

**NATIONAL WEATHER SERVICE INSTRUCTION 10-924
DECEMBER 8, 2008**

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

WEATHER FORECAST OFFICE HYDROLOGIC REPORTING

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SUMMARY OF REVISIONS: This directive supersedes NWS Instruction 10-924, “Weather Forecast Office Hydrologic Reporting,” dated July 12, 2006. The following revisions were made to this manual:

- 1) To be consistent with a recent change made to NWS Instruction 10-921, uses “hydrology program manager (HPM)” as the collective term for service hydrologists and hydrology focal points.
- 2) Changes the first sentence of 4.1.2 d from “A general statement as to warnings and forecasts issued and effectiveness of services provided by the NWS” to “A general statement as to hydrologic warnings and forecasts issued and effectiveness of hydrologic services provided by the WFO.
- 3) Because the new Drought Information Statement is now being issued, adds the following to the end of section 4.1.4: “A copy of a recently issued Drought Information Statement (DGT) for the WFO area may be used for this section (see [NWS Instruction 10-1201, WFO Drought Products Specification](#)).”
- 4) Makes it clearer in Appendix A that each database field listed there is required and can only be left unpopulated if it is impossible to obtain the information.
- 5) Adds horizontal datum, hydrologic unit number, and station begin date as required fields in the IHFS-DB.
- 6) Adds flood impact statement information found in the Hydrobase Rivergauge menu/Impact Statement window and drought/low water impact information found in the Hydrobase Rivergauge menu/Low Water Statement window to Appendix A.

(Signed)

November 24, 2008

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Date

Weather Forecast Office Hydrologic Reporting

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1. Introduction. The National Weather Service (NWS) requires centralized collection of river station descriptions and recent hydrologic activity to support agency operations and management of the Hydrologic Services Program. Historically, this reporting has been accomplished by submitting hard copy forms such as Weather Service (WS) Forms E-19, E-19a, E-5 and E-3. However, the data and information on some of these forms can now be stored easily in databases, eliminating the need for hardcopy submission. This directive provides instructions on the population and maintenance of the Integrated Hydrologic Forecasting System (IHFS) Database (IHFS-DB) and the hydrologic reports required from weather forecast offices (WFO). Fully populating, maintaining and ensuring the accuracy of the required database fields in IHFS-DB and the preparation of the forms and reports described below is the responsibility of the WFO’s hydrology program manager (HPM).

2. River Gage Station Description and History. The database fields identified in Appendix A provide a complete description and history of all gages that have been used for public forecasts since establishment of the station. The data and information within these database fields provide an operational reference and serve as a quick review of the public service needs within a particular river reach at the onset of and during a flood. The HPM at the WFO is responsible for the overall quality of the IHFS-DB. The HPM should ensure that the data and

information in the appropriate database fields of IHFS-DB are current and accurate at each river station with periodic maintenance (minimum every 5 years) and for significant events, such as the discontinuance of a river stage reporting station (30 days). Database fields for river gage station information and history should be maintained for all river gage stations used by the NWS in any part of the Hydrologic Services Program regardless of ownership. These stations are specifically defined as:

- a. Forecast Points – locations along a river or stream for which hydrologic forecast and/or warning services are provided by a WFO.
- b. Data Points – locations along a river or stream for which observed data is input to RFC or WFO hydrologic forecast procedures. Flood forecasts and warnings are not issued for Data Points.

For a new river forecast point, the HPM should populate the appropriate IHFS-DB fields identified in Appendix A and distribute the information to NWS offices which use the data before river forecast service for the site is added to the Hydrologic Services Program. For a new data point, the appropriate IHFS-DB fields identified in Appendix A should be populated no more than 60 days after data from the site are incorporated into the NWS program.

River gage station description and history information stored in IHFS-DB may be printed and filed in traditional WS Form E-19 and WS Form E-19a formats from HydroBase to serve as a local reference document and be distributed as appropriate.

3. Flood Stage Reports. After a flood event, the HPM must ensure that the crest stages and duration above flood stage data posted to the IHFS-DB are accurate. Hydrologic reporting of crests above flood stage can be accomplished by either maintaining an extended Flood-TS table in the IHFS-DB or by providing a completed template of Weather Service Form E-3 (shown in Appendix B). To maintain flood stage reports within IHFS-DB, the retention parameter on the floods table must be changed from the default of 15 months to 30 months. It is anticipated that within this 30 month time frame, centralized collection of this data through the National River Location Database will commence and eliminate the need for providing the data in a template of WS Form E-3. If resources do not permit extending the IHFS-DB floods table to 30 months, manual hydrologic reporting of flood stages is still required. To manually report flood stage information, prepare a template of WS Form E-3 (shown in Appendix B) whenever a river crests at or above flood stage. Rivers and stations in flood are listed in a downstream order. Provide inclusive dates for the duration of flooding for each station. Days with flood stage or higher will be considered in determining the duration of the flood. Submit the completed WS Form E-3 template with WS Form E-5 as described in Section 5.

4. Monthly Report of Hydrologic Conditions. By the 15th of the following month, prepare a monthly report that contains a summary of hydrologic conditions for the Hydrologic Service Area (HSA) using a template of WS Form E-5 (shown in Appendix C). The general content and dissemination of this report is specified below.

4.1 Content. Include one or more of the following sections in the monthly report of hydrologic conditions:

- a. Summary
- b. Flood Conditions
- c. River Conditions
- d. Drought
- e. Water Supply
- f. General Hydrologic Conditions

Include the summary section each month. Include the other sections if local conditions warrant.

4.1.1 Summary. The text of the summary will include a general overview of hydrologic conditions. If there was no significant hydrologic activity, a simple statement to that effect is sufficient.

4.1.2 Flood Conditions. When a flood occurs, prepare a descriptive summary of the flooding. The report should be comprehensive but concise and should include the following:

- a. A statement as to the rivers, areas, and states in which the floods occurred, the period of flooding, its magnitude, interesting or unusual features, if floods were of unusual severity, and a tabular comparison with past floods.
- b. A summary relative to the rainfall or other conditions causing the floods, indicating the approximate average precipitation over the basins.
- c. A brief summary of flood damages in general terms, indicating location and extent, number of deaths by states, and total damage (if available).
- d. A general statement as to hydrologic warnings and forecasts issued and effectiveness of hydrologic services provided by the WFO. In the discussion of lead time, include flood mitigation actions taken and monetary savings realized, if known.

4.1.3 River Conditions. When no floods have occurred, describe miscellaneous hydrologic conditions such as significant rises, record low stages, ice conditions, and opening and closing of the river to navigation.

4.1.4 Drought. When drought conditions affect the HSA, a drought section will be included in the monthly hydrologic summary. Topics may include information on precipitation deficits, stream conditions, ground water levels, soil moisture conditions, impacts on water supply, agriculture and fire danger, drought declarations issued by civil or water management authorities, as well as long-term outlooks. A copy of a recently issued Drought Information Statement (DGT) for the WFO area may be used for this section (see [NWS Instruction 10-1201, WFO Drought Products Specification](#)).

4.1.5 Water Supply. In areas where water supply conditions are of particular interest, the summary may include information on past precipitation, snow conditions, water supply forecasts, reservoir and ground water levels, and anticipated problems.

4.1.6 General Hydrologic Information. This section may include general information on hydrology in the HSA that is not included in the sections above. It may also include topics of local interest.

5. Distribution. E-mail copies of the Monthly Report of Hydrologic Conditions and, if required, the Flood Stage Report to the Hydrologic Information Center (hic@noaa.gov) as an attachment by the 15th of the following month. Also send copies to the appropriate river forecast center and hydrologic services division, hydrologic and climate services division, or hydrologic services branch (within a climate, water, and weather division) at regional headquarters. Additional copies of the report may be sent to other offices based on local agreements.

The file format may be either MS Word (.doc) or Portable Document Format (.pdf). File name will adhere to the following format:

E5_SID_YYYY-MM.ext and
E3_SID_YYYY-MM.ext,

where,

SID is the 3-letter WFO site identification,
YYYY is the 4-digit year,
MM is the 2-digit representation of the month, and
ext is the three letter file format extension (doc or pdf).

APPENDIX A – Required IHFS-DB Fields of River Gage Station Description and History

The HPM is responsible for overall quality of the information stored in the IHFS-DB. Information in the database fields identified below summarizes a river/stream location's description and history. Filling in these fields is required for all river/stream locations used in any part of the NWS Hydrologic Services Program regardless of who operates the gaging station. If it is impossible to obtain information for a field, it may be left unpopulated. Various data codes are referenced in [NWS Manual 10-944, Standard Hydrometeorological Exchange Format \(SHEF\) Manual](#). Definitions of a few of the terms used in these database field names can be found in [NWS Instruction 10-950, Definitions and General Terminology](#).

Site Information. In the required fields listed below, asterisks indicate those whose values must be previously defined in other tables/windows in order to have those values entered in the tables/windows described below. These are the foreign key constraints. After each field description is an entry representing the database table and column name where the data value can be found in the database (tablename.columnname).

Location information found in the HydroBase Location menu/Modify Location window:

LID - location.lid
 Name (Location) - location.name
 *County - location.county
 *State - location.state
 Basin - location.rb
 Latitude - location.lat
 Longitude - location.lon
 Horizontal datum – location.hdatum
 Station Number (NWS Index Number) - location.sn
 Hydrologic unit number - location.hu
 *RFC - location.rfc
 *HSA - location.hsa
 Station begin date - location.sbd
 Directions to gage station/other remarks - location.lremark

Observer information found in the HydroBase Location menu/Data Sources window/Observer Page:

Name - observer.firstname, observer.lastname
 Address - observer.a1, observer.a2, observer.a3, observer.city, observer.state, observer.zip
 Service Date - observer.dos
 *Sponsor - observer.spons
 CD-404 - observer.ornr
 Home Phone - observer.hphone
 Work Phone - observer.phone
 Rate - observer.rate
 E-Mail - observer.email

Duties - observer.rprt
*Recipient - observer.recip
*Comms type - observer.comm
Task - observer.tsk

Telemetry information found in the HydroBase Location menu/Data Sources window Telemetry Page:

*Telemetry Type - telem.type
*Telemetry Owner - telem.owner
Telemetry Interval or Reporting Frequency - telem.rptfreq
Telemetry Pay or/ Cost of Line - telem.cost
Phone - telem.phone

DCP information found in the HydroBase Location menu/Data Sources window DCP Page:

DCP (GOES) ID - dcp.goes
*DCP Owner - dcp.owner
DCP Report Time - dcp.rptime
DCP Report Interval - dcp.rptfreq

River location information found in the HydroBase RiverGage menu/RiverGage window:

Stream - riverstat.stream
Drainage - riverstat.da
River Mile - riverstat.mile
Zero Datum (Elevation at Gage Zero) - riverstat.zd
Latitude - riverstat.lat
Longitude - riverstat.lon
Flood Stage - riverstat.fs
Action Stage - riverstat.wstg
Flood Flow - riverstat.fq
Action Flow - riverstat.action_flow
Directions to gage station/other remarks - riverstat.remark

River location information found in the HydroBase RiverGage menu/RiverGage window Additional Info page:

Vertical Datum - riverstat.vdatum
Checkbar - riverstat.cb
Bankfull Stage - riverstat.bf
Tidal Effects - riverstat.tide
USGS Number - riverstat.gsno
Period of Record - riverstat.por
Leveling Agency and Leveling Date (Level) - riverstat.level
Rating Agency (Rated) - riverstat.rated

Flood Impact Statement Information found in the Hydrobase Rivergage menu/Impact Statement window:

Impact Value - floodstmt.impact_value
Impact PE - floodstmt.impact_pe
Begin - floodstmt.datestart
End - floodstmt.dateend
Impact - floodstmt.statement

Fields found in the HydroBase RiverGage menu/Flood Category window:

Major - floodcat.major_stage, floodcat.major_flow
Moderate - floodcat.moderate_stage, floodcat.moderate_flow
Minor - floodcat.minor_stage, floodcat.minor_flow

Crest information found in the HydroBase RiverGage menu/Crest History window:

Date of Crest - crest.datercrst
Time (LST) - crest.timcrst
Crest (ft) - crest.stage
Flow (cfs) - crest.q
From High Water Marks - crest.hw
Based on old datum - crest.olddatum
Caused by ice jam - crest.jam
Remarks - crest.cremark

Reference information found in the HydroBase RiverGage menu/References window

References - refer.reference

Datum information found in the HydroBase RiverGage menu/Datum window:

Zero Datum (Elevation at Gage Zero) - datum.elev
Starting Date - datum.ddate

Benchmark information found in the HydroBase RiverGage menu/Benchmark window:

Benchmark - benchmark.bnum
Description - benchmark.remark
Elevation - benchmark.elev

Gage information found in the HydroBase RiverGage menu/Publications window:

Publication/Location of Records - pub.ppub
Starting Date - pub.pbegin
Ending Date - pub.pend

Gage information found in the HydroBase RiverGage menu/Gage History window:

*Gage Type - gage.type
*Owner - gage.owner
*Maintenance - gage.maint
Began - gage.gbegin
Ended - gage.gend
Gage Location/Remarks - gage.remark

Low Water information found in the HydroBase RiverGage menu/Low Water window:

Date of low water - lowwater.lwdat
Stage (ft) - lowwater.stage
Flow (cfs) - lowwater.q
Remarks - lowwater.lwrem

Drought/Low Water Impact Information found in the Hydrobase Rivergage menu/Low Water Statement window:

Physical Element - lwstmt.pe
Lower Limit - lwstmt.lower_value
Upper Limit - lwstmt.upper_value
Criteria - lwstmt.lw_criteria
Source - lwstmt.lw_source
Statement - lwstmt.statement

Descriptive conditions for a location found in the HydroBase RiverGage menu/Description window:

Stream Bed - descrip.bed
Reach - descrip.reach
Regulation - descrip.res
Diversion - descrip.divert
Winter (Freezing)- descrip.ice
Topography - descrip.topo
Remarks - descrip.remark
*Proximity - descrip.proximity

Flood damage information found in the HydroBase RiverGage menu/Flood Damage window:

Stage - flood.stage
Areas Affected (Damage) - flood.damage

Reservoir information found in the HydroBase Reservoir menu/Reservoir window:

Reservoir name - reservoir.name
Impound date - reservoir.impounded
*Reservoir type - reservoir.type
*Reservoir owner - reservoir.owner
Max surcharge elevation - reservoir.surchg
Top elevation - reservoir.top
Sill elevation - reservoir.sill
Reservoir elevation - reservoir.elev
Flood pool height - reservoir.floodpool
Spillway pool height - reservoir.spillway
Conservation pool height - reservoir.conserpool
Dead pool height - reservoir.deadpool
National Inventory of Dams ID (NIDID) - reservoir.damidn
National Inventory of Dams State - damids

APPENDIX B – Template of WS Form E3: Flood Stage Report

NWS Form E-3 (04-2006) (PRES. BY NWS Instruction 10-924)		U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE		Hydrologic Service Area (HSA)	
FLOOD STAGE REPORT				REPORT FOR: MONTH YEAR	
RIVER AND STATION	FLOOD STAGE (Feet)	ABOVE FLOOD STAGES (Date)		CREST	
		FROM	TO	STAGE (Feet)	DATE

APPENDIX C – Template of WS Form E5: Monthly Report of Hydrologic Conditions

<p>NWS Form E-5 (04-2006) (PRES. BY NWS Instruction 10-924)</p> <p>U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE</p>	<p>HYDROLOGIC SERVICE AREA (HSA)</p>
<p>MONTHLY REPORT OF HYDROLOGIC CONDITIONS</p>	<p>REPORT FOR: MONTH YEAR</p>
<p>TO: Hydrologic Information Center, W/OS31 NOAA's National Weather Service 1325 East West Highway Silver Spring, MD 20910-3283</p>	<p>SIGNATURE</p> <hr/> <p>DATE</p>

When no flooding occurs, include miscellaneous river conditions below the small box, such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Instruction 10-924).

An X inside this box indicates that no flooding occurred within this hydrologic service area.