

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

TO: NATIONAL WEATHER SERVICE (W/OS31)
HYDROMETEOROLOGICAL INFO CENTER
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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 flooding occurred within this Hydrologic Service Area.

Summary

Minor river flooding occurred in March along the Maple, Grand, and Rogue, Rivers. Flood advisories were issued for Mason, Lake, Osceola, Oceana, and Clare counties. No significant property damage was reported and no lives were lost during the minor flooding that occurred in March.

Flood Conditions

The month started out with a series of snowstorms that were followed by temperatures into the lower 70s, and a rapidly melting snowpack. The rapidly melting snowpack resulted in significant rises in local rivers, and flood warnings were issued on March 12th, 14th, and 15th, for river forecast points located along the Flat, Rogue, Grand, Maple, and Chippewa Rivers. Out of the six flood warnings issued, four verified by cresting above flood stage and the other two crested just below flood stage. Only minor flooding occurred during this event, with no significant property damage or loss of life reported.

On March 21st and 22nd, thunderstorms over our hydrologic service area produced an inch, to an inch and a half, of rainfall over saturated soils and resulted in the issuance of flood watches, advisories and warnings. Early in the morning on March 22nd, flood advisories were issued for Mason, Lake, Osceola, and Oceana Counties, and a flood watch was issued for the Muskegon River near Croton. Later that morning on the 22nd, flood warnings were issued for river forecast points located along the Flat, Chippewa, Pere Marquette, and Muskegon Rivers. Minor flooding of secondary roads occurred during this event and rivers crested near, but remained below flood stage.

Flood Stage Report

Please refer to NWS Form E 3

River Conditions

River levels across the Grand Rapids HSA by the end of March were near to above normal by the end of the month.

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 | 129 |
| Whitehall | White | 123 |
| Evart | Muskegon | 149 |
| Mt. Pleasant | Chippewa | 132 |
| Lansing | Grand | 106 |
| Grand Rapids | Grand | 135 |
| East Lansing | Red Cedar | 112 |
| Hastings | Thornapple | 139 |
| Battle Creek | Battle Creek | 103 |
| Comstock | Kalamazoo | 107 |

General Hydrologic Information

March precipitation and temperatures were above normal across Southwest Lower Michigan.

March precipitation totals at first order stations across our HSA were above normal for Grand Rapids, Lansing, and Muskegon, Michigan. March precipitation totals at Grand Rapids, Lansing, and Muskegon, were 3.50, 2.66, and 3.50 inches, respectively. Precipitation for the month at these three sites were 0.91 of an inch above normal at Grand Rapids, 0.33 of an inch above normal at Lansing, and 1.14 inches above normal at Muskegon, Michigan. For the year, precipitation totals were above normal at Grand Rapids and Muskegon and near normal for Lansing, Michigan. Yearly precipitation totals were 1.51 inches above normal for Grand Rapids, 0.13 of an inch below normal for Lansing, and 0.73 of an inch above normal for Muskegon, Michigan.

Snowfall totals for the month of March were above normal for Grand Rapids (+4.6"), below normal for Lansing (-5.9") and near normal at Muskegon (-0.5"). March snowfall totals at Grand Rapids, Lansing, and Muskegon were 13.6, 2.8, and 10.6 inches, respectively. By the end of the month the snowpack across our HSA had all melted.

Temperatures for the month of March were significantly above normal at Grand Rapids, Lansing, and Muskegon, with average monthly departures of +5.0, +5.5, and +4.9 degrees Fahrenheit, respectively. At Grand Rapids the soil temperatures at the end of the month were 46 degrees near the surface and 41 degrees Fahrenheit at a depth of 60 inches.

Hydrologic Products issued this month:

- 8 Flood Warnings (ARBFLWGRR) were issued
- 20 Flood Statements (ARBFLSGRR) were issued
- 7 Flood Advisories (ARBFLSGRR) were issued
- 3 Flood Watches (ARBFFAGRR) were issued
- 1 Hydrologic Outlook (ARBESFGRR) was issued
- 60 Hydrologic Statements (ARBRVSGRR) were issued
- 31 Hydrologic Summary's (ARBRVAGRR) were issued