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Operations and Services
Water Resources Services Program, NWSPD 10-9

NATIONAL WATER RESOURCES PRODUCTS SPECIFICATION

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

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SUMMARY OF REVISIONS: This directive supersedes NWS Instruction 10-930, "National Hydrologic Products Specification," dated January 3, 2018. Changes include the following:

1) Noted that the Weather Prediction Center (WPC) will issue the first scheduled update to the Day 1 Excessive Rainfall Outlook (ERO) at 1600 UTC instead of 1500 UTC.
2) Noted the consolidation of WPC's Quantitative Precipitation Forecast Discussion and Excessive Rainfall Discussion.
3) Noted that the high risk category can now be used in the Day 3 ERO.

Signed 7/17/2019

Andrew D. Stern Date
Director
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National Water Resources Products Specification

Table of Contents: Page

1. Introduction....6

2. Hydrometeorological Automated Data System Report (RRS)....6
2.1 Mission Connection....6
2.2 Issuance Guidelines....6
2.2.1 Creation Software....6
2.2.2 Issuance Time....6
2.3 Technical Description....6
2.3.1 Dissemination....6
2.3.2 Content....6
2.3.3 Format....7

3. Daily SNOTEL Report (RSD)....7
3.1 Mission Connection....7
3.2 Issuance Guidelines....7
3.2.1 Creation Software....7
3.2.2 Issuance Time....7
3.3 Technical Description....7
3.3.1 Dissemination....7
3.3.2 Content....7
3.3.3 Format....8

4. Monthly SNOTEL Report (RSM)....8
4.1 Mission Connection....8
4.2 Issuance Guidelines....8
4.2.1 Creation Software....8
4.2.2 Issuance Time....8
4.3 Technical Description....8
4.3.1 Dissemination....8
4.3.2 Content....8
4.3.3 Format....9

5. Airborne Survey Gamma Product (RRM)....9
5.1 Mission Connection....9
5.2 Issuance Guidelines....9
5.2.1 Creation Software....9
5.2.2 Issuance Criteria....9
5.2.3 Issuance Time....9
5.3 Technical Description....9
5.3.1 Dissemination....9
5.3.2 Content....9
5.3.3 Format....10

6. Modeled Areal Extent of Snow Cover Product (SCV)....10

6.1 Mission Connection....10
6.2 Issuance Guidelines....10
6.2.1 Creation Software....10
6.2.2 Issuance Criteria....10
6.2.3 Issuance Time....10
6.3 Technical Description....10
6.3.1 Dissemination....10
6.3.2 Content....11
6.3.3 Format....11

7. Modeled Snow Water Equivalent by Basin Product (SWE)....12
7.1 Mission Connection....12
7.2 Issuance Guidelines....12
7.2.1 Creation Software....12
7.2.2 Issuance Criteria....12
7.2.3 Issuance Time....12
7.3 Technical Description....12
7.3.1 Dissemination....12
7.3.2 Content....13
7.3.3 Format....13

8. Excessive Rainfall Outlook (94E, 98E, 99E)....13
8.1 Mission Connection....14
8.2 Issuance Guidelines....14
8.2.1 Creation Software....14
8.2.2 Issuance Criteria....14
8.2.3 Issuance Time....14
8.2.4 Valid Time....14
8.3 Technical Description....14
8.3.1 Dissemination....14
8.3.2 Content....15
8.3.3 Format....15
8.4 Updates, Amendments, and Corrections....17

9. Excessive Rainfall Discussion (ERD)....17
9.1 Mission Connection....17
9.2 Issuance Guidelines....17
9.2.1 Creation Software....17
9.2.2 Issuance Criteria....17
9.2.3 Issuance Time....17
9.2.4 Valid Time....17
9.2.5 Product Expiration Time....17
9.3 Technical Description....17
9.3.1 Dissemination....17
9.3.2 Content....17
9.3.3 Format....18
9.4 Updates, Amendments, and Corrections....18

10. 6-Hour Quantitative Precipitation Forecasts (Day 1- 3) 18
10.1 Mission Connection 18
10.2 Issuance Guidelines 18
10.2.1 Creation Software 19
10.2.2 Issuance Criteria 19
10.2.3 Issuance Time 19
10.2.4 Valid Time 21
10.3 Technical Description 21
10.3.1 Dissemination 21
10.3.2 Content 21
10.3.3 Format 21
10.4 Updates, Amendments, and Corrections 23

11. 24-Hour Quantitative Precipitation Forecast (Day 1 - 3) 23
11.1 Mission Connection 23
11.2 Issuance Guidelines 23
11.2.1 Creation Software 23
11.2.2 Issuance Criteria 23
11.2.3 Issuance Time 23
11.2.4 Valid Time 23
11.3 Technical Description 23
11.3.1 Dissemination 23
11.3.2 Content 24
11.3.3 Format 24
11.4 Update, Amendments, and Corrections 25

12. 48-Hour Quantitative Precipitation Forecast (Day 4 - 5) (95E) 25
12.1 Mission Connection 25
12.2 Issuance Guidelines 25
12.2.1 Creation Software 25
12.2.2 Issuance Criteria 25
12.2.3 Issuance Time 25
12.2.4 Valid Time 25
12.3 Technical Description 25
12.3.1 Dissemination 26
12.3.2 Content 26
12.3.3 Format 26
12.4 Update, Amendments, and Corrections 27

13. 5-Day Quantitative Precipitation Forecast (p120i) 27
13.1 Mission Connection 27
13.2 Issuance Guidelines 27
13.2.1 Creation Software 27
13.2.2 Issuance Criteria 27
13.2.3 Issuance Time 27
13.2.4 Valid Time 27
13.3 Technical Description 27
13.3.1 Dissemination 27

13.3.2 Content 28
13.3.3 Format....28
13.4 Updates, Amendments, and Corrections 28

14. 48-Hour Quantitative Precipitation Forecast (Day 6 - 7) (97E) 28
14.1 Mission Connection....28
14.2 Issuance Guidelines....28
14.2.1 Creation Software....28
14.2.2 Issuance Criteria....28
14.2.3 Issuance Time....29
14.2.4 Valid Time....29
14.3 Technical Description....29
14.3.1 Dissemination....29
14.3.2 Content 29
14.3.3 Format....29
14.4 Update, Amendments, and Corrections....30

15. 7-Day Quantitative Precipitation Forecast (p168i)....30
15.1 Mission Connection....30
15.2 Issuance Guidelines....30
15.2.1 Creation Software....30
15.2.2 Issuance Criteria....30
15.2.3 Issuance Time....30
15.2.4 Valid Time....30
15.3 Technical Description....30
15.3.1 Dissemination....30
15.3.2 Content 31
15.3.3 Format....31
15.4 Updates, Amendments, and Corrections 31

16. Mesoscale Precipitation Discussion (MPD) 31
16.1 Mission Connection....31
16.2 Issuance Guidelines....31
16.2.1 Creation Software....31
16.2.2 Issuance Criteria....31
16.2.3 Issuance Time....32
16.2.4 Valid Time....32
16.3 Technical Description....32
16.3.1 Dissemination....32
16.3.2 UGC Type 32
16.3.3 Content 32
16.3.4 Format....32
16.4 Updates, Amendments, and Corrections 34

Appendix A – Hydrometeorological Automated Data System Report (RRS) Product Headers For Individual WFOs, RFCs, and NCEP.... A-1
Appendix B – Acronyms....B-1

1. Introduction. This directive describes issuance criteria, content, and format of water resources 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 water resources products available only through the Internet are described in *NWSI 10-932, National Hydrologic 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), which has been integrated into the Meteorological Assimilation Data Ingest System (MADIS). The home page for HADS is: https://hads.ncep.noaa.gov. Data collection platform (DCP) and user support requests should be emailed to hadsteam@noaa.gov. Report any outages to MADIS Support at 301-683-3943 or ncep.list.madis_support@noaa.gov during normal business hours or the Senior Duty Meteorologist (SDM) during non-business hours at 301-683-1500 or SDM@noaa.gov.

2.1 Mission Connection. HADS reports support the NWS mission by providing critical automated sensor data which is used in National Centers for Environmental Prediction (NCEP) operations, River Forecast Center (RFC) operations, Weather Forecast Office (WFO) water resources 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 two 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, RFC, and NCEP are contained in Appendix A.

2.3.2 Content. Messages contain automated river, reservoir, precipitation, temperature, water quality, and fire weather observations.

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

```
SXUS37 KWOH ddhhmm                    (Unique WMO header for each office, see Appendix A)
RRSxxx                                (AWIPS ID, special format approved for HADS)
:
:&&HADS SOR REPORT FOR USER xxx
<One or more lines of SHEF-encoded data>
:END OF REPORT
```

Figure 1. Generic format for HADS Report (RRS).

3. Daily SNOTEL Report (RSD). The SNOwpack TELemetry (SNOTEL) network operated by the Natural Resources Conservation Service (NRCS) provides automated snow water equivalent (SWE), precipitation, temperature, and other hydrometeorological data from high elevation areas of the western U.S. and Alaska. MADIS collects and processes SNOTEL data and creates RSD products for dissemination.

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 precipitation and snow pack conditions in support of the NWS water resources services program.

3.2 Issuance Guidelines.

3.2.1 Creation Software. MADIS creates these products.

3.2.2 Issuance Time. MADIS produces and transmits messages on an hourly and daily basis.

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 KWBC	RSDAK
Arizona	CXUS86 KWBC	RSDAZ
California	CXUS86 KWBC	RSDCA
Colorado	CXUS86 KWBC	RSDCO
Idaho	CXUS86 KWBC	RSDID
Montana	CXUS86 KWBC	RSDMT
Nevada	CXUS86 KWBC	RSDNV
New Mexico	CXUS86 KWBC	RSDNM
Oregon	CXUS86 KWBC	RSDOR
South Dakota	CXUS86 KWBC	RSDSD
Utah	CXUS86 KWBC	RSDUT
Washington	CXUS86 KWBC	RSDWA
Wyoming	CXUS86 KWBC	RSDWY

Table 1. Daily SNOTEL Report (RSD) 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.

```
CXUS86 KWBC ddhhmm
RSDxx
:  SOURCE OF DATA
:  U.S. DEPT. OF AGRICULTURE - Natural Resources Conservation Service.
:  PROVISIONAL DATA, SUBJECT TO REVISION.
:
 <SHEF-encoded SNOTEL data>
.END
:
: <Comments if required>
```

Figure 2. Generic format for Daily SNOTEL Report (RSD).

4. Monthly SNOTEL Report (RSM). Monthly SNOTEL Reports contain summaries of SNOTEL network observations which have been quality controlled by the NRCS. MADIS collects and processes these quality-controlled data and creates RSM products for dissemination.

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 snowmelt runoff.

4.2 Issuance Guidelines.

4.2.1 Creation Software. MADIS creates these products.

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 snowmelt season.

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 KWBC	RSMAK
Arizona	CSUS86 KWBC	RSMAZ
California	CSUS86 KWBC	RSMCA
Colorado	CSUS86 KWBC	RSMCO
Idaho	CSUS86 KWBC	RSMID
Montana	CSUS86 KWBC	RSMMT
Nevada	CSUS86 KWBC	RSMNV
New Mexico	CSUS86 KWBC	RSMNM
Oregon	CSUS86 KWBC	RSMOR
South Dakota	CSUS86 KWBC	RSMSD
Utah	CSUS86 KWBC	RSMUT
Washington	CSUS86 KWBC	RSMWA
Wyoming	CSUS86 KWBC	RSMWY

Table 2. Monthly SNOTEL Report (RSM) headers by state.

4.3.2 Content. Messages contain precipitation and snow water equivalent amounts.

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 KWBC ddhhmm
RSMxx
: SOURCE OF DATA
: U.S. DEPT. OF AGRICULTURE - Natural Resources Conservation Service.
: PROVISIONAL DATA, SUBJECT TO REVISION.
:
 <SHEF-encoded SNOTEL data>
.END
:
: <Comments if required>
```

Figure 3. Generic format for Monthly SNOTEL Report (RSM).

5. Airborne Survey Gamma Product (RRM). These products are prepared by the Office of Water Prediction (OWP). They contain 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 SWE. 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 OWP web page at http://www.nohrsc.noaa.gov/snowsurvey/.

AWIPS ID	WMO Header	Description
RRMASB	SRUS43 KMSR	Airborne Soil Moisture by Basin
RRMASF	SRUS43 KMSR	Airborne Soil Moisture by Flight Line
RRMASP	SRUS43 KMSR	Airborne SWE by Flight Line
RRMASW	SRUS43 KMSR	Airborne Estimated SWE by Basin

Table 3. Airborne Survey Gamma Product (RRM) 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 OWP Airborne Survey Gamma Product (RRM).

6. Modeled Areal Extent of Snow Cover Product (SCV). These OWP 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 0000 UTC, 0600 UTC, 1200 UTC, and 1800 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 OWP web page at: http://www.nohrsc.noaa.gov/shef_archive/.

AWIPS ID	WMO Header	Description
SCVACR	SRUS43 KMSR	Estimated SCV by Basin for APRFC
SCVALR	SRUS43 KMSR	Estimated SCV by Basin for SERFC
SCVFWR	SRUS43 KMSR	Estimated SCV by Basin for WGRFC
SCVKRF	SRUS43 KMSR	Estimated SCV by Basin for MBRFC
SCVMSR	SRUS43 KMSR	Estimated SCV by Basin for NCRFC
SCVORN	SRUS43 KMSR	Estimated SCV by Basin for LMRFC
SCVPTR	SRUS43 KMSR	Estimated SCV by Basin for NWRFC
SCVRHA	SRUS43 KMSR	Estimated SCV by Basin for MARFC
SCVRSA	SRUS43 KMSR	Estimated SCV by Basin for CNRFC
SCVSTR	SRUS43 KMSR	Estimated SCV by Basin for CBRFC
SCVTAR	SRUS43 KMSR	Estimated SCV by Basin for NERFC
SCVTIR	SRUS43 KMSR	Estimated SCV by Basin for OHRFC
SCVTUA	SRUS43 KMSR	Estimated SCV by Basin for ABRFC

Table 4. Modeled Areal Extent of Snow Cover Product (SCV) headers.

6.3.2 Content. SCV products 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 products.

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 a Modeled Areal Extent of Snow Cover Product (SCV).

7. Modeled Snow Water Equivalent by Basin Product (SWE). These products are prepared by the OWP. 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 SWE 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 0000 UTC, 0600 UTC, 1200 UTC, and 1800 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 OWP web page at: http://www.nohrsc.noaa.gov/shef_archive/.

AWIPS ID	WMO Header	Description
SWEACR	SRUS43 KMSR	Estimated SWE by Basin for APRFC
SWEALR	SRUS43 KMSR	Estimated SWE by Basin for SERFC
SWEFWR	SRUS43 KMSR	Estimated SWE by Basin for WGRFC
SWEKRF	SRUS43 KMSR	Estimated SWE by Basin for MBRFC
SWEMSR	SRUS43 KMSR	Estimated SWE by Basin for NCRFC
SWEORN	SRUS43 KMSR	Estimated SWE by Basin for LMRFC
SWEPTR	SRUS43 KMSR	Estimated SWE by Basin for NWRFC
SWERHA	SRUS43 KMSR	Estimated SWE by Basin for MARFC
SWERSA	SRUS43 KMSR	Estimated SWE by Basin for CNRFC
SWESTR	SRUS43 KMSR	Estimated SWE by Basin for CBRFC
SWETAR	SRUS43 KMSR	Estimated SWE by Basin for NERFC
SWETIR	SRUS43 KMSR	Estimated SWE by Basin for OHRFC
SWETUA	SRUS43 KMSR	Estimated SWE by Basin for ABRFC

Table 5. Modeled Snow Water Equivalent by Basin Product (SWE) 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 a Modeled Snow Water Equivalent by Basin Product (SWE).

8. Excessive Rainfall Outlook (94E, 98E, 99E). These products are prepared by the NCEP's Weather Prediction Center (WPC) for the CONUS. The products identify areas at risk of receiving one-, three-, or six-hour rain rates exceeding RFC flash flood guidance (FFG), which is an estimate of the amount of rainfall required over a given area during a given duration to cause small streams to flood. These estimates are based on the current soil moisture and streamflow conditions for the area. Excessive rainfall risk is expressed in categories which have corresponding probabilities, representing the probability of rainfall exceeding FFG within 25 miles (40 kilometers) of a point.

8.1 Mission Connection. These products support the NWS mission by providing NWS field offices with graphical information depicting the likelihood of rainfall exceeding FFG.

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	Valid Time (UTC)	AWIPS ID	WMO Header	Product Description
0830	1200 – 1200	RBG94E	MENC98 KWNH	Probability of rainfall exceeding FFG during the 24 hours of forecast valid time
1600	1600 – 1200	RBG94E	MENC98 KWNH	Probability of rainfall exceeding FFG during the 20 hours of forecast valid time
0100	0100 – 1200	RBG94E	MENC98 KWNH	Probability of rainfall exceeding FFG during the 11 hours of forecast valid time
Special Update	From variable issuance time to 1200 at the end point of the original 0830 UTC issuance	RBG94E	MENC98 KWNH	Probability of rainfall exceeding FFG during the period from the issuance hour to 12 UTC at the end time of the original 0830 UTC issuance
0830	1200 Day 2 – 1200 Day 3	RBG98E	MENS98 KWNH	Probability of rainfall exceeding FFG during the 24 hours of forecast valid time
0830	1200 Day 3 – 1200 Day 4	RBG99E	MENU98 KWNH	Probability of rainfall exceeding FFG during the 24 hours of forecast valid time
2030	1200 Day 2 – 1200 Day 3	RBG98E	MENS98 KWNH	Probability of rainfall exceeding FFG during the 24 hours of forecast valid time
2030	1200 Day 3 – 1200 Day 4	RBG99E	MENU98 KWNH	Probability of rainfall exceeding FFG during the 24 hours of forecast valid time

Table 6. Issuance time, valid time, product ID, and content of WPC Excessive Rainfall Outlooks (94E, 98E, 99E).

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. Uniform Resource Locators (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 over which the probability of rainfall exceeding FFG is noteworthy. Probabilities associated with the risk contours are neighborhood based, so the forecast represents the probability of rainfall exceeding FFG within 25 miles (40 kilometers) of any given point inside the contour. These products use one-, three- or six-hour FFG as produced daily by the CONUS RFCs. The Excessive Rainfall Outlooks include four categories of probability (Marginal, Slight, Moderate and High) and are based on FFG as it exists at the time of issuance. The outlooks are naturally aligned with WPC areal average quantitative precipitation forecasts, but also incorporate assessment of potential rain rate and duration on local scales and uncertainty as to exact placement. Text representation of the threat areas for Day 1, Day 2, and Day 3 may be found below the valid time for each day and via web links beneath the respective graphics.

8.3.3 Format. These products outline areas at risk from rainfall exceeding RFC FFG during the valid period for Day 1, Day 2, and Day 3 products. The probability categories and associated color codes used in this product are shown below in Table 7.

MARGINAL RISK 5-10%	5-10% chance of exceeding FFG
SLIGHT RISK 10-20%	10-20% chance of exceeding FFG
MODERATE RISK 20-50%	20-50% chance of exceeding FFG
HIGH RISK >50%	Greater than 50% chance of exceeding FFG

Table 7. Risk categories and forecast probabilities of rainfall exceeding FFG along with associated color codes used in WPC Excessive Rainfall Outlooks.

If conditions are not favorable or are not expected to become favorable for excessive rainfall, then "The probability of rainfall exceeding flash flood guidance is less than 5 percent" is appended to the graphic. The Marginal, Slight, Moderate, and High Risk areas are delineated by an enclosed solid line (with arrowhead). A sample Day 1 Excessive Rainfall Outlook is shown below in Figure 7 and a Day 2 Outlook is shown in Figure 8.

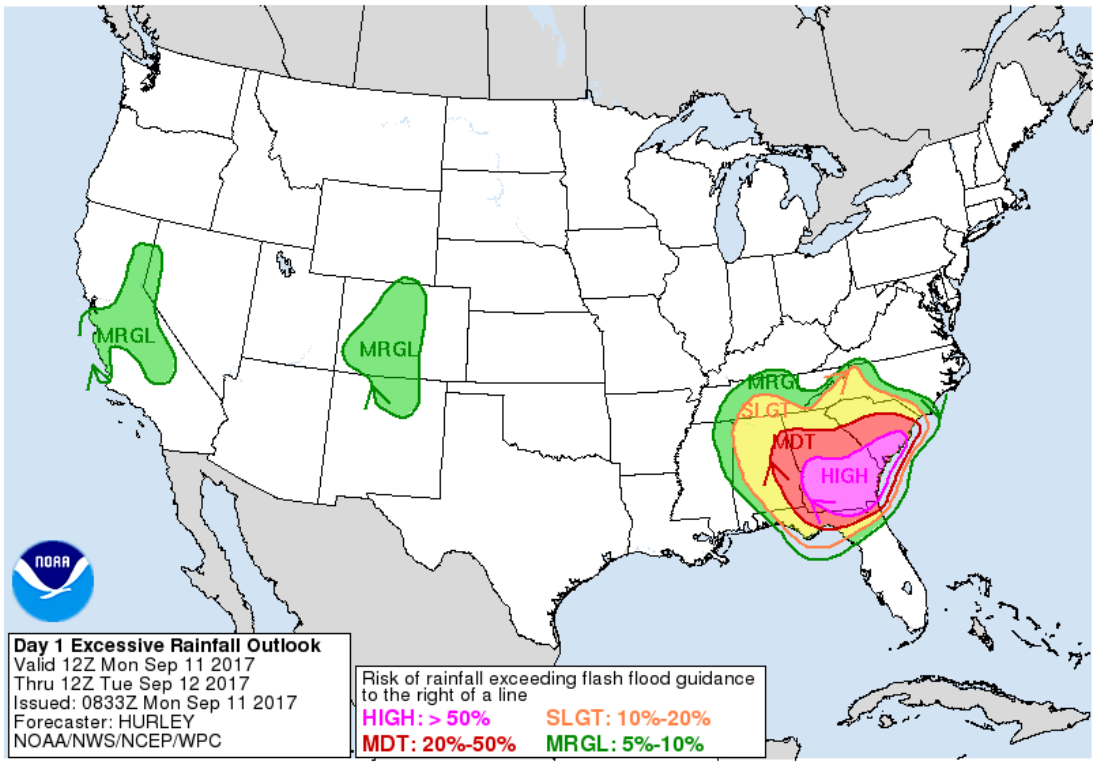

Figure 7. Sample Day 1 Excessive Rainfall Outlook.

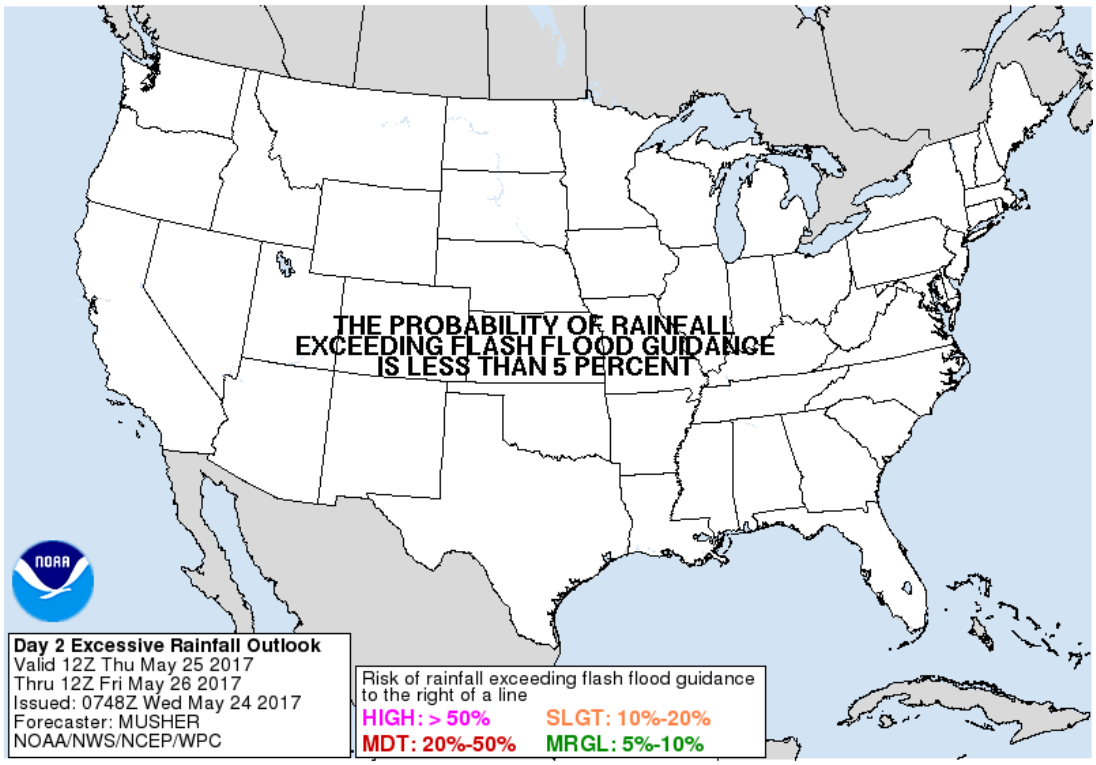

Figure 8. Sample Day 2 Excessive Rainfall Outlook.

8.4 Updates, Amendments, and Corrections. This product is updated 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 Day 1, Day 2, and Day 3 Excessive Rainfall Outlook graphics (94Q, 98Q, and 99Q).

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 associated with excessive rainfall. Occurrence of flash floods is not driven by heavy rainfall alone. Other influences on flash flood occurrence include topography, soil characteristics, ice jams, and dam failures.

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. 0830, 1600, 0100 UTC, and unscheduled updates.

9.2.4 Valid Time. 1200-1200 UTC, 1600-1200 UTC, 0100-1200 UTC, and for unscheduled updates, always valid from issuance time to 1200 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/hpcdiscussions.php?disc=qpferd

9.3.1 Dissemination. Use AWIPS ID “QPFERD” and MND Header “Excessive Rainfall Discussion”.

9.3.2 Content. The product is a text message providing an explanation and interpretation of the Excessive Rainfall Outlook graphics (94Q, 98Q, and 99Q).

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

Day 1
Valid timeZ day mon dd yyyy – timeZ day mon dd yyyy

<Discussion for day 1>

<forecaster name>

Day 2
Valid timeZ day mon dd yyyy – timeZ day mon dd yyyy

<Discussion for day 2>

<forecaster name>

Day 3
Valid timeZ day mon dd yyyy – timeZ day mon dd yyyy

<Discussion for day 3>

<forecaster name>


Day 1 threat area: https://www.wpc.ncep.noaa.gov/qpf/94epoints.txt
Day 2 threat area: https://www.wpc.ncep.noaa.gov/qpf/98epoints.txt
Day 3 threat area: https://www.wpc.ncep.noaa.gov/qpf/99epoints.txt


$$
```

Figure 9. Generic format for the 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 the expected areal average quantitative precipitation forecasts (QPFs) over the CONUS for specified 6-hour periods. The products are available in both graphical and gridded format. Forecasters prepare QPFs at approximately 5 km horizontal resolution; the QPFs are then automatically downscaled to 2.5 km resolution before dissemination.

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 AWIPS and 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.

Issuance Time (UTC)	Valid Time (UTC)	Graphical Product WMO Header		Gridded Product WMO Header	Product Description (forecast hour referenced from initial valid time of associated final package)
		AWIPS ID	WMO Header		
0600	0600 – 1200	GPH91E	PEIB40 KWNO	LEMB98 KWNH	Final 0 – 6 h QPF
0600	1200 – 1800	GPH92E	PEIC43 KWBC	LEMC98 KWNH	Preliminary 00 – 06 h QPF
	1800 – 0000	GPH93E	PEID44 KWBC	LEMD98 KWNH	Preliminary 06 – 12 h QPF
	0000 – 0600	GPH9EE	PEIE40 KWNO	LEME98 KWNH	Preliminary 12 – 18 h QPF
	0600 – 1200	GPH9FE	PEIF40 KWNO	LEMF98 KWNH	Preliminary 18 – 24 h QPF
	1200 – 1800	GPH9GE	PEBF98 KWNH	LEMG98 KWNH	Preliminary 24 – 30 h QPF
	1800 – 0000	GPH9HE	PEBG98 KWNH	LEMH98 KWNH	Preliminary 30 – 36 h QPF
	0000 – 0600	GPH9IE	PEBH98 KWNH	LEMI98 KWNH	Preliminary 36 – 42 h QPF
	0600 – 1200	GPH9JE	PEBI88 KWNH	MEMM98 KWNH	Preliminary 42 – 48 h QPF
	1200 – 1800	GPH9KE	PEBI98 KWNH	LEMJ98 KWNH	Preliminary 48 – 54 h QPF
	1800 – 0000	GPH9LE	PEBJ88 KWNH	MEMN98 KWNH	Preliminary 54 – 60 h QPF
	0000 – 0600	GPH9OE	PEBJ98 KWNH	LEMK98 KWNH	Preliminary 60 – 66 h QPF
	0600 – 1200	GPH9NE	PEBK98 KWNH	MEMT98 KWNH	Preliminary 66 – 72 h QPF

Issuance Time (UTC)	Valid Time (UTC)	Graphical Product WMO Header		Gridded Product WMO Header	Product Description (forecast hour referenced from initial valid time of associated final package)
		AWIPS ID	WMO Header		
0830	1200 – 1800	GPH92E	PEIC43 KWBC	LEMB98 KWNH	Final 00 – 06 h QPF
	1800 – 0000	GPH93E	PEID44 KWBC	LEMC98 KWNH	Final 06 – 12 h QPF
	0000 – 0600	GPH9EE	PEIE40 KWNO	LEMD98 KWNH	Final 12 – 18 h QPF
	0600 – 1200	GPH9FE	PEIF40 KWNO	LEME98 KWNH	Final 18 – 24 h QPF
	1200 – 1800	GPH9GE	PEBF98 KWNH	LEMF98 KWNH	Final 24 – 30 h QPF
	1800 – 0000	GPH9HE	PEBG98 KWNH	LEMG98 KWNH	Final 30 – 36 h QPF
	0000 – 0600	GPH9IE	PEBH98 KWNH	LEMH98 KWNH	Final 36 – 42 h QPF
	0600 – 1200	GPH9JE	PEBI88 KWNH	LEMI98 KWNH	Final 42 – 48 h QPF
	1200 – 1800	GPH9KE	PEBI98 KWNH	MEMM98 KWNH	Final 48 – 54 h QPF
	1800 – 0000	GPH9LE	PEBJ88 KWHN	LEMJ98 KWNH	Final 54 – 60 h QPF
	0000 – 0600	GPH9OE	PEBJ98 KWNH	MEMN98 KWNH	Final 60 – 66 h QPF
	0600 – 1200	GPH9NE	PEBK98 KWNH	LEMK98 KWNH	Final 66 – 72 h QPF
1800	1800 – 0000	GPH91E	PEIB40 KWNO	LEMB98 KWNH	Final 00 – 06 h QPF
1800	0000 – 0600	GPH92E	PEIC43 KWBC	LEMC98 KWNH	Preliminary 00 – 06 h QPF
	0600 – 1200	GPH93E	PEID44 KWBC	LEMD98 KWNH	Preliminary 06 – 12 h QPF
	1200 – 1800	GPH9EE	PEIE40 KWNO	LEME98 KWNH	Preliminary 12 – 18 h QPF
	1800 – 0000	GPH9FE	PEIF40 KWNO	LEMF98 KWNH	Preliminary 18 – 24 h QPF
	0000 – 0600	GPH9GE	PEBF98 KWNH	LEMG98 KWNH	Preliminary 24 – 30 h QPF
	0600 – 1200	GPH9HE	PEBG98 KWNH	LEMH98 KWNH	Preliminary 30 – 36 h QPF
	1200 – 1800	GPH9IE	PEBH98 KWNH	LEMI98 KWNH	Preliminary 36 – 42 h QPF
	1800 – 0000	GPH9JE	PEBI88 KWNH	MEMM98 KWNH	Preliminary 42 – 48 h QPF
	0000 – 0600	GPH9KE	PEBI98 KWNH	LEMJ98 KWNH	Preliminary 48 – 54 h QPF
	0600 – 1200	GPH9LE	PEBJ88 KWHN	MEMN98 KWNH	Preliminary 54 – 60 h QPF
	1200 – 1800	GPH9OE	PEBJ98 KWHN	LEMK98 KWNH	Preliminary 60 – 66 h QPF
	1800 – 0000	GPH9NE	PEBK98 KWNH	MEMT98 KWNH	Preliminary 66 – 72 h QPF

Issuance Time (UTC)	Valid Time (UTC)	Graphical Product WMO Header		Gridded Product WMO Header	Product Description (forecast hour referenced from initial valid time of associated final package)
		AWIPS ID	WMO Header		
2030	0000 – 0600	GPH92E	PEIC43 KWBC	LEMB98 KWNH	Final 00 – 06 h QPF
	0600 – 1200	GPH93E	PEID44 KWBC	LEMC98 KWNH	Final 06 – 12 h QPF
	1200 – 1800	GPH9EE	PEIE40 KWNO	LEMD98 KWNH	Final 12 – 18 h QPF
	1800 – 0000	GPH9FE	PEIF40 KWNO	LEME98 KWNH	Final 18 – 24 h QPF
	0000 – 0600	GPH9GE	PEBF98 KWNH	LEMF98 KWNH	Final 24 – 30 h QPF
	0600 – 1200	GPH9HE	PEBG98 KWNH	LEMG98 KWNH	Final 30 – 36 h QPF
	1200 – 1800	GPH9IE	PEBH98 KWNH	LEMH98 KWNH	Final 36 – 42 h QPF
	1800 – 0000	GPH9JE	PEBI88 KWNH	LEMI98 KWNH	Final 42 – 48 h QPF
	0000 – 0600	GPH9KE	PEBI98 KWNH	MEMM98 KWNH	Final 48 – 54 h QPF
	0600 – 1200	GPH9LE	PEBJ88 KWNH	LEMJ98 KWNH	Final 54 – 60 h QPF
	1200 – 1800	GPH9OE	PEBJ98 KWNH	MEMN98 KWNH	Final 60 – 66 h QPF
	1800 – 0000	GPH9NE	PEBK98 KWNH	LEMK98 KWNH	Final 66 – 72 h QPF

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 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. Gridded products are created using the World Meteorological Organization's (WMO's) GRIB (GRIdded Binary) format; the description of GRIB is at http://www.nco.ncep.noaa.gov/pmb/docs/grib2/.

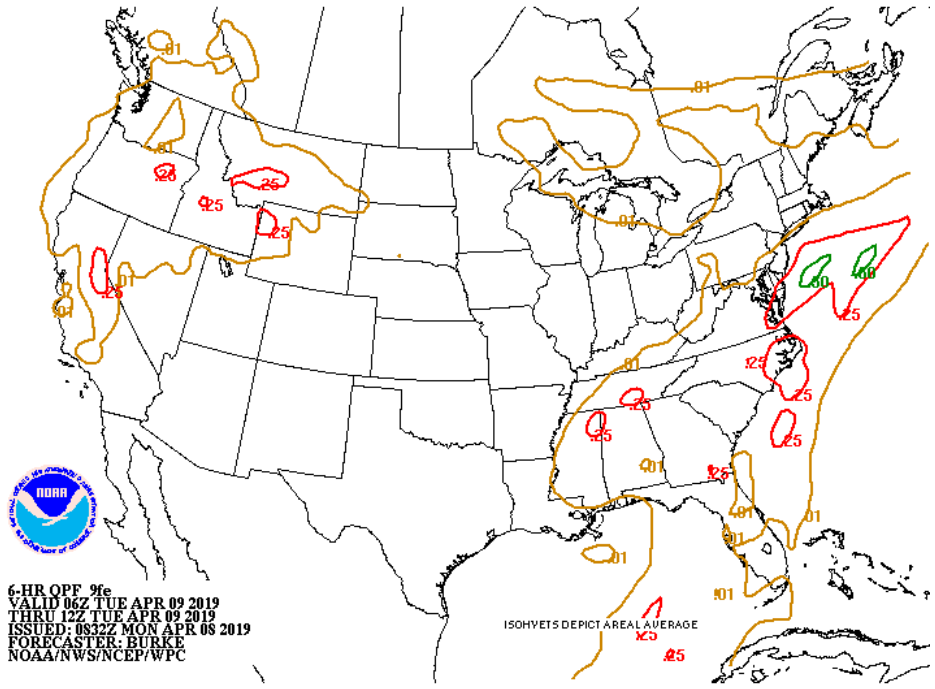

Figure 10. WPC 6-hr QPF graphic showing forecast precipitation using predefined isohyets.

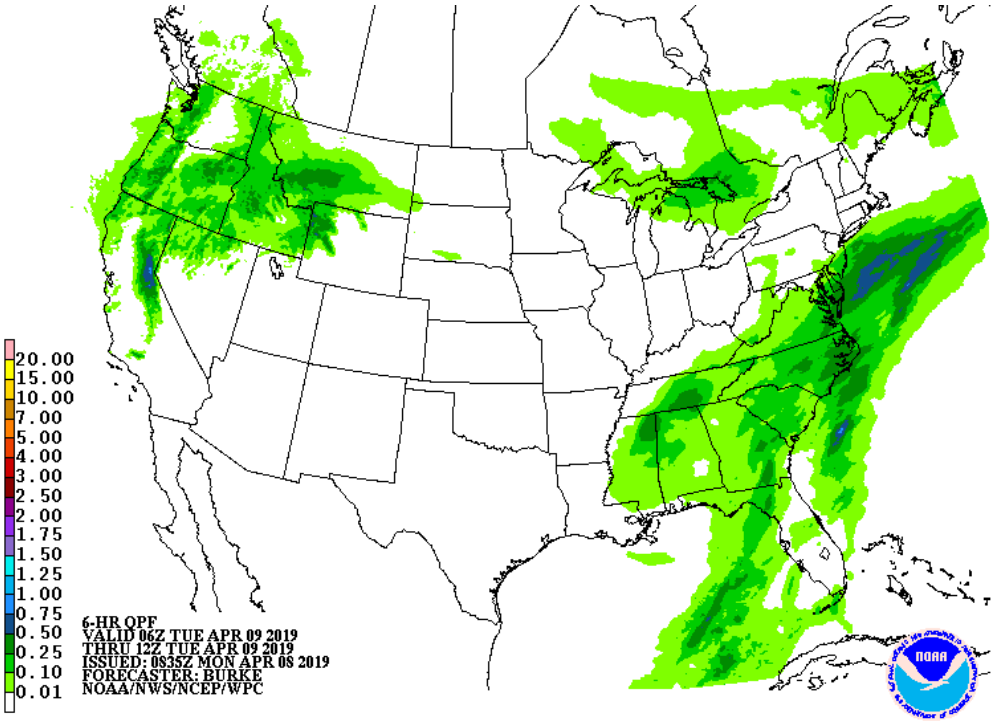

Figure 11. WPC 6-hr QPF graphic showing forecast precipitation, based on gridded data.

10.4 Updates, Amendments, and Corrections. Update if deemed necessary, to describe changes in thinking or new model guidance, or to reflect collaboration with field offices. Issue corrections as needed.

11. 24-Hour Quantitative Precipitation Forecast (Day 1 - 3). These products, prepared by the WPC, delineate the expected areal average QPFs over the CONUS for specified 24-hour periods. Forecasters create QPFs for each 6-hour period, and these are then summed to produce the 24-hour QPFs. Forecasters prepare QPFs at approximately 5 km horizontal resolution on average. The QPFs are then automatically downscaled to 2.5 km resolution before dissemination.

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 (forecast hour referenced from initial valid time)
0600	1200 – 1200	GPH94Q	PEIE41 KWBC	Preliminary 00 – 24 h (Day 1) QPF
	1200 – 1200	GPH98Q	PEII42 KWBC	Preliminary 24 – 48 h (Day 2) QPF
	1200 – 1200	GPH99Q	PEIK98 KWNH	Preliminary 48 – 72 h (Day 3) QPF
0830	1200 – 1200	GPH94Q	PEIE41 KWBC	Final 00 – 24 h (Day 1) QPF
	1200 – 1200	GPH98Q	PEII42 KWBC	Final 24 – 48 h (Day 2) QPF
	1200 – 1200	GPH99Q	PEIK98 KWNH	Final 48 – 72 h (Day 3) QPF
1800	0000 – 0000	GPH94Q	PEIE41 KWBC	Preliminary 00 – 24 h (Day 1) QPF

	0000 – 0000	GPH98Q	PEII42 KWBC	Preliminary 24 – 48 h (Day 2) QPF
	0000 – 0000	GPH99Q	PEIK98 KWNH	Preliminary 48 – 72 h (Day 3) QPF
2030	0000 – 0000	GPH94Q	PEIE41 KWBC	Final 00 – 24 h (Day 1) QPF
	0000 – 0000	GPH98Q	PEII42 KWBC	Final 24 – 48 h (Day 2) QPF
	0000 – 0000	GPH99Q	PEIK98 KWNH	Final 48 – 72 h (Day 3) 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 areal average 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 CONUS.

11.3.3 Format. A sample graphical product is shown in Figure 12 (based on the gridded QPFs). Contours for graphical products use predefined isohyets. Gridded products are created using the International GRIB (Gridded Binary) format as shown in Figure 13.

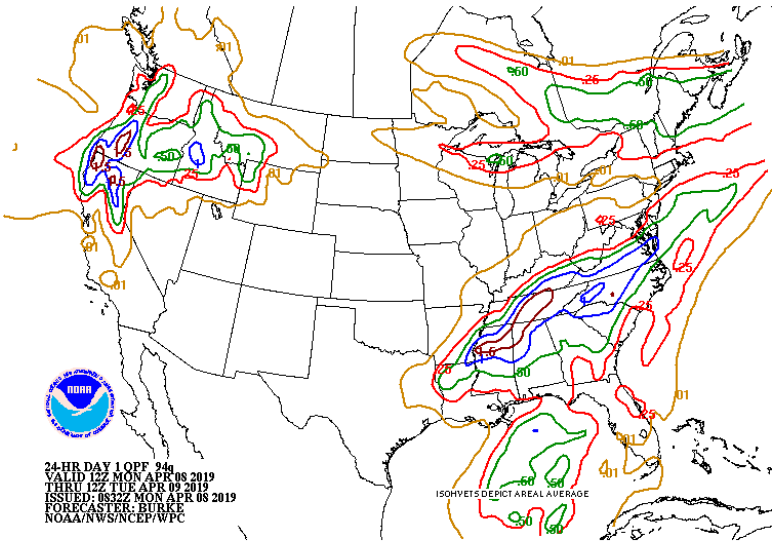

Figure 12. WPC 24-hr QPF graphic showing forecast precipitation using predefined isohyets.

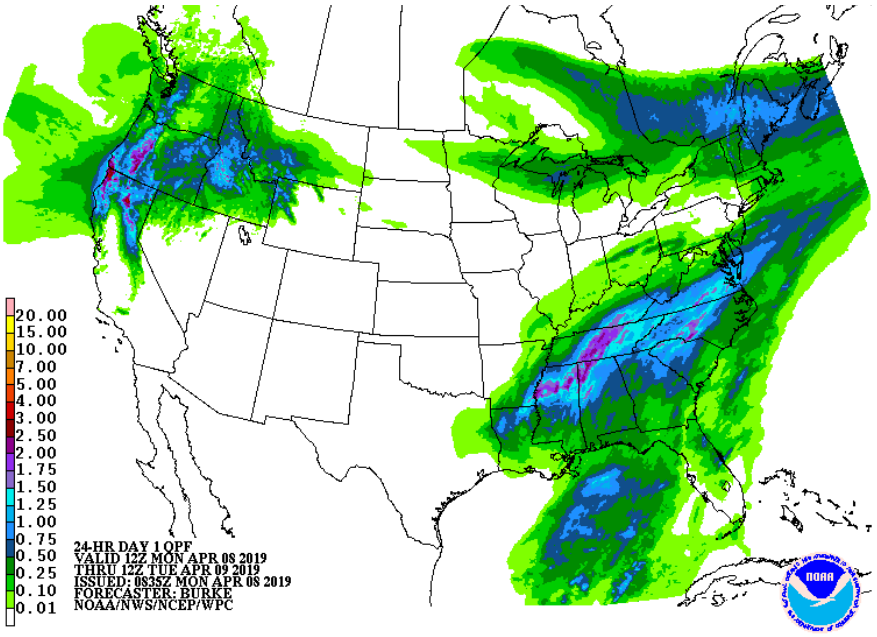

Figure 13. WPC 24-hr (Day 1, 2, or 3) QPF graphic showing forecast precipitation based on gridded data.

11.4 Update, Amendments, and Corrections. Update if deemed necessary, to describe changes in thinking or new model guidance, or to reflect collaboration with field offices. Issue corrections as needed.

12. 48-Hour Quantitative Precipitation Forecast (Day 4 - 5) (95E). This product, prepared by the WPC, delineates the expected areal average QPF over the CONUS for the 48-hour period starting on day 4 and ending on day 5. Forecasters prepare QPFs at approximately 5 km horizontal resolution on average. The QPFs are then automatically downscaled to 2.5 km resolution before dissemination.

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 AWIPS and 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**	**Graphical Product WMO Header**	**Gridded Product WMO Header**	**Product Description**
0830	1200 – 1200	RBG95E	PEIO46 KWBC	LEMO98 KWNH	Final 72 – 120 h (Day 4 -5) QPF
1930	0000 – 0000	RBG95E	PEIO46 KWBC	LEMO98 KWNH	Final 72 – 120 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 areal average 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 CONUS. 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. A sample graphical product is shown in Figure 14 (based on the gridded QPFs). Contours for the graphical product use predefined isohyets. Gridded products use the International GRIB (Gridded Binary) format as shown in Figure 15.

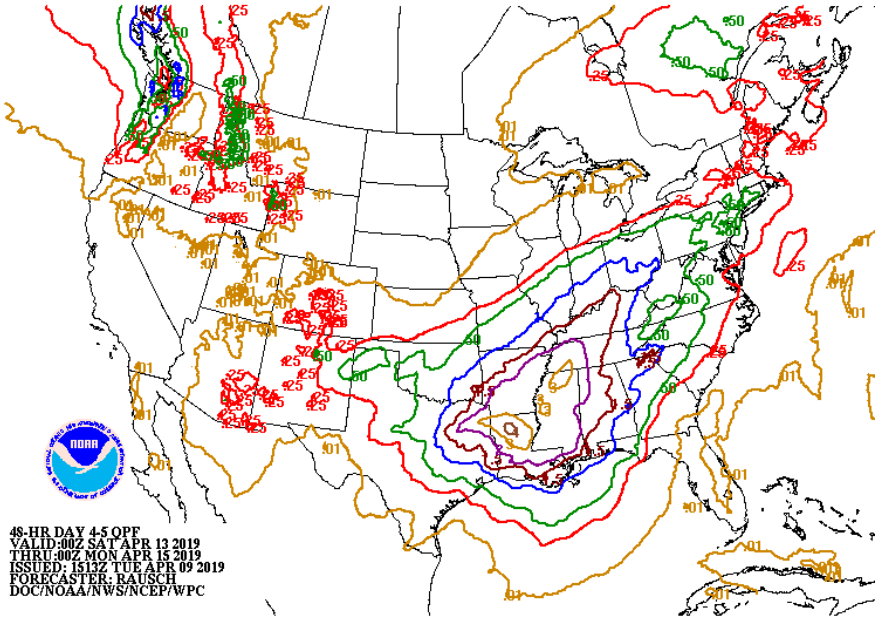

Figure 14. WPC 48-hr (Day 4-5) QPF graphic showing forecast precipitation using predefined isohyets.

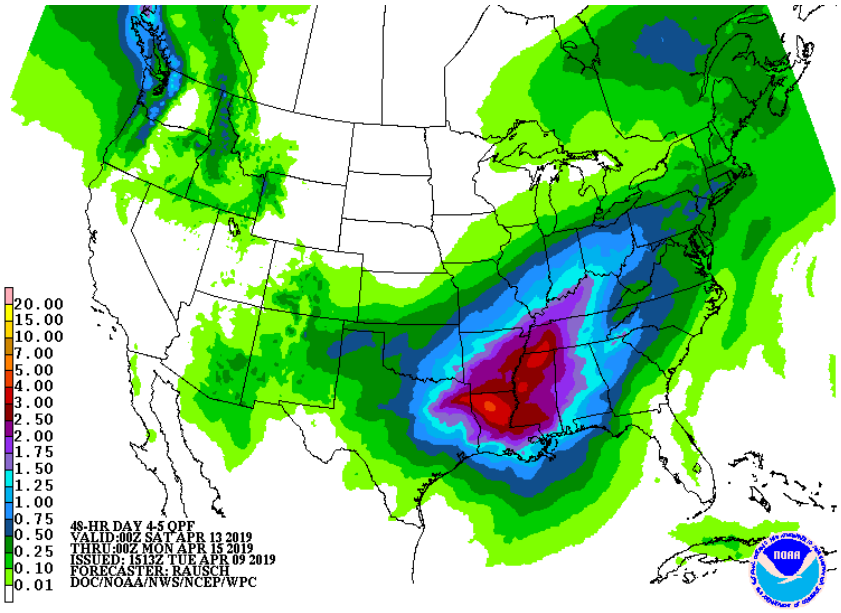

Figure 15. WPC 48-hr (Day 4-5) QPF graphic showing forecast precipitation based on gridded data.

12.4 Update, Amendments, and Corrections. Update if deemed necessary, to describe changes in thinking or new model guidance, or to reflect collaboration with field offices. Issue corrections as needed.

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

13.1 Mission Connection. This product helps the NWS to meet its mission by highlighting areas forecast 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 0830 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 areal average precipitation forecast. It is produced by a simple arithmetic addition of 24-hour QPFs in the 94Q, 98Q, and 99Q products (Section 11.3.1, 25) combined with the 48-hr QPF produced by the WPC medium-range forecaster.

13.3.3 Format. A sample graphical product is shown in Figure 16 (based on the gridded QPFs). Produce gridded products using the International GRIB (Gridded Binary) format. Contours for the graphical product use predefined isohyets.

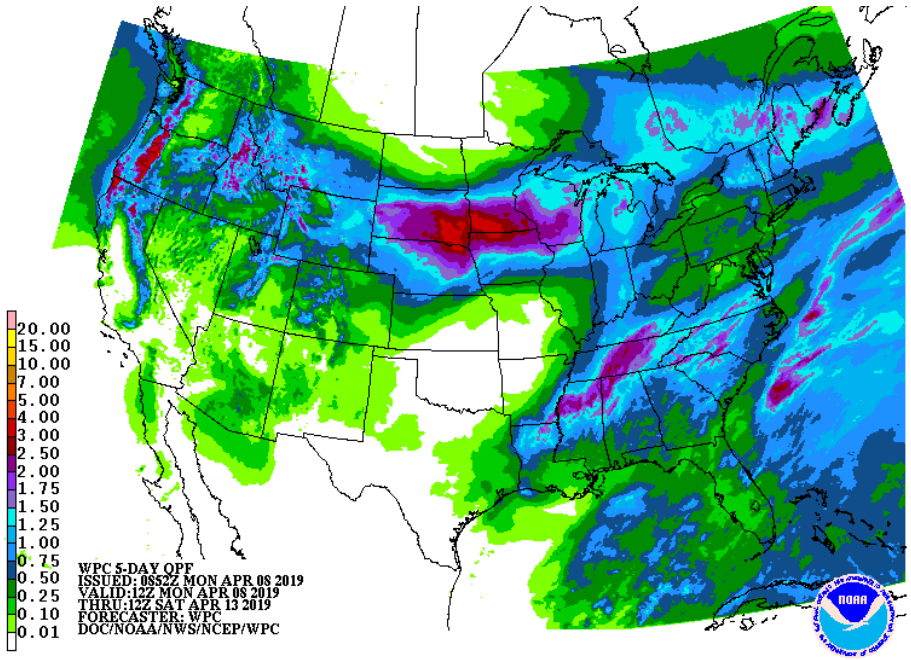

Figure 16. WPC 5-day QPF graphic showing forecast precipitation, based on gridded data.

13.4 Updates, Amendments, and Corrections. Update if deemed necessary, to describe changes in thinking or new model guidance, or to reflect collaboration with field offices. Issue corrections as needed.

14. 48-Hour Quantitative Precipitation Forecast (Day 6 - 7) (97E). This product, prepared by the WPC, delineates the expected areal average QPF over the CONUS for the 48-hour period starting on day 6 and ending on day 7. Forecasters prepare QPFs at approximately 5 km horizontal resolution on average. The QPFs are then automatically downscaled to 2.5 km resolution before dissemination.

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 AWIPS and 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**	**Graphical Product WMO Header**	**Gridded Product WMO Header**	**Product Description**
0830	1200 – 1200	RBG97E	PEIS46 KWBC	LEMQ98 KWNH	Final 120 - 168 h (Day 6-7) QPF
1930	0000 – 0000	RBG97E	PEIS46 KWBC	LEMQ98 KWNH	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 areal average 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 CONUS. 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. A sample graphical product is shown in Figure 17 (based on the gridded QPFs). Produce gridded products using the International GRIB (Gridded Binary) format. Produce contours for graphical product using predefined isohyets.

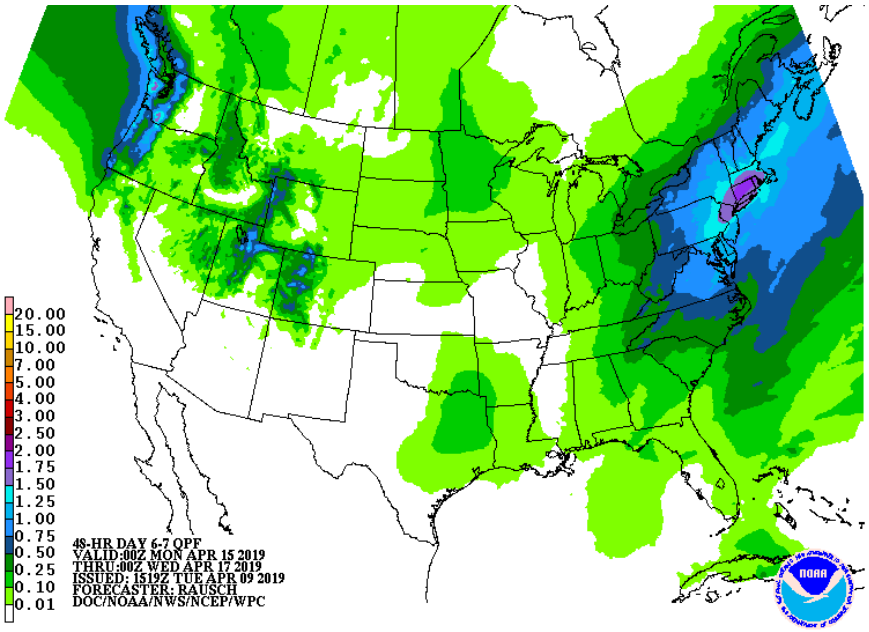

Figure 17. WPC 48-hr QPF (Day 6-7) graphic showing forecast precipitation, based on gridded data.

14.4 Update, Amendments, and Corrections. Update if deemed necessary, to describe changes in thinking or new model guidance, or to reflect collaboration with field offices. Issue corrections as needed.

15. 7-Day Quantitative Precipitation Forecast (p168i). This product, prepared by the WPC, provides a 7-day CONUS areal average 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 AWIPS and N-AWIPS software.

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

15.2.3 Issuance Time. Twice daily – at 0830 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 areal average precipitation forecast. It is produced by a simple arithmetic addition of 24-hour QPFs in the 94Q, 98Q, and 99Q products (Section 11.3.1, 25) combined with the 48-hr QPFs for days 4-5 and 6-7 produced by the WPC medium-range forecaster.

15.3.3 Format. A sample graphical product is shown in Figure 18 (based on the gridded QPFs). Produce gridded products using the International GRIB (Gridded Binary) format. Produce contours for graphical product using predefined isohyets.

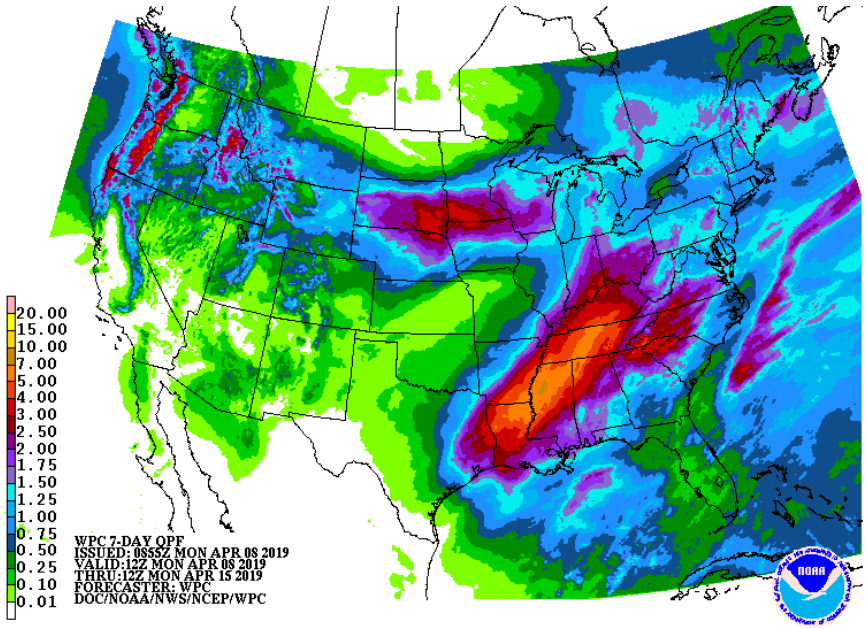

Figure 18. WPC 7-day QPF graphic showing forecast precipitation, based on gridded data.

15.4 Updates, Amendments, and Corrections. Update if deemed necessary, to describe changes in thinking or new model guidance, or to reflect collaboration with field offices. Issue corrections as needed.

16. 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.

16.1 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.

16.2 Issuance Guidelines.

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

16.2.2 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.

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

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

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

16.3.1 Dissemination. Use AWIPS ID "FFGMPD" and MND Header "Mesoscale Precipitation Discussion" nnnn, where nnnn is a four-digit number reset to 0001 on 1 January at 0000 UTC.

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

16.3.3 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, topography, soil characteristics, 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.

16.3.4 Format. The generic format is shown in Figure 20.

(Mesoscale Precipitation Discussion)

```
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)

$$
```

(Mesoscale Precipitation Discussion Graphic)

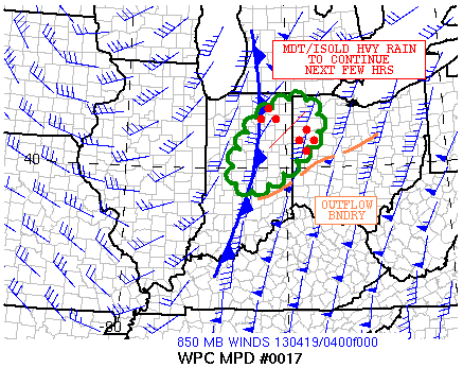

Figure 20. Mesoscale Precipitation Discussion format, where AAaa = Latitude north in degrees to two decimal places (without decimal point), BBbb = Longitude west in degrees to two decimal places (without decimal point and without leading 1 west of 100 degrees west).

16.4 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 WFOs, RFCs, and NCEP

(Reference Section 2)

Table A-1. RRS product headers by WFO.

WFO	WMO Header	AWIPS Header
Aberdeen SD	SXUS42 KWOH	RRSABR
Albany NY	SRUS38 KWOH	RRSALY
Albuquerque NM	SRUS75 KWOH	RRSABQ
Amarillo TX	SRUS76 KWOH	RRSAMA
Anchorage AK	SRAK40 KWOH	RRSAFC
Atlanta GA	SRUS59 KWOH	RRSFFC
Austin/San Antonio TX	SRUS82 KWOH	RRSEWX
Baltimore MD/Washington DC	SRUS47 KWOH	RRSLWX
Billings MT	SXUS58 KWOH	RRSBYZ
Binghamton NY	SRUS37 KWOH	RRSBGM
Birmingham AL	SRUS67 KWOH	RRSBMX
Bismarck ND	SXUS52 KWOH	RRSBIS
Boise ID	SXUS69 KWOH	RRSBOI
Boston MA	SRUS39 KWOH	RRSBOX
Brownsville TX	SRUS85 KWOH	RRSBRO
Buffalo NY	SRUS36 KWOH	RRSBUF
Burlington VT	SRUS35 KWOH	RRSBTV
Caribou ME	SRUS33 KWOH	RRSCAR
Central Illinois IL	SXUS30 KWOH	RRSILX
Central Pennsylvania PA	SRUS42 KWOH	RRSCTP
Charleston SC	SRUS55 KWOH	RRSCHS
Charleston WV	SRUS46 KWOH	RRSRLX
Cheyenne WY	SXUS54 KWOH	RRSCYS
Chicago IL	SXUS31 KWOH	RRSLOT
Cincinnati OH	SRUS45 KWOH	RRSILN
Cleveland OH	SRUS44 KWOH	RRSCLE
Columbia SC	SRUS54 KWOH	RRSCAE
Corpus Christi TX	SRUS84 KWOH	RRSCRP
Dallas/Fort Worth TX	SRUS80 KWOH	RRSFWD
Denver CO	SXUS55 KWOH	RRSBOU
Des Moines IA	SXUS40 KWOH	RRSDMX
Detroit MI	SXUS21 KWOH	RRSDTX
Dodge City KS	SXUS47 KWOH	RRSDDC
Duluth MN	SXUS35 KWOH	RRSDLH
Eastern North Dakota ND	SXUS41 KWOH	RRSFGF
El Paso TX	SRUS79 KWOH	RRSEPZ
Elko NV	SXUS68 KWOH	RRSLKN
Eureka CA	SXUS77 KWOH	RRSEKA

WFO	WMO Header	AWIPS Header
Fairbanks AK	SRAK41 KWOH	RRSAFG
Flagstaff AZ	SXUS64 KWOH	RRSFGZ
Glasgow MT	SXUS59 KWOH	RRSGGW
Goodland KS	SXUS48 KWOH	RRSGLD
Grand Junction CO	SXUS57 KWOH	RRSGJT
Grand Rapids MI	SXUS22 KWOH	RRSGRR
Great Falls MT	SXUS60 KWOH	RRSTFX
Green Bay WI	SXUS33 KWOH	RRSGRB
Greenville/Spartanburg SC	SRUS53 KWOH	RRSGSP
Guam PC	SRPA41 KWOH	RRSGUM
Hastings NE	SXUS49 KWOH	RRSGID
Honolulu HI	SRPA40 KWOH	RRSHFO
Houston/Galveston TX	SRUS83 KWOH	RRSHGX
Indianapolis IN	SXUS24 KWOH	RRSIND
Jackson KY	SXUS25 KWOH	RRSJKL
Jackson MS	SRUS68 KWOH	RRSJAN
Jacksonville FL	SRUS60 KWOH	RRSJAX
Juneau AK	SRAK42 KWOH	RRSAJK
Kansas City MO	SXUS39 KWOH	RRSEAX
Key West FL	SRUS63 KWOH	RRSEYW
Knoxville/Tri Cities TN	SRUS56 KWOH	RRSMRX
La Crosse WI	SXUS37 KWOH	RRSARX
Lake Charles LA	SRUS69 KWOH	RRSLCH
Las Vegas NV	SXUS67 KWOH	RRSVEF
Little Rock AR	SRUS72 KWOH	RRSLZK
Los Angeles CA	SXUS80 KWOH	RRSLOX
Louisville KY	SXUS26 KWOH	RRSLMK
Lubbock TX	SRUS77 KWOH	RRSLUB
Marquette MI	SXUS34 KWOH	RRSMQT
Medford OR	SXUS74 KWOH	RRSMFR
Melbourne FL	SRUS61 KWOH	RRSMLB
Memphis TN	SRUS58 KWOH	RRSMEG
Miami FL	SRUS62 KWOH	RRSMFL
Midland/Odessa TX	SRUS78 KWOH	RRSMAF
Milwaukee WI	SXUS32 KWOH	RRSMKX
Minneapolis MN	SXUS36 KWOH	RRSMPX
Missoula MT	SXUS61 KWOH	RRSMSO
Mobile AL	SRUS66 KWOH	RRSMOB
Morehead City NC	SRUS51 KWOH	RRSMHX
Nashville TN	SRUS57 KWOH	RRSOHX
New Orleans/Baton Rouge LA	SRUS70 KWOH	RRSLIX
New York City NY	SRUS40 KWOH	RRSOKX
North Central Lower Michigan MI	SXUS20 KWOH	RRSAPX

WFO	WMO Header	AWIPS Header
North Platte NE	SXUS50 KWOH	RRSLBF
Northern Indiana IN	SXUS23 KWOH	RRSIWX
Norman OK	SRUS74 KWOH	RRSOUN
Omaha NE	SXUS44 KWOH	RRSOAX
Paducah KY	SXUS27 KWOH	RRSPAH
Pendleton OR	SXUS72 KWOH	RRSPDT
Philadelphia PA./Mt Holly NJ	SRUS41 KWOH	RRSPHI
Phoenix AZ	SXUS66 KWOH	RRSPSR
Pittsburgh PA	SRUS43 KWOH	RRSPBZ
Pocatello/Idaho Falls ID	SXUS62 KWOH	RRSPIH
Portland ME	SRUS34 KWOH	RRSGYX
Portland OR	SXUS73 KWOH	RRSPQR
Pueblo CO	SXUS56 KWOH	RRSPUB
Quad Cities IA	SXUS38 KWOH	RRSDVN
Raleigh/Durham NC	SRUS50 KWOH	RRSRAH
Rapid City SD	SXUS51 KWOH	RRSUNR
Reno NV	SXUS75 KWOH	RRSREV
Riverton WY	SXUS53 KWOH	RRSRIW
Roanoke VA	SRUS49 KWOH	RRSRNK
Sacramento CA	SXUS76 KWOH	RRSSTO
Salt Lake City UT	SXUS63 KWOH	RRSSLC
San Angelo TX	SRUS81 KWOH	RRSSJT
San Diego CA	SXUS81 KWOH	RRSSGX
San Francisco Bay Area CA	SXUS78 KWOH	RRSMTR
San Joaquin Valley CA	SXUS79 KWOH	RRSHNX
San Juan PR	SRUS86 KWOH	RRSSJU
Seattle/Tacoma WA	SXUS71 KWOH	RRSSEW
Shreveport LA	SRUS71 KWOH	RRSSHV
Sioux Falls SD	SXUS43 KWOH	RRSFSD
Spokane WA	SXUS70 KWOH	RRSOTX
Springfield MO	SXUS28 KWOH	RRSSGF
St. Louis MO	SXUS29 KWOH	RRSLSX
Tallahassee FL	SRUS65 KWOH	RRSTAE
Tampa Bay Area FL	SRUS64 KWOH	RRSTBW
Topeka KS	SXUS45 KWOH	RRSTOP
Tucson AZ	SXUS65 KWOH	RRSTWC
Tulsa OK	SRUS73 KWOH	RRSTSA
Wakefield VA	SRUS48 KWOH	RRSAKQ
Wichita KS	SXUS46 KWOH	RRSICT
Wilmington NC	SRUS52 KWOH	RRSILM

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

RFC	WMO Header	AWIPS Header
Alaska-Pacific RFC	SRUS32 KWOH	RRSACR
Arkansas-Red Basin RFC	SRUS26 KWOH	RRSTUA
California-Nevada RFC	SRUS30 KWOH	RRSRSA
Colorado Basin RFC	SRUS29 KWOH	RRSSTR
Lower Mississippi RFC	SRUS24 KWOH	RRSORN
Middle Atlantic RFC	SRUS21 KWOH	RRSRHA
Missouri Basin RFC	SRUS27 KWOH	RRSKRF
North Central RFC	SRUS28 KWOH	RRSMSR
Northeast RFC	SRUS20 KWOH	RRSTAR
Northwest RFC	SRUS31 KWOH	RRSPTR
Ohio RFC	SRUS22 KWOH	RRSTIR
Southeast RFC	SRUS23 KWOH	RRSALR
West Gulf RFC	SRUS25 KWOH	RRSFWR

Table A-3. RRS product headers for NCEP.

RFC	WMO Header	AWIPS Header
NCEP	SXUS72 KWBC	RRSNMC

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
MADIS	Meteorological Assimilation Data Ingest System
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
OWP	Office of Water Prediction
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