An example of this is in Figure 510-5.
 - Credit is provided for a recommendation on floodplain regulations, provided it recommends adopting or continuing a regulatory standard that exceeds the minimum requirements of the National Flood Insurance Program (NFIP). Simply continuing to meet the minimum criteria of the NFIP is not credited as an action item to improve the community’s floodplain management program.
 - If the plan calls for acquiring properties, there must be a discussion of how the project(s) will be managed and how the land will be used after it is acquired.
 - When a multi-jurisdictional plan is prepared, it must have action items from at least two of the six categories that directly benefit each community seeking CRS credit.
 - To qualify as a multi-hazard mitigation plan, the plan must include a “process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate” (44 CFR §201.6(c)(4)(ii)). The action items that relate to preventive activities should clarify how this is done. For example, an action item could recommend that the next time the zoning ordinance is revised, flood and landslide hazard areas be considered when determining allowable uses.
- (a) 45 points, depending on how many categories are covered by the action items:
- (1) 10 points, if the action plan includes flood-related recommendations for activities from two of the six categories credited in Step 7; OR
 - (2) 20 points, if the action plan includes flood-related recommendations for activities from three of the six categories credited in Step 7; OR
 - (3) 30 points, if the action plan includes flood-related recommendations for activities from four of the six categories credited in Step 7; OR
 - (4) 45 points, if the action plan includes flood-related recommendations for activities from five of the six categories credited in Step 7.

Table 9-1. Action Items, Goals, and Recommendations							
Action Item	Goal 1. Protect critical facilities and utilities	Goal 2. Protect lives and health	Goal 3. Protect homes, businesses, and schools	Goal 4. Minimize the costs to the City and property owners	Goal 5. Ensure that new construction supports these goals	Chapter – Recommendation	Deadline
9.2. Administrative Action Items							
1. Plan adoption	X	X	X	X	X		5/31/07
2. Monitoring and reporting	X	X	X	X	X		9/30 each year
3. Community Rating System	X	X	X	X	X	4-3, 6-5, 7-3, 8-1 - 8-8	CRS visit
9.3. Program Action Items							
4. Levee improvements	X	X	X	X		4-1	Ongoing
5. Drainage improvements	X	X	X	X		4-2	8/31/08
6. Drainage system maintenance	X	X	X			4-3	CRS visit
7. Property protection funding	X	X	X	X		5-2, 5-3	8/31/07
8. Regulatory review	X		X		X	6-5	CRS visit
9. NFIP administration	X	X	X		X	6-2	After CAC
10. CFMs	X	X	X		X	6-2, 6-3	8/31/07
11. BCEGS	X	X	X		X	6-4	5/31/07
12. Flood response plan	X	X	X			7-1 – 7-4	Ongoing
9.4. Public Information Action Items							
13. Annual mailing		X	X		X	8-1, 8-2, 8-7, 8-8	Each Spring
14. Technical references		X	X		X	8-4, 8-5	CRS visit
15. Public information projects		X	X		X	4-4, 5-1, 6-1, 6-6, 7-4, 8-1 – 8-8	Ongoing
16. Public information messages		X	X		X	4-4, 5-1, 6-1, 6-6, 7-4, 8-1 – 8-8	Ongoing

This table relates the 16 action items to the 5 goals of this Plan. The goals are stated in full on pages 3-6 and 9-1. The table also shows the relation between the action items and the recommendations at the end of chapters 4 – 8. For example action item 8, Regulatory Review, implements recommendation 6-5 at the end of chapter 6. The reviews need to be completed in time for the CRS verification visit, which will be in the second half of 2007.

Figure 510-5. An excerpt from the City of Gretna, Louisiana's Flood Hazard Mitigation Plan.

- (b) 10 additional points are provided if the action plan establishes or revises post-disaster redevelopment and mitigation policies and procedures. These policies and procedures should account for the expected damage from a base flood or other disaster. For example, the action plan should identify the areas likely to be worst hit and the policies should determine whether they will be rebuilt if substantially damaged. Post-disaster mitigation procedures should assign responsibilities for public information, code enforcement, planning, and other efforts that encourage, mandate, and/or fund loss reduction activities.

Note that Activity 330 (Outreach Projects) provides credit for public information materials developed for use during and after a flood (Flood Response Preparations (FRP)). Preparation of those materials should be done when the other post-disaster policies and procedures are prepared.

- (c) 5 additional points are provided if the plan includes action items (other than public information activities) to mitigate the effects of the other natural hazards identified in the hazard assessment (Step 4, item (d)).

Step 9. Adopt the plan

The points for this step are provided if the plan and later amendments are officially adopted by the community's governing body. The plan must be an official plan of the community, not an internal staff proposal. "Adopted" means that there is a resolution or other formal document that is voted on by the community's governing body. A note in the minutes or passage via a consent agenda is not credited.

When a multi-jurisdictional plan is prepared, it must be adopted by the governing body of each community seeking CRS or multi-hazard mitigation plan credit.

Step 10. Implement, evaluate, and revise

To be useful, planning must be ongoing and plans must be dynamic. The plan should not sit on a shelf gathering dust once it is completed. Therefore, the community must have an evaluation and update process.

For CRS credit, plans must be implemented. No plan is perfect. As implementation proceeds, flaws will be discovered and changes will be needed. Not only can hazard conditions change but also goals and objectives may change. If a community is hit by a tornado, for example, the short-term action items may be changed to focus attention on the newly damaged areas in the SFHA.

Changes should be made in the action plan when opportunities arise to add new activities or complete some items ahead of schedule. The plan should also be revised if it is found that some activities cannot be completed on the original timetable. At a minimum, these types of changes must be made at the required 5-year update.

The key to this step is the annual evaluation report on progress in implementing the plan. Not only are annual evaluations required with the community's annual recertification, but also the process of conducting an annual evaluation gives the community a framework for

monitoring the plan's effectiveness and the community's progress in implementing it. Failure to submit the evaluation report with the community's annual recertification will result in loss of the planning credit (i.e., FMP = 0). This can cause a Category C repetitive loss community to revert to a Class 10.

Credit Points for FMP Step 10

The credit for this step is the total of the following points, based on how the community monitors and evaluates its plan. (Maximum credit: 26 points)

- The plan document must describe how, when, and by whom the plan will be monitored, evaluated, and revised. It is recommended that these items be included in the adoption resolution as well.
- An annual evaluation report on progress towards plan implementation must be prepared at least once each year and submitted with the community's annual CRS recertification. The report must be submitted to the governing body, released to the media, and made available to the public.
- If a community receives credit as a result of participation in a multi-jurisdictional plan that includes action items for each community, the annual evaluation report must cover those action items. This can be done either by a multi-jurisdictional planning committee or through separate submittals by each community. However, a community will not receive credit if it did not participate in the meeting at which the annual report was prepared. Therefore, the submittal needs to show who participated in the preparation of the report.
- The community must update the plan at least every five years. The update is due by October 1, five years after the plan was adopted (see next section).
- Step 10(b) provides credit if the planning committee does the evaluation and revision. If the committee does not continue to meet and report or if the committee membership no longer meets the credit criteria in Step 2(a), the community will not keep the committee credits under Steps 1(b) or 2(a).
 - (a) 2 points, if the community has procedures for monitoring implementation, reviewing progress, and recommending revisions to the plan in an annual evaluation report. The report must be submitted to the governing body, released to the media, and made available to the public. (REQUIRED)
 - (b) 24 points, if the annual evaluation report is prepared by the same planning committee that prepared the plan that is credited in Step 2(a) or by a successor committee with a similar membership that was created to replace the planning committee and charged with monitoring and evaluating implementation of the plan. The points are based on how frequently the committee meets, since more frequent meetings yield more progress toward implementing the plan. The committee must continue to meet the representation, quorum, and other criteria that determined the credit points under Step 2(a).
 - (1) 6 points, if the committee meets only once a year.
 - (2) 12 points, if the committee meets twice a year.
 - (3) 24 points, if the committee meets at least quarterly.

Five-year Update

The community must submit a copy of its plan update at least every five years. The plan update will be reviewed for CRS credit according to the *Coordinator's Manual* currently in effect, not the version used when the community originally requested this credit. The update must include the following steps:

- (a) Steps 1 and 2: If the original planning process included a committee, then in order to keep the credit provided under Step 1(b) or Step 2(a), the update must be conducted by a committee that meets the criteria identified in those steps.
- (b) Step 2: If the original planning process received credit for a public meeting credited under Step 2, item (c), then to keep this credit the community must also conduct a public meeting that reviews and receives comments on the draft update.
- (c) Step 3, item (a): The update must include a review of new studies, reports, and technical information and of the community's needs, goals, and plans for the area that have been published since the plan was prepared.
- (d) Steps 4 and 5: The hazard and problem assessments must be reviewed and brought up to date. The assessments must account for
 - New floodplain or hazard mapping,
 - Annexation of flood-prone areas,
 - Additional repetitive loss properties,
 - Completed mitigation projects,
 - Increased development in the floodplain or watershed,
 - New flood control projects,
 - Lack of maintenance of flood control projects,
 - Major floods or other disasters that occurred since the plan was adopted, and
 - Any other change in flooding conditions and/or development exposed to flooding or the other hazards covered in the plan.
- (e) Step 6: The original plan's goals must be reviewed to determine if they are still appropriate, given the revisions to Steps 4 and 5.
- (f) Step 8: The action plan must be revised to account for projects that have been completed, dropped, or changed and for changes in the hazard and problem assessments, as appropriate.
- (g) Step 9: The update must be adopted by the community's governing body.

An annual evaluation report that includes these steps may qualify as the five-year update (but may not qualify as an update for a multi-hazard mitigation plan).

Impact Adjustment for FMP

rFMP is a ratio that reflects how much of the community's flood hazard areas are covered by the floodplain management plan. Note that for a hazard mitigation plan to qualify, all of the community's flood hazards must be covered.

rFMP = EITHER

1.0, if the plan covers all of the community's known flood hazard areas. "Known flood hazard areas" means the SFHA shown on the FIRM, repetitive loss areas, areas not mapped on the FIRM that have been flooded in the past, and surface flooding identified in existing studies (see Step 4)

OR

0.25, if the planning covers either all of the community's repetitive loss areas or at least 25% of the community's known flood hazard areas.

Documentation for FMP Provided by the Community

- (1) With the submittal of the plan or the five-year update to the plan,
 - (a) A copy of the plan or updated plan to be credited. This can be digital, a hard copy, or a link to a website with the full document. Either the plan is marked, or a separate document is provided, to show where each credited step and sub-step appears. There is a checklist that can be used to do this, available at www.CRSresources.org/500.
 - (b) [For Step 1(b) credit for a committee of staff from different departments] The plan or a separate document must show which department representatives implement, or have expertise in, which of the six categories of mitigation measures.
 - (c) [For Step 1(c) credit] A copy of the resolution or other official action taken by the governing body to create or recognize the planning process as specified in Step 1. For Step 2(a) credit for a planning committee, the resolution or action must identify the committee's membership.
 - (d) [For Step 2(a) credit for a planning committee] The names of the committee members, their titles, and their represented organizations must be listed in the plan. The community may submit separate materials, such as meeting minutes and sign-in sheets, to document meeting attendance.
 - (e) For Step 2(b), (c), or (d) credit for public meetings] Copies of the publicity for the public meetings. The notices of the meetings should be in the form of letters to floodplain residents, a notice sent to all residents, or a newspaper article or advertisement. An inconspicuous legal notice appearing in the classified section of the newspaper is not sufficient for CRS credit. If very few residents are affected, as may be the case for a plan that addresses only a repetitive loss area, a written record that the residents were called would be sufficient documentation.

- (f) [For Step 3(a) credit for reviewing existing studies, reports, and technical information] The plan must note where the information from the studies and reports was used, e.g., with quotations or footnotes. The plan also needs to include a list of all the documents reviewed. This is usually done in a reference section or at the end of each chapter.
 - (g) [For Step 3(b) credit for coordination with other agencies and organizations] A record of the contacts and meetings. Acceptable records include letters that cover the items needed for coordination, copies of any responses that were received, follow-up memos from the meetings, notes from telephone conversations, and e-mails. These items are usually not included as a part of the plan document.
 - (h) A copy of the resolution or other formal adoption action by the governing body as specified in Step 9. The resolution should identify the implementation responsibilities, describe the evaluation and revision procedures, and call for the five-year update (or adopt by reference such language that may be in the plan document).
- (2) With each annual recertification,
- (a) A copy of the annual evaluation report as specified in Step 10. The report must review each action item, describe what was implemented (or not implemented), and recommend changes to the action plan as appropriate. If not in the evaluation report document, the recertification submittal must also include the minutes of the committee meeting(s) (if getting credit for Step 10(b)) and a description of how the report was submitted to the governing body, released to the media, and made available to the public.

NOTE: Failure to submit the floodplain management plan's evaluation report with the annual recertification or the five-year update will result in loss of the planning credit (i.e., FMP = 0). Loss of credit for this activity may cause a repetitive loss Category C community to revert to a Class 10.

512.b. Repetitive loss area analysis (RLAA)

The maximum credit for this element is 140 points.

A repetitive loss area analysis is a detailed mitigation plan for a repetitive loss area. It provides more specific guidance on how to reduce damage from repetitive flooding than a community-wide floodplain management or hazard mitigation plan. Before beginning the RLAA process, the community must review its repetitive loss list to determine if any properties have been mitigated or incorrectly assigned to the community. Once the list is reviewed and the necessary updates approved as per Section 502, the remaining unmitigated repetitive loss properties will form the basis for the RLAA. Mapping repetitive loss areas is discussed in Section 503.

As with a floodplain management plan, CRS credit is dependent upon the community's following an appropriate process. The five steps for an area analysis are less involved than

the 10-step floodplain management planning process, but the analysis must evaluate each building in the repetitive loss area(s).

A community may receive credit for both a floodplain management plan and repetitive loss area analyses. Area analyses may be conducted during floodplain management planning or a floodplain management plan may identify areas needing analyses, which are conducted after the plan is adopted. For CRS credit, a separate analysis must be prepared for each repetitive loss area and made available to residents of those areas.

Additional guidance and suggestions for conducting an area analysis can be found in Chapter 7 of *Reducing Damage from Localized Flooding*, FEMA-511.

Credit Criteria for RLAA

- (1) Communities with one or more repetitive loss properties on FEMA's list must have at least one repetitive loss area delineated in accordance with the criteria in Section 503. The area(s) must include at least one of the properties on FEMA's repetitive loss list.

An exception to this criterion is made for communities that have no historic repetitive flood claims, but are nevertheless working to reduce repetitive flooding. These communities may prepare area analyses for areas that have been repetitively flooded. The analyses must describe and map the repetitive flooding problem (including all past flood insurance claims, if any) and meet all the following credit criteria. If there are multiple areas, they must not be contiguous. Communities using this approach may receive 20 credit points per area.

- (2) An area analyses must have been prepared and adopted for each repetitive loss area in the community. The analyses must meet the following criteria:

- (a) The repetitive loss areas must be mapped as described in Section 503.a.
- (b) If the community does not conduct an analysis of all the areas, it will be reflected through the impact adjustment. A Category C community must prepare analyses for all of its repetitive loss areas if it wants to use RLAA to meet its repetitive loss planning prerequisite (see Section 502).
- (c) A five-step process must be followed. Although all five steps must be completed, steps 2–4 do not have to be done in the order listed. For example, the planners may want to contact agencies and organizations to see if they have useful data (Step 2) after the site visit is conducted (Step 3).

Step 1. Advise all the properties in the repetitive loss areas that the analysis will be conducted and request their input on the hazard and recommended actions. The notice (or any public document) cannot identify which properties are on FEMA's repetitive loss list (see the box on flood insurance data and the Privacy Act). There are no restrictions on publicizing what properties are in repetitive loss AREAS that have more than one property and there are no restrictions on publishing aggregate data, such as how many properties received claims or the average value of those claims. Community planning staff may share insurance claims information with the owner of the property, but may not make it available to anyone else.

The Privacy Act

Flood insurance data about private property, including repetitive loss properties, are protected under the Privacy Act. Personally identifiable information such as the names or addresses of specific properties, whether they are covered by flood insurance or not, whether they have received flood insurance claims, or the amounts of such claims may not be released outside of local government agencies or to the public or used for solicitation or other purposes. Such information should be marked "For internal use only. Protected by the Privacy Act of 1974."

General or aggregated information, such as total claims paid for a community or an area or data not connected to a particular property may be made public.

- The notice can be sent to owners OR residents at the community's discretion, as long as a representative of each property is notified.
- The notice cannot be done via a newspaper or newsletter notice or article.
- The notice must advise the recipients when and how copies of the draft report can be obtained and ask for their comments on the draft.

Step 2. Contact agencies or organizations that may have plans or studies that could affect the cause or impacts of the flooding. The agencies or organizations must be identified in the analysis report.

Step 3. Visit each building in the repetitive loss area and collect basic data.

- The site visit must collect data sufficient to do a preliminary determination of the cause of the repetitive flooding and of the mitigation measures that would be appropriate. This usually includes a review of drainage patterns around the building, the condition of the structure, and the condition and type of foundation.
- The person conducting the visit should not have to enter the property—adequate information should be collected from observations from the street.
- Floor elevations or historical flood levels are not required, but can be very helpful where available.
- The date for each building's insurance claim can help identify the cause of flooding (e.g., rainfall or overbank flooding) and the amount of the claim can help determine the amount of damage. Note that, every year, each repetitive loss community is provided with a list of its historic insurance claims. This includes single-claim properties. Non-repetitive-loss communities that elect to do an RLAA may request these data from their ISO/CRS Specialist.
- More information on appropriate data can be found in *Selecting Appropriate Mitigation Measures for Floodprone Structures*, FEMA-551.

Step 4. Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible. The review must look at all of the property protection measures listed in Figures 360-1 and 510-4 that are appropriate for the types of buildings affected. A review that looks only at drainage or structural flood control project alternatives is not sufficient.

Step 5. Document the findings. A separate analysis must be conducted for each area. In general, separate reports are preferred for each area, but in cases in which several areas have similar building and flooding characteristics and similar mitigation measures are appropriate, the analyses can be assembled into a single report. Each report must include

- A summary of the process that was followed, including how the property owners were involved;
- The problem statement with a map of the area affected. The statement and map may show individual properties or parcels, but cannot show which ones are on FEMA's repetitive loss list;
- A list or table showing basic information for each building, such as address, foundation type, condition, and appropriate mitigation measures. This list cannot include insurance data, such as how many claims have been paid for that property. If the property owners responded to a survey, the survey responses may be included (unless the community promised confidentiality);
- The alternative approaches that were reviewed; and
- Action items that include
 - Who is responsible for implementing the action,
 - When it will be done, and
 - How it will be funded.

“When it will be done” can be expressed in terms of a date, a set period of time after another action is complete, after the next flood, etc. “How it will be funded” could state that funding will be dependent upon receiving a grant, provided that one or more suitable grant programs are specified to which application(s) for funding will be made.

- (3) The repetitive loss area analysis report(s) must be submitted to the community's governing body and made available to the media and the public. If private or sensitive information (such as names or street addresses) is included in the report, then a summary report(s) must be prepared for the governing body, committees, media, and the public. The complete repetitive loss area analysis report(s) must be adopted by the community's governing body or by an office that has been delegated approval authority by the community's governing body.
- (4) The community must prepare an annual evaluation report for its area analyses.
- The report must review each action item, describe what was implemented (or not implemented), and recommend changes to the action items as appropriate.
 - One annual report can cover some or all of the area analyses that were prepared.
 - The report must be made available to the media and the public (including the property owners and residents of the repetitive loss areas).
 - The report is submitted with the community's annual recertification.
- (5) The community must update its repetitive loss area analyses in time for each CRS cycle verification visit.
- The update must review the flooding and building conditions as well as any changes to FEMA's repetitive loss list, to determine whether the number of buildings on the list or other circumstances have changed, and revise the mapping and action items accordingly.
 - The update can be a new report or an addendum to the existing report.
 - An annual evaluation report that reviews and updates the 5-step process may qualify as the area analysis update.
 - The update can qualify as the annual evaluation report for the year it was prepared.
 - The update must be made available to the media and the public (including the property owners and residents of the repetitive loss areas).
 - If the repetitive flooding problem has been mitigated, the appropriate documentation must be submitted in order to remove the properties from FEMA's repetitive loss list (see Section 501).
 - Any changes to an adopted area analysis must be approved following the same process as approval of the original analysis.

If, during the area analysis or annual reviews, the community finds that the flood risk to one or more repetitive loss properties has been mitigated, FEMA must be notified by submitting an AW-501, as described in Section 501.

Credit Points for RLAA

$$\text{RLAA} = 140$$

The maximum credit for this element is 140 points. A community can obtain the maximum only if it prepares and adopts repetitive loss area analyses for all its repetitive loss areas. This is factored in through the impact adjustment.

Impact Adjustment for RLAA

rRLAA is the ratio of the number of buildings covered by credited area analyses to the total number of buildings in the community's repetitive loss areas. See Sections 301–303 on calculating an impact adjustment.

$$r\text{RLAA} = \frac{b\text{AA}}{b\text{RLA}}, \text{ where}$$

bAA = the number of buildings addressed in credited area analyses, and

bRLA = the number of buildings in the community's repetitive loss areas

Documentation for RLAA Provided by the Community

(1) At each verification visit,

- (a) A copy of each repetitive loss area analysis report or update of an earlier report that the community wants credited (see Step 5).
- (b) Documentation showing how the owners or residents of the areas were notified (see Step 1).
- (c) Documentation showing how the analysis was made available to the media and the public.
- (d) A copy of the resolution or other formal action by the governing body that adopts the area analysis or accepts changes in subsequent updates.

(2) With the annual recertification,

- (a) A copy of the annual evaluation report (Section 512.b, credit criterion (4)). If not in the evaluation report, the recertification submittal must also document how the evaluation report and update were made available to the media and the public.

NOTE: Failure to submit the area analysis' evaluation report with the annual recertification or the update at the next cycle verification visit will result in loss of the credit (i.e., $\text{RLAA} = 0$). Loss of credit for this activity may cause a repetitive loss Category C community to revert to a Class 10.

512.c. Natural floodplain functions plan (NFP)

The maximum credit for this element is 100 points.

NFP credit is provided for adopting plans that protect one or more natural functions within the community's floodplain. Examples include

- A habitat conservation plan that explains and recommends actions to protect rare, threatened, or endangered aquatic or riparian species.
- A habitat protection or restoration plan that identifies critical habitat within the floodplain, actions to protect remaining habitat, and/or actions to restore fully functioning habitat. Frequently this will result in the preservation and/or restoration of riparian habitat that is necessary for water-dependent species.
- A “green infrastructure plan” that identifies open space corridors or connected networks of wetlands, woodlands, wildlife habitats, wilderness, and other areas that support native species, maintain natural ecological processes, and/or sustain air and water resources (for credit, the corridors or networks must include some floodplains).
- A plan or section of a comprehensive or other community plan that includes an inventory of the ecological attributes of the watershed and/or the floodplain and recommends appropriate actions for protecting them, provided that the recommendations are implemented through a mechanism such as a development regulation, development order, grant program, or capital improvement plan.

NOTE: Element NFOS2, (*section 2 of the natural floodplain functions open space credit under Activity 420 (Open Space Preservation)*), provides bonus credit for open space parcels that are designated in a plan to protect natural functions. A plan that receives NFP credit qualifies parcels for this extra open space credit.

Credit Criteria for NFP

(1) For all plans:

- (a) The plan may cover more than one community, but it must identify the natural floodplain functions present within the community and have an impact on those functions within the community seeking credit.
- (b) The plan must be adopted. If the plan is not a community plan adopted by the community's governing body, it must be adopted by the appropriate regional agency.
- (c) The plan must be updated at least once every 10 years. The update must include a review of any changes to conditions as well as progress made since the original plan was prepared. Any changes to the adopted plan must be approved by the original adopting agency.
- (d) The plan must include an inventory of the species and/or habitat present within the floodplain and action items for protecting one or more identified species of interest and natural floodplain functions. The action items must describe who is responsible for implementing the action, how it will be funded, and when it will be done.

General policy statements with no means of implementation are not considered action items.

- (e) There is no credit for a plan that addresses water quality issues prepared pursuant to a requirement for an NPDES (National Pollution Discharge Elimination System) permit. Plans to improve drainage, stormwater storage, or channel bank erosion may be credited under Activity 450 (Stormwater Management) or Activity 540 (Drainage System Maintenance). Plans that are produced as a requirement for a development permit are not credited.
- (2) For NFP1: A plan for NFP1 credit must include a comprehensive inventory of the natural floodplain habitat within the community. It must identify areas that warrant protection or preservation in order to maintain fully functioning habitat for the species of interest. Where threatened or endangered species are present, each species must be addressed and a restoration plan must be included.
- (3) For NFP2: This sub-element credits other plans that meet the credit criteria listed in (1), but that do not address the entire SFHA or all of the species present. These could be single-issue or single-species plans or plans that cover only one area of the community's floodplain.

Credit Points for NFP

NFP = EITHER

NFP1 = 100 points, for a plan, or combination of plans, that meets credit criteria (1) and (2) and covers the entire SFHA within a community

OR

NFP2 = $15 \times$ the number of plans that meet credit criterion (1), up to four plans (60 points maximum)

Impact Adjustment for NFP

There is no impact adjustment for this element. The NFP1 plan must cover the entire community or all of the community's SFHA. Each NFP2 plan receives 15 points regardless of the extent of the area covered.

Documentation for NFP Provided by the Community

- (1) At each verification visit,
 - (a) A copy of each natural floodplain functions plan or update to a plan that the community wants credited.
 - (b) A copy of the resolution or other formal adoption action.

513 Credit Calculation

c510 = (FMP x rFMP) + (RLAA x rRLAA) + NFP, where

FMP = the total of the credit points for the 10 steps in
Section 512.a

514 For More Information

- a. Additional information, reference materials, checklists, and examples can be found at www.CRSresources.org/500.
- b. Hazus-MH is a risk assessment software program that is described in Figure 510-2. Copies are available free from FEMA. Users need to be familiar with operating GIS software. Training is also available. More information is available at www.fema.gov/hazus/.
- c. Contact state or regional planning, water resources, natural resources, environmental protection, state hazard mitigation, or NFIP coordinating agencies for information on state and federal agencies that can help prepare a floodplain management plan.
- d. The following publications discuss the floodplain management planning process and the variety of measures that should be examined. They can be found on the websites noted.

FEMA has a series of “how-to guides” on planning, to help communities meet the multi-hazard mitigation planning criteria. They can be found at www.fema.gov/vi/media-library/collections/6.

Getting Started: Building Support for Mitigation Planning (FEMA-386-1) covers planning Phase I and CRS planning Steps 1–3.

Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA-386-2) covers planning Phase II and CRS planning Steps 4–5.

Developing the Mitigation Plan: Identifying Mitigation Actions and Implementation Strategies (FEMA-386-3) covers planning Phase III and CRS planning Steps 6–8.

Bringing the Plan to Life: Implementing the Hazard Mitigation Plan (FEMA-386-4) covers planning Phase IV and CRS planning Steps 9–10.

Integrating Manmade Hazards into Mitigation Planning, FEMA-386-7.

Reducing Damage from Localized Flooding: A Guide for Communities, FEMA-511 (2005). Also available at www.fema.gov/library/viewRecord.do?id=1448.

Planning for Post Disaster Recovery and Reconstruction, American Planning Association (APA) Planning Advisory Service, 346 pages, APA Report # 483/484, FEMA-421 (1998). www.fema.gov/library/viewRecord.do?id=1558.

Planning for a Sustainable Future: The Link Between Hazard Mitigation and Livability, 43 pages, FEMA-364, 2000. Also available for downloading at <http://www.fema.gov/media-library/assets/documents/2110?id=1541>.

Reducing Losses in High Risk Flood Hazard Areas—A Guidebook for Local Officials, FEMA-116, 1987. Also available for downloading at www.fema.gov/library/viewRecord.do?id=1508.

“Mitigation Benefit Cost (BCA) Toolkit.” This is FEMA’s BCA software, used to perform benefit-cost analyses for applications to FEMA’s mitigation grant programs. It and its supporting documentation are available for download from www.fema.gov/media-library/assets/documents/92923. More information can be obtained by calling FEMA’s toll-free BC Hotline at 1-855-540-6744 or emailing bchelpline@dhs.gov.

- e. *Hazard Mitigation: Integrating Best Practices into Planning*, James C. Schwab (ed.) (2010) is published by the American Planning Association as Planning Advisory Service No. 560. Available for \$60 from <https://www.planning.org/research/hazards/>.
- f. The Corps of Engineers can also provide technical information and advice to communities interested in preparing a comprehensive floodplain management plan. Requests for assistance should be submitted to the Flood Plain Management Services Coordinator at the appropriate District Office of the Corps. Corps offices can be found at <http://www.usace.army.mil/Locations.aspx>.
- g. The following publications can help with a repetitive loss area analysis.

Selecting Appropriate Mitigation Measures for Floodprone Structures, FEMA-551.

Reducing Damage from Localized Flooding: A Guide for Communities, FEMA-511 (2005).

Flood Proofing: How to Evaluate Your Options, U.S. Army Corps of Engineers (1994). Download at <http://www.usace.army.mil/Missions/CivilWorks/ProjectPlanning/nfpc.aspx>. Click on “NFPC Publications” and scroll down to find the title.

515 Related Activities under the Community Rating System

- A floodplain management plan should be a blueprint for ALL of a community's public information and floodplain management activities. Planning Step 7 should review all ongoing and possible activities and Step 8 should identify which should continue, which should change, and what new ones should be initiated.
- The CRS Community Self Assessment in Section 240 can help with the hazard and problem analyses in FMP Steps 4 and 5.
- Activities 330 (Outreach Projects) and 370 (Flood Insurance Promotion) provide credit for having a committee that meets criteria very similar to those of the committee in FMP Step 2. The same committee can fulfill all activities' credit criteria.
- The credit for natural floodplain functions open space (NFOS) under Activity 420 (Open Space Preservation) can be increased if the open space parcels are identified in a natural floodplain functions plan (NFP).
- A repetitive loss area analysis (RLAA) can identify projects and priorities for mitigation activities that can receive bonus credit under Activities 520 (Acquisition and Relocation) and 530 (Flood Protection).
- A multi-hazard mitigation plan that meets FEMA planning criteria is a prerequisite for FEMA funding for projects that can be credited under Activities 520 (Acquisition and Relocation) and 530 (Flood Protection).

520 ACQUISITION AND RELOCATION—Summary

Maximum credit: 2,250 points

522 Elements

A community can obtain credit under one or a combination of elements. The elements reflect the different scoring that is applied to different types of buildings. A given building can only be credited under one element.

- a. **Buildings acquired or relocated (bAR)** from the regulatory floodplain.
- b. **Buildings on the repetitive loss list (bRL)** that have been acquired or relocated.
- c. **Severe Repetitive Loss properties (bSRL)** that have been acquired or relocated.
- d. **Critical facilities (bCF)** that have been acquired or relocated.
- e. **Buildings located in the V Zone or coastal A Zone (bVZ)** that have been acquired or relocated.

Credit Criteria

Credit criteria for this activity are described in Section 521.b. Each element has additional criteria specific to that element.

Impact Adjustment

There is no impact adjustment for this activity.

Documentation Provided by the Community

The documentation needed for this activity is described in Section 524.

520 ACQUISITION AND RELOCATION

The OBJECTIVE of this activity is to encourage communities to acquire, relocate, or otherwise clear existing buildings out of the flood hazard area.

521 Background

Acquisition and relocation projects remove people and property from harm's way and reduce the community's costs for disaster response, recovery, and repair. The Federal Emergency Management Agency (FEMA) recognizes that the acquisition of buildings in the floodplain is especially effective at reducing flood losses because it is a permanent form of mitigation. Other government agencies also have found acquisition projects to be more cost effective than major flood control projects.

Acquisition and relocation (or demolition) of buildings also creates additional open space in the floodplain and allows those lands to return to their natural functions. Acquisition is the most effective mitigation alternative for addressing repetitive loss properties (see Sections 501–503).

521.a. Activity Description

The maximum credit for Activity 520 is 2,250 points. A community can obtain credit with one or a combination of the five elements, provided that the total credit does not exceed 1,900 points. Up to 350 additional points are provided in Section 523.b if more than 30% of the buildings in the Special Flood Hazard Area (SFHA) have been acquired or relocated. The credit points for each element are not listed because any element alone could be worth up to 1,900 points, depending on the circumstances in the community.

This activity credits the acquisition of a property and either the demolition of the building, or the relocation of the building outside the regulatory floodplain. Credit is provided as long as an insurable building is removed from the regulatory floodplain and the community can document that the property (or that portion of the property that lies within the regulatory floodplain) will remain vacant. The credit points are based on the number of buildings cleared in proportion to the total number of buildings in the community's SFHA. Different types of buildings are credited differently under the five elements:

- Buildings acquired or relocated away from the regulatory floodplain (bAR),
- Buildings on the repetitive loss list that have been acquired or relocated (bRL),
- Severe Repetitive Loss properties that have been acquired or relocated (bSRL),
- Critical facilities that have been acquired or relocated (bCF), and
- Buildings located in the V Zone or coastal A Zone that have been acquired or relocated (bVZ).

No Community Rating System (CRS) credit is provided for acquisition or relocation projects undertaken before the community joined the Regular Phase of the National Flood Insurance Program (NFIP). No credit is provided for removing a building if another

building has since been built on the same site, even if the new building was built to flood protection standards (although such a project may qualify for credit under Activity 530 (Flood Protection)).

521.b. Activity Credit Criteria

To be counted toward any of the elements in this activity, an acquired or relocated building must meet all of the following requirements.

- (1) It must have been an insurable building. A description of the kinds of buildings that can be counted toward this activity appears in Section 301 and 302. Note that when buildings are counted toward this and other CRS activities, only the primary structure on a lot is counted. There is no credit for removing accessory structures, such as detached garages and storage sheds.
- (2) It must have been acquired or relocated after the date of the community's initial FIRM.
- (3) The building site will remain preserved as open space. This is documented in the same way as crediting a property for open space preservation (OSP) in Activity 420. There is, in effect, the potential for duplicate credit for purchasing a property and maintaining it as public open space under Activities 520 and 420. There may also be additional credit if the property is preserved as open space under a deed restriction (DR) or restored to its natural condition (NFOS).

These extra credits are encouraged because of the benefits of maintaining the floodplain as open space. However, this criterion does not mandate that the community apply for Activity 420 credit, only that it provide the same documentation that is needed for OSP under Activity 420. The documentation is also needed for areas outside the regulatory floodplain where there is no Activity 420 credit, such as for repetitive loss properties (bRL).

- (4) If the building was relocated, there is no credit if it was moved to a site in the regulatory floodplain or a mapped repetitive loss area.
- (5) A building is counted toward only one of the five elements.
- (6) If a building was acquired or cleared with funding support from FEMA's Flood Mitigation Assistance (FMA) program, then the credit is 25% of the points listed for the element. This is explained in Section 506.

Environmental Protection and Historic Preservation

Because it is a FEMA program, the CRS must ensure that activities for which it provides credit are compliant with applicable federal environmental and historic preservation laws and executive orders. Section 507 expands on this requirement and presents a summary of FEMA's policy. Figure 500-5 lists the federal programs that should be considered during project development.

(7) Acquisition or relocation projects must have been compliant with applicable federal environmental and historic preservation laws and executive orders (see Section 507). The Certification of Compliance with Environmental and Historic Preservation Requirements for Acquisition and Relocation Projects, CC-520EHP, must be completed for projects that are permitted or initiated after the effective date of the 2013 *CRS Coordinator's Manual* (April 1, 2013). The certification form can be found in Appendix F, on www.CRSresources.org/200, or requested from the ISO/CRS Specialist. Credit is not provided if the project was not in compliance with applicable federal laws and executive orders.

(8) There is no credit for a project initiated to meet the minimum criteria of the NFIP.

522 Elements

522.a. Buildings acquired or relocated (bAR)

The credit for this element is based on the number of buildings in the regulatory floodplain that have been acquired or relocated.

NOTE: *The “regulatory floodplain” is defined in Section 120, Glossary. It includes the SFHA and areas outside the SFHA that are subject to the community’s floodplain management regulations. bAR credit is for clearing buildings out of the regulatory floodplain. The extra bonus points in Section 523.a are based on the number of buildings cleared out of the SFHA.*

bAR = the number of buildings acquired, relocated, or otherwise cleared from the regulatory floodplain since the effective date of the FIRM

Credit Criteria for bAR

- (1) For bAR credit, buildings must have been acquired or relocated since the effective date of the Flood Insurance Rate Map (FIRM).
- (2) The building must have been located in the regulatory floodplain as shown on the impact adjustment map prepared in accordance with Section 403.

If the community did not prepare an impact adjustment map, credit is provided for buildings that were in the SFHA as shown on the community’s current FIRM or a published preliminary FIRM, whichever shows the larger floodplain. If areas outside the SFHA are included in the community’s regulatory program and credit is requested for buildings acquired or relocated in these areas, the community must demonstrate that these buildings were in areas currently regulated to at least the minimum standards of the NFIP.

-
- (3) A building that lies outside the regulatory floodplain because of remapping, completion of a flood control structure, or other activity is not eligible for this credit. Such a building has already benefited twice: first, it is not subject to the mandatory NFIP insurance purchase requirement; and second, if the owner chooses to purchase NFIP insurance, the premium will be based on the lower X-Zone rate.

522.b. Buildings on the repetitive loss list (bRL)

bRL = the number of buildings that are listed on FEMA's repetitive loss list that have been acquired, relocated, or otherwise removed from the flood problem site they occupied

Element bRL credits those repetitive loss properties that have been acquired, relocated, or otherwise removed from the site where they suffered flooding. A repetitive loss building receives twice the credit of a non-repetitive loss property. Section 501 explains the FEMA repetitive loss list. Communities with one or more properties on the repetitive loss list must review and update the list at each verification visit.

Credit Criteria for bRL

- (1) Credited buildings must be on FEMA's updated repetitive loss list for the community (see Section 501). Properties in mapped repetitive loss areas that are not on the list do not qualify for bRL (but may qualify for bAR if they are in the regulatory floodplain).
- (2) The FEMA repetitive loss data base must be updated to reflect the mitigation project, as explained in Section 501.
- (3) Buildings counted toward one of the other elements in Activity 520 are not counted toward bRL. For example, if the community acquired and cleared 32 buildings from the SFHA and 5 of them were repetitive loss properties, bAR = 27 and bRL = 5.
- (4) To be credited toward bRL, the building may be located anywhere in the community, including outside the regulatory floodplain.
- (5) A community with no properties on the FEMA repetitive loss list is not eligible for this credit.

522.c. Severe Repetitive Loss properties (bSRL)

bSRL = the number of Severe Repetitive Loss properties that have been acquired, relocated, or otherwise removed from the flood problem site they occupied

bSRL credits those Severe Repetitive Loss properties that have been acquired, relocated, or otherwise removed from the site where they suffered flooding. A Severe Repetitive Loss building receives three times the credit of a non-repetitive loss property.

Severe Repetitive Loss properties are a subset of the community's repetitive loss properties. They are explained in Figure 500-1 in Section 501 and have a special identifier in the community's repetitive loss list. Because they have been particularly hard hit by repetitive flooding, they receive more credit under this element if they are acquired or relocated.

Credit Criteria for bSRL

- (1) Credited buildings must be designated as Severe Repetitive Loss properties on FEMA's updated repetitive loss list for the community (see Section 501).
- (2) The FEMA repetitive loss data base must be updated to reflect the mitigation project, as explained in Section 501.
- (3) Buildings counted toward one of the other elements are not counted toward bSRL. For example, if the community acquired and cleared 32 buildings from the SFHA and 3 of them were repetitive loss properties and 2 of them were Severe Repetitive Loss properties, bAR = 27, bRL = 3, and bSRL = 2.
- (4) To be credited toward bSRL, the building may be located anywhere in the community, including outside the regulatory floodplain.
- (5) A community with no Severe Repetitive Loss properties on the FEMA repetitive loss list is not eligible for this credit.

Example 522.a-1.

A check of building permit records since the community's initial FIRM date has shown that 36 buildings were acquired or relocated out of the SFHA. Three properties were acquired with funding support from FEMA's former Section 1362 buyout program and three with funds from the Pre-Disaster Mitigation Program. Eighteen homes in the regulatory floodplain were bought and cleared as part of a community flood mitigation project. Eight buildings were demolished to make way for a ballfield expansion. Three people have moved their homes to higher ground on their lots outside the regulatory floodplain and above the base flood elevation, and the community purchased easements to keep the flood-prone portions of the lots open. One elementary school was relocated outside the 500-year floodplain and the land was sold to the local park district.

Of the 35 homes, 15 are on the repetitive loss list. Three of the 15 were Severe Repetitive Loss properties. The community used a copy of the tax assessor's map to show the location of each of the 35 properties.

bAR = 20

bRL = 12

bSRL = 3

bCF = 1 (because the school is a critical facility)

The community supplied the necessary documentation to show that all 36 acquired properties qualify for OSP credit under Activity 420 (Open Space Preservation).

522.d. Critical facilities (bCF)

The credit for this element is based on the number of critical facilities acquired or relocated.

bCF = number of critical facilities that have been acquired, relocated, or otherwise cleared from the regulatory floodplain since the effective date of the FIRM

A critical facility building receives twice the credit of a bAR building.

Credit Criteria for bCF

- (1) For bCF credit, critical facilities must have been acquired or relocated, since the effective date of the FIRM. “Critical facilities” are defined in Section 120, Glossary.
- (2) The critical facility must have been located in either the regulatory floodplain or the 500-year floodplain mapped on the current FIRM or on a published preliminary FIRM, whichever shows the larger 500-year floodplain. Critical facility buildings must have been relocated outside the 500-year floodplain.

522.e. Buildings located in the V Zone or Coastal A Zone (bVZ)

The credit for this element is based on the number of buildings from the V Zone or coastal A Zones that have been acquired or relocated.

bVZ = number of buildings that have been acquired, relocated, or otherwise cleared from the V Zone, regulated coastal A Zones, or regulated land included within the Limit of Moderate Wave Action (LiMWA) since the effective date of the FIRM

These buildings receive 50% more credit than a building in an A Zone (bAR).

Credit Criteria for bVZ

- (1) For bVZ credit, buildings must have been acquired, relocated, or otherwise cleared from the V Zone as shown on the current FIRM or on a published preliminary FIRM if adopted by the community. bVZ can also include buildings cleared from the area designated as a coastal A Zone or LiMWA, provided the community is receiving credit for regulating that area under CAZ in Activity 430 (Higher Regulatory Standards).

(2) Acquired, relocated, or otherwise cleared buildings located in the V Zone or coastal A Zone are counted under bVZ, not under bAR.

523 Credit Calculation

There are two options for calculating the total value for this activity. The first, Option 1, is easier to use, but is limited to 190 points. Option 2 allows for higher credit, but it favors communities that have cleared more than a small percentage of the buildings in their SFHA. Option 1 produces more credit for large communities or for a community that has cleared a small percentage of properties within the regulatory floodplain.

A community may use whichever option provides the most credit. The maximum credit for c520 using Option 1 is 190 and using Option 2 is 2,250 (including the bonus credit).

523.a. Option 1

$$c520 = (bAR \times 3) + (bRL \times 6) + (bSRL \times 9) + (bCF \times 6) + (bVZ \times 4.5)$$

The maximum credit under Option 1 is 190 points.

Example 523.a-1.

Using the buildings in Example 522.a-1:

$$bAR = 20$$

$$bRL = 12$$

$$bSRL = 3$$

$$bCF = 1$$

$$bVZ = 0$$

The community has 2,000 buildings in the SFHA, so it uses Option 1.

$$\begin{aligned} c520 &= (bAR \times 3) + (bRL \times 6) + (bSRL \times 9) + (bCF \times 6) + (bVZ \times 4.50) \\ &= (20 \times 3) + (12 \times 6) + (3 \times 9) + (1 \times 6) + (0 \times 4.50) \\ &= 60 + 72 + 27 + 6 + 0 = 165 \end{aligned}$$

523.b. Option 2

The maximum credit under Option 2 is 2,250 points.

The credit calculation under Option 2 is based on the credit for all the buildings that have been acquired or relocated expressed as a percentage of all the buildings in the SFHA

(bSF). If the SFHA is cleared out, c520 = the maximum of 2,250 points. This is done in two steps:

Step 1 calculates the credit based on 1,900 points. Step 1 cannot exceed 1,900.

Step 2 adds bonus points based on how much of the SFHA has been cleared out. Step 2 only applies if more than 30% of the buildings in the SFHA have been removed.

$$\text{c520} = \text{the credit for Step 1} + \text{the credit for Step 2}$$

(1) Option 2, Step 1.

Step 1 =

$$\frac{1,900 \times (\text{bAR} + (\text{bRL} \times 2) + (\text{bSRL} \times 3) + (\text{bCF} \times 2) + (\text{bVZ} \times 1.5))}{\text{bSF} + \text{bAR} + \text{bRL} + \text{bSRL} + \text{bCF} + \text{bVZ}}$$

where bSF = the number of buildings in the SFHA

- (a) The value for bSF is the number of buildings CURRENTLY in the SFHA. bSF does not include buildings that have been removed from the SFHA (e.g., buildings that are counted in bAR, bRL, etc.). bSF does include buildings that have been constructed in or annexed into the SFHA since the projects were completed. Note that communities are required to calculate and keep track of bSF as part of their annual recertification (see Section 213.a).

There is a separate formula for calculating bSF in communities with a large number of post-FIRM buildings. It can be found in Section 302.b.

- (b) The denominator includes bSF PLUS all buildings that have been acquired or relocated (bAR, bRL, etc.). As more buildings are removed, the credit increases because numbers are added to bAR, bRL, etc. This means that the ratio gets larger, and so does the credit for 520.

However, communities should note that if development is allowed in the SFHA, even if it is in compliance with the NFIP requirements, credit for this activity may decrease over time as bSF in the denominator increases.

- (c) It should be noted that bAR buildings are in the regulatory floodplain while bSF buildings are only in the SFHA as shown on the FIRM. If a community maps and regulates non-SFHA flood problem areas, it can also count buildings acquired or relocated from those areas towards bAR. This will result in a higher credit.

Example 523.b-1.

This example uses the same numbers as the Option 1 example. The difference is that the total number of buildings currently in the SFHA is smaller, bSF = 400.

$$bAR = 20$$

$$bRL = 12$$

$$bSRL = 3$$

$$bCF = 1$$

$$bVZ = 0$$

$$\begin{aligned} c520 \text{ (Step 1)} &= 1,900 \times \frac{20 + (12 \times 2) + (3 \times 3) + (1 \times 2) + (0 \times 1.5)}{400 + 20 + 12 + 3 + 1 + 0} \\ &= 1,900 \times \frac{20 + 24 + 9 + 2 + 0}{436} \\ &= 1,900 \times \frac{55}{436} = 1,900 \times 0.13 = 247 \end{aligned}$$

Example 523.b-2.

After a severe hurricane, a coastal community cleared 160 damaged buildings from its regulatory floodplain. There are 75 buildings left in the SFHA.

bAR = 110; 10 of these were outside the SFHA, but within the regulatory floodplain

bRL = 15; all of these were in the SFHA

$$bSRL = 0$$

$$bCF = 0$$

$$bVZ = 35$$

$$bSF = 75$$

$$\begin{aligned} c520 \text{ (Step 1)} &= 1,900 \times \frac{110 + (15 \times 2) + (0 \times 3) + (0 \times 2) + (35 \times 1.50)}{75 + 110 + 15 + 0 + 0 + 35} \\ &= 1,900 \times \frac{110 + 30 + 0 + 0 + 52.50}{235} \\ &= 1,900 \times \frac{192.50}{235} = 1,900 \times 0.82 = 1,558 \end{aligned}$$

- (2) Option 2, Step 2 applies if the community has acquired or relocated more than 30% of the buildings in its current SFHA. Some of the buildings counted toward bAR, bRL,

bSRL, bCF, and bVZ may not have been in the SFHA. For example, some could be in the regulatory floodplain outside the SFHA, and repetitive loss buildings could be in the X Zone. Step 2 only considers buildings in the SFHA, so the community needs to count the number of buildings acquired or relocated out of the SFHA (bARSF). Each building is counted once. There is no extra credit for repetitive loss properties, critical facilities, or buildings in the V Zone.

$$\text{Step 2} = \frac{((\text{bARSF} \times 100) - 30) \times 5}{\text{bSF} + \text{bARSF}}, \text{ where}$$

$\text{bARSF} = \text{the number of buildings acquired or relocated out of the SFHA}$

Example 523.b-3.

Of 436 buildings in the SFHA, the community in Example 523.b-1 cleared 36 buildings. Since it cleared only 8% of its SFHA buildings, Step 2 = 0.

$$\text{c520} = \text{the credit for Step 1} + \text{the credit for Step 2} = 247 + 0 = 247$$

Example 523.b-4.

The coastal community that cleared 160 buildings counted those that had been in the SFHA:

100 of the 110 buildings that were counted toward bAR

All 15 of the buildings that were counted toward bRL

All 35 of the buildings in the V Zone

Therefore, 150 buildings were removed from the SFHA.

$$\text{bARSF} = 150$$

$$\text{bSF} = 75$$

$$\text{Step 2} = \frac{((\text{bARSF} \times 100) - 30) \times 5}{\text{bSF} + \text{bARSF}} = \frac{((150 \times 100) - 30) \times 5}{75 + 150}$$

$$= \frac{(15,000 - 30) \times 5}{225} = (66.67 - 30) \times 5 = 36.67 \times 5 = 183.35$$

$$\text{c520} = \text{the credit for Step 1} + \text{the credit for Step 2}$$

$$= 1,556.38 + 183.35 = 1,739.73 = 1,740$$

524 Documentation Provided by the Community

a. At each verification visit,

- (1) A map showing the location of parcels where buildings have been demolished or relocated since the effective date of the FIRM and the total number of such buildings (bAR, bRL, bSRL, bCF and bVZ).

The map must show the community's regulatory floodplain boundaries, which include the SFHA, any LiMWA regulated areas, and any additional floodplain subject to the community's regulations. The SFHA is as shown on the current FIRM or on a published preliminary FIRM, whichever shows the larger floodplain.

This map may be the same one used for documentation of open space credit under Section 424.d under Activity 420 (Open Space Preservation). It need only show the part of the community from which buildings have been cleared. It should show lot boundaries. The map will also be used by the ISO/CRS Specialist to check the sites during the verification visit.

- (2) Documentation that shows that each site credited under this activity can also qualify for credit in Activity 420. For properties in the regulatory floodplain, this may be done by applying for open space preservation (OSP) credit. For repetitive loss or Severe Repetitive Loss properties outside the regulatory floodplain, separate documentation is needed.
- (3) Calculations showing the total number of buildings in the SFHA (bSF). The variable bSF represents the number of buildings in the SFHA at the time of verification of this credit. It is discussed in detail in Section 302.
- (4) [For each parcel counted toward bAR or bCF that is located in the regulatory floodplain, but outside the SFHA] Documentation showing that floodplain regulations are in effect in the area.
- (5) [For each parcel that is credited toward bRL or bSRL] Documentation and a marked-up form AW-501 to update the repetitive loss data base, as explained in Section 501.
- (6) [For each parcel counted toward bCF] A description of the demolished or relocated critical facility to demonstrate that the facility meets the critical facility definition for CRS purposes. [For each parcel counted toward bCF that had the building relocated] Documentation that demonstrates that it has been relocated outside the 500-year floodplain.
- (7) Documentation of the implementation date for each project for which new credit is requested. A project is the building or group of buildings acquired or relocated within the same grant award, contract, or scope of work. A completed CC-520EHP, Certification of Compliance with Environmental and Historic Preservation Requirements for Acquisition and Relocation Projects, is needed for projects

implemented after the implementation date of the 2013 *Coordinator's Manual* (see Section 507) The certification form can be found in Appendix F.

- (8) Identification of which properties if any, were cleared with support from FEMA's Flood Mitigation Assistance (FMA) program.

525 For More Information

- a. Additional information, reference materials, checklists, and examples can be found at www.CRSresources.org/500.
- b. There are several possible sources of financial assistance for acquiring and relocating flood-prone properties, which are mentioned in Section 505.
- c. *Property Acquisition Handbook for Local Communities*, FEMA-317, 2007, is a "how-to" guide to help communities work through property acquisition. This handbook also contains a toolkit with tools and forms, including checklists, fact sheets, and briefing notes, to aid the process. It can be found at www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&id=1654.

526 Related Activities under the Community Rating System

- A first step to working with a property owner is to provide property protection advice that includes a discussion of alternatives and sources of financial assistance. This is credited under Activity 360 (Flood Protection Assistance).
- A prerequisite for Activity 520 credit is that the property that has been cleared must meet the OSP criteria for preserved open space under Activity 420 (Open Space Preservation). All such properties should receive OSP credit. If the properties were cleared with FEMA mitigation funds, they should also qualify for deed restriction (DR) credit.
- A floodplain management plan (FMP) or a repetitive loss area analysis (RLAA) credited under Activity 510 (Floodplain Management Planning) can identify projects for acquisition or relocation. The RLAA can identify properties that receive bonus credit in Activity 520.
- A multi-hazard mitigation plan credited under Activity 510 (Floodplain Management Planning) is a prerequisite for FEMA funding for creditable acquisition or relocation projects.

530 FLOOD PROTECTION—Summary

Maximum credit: 1,600 points

Of the 1,600 points, credit for sewer backup protection projects is limited to 200 points and flood control techniques are limited to 1,000 points.

532 Elements

- a. **Flood protection project technique used (TU_)**: Credit is provided for retrofitting techniques or flood control techniques.
 - **Retrofitting technique used**: Points are provided for the use of elevation (TUE), dry floodproofing (TUD), wet floodproofing (TUW), protection from sewer backup (TUS), and barriers (TUB)
 - **Structural flood control technique used**: Points are provided for the use of channel modifications (TUC), and storage facilities (TUF).
- b. **Flood protection improvement (FPI)**: Credit points are determined for the difference between the level of flood protection provided before and after the project.
- c. **Protected buildings (PB)**: The value of TU is multiplied by the value of FPI for each building and used in the credit calculation.

Credit Calculation

There are two options for calculating the total points. Option 1 is used if the number of buildings eligible for credit is a small percentage of the total number of buildings in the floodplain. The maximum credit for Option 1 is 160 points.

Option 2 is used if the number of buildings eligible for credit is a larger percentage of the total number of buildings in the floodplain. The maximum credit for Option 2 is 1,600 points.

Impact Adjustment

There is no impact adjustment for this activity.

Documentation Provided by the Community

The documentation needed for this activity is described in Section 534.

530 FLOOD PROTECTION

The OBJECTIVE of this activity is to protect buildings from flood damage by

- Retrofitting the buildings so that they suffer no or minimal damage when flooded, and/or
- Constructing small flood control projects that reduce the risk of flood waters' reaching the buildings.

531 Background

Acquisition and relocation of flood-prone buildings is the surest method of both reducing flood damage and keeping people out of harm's way. It is credited under Activity 520 (Acquisition and Relocation). However, existing buildings can be protected on site, especially from shallow, slow-moving flood waters, by implementing one or more flood protection techniques.

This activity provides credit for buildings located in the floodplain that have been protected from flood damage by being retrofitted or by the placement of certain types of flood control structures that protect building(s) to at least the 25-year flood level.

531.a. Activity Description

This credit is based on the number of insurable buildings in the regulatory floodplain that have been retrofitted since the date of the community's original Flood Insurance Rate Map (FIRM). For the purposes of this activity, an accessory structure such as a garage or shed is not counted as an insurable building. Extra credit is given for protecting buildings on Federal Emergency Management Agency's (FEMA's) repetitive loss list (see Section 501) and for protecting buildings that are critical facilities.

Flood protection techniques used (TU) that are recognized by this activity include retrofitting projects and structural flood control projects (see Figure 530-1). The credit points are based on the effectiveness of the technique in preventing flood damage. The most effective techniques are elevation and those measures designed by a registered design professional.

Retrofitting projects, such as

- Elevating buildings above predicted flood levels,
- Dry floodproofing,
- Wet floodproofing,
- Protecting basements from sewer backup, and
- Barriers (for individual structures only), including levees, berms, and floodwalls.

Structural flood control projects, such as

- Channel modifications, including enlarging bridges and culverts;
- Storm drain improvements, including enclosing open channels;
- Diversions and other structural projects; and
- Small reservoirs, including retention and detention basins.

Figure 530-1. Flood protection techniques credited under Activity 530.

531.b. Activity Credit Criteria

The following criteria must be met to receive credit for this activity.

- (1) All projects: Each flood protection project (retrofitting technique or structural flood control technique) must meet the following criteria:
 - (a) The protected building(s) must be an insurable building(s) (see Section 301);
 - (b) The project must have been completed after the effective date of the initial FIRM;
 - (c) The project must protect the building(s) from at least the 25-year flood;
 - (d) All required permits must have been issued for the project or the local permit officer must state in writing that the project complies with all federal, state, and local codes and regulations;
 - (e) For critical facilities, to receive the bonus credit the buildings must be protected to at least the 500-year flood level;
 - (f) If the project requires human intervention, there must be at least one hour of flood warning time plus the time it takes to install the measure. "Human intervention" means that a person is needed at the site to close an opening or install or operate a protection device before flood waters reach the building; and
 - (g) Credit is not provided for a retrofitted building or flood control project that is in disrepair or does not appear to be maintained.
- (2) Retrofitting projects: In addition to the criteria in Section 531.b(1), the design of retrofitting projects for buildings located in the following high hazard areas must be signed and sealed by a registered design professional:
 - (a) V Zones, coastal A Zones, and areas seaward of the Limit of Moderate Wave Action (LiMWA);
 - (b) Areas with velocities greater than 5 feet per second during the 100-year event; and
 - (c) Areas subject to any of the special flood-related hazards listed in Section 401.
- (3) Flood control projects: In addition to the criteria in Section 531.b(1), structural flood control projects must meet the following:
 - (a) The design and construction of the project must have been certified by a licensed professional engineer;
 - (b) The responsible agency must be implementing an operations and maintenance plan that was prepared for the project by a licensed professional engineer;
 - (c) If the flood control project lowers the base flood elevation shown on the FIRM, a request for a Letter of Map Revision (LOMR) must be submitted to FEMA, as required by the regulations of the National Flood Insurance Program (NFIP) at 44 CFR §65.3.
 - (d) The community must ensure that the impact of future development will not adversely affect the project's flood protection level. This can be done by either
 - (i) Enforcing watershed-wide regulations that prevent increases in stormwater runoff. This can be documented by receipt of credit for stormwater management

regulations under Activity 450 (Stormwater Management) (i.e., credit for SMR or WMP with an impact adjustment of 1.0 for the watershed upstream of the project). The design storm (DS) must be at least as large as the flood protection level for the project; or

(ii) Designing the project so that it will perform to its design protection level based on a watershed that is fully built out or developed in accord with an adopted long-range land use plan. The community must document that the protection level is still valid at each cycle verification; and

- (e) Additional documentation may be required for the review of flood control projects that are unique to a community or region.
- (4) Environmental compliance: Flood protection projects must adhere to applicable federal environmental and historic preservation laws and executive orders (see Section 507). CC-530EHP, Flood Protection, is a form on which the community certifies its compliance. The appropriate portions of the certification must be completed for all projects permitted or implemented after the effective date of the 2013 *CRS Coordinator's Manual* (April 1, 2013). CC-530EHP can be found in Appendix F or at www.CRSresources.org/500. Credit is not provided if the project was not in compliance with applicable federal laws and executive orders.

- (5) Projects not credited: The following projects are NOT credited under this activity:
 - (a) Projects that protect to less than the 25-year flood level;
 - (b) Projects that protect buildings outside of the regulatory floodplain (except repetitive loss buildings);
 - (c) Post-FIRM buildings. Credit is not provided for post-FIRM buildings because the NFIP already requires that they be protected. However, if a post-FIRM building was retrofitted to protect it from a flood hazard not covered by the FIRM or NFIP regulations, credit is provided under this activity. For example, a post-FIRM building may have been constructed to the base flood elevation shown on an old FIRM, but the current base flood elevation is higher because of a recent restudy. If the building is elevated again to protect to the new base flood elevation, then the community could receive Activity 530 credit. However, constructing a new building to meet the community's flood protection requirements is not retrofitting;
 - (d) Projects implemented due to a requirement of the NFIP, such as elevating a substantially damaged or substantially improved residential building. The following are examples of how this rule is applied:

Environmental Protection and Historic Preservation

Because it is a FEMA program, the CRS must ensure that activities for which it provides credit are compliant with applicable federal environmental and historic preservation laws and executive orders. Section 507 expands on this requirement and presents a summary of FEMA's policy. Figure 500-5 lists the federal programs that should be considered during project development.

- (i) Although elevating a building solely to meet the NFIP rules is not credited, credit is provided for bringing a noncompliant building into compliance if the project was implemented voluntarily or pursuant to a community action, such as providing financial assistance or declaring a dilapidated structure to be unsafe and uninhabitable.
 - (ii) Projects constructed to mitigate the adverse effect of not properly regulating new construction in accordance with a court order or an agreement with FEMA are not credited. Such an action would be considered one taken to meet the minimum requirements of the NFIP;
 - (e) If a building is removed but not replaced, and the parcel is preserved as open space, it can be counted toward credit under Activity 520 (Acquisition and Relocation). If a building is removed but not replaced, and the parcel is not preserved as open space, it can be counted toward TU1 because local codes will ensure that if anything is constructed, it will meet post-FIRM standards;
 - (f) Coastal structural projects, including seawalls, groins, and beach nourishment;
 - (g) Levees or floodwalls that protect more than one property. Levees are covered under Activity 620 (Levees);
 - (h) Dams that are not in compliance with the state's dam safety regulations; and
 - (i) Structural flood control projects owned AND operated by a federal agency. Credit is not provided for the major flood control works owned and operated by agencies such as the U.S. Army Corps of Engineers, Tennessee Valley Authority, and the Bureau of Reclamation. However, credit is provided for locally owned and operated projects that were partially funded by a federal agency.
- (6) Regulatory floodplain: Credit is provided for buildings in the Special Flood Hazard Area (SFHA) shown on the current FIRM or preliminary FIRM, whichever is larger.

If the community has prepared an Impact Adjustment Map in accordance with Section 403 that shows flood-prone areas subject to regulation outside of the SFHA, then buildings in that regulatory floodplain may be counted for this credit. The community must demonstrate that these areas are currently regulated to at least the minimum standards of the NFIP.

A building that lies outside the regulatory floodplain because of remapping, completion of a flood control structure, or other activity is not eligible for this credit. Such a building has already benefited twice: it does not have a mandatory NFIP insurance purchase requirement; and if the owner chooses to purchase NFIP insurance, the premium will be based on the lower X-Zone rate.

532 Elements

The credit for Activity 530 is based on the combination of flood protection techniques used and the level of flood protection provided. Points are calculated for each protected building. Bonus points are provided for the protection of repetitive loss buildings and critical facilities. Credit is based on the elements described below.

532.a. Flood protection project technique used (TU)

Credit is provided for each building that has been protected by a retrofitting technique or a flood control project technique. It is symbolized as TU or, when a specific technique is being discussed, as TU plus another letter, such as TUE. Each building protected by a project will have a TU value. The value of TU is based on the technique used for each building and varies based on factors such as whether the project was designed by a registered design professional. The credited techniques (and the acronyms used for them) are shown in the Table 530-1.

Table 530-1. Flood protection techniques used.	
Acronym (TU_)	Technique Used
TUE	Elevation
TUD	Dry floodproofing
TUW	Wet floodproofing
TUS	Sewer backup
TUB	Barrier, levee, or floodwall
TUC	Channel modification, storm sewer improvements, diversions
TUF	Storage facilities

The variation in the value for the technique used is based on the reliability of the project to prevent flood damage. For example, dry floodproofing is a less reliable retrofitting approach than elevation, so it is not worth as many points. Other methods and variations on these methods can be submitted for review to determine the credit points.

TU_#i = the type of technique used for building i

(1) Retrofitting technique used:

The value of the technique used is based on the retrofitting technique used. Credit criteria in Section 531.b must be met.

-
- (a) TUE: Technique used for elevated buildings:

TUE = 1.0, if the building is elevated

- (b) TUD: Technique used for buildings that are dry floodproofed (i.e., the walls and floor are made watertight so flood water does not enter the building):

TUD = 0.6, if the project was designed by a registered design professional and the design accounts for openings, internal drainage, seepage, and underdrainage

TUD = 0.4, if the project does not depend on human intervention to close openings; the project protects to a level less than 3 feet above the first floor; the design accounts for internal drainage, seepage, and underdrainage; and the building has no basement (i.e., any floor below grade on all sides)

TUD= 0.2, for all other cases, including those for which there is no documentation of how openings, interior drainage, seepage, or underdrainage are handled

- (c) TUW: Technique used for buildings that are wet floodproofed (i.e., flood water is allowed into the building, but measures are taken to minimize damage):

TUW = 0.5, if the project was designed by a registered design professional

TUW = 0.3, if the project was not designed by a registered design professional

TUW = 0.2, if the furnace, water heater, electrical breaker box, and other utilities are relocated above flood level

- (d) TUS: Technique used for buildings that are protected from sewer or sump backup:

TUS = 0.2, if the building is located in the SFHA

TUS = 0.1, for sewer backup prevention measures if the building is located outside of the SFHA and the community has a building code or other regulations that require positive drain sewers or other measures that prevent sewer backup into new buildings

A maximum of 200 points is provided under this activity for sewer backup prevention measures outside of the SFHA.

- (e) TUB: Technique used for buildings protected by a barrier, including a levee, berm, or floodwall:

The following conditions must be met.

- (i) The barrier must be located entirely on the property of the owner of the protected building(s).

This requirement ensures that those who are protected will maintain the levee or floodwall. When a barrier protects several neighbors but one of them neglects maintenance, all the properties are placed in jeopardy.

A barrier entirely on property owned by a condominium association would meet this requirement, but one on property owned by a homeowner's association that protects several privately owned homes would not.

- (ii) The barrier must either have no openings (e.g., access is gained by going over the wall), have openings that close without human intervention, or have a written plan and adequate warning time so that available personnel are able to close the openings.

TUB = 0.8, if the barrier was designed, and the construction approved by, a registered design professional, and the design accounts for interior drainage, seepage, and underdrainage

TUB = 0.4, if the barrier was not designed by a registered design professional, but the design accounts for interior drainage, seepage, and underdrainage

- (2) Structural flood control technique used (Maximum credit: 1,000 points):

The value of the technique used is based on the structural flood control technique. If more than one technique is used to protect a building, then TU = the lower of the techniques' values. Credit criteria in Section 531.b must be met.

- (a) TUC: Technique used for buildings protected by a channel modification project, including diversions, enlarging bridges and culverts, and storm drain improvements:
A registered design professional must design the project and certify that no buildings are located in areas that would be affected by any increases in flood elevations caused by the project.

TUC = 0.8, if the project design provides at least one foot of clearance between the flood protection level and bridge decks, top of pipe, and other obstructions

TUC = 0.7, for pump systems and all other cases

- (b) TUF: Technique used for buildings protected by a reservoir, detention basin, retention pond, or other flood water storage facility

TUF = 0.8, for all flood water storage facilities

If the flood water is stored behind a dam or other above-ground containment structure, then the community must document that the structure meets all state dam safety requirements. If the state does not have a dam safety program, then a registered design professional must certify that the structure meets the Corps of Engineers' dam safety criteria.

532.b. Flood protection improvement (FPI)

Flood protection improvement is a measure of the enhanced flood protection that a given project provides for a given building. It is symbolized as FPI#i.

Credit Calculation for FPI

For buildings on which any other flood protection measure was used, the credit is adjusted for the flood protection improvement provided to each building.

FPI#i = FPP#i – FPB#i, where

FPI#i = flood protection improvement for building i,

FPP = flood protection provided by the project, and

FPB = flood protection level before the project was constructed

The values for FPP and FPB are shown in Table 530-2.

Table 530-2. Values for FPP and FPB	
Flood Protection Level	FPP or FPB
Less than the 10-year flood	0.0
10-year flood, but less than the 25-year flood	0.3
25-year flood, but less than the 50-year flood	0.5
50-year flood, but less than the 100-year flood	0.7
100-year flood	0.8
100-year flood plus one foot of freeboard	0.9
100-year flood plus two or more feet of freeboard	1.0
500-year flood	1.0

The minimum value for FPP is 0.5. There is no credit for flood protection measures that protect to less than the 25-year flood level. For a repetitive loss property, it is assumed that the property was subject to flooding more frequent than every 10 years (less than the 10-year event), so FPB = 0. If the value of FPB cannot be determined (e.g., from Elevation Certificates or flood profiles), then it will be assumed that a 25-year flood protection level existed before the project (FPB = 0.5).

The flood protection level of a barrier is one foot below the top of the barrier.

If a basement is protected from sewer backup by an overhead sewer or backup valve, then FPP = 1.0.

Example 532.b-1.

- (a) A building on a crawlspace was elevated from the 10-year flood elevation to two feet above the 100-year flood elevation.

$$\text{FPP} = 1.0, \text{FPB} = 0$$

$$\text{FPI} = \text{FPP} - \text{FPB} = 1.0 - 0 = 1.0$$

- (b) A building has been protected by a 25-year berm (changing its protection level from 0 to the 25-year flood level).

$$\text{FPP} = 0.05, \text{FPB} = 0$$

$$\text{FPI} = \text{FPP} - \text{FPB} = 0.50 - 0 = 0.50$$

- (c) A channel improvement lowers the 100-year flood by two feet. The buildings are now protected from the 100-year flood. Before the project the buildings were subject to flooding during the 50-year flood. The community applied to FEMA for a LOMR. Because the LOMR will result in the removal of the buildings from the SFHA there is no credit under this activity for the project. The community receives a lower base flood elevation and a smaller SFHA as the benefit.

Buildings that were in the community's regulatory floodplain will be in the X Zone and benefit from X-Zone insurance premiums. Buildings that remain in the SFHA are credited for the flood protection provided (see (d), below).

- (d) Another building closer to the stream is affected by the same channel improvement. The two-foot drop in flood levels means that this building is now subject only to the 60-year flood instead of the 35-year flood. For that building,

$$FPP = 0.7, FPB = 0.5$$

$$FPI = FPP - FPB = 0.7 - 0.5 = 0.2$$

532.c. Protected buildings (PB)

A PB value is calculated for each protected building. It is the product of the TU value for each building multiplied by the FPI value for that building.

PBi = TU_ x FPI#i for each building protected using one or more of the techniques described in Section 531.a

PB = the sum of all PB#i

In the formula above, the letter "i" represents a given building. TU_#i is the credit for the flood protection technique used to protect building "i." The " " stands for the letter for the technique used in Section 532.a (TUE, for example). When the formulae are completed, TU_#1 and FPI#1 will be the credits for building number 1. For example, if building number 24 were elevated, its credits would be TUE#24 and FPI#24. Their product is PB#24. If there are 52 protected buildings to be credited, then PB = \sum PB#1 through PB#52 or the sum of the values for buildings #1 through #52.

The values for some protected buildings are modified by multipliers as follows.

- (1) Repetitive loss property multiplier: If a protected building in the regulatory floodplain is also on the FEMA repetitive loss list, it is counted twice toward PB. If a protected building outside of the regulatory floodplain is also on the FEMA repetitive loss list, it is counted once toward PB.

Section 501 explains the FEMA repetitive loss list. It is a list of properties that have received multiple flood insurance claims. Communities with one or more properties on the repetitive loss list must review and update the list at each verification visit (see Section 211).

- (2) Severe Repetitive Loss property multiplier: If a protected building is a Severe Repetitive Loss property and lies within the regulatory floodplain, it is counted three times toward PB. If a protected building lying outside the regulatory floodplain is also a Severe Repetitive Loss property, it is counted twice toward PB.

Multipliers (1) and (2) are provided only if the flood protection measure was sufficient to remove the property from the repetitive loss list. The repetitive loss data base must be updated to reflect the mitigation project, as explained in Section 501.

A community with no properties on the FEMA repetitive loss list is not eligible for these extra credits.

- (3) Critical facilities multiplier: If a protected building is a critical facility it will receive credit based on the level of protection provided. If the flood protection provided (FPP) is the 500-year flood level or higher, critical facilities buildings are counted twice toward PB (bonus credit). The critical facility must be located in either the regulatory floodplain or the 500-year floodplain on the current FIRM or published preliminary FIRM, whichever shows a larger 500-year floodplain. For CRS credit purposes, “critical facilities” are defined in Section 120 (Glossary).

- (4) Flood Mitigation Assistance grant multiplier: If a building was protected with funding support from FEMA’s Flood Mitigation Assistance program, then the credit is 0.25 times the value of PB. This is explained in Section 506.

A worksheet is available at www.CRSresources.org/500 to help track retrofitted properties and their multipliers.

Example 532.c-1.

A community has protected 29 buildings from varying levels of flooding. Twenty buildings are protected from the 50-year flood with a channel improvement, and eight buildings subject to flooding every 10 years have been elevated above the 100-year flood level.

The public works garage is on the edge of the SFHA, above the 10-year flood level, but subject to shallow flooding during a 100-year flood. The department constructed a barrier around it to protect it from the 500-year flood. All buildings and projects meet the credit criteria of Sections 531.b and 532 for the technique used.

Three of the elevated buildings are on FEMA's repetitive loss list and a fourth is a Severe Repetitive Loss property. The public works garage is considered a critical facility because it is needed during a flood fighting operation.

For the 20 buildings protected from the 50-year flood by the channel improvement,

$$\text{TUC}\#1-\#20 = 0.80; \text{ FPP}\#1-\#20 = 0.70; \text{ FPB}\#1-\#20 = 0$$

$$\text{FPI}\#1-\#20 = \text{FPP}\#1-\#20 - \text{FPB}\#1-\#20 = 0.70 - 0 = 0.70$$

$$\text{PB}\#1-\#20 = \text{TUC}\#1-\#20 \times \text{FPI}\#1-\#20 = 0.80 \times 0.70 = 0.56$$

$$\sum \text{PB for 20 buildings} = \sum \text{PB}\#1-\#20 = 20 \times 0.56 = 11.20$$

Eight buildings are elevated to the 100-year flood level. Since there are three repetitive loss and one Severe Repetitive Loss buildings, they are counted as $8 + 3 + 2 = 13$ buildings, and numbered as buildings #21 through #33.

$$\text{TUE}\#21-\#33 = 1.00, \text{ FPP}\#21-\#33 = 0.80, \text{ FPB}\#21-\#33 = 0,$$

$$\text{FPI}\#21-\#33 = \text{FPP}\#21-\#33 - \text{FPB}\#21-\#33 = 0.80 - 0 = 0.80$$

$$\text{PB}\#21-\#33 = \text{TUE}\#21-\#33 \times \text{FPI}\#21-\#33 = 1.0 \times 0.80 = 0.80$$

$$\sum \text{PB for 13 buildings} = \sum \text{PB}\#21 \text{ through PB}\#33 = 13 \times 0.80 = 10.40$$

The public works garage is protected by a 500-year barrier. Because it is a critical facility, it is counted as two buildings, numbered 34 and 35.

$$\text{TUB}\#34-\#35 = 0.80, \text{ FPP}\#34-\#35 = 1.00, \text{ FPB}\#34-\#35 = 0.30,$$

$$\text{FPI}\#34-\#35 = \text{FPP}\#34-\#35 - \text{FPB}\#34-\#35 = 1.0 - 0.30 = 0.70$$

$$\text{PB}\#34-\#35 = \text{TUB}\#34-\#35 \times \text{FPI}\#34-\#35 = 0.80 \times 0.70 = 0.56$$

$$\sum \text{PB}\#34 \text{ through PB}\#35 = 2 \times 0.56 = 1.12$$

$$\text{PB} = \sum \text{PB}\#1-\#35 = 11.20 + 10.40 + 1.12 = 22.72$$

533 Credit Calculation

There are two options for calculating the total credit for this activity. Option 1 is simplest but is limited to 160 points. It produces more credit in communities that have protected a small percentage of the buildings in their SFHAs. As long as a project meets the credit criteria, and the lowest-floor elevations of buildings protected before the project (flood protection level before the project (FPB)) were below the community's current effective base flood elevation, then Option 1 can be used.

Option 2 allows for higher credit in communities that have protected a large percentage of the buildings in their SFHAs. Option 2 must be used for projects in which the lowest-floor elevations of buildings protected before the project (flood protection level before the project (FPB)) were at or above the community's current effective base flood elevation.

A checklist is available at www.CRSresources.org/500 that can help when there are multipliers that increase the credit for certain buildings and with the impact adjustment calculations.

A community may use whichever option provides the larger credit, provided that the flood protection level before the project (FPB) is below the community's current effective base flood elevation. The maximum credit for Activity 530 using Option 1 is 160 and using Option 2 is 1,600.

533.a. Option 1

$$c530 = 2.4 \times (\text{the number of buildings that qualify for Activity 530 credit} \times \text{the TU}_\text{U} \text{ for the flood protection implemented for those buildings (Section 542.a)})$$

The maximum credit under Option 1 is 160 points.

Example 533.a-1.

Using the same community as in Example 532.c-1, 29 buildings have been protected from varying levels of flooding. Twenty-eight buildings were elevated above the base flood elevation and to the freeboard elevation required by the community. Three of the elevated buildings are on FEMA's repetitive loss list and a fourth is a Severe Repetitive Loss property. The public works garage was wet floodproofed and is considered a critical facility because it is needed during a flood fighting operation.

Although 28 buildings were elevated, the three repetitive loss buildings are counted twice and the Severe Repetitive Loss building is counted

three times. The other 24 elevated buildings are counted once. This total gives the number of buildings that qualify for Activity 530 credit.

$$24 + (3 \times 2) + (1 \times 3) = 33 \text{ buildings that qualify for 530 credit}$$

The public works garage is counted twice (because it was protected to the 500-year flood level).

$$c530 = (2.40 \times 33 \times \text{TUE}) + (2.40 \times 2.00 \times \text{TUE})$$

$$c530 = (2.40 \times 33 \times 1.0) + (2.40 \times 2.00 \times 0.50) = 79.20 + 2.40 = 81.60$$

$$c530 = 82$$

533.b. Option 2

The credit calculation under Option 2 is based on the credit for all the buildings that have been protected as a percentage of all the buildings in the SFHA (bSF).

$$c530 = 16 \times \frac{\text{PB} \times 100}{\text{bSF}}, \text{ where}$$

PB is the sum of all PB_i, and

bSF = the number of buildings in the SFHA

- (1) The value for bSF is the number of buildings currently in the SFHA. bSF includes buildings that have been constructed in or annexed into the SFHA since the projects were completed. Note that communities are required to calculate and keep track of bSF as part of their annual recertification. Note also that if development is allowed in the SFHA, even if it is in compliance with the NFIP requirements, credit for this activity may decrease over time as bSF in the denominator increases.

There is a separate formula for calculating bSF in communities with a large number of post-FIRM buildings. It can be found in Section 303.

- (2) The maximum credit for Option 2 is 1,600.

Example 533.b-1.

Using the same 29 buildings in Example 532.c-1, in a community with a relatively small number of buildings in the SFHA, 125.

$$PB = 22.72, \ bSF = 125$$

$$c530 = 16 \times \frac{PB \times 100}{bSF}$$

$$= 16 \times \frac{22.72 \times 100}{125} = 16 \times \frac{2,272}{125} = 16 \times 18.18 = 290.82$$

534 Documentation Provided by the Community

- (1) At each verification visit,
 - (a) [For elevation projects] Copies of the Elevation Certificate for each elevated building.
 - (b) [For retrofitting projects other than elevation] A list of all buildings for which credit is requested and a signed Community Certification for Retrofitted Buildings (CC-530).
 - (c) [For structural flood control projects]
 - (i) The level of flood protection for each building to be credited, both before and after the project was installed or constructed.
 - (ii) [For buildings protected by a reservoir, detention basin, retention pond, or other facility that stores water above ground] A letter from the state dam safety office stating that the structure meets all state dam safety requirements. If there is no state dam safety office, then a registered design professional must certify that the project meets all appropriate dam safety criteria.
 - (d) A map showing the location of all protected buildings for which credit is being requested. This map is not necessarily the same as the Impact Adjustment Map prepared pursuant to Section 403. It need only show the part of the community in which buildings have been protected. The map for this activity does not need to show lot boundaries, unless the same map is used for Activity 520 (Acquisition and Relocation).
 - (e) Documentation of the implementation date for each project for which new credit is requested. A project is the building or group of buildings acquired or relocated within the same grant award, contract, or scope of work. A completed CC-530EHP, Certification of Compliance with Environmental and Historic Preservation for Flood Protection Projects, is needed for projects implemented after the implementation date of the 2013 *Coordinator's Manual* (see Section 507). The form can be found in Appendix F or at www.CRSresources.org/200.

- (f) [If the community is using Option 2 under Section 532.b] Calculations showing the total number of buildings in the SFHA (bSF).

NOTE: The variable bSF must have the same value as bSF in Activities 510, 520, and 610.

- (g) [For credit for protecting non-repetitive loss buildings located outside the SFHA] Documentation that shows that floodplain regulations are in effect in the area outside the SFHA.
- (h) [If the flood control project revised the base flood elevation] A copy of the request for a CLOMR submitted to FEMA.

535 For More Information

- a. Additional information, reference materials, checklists, and examples can be found at www.CRSresources.org/500.
- b. FEMA and the Corps of Engineers have many references on elevating and retrofitting buildings. FEMA's references can be found at www.fema.gov/building-science/building-science-publications-flood/wind. For a list of the Corps documents, go to www.usace.army.mil/Missions/CivilWorks/ProjectPlanning/nfpc.aspx then scroll down to "NFPC Publications."
- c. Several states have published their own floodproofing or retrofitting manuals and some have programs to help fund or otherwise assist property owners. State NFIP Coordinators are listed at www.floods.org/index.asp?menuID=274.
- d. The Emergency Management Institute (EMI) is a FEMA training center located in Emmitsburg, Maryland. It offers a four-day course on retrofitting techniques oriented to engineers and experienced building professionals as well as courses on FEMA financial assistance programs, including application procedures and benefit/cost analyses. Stipends to cover travel, registration, and rooms are usually available from FEMA for federal, state, and local officials. EMI also offers field-deployed and independent study versions of many of its subjects, which are also free. For more information, see the EMI website at <https://training.fema.gov/emi.aspx>.

536 Related Activities under the Community Rating System

- A first step to working with a property owner is to provide property protection advice that includes a discussion of alternatives and sources of financial assistance. This is credited under Activity 360 (Flood Protection Assistance).
- Flood control projects that change the base flood elevation may result in revisions to the community's FIRM. Such revisions may or may not receive credit under Activity 410 (Flood Hazard Mapping). Activity 410 lists criteria for credit due to changes in the base flood elevation.
- A floodplain management plan (FMP) or a repetitive loss area analysis (RLAA) credited under Activity 510 (Floodplain Management Planning) can identify projects for flood protection. The RLAA can identify properties that receive bonus credit under Activity 530.
- A multi-hazard mitigation plan credited under Activity 510 (Floodplain Management Planning) is a prerequisite for FEMA funding for creditable retrofitting projects.

540 DRAINAGE SYSTEM MAINTENANCE—Summary

Maximum credit: 470 points

542 Elements

- a. **Channel debris removal (CDR)**: Up to 200 points for inspecting natural channels on public and private property and removing debris as appropriate.
- b. **Problem site maintenance (PSM)**: Up to 50 points for paying special attention to known problem flooding sites, such as those needing more frequent inspections.
- c. **Capital improvement program (CIP)**: Up to 70 points for having a capital improvement program that corrects drainage problems.
- d. **Stream dumping regulations (SDR)**: Up to 30 points if the community has and publicizes regulations prohibiting dumping in streams, canals, and ditches.
- e. **Storage basin maintenance (SBM)**: Up to 120 points for annually inspecting public and private storage basins and performing the required maintenance.

Credit Criteria

Credit criteria for this activity are described in Section 541.b. They include drainage system inspections and maintenance requirements, no reliance on unsecured outside funding for maintenance, and compliance with federal and state laws and executive orders for environmental and historic preservation.

Each element has additional criteria specific to that element.

Impact Adjustment

The credit for CDR is adjusted based on the percentage of the community's natural drainage system that is inspected annually and properly maintained. There is no impact adjustment for PSM or SDR. The credit for SBM is adjusted based on the percentage of all the public and private storage basins within the community that are inspected and maintained.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

540 DRAINAGE SYSTEM MAINTENANCE

The OBJECTIVE of this activity is to ensure that the community keeps its streams, channels, and storage basins clear of debris so that their flood carrying and storage capacity are maintained.

541 Background

A community's drainage system consists of natural watercourses or channels; constructed storm drains, canals, and ditches; and detention/retention basins built to store high flows. In most cases, the actual channel of a natural stream will carry only the two-year flood, with larger flows being carried in the overbank area. Constructed channels are typically designed to carry larger floods than natural channels do, and communities usually have an active maintenance program for their constructed facilities. When a channel loses a portion of its conveyance capacity, overbank flooding occurs more frequently and flows reach higher elevations, potentially damaging nearby structures or causing increased channel erosion.

Even where floodplain regulations prevent construction from encroaching, streams can lose their carrying capacities as a result of the accumulation of debris, sedimentation, and the growth of unwanted vegetation. Detention and retention basins can lose their ability to store water if upstream sediment controls do not function properly or if there are highly erosive lands upstream.

One proven approach to preventing this reduction of capacity is a community program that routinely inspects and clears debris from the channels and basins. This work can be as simple as cleaning out culverts and removing trash, shopping carts, and similar debris that can dam a stream and cause flooding, even during small storms.

541.a. Activity Description

The maximum credit for Activity 540 is 570 points.

Credit is provided for keeping the channel and storage basin (detention or retention) portion of a community's drainage system clear of debris in order to maintain its flood-carrying and storage capacity during floods, and to protect water quality.

A community can receive credit for five drainage system maintenance activities:

- Inspecting and maintaining natural channels (CDR),
- Paying attention to problem sites (PSM),
- Having a capital improvements program that benefits the drainage system (CIP),

Activity 540

If a community can answer "yes" to the following questions, it should be able to receive credit for this activity.

- Does the drainage maintenance program have written procedures and written records?
- Is there an annual inspection for at least some of the channel system?
- Are inspections also conducted after major storms and in response to citizens' complaints?
- Are debris and other obstructions to flow or storage removed when they are found?

- Implementing and publicizing “no dumping” regulations (SDR), and
- Inspecting and maintaining storage basins (SBM).

The drainage system—A drainage system consists of all natural and manmade watercourses, conduits, and storage basins that collect rainfall and convey flood flows. It includes both open systems and those that are underground.

The natural conveyance system—For purposes of this activity, the natural conveyance system includes the channels that need to be maintained in order to prevent damage to buildings, roads, and other infrastructure from small, frequent storms.

The defined conveyance system varies in each community. In some communities, it may be vital to maintain the channels, bridges, and culverts in order to avoid flooding. For other communities, streams that have been converted into large roadside ditches are significant conveyors of surface water and must be kept clean

This activity is concerned primarily with the parts of the natural conveyance system that lie within the developed areas of the community. However, streams in undeveloped areas of the community also need to be included if there is a culvert or bridge crossing that is a critical access route or if there are insurable buildings that could be affected if the stream is not able to convey flows.

The areas or locations of flood insurance claims and disaster assistance should be considered when determining the extent of the conveyance system that deserves regular maintenance. In communities with repetitive losses (Category B and C communities as noted in Section 502), the drainage system **MUST** cover those areas having repetitive loss properties if the cause of the losses was local drainage problems or small, frequent storms. In general, all channels with a drainage area of 40 acres or more should be included in the conveyance system and on the map (see below).

Storage basins—For the purposes of this activity, storage basins include all constructed stormwater runoff detention or retention facilities located on public and private property. These include onsite detention or retention as well as infiltration facilities that are required for new development. The community must include all facilities constructed pursuant to stormwater management regulations credited as SMR under Activity 450 (Stormwater Management) and all publicly owned facilities. These do not include facilities constructed solely to manage water quality.

NFIP Requirement

The NFIP requires communities to “assure [that] the carrying capacity within the altered or relocated portion of any watercourse is maintained” (44 CFR §60.3(b)(7)).

This maintenance provision applies to any watercourse altered or relocated after the date of adoption of the community’s floodplain management ordinance. Any natural growth or manmade debris that reduces the carrying capacity of these artificial channels may be a violation of that ordinance.

In addition, these areas may be remapped by the Federal Emergency Management Agency (FEMA) to reflect the current carrying capacity and potential increased risk to existing development.

Maps and inventories—For this activity, a map of the community’s conveyance system is required for CDR credit and a map of all storage basins within the community is required for SBM credit. Depending on the scale of the map, the map of the conveyance system and the map of the storage basins may be combined if the community is requesting both CDR and SBM credit.

The conveyance system map must show each item (stream segment, bridge, culvert, channel, etc.) that is listed in the community’s inventory. An inventory of the entire natural conveyance system, including areas the community does not inspect or maintain, is needed to document the annual inspections. Similarly, an inventory of all storage basins, public and private, is needed for SBM credit.

541.b. Activity Credit Criteria

- (1) Drainage system inspections—Credit for this activity is dependent upon annual inspection of the natural conveyance system and/or storage basins, and proper documentation of those inspections. The community (or other non-federal agency) must have a program to inspect its drainage facilities annually, upon receiving a complaint, and after each major storm. If all parts of the natural system cannot be inspected annually (for example, because there is no legal access to those parts of the streams that lie on private property or for budgetary reasons), then credit will be adjusted by the impact adjustment. Written records of inspections correlated to specific parts of the inventory are required for CRS credit.
- (2) Inspection and maintenance—The inspection and maintenance of the streams and storage basins can be provided by the community, another non-federal agency, or private property owners. Many communities are in flood control or drainage districts that perform this work. Whether the inspections and maintenance are performed by the community; a county, regional or state agency; or a private property owner, the Community Rating System (CRS) community is responsible for providing all the documentation needed to verify credit. An inventory and map of the system as well as written procedures and inspection records are required for CRS credit.
- (3) No credit is provided for projects that rely on unsecured outside funding, such as a special appropriation from the state legislature or approval of a U.S. Army Corps of Engineers clearing-and-snagging project. Secure outside funding, such as an annual state distribution of gasoline tax receipts, is acceptable.
- (4) Environmental compliance—The community’s program for drainage system maintenance must be compliant with applicable federal environmental and historic preservation laws and executive orders (see Section 507). The community and other local, regional, and state agencies responsible for portions of the drainage system must complete a CC-540EHP, Certification of Compliance with Environmental and Historic Preservation Requirements for Drainage System Maintenance. This form can be

found in Appendix F and at www.CRSresources.org/200. Credit is not provided if local drainage system maintenance procedures are not compliant with applicable federal laws and executive orders.

- (5) There may be special restrictions or requirements to obtain a federal or state permit before certain maintenance work can proceed. Often, a “general” or “statewide” permit or other permission can be granted in advance for projects that are specifically described in the permit. Such laws and regulations usually do not preclude all maintenance work, but they may place restrictions on activities that disturb natural or protected areas. These restrictions must be included in the community’s procedures.

Environmental Protection and Historic Preservation

The CRS is a FEMA program and therefore must ensure that activities credited by the CRS are compliant with applicable federal environmental and historic preservation laws and executive orders. Section 507 expands on this requirement and presents a summary of FEMA’s policy. Figure 500-5 lists the federal programs that should be considered during project development.

542 Elements

542.a. Channel debris removal (CDR)

The maximum credit for this element is 200 points.

Credit for this element is dependent upon annual inspection and regular maintenance of the natural channels within the community. There is no credit in this element for the inspection or maintenance of catch basins, canals, ditches, pipes, roadways, road drainage, or similar infrastructure. The community (or other non-federal agency) must have a program to inspect its natural channels annually, upon receiving a complaint, and after each major storm, and the community must record such inspections. The community (or other non-federal agency) must remove debris as needed after each inspection in accordance with a written maintenance plan. Neither the cost of the work nor the amount of debris removed affects the credit. While responding to complaints and performing inspections after storm events are required to obtain credit, a program that only responds to complaints or inspects after storms is not eligible for this credit.

To receive full credit for this activity, the community must document that it annually inspects, and maintains as required, all public and private channels in the developed portion of the community, not just natural channels in the floodplain. The impact adjustment determines the final credit, based on the percentage of the conveyance system that is covered by the inspection and maintenance program and proper documentation of the annual inspections. Note that CDR credit is provided for the natural channels that are inspected every year, and not for programs that inspect a portion of the system in one year and another portion in another year.

The maintenance work is normally done by a public works crew, frequently without heavy equipment. The objective of this activity is to remove accumulated debris, yard waste, trash, shopping carts, and the like that obstruct flows that can cause flooding to adjacent

properties. It is important that the community's procedures spell out what can and cannot be removed. In areas with natural streams, for example, a certain amount of woody debris may remain in the channel area without causing a flooding problem. Concrete-lined ditches, by contrast, may need to have all debris removed in order to maintain their carrying capacity.

Credit Criteria for CDR

- (1) The activity credit criteria in Section 541.b must be met.
- (2) The community (or other non-federal agency) must have a program to inspect and maintain its natural channels, and inspections must be conducted
 - (a) At least once each year for each portion of the system credited,
 - (b) Upon receiving a complaint, and
 - (c) After each major storm.Inspections must be recorded and action must be taken after an inspection identifies a need for maintenance or cleaning.
- (3) Procedures for annual inspection and maintenance for natural channels must be in the form of written procedures or guidelines. These are explained in Inspection and Maintenance Procedures for the Conveyance System, below.
- (4) The community must provide a map of the conveyance system with each item in the inventory of the drainage system labeled.
- (5) The community must provide a complete inventory of its natural conveyance system.
- (6) All the inspection and maintenance activities must be recorded and the records must be maintained until the next verification visit. All inspection records must be correlated with the inventory and must designate which section of the system was inspected, when it was inspected, and what the results of the inspection were, even when no work is required.

Inspection and Maintenance Procedures for the Conveyance System

The community must provide written procedures, instructions, or other documents that explain the community's inspection and maintenance program. The document(s) need not exceed several pages. In some cases, the description will be in various documents, such as a field procedures manual, memorandum of agreement with another agency, contract for ongoing maintenance work, drainage system map, or forms used for records.

The following must be included in the document(s):

- (1) Designation of the person, entity, or position responsible for the program. This may be an agency other than the community's public works department, such as a drainage district, the state highway department (responsible for highway bridges and culverts), or even a private property owner.
- (2) An explanation of the procedures for inspection, including when regular inspections are conducted, how soon inspections are conducted after a complaint or a storm, and whether the procedures are different for manmade and natural channels.

- (3) The debris removal procedures, i.e., how soon after an inspection an area must be cleared, and what can and cannot be removed. These procedures may be different for different streams. For example, they may call for the public works department to remove downed trees and underbrush from channels near homes, but to leave them in parks or natural areas. Simply stating that “problems are corrected” or “debris is removed” is not an adequate description of what actions are to be taken for the different types of materials that may be found.
- (4) A description of the records that are kept to document both the inspections and the removal projects. These records must show which portions of the conveyance system were inspected and whether maintenance was required and performed (as needed). Records showing that “staff worked for eight hours each week last year inspecting channels,” for example, are not adequate if there is no record of which channels were inspected or whether any problems were found.

Even if an entity other than the community performs the inspection and/or debris removal, it is the community’s responsibility to document the activity for credit. In the case of a drainage district or county-wide maintenance program, the community may find it advantageous to work with other affected communities and with the larger agency to develop consistent documentation that can be used by all communities.

Map and Inventory of the Natural Conveyance System

The community must provide a detailed map of the developed areas of the community and the natural channels in those areas and an inventory of the system. The map and inventory should include a description of which portions of the natural drainage system are in the community’s inspection and maintenance program, in another agency’s program or privately inspected, and qualify for credit. The five-step process described below can be used to develop the map and the inventory for CDR credit. A sixth step is provided for problem site maintenance credit (PSM) and a similar process is followed for storage basin maintenance (SBM).

Step 1. Identify the developed area of the community. Select a map of the community and identify the developed areas. Undeveloped or sparsely developed areas (e.g., those with minimum lot sizes of five acres or more), or areas in which no buildings would be affected by a lack of maintenance (e.g., steep ravines), may be excluded. However, undeveloped or sparsely developed areas with insurable buildings or critical facilities that could be affected by a lack of maintenance must be included.

Step 2. Map the natural conveyance system. Within the developed area of the community identified in Step 1, delineate all the rivers, streams, and other natural channels on the map. Note:

- (a) Both public and private areas must be included in the delineation, regardless of the community’s authority to inspect those areas.
- (b) The delineation must include all channels in developed Special Flood Hazard Areas (SFHAs) shown on the community’s Flood Insurance Rate Map (FIRM).

- (c) All natural channels shown as blue lines on a U.S. Geological Survey quadrangle and draining more than 40 contributing acres must be shown.
- (d) Although credit is provided only for maintenance of the natural conveyance system, the entire system that drains 40 acres or more must be shown on the map.
- (e) Large underground segments of the surface conveyance system need to be shown on the conveyance system map if they convey flow from a natural channel.

Step 3. Label the segments, portions, or components of the natural conveyance system.

On the map, identify and label the segments of the natural conveyance system within the drainage maintenance area. There are no requirements for how the components, segments, or portions of the system are labeled except that they must correspond to the inventory prepared in Step 4 (below).

When labeling the components or portions of the conveyance system, the community should consider the owner (e.g., the community, the state, or private owner) or whoever inspects and maintains the segment of the system. Inventory labels may be as simple as numbers or numbers with prefixes to identify the stream or channel name. Communities may choose to label their inventory with an identifier for a channel segment (“CH001”) or a bridge crossing (“BR001”).

Step 4. Develop an inventory of the system. Develop an inventory or list of all components, portions, or segments of the natural conveyance system. Each listed channel segment or item in the inventory should correspond to the labels on the conveyance system map. The community may determine the format for the inventory that best fits its needs. However, the inventory should include a column to indicate whether the portion of the system is included in the community’s inspection and maintenance program. A column for the most recent inspection date is recommended. Figure 540-1 shows a sample inventory table. In this example channels, bridges, and culverts are shown separately. A community may, instead, provide an inventory of only channel segments if that is how they are designated in the community’s record keeping system.

All natural portions of the conveyance system within the community’s developed area must be listed in the inventory. The inventory is used for determining the community’s impact adjustment for this activity.

Step 5. Show the portions of the natural conveyance system that are included in the community’s annual inspection and maintenance program. The natural conveyance components included in the community’s annual inspection and maintenance program must be highlighted on the conveyance system map or marked in some other method, and they must be noted on the inventory (Figure 540-2).

Component	Type	Description	Owned By	Included in Inspection/Maintenance Program	
CH0001	Channel	Between 1st Street and Central	City		
CU0001	Culvert	Jones Creek at Central	City		
CH0002	Channel	Between Central and Main	City		
BR0001	Bridge	Jones Creek at Main	County		
CH0003	Channel	Between Main and Grand Avenue	Private		
CU0002	Culvert	Jones Creek at Grand Avenue	City		

Figure 540-1. Step 4 of a sample inventory of a conveyance system.

The community may also note the portions of the system that are not part of their program for various reasons. For example, there may be no right of access on private property or there may be areas that the community does not cover for budgetary or other reasons.

Step 6. Show the problem site maintenance locations on the map and list locations in the inventory. If the community is requesting credit for problem site maintenance (PSM) (see Section 542.b), the list should identify the problem sites, as shown in Figure 540-2, and any problem sites not included in the inventory of the natural drainage system.

Identifier (nCDC)	Type	Description	Owned By	Included in Program (Credited) (nCDR)	Problem Site?
CH0001	Channel	Between 1st St. and Central	City	Yes	
CU0001	Culvert	Jones Creek at Central	City	Yes	Yes
CH0002	Channel	Between Central and Main	City	Yes	
BR001	Bridge	Jones Creek at Main	County	Yes	Yes
CH003	Channel	Between Main and Grand Avenue	Private	No	
CU001	Culvert	Jones Creek at Grand Avenue	City	Yes	

Figure 540-2. Step 5 of a sample inventory of a conveyance system.

Credit Points for CDR

CDR = 200 points, for channel debris removal within the community's natural drainage system in accordance with the credit criteria

The action taken must be in accord with the community's inspection and maintenance procedures, which must be consistent with federal and state environmental protection laws and regulations.

Impact Adjustment for CDR

$$rCDR = \frac{nCDR}{nCDC}, \text{ where}$$

nCDR = EITHER the number of items in the inventory that are inspected and maintained, OR the length of the system that is inspected annually (every year) and maintained, and

nCDC = EITHER the total number of items in the developed portion of the community's drainage system, OR the total length of the system

Items can be components or segments. If rCDR is less than 0.10, then 0.10 is used.

If the community, other agency, or private inspection program does not include all of the natural conveyance system in all developed areas of the community, then the impact adjustment measurements (nCDR) must exclude those areas (components, segments, or portions). The most common reason for not maintaining portions of the system in a developed area is that the streams or channels lie on private property.

Note that the CRS is not intended to encourage communities to look at flood protection in isolation from other equally important local concerns, such as habitat preservation. However, if a stream or channel is not maintained in compliance with the community's procedures for any reason, and damage to buildings could result, the lack of drainage system maintenance must be reflected in the impact adjustment.

Example 542.a-2.

A public works department for a community in Georgia inspects all of the publicly owned channels, bridges, and culverts within the city, but not the streams on private property. City crews remove critical accumulations of debris that are found during the annual inspection and when problems are reported by neighboring residents. The crews record the inspections and the removals on forms maintained in the public works department. This work is done every winter. From the

community's conveyance system map and inventory, the community has identified a total of 125 conveyance system segments within the city, and 80 of those segments are inspected and maintained by the community.

$$\text{rCDR} = \frac{\text{nCDR}}{\text{nCDC}} = \frac{80}{125} = 0.64$$

Documentation for CDR Provided by the Community

(1) At each verification visit,

- (a) A dated copy of the written procedures, instructions, or other documents that explain the community's routine inspection and debris removal program.
- (b) The map of the community's drainage maintenance area with the natural conveyance system delineated and labeled.
- (c) A complete inventory of the community's conveyance system, corresponding to the map.
- (d) Copies of the records that show when and where inspections were conducted and the results of those inspections. Copies of records that show that maintenance was performed in instances in which inspections revealed problems.
- (e) Completed Certifications of Compliance with Environmental and Historic Preservation Requirements for Drainage System Maintenance (CC-540EHP) from the community and any other relevant local, regional, or state agencies, which can be found in Appendix F.

The ISO/CRS Specialist may visit a sample of sites in the field to verify that maintenance has been performed in accordance with the procedures.

(2) With the annual recertification,

- (a) Examples of the records that show that inspections were conducted during the year and maintenance was performed when the inspections revealed problems.

542.b. Problem site maintenance (PSM)

The maximum credit for this element is 50 points.

PSM credit is provided if the community's drainage system maintenance program identifies locations within its conveyance system, natural or constructed, that are "choke points," chronic dumping sites, obstructions to flows, or sites with erosion or sedimentation problems, that are inspected and maintained differently or more frequently than other parts of the system. Such inspections are in addition to those credited under CDR. Communities with no natural drainage system can receive this credit if portions of their constructed conveyance system are chronic problem maintenance sites that need and receive attention more often than annually.

Credit Criteria for PSM

- (1) The activity credit criteria in Section 541.b. must be met.
- (2) The community must have written procedures or guidelines that identify each problem site, what the issues are, and what special inspection and/or maintenance is needed at each site. These are explained in “Maintenance Procedures for Problem Sites,” below.
- (3) The problem sites must be identified on the community conveyance system map developed for CDR credit, or a map of the constructed system if the community is not eligible for CDR credit.
- (4) The community’s problem site maintenance program must require that
 - (a) An inspection be conducted more than once each year,
 - (b) An inspection of each problem site be conducted after each major storm, and
 - (c) Action must be taken after an inspection identifies a need for maintenance or cleaning.

Maintenance Procedures for Problem Sites

The written procedures or guidelines for problem site maintenance may be a part of the community’s CDR procedures or a separate document. It needs the following additional information:

- (1) A list of each problem site, including
 - What makes the site different from the rest of the drainage system,
 - The procedure for increased inspection and maintenance, and
 - Who is responsible for the inspection and maintenance of the site.
- (2) The records that are kept to document both the inspections and the maintenance, if different from the CDR records.

Credit Points for PSM

PSM = 50, if the community’s program for problem site maintenance is in accord with the credit criteria

Example 542.b-1.

Over the years the City of Pullman’s crews have identified spots that are chronic drainage problems, such as the culvert under the railroad on the South Fork Palouse River and places on Missouri Flat Creek where ice jams usually form in late winter. The drainage maintenance procedures list these spots and require the crews to visit them first and

more frequently during rains or ice breakup. The culvert under the railroad is inspected weekly and cleaned out as soon as debris is found. PSM = 50

Impact Adjustment for PSM

There is no impact adjustment for PSM.

Documentation for PSM Provided by the Community

(1) At each verification visit,

- (a) A copy of the procedures, instructions, or other documents that explain the community's problem site inspection and maintenance. These are likely to be part of the procedures submitted for CDR credit. The special problem site inspection and maintenance procedures need to be identified, e.g., marked in the margin as "PSM."
- (b) A list of the problem sites and a map showing their locations.
- (c) Copies of the records for specific sites as requested by the ISO/CRS Specialist, showing that inspections were conducted and that maintenance was performed when inspections revealed problems.

The ISO/CRS Specialist may visit a sample of sites in the field to verify that maintenance has been performed in accordance with the procedures.

(2) With the annual recertification,

- (a) Examples of the records showing that the required inspections were conducted during the year and that maintenance was performed when inspections revealed problems.

542.c. Capital improvement program (CIP)

The maximum credit for this element is 70 points.

CIP credit recognizes the implementation of a capital improvement plan and a capital improvement program that make permanent, structural changes within the drainage system to reduce flood problems or maintenance problems. This credit is not for a program of continuous maintenance, such as cleaning or repairing inlets and culverts. Creditable examples would be ongoing programs to

- Enlarge culvert and bridge openings to eliminate bottlenecks,
- Install permanent hard or soft bank protection measures,
- Install grates to catch debris during high flows,

- Build new retention basins to reduce flows into existing channels,
- Convert problem channels into “low-maintenance” channels, or
- Improvements to the underground system.

The capital improvements program should address the “choke points and other obstructions to flows” that warrant the special attention that is credited in PSM.

Credit Criteria for CIP

- (1) The activity credit criteria in Section 541.b. must be met.
- (2) The community must also be receiving credit for PSM.
- (3) Sites that are improved through the program must be in either the community’s natural or constructed conveyance system.
- (4) There must be a “master list” of sites that are planned for improvement projects. The list can be prepared from master watershed plans, complaints, or reports from maintenance crews. Projects do not have to be prioritized or listed in any order. For example, the community may determine which projects will be funded at the beginning of each fiscal year.

The master list could be of sites submitted in relation to PSM credit, provided that the community intends to “eliminate or correct the problem sites.” In other words, the list must be related to the capital improvement program. It cannot just be a list of problems that are not slated for correction.

The recommended correction measures for the problem sites do not need to be the result of detailed plans or studies. They may be one-sentence statements on the most likely approach (e.g., “enlarge culvert,” “bank stabilization,” etc.).

If the program is administered by a county or multi-community district (i.e., an organization outside the community’s jurisdiction), then the list must be prepared from master watershed plans and not based solely on complaints or other ad hoc methods.

- (5) The community must spend money on a regular basis on such improvement projects (a one-time-only project would not be credited). This can be documented by a multi-year capital improvements budget or line items in several years’ budgets that fund drainage improvement projects.

All the needed documentation can usually be found in three documents: a watershed or stormwater management master plan identifying problems and likely projects, a written capital improvement plan for public works or a drainage plan that has a master list of proposed projects, and the community’s annual budget that shows how funds are spent each year.

CIP and Credit for Activity 530

Once a capital improvement project is completed, it may qualify for CRS credit under Activity 530 (Flood Protection). Projects that protect repetitive loss properties and critical facilities receive higher credit under Activity 530.

The analyses done for WMP credit under Activity 450 (Stormwater Management) may include a list of projects that may qualify for CIP credit.

Credit Points for CIP

$$\text{CIP} = \text{CIP1} + \text{CIP2}$$

$\text{CIP1} = 30$, if the community has an ongoing program, such as a capital improvement plan, that meets the credit criteria

$\text{CIP2} = 40$, if the community has an acceptable engineering analysis of the drainage system that includes an evaluation of the 1% annual chance (100-year) flood at the problem site

For CIP2 (40 points), a watershed-based hydrologic and hydraulic analysis (sometimes called a stormwater master plan) must have been completed that identifies the problem and provides a solution. It must include an estimate of the 1% annual chance (100-year) flood at the problem site and the resulting flood elevations. The design of the “solution” may use a lower design standard, but the community needs to recognize the impact of the 1% flood.

Example 542.c-1.

King County, Washington, has a county-wide Flood Control Zone District that is funded by property taxes. It funds a variety of programs, including a six-year Capital Improvement Program, which is updated annually. The Capital Improvement Program was developed through an engineering analysis of each watershed within the community. Currently over 50 projects are completed each year. $\text{CIP} = 70$

Impact Adjustment for CIP

There is no impact adjustment for CIP1.

$$\text{rCIP2} = \frac{\text{aCIP2}}{\text{aC}}, \text{ where}$$

aCIP2 = the area of the community covered by the watershed-based analysis and

aC = the area of the community

Documentation for CIP Provided by the Community

(1) At each verification visit,

- (a) Excerpts from the capital improvement plan or other documentation that shows that the community (or other drainage maintenance agency) has an ongoing program to reduce drainage maintenance or flooding problems. The submittal must include
 - (i) A master list of the community's drainage and flooding problem sites that need to be corrected or eliminated;
 - (ii) Recommended correction measures for the problem sites;
 - (iii) Documentation that funds are spent on capital improvement projects each year, and
 - (iv) [If full credit is requested] Documentation of the engineering analysis done for each watershed.

542.d. Stream dumping regulations (SDR)

The maximum credit for this element is 30 points.

SDR credit is provided for adopting and enforcing regulations that prohibit the dumping or disposal of debris throughout the community's drainage system. Many local urban flood problems are caused when shopping carts, yard waste, trash, or other debris is dumped into channels. This debris can clog culverts, divert flows, and reduce the conveyance capacity of channels. Regulations that prohibit the disposal of all debris within a channel help reduce this problem.

Credit is not provided for an ordinance that prohibits littering or similar general nuisances, for ordinance language directed solely at water quality problems, or for language limited to activities in the floodplain. The regulations must specifically address the problem of keeping channels clear of materials such as brush, fill, and items normally not covered in littering ordinances.

Credit Criteria for SDR

- (1) The activity credit criteria in Section 541.b. must be met.
- (2) The community must also be receiving credit for CDR.
- (3) The regulations that prohibit disposal of debris in the community's drainage system must be enforced throughout the entire community. The regulation must designate an office or official responsible for receiving complaints and monitoring compliance and it also must include enforcement and abatement provisions.

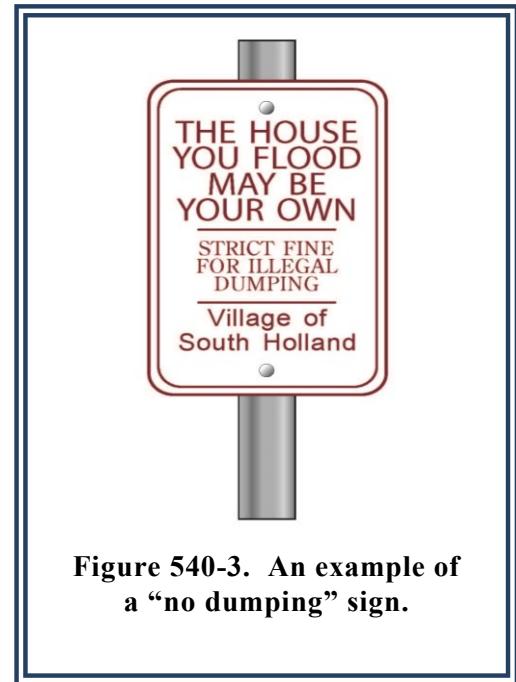


Figure 540-3. An example of a “no dumping” sign.

- (4) Additional credit is provided if the community publicizes the regulatory requirements that prohibit stream dumping. This may be done through the following outreach projects:
- (a) A notice sent to all property owners in the community (which may or may not be credited under OP in Activity 330 (Outreach Projects)); or
 - (b) Posting “no dumping in the stream” signs at key locations in the drainage system, such as frequent problem spots, schools, or public parks. An example of a sign that has been used by several CRS communities is shown in Figure 540-3; or
 - (c) An outreach project identified in the community’s Program for Public Information (PPI) credited under Activity 330 (Outreach Projects), provided that the PPI specifies the message and recommends the best way to disseminate it.

Credit Points for SDR

SDR = EITHER:

SDR = 15, if regulations prohibit dumping in the community’s drainage system,

OR

SDR = 25, if regulations prohibit dumping in the community’s drainage system and the community publicizes the regulatory requirements (see credit criterion (4)(a) or (b)),

OR

SDR = 30, if regulations prohibit dumping in the community’s drainage system and the publicity is covered in the community’s PPI (see credit criterion (4)(c))

Example 542.d-1.

A community’s code of ordinances deals with nuisances and misdemeanors. The article states that the police department is responsible for enforcement of listed violations. It also prescribes penalties.

The code states:

It shall be unlawful to dump, deposit, or otherwise cause any trash, landscape debris, or other material to be placed in any stream, channel, ditch, pond, or basin that regularly or periodically carries or stores water.

The community's documentation includes all appropriate sections of the municipal code with "SDR" marked in the margins. One of the City's outreach projects in Activity 330 discusses the need for drainage system maintenance and what to do if dumping is seen. SDR = 25

Impact Adjustment for SDR

There is no impact adjustment for this element. The regulation must be enforced throughout the entire community.

Documentation for SDR Provided by the Community

(1) At each verification visit,

- (a) A copy of the stream dumping regulation prohibiting the disposal of debris in the affected drainage system. The acronym SDR must be marked in the margin of the ordinance sections that pertain to this element, including the responsible office or official.
- (b) [If the community is requesting the extra credit for publicizing the regulation] A copy of how the community publicized the regulations during the year. If the publicity was in a document credited under Activity 330 (Outreach Projects), a separate submittal is not needed, provided that the other document (including a PPI, if credited) is annotated to show where SDR is publicized.

(2) At each recertification,

- (a) [If the community is requesting the extra credit for publicizing the regulations] A copy of how the community publicized the regulations during the year.

542.e. Storage basin maintenance (SBM)

The maximum credit for this element is 120 points.

SBM credit is dependent upon annual inspections and regular maintenance of retention, detention, infiltration, and other types of storage basins. The community (or other non-federal agency) must have a program to regularly inspect, at least annually, public and private storage basins and remove debris as needed. Neither the cost of the work nor the amount of debris removed affects the credit. A program that responds to complaints and conducts inspections after storms is required, but such a program alone is not enough to obtain this credit.

After each inspection, appropriate maintenance must be completed where it has been determined that it is needed.

The maintenance work is normally done by a public works crew, usually without specialized equipment, but backhoes and trucks are frequently required. The objective of this activity is to remove accumulated sediment or debris that prevents the storage or infiltration of excess stormwater. It is important that the community's procedures spell out

what can and cannot be removed. In some areas detention facilities also provide water quality treatment. In those situations, special care must be taken when removing sediment and debris to ensure that the facility still provides all its design functions.

Inspection and maintenance may also be performed by the owner of the basin if it is not owned by the community. The community's ordinance (credited under PUB in Activity 450) must require inspections by a registered design professional at least annually, with the reports submitted to the community if the owner is responsible for inspection and maintenance.

Credit Criteria for SBM

- (1) The activity credit criteria in Section 541.b. must be met.
- (2) The community must be receiving credit for PUB within element SMR under Activity 450.
- (3) The community must have a program to inspect and maintain its storage basins and any storage basins constructed to comply with the standards credited in SMR (Activity 450), and inspections must be conducted
 - (a) At least once each year,
 - (b) Upon receiving a complaint, and
 - (c) After each storm that could adversely affect the drainage system.

Action must be taken when an inspection reveals a need for maintenance or cleaning. Procedures for inspection and maintenance must be in the form of written procedures or guidelines. These are explained in "SBM Procedures," below

- (4) Procedures for annual inspection and maintenance of storage basins must be in the form of written procedures or guidelines. These are explained in SBM Procedures, below.
- (5) The location of all public and private storage basins must be mapped.
- (6) The community must have a complete inventory of storage basins within its jurisdiction.
- (7) All the maintenance and inspection activities must be recorded and the records must be maintained until the next verification visit.

Component (nSBC)	Type	Description	Owned by	Credited (nSBM)
Det0001	Detention	Central Creek Basin	City	Yes
Det00012	Detention	North Fork Clover	City	Yes
IN0001	Infiltration	Sunrise HOA	City	Yes
IN0002	Infiltration	Jones Creek at Main	County	Yes
Det0003	Detention	Northstar Safeway	Private	No
Det0004	Detention	Stonewater HOA	Private	Yes
		Total:	6	5

Figure 540-4. A sample of an inventory included as part of a community's storage basin maintenance procedures.

SBM Procedures

The written SBM procedures or guidelines, which may be included in the same document as the community's CDR procedures, must include the following information:

- (1) Designation of the person, entity, or position responsible for the program.
- (2) An explanation of the procedures for inspection, including when regular inspections are conducted and how soon inspections are conducted after a complaint or a storm. The explanation should include procedures that are different based on
 - (a) The type of each facility (detention, infiltration, retention, below-ground),
 - (b) Whether it is publicly or privately owned, and
 - (c) Whether it is subject to the maintenance program;
- (3) The maintenance procedures, i.e., how soon after an inspection an area must be cleared, what can and cannot be removed, and who is responsible (based on public or private ownership); and
- (4) A description of the records that are kept to document both the inspections and the maintenance activities.

Credit Points for SBM

SBM = 120 points for maintenance of storage basins within the community in accordance with the credit criteria

Impact Adjustment for SBM

The impact adjustment for SBM is based on all storage basins in the community, rather than only those that are in developments approved since the community started receiving CRS credit. The community's SBM procedures must include a list of all public and private storage or retention basins and note those that are covered by the procedures (nSBM).

$$r\text{SBM} = \frac{n\text{SBM}}{n\text{SBC}}, \text{ where}$$

nSBM = number of storage basins, public and private, inspected annually and maintained as needed, and

nSBC = total number of storage basins, public and private, within the community

If rSBM is less than 0.10, then 0.10 is used.

Example 542.d-1.

A city's public works department inspects all of the city's public storage basins and requires the owners of private storage basins to submit an annual inspection report to the city. City crews remove critical accumulations of debris that are found during the annual inspection and when problems are reported by neighboring residents. In addition, the city frequently performs maintenance on private facilities and then bills the owner for the work when the owners do not perform the required annual inspection or maintenance.

The program inspects and maintains 10 publicly owned basins and 54 of the 102 private basins. The 54 basins were constructed after passage of an ordinance that requires public maintenance.

$$n_{SBM} = 10 + 54 = 64$$

$$n_{SBC} = 10 + 102 = 112$$

$$r_{SBM} = \frac{n_{SBM}}{n_{SBC}} = \frac{64}{112} = 0.57$$

Documentation for SBM Provided by the Community

(1) At each verification visit,

- (a) A copy of the procedures, instructions, or other documents that explain the community's storage basin inspection and maintenance program.
- (b) The map showing the location of all storage basins in the community.
- (c) The inventory of the storage basins located in the community.
- (d) Copies of the records that show that annual inspections were conducted and maintenance was performed when the inspections revealed problems.
- (e) A completed Certification of Compliance with Environmental and Historic Preservation Requirements for Drainage System Maintenance (CC-540EHP), which can be found in Appendix F.

The ISO/CRS Specialist may visit a sample of sites in the field to verify that maintenance has been performed in accordance with the procedures.

(2) With the annual recertification,

- (a) Examples of the records showing that inspections were conducted during the year and maintenance was performed when the inspections revealed problems.

543 Credit Calculation

c540 = cCDR + PSM + cCIP + SDR + cSBM, where

cCDR = CDR x rCDR, and

cCIP = CIP1 + CIP2 x rCIP2, and

cSBM = SBM x rSBM

544 For More Information

- a. Additional information, reference materials, checklists, and examples can be found at www.CRSresources.org/500.
- b. *Stream Obstruction Removal Guidelines*, C. McConnell et al., eds., American Fisheries Society, 1983. Copies are available for \$8 plus shipping from the American Fisheries Society, 5410 Grosvenor Lane, Bethesda, MD 20814 or from the online bookstore at <http://afsbooks.org/x55010xm>.

545 Related Activities under the Community Rating System

- The publicity needed for stream dumping regulations credit (SDR) can be an outreach project credited under Activity 330 (Outreach Projects). More credit can be received if the outreach project was part of a Program for Public Information, which is also credited under Activity 330.
- Element OSP (open space preservation) under Activity 420 (Open Space Preservation) reduces the need for channel maintenance.
- Activity 420's natural shoreline protection element (NSP) encourages communities to let their shorelines and stream banks go natural, reducing the need for maintenance in these areas. However, if the natural shorelines are in developed areas, they would still need to be inspected for debris to receive full credit for CDR. The impact adjustment map for NSP should be the same as the conveyance system map needed for CDR.
- Stormwater management regulations (SMR) in Activity 450 (Stormwater Management) establish the criteria and design standards for storage basins within a community.
- Public maintenance of required facilities (PUB) in Activity 450 (Stormwater Management) provides the authority for public inspection and maintenance of private drainage facilities.
- Once a capital improvements project (CIP) is completed, it may qualify for CRS credit under Activity 530 (Flood Protection). Projects that protect repetitive loss properties and critical facilities receive higher credit under Activity 530.

600 WARNING AND RESPONSE

The activities in this series focus on emergency warnings and response, because adequate notification combined with a plan for how to respond can save lives and prevent and/or minimize property damage. The activities emphasize coordinating emergency management functions with a community's other floodplain management efforts, such as providing public information and implementing a regulatory program. Separate, parallel activities are included for levees (Activity 620) and dams (Activity 630). Credit points are based on threat recognition, planning for a subsequent emergency response, and ongoing testing and maintenance.

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The Community Rating System (CRS) recognizes the importance not only of effective flood warning and response in a comprehensive floodplain management program, but also of coordinating public information, regulatory programs, and flood protection with the efforts of emergency management. Emergency management is included in a number of CRS activities, but especially the three in the 600 series, which focuses specifically on emergency warning and response.

- Activity 610 (Flood Warning and Response) is based on the principle that an ample warning combined with a flood response plan can prevent loss of life and damage to property.
- Activity 620 (Levees) credits the locally coordinated maintenance of levees combined with a flood response plan that recognizes the hazards of levee failure.
- Activity 630 (Dams) recognizes not only that state dam safety programs benefit communities downstream from dams but also that a flood response plan that anticipates possible dam failures can prevent loss of life and damage to property.

The elements and requirements of these three CRS activities have many similarities. They require a positive means of recognizing an imminent threat to the community, an emergency response plan that provides for warning the affected populations, the activation of community emergency response efforts, and giving special attention to critical facilities. Each of the activities also requires public outreach pertaining to flood warning and response, and an annual exercise of the warning and response plan.

Outreach Projects for Flood Warning and Response

Credit for the public outreach that is required for the activities in the 600 series can be credited under Activity 330.

There are differences among these activities, but they should be bound together under the community's emergency response plan. All three have similar credits, organized in the following flood preparedness order:

- Advance notification of an impending flood (threat recognition),
- Issuing warnings to the threatened population (warning),
- Taking steps to protect life and reduce losses during the flood (operations), and
- Coordinating with critical facilities (critical facilities planning).

In all three activities, most of the CRS credit provided is for threat recognition and emergency response planning. In Activities 620 and 630, there is also credit for locally coordinated maintenance of levees and recognition of coordination between communities and state dam safety programs.

610 FLOOD WARNING AND RESPONSE—Summary

Maximum credit: 395 points

612 Elements

- a. **Flood threat recognition system (FTR):** Up to 75 points for a system that predicts flood elevations and arrival times at specific locations within the community.
- b. **Emergency warning dissemination (EWD):** Up to 75 points for disseminating flood warnings to the public.
- c. **Flood response operations (FRO):** Up to 115 points for implementation of specific tasks to reduce or prevent threats to health, safety, and property.
- d. **Critical facilities planning (CFP):** Up to 75 points for coordinating flood warning and response activities with operators of critical facilities.
- e. **StormReady community (SRC):** 25 points for designation by the National Weather Service as a StormReady community.
- f. **TsunamiReady community (TRC):** 30 points for designation by the National Weather Service as a TsunamiReady community.

Credit Criteria

Credit criteria for this activity are described in Section 611.b.

- a. The community must receive some credit in each of the elements FTR, EWD, FRO, and CFP in order to receive credit (including SRC or TRC credit) under this Activity.
- b. The community must have a description of its flood hazard.
- c. There must be a multi-level flood inundation map or series of related maps (e.g., surge and evacuation zones) that are tied to different levels of response as designated in the community's plan.
- d. There must be an adopted flood warning and response plan that is associated with the maps in credit criterion (c)..
- e. There must be one or more annual outreach projects on the flood warning and safety precautions.
- f. There must be an annual exercise of the plan or an emergency operations center activation, with a lessons-learned report.

Each element has additional criteria specific to that element.

Impact Adjustment

The credits for FTR, EWD, and FRO are adjusted based on the number of buildings within the Special Flood Hazard Area affected by each element. There is no impact adjustment for CFP, SRC, or TRC.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

610 FLOOD WARNING AND RESPONSE

The OBJECTIVE of this activity is to encourage communities to ensure timely identification of impending flood threats, disseminate warnings to appropriate floodplain occupants, and coordinate flood response activities to reduce the threat to life and property. This activity focuses on the community's emergency management actions and plans, and efforts coordinated through the community's emergency manager. Therefore, the emergency manager should be the point of contact.

611 Background

With sufficient warning of a flood, a community and its floodplain occupants can take protective measures to mitigate potential damage. A flood threat recognition system integrated with an emergency response plan and a multi-level flood inundation map(s) enables emergency warning dissemination to the public and critical facilities. This is the basis of flood warning and response and is part of the emergency management preparedness cycle.

The National Weather Service (NWS) issues specific flood warnings for many locations along major rivers and coastlines. A community's ability to receive notifications 24 hours a day, seven days a week, and 365 days a year is crucial to utilization of such warnings. Many communities have their own flood threat recognition systems, which enable advance identification of floods on smaller rivers and streams. The full benefit of early flood warning is only realized if the community disseminates the warning to the general public and to critical facilities and has a flood warning and response plan that includes appropriate tasks, such as directing evacuation, sandbagging, and/or moving building contents above flood levels.



611.a. Activity Description

The maximum credit for Activity 610 is 395 points.

Credit is provided for a community that, at a minimum, has adopted a flood warning and response program that includes

- A flood threat recognition system that identifies an impending flood (credited under FTR),
- Methods to warn the public of the impending flood (credited under EWD),
- A plan for flood response operations (credited under FRO), and
- Coordination with critical facility operators (credited under CFP).

In addition to these four basic components of a local flood warning and response program, this activity credits two programs operated by the NWS that recognize communities that are

better prepared for flooding caused by storms: SRC—StormReady communities and TRC—TsunamiReady communities.

This activity is not intended to be a model for developing a flood warning or flood response program. Its objective is to credit a local program's potential impact on life, safety, and property damage. An effective emergency management flood warning or response program must be carefully prepared and tailored to the local flood hazards and the specific needs of the community.

611.b. Activity Credit Criteria

- (1) The community must obtain some credit in the first four flood warning and response elements (FTR, EWD, FRO, and CFP) to receive any credit under this activity.
- (2) The community must have a description of its flood hazard that includes information about
 - (a) The nature of the community's flood hazard, such as flood depths, velocities, warning times, historical flood problems, and special flood-related hazards;
 - (b) An inventory of the types of buildings (residential, commercial, etc.) exposed to flooding including an estimated number of the buildings, and an inventory of the land use (residential, agricultural, open space, etc.) of both developed and undeveloped places within the area(s) affected; and
 - (c) An inventory of critical facilities and the expected impacts of flooding on health and safety, community functions, such as police and utility services, and the potential for secondary hazards.

Local governments may have completed a risk assessment that meets this criterion as part of their floodplain management or hazard mitigation plan credited under Activity 510. If not, the community can complete the CRS Community Self Assessment described in Section 240 of the *CRS Coordinator's Manual*. The products from either of these efforts should provide the basis for the flood hazard description.

- (3) The community must have a flood inundation map(s), also known as a flood stage forecast map. The map must show areas that are inundated by at least three different flood levels in riverine areas and/or two storm surge levels in coastal areas. If a community is only inundated by flash flooding, impact area maps based on cubic feet per second (cfs) alert levels, rainstorm thresholds, or flow depths are acceptable. Such maps must be used in planning the community's flood response when different flood levels or rainfall amounts are predicted. Examples of riverine, flash flood, and coastal maps are shown in Figure 610-1, Figure 610-2, and Figure 610-3, respectively. A community may show that only one flood level is appropriate for some areas of the community, such as for an area subject to shallow flooding.

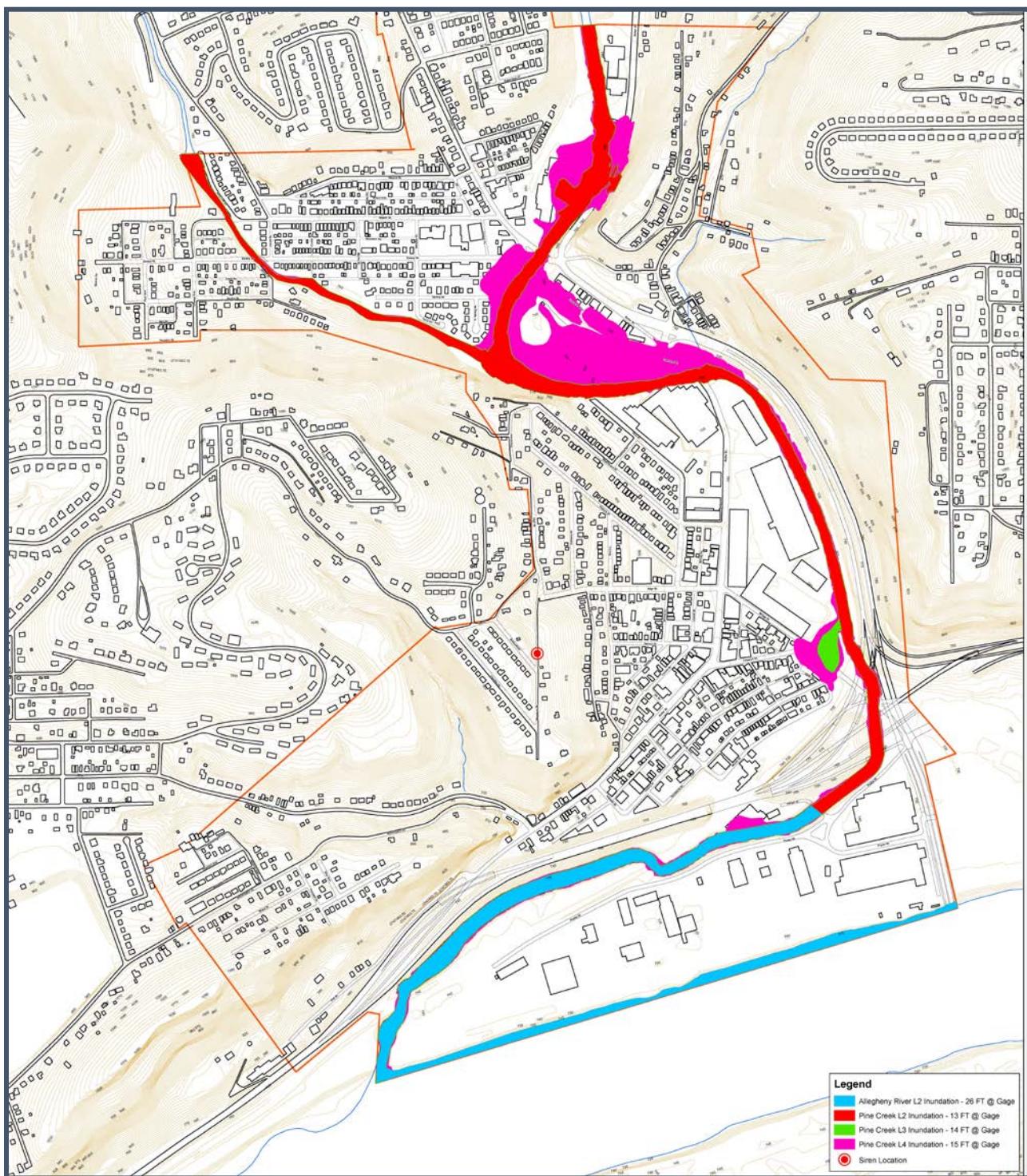


Figure 610-1. An example of a riverine flood inundation map.

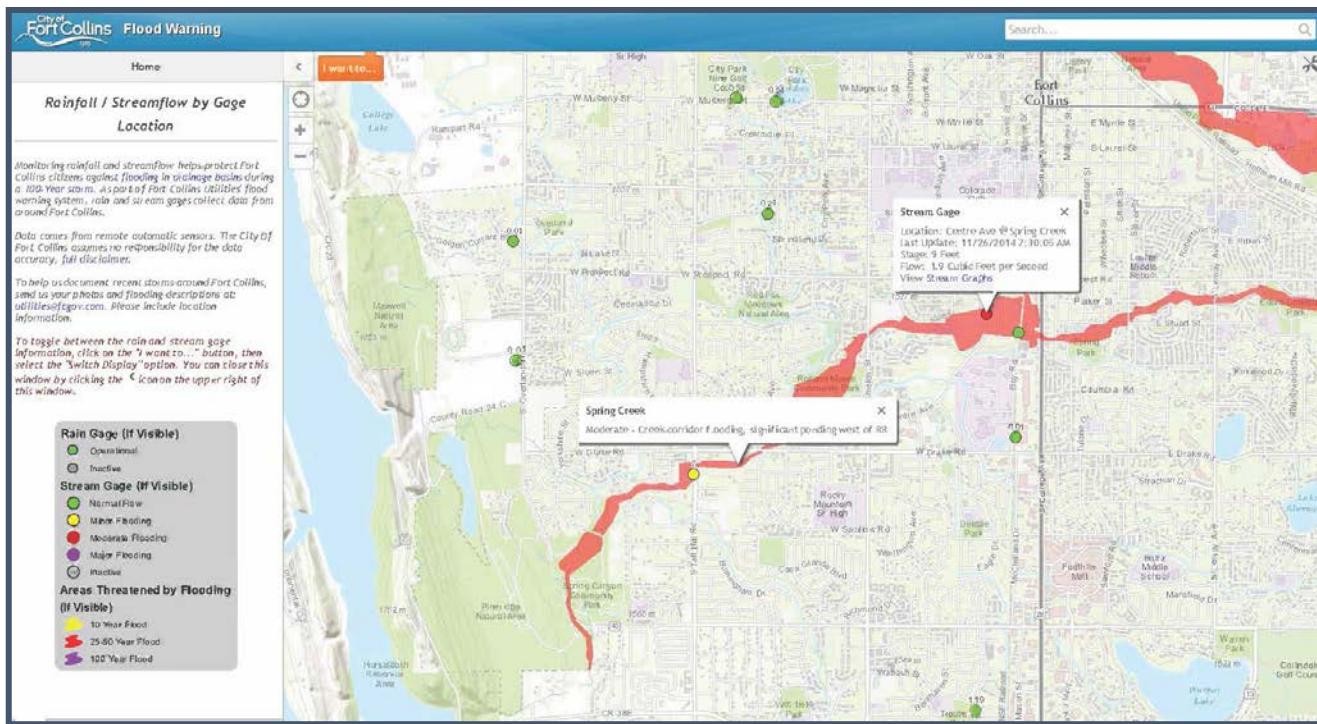


Figure 610-2. An example of a flash flood impact area map.

In large counties, there may not be detailed mapping and flood warning planning for the entire floodplain. In such cases, some counties designate the entire 100-year flood level as the initial area to be notified by the Emergency Alert System and other flood alerts and have detailed, multi-layered flood levels only in the populated areas. If the flood threat recognition system and flood response plan utilize such a scenario, they can be considered a creditable flood warning and response system.

- (4) The community must have a flood warning and response plan that has been adopted by the community's governing body. A "flood warning and response plan" may have different names in different communities, such as "flood warning plan," "flood preparedness plan," or "flood annex" to a comprehensive emergency management plan. To qualify as a flood warning and response plan, the plan must
 - (a) Describe the methods and warning devices used to disseminate emergency warnings to the general public that are credited under EWD,
 - (b) Include specific flood response actions that are taken at the different flood levels or flash flood impact areas that are credited under FRO, and
 - (c) Be adopted by the community's governing body or by an office that has been delegated approval authority by the community's governing body.

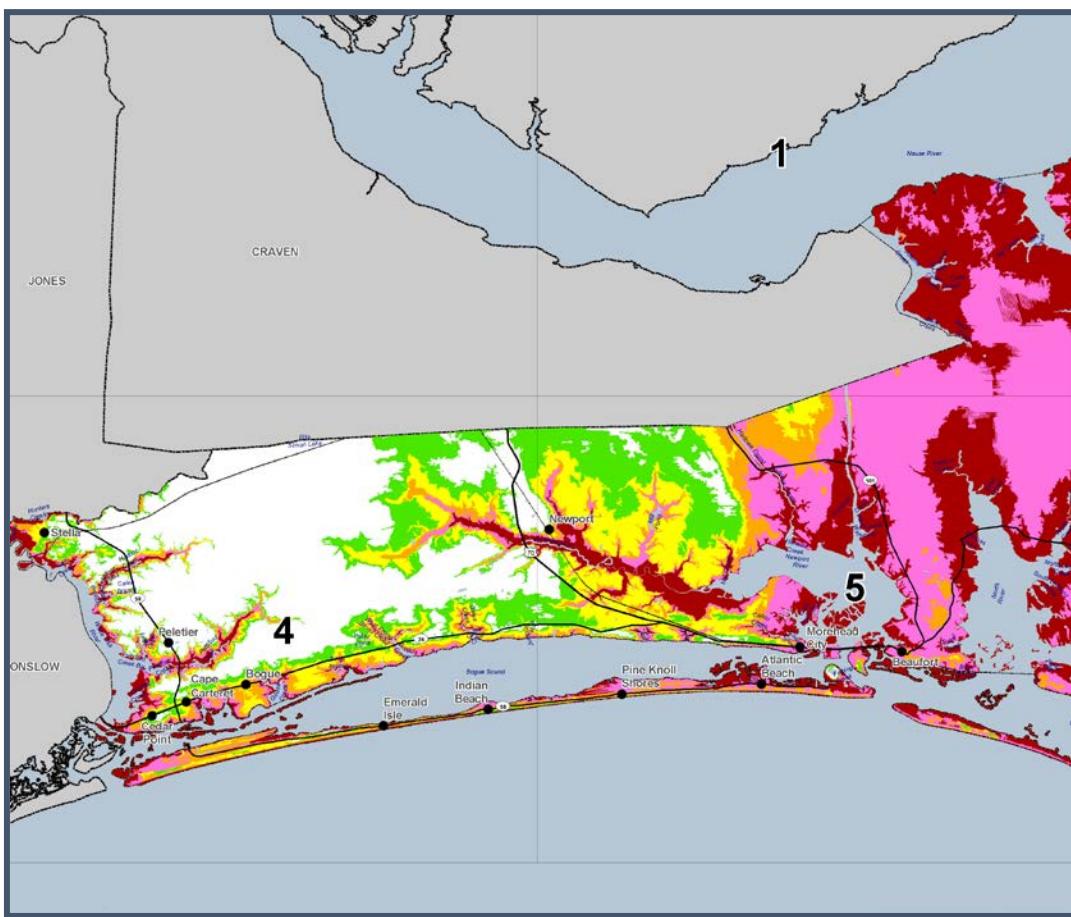


Figure 610-3. An example of a coastal flood inundation map.

- (d) If the plan is prepared at the borough, county, or parish level, it must include or be adopted by the individual communities seeking CRS credit for it. Annexes, standard operating procedures (SOPs), standard operating guidance (SOGs), and other documents developed pursuant to the flood warning and response plan do not require formal adoption by the governing body. If the borough, county, or parish plan has been reviewed and the signatory community applies for credit under that previously reviewed flood warning program, then the following applies:
 - (i) If the “parent plan” has provided the required inundation mapping that covers the community’s jurisdiction adequately, no additional map is needed.
 - (ii) The community must provide the number of structures used in calculating the sums in bSFHA, bFTR, bEWD and bFRO
 - (iii) The community must provide a list of all public and private critical facilities affected by flooding (or that are needed to be operational during a flood), including contact names and current phone numbers and other pertinent information, and the list must be updated annually.
 - (iv) The community must provide the adopted definition of critical facilities.

- (v) The community must provide verification that the community participated in a drill/exercise or an actual activation of the plan within the past 12 months.
 - (vi) If credit was provided in EWD for a warning system or systems, then the community must provide verification that the community tested those systems within the past 12 months.
- (5) The community must implement one or more outreach projects that tells its residents and businesses how they will be warned about a potential flood and the safety measures they should take during a flood. This outreach is for the purpose of shaping public actions, and can be done by using one or more of the following approaches:
- (a) Sending an outreach project (e.g., a brochure, letter, or newsletter) each year to all residents and businesses in the community;
 - (b) Sending an outreach project each year to all residents and businesses in the floodplain where the warning program is in effect;
 - (c) Developing an appropriate approach as part of a Program for Public Information (PPI) credited under Activity 330 (Outreach Projects);
 - (d) If the community has at least three days of advance flood notification, such as coastal areas subject only to tropical storms and hurricanes or communities on large rivers, it may document that it provides repeated watch, warning, and safety information to all residents and businesses, beginning at least 72 hours in advance of the predicted flooding; or
 - (e) A community with more than one source of flooding (e.g., coastal and riverine) may need to use different types of projects to reach different audiences.
- (6) There must be at least one exercise and evaluation of the flood warning and response plan each year that is compliant with the National Incident Management System (NIMS). This process is described in the Homeland Security Exercise Evaluation Program. The exercise can be for a flood, levee failure, dam failure, or hurricane. This criterion can be met if the plan is implemented in response to an actual flood-related event, or threat of a levee failure. In either case, there must be an evaluation of the performance of the plan and recommended changes that may be needed, as is usually documented in an after-action report. This criterion is part of the national emergency preparedness cycle

Annual Warning and Response Exercise

Activities 610 (Flood Warning and Response), 620 (Levees), and 630 (Dams) require an annual exercise of the warning and response plan. A flood, levee failure, dam failure, or hurricane exercise qualifies as an exercise for all three activities.

An after-action report/improvement plan for the warning and response plan must include

- A description of the exercise;
- An evaluation of the
 - Threat recognition procedures,
 - Warning dissemination,
 - Response operations; and
- Recommended changes to the plan.

The exercise requirement can also be met if the community responds to an actual flood or threat of a levee or dam failure, provided that the items listed above are discussed in an after-action (or similar) report.

612 Elements

612.a. Flood threat recognition system (FTR)

The maximum credit for this element is 75 points.

FTR credit is based on the level of service provided by the community's flood threat recognition system. Level 1 is a manual flood threat recognition system, Level 2 is an automated flood alarm threat recognition, and Level 3 is an automated flood threat warning system. Devices such as ALERT (Automated Local Evaluation in Real Time) and ALERT 2 precipitation gages, river gages, and tidal gages are used to provide data that can range from flash flood warning to the timing of potential flood level crests, areal impacts, and storm surge heights. From these data, maps can be developed and response actions identified. The data allow the flood threat recognition system credited in FTR to be linked to the flood response operation, credited in FRO.

A flood threat recognition system provides the community with the notification that a flood is imminent. The amount of lead time needed between the recognition of a flood, the ability to forward a timely alert to the public and to critical facilities and with special-needs registrants, and the successful response to a flood warning are factors in determining the level of flood threat recognition system that is necessary. This serves to tie FTR and emergency warning dissemination (EWD) together.

Designing an effective flood threat recognition system also depends on knowing what areas of the community are the most vulnerable; what sensor locations will best serve the vulnerable areas; the type and frequency of measurements that are needed; budgetary constraints; and operational costs. These systems will vary in their level of sophistication.

The flood threat recognition system's level of service is a function of the distribution of gages, population density, and other factors.

- (a) **Level 1: Manual flood threat recognition systems.** A manual system relies on a person to interpret the data received from river and/or tide gages, often using paper tables or graphs. In many cases, the gage data are collected and reported manually, usually by volunteers.
- (b) **Level 2: Automated flood alarm systems.** These systems issue a signal when a flood threatens. When water reaches a certain height on a river or tide gage, an alarm is sent to the monitoring location. Unlike automated flood warning systems (credited as Level 3), Level 2 systems do not predict flood heights or provide any data other than the current water level.
- (c) **Level 3: Automated flood warning systems.** These systems provide information such as the timing and potential crest of an oncoming flood. On larger rivers, they may be operated by the NWS and the U.S. Geological Survey. Where there are flash floods on smaller rivers, a local ALERT system or IFLOWS (Integrated Flood Observing and Warning System) may be established.

In coastal areas, the systems use models like the Sea, Lake, and Overland Surge from Hurricanes (SLOSH) model. These models determine surge heights and delineate the areas of the community that are subject to inundation during a particular category of storm in real time.

A community may determine that different levels of service are appropriate for different sources of flooding in the community (e.g., riverine, flash flood, and coastal) and may receive FTR credit for more than one system. The credit calculation is based on the levels of service and the number of buildings that benefit from the service.

Credit Criteria for FTR

- (1) The activity credit criteria in Section 611.b must be met.
- (2) The community must have a Level 1, Level 2, or Level 3 flood threat recognition system that provides early notice of a flood for at least one location within the community. The system must be able to receive or provide flood warnings 24 hours a day, 7 days a week, and 365 days a year. A community may have different levels of service for different sources of flooding, and in different locations in the community.
- (3) Each flood threat recognition system must be correlated to a flood inundation or evacuation map, so that the emergency manager can see what areas will be affected by the predicted flood. Generally, this is done by showing areas affected by different flood levels on a map using the same terminology as the flood threat recognition system. An example of this is the riverine map shown in Figure 610-1, which is keyed to the river stages reported by the river gage.

Credit Points for FTR

FTR = EITHER:

- (1) 25 points, for a Level 1 manual system, OR
 - (2) 50 points, for a Level 2 automated flood alarm system,
OR
 - (3) 75 points, for a Level 3 automated flood warning system
-

Example 612.a-1.

A community has a NWS river gage at a bridge in the center of town. Data from the gage are automatically transmitted to the NWS Weather Forecast Office and River Forecast Center. The NWS offices process the data and issue notices that include predicted flood crest levels and times. The police department monitors the notices 24 hours a day, seven days a week. FTR = 75

Impact Adjustment for FTR

The impact adjustment for the activity is described in Section 613.

Documentation for FTR Provided by the Community

(1) At each verification visit,

- (a) The needed documentation is assembled by the ISO/CRS Specialist and provided to the technical reviewer for this activity. There is a checklist to help the emergency manager identify all the needed documentation (available at www.CRSresources.org/600).
 - (i) A copy of the community's flood hazard description (credit criterion (2) in Section 611.b).
 - (ii) A copy of the flood inundation or evacuation map or maps (credit criterion (3) in Section 611.b).
 - (iii) A copy of the flood warning and response plan and documentation that it has been adopted. If the plan was approved by an office that has been delegated approval authority by the community's governing body, a copy of the delegation authorization. The plan must be marked to show where the credited items appear (credit criterion (4) in Section 611.b).
 - (iv) A description of the flood threat recognition system. The description must identify the rivers, streams, and coastal floodplains where flood stage forecasts are prepared and each forecast point. If the community has its own gage system, such as an ALERT system, the description must include the locations of the stream and precipitation gages.
 - (v) If the community has its own gage system, such as an ALERT system, a copy of the maintenance procedures for the system and records showing that the system is being maintained.
 - (vi) An impact adjustment map showing the area(s) affected by each element and documentation showing how the numbers of buildings used in the calculations were determined.

(2) At the verification visit and with the annual recertification,

- (a) A copy of the outreach material used to tell people how they will be warned and the safety measures they should take (credit criterion (5) in Section 611.b). If the outreach material is also credited under Activity 330 (Outreach Projects), a separate submittal is not needed, provided that the other document (including a PPI, if used) is annotated to show where the Activity 610 outreach topics are covered.
- (b) A description of the flood exercise, drill, or response to an actual emergency or disaster response conducted during the previous year (credit criterion (6) in Section 611.b). The description must include a list of who participated, lessons learned, and any recommendations for changes to the system. A copy of the after-action report or any similar report for any actual response is required.

NOTE: *There is a checklist to help the emergency manager identify all needed documentation, available at www.CRSresources.org/600.*

612.b. Emergency warning dissemination (EWD)

The maximum credit for this element is 75 points.

EWD credit is provided for emergency warning alerts and messages that are disseminated to the public when a flood is imminent. The public is most influenced by the multiple alerts and notifications produced by the emergency manager. Therefore, emergency warning procedures and messages must be planned in order to reduce time of issuance and increase public protective actions. The message content and frequency of issuance greatly influence desired behavior. Multiple channels of alerts and notifications must be employed to reach the maximum number of people and facilities.

Flood warning dissemination provides a critical linkage between the recognition of an impending flood and the community's response to the emergency. New message distribution technology includes the third-generation Emergency Alert System, which includes the Federal Emergency Management Agency's (FEMA's) Integrated Public Alert Warning System (known as IPAWS); the NWS's InteractiveNWS (known as iNWS), Wireless Emergency Alerts (known as WEAs); and various vendor-developed Short Message Service (known as SMS) systems to subscribers.

Once the flood threat recognition system alerts local emergency managers to which areas will be flooded and when, warnings should be issued to the affected populations. The response gap or time delay that takes place between an individual's receiving an alert and taking action can be reduced by pre-scripted messages. The messages that need to be conveyed and the appropriate times to deliver them should be thought out in advance, as part of the flood warning and response plan. Anticipating and targeting potentially impacted people is vital to any alert notification system, pre-planning prevents poor performance.

A community that has created a comprehensive emergency plan will likely receive credit for multiple sub-elements in EWD when it has made the arrangements to execute the plan. For example, a community may have a reverse telephonic notification system (EWD6) that uses pre-scripted messaging templates for a variety of possible flooding events (EWD1) that inform the public of the pending threat and actions to be taken (EWD2). In the planning process the community recognized that some of the population would not receive the land-line phone call, so a geocoded cell phone registry of those located in community (EWD8) was established. At public gathering locations or areas with poor cell coverage, the community installed outdoor public address systems (EWD3). The community also worked with the NWS to ensure that flood threats for the community are accurately represented on the NWS/AHPS web site and in EAS announcements (EWD5).

The warning messages should state when flooding is predicted to occur, its expected severity, and appropriate response actions (e.g., evacuation routes, safe shelters, protective actions). As noted earlier, these messages should be predetermined (use of templates or pre-scripted messages) in order to shorten the time between the agency's awareness of the threat and the issuance of the first alert to the public. Good messages not only consider those in immediate danger, but also those in adjacent areas who might be subject to related impacts from the threat.

Credit Criteria for EWD

(1) The activity credit criteria in Section 611.b must be met.

(2) The warning must reach people in a timely manner. For example, television or radio announcements are not credited in areas subject to flash flooding during the night.

More than one notification channel should be used to reach desired populations and facilities in a timely manner. Some examples are shown in the box.

(3) For those warning systems requiring specialized equipment, such as sirens and SMS-related products, the equipment and procedures must be tested at least annually. Equipment that is used routinely throughout the year, such as television notices and message boards, do not need testing records for CRS credit.

Credit Points for EWD

Examples of Warning Notification Channels

- Broadcast sirens or fixed-siren system
- Route Alerting
- Loudspeakers and public address systems
- Reverse telephone distribution systems
- Television (broadcast and message scrolls)
- Dedicated tone alert radios and NOAA weather radios
- Text and telephone alerts
- Radio
- Message boards
- Social media

EWD = the total of the following, up to the maximum of 75 points

EWD1 = 10 points, if the flood warning and response plan includes pre-scripted messages or message templates and guidance for staff to quickly issue appropriate flood warnings

EWD2 = 10 points, if the public messages include information and instruction on the expected elevation of the flood waters or storm surge, or the impact of flash flooding, and instructions on when to evacuate

EWD3 = 10 points, if an outdoor voice-sound system or fixed-siren system is used that covers the community's jurisdiction

EWD4 = EITHER:

- (a) 5 points, if the plan identifies the primary and support agencies responsible for door-to-door or mobile public address warning; OR
- (b) 15 points, if the plan identifies the routes, procedures, responsible staff, and equipment necessary for door-to-door or mobile public address warning

EWD5 = 10 points, if the Emergency Alert System through all channels/stations with pre-scripted draft messages is used

EWD6 = 15 points, if telephone warning/enhanced telephone notification is used

EWD7 = 10 points, if television broadcast or message scroll notifications are implemented by the community

EWD8 = 15 points, if the community uses other forms of public notification for emergency warnings, such as geocoded alert notification products and social media coordination of emergency-related topics

EWD9 = 10 points, if tone alert radios or NOAA Weather Radios either provide a system of notification to or are physically located within the schools, hospitals, nursing homes, prisons, and similar facilities that need flood warning

EWD10 = 10 points, if the flood inundation or evacuation map or series of maps used to meet the credit criteria in Section 611.a are posted online.

The procedures and messages should be coordinated with the public information activities credited under flood response preparation (FRP) under Activity 330 (Outreach Projects).

Example 612.b-1.

A community's emergency response plan describes its warning dissemination system. The city receives credit under the following sections under EWD.

EWD1: The plan includes pre-scripted messages and guidance on what warnings to issue, and to whom, when the river is predicted to reach different stages. [10 points]

EWD3: When the flood threat recognition system shows that the river is expected to exceed a flood stage of 30 feet, the police dispatcher sounds the sirens, which are located throughout the community. [10 points]

EWD4: The Police Department sends squad cars along streets in accordance with its plan to warn residents with its public address system. [15 points]

EWD5: The police dispatcher also activates the Emergency Alert System and advises area radio stations about the hazard, and pre-scripted messages are used. [10 points]

EWD6: The guidance authorizes the police dispatcher to initiate the enhanced telephone notification system. [15 points]

EWD7: The local cable television system programming is overridden with scripted warning messages developed for different flood

stages identified in the plan. The messages identify evacuation routes. [10 points]

EWD8: The community uses a geocoded alert subscriber system as an additional public notification for its emergency warnings and the EOC administers the social media coordination of emergency related topics. [15 points]

EWD9: All schools are notified by the school district after the district office receives a flood warning via NOAA Weather Radio receivers. Identified hospitals, nursing homes, and other group facilities for the care of the elderly that need flood warning have NOAA Weather Radio receivers. [10 points]

Different messages are used based on the predicted flood stage. Flood stage messages are evaluated each year based on changes in local conditions such as new construction and lessons learned from the annual exercises.

Sirens are tested on the first Monday of each month. The Emergency Alert System is tested every six months. Maintenance of the sirens and communications equipment is provided for by contracts with the manufacturers. Community-operated SMS products are tested annually. The squad cars are used daily, so there is no special testing or maintenance documentation needed for them.

$$\text{EWD} = 10 + 10 + 10 + 10 + 15 + 10 + 15 + 10 = 90$$

Because the maximum value for EWD is 75, EWD = 75.

Impact Adjustment for EWD

The impact adjustment for the activity is described in Section 613.

Documentation for EWD Provided by the Community

(1) At each verification visit,

- (a) A copy of the flood warning and response plan, marked to show where the EWD-credited items appear in the plan.
- (b) Copies of any written warning materials, such as handouts or the flood inundation map credited under EWD 10.
- (c) [For EWD1, 2, 5, 6, or 7] A copy of the pre-scripted messages.
- (d) [For EWD3] The impact adjustment map, showing the siren locations and their effective coverage areas.
- (e) [For EWD6] A copy of the description of a publicly owned call warning system or a copy of the contract with a private provider.
- (f) [For EWD7] A copy of the documentation concerning the community-operated television channel or cable television agreement and override procedures.

- (g) [For EWD8] A description of the capability and use of other forms of public notification.
- (2) At the verification visit and with the annual recertification,
- (a) The description of the flood exercise, drill, or response to an actual emergency or disaster response conducted during the previous year that notes experiences and lessons learned about the warning dissemination measures. If the community is covered by a borough, county, or parish emergency management agency exercise, drill or response, then documentation of its participation must be included.

NOTE: There is a checklist to help the emergency manager identify all needed documentation, available at www.CRSresources.org/600.

612.c. Flood response operations (FRO)

The maximum credit for this element is 115 points.

FRO credit is based on the extent of coverage and level of detail that the community's flood warning and response plan provides for the flood response operations.

The NIMS requires local governments to validate the inventory of response assets using FEMA's Resources Typing Standards. Department heads and other emergency response team members should know what kinds of resources they have available. This should be compared with the resources needed. Shortfalls may require negotiating agreements with private suppliers or other jurisdictions.

Flood warning and response planning must identify every opportunity to prevent loss of life and property damage during a flood. Using information from the flood inundation maps, the planning team should think about how flooding would occur—what areas will be affected and when. Through this brainstorming, the team can decide what actions and resources will become necessary.

Developing scenarios can assist this process by helping the community determine what actions it must plan for, and what resources it is likely to need. Scenarios are produced by thinking through what will happen in the community during a flood (e.g., where will the water go, who will get flooded, who will lose access because of high water, what critical facilities will be affected). By accounting for the local geography, the specific characteristics of the community's residents, and other factors, scenarios help with the design of the response operations so that the threats to life and property at identified flood levels or flood impact areas can be minimized.

The flood warning and response plan must include appropriate actions to be implemented at the different flood levels shown on the flood inundation map or series of maps. For each action that needs to be taken, the plan must assign a person or office. See the examples below.

Examples.

- River at elevation 733 feet: notification phase
 - Activate the emergency operations center (emergency manager),
 - Monitor water levels (engineering),
 - Etc.
- River at elevation 736 feet: 25 homes and businesses affected
 - Close [*list the names*] streets or bridges (police),
 - Shut off power to threatened areas (utility company),
 - Etc.
- River at elevation 738 feet: 350 homes and businesses affected
 - Close [*list the names*] streets or bridges (police),
 - Pass out sand and sandbags at [*list the locations*] (public works),
 - Relocate equipment in Fire Station #4 to high ground (fire department),
 - Release children from [*name*] school (school superintendent),
Open evacuation shelters (Red Cross),
 - Establish security and other protection measures (police/sheriff).
 - Etc.

Credit Criteria for FRO

(1) The activity credit criteria in Section 611.b must be met.

(2) For full credit for flood response operations, the plan needs to

- (a) Describe the actions to be taken,
- (b) Identify the office or official responsible for the action,
- (c) Define the time needed to carry out the activity, and
- (d) Contain other critical information that designated agencies and organizations will need in order to perform their assigned responsibilities.

General statements or an assignment of responsibilities with no specifics about what is to be done are not credited.

(3) Bonus credit is provided under FRO5 if there is a list of the personnel, equipment, facilities, supplies, and other resources needed to complete each task. For full credit the list must identify what is available within the community and what is needed from private suppliers or other jurisdictions.

- (4) FRO5 also provides bonus credit for preparing for mitigation opportunities that may arise in the aftermath of a disaster—a time when hazard awareness is high, funds are more likely to be available, and disruption of the status quo makes it possible to rethink the design and location of facilities and infrastructure. This should be coordinated with the public information activities credited under flood response preparations (FRP) under Activity 330 (Outreach Projects), which encourages owners to take mitigation measures during repairs.
- (5) FRO6 provides bonus credits for identifying response and recovery measures to take that support property protection, such as providing a high-ground site for relocated vehicles, helping move building contents, and distributing sandbags.

Credit Points for FRO

FRO = the sum of the following, up to the maximum of 115 points:

FRO1 = 15 points, if the community has developed scenarios that review how flood incidents might develop at the different levels shown on the flood inundation map

FRO2 = Up to 35 points, if the plan identifies flood response tasks and responsible community staff and other public and private organizations with responsibilities related to the flood tasks in the plan, the estimated equipment, supplies, and time required for each response task and the sources of necessary resources

FRO2 = the sum of the following:

- (a) 5 points, for identified flood response tasks and responsible staff,
- (b) 10 points, for an estimate of the number of personnel needed for each task,
- (c) 5 points, for an estimate of the time required for each response task, and
- (d) 15 points, for a list of equipment and supplies expected to be needed and how they will be obtained

FRO3 = 25 points, if specific actions are keyed to the different flood levels shown on the flood inundation map or maps used for credit under Section 611.b(3)

FRO4 = 10 points, for maintaining a data base of people with special needs who require evacuation assistance when a flood warning is issued and for having a plan to provide transportation to secure locations

FRO5 = Up to 15 points, if the plan includes instructions for

- When and how returning evacuees can reoccupy their damaged homes and businesses,
- Permit requirements during the recovery phase,
- Implementing the community hazard mitigation plan's identified flood loss mitigation measures on community properties, and
- Promoting flood loss mitigation measures for private property

FRO6 = 20 points, if the plan identifies actions that support property protection measures that could be carried out during response and recovery phases

Example 612.c-1.

A community's emergency response plan includes the following flood response information. The city receives credit under the following sections under FRO:

FRO1 The plan includes various scenarios based upon different inundation levels on the flood inundation map. [15 points]

FRO2 Various public and private organizations are listed, along with their flood response assignments. The plan lists the staff, equipment, and supplies needed for each response task and the time required for each task. Assets are identified by departments using NIMS resource typing standards. [35 points]

FRO3 The tasks are tied to specified flood levels or gage heights of the river. [25 points]

FRO5 Instructions for the return of evacuees to affected areas are also in the plan, including credential instructions and area security assignments. Substantial damage assessments are prescribed before repair permits can be issued [10 points, partial credit under FRO5]

$$\text{FRO} = 15 + 35 + 25 + 10 = 85$$

Impact Adjustment for FRO

The impact adjustment for FRO is described in Section 613.

Documentation for FRO Provided by the Community

(1) At each verification visit,

- (a) A copy of the flood warning and response plan, marked to show where the FRO-credited items appear.
- (b) Copies of the appropriate documents, for the credited items that are not in the flood warning and response plan.

NOTE: There is a checklist to help the emergency manager identify all needed documentation, available at www.CRSresources.org/600.

(2) With the annual recertification,

- (a) The description of the flood exercise, drill, or response to an actual emergency or disaster response conducted during the previous year, which notes experiences with, and lessons learned from, the flood response operations portion of the plan. If the community is covered by a borough, county, or parish emergency management agency exercise, drill, or response, then documentation of its participation must be included.

612.d. Critical facilities planning (CFP)

The maximum credit for this element is 75 points.

CFP credit is provided for coordinating the community's warning and response program with its critical facilities.

By definition, "critical facilities" are critical to the community. For CRS credit purposes, critical facilities are defined in Section 120. There are usually two kinds of critical facilities that a community should address with regard to flooding:

- Facilities that are vital to flood response activities or crucial to the health and safety of the public before, during, and after a flood, such as a hospital, emergency operations center, electric substation, police station, fire station, nursing home, school, vehicle and equipment storage facility, or shelter; and
- Facilities that, if flooded, would make the flood problem and its impacts much worse, such as a hazardous materials facility, power generation facility, water utility, or wastewater treatment plant.

Coordinating the flood warning and response planning with these facilities will allow more timely and effective protection of them and more rapid response and community recovery.

Critical facilities may need special early warning. Every facility should have its own individual flood warning and response plan. Not only will this make them better prepared, but also it will reduce the workload on emergency response teams because the critical facilities will be performing some or all of the response themselves.

Credit Criteria for CFP

- (1) The activity credit criteria in Section 611.b must be met.
- (2) CFP1 is a prerequisite for any CFP credit.
- (3) For CFP1, the community's flood warning and response plan must list the facilities considered critical in a flood. This can be in a separate document or SOP. In general, facilities not subject to flooding do not need to be addressed, although in some cases loss of access can cause a critical situation. There may also be facilities in flood-free sites that are needed to support the flood response effort (e.g., sandbag suppliers and shelters for evacuees). The list must be updated at least annually.

The community must also contact the facilities to determine if they need any special warning arrangements. For example, a factory where there is a lot of noise may need a direct telephone call because no one would hear a siren. Another facility may need an earlier notice because it needs more time to get ready.

The community does not need to provide a special warning to all critical facilities, only those that need one.

- (4) For CFP2, additional credit is provided if flood warning and response plans have been developed, reviewed, or accepted by the community for individual critical facilities.
- (5) If there are no critical facilities that can be affected by flooding, the community must provide documentation stating this and provide a copy of the community's adopted definition of critical facilities.

Credit Points for CFP

CFP = the sum of the following, up to 75 points:

CFP1 = up to 25 points, if the flood warning and response plan includes

- (a) contact information, including the names and phone numbers of the operators of all public and private critical facilities affected by flooding, and
- (b) arrangements for special warnings or early notifications directly to those critical facilities that need advanced warning

CFP2 = up to 50 points, if critical facilities listed under CFP1 have their own flood warning and response plans that have been developed, reviewed, or accepted by the community. The credit is prorated based on the percentage of affected critical facilities that have creditable plans

Example 612.d-1.

A community's multi-hazard plan lists all critical facilities in the community, their operators, and their telephone numbers. The list is updated by the emergency manager every six months. There are three critical facilities affected by flooding: the public works garage, a church, and a school. The first is in the floodplain and the last two are adjacent to the floodplain but are needed as shelters as described in the flood warning and response plan. The community's plan includes providing special warnings to these three facilities. CFP1 = 25 points

$$\text{CFP} = 25 + 0 = 25$$

Impact Adjustment for CFP

There is no impact adjustment for CFP.

Documentation for CFP Provided by the Community

(1) At each verification visit,

- (a) A list of all public and private critical facilities affected by flooding or needed to be operational during a flood, with the contact information and agreed-upon warning needs.
- (b) [For CFP2] The list of critical facilities marked to identify those that have developed their own flood warning and response plans that have been reviewed and accepted by the community. The ISO/CRS Specialist will ask for samples of the plans for review.
- (c) If there are no critical facilities that can be affected by flooding, the community must provide a letter on community letterhead stating that information, and a copy of the community's adopted definition of critical facilities.

NOTE: *There is a checklist to help the emergency manager identify all needed documentation, available at www.CRSresources.org/600.*

(2) With the annual recertification,

- (a) A page from the latest list of the critical facilities provided for CFP1 that must be updated at least annually.

612.e. StormReady community (SRC)

The maximum credit for this element is 25 points.

SRC credit is provided to communities that have received a StormReady designation from the NWS.



StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather—from tornadoes to tsunamis. The program encourages communities to take a new, proactive

approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations.

To be officially StormReady, a community must

- Establish a 24-hour warning point and emergency operations center;
- Have more than one way to receive severe weather warnings and forecasts and to alert the public;
- Create a system that monitors weather conditions locally;
- Promote the importance of public readiness through community seminars; and
- Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises (see www.weather.gov/stormready/).

There are more than 2,000 StormReady communities in the United States. StormReady credits communications and educational requirements that go beyond the elements credited by the CRS. Because of the advantages of being a StormReady community, this element provides credit to encourage communities to qualify.

Credit Criteria for SRC

(1) The activity credit criteria in Section 611.b must be met.

(2) The community must be designated as a StormReady community by the NWS, either by the inclusion of its name on the StormReady website or by being named in the award letter from the regional NWS office.

Credit Points for SRC

SRC = 25, for being designated by the NWS as a StormReady community and meeting all credit criteria

Impact Adjustment for SRC

There is no impact adjustment for SRC.

Documentation for SRC Provided by the Community

No documentation is required from the community. Credit is based on the list of StormReady communities posted on the NWS website, www.weather.gov/stormready/.

612.f. TsunamiReady community (TRC)

The maximum credit for this element is 30 points.

TRC credit is provided to communities that have received a TsunamiReady designation from the NWS.



The TsunamiReady program is the NWS's counterpart to StormReady for communities that are exposed to a tsunami hazard. There are over 100 TsunamiReady communities in the

country. A community can participate in both programs and receive credit for both elements, SRC and TRC.

Credit Criteria for TRC

- (1) The activity credit criteria in Section 611.b must be met.
- (2) The community must be designated as a TsunamiReady community by the NWS either by the inclusion of its name on the TsunamiReady website or by being named in the award letter from the regional NWS office.
- (3) The community must meet the CRS tsunami hazards mapping requirements of element MTS, Mapping tsunami hazards, in Section 412.f(2) of the *Coordinator's Manual*.
- (4) The community must have adopted a tsunami hazards operations plan that describes the actions the community is to take upon receiving a tsunami warning.

Credit Points for TRC

TRC = 30, for being designated by the NWS as a TsunamiReady community and meeting all credit criteria

Impact Adjustment for TRC

There is no impact adjustment for TRC.

Documentation for TRC Provided by the Community

- (1) At each verification visit,
 - (a) A copy of the tsunami hazards map and a description of how it was prepared; and
 - (b) A copy of the tsunami emergency operations plan.

No documentation is required of communities to demonstrate their TsunamiReady credit. Credit is confirmed based on the list of TsunamiReady communities posted on the NWS website, www.tsunamiready.noaa.gov.

613 Impact Adjustment

The credit points for FTR, EWD, and FRO are adjusted based on the number of buildings affected by the element. Determining these adjustments usually will require identifying the area affected and then counting the buildings within that area.

$$(1) rFTR = \frac{bFTR}{bSF}$$

$$(2) rEWD = \frac{bEWD}{bSF}$$

$$(3) \text{ rFRO} = \frac{\text{bFRO}}{\text{bSF}}, \text{ where}$$

bFTR = the number of buildings that benefit from the level of the flood threat recognition system,

bEWD = the number of buildings that benefit from the flood emergency warnings,

bFRO = the number of buildings in the area covered by the flood response operations, and

bSF = the number of buildings in the Special Flood Hazard Area, and

bFRO cannot be greater than bEWD

bEWD cannot be greater than bFTR

rFTR cannot be greater than 1.00

See Section 301 for more information on counting buildings for impact adjustments. Note that bSF includes all buildings in the Special Flood Hazard Area (SFHA), but bFTR, bEWD, and bFRO can include buildings outside the SFHA that benefit from the flood warning and response plan. The maximum impact adjustment is 1.0. For example, a community with a plan for up to a category 5 hurricane may be providing a safety benefit for many buildings on ground higher than that flooded by the base flood.

In general, bFTR = bEWD = bFRO, because the flood warning and response plan will provide the same level of services to the same areas. There may be cases in which the flood threat recognition system covers a larger area than a detailed flood warning and response plan, so their impact adjustments are calculated separately.

Example 613-1.

The community in the previous examples has a warning and response program for its major river. It does not have a program for three small streams that affect a portion of its SFHA. There are 452 buildings within the community's SFHA. Its flood warning and response plan covers the 410 buildings that are in the major river's floodplain.

$$\text{bFTR, bEWD, and bFRO} = 410 \quad \text{bSF} = 452$$

$$\text{rFTR} = \frac{\text{bFTR}}{\text{bSF}} = \frac{410}{452} = 0.91 \quad \text{rEWD} = \frac{\text{bEWD}}{\text{bSF}} = \frac{410}{452} = 0.91$$

$$\text{rFRO} = \frac{\text{bFRO}}{\text{bSF}} = \frac{410}{452} = 0.91$$

614 Credit Calculation

The credit points for each element are multiplied by the impact adjustment ratios and the products are totaled.

$$c610 = (FTR \times rFTR) + (EWD \times rEWD) + (FRO \times rFRO) + CFP1 + CFP2 + SRC + TRC$$

Example 614-1.

The community's flood warning and response program is described in the previous sections' examples.

$$FTR = 75 \quad rFTR = 0.91$$

$$EWD = 75 \quad rEWD = 0.91$$

$$FRO = 65 \quad rFRO = 0.91$$

$$CFP1 = 25 \quad CFP2 = 0$$

$$SRC = 25$$

$$TRC = 0$$

$$c610 = (FTR \times rFTR) + (EWD \times rEWD) + (FRO \times rFRO) \\ + CFP1 + CFP2 + SRC + TRC$$

$$c610 = (75 \times 0.91) + (75 \times 0.91) + (65 \times 0.91) + 25 + 0 + 25 + 0 \\ = 68.25 + 68.25 + 59.15 + 25 + 25 + 0 \\ = 245.65 = 246 \text{ (rounded)}$$

615 For More Information

- a. Additional information, documentation checklists, reference materials, and examples can be found at www.CRSresources.org/600.
- b. *Flood Warning Systems Manual*. National Weather Service Manual 10-942. Operations and Services Hydrologic Services Program, NWSPD 10-9. 2010. Silver Spring, MD: Department of Commerce, NOAA, www.nws.noaa.gov/os/water/ahps/resources/Flood_Warning_Systems_Manual.pdf.
- c. CPG 101: *Developing and Maintaining State, Territorial, Tribal and Local Government Emergency Plans*. March 2009. Washington, D.C.: Federal Emergency Management Agency. www.fema.gov/pdf/about/divisions/npd/CPG_101_V2.pdf.

616 Related Activities under the Community Rating System

- Developing an appropriate outreach approach to the residents as required in Section 611.b(5) as part of a Program for Public Information can be credited under Activity 330 (Outreach Projects).
- FTR is similar to element LFR under Activity 620 and element DFR under Activity 630. It credits a system that provides the community with the earliest possible notification that a flood is imminent. The three threat recognition systems should be closely coordinated.
- EWD is similar to element LFW under Activity 620 and element DFW under Activity 630. It credits a flood warning dissemination system that provides a critical link between the recognition of an impending flood and the community's response to the emergency. The three warning dissemination systems should be closely coordinated.
- FRO is similar to element LFO under Activity 620 and DFO under Activity 630. It identifies opportunities to prevent loss of life and property damage during a flood. The three response operations plans should be closely coordinated.
- FRO6 credit should be coordinated with the public information activities credited as flood response preparations (FRP) under Activity 330 (Outreach Projects), regulations under Activity 430 (Higher Regulatory Standards), and mitigation measures under Activity 530 (Flood Protection).
- Documentation of the annual exercise is a prerequisite for Activities 610, 620, and 630. One exercise can meet all three activities' requirement.

620 LEVEES—Summary

Maximum credit: 235 points

622 Elements

- a. **Levee maintenance (LM):** Up to 95 points if the levee system is maintained and operated according to a written maintenance plan. There are no credit points for levees that are recognized on the community's adopted Flood Insurance Rate Map (FIRM), although documentation of annual inspection and maintenance is a prerequisite for any credit under this activity.
- b. **Levee failure threat recognition system (LFR):** Up to 30 points for having a system to advise the emergency manager when there is a threat of a levee's failure or overtopping.
- c. **Levee failure warning (LFW):** Up to 50 points for disseminating the warning to the public.
- d. **Levee failure response operations (LFO):** Up to 30 points for response actions to be undertaken to reduce or prevent threats to health, safety, and property.
- e. **Levee failure critical facilities planning (LCF):** Up to 30 points for coordination of actions with operators of critical facilities.

Credit Criteria

Credit criteria for this activity are described in Section 621.b.

- a. Credit is limited to levee systems that were designed and constructed as levee systems and are operated and maintained by a public agency.
- b. The community must submit a map showing the location of each levee and the areas that would be flooded if the levee were to fail or be overtopped.
- c. Annual inspections of the levee system must be conducted according to a written maintenance plan.
- d. The community must implement an annual outreach project to the residents and businesses in the area(s) that would be inundated if a levee were overtopped.
- e. To receive Activity 620 credit for LFR, LFW, LFO, and LCF, the community must receive some LM credit.
- f. To receive Activity 620 credit other than LM credit, the community must receive some credit in all four levee warning and response elements (LFR, LFW, LFO, and LCR), and
 - (1) There must be a levee failure flood warning and response plan that has been adopted by the community's governing body; and
 - (2) There must be an annual exercise of the plan and a lessons-learned report.

Each element has additional criteria specific to that element.

Impact Adjustment

The credits for LM, LFR, LFW, and LFO are adjusted based on the number of buildings affected by each element. There is no impact adjustment for LCF.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

620 LEVEES

The OBJECTIVE of this activity is to encourage communities to properly inspect and maintain levees and to identify impending levee failures in a timely manner, disseminate warnings to appropriate floodplain occupants, and coordinate emergency response activities to reduce the threat to life and property. This activity focuses on the community's emergency management actions and plans. Therefore, the emergency manager should be the point of contact, and he or she should coordinate with the agency responsible for the levee.

621 Background

The failure or overtopping of a levee poses extreme hazards to buildings, infrastructure, and people on the landward side of the levee.

Flood waters near a levee breach usually move at a much greater velocity than the water within the channel. The combination of high-velocity flows and rapidly rising water makes evacuation and other responses difficult or impossible. Sound emergency response plans for levee failures are critical, especially if evacuation routes would be restricted or severed.

Up to a certain point, a levee usually will prevent flooding to properties on its landward side. However, regardless of the design standard used, levees can and do fail. Someday there will be a flood that exceeds the levee's ability to hold flood waters, and when a levee is overtopped it is far more likely that it will suffer a catastrophic breach or failure as well. Even well-maintained levees can fail for a variety of reasons.

By doing everything possible to reduce the chance of levee failure and by being prepared for an event that could lead to a levee failure, a community can reduce the potential hazards to life, health, and property.

Definition of a Levee

A levee is a structure, usually an earthen embankment, designed and constructed using sound engineering practices, to contain, control, or divert flood waters in accordance with a designated risk reduction level.

See Section 120 (Glossary).

621.a. Activity Description

The maximum credit for Activity 620 is 235 points.

The items credited by this activity include

- Proper maintenance of the levees (credited under LM),
- A system to advise local emergency managers of a potential levee failure or overtopping (credited under LFR),
- A warning system for people on the landward side of the levee (credited under LFW),

- A plan of action to minimize the threat to life and property during the flood (credited under LFO), and
- Coordination with critical facility operators (credited under LCF).

For levee maintenance credit, a community must implement a levee maintenance plan, create and maintain an inventory of levees, identify the vulnerable population and at-risk structures, and conduct an annual outreach project to advise the vulnerable population.

Levee maintenance (LM) credit is a prerequisite for the four emergency preparedness and response elements (LFR, LFW, LFO, and LCF), which are based on the community's adopted levee failure warning and response plan. This activity is not intended to be a model for developing a levee failure warning and response plan or program. As with the rest of the Community Rating System (CRS) activities, its objective is to provide a way to measure a local program's potential impact on life safety, health, and property damage. An effective program needs to be carefully prepared and tailored to the local hazards and the specific needs of the community.

621.b. Activity Credit Criteria

Credit for this activity is based on levee systems, i.e., the levee structure plus all appurtenant facilities, such as pump stations and flood walls, that are needed to control flood waters. To receive credit under this activity,

- (1) The levee system(s) for which the community requests credit (or qualification for credit) must have been designed and constructed as a levee (see Section 120, Glossary). Structures such as road and railroad embankments that divert flood waters are not considered "levees" for the purposes of this activity unless it can be documented that they were intended to be levees and were designed and constructed accordingly.
- (2) The levee system(s) for which the community requests credit (or qualification for credit) must be operated and maintained by a public agency. This could be a federal or state agency, a levee district, an office or department of the community, or other public entity.
- (3) The community must submit a map showing the location of each levee or levee system and the areas that would be flooded if the levee or levee system were to be overtopped or fail

Emergency Action Plans and Levee Failure Warning and Response Plans

A levee EMERGENCY ACTION PLAN is prepared and implemented by the LEVEE OWNER OR OPERATOR. It includes actions such as closing openings and patrolling for problems along the levee. It may have another name, such as a levee operations plan.

A LEVEE FAILURE WARNING AND RESPONSE PLAN is prepared and implemented by the LOCAL EMERGENCY MANAGEMENT AGENCY. It specifies actions to take to protect people and property in the flood-prone area, such as ordering an evacuation.

Non-Levee Structures

Non-levee structures, such as roads and railroad embankments, pose the same hazards as levees and are more likely to fail. Communities are urged to mitigate these hazards by paying special attention to emergency preparedness and response for buildings on the landward side of these structures.

and an inventory of the buildings and critical facilities that would be flooded upon overtopping or failure. For each levee or levee system, the following information must be submitted:

- (a) The elevation at which the levee is expected to be overtopped or the expected breach elevation. Newer levee systems may include extra levee height to ensure overtopping at a predefined location. Older designs often use freeboard, which may vary along the system;
- (b) A map of the levee or levee system and the area(s) affected should the levee(s) fail or be overtopped. If there are no detailed levee breach maps or levee failure studies, then the map would show the area below the expected overtopping elevation. Guidance for this mapping can be found in Section 621.c;
- (c) An inventory of the types of buildings (residential, commercial, etc.) exposed to flooding should the levee(s) be overtopped or fail, with an approximate count of the number of buildings and an inventory of the land use (residential, agricultural, open space, etc.) of developed and undeveloped areas in the area(s) affected should the levee(s) fail or be overtopped; and
- (d) A list of the critical facilities that would be flooded or otherwise affected by a failure or by the overtopping of the levee (see Section 622.e, LCF1).

This credit criterion is a prerequisite for Class 4 communities.

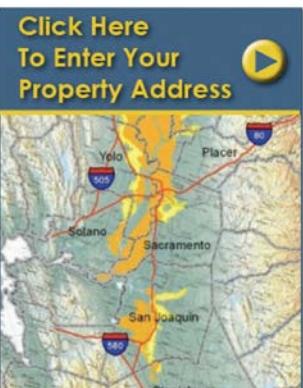
- (4) The community must have a levee maintenance plan that includes annual inspections and an emergency action plan for the levee system(s), and the plans must meet the credit criteria for LM. There are no LM CREDIT POINTS for levees shown on the effective FIRM as providing protection (e.g., accredited levees), or levees owned and operated by a federal agency, but all levees must qualify for LM credit in order for the community to receive credit for the rest of the elements in this activity.

Dear Property Owner:

Your property is located behind a State-Federal project levee. According to our records, your property located at [REDACTED] may be exposed to potential flood risk from the [REDACTED]. Your property may also be at risk for flooding from other sources not identified in this notice, such as creeks and local storm drains.

Visit www.water.ca.gov/myfloodrisk and enter your property address to find the areas subject to flooding if State-Federal project levees should fail, and to get information on the condition of the levees.

Be aware of your flood risk and be prepared. Read this notice for important information about purchasing flood insurance, emergency planning, and protecting your property.



Consider these facts:

Excerpt from the annual outreach project sent by the California Department of Water Resources to residents of leveed areas.

- (5) The community must implement one or more annual outreach projects to the residents and businesses in the area(s) expected to be inundated by a flood that overtops a levee. The project(s) must tell people about their risk of flooding, how they will be warned of a levee-failure flood, the safety measures they should take during a flood (e.g., evacuation procedures and routes), and the benefits of purchasing flood insurance. This can be done by using one or more of the following approaches:
- (a) Sending an outreach project (e.g., a letter, brochure, or newsletter) each year to all properties with insurable buildings in the area(s) subject to a flood that overtops the levee, or
 - (b) Developing an appropriate approach as part of a Program for Public Information credited Activity 330 (Outreach Projects).
- (6) To receive credit beyond LM credit, the community must obtain some credit in all four levee failure warning and response elements (LFR, LFW, LFO, and LCF).
- (7) The community must have a levee failure flood warning and response plan that has been adopted by the community's governing body to receive LFR, LFW, LFO and LCF credit. The levee failure flood warning and response plan should be part of, and must meet the same criteria as, the community's flood warning and response plan described in Section 611.b(4).
- (8) There must be at least one exercise or drill of the levee failure warning and response plan each year. This can be an exercise for a flood, levee failure, dam failure, or hurricane. This criterion can be met if the plan is implemented in response to an actual flood or threat of a levee failure. In either case, there must be an evaluation of the performance of the plan and recommended changes that may be needed, as is usually done in an after-action report.

621.c. Map of the Affected Area

Credit criterion Section 621.(b)(3)(b) calls for a map that is used to identify the area affected should the levee fail, be breached, or be overtopped. This map is central to CRS credit for this activity. It can help determine the building inventory (Section 621.(b)(3)(c)), the addresses that get the outreach project (Section 621.b(5)), and the impact adjustment factors (Section 623).

Annual Warning and Response Exercise

Activities 610 (Flood Warning and Response), 620 (Levees), and 630 (Dams) require an annual exercise or drill of the warning and response plan. A flood, levee failure, dam failure, or hurricane exercise qualifies as an exercise for all three activities.

An evaluation of the performance of the warning and response plan must include

- A description of the exercise;
- An evaluation of the
 - Threat recognition procedures,
 - Warning dissemination, and
 - Response operations; and
- Recommended changes to the plan.

The exercise requirement can also be met if the community responds to an actual flood or an actual threat of a levee or dam failure, provided that the items listed above are discussed in an after-action (or similar) report.

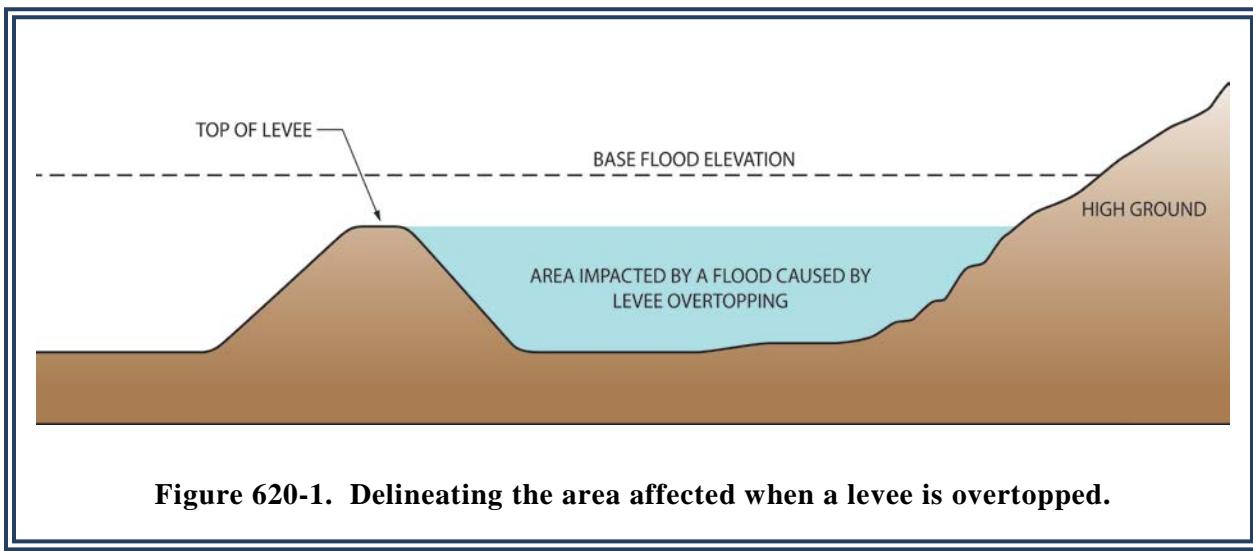


Figure 620-1. Delineating the area affected when a levee is overtopped.

This map is not necessarily the map (or series of maps) the community uses in its flood warning and response plan, which is credited in Sections 622(b)–(d). A community should develop a warning and response plan based on different flood level scenarios, including levee breaks at elevations lower than the overtopping level.

The criteria for an affected area map is the same for levees that have been accredited and those that have not been recognized on a Flood Insurance Rate Map (FIRM). There are two ways the map can be prepared:

- (1) If the community or levee agency has an engineering study that identified the area affected by a levee breach or overtopping, that map can be used. Note that such studies often have more than one scenario. The total area flooded by all the scenarios should be used for the affected-area map.
- (2) In the absence of an engineering study on areas that would be flooded by a levee failure or levee overtopping, the affected area is all land below the elevation of the top of the levee. Figure 620-1 identifies such an area where the top of the levee is lower than the base flood elevation. Where the top of the levee is higher than the base flood elevation, the same approach is used and the affected area would be larger than the Special Flood Hazard Area.

Communities that have levee breach analyses are encouraged to use the larger levee overtopping area to determine the addresses for the outreach project. It is a safer standard for identifying the properties potentially affected by a worst case/deepest flooding situation.

622 Elements

622.a. Levee maintenance (LM)

The maximum credit for this element is 95 points.

LM credit is provided for the levee system's maintenance program and emergency action plans.

A levee system (the levee structure plus all appurtenant facilities) is only as good as its weakest part. An operations and maintenance plan needs to include an inspection process that identifies openings or potential weak points in the levee. Equipment to close these openings needs to be checked and tested and instructions that define roles and responsibilities need to be put in place before the levee is threatened by a flood. All of these items are vital to good maintenance and are credited in this element.

LM credit is provided in two ways:

- (1) LM1 credit is provided for the annual inspection and maintenance of the levee system to identify and correct problems as required in a maintenance plan; and
- (2) LM2 credit is provided for the levee agency's emergency action plan. This credit is for having a written operations plan or manual that describes what must be done when a flood occurs by the agency that owns the levee. The plan may be in the same document as the LM1 maintenance plan.

Levees that are shown by the Federal Emergency Management Agency (FEMA) on the effective FIRM as providing protection to the base flood (e.g., accredited levees) are not eligible for CREDIT POINTS under LM, because they are already required to have an adequate maintenance program as a condition of being shown on the FIRM as providing protection. There are no LM credit points for a levee owned or operated by a federal agency. However, communities can receive credit points for their levee failure warning and response plans (LFR, LFW, LFO, and LCF credit) for the areas protected by accredited or federally owned or operated levees.

To receive credit points for a levee failure warning and response plan, the levee must be shown to "qualify" for LM credit. All levees must "qualify," but the credit points for LM are limited to non-accredited and non-federal levees.

Credit Criteria for LM

- (1) The activity credit criteria in Section 621.b must be met.
- (2) The community must receive some credit for both LM1 and LM2 to receive any LM credit.
- (3) To qualify for LM1 credit, the levee system maintenance must
 - (a) Ensure that the levee system's stability, height, and overall integrity are maintained. Encroachments must be controlled to ensure that they do not compromise the levee's

integrity, hinder operations and maintenance, and/or diminish the ability to engage in flood fighting activities. Maintenance programs must correct problems posed by existing encroachments.

- (b) Provide written operations and maintenance procedures that include
 - (i) Annual inspections of the condition of the levee system (i.e., the levee structure, pump stations, closure devices, etc.);
 - (ii) The maintenance activities to be performed;
 - (iii) The frequency of their performance; and
 - (iv) The person responsible for their performance (by name or title).
 - (c) Perform and document annual inspections and needed maintenance of levees and floodwalls, as well as pumps, interior drainage systems, closures, penetrations, and transitions that provide for system integrity.
- (4) To qualify for LM2 credit, the emergency action plan must have a written operations plan or manual that describes what must be done by the agency that owns the levee when a flood occurs. It must include
- (a) A list of all actions that need to be taken at different flood levels, including
 - (1) Procedures to notify the local emergency managers of a potential problem,
 - (2) All openings and closures that need to be closed and the location of the equipment and materials to effect the closure, and
 - (3) Periodic patrols of the levee to detect problems such as erosion and seepage;
 - (b) The person or office responsible for their performance (by name or title);
 - (c) Annual inspections of all equipment and material needed for the plan, such as vehicles and stockpiled sandbags; and
 - (d) Annual tests of all closures, pumps, and other equipment needed to implement the emergency action plan. Any equipment that is used routinely throughout the year, such as vehicles and drainage pumps, do not need testing records for CRS credit.
- The plan may be in the same document as the LM1 maintenance plan.
- (5) The community's levee maintenance program must be compliant with applicable federal environmental and historic preservation laws and executive orders (see Section 507). The community and/or levee owners must complete CC-620EHP, Certification of Compliance with Environmental and Historic Preservation Requirements for Levee Maintenance, which can be found in Appendix F of downloaded

Environmental Protection and Historic Preservation

Because it is a FEMA program, the CRS must ensure that activities for which it provides credit are compliant with applicable federal environmental and historic preservation laws and executive orders. Section 507 expands on this requirement and presents a summary of FEMA's policy. Figure 500-5 lists the federal programs that should be considered during project development.

from www.CRSresources.org/200. Credit is not provided if levee maintenance procedures are not compliant with applicable federal laws and executive orders.

Credit Points for LM

$$LM = LM1 + LM2$$

LM1 = up to 50 points, for the levee system maintenance;

LM2 = up to 45 points, for the levee system emergency action plans.

Impact Adjustment for LM

The impact adjustment for the activity is described in Section 623.

Documentation for LM Provided by the Community

(1) At each verification visit,

- (a) The needed documentation for this activity is assembled by the ISO/CRS Specialist and provided to the technical reviewer. There is a checklist to help the emergency manager identify all needed documentation available at www.CRSresources.org/600.
- (b) The map and inventory of buildings described in credit criterion (3) in Section 621.b.
- (c) The LM1 maintenance procedures described in credit criterion (3)(b) in Section 622.a, or documentation that the procedures have been approved by FEMA as meeting PM 63 requirements or approved by the U.S. Army Corps of Engineers.
- (d) The LM2 emergency action plan described in credit criterion (4) in Section 622.a, or documentation the plan has been approved by FEMA as meeting PM 63 requirements or approved by the Corps of Engineers.
- (e) Completed Community Certifications of Compliance with Environmental and Historic Preservation Requirements for Levee Maintenance (CC-620EHP) from all levee owners, which can be found in Appendix F.

(2) At each verification visit and with the annual recertification,

- (a) Documentation that all levees to be credited have been inspected during the previous year and are being maintained in accordance with the procedures and standards of the LM1 maintenance plan (credit criterion (3)(c) in Section 622.a).
- (b) Records showing the most recent annual inspection of all equipment and material needed for the LM2 emergency action plan (credit criterion (4)(c) in Section 622.a).
- (c) Records showing the most recent annual test of all closures, pumps, and other equipment needed to implement the LM2 emergency action plan (credit criterion (4)(d) in Section 622.a).

- (d) A copy of the outreach materials used to advise people of the levee failure hazard and ways to protect themselves from flooding (credit criterion (5) in Section 621.b). If the outreach material is also credited under Activity 330 (Outreach Projects), a separate submittal is not needed, provided that the other document (including a PPI, if used) is annotated to show where the Activity 620 outreach topics are covered.

NOTE: There is a checklist to help the emergency manager identify all needed documentation, available at www.CRSresources.org/600.

622.b. Levee failure threat recognition system (LFR)

The maximum credit for this element is 30 points.

LFR credit is provided for monitoring flood conditions near the levee. LFR credit is separate from flood threat recognition credit in Activity 610 (FTR), but the levee failure threat recognition system should be closely coordinated with the FTR system.

The more lead time that a community has, the more that can be done to reduce hazards associated with a flood. Although a levee may fail suddenly, overtopping is more predictable. There may be some advance indications of a potential levee failure, such as seepage and sand boils. Therefore, there are two key aspects of a levee failure threat recognition system that would provide the early notification needed by emergency managers to issue timely warnings and implement their flood response operations.

- (1) Monitoring flood conditions (LFR1): When flood levels reach (or are predicted to reach) certain heights, specific actions should be initiated, such as mobilizing patrols or opening the emergency operations center.
- (2) Monitoring levee conditions (LFR2): This is done with patrols (on the ground or from the air) and checking known problem sites during a flood.

Credit Criteria for LFR

- (1) The activity credit criteria in Section 621.b must be met.
- (2) The threat recognition procedures must be in the levee failure warning and response plan or a related document (credit criterion (7) in Section 621.b).
- (3) To receive LFR credit, some credit points must be obtained under both LFR1 and LFR2.
- (4) For monitoring flood conditions and LFR1 credit:
 - (a) The community and the levee owner must have a flood threat recognition system that monitors conditions. This would be a system that provides early notification of rising waters that may threaten the levee's integrity. The system must meet the credit criteria of FTR in Activity 610 (Flood Warning and Response). A National Weather Service flood potential outlook or flood watch would also be sufficient.
 - (b) Additional credit is provided for redundant or backup monitoring systems along a levee that send a signal to the emergency manager if water is rising on the landward side of

the levee. This system could use automated flood alarms or automated flood warning systems, or it could rely on trained spotters.

- (c) The equipment used for the flood monitoring must be tested at least annually. For CRS credit, testing records are not needed for equipment that is used routinely throughout the year, such as radios and vehicles.
- (5) For LFR2 credit, the community and/or the levee owner must initiate the monitoring of levee conditions when certain, pre-defined flood conditions are present, and
- (a) The monitoring procedures must cover
 - Levee patrol staffing and assigned sections of the levee system,
 - How and when the patrol teams are activated,
 - What the patrols are to look for in the different sections,
 - Methods and frequency for reporting, and
 - How the community's emergency managers are kept posted on the situation.
 - (b) The procedures for monitoring levee conditions must be exercised at least once each year, in accordance with credit criterion (8) in Section 621.b.

Credit Points for LFR

LFR = the total of LFR1 and LFR2, up to the maximum of 30 points

LFR1 = the sum of

- (a) 10 points, for monitoring flood conditions, and
- (b) 5 points, for monitoring flood conditions along the levee

LFR2 = up to 15 points, for monitoring levee conditions

Impact Adjustment for LFR

The impact adjustment for the activity is described in Section 623.

Documentation for LFR Provided by the Community

- (1) At each verification visit,
 - (a) The levee failure warning and response plan or related document that describes the threat recognition procedures (credit criterion (2) in Section 622.b) and credit criterion (7) in Section 621.b. The plan or related document must be marked to show where the credited items appear.
 - (b) An impact adjustment map showing the area(s) affected by each element and documentation showing how the numbers of buildings used in the calculations were

determined (credit criteria (3)(b) and (3)(c) in Section 621.b and Section 623 impact adjustment).

(2) At each verification visit and with the annual recertification,

- (a) Records showing the most recent annual test of all equipment and material needed for the system (credit criterion (4)(c) in Section 622.b).
- (b) A description of the exercise, drill, or response to an actual emergency or disaster conducted during the previous year (credit criterion (8) in Section 621.b). The exercise must include the procedures for monitoring levee conditions, if they are credited.

NOTE: There is a checklist to help the emergency manager identify all needed documentation, available at www.CRSresources.org/600.

622.c. Levee failure warning (LFW)

The maximum credit for this element is 50 points.

LFW credit is provided for disseminating warnings of a potential levee failure to the public. The warning program for LFW credit should be closely coordinated with the flood warning dissemination activities credited in Section 612.b (EWD).

Once the levee failure flood threat recognition system tells local emergency managers what will be flooded and when, warnings should be issued to the affected populations. The messages that need to be conveyed and the timing for delivering them should be thought out in advance, as part of the levee failure warning and response plan.

The messages should state when flooding is predicted to occur, its expected severity, and appropriate response actions (e.g., evacuation routes, safe shelters, protective actions). The messages should be drafted in coordination with the messages and projects credited under flood response preparations (FRP) under Activity 330 (Outreach Projects).

Special warning arrangements for schools, nursing homes, and other critical facilities are also credited under LCF.

In general, this warning and protective action notification process (using pre-scripted message templates) falls into three time periods:

- (a) **Warning delay time** is the period between the time at which a threat is first detected or an emergency manager is first notified of the threat and the time at which the first alert/warning is issued.
- (b) **Warning diffusion time** is the period between the issuance of the first alert/warning and the time at which people receive the alert/warning.
- (c) **Protective action initiation time** is the period after people receive the first alert/warning up to the point at which they begin protective action. During this period, most people take a range of actions to prepare to implement a protective action and may receive subsequent warning messages.

Credit Criteria for LFW

- (1) The activity credit criteria in Section 621.b must be met.
- (2) The warning procedures must be included the levee failure warning and response plan or a related document (credit criterion (7) in Section 621.b).
- (3) The warning must reach people in a timely manner, especially because there may not be much lead time between a sudden levee failure and the moment when water reaches homes and businesses. For example, television or radio announcements are not credited if they are the only approach used because the failure may occur during the night.
- (4) For those warning systems requiring specialized equipment, such as sirens, the equipment and procedures must be tested at least annually. Equipment that is used routinely throughout the year, such as television notices and message boards, does not need testing records for CRS credit.

Credit Points for LFW

LFW = the total of the following, up to the maximum of 50 points

LFW1 = 5 points, if the plan includes pre-scripted messages and guidance for staff to quickly issue appropriate warnings keyed to specific triggers, such as when the river reaches a certain level, or when sand boils appear

LFW2 = 5 points, if the public messages include information on the expected elevation of the flood waters and instructions on when to evacuate

LFW3 = 10 points if an outdoor voice-sound system or fixed siren system is used

LFW 4 = EITHER

(a) 2 points if the plan identifies the primary and support agencies responsible for door-to-door or mobile public address warning, OR

(b) 10 points, if the plan identifies the routes, procedures, staff, and equipment necessary for door-to-door or mobile public address warning

LFW 5 = 10 points, if the Emergency Alert System through all channels/stations with pre-scripted draft messages is used

LFW 6 = 10 points, if telephone warnings to residents and businesses are used

LFW 7 = 10 points, if all schools, hospitals, nursing homes,

prisons, and similar facilities that need flood warning have NOAA Weather Radio receivers and at least one other automated backup system for receiving flood warnings, provided that the community has coordinated with NOAA and there are arrangements for issuing warnings about levee failures

Impact Adjustment for LFW

The impact adjustment for the activity is described in Section 623.

Documentation for LFW Provided by the Community

(1) At each verification visit,

- (a) The levee failure warning and response plan or related document that describes the emergency warning procedures (credit criterion (2) in Section 622.c and credit criterion (7) in Section 621.b). The plan or related document must be marked to show where the credited items appear.

(2) At each verification visit and with the annual recertification,

- (a) Records showing the most recent annual test of all equipment and material needed for the system (credit criterion (4) in Section 622.c).
- (b) A description of the exercise, drill, or response to an actual emergency or disaster conducted during the previous year (credit criterion (8) in Section 621.b). The exercise must include the procedures for warning people credited under this element.

NOTE: There is a checklist to help the emergency manager identify all needed documentation, available at www.CRSresources.org/600.

622.d. Levee failure response operations (LFO)

The maximum credit for this element is 30 points.

LFO credit is provided for the development of levee failure response operations that identify flood response scenarios, responsibilities, special need populations, and necessary resources. The operations should be closely coordinated with the flood response operations credited in Section 611.c (FRO).

The National Incident Management System (NIMS) requires local governments to validate the inventory of response assets using FEMA Resources Typing Standards. Department heads and other emergency response team members should know what kinds of resources they have available. This should be compared with the resources needed. Shortfalls may require negotiating agreements with private suppliers or other jurisdictions.

Levee failure response operations need to be spelled out in the levee failure warning and response plan. They include appropriate actions to be implemented when flooding due to the

levee failure threatens or actually occurs. The actions are conducted by the community and other cooperating agencies and organizations.

Developing scenarios can help this process. Scenarios are produced by thinking through what will happen in the community if a levee fails or is overtopped. For example, where will the water go? who will get flooded? who will lose access because of high water? and which critical facilities will be affected? These sorts of questions, and the scenarios developed by thinking about them, help with the design of the response operations to minimize the threats to life and property at those flood levels.

Two types of operations should be in the plan.

(1) Levee protection operations: These are actions taken to prevent or limit a levee's failure due to flood waters and/or from overtopping. The levee agency is usually the lead on levee protection operations, but the community likely will need to provide resources and support. These actions are often called "flood fighting" and can include

- Sandbagging the top of the levee,
- Sandbagging and other measures to restrict sand boils, and
- Measures taken to limit erosion on the toe of the levee.

(2) Community protection operations: These are actions to minimize the loss of life and property damage in the area flooded when the levee fails or is overtopped. They should be similar to, and even a part of, the flood response operations credited in Section 612.c (FRO). They can include

- Ordering an evacuation of the threatened area,
- Controlling traffic in and out of the flooded area, and
- Opening evacuation shelters.

Credit Criteria for LFO

- (1) The activity credit criteria in Section 621.b must be met.
- (2) The levee failure response operations actions must be in the levee failure warning and response plan or a related document (credit criterion (7) in Section 621.b).
- (3) Levee protection operations actions must be closely coordinated with the levee emergency action plan credited under Section 622.a (LM2).
- (4) Credit is based on the extent and level of detail that the levee failure warning and response plan provides for the response operations. General statements or an assignment of responsibilities with no specifics about what is done are not credited. For full credit for LFO, the plan needs to
 - (a) Describe the actions to be taken,
 - (b) Identify the office or official responsible for the action,

- (c) Define the time needed to carry out the activity, and
 - (d) Contain other critical information that designated agencies and organizations need in order to perform their assigned responsibilities.
- (5) LFO4 credit is provided if there is a list of the personnel, equipment, facilities, supplies, and other resources needed to complete each task. For full credit, the list must identify what is available within the community and what is needed from private suppliers or other jurisdictions.

Credit Points for LFO

LFO = the total of the following, up to the maximum of 30 points

LFO1 = 10 points, if the community has developed scenarios that review what could happen if the levee were to fail or be overtopped by a flood

LFO2 = 10 points, if the plan identifies response tasks and responsible community staff and other public and private organizations with responsibilities related to the response tasks in the plan

LFO3 = 5 points, for maintaining a data base of people with special needs who require evacuation assistance when a levee failure warning is issued and for having a plan to provide transportation to secure locations

LFO4 = the sum of the following:

- (a) 5 points, if the plan includes a summary of estimated staff, equipment, supplies, and time required for each response task, and
 - (b) 5 points, for identification of the sources of necessary resources
-

Impact Adjustment for LFO

The impact adjustment for the activity is described in Section 623.

Documentation for LFO Provided by the Community

(1) At each verification visit,

- (a) The levee failure warning and response plan or related document that describes the operations and actions credited above (credit criterion (2) in Section 622.d) and credit criterion (7) in Section 621.b). The plan or related document must be marked to show where the credited items appear.

- (2) At each verification visit and with the annual recertification,
 - (a) A description of the exercise, drill, or response to an actual emergency or disaster conducted during the previous year (credit criterion (8) in Section 621.b). The exercise must include the actions credited under this element.

NOTE: There is a checklist to help the emergency manager identify all needed documentation, available at www.CRSresources.org/600.

622.e. Levee failure critical facilities planning (LCF)

The maximum credit for this element is 30 points.

LCF credit and planning should be closely tied to the critical facilities coordination done under Section 612.d (CFP).

LCF1 credit is provided for having information in the community's levee failure response plan about all critical facilities that could be affected by a levee failure. In general, facilities not subject to flooding during a levee failure do not need to be addressed, although in some cases loss of access can cause a critical situation. There may also be facilities in flood-free sites that are needed to support the flood response effort.

Additional credit is provided in LCF2 if levee failure warning and response plans for individual critical facilities have been developed, reviewed, or accepted by the community.

Credit Criteria for LCF

- (1) The activity credit criteria in Section 621.b must be met.
- (2) LCF1 is a prerequisite for any LCF credit.
- (3) For LCF1 credit, the community's levee failure response plan must list the facilities considered critical in a levee failure emergency. The community must contact the facilities to determine whether they need any special warning arrangements. The community does not need to provide a special warning to all critical facilities, only to those identified in the levee warning and response plan as needing one.

There is no impact adjustment for LCF1. The community must include all critical facilities affected by a levee failure on its list.

- (4) For LCF2 credit, levee failure warning and response plans must have been developed, reviewed, or accepted by the community for individual critical facilities.

Credit Points for LCF

LCF = the total of the following

LCF1 = up to 15 points, if the adopted plan includes

- (a) a list of the facilities considered critical in a levee failure emergency (5 points)
- (b) contact information, including the names and phone numbers of the operators of all public and private critical facilities affected by levee failure (5 points)
- (c) arrangements for issuing special warnings or early notifications directly to those critical facilities that need advance warning (5 points)

LCF2 = up to 15 points, if critical facilities listed under LCF1 have their own levee failure response plans that have been developed, reviewed, or accepted by the community. The credit is prorated based on the percentage of affected critical facilities that have creditable plans

Impact Adjustment for LCF

There is no impact adjustment for LCF.

Documentation for LCF Provided by the Community

(1) At each verification visit,

- (a) A list of all public and private critical facilities that would be affected by levee failure or that would need to be operational during a levee-failure flood.
- (b) Contact information (names and phone numbers) of the operators of the facilities on the above ((1)(a)) list.
- (c) The above ((1)(a)) list of critical facilities, marked to identify those needing special warning or advance notification.
- (d) [For LCF2 credit] The above ((1)(a)) list of critical facilities, marked to identify those that have developed their own flood warning and response plans that have been reviewed and accepted by the community. The ISO/CRS Specialist will ask for samples of the plans for review.

NOTE: There is a checklist to help the emergency manager identify all needed documentation, available at www.CRSresources.org/600.

(2) With the annual CRS recertification,

- (a) A page from the latest list of the critical facilities provided for LCF1, which must be updated at least annually.
- (b) A copy of the annual exercise of the plan and a lessons-learned report.

623 Impact Adjustment

There is no impact adjustment for LCF. The community must include all critical facilities affected by a levee failure on its list.

The credit points for LM, LFR, LFW, and LFO are adjusted based on the number of buildings affected by the element. Determining these adjustments requires identifying the area affected and then counting the buildings within that area. Identifying the affected area is described in Section 621.c, Map of the Affected Area.

Counting buildings for an impact adjustment is discussed in Section 302.

$$(1) rLM = \frac{bLM}{bLF}$$

$$(2) rLFR = \frac{bLFR}{bLF}$$

$$(3) rLFW = \frac{bLFW}{bLF}$$

$$(4) rLFO = \frac{bLFO}{bLF}, \text{ where}$$

bLM = the number of buildings in the area affected by a flood resulting from a failure of the levee being maintained,

$bLFR$ = the number of buildings that benefit from the levee failure threat recognition system,

$bLFW$ = the number of buildings that benefit from the levee failure flood warnings,

$bLFO$ = the number of buildings in the area covered by the levee failure response operations actions, and

bLF = the total number of buildings in the community affected by levee failure as shown on the affected-area map (Section 621.c)

$bLFO$ cannot be greater than $bLFW$
 $bLFW$ cannot be greater than $bLFR$

bLFR cannot be greater than bLM
rLM cannot be greater than 1.0

624 Credit Calculation

$$c620 = (LM \times rLM) + (LFR \times rLFR) + (LFW \times rLFW) \\ + (LFO \times rLFO) + LCF1 + LCF2$$

625 For More Information

- a. Additional information, documentation checklists, reference materials, and examples can be found at www.CRSresources.org/600.
- b. Levee mapping and public information materials are available on FEMA's website, <http://www.fema.gov/living-levees-its-shared-responsibility>.
- c. Each district of the Corps of Engineers has expertise in levee construction, maintenance, and flood fighting. See www.usace.army.mil/Locations.aspx.
- d. The California Department of Water Resources has special programs for leveed areas in the Central Valley, including an outreach project. www.water.ca.gov/myfloodrisk.
- e. The American Society of Civil Engineers (ASCE) has a booklet for residents in leveed areas, "So, You Live Behind a Levee!" it is available at <http://ascelibrary.org/doi/book/10.1061/9780784410837>.

626 Related Activities under the Community Rating System

- A community that develops an appropriate approach to the outreach to residents required in Section 621.b(5) as part of a Program for Public Information can be credited under Activity 330.
- LFR is similar to element FTR under Activity 610 and to element DFR under Activity 630. It credits a system that provides the community with the earliest possible notification that a flood is imminent. The three threat recognition systems should be closely coordinated.
- LFW is similar to element EWD under Activity 610 and element DFW under Activity 630. It credits a flood warning dissemination system that provides a critical linkage between the recognition of an impending flood and the community's response to the emergency. The three warning dissemination systems should be closely coordinated.

- LFO is similar to element FRO under Activity 610 and element DFO under Activity 630. It identifies opportunities to prevent loss of life and property damage during a flood. The three response operations plans should be closely coordinated.
- LCF is similar to credits under Activity 610 and 630 because it requires the maintenance of a current list of critical facilities in potential levee inundation areas, the maintenance of up-to-date contact information for each critical facility, and having plans for warning each critical facility in a timely manner.
- Documentation of the annual exercise is a prerequisite for Activities 610, 620, and 630. One exercise can meet the requirements for all three activities.

630 DAMS—Summary

Maximum credit: 160 points

632 Elements

- a. **State dam safety program (SDS):** Up to 45 points based on the credit for the state's program.
- b. **Dam failure threat recognition system (DFR):** Up to 30 points for having a system to advise the emergency manager when there is a threat of a dam failure.
- c. **Dam failure warning (DFW):** Up to 35 points for disseminating the warning to the public.
- d. **Dam failure response operations (DFO):** Up to 30 points for planning and practicing specific tasks to be undertaken to reduce or prevent threats to health, safety, and property.
- e. **Dam failure critical facilities planning (DCF):** Up to 20 points for coordination of dam failure warning and response activities with operators of critical facilities.

Credit Criteria

Overall criteria for this activity are described in Section 631.b.

- a. There must be at least one insurable building within the community that is subject to inundation from the failure of a high-hazard-potential dam for SDS and other credit under this Activity.
- b. The community must have a description of the dam failure threat and a dam failure inundation map.
- c. To receive any Activity 630 credit other than SDS, the community must receive some credit in each of the elements DFR, DFW, DFO, and DCF.
- d. There must be an adopted dam failure warning and response plan.
- e. There must be one or more annual outreach projects on the warning and safety precautions.
- f. There must be an annual exercise of the plan with a lessons-learned report.

Each element has additional criteria specific to that element.

Impact Adjustment

There is no impact adjustment for the state dam safety program (SDS). The credit for DFR, DFW, and DFO is adjusted based on the number of buildings in the community that would be affected by the failure of a high-hazard-potential dam. There is no impact adjustment for DCF.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

630 DAMS

The OBJECTIVES of this activity are to encourage states to provide dam safety information to communities and to encourage communities, in turn, to provide timely identification of an impending dam failure, disseminate warnings to those who may be affected, and coordinate emergency response activities to reduce the threat to life and property.

This activity focuses on public safety and the community's emergency management actions and plans. Therefore, the local emergency manager must be the point of contact and he or she should coordinate with the dam owner(s).

Every dam has an inherent risk of failure, a fact not generally recognized by the public. The risk associated with dams tends to change along with the evolving environment that surrounds them.

631 Background

The legal definition of a “dam” for regulatory purposes varies from state to state. A dam may be as low as 5 feet, with an impoundment of no more than 5 acre-feet of water, or it may be 100 feet high, creating a recreational reservoir. For the purposes of this activity, a “dam” is a structure regulated by the state’s dam safety office.

This activity focuses less on the dam structure itself and more on the impact of a flood that would result from a breach or failure of that structure.

Unlike levees, dams do not need flood conditions to fail. They can be breached with little or no warning and send a wall of water downstream. The combination of high velocity, great depth, and short notice has proven particularly deadly and destructive. The most-recognized way to minimize the dam failure hazard is to enforce dam construction and maintenance standards, usually through a state dam safety program.

In addition to dam failures, normal operations of dams may cause unusual flooding situations downstream. Dams normally have operations plans to deal with unusual circumstances, including excessive runoff into the dam and the occasional need to lower the reservoir level.

Because of the threat of flooding from dam failure or dam operations, the Community Rating System (CRS) credits cooperation among state dam safety officials, dam owners and operators, and local emergency managers. Credit is for state and local dam safety programs that

- Help make the needed information available,
- Improve communications among operators of the dams and downstream communities, and
- Develop warning and response plans for dam failures.

The credit is keyed to addressing the areas at risk from the failure of a high-hazard-potential dam. A “high-hazard-potential dam” is one for which failure or operational errors will probably cause loss of human life downstream. Communities must contact their state dam safety office to determine if they are affected by such a dam.

Communities are encouraged to address other dams whose failure could cause loss of life or property damage.

This activity is not intended to be a model for developing a dam failure warning and response plan program. As with the rest of the CRS activities, its objective is to provide a simple way to measure a local program’s potential impact on life safety, health, and property damage. An effective program needs to be carefully prepared and tailored to the local hazards and the specific needs of the community.

631.a. Activity Description

The maximum credit for Activity 630 is 160 points.

This activity provides credit to communities that would be affected by the failure of an upstream high-hazard-potential dam. State definitions of a high-hazard-potential dam vary, and may include potential damage to buildings or property. However, all state definitions of high-hazard-potential dams include or refer to probably loss of life if there is a failure of the dam.

Credit is provided under five elements:

- The state’s dam safety program that sets construction, maintenance, and data provision standards for dams (credited under SDS),
- A system to advise local emergency managers of a potential dam failure (credited under DFR),
- A warning system for the areas downstream of the dam (credited under DFW),
- A plan of action to minimize the threat to life and property during the flood (credited under DFO), and
- Coordination with critical facility operators (credited under DCF).

High-hazard-potential Dams

“Dams assigned the high hazard potential classification are those where failure or mis-operation will probably cause loss of human life.”

—Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams, 2004, by the Interagency Committee on Dam Safety

631.b. Activity Credit Criteria

These activity credit criteria apply to all Activity 630 elements except SDS (Section 632.a).

- (1) There must be at least one insurable building within the community subject to inundation due to the failure of a high-hazard-potential dam.

- (2) The community must submit a description of the dam failure threat, including the following for each high-hazard-potential dam that affects the community. The first three items should be available from the state's dam safety office. If they are not available from the state or the owner of the dam, the community may have to develop the information and document it.
- (a) A general description of the dam, including its distance upstream from the community;
 - (b) A dam failure inundation or evacuation map;
 - (c) Dam failure flood hazard data, including the arrival time of flood waters at different locations and peak elevations of the dam failure flood;
 - (d) An inventory of the types of buildings (residential, commercial, etc.) exposed to dam failure flooding with an approximate count of the number of buildings and an inventory of the land use (residential, agricultural, open space, etc.) of developed and undeveloped areas within the dam failure inundation or evacuation area for each high-hazard-potential dam;
 - (e) A list of the critical facilities that would be flooded or otherwise affected by a failure of the dam; and
 - (f) The expected impacts of dam failure flooding on health and safety; community functions, such as police and utility services; and the potential for secondary hazards.

Local governments may have completed a risk assessment that meets this criterion as part of their floodplain management or hazard mitigation plan credited under Activity 510. If not, the community can complete the CRS Community Self Assessment described in Section 240 of the *CRS Coordinator's Manual*. The products from either of these efforts should provide the basis for the dam failure flood hazard description.

This credit criterion is a prerequisite for Class 4 communities.

- (3) The community must obtain some credit in all four dam failure warning and response elements (DFR, DFW, DFO, and DCF) in order to receive any credit for its local dam failure warning and response planning.
- (4) To receive DFR, DFW, DFO, and DCF credit, the community must have a dam failure warning and response plan that has been adopted by the community's governing body. The plan should be part of, and must meet the same criteria as, the community's flood warning and response plan described in Section 611.b(4).
- (5) To receive DFR, DFW, DFO, and DCF credit, the community must implement one or more annual outreach projects to the residents and businesses in the area(s) expected to be inundated by a dam failure of an identified high-hazard-potential dam. The project(s) must tell people of their risk of flooding, how they will be warned of a dam failure flood, and the safety measures they should take during a flood (e.g., evacuation

procedures and routes). This can be done by using one or more of the following approaches:

- (a) Sending an outreach project (e.g., a brochure, letter, or newsletter) each year to all residents and businesses in the community;
 - (b) Sending an outreach project each year to all residents and businesses in the area(s) subject to dam failure flooding; or
 - (c) Developing an appropriate approach as part of a Program for Public Information credited under Activity 330 (Outreach Projects).
- (6) To receive DFR, DFW, DFO, and DCF credit, there must be at least one exercise or drill of the dam failure warning and response plan each year. This can be an exercise for a flood, levee failure, dam failure, or hurricane. This criterion would be met if the plan is implemented in response to an actual flood or actual threat of a dam failure. In either case, there must be an evaluation of the performance of the plan and recommended changes that may be needed, as is usually done in an after-action report.

Annual Warning and Response Exercise

Activities 610 (Flood Warning and Response), 620 (Levees), and 630 (Dams) require an annual exercise or drill of the warning and response plan. A flood, levee failure, dam failure, or hurricane exercise qualifies as an exercise for all three activities.

An evaluation of the performance of the warning and response plan must include

- A description of the exercise,
- An evaluation of the
 - Threat recognition procedures,
 - Warning dissemination,
 - Response operations, and
- Recommended changes to the plan.

The exercise requirement can also be met if the community responds to an actual flood or actual threat of a levee or dam failure, provided that the items listed above are discussed in an after-action (or similar) report.

632 Elements

632.a. State dam safety program (SDS)

The maximum credit for this element is 45 points.

SDS credit is provided for the state's dam safety program to a community that would be affected by the failure of an upstream high-hazard-potential dam. Credit is based on

- The assessment of the condition of dams in the state,
- Risk communication and public awareness, and
- Promotion of emergency action plans by operators of the dams.

All of these are designed to encourage states to provide needed flood threat data to communities and to encourage operators of the dams to cooperate with local emergency management planning.

Credit Criteria for SDS

- (1) The SDS credit earned by the state dam safety office is provided to all communities that would be affected by a flood from the failure of a high-hazard-potential dam. This must be documented with a description and a map.
- (2) The community must meet state dam safety standards to receive credit for this element. If the community owns or regulates the construction, operation, or maintenance of any dams, the community's dams and/or its dam safety program must meet the state standards for dam safety.
- (3) If the state's SDS credit changes, the community's credit for SDS will be updated at the next verification visit or modification.

Credit Points for SDS

SDS = up to 45 points for communities affected by high-hazard-potential dams

Impact Adjustment for SDS

There is no impact adjustment for SDS.

Documentation for SDS Provided by the Community

- (1) At each verification visit,
 - (a) The needed documentation is assembled by the ISO/CRS Specialist and provided to the technical reviewer for this activity. There is a checklist to help the emergency manager identify all needed documentation, available at www.CRSresources.org/600.
 - (b) A map and description of the threat from failure of high-hazard-potential dams (credit criterion (2) in Section 631.b).

632.b. Dam failure threat recognition system (DFR)

The maximum credit for this element is 30 points.

DFR credit is provided for primary and secondary threat recognition procedures. This credit is separate from flood threat recognition credit in Activity 610 (FTR), but the dam failure threat recognition system should be closely coordinated with the FTR system.

The more lead time that a community has, the more that can be done to protect people from a flood. Although a dam may be breached suddenly, the flood waters may not reach the community for some time. This credit is for a system that advises the community if a breach is likely or is occurring, giving the community and residents time to respond.

- (1) Primary dam failure threat recognition (DFR1): Credit is provided for primary threat recognition procedures in which the operator of the dam notifies local emergency

managers of a potential or actual dam breach. This could be based on a predetermined reservoir level, water flowing over the spillway, structural problems discovered in the dam, or other cause for alarm.

- (2) Secondary dam failure threat recognition (DFR2): Additional credit is provided for a backup system that includes sensors or cameras on the dam and/or a gage, camera, or other river-level monitoring system located between the dam and the community. This information must be directly available to the emergency manager.

Credit Criteria for DFR

(1) The activity credit criteria in Section 631.b must be met.

(2) For DFR1 and DFR2:

- (a) The threat recognition procedures must be in the dam failure warning and response plan or a related document (credit criterion (4) in Section 631.b).
- (b) The threat recognition system must be monitored by the operator and/or the local emergency manager (or office on behalf of the emergency manager) 24 hours a day, seven days a week.
- (c) The equipment used must be tested at least quarterly. Equipment that is used routinely throughout the year, such as a telephone, does not need testing records for CRS credit.

(3) DFR1 credit is a prerequisite for DFR2 credit.

(4) For DFR1 credit, the primary dam failure threat recognition procedures must include

- (a) Procedures and predetermined conditions for when the operator of the dam notifies local emergency managers of a potential or actual dam breach; and
- (b) At least quarterly communication checks between the operator of the dam and emergency services officials.

(5) For DFR2 credit, the secondary dam failure threat recognition backup system must be directly available to the emergency manager.

Credit Points for DFR

DFR = the total of the following, up to the maximum of 30 points

DFR1 = up to 20 points, for the primary dam failure threat recognition system

DFR2 = up to 10 points, for the secondary dam failure threat recognition system

Impact Adjustment for DFR

The impact adjustment for the activity is described in Section 633.

Documentation for DFR Provided by the Community

(1) At each verification visit,

- (a) The dam failure warning and response plan or related document that describes the threat recognition procedures (credit criterion (2)(a) in Section 632.b and credit criterion (4) in Section 631.b). The plan must be marked to show where the credited items appear.
- (b) An impact adjustment map showing the area(s) affected by each element and documentation showing how the numbers of buildings used in the calculations were determined (credit criteria (2)(b) and (2)(d) in Section 631.b and Section 633 impact adjustment).

(2) At each verification visit and with the annual recertification,

- (a) Records of the quarterly test of all equipment and material needed for the system (credit criterion (2)(c) in Section 632.b) and the quarterly communication checks between the operator of the dam and emergency services officials (credit criterion (3)(b) in Section 632.b).
- (b) A copy of the outreach material used to advise people of the dam failure hazard and of ways to protect themselves from flooding (credit criterion (5) in Section 631.b). If the outreach material is also credited under Activity 330 (Outreach Projects), a separate submittal is not needed provided the other document (including a PPI, if used) is annotated to show where the 630 outreach topics are covered.
- (c) A description of the exercise, drill, or response to an actual emergency or disaster conducted during the previous year (credit criterion (6) in Section 631.b). The exercise must include the dam failure threat recognition procedures.

NOTE: There is a checklist to help the emergency manager identify all needed documentation, available at www.CRSresources.org/600.

632.c. Dam failure warning (DFW)

The maximum credit for this element is 35 points.

DFW credit is provided for disseminating the warning of a potential dam failure to the public through messages and other notification systems. This warning program for DFW credit should be closely coordinated with the flood warning dissemination activities credited in Section 612.b (EWD).

The inability of dams to fully protect any downstream development and population often is not known by those at risk, nor is it publicized by the community. The emergency management staff faces the task of convincing citizens that very real residual risks exist, which can greatly affect their lives and property. Risk awareness within the community can be limited by political constraints or by the security concerns of dam-owing agencies—both of which seriously limit lifesaving opportunities.

Once the dam failure flood threat recognition system tells local emergency managers what will be flooded and when, warnings should be issued to the affected populations. The messages that need to be conveyed and the time at which they should be delivered should be thought out in advance, as part of the dam failure warning and response plan.

The messages should state when flooding is predicted to occur, its expected severity, and appropriate response actions (e.g., evacuation routes, safe shelters, or protective actions).

Special warning arrangements for schools, nursing homes, and other critical facilities are credited under DCF.

Credit Criteria for DFW

- (1) The activity credit criteria in Section 631.b must be met.
- (2) The warning procedures must be included in the dam failure warning and response plan or a related document (credit criterion (4) in Section 631.b).
- (3) The warning must reach people in a timely manner, especially because there may not be much time between a sudden dam failure and the point at which the water reaches homes and businesses. For example, television or radio announcements are not credited if they are the only approach used because the failure may occur during the night. The messages should be drafted in coordination with the messages and projects credited under flood response preparations (FRP) in Activity 330 (Outreach Projects).
- (4) For those warning systems requiring specialized equipment, the equipment and procedures must be tested at least annually. Equipment that is used routinely throughout the year, such as television notices and message boards, do not need testing records for CRS credit.

Credit Points for DFW

DFW = the total of the following, up to the maximum of 35 points:

DFW1 = 5 points, if the plan includes pre-scripted messages and guidance for staff to quickly issue appropriate warnings

DFW2 = 5 points, if the public messages include information on the expected elevation of the flood waters, and instructions on when to evacuate

DFW3 = 10 points, if an outdoor voice-sound system or fixed siren system is used

DFW4 = EITHER:

- (a) 2 points, if the plan identifies the primary and support agencies responsible for door-to-door or mobile public address warning; OR

- (b) 10 points, if the plan identifies the routes, procedures, responsible staff, and equipment necessary for door-to-door or mobile public address warning

DFW5 = 10 points, if the Emergency Alert System through all channels/stations with pre-scripted draft messages is used

DFW6 = 10 points, if telephone warnings to residents and businesses are used

DFW7= Up to 10 points, if schools, hospitals, nursing homes, prisons, and similar facilities that need flood warning have NOAA Weather Radio receivers and at least one other automated backup system for receiving flood warnings, provided that the community has coordinated with the National Oceanic and Atmospheric Administration (NOAA) and there are arrangements for issuing warnings about dam failures

Impact Adjustment for DFW

The impact adjustment for the activity is described in Section 633.

Documentation for DFW Provided by the Community

(1) At each verification visit,

- (a) The dam failure warning and response plan or related document that describes the emergency warning procedures (credit criterion (2) in Section 632.c and credit criterion (4) in Section 631.b). The plan or related document must be marked to show where the credited items appear.

(2) At each verification visit and with the annual CRS recertification,

- (a) Records showing the annual test of all equipment and material needed for the system (credit criterion (4) in Section 632.c).
- (b) A description of the exercise, drill, or response to an actual emergency or disaster conducted during the previous year (credit criterion (6) in Section 631.b). The exercise must include the procedures for warning people credited under this element.

NOTE: There is a checklist to help the emergency manager identify all needed documentation, available at www.CRSresources.org/600.

632.d. Dam failure response operations (DFO)

The maximum credit for this element is 30 points.

DFO credit is provided for the development of dam failure response operations that identify flood response scenarios, responsibilities, special need populations, and necessary resources. The actions undertaken that receive DFO credit should be closely coordinated with the flood response operations credited in Section 612.c (FRO).

The National Incident Management System (NIMS) requires local governments to validate the inventory of response assets using Federal Emergency Management Agency (FEMA) Resources Typing Standards. Department heads and other emergency response team members should know what kinds of resources they have available. This should be compared with the resources needed. Shortfalls may require negotiating agreements with private suppliers or other jurisdictions.

Dam failure response operations need to be spelled out in the dam failure warning and response plan. They must include appropriate actions to be implemented when the dam failure flood threatens or occurs. The actions are conducted by the community and other cooperating agencies and organizations.

Credit Criteria for DFO

- (1) The activity credit criteria in Section 631.b must be met.
- (2) The dam failure operations actions must be included in the dam failure warning and response plan or a related document (credit criterion (4) in Section 631.b).
- (3) Credit is based on the extent and level of detail the dam failure warning and response plan provides for the response operations. General statements or an assignment of responsibilities with no specifics about what is to be done are not credited. For full credit for DFO, the plan needs to
 - (a) Describe the actions to be taken,
 - (b) Identify the office or official responsible for the action,
 - (c) Define the time needed to carry out the activity, and
 - (d) Contain other critical information that specified agencies and organizations need in order to perform their assigned responsibilities.
- (4) DFO4 credit is provided if there is a list of the personnel, equipment, facilities, supplies, and other resources needed to complete each task. For full credit, the list must identify what is available within the community and what is needed from private suppliers or other jurisdictions.

Credit Points for DFO

DFO = the sum of the following, up to the maximum of 30 points:

DFO1 = 10 points, if the community has developed scenarios that explain what could happen if a dam failed

DFO2 = 10 points, if the plan identifies response tasks and responsible community staff and other public and private organizations with responsibilities related to the response tasks in the plan

DFO3 = 5 points, for maintaining a data base of people with special needs who require evacuation assistance when a dam failure warning is issued, and for having a plan to provide transportation to secure locations

DFO4 = up to 10 points, if the plan includes a summary of estimated staff, equipment, supplies, and time required for each response task and the sources of necessary resources

Impact Adjustment for DFO

The impact adjustment for the activity is described in Section 633.

Documentation for DFO Provided by the Community

(1) At each verification visit,

(a) The dam failure warning and response plan or related document that describes the operations and actions credited above (credit criterion (2) in Section 632.d and credit criterion (4) in Section 631.b). The plan or related document must be marked to show where the credited items appear.

(2) At each verification visit and with the annual recertification,

(a) A description of the exercise, drill, or response to an actual emergency or disaster conducted during the previous year (credit criterion (6) in Section 631.b). The exercise must include the actions credited under this element.

NOTE: There is a checklist to help the emergency manager identify all needed documentation, available at www.CRSresources.org/600.

632.e. Dam failure critical facilities planning (DCF)

The maximum credit for this element is 20 points.

DCF credit should be closely tied to the critical facilities coordination done under Section 612.d (CFP).

DCF1 credit is provided for having information about all critical facilities that could be affected by a dam failure included in the community's dam failure response plan. In general, facilities not subject to flooding during a dam failure do not need to be addressed, although in some cases loss of access can cause a critical situation. There may also be facilities in flood-free sites that will be needed to support the flood response effort.

Additional credit is provided in DCF2 if dam failure warning and response plans for individual critical facilities have been developed, reviewed, or accepted by the community.

Credit Criteria for DCF

- (1) The activity credit criteria in Section 631.b must be met.
- (2) DCF1 is a prerequisite for any DCF credit.
- (3) For DCF1 credit, the community's dam failure response plan must list the facilities considered critical in a dam failure emergency. The community must contact the facilities to determine if they need special warning arrangements. The community does not need to provide a special warning to all critical facilities, only those that need one.

There is no impact adjustment for DCF1. The community must include all critical facilities affected by a dam failure on its list.

- (4) For DCF2 credit, dam failure warning and response plans must have been developed, reviewed, or accepted by the community for individual critical facilities.

Credit Points for DCF

DCF = the sum of the following

DCF1 = up to 10 points, if the adopted plan includes

- (a) contact information, including the names and phone numbers of the operators of all public and private critical facilities affected by dam failure, and
- (b) arrangements for special warnings or early notifications directly to those critical facilities that need advance warning

DCF2 = up to 10 points, if critical facilities listed under DCF1 have their own dam failure response plans that have been developed, reviewed, or accepted by the community. The credit is prorated based on the percentage of affected critical facilities that have creditable plans

Impact Adjustment for DCF

There is no impact adjustment for DCF.

Documentation for DCF Provided by the Community

(1) At each verification visit,

- (a) A list of all public and private critical facilities affected by dam failure or needed to be operational during a dam failure flood, with the contact and warning needs information.
- (b) [For DCF2] The above ((1)(a)) list of critical facilities marked to identify those that have developed their own flood warning and response plans that have been reviewed and accepted by the community. The ISO/CRS Specialist will ask for samples of the plans for review.

(2) With the annual CRS recertification,

- (a) A page from the latest list of the critical facilities provided for DCF1, which must be updated at least annually.
- (b) A description of the exercise, drill, or response to an actual emergency or disaster conducted during the previous year and a copy of the after-action report or lessons-learned report.

NOTE: There is a checklist to help the emergency manager identify all needed documentation, available at www.CRSresources.org/600.

633 Impact Adjustment

There is no impact adjustment for the state dam safety program (SDS). All communities that benefit from the program receive the same credit. There is no impact adjustment for DCF.

The credit points for DFR, DFW, and DFO are adjusted based on the number of buildings affected by the element. Determining these adjustments requires identifying the area affected and then counting the buildings within that area.

- (1) The area affected by a dam failure flood is shown on the map required under credit criterion (2)(b) in Section 631.b. This area may be larger or smaller than the community's Special Flood Hazard Area (SFHA), depending on the size of the dam's reservoir and its distance upstream from the community.
- (2) Counting buildings for an impact adjustment is discussed in Section 302. In most cases, the number of buildings affected by an element will be the same as the number of buildings in the area expected to be inundated by a dam failure flood.

$$(1) rDFR = \frac{bDFR}{bDF}$$

$$(2) \text{ rDFW} = \frac{\text{bDFW}}{\text{bDF}}$$

$$(3) \text{ rDFO} = \frac{\text{bDFO}}{\text{bDF}}, \text{ where}$$

bDFR = the number of buildings that benefit from the dam failure threat recognition system,

bDFW = the number of buildings that benefit from the dam failure flood warnings,

bDFO = the number of buildings in the area covered by the dam failure operations actions, and

bDF = the number of buildings in the community expected to be inundated by a failure of all the high-hazard-potential dams that affect the community

bDFO cannot be greater than bDFW

bDFW cannot be greater than bDFR

rDFR cannot be greater than 1.0

634 Credit Calculation

$$\begin{aligned} \text{c630} = & \text{ SDS} + (\text{DFR} \times \text{rDFR}) + (\text{DFW} \times \text{rDFW}) \\ & + (\text{DFO} \times \text{rDFO}) + \text{DCF1} + \text{DCF2} \end{aligned}$$

635 For More Information

- a. Additional information, documentation checklists, reference materials, and examples can be found at www.CRSresources.org/600.
- b. Information on state definitions for high-hazard-potential dams was prepared in 2010 by the Association of State Dam Safety Officials and is available at http://www.damsafety.org/media/Documents/Surveys/HazardPotentialClassifications_2010sep t.pdf.
- c. More information on dam safety activities and state programs can be found on the website for the Association of State Dam Safety Officials at www.damsafety.org.
- d. The following can be obtained from FEMA's Dam Safety Office website at www.fema.gov/protecting-our-communities/plan-ahead-dam-failure/dam-failure-information.

Model State Dam Safety Program, Association of State Dam Safety Officials, FEMA-316CD. (2007).

Catalog of FEMA Dam Safety Resources, FEMA. (2008).

Emergency Action Planning for Dam Owners, FEMA-64. (2007).

636 Related Activities under the Community Rating System

- The outreach to residents required in Section 631.b (5) and developing an appropriate approach as part of a Program for Public Information can be credited under Activity 330.
- DFR is similar to element FTR under Activity 610 and element LFR under Activity 620. It credits a system that provides the community with the earliest possible notification that a flood is imminent. The three threat recognition systems should be closely coordinated.
- DFW is similar to element EWD under Activity 610 and element LFW under Activity 620. It credits a flood warning dissemination system that provides a critical linkage between the recognition of an impending flood and the community's response to the emergency. The three warning dissemination systems should be closely coordinated.
- DFO is similar to element FRO under Activity 610 and element LFO under Activity 620. It identifies opportunities to prevent loss of life and property damage during a flood. The three response operations plans should be closely coordinated.
- DCF is similar to Activity 610 and 620 credits because it requires the maintenance of a current list of critical facilities in potential levee inundation areas, the maintenance of up-to-date contact information for each critical facility, and having plans for warning each critical facility in a timely manner.
- Documentation of the annual exercise is a prerequisite for Activities 610, 620, and 630. One exercise can meet all three activities' requirements.

700 COMMUNITY CLASSIFICATION CALCULATIONS

In this series, the credit points calculated for each of the Community Rating System (CRS) activities undergo final adjustment. In Section 710, the scores for Series 400 (Mapping and Regulations) activities are adjusted to reflect the county's rate of growth. The points for all the activities are then totaled in Section 720.

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710 COUNTY GROWTH ADJUSTMENT

The OBJECTIVE of this credit calculation step is to increase the credit for activities related to managing new development in areas that are growing.

Background

Flood loss prevention activities have a greater impact in growing areas than in communities with little or no pressure for future development in their floodplains. Therefore, the credit points provided for activities in the 400 series (Mapping and Regulations) are adjusted to reflect the growth rate of the county in which a community is located. The county growth adjustment (CGA) is applied by multiplying the number of points for the activity by the growth rate (see Section 720).

Community Rating System (CRS) communities should be aware that if they have a significant amount of credit for the activities in the 400 series, and if their county has a high growth rate, then the growth rate is providing a significant proportion of their total credit. If the growth rate drops in the future, a community will lose credit points, and may lose its CRS class if it cannot make up those points.

711 Growth Data

The county growth adjustment used to adjust credit for the 400 series activities is calculated by Insurance Services Office, Inc. (ISO) for the county in which the community is located. If a community's corporate limits are in two or more counties, the county growth rates are averaged.

The annual growth rate for a county is calculated from the growth in dwelling units over a 10-year period beginning five years before and ending five years after the year of the verification visit. These numbers are updated every year.

The data used are

- (1) DU-5: The estimated number of dwelling units in the county five years ago, as reported by the U.S. Bureau of the Census, and
- (2) DU+5: The estimated number of dwelling units in the county five years from now, as projected by a Federal Emergency Management Agency (FEMA) demographic contractor, Applied Geographic Solutions, Inc.

712 Growth Adjustment Calculation

There are three steps to calculating the county growth adjustment. The first is to establish a county 10-year growth rate. Then the growth rates are converted to an annual county growth rate. Finally, the CGA is determined.

NOTE: The county growth adjustment is calculated by ISO and provided to the community. There is no need for additional calculations. The formulae are shown here to explain how the number that ISO provides is generated.

712.a. County 10-year growth rate (CGR)

A county's 10-year growth rate in dwelling units is calculated as

$$\text{CGR} = 1 + \frac{\text{DU}+5 - \text{DU}-5}{\text{DU}-5}, \text{ where}$$

$\text{DU}+5$ = the number of dwelling units projected 5 years from now, and

$\text{DU}-5$ = the number of dwelling units estimated by the U.S. Census five years ago

Example 712.a-1.

The estimated number of dwelling units in a county five years ago was 100,000, and the projected number of dwelling units five years from now is 130,000.

$$\text{DU}-5 = 100,000$$

$$\text{DU}+5 = 130,000$$

$$\text{CGR} = 1 + \frac{(130,000 - 100,000)}{100,000} = 1 + \frac{30,000}{100,000} = 1 + 0.30 = 1.30$$

The number of dwelling units in the county is predicted to grow by 30% over the 10-year period.

712.b. Annual growth adjustment (AGA)

The county 10-year growth rate is a product of 10 years of growth. This is converted to an annual growth rate. The annual growth rate accounts for the total increase in dwelling units each year, which changes every year. Therefore, dividing the 10-year growth rate by 10 does not produce a correct annual growth rate. A different formula must be used:

$$\text{AGA} = \text{CGR}^{(1/10)}$$

Example 712.b-1.

Using the data in the previous example, CGR = 1.30.

$$\text{AGA} = 1.30^{(1 \div 10)} = 1.30^{(0.1)} = 1.0266$$

The number of dwelling units in the county is predicted to grow at a rate of 2.66% each year.

712.c. County growth adjustment (CGA)

The CGA is 10 times the annual growth adjustment, rounded to two decimal points.

$$\text{CGA} = (\text{AGA} \times 10) - 9, \text{ where}$$

CGA cannot be less than 1.00 or greater than 1.50

Example 712.c-1.

Using the data in the previous examples, AGA = 1.0266.

$$\text{CGA} = (1.0266 \times 10) - 9 = 10.266 - 9 = 1.266, \text{ rounded to 1.27}$$

The maximum value for CGA is 1.5. Counties with growth rates exceeding the maximum use 1.5 for CGA. Counties that are losing population are not affected because CGA must be greater than or equal to 1.0. If a community's corporate limits are in two or more counties, the county growth rates are averaged.

713 Credit Documentation

No documentation is required. The ISO/CRS Specialist has the growth rate data and the value for CGA for all counties. The data are also posted at www.CRSresources.org/700.

720 COMMUNITY TOTAL POINTS

At this step the points for all of the community's activities are totaled. The resulting total decides the community's Community Rating System (CRS) classification, provided that all the class prerequisites have been met.

Step 1. The credit for the 400 series activities are multiplied by the current value for CGA (from Section 710).

Step 2. The results are added to the credits for the other activities to arrive at the community's total points (cT).

The result is the community's total credit points (cT), which determines the community's CRS classification, assuming that all class prerequisites have been met. Table 110-1 relates the total points to the CRS classification and the flood insurance premium discount.

If the community does not have enough total points to attain a better class than it currently has, then it should request credit for additional activities or elements. A request for a modification with fewer points than are needed for an improved class will be returned.

The community's total points are verified by the ISO/CRS Specialist at the verification visit. The ISO/CRS Specialist submits a verification report to the Federal Emergency Management Agency (FEMA) and FEMA determines the community's CRS classification.

The classes and the resulting flood insurance premium credits may be revised from year to year by FEMA, based on experience gained in measuring the impacts of the activities.

Example 720-1.

The verified credits for a community are computed below. The county growth adjustment (CGA) is from the example in Section 710.

c310 =	58
c320 =	90
c330 =	175
c340 =	28
c350 =	56
c360 =	65
c370 =	0
c410 = 0 x CGA 1.27 =	0
c420 = 203 x CGA 1.27 =	258

Community Total Points

c430 = 117 x CGA 1.27 =	149
c440 = 68 x CGA 1.27 =	86
c450 = 60 x CGA 1.27 =	76
c510 =	158
c520 =	324
c530 =	60
c540 =	470
c610 =	105
c620 =	0
c630 =	0
cT = total of above	2,158

As seen in Table 110-1, the community has enough points to become a CRS Class 6. If it meets the Class 9 and Class 6 prerequisites discussed in Sections 211.a and 211.b, it can be verified as a Class 6.

Appendix A **ACRONYMS**

The acronyms used in the *CRS Coordinator's Manual* are listed below. The section number tells where the first detailed description of the acronym appears.

Most of the acronyms are elements of the credited activities in the 300 through 600 series. All elements are in capital letters. Attributes of an element are in lower-case letters. The lower-case letters, "a," "b," "c," and "r," are prefixes. The letters "i," "n," and "s" are suffixes to the elements. For example, "bAR" represents the number of buildings acquired or relocated. The "b" is described in Section 302 and the "AR" is described in Section 522.

Acronym	Section	Description
aC	542	area of the community
aCIP	542	area covered by the watershed-based analysis
AGA	712	annual growth adjustment
AMD	442	additional map data
aSFHA	402	area of the Special Flood Hazard Area
ASFPM	431	Association of State Floodplain Managers
aSFT	413	the area of the Special Flood Hazard Area for the community at the time of adoption of a study
aW	452	area of a community's watersheds
AW-nnn	230	Activity Worksheet number nnn
aXXX	402	area affected by element XXX
bAR	522	number of buildings acquired or relocated
bARSF	523	buildings acquired or relocated in the Special Flood Hazard Area
BC	432	building code
BCEGS	211	Building Code Effectiveness Grading Schedule
bCF	522	number of critical facilities acquired or relocated
BFE	120	base flood elevation
bLF	623	number of buildings affected by levee failure
BMM	442	benchmark maintenance
BMP	452	best management practices (for stormwater quality)
bPO	302	number of post-FIRM buildings in the Special Flood Hazard Area
bPR	302	number of pre-FIRM buildings in the Special Flood Hazard Area
bRL	522	number of buildings on the repetitive loss list acquired or relocated
bSF	302	number of buildings in the Special Flood Hazard Area
bSRL	522	number of Severe Repetitive Loss Properties acquired or relocated
bVZ	522	number of buildings acquired or relocated within V or coastal A Zones
bXXX	302	number of buildings affected by element XXX
CAZ	432	coastal A Zone regulations
CBRA	320	Coastal Barrier Resources Act
CBRS	320	Coastal Barrier Resources System areas
CC-nnn	230	Community Certification number nnn

Appendix A

Acronym	Section	Description
CC-nnnEHP	507	Community Certification of Compliance with Environmental and Historic Preservation Requirements number nnn
CDR	542	channel and basin debris removal
CEO	212	Chief Executive Officer of a community
CFM®	432	Certified Floodplain Manager
CFP	612	critical facilities planning
CFR		<i>Code of Federal Regulations (in the Federal Register)</i>
CER	432	coastal erosion regulations
CGA	712	county growth adjustment
CGR	712	county 10-year growth rate
CIP	542	capital improvement plan
CORS	442	Continuously Operating Reference Stations
CP	372	coverage improvement plan
CPI	372	coverage improvement plan implementation
CRS	p. v	Community Rating System
CSI	432	cumulative substantial improvement regulations
cT	720	community's total credit points under the Community Rating System
cXXX	223	credit points for element or Activity XXX
DCF	632	dam failure critical facilities planning
DFH	342	disclosure of the flood hazard by real estate agents
DFIRM	411	digital Flood Insurance Rate Map
DFO	632	dam failure response operations
DFR	632	dam failure threat recognition system
DFW	632	dam failure warning
DL	432	development limitations
DOH	342	disclosure of other hazards, such as subsidence
DR	422	deed restrictions placed on open space properties
DS	452	design storms used in stormwater management regulations
DU	711	dwelling units counted toward the county growth rate
EC	312	maintaining FEMA Elevation Certificates
ECPO	312	maintaining post-FIRM elevation certificates
ECPR	312	maintaining pre-FIRM elevation certificates
EDM	442	erosion data maintenance
EMI	362	the Emergency Management Institute of the Federal Emergency Management Agency
ENL	432	regulations limiting enclosures below elevated floors
ENLCAZ	432	enforcing enclosure regulations within CAZ-credited areas (bonus credit)
ESC	452	erosion and sedimentation control regulations
EWD	612	emergency warning dissemination
FAA	362	financial assistance advice
FDN	432	foundation protection regulations

Acronym	Section	Description
FEMA	p. v	Federal Emergency Management Agency
FIA	372	flood insurance coverage assessment
FIRM	p. v	Flood Insurance Rate Map
FM	442	Flood Insurance Rate Map maintenance
FMP	511	floodplain management planning
FPB	532	flood protection level before the project was constructed
FPI	532	flood protection improvement
FPP	532	flood protection provided by the project
FRB	432	freeboard
FRO	612	flood response operations
FRP	332	flood response preparations
FTR	612	flood threat recognition system
FWS	412	more restrictive floodway standard
GIS	442	geographic information system
HSS	412	higher study standard
ICC	432	Increased Cost of Compliance (a claim provision of a National Flood Insurance Program policy)
ISO	114	Insurance Services Office, Inc.
LCF	622	levee failure critical facilities planning
LDP	432	local drainage protection
LEV	412	leverage
LFO	622	levee failure response operations
LFR	622	levee failure threat recognition system
LFW	622	levee failure warning
LIB	352	flood protection library
LID	452	low-impact development
LiMWA	432	limit of moderate wave action
LM	622	levee maintenance
LOMA	321	Letter of Map Amendment
LOMR	321	Letter of Map Revision
LPD	352	locally pertinent documents for a library
LSI	432	lower substantial improvement threshold
LZ	422	low-density zoning
MAP	412	mapping credit (the sum of all 410 elements)
MAPSH	412	mapping credit for special flood-related hazards
MHP	432	manufactured home park regulations
MI	322	providing map information and Flood Insurance Rate Map data
MLS	342	Multiple Listing Service

Appendix A

Acronym	Section	Description
NAVD	120	North American Vertical Datum
nCDC	542	total number of conveyance system components in the community
nCDR	542	number of inspected and maintained conveyance system components
NFIP	p. v	National Flood Insurance Program
NFOS	422	natural functions open space
NFP	512	natural floodplain functions plan
NGS	442	National Geodetic Survey
NGVD	120	National Geodetic Vertical Datum
NIMS	620	National Incident Management System
NOAA	612	National Oceanic and Atmospheric Administration
NS	412	new flood study
nSBC	542	total number of public and private storage basins in the community
nSBM	542	number of storage basins inspected and maintained by the community
NSP	422	natural shoreline protection
NSRS	442	National Spatial Reference System
ODR	342	other disclosure requirements
OHS	432	other higher regulatory standards
OP	332	outreach projects
OSI	422	open space incentives
OSP	422	open space preservation
PB	532	protected buildings
PBi	532	protection credit for building “i”
PCF	432	regulations that protect critical facilities
PPA	362	property protection advice
PPI	332	program for public information
PPV	362	flood protection site visit
PSM	542	problem site maintenance
PUB	452	stormwater facilities subject to public maintenance
RA	432	regulations administration
REB	342	real estate agent brochure (explains flood hazards)
RLAA	512	repetitive loss area analysis
rXXX	222	ratio of the buildings or area affected by XXX
SBC	542	storage basins in the community
SBM	542	storage basin maintenance
SDR	542	stream dumping regulations
SDS	632	state dam safety program
SFHAs	p. v	Special Flood Hazard Area
SHOS	422	open space preservation in areas subject to special flood-related hazards
SHR	432	special flood-related hazards regulations
SMR	452	stormwater management regulations

Acronym	Section	Description
SMS	432	state-mandated regulatory standards
SR	412	state review of a new flood study
SRC	612	StormReady community
STK	332	stakeholder delivery of outreach projects
SZ	452	size of development subject to stormwater management
TA	372	technical assistance
TNG	362	training credit
TRC	612	TsunamiReady community
TUB	532	barrier, levee, or floodwall technique used to protect a single building
TUC	532	channel modification or other techniques used to protect buildings
TUD	532	dry floodproofing technique used to protect a building
TUE	532	elevation technique used to protect a building
TUF	532	storage facility technique used to protect buildings
TUi	532	technique used to protect building “i”
TUS	532	sewer backup prevention technique used to protect buildings
TUW	532	wet floodproofing technique used to protect a building
URL	352	universal resource locator
WEB	352	flood protection website
WMP	452	watershed master plan
WQ	452	stormwater management regulations for water quality
XXX		element acronym or variable number

Appendix B

A Comparison of the Minimum NFIP Requirements and the CRS

The Community Rating System provides credits for exceeding the minimum requirements of the National Flood Insurance Program (NFIP). Many local officials are not sure whether their regulations exceed the NFIP requirements or just meet them. The minimum NFIP requirements for communities are spelled out in 44 CFR Part 59—General Provisions and Part 60—Criteria for Land Management and Use. This Appendix compares these minimum requirements with specific CRS credits.

NFIP Requirement	Related CRS Credit
<i>Part 59 General Provisions</i>	
<i>Subpart A—General</i>	
59.1 Definitions	“Exceeding” the definitions for substantial improvement and substantial damage is recognized in Sections 432.d and e, which credit cumulative substantial improvements (CSI) and lower substantial improvement thresholds (LSI).
59.2 Description of program	N/A
59.3 Emergency program	N/A
59.4 References	N/A
<i>Subpart B—Eligibility Requirements</i>	N/A
<i>Part 60—Criteria for Land Management and Use</i>	
<i>Subpart A—Requirements for Flood Plain Management Regulations</i>	
60.1 Purpose of subpart	In other words, the NFIP expects communities to exceed the minimum requirements.
(c) “Nothing in this subpart shall be construed as modifying or replacing the general requirement that all eligible communities must take into account flood, mudslide (i.e., mudflow) and flood-related erosion hazards, to the extent that they are known, in all official actions...”	

NFIP Requirement	Related CRS Credit
(d) “The criteria set forth in this subpart are minimum standards...”	N/A
60.2 Minimum compliance with flood plain management criteria: describes the procedures for getting the local regulations approved.	N/A
60.3 Flood plain management criteria for flood-prone areas: the requirements in sections (a)—(e) are based on the type of flood data provided by FEMA.	
(a) When no flood data are provided by FEMA, the community shall:	
1. Require permits for development everywhere to determine if the development is in a flood-prone area.	Section 412.a, new study (NS) credits identifying and regulating additional flood-prone areas
2. Make sure proposed developments have permits from other agencies.	N/A
3. Make sure building sites will be reasonably safe from flooding. If in a flood-prone area, new buildings and substantial improvements must be anchored, constructed with materials and methods resistant to flood damage, and have their utilities protected.	This NFIP requirement should not be confused with the credit for engineered foundations under Section 432.c (FDN).
4. New subdivisions must meet similar requirements.	There is credit for higher standards for subdivisions in Section 422.e (OSI).
5. New and replacement water systems must be protected.	N/A
6. New and replacement sanitary and septic systems must be protected.	There is credit for adopting the International Private Sewage Disposal Code in Section 432.h (BC).
(b) When FEMA provides a flood map but no flood elevations, the community shall:	

NFIP Requirement	Related CRS Credit
1. Require permits for development in the A Zone.	Section 412.a credits providing regulatory flood elevations where not available (NS).
2. Require development to meet the requirements in 60.3(a). 2–6.	N/A
3. Require larger subdivisions and developments to produce flood elevations.	Section 412.a (NS) credits providing regulatory flood elevations for all new developments, not just large ones.
4. “Obtain, review and reasonably utilize” available flood elevations.	Section 412.a (NS) credits providing regulatory flood elevations for all new developments, not just those where data are readily available.
5. Obtain and maintain records of the elevations and floodproofing protection levels of new buildings.	Activity 310 (Elevation Certificates) credits keeping the records on the FEMA Elevation and Floodproofing Certificates.
6. Tell the State and other communities if a watercourse will be altered.	There is credit for keeping watercourses in their natural state in Section 422.g (NSP).
7. Assure that the flood carrying capacity of an altered watercourse is maintained.	There is credit for keeping watercourses in their natural state in Section 422.g (NSP). There is credit for maintaining watercourses in Activity 540 (Drainage System Maintenance), which includes an environmental review requirement if maintenance activities or capital improvement programs alter a watercourse.
8. Require that manufactured homes be elevated and anchored.	N/A
(c) When FEMA provides a Flood Insurance Rate Map (FIRM) with flood elevations, the community shall:	
1. Meet all the requirements of 60.3(b) in all types of A Zones.	N/A

NFIP Requirement	Related CRS Credit
2. Make sure that residential buildings and substantial improvements are elevated to or above the base flood elevation in those A Zones with flood elevations or depths.	Section 412.a credits providing regulatory flood elevations where not available (NS). Section 432.b, Freeboard, credits going higher than the base flood elevation.
3. Make sure that non-residential buildings and substantial improvements are elevated or floodproofed in those A Zones with flood elevations or depths.	See (c)2, above.
4. Obtain an architect's or engineer's certification for floodproofing non-residential buildings.	Activity 310 credits certifications on FEMA forms. This language does not receive credit for engineered foundations (FDN) under Section 432.c.
5. Make sure that the areas below elevated buildings allow for the entry of water.	This is often confused with the credit for engineered foundations under Section 432.c (FDN), but it is a minimum NFIP requirement. Prohibiting enclosing the lower area is credited under Section 432.g (ENL).
6. Make sure that mobile homes outside of existing mobile home parks are elevated.	N/A
7. Require new and substantially improved residential buildings in AO Zones to be elevated above the specified depth or, where none is specified, two feet.	Section 432.b, Freeboard, credits going higher than the base flood depth. Freeboard (FRB) credit criterion (2)(c) notes that the two feet language is not eligible for freeboard credit.
8. Require new and substantially improved non-residential buildings in AO Zones to be elevated or floodproofed above the specified depth or, where none is specified, two feet.	See (c)7, above.
9. Require the standards of (a)1–4 and (b)5–9 in A99 Zones.	N/A
10. Make sure there is no cumulative increase in flood heights in areas with no floodway designated.	Section 412.a credits new floodway mapping as additional data (NS).

NFIP Requirement	Related CRS Credit
11. Require drainage paths around buildings in AH and AO Zones, areas of shallow flooding without defined channels.	N/A
12. Require mobile homes in existing mobile home parks to be elevated above the base flood elevation or at least three feet above grade.	Section 432.j credits higher regulatory standards for existing manufactured home parks (MHP).
13. Apply for a conditional FIRM revision if a development will increase the base flood elevation by more than one foot.	Section 412.e credits a floodway standard more restrictive than one foot (FWS).
14. Require that recreational vehicles on a site for more than 180 days be treated as a manufactured home.	N/A
(d) When FEMA provides a floodway map, the community shall:	
1. Meet all the requirements of 60.3(c).1–14.	N/A
2. Adopt a regulatory floodway that does not result in increasing the base flood by more than one foot.	Section 412.e credits a floodway standard more restrictive than one foot (FWS).
3. Prohibit encroachments in the floodway from causing any increase in the base flood.	This should not be confused with Section 432.a, which credits preserving floodplain storage capacity (DL1b).
4. Apply for a conditional FIRM revision if a development in the floodway will increase the base flood elevation.	N/A
(e) When FEMA provides a FIRM that shows the coastal high hazard area (V Zone), the community shall:	
1. Meet all the requirements of 60.3(c).1–14	N/A
2. Keep records of the lowest structural member of new buildings.	Activity 310 (Elevation Certificates) credits keeping the records on the FEMA Elevation Certificate.

NFIP Requirement	Related CRS Credit
3. Make sure all new buildings are landward of mean high tide.	Section 432.k (CAZ) credits requiring structures outside of V Zones to be landward of mean high tide.
4. In V Zones with base flood elevations, require all new buildings to be elevated on pilings and columns so (i) the lowest horizontal structural member is elevated above the base flood level and (ii) an engineer or architect certifies the foundation anchoring.	Credit criterion (2)(a) in Section 432.b provides freeboard credit for requiring buildings outside of V Zones to have the lowest horizontal member elevated above the base flood. Credit under Section 432.c for engineered foundations (FDN) is not available in V Zones because they are required there. Section 432.k (CAZ) credits extending the V-Zone standards to coastal A Zones.
5. Make sure that the areas below elevated buildings are open or enclosed with breakaway walls.	Section 432.g (ENL) credits prohibiting all enclosures of the lower area.
6. Prohibit fill for structural support in V Zones.	Section 432.a credits prohibition of all fill in the floodplain (DL1), including CLOMR-Fs and filling in V Zones.
7. Prohibit man-made alteration of sand dunes and mangrove stands in V Zones.	Section 432.n credits prohibiting alteration of dunes outside of V Zones and regulations that restrict traffic on dunes (CER2).
8. Require mobile homes outside of existing mobile home parks to meet the requirements of (e)2–7 and mobile homes in existing parks to meet the requirements of (c)12.	N/A
9. Require that recreational vehicles on a site for more than 180 days meet the requirements of (b)1 and (e)2–7.	N/A
60.4 Flood plain management criteria for mudslide (i.e., mudflow) -prone areas.	Section 432.l(2) credits regulations that manage building in areas susceptible to mudflows (MFR) and Section 412.b (NS) credits mapping or providing new mapping data for areas subject to mudflows.

NFIP Requirement	Related CRS Credit
60.5 Flood plain management criteria for flood-related erosion-prone areas.	Section 432.1 (SHDL2) credits prohibitions on development in erosion-prone riverine areas. Section 432.1 (UFR2) credits regulations for development in areas prone to riverine erosion hazards.
60.6 Variances and exceptions.	N/A
60.7 Revisions of criteria for flood plain management regulations.	N/A
60.8 Definitions (references the definitions in Part 59).	N/A
<i>Subpart B - Requirements for State Flood Plain Management Regulations</i>	N/A
<i>Subpart C - Additional Considerations in Managing Flood-Prone, Mudslide (i.e., Mudflow)-Prone, and Flood-Related Erosion-Prone Areas</i>	N/A: These are planning considerations, not requirements. Implementing them would exceed the minimum NFIP requirements.
Part 65 has criteria for development and adoption of flood elevation data and floodplain maps. Section 65.3 requires communities to submit data on changes in data and maps to FEMA.	Credit criterion (2) for new flood study (NS) in Activity 410 (Flood Hazard Mapping) states that NS credit is contingent on submitting the data and map(s) to FEMA.

Regulations Credited by the CRS not Related to Minimum NFIP Requirements

Regulations Credited under Activity 430 (Higher Regulatory Standards)

Section 432.c: Requiring that fill and building foundations be designed to protect them from damage due to erosion, scour and settling (FDN).

Section 432.f: Requiring that critical facilities, such as hospitals and hazardous materials storage sites, be protected from higher flood levels (PCF).

Section 432.a: Maintaining floodplain storage by prohibiting fill or by requiring compensatory storage (DL1). Although floodway regulations preserve flood conveyance, they allow the flood fringe to be filled in, which can have a significant effect on downstream flood heights.

Section 432.a: Prohibiting new buildings in the floodplain (DL2). Credit is prorated for prohibiting certain kinds of buildings.

Section 432.a: Prohibiting storage of materials or storage of hazardous materials in the floodplain (DL3).

Section 432.m: Implementing other regulations that exceed the minimum requirements of the NFIP Regulations (OHS).

The NFIP regulations are oriented toward the more common overbank and coastal flooding. Special flood-related hazards regulations (“SH”) are requirements tailored to different conditions.

Regulations Credited under other Activities

Section 342.b: Requiring developers or sellers to publicize or disclose the flood hazard on their properties (ODR).

Section 422.a: Prohibiting new buildings and filling in the floodway, V Zone, or other part of the floodplain to preserve open space (OSP).

Section 422.e: Regulations that encourage preserving floodplain lands as open space.

Section 422.f: Zoning to minimize the number of buildings in the floodplain to reduce the damage potential and help maintain flood storage capacity (LZ).

Section 422.g: Programs that protect natural channels and shorelines.

Section 452.a: Requiring new developments to provide retention or detention of their stormwater runoff to minimize the increase in flood flows due to watershed urbanization (SMR).

Section 452.c: Requiring erosion and sedimentation control during construction projects to reduce siltation and the resulting loss of channel carrying capacity (ESC).

Section 452.d: Requiring developers to implement appropriate “best management practices” that will improve the quality of stormwater runoff (WQ).

Section 452.e: Prohibiting dumping or placing debris in stream channels (SDR).



Appendix C

COMMUNITY RATING SYSTEM PUBLICATIONS

The Community Rating System (CRS) materials referred to throughout the Coordinator's Manual are available for free downloading at www.CRSresources.org.

Also on the www.CRSresources.org website are many additional resources, including

- The *CRS Coordinator's Manual* (2017), in pdf format
- The *CRS Application and Quick Check* (2017), including a sample letter of interest for communities that want to join the CRS, and a tool—with instructions—for documenting current activities and calculating possible credit points
- An assortment of short (2–4 page) handouts giving concise overviews and additional information about selected CRS-related topics
- Checklists and worksheets to help work through the activities, assemble needed documentation, score outreach projects, complete certificates, and similar tasks
- The CRS Self-Assessment online tool
- Examples of logs, Program for Public Information documents, and letters.

Available by sending a fax request to (201) 748-1936 or emailing NFIPCRS@ISO.com are

- Printed copies of the color brochure, *The National Flood Insurance Program's Community Rating System*
-

Many more publications are available online through the websites of the publishing agencies and organizations. FEMA's online library of publications can be found at www.fema.gov/library.

The next page of this appendix is a form that may be used to request printed copies from FEMA of the FEMA publications credited under Activity 350.



Publications for a Community's Library

A community needs the following publications to obtain credit for the flood protection library (LIB) under Activity 350 (Flood Protection Information).

Free copies can be obtained by faxing this form to (240) 699-0525.

For more than one copy, call (800) 480-2520. These publications also can be downloaded from www.fema.gov/library.

- Above the Flood: Elevating Your Floodprone House*, FEMA P347 (2000)
- Answers to Questions About the National Flood Insurance Program*, F-084 (2011)
- Coastal Construction Manual*, FEMA P-55 (2011)
- Elevated Residential Structures*, FEMA-54 (1984)
- Protecting Manufactured Homes from Floods and Other Hazards*, FEMA P-85 (2009)
- Mitigation of Flood and Erosion Damage to Residential Buildings in Coastal Areas*, FEMA-257 (1994)
- Protecting Building Utilities from Flood Damage*, FEMA P-348 (1999)
- Protecting Floodplain Resources*, FEMA-268 (1996)
- Reducing Damage from Localized Flooding*, FEMA-511 (2005)

Please send these publications to:

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Community name: _____ NFIP number: _____
(if applicable) (if applicable)

Appendix D

A HISTORY OF CHANGES TO CRS CREDITS

This appendix notes the major changes in the scoring for CRS activities that have been made since the CRS was initiated in 1990. The changes were introduced in the year noted. Other changes, such as added examples, minor revisions to documentation requirements, and alterations to format, are not discussed.

1994: Each section and activity in the 200 through 700 series was summarized in an outline on the first page of the section.

2013: Pursuant to the *CRS Strategic Plan* and after the first full weighting forum since the program began, the credit points for all the activities were re-weighted, resulting in a redistribution of credit points while maintaining the same overall level of premium discount.

2017: The credit criteria, credit points, scoring, and documentation information for special-flood related hazards were incorporated into appropriate sections of the *CRS Coordinator's Manual*. The Special Hazards Supplements were discontinued.

Application Procedures

In each year, one or more activities had additional documentation required with the initial application instead of being reviewed at the verification visit. This approach has helped to prevent communities from losing credit points after the verification visit.

1992: The application worksheets were revised to reduce the amount of work needed to complete them.

1993 and 1994: The procedures for submitting modifications were revised. A modification of one element in an activity required an application worksheet and documentation for all the elements of the activity. A modification that resulted in a two-class improvement required a reverification that included the application worksheets and documentation for all activities.

1994: A new Section 234 was added to explain the criteria for reverifying a community's credit points every few years.

1994: A new *Short Form Application* was introduced as a separate publication to provide a simpler way to submit an initial application.

1996: The *Short Form Application* was expanded to include all activities and elements and was named the *CRS Application*. New applicants for CRS credit were required to use the *CRS Application*.

1999: A new requirement was added for a community to attain a Class 7 or better classification: a Building Code Effectiveness Grading Schedule (BCEGS) of Class 6 or better. To attain a Class 4 or better, a community must demonstrate that it has taken appropriate steps to eliminate or minimize future flood losses.

2013: The formal application process was replaced with a letter of intent plus documentation showing that the community can obtain at least 500 points for its floodplain management activities. The full processing of the community's program is set to take place at the verification visit conducted in response to the letter of intent.

2017: The term "uniform minimum credit" was changed to "state-based credit" to emphasize the importance of state confirmation of the implementation of CRS-creditable activities by the state or regional agency.

Activity 240 (Floodplain Management Plan)

1992: Credits for planned activities were changed to modify the activities rather than the elements. The "p" credit for an element was changed to a "p" credit for that activity's total credit.

Calculating the credits for the plan was moved from the activity's application worksheet to AW-720. As a result of this scoring change, the total credit points for a given activity either remained the same or increased.

1994: The planning process was revised to be more explicit and to include reviewing activities that protect natural and beneficial functions. Credit for five activities could be increased by 15% if natural and beneficial functions are protected.

1996: Credit for the floodplain management plan was moved to Section 510 and revised to provide credit for the planning process rather than the content of the plan.

2013: A new Section 240 was initiated to describe the CRS Community Self Assessment.

300 Series (Public Information)

Activity 310 (Elevation Certificate)

1992: To simplify the formulae, ECCF—Elevation certificates in computer format, was changed from being a multiplier worth up to 12.7 points to a separate variable worth up to 15 points. The total possible points increased from 140 to 142. However, few if any communities had enough points for the multiplier to be worth more than 10 points. Therefore, for most communities, the total credit for this activity either stayed the same or increased slightly.

1994: A default impact adjustment was added for communities holding elevation certificates for at least 25% of their post- or pre-FIRM buildings or at least 25% in computer format.

2002: A new element, ECWS—Elevation certificate data on a website, was added.

2013: Three elements were moved to other activities. ECCF—Elevation certificates in a computer format, became a new, similar credit termed AMD—Additional Map Data, under Activity 440 (Flood Data Maintenance). ECWS—Elevation certificates on the community's website, was moved to Activity 350 (Flood Protection Information), with the rest of the CRS website credits. ORS—Off-site record storage was moved to a new element, Regulation administration (RA), under Activity 430 (Higher Regulatory Standards).

Activity 320 (Map Information Service)

1994: More guidance was provided about telling inquirers of the flood insurance purchase requirement.

1999: More explicit guidance was given on providing information about areas designated as part of the Coastal Barrier Resources System.

2006: Partial credit was allowed for providing the service through a website or remote computer terminal.

2013: Having all the credit dependent on reading the Flood Insurance Rate Map for inquirers was replaced with a menu of map information from which a community can choose topics to provide for credit. Reading the Flood Insurance Rate Map (FIRM) is a prerequisite for the other credits.

Activity 330 (Outreach Projects)

1994: Three new topics were added, bringing the total possible points up from 175 to 250: a map of the local flood hazard, the substantial improvement requirements, and natural and beneficial functions. A fourth element, FML—Floodplain mailing list, was added.

1996: FML was dropped.

2006: A new element was added to credit outreach projects that encourage the purchase or retention of a flood insurance policy.

1999: A new element was added to allow a community to receive more points by implementing outreach projects pursuant to an adopted public information program strategy (OPS).

2013: The emphasis on nation-wide, standard project formats was replaced with an emphasis on locally selected messages and more credit for more repetition of the messages. The public information program strategy (OPS) was replaced with a Program for Public

Information (PPI) and two new credits were introduced: Flood response preparations—FRP, and credit for projects delivered by stakeholders—STK.

Activity 340 (Hazard Disclosure)

1992: To simplify the formulae, REB—Real estate agents’ brochure, and DOH—Disclosure of other hazards, were changed from being multipliers worth 9.2 points to separate variables worth 10 points. The total credit for this activity either stayed the same or increased slightly.

1999: An alternative approach was initiated for crediting DFH—Disclosure of the flood hazard by real estate agents.

Activity 350 (Flood Protection Information)

1994: Credit was increased for having documents related to protecting natural and beneficial functions and the Floodplain Management Resource Center. The requirement for publicity and related documentation was dropped, but documents were still required to be kept in the card catalog or equivalent retrieval system.

2002: New credit was provided for reference material available on or through a community’s website. The points were increased and the title of the activity was changed from “Flood Protection Library” to “Flood Protection Information.”

2013: The relative credit for the website was increased and the prerequisites were revised.

Activity 360 (Flood Protection Assistance)

1994: The credit criteria were substantially revised, although the total possible points remained the same.

1996: Points were added if the person providing the assistance graduated from the Emergency Management Institute’s retrofitting course.

2013: The activity was reorganized to focus on providing one-on-one property protection advice to an inquirer (PPA), with more credit for providing it on the inquirer’s property during a site visit (PPV). New credits were introduced for providing advice on financial assistance programs (FAA) and for attending training on those programs (TNG).

Activity 370 (Flood Insurance Promotion)

2013: This new activity was added to credits communities that take an active role in encouraging residents and businesses to purchase and maintain adequate flood insurance coverage. A three-step planning and implementation process is credited, along with credit for providing technical assistance.

400 Series (Mapping and Regulations)

1994: More references to the special flood-related hazards were added. Coastal erosion was added as a creditable special hazard. More information was provided in *CRS Commentary Supplement for Special Hazards Credit*, which can be ordered as explained in Appendix C.

2017: The credit criteria, credit points, scoring, and documentation information for special-flood related hazards were incorporated into appropriate sections of the *CRS Coordinator's Manual*. The Special Hazards Supplements were discontinued.

Activity 410 (Flood Hazard Mapping)

1992: The approach to identifying and measuring the elements in this activity was significantly revised and simplified. The scoring was also changed, so a direct conversion was not possible. The three elements NDS—New detailed study, SSA—Site-specific analysis, and HED—Higher standards for existing data, were replaced by one, AFD—Additional flood data.

The relative scores for the NDS and SSA approaches were incorporated into a new variable, RFE—Regulatory flood elevation. If a community received credit for NDS (a detailed study on a relatively long reach), then RFE = 50. An SSA approach (a study of only the development site before a permit is issued) resulted in RFE = 25.

Credit for additional data in areas studied in detail on the FIRM was formerly credited by HED. If the Federal Emergency Management Agency (FEMA) provided a base flood elevation, then RFE = 0, similar to the credit for HED. However, a new credit was added for a new study of an area that was already studied in detail on the FIRM. While previously there was no credit for such a restudy, RFE became = 20.

To simplify the formulae, the old variables of AD—Additional delineations, HHS—Higher hydrology standard, and SRAD—State review of additional data, were changed from multipliers. They were combined into one element, ADS—Additional data standards.

FWS—More restrictive floodway standard, was still worth approximately the same, but the basis of its credit points was shifted from a formula to discrete value ranges. A similar simplification was done to calculate the local cost sharing. The former variable, LCS—Local cost sharing, was replaced by NFS—Non-FEMA share. Applicants no longer needed to research the original study costs because credit was based simply on whether there was any non-FEMA cost sharing.

Three options were introduced for the impact adjustment. The inclusion of a default value was expected to make using the impact adjustment easier.

The denominator in the impact adjustment has been changed from aRF—area of the regulatory floodplain, to aSFHA—area of the Special Flood Hazard Area. The maximum

value for the impact adjustment changed from 1.0 to 2.0. These changes resulted in higher scores, especially where the activity covered large areas not mapped as SFHA on the FIRM.

The maximum points for Activity 410 increased from 247 to 360. The maximum was attainable only if the impact adjustment was 2.0. If a more common impact adjustment of 1.0 was used, the maximum would decrease from 247 to 180.

1996: The *Coordinator's Manual* clarified the credit for providing additional flood data in areas affected by one of the special hazards that covered in the *CRS Commentary Supplement for Special Hazards Credit*.

1999: Credit points for most of the elements were increased and the credit criteria revised.

2002: A new element, CTP, was added to credit studies and mapping done under a Cooperating Technical Partner agreement with FEMA.

2006: The activity was substantially revised to better support FEMA's Map Modernization effort and to increase the credit points for new maps and those done to higher standards.

2013: The credit for state review of new studies was made a separate element—SR.

2017: Credit criteria, points, and discussion for mapping coastal erosion hazard areas and mapping tsunami areas were inserted from the *Coastal Erosion Hazards* supplement and the *Tsunami Hazards* supplement, and both supplements were discontinued.

Credit for Cooperating Technical Partner (CTP) was discontinued. The element's 180 points were distributed among other elements of Activity 410, to raise the available credit for HSS, Using higher flood study standards; FWS, More restrictive floodway standard; and MAPSH, Mapping special flood-hazard areas.

Activity 420 (Open Space Preservation)

1992: To simplify the formulae, DR—Deed restrictions, was changed from being a multiplier worth up to 75 points to a separate variable worth 75 points. There was no change in the total credit for DR when combined with the impact adjustment.

The impact adjustment then had three options, including a default value for those who do not want to calculate the affected areas.

1994: A new element was added: NB—Natural and beneficial functions, worth up to 100 points for open space preserved or restored to its natural state.

1999: The credit points for Preserving open space—OS, were significantly increased.

2013: NB—Natural and beneficial functions, was replaced with NFOS—Natural functions open space, with more points and more options for credit. Two elements, OSI—Open space incentives, and LZ—Low-density zoning, were transferred from Section 430LD (Land

Development Criteria), which was eliminated. A new credit was introduced for keeping shorelines in their natural state—NSP.

2017: Credit criteria, points, and discussion for CEOS—coastal erosion open space were inserted from the *Coastal Erosion Hazards* supplement and the supplement was discontinued.

Credit for LZSH—low density zoning in special flood-related hazard areas was discontinued.

Activity 430 (Higher Regulatory Standards)

Most of the changes to Activity 430 have been aimed at simplifying the formulae and crediting partial approaches to an element. Maximum points increased from 35 to 100 for five special hazards. Incorporating low-density zoning from Activity 420 increased the total possible points.

1992: Another partial credit was made possible for tracking improvements over 5–10 years. The changes did not alter existing applications; they only made it easier to credit alternative approaches to CSI.

The formula for the LSI—Lower substantial improvement threshold, was replaced with discrete value ranges.

The impact adjustment had three options, including a default value for those who do not want to calculate areas.

1994: Credit was provided under foundation protection for adopting the soil testing and compaction language of one of the three national building codes. The credit for regulating additions was no longer mutually exclusive from other cumulative substantial improvement credit. Prohibiting fill under PSC—Protection of storage capacity, increased from 50 to 80 points while compensatory storage decreased from 80 to 70.

Three new elements were added, bringing the total possible points up to 905 (including low-density zoning):

NBR—Natural and beneficial functions regulations: Up to 25 points for prohibiting development in the floodplain that is hazardous to public health or water quality.

ENL—Enclosure limits: 50 points for prohibiting first floor enclosures.

OHS—Other higher standards: Up to 25 points for other regulations that will be reviewed and scored by FEMA.

1996: Points were added if the person responsible for floodplain permitting graduated from the Emergency Management Institute's course on managing floodplain development.

1999: The credit points were significantly increased for FRB—Freeboard, PCF—Protection of critical facilities, and ENL—Enclosure limits. Credit for CSI—Tracking cumulative substantial improvements, was revised. Two new elements, credit for SMS—State-mandated regulatory standards, and BCS—Building code and staffing, were introduced.

2002: The Building Code and Staffing element was split into two new elements, BC—Building code, and STF—Staffing. More points were provided under each new element. Two other new elements were added: MHP—Manufactured home parks, to credit protection of manufactured homes in existing parks, and CAZ—Coastal A Zones, to credit higher regulatory standards in these hazardous coastal areas.

2002: Section 430LZ, Low-density Zoning, was renamed 430LD, Land Development Criteria. Points were added under an new element, LDC—Land development criteria, to recognize local regulations that encourage preserving floodplain lands as open space.

2013: Various credits for discouraging floodplain development were consolidated into a new element, DL—Development limitations, for credit for prohibiting fill, buildings, and/or storage of materials in the floodplain. FRB—Freeboard, and FDN—Foundation protection, credits were increased, with the higher credits tied to prohibiting fill or requiring compensatory storage. LDP—Local drainage protection, was revised and transferred from Activity 450 (Stormwater Management). A new element, RA—Regulations administration, was added to encourage better management of local floodplain management regulations. Credits for natural and beneficial functions regulations (NBR) were transferred to NFOS and NSP under Activity 420 (Open Space Preservation).

2017: Credit points for limiting enclosures below the base flood elevation were transferred from CAZ—enforcing V-Zone rules in coastal A Zones to element ENL—Limiting enclosures below the base flood elevation. Bonus credit under a new element ENLCAZ was made available for communities that enforce creditable enclosure regulations within their CAZ-credited areas.

Credit criteria, points, and discussion for TSR—Tsunami hazard regulations and for CER—Coastal erosion hazard regulations were inserted from the *Coastal Erosion Hazards* supplement and the *Tsunami Hazards* supplement, and both supplements were discontinued.

The element DR2—Prohibition of buildings in the floodplain was modified to require prorating of credit if the community allows Conditional Letters of Map Amendment based on Fill (CLOMR-Fs) or Letters of Map Amendment based on Fill (LOMR-Fs).

Activity 440 (Flood Data Maintenance)

1992: DMD—Digitized map data, was split into two elements, GIS—Geographic information system, and DPD—Digitized parcel data. More credit was provided for GIS mapping. MAM—More accurate base map, and OM—Overlay map, were combined so that more credit is provided for OM.

GIS, DPD, and OM were made no longer mutually exclusive, which allowed more credit where new systems are being installed gradually or where one system does not receive maximum credit. Due to the elimination of MAM as a separate element, the maximum points decreased slightly, from 125 to 120.

The impact adjustment had three options, including a default value for those who do not want to calculate areas.

1994: The element GIS was renamed DMS—Digital mapping system to avoid confusion with real geographic information systems. Full credit was only possible if the community had a real GIS that works on FEMA's systems.

Ten more points became available for DMS, DPD, and OM for showing special hazard areas, including coastal erosion. A new element was added: EDM—Erosion data maintenance, for keeping track of coastal erosion. It was described in *CRS Commentary Supplement for Special Hazards Credit*.

1996: Credit for DMS, DPD, and OM were modified slightly for clarification and consistency.

1999: Three approaches to maintaining flood data were combined under one element, AMD—Additional map data. A new element was added to provide credit for maintaining copies of all FIRMs that have been issued for the community—FM.

2013: New credit for supporting GPS surveying was added to the benchmark maintenance element—BMM.

Activity 450 (Stormwater Management)

1992: A review of this activity resulted in several credit point revisions. SZ—Size of development, dropped from a maximum of 64 to 40 points, and PUB (Public Maintenance) was reduced from 32 to 30 points. These reductions were offset by an increase in DS—Design storm, from 130 to 155 maximum points.

To simplify the calculation, the formulae for SZ and PUB were replaced by discrete range values. This changed the credit for SMR—Stormwater regulations, for many communities. Total credit for communities with 100-year design storms increased, while the scores for communities that regulate to 10-year or smaller storms generally decreased.

SMP—Stormwater management master plan, and SRSM—State review of stormwater management plans, were changed from 10% multipliers to discrete values of 25 points. ESC—Erosion and sediment control, was moved from Activity 540 to this activity. The 45 points for ESC accounted for most of the increase in the maximum points, from 331 to 380.

1994: There was some reorganization to clarify the importance of the stormwater management regulation language. No credit was to be provided under this activity if only very large developments are regulated.

A new element was added: WQ—Water quality, for stormwater management regulations that require use of best management practices to minimize the impact of stormwater runoff from new development.

1999: The points for the various sub-elements in SMR—Stormwater management regulations, were revised to provide relatively more credit for PUB—Public maintenance of stormwater facilities. The maximum for SMP—Stormwater management master plan, was greatly increased and the points for partial credit were clarified.

2013: Credits were increased for management of volume and LID—Requiring low-impact development techniques that improve downstream natural floodplain functions. Most of the credits for PUB—Public maintenance of new storage basins, were moved to Activity 540 (Drainage System Maintenance).

500 Series (Flood Damage Reduction)

1994: The description of the repetitive loss list and application requirements was clarified. A new Section 503 discussed why the CRS does not credit structural projects.

1996: The repetitive loss requirements were moved from Section 510.

2017: The definition of a Category B repetitive loss community was changed from a community with from 1-10 repetitive loss properties to one with 1-50 such properties. The definition of a Category C repetitive loss community was changed to mean a community with 50 or more such properties.

Activity 510 (Floodplain Management Planning)

1992: The formula for the credits from Activity 330 was corrected to account for the number of years between projects. Because Activity 610 was revised, the credits for the contributing elements from 610 were revised. As a result, the maximum points decreased from 444 to 441.

1996: This section was changed to 510 (Floodplain Management Planning). Credit for floodplain management planning was moved from Section 240. Repetitive loss requirements were moved to Section 500. Credit for floodplain management planning and repetitive loss planning were combined and revised to provide credit for the planning process rather than the content of the plan.

2002: The credit criteria were revised and expanded to be consistent with the mitigation planning requirements for other FEMA programs. Additional points were provided to encourage preparing multi-hazard plans and involving more stakeholders in the planning process.

2006: A new element was added to credit a detailed analysis of the community's repetitive loss areas and identify ways to mitigate flood damage to each building.

2013: The credit criteria for FMP—Floodplain management planning, were revised to improve implementation of plans. The habitat conservation plan element was replaced with a new element that credits more types of natural floodplain functions plans—NFP.

Activity 520 (Acquisition and Relocation)

1994: A default impact adjustment was added. If the community has acquired or relocated at least 5 buildings, it can receive 16 points.

1999: The credit points were significantly increased. Additional credit was provided for acquiring or relocating buildings on FEMA's repetitive loss list. A new default impact adjustment formula was instituted.

2006: Bonus points were added to encourage acquiring or relocating buildings from among the Severe Repetitive Loss Properties.

2013: Bonus points were added to encourage acquiring or relocating buildings in V Zones and critical facilities. A new bonus was introduced for clearing out more than 30% of the buildings in the community's SFHA.

Activity 530 (Flood Protection)

1994: The retrofitting credits were substantially revised to provide less credit for projects that were not engineered or otherwise have a higher possibility of failure. A default impact adjustment was added. If the community has at least 5 buildings that have been retrofitted, it can receive 14 points. A new five-page supplement explained retrofitting techniques.

1999: The credit points were significantly increased. Additional credit was provided for acquiring or relocating buildings on FEMA's repetitive loss list.

2002: CRS credit for protecting buildings with structural flood control projects was incorporated into this activity. The name was changed from "Retrofitting" to "Flood Protection."

2006: Bonus points were added to encourage protecting buildings from among the Severe Repetitive Loss Properties.

2013: New environmental compliance review criteria were introduced.

Activity 540 (Drainage System Maintenance)

1992: Because it is a stormwater management regulation, ESC was moved to Activity 450 (Stormwater Management). This resulted in a lowering of the total possible points from 375 to 330. However, the maximum points for Activity 450 were increased accordingly.

To simplify the formulae, SDR—Stream dumping regulations, was changed from being a multiplier worth up to 30 points to a separate variable worth up to 30 points. The impact adjustment had three options, including a default value for those who do not want to calculate areas.

The requirements for the documentation for CDR—Channel and basin debris removal, were changed. Most communities would need to prepare new program explanations when resubmitting their application for this activity.

1994: In most cases, the application documentation was required to include a map of the drainage system. A new prerequisite was introduced for stream dumping regulations: the community must publicize the regulations through an annual outreach project. A new element was added: EPM—Coastal erosion protection maintenance, as described in *CRS Commentary Supplement for Special Hazards Credit*.

1999: The approach to crediting CDR—Channel and basin debris removal, and SDR—Stream dumping regulations, was revised to allow more flexibility in recognizing local programs.

2013: Credits for problem site maintenance and capital improvement programs were created as separate elements (PSM and CIP). Storage basin maintenance was separated from CDR—Channel and basin debris removal, and incorporated credits from Activity 450 (Stormwater Management). New environmental compliance review criteria were introduced.

2017: The element EPM—Coastal erosion protection maintenance was eliminated.

The credit criteria for CDR—Channel debris removal was revised to clarify that credit is provided for removing debris from natural channels only, not from manmade portions of the drainage system.

600 Series (Warning and Response)

2013: The three activities' elements were aligned to follow a standard flood preparedness process.

Activity 610 (Flood Warning and Response)

1992: This activity was completely revised. Credit was no longer given for LSDS—Local data sharing. The same basic documentation was required: a description of the flood threat recognition system and excerpts from the flood response plan. However, all the elements and the scoring were changed.

The impact adjustment had three options, including a default value for those who do not want to calculate the affected areas. The maximum points decreased slightly from 205 to 200.

2002: A new element was added: SRC—StormReady Community, to credit communities that participate in the National Weather Service's StormReady Community Program.

2013: The credit criteria were revised to encourage more attention to planning response actions at different predicted flood levels.

Activity 620 (Levees)

1994: A default impact adjustment was added. If the levee protects at least five buildings, the community can receive 9 points. The requirements for levee certification were revised to allow determinations made by the U.S. Army Corps of Engineers.

2013: This activity was reorganized and renamed. Credit prerequisites include an inventory of all areas protected by levees, a documented maintenance program (LM), and an outreach project to protected areas. Four new elements more closely coordinate a levee failure warning and response program with the community's emergency management program:

- LFR—Levee failure threat recognition system,
- LFW—Levee failure warning,
- LFO—Levee failure response operations, and
- LCF—Levee failure critical facilities planning.

2017: The credit criteria were revised to require an inventory of buildings and critical facilities within the expected inundation area.

Activity 630 (Dams)

1992: The impact adjustment had three options, including a default value for those who do not want to calculate the affected areas.

2002: Credit for dam failure regulations was deleted. The credit for DFP—Dam failure emergency action plans, was expanded, with a net increase in points.

2013: This activity was reorganized and renamed. SDS—State dam safety program, credit criteria were revised to reflect FEMA’s new directions to have state programs more active with local emergency preparedness programs. Credit prerequisites for local programs included an inventory of all areas subject to flooding from the failure of a high hazard dam and an outreach project to affected areas. Four new elements more closely coordinate a dam failure warning and response program with the community’s emergency management program:

DFR—Dam failure threat recognition system,
DFW—Dam failure warning,
DFO—Dam failure response operations, and
DCF—Dam failure critical facilities planning.

2017: The credit criteria were revised to require an inventory of buildings and critical facilities within the expected inundation area.

Activity 710 (Community Growth Adjustment)

1994: The Donnelley Report Growth Rate was dropped from the calculations for average growth rate.

2013: A new approach was initiated that uses a 10-year average growth in dwelling units for the county. Averaging city growth rates that may be higher than the overall growth pressure in the whole county was eliminated.

Appendix E

CRS COMMUNITY CERTIFICATIONS

This appendix contains forms for the community certifications that are part of the documentation needed to obtain credit for certain activities under the National Flood Insurance Program's Community Rating System (CRS). The certification forms are designed to be used in conjunction with the 2013 *CRS Coordinator's Manual*.

Two required certifications are not included here. The AW-501 (Repetitive Loss Update Certification) and the AW-501 Transmittal Sheet are generated separately by the Federal Emergency Management Agency (FEMA) and provided to the community when needed.

The certifications of compliance with environmental and historic preservation requirements can be found in Appendix F.

Instructions for completing the forms can be found on page CC-ii.

The forms included here can be photocopied and completed and submitted as needed, or the community can access fillable-pdf versions of the forms at www.CRSresources.org/200.

Contents

- CC-213 Recertification
- CC-230 Verification
- CC-RL The Repetitive Loss List
- CC-530 Retrofitted Buildings

DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency

CRS COMMUNITY CERTIFICATIONS

OMB Control Number: 1660-0022

Expiration: 3/31/2020

Public reporting burden for this form is estimated to average 4 hours for annual recertification, per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and submitting the form. This collection of information is required to obtain voluntary benefits. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, S.W., Washington, D.C. 20472, Paperwork Reduction Project (1660-0022). NOTE: Do not send your completed form to this address.

Appendix E

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- CC-213 Recertification
- CC-230 Verification
- CC-RL The Repetitive Loss List
- CC-530 Retrofitted Buildings

The following community certifications are part of the documentation needed to obtain credit for certain activities under the National Flood Insurance Program's Community Rating System (CRS). These certifications are designed to be used in conjunction with the *CRS Coordinator's Manual*.

Sections in each certification correspond to the same numbered sections in the *Coordinator's Manual*. If a section appears to be missing, it is because that section does not call for the submission of a specific item.

It is recommended that these certifications be photocopied before they are used. They are also available in Microsoft Word® and as fillable pdf files at www.CRSresources.org/200.

The "CID" at the top of each page signifies the six digit National Flood Insurance Program (NFIP) community identification number, which can be found on the community's Flood Insurance Rate Map and other NFIP documents.

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

CC-213 Recertification

Date	
Chief Executive Officer	CRS Coordinator
Name	
Title	
Address	
Phone number	
E-mail address	

I hereby certify that _____ [community name] is implementing the following activities on the attached pages as credited under the Community Rating System and described in our original application to the CRS and subsequent modifications.

I hereby certify that, to the best of my knowledge and belief, we are in full compliance with the minimum requirements of the NFIP and we understand that we must remain in full compliance with the minimum requirements of the NFIP. We understand that at any time we are not to be in full compliance, we will retrograde to a CRS Class 10.

I hereby certify that we will continue to maintain FEMA Elevation Certificates on all new buildings and substantial improvements constructed in the Special Flood Hazard Area following the date at which we joined the CRS.

I hereby certify that if there are one or more repetitive loss properties in our community that we must take certain actions that include reviewing and updating the list of repetitive loss properties, mapping repetitive loss areas, describing the cause of the losses, and sending an outreach project to those areas each year, and if we have fifty (50) or more unmitigated repetitive loss properties we must earn credit under Activity 510 (Floodplain Management Planning) for either a repetitive loss area analysis (RLAA) or a floodplain management plan (FMP).

I hereby certify that, to the best of my knowledge and belief, we are maintaining in force all flood insurance policies that have been required of us as a condition of federal financial assistance for insurable buildings owned by us and located in the Special Flood Hazard Area (SFHA) shown on our Flood Insurance Rate Map. I further understand that disaster assistance for any community-owned building located in the SFHA is reduced by the amount of National Flood Insurance Program (NFIP) flood insurance coverage (structure and contents) that a community should be carrying on the building, regardless of whether the community is carrying a policy.

Signature _____ (Chief Executive Officer)

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

CRS Program Data Table	A. In the SFHA	B. In a regulated floodplain outside the SFHA	C. In the rest of the community
1. Last report's number of buildings in the SFHA (bSF) (line 6, last report)			
2. Number of new buildings constructed since last report	+		
3. Number of buildings removed/demolished since last report	-		
4. Number of buildings affected by map revisions since last report (+ or -)			
5. Number of buildings affected by corporate limits changes (+ or -)			
6. Current total number of buildings in the SFHA (bSF) (total lines 1-5)			
7. Number of substantial improvement/damage projects since last report			
8. Number of repetitive loss properties mitigated since last report			
9. Number of LOMRs and map revisions (not LOMAs) since last report			
10. Acreage of the SFHA (aSFHA) as of the last report (line 13, last report)			
11. Acreage of area(s) affected by map revisions since last report (+ or -)			
12. Acreage of area(s) affected by corporate limits changes (+ or -)			
13. Current acreage of the SFHA (total lines 10-12)			
14. Primary source for building data:			
15. Primary source for area data:			
16. Period covered:		Current FIRM date	
<i>If available, the following data would be useful:</i>			
17. Number of new manufactured homes installed since last report			
18. Number of other new 1-4 family buildings constructed since last report			
19. Number of all other buildings constructed/installed since last report			

Comments:

(Please note the number of the line to which the comment refers.)

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

Instructions

At the first verification visit after the 2013 *CRS Coordinator's Manual* takes effect, ONLY LINES 6 AND 13 NEED TO BE COMPLETED. These lines form the baseline data about the number of buildings and area of the SFHA for when the table is completed as part of the next annual recertification. The "period covered" entered in line 16 is the date that lines 6 and 13 are first completed.

At all subsequent annual recertifications and cycle verification visits, the entire table is completed. The information in lines 6 and 13 from the last report is transferred to lines 1 and 10 in the next report.

Instructions for the Columns

Column A numbers are for the SFHA (the A and V Zones shown on the Flood Insurance Rate Map) (FIRM)). Use the FIRM currently in effect, not a draft or pending revision.

Column B is completed only if the community receives CRS credit for regulating floodplain development outside the SFHA under Activity 410 (Floodplain Mapping) or Activity 430 (Higher Regulatory Standards).

Column C numbers help relate what happens in the floodplain to what is happening in the rest of the community.

Enter "0" if there are no numbers to report for this period. Do not leave a cell blank. Do not fill in the shaded boxes.

Instructions for the Lines

Lines 1-7 deal with buildings.

- o Section 301.a of the *CRS Coordinator's Manual* defines what constitutes a "building" and lists examples of structures that are not counted as "buildings" by the CRS.
- o Section 302.a of the *CRS Coordinator's Manual* describes how the CRS counts buildings. For example, accessory structures are not counted.
- o As noted in Section 302.a, to determine building counts, communities may use any method that yields reasonably good estimates of the number of buildings. Examples of acceptable methods are listed in Section 302.a. Precision is less important for large numbers. For example, the impact of the numbers will not change much if there are 10,000 buildings or 10,100 buildings.
- o If a building is out of the SFHA, but in a parcel that is partly in the SFHA, it is not counted in column A --In the SFHA.
- o In line 14, note how the building counts were obtained or estimated. Use the comments area, if needed.

Line 4 refers to map revisions. These include physical map revisions, Letters of Map Revision (LOMR), and Letters of Map Amendment (LOMA). If a building is removed from the SFHA by FEMA through a LOMA, but the community still administers its floodplain management regulations on the property, the building should not be included in the line 4 count in column A --In the SFHA. However, communities that still regulate areas removed by LOMAs can receive credit under Activities 410 or 430. If the community is receiving such credit, the building should be counted under column B --In a regulated floodplain outside the SFHA.

Line 7 is for the total number of buildings that were substantially improved plus the number of buildings that were substantially damaged during the period covered.

Lines 10 -13 deal with areas.

- o These areas are based on the areas shown on the community's FIRM including LOMRs or LOMAs. Section 403.b discusses those portions of the SFHA that are subtracted from the area of the SFHA to calculate the community's aSFHA used in credit calculations.
- o Section 403.e of the *CRS Coordinator's Manual* discusses calculating areas for CRS purposes.
- o Section 403.e notes that communities "should not spend an inordinate amount of time measuring areas." As with buildings, communities may use any method that yields reasonably good estimates. Examples of acceptable approaches are listed in Section 403.e.
- o Line 13 asks for the current acreage of the SFHA. The best source for this number is a GIS layer that shows the SFHA. If the community does not have GIS, the county, regional agency, or state NFIP mapping office may have SFHA layers and may be able to provide the data. If the community has a relatively recent FIRM, the study contractor or consulting engineer may have the data.
- o In line 15, note how the area calculations were obtained or estimated. Use the comments area, if needed.

Lines 17 -19 are voluntary, if the numbers are readily available.

- o Line 17 includes replacing an existing manufactured home with a new one. The newly placed manufactured home is counted as a new, post-FIRM, building.
- o The total of lines 17 -19 should equal the value entered in line 2.

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

CC-230 Verification

Date of Visit	Initial FIRM Date
Population	Current FIRM Date
County	ISO/CRS Specialist
Coordinator's Manual Year	
Chief Executive Officer	CRS Coordinator
Name	
Title	
Address	
Phone number	
E-mail address	

I hereby certify that _____ [community name] is implementing the following activities [check the ones that apply]. We will continue to implement these activities and will advise FEMA if any of them are not being conducted in accordance with this certification. We will cooperate with the ISO/CRS Specialist's verification visit and will submit the documentation and annual recertification needed to validate our program.

- | | |
|---|---|
| <input type="checkbox"/> 310 (Elevation Certificates) | <input type="checkbox"/> 440 (Flood Data Maintenance) |
| <input type="checkbox"/> 320 (Map Information Service) | <input type="checkbox"/> 450 (Stormwater Management) |
| <input type="checkbox"/> 330 (Outreach Projects) | <input type="checkbox"/> (Repetitive Loss Requirements) |
| <input type="checkbox"/> 340 (Hazard Disclosure) | <input type="checkbox"/> 510 (Floodplain Management Planning) |
| <input type="checkbox"/> 350 (Flood Protection Information) | <input type="checkbox"/> 520 (Acquisition and Relocation) |
| <input type="checkbox"/> 360 (Flood Protection Assistance) | <input type="checkbox"/> 530 (Flood Protection) |
| <input type="checkbox"/> 370 (Flood Insurance Promotion) | <input type="checkbox"/> 540 (Drainage System Maintenance) |
| <input type="checkbox"/> 410 (Floodplain Mapping) | <input type="checkbox"/> 610 (Flood Warning and Response) |
| <input type="checkbox"/> 420 (Open Space Preservation) | <input type="checkbox"/> 620 (Levees) |
| <input type="checkbox"/> 430 (Higher Regulatory Standards) | <input type="checkbox"/> 630 (Dams) |

I hereby certify that, to the best of my knowledge and belief, we are in full compliance with the minimum requirements of the NFIP and we understand that we must remain in full compliance with the minimum requirements of the NFIP. We understand that at any time we are not to be in full compliance, we will retrograde to a CRS Class 10.

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

I hereby certify that we will maintain FEMA Elevation Certificates on all new buildings and substantial improvements constructed in the Special Flood Hazard Area following the date at which we joined the CRS.

I hereby certify that if there are one or more repetitive loss properties in our community that we must take certain actions that include reviewing and updating the list of repetitive loss properties, mapping repetitive loss areas, describing the cause of the losses, and sending an outreach project to those areas each year, and if we have fifty (50) or more repetitive loss properties must also prepare a plan of how it will address its repetitive flood problem.

I hereby certify that, to the best of my knowledge and belief, we are maintaining in force all flood insurance policies that have been required of us as a condition of Federal financial assistance for insurable buildings owned by us and located in the Special Flood Hazard Area shown on our Flood Insurance Rate Map. I further understand that disaster assistance for any community-owned building located in the Special Flood Hazard Area is reduced by the amount of National Flood Insurance Program flood insurance coverage (structural and contents) that a community should be carrying on the building, regardless of whether the community is carrying a policy.

Signature _____ (Chief Executive Officer)

Community _____ State _____ CID _____
 (6-digit NFIP Community Identification Number)

CRS Program Data Table	A. In the SFHA	B. In a regulated floodplain outside the SFHA	C. In the rest of the community
1. Last report's number of buildings in the SFHA (bSF) (line 6, last report)			
2. Number of new buildings constructed since last report	+		
3. Number of buildings removed/demolished since last report	-		
4. Number of buildings affected by map revisions since last report (+ or -)			
5. Number of buildings affected by corporate limits changes (+ or -)			
6. Current total number of buildings in the SFHA (bSF) (total lines 1 -5)			
7. Number of substantial improvement/damage projects since last report			
8. Number of repetitive loss properties mitigated since last report			
9. Number of LOMRs and map revisions (not LOMAs) since last report			
10. Acreage of the SFHA (aSFHA) as of the last report (line 13, last report)			
11. Acreage of area(s) affected by map revisions since last report (+ or -)			
12. Acreage of area(s) affected by corporate limits changes (+ or -)			
13. Current acreage of the SFHA (aSFHA) (total lines 10-12)			
14. Primary source for building data:			
15. Primary source for area data:			
16. Period covered:	Current FIRM date		
<i>If available, the following data would be useful:</i>			
17. Number of new manufactured homes installed since last report			
18. Number of other new 1 -4 family buildings constructed since last report			
19. Number of all other buildings constructed/installed since last report			

Comments:

(Please note the number of the line to which the comment refers.)

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

Instructions

At the first verification visit after the 2013 *CRS Coordinator's Manual* takes effect, ONLY LINES 6 AND 13 NEED TO BE COMPLETED. These lines form the baseline data about the number of buildings and area of the SFHA for when the table is completed as part of the next annual recertification. The "period covered" entered in line 16 is the date that lines 6 and 13 are first completed.

At all subsequent annual recertifications and cycle verification visits, the entire table is completed. The information in lines 6 and 13 from the last report is transferred to lines 1 and 10 in the next report.

Instructions for the Columns

Column A numbers are for the SFHA (the A and V Zones shown on the Flood Insurance Rate Map) (FIRM)). Use the FIRM currently in effect, not a draft or pending revision.

Column B is completed only if the community receives CRS credit for regulating floodplain development outside the SFHA under Activity 410 (Floodplain Mapping) or Activity 430 (Higher Regulatory Standards).

Column C numbers help relate what happens in the floodplain to what is happening in the rest of the community.

Enter "0" if there are no numbers to report for this period. Do not leave a cell blank. Do not fill in the shaded boxes.

Instructions for the Lines

Lines 1-7 deal with buildings.

- o Section 301.a of the *CRS Coordinator's Manual* defines what constitutes a "building" and lists examples of structures that are not counted as "buildings" by the CRS.
- o Section 302.a of the *CRS Coordinator's Manual* describes how the CRS counts buildings. For example, accessory structures are not counted.
- o As noted in Section 302.a, to determine building counts, communities may use any method that yields reasonably good estimates of the number of buildings. Examples of acceptable methods are listed in Section 302.a. Precision is less important for large numbers. For example, the impact of the numbers will not change much if there are 10,000 buildings or 10,100 buildings.
- o If a building is out of the SFHA, but in a parcel that is partly in the SFHA, it is not counted in column A --In the SFHA.
- o In line 14, note how the building counts were obtained or estimated. Use the comments area, if needed.

Line 4 refers to map revisions. These include physical map revisions, Letters of Map Revision (LOMR), and Letters of Map Amendment (LOMA). If a building is removed from the SFHA by FEMA through a LOMA, but the community still administers its floodplain management regulations on the property, the building should not be included in the line 4 count in column A --In the SFHA. However, communities that still regulate areas removed by LOMAs can receive credit under Activities 410 or 430. If the community is receiving such credit, the building should be counted under column B --In a regulated floodplain outside the SFHA.

Line 7 is for the total number of buildings that were substantially improved plus the number of buildings that were substantially damaged during the period covered.

Lines 10 -13 deal with areas.

- o These areas are based on the areas shown on the community's FIRM including LOMRs or LOMAs. Section 403.b discusses those portions of the SFHA that are subtracted from the area of the SFHA to calculate the community's aSFHA used in credit calculations.
- o Section 403.e of the *CRS Coordinator's Manual* discusses calculating areas for CRS purposes.
- o Section 403.e notes that communities "should not spend an inordinate amount of time measuring areas." As with buildings, communities may use any method that yields reasonably good estimates. Examples of acceptable approaches are listed in Section 403.e.
- o Line 13 asks for the current acreage of the SFHA. The best source for this number is a GIS layer that shows the SFHA. If the community does not have GIS, the county, regional agency, or state NFIP mapping office may have SFHA layers and may be able to provide the data. If the community has a relatively recent FIRM, the study contractor or consulting engineer may have the data.
- o In line 15, note how the area calculations were obtained or estimated. Use the comments area, if needed.

Lines 17 -19 are voluntary, if the numbers are readily available.

- o Line 17 includes replacing an existing manufactured home with a new one. The newly placed manufactured home is counted as a new, post-FIRM, building.
- o The total of lines 17 -19 should equal the value entered in line 2.

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

CC-RL The Repetitive Loss List

(See Section 501 in the CRS Coordinator's Manual).

- We have reviewed the repetitive loss list dated: _____, 20_____, and [check one]
 Attached are updated Repetitive Loss Update Certifications, AW-501; or
 There are no changes to FEMA's repetitive loss list.

As the current CRS Coordinator for _____ [community name], I have examined the repetitive loss data provided for each of our _____ [number] assigned repetitive loss properties. For each property in need of update, I have attached an AW-501 that reflects the current and accurate address, the correct National Flood Insurance Program (NFIP) community identification number, and all known mitigation actions with the primary source of funding noted. To the best of my knowledge and belief, any AW-501 not updated and submitted as part of this application has been checked and is not in need of update at this time.

Signature _____ (Community CRS Coordinator)

To facilitate verification, please provide the names of the CRS Coordinator and local repetitive loss contact person, if other than the CRS Coordinator

CRS Coordinator	Repetitive Loss Contact
Name	
Title	
Phone number	
Fax number	
Address	
E-mail address	

Comments:

Federal Emergency Management Agency

National Flood Insurance Program

NFIP REPETITIVE LOSS UPDATE WORKSHEET (AW-501)

THE INFORMATION ON THIS FORM IS BASED ON CLAIMS ON OR BEFORE:

REPETITIVE LOSS NUMBER:

Internal use only A N/A FRR

NFIP Community Name:

CID#:

Local Property Identifier:

Current Property Address	Previous Property Address/Community ID#
Last Claimant:	Last Claimant:
Insured:	Name Insured:
Date of Losses:	Total Number of Losses for Property:

REQUESTED UPDATES

MARK ALL UPDATES BELOW THAT APPLY (IMPORTANT - SEE INSTRUCTIONS)

1. INFORMATION PROVIDED NOT SUFFICIENT TO IDENTIFY PROPERTY.

Choose this update if all attempts to locate the property fail. Please describe the steps you took to locate the property in the comments section below.

2. COSMETIC CHANGES REQUIRED TO THE ADDRESS:

Update the address shown above and/or add our local alternative property identifier such as a Tax Assessor #.

--

3. PROPERTY NOT IN OUR COMMUNITY OR JURISDICTION:

Choose this update if you have positively determined that the property shown is not located in your community. Please provide the correct NFIP community name and if known the NFIP community ID Number. If available, please attach a map showing the property location.

ASSIGN TO NFIP COMMUNITY NAME: _____ NFIP COMMUNITY ID#: _____

4. FLOOD PROTECTION PROVIDED.

Choose this update only if some type of structural intervention has occurred to the building, property or the source of flooding that protects the building from future events similar to those that occurred in the past. The update must be supported by documentation such as an Elevation Certificate and the Mitigation action and funding below must be provided.

(Mitigation Action 1.)

(Source of Primary Mitigation Funding 3.)

(Secondary Source of Funding 3.)

5. **NO BUILDING ON PROPERTY.**

Choose this update only if the property in question can be positively identified as the site of the previously flooded building and documentation is available to support that an insurable building no longer exists at this site. The update must be supported by documentation such as a Demolition or Relocation Permit and the Mitigation action and funding information below must be provided.

(Mitigation Action 2.)

(Source of Primary Mitigation Funding 3.)

(Secondary Source of Funding 3.)

6. **DUPLICATE LISTING WITH RL NUMBER:** _____ COMBINE AS ONE LISTING.

Choose this update to identify two or more separate listings that are for the same building. List all other RL numbers that are duplicates to this property. Please indicate which address shown is the correct address to use.

7. **HISTORIC BUILDING:**

Choose this update if you know the building is or would be eligible to be listed on a State or National Historic Registry.

COMMENTS SECTION:

A signed RL transmittal sheet must accompany this form for approval of the update!

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

CC-530 Retrofitted Buildings

This certification is used for retrofitting projects that are not in a high-hazard area and that do not need to be designed or approved by a registered design professional. Completed FEMA Elevation Certificates are used for buildings retrofitted by elevation (TUE).

Part 1. For Credit Calculations Option 1 and Option 2

Part 1 is used for all submissions for credit under TUD, TUW, TUS, and TUB.

I certify that, for the buildings on the attached list,

- All retrofitting projects were completed after the effective date of our initial FIRM:
_____ [Date];
- All retrofitting projects provide protection to at least the 25-year flood level;
- All required permits were issued for each project, or the project complies with all federal, state, and local codes and regulations;
- None of the retrofitting projects was mandated by the substantial improvement or substantial damage requirements of our floodplain management regulations; and
- All retrofitting projects are currently in good condition.

Part 2. For Credit Calculation Option 2

Part 2 is needed only if the community is requesting credit under Section 533.b. Option 2 for buildings submitted for credit under TUD, TUW, and TUS.

One copy of this certification can be used for multiple properties that have the same score.

Dry floodproofed buildings (TUD)

The buildings listed as property numbers _____
have been dry floodproofed and [check one]

- The project was designed by a registered design professional and the design accounts for openings, internal drainage, seepage, and underdrainage. (TU = 0.6)
- The project does not depend on human intervention to close openings; the project protects to a level less than 3 feet over the first floor; the design accounts for internal drainage, seepage, and underdrainage; and the building does not have a basement (i.e., any floor below grade on all sides). (TU = 0.4)
- There is no documentation of how openings, interior drainage, seepage, or underdrainage are handled. (TU = 0.2)

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

Wet floodproofed buildings (TUW)

The buildings listed as property numbers _____ have been wet floodproofed and [check one]

- The project was designed by a registered design professional. (TU = 0.5)
- The project was not designed by a registered design professional. (TU = 0.3)
- The furnace, water heater, electrical breaker box, and other utilities are relocated above flood level. (TU = 0.2)

Buildings protected from sewer or sump backup (TUS)

The buildings listed as property numbers _____, which have been protected from sewer or sump backup and [check one]

- The building is located in the SFHA. (TU = 0.2)
- The building is located outside of the SFHA and the community has a building code or other regulations that require positive drain sewers or other measures that prevent sewer backup into new buildings. (TU = 0.1)

Name (printed) _____ Title _____

Signature _____ Date _____

Appendix F

CRS COMMUNITY CERTIFICATIONS FOR ENVIRONMENTAL AND HISTORIC PRESERVATION

This appendix contains forms for a community's certification of its compliance with environmental and historic preservation requirements. These certifications are part of the documentation needed to obtain credit for certain activities under the National Flood Insurance Program's Community Rating System (CRS). The certification forms are designed to be used in conjunction with the *CRS Coordinator's Manual*.

Community certification forms for non-environmental aspects of the CRS can be found in Appendix E.

Instructions for completing the certification forms can be found on each page.

The forms included here can be photocopied and completed and submitted as needed, or the community can access fillable-pdf versions of the forms at www.CRSresources.org/200.

Contents

- CC-520EHP Acquisition and Relocation—Certification of Compliance with Environmental and Historic Preservation Requirements
- CC-530EHP Flood Protection—Certification of Compliance with Environmental and Historic Preservation Requirements
- CC-540EHP Drainage System Maintenance—Certification of Compliance with Environmental and Historic Preservation Requirements
- CC-620EHP Levees—Certification of Compliance with Environmental and Historic Preservation Requirements

DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency

CRS COMMUNITY CERTIFICATIONS FOR ENVIRONMENTAL AND HISTORIC PRESERVATION

OMB Control Number: 1660-0022
Expiration: 3/31/2020

Public reporting burden for this form is estimated to average 1.6 hours for the environmental and historic preservation certifications, per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and submitting the form. This collection of information is voluntary. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, S.W., Washington, D.C. 20472, Paperwork Reduction Project (1660-0022). NOTE: Do not send your completed form to this address.

Appendix F

This appendix contains forms for a community's certification of its compliance with environmental and historic preservation requirements. These certifications are part of the documentation needed to obtain credit for certain activities under the National Flood Insurance Program's Community Rating System (CRS). The certification forms are designed to be used in conjunction with the *CRS Coordinator's Manual*.

Community certification forms for non-environmental aspects of the CRS can be found in Appendix E.

Instructions for completing the certification forms can be found on each page.

Contents

- CC-520EHP Acquisition and Relocation --Certification of Compliance with Environmental and Historic Preservation Requirements
- CC-530EHP Flood Protection --Certification of Compliance with Environmental and Historic Preservation Requirements
- CC-540EHP Drainage System Maintenance --Certification of Compliance with Environmental and Historic Preservation Requirements
- CC-620EHP Levees --Certification of Compliance with Environmental and Historic Preservation Requirements

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

CC-520EHP Acquisition and Relocation

Compliance with Environmental and Historic Preservation Requirements

(see Section 521.b(7) in the CRS Coordinator's Manual)

In the table below, list each property for which credit is desired under Activity 520, indicate the project date, and check the box that identifies the source of the project funding. Add additional copies of this page (CC-520EHP-1) as necessary. Then, complete pages CC-520EHP-2 and CC-520EHP-3, as appropriate, based on the project's funding source.

If any FEMA funding was included in the project, then the source of funding is "FEMA." FEMA funding includes FEMA Hazard Mitigation Assistance grants (under the Hazard Mitigation Grant Program or the Pre-disaster Mitigation, Flood Mitigation Assistance, Repetitive Flood Claims, or Severe Repetitive Loss programs) and FEMA Public Assistance funds. If no FEMA funding was used but any other federal funds were included (e.g., from the Corps of Engineers), then the funding source is "Other Federal Agency." If the project was funded only by state, local, and/or private funds, the source is "No Federal Funds." An NFIP claim payment, including funds provided under Increased Cost of Compliance coverage, is considered "No Federal Funds."

NOTE: The self-certification of compliance with environmental and historic preservation requirements incorporated into this certification applies only to projects implemented after the effective date of the 2013 Coordinator's Manual (April 1, 2013).

CC-520EHP-1

[continued on next page]

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

Acquisition and Relocation Projects

Project Name:

Project or Grant Number:

Project Description (or include as a attachment):

On each row of the table below, initial the box that applies to the project, signifying that the appropriate steps were taken (shaded areas are "not applicable"). Then sign at the end of the certification. More information on these programs can be found in Figure 500-5 of the *Coordinator's Manual*.

Federal Funding	No Federal Funding	Certification Statement for Acquisition and Relocation Projects
		All properties marked "FEMA Funded" on CC-520EHP-1 were included in the above description of the FEMA-funded project.
		State and local requirements: In addition to federal laws, implementing regulations, and executive orders, this project took into consideration the requirements of all state and local environmental and historic preservation laws, ordinances, and permits that apply to this type of project. Communication with the appropriate state agency and/or local government entity took place before project implementation. Any recommendations made by the agency or office were carried out.
		National Historic Preservation Act: If any acquired or relocated structure affected by this project was 50 years of age or older at the time of the acquisition, communication with the State Historic Preservation Officer or Tribal Historic Preservation Officer (if on tribal land or reservation) took place to determine if the structure was either on or eligible for the National Register of Historic Places (historic property) and to resolve any adverse effect(s) to the historic property.
		Protection of floodplains (E.O. 11988—Floodplain Management): Consideration was given to the project's long- and short-term adverse impacts that are associated with the occupancy and modification of floodplains, and to avoiding direct and indirect support of floodplain development wherever there was a practicable alternative.
		E.O. 11990—Protection of Wetlands: Consideration was given to the possible loss or degradation of wetlands associated with the construction of this project, as well as to the preservation and enhancement of the natural and beneficial values of wetlands.
		E.O. 12898—Environmental Justice in Minority and Low-income Populations: Consideration was given to the possible negative impacts associated with the implementation of this project on minority and low-income populations, and to avoiding those impacts where practicable.

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

Federal Funding	No Federal Funding	Certification Statement for Acquisition and Relocation Projects (cont.)
		For projects in areas subject to the Coastal Barrier Resources Act: There was communication with the U.S. Fish and Wildlife Service regarding this project's potential to jeopardize any ecologically sensitive coastal barrier resources. Any recommendations made by the Service were carried out.
		For projects in coastal communities: There was communication concerning this project with the state's lead coastal zone management agency regarding the enforcement of the policies of the state's coastal zone management program in carrying out federally funded or federally authorized construction activities. Any recommendations made by the agency were carried out.

In addition to the above, for projects that also involved the development of a new site on which to place the relocated building(s), continue initialing in the appropriate boxes, below.

	Endangered Species Act: Consideration was given to the protection and preservation of threatened and/or endangered species (including plants and animals and their habitat) whose existence may have been threatened by the construction activities. Communication took place with the U.S. Fish and Wildlife Service (or the National Marine Fisheries Service if the project is in a coastal area) and the applicable state agencies for state-protected species and/or their habitat. Any recommendations made by the Services or state agencies were carried out.
	Archaeological and Historic Preservation Act: The effects of the proposed relocation on archaeological sites were considered.
	Point source and non-point source discharge (Clean Water Act, Section 402): Consideration was given to all permit requirements for municipal point source discharge (sewage treatment plant discharge) as well as non-point discharge (surface runoff) of a pollutant into surface waters. Communication with the Environmental Protection Agency or designated state office took place. Any recommendations made by the agencies were carried out.
	Dredge and fill materials (Clean Water Act, Section 404): Consideration was given to all permit requirements for discharging dredge or fill material into waters of the United States, including wetlands, and communication with the U.S. Army Corps of Engineers took place. Any recommendations made by the Corps were carried out.
	Farmland Protection Policy Act: Consideration was given to the protection of prime and unique farmlands in the construction of this project. Communication with the U.S. Department of Agriculture's Natural Resources Conservation Service took place. Any recommendations made by the Service were carried out.

I certify that the items initialed above are correct to the best of my knowledge.

Name (printed) _____ Title _____

Signature _____ Date _____

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

CC-530EHP Flood Protection

Compliance with Environmental and Historic Preservation Requirements

(see Section 531.b(4) in the CRS Coordinator's Manual)

NOTE: The self-certification of compliance with environmental and historic preservation requirements incorporated into this certification applies ONLY to projects implemented AFTER the effective date of the 2013 Coordinator's Manual (April 1, 2013).

Part A. Retrofitting Projects (TUE, TUD, TUW, TUS)

In the table below, list each retrofitted property for which credit is desired under Activity 530, indicate the type of project, check the box that identifies the source of project funding, and insert the project date. Add additional copies of this page (CC-530EHP-1) as needed for the number of properties. Then, complete pages CC-530EHP-2 and CC-530EHP-3 as appropriate, based on the project's funding source.

If any FEMA funding was included in the project, then the source of funding is "FEMA." FEMA funding includes FEMA Hazard Mitigation Assistance grants (under the Hazard Mitigation Grant Program or the Pre-disaster Mitigation, Flood Mitigation Assistance, Repetitive Flood Claims, or Severe Repetitive Loss programs) or FEMA Public Assistance funds. If no FEMA funding was used but any other federal funds were included (e.g., from the Corps of Engineers), then the funding source is "Other Federal Agency." If the project was funded only by state, local, and/or private funds, the source is "No Federal Funds." An NFIP claim payment, including funds provided under Increased Cost of Compliance coverage, is considered "No Federal Funds."

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

Part A. Retrofitting Projects (TUE, TUD, TUW, TUS) (cont.):

Project Name:

Project or Grant Number:

Project Description (or include as a attachment):

On each row of the table below, initial the box that applies to the project, signifying that the appropriate steps were taken (shaded areas are "not applicable"). Then sign at the end of the certification. More information on these programs can be found in Figure 500-5 of the *Coordinator's Manual*.

Federal Funding	No Federal Funding	Certification Statement for Retrofitting Projects
		All properties marked "FEMA Funded" on CC-530EHP-1 were included in the above description of the FEMA-funded project.
		State and local requirements: In addition to federal laws, implementing regulations, and executive orders, this project took into consideration the requirements of all state and local environmental and historic preservation laws, ordinances, and permits that apply to this type of project. Communication with the appropriate state agency and/or local government entity took place before project implementation. Any recommendations made by the agency or office were carried out.
		For projects that affected buildings 50 years of age or older (National Historic Preservation Act): If any retrofitted structure affected by this project was 50 years of age or older at the time of the acquisition, communication with the State Historic Preservation Officer or Tribal Historic Preservation Officer (if on tribal land or reservation) took place to determine if the structure was either on or eligible for the National Register of Historic Places (historic property) and to resolve any adverse effect(s) to the historic property.
		Protection of floodplains (E.O. 11988—Floodplain Management): Consideration was given to the project's long- and short-term adverse impacts that are associated with the occupancy and modification of floodplains, and to avoiding direct and indirect support of floodplain development wherever there was a practicable alternative.
		E.O. 11990—Protection of Wetlands: Consideration was given to the possible loss or degradation of wetlands associated with the construction of this project, as well as to the preservation and enhancement of the natural and beneficial values of wetlands.

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

Federal Funding	No Federal Funding	Certification Statement for Retrofitting Projects (cont.)
		E.O. 12898—Environmental Justice in Minority and Low-income Populations: Consideration was given to the possible negative impacts associated with the implementation of this project on minority and low-income populations, and to avoiding those impacts where practicable.
		For projects in areas subject to the Coastal Barrier Resources Act: There was communication with the U.S. Fish and Wildlife Service regarding this project's potential to jeopardize any ecologically sensitive coastal barrier resources. Any recommendations made by the Service were carried out.
		For projects in coastal communities: There was communication concerning this project with the state's lead coastal zone management agency regarding the enforcement of the policies of the state's coastal zone management program in carrying out federally funded or federally authorized construction activities. Any recommendations made by the agency were carried out.

I certify that the items initialed above are correct to the best of my knowledge.

Name (printed) _____ Title _____

Signature _____ Date _____

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

Part B. Flood Control Projects (TUB, TUC, TUF)

In the table below, list each property for which credit is desired under Activity 530 for flood control projects (TUB, TUC, and TUF), indicate the type of project, check the box that identifies the source of project funding, and insert the project date. Add additional pages (page CC-530EHP-4 as necessary. Then, complete pages CC-530EHP-5 through CC-530EHP-11 as appropriate, based on the project's funding source.

If any FEMA funding was included in the project, then the source of funding is "FEMA." FEMA funding includes FEMA Hazard Mitigation Assistance grants (under the Hazard Mitigation Grant Program or the Pre-disaster Mitigation, Flood Mitigation Assistance, Repetitive Flood Claims, or Severe Repetitive Loss programs) or FEMA Public Assistance funds. If no FEMA funding was used but any other federal funds were included (e.g., from the Corps of Engineers), then the funding source is "Other Federal Agency." If the project was funded only by state, local, and/or private funds, the source is "No Federal Funds." An NFIP claim payment, including funds provided under Increased Cost of Compliance coverage, is considered "No Federal Funds."

NOTE: The self-certification of compliance with environmental and historic preservation requirements incorporated into this certification applies ONLY to projects implemented AFTER the effective date of the 2013 Coordinator's Manual (April 1, 2013).

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

TUB—Barriers, Levees, Floodwalls

Project Name:

Project or Grant Number:

Project Description (or include as a attachment):

On each row of the table below, initial the box that applies to the project, signifying that the appropriate steps were taken (shaded areas are "not applicable"). Then sign at the end of the certification. More information on these programs can be found in Figure 500-5 of the *Coordinator's Manual*.

Federal Funding	No Federal Funding	Certification Statement for Barriers, Levees, and Floodwalls (TUB)
		All properties marked "FEMA Funded" on CC-530EHP-1 were included in the above description of the FEMA-funded project.
		State and local requirements: In addition to federal laws, implementing regulations, and executive orders, this project took into consideration the requirements of all state and local environmental and historic preservation laws, ordinances, and permits that apply to this type of project. Communication with the appropriate state agency and/or local government entity took place before project implementation. Any recommendations made by the agency or office were carried out.
		For projects that affected buildings 50 years of age or older: (National Historic Preservation Act and Archaeological and Historic Preservation Act): (1) If any structure affected by this project was 50 years of age or older at the time of the project implementation, communication with the State Historic Preservation Officer or Tribal Historic Preservation Officer (if on tribal land or reservation) took place to determine if the structure was either on or eligible for the National Register of Historic Places (historic property) and to resolve any adverse effect(s) to the historic property. (2) The effects of the project on archaeological sites were considered.
		Protection of threatened and endangered species (Endangered Species Act): Consideration was given to the protection and preservation of threatened and/or endangered species (including plants and animals and their habitat) whose existence may have been threatened by the construction activities. Communication took place with the U.S. Fish and Wildlife Service (or the National Marine Fisheries Service if the project is in a coastal area) and the applicable state agencies for state-protected species and/or their habitat. Any recommendations made by the Services or state agencies were carried out.
		Discharge of dredge and fill materials (Clean Water Act, Section 404): Consideration was given to all permit requirements for discharging dredge and fill materials into waters of the United States, including wetlands, and communication with the U.S. Army Corps of Engineers took place. Any recommendations made by the Corps were carried out.

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

Federal Funding	No Federal Funding	Certification Statement for Barriers, Levees, and Floodwalls (cont.)
		Protection of floodplains (E.O. 11988—Floodplain Management): Consideration was given to the project's long- and short-term adverse impacts that are associated with the occupancy and modification of floodplains, and to avoiding direct and indirect support of floodplain development wherever there was a practicable alternative.
		E.O. 11990—Protection of Wetlands: Consideration was given to the possible loss or degradation of wetlands associated with the construction of this project, as well as to the preservation and enhancement of the natural and beneficial values of wetlands.
		E.O. 12898—Environmental Justice in Minority and Low-income Populations: Consideration was given to the possible negative impacts associated with the implementation of this project on minority and low-income populations, and to avoiding those impacts where practicable.
		For projects in areas subject to the Coastal Barrier Resources Act: There was communication with the U.S. Fish and Wildlife Service regarding this project's potential to jeopardize any ecologically sensitive coastal barrier resources. Any recommendations made by the Service were carried out.
		For projects in coastal communities: There was communication concerning this project with the state's lead coastal zone management agency regarding the enforcement of the policies of the state's coastal zone management program in carrying out federally funded or federally authorized construction activities. Any recommendations made by the agency were carried out.

I certify that the items initialed above are correct to the best of my knowledge.

Name (printed) _____ Title _____

Signature _____ Date _____

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

TUC— Bridge or Culvert Projects, Channel Modification, Channel Diversion, Pump Station Improvements, Storm Drain Improvements, or Other Projects

Project Name:

Project or Grant Number:

Project Description (or include as a attachment):

On each row of the table below, initial the box that applies to the project, signifying that the appropriate steps were taken (shaded areas are "not applicable"). Then sign at the end of the certification. More information on these programs can be found in Figure 500-5 of the *Coordinator's Manual*.

The creditable projects include:

- Bridge or culvert projects;
- Channel modification or channel diversion;
- Pump station improvements;
- Storm drain improvements; and
- Other (project not listed in Activity 530, but being considered for CRS credit).

Also see the matrix of the various environmental and historical preservation compliance requirements as they relate to these types of projects. It is available at www.CRSresources.org/500.

Federal Funding	No Federal Funding	Certification Statement for Bridge or Culvert Projects, Channel Modification, Channel Diversion, Pump Station Improvements, Storm Drain Improvements, or Other Projects (TUC)
		All properties marked "FEMA Funded" on CC-530EHP-1 were included in the above description of the FEMA-funded project.
		For bridge or culvert projects, channel modification, channel diversion, storm drain improvements, pump station improvements, or other projects:
		State and local requirements: In addition to federal laws, implementing regulations, and executive orders, this project took into consideration the requirements of all state and local environmental and historic preservation laws, ordinances, and permits that apply to this type of project. Communication with the appropriate state agency and/or local government entity took place before project implementation. Any recommendations made by the agency or office were carried out.
		Protection of threatened and endangered species (Endangered Species Act): Consideration was given to the protection and preservation of threatened and/or endangered species (including plants and animals and their habitat) whose existence may have been threatened by the construction activities. Communication took place with the U.S. Fish and Wildlife Service (or the National Marine Fisheries Service if the project is in a coastal area) and the applicable state agencies for state-protected species and/or their habitat. Any recommendations made by the Services or state agencies were carried out.
		Protection of floodplains (E.O. 11988—Floodplain Management): Consideration was given to the project's long- and short-term adverse impacts that are associated with the occupancy and modification of floodplains, and to avoiding direct and indirect support of floodplain development wherever there was a practicable alternative.

Community _____

State _____

CID _____

(6-digit NFIP Community Identification Number)

Federal Funding	No Federal Funding	Certification Statement for Bridge or Culvert Projects, Channel Modification, Channel Diversion, Pump Station Improvements, Storm Drain Improvements, or Other Projects (cont.)
Bridge or culvert projects, channel modification, channel diversion, storm drain improvements, pump station improvements, or other projects (cont.)		
		E.O. 11990—Protection of Wetlands: Consideration was given to the possible loss or degradation of wetlands associated with the construction of this project, as well as to the preservation and enhancement of the natural and beneficial values of wetlands.
		E.O. 12898—Environmental Justice in Minority and Low-income Populations: Consideration was given to the possible negative impacts associated with the implementation of this project on minority and low-income populations, and to avoiding those impacts where practicable.
		For projects in areas subject to the Coastal Barrier Resources Act: There was communication with the U.S. Fish and Wildlife Service regarding this project's potential to jeopardize any ecologically sensitive coastal barrier resources. Any recommendations made by the Service were carried out.
		For projects in coastal communities: There was communication concerning this project with the state's lead coastal zone management agency regarding the enforcement of the policies of the state's coastal zone management program in carrying out federally funded or federally authorized construction activities. Any recommendations made by the agency were carried out.
In addition to the above, for bridge or culvert projects, storm drain improvements, or other projects:		
		For projects that affected structures 50 years of age or older: (National Historic Preservation Act): If any protected structure affected by this project was 50 years of age or older at the time of the project, communication with the State Historical Preservation Officer or Tribal Historical Preservation Officer (if on tribal land or reservation) took place to determine if the structure was either on or eligible for the National Register of Historic Places (historic property) and to resolve any adverse effect(s) to the historic property.
In addition to the above, for bridge or culvert projects, channel modification, channel diversion, storm drain improvements, or other projects:		
		Archaeological and Historic Preservation Act: The effects of the project on archaeological sites were considered.
In addition to the above, for bridge or culvert projects, channel modification, channel diversion, and other projects:		
		Dredge and fill materials (Clean Water Act, Section 404): Consideration was given to all permit requirements for discharging dredge and fill material into waters of the United States, including wetlands, and communication with the U.S. Army Corps of Engineers took place. Any recommendations made by the Corps were carried out.
		Rivers and Harbors Act, Section 10: Consideration was given to any permit requirements for the project's impact on navigable waterways. Communication with the U.S. Army Corps of Engineers took place.

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

Federal Funding	No Federal Funding	Certification Statement for Bridge or Culvert Projects, Channel Modification, Channel Diversion, Pump Station Improvements, Storm Drain Improvements, or Other Projects (cont.)
For bridge or culvert projects, channel modification, channel diversion, or other projects (cont.)		
		Fish and Wildlife Coordination Act: Consideration was given to the potential for this project to result in the control or modification of a natural stream or body of water. Communication with the U.S. Fish and Wildlife Service (or National Marine Fisheries Service if the project is in a coastal area) took place. Any recommendations made by the agencies were carried out.
For pump station improvements, storm drain improvements, and other projects:		
		Point source and non-point source discharge (Clean Water Act, Section 402): Consideration was given to all permit requirements for municipal point source discharge (sewage treatment plant discharge) as well as non-point discharge (surface runoff) of a pollutant into surface waters. Communication with the Environmental Protection Agency or designated state office took place. Any recommendations made by the agencies were carried out.
For channel modification, channel diversion, and other projects:		
		Farmland Protection Policy Act: Consideration was given to the protection of prime and unique farmlands in the construction of this project. Communication with the U.S. Department of Agriculture, Natural Resources Conservation Service took place. Any recommendations made by the Service were carried out.

I certify that the items initialed above are correct to the best of my knowledge.

Name (printed) _____ Title _____

Signature _____ Date _____

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

TUF—Storage Facilities

Project Name:

Project or Grant Number:

Project Description (or include as a attachment):

On each row of the table below, initial the box that applies to the project, signifying that the appropriate steps were taken (shaded areas are "not applicable"). Then sign at the end of the certification. More information on these programs can be found in Figure 500-5 of the *Coordinator's Manual*.

Federal Funding	No Federal Funding	Certification Statement for Storage Facilities (TUF)
		All properties marked "FEMA Funded" on CC-530EHP-1 were included in the above description of the FEMA-funded project.
		State and local requirements: In addition to federal laws, implementing regulations, and executive orders, this project took into consideration the requirements of all state and local environmental and historic preservation laws, ordinances, and permits that apply to this type of project. Communication with the appropriate state agency and/or local government entity took place before project implementation. Any recommendations made by the agency or office were carried out.
		Archaeological and Historic Preservation Act: The effects of the project on archaeological sites were considered.
		Protection of threatened and endangered species (Endangered Species Act): Consideration was given to the protection and preservation of threatened and/or endangered species (including plants and animals and their habitat) whose existence may have been threatened by the construction activities. Communication took place with the U.S. Fish and Wildlife Service (or the National Marine Fisheries Service if the project is in a coastal area) and the applicable state agencies for state-protected species and/or their habitat. Any recommendations made by the Services or state agencies were carried out.
		Point source and non-point source discharge (Clean Water Act, Section 402): Consideration was given to all permit requirements for municipal point source discharge (sewage treatment plant discharge) as well as non-point discharge (surface runoff) of a pollutant into surface waters. Communication with the Environmental Protection Agency or designated state office took place. Any recommendations made by the agencies were carried out.
		Dredge and fill materials (Clean Water Act, Section 404): Consideration was given to all permit requirements for discharging dredge and fill material into waters of the United States, including wetlands, and communication with the U.S. Army Corps of Engineers took place. Any recommendations made by the Corps were carried out.

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

Federal Funding	No Federal Funding	Certification Statement for Storage Facilities (cont.)
		Farmland Protection Policy Act: Consideration was given to the protection of prime and unique farmlands in the construction of this project. Communication with the U.S. Department of Agriculture, Natural Resources Conservation Service took place. Any recommendations made by the Service were carried out.
		Protection of floodplains (E.O. 11988—Floodplain Management): Consideration was given to the project's long- and short-term adverse impacts that are associated with the occupancy and modification of floodplains, and to avoiding direct and indirect support of floodplain development wherever there was a practicable alternative.
		E.O. 11990—Protection of Wetlands: Consideration was given to the possible loss or degradation of wetlands associated with the construction of this project, as well as to the preservation and enhancement of the natural and beneficial values of wetlands.
		E.O. 12898—Environmental Justice in Minority and Low-income Populations: Consideration was given to the possible negative impacts associated with the implementation of this project on minority and low-income populations, and to avoiding those impacts where practicable.
		For projects in areas subject to the Coastal Barrier Resources Act: There was communication with the U.S. Fish and Wildlife Service regarding this project's potential to jeopardize any ecologically sensitive coastal barrier resources. Any recommendations made by the Service were carried out.
		For projects in coastal communities: There was communication concerning this project with the state's lead coastal zone management agency regarding the enforcement of the policies of the state's coastal zone management program in carrying out federally funded or federally authorized construction activities. Any recommendations made by the agency were carried out.

I certify that the items initialed above are correct to the best of my knowledge.

Name (printed) _____ Title _____

Signature _____ Date _____

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

CC-540EHP Drainage System Maintenance

Compliance with Environmental and Historic Preservation Requirements

(see Section 541.b(4) in the CRS Coordinator's Manual)

On each row of the table below, initial the box that applies to the project, signifying that the appropriate steps were taken (shaded areas are "not applicable"). Then sign at the end of the certification. More information on these programs can be found in Figure 500-5 of the Coordinator's Manual.

NOTE: To receive credit under Activity 540, the self-certification of compliance with environmental and historical preservation requirements incorporated in this certification must be submitted with a CRS application, a modification, or a cycle verification.

All Projects	Certification Statement for Drainage System Maintenance
	State and local requirements: In addition to federal laws, implementing regulations, and executive orders, this project took into consideration the requirements of all state and local environmental and historic preservation laws, ordinances, and permits that apply to this type of project. Communication with the appropriate state agency and/or local government entity took place before project implementation. Any recommendations made by the agency or office were carried out.
	Protection of threatened and endangered species (Endangered Species Act): Consideration was given to the protection and preservation of threatened and/or endangered species (including plants and animals and their habitat) whose existence may have been threatened by the construction activities. Communication took place with the U.S. Fish and Wildlife Service (or the National Marine Fisheries Service if the project is in a coastal area) and the applicable state agencies for state-protected species and/or their habitat. Any recommendations made by the Services or state agencies were carried out.
	Dredge and fill materials (Clean Water Act, Section 404): Consideration was given to all permit requirements for discharging dredge and fill material into waters of the United States, including wetlands, and communication with the U.S. Army Corps of Engineers took place. Any recommendations made by the Corps were carried out.
	For all activities that involve heavy equipment and result in the disturbance and release of sediment, such as dredging, channel alteration, bank stabilization, debris removal, and other activities, consideration is given to any permit requirements under the Clean Water Act, Section 404 . Communication with the U.S. Army Corps of Engineers takes place. Any recommendations made by the Corps are carried out.

I certify that the items initialed above are correct to the best of my knowledge.

Name (printed) _____ Title _____

Signature _____ Date _____

Community _____ State _____ CID _____
(6-digit NFIP Community Identification Number)

CC-620EHP Levess

Compliance with Environmental and Historic Preservation Requirements

(see Section 622.a in the *CRS Coordinator's Manual*)

On each row of the table below, initial the box that applies to the project, signifying that the appropriate steps were taken (shaded areas are "not applicable"). Then sign at the end of the certification. More information on these programs can be found in Figure 500-5 of the Coordinator's Manual.

NOTE: To receive credit under Activity 620, the self-certification of compliance with environmental and historical preservation requirements incorporated in this form (CC-620EHP-1) must be submitted with a CRS application, a modification, or a cycle verification.

All Projects	Certification Statement for Levee Maintenance
	State and local requirements: In addition to federal laws, implementing regulations, and executive orders, this project took into consideration the requirements of all state and local environmental and historic preservation laws, ordinances, and permits that apply to this type of project. Communication with the appropriate state agency and/or local government entity took place before project implementation. Any recommendations made by the agency or office were carried out.
	Protection of threatened and endangered species (Endangered Species Act): Consideration was given to the protection and preservation of threatened and/or endangered species (including plants and animals and their habitat) whose existence may have been threatened by the construction activities. Communication took place with the U.S. Fish and Wildlife Service (or the National Marine Fisheries Service if the project is in a coastal area) and the applicable state agencies for state-protected species and/or their habitat. Any recommendations made by the Services or state agencies were carried out.
	Dredge and fill materials (Clean Water Act, Section 404): Consideration was given to all permit requirements for discharging dredge and fill material into waters of the United States, including wetlands, and communication with the U.S. Army Corps of Engineers took place. Any recommendations made by the Corps were carried out.
	For all activities that involve heavy equipment and result in the disturbance and release of sediment, such as dredging, channel alteration, bank stabilization, debris removal, and other activities, consideration is given to any permit requirements under the Clean Water Act, Section 404 . Communication with the U.S. Army Corps of Engineers takes place. Any recommendations made by the Corps are carried out.

I certify that the items initialed above are correct to the best of my knowledge.

Name (printed) _____ Title _____

Signature _____ Date _____

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