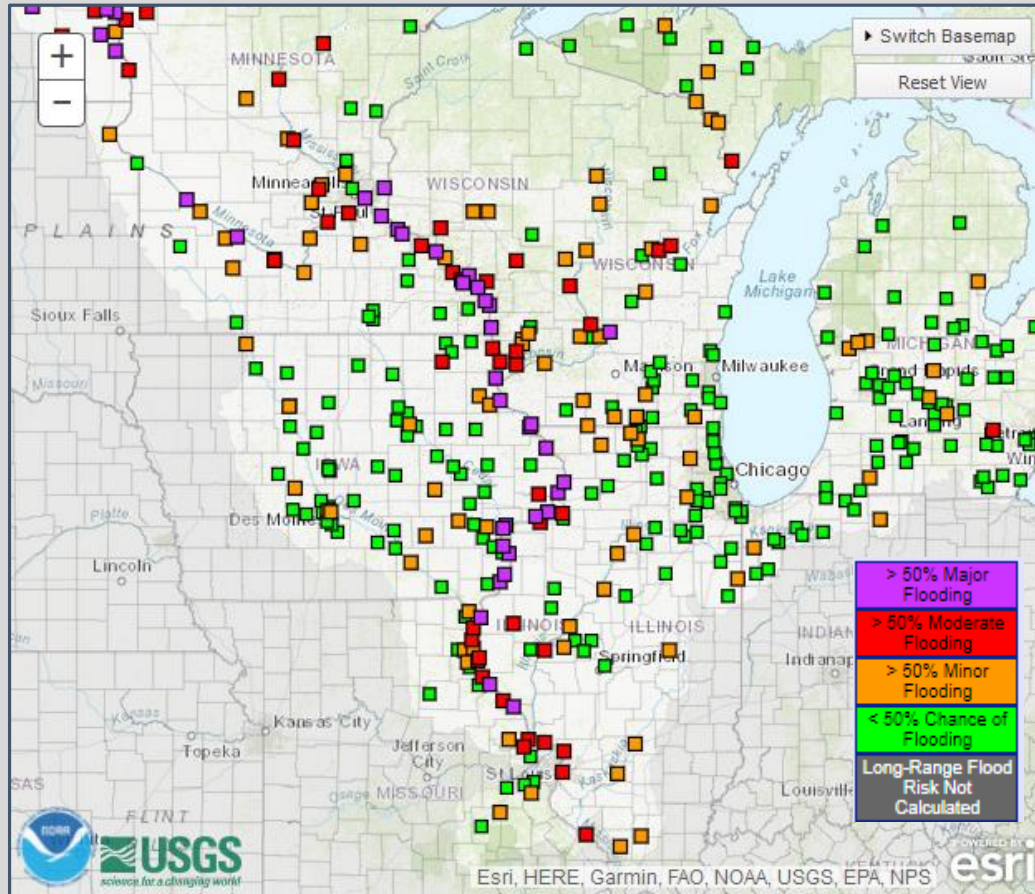




2020 Spring Flood Outlook

National Weather Service – WFO Quad Cities



Factors to Consider for Spring Flooding

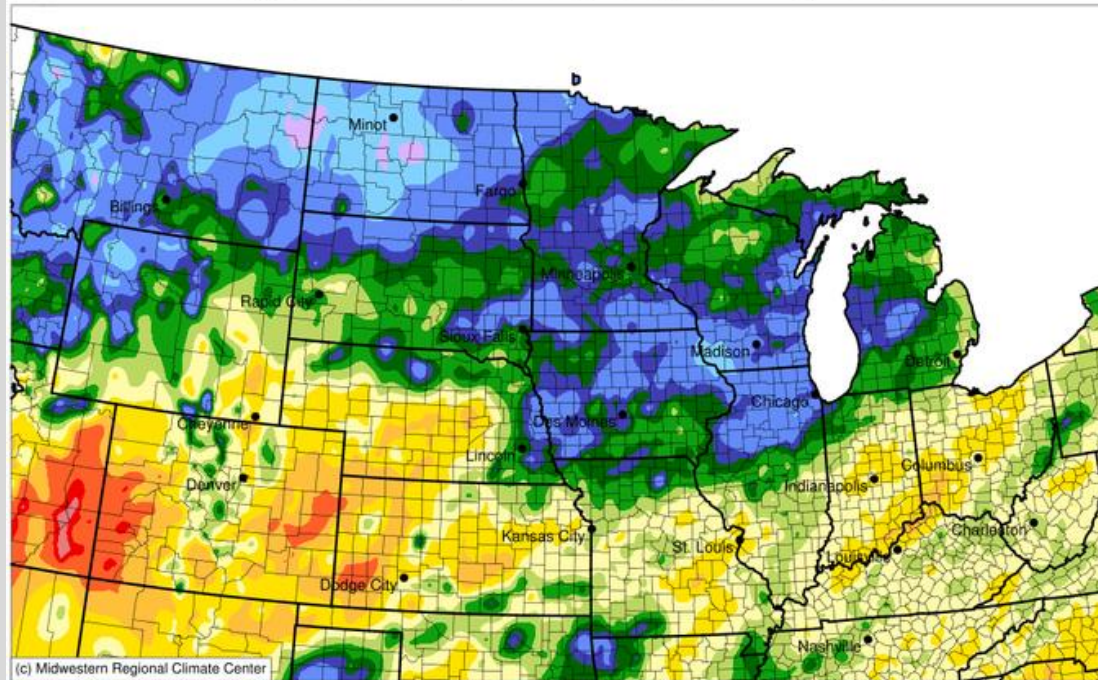
- Antecedent Conditions
- Snow Cover (Snowpack) / Liquid Water Equivalent
- Frozen Ground
- Soil Moisture
- Streamflows
- Weather Forecasts/Outlooks



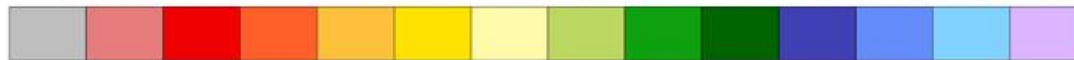
Antecedent Conditions: 2019 Fall Moisture

Accumulated Precipitation (in): Percent of 1981-2010 Normals

September 01, 2019 to October 31, 2019



(c) Midwestern Regional Climate Center



2 5 10 25 50 75 100 125 150 175 200 300 400

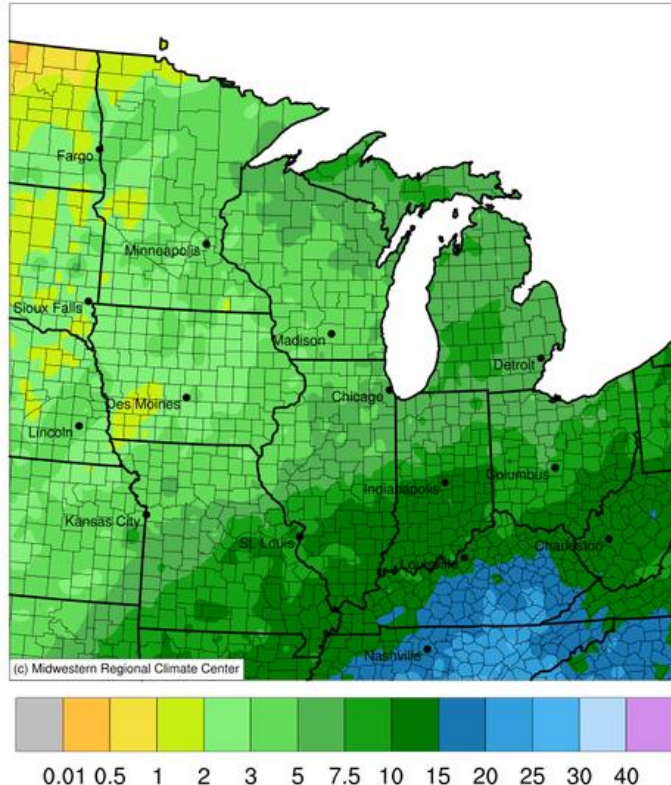
Stations from the following networks used: WBAN, COOP, FAA, GHCN, ThreadEx, CoCoRaHS, WMO, ICAO, NWSLI, Missouri FSA, Missouri Mesonet, Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 11/1/2019 3:44:02 PM CDT



Winter Precipitation

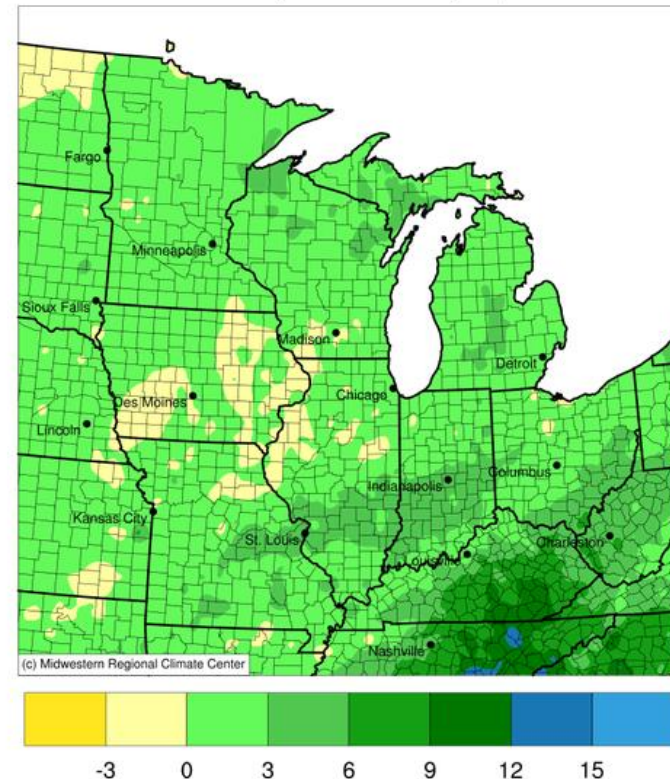
Accumulated Precipitation

December 01, 2019 to February 13, 2020



Accumulated Precipitation Departure from Normal

December 01, 2019 to February 13, 2020

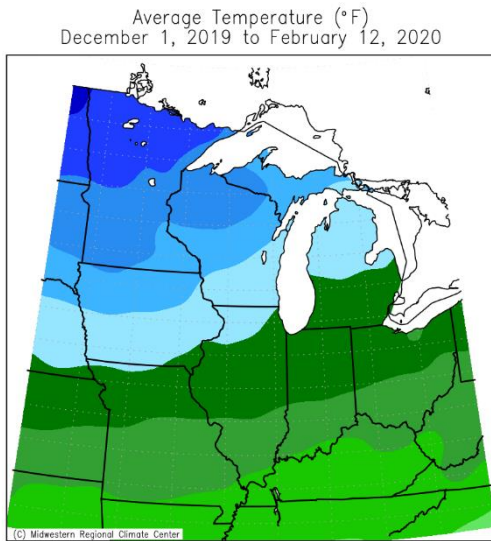


Images courtesy of Midwestern Regional Climate Center (MRCC)



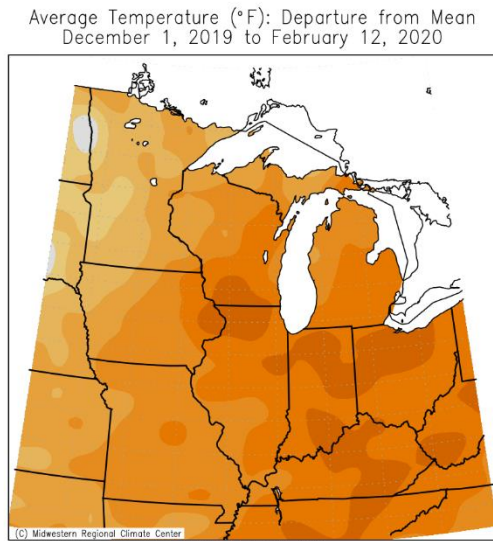
Winter Temperatures

Average Temperature Dec 1, 2019 – Feb 12, 2020



Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 2/14/2020 8:03:40 AM CST

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



Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 2/13/2020 9:46:47 AM CST

Images courtesy of Midwestern Regional Climate Center (MRCC)



Seasonal Snowfall

National Snowfall Analysis: accumulation from 2018-09-30 to 2019-03-07

Issued 2019-09-23 13:04:40 UTC

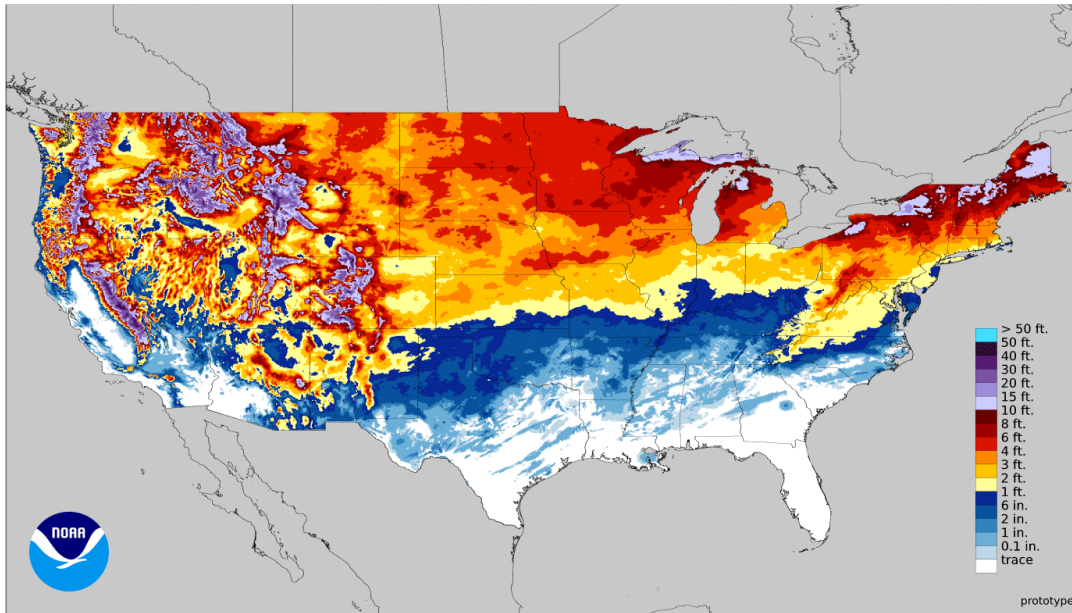
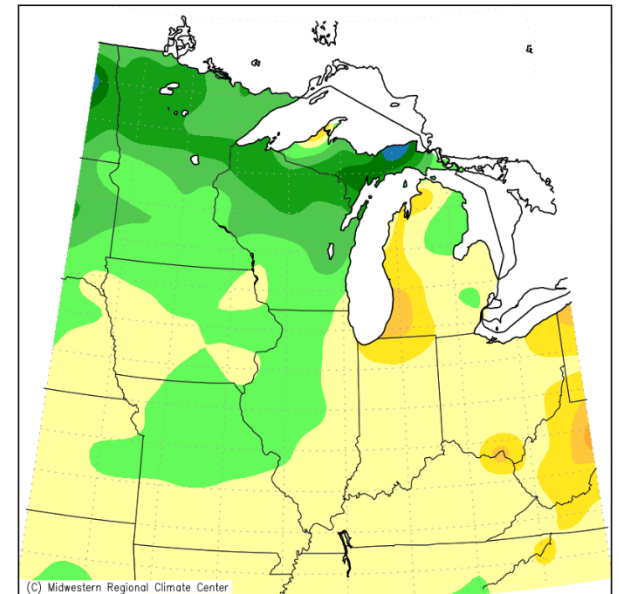


Image courtesy of NOHRSC (NWS)

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



Midwestern Regional Climate Center

Illinois State Water Survey, Prairie Research Institute
University of Illinois at Urbana-Champaign

Image courtesy of Midwestern Regional Climate
Center (MRCC)



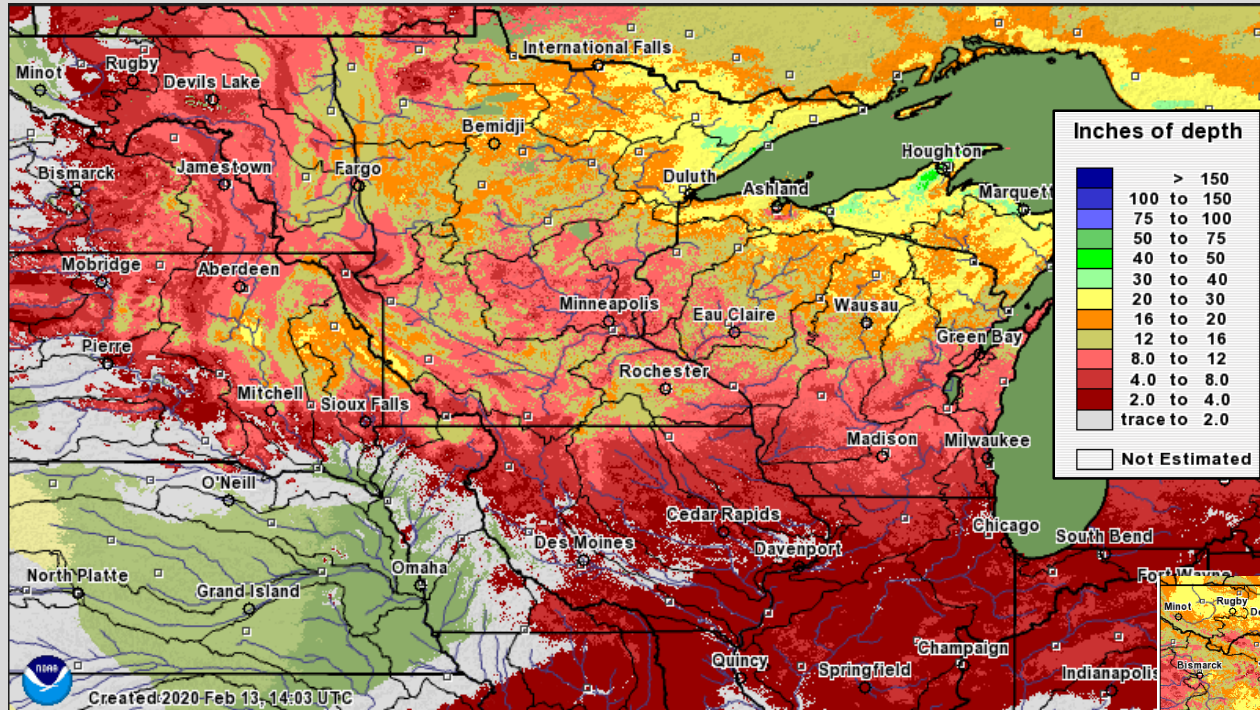
NATIONAL WEATHER SERVICE
QUAD CITIES IA/IL
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



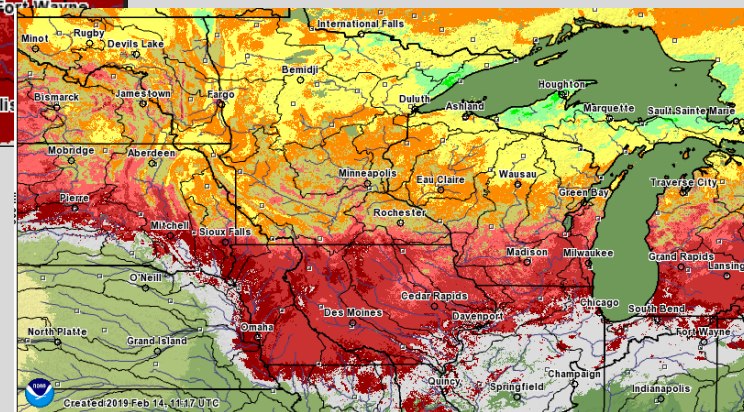
Snow Depth

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



Snow Depth – February 13, 2020



Snow Depth – February 13, 2019

Images courtesy of NOHRSC (NWS)



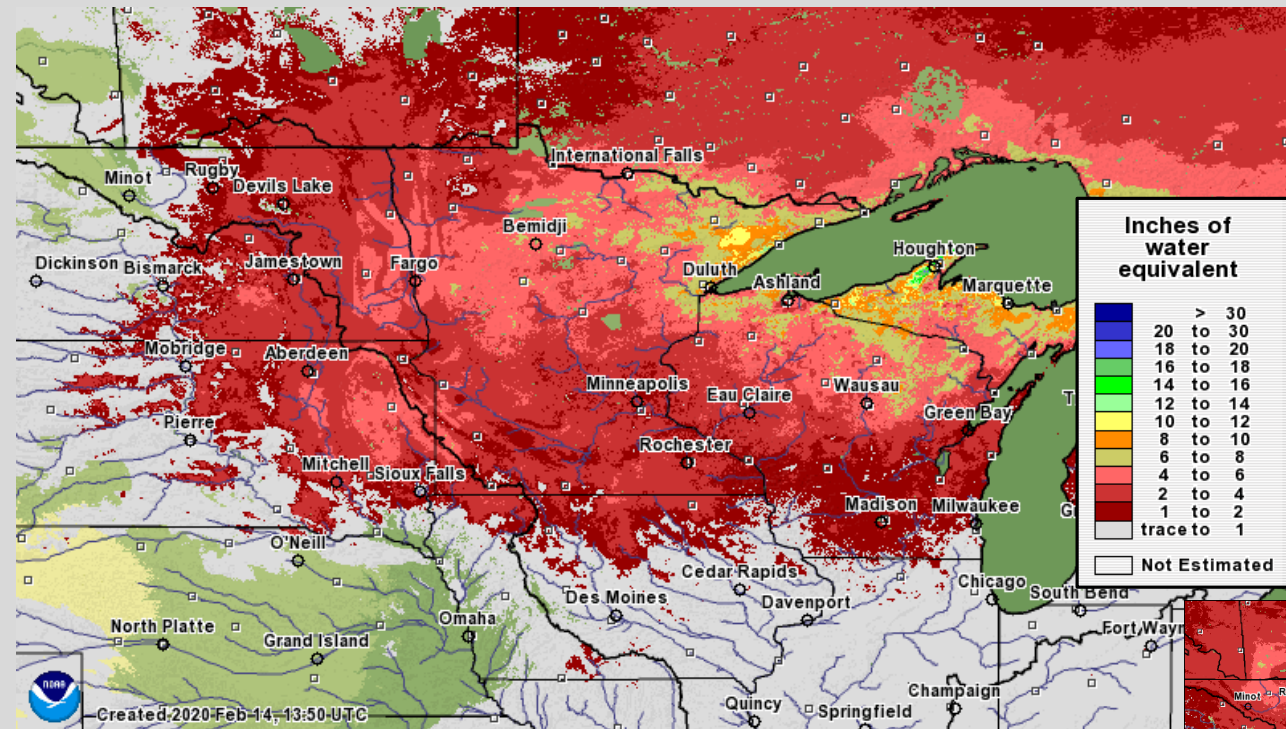
NATIONAL WEATHER SERVICE
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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



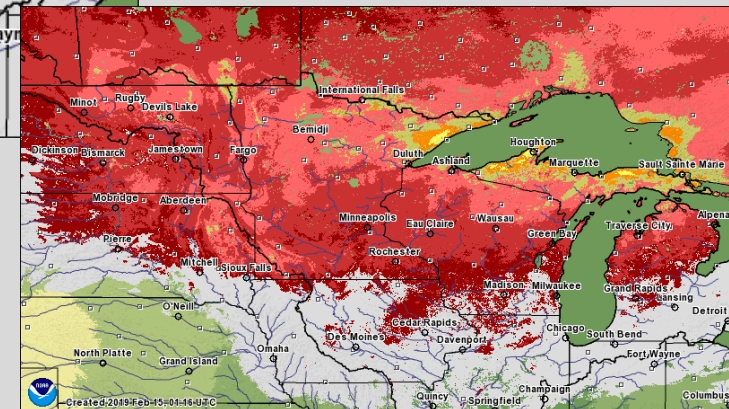
Snow Water Equivalent (Liquid Water Content)

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 – February 14, 2020



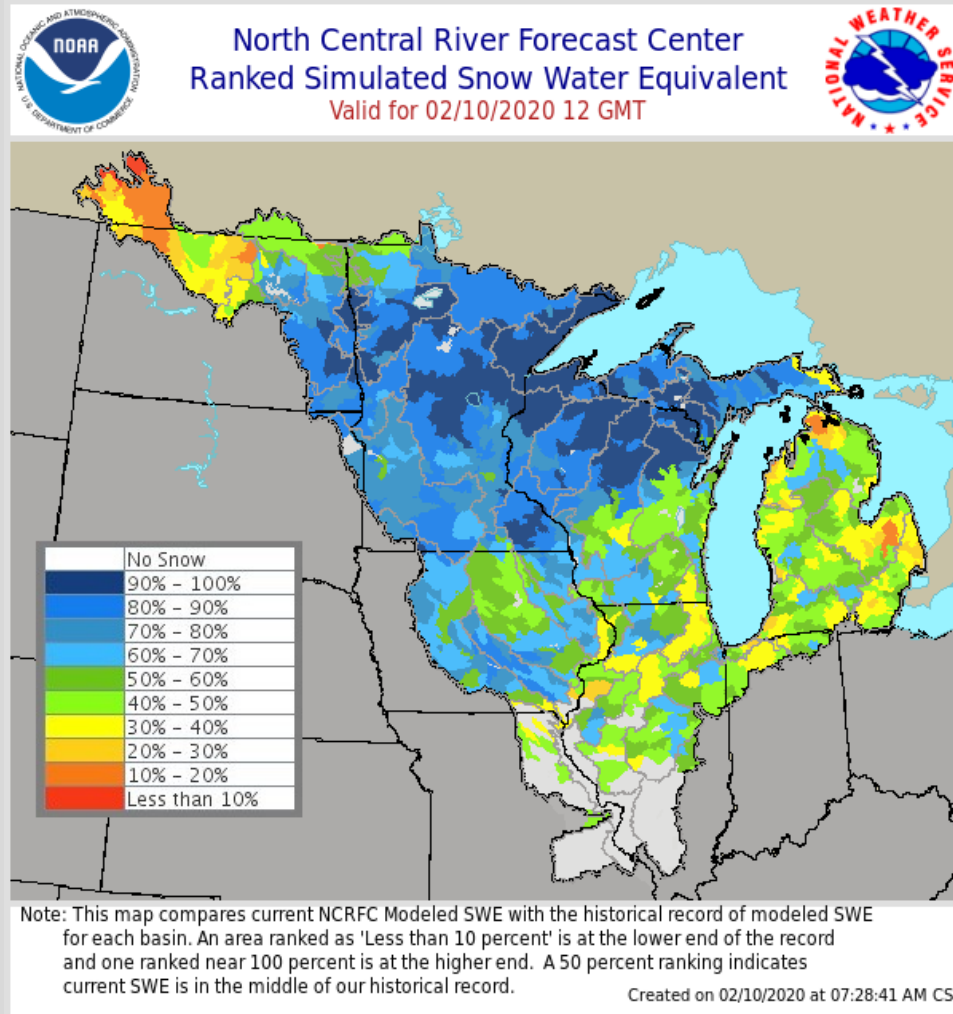
Snow Water Equivalent – February 14, 2019

Images courtesy of NOHRSC (NWS)

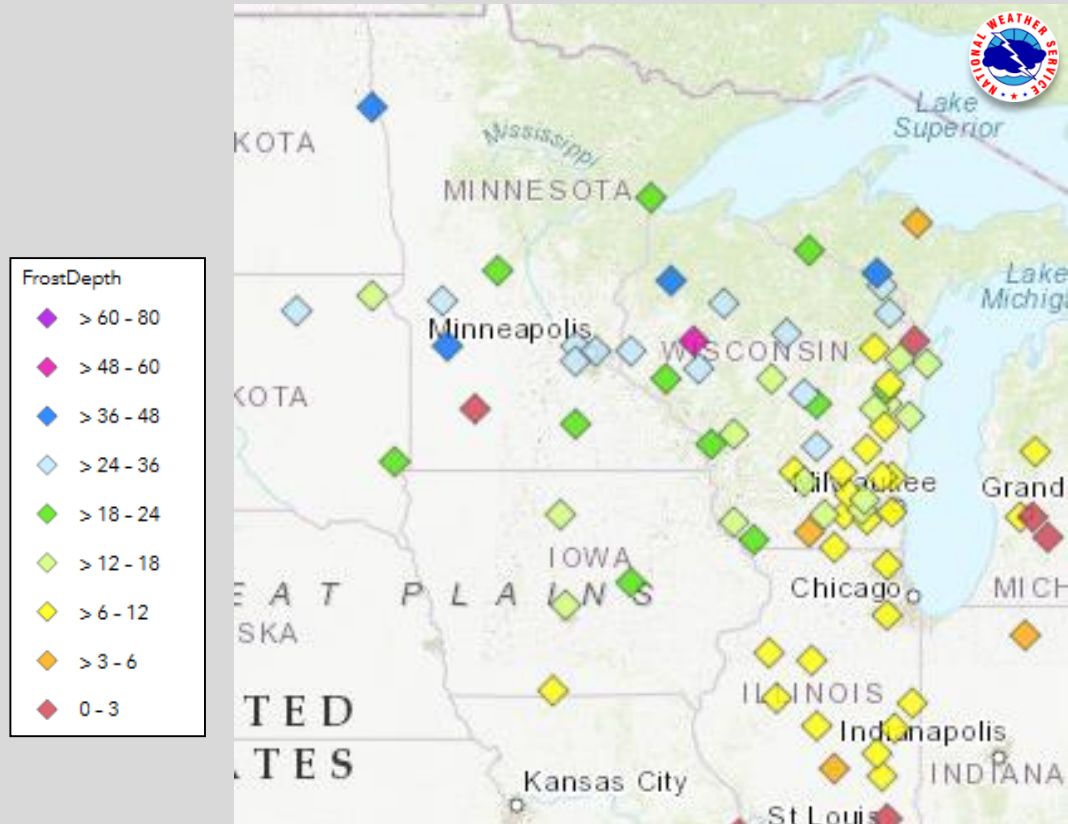


Snow Water Equivalent

(Liquid Water Content) – Comparison to Historical Records



Frozen Ground: Current Frost Depth



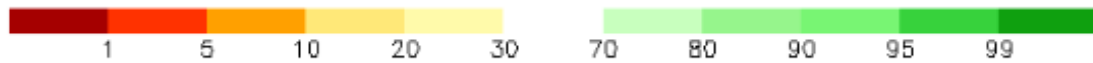
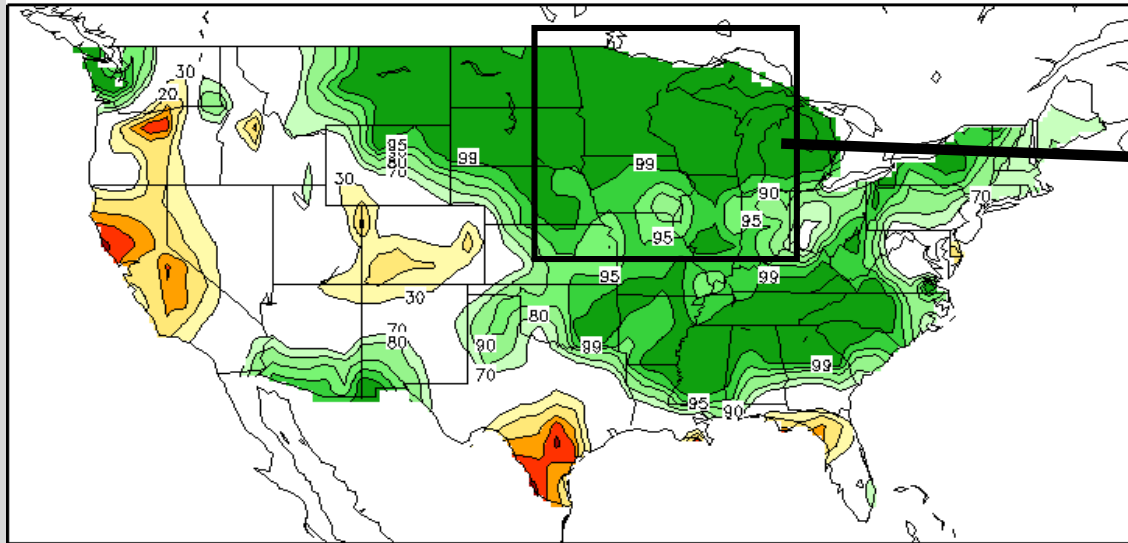
https://www.weather.gov/ncrfc/LMI_FrostDepthMap

* Can overlay current snow analysis from NOHRSC and precipitation forecast from WPC



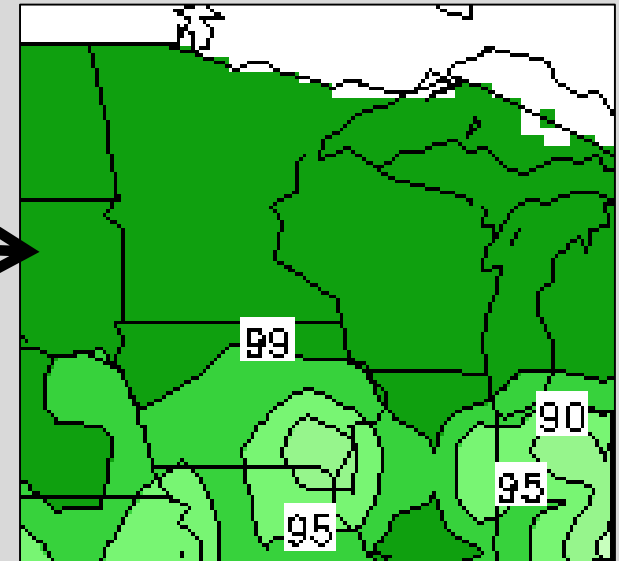
Soil Moisture

Calculated Soil Moisture Ranking Percentile
FEB 12, 2020

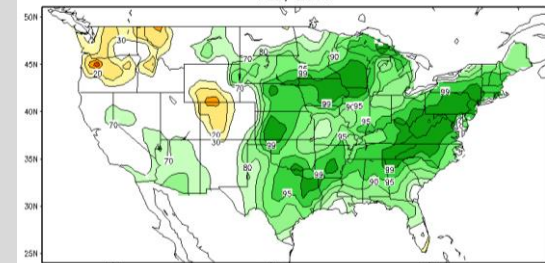


Soil Moisture – February 12, 2020

- 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.



Calculated Soil Moisture Ranking Percentile
FEB, 2019



Soil Moisture – February 2019

Images courtesy of NWS Climate Prediction Center

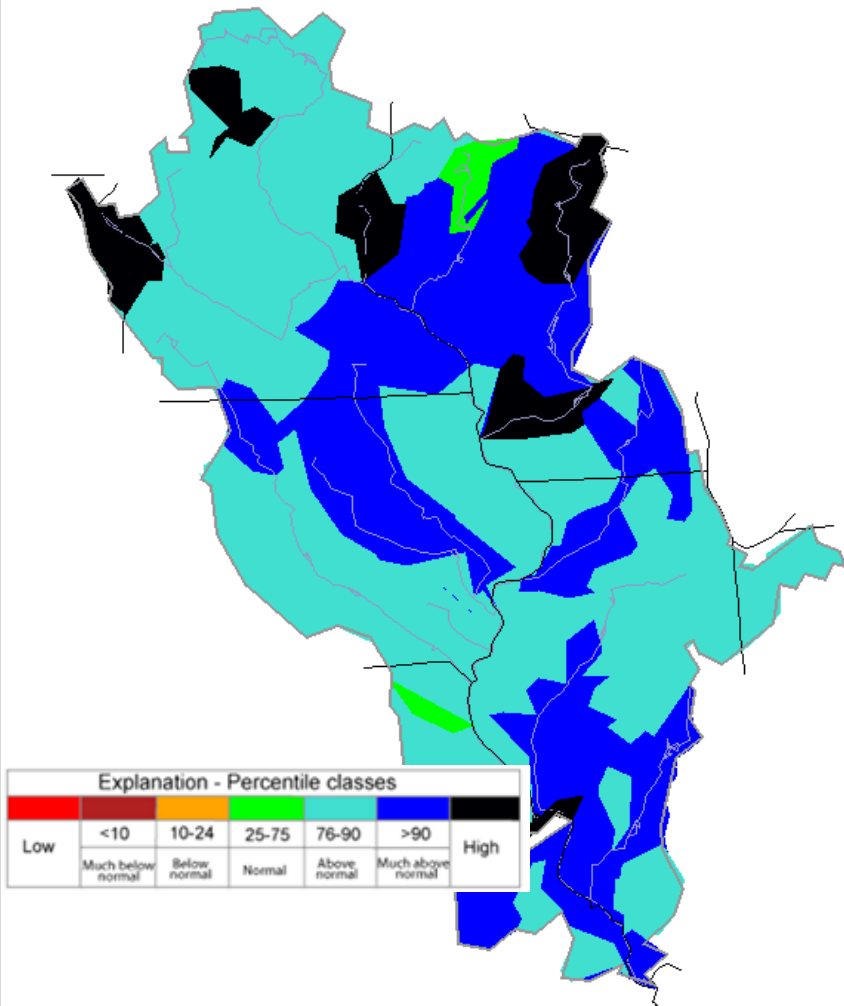


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Streamflows

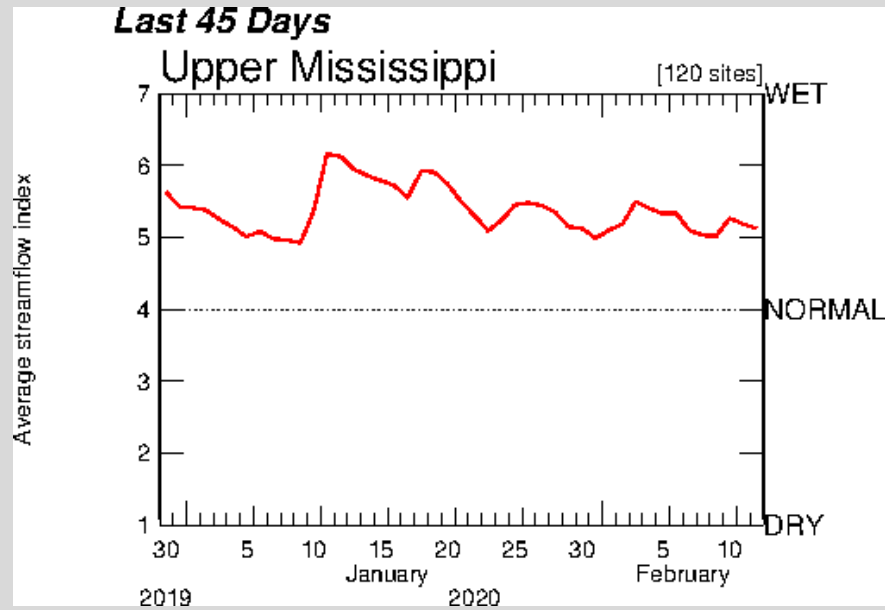
Wednesday, February 12, 2020



Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	



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



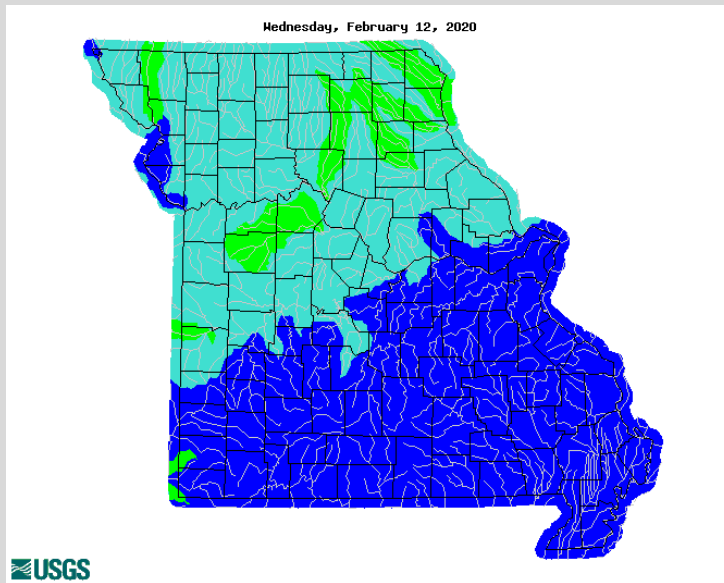
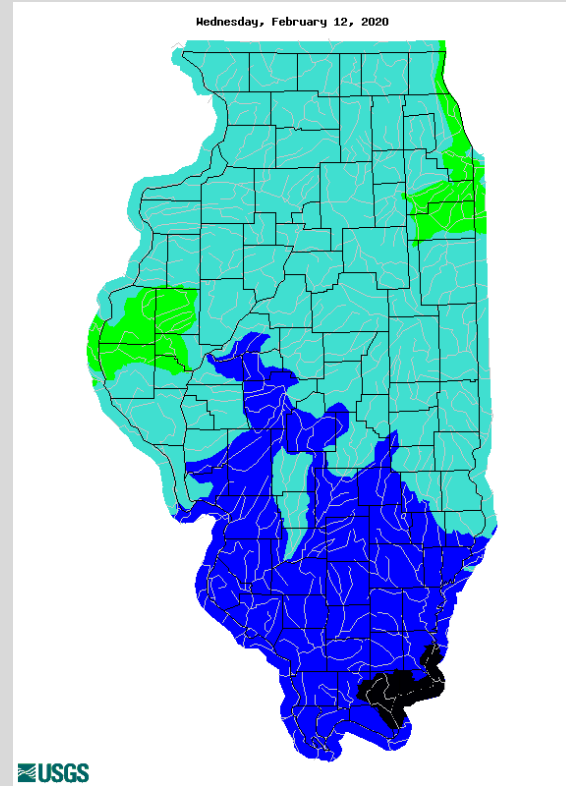
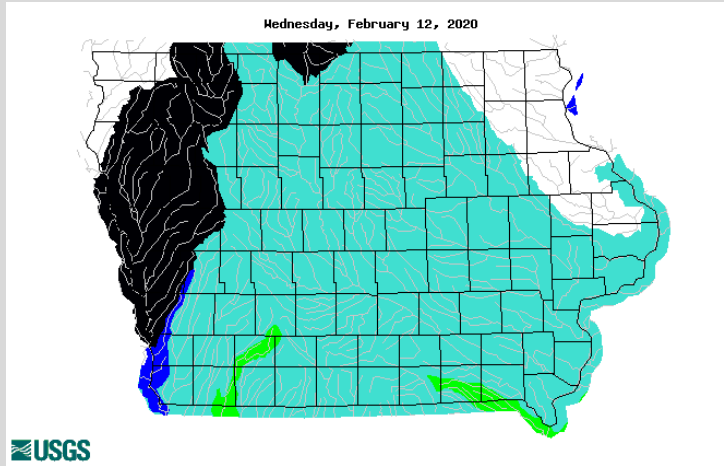
Images courtesy of US Geological Survey



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Streamflows by State



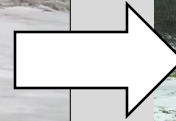
Explanation - Percentile classes

Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

Images courtesy of US Geological Survey



Ice Jams Potential

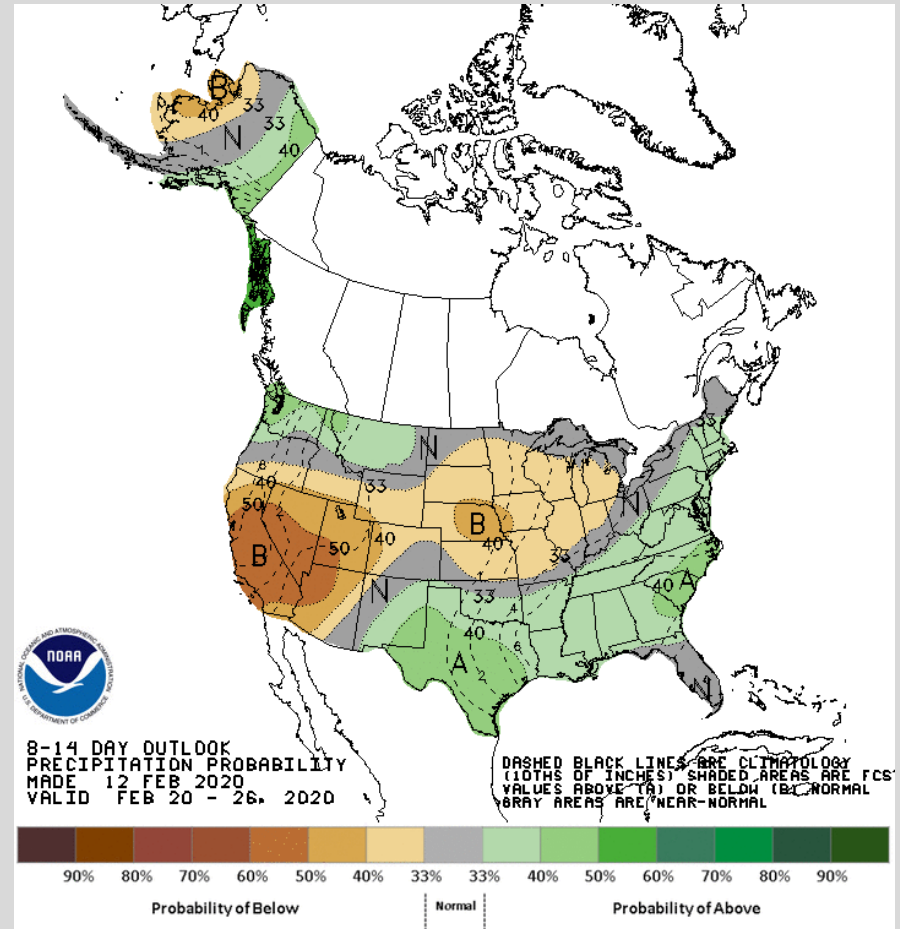
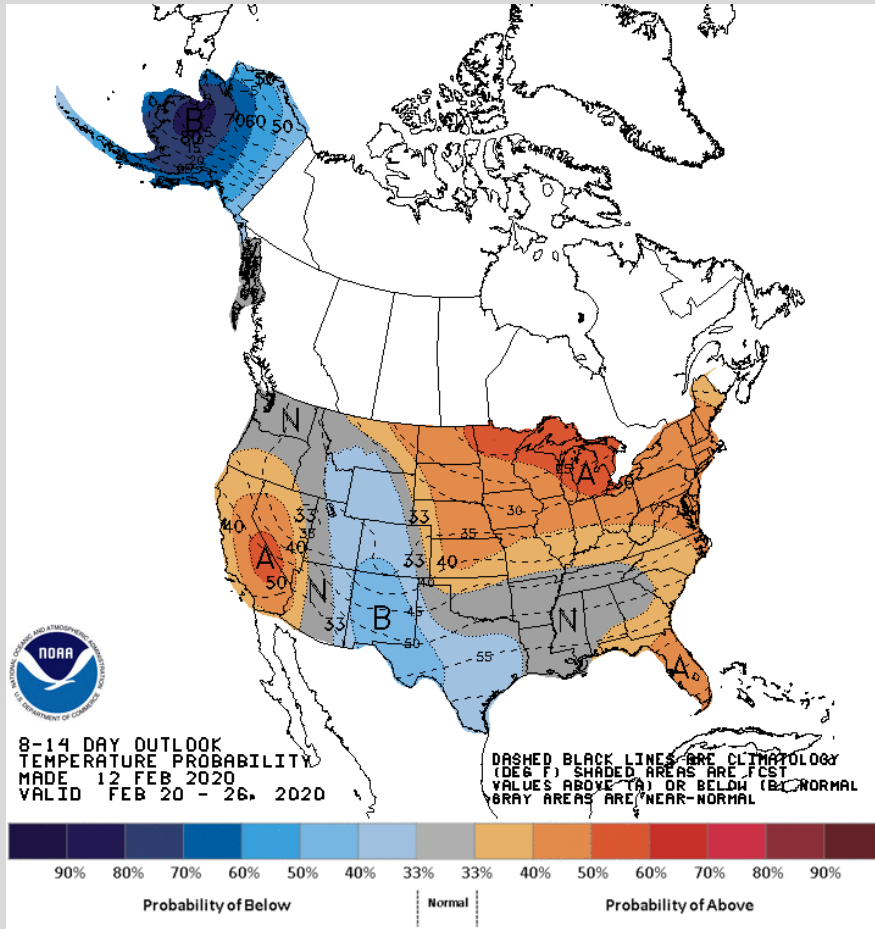


- **This extreme cold will be short lived – could get more still this winter**
- **Overall warm weather has kept ice on the local rivers from getting too thick. Many rivers have been open through the first part of February.**
- **Can still get ice development and ice jams to form, but overall risk is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



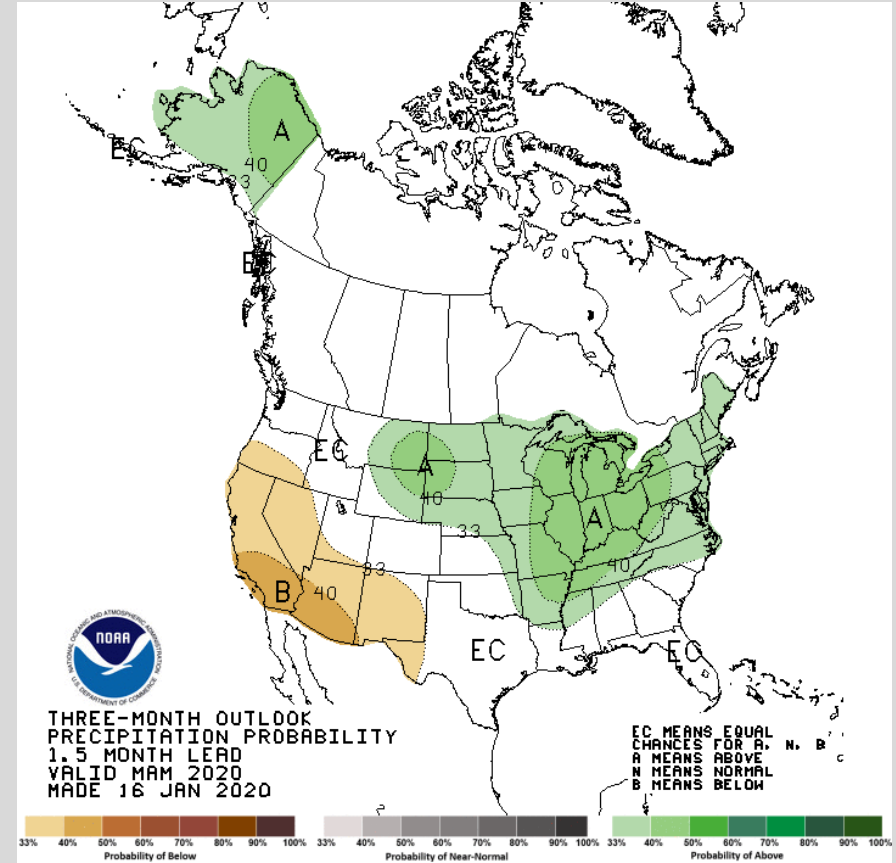
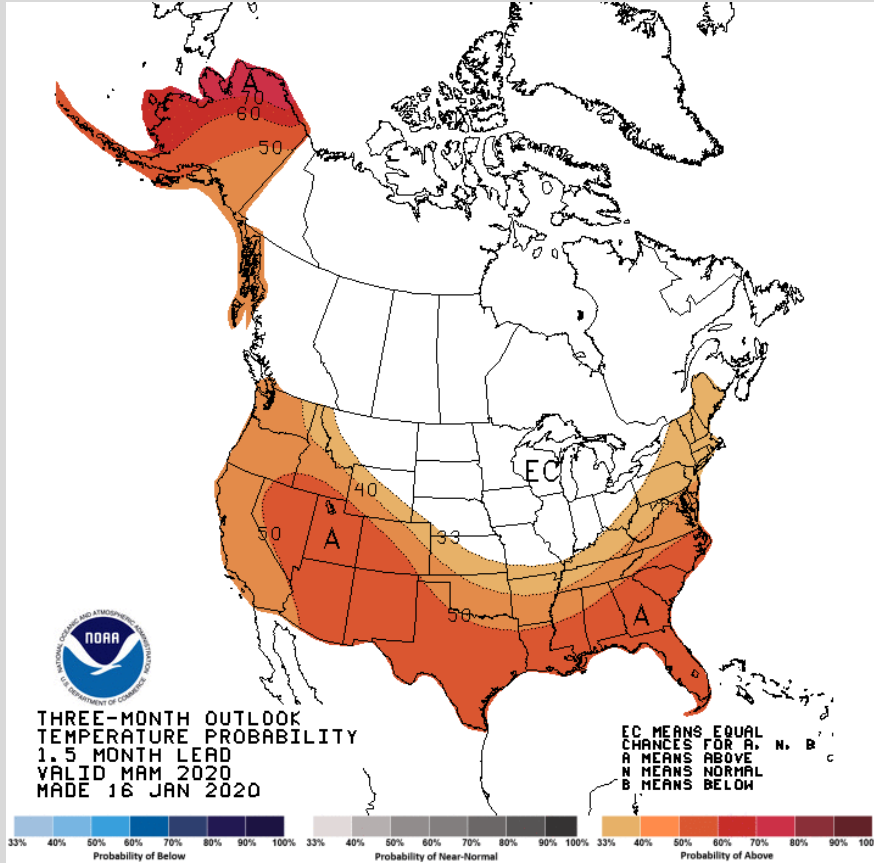
Week 2 Weather Outlook

February 20th – 26th



3 Month Weather Outlooks

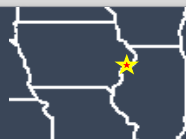
March/April/May



NOAA Climate Prediction Center – www.cpc.ncep.noaa.gov



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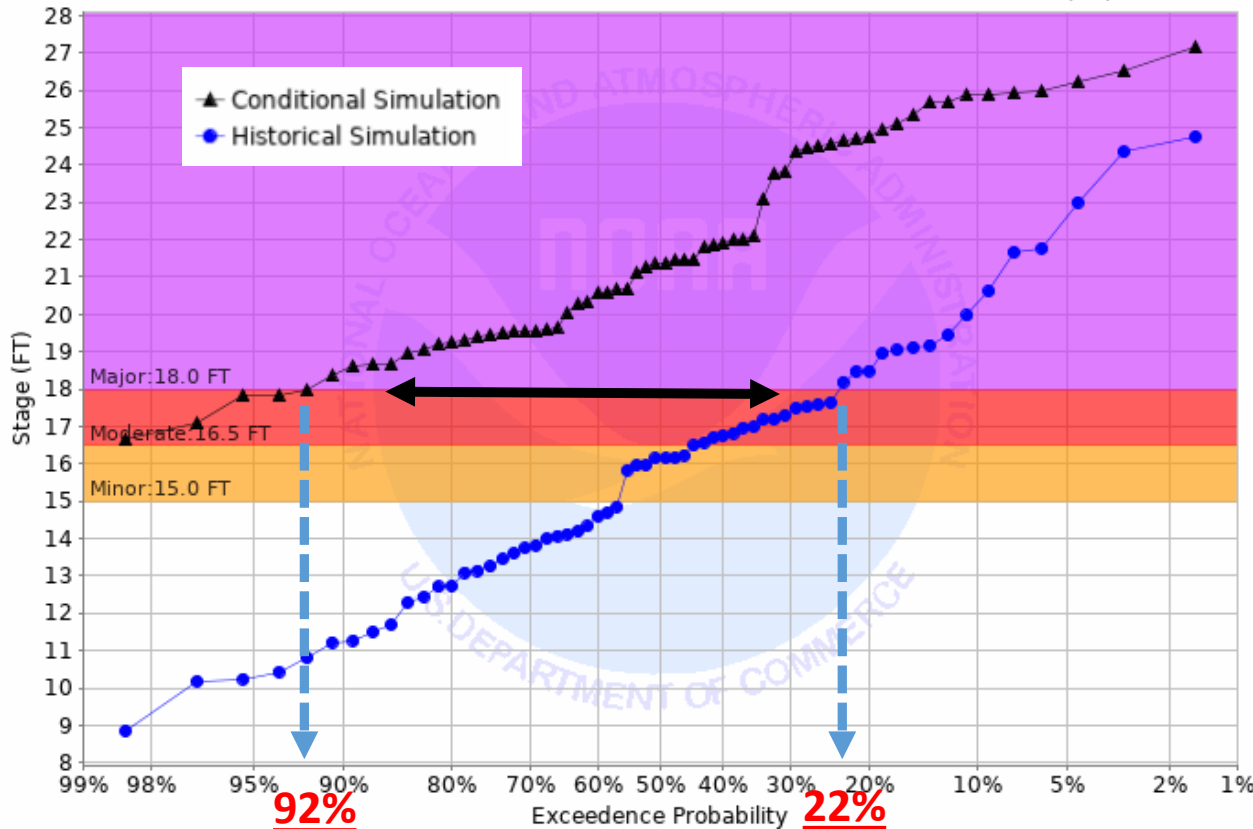


What is the Flood Risk?

And how much outside of normal is it?

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

Chance of Exceeding River Stage at Mississippi River at Burlington (BRLI4)
Forecast for the period 02/17/2020 - 05/17/2020
This is a conditional simulation based on the conditions as of 02/10/2020



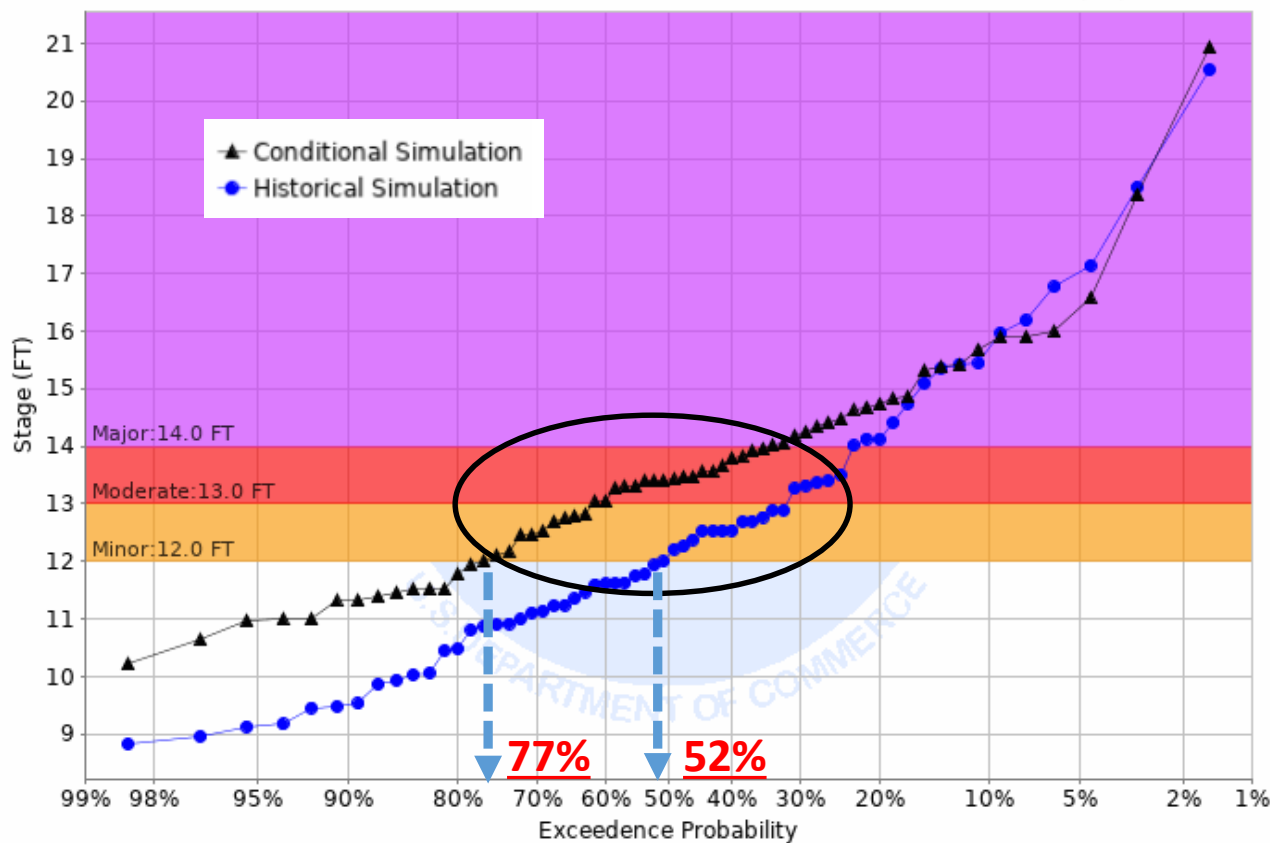
This graphic shows the probability of the Mississippi River at Burlington reaching Major Flood stage (18.0 ft) this year is roughly around 92%. In a normal year this gage has a 22% of reaching 18.0 ft.

What is the Flood Risk?

And how much outside of normal is it?

Most Local Rivers have similar risk to this location.

Chance of Exceeding River Stage at Rock River at Moline (MLI12)
Forecast for the period 02/17/2020 - 05/17/2020
This is a conditional simulation based on the conditions as of 02/10/2020

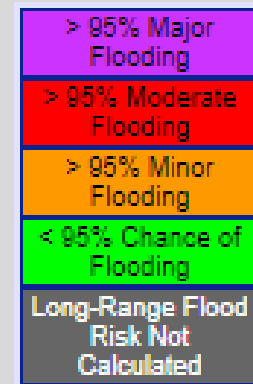
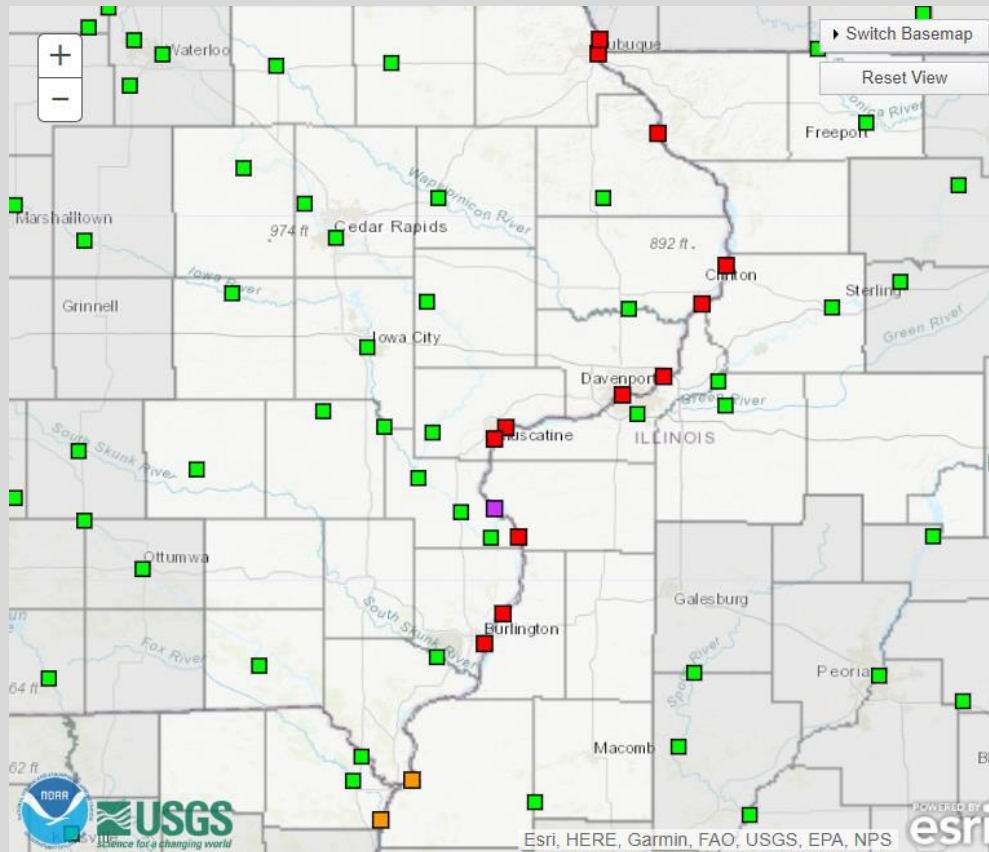


For the Rock River at Moline, the risk for reaching Major Flood Stage (14.0 ft) this year is 30%. In a normal year this gage has a 23% Of reaching 14.0 ft.

Long-Range River Outlooks

Locations with high chances for flooding:

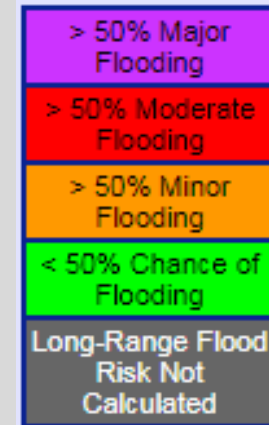
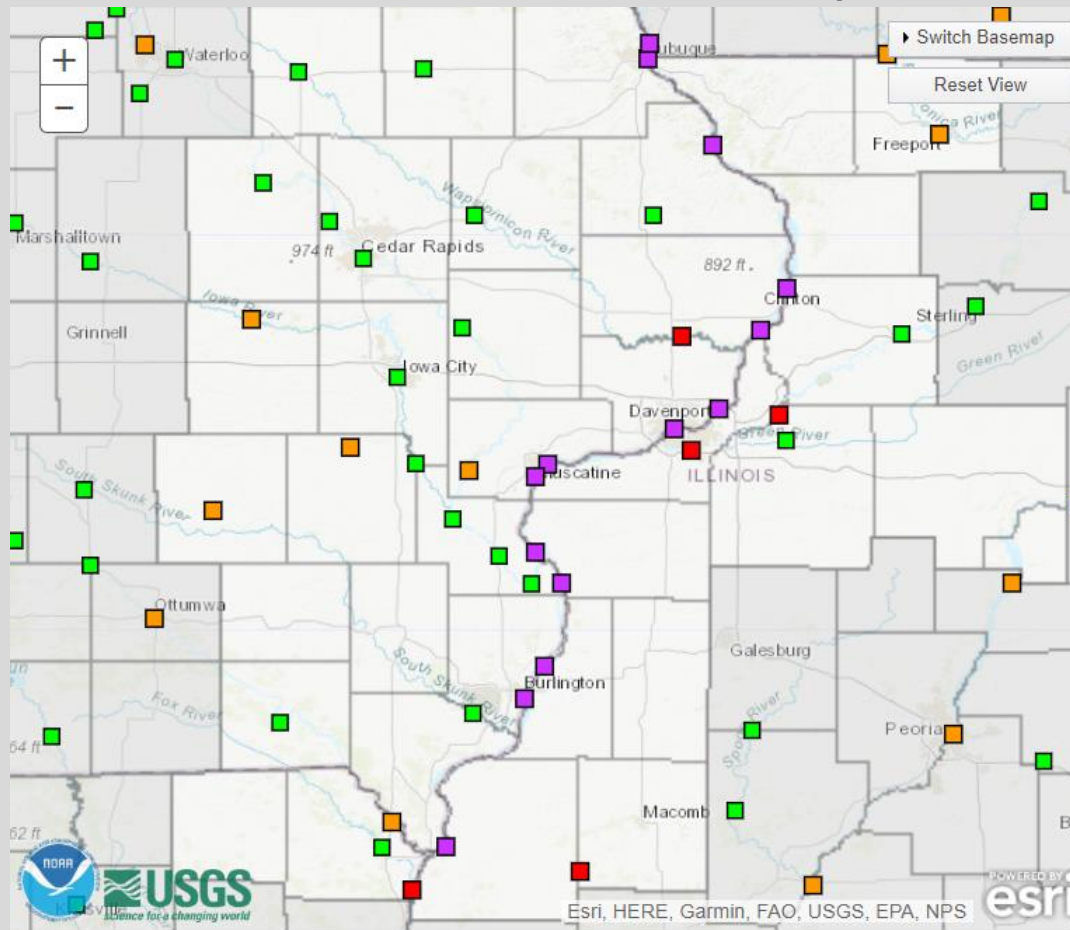
- Greater than 95% chance to reach the labeled flood stage
- Many of the Mississippi locations are closer to the Major Flood category at 95%



Long-Range River Outlooks

Locations with chances for flooding:

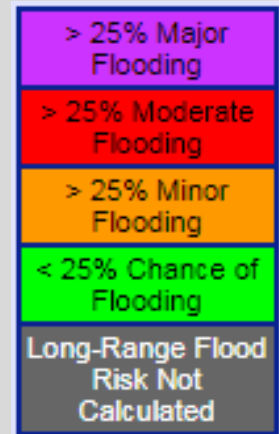
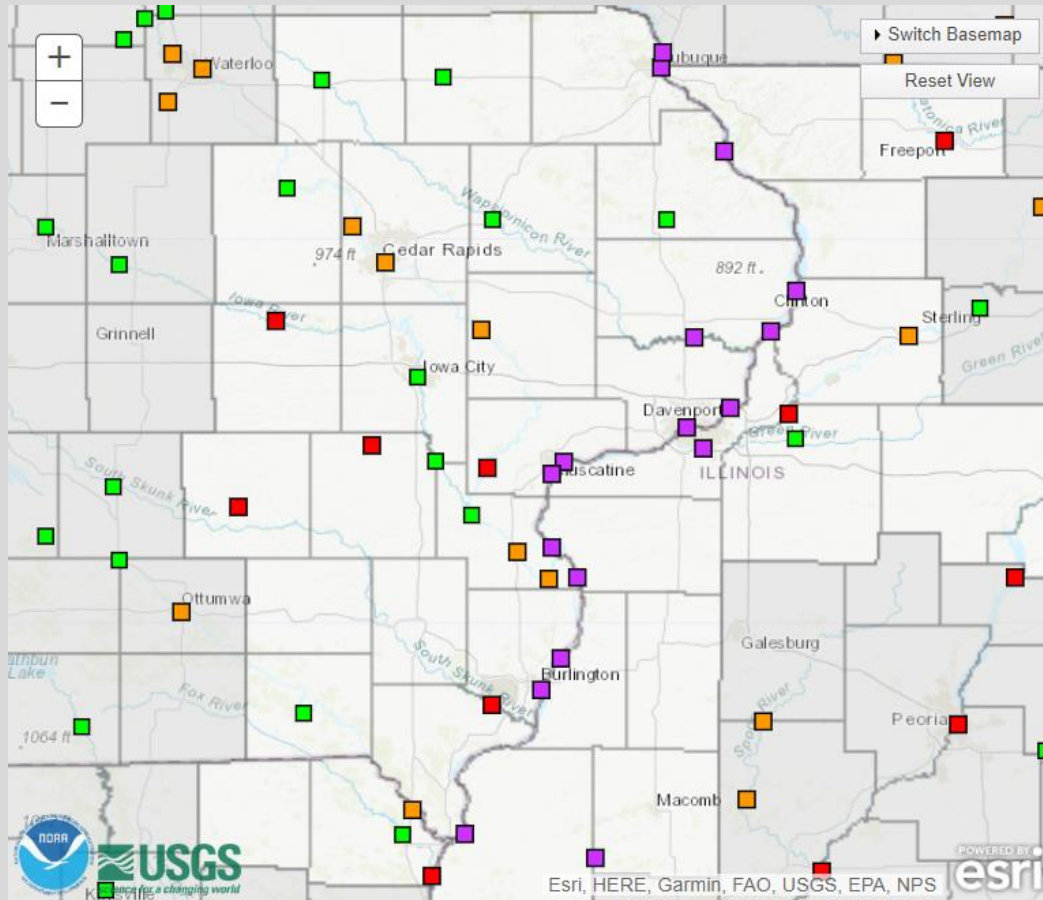
- Around a 50% chance to reach the labeled flood stage



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](https://www.weather.gov/dvn/2020_springfloodoutlook)

Jessica Brooks

NWS Quad Cities

jessica.brooks@noaa.gov



Information Sources

- Midwest Regional Climate Center (MRCC) – <http://mrcc.isws.illinois.edu/>
- US Geological Survey (USGS) – <http://www.usgs.gov>
- 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

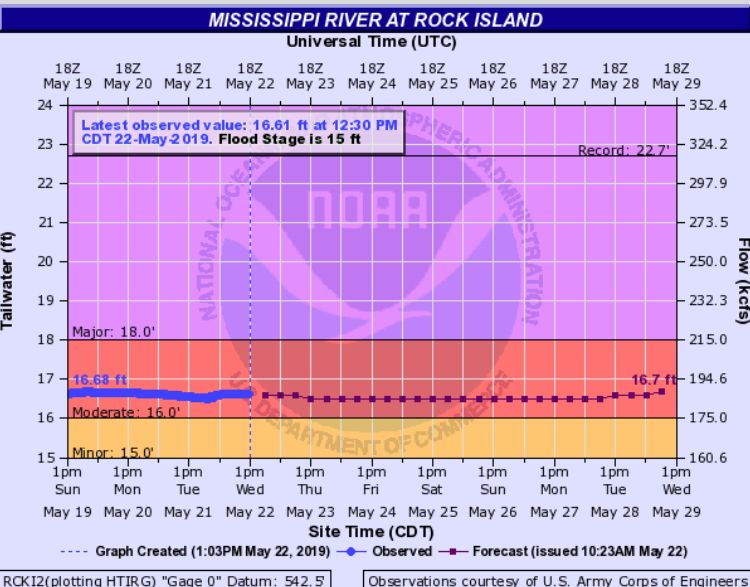


Resources



NWS AHPS Webpage

weather.gov/dvn → Rivers and Lakes tab



Upstream Gauge Downstream Gauge

Flood Categories (in feet)

- Major Flood Stage: 18
- Moderate Flood Stage: 16
- Flood Stage: 15
- Action Stage: 13

Historic Crests

- (1) 22.63 ft on 07/09/1993
- (2) 22.48 ft on 04/28/1965
- (3) 22.33 ft on 04/25/2001
- (4) 22.00 ft on 03/10/1868
- (5) 21.49 ft on 06/16/2008
- (6) 20.94 ft on 07/04/2014 (P)
- (7) 20.71 ft on 04/22/2011
- (8) 19.66 ft on 04/20/1997
- (9) 19.40 ft on 06/27/1892
- (10) 19.30 ft on 04/26/1969

(P): Preliminary values subject to further review.

Recent Crests

- (1) 20.94 ft on 07/04/2014 (P)
- (2) 16.94 ft on 06/24/2014 (P)
- (3) 18.01 ft on 07/01/2013 (P)
- (4) 15.95 ft on 06/14/2013 (P)
- (5) 19.12 ft on 04/21/2013 (P)
- (6) 15.24 ft on 07/30/2011
- (7) 20.71 ft on 04/22/2011
- (8) 21.49 ft on 06/16/2008
- (9) 19.24 ft on 04/29/2008
- (10) 17.08 ft on 06/22/2004

(P): Preliminary values subject to further review.

Low Water Records
Currently none available.

Latitude/Longitude Disclaimer: The gauge location shown in the above map is the approximate location based on the latitude/longitude coordinates provided to the NWS by the gauge owner.

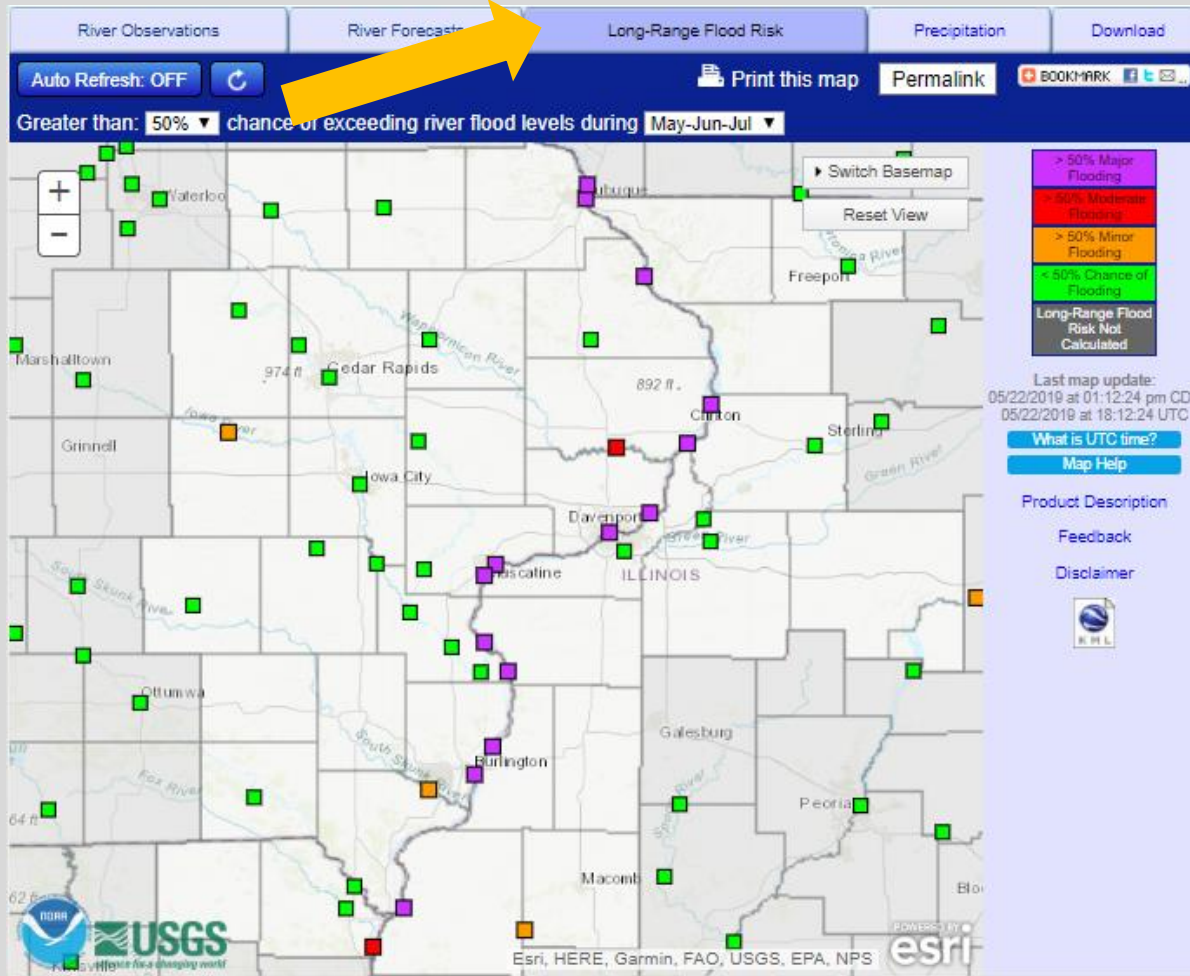
RK12(plotting HTIRG) "Gage 0" Datum: 542.5' Observations courtesy of U.S. Army Corps of Engineers

- Flood Impacts & Photos
- If you notice any errors in the below information, please contact our Webmaster
- 29 Water reaches the top of the flood walls and levees in Bettendorf, Rock Island, and East Moline.
 - 27.5 Water affects Moline's water treatment plant.
 - 27 Water reaches the bottom of the Arsenal Bridge deck.
 - 26 Water reaches the top of the lowest section of the flood wall at Leach Park in Bettendorf.
 - 25.7 Water affects many residences and businesses in the vicinity of State Street and 8th Street in Bettendorf.
 - 25 Water reaches the top of the lowest section of Rock Island's flood wall in the District.
 - 24 Water affects the main concourse of the River's Edge Center. In Riverdale, water is at floor level in the ALCOA plant.
 - 23.6 Water affects ramps at the bus station in Davenport.
 - 23.5 Water affects Davenport's Water Pollution Control Plant.

<https://water.weather.gov/ahps2/index.php?wfo=DVN>



Extended Outlooks 50% or Greater Chance



<https://water.weather.gov/ahps2/index.php?wfo=dvn>

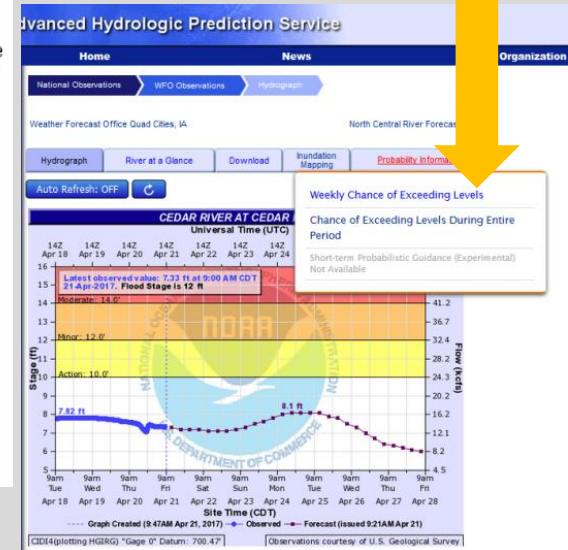
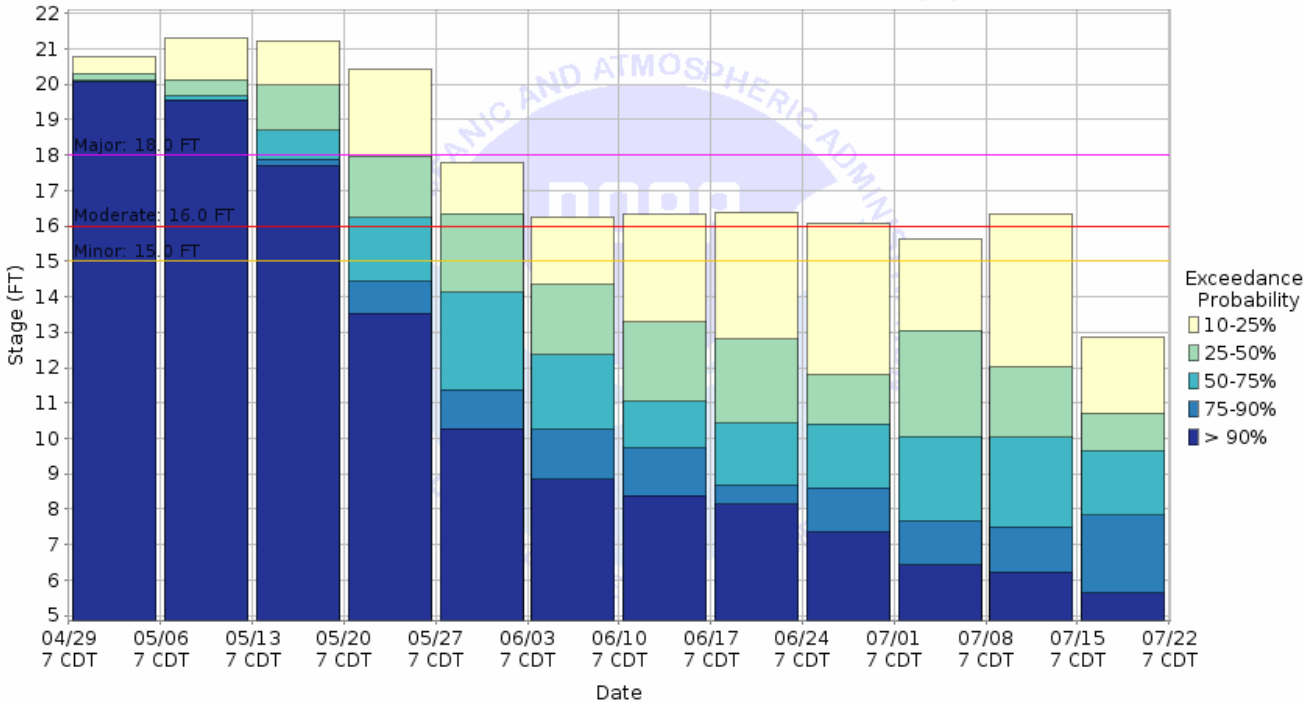


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Long Range Outlooks AHPS

Weekly Chance of Exceeding River Stage at Mississippi River at Rock Island L&D 15 (RCKI2)
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

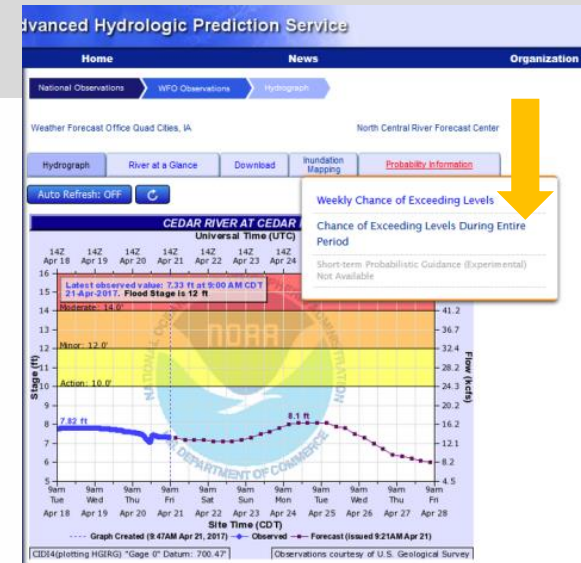
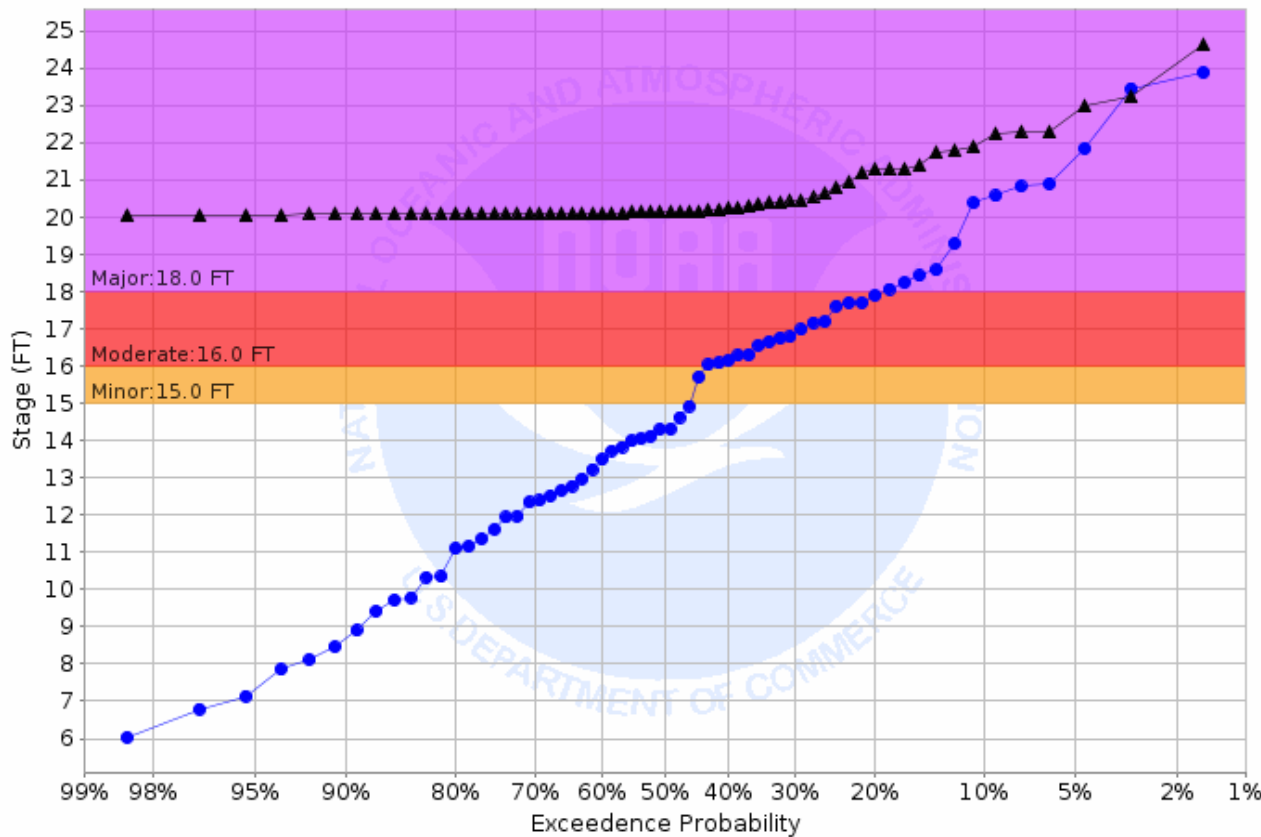


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Long Range Outlooks

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

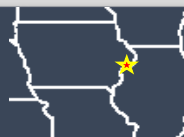


- ▲ Conditional Simulation
- Historical Simulation

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



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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.

.HYDROLOGY...

Issued at 121 PM CDT Fri May 24 2019

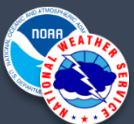
Heavy rain fell over the last 24 hours across the region, with the heaviest amounts of an inch or more north of a line from Sigourney, IA through Freeport, IL. There was a narrower strip of amounts up to 3.50 inches from about Dysart, IA through Potosi, WI. With this rain and expected rains still through 12Z Saturday morning most river forecasts this morning saw rises, some quite significant rises.

This continues to be a concerning situation with more rain in the forecast every day. With the ground conditions saturated, and accounting for little vegetation to pull any water out as the majority of farm fields are either not yet planted, or have very new plants emerging runoff amounts will be high with quicker responses in the rivers likely than would normally occur.

Numerous flood warnings were issued this morning for tributary rivers. Many of these forecasts to show crests over the weekend, with falling levels next week. We would express caution with these forecasts as more rain is expected through the weekend and into next week which will likely either raise the crest forecasts or prolong the time the rivers remain high.

On the Mississippi, significant rises were sent out in this morning's forecasts. NOTE: these crest forecasts will likely change and rise further as more of the forecast rain gets utilized in the forecasts in the coming days.

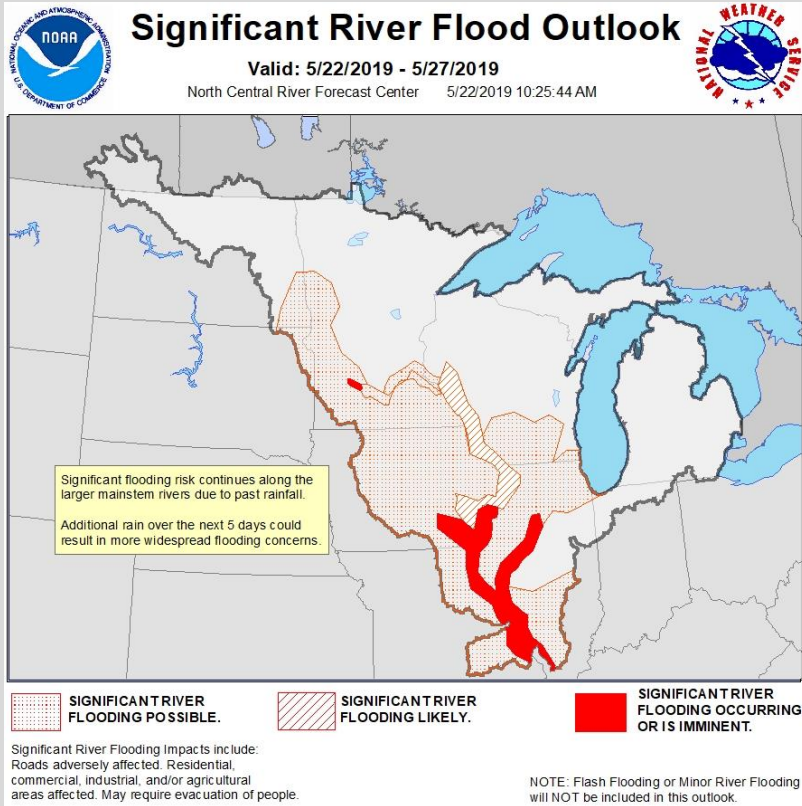
<https://forecast.weather.gov/product.php?site=DVN&issuedby=DVN&product=AFD&format=CI&version=1&glossary=1>



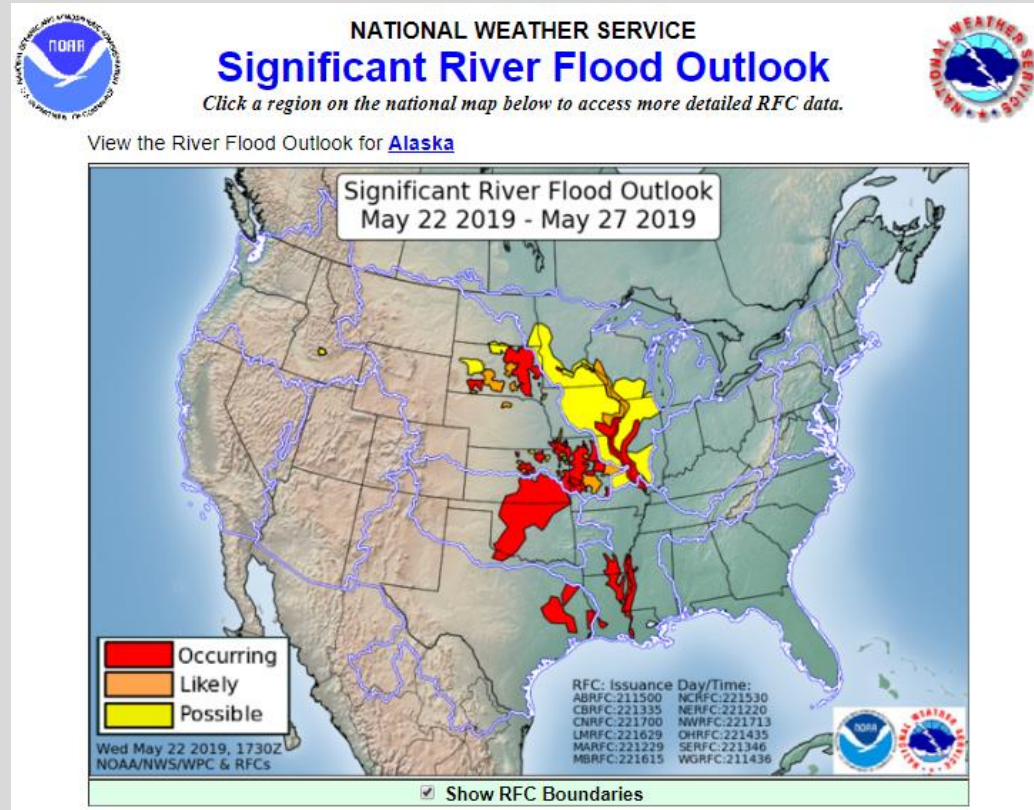
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River Flood Outlooks



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



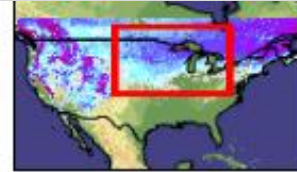
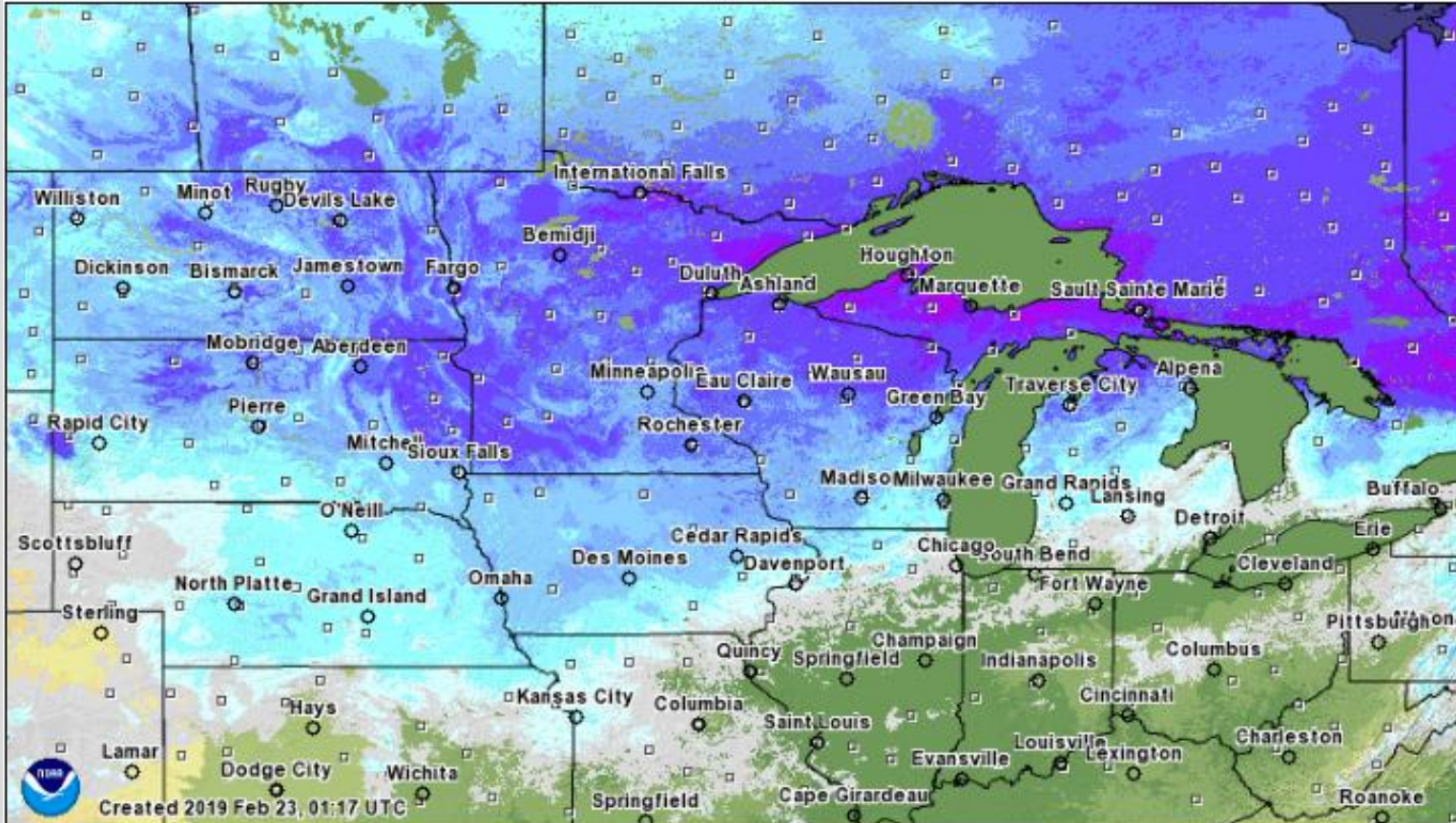
<http://www.wpc.ncep.noaa.gov/nationalfloodoutlook/>



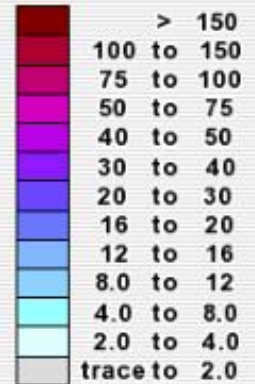
Snow Cover

National Operational Hydrologic Remote Sensing Center

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



Inches of depth



Not Estimated

Elevation in feet



www.nohrsc.noaa.gov



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Excessive Rain Outlooks

WEATHER PREDICTION CENTER
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NCEP: AWC · CPC · EMC · NCO · NHC · OPC · SPC · SWPC · WPC

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HAZARD	MAY 22	MAY 23	MAY 24
EXCESSIVE RAINFALL	SLIGHT	SLIGHT	SLIGHT
HEAVY SNOW (≥ 4")	HIGH	HIGH	SLIGHT
ICE (≥ 0.25")	NO AREA	NO AREA	NO AREA

WPC'S MEDIUM RANGE HAZARDS FORECAST

Overview Surface Analysis Fronts QPF **Excessive Rain** Winter Wx Day 3-7 Forecast Tools

Excessive Rainfall Forecasts [Legacy Page:](#) Valid 12Z Wed May 22 2019 - 12Z Thu May 23 2019

Day 1 Day 2 Day 3

Day 1 Excessive Rainfall Outlook
 Valid 12Z Wed May 22 2019
 Thru 12Z Thu May 23 2019
 Issued: 0823Z Wed May 22 2019
 Forecaster: HURLEY
 NOAA/NWS/NCEP/WPC

Risk of rainfall exceeding flash flood guidance within 25 miles of a point
HIGH: > 50% **SLGT: 10%-20%**
MDT: 20%-50% **MRGL: 5%-10%**

+ Forecast Discussion
 + Additional Links

Day 2 Excessive Rainfall Outlook
 Valid 12Z Thu May 23 2019
 Thru 12Z Fri May 24 2019
 Issued: 0807Z Wed May 22 2019
 Forecaster: CAMPBELL
 NOAA/NWS/NCEP/WPC

Risk of rainfall exceeding flash flood guidance within 25 miles of a point
HIGH: > 50% **SLGT: 10%-20%**
MDT: 20%-50% **MRGL: 5%-10%**

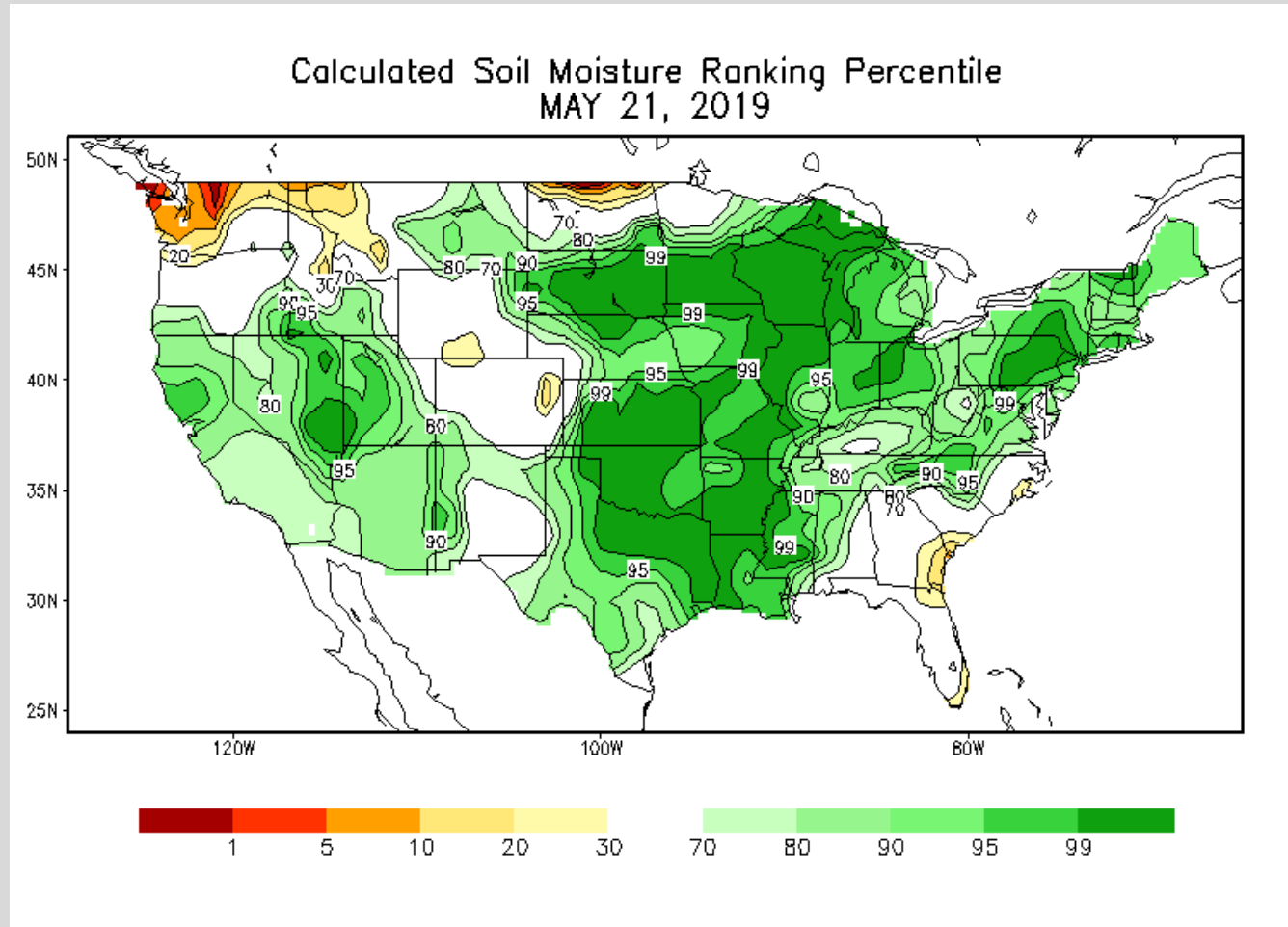
Day 3 Excessive Rainfall Outlook
 Valid 12Z Fri May 24 2019
 Thru 12Z Sat May 25 2019
 Issued: 0821Z Wed May 22 2019
 Forecaster: CAMPBELL
 NOAA/NWS/NCEP/WPC

Risk of rainfall exceeding flash flood guidance within 25 miles of a point
HIGH: > 50% **SLGT: 10%-20%**
MDT: 20%-50% **MRGL: 5%-10%**

wpc.ncep.noaa.gov



Soil Moisture



http://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml



Drought Status

U.S. Drought Monitor Midwest

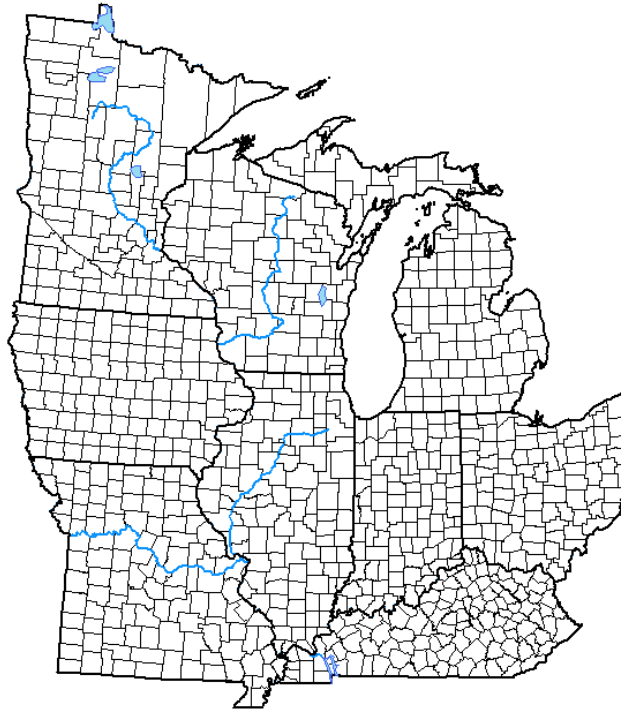
May 14, 2019

(Released Thursday, May 16, 2019)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	100.00	0.00	0.00	0.00	0.00	0.00
Last Week 05-07-2019	100.00	0.00	0.00	0.00	0.00	0.00
3 Months Ago 02-12-2019	99.72	0.28	0.00	0.00	0.00	0.00
Start of Calendar Year 01-01-2019	99.27	0.73	0.00	0.00	0.00	0.00
Start of Water Year 09-25-2018	81.26	18.74	8.55	1.71	0.37	0.01
One Year Ago 05-15-2018	74.62	25.38	4.45	0.00	0.00	0.00



Intensity:

None	D0 Abnormally Dry	D1 Moderate Drought	D2 Severe Drought	D3 Extreme Drought	D4 Exceptional Drought
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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



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River Levels

US Army Corps of Engineers

RIVERGAGES.COM
Water Levels of Rivers and Lakes

US Army Corps of Engineers

Home Search This Site Related Websites Data Mining Glossary Reports Who We Are Contact Us

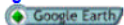
Water Levels By:
Choose An Option

National Weather Service Products



Mississippi River & Passes

- View Real-Time Stations In This Basin
- View All Stations In This Basin
- View All Values In Stage
- View All Values In Elevation



STATION * Currently Forecasted Station	RECORD STAGE	FLOOD STAGE	LATEST LEVEL	24 Hr CHANGE	24 Hr PRECIP
Mississippi River at Lock and Dam 15 (POOL) as of 08:00			17.34	+ 0.02	
* Mississippi River at Lock and Dam 15 (Rock Island,IL) as of 08:00	22.63 07/09/1993	15.00	16.62	+ 0.04	
* Mississippi River at Lock and Dam 15 (MET Station) as of 14:00		15.00	16.60	+ 0.05	0.43

Google Earth

[What's This?](#)

Mississippi River at Lock and Dam 15 (Rock Island,IL)

Stream Name: Mississippi River
Gage Zero: 542.50 Ft. MSL 1912
Flood Stage: 15 Ft.
Record High Stage: 22.63 Ft.

Longitude: -90.56194000
Latitude: 41.51778000
Flat Pool: 18.50
Flat Tail: 2.60
River Mile: 482.9 miles above the mouth of the Ohio River
Record High Stage Date: 07/09/1993

Drainage Area: 88500.00 Mi²
Location of Gage:

Pool No. 15 extends from Rock Island, IL, 10.4 miles upstream to LeClaire, IA. Lock and Dam 15 is located on the north side of the West End of Arsenal Island. The Lock and Dam is immediately downstream of the Government Bridge. A Visitor's Center is located at the Lock and Dam.

The National Weather Service information is also linked in the Additional Links for this station.

This gage is operated by the US Army Corps of Engineers (Rock Island District).

Latest Data
05/22/2019 08:00 Central

Latest Stage: **16.62 Ft.**
24 Hr. Change: +0.04 Ft.
Tomorrow's Forecast (Issued 05/22/2019 10:40): 16.50 Ft. [Plot Forecast](#)
Last Year's Stage: 13.57 Ft.
Today's Historic Normal Stage: 8.40 Ft.
Today's Historic Max Stage: 15.67 Ft.
Today's Historic Min Stage: 3.80 Ft.
Latest Pool Level: 17.34 Ft.
24 Hr. Change: +0.02 Ft.
Last Year's Pool Level: 18.03 Ft.

7 Days Stage

Plot Tabulate

Daily Historic Data (06:00 Central Reading)
Choose A Parameter

From: JAN 1 2019
To: DEC 31 2019

Stage

Plot (5-Year Limit) Tabulate (Yearly Formatted)

[View All Images](#)

Additional Links:
[View Record Stage High / Lows](#)
[Vessel's Queued at Lock 15](#)
[Historic Flood Profiles \(Pool 15\)](#)
[WebMET15](#)
[Real-Time SHEF Report](#)
[Water Transparency](#)
[Official National Weather Service information for this station](#)

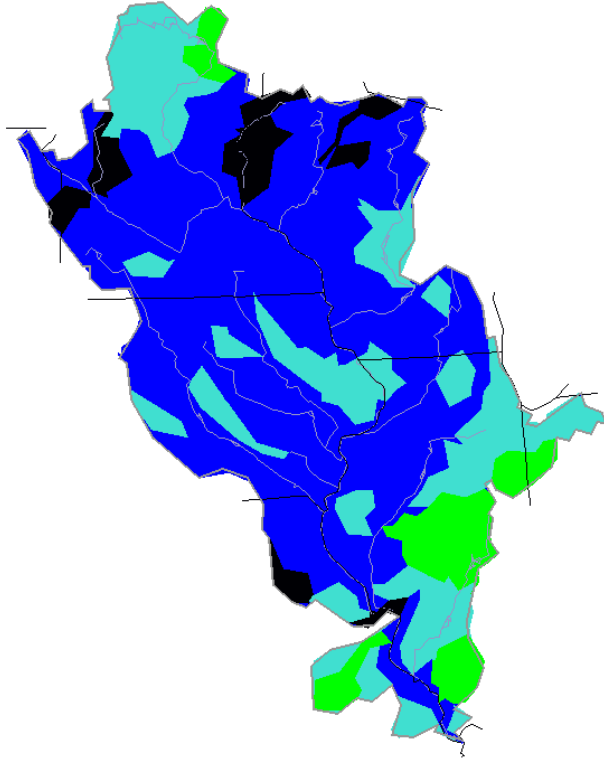
Rivergages.com



Stream Levels

US Geological Survey

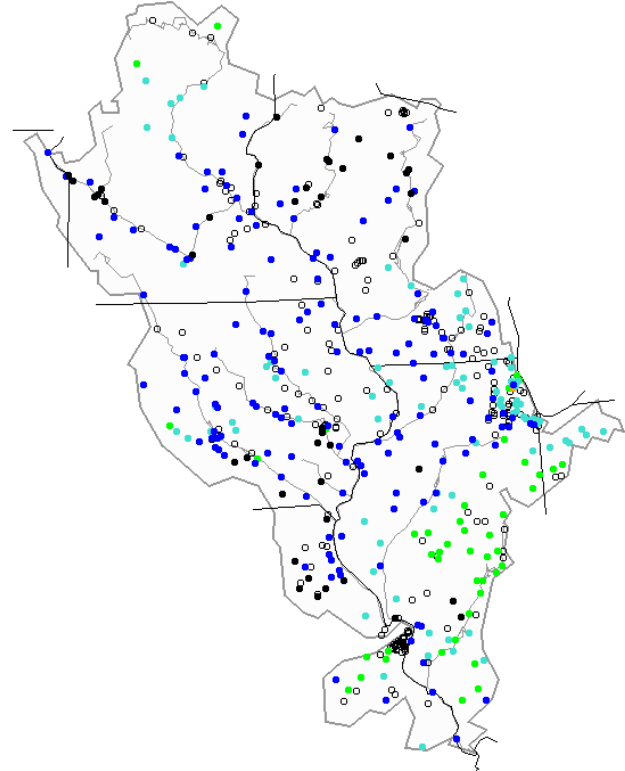
Tuesday, May 21, 2019



USGS

Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

Tuesday, May 21, 2019



USGS

Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

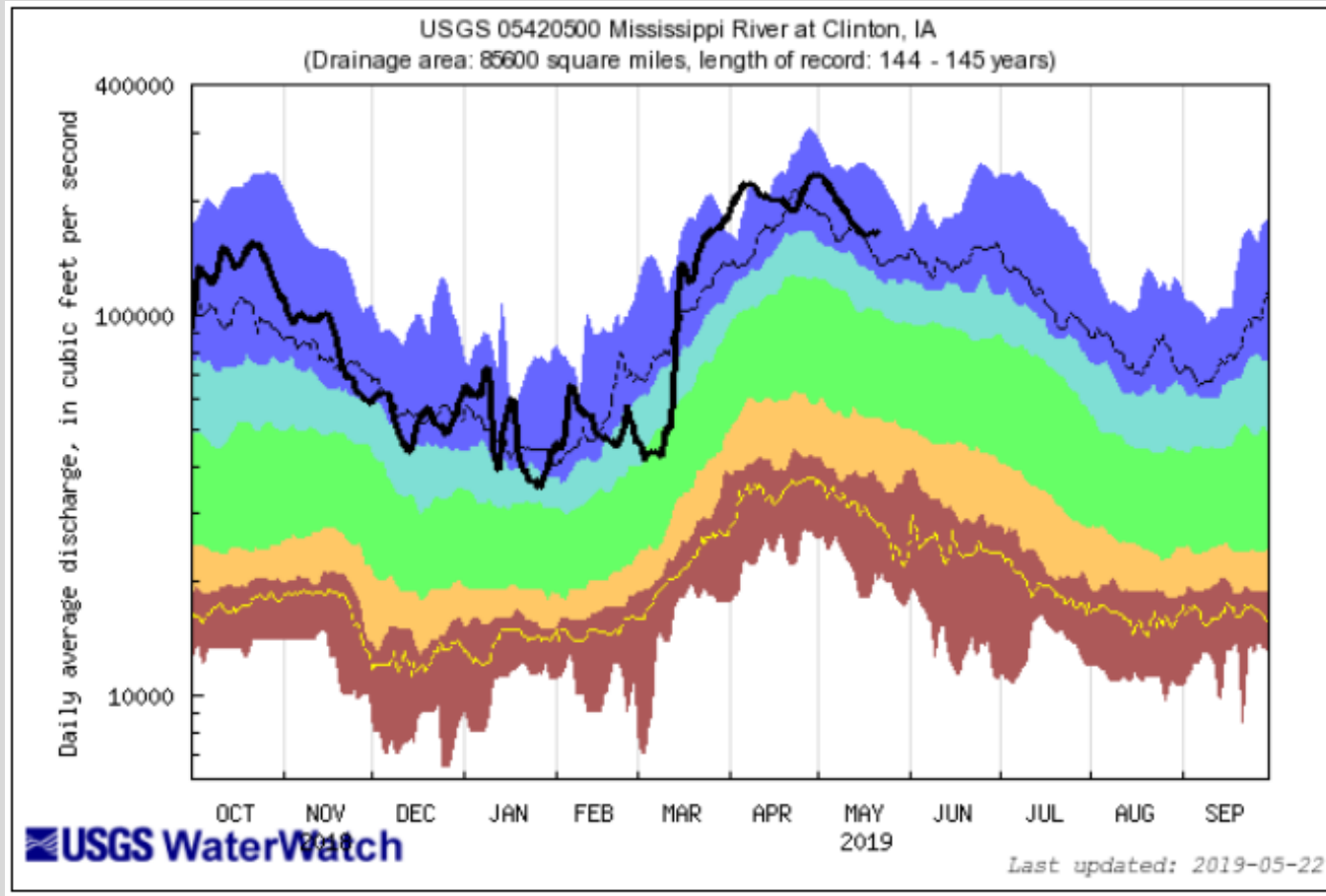
<https://waterwatch.usgs.gov/>



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Stream Levels

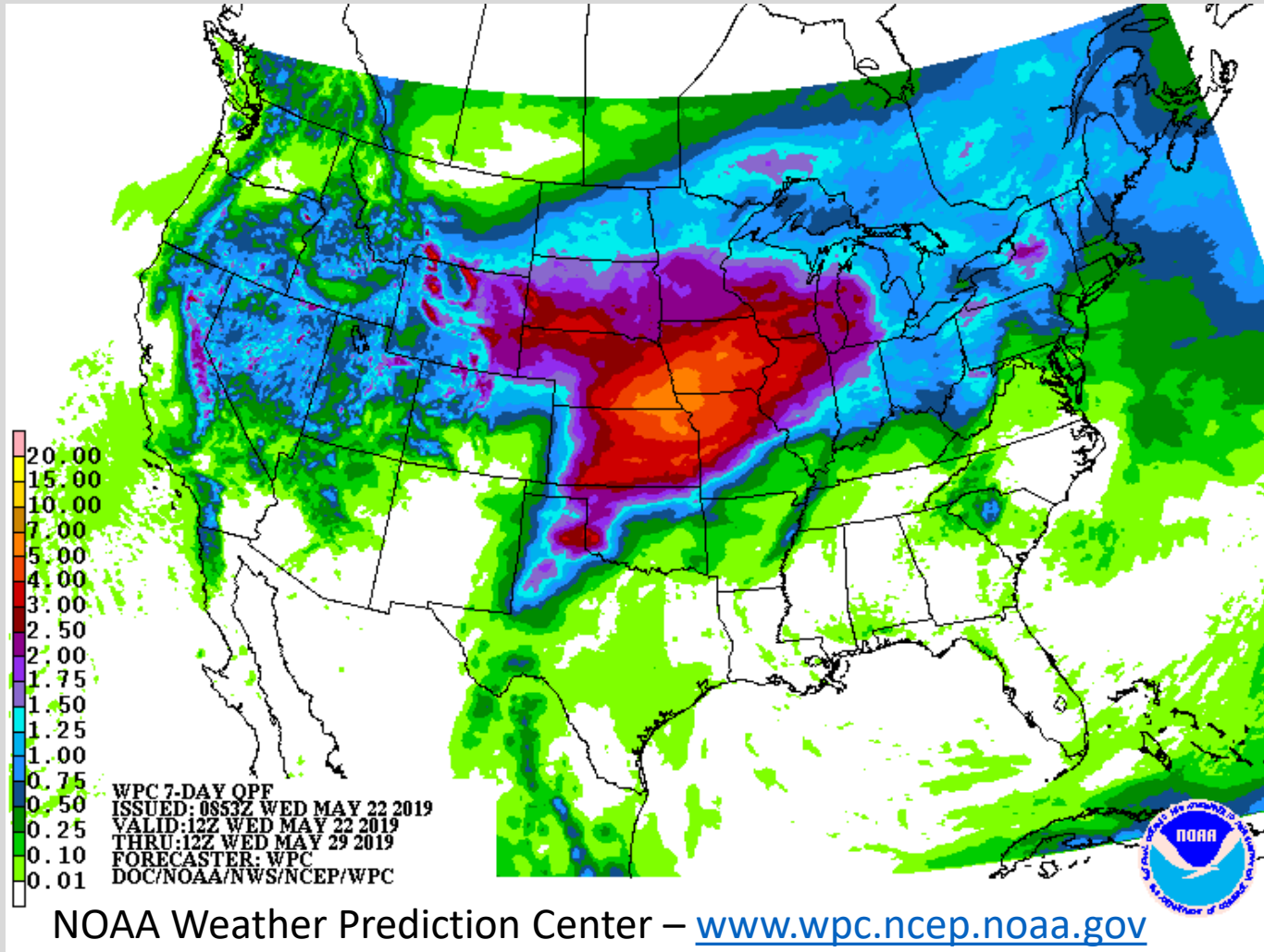


Explanation - Percentile classes						
lowest-10th percentile	5	10-24	25-75	76-90	95 90th percentile-highest	Runoff
Much below Normal	Below normal	Normal	Above normal	Much above normal		

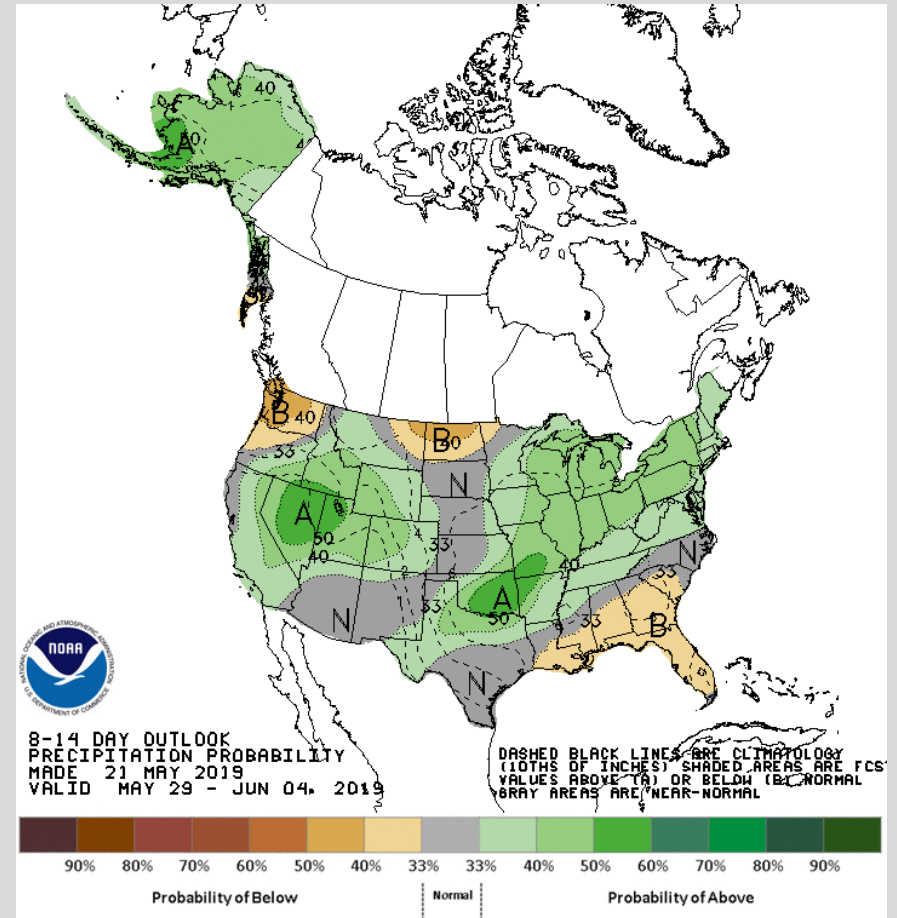
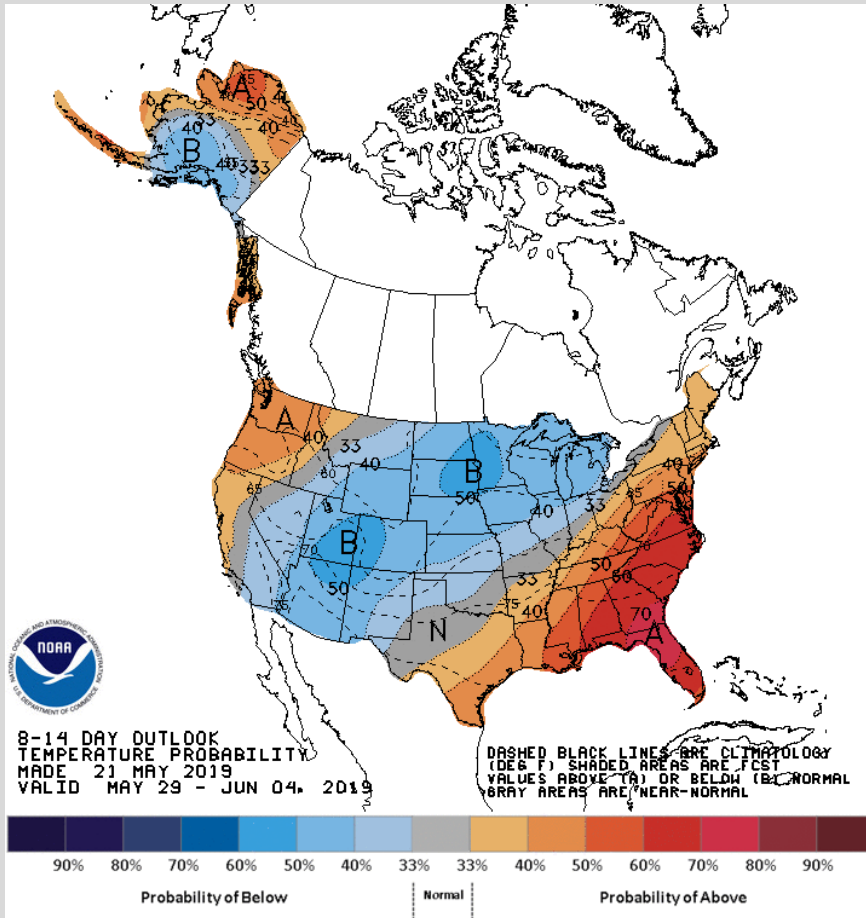
<https://waterwatch.usgs.gov/>



7-day Precipitation (QPF) Forecast



Week 2 Weather Outlook



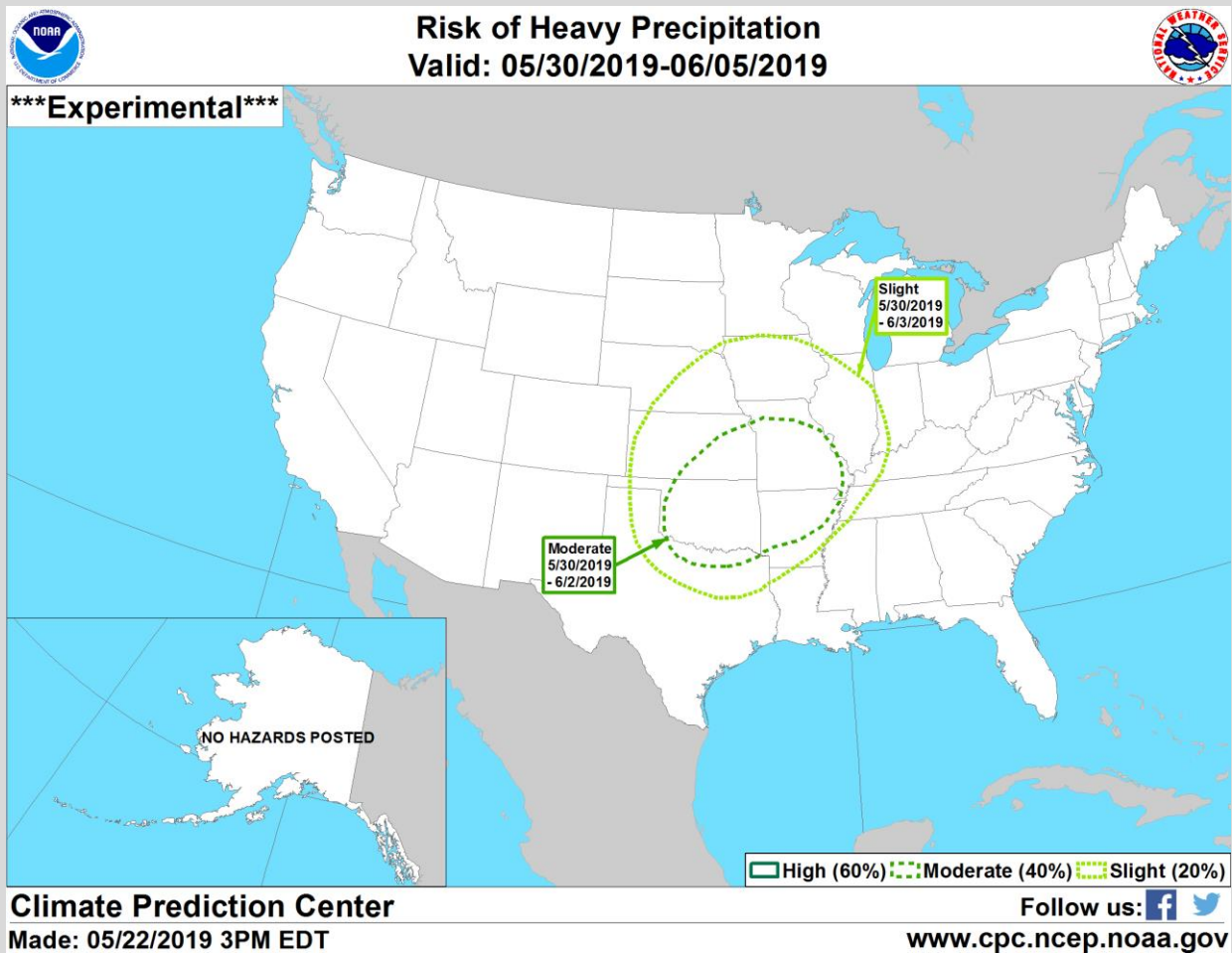
NOAA Climate Prediction Center – www.cpc.ncep.noaa.gov



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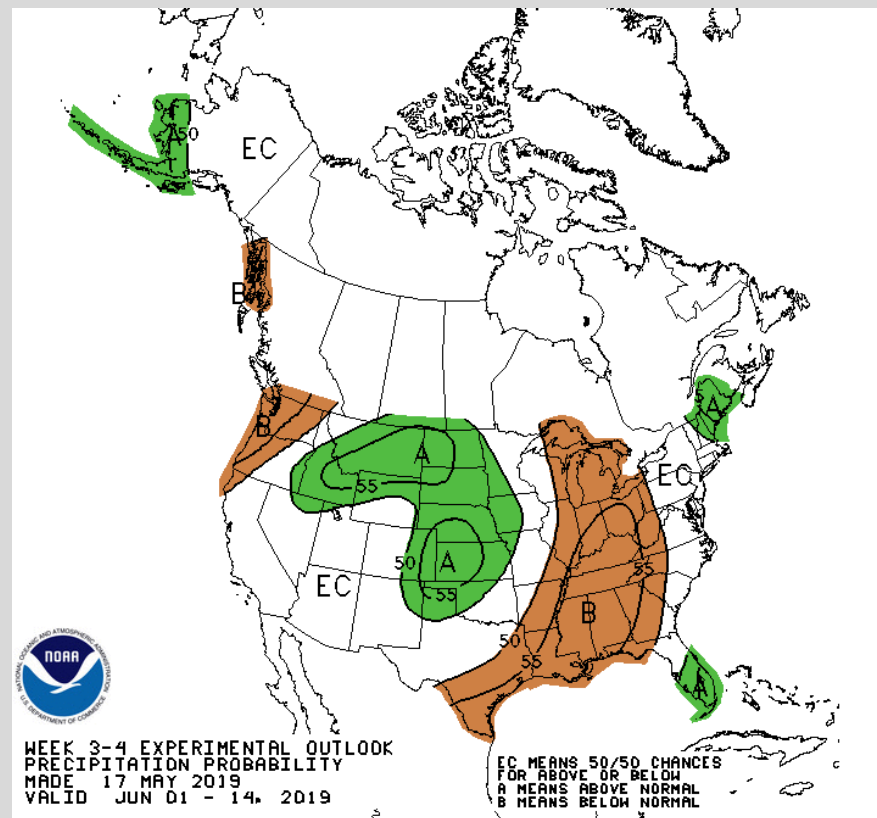
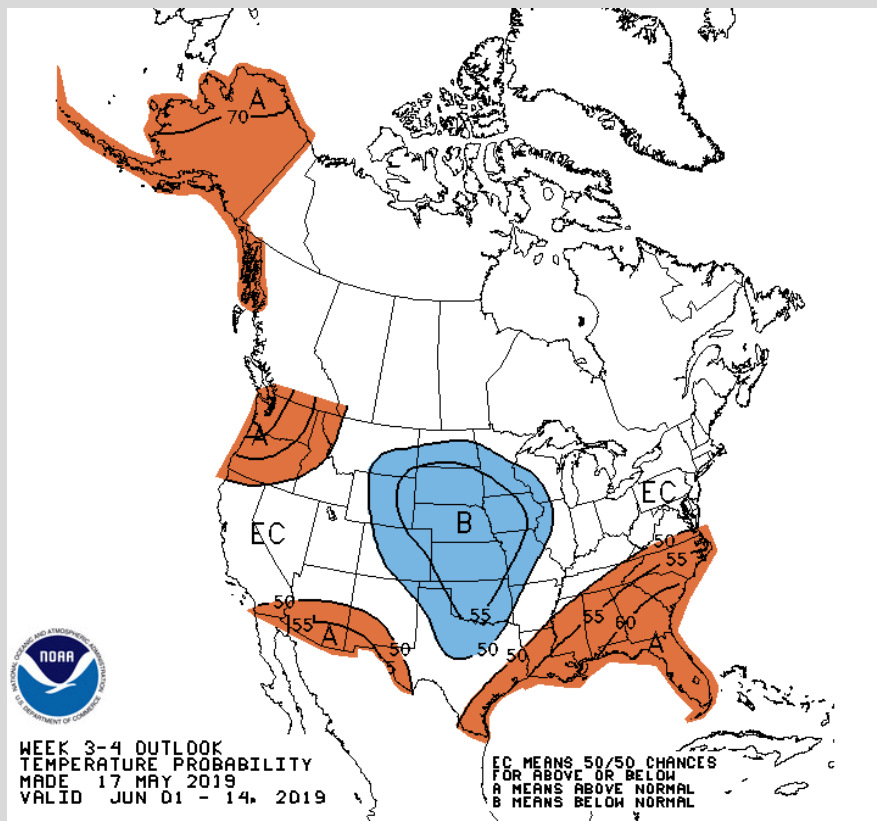
Week 2 Risk of Heavy Precipitation



NOAA Climate Prediction Center – www.cpc.ncep.noaa.gov



Weeks 3 & 4 Outlooks



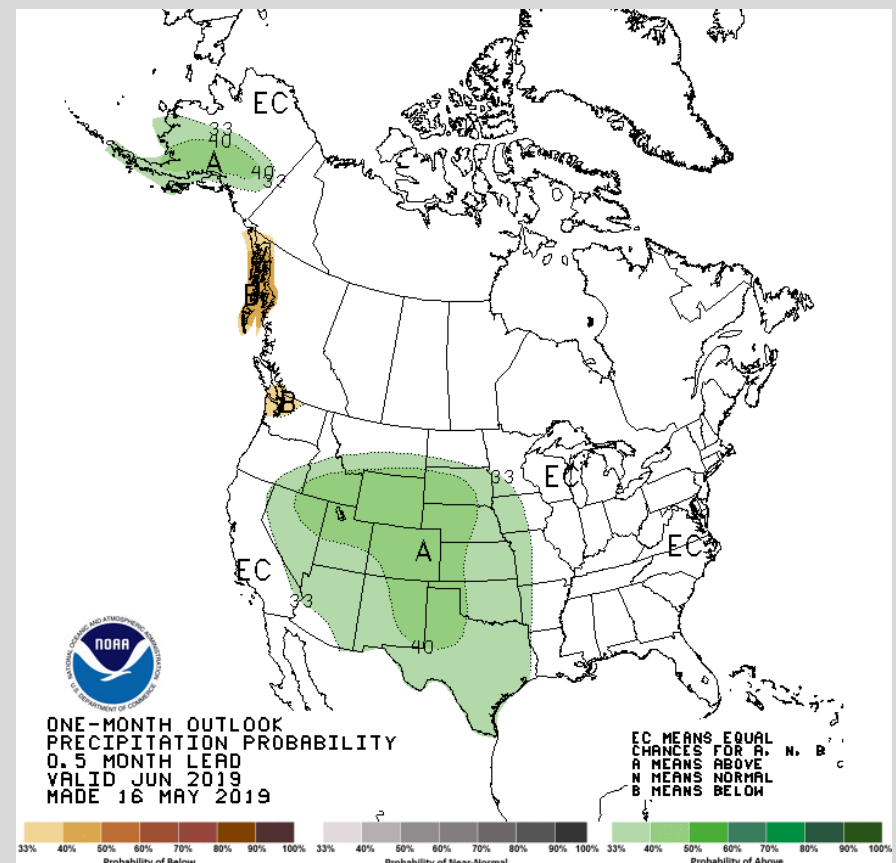
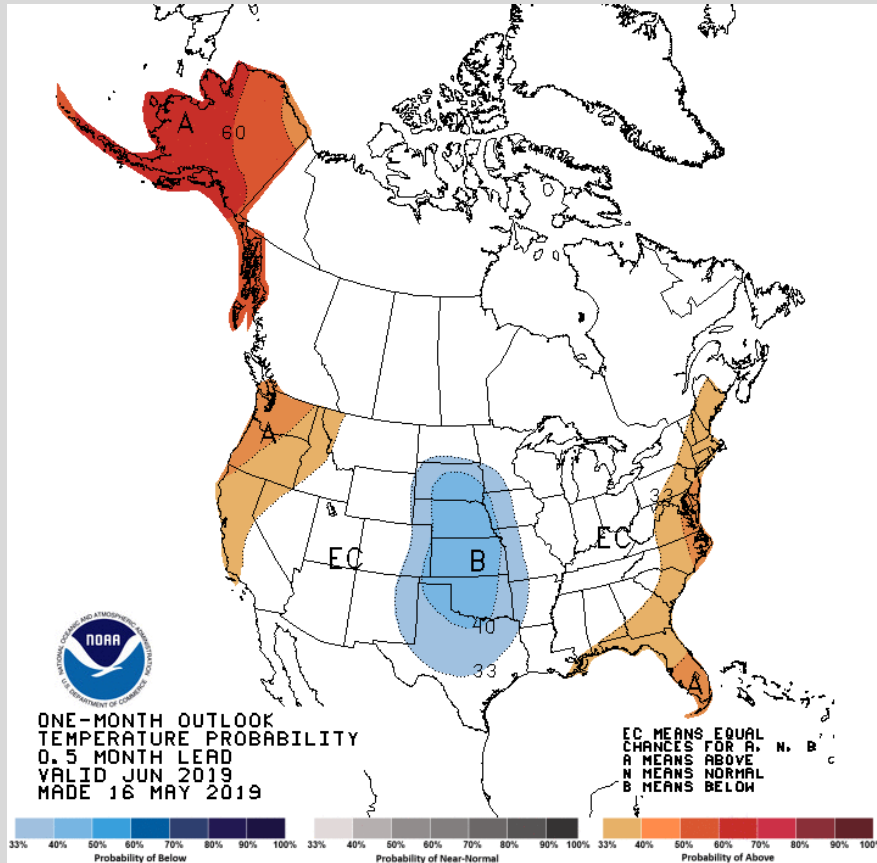
NOAA Climate Prediction Center – www.cpc.ncep.noaa.gov



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Monthly Weather Outlooks



NOAA Climate Prediction Center – www.cpc.ncep.noaa.gov



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