

NATIONAL WEATHER SERVICE INSTRUCTION 10-1307
FEBRUARY 10, 2025
Operations and Services
Surface Observing Program (Land), NDSPD 10-13
COOPERATIVE PROGRAM MANAGEMENT AND OPERATIONS

NOTICE: This publication is available at <https://www.weather.gov/directives/>.

OPR: W/OBS31 (T. Day)

Certified by: W/OBS3 (M. Hopkins)

Type of Issuance: Routine

SUMMARY OF REVISIONS: This instruction supersedes NWSI 10-1307 “Cooperative Program Management and Operations,” dated August 20, 2019. The chapters and appendices were reorganized for greater unity and clarity of subject matter. Additional changes include:

1. Added a section for the WxCoder 3 Data Reporting System (Sec. 7).
2. Added a section for the IV-ROCS Data Reporting System (Sec. 8).
3. Revised time limit from five to 30 days to update STAMS for station changes (Sec 5.5).
4. Permitted use of cell phone GPS to determine station elevation datum (Sec 9.10).
5. Removed section on Stations that Report Basic Observations (Sec. 9).
6. Added a section for Closing COOP Stations (Sec 9.15)
7. Clarified the terms of reference for station moves and relocations (Sec 10).
8. Replaced the term Data Continuity Committee with Data Continuity Group (Sec. 10)
9. Renamed the Station Inspection report to the Station Inspection Checklist (Appendix C).

BURNETT.WILLIAM.HOWELL
.1122662078

Digitally signed by
BURNETT.WILLIAM.HOWELL.1122662078
Date: 2025.01.27 18:00:31 -06'00'

William Burnett
Acting Director, Office of Observations

Date

Cooperative Program Management and Operations

Table of Contents	Page
1. Introduction	3
2. Purpose	4
3. Definition of Cooperative Observing Program	4
4. Official COOP Station.....	4
5. Cooperative Observing Program Responsibilities	5
5.1 National Weather Service Headquarters (NWSHQ)	5
5.2 Analyze, Forecast, and Support Office (AFSO).....	5
5.3 Office of Observations (OBS)	5
5.4 Regional Headquarters (RH)	6
5.5 Weather Forecast Office, Weather Service Office, and Data Collection Office	7
6. Station Management System (STAMS)	8
7. WxCoder Data Reporting System	8
8. IV-ROCS Data Reporting System	9
9. Establishing, Changing, and Closing a COOP Station	9
9.1 Selection of Sites	9
9.2 Selection of COOP Observers	10
9.3 Installation of Equipment	11
9.4 Training of Observers.....	11
9.5 Procedures for Numbering and Naming COOP Stations	11
9.6 Procedures and Instructions for Obtaining Station Identifiers (SID)	12
9.7 Determining Latitude, Longitude, and Elevation of Station	13
9.8 Proper Documentation.....	14
9.9 Planning of Travel	14
9.10 Inspecting and Servicing Equipment.....	15
9.11 Inspection Reports	15
9.12 Updating Station Management System (STAMS) Files	15
9.13 Maintaining Proper COOP Stations	16
9.14 Inactive COOP Stations.....	16
9.15 Closing COOP Stations	16
10. Relocations and Moves	17
10.1 Definitions	17
10.2 Compatibility Determination	17

10.2.1	Compatible Relocation	18
10.2.2	Compatibility Checklist Fails (Non-Compatible).....	19
10.2.3	Summary of Station Relocation Naming and Numbering Procedures	22
11.	Data Management and Quality Control.....	22
11.1	Data Consistency, Timeliness, and Accuracy	23
11.2	Finding and Correcting Observing and Reporting Errors	23
11.2.1	Common Observing Errors	24
11.2.2	Missing and Questionable Temperature Values.....	24
11.2.3	NCEI Quality Assurance Reports.....	24
11.2.4	Precipitation Irregularities	25
11.2.5	HPD Precipitation File Inventory	25
12.	Reporting and Publishing Observations	25
12.1	Methods of Reporting Data	25
12.2	Publications Available to COOP Observers.....	26
12.3	NCEI Published COOP Station Data	26
12.3.1	Criteria for Publishing COOP Stations.....	26
12.3.2	Hourly Precipitation Data (HPD)	27
12.3.3	Publication of Soil Temperatures	27
12.3.4	Publication of Data from New Observing Programs.....	28
12.3.5	NCEI Archiving of Non-Published Observations	28
13.	Court Appearances for Observation Records	28
14.	Observer Awards.....	29
15.	Environment and Safety	29
16.	Automation.....	29

APPENDICES

A.	COOP Station Networks	A-1
B.	Reimbursable Stations.....	B-1
C.	Forms.....	C-1

1. Introduction

This instruction defines and describes the mission and scope of the National Weather Service (NWS) Cooperative Observer Program (COOP). It provides overall policy and responsibilities for the management and operation of the COOP, its networks, observing sites, and the applicable databases. The mission of the COOP is two-fold: (1) to provide observational data (usually consisting of daily maximum and minimum temperatures and 24-hour precipitation totals) necessary to define the climate of the United States and to help measure extreme weather events,

climate variability, and long-term climate changes; and (2) to provide observational data during an event usually by phone, to support forecast, warning, or other public service programs of the NWS, and entities outside of the NWS.

2. Purpose

This instruction provides basic instructions for COOP station operations and management. It is intended for the use of the NWS Representative (NWSREP) – the person who establishes, maintains, visits, and closes COOP stations. The NWSREP is usually the Observations Program Leader (OPL), and in some offices, the OPL is assisted by one or more of the following: Hydrometeorological Technicians (HMT), Meteorologists (MET), Hydrologists (HYD), or Electronic Technicians (ET). However, a NWSREP may be any NWS employee who conducts official visits to cooperative stations.

3. Definition of Cooperative Observing Program

The COOP is a means by which the NWS obtains observational data to support the climate mission and field operations. The program includes the selection of data sites; recruiting, appointing, COOP agreements and training of observers; installation and maintenance of equipment; station documentation (metadata); data collection and its delivery to users; data quality control functions; the management of fiscal and human resources; and modernization; required to accomplish program objectives.

COOP observers typically serve on a volunteer basis, and their services consist of observing and recording precipitation and temperature daily and reporting those observations to the NWS on either a daily or monthly basis. Many COOP observers also provide additional hydro-meteorological data, such as evaporation, soil temperature, and other observations. Data are sent via telephone, computer, mail, or electronic transfer medium. NWS COOP station equipment should be the property of the NWS but, in unique situations, may be owned by the observer, a company, or another government agency. All equipment must meet the NWS COOP equipment performance and siting requirements as defined in NWSI 10-1302, Requirements and Standards for NWS Climate Observations (<https://www.nws.noaa.gov/directives/sym/pd01013002curr.pdf>) and NWSM 10-1315 *Cooperative Station Observations and Maintenance* ([pd01013015curr.pdf](#)).

4. Official COOP Station

An official COOP station will be included in the cooperative network when it has been approved by the servicing Regional Headquarters and meets the following criteria (Publication of data is not a criterion.):

1. Equipment for observations meets NWS cooperative equipment performance and siting requirements for climate observations.
2. The station is assigned:
 - a) A station index number by the National Centers for Environmental Information (NCEI) requested by the NWSREP through the Regional Cooperative Program Manager (RCPM).
 - b) A Station Identifier by the NWS Office of Observations (OBS) is requested

through the NWS Location Identifier (NWSLI) system database.

3. Station metadata is documented in the Station Management System (STAMS) database.
4. The NCEI reviews COOP station metadata for accuracy and completeness and provides a COOP station's metadata as the official rendition for the Historical Observing Metadata Repository (HOMR) when the COOP station is determined to have met the requirements.

These criteria are necessary to ensure satisfactory instrumentation, sensor exposure, documentation, and approval to ensure the availability of supporting funds. A cooperative station may be co-located with other types of observing stations. In these cases, the portion of the observing program that supports the cooperative program's missions is treated and documented independently of the other observational and service programs.

5. Cooperative Observing Program Responsibilities

Management responsibilities for the COOP are shared by Weather Service Headquarters (NWSHQ), Regional Headquarters (RH), and Weather Forecast Offices (WFO). Weather Service Offices (WSO) and Data Collection Offices (DCO) may be involved in the cooperative program when appropriate.

5.1 National Weather Service Headquarters (NWSHQ)

NWSHQ establishes national policy and manages the overall program, including maintaining program goals and securing resources needed to support the operations of the program. NWSHQ also provides national leadership for program goals and seeks resources needed to operate the program. To affect an orderly management program, there are certain areas in which procedures remain uniform for all regions.

5.2 Analyze, Forecast, and Support Office (AFSO)

The AFSO develops, validates, and prioritizes national requirements and ensures resources are allocated to the programs, projects, and activities that will save lives and property and enhance the national economy. The AFSO is responsible for collecting and validating requirements and policies associated with the programmatic management of eleven National service programs, including Climate, Water Management, Hydrology, Severe Weather, and Winter Weather. Requirements for these service programs drive supporting activities within the COOP program.

5.3 Office of Observations (OBS)

The OBS, in Coordination with other offices (i.e., AFSO), determines the requirements to establish, change, or close observing sites.

The Office of Observations (OBS) will:

1. Coordinate program activity and establish procedures to maintain the integrity of COOP networks and to ensure the networks continue to meet the data requirements

for which they were established.

2. Establish policy and procedures for inspecting and maintaining stations.
3. Establish procedures that ensure uniform implementation and application of policy changes relating to the cooperative program.
4. Conduct liaison activities with other government agencies and NWSHQ divisions in the management of cooperative station tasks financially supported by these other agencies through reimbursable funding. Establishes Interagency Agreements (IAA) and Memoranda of Understanding (MOU) for two reimbursable agreements. One is with the U.S. Army Corps of Engineers (CONUS states), and the other is with the U.S. Bureau of Reclamation (Montana & Wyoming Network). See Appendix B, Reimbursable Stations, for details.
5. Develop program instruction manuals documenting observing procedures, policies, and other management procedures.
6. Procure parts and supplies in coordination with the Logistics Management Branch to maintain stock levels at the National Logistics Support Center (NLSC) and the National Reconditioning Center (NRC). Approve field requests to initial-issue stock parts and cancel the due-in for these parts.
7. Coordinate the awards program with the regional offices.
8. Oversee databases that contain descriptions, histories, and other information.
9. Establish procedures for receipt and review of software and database change requests that are controlled nationally by NWSHQ.
10. Operate and maintain the COOP database(s), including controlling access, software updates, and database changes, and provide support to the field offices during normal business hours.
11. Request the Sterling Field Support Center (SFSC) to test and evaluate existing and proposed observing equipment.

5.4 Regional Headquarters (RH)

The RH ensures compliance with the procedures and policies of the Cooperative Observer Program. The RH is responsible for:

1. Establishing regional policy and guidelines for the installation, operation, maintenance, inspection, and management of cooperative stations, as required.
2. Coordinate related hydro-meteorological matters with NWS regional and field officials, other government officials from Federal, state, and local agencies, and local citizenry.
3. Distribute QA/QC reports from NCEI to field offices and address ongoing discrepancies.
4. Utilize reimbursable funds from other government agencies and ensure that these funds are spent in accordance with the agreed-upon activities.

5. Prepare and distribute statistical information and other tabulations that identify accomplishments and achievements related to the regional COOP.
6. Coordinate the Length of Service awards program with the field offices and the OBS program office on a scheduled basis.
7. Coordinate the meritorious observer awards program (i.e., Jefferson Awards, Holm Awards) with the field offices and the OBS program office on a scheduled basis.
8. Visit and/or phone the COOP Observer to ensure station records are correctly documented, equipment is correctly maintained, and equipment is within standards: NWSM 10-1315, *Cooperative Station Observations and Maintenance* ([pd01013015curr.pdf](#)).

5.5 Weather Forecast Office, Weather Service Office, and Data Collection Office

The MIC of the WFO and the OIC of the WSO/DCO are responsible for the COOP Program in their offices. The NWSREP is usually assigned the duties by the MIC of the WFO or by the OIC of the WSO/DCO. The NWSREP is responsible for the installation and maintenance of cooperative station equipment in the given WFO/WSO County Warning Area, and quality control is done in near real-time by WFO staff and shared with the NWSREP. Thus, duties and assignments of ensuring that COOP data is gathered on a routine and timely basis and that proper Quality Control and monthly “closeouts” are achieved may be assigned to others at the WFO/WSO where the Whole Office Concept is used. Otherwise, the NWSREP is responsible for the monthly “close out” of the COOP data for each station and for the submission of the data to NCEI. In this way, the MIC and the NWSREP are responsible for the efficient operation of the COOP Program within their assigned area. Their duties are highlighted in Section 3 above. Important aspects of the NWSREP’s work are:

1. Taking responsibility for all COOP stations and program activities within their assigned geographical area, usually defined as the Cooperative Program Area (CPA). The area generally coincides with that of the Meteorologist in Charge (MIC) of the same WFO or, for the Pacific Region, the Official in Charge (OIC) of the same WSO or DCO. The density of stations and other factors (i.e., highway locations) may require assigned areas to vary from the ideal CPA.
2. Stations with new observers may require additional visits until the observers are fully trained. Make regular contact with new COOP observers. Make visits for observer training, maintain a positive relationship with the observer, maintain equipment, and verify the siting and exposure metadata for the station.
3. Phone the COOP Observer to ensure station records are correctly documented, equipment is correctly maintained, and equipment is within standards: NWSM10-1315 *Cooperative Station Observations and Maintenance*. ([pd01013015curr.pdf](#)).
4. At least once every 12 months, visit all stations with thermometers and non-recording precipitation gauges.
5. At least twice every 12 months, visit all stations with a Fischer-Porter Rebuild (FPR) rain gauge to drain and service the collection bucket. For sites in wetter climate zones, visit

- FPR stations every several months. Ensure one visit in the autumn to winterize the FPR.
6. Once in early Spring and once in Autumn, visit Pan Evaporation stations, respectively, to deploy the Evap Pan, and at the end of the growing season, drain and stow the Evap Pan.
 7. Once every 12 months visiting stations with telemetry equipment to ensure the metadata is correct. However, the NWS electronics technicians are normally responsible for servicing the telemetry equipment.
 8. Making additional visits to sites with equipment failures, recruitments, observer retirements, or storm damage may necessitate priority scheduling to visit the site. Some situations may require an emergency visit.
 9. Installing, relocating, changing, or inspecting a station.
 10. Creating all necessary documentation, including adequate notes, sketches, photographs, and diagrams, to a WFO workstation file separate from the Station Management System (STAMS). This serves as an aid to the person updating metadata information in the Station Profile.
 11. Securing sensitive information such as the COOP Observer Agreement (Form B-30) or any Personally Identifiable Information (PII) that is necessary to conduct official program activities (i.e., site visits), into a locked file cabinet or password protected federal information technology workstation. Note: Google Drive is permissible for storing sensitive PII information when following the NOAA Guidance in the [Sensitive Information CIO Memo, April 6, 2020](#).
 12. Updating Station Profile in STAMS within 30 work days of any change to the COOP site.
 13. Performing near real-time and after-the-fact QC duties in WxCoder, performing month end data closeouts on or before the 25th of the following month, in WxCoder. If the observer's data arrives late after a station is closed out with no data, then that monthly report can be reopened in WxCoder. This accommodates the current data-month and back 24 months. For partial station entries and corrections to the climate record, this requires coordination with NCEI and opening a ticket in Datzilla.

6. Station Management System (STAMS)

The STAMS is the official and only method to submit COOP site metadata to NCEI. STAMS is a national database, with its records maintained by the NWSREP, and contains descriptions of the cooperative stations, including the location, observer's name, equipment in use, where and how data are sent, sponsors, and other metadata fields. The STAMS database is intended to provide cooperative station information. The STAMS instructions are located on the STAMS website (<https://stams.wxcoder.org>).

7. WxCoder Data Reporting System

The Weather Coder (WxCoder) system is the official web-based data entry system of the NWS Cooperative Observer Program (COOP) network. It was established in 2009 to provide the COOP observers with a secure platform to submit daily weather observations in accordance with official NWS policy. Observations include maximum and minimum temperatures, daily

precipitation, snowfall, snow depth, soil temperature, and pan evaporation, and a limited number of river stage observations. Thousands of COOP Observers use WxCoder3 on a daily basis. The WxCoder3 routes the COOP observation data on a daily basis to the NCEI for compilation to the Global Historical Climatology Network (GHCN) datasets.

The management, operations, and maintenance of the WxCoder system are performed by the NCEI Western Region Climate Center (WRCC) in Nevada. The WRCC publishes a WxCoder Administrator's Guide and a WxCoder User's Guide to provide detailed instructions for field office management and observer use. The WxCoder3 has an expanded ability since 2021 to ingest automatically generated data reports on a sub-hourly basis.

8. IV-ROCS Data Reporting System

The Interactive Voice—Remote Observation Collection System (IV-ROCS) is a touchtone phone system that enables COOP observers to report their daily observations via phone keypad. The system provides COOP observers without internet service with a convenient means to report their daily observations to the NWS and NCEI. Approximately 500 observers use IV-ROCS.

The IV-ROCS is cable recording the following elements: precipitation (including snow), temperature, pan evaporation, soil temperature, and river stage. After entering a precipitation amount, the automated voice will ask the observer to report the type of precipitation. There are nine types: Rain, Freezing Rain, Drizzle, Freezing Drizzle, Snow, Snow Pellets, Snow Grains, Ice Pellets, and Hail. Multiple precipitation types cannot be reported. The IV-ROCS allows reports to be corrected in the two hours after the scheduled observation time. The NWS Southern Region headquarters manages the IV-ROCS operations and maintenance.

9. Establishing, Changing, and Closing a Cooperative Station

This section defines the guidelines and responsibilities of the NWS COOP station inspection program. The instruction provides a common general guide for the COOP stations and establishes uniform standards for the national program. The procedures described are considered a guide and not in lieu of good judgment and initiative on the part of the NWSREP.

9.1 Selection of Sites

The NWSREP and the RCPM may coordinate with the Regional and Local Hydrologic Program Manager to determine the best sites for COOP stations with respect to location, exposure, and availability of COOP observers. The NWSREP makes the necessary arrangements with owners for the use of sites, negotiates cooperative agreements for space, and installs the equipment. They document the COOP station and exposures by collecting the required metadata and entering the information into the STAMS.

Some of the prerequisites when selecting a site are:

1. Area not subject to flooding.
2. Availability of communications, such as internet use and availability, is strongly preferred but not absolutely necessary.

3. The exposure of instruments as per NWSI 10-1302 Requirements and Standards for NWS Climate Observations.
4. Equipment access by observer. It may be necessary to consider a slightly less than best possible location if, by doing so, it is more convenient for the observer so long as siting does not violate exposure standards.
5. Stability and Longevity Potential. Select a site thinking for the future years. Sites will not need equipment relocations from repeated vandalism or theft of equipment or other siting issues. Inquire with observers to learn if they plan to remain on location for long periods.
6. Continuity of Data. It is extremely difficult to judge how much the data will be affected in the long term by moving instruments. Removing trees, vegetation, etc., is the preferable method if possible, especially when a long period of record has been established.

9.2 Selection of COOP Observers

Establishing and maintaining a COOP observer network is a difficult task. Observers are asked to provide services that can, at times, be quite demanding and are entirely voluntary, with no compensation provided. There are three formal categories of station types in the COOP program: Individual, Institution, and Government. The ‘Government’ sites have the observing equipment located on government property at federal, state, or county levels. For ‘Institution’ sites, the equipment is located on property owned by the business (i.e., radio station). There may be more than one COOP observer who takes the observations from these stations and is an employee of the business or agency. For the station designation called ‘Individual,’ these locations are private residential properties, and there are additional considerations to weigh before selection.

Some considerations when selecting observers are:

1. Longevity – A person will likely record data over a long period of time.
2. Daily Routine – An observer whose daily life fits the observational program with a minimum of inconvenience. Be flexible in accommodating the observer’s preferred hour of observation (though we prefer 7 am, exceptions can be made, i.e., 10 am). However, ensure the observer stays with that hour to be consistent.
3. Interest – An observer who already shows an interest in reporting weather (i.e., CoCoRaHS) understands the NWS program and is civic-minded.
4. Dependability – A person who appears to be a conscientious individual and who is willing and able to observe around the same time each day.
5. Capabilities – An observer with the capabilities to take the required observations and then complete the required forms.

When recruiting new observers, the NWSREP should approach people who may have use for our data. For example, a farmer may make use of the information they gather to help in their daily work.

When interviewing a prospect, the NWSREP should:

1. Explain the fundamental observing duties to the prospect and allow them to make up their own mind about accepting the position. Do not pressure them.
2. Explain the need for the data gathered and its various uses. Emphasize their importance in taking the observations.
3. Look for indications of dependability. Recommendations from others in the community may be better than observers' general appearances or self-recommendations.

Once a selection is made, the NWSREP should:

1. Train the new observer thoroughly. Otherwise, a new observer may feel confused and frustrated from the experience.
2. Be liberal with compliments and make them public, if possible, when the observer is doing a good job. Everyone appreciates recognition for their work.

9.3 Installation of Equipment

The NWSREP installs or supervises the installations of officially approved COOP equipment. Standards and details of installation are found in other sections of the NWSI directive system (NWSM 10-1315 and NWSI 10-1302). On occasion, installation directions are furnished with the equipment.

9.4 Training of Observers

The NWSREP should offer training materials and online links (i.e., Snow Training Video) to the COOP observer for proper taking and reporting observations. The NWSREP should demonstrate proper procedures until satisfied the observers are competent to carry on independently. Make follow-up visits to ensure satisfactory observational standards and to correct any existing divergent practices. Diplomacy is always necessary when dealing with observers in order to maintain their interest and to retain their services.

9.5 Procedures for Numbering and Naming Cooperative Stations

The COOP station numbers are assigned by NCEI pursuant to requests by the RH to identify the stations and to facilitate alphabetical listings. Station numbers consist of eight digits, for example: 18-1124-06, or 10-1124-10. The first two digits identify the state (e.g., 18 in Maryland, 10 in Idaho), the middle four digits are based upon the alphabetical of the station name whenever policy and the last two digits identify the NCEI climatological division in which the station is located.

The NWSREP selects and changes station names. The purpose of determining the name is to help pinpoint the station location in terms familiar to the public. Whenever practicable and reasonable, associate the station with the name of the nearest community within the state

recognized by the Census Bureau. This is to be the primary name. Also, realize that for naming a relocated COOP site, we conserve the original name and add a distance value (i.e., Smithtown 7 E), but if it crosses into another county, the NWSLI system will not use the COOP name but will assign a name of the nearest town as a reference point.

In the following situations, a secondary name is needed to help identify the station.

1. The station name, once chosen, should be used consistently on all reports. The official station name should be on file in STAMS.
2. Two stations are located in the same town or city. Use a descriptive secondary name familiar to the area for one station, such as Ohio State Farm or Ohio State University.
3. The station is located more than two miles from the main post office building or center of the community. Either add a secondary name, as above, or use the distance in whole miles and direction relative to true north to 16 points of the compass from the main post office or community center to the data site, such as Lutz 4 ENE. Secondary names are not required if the station is within the city limits and no other station uses the primary name.
4. There are two stations within one-half mile of the post office, and there is no clearly descriptive local secondary name. Use numbers 1, 2, 3, etc., such as Lutz No. 2. Two stations this close to each other should be incompatible or should not observe the same parameters. One may observe the river stage and the other temperature and precipitation.

Multiple service stations are those which participate in more than one task (such as recording precipitation, rainfall reporting, river reporting, etc.) and which have the same observer. Consider each of these as a single station with the same name if the instruments are at approximately the same site.

9.6 Procedures and Instructions for Obtaining Station Identifiers (SID)

While the identification number of COOP stations is assigned by NCEI, the SID is assigned by the Office of Observations (OBS). Issuances, changes, and deletions of SIDs are requested via the Internet using the National Weather Service Location Identifier (NWSLI) Transaction Form. The web address is: https://cbits.nws.noaa.gov/ords/nwslimain/nwsl_home.main. COOP stations are assigned SIDs, usually containing five characters. The first three characters identify the city or a town, and the last two are a letter and number identifying the state (e.g., N2 for Nevada).

Submit a SID request for any cooperative station that has been established, moved, relocated, renamed, or closed to correct errors in the NWSLI database. Assigned SIDs establish a director of the locations where observations are taken. All cooperative stations will be listed in the NWSLI database.

All NWSLI requests are submitted for approval to the OBS through the Regional Headquarters. Instructions for completing the NWSLI Transaction form can be found at the web address listed in this section.

When cooperative stations are moved or relocated, the procedures set out below will be used.

If data from the new location are considered climatologically compatible with the data from the old site, the SID will not change. Even if a new SID is not required for a compatible relocation, an NWSLI Transaction Form will be required to change information such as latitude, longitude, etc., which did change as a result of the relocation.

A new SID will be required whenever a station relocation results in incompatible data. In cases of an incompatible relocation, two Request Forms are required:

- 1) To remove the old SID from use, and
- 2) To establish a new one.

9.7 Determining Latitude, Longitude, and Elevation of a Station

The latitude and longitude of a station are specified to the nearest second using a Global Positioning System (GPS) instrument as referenced from the primary rain gauge or observing instrument if no rain gauge. The elevation of a cooperative station should be determined to the nearest ten feet (10 ft) using a mobile device that has accurately matched its location to a recognized GPS device in the NWS field office.

The use of cellular mobile devices is approved for determining the latitude, longitude, and elevation of the site, provided the following conditions are met:

1. Cell phone GPS accuracy must be verified against an on-station dedicated GPS unit to within 1.0 seconds of latitude and longitude. The following remark will be added to the remarks section of the COOP metadata system: “Cell phone GPS accuracy verified against (make and model of GPS) dedicated GPS unit.”
2. When completing the metadata for the site, the source of the latitude and longitude will be annotated as the manufacturer of the cell phone, such as “Cell Phone, Apple” or “Cell Phone, HTC.” If the needed model is not listed in the provided drop-down list, please request that it be added.
3. The on-board cell phone Compass will not be allowed for use. These are generally far too sensitive to localized magnetic sources.

The Federal Standard Datum to be used in determining horizontal station location coordinates (Lat, Lon) is the North American Datum (NAD 1983). When using GPS equipment, ensure that the proper Datum is selected so that the resultant coordinates are compatible with GIS system standards for mapping.

The elevation of a COOP station can also be determined using resources from the U.S. Geological Survey, such as charts available online (i.e., <https://apps.nationalmap.gov/viewer>) or other applications. The elevation of a cooperative station is the mean sea level elevation of the ground in a 20-meter (60-ft) circle around the primary rain gauge and is entered to the nearest whole foot. Elevations below sea level are preceded by a minus sign. In the case of a station

that only has a river gauge and no rain gauge, the elevation entered will be the ZERO DATUM of the gauge.

Note: If using non-GPS methods when determining the elevation of a station from a USGS topographic map, check the bottom center of the map to determine which vertical datum was used. If the datum on the map is the National Geodetic Vertical Datum of 1929 (most topographic maps were based on this datum), you need to convert the station elevation to NAVD 88. You can adjust the value (if needed) using the resource on the National Geodetic Survey (NGS) website: <https://www.ngs.noaa.gov/TOOLS/Vertcon/vertcon.html>. Be advised NGS is planning to implement a new vertical datum standard in 2026. It is known as GRAV-D. Information on the planned transition is found on NGS's website, linked here: <https://www.ngs.noaa.gov/datums/newdatums/release.shtml>.

9.8 Proper Documentation

It is essential that prompt and correct documentation be made for all COOP stations. The Station Profile is intended to provide a complete and permanent record of a cooperative station. A report of this form should be prepared for the establishment, discontinuance, or any change in a cooperative station. Detailed instructions for the preparation of this form are given in the STAMS website (<https://stams.wxcoder.org>).

9.9 Planning of Travel

Visits to the COOP site are relatively infrequent, and therefore, each should be as complete and thorough as possible to meet all of the needs prescribed for operating the station. This includes exposure evaluation; inspection and maintenance of the instruments for data validity and continuity; consultation with the observer for adequacy of supplies and review of observational practices; documentation and recommendations by means of reports; and public relations liaison with the observer, community, associated agencies, and news media relative to the station, the data, observer recognition, etc., as indicated or required.

Plan travel carefully on a semi-annual and an annual basis for efficient coverage of the area. Anticipate and secure spare parts, supplies, forms, and maintenance manuals for the planned trip. Coordinate travel plans with other offices that may be interested in COOP stations. You can request accommodations for overnight travel, multi-day trips, and special transportation services from your regional office (i.e., ferry, boat, air transport, etc.).

Adequate trip preparation means anticipation of the aforementioned needs, and successful trip execution means doing all that can be done at the site before moving on to the next station or returning to the WFO. In large measure, the success of the COOP program depends on the economy and efficiency of the well-planned multi-purpose visit.

Always phone the observer in advance of visits to ensure they are home. The NWSREP has the responsibility to arrive at the scheduled time. In case of delay and out of courtesy, the NWSREP should phone the observer. If a visit with an observer is not possible at the time of the routine inspection, phone calls or emails may have to suffice.

9.10 Inspecting and Servicing Equipment

The NWSREP inspects and services climatological and hydrological stations and stations that support meteorological forecasts, warnings, and public service programs that are owned by the NWS. Prior to a site inspection, make plans to clean the NWS equipment. This will require cleaning supplies that are not available from NLSC. Therefore, request funds from your regional COOP manager to purchase cleaning supplies locally. In select locations (i.e., dams), personal protective equipment (PPE) for safety purposes (i.e., boots, gloves, hard hats) is required by site managers. In other locations, for example extreme cold sites, purchasing PPE may be required. The NWS personnel should be diligent and do everything possible to maintain their goodwill. The inspection of each COOP station should be unbiased, positive, polite, and thorough. COOP stations strive to meet observational standards for accuracy and completeness. A simple, common-sense technique applied with patience and a genuinely friendly and helpful spirit will go far toward ensuring success.

9.11 Inspection Reports

The NWSREP should prepare and keep up-to-date routine cooperative station inspection reports, such as WS Form 10-13-6 (see Appendix C of this directive). Inspection data is only official and validated when entered into STAMS. This is done as soon as possible during normal duty hours after returning to the office. Instructions for entering the data contained are contained in the STAMS website and should be entered as soon as possible during normal duty hours after returning to the office.

9.12 Updating Station Management System (STAMS) Files

The STAMS system is a collection of COOP station information residing in a database on a centralized server at NWSHQ. The system is designed for data entry and manipulation to account for equipment type, observed weather element, method of reporting, and other tasks associated with the NWS Cooperative Program. The files are updated as follows:

1. When visiting the cooperative station, the NWSREP reviews and verifies all information on the current rendition of the Station Profile for the station. If changes necessitate an update of the STAMS files, the NWSREP prepares and submits a new rendition of the Station Profile. See the STAMS website for instructions on preparing, submitting, and approving the Station Profile.
2. The Station Profile is required to be updated every three years, even if no changes were made to the station during that time. Updates should be made every time a change is made to the station or a change of the observers.
3. The Station Profile is designated 'preliminary' until final approval from NCEI. Quality control and approval are accomplished in the following order: WFO Reviewer, RCPM level, and NCEI level.
4. When approved by NCEI, the form changes from preliminary to final.

If the form is rejected at any level, a reason for rejection is required. It then returns to the NWSREP for their action. Once corrections are made, the NWSREP resubmits the form, and the

approval process begins again.

Requests to establish, change, or close a COOP station are made through STAMS by the field office NWSREP. From the STAMS homepage, the NWSREP enters the ‘Station Management’ area and clicks on ‘Request New Station,’ and then provides the names of offices that should be notified of this request, the equipment needed, and the justification for this request. The justification should state the purpose and program that is affected. For example, the station may be established to improve flash flood forecasts and serve the FWO local warning program. The field office then submits the Request New Station within STAMS, and the system thereby notifies the WFO manager (MIC). If approved, the STAMS notifies the region’s COOP manager (RCPM). The region’s COOP manager can accept or reject the request for a New Station. Each region may have guidelines that are unique for that region. The change is not final until NCEI approves the update.

Note: Any proposed change that affects a U.S. Historical Climatology Network (USHCN) site needs special coordination with NCEI; see Section 2.4 of Appendix A in this NWS directive.

9.13 Maintaining Proper COOP Stations

As outlined above, maintaining a proper COOP Station involves periodic site visits and routine maintenance. Positive feedback strengthens the relationship between the observer and the agency and is ultimately reflected in data quality. The NWSREP’s visits, phone calls to the Observers, and recommended awards are appropriate forms of feedback. The NWSREP may invite the observer for an office visit, write local newsletters, and coordinate newspaper articles or any form of feedback approved by the MIC or OIC that highlights the observer.

However, there are times when conditions change at a COOP station, e.g., vegetation growth, soil settling, accidental contact and breakage of COOP equipment, disinterest of COOP observer, etc. In these cases, the WFO should work with the observer to remedy the situation in order to re-establish the effectiveness of the site, whether it is re-training of the observer, re-siting of the equipment, etc. If re-siting involves more than a minimal move of the equipment, the WFO should work with the National COOP program Manager (NCPM), Regional SOD Chief, and NCEI to evaluate the situation and implement solutions that resolve the problem while maintaining a reliable COOP network.

9.14 Inactive COOP Stations

A station is declared inactive if no observations are taken, but observations are expected to resume within six months. If a station remains inactive for longer than six months, it should be closed. To inactivate a station, the NWSREP submits a Station Profile within the Station Management System (STAMS) and states the Reason for the Report: “Inactivate a Station.” A station can be reactivated when observations resume. The reactivation is documented with an entry in the Reason for Report that states: “Reactivate an Inactive Station.” If you have to Close the station, it should remain in the ‘Inactive’ status until the equipment is removed.

9.15 Closing COOP Stations

To officially close a COOP station, the NWSREP submits a Station Profile for management's approval. After approval is granted, the NWSREP documents the closed station with an update to the Station Profile in the Reason for Report that says: "Close a Station." Upon officially closing the station, the NWS instruments will be removed and retained in the NWSREP's stock for future use.

10 Relocation and Moves

10.1 Definitions

A 'Relocation' is defined as being a move of the observing equipment more than 1,000 feet from the primary rain gauge equipment (or the primary observing gauge). Whereas the definition of a station 'Move,' is when the observing equipment is moved less than 1,000 feet, and a compatibility checklist is not required.

The purpose of the Continuity Checklist is to respect and conserve the long history of the station in an effort to maintain climatological continuity. There are five criteria (Table 2, Relocation Evaluation Checklist) that give a pass/fail for compatibility. The criteria include localized siting characteristics, topographic siting characteristics, topographic slope or exposure, and range of relocation not exceeding a change of 100 feet elevation, nor exceeding five miles from the original site that is documented in Rendition 1 of the Station metadata archive.

10.2 Compatibility Determination

A climate data compatibility determination is made at the time the station is relocated so that a station number can be assigned as soon as data reporting resumes.

Climate data compatibility is maintained when the difference in daily maximum and minimum temperatures and 24-hour precipitation (including snowfall) between the original location and the new location is expected to be equal to or less than the difference in measurements that would occur by simply replacing the instrumentation. For example, the functional precision of the MMTS over the vast majority of the temperature range being measured is about 1° F. Thus, if the difference between two locations is expected (or shown by parallel testing) to be equal to or less than 1° F for the daily maximum and minimum temperatures, data compatibility for temperature between the locations is satisfied.

In cases where analysis of parallel observations is unavailable (the vast majority of cases), climate data compatibility is determined by:

1. Comparing the differences in location between the new and original equipment (as described in Rendition 1 in the station's metadata archive) and
2. Considering a number of factors related to climate data continuity. See Table 1.

The station moves where the new equipment location is within 5 miles of the original site, and the difference in elevation is 100 feet or less, which are also assumed to be incompatible unless they pass a data compatibility evaluation (Table 2). While most re-locations are expected to exhibit data incompatibility, there may be cases when the data record from the new location may

be a faithful continuation of the climate record from the old location. However, the compatibility evaluation will be conducted for all relocations of less than 5 miles and/or 100 feet unless the move is deemed incompatible by the NWSREP.

The NWSREP will convene a Data Continuity Group (DCG) comprised of the Climate Focal Point, Service Hydrologists, and the MIC, to conduct a thorough examination, only for relocations off-site that are not considered local moves. The group may notify climate focal points with an email only if a new location is with or without a change made to the COOP SID (numerical 6-digit ID). Following the decision on station relocation, notification of NWS partners and affiliated climate offices should be made:

1. WFO Science Operations Officer.
2. River Forecast Center (RFC)
3. NWS Regional COOP Manager (RCPM) and Regional Hydrologist if applicable.
4. NWS Regional Climate Services Manager
5. Appropriate Regional Climate Center (RCC)
6. State Climatologist.
7. NCEI, only when results of parallel testing are available for evaluation or when a new station identifier is issued.

Determine compatibility by consulting with your State Climatologist and your Regional Climate Center on an advisory basis and apply the compatibility checklist (Table 1). Relocations that satisfy the conditions on the checklist may then be declared data compatible by the NWSREP. The checklist will be entered into the official metadata record for the station and be available as part of the site's historical record as funds are available.

For climate continuity purposes, the establishment of a station near the site of a previously closed site will be treated in the same manner as other relocations. That is, the station number of the previously closed station can only be used again if data continuity is found to be maintained between the two locations through the checklist process and simple collaboration with your field offices and climatologists. In such cases, there will be an acceptable period of missing data between the closure of the historic site and the opening of a new site.

10.2.1 Compatible Relocation

A relocation is considered to be compatible when data compatibility is maintained, as demonstrated by the process described in Table 1. An example of a compatible relocation occurs when an observer quits, and the equipment is relocated to a neighbor's yard or to some other location, and the compatibility is maintained per validation of the checklist conditions.

Prepare and submit a Station Profile to document all equipment moves and relocations by accessing the STAMS website (<https://stams.wxcoder.org>). Use the Permanent Remarks section to make comments that justify the compatibility and can cite any of the five criteria from Table 2.

10.2.2 Compatibility Checklist Fails (Non-Compatible)

When a station does not pass the Checklist, then the station is closed, and a new station is **initiated** with a new Station Name, new SID, and new NWSLI, **and the metadata rendition is assigned as number one**. Note: All observed weather elements need to be considered, to be compatible. If temperature is compatible, but precipitation is not, then the move is incompatible.

Original Station COOP ID (6 digits)		Data Continuity Group (DCG) Advisory Committee Members					
Relocated Station COOP ID (6 digits)			NWSREP				
Supervising WFO			NWS Regional COOP Manager				
NWSREP's Name			NWS Regional Climate Services Program Manager				
Date of Evaluation			Regional Climate Center Representative				
No.	Data Continuity Criteria	Yes	No	Reviewer	Org.	Date	Comment
1	Equipment \leq 5 horizontal miles from Rendition 1.						
2	Equipment \leq 100 feet different in elevation from Rendition 1.						
3	The geographic setting of relocated and original stations is similar (i.e., urban, suburban, rural, wilderness), and surrounding environmental characteristics (asphalt driveway, vegetation, buildings, steep slopes, bodies of water, and solar exposure) are also similar. Environmental categories are subjectively determined using existing field observations/knowledge, photography, GIS land use mapping, etc.						
4	Relocated and original topographic settings are the						

	same (considered in the context of basic categories [i.e., valley, crest, slope, and plateau]). Topographic categories are subjectively determined using existing field observations, photography, topographic charts, and GIS land use mapping.						
5	The relocated station site has a topographic “slope” orientation (north, south, east, or west) that is ≤ 90 degrees different from the original site (as defined by Rendition 1). A slope exists if the average ground slope within a 200-foot radius of the station averages $> 2^\circ$ from the horizontal (flat surface). This condition can be subjectively evaluated.						

Table 1, Station Relocation Data Continuity Evaluation Checklist

Type of Change	Station Name	Station Number
No station relocation: Observing program and/or instrumentation changed (i.e., max and min thermometers installed at precip stations).	Station name retained	Station number retained
No station relocation: Community or post office name changed.	The name changed to conform to new name of community. Old name included in parentheses following new name [i.e., new name (old name)].	Station number retained
Station relocation: Station remains within community. Climatologically Compatible.	Primary name retained; secondary name changed if needed to conform to new orientation to community (e.g. Jonesville 1W to Jonesville 2SE or State Univ. to Jonesville Park).	Station number retained
Station relocation: The station moves to a new community. Climatologically Compatible.	The name changed to conform to the name of the new community.	Station number retained
Station relocation: The station moves to a new community. Climatologically incompatible.	The old station closed, a new station was established.	New station number and Station Identifier (SID) assigned
Station relocation: The station remains within the community. Climatologically Incompatible.	The old station closed, new station established with new secondary name. Primary name retained; secondary name changed (e.g. from No 1 to No 2 if within ½ mile of city center) or to reflect orientation to community (e.g. Jonesville 1W to Jonesville 2SE or State Univ. to Jonesville Park).	New station number and SID assigned

Table 2, Relocation Naming and Numbering.

10.2.3 Summary of Station Relocation Naming and Numbering Procedures

If the two sites are climatologically compatible, then the station retains its number following the move. If the sites are incompatible, then the new site receives a new station number. In such cases, formal procedures should be taken to close the original site and establish the new one. Two Station Profiles will be issued, one for closing the station with the old name and one for creating a new station with the new name, number, and SID.

For stations that relocate within the same community, the primary name should be retained, but the secondary name should be changed to reflect its new location. Stations that relocated outside the community will adopt the name of the new community. Where there are no post offices or town halls, then the station name can agree with the current U.S. Census Bureau-named towns in the vicinity. The NWSLI database maintains a list of towns and cities that may be the best reference for assigning a name to a new station.

In the rare situation, when the community changes its name but the station does not move, the station name will be changed to the new name of the community. No formal action will be taken to close the original site and establish a new site. The rules for naming and numbering following relocation are summarized in Table 2, Naming and Numbering a Relocated Station.

11. Data Management and Quality Control

One of the most important tasks of the WFO/WSO/DCO is ensuring the accuracy of recorded and reported observations and that the users receive the data promptly. Otherwise, the value of the observing program degrades significantly. The WxCoder monthly reports, HPD data files, and similar B91 monthly reports, if not received at NCEI by their cutoff dates are not archived. However, data will be archived, and annual statistics will be produced if the form is received prior to annual processing. If a monthly report is incomplete or missing, no monthly or annual precipitation total can be determined or published, nor can an average annual temperature be published.

The NWSREP ensures:

1. The quality control of daily observation in near real time and *before the monthly close out on the 25th of the following month.*
2. The collection, review, and perfunctory quality assurance of the Hourly Precipitation Data (HPD) electronic files upon receipt from the observers with FPR recording rain gauges.
3. The prompt delivery of daily precipitation and the daily maximum and minimum temperature data to NCEI by the 25th of the following data month.
4. The prompt delivery of HPD monthly precipitation data to NCEI by the 25th of the following data month.
5. The quality control of the received WxCoder observations.
6. Full use of Datzilla to report post-submission errors and track resolutions.
7. Data completeness, data validity and quality assurance through evaluation of NCEI monthly reports (i.e., Quality Assurance Reports for Climate Data publications and data inventory reports for the HPD sites).

Note: Corrections that need to be made to the observation data, must be completed before Closeout date using WxCoder3. If corrections are needed after that date, a Datzilla ticket will be required.

11.1 Data Consistency, Timeliness, and Accuracy

The observer takes daily observations consistently and at the same time of day. Most of the daily observations are recorded in the WxCoder online form, and if the observer does not use the internet, then WS Form B-91 (or another form) is provided for the observer to legibly write in the observations to that form. If an observation is missed, the observer should enter “M” into the appropriate columns of the meteorological elements that were not observed on a particular date, and indicate the missed observation in the remarks section for that date. Readings should not be missed. An observer who is ill or leaves home should have a neighbor or friend as a substitute observer. Observers should be encouraged to add information about severe weather and its effects in the remarks, where possible.

The hourly precipitation data (HPD) are generated automatically by Fischer Porter Rebuild (FPR) rain gauges. The COOP observer is required to manually download the HPD data on a monthly basis. Most observers email the log file to their WFO; however, some observers mail the NWS issued removable memory card (or flash drive) via the U.S. Postal Service. The NWSREP then has the responsibility of taking inventory of each FPR site’s monthly data files and phoning the observer if files are not received during the first ten (10) days of the month following the data month. The NWSREP submits all FPR files to NCEI on a monthly basis via an FTP upload process.

11.2 Finding and Correcting Observing, and Reporting Errors

The Forecast Desk should review the RR3 products for accuracy of Maximum Temperature, Minimum Temperature, Precipitation (24-hour), and Snowfall, and Snow Depth. These are gross error checks that should be reviewed during a weather event when observations could be newsworthy and for extreme climate records.

Additional review of Advanced Hydrologic Prediction Service (AHPS) data and radar loops and archived radar loop, or supplemental weather resources, should be conducted during storm events in real-time, or as soon after the end of the event.

Upon detection of an error, the observer should be notified to correct their observation and resend the WxCoder report. This new report will be an “AR” report and will be the only value to go into the climate record.

The NWSREPs review any received forms from observers, making mental or written notes of any problems with the data, but the best control of data is accomplished closest to the source, the COOP observer. Problems requiring urgent attention (significant errors in reporting procedures, late or missing data, etc.) should be discussed as soon as practical with the observer by telephone, email, or in person. Less urgent problems should be dealt with during the next scheduled (annual or semiannual) station inspection.

11.2.1 Common Observing Errors

Common errors are listed below. Many of the errors will be flagged in WxCoder on data entry. The program will not let you save the temperature, precipitation, and snowfall data if there are format errors. In addition, the NCEI applies its quality control process to the observation data it receives.

1. Reporting snowfall (new snow) only in whole inches or to the nearest quarter inch instead of tenths of an inch.
2. Omitting entries of the total depth of snow on the ground (especially in the days following the snowfall) or reporting this in tenths of inches. Snow depth is to be reported in whole inches.
3. Reporting Maximum/Minimum Temperature System (MMTS) readings in degrees and tenths. Temperature is recorded in whole degrees (F).
4. Missing a day's observations, then entering subsequent readings on the wrong (usually the preceding) date.
5. Making an estimate of, or substituting a value from a non-approved sensor; of the temperature *or precipitation* not recorded.
6. Shifting – Observers that take readings in the morning or evening (not midnight) may confuse a calendar day with an observation day (crosses two days) and incorrectly shift observations to the previous day.
7. Observing at a time different than indicated on the form.

11.2.2 Missing and Questionable Temperature Values

The NCEI compares maximum and minimum temperature observations with values from nearby stations, taking observations at the same general time of day. These are intended to correct errors such as “4” through “7” in the preceding section. Suspect data that exceed data quality assurance thresholds may be edited. Both original and edited data are preserved in the database, and both are reflected in the CD publication. An OBS line was added to the Daily Temperatures tables of the CD publication. This line is entered immediately below the MAX or MIN line. The temperature in the OBS line is the value reported by the observer, while the reading on the MAX or MIN line is the estimated value. When *** appears on the OBS line, readings were missing on the observer's report, and the values on the MAX and/or MIN lines have been estimated.

11.2.3 NCEI Quality Assurance Reports

The Climate Data Quality Assurance Report (i.e., the ‘CD QA Report’) is published by the NCEI on a monthly basis in a PDF and CSV format and should be disseminated by each regional COOP program manager. It contains a comprehensive listing by region of the sites flagged by NCEI as not meeting NCEI's QA criteria, and having questionable and missing data. The CD QA Report does not check snowfall observations; only temperature and precipitation are evaluated.

11.2.4 Precipitation Irregularities

The NCEI performs both temporal and spatial checks on precipitation data. Most of these checks compare one station against another. More common in recent years are COOP observers who also report on the CoCoRaHS (Community Collaborative Rain, Hail, and Snow) Network, but they are seen to take observations at different hours (i.e., 7 am, 8 am, Midnight). These observers need to be reminded to report at the same hour for both the CoCoRaHS and the COOP networks.

Weather maps, radar, and satellite imagery are also used to confirm or deny questionable values. Comparisons are also made between the days with various weather elements (hail, thunder, ice pellets, etc.) and precipitation. NCEI runs extensive checks and comparisons of snowfall and snow on the ground to ensure continuity in the reports.

11.2.5 HPD Precipitation File Inventory

The NCEI updates the HPD Inventory web page daily and creates a running list of data-months on this website: <https://NCEI.noaa.gov/pub/data/hpd/inv/>. This site can be checked for proper receipt of all HPD sites' monthly data files.

12. Reporting and Publishing Observations

The COOP observer provides the National Oceanic and Atmospheric Administration (NOAA) with data representing a true picture of the climate on a regional and sub-regional scale. As a result, the importance of this data continues to increase in value for all citizens, government, industry, and the research community.

12.1 Methods of Reporting Data

Many of the COOP stations provide real-time or near real-time data to NWS offices by web-based data entry and touchtone phone input. Some observers may ~~postal~~ mail their data to the NWS on a monthly basis, but it is up to the NWSREP to ensure the data is transferred electronically to NCEI if it is to be included in the electronic archive and made available for publication. Some "b" network stations are entirely automatic and telemetered primarily by telephone, satellite, or VHF radio. Nearly all "b" and some "c" network observations, whether manual or telemetered, are sent to a River Forecast Center (RFC). Information also goes to other offices needing the data as input to hydrological models, to support hydrologic forecast and warning operations, and/or water resource forecasting. As long as the following requirements are met, the NWS is authorized to submit COOP observation data for inclusion to the official climate record.

1. The phone and web-based data entries create a preliminary monthly data summary accessible by the NWSREP and to the observer on a daily basis.
2. The observer electronically verifies the preliminary monthly climate data summary before submission at the end of the calendar month.
3. Each month, the NWSREP electronically verifies that they have reviewed and approved the data before it is transmitted to NCEI. The monthly observation form will be verified by the observer within 5 days after the close of a calendar month, and

the NWSREP will verify and submit the monthly form to NCEI via the ‘admin’ Closeout Process in WxCoder before the 25th day.

The NWSREP will encourage the COOP observers who are able to transition to paperless data reporting to do so by phone or via PC and website. Observers with a PC and web access will be encouraged to use web-based reporting. Observers with only touch tone phone service will be encouraged to use a telephone-based data transmission system. In recognition of the many years of dedicated volunteer support to the nation, observers will not be required to convert from the paper and pen process.

If the data is intended for NCEI publication and placed into the digital archive, the NWSREP will need to assist with the electronic transfer of data. This can be through the NWSREP entering the data for the observer or some other mutually agreed upon procedure between the NWSREP, RCPM, and NCEI. Inform the observer that even if they choose not to have their data reported as part of the NCEI monthly publications, once their precipitation, snow, or temperature data is encoded into WxCoder, whether directly by the observer or not, this data will be added to the Global Historical Climatology Network (GHCN) dataset. The monthly data reports are accessible on Climate Data Online, a publicly accessible website managed by NCEI.

Note: New COOP observers are required to use paperless data transmission to become part of the published climate network. This is so unless they are located in regions not having reliable paperless data transmission systems (i.e., Alaska and Pacific Regions). If a new observer has phone service only, but expects to have wide band internet service, they should be encouraged to transfer to web-based reporting. Observers will be provided the training necessary to decide when and how they can successfully transition to paperless reporting. In cases where an observer uses more than one observation time e.g., 7 a.m. to 7 a.m. for different climate elements, the times are identified clearly for NCEI in the station’s metadata. The NCEI states in their published climate records which 24-hour period is represented by the observation data.

12.2 Publications Available to COOP Observers

The NWSREP should share the names and locations of the publications that contain their weather and climate observations. Publications can illustrate the NWS’s appreciation of their great personal contribution. The publications can also be an important feedback to encourage observing excellence and continued participation in the cooperative program. Published data is available from the following website: <https://www.NCEI.noaa.gov>

12.3 NCEI Published COOP Station Data

This section establishes the criteria to determine which cooperative stations have their data published as well as archived by NCEI. In general, NCEI publishes data from COOP stations when established criteria are met, including proper settings in the station metadata. As the NWSREP, you should ensure NWS owned or approved equipment is sited to meet the requirements for published data.

12.3.1 Criteria for Publishing COOP Stations

Publication of cooperative data will meet the following criteria:

1. The station is an official COOP station with an assigned station index number.
2. A current Station Profile for the station on file at NCEI indicates the type of data to publish in the Climatological Data (CD) and/or Hourly Precipitation Data (HPD), i.e., daily precipitation in the CD or hourly precipitation in the HPD.
3. Official observation forms are used to record observational data. Computer-produced forms or forms used by other agencies may be used if the form has the same format as NWS cooperative program forms. The preferred method of reporting observations is through electronic means such as WxCoder or IV-ROCS.
4. The observing equipment is of a type approved by the NWS and that meets the NWS standards for siting and instrumentation.
5. The station receives routine visits and/or maintenance by a NWSREP.
6. The station is part of the “a,” “b,” or “ab” network to be considered for publication.

12.3.2 Hourly Precipitation Data (HPD)

The NCEI terminated its monthly HPD publication in 2012, but current HPD data is made available on this website, <https://www.ncei.noaa.gov/access/search/data-search/coop-hourly-publications>, under two product categories: HPD Version 2, and HPD 15-Minute Version 2. In past years, the publication of HPD was funded in part by the U.S. Army Corps of Engineers and other reimbursable networks. Requests from other agencies for publication of data in the HPD dataset should be approved by NCEI when NWS reimbursable agreements call for data publishing and archival. Costs are funded by the requesting agency through the NWS.

12.3.3 Publication of Soil Temperatures

The COOP stations that report soil temperature data have their data reported in the NCEI’s Climatological Data (CD) publication and the U.S. Department of Agriculture’s publication, the Weekly Weather and Crop Bulletin. The NWSREP ensures the following conditions are met before soil temperature data are considered acceptable for publication.

1. Exposure and instrumentation are considered adequate by the Regional NWSREP.
2. Records are made available in time for regular publication.
3. Records are furnished in final corrected form by the cooperator to be retained in NOAA files.
4. A station’s distance from other stations approximates that of either “a” network sites, i.e., 25 miles, or was established specifically to compare data between sites closer than 25 miles.
5. A station is fully documented, including soil type, aspect, slope, ground cover, and instrumentation.
6. Soil data are obtained at one or more of the World Meteorological Organization approved depths (2, 4, 8, 20, 40, 60, or 72 inches) or at approximately similar depths. The 4-inch depth is most frequently observed.

- 1) At the 2, 4, and 8-inch depths, data will be published as either daily maximum and minimum values or as observed values at no more than two fixed observation times a day. At the 20, 40, 60, or 72-inch depths, data will be published only as observed values at one fixed observation time a day.
- 2) Data will be published if obtained under either bare soil or cropped native grasses.
- 3) Data from soil temperature stations operated or funded by a NOAA component will be processed and published provided all conditions are met and funds to support the work can be transferred from the NOAA component collecting the data.
- 4) Soil temperature data from stations or depths not meeting processing and publication criteria will be accepted, but only for archiving and other applications.

12.3.4 Publication of Data from New Observing Programs

When new or expanded observing programs are planned that require additional regional funding for data processing and publication, the plan will be coordinated with NCEI and included in the budget request for the new or expanded program.

12.3.5 NCEI Archiving of Non-Published Observations

All or part of a COOP station's data may be considered official yet not published. All data received from COOP stations with a proper station ID and full data documented in the metadata database are archived in GHCN-Daily and are quality controlled by GHCN-Daily's quality control process. They are provided to users with the disclaimer of "best available" record.

Instances where non-published status may be used:

1. Reporting of automated stations, such as river gauges
2. "b" network stations that also observe temperature
3. Trial periods for new observers to determine the quality of observations
4. Recruitment of promising new observers who are expected to replace current observers in the near future.

13. Court Appearances for Observation Records

If an observer is served a subpoena by an attorney or court official for a case where weather conditions may be a factor in litigation, the observer should inform the attorney or official having issued the subpoena the following:

1. Cooperative observers cannot authenticate any NWS records they have in their possession, neither photocopies nor PDFs, for they do not have the authority to certify these records.
2. Cooperative observers cannot testify on behalf of the NWS.

3. The National Centers for Environmental Information (NCEI) in Asheville, North Carolina, are the official custodians for weather records of the NWS. The NCEI can certify/authenticate weather and climate records by request through the following points of contact:

<https://www.ncei.noaa.gov/certification>

Email: ncei.orders@noaa.gov

Phone: (828) 271-4800

If the attorney (or official) is seeking expert testimony, refer him/her to the following commercial website for a list of expert meteorologists: <https://wcdirectory.amestsoc.org>.

Once these points have been explained to the attorney, and he/she understands and accepts that the observer is not authorized to provide official weather observation records, then ask the attorney to withdraw the subpoena. If the attorney insists on the observer's testimony, the observer is required to honor the subpoena. The observer's testimony should be limited to elements about which he/she has personal knowledge and information.

Note: Court officials with subpoenas are process servers. Process servers do not have the power to withdraw a subpoena. Contact the attorney who issued the subpoena.

14 Observer Awards

Recognition awards are a tangible method of showing appreciation for many years of dedication. The awards may be given to individual observers, families, and institutions for length of service or in recognition of one or several significant achievements. Recognition for many years of service and for special or sustained achievements is usually secondary in importance only to the encouragement given to observers through positive feedback. In addition, observers should be recognized for outstanding service in their role of delivering reliable, high quality, daily weather, and climate observations, with the meritorious awards, either the John Campanius Holm Award or the most prestigious recognition, the Thomas Jefferson Award. Nominations are made via Google Forms via this link to the [Meritorious Service Award Nomination Form](#). Policy and instructions for the awards program are described in NWSI 10-1314, *Cooperative Observer Awards* ([pd01013014curr.pdf](#)).

15. Environment and Safety

Safety is the duty of every employee and can only be accomplished through the commitment and diligence of everyone. The NWSREP will ensure compliance with NWSM 50-1115 *Occupational Safety and Health* ([pd05011015curr.pdf](#)), and NWSM 50-5116, *Environmental Management* (https://www.weather.gov/media/directives/050_pdfs/pd05051016curr.pdf).

16. Automation

With the retirement of local Observers and non-availability of willing or capable Observers as replacements, automation of that location may be required. NWSREP will coordinate with the COOP Program Management to determine if the site is necessary and, if necessary, will schedule that location for automatic data collection and acquisition. Automation plans will be developed

in NWS Headquarters and reviewed by the RCPM and the appropriate Regional Division Chief(s) SOD Chief(s) to ensure the solution is viable, has proper tooling and parts on hand, and is viable for the location under consideration.

APPENDIX A – COOP Station Networks

Table of Contents	Page
1. Introduction	A-1
2. COOP Networks	A-1
2.1 “a” Networks.....	A-1
2.2 “b” Networks	A-1
2.3 “c” Networks.....	A-1
2.4 U.S. Historical Climatology Network (USHCN)	A-2

1. Introduction

This appendix describes the observing networks comprising the cooperative observer program. Stations are included in one or more of these networks depending upon the NWS programs (climatology, hydrology, and/or meteorology) supported by their observed data.

2. COOP Networks

2.1 “a” Network

This is the basic climatic network of the NWS. Data from this network are used to describe the climate of the United States. At a minimum, they observe and report daily 24-hour precipitation totals, 24-hour maximum air temperature, and 24-hour minimum air temperature. Observations are made with instruments that meet NWS standards as stated in NWSI 10-1302, *Requirements and Standards for NWS Climate Observations* ([pd01013002curr.pdf](#)).

Ideally, “a” network stations should be spaced approximately 25 miles apart. A greater spacing (60 miles or more) may suffice in areas with relatively homogenous climates; a closer spacing may be needed in coastal and mountainous sections where climate differences are more pronounced.

2.2 “b” Network

COOP stations are in the “b” network when observed data are used to support NWS hydrologic programs, such as the forecast and warning program and the water resource forecast service program. Stations are established, changed, or closed to meet changing hydrologic requirements that have been defined by field offices and verified by regional hydrologists. Observations are made with instruments that meet NWS standards as stated in NWSI 10-1302 *Requirements and Standards for NWS Climate Observations*. ([pd01013002curr.pdf](#)).

Observing programs at “b” network stations, at a minimum, include 24-hour precipitation (some with recording gauges) and often one or more of the following elements: river stage or lake level, maximum and minimum air temperatures, evaporation, and soil temperature.

2.3 “c” Network

Cooperative stations are in the “c” network when observed data are used to support the meteorological forecast and warning, as well as public service programs of the WFO. Stations are added, deleted, and

changed to reflect changing requirements. The “c” network includes the following general classes of stations:

1. Local Service. These are temperature and/or precipitation stations used primarily for local public service purposes (metropolitan networks, media releases, etc.).
2. Long Record. These are temperature and/or precipitation stations with long records but are not included in the “a” or “b” network.
3. Research, Experimental, and Special Purpose. These are temperature, precipitation, and/or special purpose stations not included in the “a” or “b” network. Their observations generally include but are not limited to, maximum and minimum temperatures and 24-hour precipitation. Those stations supporting local service are asked to telephone or transmit their observations to the NWS office digitally.

* Several combinations are possible depending on what network is represented at the COOP site; i.e., ‘ab’, ‘ac’, ‘bc,’ and ‘abc.’

2.4 U.S. Historical Climatology Network (USHCN)

The United States Historical Climatology Network is a high-quality dataset of daily records of basic meteorological variables from approximately 1200 observing stations across the conterminous United States. Daily data include observations of maximum and minimum temperature, precipitation, snowfall, and snow depth. Most of these sites are located in rural locations, while some are identified as first-order stations located in more urbanized environments. The period of record varies for each station. Stations are chosen using a number of criteria, including length of record, percent of missing data, number of stations moved, and other station changes that may affect data consistency. Due to the stringent requirements for the identification of a USHCN site, NCEI involvement is necessary prior to any changes to the station location or the STAMS database. NCEI identifies USHCN.

This network is a subset of COOP that provides a data set suitable for detecting and monitoring secular changes in regional rather than local climate. To minimize artificial changes in local environments, the selected sites should contain few discontinuities (i.e., station moves, instrument changes, and relocations). At least 80 years of temperature and precipitation records are required, with no more than five percent of the observations missing.

In the event a USHCN station become non-compliant or incompatible with the station’s history due to site conditions, the following steps should be followed:

1. The COOP Regional Representative will confirm with the NCEI representative that the location data is in error according to NCEI standards.
2. The COOP Regional Representative will visit the site to determine the cause of the data error.
 - a) If the error is caused by a maintenance issue, the COOP Regional Representative will perform the required maintenance and validate that the system is working correctly.
 - b) Upon completion of the maintenance, the COOP Regional Representative will notify the COOP Observer of the maintenance and notify NCEI of the resolution.

- c) Should the problem require the USHCN site to be relocated, the regional representative will attempt to find a location, or locations, that fit within the parameters or a compatible move (Table C-1) and do the following:
 - 1. The regional representative will convene a committee to review the siting options. The committee will be comprised of:
 - 1) NCEI Dataset Section Chief
 - 2) WFO Representative
 - 3) Regional COOP Program Manager
 - 4) Regional Climate Services Manager
 - 5) Regional Climate Center Representative
 - 6) State Climatologist
 - 2. If one of the alternatives proves to be a compatible site, and all committee members have agreed to the change, the COOP Regional Representative will:
 - 1) Relocate the station equipment
 - 2) Update the Station Management System (STAMS) to reflect all change parameters but keep the original station identifier and name.
 - 3. Should the problem prove to be non-reconcilable as a compatible move, the committee will do the following:
 - 1) NCEI Climate Science Branch, Dataset Section, will remove the existing station from their USHCN roster
 - 2) NCEI Climate Science Branch, Dataset Section, will conduct a database search for a replacement USHCN site and present the findings to the committee
 - 3) Once identified and reviewed by the committee, the NCEI will add the new site to their USHCN roster and include the COOP Station Identifier to the metadata
 - 4) The COOP Representative will coordinate the removal of the equipment, mitigate the site (if needed), and then close the former station in the STAMS.
 - 5) The COOP Representative will then follow procedures in Section 9 to establish a new station within the same grid zone or the same climate zone as the closed station.

APPENDIX B - Reimbursable Stations

Table of Contents	Page
1. Introduction	B-2
2. General	B-2
3. Reimbursable Station Proposals	B-2
4. Description of Reimbursable Networks.....	B-3
4.1 U.S. Army Corps of Engineers Networks.....	B-3
4.2 U.S. Bureau of Reclamation and Other Reimbursable Networks.....	B-3
4.3 Bonneville Power Administration (BPA)	B-3
5. Responsibilities for Establishing and Closing Reimbursable Stations	B-4
5.1 Flood Control Networks	B-4
5.2 Establishment	B-4
5.3 Changes.....	B-4
5.4 Closure	B-5
6. Preparing Reimbursable Cost Estimates for the Next Fiscal Year	B-6
7. Procedures for Establishing Reimbursable Cost.....	B-6
7.1 NWSREP Salary	B-7
7.2 Supplies, Shipping and Postage	B-7
7.3 Inspection and Maintenance Equipment	B-7
7.4 Vehicle Cost and Mileage.....	B-8
7.5 Per Diem Travel.....	B-8
7.6 NLSC Surcharge	B-8
7.7 NCEI Processing.....	B-8
7.8 Communications	B-8
7.9 Observer Salary.....	B-8
7.10 Contractual Services	B-8
7.11 NWS Headquarters Overhead.....	B-8
8. Reimbursable Reporting Services Provided by NWS-Funded Observing Sites.....	B-9
9. Billing	B-9
10. Task Numbers	B-9
11. Prorating Travel Costs	B-9
12. Procedures for Replacing and Upgrading Equipment	B-10
12.1 Equipment for NWS Funded Stations.....	B-10
12.2 New Reimbursable Equipment	B-10

12.3 Replacing Privately-Owned Equipment B-10

Tables

B-1 Names of USACE Flood Control (FC) Networks B-5
B-2 Names of USACE Divisions and Districts B-6
B-3 Names of USBR Networks B-6

1. Introduction

This appendix describes the reimbursable networks and general procedures to support and fulfill the agreements with other Federal and State agencies needing National Weather Service (NWS) services.

2. General

At a number of COOP sites, it is more cost effective for the NWS to keep deployed and serviceable its observing equipment and be reimbursed by another federal agency than it would be to close the site, when another federal agency has a requirement for observations from that site. In addition, it may prove more cost effective for an NWS employee to maintain similar types of NWS, U.S. Army Corps of Engineers (USACE), and U.S. Bureau of Reclamation (USBR) rain gauges in the same general area, rather than for each agency to service stations with their own personnel.

Stations that exist to meet the requirements of other federal agencies, but are serviced by the NWS, are known as reimbursable stations (see, NOAA Finance Handbook, Chapter 10). This service includes the costs to properly operate, maintain, and inspect the stations, as well as to ensure the data are transmitted in a timely manner with quality controls in place. These routine costs at specified stations are reimbursed by the federal agency served. This appendix is in accord with NOAA policy and procedures and pertains specifically to COOP sites.

3. Reimbursable Station Proposals

Proposals from other government agencies or organizations for establishing new reimbursable programs or for making major changes in existing reimbursable accounts are approved by NWS Headquarters (NWSHQ). Minor changes, for example, opening, closing, or relocating individual stations, are approved by the Regional Headquarters (RH).

Each spring, the National Cooperative Program Manager (NCPM) or designee initiates the reimbursable process. The Regional Cooperative Program Manager (RCPM) or designee will complete the cost estimates by the end of August. The NCPM completes the process by the end of September.

Each year the NWS Regions, by memorandum, will inform the reimbursable agency of the expected cost for operating the reimbursable sponsored stations for the upcoming fiscal year. Agencies respond in writing, agree to the proposed charges, and services or agree in part and

indicate necessary changes. Changes at reimbursable stations are approved at the regional level, provided the following conditions are met: The proposal is minor in nature and approved by the reimbursable agency. Minor changes include adjustments to observer pay, establishment or closure of one or two stations, replacement of less expensive equipment, etc.

1. The reimbursable agency agrees to pay any increased cost.
2. The NWSREP's submission of a Request New Station entry, or submission of a change to Station Profile into the Station Management System (STAMS), clearly states coordination was conducted with the reimbursable agency.

When a reimbursable station cannot be operated as indicated in the annual reimbursable agreement, the NWSREP should coordinate the change with the applicable reimbursable agency and, when appropriate, initiate action to adjust the reimbursable charges.

4. Description of Reimbursable Networks

This section describes the networks established as reimbursable.

4.1 U.S. Army Corps of Engineers Networks

The USACE networks of precipitation gauge and river stage gauge stations were established in 1937 to provide more complete information for the USACE than could be obtained from NWS-funded networks. These networks are FC-2 through FC-58. Table B-1 contains the 39 networks, and Table B-2 lists the divisions and districts in which these USACE networks are located. The national COOP program manages one reimbursable agreement with the US Army Corps of Engineers. The NWS observes and reports daily precipitation from approximately 250 COOP stations.

4.2 U.S. Bureau of Reclamation and Other Reimbursable Networks

Reimbursable agreements covering USBR networks are based on a Memorandum of Understanding between the agencies, dated February 13, 1948, which provides for the NWS to establish and operate networks of meteorological cooperative stations to meet the needs of the USBR. Installations may include recording, storage, and standard 8-inch precipitation gauges, as well as temperature, evaporation, solar radiation, and other equipment.

The task symbols for USBR tasks are Interior Reclamation Project Network (IRPN), Network symbols, names, and other networks, as shown in Table B-3. The national COOP program manages one reimbursable agreement with the U.S. Bureau of Reclamation. The NWS observes and reports daily precipitation observations from approximately 60 COOP stations located in the IRPN regions of Montana and Wyoming (IRPN 6 & 7).

4.3 Bonneville Power Administration (BPA)

The BPA agreement is based upon the Memorandum of Understanding executed November 26, 1957, and calls for the operation and maintenance of temperature and/or precipitation stations for

basic data and/or reporting services for developing forecasting procedures for stream flow in the Pacific Northwest. The agreement is managed by the NWS Western Region Headquarters.

5. Responsibilities for Establishing and Closing Reimbursable Stations

5.1 Flood Control Networks

Reimbursable Networks FC-2 through FC-58 were established and maintained by NWS for USACE to meet their data requirements, with USACE reimbursing NWS for maintenance expenses. The Flood Control (FC) stations are placed in the “b” network.

Note: The FC-1 network consists of cooperative stations with Fischer Porter Rebuild (FPR) recording precipitation gauges for which the NWS had taken over funding and maintenance from the USACE. Many of these stations report additional parameters. Observations are needed by both NWS and USACE. USACE uses these data to support its water resource management activities, such as reservoir release forecasts, or to mitigate damage associated with mainstream flooding.

5.2 Establishment

If USACE proposes a new FC network (i.e., FC-59), then the Regions will assign the FC network number in numerical order through coordination with OBS31.

5.3 Changes

Because FC’s were originally established by USACE to meet USACE data requirements, any changes, such as site relocations in the FC network, should be coordinated with USACE.

2	Lower Mississippi River	28	Mooringsport Reservoir
5	Willamette River	29	Iowa River
6	Yazoo River	30	Roanoke River
7	Red River	32	Middle Mississippi River
8	Wallace Lake Reservoir	33	Kansas City District
9	Middle Arkansas River	35	Leon River
10-12	Ohio River	36	Savannah River
13	Mobile Reporting	39	Genessee River
15	St. Francis River	40	Hords Creek Reservoir
16	Lower Arkansas River	42	Guadalupe River
17	Snake River	43	Intra-Coastal Canal
18	Delaware River	44	Neches River
20	Ouachita River	46	San Francisco District
21	Upper Trinity Basin	49	Philadelphia District
22	Brazos River	50	Omaha District
23	North Concho River	51	Puerto Rico Reporting

24	Buffalo Bayou	52	Norfolk District
25	Bayou Bodcau Reservoir	53	Pearl River Valley
26	Texarkana Reservoir	58	Heppner Project
27	Ferrell's Bridge Reservoir		

Table B-1, Names of USACE Flood Control (FC) Networks

5.4 Closure

Stations in FC and other networks may have to be discontinued due to the unavailability of observers, poor observation quality, replacement by automated stations, or because the stations no longer serve their intended purpose. The closure of stations in FC networks should be coordinated with the Regional COOP Program Manager as well as the applicable USACE office. Closure of stations sponsored by a reimbursable agency should be coordinated with that agency. The district USACE office should be encouraged to review requirements annually and make recommendations for adjusting the networks.

LMVD – Lower Mississippi Valley			
LMK	Vicksburg	2, 6, 20, 53	
LMN	New Orleans	8, 25, 28	
LMS	St. Louis	32	
MRD – Missouri River			
MRK	Kansas City	33	
MRO	Omaha	50	
NAD – North Atlantic			
NAO	Norfolk	52	
NAP	Philadelphia	18, 49	
NCD – North Central			
NCB	Buffalo	39	
NCR	Rock Island	29	
NPD – North Pacific			
NPP	Portland	5, 58	
NPW	Walla Walla	17	
ORD – Ohio River			
ORH	Huntington	10	
ORL	Louisville	11	
ORN	Nashville	12	
SAD – South Atlantic			
SAJ	Jacksonville	51	
SAM	Mobile	13	
SAS	Savannah	36	
SAW	Wilmington	30	
SPD – South Pacific			

SPS	Sacramento	46
SWD – Southwest		
SWF	Fort Worth	21-23, 26-27, 35, 40, 42, 44
SWG	Galveston	24, 43
SWL	Little Rock	16
SWT	Tulsa	7, 9

Table B-2, Names of USACE Divisions and Districts

6 Preparing Reimbursable Cost Estimates for the Next Fiscal Year

In the spring of each year, the National Cooperative Program Manager (NCPM) or designee will prepare estimates of costs for establishing new reimbursable stations and servicing existing ones. These estimates are then coordinated with and approved (with revisions, if necessary) by the other agencies and the Regional representative. NWSHQ estimates are for an average station and are intended for use as general guidelines by the regions. Actual costs may vary among regions and stations.

Factors causing costs to vary include distances traveled to stations, differing overheads among regions, etc. The NCPM or designee will supply each region with separate spreadsheet listing equipment, expenses and a line by line explanation for the costs on the guidance sheet.

IRPN-1	Pacific Northwest Region (Region 1)
IRPN-2	Sacramento (Region 2)
IRPN-4	Upper Colorado (Region 4)
IRPN-6	Billings, Montana, office (Region 6)
IRPN-7	Denver, Colorado, office (Region 7)
IRPN-8	McGee Creek: Amarillo, Texas, office (Region 8)
IRPN-9	Choke Canyon: Amarillo, Texas, office (Region 9)
IRPN-10	Brantley Dam (Region 10)
BPA-1	Bonneville Power Administration (see Section 4.3)
SJRA	San Jacinto River Authority

Table B-3, Names of USBR Networks

7 Procedures for Establishing Reimbursable Cost

This section describes what charges are apportioned among NWS and reimbursable networks. In the spring, each region receives a detailed explanation from the NCPM, which may be adjusted by each Region. Agencies reimbursing the NWS for maintaining their observing sites are billed for the following:

1. NWSP salary (hours worked, surcharges, overhead).
2. Supplies, shipping, postage.
3. Inspection and maintenance of equipment.
4. Vehicle cost, mileage.
5. Per Diem travel.
6. National Logistics Supply Center (NLSC) surcharge.
7. Processing by NCEI.
8. Communications.
9. Observer salary.
10. Contractual services.
11. NWSHQ overhead.

Communications, observer salary, and contractual services vary for each site and should be added to the estimate by the Regional representative.

Installation/relocation at the request of the sponsoring agency is considered a nonrecurring cost and will be billed directly to the sponsoring agency.

7.1 NWSREP Salary

The NWSREP salary is found in the federal pay tables located on this Office of Personnel Management (OPM) website: www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/. The usual pay scale is GS12 Step 5 and should be taken from either the Rest of United States table or from the specified Locality Pay tables. The salary also includes surcharges and overhead. Adjustments may be calculated by the sponsoring agency and the Regional representative for a specific site.

7.2 Supplies, Shipping and Postage

Included in these costs are supplies for the station. If the observer does not use WxCoder or IV-ROCS, then costs for postage and mailing supplies should be included.

7.3 Inspection and Maintenance Equipment

Each spring, the NCPM will send estimates of the average cost of installing a new reimbursable observing site and maintaining an existing one to the regional offices. These estimates include labor (installation of new stations and inspection and maintenance for existing ones) and equipment costs. The maintenance cost is the average cost over a two-year period and is intended as general guidance.

7.4 Vehicle Cost and Mileage

Vehicle cost is based on GSA rent charged for the vehicle each month. Mileage logged for the previous year is averaged and may vary for each station.

7.5 Per Diem Travel

Per Diem is averaged for each Region and for the sites listed in Section 7.3. Per Diem may be adjusted by the Region for each station

7.6 NLSC Surcharge

This is applied to equipment costs based on storage and overhead.

7.7 NCEI Processing

On an annual basis NCEI reviews the costs to publish online the reimbursable stations' observation data.

7.8 Communications

These are charges for reports to an NWS office. The charges can be based on telephone usage; whether it is automated or manual; and on computer technology. The reimbursable agency is billed for its prorated share of the line and equipment cost. This cost is not included in the estimates provided by NWSHQ.

7.9 Observer Salary

This is the actual amount paid to the observer, if any. This is not included in the estimates provided by NWSHQ.

7.10 Contractual Services

Some locations may require a contract such as electrical hookups, weed clearing, etc. This is not included in the estimates provided by NWSHQ.

7.11 NWS Headquarters Overhead

NWSHQ negotiates overhead with the sponsoring agency each year if needed. These funds are not included in the Region estimates.

8. Reimbursable Reporting Services Provided by NWS-Funded Observing Sites

In some cases, a reimbursable reporting service is provided by an NWS-funded cooperative station. If the region agrees no reimbursable charge should be made for the maintenance of the equipment used for the reporting service, no charge will be made to the reimbursable task for station visitation. Essentially, the region agrees to support the additional cost, if any, incurred by the reporting service. Observer fees and communication costs should be adequately provided in the proposal and charges made accordingly.

Suppose a reimbursable reporting service is provided by a cooperative station but reimbursable maintenance for this service is agreed to by the other agency. In that case, fractional visits should be indicated and the time on visits relating to the reporting service will be prorated to the reimbursable task concerned. Visits made principally for the superimposed reporting service will be charged entirely to the reimbursable task.

9. Billing

For billing purposes, the Regions negotiate charges by networks to the USACE district office. After finalizing the charges, the Regions send the estimates to NWSHQ. NWSHQ then coordinates with USACE headquarters for the USACE lump sum payment to cover the expenses of all networks. The USACE headquarters office, which pays the NWS for these services, is reimbursed by each USACE division and district rather than by each network. The National CPM office monitors reimbursable accounts, tracks expenses, and assists in the detection of billing errors. The National CPM office converts the lump sum payment to each Regions share.

USBR reimbursable estimates are negotiated at the regional level. Regions send the estimates to NWSHQ for informational purposes. USBR sends a lump sum payment to NWSHQ, and the funds are distributed to each Region as indicated in Regions final negotiated estimates.

10. Task Numbers

Reimbursable costs are charged to task numbers assigned to each network. A WFO that has a reimbursable site can obtain the proper task number from the Administrative Management Division at their Region.

11. Prorating Travel Costs

The NWSREP frequently services climatological, hydrological, and reimbursable observing sites on the same or series of trips. These costs are prorated in proportion to the amount of time funds consumed for each network and to the appropriate task number:

1. The NWSREP's time
2. Per Diem
3. Any contractual services
4. Travel expenses if using POV

12. Procedures for Replacing and Upgrading Equipment

12.1 Equipment for NWS Funded Stations

The following procedures are to be observed in the replacement and upgrading of equipment.

1. Replacement in Kind. Replacement of equipment no longer in satisfactory condition will be made through regular requisition procedures. When replacing equipment, indicate the name of the station on the requisition. Do not use this procedure to obtain used equipment for informal or unofficial station installations.
2. New or Upgraded Equipment. New or upgraded equipment is approved in advance by the appropriate regional office and NWSHQ. Requests for additional or upgraded equipment at a station will be submitted to the Regional COOP Manager via email.
3. Equipment Not Previously Used at NWS-Funded Stations. Observations from this equipment can be disseminated, published, and archived in place of NWS equipment if comparison testing determines the observations are comparable and NWSHQ approves the equipment.
4. For comparison testing, follow NWSI 10-2101, [pd01021001curr.pdf](#), *General Instructions for Terrestrial-Based In-Situ Instrument and Algorithm Intercomparisons for the Purpose of Climate Data Continuity*.

12.2 New Reimbursable Equipment

The NCPM will determine billing for new equipment. If a new system by an NWS initiative is fielded (i.e., Fischer Porter Rebuild), the sponsoring agency will not likely be billed. If a sponsoring agency requests the equipment, the agency will be billed directly for equipment and installation costs by the Region. When parts for upgraded equipment need replacement; the usual practice will be to add the new costs to the maintenance estimates.

12.3 Replacing Privately-Owned Equipment

Privately owned equipment at a station remains the responsibility of the owner. Should the owner have no interest in replacing his/her equipment, then the regional office should review the services rendered and determine if policy or agreements require observations from this COOP site. Upon completion of the review, the regional manager will notify the NWSREP to offer the observer NWS equipment and if the observer is not interested, then the NWSREP is instructed to cease maintenance of the site and cease taking delivery of the data.

APPENDIX C – Forms

Table of Contents	Page
1. Introduction	C-1
2. WS Form B-82	C-1
3. WS Form B-91	C-2
4. WS Form B-92	C-2
5. WS Form B-83a	C-2
6. WS Form B-83b	C-3
7. WS Form E-21	C-3
8. WS Form B30 and B-30a.....	C-3
9. WS Form 10-13-6 Station Inspection Checklist	C-3
10. CD 404	C-3
11. Official Cooperative Observation Site Certificate	C-4
12. Station Inspection Checklist	C-6

Figures

C-1 Official COOP Observation Site Certificate.....	C-5
C-2 Station Inspection Checklist	C-10

1. Introduction

This appendix describes the forms that have historically been used to log and report weather observations to the NWS field offices. In addition, several forms are used by the NWS field offices, regions, and headquarters to manage certain aspects of the observer program. This appendix also includes the COOP Station Inspection Checklist.

2. WS Form B-82

The purpose of this handy pocket-size pad of forms is to record observations while reading the instruments. Information recorded on WS Form B-82 is then transferred to the official

permanent record, WS Form B-91, or the approved NOAA paperless systems. Each pad of WS Form B-82 is intended to last one month. WS Form B-82 contains complete instructions for recording observations. This form is not mailed and may be retained by the observer. The form can also be used to transfer data to other WS forms. An illustration of this form is found in Appendix B, NWSM 10-1315, *Cooperative Station Observations and Maintenance*. (https://www.weather.gov/media/directives/010_pdfs/pd0101305curr.pdf).

3. WS Form B-91

Record of River and Climatological Observations (WS Form B-91) is used for daily entries of the observational day (24 hours ending at the official time of observation) rather than calendar day (midnight to midnight). The information on one page of WS Form B-82 is transferred to one line of WS Form B-91. For example, information for March 23rd on WS Form B-82 is transferred to the line designated for the 23rd day of the month on the WS Form B-91. Each WS Form B-91 contains space for an entire month's observations. The NWSREP will instruct the cooperative observer on how many carbon copies are required, and to where the copies will be sent. The forms should be mailed as soon as possible but no later than the fifth day of the following month. Instructions for filling out the WS Form B-91 are contained on the cover pages of the form. If data are missing, M will be entered in the appropriate column(s) for the day(s).). An illustration of a completed form is found in Appendix B, NWSM 10-1315, *Cooperative Station Observations and Maintenance*.

Note: The NWSREPs may print this form off the WxCoder system to supply an observer without WxCoder, a customized form with the observer's name and station number pre-printed.

4. WS Form B-92

Record of Evaporation and Climatological Observations (WS Form B-92) is the official permanent record form used by cooperative stations measuring evaporation. In addition to temperature and precipitation data, the following elements may be recorded in this form: dry and wet bulb readings, wind movement, evaporation, and temperature of the evaporation water. It is frequently used by agricultural extension stations, and the data may be published by NCEI. Instructions for filling out the WS Form B-92 are contained on the cover pages of the form. If data is missing, M will be entered in the appropriate column(s) for the day(s). An illustration of this form is found in Appendix B, NWSM 10-1315, *Cooperative Station Observations and Maintenance*.

5. WS Form B-83a

Supplementary Record of Climatological (WS Form B-83a) reports temperature and precipitation data as well as dry and wet bulb temperatures up to three elevations, soil temperatures and soil moisture at up to six depths, wind movement or speed at up to three heights, and wind direction. It is mailed as directed by the NWSREP. Normally, a copy will be sent to NCEI. If data is missing, M will be entered in the appropriate column(s) for the day(s).

6. WS Form B-83b

Record of Reference Climatological Station Observations (WS Form B-83b) is used by the 20 stations in this network to record maximum and minimum temperatures, precipitation, weather conditions, and, in some cases, wind movement. If data is missing, M will be entered in the appropriate column(s) for the day(s).

7. WS Form E-21

Supplemental Precipitation Survey (WS Form E-21) is used by the NWSREP to obtain data after a flooding event. Data obtained from bucket surveys are used to correlate heavy rainfall amounts with flood and flash flood crests. This information is vital in developing models that relate heavy rainfall to peak water levels. These relationships are used to increase the accuracy of future flash flood forecasts. Bucket surveys are also needed to justify the building of dams, the widening of draining channels, the control of upstream urbanization (which can greatly increase future flooding risks), and to decide legal questions.

Many cooperative observers routinely compare rainfall amounts with other unofficial observers. The official observer can be of great help to the bucket survey team by providing locations and rainfall amounts recorded by others, or by informing the team how best to contact other observers for further information. They can often assist the team to identify the area(s) having received the most precipitation.

8. WS Form B-30 and B-30a

Cooperative Agreement with an Observer ([WS Form B-30](#)) is used for effecting or terminating an agreement with an unpaid observer or cooperator for services or facilities, and (WS Form B-30a) is used with COOP-paid observers. The forms will be prepared by the NWSREP, who will finalize the agreement with the observer or cooperator. If the operation of a cooperative station is shared by more than one individual or agency, it will be necessary to prepare a separate WS Form B-30 to cover the services provided by each of the cooperators unless they are married.

The NWSREP responsible for the cooperative station enters the data into the STAMS system for changes to the observing site. The data is entered into the system when:

1. Establishing, relocating, reestablishing, inactivating, or discontinuing a station.
2. Documenting changes at a station or the observing program.
3. Five years have passed since the last recorded update.

9. WS Form 10-13-6 Station Inspection Checklist

The NWSREP should prepare for the annual or semiannual COOP station inspection by referring to the Station Inspection Checklist (WS Form 10-13-6). The information recorded in the checklist shall be entered into the STAMS Station Inspection Report, as described on the STAMS website. The STAMS contains the official inspection report for all COOP site inspections.

10. CD 404

The voucher for the government to pay a COOP observer for certain services rendered is conveyed in the form titled “Supply, Equipment and Service Order (CD-404).” As of 2018, payment is not authorized for COOP observers not already on a COOP Paid Agreement

(Form B-30a). There are fewer than twenty observers across the entire COOP network who receive payment for their observations.

The NWS makes semi-annual payments to the observers, as instructed in CD-404. In March and September of each year, the National COOP Program Manager (NCPM), or designee, completes individual CD-404s for each COOP Paid observer who has reported observations for the six months ending March 31 and September 30, respectively. The NCPM then submits completed forms to the respective NOAA Finance Center (i.e., Eastern Operations or Western Operations) to complete the payment process.

11. Official Cooperative Observation Site Certificate

This certificate (Figure F-1) can be used as an official designation of a cooperative site. The certificate can be framed and displayed at the observer’s residence or any place the observer takes the observation. The certificate can be downloaded from the cooperative program website: <https://www.weather.gov/coop/Forms-Manuals-Equipment> , and click on ‘NWS Cooperative Observer Site – Authorization’ among the list of forms.

NOAA/National Weather Service Official Cooperative Observation Site	
Site Name: _____	
Coop Site ID: _____	
Supervising Office: _____	
Date Observation Begin: _____	
	Authorizing Signature: _____
	

Figure C 1, Official Cooperative Observation Site Certificate

12. Station Inspection Checklist

The NWSREP reviews the Station Inspection Checklist, WS Form 10-13-6, ahead of each annual and semiannual COOP station inspection. The form is brought to the site of the inspection to log the results and then later enter the data into the Station Management System (STAMS) Inspection Report. The STAMS Station Inspection Report, is the official report for all COOP site inspections. The NWSREP refers to the STAMS website for specific instructions.

WS FORM 10-13-6 (2012) (Ref. NWSI 10-1307)		U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE		
Date of Previous Visit:	Date of Present Visit:	Station:	State:	
Inspector:		Type of Inspection:	Mileage to/from Station:	Staff Hours:
Per Diem Cost:		Mileage Cost (Including Vehicle Rental):	Supplies Cost So Far This Year:	
Observer:		Home Phone:	Office Phone:	
Backup Observer:		Home Phone:	Office Phone:	
REPORTS				
Reporting Method	Weekdays	Weekends	Days not Reported	
WxCoder				
IV-ROCS				
Telephone				
Radio				
Other				
INSTRUMENTS INSPECTED FOR CONDITION AND EXPOSURE Check (S) for Satisfactory and (U) for Unsatisfactory				

Instrument

	Condition		Exposure		Instrument	Condition		Exposure						
	S	U	S	U		S	U	S	U					
Max/Min Temp System - MMTS					Cotton Region Shelter									
FPR Recording Rain Gauge					Standard Rain Gauge (SRG) or 4-inch Plastic Gauge									
Evaporation					Automated System									
Anemometer					Soil Thermometer									
River Gauge														
READINGS	BEFORE		AFTER											
Anemometer														
Evaporation														
Does the Station Profile Need Updating as a Result of Inspection? Check if Yes [____] or No [____].					Was the Station Profile Updated in the Last 3 Years? Check if Yes [____] or No [____].									
OBSERVER CHECKLIST														
FORMS (B-91, B-92, WxCoder, etc.)					Y	N	If No, List Action Taken							
Are forms neat, legible and completely filled out. (where applicable)														
Are forms received in a timely manner?														
Are observations received daily?														
Is the observer error rate at a minimum?														

Is observer entering “M” for missing data?			
Are element values entered at observation time listed in the Station Profile?			
Are element values entered on the proper date, no shifting?			
Does the observer report temperature to the nearest degree using proper rounding techniques?			
If MxMn thermometers are used, is a mercury spill kit available and the Material Safety Data Sheet (MSDS) provided?			
Does the observer enter precipitation properly?			
Is the observer entering 0 (zero) when there is no precipitation?			
Is the observer entering snow depth to the nearest inch?			
Is the observer entering snowfall to the nearest tenth of an inch?			
Is the observer entering liquid precipitation to the nearest hundredth of an inch?			
Does the observer continue to enter snow depth until the value is a trace?			
Does the observer provide a snow core sample?			
Are recording rain gauge observations sent each month?			
Does the observer use email to send monthly recording rain gauge data?			
OTHER CHECKS			
Is the station on the NCEI Quality Assurance Report (QAR)?			

Does soil temperature equipment work properly?			
What soil temperature equipment is used?			
What soil temperature depths are recorded?			
Does evap anemometer work properly?			
Does Evap Thermometer work properly?			
Is mercury spill kit available and MSDS for provided mercury for and mercury and Creosote?			
Does Evap stilling well work properly?			
What type of Evap stilling well is used?			
If any, is backup equipment working properly?			
Is all backup equipment reported on the Station Profile?			
Has the observer received all qualifying Length of Service (LOS) awards?			
Does the observer qualify for the John Campanius Holm Award?			
Does the observer qualify for the Thomas Jefferson Award?			
Has the observer been instructed on environmental compliance and safety rules?			
Does the observer use any printed forms (i.e., WS B-82), and are they still needed?			
CALIBRATION OF FISCHER PORTER RECORDING (FPR) RAIN GAUGE			
	0	5	10
			15
			19

Before					
After					
Oil used? Type:			Propylene Glycol Used?		
RIVER EQUIPMENT					
River Gauges	Staff	Wire Weight	Bubbler	Wire Weight Gauge (Transistorized)	
The type used by observer				Yes	Check Bar when an error is 0.06 ft. or more
Owner Name				No	Correct at visit adjusted
Remarks:					
Supplies Provided:					
Additional Supplies Needed:					
Signature:			Title:		

Figure C 2, Station Inspection Checklist