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***Operations and Services
Hydrologic Services Program, NWSPD 10-9***

HYDROLOGIC DATA NETWORK SERVICES

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SUMMARY OF REVISIONS: This directive supercedes NWS Instruction 10-940, dated September 17, 2002. This directive was revised to make the last paragraph of section 2.2 (River Forecast Center Responsibilities) read more closely to the last paragraph of section 2.1 (Weather Forecast Office Responsibilities).

Signed _____

September 30, 2003

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Director, Office of Climate,
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Date

Hydrologic Data Network Services

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Appendix

A. Template for Letter on Stream Gage Closures.....A-1

1. Introduction. This directive provides instructions specific to the hydrologic/ hydro-meteorologic network concerns of the National Weather Service (NWS) Hydrologic Services Program.

2. Network Management Responsibilities. All NWS offices, including the National Centers for Environmental Prediction (NCEP), Office of Science & Technology (OST), Office of Operational Systems (OOS), and Office of Hydrologic Development (OHD), whose activities affect the operation of networks operated and/or used by the NWS, should account for river forecast center (RFC) and weather forecast office (WFO) data requirements. When appropriate, RFCs and WFOs should coordinate surface data network-related issues, including the design, development, and maintenance of these data networks. RFCs and WFOs rely on hydrometeorological data from networks operated by the NWS and agencies such as the U.S. Geological Survey (USGS), U.S. Army Corps of Engineers, Bureau of Reclamation, Natural Resources Conservation Service (NRCS) as well as state and local cooperators. Data from these networks are, in many cases, received simultaneously at RFCs and WFOs through real-time distribution mechanisms. The operation and maintenance of NWS data distribution networks is the shared responsibility of NWS Headquarters and field office personnel.

2.1 Weather Forecast Office Responsibilities. WFOs have the primary responsibility for the quality control (QC) of data from both the NWS Cooperative Observer Network and other hydrometeorological networks.

WFOs are responsible for collecting observational data from the NWS Cooperative Observer Network in their areas of responsibility. WFOs should perform quality control of data from the Cooperative Observer Network prior to forwarding it to supported RFCs. The service hydrologist or hydrologic focal point should ensure that the Cooperative Observer Network is meeting the requirements of the hydrology program through periodic monitoring of data and coordination with the RFC(s). Instructions on the NWS Cooperative Observing Program can be found in NWS Instruction 10-1305.

For automated sensor data (e.g. GOES Data Collection Platforms, SNOTEL) received simultaneously at WFOs and RFCs, WFOs should QC data, coordinating with the appropriate RFC(s) to flag known bad sensors. When an equipment outage or malfunction is noted in an individual data sensor, WFO personnel should notify the appropriate owner or entity responsible for maintaining the equipment.

If a WFO serves as a central data collection site for a local data acquisition network, including but not limited to automated flood warning systems (AFWS), the WFO should forward the data to supported offices, including RFCs which need the data for operations, in as timely a manner as possible.

2.2 River Forecast Center Responsibilities. While WFOs have the primary responsibility for QC of data from both the NWS cooperative network and other hydrometeorological networks, RFCs also will need to perform QC of data used in their modeling and forecast operations. RFCs should provide QC information and network analysis reports to the WFOs to assist the WFO with the data QC duties and improvements to data collection networks.

If an RFC serves as a central collection location for any type of local data acquisition network, including but not limited to automated flood warning systems (AFWS), the RFC should forward the data to supported offices, including WFOs which need the data for operations, in as timely a manner as possible.

3. Stream Gaging Network. The NWS relies on other government agencies, primarily the USGS but also other federal, regional, state, and local agencies to operate the automated and manual stream gaging stations required for hydrologic forecast and warning operations.

3.1 Gaging Station Closures. The NWS should work with the USGS and other gaging station operators at all agency levels to ensure that it obtains information on potential gaging station closures as early in the process as possible. Hydrology program managers at WFOs (service hydrologists or hydrology focal points) should maintain awareness of potential gaging station closures in their hydrologic service areas (HSA). When necessary, they should alert the division or branch within regional headquarters responsible for overseeing hydrologic services in the region (herein referred to as regional HSD). Once the potential for the closure of one or more gaging stations has been identified, the impacts of the closure on NWS hydrologic services will

be documented. This documentation will normally involve collaboration between the WFO, RFC, and regional HSD. The documentation will be shared between all levels of the NWS Hydrologic Services Program, including Hydrologic Services Division in the Office of Climate, Water and Weather Services (national HSD). The documentation will also be shared with the operating agencies, other cooperating agencies, and affected emergency managers/local officials. Along with this impact documentation, the NWS should use letters, meetings and other contacts to encourage operators and partners to keep critical gaging stations operational.

The USGS conducts an annual review of funding for the Federal cooperative stream gaging network and determines which stations can be operated during the next year. If the USGS determines support for a gaging station(s) must be terminated, they inform the appropriate NWS regional HSD, WFO(s), and RFC(s). For each USGS stream gaging station used in the NWS hydrologic forecast and warning process which is proposed for closure, the following mitigation procedures should be employed:

- a. Regional HSD will coordinate with affected field office(s) to assess the impact of the gaging closure(s) on the NWS hydrologic services program. If NWS hydrologic forecast services will be degraded, regional HSD and/or affected field office(s) will write a letter to the appropriate USGS district office and/or federal/state/local cooperator describing the impact of the closure(s).
- b. National HSD should also be notified regarding stream gaging closures so that action can be taken at the National level as well.

Appendix 1 can be used as a template for the letter mentioned in item (a) above. Copies of the letter(s) will be sent to the Chief, National HSD.

Closure of a stream gaging station may require a change in NWS service for that location. The regional HSD, in collaboration with the appropriate field office personnel, will make the determination concerning change in service, such as, providing categorical forecasts (e.g., no flooding, flooding, major flooding) instead of numerical forecast values.

3.2 Changes in Datum/Flood Stage. Changes in river gage datum and/or flood stage may be necessary at times due to below-zero readings, channel changes, development (e.g., urbanization) and/or station relocation. Changes in river gage datum or flood stage, including those proposed by the NWS, will be coordinated with partners, customers and the general public. All changes should be approved by the regional HSD. These changes and associated flood impact change information should be updated in the WFO hydrologic database and shared with the appropriate RFC.

4. Hydrometeorological Networks. Hydrometeorological networks used by the NWS consist of a combination of NWS- and cooperator-owned sites. This section provides policies on selected operational aspects of these networks. WFOs should pursue access to new sources of hydrometeorological data, including automated data (precipitation and streamflow) from mesonets.

4.1 Automated Surface Observing System. General procedures covering the operations and services aspects of Automated Surface Observing System (ASOS) are provided in several Instructions under NWS Policy Directive 10-13. Each WFO will be responsible for defining the onset and termination thresholds used in the ASOS precipitation products for each ASOS in its HSA.

4.2 GOES Data Collection Platforms. Some data collection platforms (DCP) are owned and operated by the NWS, but most are operated by cooperators. WFOs and RFCs regularly use data from these systems in their hydrologic forecast and warning operations. Service hydrologists and hydrology focal points should coordinate with DCP owners and/or operators to maximize the availability of DCP data in meeting the requirements of the NWS Hydrologic Services Program.

The NWS supported system for processing and distribution of GOES data is the Hydrometeorological Automated Data System (HADS). HADS is an Office of Hydrologic Development supported system (<http://www.nws.noaa.gov/oh/hads/>) which interfaces with other computer systems to obtain real-time hydrometeorological data from Geostationary Operational Environmental Satellite (GOES) DCPs. HADS decodes the data and then distributes it to NWS field offices. Field offices should utilize the HADS, request additional data types, and recommend other changes in HADS processes through procedures outlined in the HADS Handbook (<http://www.nws.noaa.gov/oh/hads/internal/>). All requirements for changes to the HADS will be coordinated with the Office of Hydrologic Development.

4.3 NWS Cooperative Observer Network. Daily and criteria precipitation values from the cooperative observer network are required to support the hydrologic modeling operations at WFOs and RFCs. NWS Instruction 10-1307, "Cooperative Observer Program (COOP)," contains procedures for the Cooperative Observer Program. See the following web page - <http://www.nws.noaa.gov/om/coop/index.htm>) for additional details on this program.

4.4 SNOTEL and Snow Course Networks. The SNOwpack TELemetry (SNOTEL) and manual snow course networks are operated by the NRCS. Each day, the NRCS provides real-time data from the SNOTEL network to the NWS. Snow course data is supplied to RFCs when the manual snow course measurements are taken by NRCS snow surveyors during the winter months. Issues regarding location and placement of SNOTEL and snow courses should be directed to the NRCS. See the following web page - <http://www.wcc.nrcs.usda.gov/> for additional details on SNOTELs and snow courses.

4.5 Limited Automated Remote Collectors. Limited Automated Remote Collectors (LARC) allow the NWS to access data from a hydrometeorological sensor via a telephone line. Often, but not always, the sensor(s) are maintained by another agency. Every six hours, LARCs are polled by the Centralized Acquisition and Dissemination System (CADAS) to obtain stream elevation and/or precipitation amounts. CADAS system is maintained at NWS headquarters. Polling by an individual office may provide more parameters and/or more frequent data.

4.6 Supplementary Climatological Data Network. The Supplementary Climatological Data (SCD) network provides data every six hours from every WFO. WFOs and RFCs should use this data in their forecasts and warnings when appropriate.

Appendix A - Template for Letter on Stream Gage Closures

Name

Address

Dear Name,

The proposed discontinuation of funding for river gages supported by the U.S. Geological Survey (USGS) Federal cooperative hydrologic data collection program is expected to have a major impact on the National Weather Service (NWS) river and flood forecasting capabilities for the state of state name. If this action is taken, NWS services will be seriously affected, including our ability to provide timely and accurate warnings and forecasts of floods for the city of Name of city as well as additional communities downstream, including Name of city and Name of city.

[Discuss a recent hydrologic event when the USGS stream gage(s) proposed for closure were instrumental in providing NWS forecast and warning services. Describe the causes for the event, where the flooding occurred (e.g., basins), the magnitude of the event, and how data from the threatened stream gages were used to provide timely and accurate flood forecasts.]

River gaging stations affected by the USGS-Federal cooperative hydrologic data collection program include Number official NWS forecast points in State. This is slightly more than Fraction of the total number of forecast points in the entire state. There are also Number additional gages which are used in forecast procedures. These locations are identified on the enclosed chart. They affect the issuance of river forecasts at Number NWS Forecast Offices. They also impact forecast operations at Number River Forecast Centers.

Real-time streamflow data is essential to the issuance of accurate river, flood stage, and water supply forecasts that are issued by the NWS. Without real-time data from these gages that are scheduled to be closed, the NWS will be forced to discontinue the issuance of site-specific river forecast products with stage forecast values. We will then only be able to provide limited services such as categorical forecasts for minor, moderate, and major flooding, because forecasts will be based on precipitation data alone rather than both precipitation data and observed river stage.

I urge you to continue funding your share of the operation of the USGS river gaging network in state. If you require additional information about the effect of discontinuing these gages and what it would mean to the people in your state, please feel free to contact me at Phone number.

Sincerely yours,

Meteorologist In Charge, Name of WFO