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***Operations and Services
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IMPACT OF GAGE CLOSURES/OUTAGES ON RIVER FORECAST SERVICES

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SUMMARY OF REVISIONS: Eliminated references to funding and budgets in Section 2, 4, Appendix A & B. Added requirement to send draft letter through ERH HSD for review and approval in Section 4. Reordered Sections 3 & 4 into more logical sequence.

<signed>

November 7, 2008

Dean P. Gulezian
Director, Eastern Region

Date

<u>Table of Contents:</u>	<u>Page</u>
1. Purpose.....	2
2. Background.....	2
3. Gage Closures.....	2
4. Reduced Forecast Services due to Gage Closures.....	3

Appendix:

A. Template for Letter on Multiple Stream Gage Closures.....	5
B. Example Letter on Single Stream Gage Closure.....	6

1. Purpose. The purpose of this supplement is to state regional policy on the impact of gage closures and outages on river forecast services.

2. Background. The National Weather Service (NWS), Eastern Region (ER) prepares daily and high water river forecasts for approximately 600 locations. In order to assure accuracy and integrity of forecast information, automated or manual real-time observed river gage data must be available on a daily and criteria basis, at a minimum, to support River Forecast Centers (RFC)/Weather Forecast Offices (WFO) in their forecast operations. The U.S. Geological Survey (USGS) in cooperation with other sponsoring agencies support, operate, and maintain the bulk of the nation’s river gaging network. On occasion, the status of the support for an individual gage may change. This may force closure of a station and discontinuation of river gage operations. The impact of the closures may have a direct effect on river forecast operations.

Such effects can include: (1) no available near real-time river gage readings for daily hydrologic forecast operations; (2) discontinuance of archived stream flow information impacting hydrologic model calibration and procedure development activities at the RFC; and (3) discontinuance of discharge measurements that are used to update existing rating curves.

The NWS has a responsibility to follow-up on proposed gage closures that affect river forecast points, and if gages are discontinued, take appropriate action in providing a level of forecast services commensurate with data availability for the impacted river basin or forecast point. Any gage closure that changes the availability of data from a location must be investigated regarding the level of NWS river forecast service. The subsequent level of service will be based on the type and timeliness of the remaining available data.

3. Gage Closures. Field offices should alert ER Hydrologic Services Division (HSD) upon receiving notification of proposed gage discontinuations at river forecast points. ER HSD will

coordinate with sponsoring agencies at both the regional and national levels about the impacts of proposed stream gage closures to the ER hydrology program. The affected Hydrologic Service Area (HSA) will coordinate with local sponsoring agencies. Under the direction of ER HSD, Meteorologists-in-Charge (MIC)/Hydrologists-in-Charge (HIC) should encourage support for the continuation of the stream gaging program by highlighting its importance in the hydrologic warning and forecast program. The Office of Climate, Water, and Weather Services (OCWWS) will seek support for the cooperative stream gaging program at the national level.

The WFO should send a letter to affected hydrologic users (emergency managers, water resource managers, community official, etc.) alerting them to the possibility that forecast services may be reduced due to pending gage closures. Refer to the template letter in Appendix A and the sample letter in Appendix B for the required format the letter will follow. A draft of the letter will be coordinated through ER HSD prior to transmission to affected hydrologic users. Notification of potential loss of forecast services should be done immediately following the first published announcement of potential gage closure. Coordinating with ERH HSD prior to the public announcement will provide maximum amount of time to raise customer concern and perhaps locate additional partnered support. It will also provide maximum amount of time for customers to prepare for loss of service.

4. Reduced Forecast Services due to Gage Closures. The WFO in coordination with the RFC will be responsible for evaluating the impact of the closure of a stream gaging station(s) on forecast services. The following procedure will be followed for requesting approval for reduced forecast services as a result of gage closures or extended outages:
 - a. The WFO is the office responsible for submitting requests to ERH HSD for reduced forecast services as a result of gage closures within its HSA.
 - b. Prior to submitting a request for reduced forecast services, the HSA office should coordinate with the responsible RFC on any impacts the gage closure(s) will have on forecast services. RFC should provide their written comments on any impact(s) and their recommendations on the level of reduced service.
 - c. If appropriate, options for alternative river gage readings (e.g., the installation of a staff gage at the gage site or the recruitment of a cooperative observer to take river observations) should be considered. Any options should be coordinated between the WFO and the servicing RFC.
 - d. The WFO, in collaboration with the servicing RFC, may consider discontinuance of hydrologic forecast services based on the following criteria:
 - i. There is limited interest for hydrologic forecast services at the existing service location.

- ii. There is no near-real time river stage data available to support daily hydrologic forecast operations.
 - iii. The stream channel at the service location is unstable (i.e., requires frequent updates to the rating curve, yet there will be no updates to the rating curve by a cooperating agency).
- e. All requests for reduced forecast services due to gage closures should be made in **writing** by the MIC of the office with HSA responsibility to ERH HSD. An electronic copy of the request using the latest approved word-processing software is sufficient. Hard copies sent via U.S. mail are no longer required.
- f. Requests for changes to hydrologic forecast services should be as specific as possible. They should include customer requirements for hydrologic forecast services and technical evaluations by the servicing RFC (e.g., reliability of rating curve at service location, accuracy of numerical river forecasts based on verification statistics, etc.).
- g. ERH HSD will coordinate an evaluation of the request with the appropriate NWS offices (RFC, WFO, OCWWS HSD, other regional HSD, etc.) as necessary.
- h. ERH HSD will issue a letter of authorization on the request for reduced services to the office with HSA responsibility and the appropriate RFC. The level of reduced services will be directly related to the type and frequency of data remaining available at the location in question. Reduced service may include categorical (Major, Moderate, Minor) forecasts.
- i. The office with HSA responsibility will be responsible for coordinating the reduction in hydrologic services with affected hydrologic users (e.g. emergency managers, community officials, water resource managers, etc.) through the most appropriate means, e.g., phone calls, letters, press releases, announcements on the AHPS web pages, information appended to NWS hydrology text products, town hall meetings, public information statements, etc.
- j. Temporary or short-term gage outages should not be considered for reduction in services unless the outages develop into a long-term (6 months or more) duration. For short-term outages at river forecast points, site-specific forecasts should continue to be released. An estimated stage may be provided, where practical, and coordinated with the servicing RFC. Public hydrology text products and web pages containing these data should note that the stream gage data is unavailable, missing, or estimated. Public issuances should note that current data is unavailable or missing.
- k. The integrated hydrologic database, template files associated with the river product formatter application at the WFO, river forecast generation software at the RFC,

NWS ERS 01-2006 December 4, 2008

Advanced Hydrologic Prediction Service (AHPS) web pages, and Report on River Gage Station (E-19) should be updated to reflect the change in hydrologic forecast services.

Appendix A - Template for Letter on Multiple Stream Gage Closures

Name

Address

Dear Name,

The proposed discontinuation 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.]

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 warning and forecast services at those locations. River warning and forecast services that will be provided will be limited based on precipitation alone rather than both precipitation data and observed river stages.

If you require additional information about the effect of discontinuing these gages and what it would mean to the people in your Jurisdiction, please feel free to contact me at Phone number.

Sincerely yours,

Meteorologist-in-Charge, Name of WFO

Date Signed

Appendix B – Example Letter on Single Stream Gage Closure

Name

Address

Dear Name,

We have been notified by the United States Geological Survey (USGS) that the Pawtuxet River gage at Cranston might be discontinued. This would have a major impact on the National Weather Service (NWS) river and flood forecasting capabilities for the state of Rhode Island. Our ability to provide timely and accurate flood warnings and forecasts for the cities of Warwick and Cranston is highly dependant on the hydrometeorological information provided by this USGS river gage.

The Pawtuxet River has flooded in Warwick and Cranston as recently as April 4th of this year. During this flood, the Pawtuxet River rose to 10.5 feet, 1.5 feet above the 9 foot flood stage. Another notable flood event was on March 31st 2001, when the Pawtuxet River rose to 11.9 feet at the Cranston gage. At this stage, residential and business structures are impacted in sections of Cranston and Warwick. The flood of record for this gage occurred back in June 1982, at a crest of 14.5 feet.

Past crest history has shown that significant flooding is possible on the Pawtuxet River during any time of the year. Floods have been more common in the winter and spring. During the summer and fall the possibility exists for tropical systems, which historically have produced very heavy rainfall resulting in devastating flooding in southern New England.

Real-time stream flow data is essential to the issuance of accurate river, flood stage, crest, low flow and water supply forecasts that are issued by the NWS. Without real-time stream flow data from the Cranston gage, the NWS will be forced to discontinue the issuance of river stage forecasts on the Pawtuxet River. Subsequently, we will only be able to provide limited services based on precipitation data alone rather than both precipitation data and observed river stages. The National Weather Service will do all that it can to provide weather and flood warnings with information that is available. If the gage is discontinued, we will continue to issue the more general Flood and Flash Flood Warnings as warranted for ungaged streams and rivers. Nevertheless, the absence of real-time river gage data on the Pawtuxet River at Cranston will seriously hamper our ability to forecast flooding and provide advanced warning to protect lives and property.

If you require additional information about the effect of discontinuing this gage and what it would mean to the residents and businesses of the Cranston River community, please feel free to contact us at (xxx) xxx-xxxx.

Signature

Date Signed