

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

DATE:

September 14th, 2016

SIGNATURE:

Daniel K. Cobb, MIC

Mark Sekelsky, Lead Forecaster

TO: NATIONAL WEATHER SERVICE (W/OS31)  
HYDROMETEOROLOGICAL INFO CENTER  
1325 EAST-WEST HIGHWAY, RM 13468  
SILVER SPRING, MD 20910

When no flooding occurs, include miscellaneous river conditions, such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (WSOM E-41).

An X inside this box indicates that no significant flooding occurred within this Hydrologic Service Area.

**Summary**

August was a very wet month for the hydrologic service area. This resulted in some flooding with moderate impacts observed. Above normal rainfall was recorded for most locations. Southern parts of the Hydrologic Service Area saw 200 to 300 percent above normal rainfall.

**Flood Conditions**

Friday, August 12<sup>th</sup>

At 3:40 PM EDT, a flood watch was issued for much of Southwest Lower MI through Saturday morning. Forecasted rainfall amounts in excess of an inch may lead to flooding in urban and poor drainage areas.

Saturday, August 13<sup>th</sup>

At 12:46 AM EDT, a flood warning was issued for Kalamazoo, Eaton, Allegan, Van Buren, Barry and Calhoun Counties until 12:30 PM Saturday. Heavy rain was falling which triggered the warning issuance.

Saturday, August 13<sup>th</sup>

At 2:06 AM EDT, the flood warning was continued for Kalamazoo, Eaton, Allegan, Van Buren, Barry and Calhoun Counties until 12:30 PM Saturday. Rainfall amounts of 2 to 4 inches fell, causing the flooding concerns. This resulted in flooding of urban and poor drainage areas.

Saturday, August 13<sup>th</sup>

At 3:32 AM EDT, the flood warning was continued for Kalamazoo, Eaton, Allegan, Van Buren, Barry and Calhoun Counties until 12:30 PM Saturday. Rainfall amounts of 2 to 4 inches fell, causing the flooding concerns. This resulted in flooding of urban and poor drainage areas.

Saturday, August 13<sup>th</sup>

At 2:32 AM EDT, a flood warning was issued Ingham County until 2:30 PM Saturday. Heavy rain was falling which triggered the warning issuance.

Saturday, August 13th

At 4:36 AM EDT, the flood warning was continued for Ingham County until 2:30 PM Saturday. Rainfall amounts of 2 to 4 inches fell, which resulted in the flooding concerns. This resulted in flooding of urban and poor drainage areas.

Saturday, August 13<sup>th</sup>

At 7:55 AM EDT, the flood watch was allowed to expire.

Saturday, August 13th

At 9:00 AM EDT, the flood warning for Kalamazoo, Eaton, Allegan, Van Buren, Barry and Calhoun Counties was cancelled.

Saturday, August 13th

At 9:04 AM EDT, the flood warning for Ingham County was cancelled.

Monday, August 15th

At 3:51 AM EDT, a flood watch was issued for much of Southwest Lower MI through Tuesday morning. Forecasted rainfall amounts of 2 to 4 inches may lead to.

Monday, August 15<sup>th</sup>

At 10:22 AM EDT, a flood watch was issued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The river was forecasted to crest at 5.1 feet by Tuesday Evening. The watch was in effect until Wednesday afternoon.

Monday, August 15<sup>th</sup>

At 4:01 PM EDT, the flood watch was expanded to additional counties in Central Lower MI. The watch was in effect until Tuesday Morning.

Monday, August 15th

At 8:39 PM EDT, the flood watch was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 1:40 PM Monday stage was 4.4 feet. The river was forecasted to crest at 5.1 feet by Tuesday afternoon. The watch was in effect until Wednesday afternoon.

Monday, August 15th

At 10:58 PM EDT, a flood warning was issued for Kalamazoo, Eaton, Allegan, Van Buren, Barry and Calhoun Counties until 2:00 AM Tuesday. Rainfall amounts of 2 to 4 inches fell, triggering the warning issuance. This resulted in flooding of urban and poor drainage areas.

Tuesday, August 16th

At 1:48 AM EDT, the flood warning was extended for Kalamazoo, Eaton, Allegan, Van Buren, Barry and Calhoun Counties until 11:00 AM Tuesday. Rainfall rates of 1 to 2 inches were occurring across parts of the warning area, prolonging the flooding.

Tuesday, August 16th

At 2:24 AM EDT, A flood warning for was issued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 1:40 PM Monday Stage was 4.4 feet. The river was forecasted to crest at 5.1 feet by Tuesday Evening. The warning was in effect until

Thursday morning.

Tuesday, August 16<sup>th</sup>

At 2:39 AM EDT, the flood watch was cancelled for the Portage River near Vicksburg as it was upgraded to a warning.

Tuesday, August 16<sup>th</sup>

At 2:58 AM EDT, a flood warning was issued for Jackson and Ingham Counties until Noon Tuesday. Rainfall amounts of 2 to 4 inches fell, triggering the warning

Tuesday, August 16<sup>th</sup>

At 4:07 AM EDT, the areal flood watch was cancelled for Southwest Lower MI.

Tuesday, August 16<sup>th</sup>

At 4:29 AM EDT, A flood warning was issued for the Grand River at Jackson MI. Upwards of 5 inches of rain fell close to the river gage. Flood stage is 14.0 feet. The 3:30 AM Tuesday stage was 14.9 feet. The river was forecasted to crest at 15.5 feet by Tuesday Morning. The warning was in effect until Tuesday Evening.

Tuesday, August 16<sup>th</sup>

At 6:11 AM EDT, the flood warning was continued for the Grand River at Jackson MI. Flood stage is 14.0 feet. The 5:30 AM Tuesday stage was 14.6 feet. The river was forecasted to fall through the morning.

Tuesday, August 16<sup>th</sup>

At 6:14 AM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 1:40 PM Monday Stage was 4.4 feet. The river was forecasted to crest at record levels, 6.9 feet Tuesday Morning. The warning was in effect until Thursday morning.

Tuesday, August 16<sup>th</sup>

At 7:34 AM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 6:30 AM Tuesday stage was 5.1 feet. The river was forecasted to crest at record levels, 6.9 feet Tuesday afternoon. The warning was in effect until Thursday morning.

Tuesday, August 16<sup>th</sup>

At 9:46 AM EDT, the flood warning was cancelled for Kalamazoo, Eaton, Allegan, Van Buren, Barry and Calhoun Counties.

Tuesday, August 16<sup>th</sup>

At 9:48 AM EDT, the flood warning was cancelled for Jackson and Ingham Counties.

Tuesday, August 16<sup>th</sup>

At 10:22 AM EDT, the flood warning was cancelled for the Grand River at Jackson.

Tuesday, August 16<sup>th</sup>

At 10:27 AM EDT, A flood warning for was issued for Sycamore Creek, at Holt MI. Flood stage is 8.0 feet. The 9:15AM Tuesday stage was 6.2 feet. The river was

forecasted to crest at 8.2 feet by Tuesday Evening. The warning was in effect until Wednesday Evening.

#### Tuesday, August 16th

At 11:24 AM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 11:08 AM Tuesday stage was 5.2 feet. The river was forecasted to crest at record levels, 6.6 feet Tuesday night. The warning was in effect until Thursday afternoon.

#### Tuesday, August 16th

At 7:30 PM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 5:20 PM Tuesday stage was 5.4 feet. The river was forecasted to crest at 6.1 feet Wednesday morning. The warning was in effect until Thursday afternoon. The flood warning for was continued for Sycamore Creek, at Holt MI. Flood stage is 8.0 feet. The 6:15 PM Tuesday stage was 7.7 feet. The river was forecasted to crest at 8.0 feet by Tuesday Evening. The warning was in effect until Wednesday Evening.

#### Wednesday, August 17th

At 11:00 AM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 8:05 AM Wednesday stage was 5.8 feet. The river was forecasted to crest at 6.2 feet Wednesday night. The warning was in effect until Friday afternoon. The flood warning for was continued for Sycamore Creek, at Holt MI. Flood stage is 8.0 feet. The 10:15 AM Wednesday stage was 8.1 feet. The river was near crest at 8.0 feet. The warning was in effect until late Wednesday night.

#### Wednesday, August 17th

At 9:27 PM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 8:10 PM Wednesday stage was 5.8 feet. The river was forecasted to crest at 6.2 feet Wednesday night. The warning was in effect until Saturday morning. The flood warning for was downgraded to an advisory for Sycamore Creek, at Holt MI.

#### Thursday, August 18th

At 10:58 AM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 8:10 PM Wednesday stage was 5.8 feet. The river was near crest and forecasted to fall slowly. The warning was in effect until Friday afternoon.

#### Thursday, August 18th

At 9:08 PM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 1:00 PM Thursday stage was 5.6 feet. The river was falling slowly. The warning was in effect until Friday night.

#### Friday, August 19th

At 11:15 AM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 11:02 AM Friday stage was 5.5 feet. The river was falling slowly. The warning was in effect until Saturday morning.

Friday, August 19th

At 9:07 PM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 11:02 AM Friday stage was 5.5 feet. The river was falling slowly. The warning was in effect until Sunday morning.

Saturday, August 20th

At 10:54 AM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 4:50 AM Saturday stage was 5.4 feet. The river was falling slowly. The warning was in effect until Sunday night.

Saturday, August 20th

At 9:39 PM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 4:50 AM Saturday stage was 5.4 feet. The river was falling slowly. The warning was in effect late Sunday night.

Sunday, August 21st

At 1:46 PM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 1:00 PM Sunday stage was 5.5 feet. The river was falling slowly. The warning was in until Thursday morning.

Sunday, August 21st

At 8:48 PM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 1:00 PM Sunday stage was 5.5 feet. The river was falling slowly. The warning was in until Thursday morning.

Monday, August 22nd

At 10:37 AM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 9:42 AM Monday stage was 5.4 feet. The river was falling slowly. The warning was in until Friday morning.

Monday, August 22nd

At 9:10 PM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 9:42 AM Monday stage was 5.4 feet. The river was falling slowly. The warning was in until Saturday evening.

Tuesday, August 23rd

At 1:29 PM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 12:45 PM Tuesday stage was 5.2 feet. The river was falling slowly. The warning was in until Wednesday night.

Wednesday, August 24th

At 10:44 AM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 10:30 AM Wednesday stage was 5.2 feet. The river was falling slowly. The warning was in until Friday morning.

Thursday, August 25th

At 12:43 PM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 10:30 AM Wednesday stage was 5.2 feet.

The river was falling slowly. The warning was in until Thursday night.

Thursday, August 25th

At 2:32 PM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 1:10 PM Thursday stage was 5.1 feet. The river was falling slowly. The warning was in until Friday night.

Friday, August 26th

At 11:12 AM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 1:10 PM Thursday stage was 5.1 feet. The river was falling slowly. The warning was in until Friday night.

Friday, August 26th

At 10:54 PM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 11:45 AM Friday stage was 5.1 feet. The river was falling slowly. The warning was in until Saturday afternoon.

Saturday, August 27th

At 10:35 AM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 7:00 AM Saturday stage was 5.0 feet. The river was steady. The warning was in until Monday night.

Sunday, August 28th

At 11:46 AM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 7:00 AM Saturday stage was 5.0 feet. The river was forecasted to rise slightly. The warning was in until Monday afternoon.

Sunday, August 28th

At 8:33 PM EDT, the flood warning for was continued for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 2:00 PM Sunday stage was 5.0 feet. The river was steady. The warning was in until Monday afternoon.

Monday, August 29th

At 9:15 AM EDT, the flood warning for was cancelled for the Portage River near Vicksburg MI. Flood stage is 5.0 feet. The 9:00 AM Monday stage was 4.9 feet.

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The following rivers exceeded bankfull during the month of August 2016:

- Grand River Jackson, Michigan (1 day above bankfull)
- Sycamore Creek Holt, Michigan (6 days above bankfull)
- Looking Glass River Eagle, Michigan (1 day above bankfull)
- Grand River Ionia, Michigan (1 day above bankfull)
- Portage River Vicksburg, Michigan (11 days above bankfull)

## **Flood Stage Report**

Three forecast points exceeded flood stage in our HSA during the month of August 2016. See the Flood Stage Report(E3) for additional information.

## **River Conditions**

The end of the August percentage of normal flow for selected rivers is listed below:

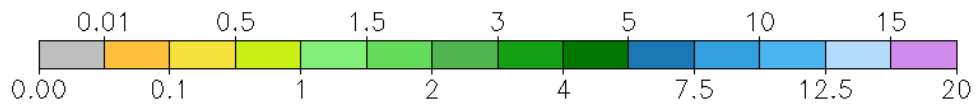
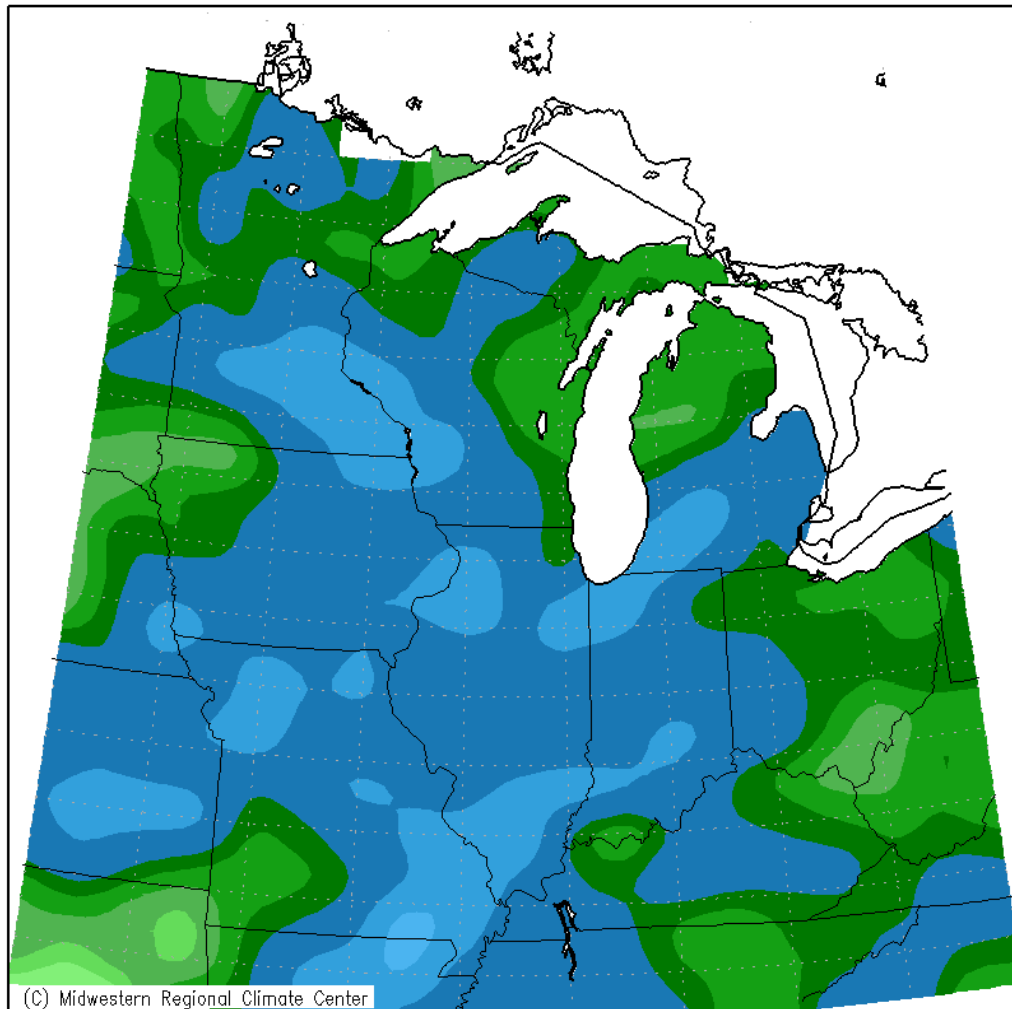
<u>Location</u>	<u>River</u>	<u>% of Normal</u>
Scottville	Pere Marquette	102
Whitehall	White	100
Ewart	Muskegon	90
Mt. Pleasant	Chippewa	125
Lansing	Grand	225
Grand Rapids	Grand	226
East Lansing	Red Cedar	245
Hastings	Thornapple	287
Battle Creek	Battle Creek	192
Battle Creek	Kalamazoo	135

## **General Hydrologic Information**

August precipitation totals at Grand Rapids, Lansing, and Muskegon, Michigan, were 7.97, 6.63, and 2.86 inches, respectively (Figure 1). The Grand Rapids and Lansing featured above normal precipitation for the August, while Muskegon was below normal. Monthly departures for Grand Rapids, Lansing and Muskegon were 4.38 inches, 3.40 inches, and -0.53 inches. Percent of mean precipitation for August 2016 is shown in Figure 2. Yearly precipitation departures through the end of August were 6.82 inches above normal for Grand Rapids, 2.39 inches above normal for Lansing, and 4.57 inches above normal for Muskegon.

Temperatures for the month of August were above normal at Grand Rapids, Lansing, and Muskegon. The average monthly temperature departures were, 2.7, 4.1, and 3.3 degrees Fahrenheit respectively.

Accumulated Precipitation (in)  
August 1, 2016 to August 31, 2016

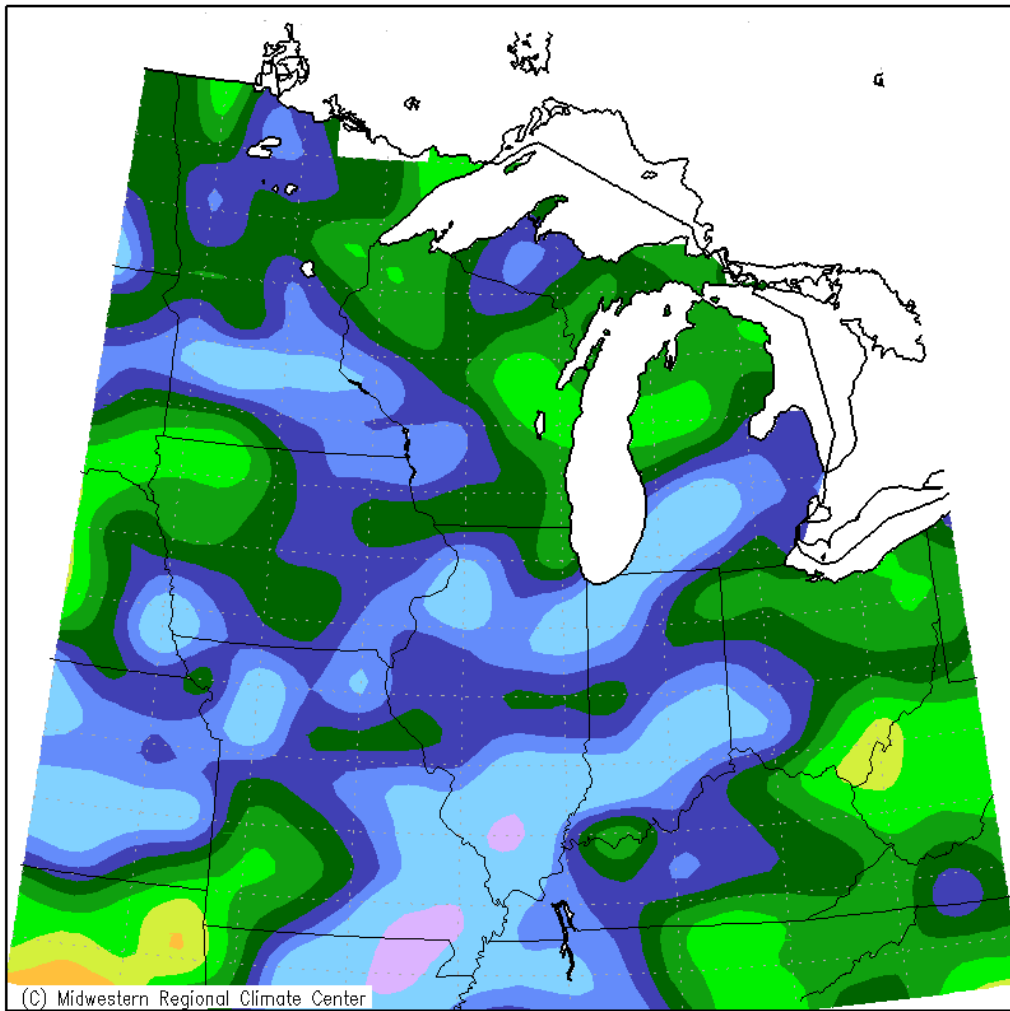


Midwestern Regional Climate Center  
Illinois State Water Survey, Prairie Research Institute  
University of Illinois at Urbana-Champaign

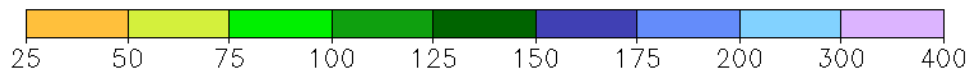
Figure 1. August Monthly Precipitation Totals



Accumulated Precipitation: Percent of Mean  
August 1, 2016 to August 31, 2016



Mean period is 1981-2010.



Midwestern Regional Climate Center  
Illinois State Water Survey, Prairie Research Institute  
University of Illinois at Urbana-Champaign

Figure 2. August Percent of Mean of Accumulated Precipitation

**Hydrologic Products issued this month:**

- 31 Hydrologic Summaries (ARBRVAGRR)
- 31 Daily River Forecasts (ARBRVDGRR)
  - 1 Probabilistic Hydrologic Outlook (ARBESFGRR)
  - 5 Areal Flood Warnings (ARBFLWGRR)
  - 3 River Flood Warnings (ARBFLWGRR)
- 10 Areal Flood Advisory Statements (ARBFLSGRR)
  - 7 Areal Flood Warning Statements (ARBFLSGRR)
- 19 River Flood Statements (ARBFLSGRR)
- 28 River Flood Warning Statements (ARBFLSGRR)
- 7 Hydrologic Statements (ARBRVSGRR)

**News Articles and Related Documentation**

None