

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**DATE:  
August 25, 2009TO: NATIONAL WEATHER SERVICE (W/OS31)  
HYDROMETEOROLOGICAL INFO CENTER  
1325 EAST-WEST HIGHWAY, RM 13468  
SILVER SPRING, MD 20910SIGNATURE:  
Daniel K. Cobb, MIC  
Mark L. Walton, Service Hydrologist

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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).

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

**Summary**

Significant flash flooding occurred during the month of June in Ottawa and Allegan counties. Both Ottawa and Allegan counties declared a local state of emergency for a flash flood event that occurred June 19 – 20<sup>th</sup>. Both counties experienced multiple road closures and washouts, with hundreds of homes experiencing flooded basements. Ottawa County was hardest hit, with flood damage in excess of \$5.4 Million for public structures, and \$31.9 Million for private structures. Allegan County reported flood damages in excess of \$3 Million for public structures, and \$1 Million for private structures. On June 20<sup>th</sup> over 1,400 cars (estimated \$ 10 Million in damages) were flooded at the B93 Birthday Bash Concert at the Ionia Fairgrounds in Ionia, Michigan, when the Grand River rose out of its banks and inundated the floodplain that was being used to park cars for the concert.

**Flood Conditions****Monday, June 8<sup>th</sup>**

Monday's Area Forecast Discussions (AFD) highlighted the potential for heavy rainfall associated with thunderstorms along a warm front moving through the HSA that morning. The hydrology section of the AFD mentioned that several rounds of rain were expected over the next 24 hours with the potential for ponding of water, but no major flooding was expected.

At 4:24 PM EDT a flood advisory for urban and small streams for Ingham County was issued, effective until 10:15 PM EDT.

At 6:00 PM EDT flood advisories for urban and small streams for Gratiot and Montcalm counties were issued, effective until midnight Tuesday.

The flood advisories were cancelled that night when rain moved out of the area and the threat of flooding subsided. No significant flooding was reported with these events.

**Wednesday, June 17<sup>th</sup>**

Wednesday's Area Forecast Discussions mentioned the possibility of heavy rain and associated flooding going into Friday.

**Thursday, June 18<sup>th</sup>**

Thursday's Area Forecast Discussions highlighted the potential for flooding of urban and low lying areas due to heavy rainfall from thunderstorms forecast to move through the

area over the next 48 hours. The Hazardous Weather Outlooks also mentioned the potential for heavy rainfall.

#### Friday, June 19<sup>th</sup>

Friday's Area Forecast Discussions highlighted the potential for severe weather and heavy rainfall associated with a cold front forecast to move across the HSA overnight. The short term forecast mentioned the possibility of heavy rain, with widespread amounts of over an inch and isolated amounts of three to five inches possible. The hydrology section of the AFD indicated that several rounds of thunderstorms were expected over the next 24 hours. It also mentioned the possibility of training thunderstorms along the warm front with the capability of producing very heavy rainfall.

At 2:50 AM EDT a flash flood warning was issued for Allegan and Ottawa counties, effective until 8:45 AM EDT. Figure 1 illustrates the radar estimated rainfall for this event. The Holland ASOS measured 2.53 inches of rainfall over a four hour period for this event, with rainfall rates during the peak of the event reaching 1.82 inches per hour.

At 4:29 AM EDT a flash flood watch was issued for 19 counties in our HSA, the 4 most southern tier of counties were not included in the watch.

At 5:12 AM EDT a flash flood statement was issued for Allegan and Ottawa counties, the warning remains in effect until 8:45 AM EDT.

At 8:45 AM EDT a flash flood statement was issued for Allegan and Ottawa counties, allowing the warning to expire.

At 9:53 AM EDT the flash flood watch was expanded to include all 23 counties in our HSA.

At 12:08 PM EDT a river flood warning was issued for the Portage River near Vicksburg, Michigan.

At 3:53 PM EDT an update was provided on the flash flood watch for all 23 counties in our HSA.

At 8:35 PM EDT a flash flood warning was issued for Calhoun, Eaton, Jackson, Allegan, Barry, Kalamazoo, Kent, Ottawa, and Van Buren counties, effective until 2:30 AM EDT on Saturday. Figure 2 illustrates the radar estimated rainfall for this event. The Holland ASOS measured 7.13 inches of rainfall in less than a 24 hour period (1:53 AM to 10:53 PM), with rainfall rates during the peak of the event reaching 2.61 inches per hour.

At 9:15 PM EDT, a flash flood warning was issued for Clinton, Ingham, and Ionia counties, effective until 3:15 AM EDT on Saturday.

At 10:40 PM EDT, a flash flood statement was issued for Calhoun, Eaton, Jackson, Allegan, Barry, Kalamazoo, Kent, Ottawa, and Van Buren counties, the warning remains in effect until 2:30 AM EDT on Saturday.

At 11:12 PM EDT, river flood advisories were issued for the following rivers:

- Grand River at Ionia, Michigan
- Sycamore Creek at Holt, Michigan
- Thornapple River near Hastings, Michigan
- Kalamazoo River at Marshall, Michigan
- Kalamazoo River at Comstock, Michigan
- Kalamazoo River near New Richmond, Michigan
- St. Joseph River at Burlington, Michigan

At 11:21 PM EDT, a river flood statement was issued for the Portage River near Vicksburg, Michigan.

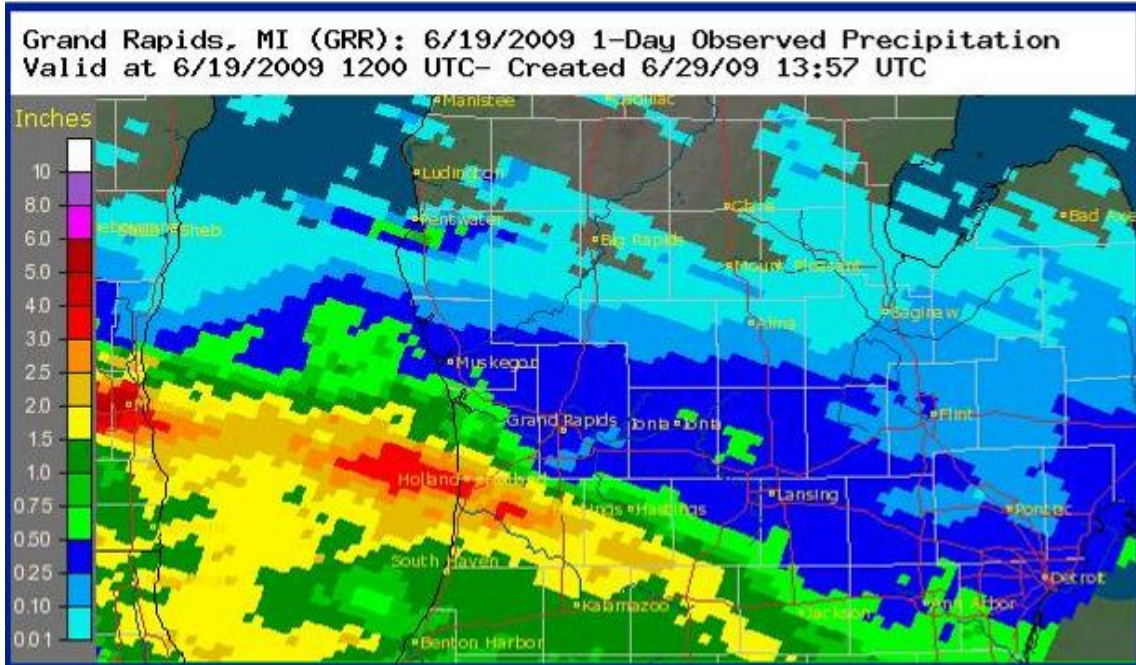


Figure 1. Radar estimated 24 Hour Rainfall from 12 Z 6/18/2009 to 12Z 6/19/2009.

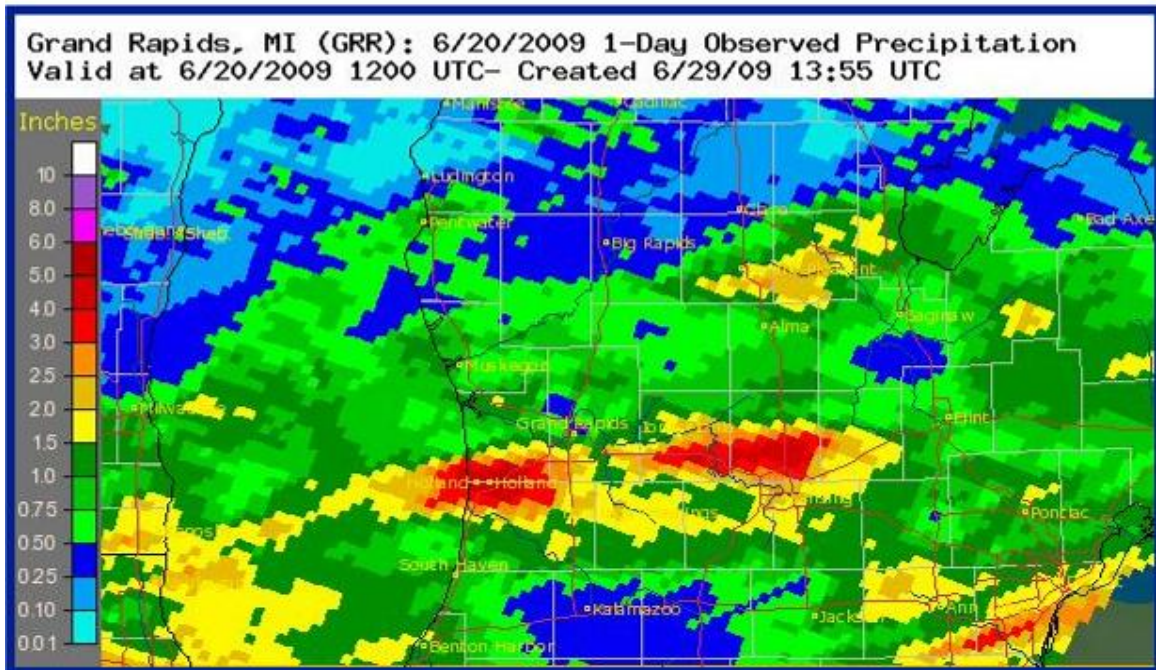


Figure 2. Radar estimated 24 Hour Rainfall from 12 Z 6/19/2009 to 12Z 6/20/2009.

### Saturday, June 20<sup>th</sup>

High pressure moved back into the HSA, and no significant weather was forecast through Monday.

At 12:30 AM EDT, the flash flood watch for all 23 counties in our HSA was cancelled.

At 12:39 AM EDT, the flash flood warning was cancelled for Van Buren, Calhoun, Kalamazoo, and Jackson counties.

At 2:23 AM EDT, a flood warning was issued for Clinton, Eaton, Ingham, Ionia, Allegan, Barry, Kent, and Ottawa counties, effective until 8:15 PM EDT.

At 2:25 AM EDT, the flash flood warning for Ottawa, Barry, Eaton, Allegan, and Kent counties was allowed to expire and was replaced by the flood warning issued earlier.

At 2:26 AM EDT, the flash flood warning was cancelled for Ingham, Clinton, and Ionia counties and was replaced by the flood warning issued earlier.

At 5:55 AM EDT, a river flood advisory was issued for the Looking Glass River near Eagle, Michigan.

At 10:24 AM EDT, a river flood advisory was issued for the Grand River at Ionia, Michigan, updating the forecast.

At 10:48 AM EDT, the river flood warning was cancelled for the Portage River near Vicksburg, Michigan, when the river crested below flood stage.

At 11:57 AM EDT, river flood advisories were updated for the following rivers:

- Looking Glass River near Eagle, Michigan,
- Grand River at Lowell, Michigan
- Sycamore Creek at Holt, Michigan
- Red Cedar River at East Lansing, Michigan
- Thornapple River near Hastings, Michigan
- Kalamazoo River at Marshall, Michigan
- Kalamazoo River at Comstock, Michigan
- Kalamazoo River near New Richmond, Michigan
- St Joseph River at Burlington, Michigan

At 1:36 PM EDT, the flood warning for Barry, Eaton, Ingham, and Kent counties was cancelled.

At 6:44 PM EDT, the river flood advisory for the Grand River at Ionia was updated.

At 8:11 PM EDT, the flood warning for Clinton, Ionia, Allegan, and Ottawa counties was extended until 8:15 PM EDT Sunday.

At 11:45 PM EDT, the river flood advisory for the Kalamazoo River at Comstock, Michigan, was cancelled.

#### Sunday, June 21<sup>st</sup>

At 12:01 AM EDT, the river flood advisory was updated for the following rivers:

- Grand River at Ionia, Michigan
- Looking Glass River near Eagle, Michigan,
- Grand River at Lowell, Michigan
- Sycamore Creek at Holt, Michigan
- Red Cedar River at East Lansing, Michigan
- Thornapple River near Hastings, Michigan
- Kalamazoo River at Marshall, Michigan
- Kalamazoo River near New Richmond, Michigan
- St Joseph River at Burlington, Michigan

At 9:05 AM EDT, a river flood warning was issued for the Red Cedar River at East Lansing, Michigan.

At 9:07 AM EDT, the river flood advisory for the Red Cedar River at East Lansing, Michigan, was cancelled when it was replaced by the river flood warning.

At 9:44 AM EDT, the river flood advisory for the Grand River at Ionia was updated.

At 10:15 AM EDT, the river flood advisory for the Looking Glass River near Eagle, Michigan was cancelled.

At 10:34 AM EDT, a river flood advisory was issued for the Red Cedar River near Williamston, Michigan, and updated for the following rivers:

- Grand River at Lowell, Michigan
- Sycamore Creek at Holt, Michigan
- Red Cedar River at East Lansing, Michigan
- Thornapple River near Hastings, Michigan
- Kalamazoo River at Marshall, Michigan
- Kalamazoo River near New Richmond, Michigan
- St Joseph River at Burlington, Michigan

At 3:48 PM EDT, the river flood advisory for the Grand River at Ionia, Michigan, was updated.

At 4:50 PM EDT, a river flood statement was issued for the Red Cedar River at East Lansing, Michigan.

At 4:54 PM EDT, a river flood advisory was issued for the Looking Glass River near Eagle, Michigan, and updated for the following rivers:

- Grand River at Lowell, Michigan
- Sycamore Creek at Holt, Michigan
- Red Cedar River at Williamston, Michigan
- Thornapple River near Hastings, Michigan
- Kalamazoo River at Marshall, Michigan
- Kalamazoo River near New Richmond, Michigan
- St Joseph River at Burlington, Michigan

At 8:13 PM EDT, the flood warning for Clinton, Ionia, Allegan, and Ottawa counties was extended until 2:15 PM EDT Monday.

At 9:53 PM EDT, a river flood warning was issued for the Kalamazoo River near New Richmond, Michigan.

At 10:17 PM EDT, the river flood advisory was updated for the following rivers:

- Grand River at Ionia, Michigan
- Grand River at Lowell, Michigan
- Sycamore Creek at Holt, Michigan
- Looking Glass River near Eagle
- Red Cedar River at Williamston, Michigan
- Thornapple River near Hastings, Michigan
- Kalamazoo River at Marshall, Michigan
- St Joseph River at Burlington, Michigan

At 10:28 PM EDT, a river flood statement was issued for the Red Cedar River at East Lansing, Michigan.

#### Monday, June 22<sup>nd</sup>

At 9:42 AM EDT, the river flood advisory for the Looking Glass River near Eagle was cancelled.

At 11:07 AM EDT, the river flood advisory for the Grand River at Ionia was updated.

At 11:11 AM EDT, the flood warnings for Ottawa, Allegan, Clinton, and Ionia counties were cancelled.

At 11:20 AM EDT, a river flood statement was issued for the following rivers:

- Red Cedar River at East Lansing, Michigan
- Kalamazoo River near New Richmond, Michigan

At 11:26 AM EDT, the river flood advisory was updated for the following rivers:

- Grand River at Lowell, Michigan
- Sycamore Creek at Holt, Michigan
- Looking Glass River near Eagle

- Red Cedar River at Williamston, Michigan
- Thornapple River near Hastings, Michigan
- Kalamazoo River at Marshall, Michigan
- St Joseph River at Burlington, Michigan

At 2:58 PM EDT, the river flood warning for the Red Cedar River at East Lansing, Michigan, was cancelled.

At 9:41 PM EDT, the river flood warning for the Kalamazoo River near New Richmond, Michigan, was cancelled.

At 9:59 PM EDT, the river flood advisory was cancelled for Sycamore Creek at Holt, Michigan, and the Red Cedar River near Williamston, Michigan. The river flood advisory was updated for the following rivers:

- Grand River at Ionia, Michigan
- Grand River at Lowell, Michigan
- Thornapple River near Hastings, Michigan
- Kalamazoo River at Marshall, Michigan
- St Joseph River at Burlington, Michigan

#### Tuesday, June 23<sup>rd</sup>

At 11:26 AM EDT, the river flood advisory for the Grand River at Ionia was updated.

At 11:43 AM EDT, a river flood advisory was issued for the Grand River near Comstock Park, Michigan, and updated for the following rivers:

- Grand River at Lowell, Michigan
- Thornapple River near Hastings, Michigan
- Kalamazoo River at Marshall, Michigan
- St Joseph River at Burlington, Michigan

At 9:39 PM EDT, the river flood advisory was updated for the following rivers:

- Grand River at Ionia, Michigan
- Grand River at Lowell, Michigan
- Grand River near Comstock Park, Michigan
- Thornapple River near Hastings, Michigan
- Kalamazoo River at Marshall, Michigan
- St Joseph River at Burlington, Michigan

#### Wednesday, June 24<sup>th</sup>

At 9:47 AM EDT, the river flood advisory was updated for the Grand River at Ionia, Michigan.

At 10:12 AM EDT, the river flood advisory was cancelled for the following rivers:

- Kalamazoo River at Marshall, Michigan
- St Joseph River at Burlington, Michigan

and updated for the following rivers:

- Grand River at Lowell, Michigan
- Grand River near Comstock Park, Michigan
- Thornapple River near Hastings, Michigan

#### Thursday, June 25<sup>th</sup>

At 9:46 AM EDT, the river flood advisory for the Grand River at Ionia was updated.

At 9:49 AM EDT, the river flood advisory for the Grand River at Lowell was cancelled.

At 10:20 PM EDT, the river flood advisory for the Grand River at Ionia was updated.

Friday, June 26<sup>th</sup>

At 10:24 AM EDT, the river flood advisory for the Grand River at Ionia was updated.

Saturday, June 27<sup>th</sup>

At 10:00 AM EDT, the river flood advisory for the Grand River at Ionia was cancelled.

**Flood Stage Report**

Two river forecast points exceeded flood stage during the month of June.

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

**River Conditions**

River levels were near to above normal across our HSA for the entire month of June. 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>
Whitehall	White	120
Evert	Muskegon	107
Mt. Pleasant	Chippewa	128
Lansing	Grand	214
Grand Rapids	Grand	200
East Lansing	Red Cedar	250
Hastings	Thornapple	158
Battle Creek	Battle Creek	142
Comstock	Kalamazoo	173

**General Hydrologic Information**

June 2009 will be remembered for near normal temperatures and above normal precipitation over our HSA. June precipitation totals at Grand Rapids, Lansing, and Muskegon, Michigan, were 6.17, 4.45, and 2.86 inches, respectively. Precipitation totals for the month at these three sites were 2.50 inches above normal at Grand Rapids, 0.85 of an inch above normal at Lansing, and 0.28 of an inch above normal at Muskegon, Michigan. Yearly precipitation totals were 5.43 inches above normal for Grand Rapids, 6.68 inches above normal for Lansing, and 4.15 inches above normal for Muskegon, Michigan.

Temperatures for the month of June were near normal at Grand Rapids, Lansing, and Muskegon, with average monthly departures of +0.5, -0.1 and +1.1 degrees Fahrenheit, respectively.

**Hydrologic Products issued this month:**

- 4 Areal Flood Watches (ARBFFAGRR)
- 3 Flash Flood Warnings (ARBFFWGRR)
- 7 Flash Flood Statements (ARBFFSGRR)
- 3 River Flood Warnings (ARBFLWGRR)

4 River Flood Statements (ARBFLSGRR)  
3 Areal Flood Warning (ARBFLWGRR)  
2 Areal Flood Statements (ARBFLSGRR)  
30 River Flood Advisories (ARBFLSGRR)  
4 Areal Flood Advisories (ABRFLSGRR)  
23 Hydrologic Statements (ARBRVSGRR)  
30 Hydrologic Summaries (ARBRVAGRR)  
30 Daily River and Lake Summaries (ARBRVDGRR)  
1 Hydrologic Outlook (ARBESFGRR)