



# FEMA

## DFIRM 101 Workshop

*Demystifying a DFIRM*



### DFIRM and Risk Communication

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Workshop

- Map Modernization will result in Digital Flood Insurance Rate Map (DFIRM) data for 92% of the population
- Stakeholders are unfamiliar with the new digital data
- DFIRM 101 workshops are being conducted in FEMA Region 9 to promote the digital data
- Risk Communication using digital data will be a key aspect of Risk MAP



## Purpose of Workshop

DFIRM 101  
Workshop

- The Digital Flood Insurance Rate Map (DFIRM) for many counties in California, Hawaii and Nevada are effective or will be effective soon
- A DFIRM is a useful product that may still be unfamiliar to you
- Therefore, today's workshop will address
  - What is the NFIP, Map Modernization and Risk MAP?
  - What is FEMA's "Digital Vision"?
  - What is a DFIRM and the National Flood Hazard Layer (NFHL)?
  - What are the advantages of digital flood hazard data?
  - What FEMA tools are available for accessing the data?
  - How to view/obtain the data?
  - How can digital data help with risk communication?

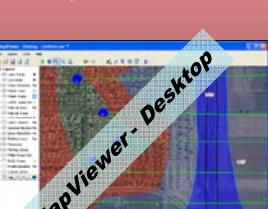


## Preview of FEMA Tools

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These tools can be used to view historic maps and FIRM panels



These tools can be used to view digital flood hazard data (just prior to or after DFIRM effective date)



# National Flood Insurance Program (NFIP)

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Workshop

The primary goal of the NFIP is to reduce the loss of life and property



# National Flood Insurance Program (NFIP)

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- NFIP is voluntary based on mutual agreement between the Federal government and a local community
- If a community adopts and enforces a floodplain management ordinance, Federally-backed flood insurance is available to property owners in the community
- NFIP Facts as of 4/30/08 (nationwide)
  - Flood policies in force: 5.6 million
  - Participating communities: 20,556
  - Coverage: \$1.1 trillion

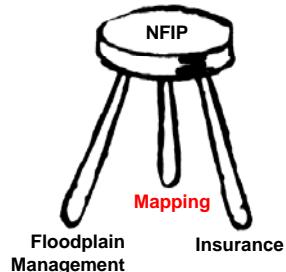


# National Flood Insurance Program (NFIP)

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## The NFIP has 3 Main Parts

- **Mapping:** identification of flood hazards
  - **Floodplain Management:** building practices aimed at reducing flood damage
  - **Insurance:** reduce economic impacts
- **Mapping:** Flood Insurance Rate Maps (FIRMs) identify areas with at least a 1-percent-annual chance of flooding



# Map Modernization

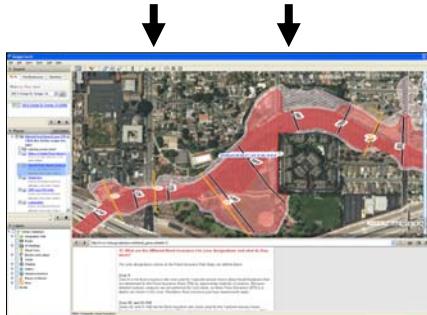
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- Flood hazards need to be accurately identified
- Most existing FIRMs were
  - Based on 70's paper mapping technology
  - Single layer of map information
  - Separate maps for individual communities
  - Difficult and costly to change and distribute
  - 20-30 or more years old



## Map Modernization

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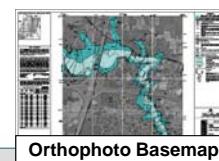
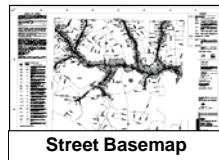
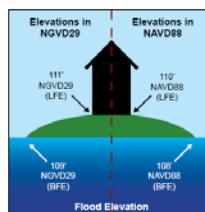
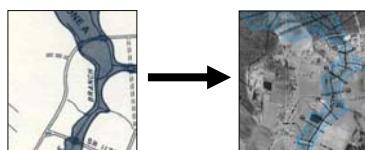
- 5-Year program to modernize FIRMs for:
  - 92% of population nationwide
  - 65% of land area nationwide
- Map Modernization was funded in Federal fiscal years 2004 – 2008
- Most Map Modernization projects completed by 2010



## Map Modernization

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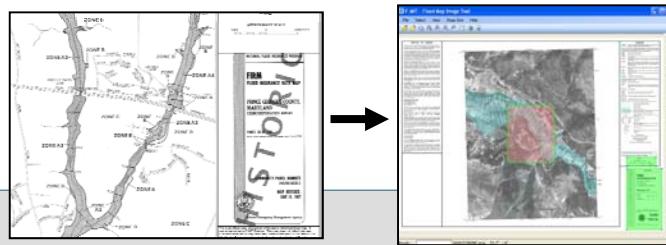
- Upgrade paper FIRMs to new GIS-based DFIRM format
- Create 1 seamless countywide FIS report and DFIRM
- Refit the floodplain and floodway data to more current basemap
- Incorporate Letters of Map Revisions (LOMRs)
- Convert the vertical reference datum for flood elevation data (NGVD 29 to NAVD 88)



## FEMA's Digital Vision

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- Digital flood products are available and easy to use
- Stakeholders are aware of the digital products and understand the advantages of the new products
- FEMA's production processes are updated to benefit from and focus on digital products
- Digital Vision is enabled by FEMA Policy on the *Use of Digital Flood Hazard Data*



## FEMA's Digital Vision

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### ▪ Benefits

- Reduce the need and demand for paper
- Provide more outreach to citizens
- Better integration of data across jurisdictions

### ▪ Goals

- Streamlines production of high-quality digital data
- Updates mapping process
- More timely data available to customers

For more info, read “Increasing Options with Digital Flood Data” fact sheet



## No More Paper ...

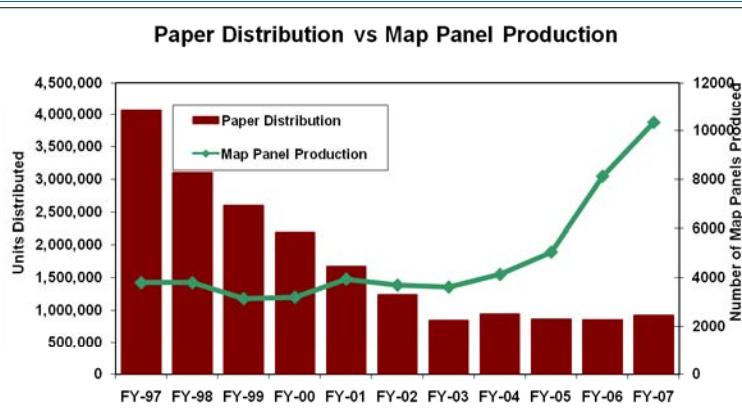
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- Beginning on October 1, 2009 customers may order only digital flood hazard reports and data
- FEMA's MSC will not produce or distribute paper maps or reports on or after this date
- One single paper copy provided to communities when their maps are updated
- Users of paper maps should start planning to make a transition to digital flood hazard maps and reports now
- FEMA will convert orders for paper products to the digital equivalent starting on October 1, 2009
- No change is anticipated for the distribution of LOMCs



## No More Paper ...

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75% reduction in paper distribution despite  
a 300% increase in map panel production



# Initial DFIRM Distribution

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- Prior to DFIRM effective date, the Chief Elected Official (City/Town Mayor or County Council President) of each community receives:
  - Hard copy of community FIRM panels
  - Hard copy of countywide FIS text/report
  - CDs containing:
    - Digital copy of countywide FIS text/report (.pdf)
    - Digital images of community panels (.png)
    - DFIRM database (GIS data)
- Digital products will also be uploaded to the MSC
- The Final Summary of Map Actions (SOMA) is distributed with the Letter of Final Determination (LFD) 6 months prior to the DFIRM effective date



# Map Service Center (MSC)

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- <http://msc.fema.gov>
- Distribution mechanism for
  - Current & Historic Flood Maps (DFIRMs & FIRMs)
  - FIS Texts/Reports
  - DFIRM & NFHL Databases
  - Letters of Map Change (LOMC)
    - Letters of Map Amendment (LOMA)
    - Letters of Map Revision (LOMR)
  - Other Data and Documents
- Download tools for viewing DFIRM/NFHL data



The screenshot shows the FEMA Map Service Center (MSC) website. The main navigation bar includes links for Product Catalog, Map Search, Quick Order, Digital Post Office, and Help. The page features several sections: 'Product Search by...', 'How to use the FEMA Map Service Center?', 'Log On', 'Announcements', 'Free Map Viewer', 'Desktop DFIRM/FIRM Viewer', and 'FIRMetric Tutorial'. Each section contains descriptive text and links to specific resources or tools.



**MSC Website**

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The screenshot shows the FEMA Map Service Center website. Several features are highlighted with red boxes and arrows:

- Product Search/Catalog**: Points to the "Product Search by..." section.
- FIRMette - Desktop Download**: Points to the "FIRMette" section under "Free Map Viewer".
- MapViewer - Desktop Download**: Points to the "MapViewer" section under "Free Map Viewer".
- DFIRM Database**: Points to the "New to the FEMA Map Service Center?" section, which includes a list of items such as "NFH Customers", "Real Estate/Flood Determination Agents", "Insurance Agents", "Engineers/Surveyors", and "Federal/Local Customers".
- Login**: Points to the "Log On" button in the top right corner.
- National Flood Hazard Layer (NFHL)**: Points to the "NFHL" section, which includes links to "View the NFHL Online using MapViewer - Web", "Order NFHL GIS Datasets by state on DVD", "Use Web Map Service in your own GIS application", and "Use Web Map Service in Google Earth™".
- FIRMette - Web Tool**: Points to the "FIRMette Tutorial" section, which includes a link to "Click here to learn how to create FIRMetts... They're free!"

**MSC Website**

DFIRM 101 Workshop

The screenshot shows a desktop application window titled "Map Service Center Demonstration". The window displays a map of a geographic area with various colored regions (blue, green, yellow, orange) representing different flood zones or hazard areas. A large white overlay box with black text is centered over the map, displaying the title "Map Service Center Demonstration".

## Viewing FIRM panels online

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- To view MSC products available for a specific address, use the “Product Search by Address” feature
- Panels and LOMCs are listed
- Click the link in the View column to view panels and create a *FIRMette*

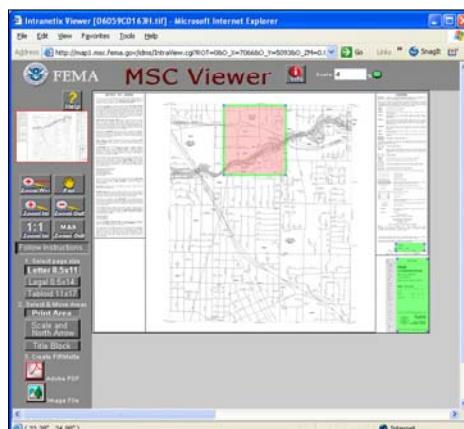
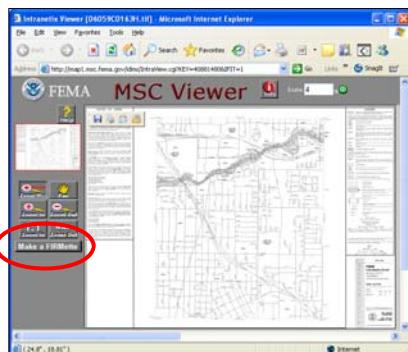
Map Panel Search Results					
Map Item ID	Description	Effective Date	Show LOMC	View	Buy
06050C043H	ORANGE CO.UNINC&INC AREAS	02/18/2004	-		
LOMC	05-09-0346P-060764	05/05/2005			
LOMC	07-09-0740A-060231	04/12/2007			
LOMC	05-09-0793P-060231	08/31/2006			



## *FIRMette – Web*

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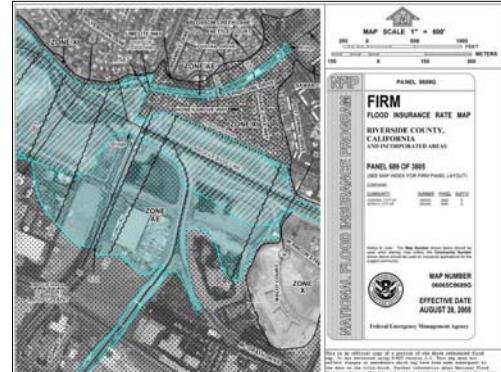
- Select “Make a FIRMette”
- Adjust boxes accordingly
- Choose output size



## FIRMette - Web

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- Free online tool
- FIRMettes are official
- Millions of FIRMettes downloaded each year
- Internet connection required
- Most recent **FIRM panels** in the MSC product catalog are used



## Viewing FIRM panels locally

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- **FIRMette – Desktop** can be downloaded
  - <http://msc.fema.gov>
- New version available with improved functionality



## ***FIRMette – Desktop***

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- Desktop application
- Uses locally saved PNG and TIF images
- Can create FIRMettes and print FIRM panels
- Cannot search by address
- Must know DFIRM panel number



## ***FIRMette – Desktop***

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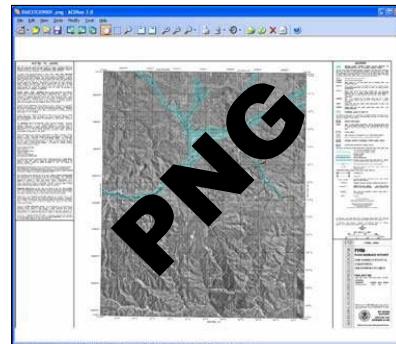


## ***FIRMette – Desktop***

## Printing and converting PNGs

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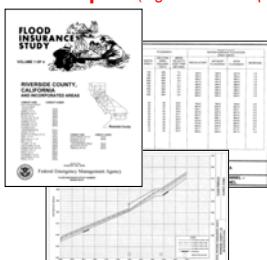
- Free tools are available to print PNG images
  - *FIRMette Desktop* available for download on MSC website
  - Steps and results may vary with different printers or printer drivers
  - Use discretion when printing PNGs as maps may not be to scale
- PNG images can be converted
  - Conversion to PDF or other formats is very easy



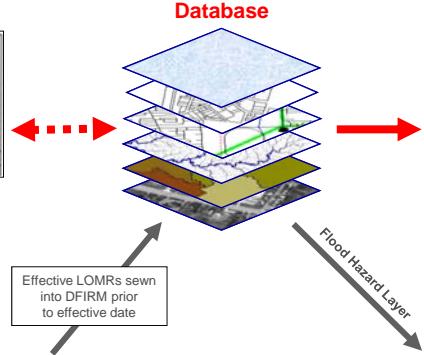
## What is a DFIRM?

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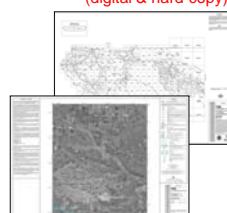
**Flood Insurance Study (FIS)**  
Text/Report (digital & hard-copy)



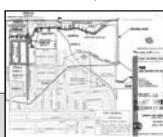
**DFIRM Database**



**FIRM Panels**  
(digital & hard-copy)



**Letters of Map Revision (LOMRs)**



Future LOMRs sewn into NFHL directly



## FIS ► DFIRM Database ► Panels

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- **Flood Insurance Study (FIS)** determines special flood hazard areas (SFHAs), base flood elevations (BFEs) and floodways
- **FIS text/report documents hydrologic and hydraulic assessments of flood risk**
  
- **DFIRM Database** is the digital GIS data source for all elements (layers) needed to create FIRM panels
  
- **FIRM Panels** are a set of maps
  - Index panel indicates which panels cover a community
  - Individual panels delineate SFHAs, BFEs and Floodways



## DFIRM Products

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- **Products that don't change**
  - Paper FIRM (Map)
  - FIRM Scan (Image of Map)
    - Viewed with *FIRMette - Web* and *FIRMette - Desktop*
  - **DFIRM Database**
    - Accessed with GIS software and *MapView - Desktop*
  
- **Product that changes (with map revisions)**
  - **National Flood Hazard Layer (NFHL)**
    - *MapView - Web*, WMS, Google Earth KMZ
    - Available through the above tools or as a monthly statewide shape file
  
- **All products and tools can be found at <http://msc.fema.gov>**



## FEMA's Policy on Use of Digital Flood Data

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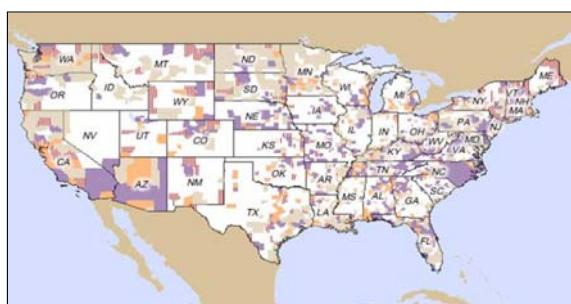
- Paper maps, FIRMettes and DFIRM database are interchangeable and equivalent (digital as official)
  - Flood zones are defined precisely by geographic coordinates
- Allows use of local data with FEMA flood data
  - Communities can integrate FEMA flood hazard data with local data without FEMA approval
  - Additional responsibility on communities to verify their data meets FEMA's accuracy requirements
- Allows for the creation of a National Flood Hazard Layer (NFHL)



## National Flood Hazard Layer (NFHL)

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- All **effective** digital flood hazard data for the entire U.S.
- New DFIRM and LOMR data sewn periodically
- FEMA's online tools for viewing NFHL data always reflect the most current NFHL data



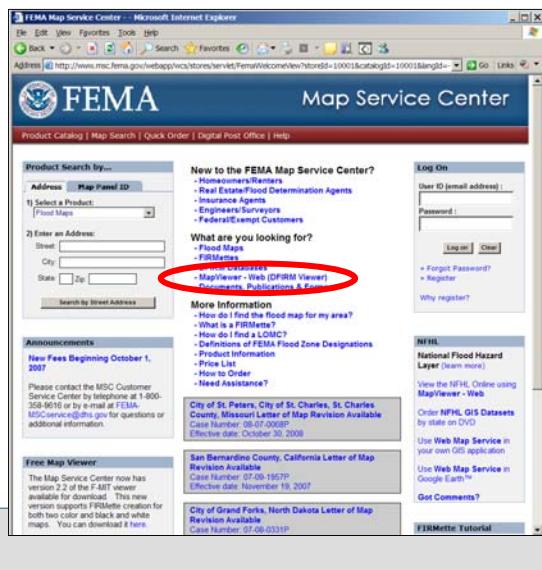
Flood Data	
■	<a href="#">DFIRM Data Availability</a>
■	<a href="#">Preliminary Maps Issued</a>
■	<a href="#">Q3 Data Availability</a>
■■■	<a href="#">Partial DFIRM Data Availability</a>



# Viewing the NFHL

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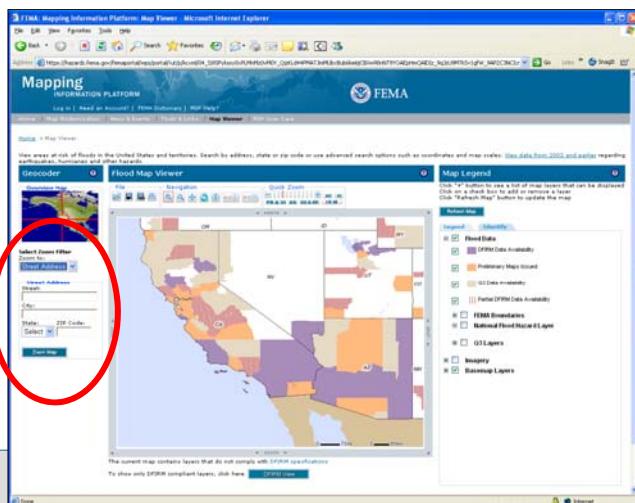
- Go to the MSC website:
  - <http://msc.fema.gov>
- Click hyperlink for MapViewer – Web



# MapViewer – Web

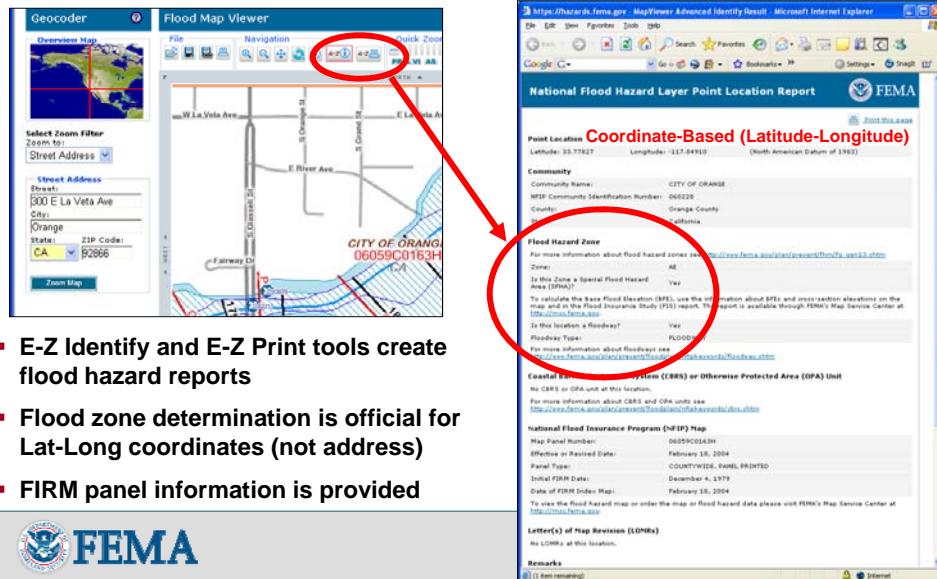
DFIRM 101  
Workshop

- Search by address or community name



# **Is this Location in a Special Flood Hazard Area?**

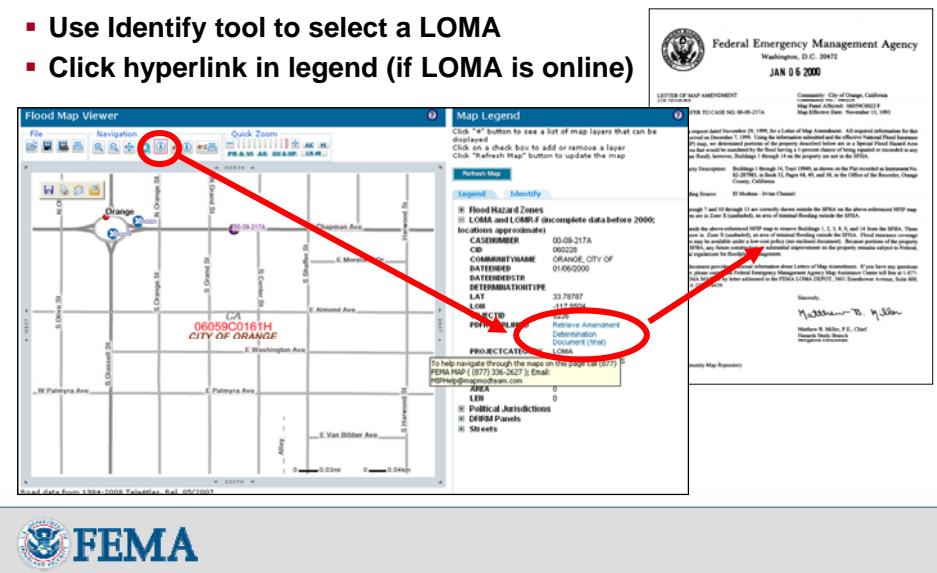
DFIRM 101  
Workshop



## **Can I get information on a LOMA or LOMR-F?**

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- Use Identify tool to select a LOMA
  - Click hyperlink in legend (if LOMA is online)



# Are the NFHL Data Current?

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**Geocoder**

**Hood Map Viewer**

**Map Legend**

**Map Layers**

**Legend**

**Identify**

- Hand Hazard Areas
- Base Flood Elevation
- LOMR's
- CASE\_ID: 06 08 0780P
- DFIRM\_ID: N0659
- FFF\_DATE: 08/01/2005
- GRID: GCE1904-F200-4447-992E-7000000000000000
- LOMR\_ID: 1041
- USEC\_ID: 1041
- SCALE: 8000
- CASE\_E\_CIT: 1041 LOMC14
- SIA10RS: 11111C111
- AREA: 0.0002475210004200
- LLN: UGC330001U12550156
- Political Jurisdictions
- DFIRM Panels

# Digital LOMRs are Current and Seamless in the NFHL

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**Quick Order Search Results**

Check the products that you would like to view or buy.

**Map Panel Search Results**

Map Item ID	Description	Effective Date	Show LOMC	View	Buy
06059C0443H	ORANGE CO.,UNINC&INC AREAS	03/18/2004	+		

FEMA.gov | Accessibility | Privacy Policy | FAQ | Site Help | Site Index | Contact  
FEMA Map Service Center, P.O. Box 1030-Jessup, Maryland 20794-1030 Phone: (800) 256-4636

**Revised by LOMC**

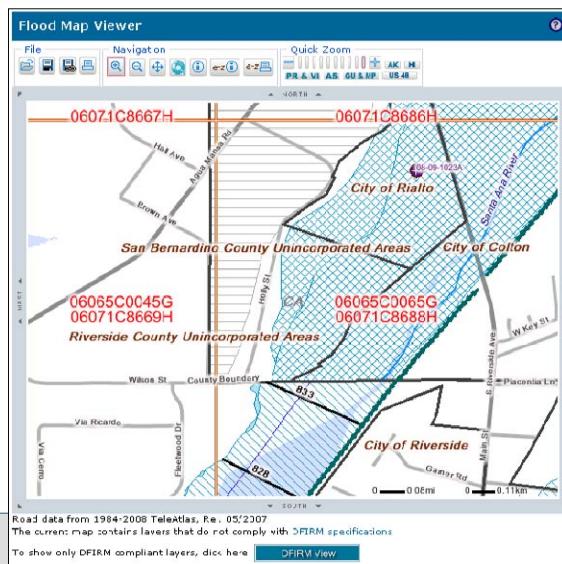
**Effective FIRM**

**▪ Revised study**

**▪ Need to look at two maps using paper FIRM**

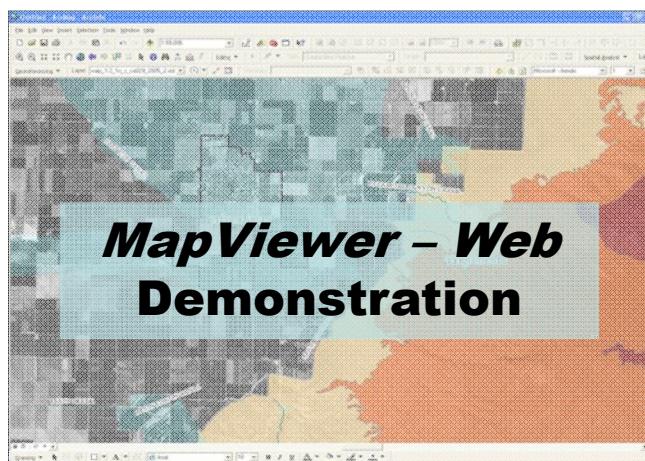
## NFHL is Also Seamless Across Counties

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## MapViewer – Web

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Workshop



## **MapViewer – Web**

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### ▪ Advantages

- View seamless layer of all effective DFIRM data
- Address search to point on map
- Can produce a simple report to determine if a clicked point is in a SFHA
- Displays LOMRs, LOMAs (where available) and produces printable reports

### ▪ Considerations

- NFHL not available until effective date
- Does not show local data



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## **Map Modernization**



Questions?



# BREAK



## Welcome Back

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- **We've reviewed**
  - NFIP and Map Modernization
  - FEMA's Digital Vision
  - Scanned FIRM panels and digital FIRM images
  - Demonstrated some tools

- **We're going to:**
  - Take closer look at the DFIRM database
    - Layers, formats, GIS analysis
  - Viewing and utilizing DFIRM data and the NFHL
  - Discuss how FEMA tools and data can assist your work
  - Provide sources for additional information



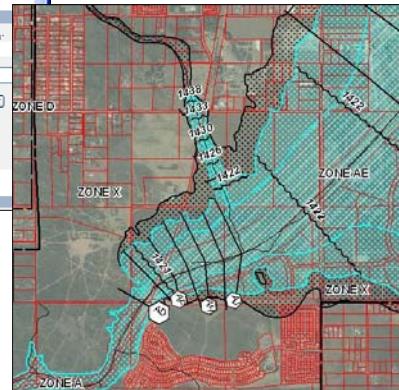
		FEMA Products and Services		
		Map views	Web map service (WMS)	GIS data
I want to ...	View a flood hazard map	FIRM FIRM Scan FIRMette <b>MapViewer - Web</b> <b>NFHL kmz files (Google Earth)</b>		
	Incorporate digital flood hazard maps into my software application	(use digital scans of maps) FIRM Scan	(create custom digital maps from map layers) <b>NFHL WMS map layers</b>	(create custom digital maps from GIS data) DFIRM database <b>NFHL GIS data</b>
	Use digital flood hazard map data in analyses			DFIRM database <b>NFHL GIS data</b>

## Back to the Basics: Getting the Data

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- Can be purchased on CD
- Also available for download on the MSC



## EDDIE: Express Document Delivery

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Map Service Center

Product Catalog | Map Search | Quick Order | Digital Post Office | EDDIE | My Account | Help

Log off

Search by Item Id

Search by Region

Show FIPS/CID codes

CALIFORNIA

KERN COUNTY

All Communities

Flood Insurance Rate Maps (FIRM)

DFIRM Databases

Flood Insurance Studies (FIS)

Letters Of Map Change (LOMC)

**For federal, state and local government employees**

**One account per community**

**Provides faster and easier access for download of**

- Flood Insurance Rate Maps (FIRM)
- DFIRM Databases
- Flood Insurance Studies (FIS)
- Letters Of Map Change (LOMC)

## Moving Beyond the Basics

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- **Questions you should be able to answer...**
  - What file formats does the database come in?
  - What data types does it contain?
  - What are the most important components?
- **Other things to be aware of...**
  - Ortho-based vs. vector-based basemaps
  - Old community based FIRMs vs. new countywide DFIRMs
  - Projections, datums and accuracy



## DFIRM Database Formats

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- DFIRM database is provided in 3 GIS formats (identical data)
  - ESRI shapefile (.shp)
  - ESRI export file (.e00)
  - MapInfo table (.tab)
- Metadata
  - Single text file located in the “Document” folder
  - Contains information about data sources, scales, projection, formats of individual layers
- Data can be converted into other GIS formats or CAD
  - Conversion process depends on particular product
- Digital orthophotos not part of the MSC distribution package



## DFIRM Database Data Types

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### Primary data types in a DFIRM database

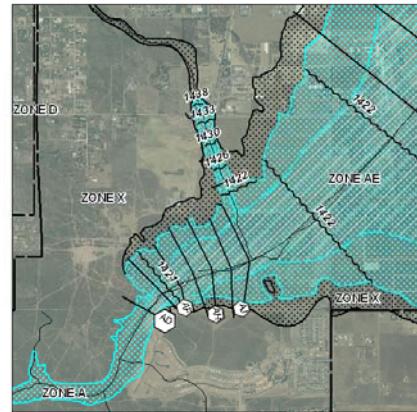
- Spatial layers (S)
  - File names begin S\_
  - Spatial (GIS) data for display/analysis of point, line or polygon features (e.g. s\_water\_ln = stream layer)
- Look-up tables (L)
  - File names begin L\_
  - Non-spatial attribute values that are unique to a county (e.g. table with community names)



# DFIRM Database Components

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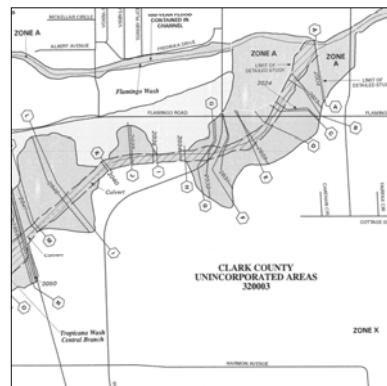
- A DFIRM database is a collection of digital data required to produce a Flood Insurance Rate Map (FIRM)
  - Important Layers
    - Base Flood Elevations
    - Cross Section Locations
    - **Flood Hazard Areas/Lines**
    - Political Boundaries
    - Water Areas/Lines
    - Basemap



# DFIRM Basemap

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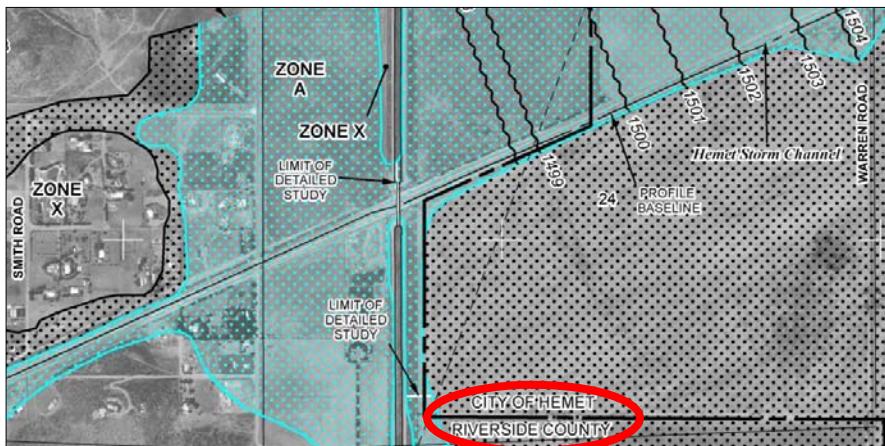
- Ortho-based (aerial photo) or Vector-based (transportation)



## Countywide Format

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All communities in a county are in 1 seamless DFIRM and FIS text/report



## Projection and Datums

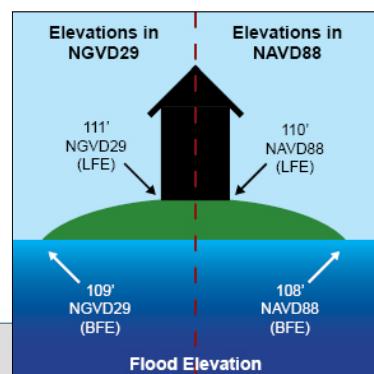
DFIRM 101  
Workshop

### ▪ DFIRM Projection

- UTM or State Plane (projection is chosen by community during scoping)
- Reprojection required to use with other projections

### ▪ Datums

- NAD83 (horizontal datum)
- NGVD29 to NAVD88 conversion (vertical datum)
  - Vertical datum elevation changes are relative to each other

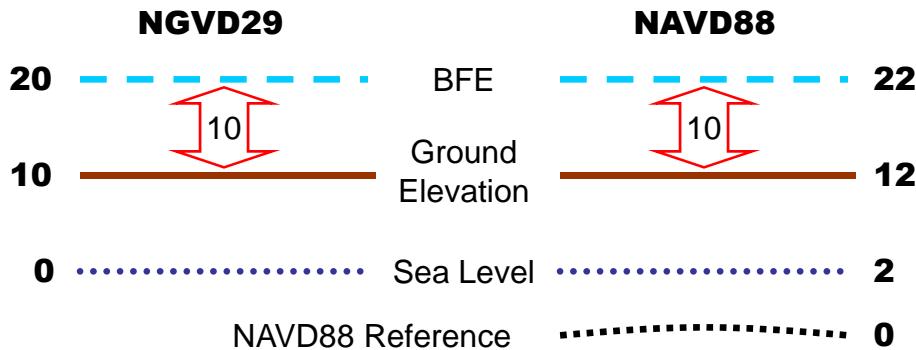


## Vertical Datum Conversion

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$$\text{NAVD88} = \text{NGVD29} +/ - X$$

Example: X (conversion factor) = +2ft



## DFIRM Data Accuracy

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- FEMA adopted the National Standard for Spatial Data Accuracy (NSSDA) of 1998, which defines two methods to determine the horizontal accuracy of a map
  - Statistical method:
    - Root Mean Squared Error (RSME)
    - Cumulative result of all errors introduced by mapping partners
  - Testing method:
    - Radial Accuracy
    - Minimum accuracy at 95-percent confidence level
- Accuracy standards vary by map scale



## DFIRM Data Accuracy

DFIRM 101  
Workshop

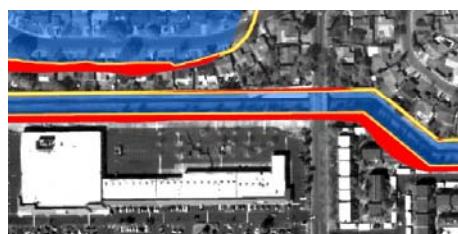
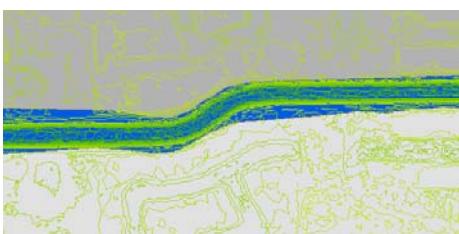
NMAS Map Scale	NMAS CMAS 90% confidence level	NSSDA Accuracy <sub>r</sub> 95% confidence level	NSSDA RMSE <sub>r</sub>	ASPRS 1990 Class 1/2/3 Limiting RMSE <sub>r</sub>
1" = 500'	16.7 feet	19.0 feet	11.0 feet	7.1 feet (Class 1) 14.1 feet (Class 2) 21.2 feet (Class 3)
1" = 1,000'	33.3 feet	38.0 feet	22.0 feet	14.1 feet (Class 1) 28.3 feet (Class 2) 42.4 feet (Class 3)
1" = 2,000'	40.0 feet	45.6 feet	26.3 feet	28.3 feet (Class 1) 56.5 feet (Class 2) 84.9 feet (Class 3)



## DFIRM Data Accuracy

DFIRM 101  
Workshop

- Potential reasons for discrepancies
  - Paper-to-digital conversion
  - Base map for prior effective FIRM is less accurate
  - Outdated topographic data was the basis for prior FIRM
  - Interpretation by data capture specialist or human error



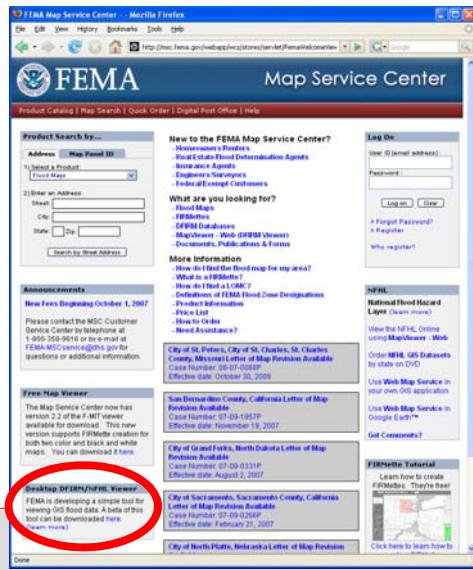
\* For illustration purposes these examples are magnified beyond the stated map scale



# Viewing the DFIRM database

DFIRM 101  
Workshop

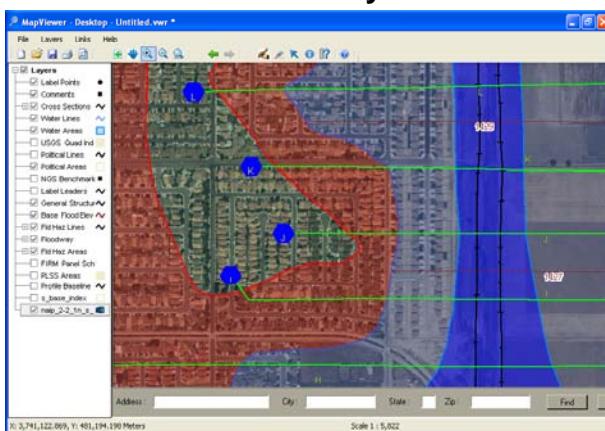
- **MapViewer – Desktop** is a non-proprietary GIS tool
- Available for download on MSC Website
  - <http://msc.fema.gov>
- Click on the hyperlink for Desktop DFIRM/NFHL Viewer



## MapViewer – Desktop

DFIRM 101  
Workshop

- View a DFIRM database locally



## MapViewer – Desktop

DFIRM 101  
Workshop

- Intended for communities to use to comment on a preliminary DFIRM during 30 day comment period
  - View locally stored DFIRM data
  - Address search to point on map
  - Automatic symbology and labels
  - Add your own GIS data and imagery
- Product update
  - New version with greatly improved functionality coming soon



## Using DFIRM Data for Analysis in ESRI ArcGIS

DFIRM 101  
Workshop

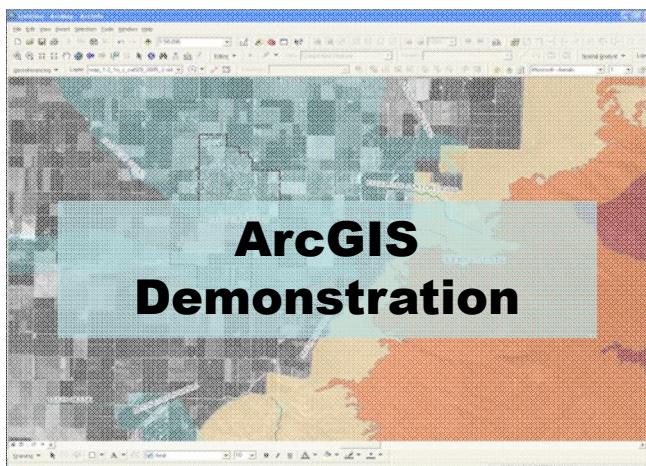
- Find parcels based on geographic coordinates or APN
- Overlay DFIRM and parcel information

U.S. DEPARTMENT OF HOMELAND SECURITY Federal Emergency Management Agency National Flood Insurance Program		ELEVATION CERTIFICATE		OMB No. 1680-0008 Expires February 28, 2009	
Important: Read the instructions on pages 1-8.					
SECTION A - PROPERTY INFORMATION		For Insurance Company Use:			
A1. Building Owner's Name	John Doe	Policy Number			
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. 1880 Silverado Trail		Company NAIC Number			
City Napa	State CA	ZIP Code 94558			
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.) APN 052080007000					
A4. Building Use (e.g., Residential, Residential, Aviation, Accessory, etc.) Residential					
A5. Latitude/Longitude Lat: 38° 19' 6.5" N Long: 122° 16' 22.1" W Horizontal Datum: <input type="checkbox"/> NAD 1927 <input checked="" type="checkbox"/> NAD 1983					
A6. Attach at least 2 photographs or a sketch if the Certificate is being used to obtain flood insurance.					
A7. Building Diagram Number_____					
A8. For a building with a crawl space or enclosure(s), provide: _____					
A9. For a building with an attached garage, provide: _____					



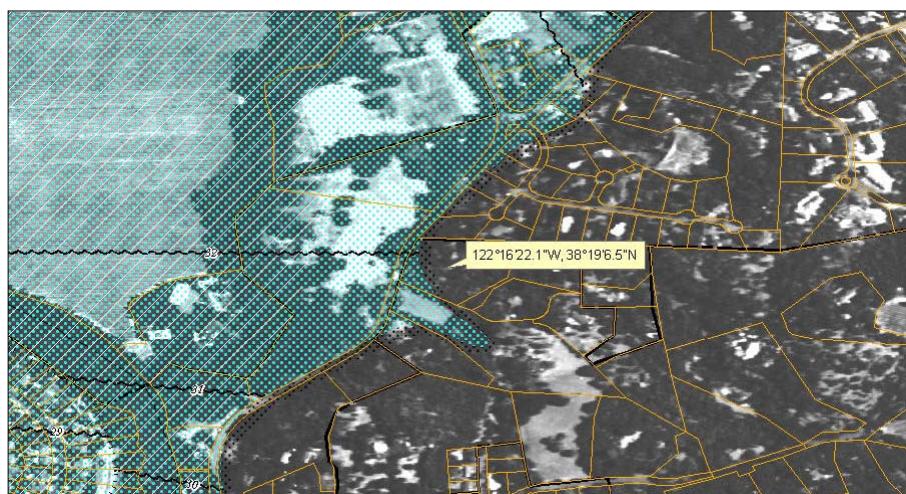
# Using DFIRM Data for Analysis in ESRI ArcGIS

DFIRM 101  
Workshop



# Using DFIRM Data for Analysis in ESRI ArcGIS

DFIRM 101  
Workshop



## GIS Analyses: Possibilities

DFIRM 101  
Workshop

- **Data Management**

- Copy, Duplicate, Join, Project, Convert, Categorize, etc.

- **Analysis**

- Overlay, Intersect, Extract, Buffer, Summarize, etc.

- **Display**

- Annotate, Label, Symbolize, Summaries, Charts, etc.



## DFIRM Database ► NFHL

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Workshop

- **Effective DFIRM databases are rolled into the NFHL**

- DFIRM database is a snapshot of the information on the printed map product

- **THE NFHL is updated continually with LOMRs**

- Updated NFHL GIS data are released monthly

- **NFHL GIS data are delivered on DVD**

- Order through the MSC
  - No charge for the data

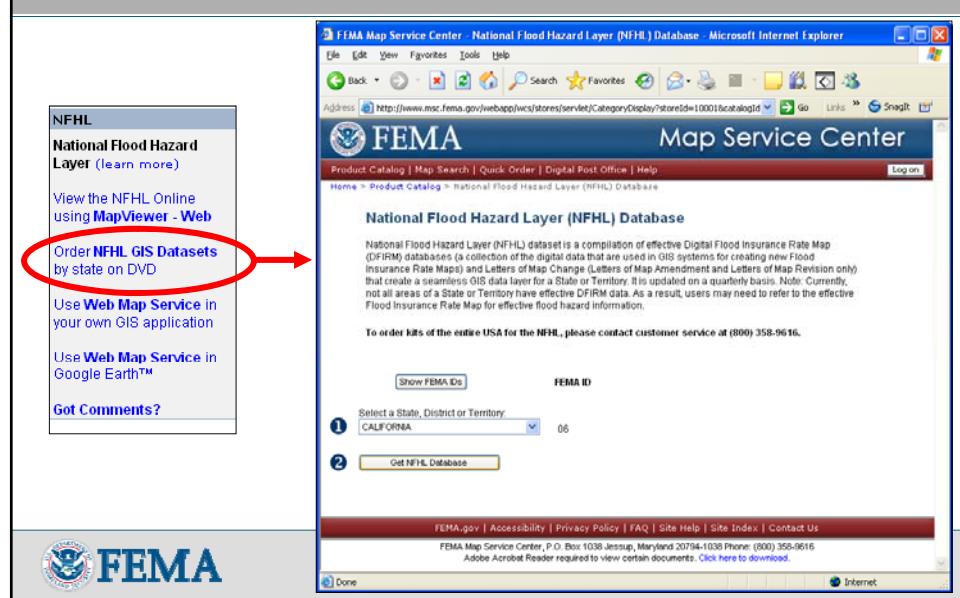
- **NFHL is available by State**

- Order as many as you need



## How do I get NFHL Updates?

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Workshop

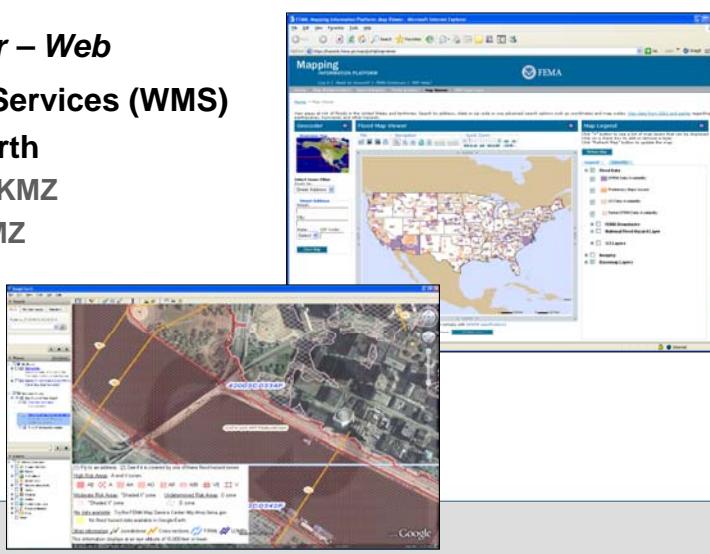


The screenshot shows the FEMA Map Service Center's NFHL Database page. On the left, there's a sidebar with options like 'View the NFHL Online using MapViewer - Web', 'Order NFHL GIS Datasets by state on DVD' (which is circled in red), 'Use Web Map Service in your own GIS application', 'Use Web Map Service in Google Earth™', and 'Got Comments?'. The main content area has a heading 'National Flood Hazard Layer (NFHL) Database' and a paragraph about the dataset. Below that is a form where step 1 shows 'Select a State, District or Territory' with 'CALIFORNIA' chosen, and step 2 shows a button 'Get NFHL Database'. At the bottom, there's a footer with links to FEMA.gov and other resources.

## More ways to view the NFHL

DFIRM 101  
Workshop

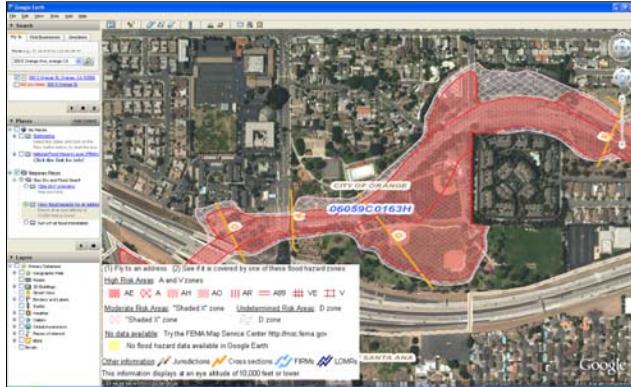
- **MapViewer – Web**
- **Web Map Services (WMS)**
- **Google Earth**
  - StayDry KMZ
  - NFHL KMZ



# Google Earth: Stay Dry KMZ

DFIRM 101  
Workshop

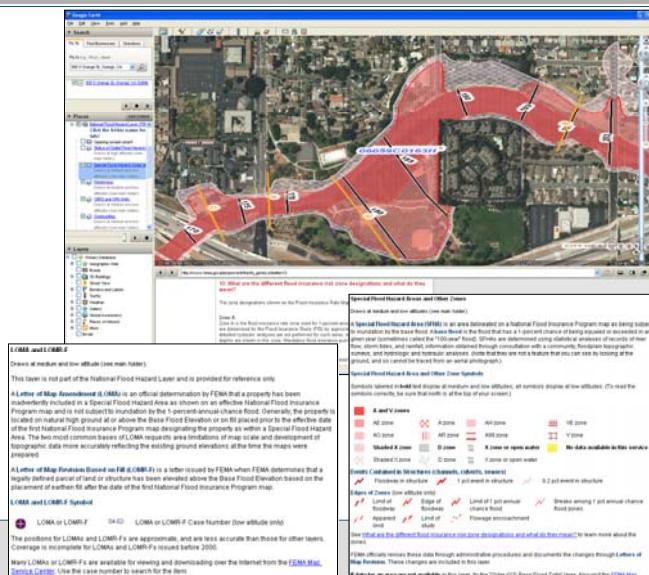
- Stay Dry KMZ shows
  - SFHAs
  - LOMRs
  - FIRM Boundaries
  - Cross Sections
  - Jurisdictions
- Can't reorder/hide specific layers
- Basic floodplain information
- Easy to understand



# Google Earth: NFHL KMZ

DFIRM 101  
Workshop

- NFHL KMZ shows
  - Stay Dry layers +
  - BFEs
  - LOMA/LOMR-Fs
  - Floodways
  - Flood Control Structures
- Can reorder layers
- Can hide/show legends
- Hyperlinks to supplemental data



**Google Earth Demo**

DFIRM 101 Workshop

**FEMA**

**Google Earth NFHL Guidance**

DFIRM 101 Workshop

- Start at the MSC
  - <http://msc.fema.gov>

**FEMA**

# How to use Web Map Services

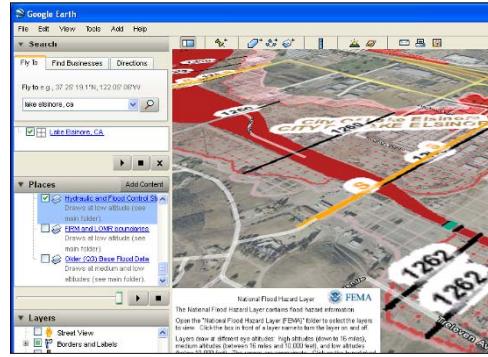
DFIRM 101  
Workshop

## ▪ In Google Earth

- Access either of the 2 KMZ files on the MSC web site

## ▪ In your own GIS application

- Guidance provided on MSC web site



# How to use Web Map Services in ESRI ArcGIS

DFIRM 101  
Workshop

## ▪ Use Add Data → GIS Servers within ArcMap to add the NFHL data

- URL for the WMS's is on the MSC web site
- As with all WMS's, the data are read-only

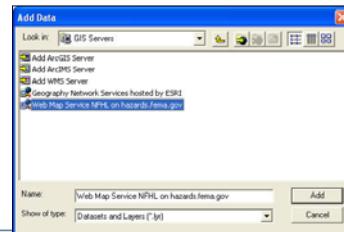
### NFHL service

The "NFHL" service provides access to most features in the NFHL and has map symbols that highlight flood hazards.

#### NFHL\_WMS Instructions

The URL for the WMS Capabilities file is:

<http://hazards.fema.gov/wmsconnector/wmsconnector/Servlet/NFHL?REQUEST=GetCapabilities&SERVICE=WMS>



## Use the Right Tool for the Job

DFIRM 101  
Workshop



Web Map Services



FIRMette - Web

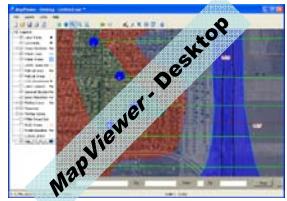


MapViewer - Web

- Tools benefit Floodplain Administrators, the general public and other stakeholders
- Perform flood zone determinations, data queries/visualizations and more
- Both on-line and desktop tools are available
- Local installation of GIS software is not required



FIRMette - Desktop



MapViewer - Desktop



## Other Applications

DFIRM 101  
Workshop

- **Risk Assessment: HAZUS-MH**
  - Analyzes potential losses from floods, hurricane winds and earthquakes
  - Produces estimates of hazard-related damage before or after a disaster
- **Hydraulic Modeling:**
  - *HEC-GEO RAS, FLO-2D, MIKE* and other products
- **Planning:**
  - Zoning, land use, city planning with CAD and other GIS products like *AutoCAD, ArcGIS, MapInfo, GeoMedia*, ...





Questions?



## Risk Communication with Digital Data: Local Examples

State of Hawaii



Maricopa County, AZ



Riverside County, CA



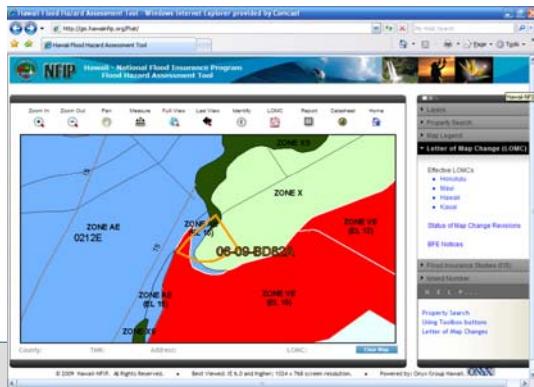
Clark County, NV



## State of Hawaii

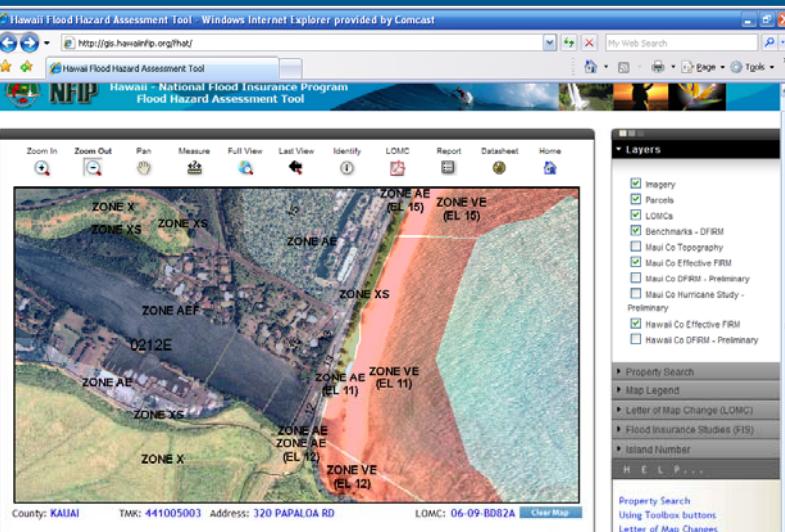
DFIRM 101  
Workshop

- Simple interface for flood zone determinations
- Parcel data integration for location-based searches
- Compare preliminary DFIRMs compared to effective FIRMs
- Hot-linked datasheets for NGS benchmarks
- Hot-linked LOMC documents
- LOMCs summarized in tabular form



## State of Hawaii

DFIRM 101  
Workshop



**State of Hawaii**

Search LOMCs - Windows Internet Explorer provider  
http://gis.hawaiifip.org/fhaReport.aspx?county=K

Letter of Map Changes for: Kauai County

Case No.	Type	Panel	Flood Sou
98-09-374A	LOMA	0326E	Nawiliwili
02-09-080A	LOMR-F	0095E	Pacific Oc
03-09-0330A	LOMA	0185E	Kalama S
05-09-0641A	LOMR-F	0095E	Anahola S
06-09-0181A	LOMA	0258E	Ponding
06-09-B290A	LOMA	0192E	Opaekaa
06-09-B541A	LOMR	0095E	Pacific Oc
06-09-BD2A	LOMA	0212E	Wailua Ri
07-09-0537P	LOMR	0055E / 0313E	Pacific Oc
07-09-1175A	LOMA	0292E	Lawai Str

**(4)4-1-005-000**

**State of Hawaii FLOOD HAZARD ASSESSMENT REPORT**

**NATIONAL FLOOD INSURANCE PROGRAM**

Small flood hazard areas are shown on FEMA's Flood Insurance Rate Map and what do they mean?

Zone VE and V1-V30: Areas along streams subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to overbank flooding. Where average depths are between 1 and 3 feet, BIFs are determined by detailed methods. BIFs are shown in this zone. Mandatory flood insurance purchases are required.

Zone A: Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. BIFs are determined by detailed methods. Mandatory flood insurance purchases are required.

Zone AE and A1-A30: Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. BIFs are determined by detailed methods. Mandatory flood insurance purchases are required.

Zone AH: Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. BIFs are determined by detailed methods. Mandatory flood insurance purchases are shown in this zone. Mandatory flood insurance is available in participating communities but is not required by regulation.

Zone D: Unshaded areas where flood hazards are undetermined. Building is possible. No mandatory flood insurance purchase requirements exist, but coverage is available in participating communities.

**PROPERTY INFORMATION**

COUNTY: KAUAI  
TMK NO.: (KA-1-005-003  
SITE ADDRESS: 320 PAPALAU RD  
FEMA FIRM PANEL(S): 1500022121R  
PANEL EFFECTIVE DATE(S): SEPTEMBER 16, 2006  
PARCEL INDEX DATE: SEPTEMBER 16, 2006  
LETTER OF MAP CHANGE(S): 06-09-BD2A

**PARCEL DATA FROM:** MARCH 2006  
**IMAGERY DATA FROM:** MAY 2005  
**IMPORTANT PHONE NUMBERS**

County MFP Coordinator: Marie Antonio, P.E., CFM (808) 241-4873  
State MFP Coordinator: Carol Yau-Brown, P.E., CFM (808) 587-0267

Disclaimer: The Department of Land and Natural Resources assumes no responsibility for the accuracy or completeness of the information contained in this report. The information is provided "as is" and is not guaranteed to be accurate. The user agrees to indemnify and hold the State of Hawaii, the Department of Land and Natural Resources from any liability, claim, or expense arising from the use of the information contained in this report. The user also agrees to release the State of Hawaii, the Department of Land and Natural Resources from any liability, claim, or expense arising from the use of the information contained in this report.

**FEMA**

**Maricopa County, AZ**

DFIRM 101 Workshop

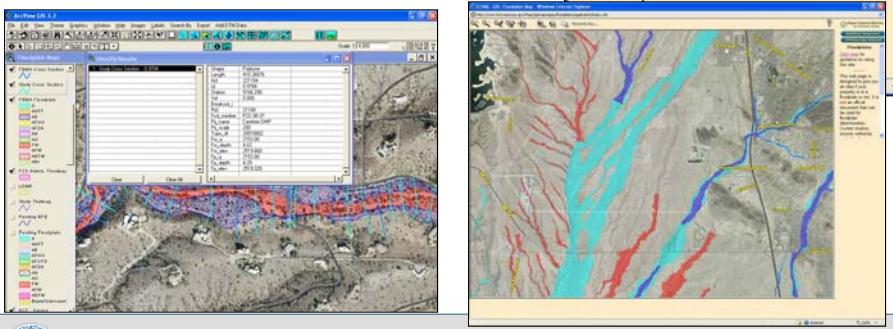
- Code enforcement inspectors use DFIRM data to create site maps which are used in mailings to homeowners and at public hearings
- “Pending” flood zones are maintained to extend DFIRM data
  - Total of 22 FEMA flood zones and local flood zone categories

**FEMA**

## Maricopa County, AZ

DFIRM 101  
Workshop

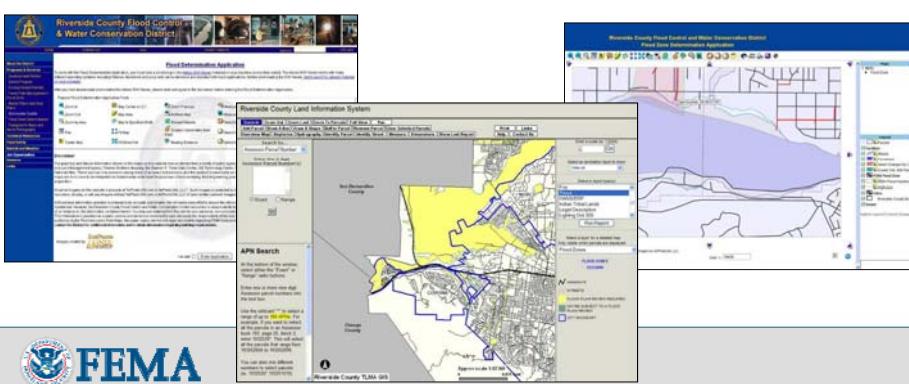
- All elevation certificates are scanned, geo-coded and spatially hot-linked
- Internal and external GIS applications on-line make the data available for stakeholders to understand risk and make flood zone determinations



## Riverside County, CA

DFIRM 101  
Workshop

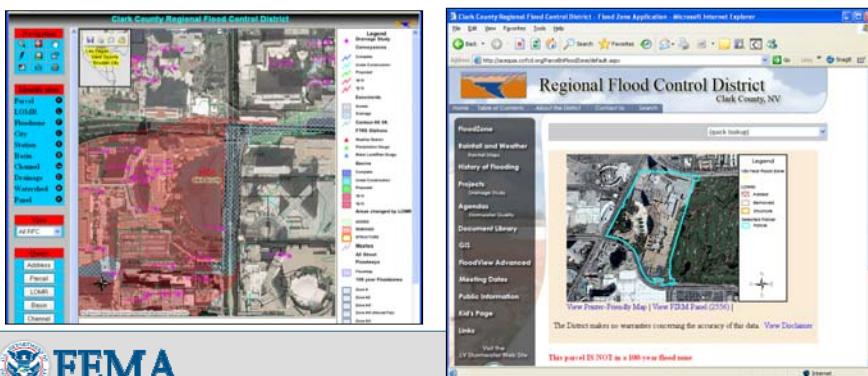
- Riverside County Land Information System combines FEMA, CA DWR and other data
- Provides flood hazard info to the public and other departments
- Flood determination tool with detailed flood hazard data



## Clark County, NV

DFIRM 101  
Workshop

- Identify areas removed from SFHAs by flood control projects
- Data shared with the Clark County GIS Clearinghouse for countywide access
- Partnership with FEMA for preparation of LOMCs
- Flood determination tool with detailed flood hazard data



## Risk Communication with Digital Data: More Examples

DFIRM 101  
Workshop

- Fly-throughs
- Historic Image Overlays
- Emergency Response
- Mobile Technologies



## WMS: Fly-Throughs and Visualizations

DFIRM 101  
Workshop



## Google Historical Aerial Imagery

DFIRM 101  
Workshop



## Google Historical Aerial Imagery

DFIRM 101  
Workshop



## Google Historical Aerial Imagery

DFIRM 101  
Workshop



## Communicating Risk

DFIRM 101  
Workshop

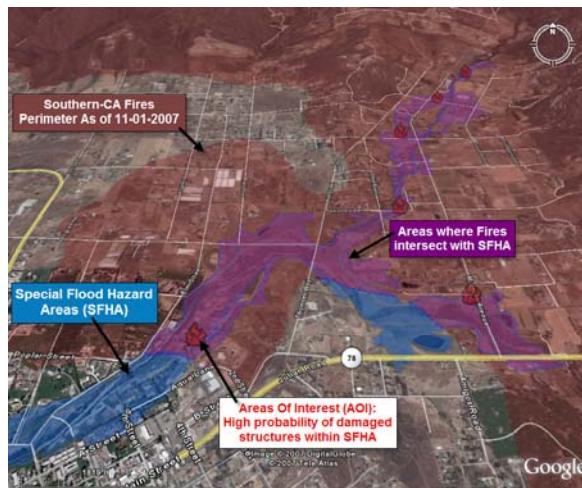
- Distribution of draft/preliminary DFIRMs
- Informing stakeholders of changes in special flood hazard areas prior to DFIRM effective date



## Emergency Response

DFIRM 101  
Workshop

- Southern California Fires
- October 2007



## Emergency Response

DFIRM 101  
Workshop

- Southern California Fires - November 2008

- Data compiled and sent to FEMA in 45 minutes
- Maps posted on-line by FEMA in less than 3 hours
- Use of DFIRM on-site at disaster field offices



## Mobile Technologies

DFIRM 101  
Workshop

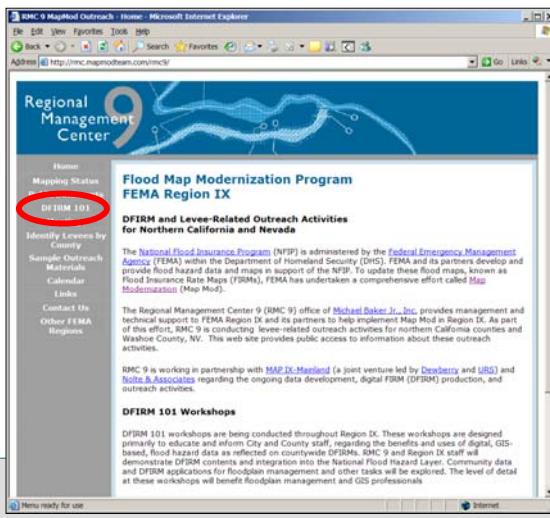
- Hawaii developed a field inspection tool to enhance and increase NFIP compliance
  - Will be able to import DFIRM data
- Smartphone mapping prototype for accessing flood hazard data (Sequoia)



## Post-Workshop Resources

DFIRM 101  
Workshop

<http://rmc.mapmodteam.com/rmc9/DFIRM101.htm>



## FEMA Map Assistance Call Center (FMAC)

DFIRM 101  
Workshop

- **1-877-FEMA MAP (1-877-336-2627)**
- [FEMAMapSpecialist@riskmapcds.com](mailto:FEMAMapSpecialist@riskmapcds.com)
- **FMAC provides info about DFIRMs, NFIP rules and procedures:**
  - Requirements for Letters of Map Change (LOMCs), Physical Map Revisions, Appeals, Protests, and Community Compliance
  - Preliminary and Revised Preliminary FIS's and Maps
  - Requests for Technical and Administrative Support Data
  - LOMC Revalidation and Re-issuance Letters and Process
  - Map Change and Data Request Processing Fees
  - Letters of Determination Review (LODRs)



## Informing FEMA of 'New Study' Needs

DFIRM 101  
Workshop

- Submit new analyses via the CLOMR and LOMR process
  - Best option to reflect new analyses on the NFHL ASAP (if DFIRM exists)
- Mail new study requests in NV, AZ, CA, and HI to:
  - FEMA Region IX (Attn: Risk Analysis Branch Chief)  
1111 Broadway, Suite 1200, Oakland, California 94607
- For written requests, provide:
  - Specific river or shoreline reach(es) needing new study
  - Why a new study is needed
  - What data and/or funding you can provide
  - Description of the expected map changes
- Higher priority given if partners can provide data and/or funding
- Cooperating Technical Partners (CTP) Program:  
[http://www.fema.gov/plan/prevent/fhm/ctp\\_main.shtm](http://www.fema.gov/plan/prevent/fhm/ctp_main.shtm)



## Post-Map Modernization

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- FEMA's Risk MAP (Mapping, Assessment, and Planning) Strategy
- Info posted at <http://www.fema.gov/plan/ffmm.shtm>
  - Risk MAP FY09 Flood Mapping Production Plan
  - Risk MAP Multi Year Plan
  - Draft Risk MAP Strategy
  - Draft Statement of Objectives
  - Draft Concept Paper



## FEMA's Risk MAP Strategy

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Workshop

Analyze and *depict* risk so that Communities and the Public can **understand their risk and make informed decisions** to *safeguard or avoid* that risk.



## FEMA's Risk MAP Vision

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Workshop

Through collaboration with State, Local, and Tribal entities, Risk MAP will deliver quality data that increases public awareness and leads to action that reduces risk to life and property





Questions?



**FEMA**