

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

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

SIGNATURE:
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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

During the month of September, areal flood warnings were issued for 14 counties in the southern half of our Hydrologic Service Area (HSA). A local State of Emergency was declared for Allegan, Eaton, and Kalamazoo Counties, which were the hardest hit by flooding. Damage to public infrastructure (mostly road and bridge washouts) and homes from flooding was estimated to exceed 11 million dollars. Moderate river flooding occurred on the Kalamazoo River at Comstock, Michigan. Minor river flooding occurred on the Portage River near Vicksburg, St. Joseph River near Burlington, Grand River at Jackson, Grand River at Eaton Rapids, Red Cedar River at East Lansing, Grand River at Lansing, and Kalamazoo River near New Richmond, Michigan. Fortunately, the significant flooding during the month of September, resulted in no deaths.

Flood Conditions

On Wednesday, September 3rd, a cold front moved into the area and then stalled, bringing a few showers and thunderstorms to the HSA. The remnants of Hurricane Gustav moved into the area on September 4th, and brought widespread 2 to 3 inches of rainfall, with isolated amounts as high as 5.30 inches, northwest of a line stretching from South Haven to Alma, Michigan. Another front moved into the area during the morning hours of Sunday, September 7th. This front brought up to a quarter of an inch of rainfall over most of the southern half of our HSA. A wave of low pressure also moved across the area during the afternoon and evening hours on September 8th. This wave brought a quarter inch of rain to the northern half of our HSA, while areas south of Interstate 96 received over an inch of rainfall.

The most notable period of weather for September occurred between Friday night, September 12th, and Sunday afternoon on the 14th. A cold front dropped down into our HSA during the day on Friday the 12th. This front stalled out just south of our HSA late on the 12th. Our first river flood warning was issued for the Portage River near Vicksburg, Michigan, on September 12th, at 9:58 PM EDT. A flood watch was issued September 12th, at 11:00 PM EDT, for the central and lower half of our HSA. Upper level jet energy combined with copious low-level atmospheric moisture from the Gulf of Mexico, resulted

in moderate to locally heavy rain through Saturday night of the 13th. An areal flood warning for urban areas and small streams was issued September 13th, at 10:56 AM EDT, for the southern half of our HSA. Most locations south of Interstate 96 received two to four inches of rain, while some local areas south of a line from Holland to Lansing, Michigan, reported six inches of rainfall. This rainfall, combined with the higher rainfall amounts from the previous two weeks, produced areal flooding and washouts of roads during the evening hours of Saturday the 13th.

The front remained near our HSA through the day of Sunday the 14th. The remnants of Hurricane Ike which came ashore over Galveston, Texas, raced northeast along the front, and right across southern Lower Michigan on the afternoon of the 14th. This brought another 2 to 3 inches of rainfall southeast of a line from Holland to Alma, Michigan, on top of the heavy rainfall from the previous day. The total rainfall from Friday night the 12th through Sunday the 14th, was in excess of 10 inches near Kalamazoo and Battle Creek, Michigan (Figure 1). A river flood warning was issued on September 14th, at 12:35AM EDT, for the Kalamazoo, St. Joseph, Grand, Thornapple, Looking Glass, and Red Cedar Rivers. This heavy rainfall brought a good deal of flooding in the Kalamazoo River basin, and to portions of the Grand River basin toward Lansing. The worst flooding occurred near Comstock in Kalamazoo County where the river rose to 10.43 feet, the third highest crest on record. Many homes and businesses downstream were flooded. Many roads in the City of Kalamazoo were closed for a few days due to high water. There was concern that the 105 year old Plainwell dam was going to be breached. The dam held with no big problems. In Van Buren County, the Breedsville Dam on the Black River did fail, but no injuries or serious property damage was reported as a result of the failure. Some of the more significant impacts are listed below:

- In Allegan County, Allegan City Hall and the Fire Hall had basement flooding, 15 homes flooded (some had 7 feet of water in basements) and 50 roads flooded. The cities of Plainwell, Allegan, as well as the County of Allegan declared a local State of Emergency.
- In Ottawa County, over 20 homes had basement flooding and 8 roads flooded.
- In Kalamazoo County, multiple roads flooded, 10 businesses flooded, 466 homes flooded, 10 major street intersections in downtown Kalamazoo were flooded. A local State of Emergency was declared.
- In Ingham County, multiple roads flooded, the city of Lansing had 200 homes flooded and several businesses in “Old Town” had flooded basements, the entrance to Potter Park Zoo flooded.
- In Eaton County, sandbagging of downtown Eaton Rapids protected over 60 homes and businesses threatened by flooding. A local State of Emergency was declared.
- In Van Buren County, the Breedsville dam failed on the Black River.
- Damage to public infrastructure (mostly road and bridge washouts) and homes was estimated to exceed 11 million dollars for this event.

Flood Stage Report

Rivers with moderate flooding:

The Kalamazoo River at Comstock, Michigan, with a flood stage of 9 feet, went above flood stage at 7:00 PM on September 15th, crested at 10.43 feet at 1:15 PM on September 18th, and fell back below flood stage on September 20th, at 9:45 AM. This was the 3rd highest crest on record.

Rivers with minor flooding:

The Portage River near Vicksburg, Michigan, with a flood stage of 5 feet, went above flood stage at 3:00 PM on September 14th, crested at 5.63 feet at 7:00 AM on September 15th, and fell back below flood stage on September 25th, at 8:00 AM. This was the 4th highest crest on record.

The St. Joseph River near Burlington, Michigan, with a flood stage of 6.5 feet, went above flood stage at 12:30 PM on September 15th, crested at 6.83 feet at 1:00 AM on September 16th, and fell back below flood stage on September 16th, at 11:00 PM. This was the highest crest on record.

The Grand River at Jackson, Michigan, with a flood stage of 14 feet, went above flood stage at 5:45 PM on September 14th, crested at 14.44 feet at 7:00 PM on September 14th, and fell back below flood stage on September 14th, at 8:45 PM. This was the 4th highest crest on record.

The Grand River at Eaton Rapids, Michigan, with a flood stage of 6 feet, went above flood stage at 7:45 AM on September 16th, crested at 6.20 feet at 8:00 AM on September 16th, and fell back below flood stage on September 16th, at 11:00 PM.

The Red Cedar River at East Lansing, Michigan, with a flood stage of 7 feet, went above flood stage at 4:00 AM on September 16th, crested at 7.32 feet at 4:30 AM on September 17th, and fell back below flood stage on September 18th, at 7:00 AM.

The Grand River at Lansing, Michigan, with a flood stage of 11 feet, went above flood stage at 10:50 PM on September 14th, crested at 12.29 feet at 11:45 PM on September 15th, and fell back below flood stage on September 18th, at 3:00 PM.

The Kalamazoo River near New Richmond, Michigan, with a flood stage of 11 feet, went above flood stage at 3:30 AM on September 16th, crested at 12.46 feet at 10:00 PM on September 18th, and fell back below flood stage on September 20th, at 2:00 AM. This was the highest crest on record.

Please refer to NWS Form E-3 "Flood Stage Report".

River Conditions

River levels by the end of September were near to significantly above normal for our HSA. The end of the month percentage of normal flow for selected rivers is listed below:

<u>Location</u>	<u>River</u>	<u>% of Normal</u>
Scottville	Pere Marquette	95
Whitehall	White	89
Evert	Muskegon	113
Mt. Pleasant	Chippewa	94
Lansing	Grand	465
Grand Rapids	Grand	205
East Lansing	Red Cedar	625
Hastings	Thornapple	262
Battle Creek	Battle Creek	287
Comstock	Kalamazoo	280

General Hydrologic Information

September 2008 will be most remembered as a very wet month with above normal temperatures. The first two weeks of September had remnants from two tropical systems (Gustav and Ike) bring heavy rainfall into our HSA. Battle Creek, Grand Rapids, Lansing, and Jackson set record rainfall totals for the first two weeks in September. During the first two weeks of September, Battle Creek recorded 11.24 inches of rainfall, Grand Rapids recorded 9.20 inches, Lansing recorded 7.36 inches, and Jackson recorded 6.22 inches. September precipitation totals at Grand Rapids, Lansing, and Muskegon, Michigan were 9.54, 8.22, and 6.71 inches, respectively. Precipitation totals for the month at these three sites were 5.26 inches above normal at Grand Rapids, 4.74 inches above normal at Lansing, and 3.19 inches above normal at Muskegon, Michigan. Yearly precipitation totals were 9.47 inches above normal for Grand Rapids, 3.91 inches above normal for Lansing, and 8.44 inches above normal for Muskegon, Michigan.

Lansing ended up with the second highest September precipitation on record with 8.22 inches, second to only September 1986 with 8.34 inches. Grand Rapids also had the second highest September precipitation on record with 9.54 inches, second only to 1986 when 11.85 inches fell. Figure 1 (next page) displays the total precipitation for September 12 - 15, 2008. Significant flooding occurred as a result of this rainfall event.

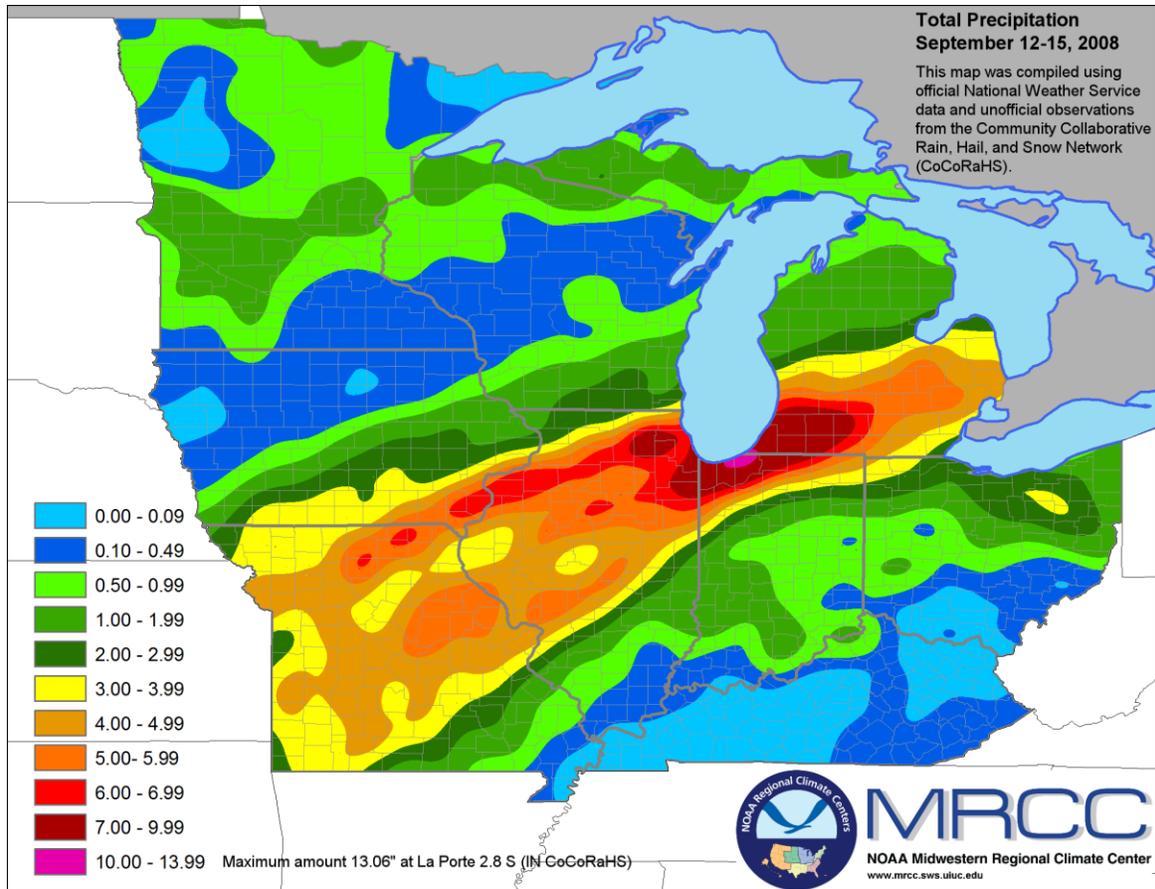


Figure 1. Total Precipitation for September 12 – 15, 2008.

Temperatures for the month of September were above normal at Grand Rapids, Lansing, and Muskegon, with average monthly departures of +3.4, +2.9 and +2.8 degrees Fahrenheit, respectively.

Hydrologic Products issued this month:

- 7 River Flood Warning (ARBFLWGRR)
- 29 River Flood Statements (ARBFLSGRR)
- 5 Areal Flood Warnings (ARBFLWGRR)
- 21 Areal Flood Statements (ARBFLSGRR)
- 44 Hydrologic Statements (ARBRVSGRR)
- 30 Hydrologic Summaries (ARBRVAGRR)
- 30 Daily River and Lake Summaries (ABRRVDGRR)
- 1 Hydrologic Outlook (ARBESFGRR)