

**NATIONAL WEATHER SERVICE INSTRUCTION 10-1307
AUGUST 20, 2019**

Operations and Services

Surface Observation Program (Land), NWSPD 10-13

COOPERATIVE PROGRAM MANAGEMENT AND OPERATIONS

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SUMMARY OF REVISIONS This instruction supersedes NWSI 10-1307 “*Cooperative Program Management and Operations*,” dated August 3, 2012. Changes made reflect the NWS Headquarters reorganization effective April 1, 2015. Additional changes include:

1. Clarified various definitions and procedures.
2. Removed references to paperless data transmission.
3. Added specificity to the opening, re-siting, and closing of COOP stations.
4. Reformatted tables for clarity.
5. Removed forms due to obsolescence.
6. The surge protection waiver was deleted.
7. Clarification between station moves and relocations were made in Appendix C.
8. Removed references to the National Climatic Data Center (NCDC); replaced with National Centers for Environmental Information (NCEI).

Signed

8/6/2019

Thomas Cuff
Director, Office of Observations

Date

Cooperative Program Management and Operations

Table of Contents

Cooperative Program Management and Operations 2

1. Introduction 3

2. Purpose 3

3. Definition of Cooperative Observing Program 3

4. Official COOP Station 3

5. Cooperative Observing Program Responsibilities 4

 5.1 National Weather Service Headquarters (NWSHQ) 4

 5.2 Analyze, Forecast, and Support Office (AFSO) 4

 5.3 Office of Observations (OBS) 4

 5.4 Regional Headquarters (RH) 5

 5.5 Weather Forecast Office, Weather Service Office, and Data Collection Office.. 6

6. Station Information System (SIS) 7

7. Maintaining Proper COOP Stations 7

8. Awards 7

9. Environment and Safety 8

10. Automation 8

APPENDIX A - Cooperative Station Networks A-1

APPENDIX B - Visitation Procedures-Cooperative Observing Stations B-1

APPENDIX C - Establishing, Changing and Closing a Cooperative Station C-1

APPENDIX D - Reimbursable Stations D-1

APPENDIX E - Data Management and Quality Control E-1

APPENDIX F - FORMS F-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 management and operation of the COOP, its networks and 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, 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 a Hydrometeorological Technician (HMT) or the Observations Program Leader (OPL). 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); observer payroll as appropriate; data collection and its delivery to users; data quality control functions; and the management of fiscal and human resources required to accomplish program objectives.

COOP observers may serve on either a paid or unpaid basis, depending on the types of services rendered. These services frequently consist of observing and recording temperature and precipitation 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 is usually the property of the NWS but may be owned by the observer, a company or other government agency. Ensure all equipment meets the NWS COOP equipment performance and siting requirements as defined in NWSI 10-1302 *Requirements and Standards for NWS Climate Observations* (<http://www.nws.noaa.gov/directives/sym/pd01013002curr.pdf>) and NWSM 10-1315 *Cooperative Station Observations and Maintenance* (<http://www.nws.noaa.gov/directives/sym/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.
2. The station is assigned:
 - 1) A station index number by National Centers for Environmental Information (NCEI) requested by the NWSREP through the Regional Cooperative Program Manager (RCPM).
 - 2) A Station Identifier by the NWS Office of Observations (OBS) requested through the NWS Location Identifier (NWSLI) system database.
3. Station metadata is documented in the Station Information System (SIS) SIS database.

These criteria are necessary to ensure satisfactory instrumentation, sensor exposure, documentation, and approval to ensure the availability of supporting funds. A coop station may be co-located with other types of observing stations. In these cases, the portion of the observing program which supports the cooperative program's mission is treated and documented independently of the other observational and service programs. Stations loosely known as 'Unofficial COOP' sites or 'UCOOP' sites are not permitted and will not be established.

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, to include 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 AFSO, is responsible for determining system requirements and technical solutions to enhance observational systems. The OBS maintains performance measures for observational platforms (i.e., measurement accuracy and data resolution) and

manages quality control and Information Technology (IT) security of observational data. It monitors the reporting of station histories and maintains a record of network configurations.

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 which 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.
5. Develop program instruction manuals documenting observing procedures, policies, and other management procedures.
6. Monitor expenditures and accomplishments.
7. Coordinate the awards program with the regional offices.
8. Oversee databases which contain descriptions, histories, and other information
9. Establish procedures for receipt and review of software and data-base change requests that are controlled nationally by NWSHQ.
10. Operate and maintain the COOP database(s), to include controlling access, software updates, database changes, and provide support to the field offices during normal business hours.
11. Participate in the review, coordination, and approval process on changes to the COOP databases.

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. Randomly exercise quality control of observed data.
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 which identify accomplishments and achievements related to the regional COOP.
6. Manage the paid cooperative observer contract program within the region and ensure compliance with established laws and regulations regarding issuance of government contracts to private citizens and businesses.
7. Coordinate the awards program with the field offices and the OBS program office.
8. Perform routine inspections of the COOP to ensure station records are correctly documented, equipment is correctly maintained and equipment siting is within standards:
NWSM 10-1315 *Cooperative Station Observations and Maintenance*
(<http://www.nws.noaa.gov/directives/sym/pd01013015curr.pdf>)

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

The NWSREP usually works out of a WFO and is responsible for the installation and maintenance of cooperative station equipment and the initial quality control of observations. At times, NWS officials such as service hydrologists, interns, electronics technicians, facilities technicians, regional headquarters personnel and others may either perform functions or be assigned responsibilities within the scope of the cooperative program and are considered an NWSREP.

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 Pacific Region, the Official In Charge (OIC) of the same WSO or DCO. Density of stations and other factors (i.e., highway locations) may require assigned areas to vary from the ideal CPA.
2. Making regular contact with the COOP observers. Routine visits to COOP stations are made for the purpose of observer training, maintaining a positive relationship with the observer, equipment maintenance and verification of station metadata. Stations with new observers may require additional visits

until the observers are fully trained.

3. Visiting at least once per year the stations with temperature and non-recording precipitation gauges.
4. Visiting twice per year the stations that measure other hydro-meteorological elements such as, but not limited to, evaporation and those with recording rain gauges (i.e., Fischer-Porter Rebuild).
5. Visiting stations with telemetry equipment. However, the NWS electronics technicians are responsible for servicing the telemetry equipment.
6. Making additional visits to sites with equipment failures. When possible, these visits should be combined with visits to other en-route stations. Observers quitting or relocating are not considered emergency visits.
7. Installing, relocating, changing, or inspecting a station.
8. Creating all necessary documentation including adequate notes, sketches, photographs, and diagrams to aid the person updating metadata information in the Station Profile.
9. Updating the Station Profile within five work days of any change to the COOP site.

6. Station Information System (SIS)

The SIS is a computerized 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 SIS database is intended to provide cooperative station information. The SIS instructions are in SIS User Manual.

7. 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 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 de minimis 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.

8. Awards

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. Instructions for the awards program are listed in NWSI 10-1314, *Cooperative Observer Awards*

(<http://www.nws.noaa.gov/directives/sym/pd01013014curr.pdf>).

9. 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*

(<http://www.nws.noaa.gov/directives/050/pd05011015e.pdf>), and NWSM 50-5116, *Environmental Management*

(<http://www.nws.noaa.gov/directives/sym/pd05051016curr.pdf>).

10. Automation

With the retirement of local Observers and the non-availability of willing or capable Observers as replacements, automation of that location may be required. NWSREP will coordinate with the COOP Program Manager 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 involved 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:.....A-1

1. Introduction..... A-2

2. Coop Networks A-2

 2.1 "a" Network A-2

 2.2 "b" Network A-2

 2.3 "c" Network A-2

 2.4 U.S. Historical Climatology Network (USHCN) A-3

3. Reimbursable Stations..... A-3

4. Establishing, Changing or Closing Coop Stations A-3

 4.1 "a" Network A-3

 4.2 "b" Network A-3

 4.3 "c" Network A-4

 4.4 Flood Control Networks (FC) A-4

 4.5 Part-Time Stations A-4

5. Status of Stations..... A-4

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.](#)

<http://www.nws.noaa.gov/directives/sym/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 homogeneous 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.](#)

<http://www.nws.noaa.gov/directives/sym/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, and 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, abc.

2.4 U.S. Historical Climatology Network (USHCN)

This network is a subset of COOP to provide a data set suitable for detecting and monitoring secular changes of regional rather than local climate. To minimize artificial changes of 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.

3. Reimbursable Stations

For more information on reimbursable stations see Appendix D.

4. Establishing, Changing or Closing Cooperative Stations

The authority to add, change, or close stations is assigned to the Chief of the Systems Operations Division (SOD), Scientific Services Division (SSD), Systems and Facilities Division (SFD) or the Regional Hydrologist (or equivalent for Pacific) at the RH. This authority may be delegated to the Regional Cooperative Program Manager. Regardless of the COOP network (i.e., a, b, or c), all COOP stations are established or changed in adherence to NWS standards for establishing a COOP station (see Appendix C for more information).

If the station needs to be changed or closed, the Region will work closely with the WFO, NWSHQ COOP PM and NCEI to jointly evaluate impacts to the availability and the reliability of the observation datasets and overall COOP network and will take necessary actions once all agencies agree to the proposed resolution. Special considerations are given for the relocation or closing of USHCN stations, and are outlined in Appendix C.

4.1 "a" Network

Stations in the "a" network should comply as closely as possible with the 25 mile spacing principle, allowing for a closer spacing in heavily populated, mountainous, and coastal areas and a wider spacing in homogenous areas. Grid maps indicating the 25 mile spacing are available at RH.

4.2 "b" Network

Changes to the "b" network are coordinated with the applicable river forecast center and approved by the office of the Regional Hydrologist (or equivalent for Pacific and Alaska Regions).

4.3 "c" Network

Changes to the "c" network should be coordinated and approved by the applicable forecast office and ratified by the regional NWS representative.

4.4 Flood Control Networks (FC)

The FC-1 network consists of cooperative stations with recording precipitation gauges for which the NWS has taken over funding and maintenance from the U.S. Army Corps of Engineers (USACE). Many of these stations report additional parameters. Observations are needed by both NWS and USACE. The USACE uses these data to support their water resource management activities, such as reservoir release forecasts or to mitigate damage associated with mainstream flooding. See Appendix D for more information on the FC Network.

4.5 Part-Time Stations

Cooperative stations operating through the year on an interrupted basis (such as 5-day-a-week stations, which fit work tours of personnel) are classified as non-published stations. Some of these stations may have equipment that functions seven days a week without the aid of an observer. The Fischer Porter Rebuild (FPR) rain gauge is an example of such equipment. In this case, that part of the station's observations may be published.

Part-time stations established for short periods or on a part-of-the-year basis to fill the needs of special programs are not considered part of the "a" network. If such stations are required in the hydrologic or other programs and evidence suggests the stations will continue over a period of years, they may be included in the "b" or "c" network.

5. Status of Stations

Information on the status of stations and networks are obtained at any time from the computerized database. Timely and accurate updates to the Station Information Report (SIR^{*}) are important to maintain the integrity of the metadata.

* (SIR) is used interchangeably with the term, Station Profile.

APPENDIX B – Visitation Procedures-Cooperative Observing Stations

Table of Contents:.....B-1

1. Introduction.....B-2

2. Specific Responsibilities of the National Weather Service Representative.....B-2

3. COOP SitesB-2

3.1 Selection of Sites.....B-2

3.2 Selection of COOP ObserversB-3

3.3 Installation of Equipment.....B-4

3.4 Training of ObserversB-4

3.5 Inspecting and Servicing EquipmentB-4

3.6 Proper DocumentationB-4

3.7 Planning of Travel.....B-4

3.8 Inspection ReportsB-4

4. The Visitation Mission.....B-10

Figures

B-1 Inspection FormB-5

1. Introduction

This appendix defines guidelines and responsibilities for the National Weather Service (NWS) COOP station inspection program. This appendix provides a common general guide for the inspection of 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.

The individuals serving as cooperative observers (paid or unpaid) do the major part of the “cooperating.” Therefore, NWS personnel should be diligent and do everything possible to maintain their good will. The inspection of each COOP station should be unbiased, positive, polite, and thorough. COOP stations strive to meet observational standards of accuracy and completeness. A simple common sense technique, applied with patience and a genuinely friendly and helpful spirit, will go far toward ensuring success.

2. Specific Responsibilities of the National Weather Service Representative (NWSREP)

The NWSREP is usually assigned duties by the MIC of the WFO, or, where applicable, by the OIC of the WSO and/or the DCO. At times, NWS officials such as service hydrologists, interns, electronic technicians, facilities technicians, regional headquarters personnel, and others may perform functions or be assigned responsibilities within the scope of the COOP and are considered an NWSREP. The NWSREP is responsible for the efficient operation of the COOP within their assigned areas. Their duties are highlighted in Section 3.

3. COOP Sites

3.1 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. They make the necessary arrangements with owners for the use of sites, negotiate cooperative agreements for space, and install the equipment. They document the COOP station and exposures by collecting the required metadata and entering the information into the SIS.

Some of the prerequisites when selecting a site are:

1. Area not subject to flooding.
2. Availability of communications, such as a phone or computer.
3. Good exposure of instruments as per NWSI 10-1302 *Requirements and Standards for NWS Climate Observations*.
4. Access by observer - It may be necessary to settle for slightly less than the best possible location, if by doing so, it is more convenient for the observer so long as siting does not violate exposure standards.
5. Continuity of data - It is extremely difficult to judge how much the data will be

affected long term by moving instruments a short distance. Every effort should be made to avoid moving instruments. Removing trees, vegetation, etc, is the preferable method if possible, especially when a long period of record has been established.

3.2 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 for which little or no compensation is provided.

Some considerations when selecting observers are:

1. Longevity - A person that 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.
3. Interest - An observer who shows an interest in 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.

The NWSREP serves as the authorized official for COOP observers.

3.3 Installation of Equipment

The NWSREP installs or supervises the installation of 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.

3.4 Training of Observers

The NWSREP trains COOP observers in taking and recording observations. The NWSREP should remain with the new observers to 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.

3.5 Inspecting and Servicing Equipment

The NWSREP inspects and services climatological and hydrological stations and stations that support meteorological forecast, warning, and public service programs that are owned by the NWS.

3.6 Proper Documentation

It is essential that prompt and correct documentation be made for all COOP stations. The SIS Station profile is intended to provide a complete and permanent record of a cooperative station. A report on 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 SIS Manual NWSM 10-1313.

3.7 Planning of Travel

Plan travel carefully on a semi-annual and an annual basis for efficient coverage of the area. Anticipate and secure in advance spare parts, supplies, forms, and maintenance manuals for the planned trip. Coordinate travel plans with other offices that may have an interest in COOP stations.

3.8 Inspection Reports

The NWSREP should prepare and keep up-to-date routine cooperative station inspection reports, such as WS Form 10-13-6 or a locally developed form. Inspection data is also entered into the SIS as soon as possible during normal duty hours after returning to the office. Instructions for entering the data contained in the SIS Users Manual as soon as possible during normal duty hours after returning to the office.

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			
Communication Used	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/M in Temp Sys					Cotton Region Shelter				
Recording Rain Gauge					Non-Recording Rain Gauge				

Evaporation					Automated System				
Anemometer					Soil Thermometer				
River Gauge									
READINGS	BEFORE		AFTER						
Anemometer									

Evaporation			
Does SIS Station Profile Need Updating as a Result of Inspection? Y / N		Has SIS Profile Station been Updated in the Past 3 Years? Y / N	

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 Health of the Network list?			
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 provided for 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 SIS Station Profile?			

Has the observer received all qualifying LOS awards?			
Does the observer qualify for the Holm Award?			
Does the observer qualify for the Jefferson Award?			
Has the observer been instructed on environmental compliance and safety rules?			
Is the observer aware of the transition plan for paperless observations?			

CALIBRATION OF RECORDING 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)	
Type used by observer				Yes	Check Bar when error is 0.06 ft. or more
Owner Name				No	Correct at visit adjusted

Remarks:
Supplies Provided:
Additional Supplies Needed:

Signature:	Title:
------------	--------

Figure B-1, Inspection Form

4. The Visitation Mission

Because of the infrequency of visits, 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. Adequate trip preparation means anticipation of such 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 depends on the economy and efficiency of the single, multi- purpose visit.

APPENDIX C – Establishing, Changing and Closing a Cooperative Station

Table of Contents:.....C-1

- 1. Introduction.....C-2
- 2. Establishing, Changing, or Closing Cooperative Stations.....C-2
- 3. Procedures for Numbering and Naming Cooperative Stations.....C-2
- 4. Relocation and Moves.....C-3
 - 4.1 Definition.....C-3
 - 4.2 Compatibility.....C-3
 - 4.2.1 Compatible Relocation.....C-5
 - 4.2.2 Incompatible Relocation.....C-5
 - 4.2.3 Station Relocation Naming & Numbering Procedures.....C-5
 - 4.3 United States Historical Climatology Network (USHCN).....C-6
 - 4.3.1 USHCN Relocation and Moves.....C-9
- 5. Determining Latitude and Longitude of a Station.....C-10
- 6. Determining Elevation of a Station.....C-10
- 7. Procedures and Instructions for Obtaining Station Identifiers (SID).....C-11
- 8. Updating SIS Files.....C-11
- 9. Inactive Stations.....C-12
- 10. Cooperative Station Services at Stations that Report Basic Observations.....C-12

Tables

- C-1 Station Relocation Data Continuity Evaluation Checklist.....C-7
- C-2 Relocation Naming and numbering.....C-8

1. Introduction

This appendix describes the procedures for establishment, change or closure of a cooperative station.

2. Establishing, Changing, or Closing Cooperative Stations

Requests to establish, change, or close a COOP station, are made through the Station Information System (SIS) by the field office NWSREP. The role of the NWSREP is described in Appendix B, Section 2. From the SIS home page the NWSREP selects the “Station Request” function 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 WFO local warning program. The field office then submits then Station Request within SIS and the system thereby notifies the WFO manager (MIC) and if approved, the SIS notifies the region’s COOP manager (RCPM). The region’s COOP manager can accept or reject the Station Request. 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 site needs special coordination with NCEI, see Section 4.3, in this Appendix C.

3. Procedures for Numbering and Naming Cooperative Stations

COOP station numbers are assigned by NCEI as per request by the RH to identify the stations and to facilitate alphabetical listings. Station numbers consist of eight digits: e.g., 18-1125-06 or 10-1124-10. The first two digits identify the state (e.g., 18 is Maryland, 10 is Idaho), the middle four digits are based upon the alphabetical of the station name whenever possible, 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 in 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 USDOC through Census. This is to be considered the primary name.

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

1. The station name, once chosen, should be used consistently on all reports. The official station name should be on file in SIS.
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 one-half mile 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 main 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 either should be incompatible or should not observe the same parameters. One may observe 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.

4. Relocation and Moves

4.1 Definition

4.1.1 A station move is defined as moving the equipment at the same observing location where, for all practical purposes, the station remains the same. An example of a move would be if new construction at the site disturbed the exposure of the equipment.

4.1.2 A station relocation is defined as the equipment being relocated to another site. A station relocation may or may not be climatologically compatible.

4.2 Compatibility Determination

A climate data compatibility determination is made at the time of the observation site move so that a station number can be assigned as soon as data reporting resumes. The preferred method for determining climate data compatibility is to conduct parallel observations at the old and new sites (in compliance with NWSI 10-2101, *Inter-comparison of Hydrometeorological Instruments and Algorithms* (<http://www.nws.noaa.gov/directives/sym/pd01021001curr.pdf>)). This approach may not be feasible, but in the event that parallel observations are performed, the results are usually not available at the time of the relocation, i.e. when the new station is assigned a data reporting identification number. Thus, use alternate means to determine data compatibility outlined in this section.

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 are 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 an 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 on Rendition 1 of the Station Information Report), and,
2. Considering a number of factors related to climate data continuity. See Table C-1.

A move is always assumed to be incompatible if the new equipment location is greater than five horizontal miles from the original equipment location and/or the difference in elevation is 100 feet or more.

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 are also assumed to be incompatible unless they pass a data compatibility evaluation (Table C-1). 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 an ad hoc committee to conduct a thorough evaluation. The committee hereafter referred to as the WFO Data Continuity Committee (DCC) (one DCC for each WFO) will be comprised of one representative from each of the following groups:

1. WFO NWSREP (chair).
2. NWS Regional COOP Program Manager (co-chair) and Regional Hydrologist if applicable.
3. NWS Regional Climate Services Manager (backup co-chair).
4. Appropriate Regional Climate Center.
5. American Association of State Climatologists Recognized State Climate Office (if a member is available).
6. NCEI, only when results of parallel testing are available for the evaluation, or when a new station identifier is issued.

The DCC determines compatibility on an advisory basis by applying a compatibility checklist (Table C-1). Relocations that satisfy the conditions on the checklist may then be declared data compatible by the NWSREP (chair, DCC). 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 data 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 of the DCC. In such cases, there will be an acceptable period of missing data between the closure of the historic site and the opening of the new site.

4.2.1 Compatible Relocation

A relocation is considered to be compatible when data compatibility is maintained as demonstrated by the process described in Table C-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 compatibility is maintained per the DCC's validation of the checklist conditions.

Prepare and submit a SIS Station Profile (Formerly the Station Information Report) to document all equipment moves and relocations (see SIS User Manual).
<https://sis.nws.noaa.gov/>

4.2.2 Incompatible Relocation

A relocation is considered incompatible when observing equipment is relocated and the data from the new location are judged not climatologically compatible with data from the original location of the station, i.e., the first rendition of the SIS. Incompatible relocations require two actions: the former data site is closed and the new site is treated as a new station establishment. The new site receives a new station number, a new primary and/or secondary name, and a new NWSLI.

* All elements are considered to be compatible. If temperature is compatible but precipitation is not then the move is incompatible.

4.2.3 Summary of Station Relocation Naming and Numbering Procedures

The convention for station identification following relocation is based primarily upon the compatibility determination between the original and new locations. 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 site. Two Station Profiles will be issued, one for the closing of the station with the old name and one for the creation of 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.

For the rare situation, when the community changes its name but the station does not move, the station name will be changed but include the former name of the station in parentheses following

the new name (i.e., new name (old name)). No formal action will be taken to close the original site and establish a new site. The rules for the naming and numbering following relocation are summarized in Table C-2.

4.3 United States Historical Climatology Network (USHCN)

The United States Historical Climatology Network is a high-quality-data set of daily records of basic meteorological variables from approximately 1200 observing stations across the 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 station moves 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 SIS database. NCEI identifies USHCN sites.

Original Station COOP ID (6 digits)		Data Continuity Advisory Committee (DCC) Members					
Relocated Station COOP ID (6 digits)			NWSREP				
Supervising WFO			NWS Regional COOP Program 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	Geographic setting of relocated and original stations are 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 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 C-1, Station Relocation Data Continuity Evaluation Checklist

Type of Change	Station Name	Station Number
<p>No station relocation Observing program and/or instrumentation changed; (i.e., max and min thermometers installed at precip stations)</p>	Station name retained	Station number retained
<p>No station relocation Community or post office name changed</p>	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
<p>Station relocation Station remains within community. Climatologically compatible</p>	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
<p>Station relocation Station moves to new community. Climatologically compatible</p>	Name changed to conform to name of new community.	Station number retained
<p>Station relocation Station moves to new community. Climatologically incompatible</p>	Old station closed, new station established.	New station number and Station Identifier (SID) assigned
<p>Station relocation Station remains within community. Climatologically incompatible</p>	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 C-2, Relocation Naming and Numbering.

4.3.1 USHCN Relocation and Moves

In the event a USHCN should become non-compliant or incompatible 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.
 - 1) 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.
 - 2) Upon completion of the maintenance, the COOP Regional Representative will notify the COOP Observer of the maintenance and notify NCEI of the resolution.

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 of 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 Representative
 - 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 Information System (SIS) 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 will remove the existing station from their USHCN roster
 - 2) NCEI will conduct a data base search for a replacement USHCN site and present the findings to the committee
 - 3) Once identified and reviewed by the committee NCEI will add the new site to their USHCN roster and include an identifier in the SIS
 - 4) The COOP Representative will close the former station in the SIS and coordinate the removal of the equipment and site mitigation
 - 5) If necessary, the COOP Representative will search for a replacement observer site within the specific 25 mile x 25 mile grid location as the previous location. Once identified, the COOP Representative will follow the procedures in Appendix C, section 2, to establish a new station

5. Determining Latitude and Longitude of a Station

The latitude and longitude of a station 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 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.

6. Determining Elevation of a Station

Elevations should be determined using U.S. Geological Survey sectional charts from, either CD ROM or paper versions, if no other markers are available. 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 having only a river gauge with no rain gauge, the elevation entered will be the ZERO DATUM of the gauge.

- * When determining the elevation of a station from USGS topographic maps, check at the bottom center of the map to see what vertical datum was used. If the datum on the map is the National Geodetic Vertical Datum of 1929 (most topographic maps are based on this datum) you need to convert the station elevation from this older coordinate system to the new federal standard NAV88 coordinate system. This is easily accomplished by going to the following web URL to make the adjustment:
<http://www.ngs.noaa.gov/TOOLS/Vertcon/vertcon.html>

7. 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 Internet using the National Weather Service Location Identifier (NWSLI) Transaction Form. The web address is: https://ops13web.nws.noaa.gov/nwslimain/nwsl_home.main. COOP stations are assigned SIDs, usually containing five characters; the first three identify the city or 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 is established, moved, relocated, renamed, or closed, and to correct errors in the NWSLI database. Assigned SIDs establishes a directory 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 RH. Instructions for completing the NWSLI Transaction form can be found at the listed web address in this Section.

When cooperative stations are moved or relocated, the following procedures 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.

1. Even if a new SID is not required for a compatible relocation, a NWSLI Transaction Form will be required to change information such as latitude, longitude, etc., which did change as a result of the relocation.
2. 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.

8. Updating SIS Files

The SIS system is a collection of COOP station information residing in a database on a centralized server at NWSHQ. The system is designed to provide for data entry and manipulation, observer payroll, reporting and other tasks associated with the NWS Cooperative Program. The files are updated as follows:

1. When visiting a 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 SIS files, the NWSREP prepares and submits a new rendition of the Station Profile. See SIS User Manual for instructions on preparing, submitting, and approving the Station Profile.
2. The Station Profile is updated every three years, even if no changes were

made to the station in that time.

3. Station Profile is designated preliminary until final approval from NCEI. Quality control and approval are accomplished in the following order; MIC level, RCPM level, NCEI level.
4. When approved by NCEI, the form changes from preliminary to final. All levels are automatically notified via e-mail.

If the form is rejected at any level, it returns to the NWSREP for his/her action. Once corrections are made, the NWSREP resubmits the form and the process begins again.

9. Inactive Stations

A station becomes inactive if no observations are taken, but observations are expected to resume within six months. If a station remains inactive longer than six months, it should be closed. To inactivate a station, the NWSREP submits a Station Profile within the Station Information System (SIS) and states in the Reason for 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." 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 closing the station, the NWS instruments should be removed and retained in the NWSREP's stock for future use.

10. Cooperative Station Services at Stations that Report Basic Observations

Observations taken at these stations, where such data are required for aircraft flight operations, are frequently used in the "a", "b", or "c" networks, and some instruments may be serviced by the NWSREP.

Occasionally there are cooperative maintenance services rendered at stations also reporting basic observations. Continue COOP servicing if the basic observation stations are consolidated, moved, relocated, or closed. Such services are hourly or daily precipitation, maximum and minimum temperatures, evaporation observations, etc. Before taking action to change a station status, any maintenance services are reviewed to determine if observations should continue to meet cooperative network requirements.

Take the following action should a basic observation station close:

1. "a" Service - Establish a cooperative station at the same or a compatible site (or, if necessary, at the closest possible incompatible site) if it is determined that the station is needed in the Coop network.
2. "b" Service - Review the need for continued service with the responsible Hydrologic Service Area (HSA) office, the River Forecast Center (RFC), and

the Regional Hydrologist.

3. “c” Service - Review the need for continued service with the appropriate WFO. If the need for service continues, a cooperative station may be necessary.

APPENDIX D – Reimbursable Stations

Table of ContentsD-1

1. Introduction.....D-3

2. GeneralD-3

3. Reimbursable Station ProposalsD-3

4. Description of Reimbursable Networks.....D-4

 4.1 U.S. Army Corps of Engineers (USACE) Networks.....D-4

 4.2 Bureau of reclamation (USBR) and Other Reimbursable Networks.....D-6

 4.3 Bonneville Power Administration (BPA).....D-6

5. Responsibilities for Establishing and Closing Reimbursable Stations.D-6

 5.1 Flood Control NetworksD-6

 5.2 EstablishmentD-6

 5.3 ChangesD-7

 5.4 Closure.....D-7

6. Preparing Reimbursable Cost Estimates for the Next Fiscal YearD-7

7. Procedures for Estimating Reimbursable CostD-7

 7.1 NWSREP SalaryD-8

 7.2 Supplies, Shipping and PostageD-8

 7.3 Inspection and Maintenance of Equipment.....D-8

 7.4 Vehicle Cost/Mileage.....D-8

 7.5 Per Diem TravelD-8

 7.6 NLSC SurchargeD-8

 7.7 NCEI ProcessingD-8

 7.8 CommunicationsD-8

 7.9 Observer Salary.....D-9

 7.10 Contractual ServicesD-9

 7.11 NWSHQ Overhead.....D-9

8. Reimbursable Reporting Services Provided by NWS-Funded Observing Sites.....D-9

9. BillingD-9

10. Task NumbersD-10

11. Prorating Travel CostsD-10

12. Procedures for Replacing and Upgrading Equipment.....D-10

 12.1 Equipment for NWS Funding Stations.....D-10

 12.2 New Reimbursable Equipment.....D-10

 12.3 Replacing Privately-Owned Equipment.....D-11

Tables

D-1 Names of USACE Flood Control (FC) Networks.....D-4

D-2 Names of USACE Divisions and Districts.....D-5

D-3 Names of USBR Networks.....D-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 (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, USACE, and USBR rain gauges in the same general area than for each agency to service stations with their own personnel.

Stations that exist to meet the requirements of other federal agencies, but 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 the 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 NWSHQ. Minor changes, i.e., opening, closing, or relocating individual stations, are approved by the RH.

Each spring the National Cooperative Program Manager (NCPM) or designee initiates the reimbursable process. The 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 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:

1. 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.
2. The reimbursable agency agrees to pay any increased cost.
3. The NWSREP's submission of a Station Request entry, or submission of a change to Station Profile into the Station Information System (SIS), 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 make adjustments to the reimbursable charges.

4. Description of Reimbursable Networks

This section describes the networks established as a reimbursable.

4.1 U.S. Army Corp of Engineers (USACE) Networks

USACE networks of precipitation gauge and river stage 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 D-1 contains the 39 networks and Table D-2 lists the divisions and districts in which these USACE networks are located.

FC	Name	FC	Name
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 D-1, Names of USACE Flood Control (FC) Networks

Division Names and Identifiers	District Headquarters	USACE 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 D-2, Names of USACE Divisions and Districts

4.2 Bureau of Reclamation (USBR) 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 Precipitation Network (IRPN). Network symbols, names and other networks are shown in Table D-3, below:

Identifier	Network Name
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 D-3, Names of USBR Networks

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.

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 USAC reimbursing NWS for maintenance expenses. All FC stations are placed in the "b" network.

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.

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 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.

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 a separate spreadsheet listing equipment, expenses and a line by line explanation for the costs on the guidance sheet.

7. Procedures for Estimating 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 and may be adjusted by each Region. Agencies reimbursing the NWS for maintaining their observing sites are billed for the following:

1. NWSREP 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

This is derived from the federal salary tables and averaged for each Region. 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 for these costs are supplies for the station and costs for postage and shipping.

7.3 Inspection and Maintenance of Equipment

Each spring, the NCPM sends 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 for new stations and inspection and maintenance for existing ones) and equipment costs. The maintenance cost is average costs over a two year period and intended as general guidance.

The National CPM prepares equipment costs for the following types of observing sites: recording rain gauge, standard rain gauge (SRG), temperature station, temperature and precipitation stations (with an SRG), and evaporation station. The costs of instruments and replacement parts are obtained from the Engineering Division.

7.4 Vehicle Cost/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 site.

7.6 NLSC Surcharge

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

7.7 NCEI Processing

NCEI reviews the publication costs annually.

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 NWSHQ 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 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.

If a reimbursable reporting service is provided by a cooperative station but reimbursable maintenance for this service is agreed to by the other agency, 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 detection of billing errors. The National CPM office converts the lump sum payment to each Regions share.

USBR reimbursable estimates are negotiated at the Region level. Regions send the estimates to NWSHQ for information 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: Prorating uses the following elements:

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. Follow <http://www.nws.noaa.gov/directives/sym/pd01021101curr.pdf> *General Instructions for Terrestrial-Based In-Situ Instrument and Algorithm Intercomparisons for the Purpose of Climate Data Continuity*, for comparison testing.

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 observer is not interested, then the NWSREP is instructed to cease maintenance of the site and cease taking delivery of the data.

APPENDIX E – Data Management and Quality Control

Table of Contents.....E-1

1. Introduction.....E-2

2. Methods of Reporting Data.....E-2

3. Publications Available to Cooperative ObserversE-3

4. Publishing Cooperative Station Data.....E-3

 4.1 Criteria for Publishing Cooperative Stations E-3

 4.2 Publication of Soil Temperatures..... E-4

 4.3 Publication of Data from New Observing Programs E-5

 4.4 Hourly Precipitation Data (HPD)..... E-5

 4.5 NCEI Archiving of Non-Published Observations..... E-5

5. Quality ControlE-5

 5.1 Finding and Correcting Observing/Reporting ErrorsE-6

 5.1.1 Common Observing Errors E-6

 5.1.2 Missing and Questionable Temperature Values E-7

 5.1.3 Health of the Network Data Base E-7

 5.1.4 Precipitation Irregularities E-7

 5.1.5 Precipitation File Inventory E-7

 5.2 Data Consistency, Accuracy and Legibility..... E-7

6. Formats of Computer Produced Forms.....E-8

7. Court Appearances by Cooperative ObserversE-8

1. Introduction

The COOP observer provides the government with data representing a true picture of the environment in which we live. As a result, the importance of this data has increasing value for all citizens, government, industry research, etc. This appendix describes the methods for reporting, publishing, and the quality control of cooperative data.

2. Methods of Reporting Data

Many of the “b” and “c” network stations provide real-time or near real-time data to NWS offices by via telephone, by a computerized data collection system, or via the Internet. Some observers may still mail their data to the NWS monthly but it is up to the NWSREP to ensure the data is transferred electronically to NCEI if it is to be included into 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 hydrologic models, to support hydrologic forecast and warning operations, and/or water resource forecasting. Station climate records are authorized to come from paperless transmission modes (PC/web, telephone, etc.) as long as the following requirements are met:

1. The paperless data stream creates a pseudo monthly data summary accessible by observer and the NWSREP alike on a daily basis.
2. The observer electronically verifies the pseudo monthly climate data summary before submission, at the end of the calendar month.
3. Each month, the NWSREP electronically verifies they have reviewed and approved the data before it is transmitted to NCEI. Electronic forms will be verified by the observer within 5 days after close of a calendar month and the NWSREP will have all forms verified before the 25th.

The NWSREP will encourage existing COOP observers to switch over to paperless data transmission, either via PC and web, or by phone. Observers with a PC and web access and/or touch-tone phone will be encouraged to use the web mode. Observers with only touch tone phone service will be encouraged to use a telephone based data transmission system. In the spirit of years of dedicated volunteer support to the nation, observers are not required to switch from the current paper and pen process. However, if the data is to be published and placed into the digital archive, the NWSREP assists the observer with the electronic transfer of the 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.

New COOP observers will be required to use paperless data transmission to become part of the published climate network unless they are located in regions not having reliable paperless data transmission systems (Alaska and Pacific at this time). If a new observer has phone service only, they will be encouraged to switch to a PC/web transmission if they obtain web access at a future

date. Observers will be provided the training necessary to decide when they can make the change to paperless data transmission and how to successfully transition to this process from paper. In cases where an observer uses more than one observation time e.g., 7 a.m. to 7a.m. for NWS operations and 10 p.m. to 10 p.m. for climate record, the NWSREP will ensure the published climate record times are identified clearly for NCEI in the station's metadata. Usually, the published climate record is the 24-hour period closest to the standard climate calendar day(midnight-to-midnight).

3. Publications Available to Cooperative Observers

Several publications are available to cooperative observers for review of their published data, and as a technical reference. Showing observers how their data are used also reflects an appreciation for their effort. These publications are intended to provide important feedback to encourage observing excellence and continued participation in the cooperative program. Published data is available from the following web site: <http://www.NCEI.noaa.gov>

4. Publishing Cooperative Station Data

This section establishes the criteria to determine which cooperative stations have their data published by NCEI. In general, NCEI publishes data from official cooperative stations whenever the region indicates a requirement provided the station meets established criteria.

4.1 Criteria for Publishing Cooperative Stations

Publication of cooperative data will meet the following criteria:

1. The station is an official cooperative station with an assigned station index number.
2. A current Station Profile for the station is on file at NCEI and 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.

4.2 Publication of Soil Temperatures

NCEI publishes soil temperature data in the CD if furnished by a cooperator. Ensure the following conditions are met for these data to be 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 the “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.

4.3 Publication of Data from New Observing Programs

When new or expanded observing programs are planned requiring 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.

4.4 Hourly Precipitation Data (HPD)

The publication of hourly precipitation data in HPD is supported by the FC-1 and reimbursable networks. Requests from other agencies for the publication of data in HPD will be approved on the basis of NCEI's current cost estimates for data publishing. Costs are funded by the requesting agency. Publication of the HPD is in electronic format only and can be found at <http://www7.NCEI.noaa.gov/IPS/hpd/hpd.html>.

4.5 NCEI Archiving of Non Published Observations

All or part of a cooperative station's data may be considered official, yet not be published. Official data that are non-published are archived by NCEI, but not digitized or quality-controlled. They are provided to users with the disclaimer of "best available" record. Instances where non-published status may be used:

- 4.2.4 Reporting of automated stations, such as river gauges.
- 4.2.5 "b" network stations that also observe temperature (only the precipitation is published).
- 4.2.6 Trial periods for new observers to determine the quality of observations.
- 4.2.7 Recruitment of promising new observers who are expected to replace current observers in the near future.

5 Quality Control

One of the most important tasks of the WFO/WSO/DCO is ensuring the accuracy of recorded and reported observations and the users receive the data promptly. Otherwise, the value of the observing program degrades significantly or becomes useless. Forms and charts not received at NCEI by their cutoff dates are not published. 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 observation forms or data streams and hourly precipitation or data monthly.
2. The prompt delivery of observation forms to the NWS by the 5th of the next data

month.

3. Prompt delivery to NCEI from the NWS by the 25th of the next data month.
4. The prompt delivery of hourly precipitation data by the 25th of the next data month.
5. The quality control of the RR3 message daily.
6. Full use of Datzilla to report post-submission errors and track resolutions.
7. Data completeness, data validity and quality assurance through Health of the Networks.

When reviewing observation forms after the end of the month, use the methods highlighted in WS Form 10-13-6 in Appendix B. When errors are noted, draw a line through the error (ensure recorded (error) is readable) and annotate the form with the correct information. Corrections should be placed in the respective remarks section of the form rather than in an adjacent data column or overwriting the original error.

5.1 Finding and Correcting Observing/Reporting Errors

Final responsibility for reviewing Station Profiles and HPD data lies with NCEI. NWSREPs review forms from observers each month, 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, e-mail, or in person. Less urgent problems should be dealt with during the next scheduled (annual or semiannual) station inspection.

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 a delay and out of courtesy, the NWSREP should call the observer.

If a visit with the observer is not possible at the time of the routine station inspection, telephone calls may have to suffice.

5.1.1 Common Observing Errors

Common errors are listed below. Errors d through g are often detected, flagged, and adjusted by NCEI.

1. Reporting snow fall (new snow) only in whole inches or to the nearest quarter inch, instead of in 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 recorded 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. Estimation of temperatures not recorded or substituting temperatures from a nearby or non-vented thermometer.
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. Inconsistency - most common temperature inconsistencies are:
 - 1) Recording a maximum temperature lower or a minimum temperature higher than the "at observation temperature" of the previous date.
 - 2) Recording a minimum temperature higher than the previous day maximum temperature or a maximum temperature lower than the previous day minimum temperature.
8. Observing at a time different than indicated on the form.

5.1.2 Missing and Questionable Temperature Values

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 d through g in Section 5.1.1. 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 is added in the Daily Temperatures tables of the CD publication. This line is entered immediately below the MAX or MIN line. The temperature entered on 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.

5.1.3 Health of the Network Data Base

The NCEI produces monthly statistical reports that depict the "Health" of network stations. Reports are tailored for NWS and include data capture rates, number and types of flags set, metadata issues among others.

5.1.4 Precipitation Irregularities

NCEI performs both temporal and spatial checks on precipitation data. Most of these checks compare one station against another. 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.

5.1.5 Precipitation File Inventory

NCEI updates the HPD Inventory web page daily. This site can be checked for proper receipt of all HPD data files. It is located at <http://www1.NCEI.noaa.gov/pub/data/hpd/inv/>.

5.2 Data Consistency, Accuracy and Legibility

The observer takes daily observations consistently and at the same time of day. The observation is recorded on the WS Form provided (or other form-see Section 6) in clearly legible handwriting. 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 (see Appendix F)

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 remarks, where possible.

If recording paper tapes are still being used at a location, the time an HPD tape is changed (day, hour, and minute, and standard or daylight time) should be clearly noted at both the beginning and end of the tape. The observer who restarts the HPD tape during the month should write the time of restart on the tape.

6 Formats of Computer Produced Forms

Some cooperative observers submit forms they have produced on their computers in place of forms such as WS Form B-91. However, it is very important that the order of the columns on these forms be the same as on the forms they replace and provide appropriate station information.

7 Court Appearances by Cooperative Observers

When an observer is contacted by an attorney or court official with a subpoena for a case where weather conditions may be a factor in litigation, the observer should inform the attorney having the subpoena issued that:

- a. Cooperative observers cannot authenticate any NWS records, even carbons or photocopies they may have in their possession, for they do not have the authority to certify these records.
- b. Cooperative observers cannot testify on behalf of the NWS.

- c. The National Centers for Environmental Information (NCEI) in Asheville, North Carolina, are the official custodian for weather records of the NWS. NCEI can certify/authenticate the records and can be contacted at:

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801-500
Request for Data: Weather/Climate 828-271-4800

If the attorney is seeking expert testimony refer him/her to the following commercial website for a list of expert meteorologists: <http://www.ametsoc.org>

If the attorney is satisfied, request the subpoena be withdrawn. 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 or information.

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

APPENDIX F – FORMS

Table of Contents:.....F-1

1. Introduction..... F-2

2. WS Form B-82 F-2

3. WS Form B-91 F-2

4. WS Form B-92 F-2

5. WS Form B83a F-2

6. WS Form B83b F-2

7. WS Form E-21 F-3

8. WS Form B30 and B-30a..... F-3

9. CD 404 F-3

10. Official Coop Observation Site Certificate F-4

Figures

F-1 Official Coop Observation Site Certificate F-5

1. Introduction

This appendix lists the forms used to record weather observations in the cooperative program. The appendix also describes the usage and purpose for each form.

2. WS Form B-82

The purpose of this handy pocket-sized 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.

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).

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 on 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).

5. WS Form B-83a

Supplementary Record of Climatological Observations (WS Form B- 83a) reports temperature and precipitation data as well as dry and wet bulb temperatures at 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 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 to obtain data after a flooding event by the NWSREP. Data obtained from bucket surveys are used to correlate heavy rain fall 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 drainage 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 the 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 B30 and B-30a

Cooperative Agreement with 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 paid observers. The forms will be prepared by the NWSREP finalizing 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 Forms 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 SIS 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. CD 404

Supply, Equipment and Service Order (CD-404) is an agreement for the government to pay a COOP observer for certain services rendered. If authorization for a new paid station is given or when an existing station changes its pay status, a Form CD-404 is required. The form is prepared by an NWSREP. However, the NWSREP should coordinate with the RCPM when preparing the form. There is no provision for the observer to sign the CD- 404.

The NWSREP enters the data using the SIS payroll option. Access the CD-404 menu and refer to Contracts Workflow in the SIS User Manual.

Essentially, the CD-404 information is entered by the NWSREP responsible for the cooperative station. The information is quality controlled by the RCPM through a workflow process. The RCPM approves the regional CD-404 prior to submission to the appropriate Operations Branch within the NOAA Finance Office Accounting Operations Division. The CD-404 is then processed as per current guidance sent by RCPM.

The ASC makes quarterly payments to the observers, as instructed on the CD-404. In October, the NWSREP compiles the end of the fiscal year data and rolls over the CD-404 for the next fiscal year. The new CD-404 is signed and sent to the NOAA Administrative Support Center (ASC).

When the cooperative agreement is with a company or municipality, separate agreements with each observer will not be obtained. The agreement will be executed by a responsible official of the company, who will be designated as observer and will stipulate the services that will be rendered.

10. 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: <http://www.nws.noaa.gov/om/coop>

Click forms on the left side of the web page.

**NOAA/National Weather Service
Official Cooperative Observation Site**

Site Name: _____

Coop Site ID: _____

Supervising Office: _____

Date Observation Begin: _____



Authorizing Signature: _____



Figure F-1, Official Cooperative Observation Site Certificate