NWS FORM E-5 **U.S. DEPARTMENT OF COMMERCE**
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
Grand Rapids, MI

REPORT FOR (MONTH &YEAR):
February 2013

DATE:
March 19, 2013

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

Minor to moderate flooding occurred during the month of February in our Hydrologic Service Area (HSA). River flood warnings were issued for the Grand River at Robinson Township, and the Pere Marquette River near Scottville. Minor River flooding carried over from January for the White River near Whitehall. Significant flooding from ice jams on the Muskegon River near Rogers Heights, Michigan, carried over from January into early February. Moderate River flooding occurred on the Grand River at Robinson Township due to backwater from an ice jam that set up downstream near Grand Haven, Michigan. No significant flood damages were reported in Robinson Township.

Flood Conditions

Minor River and significant ice jam flooding carried over from January into February.

Friday, February 1st
At 12:04 AM EST the flood warning for an ice jam on the Muskegon River near Rogers Heights remained in effect until 2:30 AM EST Saturday. Mecosta County Emergency Management reported 60 homes impacted by the flooding and ice piled 6 to 10 feet high in the area.
At 10:58 AM EST the river flood warning for the White River near Whitehall continued. The river crested at 6.61 feet at 8:45 PM EST the previous day (January 31st) and was forecast to continue to fall.
At 12:00 PM EST the flood warning for an ice jam on the Muskegon River near Rogers Heights was extended until 2:30 PM EST Monday. Mecosta County Emergency Management reported that flooding was still occurring and the ice jam was continuing to grow upstream towards the city of Big Rapids, Michigan.
At 2:48 PM EST the river flood warning for the White River near Whitehall, Michigan, was cancelled and downgraded to a river flood advisory.
At 11:00 PM EST the flood warning for an ice jam on the Muskegon River near Rogers Heights continued until 2:30 PM EST Monday. Mecosta County Emergency Management reported river levels were still out of their banks and the ice jam was continuing to grow upstream towards the city of Big Rapids, Michigan.

Saturday, February 2nd
At 1:46 PM EST the flood warning for an ice jam on the Muskegon River near Rogers Heights continued until 2:30 PM EST Monday. Mecosta County Emergency Management reported flooding still occurring in the area.

Sunday, February 3rd
At 10:23 PM EST the flood warning for an ice jam on the Muskegon River near Rogers Heights continued until 2:30 PM EST Monday. Mecosta County Emergency Management reported river levels rising upstream of the ice jam and the flooding of homes along the Muskegon River in Big Rapids, Michigan. Big Rapids, Michigan, is located 7 river miles upstream of the ice jam that formed near Rogers Heights, Michigan.

Monday, February 4th
At 1:00 PM EST the flood warning for an ice jam on the Muskegon River near Rogers Heights was cancelled. Mecosta County Emergency Management reported river levels had fallen back within banks.
At 10:01 PM EST a river flood warning was issued for the Grand River at Robinson Township due to rising river levels behind an ice jam. The ice jam formed on January 30th on the Grand River near the US 31 drawbridge in Grand Haven, Michigan, and water levels were rising upstream of the area. Large chunks of ice from upstream continued to move down the Grand River and pack into the ice jam at Grand Haven. The ice jam was expanding and working its way upstream on the Grand River towards Robinson Township, which is located 9 river miles upstream of the US 31 drawbridge in Grand Haven, Michigan. The Grand River at Robinson Township had risen to 12.8 feet and was forecast to rise above its flood stage of 13.3 feet Tuesday morning.

Tuesday, February 5th
At 8:29 AM EST the river flood warning for the Grand River at Robinson Township continued. Backwater from the ice jam located downstream in Grand Haven, Michigan, caused water levels on the Grand River at Robinson Township to rise 2 feet over the past 24 hours to a level of 13.6 feet.
At 8:54 PM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. The river level had risen 0.6 feet over the past 12 hours to a level of 14.2 feet (0.9 feet above flood stage).

Wednesday, February 6th
At 10:38 AM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. River levels were continuing to rise and had risen 1 foot over the past 24 hours.
At 10:02 PM EST the river flood warning was upgraded from minor to moderate for the Grand River at Robinson Township due to rising river levels behind an ice jam. The river had risen to 14.9 feet and was now forecast to crest near 15.3 feet Thursday morning (2 feet above flood stage).

Thursday, February 7th

At 11:17 AM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. River levels held steady overnight.

At 9:31 PM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. River levels held steady throughout the day at 14.9 feet. Flood stage on the Grand River at Robinson Township is 13.3 feet.

Friday, February 8th

At 10:49 AM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. The ice jam was stable and river levels fell 0.2 feet overnight to 14.7 feet.

At 12:55 PM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. The ice jam had begun to move and the updated statement highlighted the potential for rapidly fluctuating river levels during ice jam breakup.

At 4:32 PM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. The ice jam had stopped moving and the river levels were holding steady at 15 feet.

Saturday, February 9th

At 10:32 AM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. The ice jam had stopped moving and the river levels held steady overnight near 15 feet.

At 9:20 PM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. The ice jam was stable and water levels had fallen slightly, just below moderate flood stage, to 14.8 feet.

Sunday, February 10th

At 10:42 AM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. The ice jam was stable and water levels had fallen 0.4 feet over the past 24 hours to 14.6 feet.

At 9:45 PM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. The ice jam was stable and water levels had fallen, another 0.3feet during the day, to 14.3 feet.

Monday, February 11th

At 11:38 AM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. The ice jam was stable and water levels were continuing a slow fall in the area.

At 10:01 PM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. The ice jam was stable and water levels had fallen to 14.0 feet.

Tuesday, February 12th

At 11:08 AM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. The ice jam was stable and water levels were continuing a slow fall in the area.

At 9:59 PM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. The ice jam was weakening and water levels had fallen to 13.7 feet (0.4 feet above flood stage).

Wednesday, February 13th

At 11:55 AM EST the river flood warning for the Grand River at Robinson Township continued due to backwater from an ice jam located downstream. However, the Grand River at Robinson Township had lost 95 percent of its ice coverage overnight and river levels had fallen to 13.5 feet.

At 6:17 PM EST the river flood warning for the Grand River at Robinson Township was cancelled when the river fell below its flood stage of 13.3 feet.

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The following rivers exceeded bankfull during the month of February:

- Sycamore Creek near Holt, Michigan (1 day above bankfull)
- Kalamazoo River near New Richmond, Michigan (2 days above bankfull)
- Thornapple River near Hastings, Michigan (2 days above bankfull)
- Muskegon River near Croton, Michigan (2 days above bankfull)
- Grand River at Lowell, Michigan (1 day above bankfull)
- Grand River at Ionia, Michigan (4 days above bankfull)
- Grand River at Robinson Township, Michigan (9 days above bankfull)
- Maple River near Maple Rapids, Michigan (8 days above bankfull)
- Chippewa River near Mt Pleasant, Michigan (1 day above bankfull)
- Pere Marquette River near Scottville, Michigan (15 days above bankfull)
- White River near Whitehall, Michigan (4 days above bankfull)

The February Spring Flood and Water Resources Outlook indicated the risk of flooding from late winter into spring was near to below average.

Flood Stage Report

Three rivers in Southwest Lower Michigan exceeded flood stage during the month of February.

The White River near Whitehall, Michigan, with a flood stage of 6 feet, rose above flood stage around 6:30 PM EST on January 30th, crested at 6.61 feet at 8:45 PM EST on January 31st, and fell back below flood stage around 10:30 AM EST on February 1st.

The Pere Marquette River near Scottville, Michigan, with a flood stage of 5.5 feet, rose above flood stage around 7:45 PM EST on February 2nd, crested at 5.50 feet at 7:45 PM EST on February 2nd, and fell back below flood stage around 11:45 PM EST on February 2nd.

The Grand River at Robinson Township, with a flood stage of 13.3 feet, rose above flood stage around 4:10 AM EST on February 5th, crested at 15.10 feet at 6:24 PM EST on February 8th, and fell back below flood stage around 3:00 PM EST on February 13th.

River Conditions

River levels across the HSA were above to near normal at the end of the month. Significant ice developed on the White, Pere Marquette, Muskegon, and Grand Rivers in our HSA and ice jams were reported on the Muskegon River near Rogers Heights and the Grand River near Robinson Township during the month of February. The end of the month percentage of normal flow for selected rivers is listed below:

Location	River	% of Normal
Scottville	Pere Marquette	142
Whitehall	White	115
Evart	Muskegon	113
Mt. Pleasant	Chippewa	105
Lansing	Grand	80
Grand Rapids	Grand	99
East Lansing	Red Cedar	93
Hastings	Thornapple	89
Battle Creek	Battle Creek	85
Battle Creek	Kalamazoo	89

General Hydrologic Information

February 2013 had below normal temperatures and above normal precipitation. Snowfall for the month was above normal.

February precipitation totals at Grand Rapids, Lansing, and Muskegon, Michigan, were 3.05, 1.78, and 3.96 inches, respectively. Precipitation totals for the month at these three sites were 1.26 inches above normal at Grand Rapids, 0.31 of an inch above normal at Lansing, and 2.13 inches above normal at Muskegon, Michigan. Yearly precipitation totals were 3.18 inches above normal for Grand Rapids, 2.10 inches above normal for Lansing, and 5.58 inches above normal for Muskegon, Michigan.

Snowfall for the month of February at Grand Rapids, Lansing, and Muskegon, Michigan were 33.1 inches (18.3 inches above normal), 14.1 inches (2.5 of an inch above normal), and 53.3 inches (34 inches above normal), respectively. Muskegon set a record for monthly maximum snowfall. The 53.3 inches of snow in February for Muskegon broke the previous February record of 45.8 inches set in 1981. Snow depth across the HSA ranged from 2 to 20 inches at the end of February, with the higher amounts closer to the lake and in the more northern portions of our HSA (Figure 1).

At the end of February frost depth across the HSA ranged from 2 to 4 inches.

Temperatures for the month of February were below normal at Grand Rapids, Lansing, and Muskegon, Michigan, with average monthly departures of -2.0, -1.2 and -2.0 degrees Fahrenheit, respectively.

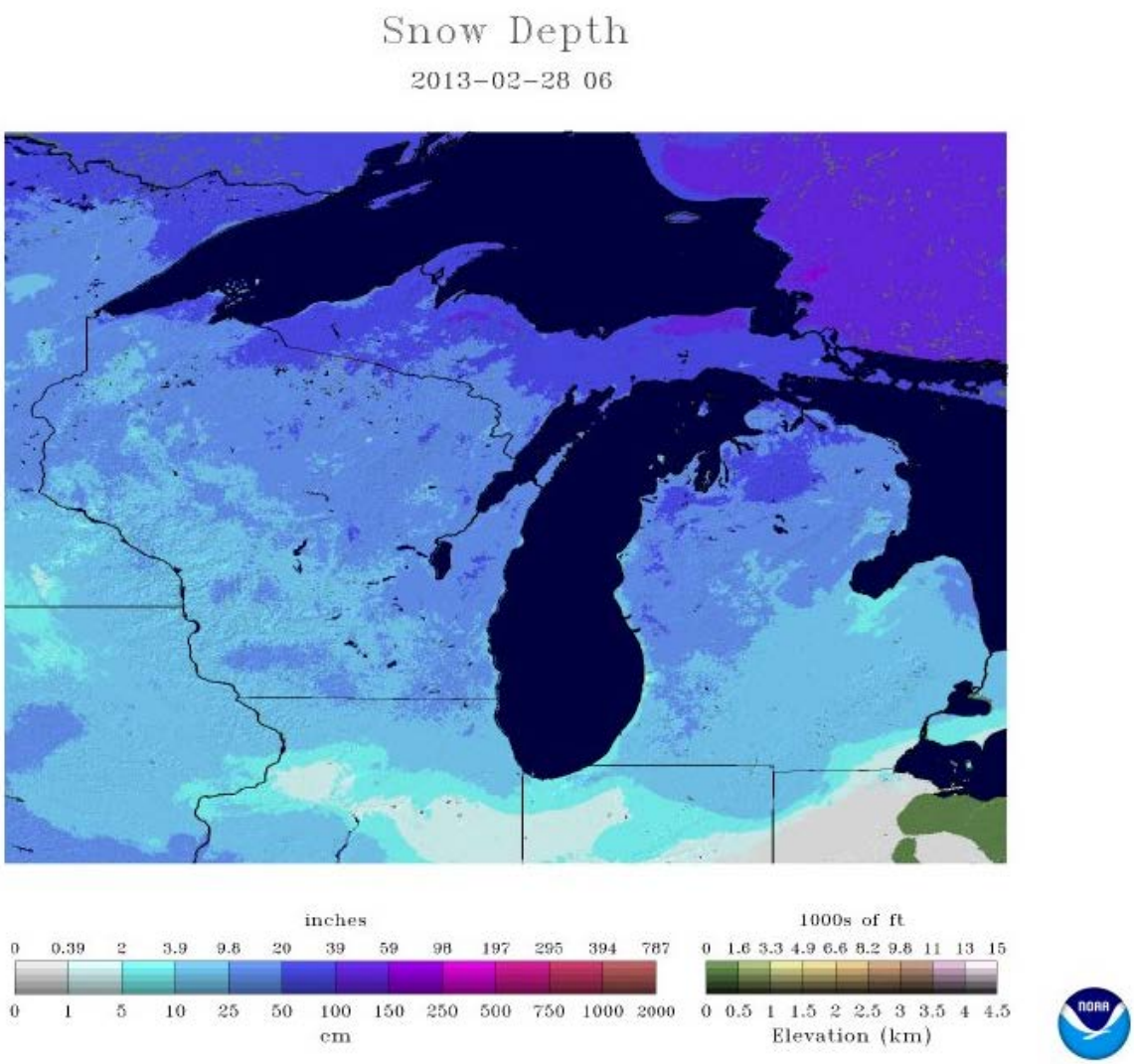

Figure 1. Snow Depth at the end of February.

Hydrologic Products issued this month:

1 Areal Flood Warning (ARBFLWGRR)
5 Areal Flood Statements (ARBFLSGRR)
2 River Flood Warnings (ARBFLWGRR)
21 River Flood Statements (ARBFLSGRR)
37 River Flood Advisories (ARBFLSGRR)
25 Hydrologic Statements (ARBRVSGRR)
1 Probabilistic Hydrologic Outlook (ARBESFGRR)
28 Hydrologic Summaries (ARBRVAGRR)