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***Surface Observing Program (Land), NWSPD 10-13***

***COOPERATIVE STATION MANAGEMENT***

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signed by  
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Date

**Cooperative Station Management**

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1. Introduction. This instruction defines and describes the mission and scope of the National Weather Service (NWS) Cooperative Observing Program (COOP). It provides overall policy and responsibilities for management, operation, and maintenance of the cooperative program, its networks and observing sites, and the associated databases. The COOP was formerly created in 1890 under the Organic Act. The mission of the cooperative observing program is two-fold: (1) to provide observational data (usually consisting of daily maximum and minimum temperatures and 24-hour precipitation totals) required 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 in near real time to support forecast, warning, and other public service programs of the NWS. Quality control, observer morale, and the award program are described briefly.

2. Definition of Cooperative Observing Program and Cooperative Station. The cooperative program is the means by which the NWS obtains observational data to support the climate program and field operations. The program includes the selection of data sites; recruiting, appointing, and training of observers; installation and maintenance of equipment; station documentation; observer payroll; data collection and its delivery to users; data quality control functions; and the management of fiscal and human resources required to accomplish mission objectives.

A cooperative station is a site where observations are taken or other services rendered by volunteers. Observers are not required to take or pass observation certification examinations. Automatic observing stations are considered COOP stations if, in the absence of the automated station, any element of their observed data would otherwise be provided by a cooperative observer. A cooperative station may be collocated with other types of observing stations. In these cases, the portion of the station observing program which supports the cooperative program's mission is treated and documented independently of the other observational and service programs.

Cooperative observers may serve on either a paid or unpaid basis, depending on the types of services rendered and needs that must be met. These services frequently consist of taking and recording temperature and precipitation daily and reporting to the National Climatic Data Center (NCDC) or an NWS office at the end of each month. Many cooperative observers provide additional hydrometeorological data, such as evaporation. Data is transmitted via telephone, computer, mail or electronic transfer medium. Equipment used at NWS cooperative stations may be owned by the NWS, the observer, or by a company or other government agency, as long as it meets NWS equipment standards (see NWSI 10-1302).

2.1 Official Cooperative Stations. A cooperative station will be considered official and will be included in a cooperative network when it has been duly approved and meets the criteria listed below (publication of data is not a criterion).

- a. Equipment used for observations is of the type approved by the NWS.
- b. The station is documented in the Cooperative Station Service Accountability (CSSA) data base.
- c. The station is assigned: (1) a station index number by NCDC requested through RH, and (2) a Station Identifier by the NWS Office of Operational Systems (OPS), Configuration Management requested through the NWS Location Identifier system data base (NWSLI).

These criteria are necessary to assure satisfactory instrumentation, sensor exposure, documentation, and approval, so that supporting funds will be available.

3. Cooperative Observing Program Responsibilities. Management responsibilities for the cooperative observing program are shared by Weather Service Headquarters (WSH), each of the six Regional Headquarters, and WFO's, WSO's, and DCO's.

3.1 Weather Service Headquarters (WSH). The WSH establishes national policy and provides guidelines for program management in areas common to the regions. To effect an orderly management program, there are certain areas in which procedures must be uniform.

3.1.1 Office of Climate, Water, and Weather Services (OCWWS). The OCWWS in coordination with other offices, is responsible for determining overall requirements for the accuracy and resolution of measurements, the frequency with which observations should be reported, and the density/spacing of observing sites in the Climatological (temperature and precipitation) network, within budgetary constraints. OCWWS determines the requirements to establish, change, or close observing sites to meet hydrologic requirements. The OCWWS also has nationwide responsibility to:

- a. Coordinate program activity and establish procedures to maintain the integrity of cooperative program networks and to assure the networks continue to meet the data requirements for which they were established.
- b. Establish standards and procedures for inspecting and maintaining stations.
- c. Establish procedures which assure uniform implementation and application of policy changes relating to the cooperative program.
- d. Conduct liaison with other government agencies and WSH divisions in the management of cooperative station tasks financially supported by these other agencies and divisions.

- e. Develop program related instruction manuals documenting the above observing procedures and policies, and other management procedures.
- f. Monitor expenditures and accomplishments.
- g. Design data bases which contain descriptions, histories, and other information relating to the physical aspects of cooperative stations.
- h. Establish procedures for the receipt and review of requests for changes to software and data bases that are nationally controlled by WSH and to obtain a consensus agreement from the regions on all requests for changes before implementation in any nationally supported software or data base.
- i. Receive requests for access to the nationally maintained data bases of the CSSA system, evaluate and approve access, and notify the Office of Operational Systems, Configuration Management, in writing to issue a password to the approved user.
- j. Establish a process for the review, coordination, and approval of changes to the CSSA system.
- k. Design forms which compliment the CSSA data base such as WS Form B-30 Cooperative Agreement with Observer, WS Form B-24 award nominations, WS Form B-43 Request for Establishment or Change in Status of Cooperative Station, and provide guidelines for the preparation and maintenance of these and related forms.

3.1.2 Office of Operational Systems (OPS), Configuration Management. The OPS has nationwide responsibility to:

- a. Establish and maintain nationally controlled software and data bases to meet determined requirements and implement approved changes to them.
- b. Establish procedures to support program changes, schedule testing, baselining, writing documentation, and final submission to the regions for integration into their systems.
- c. Establish and maintain national-level software and data bases to support the cooperative station management program at WSH.
- d. Provide on-call support during normal working hours to regions with problems with the nationally controlled software and data base.
- e. Establish a formal process for the implementation of changes to the CSSA system.

3.2 Regional Headquarters. The RHs implement national policy. Regions can also supplement national policies and procedures with additional detail, as long as the national directives are not violated. In addition to establishing regional policy for the cooperative program, the RHs are responsible for:

- a. Establishing regional policy and guidelines for the installation, operation, maintenance, inspection, and management of authorized climatological, meteorological and hydrological cooperative stations.
- b. Coordinating related hydrometeorological matters with NWS regional and field officials; other government officials from Federal, state, and local agencies; and local citizenry.
- c. In some cases, exercising quality control of observed data.
- d. Obtaining reimbursable funds from other government agencies and assuring that these funds are spent in accordance with the agreed-upon activities.
- e. Preparing and distributing statistical information and other tabulations which identify accomplishments and achievements related to the regional cooperative program.
- f. Managing the paid cooperative observer contract program within the region and assuring compliance with established laws and regulations regarding issuance of government contracts to private citizens and businesses.

3.3 Weather Forecast Office (WFO), Weather Service Office (WSO), and Data Collection Office (DCO). The NWSREP may work out of a WFO, WSO, or DCO and is responsible for the installation and maintenance of cooperative station equipment and, sometimes, the quality control of observations. Generally, their geographical area of responsibility coincides with that of the Meteorologist in Charge at the associated WFO or for the Pacific Region the Official in Charge at the associated WSO or DCO. However, the density of stations and other factors may require that assigned areas of responsibility vary from the ideal. NWSREPs are responsible for cooperative stations and program activities within their assigned geographical area. At times, NWS officials such as service hydrologists, interns, electronics technicians, facilities technicians, regional headquarters personnel and others may perform functions or be assigned responsibilities within the scope of the cooperative program and are considered an NWSREP.

Duties of the NWSREP include site selection and equipment installation, selection and training of observers, regular inspection visits to the cooperative stations, quality control of observations and recorded data, and updating records of station status. Other duties include routine and emergency maintenance of assigned COOP equipment.

One of the more important aspects of the NWSREP's work is the regular contact with the cooperative observers. Routine visits to cooperative stations are made for the purpose of observer training, equipment maintenance, and verification of station metadata. Temperature and

non-recording precipitation stations are visited on an annual basis. Other stations, such as those that measure evaporation and those with recording rain gauges are visited twice a year. The responsibility for maintenance-of-cooperative stations which are telemetered is normally assigned to NWS electronics technicians. Stations with new observers may require additional visits until the observers are fully trained.

Emergencies (e.g., equipment failures) may require additional visits at any time. When possible, these emergency visits should be combined with visits to other en route stations. Observers quitting or relocations are not considered emergency visits.

NWSREPs, maintenance and electronics technicians, and other employees installing, relocating, changing, or inspecting a station should prepare all forms required or furnish adequate notes, sketches, and diagrams within five work days of any change.

4. Cooperative Networks. This section describes the observing networks that comprise the cooperative program. Stations are included in one or more of these networks depending upon the NWS programs (climatology, meteorology, and/or hydrology) supported by their observed data.

4.1 "a" Network. The "a" network 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 must observe and report daily 24-hour precipitation totals. Most stations in the network observe 24-hour maximum and minimum temperatures and 24-hour precipitation totals. Some also observe maximum and minimum soil temperatures and evaporation.

In general, "a" network stations should be spaced approximately 20 miles apart. A greater spacing (60 miles or more) may suffice in areas with relatively homogeneous climates, and a closer spacing may be needed in coastal and mountainous sections where climate differences are more pronounced.

4.1.1 Historical Climatology Network (HCN). This network was established in 1984 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 sites which were selected should contain few discontinuities (e.g., station moves and instrument changes and relocations). At least 80 years of temperature and precipitation records are required, with no more than 5 percent of the observations missing.

4.1.2 Climate Reference Network Stations (CRN). This network, consisting of two parts, was established in 1990 in response to a WMO climate initiative. At the time of establishment, it consisted of 264 stations in or near cities (usually located at airports). Its main purpose is to monitor the climate of major cities and towns, particularly for parameters other than temperature and precipitation. The second part consisted of 640 cooperative stations, including the best of the HCN stations, monitoring temperature and precipitation for the purpose of determining long-term climate trends. Reference Climatological Stations (formerly known as Climatological Benchmark Stations) are selected by NCDC. They must meet the World Meteorological Organization (WMO) standards for such stations and certain additional National Oceanic and Atmospheric Administration (NOAA) requirements. These stations are located where a

homogeneous series of observations has been or is expected to be made over a period of not less than 30 years. They are sited with an adequate and unchanged exposure where the observations can be made in representative conditions. All reference climatological stations are considered to be part of the "a" network.

4.2 "b" Network. Cooperative stations are placed 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.

Observing programs at "b" network stations 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 temperatures, evaporation, and soil temperature.

4.3 "ab" Network. Cooperative stations that support both the climatological and hydrological programs of the NWS are referred to as being in the "ab" network.

4.4 "c" Network. Cooperative stations are placed in the "c" network when observed data are used to support the meteorological forecast and warning and public service programs of the NWS. Like the "b" network, the "c" network is not rigidly defined. Stations are added, deleted, and changed to reflect changing requirements. The "c" network includes general classes of stations, as follows:

- a. Local Service. These are temperature and/or precipitation stations that are used primarily for local public service purposes (metropolitan networks, media releases, etc.).
- b. Long Record. These are temperature and/or precipitation stations that have long records but, are not included in the "a" or "b" network. Generally, the period of record covers 50 years or more, with good prospects for continuation with little change in the environment surrounding the station.
- c. Research, Experimental, and Special Purpose. These are temperature, precipitation, and/or special purpose stations that are 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 which support local service are generally asked to telephone their observed data to an NWS office.

4.5 Reimbursable Stations. In many cases, it is more economical for NWS to service observing equipment belonging to other government agencies than for these agencies to provide the service. For example, it may take less time and cost for an NWSREP to maintain NWS, Corps of Engineers (COE), and Bureau of Reclamation (BR) rain gauges in the same general area than for each of these agencies to service stations with its own personnel. Stations belonging to other agencies (federal or state), but serviced by NWS, are known as reimbursable stations (see



NOAA Budget Policy and Procedures Handbook, Chapter 3). The costs of inspecting and maintaining these stations are reimbursed by the government agencies served.

4.6 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) or the Regional Hydrologist (or equivalent for Pacific and Alaska Regions) at the RH. This authority may be redelegated to the Regional Cooperative Program Manager.

4.6.1 "a" Network. Stations in the "a" network should comply as closely as possible with the 20 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 20 mile spacing should be available at the RHs.

4.6.2 "b" Network. Changes to the "b" network must be coordinated with the applicable river forecast center and approved by the office of the Regional Hydrologist (or equivalents for Pacific and Alaska Regions).

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

4.6.4 Reimbursable Stations. Proposals from other government agencies or organizations for establishing new reimbursable programs or for making major changes in existing reimbursable accounts must be approved by WSH. Minor changes (e.g., opening, closing, or relocating individual stations) are approved by the RH.

The reimbursable process will be initiated each year by the end of March by the National Cooperative Program Manager (NCPM). The Regional Cooperative Program Manager will complete the cost estimates by the end of June. The entire process will then be completed by the NCPM by the end of July.

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, agreeing to the proposed charges and services or agreeing in part and indicating changes that must be made. Changes at reimbursable stations are approved at the regional level, provided the following conditions are met:

- a. The proposal is minor in nature and is 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.
- b. The reimbursable agency agrees to pay any increased cost.
- c. The SIR, Request for Establishment or Change in Status of Cooperative Station, used to request the change, clearly shows coordination with the reimbursable agency has occurred.

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.

#### 4.7 Responsibilities for Establishing and Closing Flood Control (FC) Stations.

4.7.1 Definition of Flood Control Networks. The FC-1 network consists of cooperative stations with recording precipitation gauges for which NWS has taken over funding and maintenance from the COE. Many of these stations report additional parameters. Observations are needed by both NWS and COE. The COE uses these data to support their water resource management activities, such as reservoir release forecasts, to mitigate damage associated with mainstream flooding.

Networks FC-2 through FC-58 are reimbursable networks established and maintained by NWS for COE to meet their data requirements, with COE reimbursing NWS for maintenance expenses. All FC stations are placed in the "b" network.

4.7.2 Establishment. Because they were originally established by COE to meet COE data requirements, any changes in the FC-1 network must be coordinated with COE.

4.7.3 Closure. Stations in FC and other networks may have to be discontinued due to the unavailability of observers, poor quality of observations, replacement by automated stations, or because the stations no longer serve the purpose for which they were intended. The closure of stations in FC networks should be coordinated with the applicable COE office. Closure of stations sponsored by a reimbursable agency should be coordinated with that agency. The district COE office should be encouraged to review requirements annually and make recommendations for adjusting the networks.

4.8 Part-Time Stations. Cooperative stations that can operate through the year on only an interrupted basis (such as 5-day-a-week stations, which fit work tours of personnel) will be made a part of any network only as a last resort. Since publication of incomplete data presents certain problems, arrangements should be made to use data in unpublished form, if at all practicable. Special arrangements must be made before incomplete records can be published.

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

4.9 Status of Stations. Information on the status of stations and networks may be derived at any time from the computerized data base described in Section 5. Timely and accurate updates to SIR are important to maintain the integrity of the metadata.

5. Cooperative Station Service Accountability. The CSSA is a computerized national data base containing descriptions of the cooperative stations maintained by NWSREPs, including the location, observer's name, equipment in use, where and how data are sent, driving directions to

the site, sponsors, etc. The CSSA data base is intended to provide cooperative station information.

6. Publications Available to Cooperative Observers. Several publications are available to cooperative observers for review of their published data, and for technical reference. By showing observers how their data are used and their efforts are appreciated, these publications are intended to provide the feedback that will encourage observing excellence and continued participation in the cooperative program.

7. Cooperative Station Procedures. Technical procedures for both the NWSREP and the cooperative observer are found in the instruction associated with the policy instruction.

8. Publishing Cooperative Station Data. This section establishes the criteria for determining which cooperative stations will have their data published by NCDC. In general, NCDC will publish data from official cooperative stations whenever the region has indicated a requirement to do so, provided: (1) the station meets the established criteria and (2) sufficient resources are available at NCDC to process these additional data.

9. Quality Control. The most important tasks of the NWSREP is assuring observations are recorded and reported accurately and data are received promptly by users. Otherwise, the value of the observing program degrades significantly or becomes useless.

10. Maintaining Good Observer Performance and Morale. Providing motivation to the observer is one of the most important functions of the NWSREP. Human nature is such that most people perform best when they receive positive feedback for their efforts. Although the most obvious reward for many people (money) is not a factor for most cooperative observers, other forms of feedback can compensate for this and have long been vital to the success of the cooperative program. NWSREP visits and phone calls to observers, awards (Section 11), and seeing their observations in print are all forms of positive feedback.

11. Awards. Awards are very important in the cooperative observing program. They may be given to observers 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 can motivate observers to high levels of performance and help set examples for others. Observers can take great pride in hanging a certificate or plaque on the wall or seeing their photograph published. In some cases, the granting of awards is second in importance only to the encouragement given to observers by letters, telephone calls, and visits by the NWSREP.