Factors to Consider for Spring Flooding

• Antecedent Conditions
• Snow Cover (Snowpack) / Liquid Water Equivalent
• Frozen Ground
• Soil Moisture
• Streamflows
• Weather Forecasts/Outlooks
Antecedent Conditions: 2019 Fall Moisture

Accumulated Precipitation (in): Percent of 1981-2010 Normals
September 01, 2019 to October 31, 2019

Stations from the following networks used: WBAN, COOP, FAA, GHCN, ThreadEx, CoCoRaHS, WMO, ICAC, NWSLI, Missouri FSA, Missouri Masonet, Midwestern Regional Climate Center. MATE; MROC Application Tools Environment. Generated at: 11/1/2019 3:44:02 PM CDT
Winter Precipitation

Accumulated Precipitation
December 01, 2019 to February 13, 2020

Accumulated Precipitation Departure from Normal
December 01, 2019 to February 13, 2020

Images courtesy of Midwestern Regional Climate Center (MRCC)
Winter Temperatures

Average Temperature
Dec 1, 2019 – Feb 12, 2020

Average Temperature Departure from Normal
Dec 1, 2019 – Feb 12, 2020

Images courtesy of Midwestern Regional Climate Center (MRCC)
Seasonal Snowfall

Image courtesy of NOHRSC (NWS)

Accumulated Snowfall (in): Departure from Mean July 1, 2019 to February 12, 2020

Image courtesy of Midwestern Regional Climate Center (MRCC)
Snowpack has built across the region.

- Similar to 2019
- Bulk of the snow is in the northern parts of the Mississippi River watershed
- Local snow cover is shallow
Liquid Water in the snowpack:
- Similar to 2019
- Bulk of the snow is in the northern parts of the Mississippi River watershed
- Local snow cover is shallow
Snow Water Equivalent
(Liquid Water Content) – Comparison to Historical Records

North Central River Forecast Center
Ranked Simulated Snow Water Equivalent
Valid for 02/10/2020 12 GMT

Note: This map compares current NCRFC Modeled SWE with the historical record of modeled SWE for each basin. An area ranked as 'Less than 10 percent' is at the lower end of the record and one ranked near 100 percent is at the higher end. A 50 percent ranking indicates current SWE is in the middle of our historical record.

Created on 02/10/2020 at 07:28:41 AM CST
Frozen Ground: Current Frost Depth

https://www.weather.gov/ncrfc/LMI_FrostDepthMap

* Can overlay current snow analysis from NOHRSC and precipitation forecast from WPC
Soil Moisture – February 12, 2020

- Areal extent of the extremely wet soils is very widespread
- Even ‘drier’ areas (SE Iowa/NE Missouri) still above 80th percentile.
- Primary contributor to above normal risk for widespread minor flooding on local rivers.
- Flood risk will stay high until soils can dry out.
Streamflows

- Above to much above normal streamflows throughout the watershed.
- Above normal streamflows have persisted over the past few months.

Images courtesy of US Geological Survey
Streamflows by State

Near to above normal current streamflows.

Images courtesy of US Geological Survey
Ice Jams Potential

- This extreme cold will be short lived – could get more still this winter
- Overall warm weather has kept ice on the local rivers from getting too thick. Many rivers have been open through the first part of February.
- Can still get ice development and ice jams to form, but overall risk is lower than normal.
3 Month Weather Outlooks
March/April/May

NOAA Climate Prediction Center – www.cpc.ncep.noaa.gov
What is the Flood Risk? And how much outside of normal is it?

Closer the lines are together the closer to normal the flood threat is.

This graphic shows the probability of the Mississippi River at Burlington reaching Major Flood stage (18.0 ft) this year is roughly around 92%. In a normal year this gage has a 22% of reaching 18.0 ft.
Most Local Rivers have similar risk to this location.

For the Rock River at Moline, the risk for reaching Major Flood Stage (14.0 ft) this year is 30%. In a normal year this gage has a 23% Of reaching 14.0 ft.
Long-Range River Outlooks

Locations with high chances for flooding:

- Greater than 95% chance to reach the labeled flood stage
- Many of the Mississippi locations are closer to the Major Flood category at 95%
Long-Range River Outlooks

Locations with chances for flooding:

- Around a 50% chance to reach the labeled flood stage
Long-Range River Outlooks

Locations with chances for flooding:
• Around a 25% chance to reach the labeled flood stage → Lower Confidence (Probability)
Spring Flood Outlook Dates

Updated Outlooks:
February 27, 2020
March 12, 2020

Information from this outlook can be found:
From the North Central River Forecast Center
https://www.weather.gov/ncrfc/

From the Quad Cities Weather Forecast Office:
Quad Cities - weather.gov/dvn/2020_springfloodoutlook

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NWS Quad Cities
jessica.brooks@noaa.gov
Information Sources

• Midwest Regional Climate Center (MRCC) – http://mrcc.isws.illinois.edu/
• National Operational Hydrologic Remote Sensing Center (NOHRSC) – www.nohrsc.noaa.gov
• NOAA Climate Prediction Center – www.cpc.ncep.noaa.gov
• NOAA Weather Prediction Center – www.wpc.ncep.noaa.gov
• North Central River Forecast Center – www.weather.gov/ncrfc
• https://www.weather.gov/ncrfc/LMI_ROF_NFP_SpringHydroOutlook
• Advanced Hydrological Prediction Service (AHPS) – water.weather.gov/ahps
• US Drought Monitor – droughtmonitor.unl.edu
NWS AHPS Webpage
weather.gov/dvn ➔ Rivers and Lakes tab

Extended Outlooks
50% or Greater Chance

Long Range Outlooks

Chance of Exceeding River Stage at Mississippi River at Rock Island L&D 15 (RCK12)
Forecast for the period 04/29/2019 - 07/28/2019
This is a conditional simulation based on the conditions as of 04/22/2019

https://water.weather.gov/ahps2/long_range.php?wfo=DVN
Area Forecast Discussion

When there is active flooding or a concern for flooding to develop, the NWS Quad Cities will provide a technical discussion about forecast in our Area Forecast Discussion.

This discussion is updated frequently through the day and contains the thoughts of our forecasters on the weather and hydrological concerns.

https://forecast.weather.gov/product.php?site=DVN&issuedby=DVN&product=AFD&format=CI&version=1&glossary=1
River Flood Outlooks

http://www.weather.gov/ncrfc/LMI_FOP_summary

http://www.wpc.ncep.noaa.gov/nationalfloodoutlook/
Snow Cover
National Operational Hydrologic Remote Sensing Center

Modeled Snow Depth for 2019 February 22, 18:00 UTC
1125 mi

www.nohrsc.noaa.gov
Excessive Rain Outlooks

wpc.ncep.noaa.gov
Drought Status

U.S. Drought Monitor
Midwest

May 14, 2019
(Released Thursday, May 16, 2019)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

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<th>Year of Interest</th>
<th>D0-D4</th>
<th>D1-D4</th>
<th>D2-D4</th>
<th>D3-D4</th>
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<td>4.45</td>
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</table>

Intensity:
- None
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Curtis Riganti
National Drought Mitigation Center

droughtmonitor.unl.edu

- https://www.drought.gov/drought/
- droughtmonitor.unl.edu
Stream Levels
US Geological Survey

https://waterwatch.usgs.gov/
7-day Precipitation (QPF) Forecast

NOAA Weather Prediction Center – www.wpc.ncep.noaa.gov
Week 2 Risk of Heavy Precipitation

NOAA Climate Prediction Center – www.cpc.ncep.noaa.gov
Weeks 3 & 4 Outlooks

NOAA Climate Prediction Center – www.cpc.ncep.noaa.gov
Monthly Weather Outlooks

NOAA Climate Prediction Center – [www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov)