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Operations and Services
Hydrologic Services Program, NWSPD 10-9

NATIONAL HYDROLOGIC PRODUCTS SPECIFICATION

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/

OPR: W/OS31 (D. Matusiewicz) **Certified by:** W/OS3 (M. Mullusky)
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SUMMARY OF REVISIONS: This directive supersedes NWS Instruction 10-930, "National Hydrologic Products Specification," dated September 6, 2011. The following revisions were made to this instruction:

1) Changes references of Hydrometeorological Prediction Center (HPC) to Weather Prediction Center (WPC).
2) In Sections 6.2.2 and 6.2.3, updates issuance time and criteria for the Modeled Areal Extent of Snow Cover Product (SCV) that is now produced four times a day.
3) In Sections 7.2.2 and 7.2.3, updates issuance time and criteria for the Modeled Snow Water Equivalent by Basin Product (SWE) that is now produced four times a day.
4) In Section 8.3.2, deletes reference to 5-inch Quantitative Precipitation Forecasts (QPF) not being able to be delineated on Day 2 and Day 3 excessive rainfall products.
5) In Sections 12.3.1 and 14.3.1, updates tables 10 and 11 to reflect the new issuance times for the QPF for days 4 through 5 and 6 through 7.
6) Adds Sections 14 and 15 to indicate that WPC produces a 48-hour QPF for Days 6 through 7 and a 7-day QPF.
7) Adds Section 17 to indicate that WPC produces a Mesoscale Precipitation Discussion (MPD).

(Signed) March 24, 2014
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Acting Director, Office of Climate,
Water, and Weather Services

National Hydrologic Products Specification

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Appendices

A. Hydrometeorological Automated Data System Report (RRS) Product Headers For Individual Weather Forecast Offices and River Forecast Centers A-1

B. Acronyms B-1

1. Introduction. This directive describes issuance criteria, content, and format of hydrologic/hydrometeorologic products issued by NOAA's National Weather Service (NWS) that are national in scope, transmitted internally over the Advanced Weather Information Processing System (AWIPS), and available externally over the Satellite Broadcast Network (SBN). Products distributed over the SBN follow standards for World Meteorological Organization (WMO) headings and AWIPS identifiers. Procedures for text products distributed over AWIPS, SBN, and other NWS-supported dissemination systems are contained in NWSI 10-1701, *Text Product Formats and Codes*. Most AWIPS-distributed products are also available on the Internet. Procedures for hydrologic/hydrometeorologic products available only through the Internet are described in NWSI 10-932, *National Hydrologic Web Products Specification*.

2. Hydrometeorological Automated Data System Report (RRS). These products provide hydrometeorological observations in near real time to support NWS operations. These products are generated by the Hydrometeorological Automated Data System (HADS). The home page for HADS is: http://www.nws.noaa.gov/oh/hads/.

2.1 Mission Connection. HADS reports support the NWS mission by providing critical automated sensor data which is used in RFC operations, WFO hydrologic operations, fire weather operations, and other NWS operations which require near real-time hydrometeorological data.

2.2 Issuance Guidelines.

2.2.1 Creation Software. Custom software decodes telemetered data, stores it, provides for quality control, and encodes data in Standard Hydrometeorological Exchange Format (SHEF) (see *Standard Hydrometeorological Exchange Format (SHEF) Code Manual*).

2.2.2 Issuance Time. HADS products are issued every three minutes. Issuance of data for a specific data point is dependent upon the transmission schedule of the data point and receipt of its data.

2.3 Technical Description.

2.3.1 Dissemination. The product headers used for the RRS products to support each individual WFO and RFC are contained in Appendix A and in Section 4 of the HADS Handbook, which is available at: http://www.nws.noaa.gov/oh/hads/internal/manual/new_sec4.pdf.

2.3.2 Content. Messages contain automated river, precipitation, and temperature observations.

2.3.3 Format. Encode messages in SHEF using the generic format shown below in Figure 1.

```
SXUS37 KWOH ddhhmm
^NMCRRSxxx                                    (AWIPS ID, special format approved for HADS)
:
: && HADS SOR-xxx
<One or more lines of SHEF-encoded data>
```

Figure 1. Generic format for Hydrometeorological Automated Data System Report.

3. Daily SNOTEL Report (RSD). The SNOwpack TELemetry (SNOTEL) network operated by the Natural Resources Conservation Service (NRCS) provides automated snow water equivalent, precipitation, temperature, and other hydrometeorological data from high elevation

areas of the western U.S. and Alaska. SNOTEL data are collected, processed, and inserted into RSD products by the NRCS and transferred to the NWS for dissemination in accordance with a cooperative agreement between the NWS and NRCS.

3.1 Mission Connection. SNOTEL data are obtained from high elevation areas of the western U.S. and Alaska and are used by WFOs and RFCs to monitor snow pack conditions in support of the NWS hydrology program.

3.2 Issuance Guidelines.

3.2.1 Creation Software. These products are created by the NRCS using appropriate software.

3.2.2 Issuance Time. The NRCS produces messages on both a daily and hourly basis. The NWS transmits messages as received.

3.3 Technical Description.

3.3.1 Dissemination. Headers for the western U.S. and Alaska are shown in Table 1.

State	WMO Header	AWIPS Header
Alaska	CXUS86 KSCS	RSD AK
Arizona	CXUS86 KSCS	RSD AZ
California	CXUS86 KSCS	RSD CA
Colorado	CXUS86 KSCS	RSD CO
Idaho	CXUS86 KSCS	RSD ID
Montana	CXUS86 KSCS	RSD MT
Nevada	CXUS86 KSCS	RSD NV
New Mexico	CXUS86 KSCS	RSD NM
Oregon	CXUS86 KSCS	RSD OR
South Dakota	CXUS86 KSCS	RSD SD
Utah	CXUS86 KSCS	RSD UT
Washington	CXUS86 KSCS	RSD WA
Wyoming	CXUS86 KSCS	RSD WY

Table 1. RSD product headers by state.

3.3.2 Content. The product contains precipitation, snow, and temperature observations.

3.3.3 Format. Encode messages in SHEF (see *Standard Hydrometeorological Exchange Format (SHEF) Code Manual*) using the generic format shown below in Figure 2.

```
ZCZC NMCRSDxx
SRUW24 KSCS ddhhmm
 <.B format header>
:  U.S. DEPT. OF AGRICULTURE - Natural Resources Conservation Service.
:  PROVISIONAL DATA, SUBJECT TO REVISION.
:
 <SHEF-encoded SNOTEL data>
:
: <Comments if required>
.END
```

Figure 2. Generic format for Daily SNOTEL Report.

4. Monthly SNOTEL Report (RSM). Monthly SNOTEL Reports contain summaries of SNOTEL network observations which have been quality controlled by the NRCS. These quality-controlled data are collected, processed, and inserted into RSM products by the NRCS and transferred to the NWS for dissemination in accordance with a cooperative agreement between the NWS and NRCS.

4.1 Mission Connection. Monthly SNOTEL Reports help the NWS meet its mission by providing data summaries which can be used in forecasting water supply and snow melt runoff.

4.2 Issuance Guidelines.

4.2.1 Creation Software. These products are created by the NRCS using appropriate software.

4.2.2 Issuance Time. Products are issued early in the month and in the middle of the month from January through May or June, depending on the duration of the snow melt season. NWS transmits messages when received.

4.3 Technical Description.

4.3.1 Dissemination. Table 2 identifies various headers for the western U.S. and Alaska.

State	WMO Header	AWIPS Header
Alaska	CSUS86 KSCS	RSM AK
Arizona	CSUS86 KSCS	RSM AZ
California	CSUS86 KSCS	RSM CA
Colorado	CSUS86 KSCS	RSM CO
Idaho	CSUS86 KSCS	RSM ID
Montana	CSUS86 KSCS	RSM MT
Nevada	CSUS86 KSCS	RSM NV
New Mexico	CSUS86 KSCS	RSM NM
Oregon	CSUS86 KSCS	RSM OR
South Dakota	CSUS86 KSCS	RSM SD
Utah	CSUS86 KSCS	RSM UT
Washington	CSUS86 KSCS	RSM WA
Wyoming	CSUS86 KSCS	RSM WY

Table 2. RSM product headers by state.

4.3.2 Content. Messages contain precipitation and snow totals, as well as average temperatures.

4.3.3 Format. Encode messages in SHEF (see *Standard Hydrometeorological Exchange Format (SHEF) Code Manual*) using the generic format shown in Figure 3.

```
CSUS86 KSCS ddhhmm
RSMxx

 <.B Format header>
: U.S. DEPT. OF AGRICULTURE - Natural Resources Conservation Service
: PROVISIONAL DATA, MONTHLY CORRECTED SNOTEL PRECIPITATION ACCUMULATION
: DATA
 <SHEF-encoded data>
.END
```

Figure 3. Generic format for Monthly SNOTEL Report.

5. Airborne Survey Gamma Product (RRM). These products are prepared by the National Operational Hydrologic Remote Sensing Center (NOHRSC). They contain snow water equivalent (SWE) data collected from aircraft and may also include remotely-sensed soil moisture information.

5.1 Mission Connection. These products help the NWS meet its mission by providing data over areas which may have few or no ground-based observations of snow water equivalent. Data from these products allow snow accumulation and melt to be accounted for in river and flood forecasts, water supply forecasts, and spring flood outlooks for areas affected by snow.

5.2 Issuance Guidelines.

5.2.1 Creation Software. Use the Operational Product Processing System (OPPS).

5.2.2 Issuance Criteria. Issue when airborne data are processed and ready for distribution.

5.2.3 Issuance Time. Schedule times and areas for airborne surveys and subsequent product issuances based on national snow cover conditions and operational requirements of field offices. One consideration is the schedule for issuance of WFO spring snowmelt flood outlook products. This schedule can be found at: http://www.nohrsc.noaa.gov/snowsurvey/.

5.3 Technical Description.

5.3.1 Dissemination. Issue products over AWIPS based on Table 3 and post products to the NOHRSC web page at http://www.nohrsc.noaa.gov/snowsurvey/.

AWIPS ID	WMO Header	Description
MSPRRMASB	SRUS43 KMSR	Airborne Soil Moisture by Basin
MSPRRMASF	SRUS43 KMSR	Airborne Soil Moisture by Flight Line
MSPRRMASP	SRUS43 KMSR	Airborne SWE by Flight Line
MSPRRMASW	SRUS43 KMSR	Airborne Estimated SWE by Basin

Table 3. RRM product headers.

5.3.2 Content. Messages contain SWE and/or soil moisture information encoded in SHEF (see *Standard Hydrometeorological Exchange Format (SHEF) Code Manual*). Explanatory notes may also be included.

5.3.3 Format. Encode messages in SHEF, using generic format shown below in Figure 4.

```
SRUS43 KMSR ddhhmm
RRMxxx
 <.B Format header>
:TO ------ Service Hydrologist (Please give HARDCOPY to SH)
:FROM ---- Carrie Olheiser, (952) 368-2503, Minneapolis, Minnesota
:Visit our web page at www.nohrsc.noaa.gov
:SUBJECT - AIRBORNE SNOW WATER EQUIVALENT DATA
:-------------------------------------------------------------------
: Total No. of flight lines sent = #
:-------------------------------------------------------------------
:Line Survey %SC SWE SWE %SM Est Fall %SM Pilot
:No.  Date      (in)(35%)(M) Typ Date (F) Remarks
:===================================================================
 <One or more lines of SHEF-encoded flight line data>
.END
<Narrative summary, if required>
```

Figure 4. Generic format for NOHRSC Airborne Survey Gamma Product

6. Modeled Areal Extent of Snow Cover Product (SCV). These NOHRSC products contain model-derived estimates of snow cover or other snow properties over land in the CONUS and adjacent portions of Canada.

6.1 Mission Connection. These products help the NWS meet its mission by providing spatial snow cover and other snowpack information for the CONUS and southern Canada. This information is used by WFOs and RFCs when analyzing hydrologic conditions and preparing water supply forecasts, and spring flood outlooks for snow-affected areas.

6.2 Issuance Guidelines.

6.2.1 Creation Software. Use the Operational Product Processing System (OPPS).

6.2.2 Issuance Criteria. Issue products for hours 0 UTC, 6 UTC, 12 UTC, and 18 UTC.

6.2.3 Issuance Time. Issue products at approximately 0500 UTC, 1100 UTC, 1700 UTC, and 2300 UTC.

6.3 Technical Description.

6.3.1 Dissemination. Issue SCV products over AWIPS using headers shown in Table 4 and post products on the NOHRSC web page at: http://www.nohrsc.noaa.gov/shef_archive/.

AWIPS ID	WMO Header	Description
MSPSCVACR	SRUS43 KMSR	Estimated SCV by Basin for APRFC
MSPSCVALR	SRUS43 KMSR	Estimated SCV by Basin for SERFC
MSPSCVFWR	SRUS43 KMSR	Estimated SCV by Basin for WGRFC
MSPSCVKRF	SRUS43 KMSR	Estimated SCV by Basin for MBRFC
MSPSCVMSR	SRUS43 KMSR	Estimated SCV by Basin for NCRFC
MSPSCVORN	SRUS43 KMSR	Estimated SCV by Basin for LMRFC
MSPSCVPTR	SRUS43 KMSR	Estimated SCV by Basin for NWRFC
MSPSCVRHA	SRUS43 KMSR	Estimated SCV by Basin for MARFC
MSPSCVRSA	SRUS43 KMSR	Estimated SCV by Basin for CNRFC
MSPSCVSTR	SRUS43 KMSR	Estimated SCV by Basin for CBRFC
MSPSCVTAR	SRUS43 KMSR	Estimated SCV by Basin for NERFC
MSPSCVTIR	SRUS43 KMSR	Estimated SCV by Basin for OHRFC
MSPSCVTUA	SRUS43 KMSR	Estimated SCV by Basin for ABRFC

Table 4. SCV product headers.

6.3.2 Content. SCV messages contain the following information:

- Modeled Areal Extent of Snow Cover Over Land by Elevation Zones (SA)
- Modeled 24-Hour Average Snowpack Temperature Over Land by Elevation Zones (SE)
- Modeled 24-Hour Snow Melt Over Land by Elevation Zones (SM)
- Modeled 24-Hour Blowing Snow Sublimation Over Land by Elevation Zones (SB)

- Modeled Snow Depth Over Land by Elevation Zones (SD)
- Modeled 24-Hour Snow Surface Sublimation Over Land by Elevation Zones (SU)

Explanatory notes may also be included in these messages.

6.3.3 Format. Encode messages in SHEF. The generic format for an SCV product with modeled areal extent of snow cover is shown below, in Figure 5. Products with other modeled information outlined in the above section would have a similar format, with the product identification contained in the .B header.

```
SRUS43 KMSR ddhhmm
SCVxxx

 <.B Format Header with Product Identification SAxxx>
:
:-------------------------------------------------------------------
:National Weather Service
:Office of Hydrologic Development
:National Operational Hydrologic Remote Sensing Center
:Chanhassen, Minnesota                  (952) 361-6610
:-------------------------------------------------------------------
:Modeled Areal Extent of Snow Cover Over Land by Elevation Zones
:Modeled yymmddhh
:
:NE = Not Estimated
: <One or more lines of SHEF-encoded data>
.END
NNNN
```

Figure 5. Generic format for an SCV product with Modeled Areal Extent of Snow Cover

7. Modeled Snow Water Equivalent by Basin Product (SWE). These products are prepared by the NOHRSC. They contain modeled average SWE for RFC basins and/or elevation zones.

7.1 Mission Connection. These products help the NWS meet its mission by providing snow water equivalent data for individual stream basins. This allows snow accumulation and melt to be accounted for in river and flood forecasts, water supply forecasts, and spring flood outlooks issued for all basins affected by snow.

7.2 Issuance Guidelines.

7.2.1 Creation Software. Use the Operational Product Processing System (OPPS).

7.2.2 Issuance Criteria. Issue products for hours 0 UTC, 6 UTC, 12 UTC, and 18 UTC.

7.2.3 Issuance Time. Issue products at approximately 0500 UTC, 1100 UTC, 1700 UTC, and 2300 UTC.

7.3 Technical Description.

7.3.1 Dissemination. Issue SWE products over AWIPS using headers shown in Table 5 and post products to the NOHRSC web page at: http://www.nohrsc.noaa.gov/shef_archive/.

AWIPS ID	WMO Header	Description
MSPSWEACR	SRUS43 KMSR	Estimated SWE by Basin for APRFC
MSPSWEALR	SRUS43 KMSR	Estimated SWE by Basin for SERFC
MSPSWEFWR	SRUS43 KMSR	Estimated SWE by Basin for WGRFC
MSPSWEKRF	SRUS43 KMSR	Estimated SWE by Basin for MBRFC
MSPSWEMSR	SRUS43 KMSR	Estimated SWE by Basin for NCRFC
MSPSWEORN	SRUS43 KMSR	Estimated SWE by Basin for LMRFC
MSPSWEPTR	SRUS43 KMSR	Estimated SWE by Basin for NWRFC
MSPSWERHA	SRUS43 KMSR	Estimated SWE by Basin for MARFC
MSPSWERSA	SRUS43 KMSR	Estimated SWE by Basin for CNRFC
MSPSWESTR	SRUS43 KMSR	Estimated SWE by Basin for CBRFC
MSPSWETAR	SRUS43 KMSR	Estimated SWE by Basin for NERFC
MSPSWETIR	SRUS43 KMSR	Estimated SWE by Basin for OHRFC
MSPSWETUA	SRUS43 KMSR	Estimated SWE by Basin for ABRFC

Table 5 SWE product headers

7.3.2 Content. Messages contain basin-average SWE information encoded in SHEF (see *Standard Hydrometeorological Exchange Format (SHEF) Code Manual*). Explanatory notes may also be included.

7.3.3 Format. Encode messages in SHEF. The generic format is shown below in Figure 6.

```
SRUS43 KMSR ddmmhh
SWExxx

 <.B Format Header>
:------------------------------------------------------------------------
:National Weather Service
:Office of Hydrologic Development
:National Operational Hydrologic Remote Sensing Center
:Chanhassen, Minnesota                 (952) 361-6610
:------------------------------------------------------------------------
:Modeled Snow Water Equivalent Over Land by Elevation Zones
:Modeled yymmddhh
:
:NE = Not Estimated
:
<One or more lines of SHEF-encoded data>
.END
NNNN
```

Figure 6. Generic format for Modeled Snow Water Equivalent by Basin product.

8. Excessive Rainfall Potential Outlook (94E, 98E, 99E). These products are prepared by the National Center for Environmental Prediction's (NCEP) Weather Prediction Center (WPC) for the CONUS. The products identify areas where rainfall exceeding RFC flash flood guidance (FFG) criteria is a concern.

8.1 Mission Connection. These products support the NWS mission by providing NWS field offices with graphical information showing the areas with forecast probabilities of flash flooding.

8.2 Issuance Guidelines.

8.2.1 Creation Software. Use N-AWIPS software or other applications as appropriate.

8.2.2 Issuance Criteria. Issue the products routinely.

8.2.3 Issuance Time. These products are issued at times indicated in Table 6.

Issuance Time (UTC)	Valid Time (UTC)	AWIPS ID	WMO Header	Product Description
0000 (optional)	0000-0000	RBG94E	MENC98 KWNH	Rainfall potential for exceeding FFG values and/or 5 inches during the 24 hours of forecast valid time
0300 (mandatory)	0300-0000	RBG94E	MENC98 KWNH	Rainfall potential for exceeding FFG values and/or 5 inches during the 21 hours of forecast valid time
0600 (mandatory)	0600 Day 1 – 1200 Day 2	RBG94E	MENC98 KWNH	Rainfall potential for exceeding FFG values and/or 5 inches during the 30 hours of forecast valid time
0630 (mandatory)	1200 Day 2 – 1200 Day 3	RBG98E	MENS98 KWNH	Rainfall potential for exceeding FFG values during the 24 - 48 hours of forecast time
0830 (mandatory)	1200 Day 3 – 1200 Day 4	RBG99E	MENU98 KWNH	Rainfall potential for exceeding FFG values during the 48 - 72 hours of forecast time
1200 (optional)	1200-1200	RBG94E	MENC98 KWNH	Rainfall potential for exceeding FFG values and/or 5 inches during the 24 hours of forecast valid time
1500 (mandatory)	1500 Day 1 – 1200 Day 2	RBG94E	MENC98 KWNH	Rainfall potential for exceeding FFG values and/or 5 inches during the 21 hours of forecast valid time
1800 (mandatory)	1800 Day 1 – 0000 Day 2	RBG94E	MENC98 KWNH	Rainfall potential for exceeding FFG values and/or 5 inches during the 30 hours of forecast valid time
1830 (mandatory)	0000 Day 2 – 0000 Day 3	RBG98E	MENS98 KWNH	Rainfall potential for exceeding FFG values during the 24 - 48 hours of forecast time
2030 (mandatory)	0000 Day 3 – 0000 Day 4	RBG99E	MENU98 KWNH	Rainfall potential for exceeding FFG values during the 48 - 72 hours of forecast time
2100 (optional)	2100-0000	RBG94E	MENC98 KWNH	Rainfall potential for exceeding FFG values and/or 5 inches during the 27 hours of forecast valid time

Table 6. Issuance time, valid time, product ID, and content of WPC Probability of Exceeding Flash Flood Guidance products.

8.2.4 Valid Time. See Table 6.

8.3 Technical Description.

8.3.1 Dissemination. Issue these products on AWIPS using the identifiers and WMO headers in Table 6. URLs for products posted on the web are:

Day 1 - http://www.wpc.ncep.noaa.gov/qpf/94ewbg.gif

Day 2 - http://www.wpc.ncep.noaa.gov/qpf/98ewbg.gif

Day 3 - http://www.wpc.ncep.noaa.gov/qpf/99ewbg.gif

8.3.2 Content. These products depict areas that forecast the probability of rainfall exceeding FFG. These products use one-, three- or six-hour FFG as produced daily by the CONUS RFCs. The Day 1 product includes three categories of probability (Slight, Moderate and High) with areas of 5-inch QPF indicated. The Day 2 and Day 3 excessive rainfall products are based on FFG for Day 1 and quantitative precipitation forecasts for Days 2 and 3. These include two categories (Slight and Moderate). There is no written discussion with the Day 2 and Day 3 products, but if an area is forecast, a text representation of the threat region is created and can be accessed at the link below the graphic.

8.3.3 Format. These products show areas with risk of exceeding RFC FFG values or a 5 inch threshold during the valid period for Day 1 products. The probability categories and associated color codes used in this product are shown below in Table 7. The "None Forecast" through "Moderate Risk" categories apply to the Day 2 and Day 3 products.

SEE TEXT <5%	Less than a 5% chance of exceeding FFG
SLIGHT RISK 5-10%	5-10% chance of exceeding FFG
MODERATE RISK 10-15%	10-15% chance of exceeding FFG
HIGH RISK >15%	Greater than 15% chance of exceeding FFG
RAINFALL GREATER THAN 5 INCHES	This is a deterministic forecast when it is believed there is a chance for rainfall exceeding five inches during the specified forecast period

Table 7. Threat levels for exceeding FFG and forecast probabilities along with associated color codes used in Probability of Rainfall Exceeding Flash Flood Guidance product.

If the potential exists for precipitation exceeding guidance values, but the expected probability is less than 5%, WPC will place the words **SEE TEXT** over the threat area. This area will then be referenced in the Excessive Rainfall Discussion (see Section 9). In addition, areas where precipitation is expected to exceed five inches will also be indicated. If conditions are not favorable or are not expected to become favorable for excessive rainfall, then "No Organized Areas of Rainfall Exceeding Flash Flood Guidance are Expected" is appended to the graphic. The Slight, Moderate, and High Risk areas are delineated by an enclosed solid line (with arrowhead). The 5 inch area is delineated by an enclosed solid line with a hatched pattern filling the threat region. A sample Excessive Rainfall Potential Outlook product for Day 1 is shown below in Figure 7 and a product for Day 2 in shown in Figure 8.

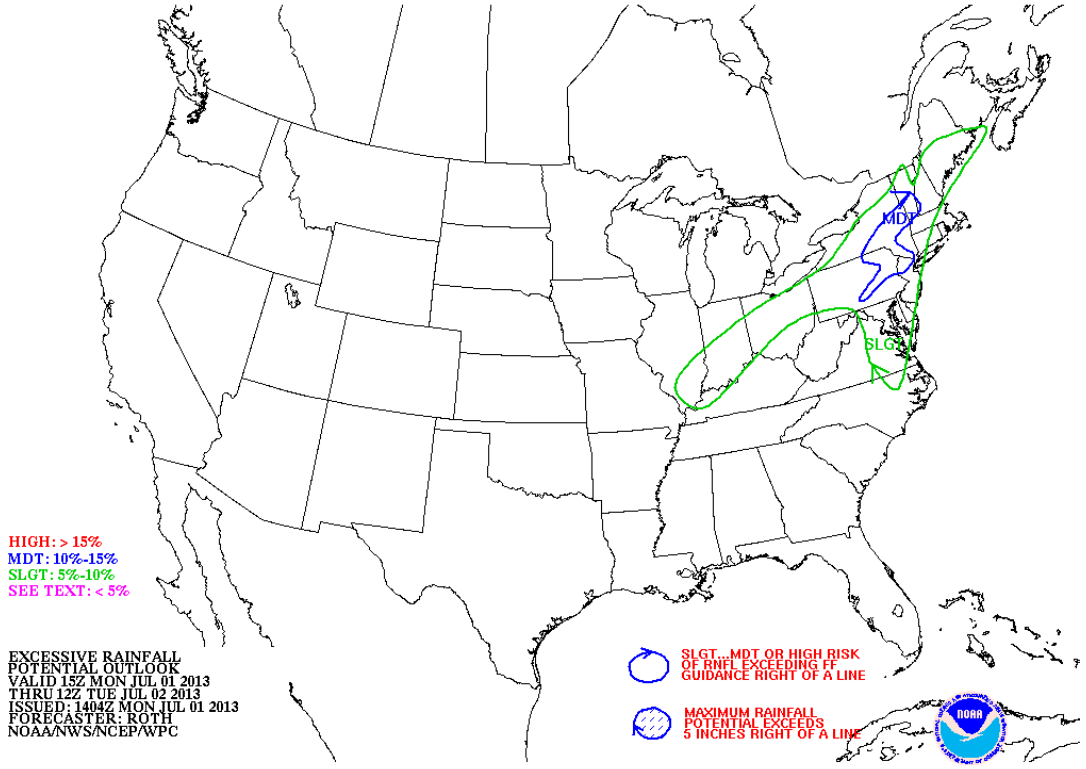

Figure 7. Sample Excessive Rainfall Potential Outlook Day 1 product.

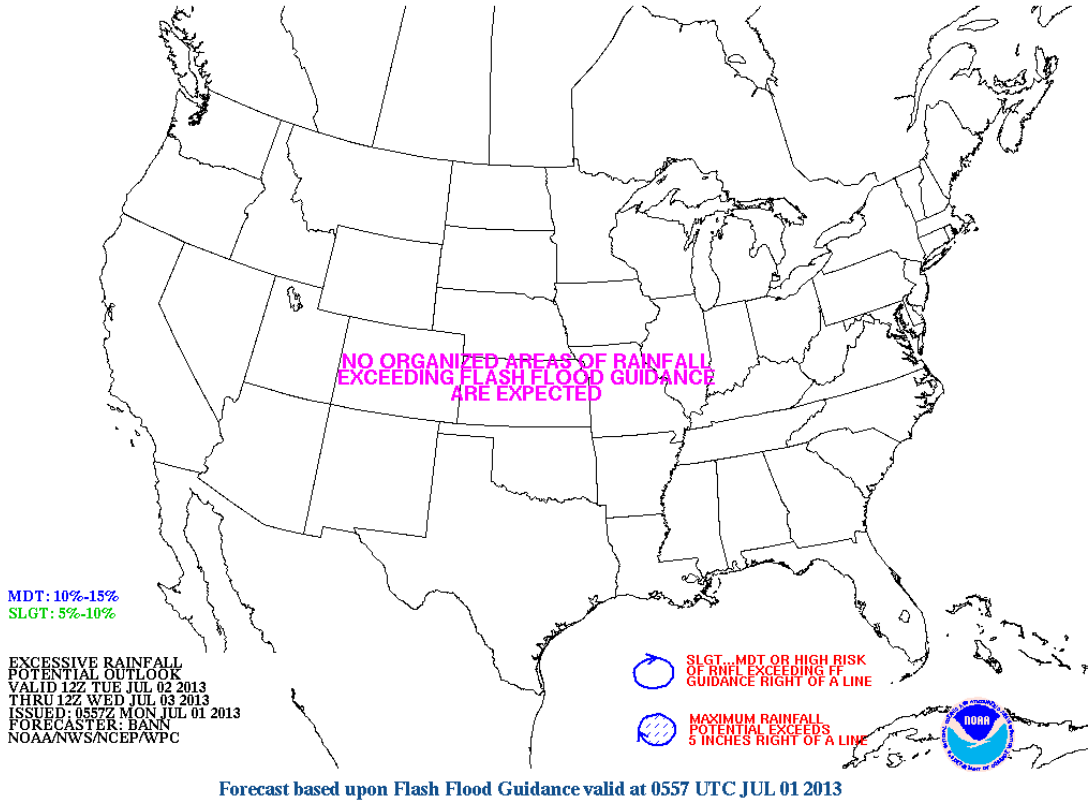

Figure 8. Sample Excessive Rainfall Potential Outlook Day 2 product.

8.4 Updates, Amendments, and Corrections. Update this product if meteorological conditions change or if corrections are needed.

9. Excessive Rainfall Discussion (ERD). This product is prepared by the WPC for the CONUS. The product provides explanation and interpretation of the Excessive Rainfall Potential Outlook graphics (see Section 8 above).

9.1 Mission Connection. This product supports the NWS mission by providing NWS field offices with information highlighting the areas with the greatest likelihood of flash flooding.

9.2 Issuance Guidelines.

9.2.1 Creation Software. Use appropriate COTS word processing software.

9.2.2 Issuance Criteria. Issue the product routinely.

9.2.3 Issuance Time. 0300, 0700, 1500, and 1900 UTC.

9.2.4 Valid Time. 0300 -1200 UTC, 1200-1200 UTC, 1500-1200, and 0000-0000 UTC.

9.2.5 Product Expiration Time. Product expires at the end of the valid time.

9.3 Technical Description. The Excessive Rainfall Discussion should follow the format and content described in this section. It is published on the web at:
http://www.wpc.ncep.noaa.gov/discussions/qpferd.html

9.3.1 MND Header. Use "EXCESSIVE RAINFALL DISCUSSION."

9.3.2 Content. The product is a text message providing an explanation and interpretation of the Excessive Rainfall Potential Outlook graphic.

9.3.3 Format. The generic format is shown in Figure 9.

```
FOUS30 KWBC ddhhmm
QPFERD

EXCESSIVE RAINFALL DISCUSSION
NWS WEATHER PREDICTION CENTER COLLEGE PARK MD
time am/pm time_zone day mon dd yyyy
...VALID hhZ day mon dd yyyy - hhZ day mon dd yyyy
...REFERENCE AWIPS GRAPHIC UNDER...DAY 1 EXCESSIVE RAINFALL

 <discussion text>
<forecaster name>

GRAPHICS AVAILABLE ON THE WEB AT www.wpc.ncep.noaa.gov

$$
```

Figure 9. Generic format for Excessive Rainfall Discussion.

9.4 Updates, Amendments, and Corrections. Update under rapidly changing meteorological conditions. Correct for format and grammatical errors as required.

10. 6-Hour Quantitative Precipitation Forecasts (Day 1- 3). These products, prepared by the WPC, delineate quantitative precipitation forecast (QPF) amounts in the CONUS for specified 6-hour periods. The products are available in both graphical and gridded format.

10.1 Mission Connection. RFCs use QPF as input to hydrologic forecast models. WFOs use QPF to support their river and flash flood warning programs. Graphical QPF products and their gridded versions are posted on the Internet for use by partners and the general public.

10.2 Issuance Guidelines.

10.2.1 Creation Software. Use N-AWIPS software or other applications as appropriate.

10.2.2 Issuance Criteria. Issue the product routinely.

10.2.3 Issuance Time. These products are issued at the times indicated in Table 8.

WPC CONUS 6-hr QPF Product Schedule

Issuance Time (UTC)	Valid Time (UTC)	Graphical		Gridded		Product Description
		AWIPS ID	WMO Header	AWIPS ID	WMO Header	
0600	0600 - 1200	RBG91E	PEIB40 KWNO	QPF91E	ZEXB98 KWNH	0 - 6 h liquid equivalent QPF
0600	1200 - 1800	RBG92E	PEIC43 KWBC	QPF92E	ZEXC98 KWNH	Preliminary 6-12 h QPF
	1800 - 0000	RBG93E	PEID44 KWBC	QPF93E	ZEXD98 KWNH	Preliminary 12-18 h QPF
	0000 - 0600	RBG9EE	PEIE40 KWNO	QPF9EE	ZEXE98 KWNH	Preliminary 18-24 h QPF
	0600 - 1200	RBG9FE	PEIF40 KWNO	QPF9FE	ZEXF98 KWNH	Preliminary 24-30 h QPF
0600	1200 - 1800	RBG9GE	PEII42 KWBC	QPF9GE	ZEXG98 KWNH	Preliminary 29 – 35 h QPF
	1800 - 0000	RBG9HE	PEBF98 KWNH	QPF9HE	ZEXH98 KWNH	Preliminary 35 - 41 h QPF
	0000 - 0600	RBG9IE	PEBG98 KWNH	QPF9IE	ZEXI98 KWNH	Preliminary 41 - 47 h QPF
	0600 - 1200	RBG9JE	PEBH98 KWNH	QPF9JE	ZEXJ98 KWNH	Preliminary 47 - 53 h QPF
0800	1200 - 1800	RBG9KE	PEBI98 KWNH	QPF9KE	ZEXK98 KWNH	50 - 56 h QPF**
	1800 - 0000	RBG9LE	PEBJ88 KWNH	QPF9LE	ZEXL98 KWNH	56 - 62 h QPF**
	0000 - 0600	RBG9OE	PEBJ98 KWNH	QPF9OE	ZEXM98 KWNH	62 - 68 h QPF**
	0600 - 1200	RBG9NE	PEBK98 KWNH	QPF9NE	ZEXN98 KWNH	68 - 74 h QPF**
1000	1200 - 1800	RBG92E	PEIC43 KWBC	QPF92E	ZEXC98 KWNH	Final 2 - 8 h QPF
	1800 - 0000	RBG93E	PEID44 KWBC	QPF93E	ZEXD98 KWNH	Final 8 - 14 h QPF
	0000 - 0600	RBG9EE	PEIE40 KWNO	QPF9EE	ZEXE98 KWNH	Final 14 - 20 h QPF
	0600 - 1200	RBG9FE	PEIF40 KWNO	QPF9FE	ZEXF98 KWNH	Final 20 - 26 h QPF
	1200 - 1800	RBG9GE	PEBF98 KWNH	QPF9GE	ZEXG98 KWNH	Final 26 - 32 h QPF
	1800 - 0000	RBG9HE	PEBG98 KWNH	QPF9HE	ZEXH98 KWNH	Final 32 - 38 h QPF
	0000 - 0600	RBG9IE	PEBH98 KWNH	QPF9IE	ZEXI98 KWNH	Final 38 - 44 h QPF
	0600 - 1200	RBG9JE	PEBI88 KWNH	QPF9JE	ZEXJ98 KWNH	Final 44 - 50 h QPF
1800	1800 – 0000	RBG91E	PEIB40 KWNO	QPF91E	ZEXB98 KWNH	0 - 6 h liquid equivalent QPF
	0000 - 0600	RBG9GE	PEBF98 KWNH	QPF9GE	ZEXG98 KWNH	Preliminary 29 – 35 h QPF
	0600 - 1200	RBG9HE	PEBG98 KWNH	QPF9HE	ZEXH98 KWNH	Preliminary 35 - 41 h QPF
	1200 - 1800	RBG9IE	PEBH98 KWNH	QPF9IE	ZEXI98 KWNH	Preliminary 41 - 47 h QPF
	1800 - 0000	RBG9JE	PEBI88 KWNH	QPF9JE	ZEXJ98 KWNH	Preliminary 47 - 53 h QPF
1800	0000 - 0000	RBG94Q	PEIE41 KWBC	--------	----------	Preliminary 6-30 h (Day 1) QPF
	0000 - 0600	RBG92E	PEIC43 KWBC	QPF92E	ZEXC98 KWNH	Preliminary 6-12 h QPF

	0600 - 1200	RBG93E	PEID44 KWBC	QPF93E	ZEXD98 KWNH	Preliminary 12-18 h QPF
	1200 - 1800	RBG9EE	PEIE40 KWNO	QPF9EE	ZEXE98 KWNH	Preliminary 18-24 h QPF
	1800 - 0000	RBG9FE	PEIF40 KWNO	QPF9FE	ZEXF98 KWNH	Preliminary 24-30 h QPF
2000	0000 - 0600	RBG9KE	PEBI98 KWNH	QPF9KE	ZEXK98 KWNH	50 - 56 h QPF**
	0600 - 1200	RBG9LE	PEBJ88 KWNH	QPF9LE	ZEXL98 KWNH	56 - 62 h QPF**
	1200 - 1800	RBG9OE	PEBJ98 KWNH	QPF9OE	ZEXM98 KWNH	62 - 68 h QPF**
	1800 - 0000	RBG9NE	PEBK98 KWNH	QPF9NE	ZEXN98 KWNH	68 - 74 h QPF**
2200	0000 - 0600	RBG92E	PEIC43 KWBC	QPF92E	ZEXC98 KWNH	Final 2 - 8 h QPF
	0600 - 1200	RBG93E	PEID44 KWBC	QPF93E	ZEXD98 KWNH	Final 8 - 14 h QPF
	1200 - 1800	RBG9EE	PEIE40 KWNO	QPF9EE	ZEXE98 KWNH	Final 14 - 20 h QPF
	1800 - 0000	RBG9FE	PEIF40 KWNO	QPF9FE	ZEXF98 KWNH	Final 20 - 26 h QPF
	0000 - 0600	RBG9GE	PEBF98 KWNH	QPF9GE	ZEXG98 KWNH	Final 26 - 32 h QPF
	0600 - 1200	RBG9HE	PEBG98 KWNH	QPF9HE	ZEXH98 KWNH	Final 32 - 38 h QPF
	1200 - 1800	RBG9IE	PEBH98 KWNH	QPF9IE	ZEXI98 KWNH	Final 38 - 44 h QPF
	1800 - 0000	RBG9JE	PEBI88 KWNH	QPF9JE	ZEXJ98 KWNH	Final 44 - 50 h QPF

Notes
* *Winter Issuance Only*
** *Only Oct 15 – Apr 15*

Table 8. Issuance time, valid time, product ID, and content of 6-hour QPF products.

10.2.4 Valid Time. See Table 8.

10.3 Technical Description.

10.3.1 Dissemination. Issue these products on AWIPS using the identifiers and WMO headers in Table 8. The URL for products posted on the web is: http://www.wpc.ncep.noaa.gov/qpf/qpf2.shtml.

10.3.2 Content. Products contain 6-hr isohyets depicting of 0.01, 0.10, 0.25, 0.50, 0.75, 1.0, 1.25, 1.50, 1.75, 2.0, 2.5, 3.0, 4.0… 9.0+ inch QPF amounts over the CONUS.

10.3.3 Format. Sample graphical products are shown in Figures 10 and 11 (the latter is based on the gridded QPFs). Produce gridded products using the International GRIB (GRIdded Binary) format, the description of GRIB is at: http://www.nco.ncep.noaa.gov/pmb/docs/grib2/.

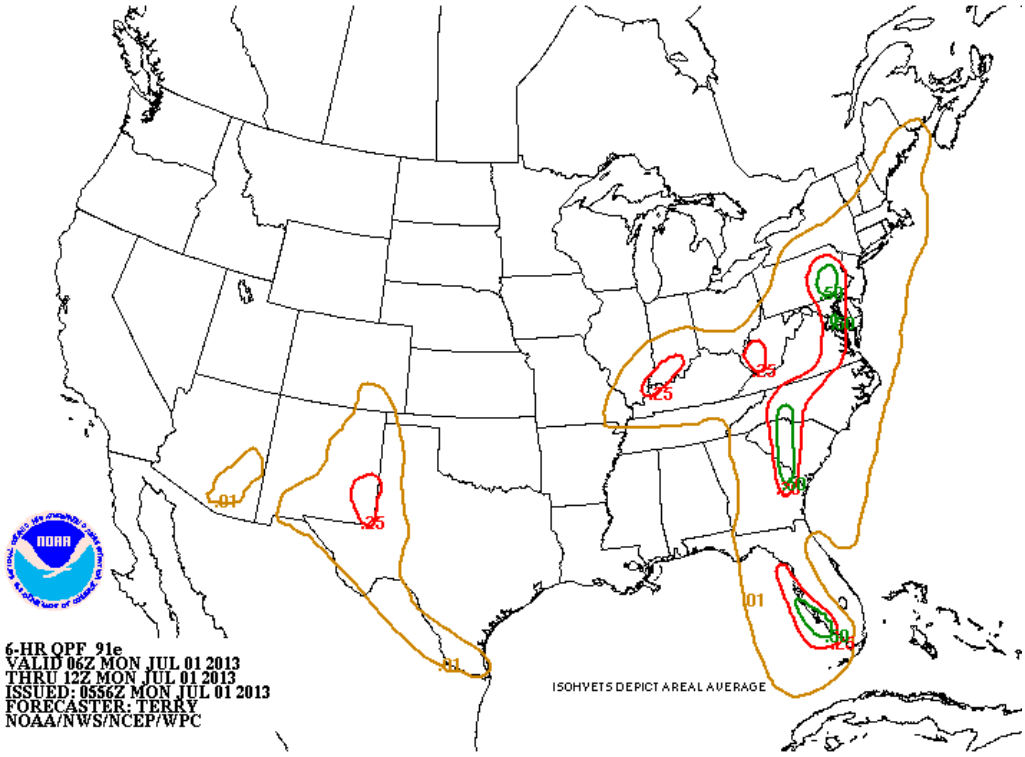

Figure 10. WPC 6-hr QPF graphic showing expected precipitation using predefined isohyets.

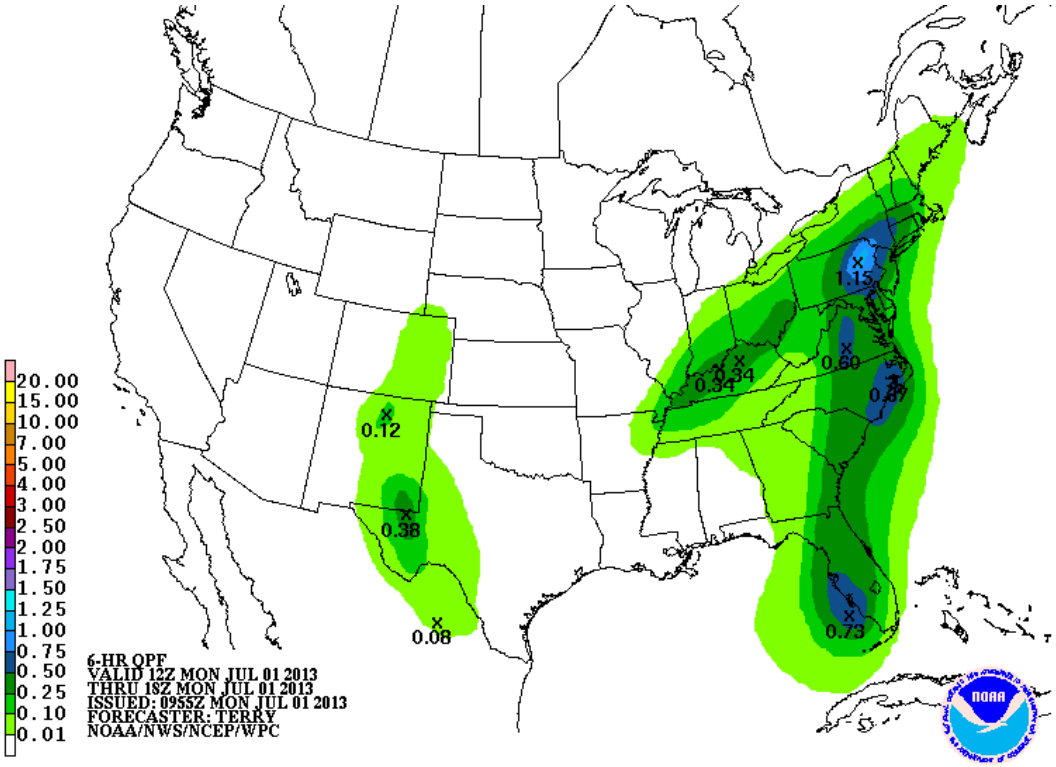

Figure 11. WPC 6-hr QPF graphic showing expected precipitation, based on gridded data.

10.4 Updates, Amendments, and Corrections. Update if requested by an RFC. Issue corrections when necessary.

11. 24-Hour Quantitative Precipitation Forecast (Day 1 - 3). These products, prepared by the WPC, delineate QPF amounts in the CONUS for specified 24-hour periods.

11.1 Mission Connection. These products help the NWS to meet its water forecasting mission by providing RFCs with forecast precipitation information used in the river modeling and forecasting process. The product also supports WFO public weather programs.

11.2 Issuance Guidelines.

11.2.1 Creation Software. Use N-AWIPS software to generate these products.

11.2.2 Issuance Criteria. Issue the product routinely.

11.2.3 Issuance Time. Issue products according to the schedule indicated in Table 9.

11.2.4 Valid Time. See Table 9.

11.3 Technical Description. Products should follow the format and content described in this section.

11.3.1 Dissemination. Issue these products on AWIPS using the identifiers and WMO headers in Table 9. The URL for products on the web is: http://www.wpc.ncep.noaa.gov/qpf/qpf2.shtml.

WPC CONUS 24-h QPF Product Schedule				
Issuance Time (UTC)	**Valid Time (UTC)**	**AWIPS ID**	**WMO Header**	**Product Description**
0600	1200 - 1200 1200 – 1200	RBG94Q RGB98Q	PEIE41 KWBC PEII42 KWBC	Preliminary 6 - 30 h (Day 1) QPF Preliminary 30 – 54 h (Day 2) QPF
0800	1200 – 1200	99Q	PEIK98 KWNH	52 – 76 h (Day 3) QPF
1000	1200 - 1200 1200 – 1200	94Q 98Q	PEIE41 KWBC PEII42 KWBC	Final 2 - 26 h (Day 1) QPF Final 26 - 50 h (Day 2) QPF
1800	0000 - 0000 0000 – 0000	RBG94Q RGB98Q	PEIE41 KWBC PEII42 KWBC	Preliminary 6 - 30 h (Day 1) QPF Preliminary 30 – 54 h (Day 2) QPF
2000	0000 – 0000	99Q	PEIK98 KWNH	52 – 76 h (Day 3) QPF
2200	0000 - 0000 0000 – 0000	94Q 98Q	PEIE41 KWBC PEII42 KWBC	Final 2 - 26 h (Day 1) QPF Final 26 - 50 h (Day 2) QPF

Table 9. Issuance time, valid time, product ID, and content of 24-hour QPF products.

11.3.2 Content. These products represent 24-hr isohyets depicting QPF amounts of 0.01, 0.10, 0.25, 0.5, 0.75, 1.0, 1.25, 1.5, 1.75, 2.0, 2.5, 3.0, 4.0… 9.0+ inches over the United States.

11.3.3 Format. Sample graphical product shown in Figure 12 (based on the gridded QPFs). Produce gridded products using the International GRIB (Gridded Binary) format. Produce contours for graphical product using predefined isohyets.

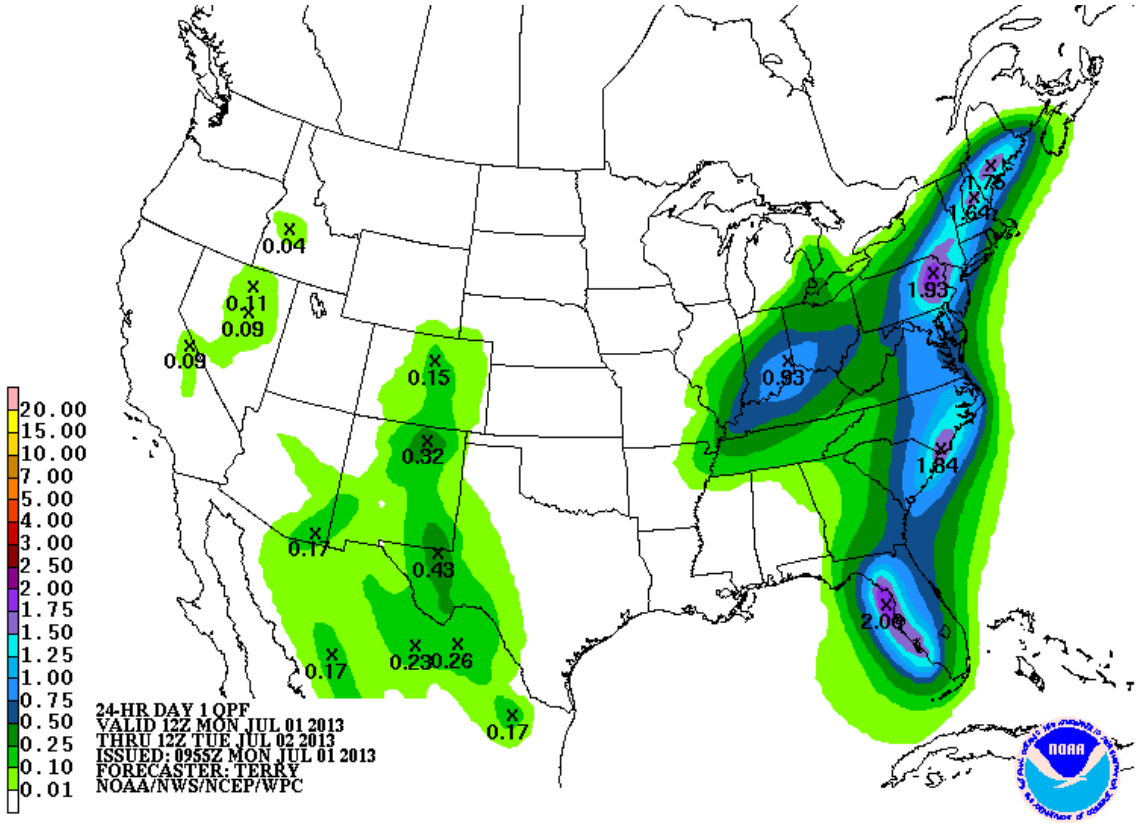

Figure 12. WPC 24-hr (Day 1, 2, or 3) QPF graphic showing expected precipitation, based on gridded data.

11.4 Update, Amendments, and Corrections. Update this product if requested by an RFC. Issue corrections as needed.

12. 48-Hour Quantitative Precipitation Forecast (Day 4 - 5) (95E). This product, prepared by the WPC, delineates QPF amount in the CONUS for the 48-hour period starting on day 4 and ending on day 5.

12.1 Mission Connection. These products help the NWS to meet its water forecasting mission by providing RFCs with forecast precipitation information used in the river modeling and forecasting process. The product also supports WFO public weather programs.

12.2 Issuance Guidelines.

12.2.1 Creation Software. Use N-AWIPS software to generate these products.

12.2.2 Issuance Criteria. Issue the product routinely.

12.2.3 Issuance Time. Issue products according to the schedule indicated in Table 10.

12.2.4 Valid Time. See Table 10.

12.3 Technical Description. Products should follow the format and content described in this section.

12.3.1 Dissemination. Issue these products on AWIPS using the identifiers and WMO headers in Table 10. The URL for products on the web is: http://www.wpc.ncep.noaa.gov/qpf/day4-7.shtml.

WPC CONUS Day 4-5 QPF Product Schedule				
Issuance Time (UTC)	**Valid Time (UTC)**	**AWIPS ID**	**WMO Header**	**Product Description**
0900	1200 – 1200	95E	PEIO46 KWBC	Final 72 - 120 h (Day 4-5) QPF
2030	0000 – 0000	95E	PEIO46 KWBC	Final 73 – 121 h (Day 4-5) QPF

Table 10. Issuance time, valid time, product ID, and content of day 4–5 48-hour QPF products.

12.3.2 Content. This product represents 48-hr isohyets depicting QPF amounts of 0.01, 0.10, 0.25, 0.5, 0.75, 1.0, 1.25, 1.5, 1.75, 2.0, 2.5, 3.0, 4.0… 9.0+ inches over the United States. On the web version of this product, the 6-hourly breakdown of the day 4-5 QPF can also be viewed as an animated forecast loop, with the same precipitation increments as the 48-hour product.

12.3.3 Format. Sample graphical product is shown in Figure 13 (based on the gridded QPFs). Produce gridded products using the International GRIB (Gridded Binary) format. Produce contours for graphical product using predefined isohyets.

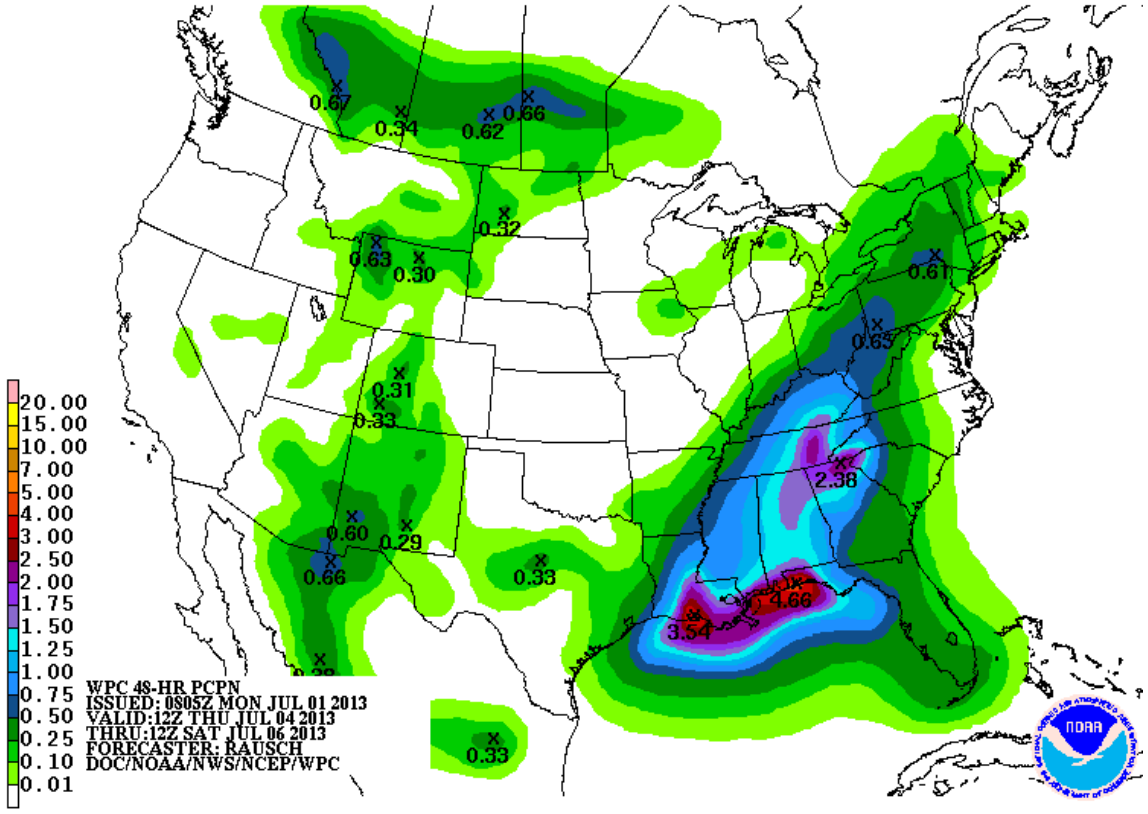

Figure 13. WPC 48-hr (Day 4-5) graphic showing expected precipitation, based on gridded data.

12.4 Update, Amendments, and Corrections. Update this product if requested by an RFC. Issue corrections as needed.

13. 5-Day Quantitative Precipitation Forecast (p120i). This product, prepared by the WPC, provides a 5-day CONUS QPF total.

13.1 Mission Connection. This product helps the NWS to meet its mission by highlighting areas expected to receive significant cumulative precipitation over the five day forecast horizon, thus providing information which can be used in near-term flood outlooks such as the Significant River Flood Outlook (see NWS Instruction 10-912 - *River Forecast Center Products Specification*). In addition, this product is used by the general public, the media and other government agencies for planning purposes.

13.2 Issuance Guidelines.

13.2.1 Creation Software. Use N-AWIPS software.

13.2.2 Issuance Criteria. Issue the product routinely.

13.2.3 Issuance Time. Twice daily – at 0900 UTC and 2030 UTC.

13.2.4 Valid Time. 1200 UTC on the day of issuance to 1200 UTC five days later.

13.3 Technical Description.

13.3.1 Dissemination. Disseminate on AWIPS. This product is available on the web at: http://www.wpc.ncep.noaa.gov/qpf/day1-7.shtml.

13.3.2 Content. This product depicts the 5-day total precipitation expected. It is produced by a simple arithmetic addition of 24-hour QPFs in the 94Q, 98Q, and 99Q products combined with the 48-hr QPF produced by the WPC medium range forecaster.

13.3.3 Format. Sample graphical product is shown in Figure 14 (based on the gridded QPFs). Produce gridded products using the International GRIB (Gridded Binary) format. Produce contours for graphical product using predefined isohyets.

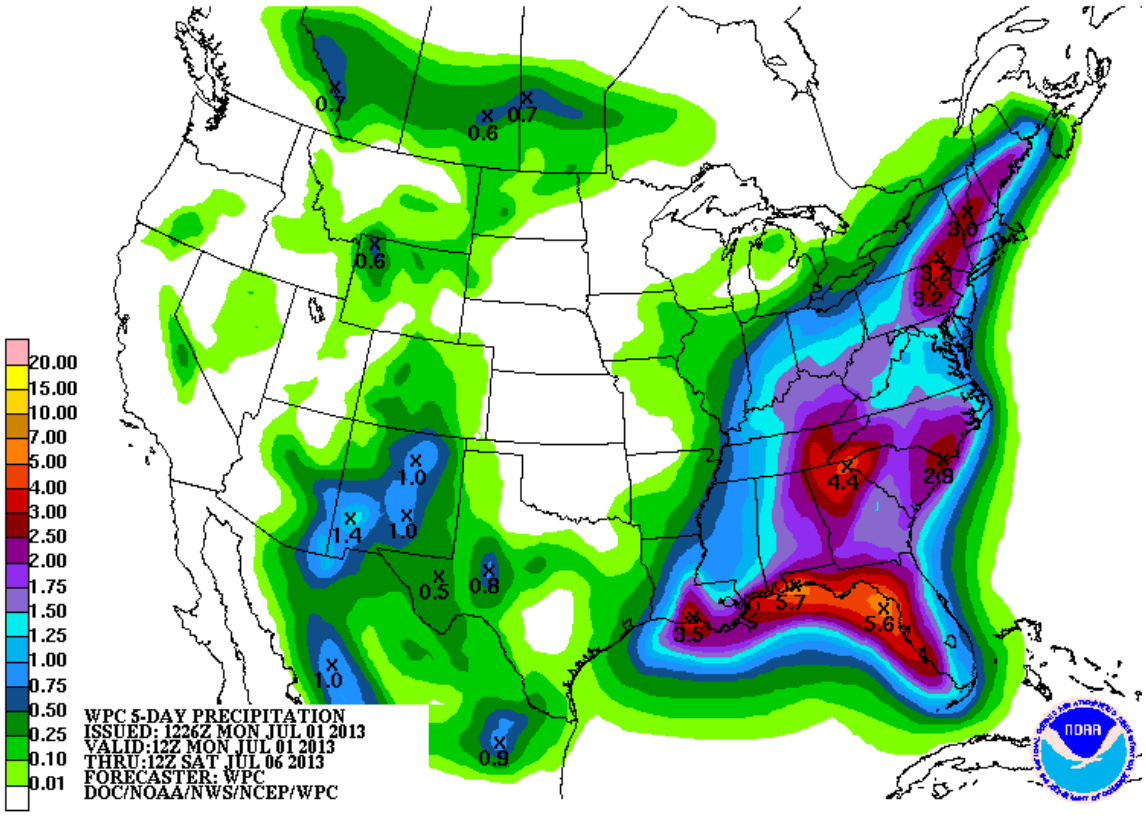

Figure 14. WPC 5-day QPF graphic showing expected precipitation, based on gridded data.

13.4 Updates, Amendments, and Corrections. WPC will update this product if conditions warrant. Corrections are sent out as needed.

14. 48-Hour Quantitative Precipitation Forecast (Day 6 - 7) (97E). This product, prepared by the WPC, delineates QPF amount in the CONUS for the 48-hour period starting on day 6 and ending on day 7.

14.1 Mission Connection. These products help the NWS to meet its water forecasting mission by providing RFCs with forecast precipitation information used in the river modeling and forecasting process. The product also supports WFO public weather programs.

14.2 Issuance Guidelines.

14.2.1 Creation Software. Use N-AWIPS software to generate these products.

14.2.2 Issuance Criteria. Issue the product routinely.

14.2.3 Issuance Time. Issue products according to the schedule indicated in Table 11.

14.2.4 Valid Time. See Table 11.

14.3 Technical Description. Products should follow the format and content described in this section.

14.3.1 Dissemination. Issue these products on AWIPS using the identifiers and WMO headers in Table 11. The URL for products on the web is: http://www.wpc.ncep.noaa.gov/qpf/day4-7.shtml.

WPC CONUS Day 6-7 QPF Product Schedule				
Issuance Time (UTC)	**Valid Time (UTC)**	**AWIPS ID**	**WMO Header**	**Product Description**
0900	1200 – 1200	97E	PEIS46 KWBC	Final 120 - 168 h (Day 6-7) QPF
2030	0000 – 0000	97E	PEIS46 KWBC	Final 121 – 169 h (Day 6-7) QPF

Table 11. Issuance time, valid time, product ID, and content of day 6–7 48-hour QPF products.

14.3.2 Content. This product represents 48-hr isohyets depicting QPF amounts of 0.01, 0.10, 0.25, 0.5, 0.75, 1.0, 1.25, 1.5, 1.75, 2.0, 2.5, 3.0, 4.0… 9.0+ inches over the United States. On the web version of this product, the 6-hourly breakdown of the day 6-7 QPF can also be viewed as an animated forecast loop, with the same precipitation increments as the 48-hour product.

14.3.3 Format. Sample graphical product is shown in Figure 15 (based on the gridded QPFs). Produce gridded products using the International GRIB (Gridded Binary) format. Produce contours for graphical product using predefined isohyets.

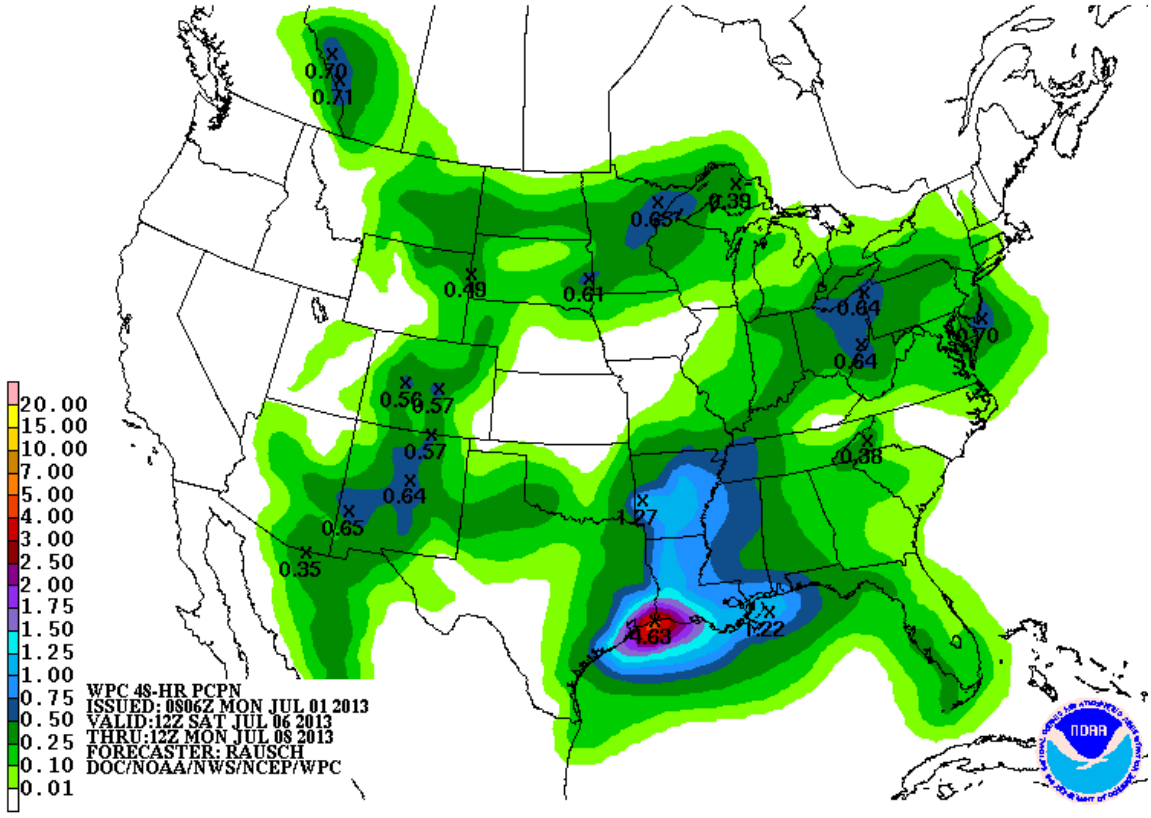

Figure 15. WPC 48-hr QPF (Day 6-7) graphic showing expected precipitation, based on gridded data.

14.4 Update, Amendments, and Corrections. Update this product if requested by an RFC. Issue corrections as needed.

15. 7-Day Quantitative Precipitation Forecast (p168i). This product, prepared by the WPC, provides a 7-day CONUS QPF total.

15.1 Mission Connection. This product helps the NWS to meet its mission by highlighting areas expected to receive significant cumulative precipitation over the seven day forecast horizon, thus providing information which can be used in near-term flood outlooks such as the Significant River Flood Outlook (see NWS Instruction 10-912 - *River Forecast Center Products Specification*). In addition, this product is used by the general public, the media and other government agencies for planning purposes.

15.2 Issuance Guidelines.

15.2.1 Creation Software. Use N-AWIPS software.

15.2.2 Issuance Criteria. This product is issued on a regular schedule.

15.2.3 Issuance Time. Twice daily – at 0900 UTC and 2030 UTC.

15.2.4 Valid Time. 1200 UTC on the day of issuance to 1200 UTC seven days later.

15.3 Technical Description.

15.3.1 Dissemination. Disseminate on AWIPS. This product is available on the web at: http://www.wpc.ncep.noaa.gov/qpf/day1-7.shtml.

15.3.2 Content. This product depicts the 7-day total precipitation expected. It is produced by a simple arithmetic addition of 24-hour QPFs in the 94Q, 98Q, and 99Q products combined with the 48-hr QPFs for days 4-5 and 6-7 produced by the WPC medium range forecaster.

15.3.3 Format. Sample graphical product is shown in Figure 16 (based on the gridded QPFs). Produce gridded products using the International GRIB (Gridded Binary) format. Produce contours for graphical product using predefined isohyets.

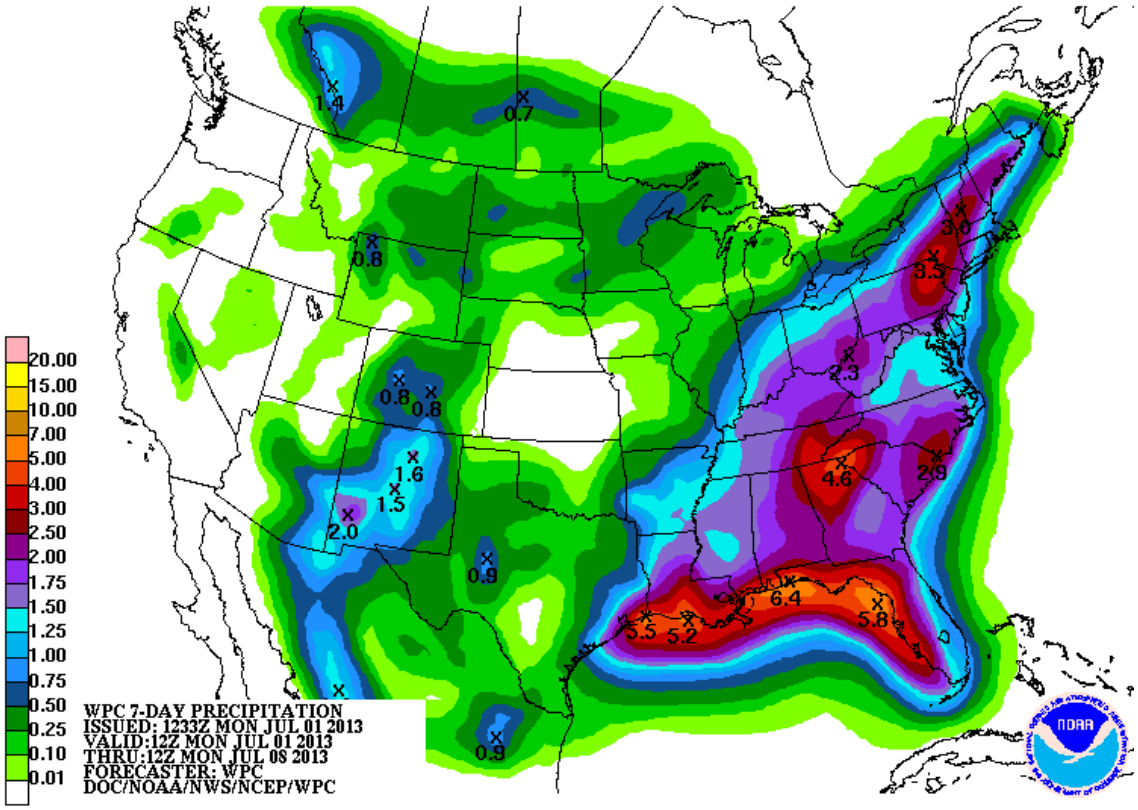

Figure 16. WPC 7-day QPF graphic showing expected precipitation, based on gridded data.

15.4 Updates, Amendments, and Corrections. WPC will update this product if conditions warrant. Corrections are sent out as needed.

16. Quantitative Precipitation Forecast Discussion (PFD). This product, prepared by the WPC, provides a discussion supporting QPF products in the CONUS for days 1, 2, and 3 (94Q, 98Q, 99Q).

16.1 Mission Connection. This product helps the NWS meet its mission by maximizing forecaster understanding of QPF products, thus ensuring production of the best possible hydrologic forecast information for partners and other users.

16.2 Issuance Guidelines.

16.2.1 Creation Software. Use appropriate COTS word processing software.

16.2.2 Issuance Criteria. Issue the product routinely.

16.2.3 Issuance Time. 2300, 0700, 1100, and 1900 UTC.

16.2.4 Valid Time. 0000-0000 UTC and 1200-1200 UTC. The product expires after valid time.

16.3 Technical Description. The quantitative precipitation forecast discussion should follow the format and content described in this section. It is published on the web at: http://www.wpc.ncep.noaa.gov/discussions/qpfpfd.html .

16.3.1 MND Header. Use QUANTITATIVE PRECIPITATION FORECAST DISCUSSION.

16.3.2 Content. A text message describing the meteorological reasoning used to create the 94Q, 98Q, and 99Q products.

16.3.3 Format. The generic format is shown in Figure 17.

```
FXUS04 KWBC ddhhmm
QPFPFD

QUANTITATIVE PRECIPITATION FORECAST DISCUSSION
NWS WEATHER PREDICTION CENTER COLLEGE PARK MD
Time am/pm time_zone day mon dd yyyy

FINAL DAY 1...DAY 2 AND DAY 3 QPF DISCUSSION
VALID mon dd/hhmm UTC THRU mon dd/hhmm UTC
REFERENCE AWIPS GRAPHICS UNDER...PRECIP ACCUM - 24HR
<Highlight(s) for all days>
DAY 1...

<Discussion for day 1>
DAY 2...

<Discussion for day 2>
DAY 3...

<Discussion for day 3
<forecaster name(s)>
GRAPHICS AVAILABLE ON THE WEB AT www.wpc.ncep.noaa.gov

<QPF vector coordinates>

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Figure 17. Generic format for Quantitative Precipitation Forecast Discussion.

16.4 Updates, Amendments, and Corrections. Do not issue updates. Correct for format and grammatical errors as required.

17. Mesoscale Precipitation Discussion (MPD). The WPC prepares these products to identify areas where heavy rainfall events are expected in the next 6 hours and mesoscale features supporting the anticipated heavy rainfall.

17.1 Mission Connection. This guidance conveys to CONUS WFOs, RFCs, the media, the public, emergency managers, and other interested partners the location and current meteorological reasoning for heavy rainfall that may lead to flash flooding.

17.2 Issuance Guidelines.

17.2.1 Creation Software. Use N-AWIPS software and appropriate COTS word processing software.

17.2.2 Issuance Criteria. WPC should issue a MPD for the following situations:

The issuance of an MPD is focused on either ongoing or anticipated areas of organized heavy rainfall that are expected to generate a threat of flash flooding. Ideally, the MPD should be issued with as much lead time as possible (1 to 6 hours into the future), as it relates to the potential onset of flash flooding. MPDs will also be issued for events where conditions with time are appearing less conducive for flash flooding or to indicate that the threat for flash flooding has ended.

17.2.3 Issuance Time. MPDs are non-scheduled, event-driven products.

17.2.4 Valid Time. The valid time is from the time of issuance until expiration time.

17.3 Technical Description. Products should follow the format and content described in this section.

17.3.1 UGC Type. MPDs will use the Zone (Z) code of the UGC.

17.3.2 MND Header. Use MESOSCALE PRECIPITATION DISCUSSION nnnn, where nnnn is a four-digit number reset to 0001 on 1 January at 0000 UTC.

17.3.3 Content. A graphic indicating the area of concern and any pertinent meteorological features as well as a brief text discussion focused on the mesoscale features supporting the anticipated heavy rainfall. The potential for flash flooding within the area of concern will be highlighted by one of three headlines:

- FLASH FLOODING LIKELY – High confidence exists that environmental conditions are favorable, or will become favorable, for heavy rainfall that will result in flash flooding.
- FLASH FLOODING POSSIBLE – Environmental conditions are favorable, or will become favorable, for heavy rainfall, but there are questions about how the event will evolve and/or whether flash flooding will occur.
- FLASH FLOODING UNLIKELY – High confidence exists that environmental conditions are unfavorable, or will become unfavorable, for heavy rainfall that will result in flash flooding.

While flash flooding is caused by a variety of factors (e.g., intense rainfall, dam failure, ice jams), this product will only focus on flash floods triggered by intense rainfall that occurs over a sufficient areal coverage. Localized flash flooding is not considered.

17.3.4 Format. The generic format is shown in Figure 18.

(Mesoscale Precipitation Discussion)

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AWUS01 KWNH ddhhmm
FFGMPD
STZ000-STZ000-ddhhmm-

MESOSCALE PRECIPITATION DISCUSSION nnnn
NWS WEATHER PREDICTION CENTER COLLEGE PARK MD
Time am/pm time_zone day mon dd yyyy

AREAS AFFECTED...(PORTION OF STATES OR GEOGRAPHICAL AREAS)...

CONCERNING...HEAVY RAINFALL...(TYPE OF POTENTIAL FOR FLASH FLOODING)

VALID DDHHMMZ - DDHHMMZ

SUMMARY...A concise statement regarding the forecast (timing, coverage,
intensity, and mode) of the heavy rainfall event.

DISCUSSION...The description of significant mesoscale features and
atmospheric processes which will likely result in the heavy rainfall event.

FORECASTER NAME

...PLEASE SEE WWW.WPC.NCEP.NOAA.GOV FOR GRAPHIC PRODUCT...

ATTN...WFO...WFO A...WFO B... (affected WFOs)

ATTN...RFC...RFC A...RFC B... (affected RFCs)

LAT...LON AAaaBBbb AAaaBBbb AAaaBBbb AAaaBBbb AAaaBBbb AAaaBBbb
          AAaaBBbb AAaaBBbb (corner points for MPD graphic)

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(Mesoscale Precipitation Discussion Graphic)

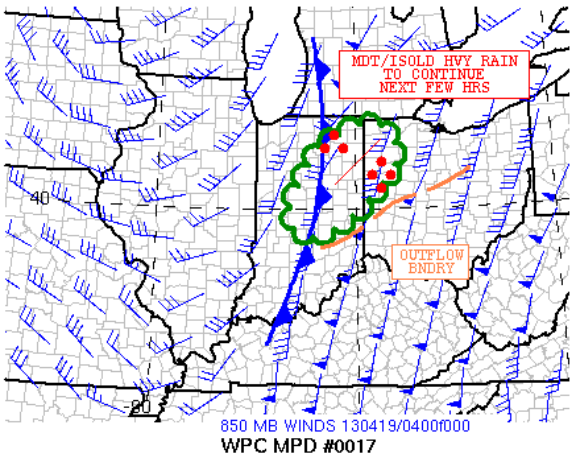

Figure 18. Mesoscale Precipitation Discussion format, where AAaa=Latitude north in degrees to two decimal places (without decimal point), BBbb=Longitude west in degrees to two decimal places (without decimal point and without leading 1 west of 100 degrees west).

17.4 Updates, Amendments, and Corrections. Issue MPDs as needed and there are no updates or amendments. Correct for format and grammatical errors.

Appendix A – Hydrometeorological Automated Data System Report (RRS) Product Headers For Individual Weather Forecast Offices and River Forecast Centers

(Reference Section 2)

Table A-1. RRS product headers, by WFO.

WFO	WMO Header	AWIPS Header
Aberdeen SD	SXUS42 KWOH	RRS ABR
Albany NY	SRUS38 KWOH	RRS ALY
Albuquerque NM	SRUS75 KWOH	RRS ABQ
Amarillo TX	SRUS76 KWOH	RRS AMA
Anchorage AK	SRAK40 KWOH	RRS AFC
Atlanta GA	SRUS59 KWOH	RRS FFC
Austin/San Antonio TX	SRUS82 KWOH	RRS EWX
Baltimore MD/Washington DC	SRUS47 KWOH	RRS LWX
Billings MT	SXUS58 KWOH	RRS BYZ
Binghamton NY	SRUS37 KWOH	RRS BGM
Birmingham AL	SRUS67 KWOH	RRS BMX
Bismarck ND	SXUS52 KWOH	RRS BIS
Boise ID	SXUS69 KWOH	RRS BOI
Boston MA	SRUS39 KWOH	RRS BOX
Brownsville TX	SRUS85 KWOH	RRS BRO
Buffalo NY	SRUS36 KWOH	RRS BUF
Burlington VT	SRUS35 KWOH	RRS BTV
Caribou ME	SRUS33 KWOH	RRS CAR
Central Illinois IL	SXUS30 KWOH	RRS ILX
Central Pennsylvania PA	SRUS42 KWOH	RRS CTP
Charleston SC	SRUS55 KWOH	RRS CHS
Charleston WV	SRUS46 KWOH	RRS RLX
Cheyenne WY	SXUS54 KWOH	RRS CYS
Chicago IL	SXUS31 KWOH	RRS LOT
Cincinnati OH	SRUS45 KWOH	RRS ILN
Cleveland OH	SRUS44 KWOH	RRS CLE
Columbia SC	SRUS54 KWOH	RRS CAE
Corpus Christi TX	SRUS84 KWOH	RRS CRP
Dallas/Fort Worth TX	SRUS80 KWOH	RRS FWD
Denver CO	SXUS55 KWOH	RRS BOU
Des Moines IA	SXUS40 KWOH	RRS DMX
Detroit MI	SXUS21 KWOH	RRS DTX
Dodge City KS	SXUS47 KWOH	RRS DDC
Duluth MN	SXUS35 KWOH	RRS DLH
Eastern North Dakota ND	SXUS41 KWOH	RRS FGF
El Paso TX	SRUS79 KWOH	RRS EPZ
Elko NV	SXUS68 KWOH	RRS LKN
Eureka CA	SXUS77 KWOH	RRS EKA

Fairbanks AK	SRAK41 KWOH	RRS AFG
Flagstaff AZ	SXUS64 KWOH	RRS FGZ
Glasgow MT	SXUS59 KWOH	RRS GGW
Goodland KS	SXUS48 KWOH	RRS GLD
Grand Junction CO	SXUS57 KWOH	RRS GJT
Grand Rapids MI	SXUS22 KWOH	RRS GRR
Great Falls MT	SXUS60 KWOH	RRS TFX
Green Bay WI	SXUS33 KWOH	RRS GRB
Greenville/Spartanburg SC	SRUS53 KWOH	RRS GSP
Guam PC	SRPA41 KWOH	RRS GUM
Hastings NE	SXUS49 KWOH	RRS GID
Honolulu HI	SRPA40 KWOH	RRS HFO
Houston/Galveston TX	SRUS83 KWOH	RRS HGX
Indianapolis IN	SXUS24 KWOH	RRS IND
Jackson KY	SXUS25 KWOH	RRS JKL
Jackson MS	SRUS68 KWOH	RRS JAN
Jacksonville FL	SRUS60 KWOH	RRS JAX
Juneau AK	SRAK42 KWOH	RRS AJK
Kansas City MO	SXUS39 KWOH	RRS EAX
Key West FL	SRUS63 KWOH	RRS EYW
Knoxville/Tri Cities TN	SRUS56 KWOH	RRS MRX
La Crosse WI	SXUS37 KWOH	RRS ARX
Lake Charles LA	SRUS69 KWOH	RRS LCH
Las Vegas NV	SXUS67 KWOH	RRS VEF
Little Rock AR	SRUS72 KWOH	RRS LZK
Los Angeles CA	SXUS80 KWOH	RRS LOX
Louisville KY	SXUS26 KWOH	RRS LMK
Lubbock TX	SRUS77 KWOH	RRS LUB
Marquette MI	SXUS34 KWOH	RRS MQT
Medford OR	SXUS74 KWOH	RRS MFR
Melbourne FL	SRUS61 KWOH	RRS MLB
Memphis TN	SRUS58 KWOH	RRS MEG
Miami FL	SRUS62 KWOH	RRS MFL
Midland/Odessa TX	SRUS78 KWOH	RRS MAF
Milwaukee WI	SXUS32 KWOH	RRS MKX
Minneapolis MN	SXUS36 KWOH	RRS MPX
Missoula MT	SXUS61 KWOH	RRS MSO
Mobile AL	SRUS66 KWOH	RRS MOB
Morehead City NC	SRUS51 KWOH	RRS MHX
Nashville TN	SRUS57 KWOH	RRS OHX
New Orleans/Baton Rouge LA	SRUS70 KWOH	RRS LIX
New York City NY	SRUS40 KWOH	RRS OKX
North Central Lower Michigan MI	SXUS20 KWOH	RRS APX
North Platte NE	SXUS50 KWOH	RRS LBF

Northern Indiana IN	SXUS23 KWOH	RRS IWX
Oklahoma City OK	SRUS74 KWOH	RRS OUN
Omaha NE	SXUS44 KWOH	RRS OAX
Paducah KY	SXUS27 KWOH	RRS PAH
Pendleton OR	SXUS72 KWOH	RRS PDT
Philadelphia PA./Mt Holly NJ	SRUS41 KWOH	RRS PHI
Phoenix AZ	SXUS66 KWOH	RRS PSR
Pittsburgh PA	SRUS43 KWOH	RRS PBZ
Pocatello/Idaho Falls ID	SXUS62 KWOH	RRS PIH
Portland ME	SRUS34 KWOH	RRS GYX
Portland OR	SXUS73 KWOH	RRS PQR
Pueblo CO	SXUS56 KWOH	RRS PUB
Quad Cities IA	SXUS38 KWOH	RRS DVN
Raleigh/Durham NC	SRUS50 KWOH	RRS RAH
Rapid City SD	SXUS51 KWOH	RRS UNR
Reno NV	SXUS75 KWOH	RRS REV
Riverton WY	SXUS53 KWOH	RRS RIW
Roanoke VA	SRUS49 KWOH	RRS RNK
Sacramento CA	SXUS76 KWOH	RRS STO
Salt Lake City UT	SXUS63 KWOH	RRS SLC
San Angelo TX	SRUS81 KWOH	RRS SJT
San Diego CA	SXUS81 KWOH	RRS SGX
San Francisco Bay Area CA	SXUS78 KWOH	RRS MTR
San Joaquin Valley CA	SXUS79 KWOH	RRS HNX
San Juan PR	SRUS86 KWOH	RRS SJU
Seattle/Tacoma WA	SXUS71 KWOH	RRS SEW
Shreveport LA	SRUS71 KWOH	RRS SHV
Sioux Falls SD	SXUS43 KWOH	RRS FSD
Spokane WA	SXUS70 KWOH	RRS OTX
Springfield MO	SXUS28 KWOH	RRS SGF
St. Louis MO	SXUS29 KWOH	RRS LSX
Tallahassee FL	SRUS65 KWOH	RRS TAE
Tampa Bay Area FL	SRUS64 KWOH	RRS TBW
Topeka KS	SXUS45 KWOH	RRS TOP
Tucson AZ	SXUS65 KWOH	RRS TWC
Tulsa OK	SRUS73 KWOH	RRS TSA
Wakefield VA	SRUS48 KWOH	RRS AKQ
Wichita KS	SXUS46 KWOH	RRS ICT
Wilmington NC	SRUS52 KWOH	RRS ILM

Table A-2. RRS product headers, by RFC.

RFC	WMO Header	AWIPS Header

Alaska-Pacific RFC	SRUS32 KWOH	RRS ACR
Arkansas-Red Basin RFC	SRUS26 KWOH	RRS TUA
California-Nevada RFC	SRUS30 KWOH	RRS RSA
Colorado Basin RFC	SRUS29 KWOH	RRS STR
Lower Mississippi RFC	SRUS24 KWOH	RRS ORN
Middle Atlantic RFC	SRUS21 KWOH	RRS RHA
Missouri Basin RFC	SRUS27 KWOH	RRS KRF
North Central RFC	SRUS28 KWOH	RRS MSR
Northeast RFC	SRUS20 KWOH	RRS TAR
Northwest RFC	SRUS31 KWOH	RRS PTR
Ohio RFC	SRUS22 KWOH	RRS TIR
Southeast RFC	SRUS23 KWOH	RRS ALR
West Gulf RFC	SRUS25 KWOH	RRS FWR

Appendix B – Acronyms

ABRFC	Arkansas-Red Basin River Forecast Center
AHPS	Advanced Hydrologic Prediction Service
APRFC	Alaska-Pacific River Forecast Center
AWIPS	Advanced Weather Interactive Processing System
CBRFC	Colorado Basin River Forecast Center
CNRFC	California Nevada River Forecast Center
CONUS	Conterminous United States
COTS	Commercial Off-The-Shelf
ERD	Excessive Rainfall Discussion
FFG	Flash Flood Guidance
GIS	Geographic Information System
GRIB	Gridded Binary
HADS	Hydrometeorological Automated Data System
HSA	Hydrologic Service Area
LMRFC	Lower Mississippi River Forecast Center
MARFC	Middle Atlantic River Forecast Center
MBRFC	Missouri Basin River Forecast Center
MND	Mass News Disseminator
N-AWIPS	National Centers- Advanced Weather Interactive Processing System
NCEP	National Centers for Environmental Prediction
NCRFC	North Central River Forecast Center
NOAA	National Oceanic and Atmospheric Administration
NOHRSC	National Operational Hydrologic Remote Sensing Center
NRCS	National Resources Conservation Service
NSA	National Snow Analysis
NWRFC	Northwest River Forecast Center
NWS	National Weather Service
OPPS	Operational Product Processing System
QPF	Quantitative Precipitation Forecast
RFC	River Forecast Center
RSS	Really Simple Syndication
SERFC	Southeast River Forecast Center
SHEF	Standard Hydrometeorological Exchange Format
SNOTEL	Snowpack Telemetry
SWE	Snow Water Equivalent
USGS	U.S. Geological Survey
UTC	Coordinated Universal Time
WFO	Weather Forecast Office
WMO	World Meteorological Organization
WPC	Weather Prediction Center