

North Central Region Climate & Drought Outlook

17 February 2022



Photo Credit: Henry Reges

Peter Goble

Service Climatologist



NATIONAL DROUGHT MITIGATION CENTER
UNIVERSITY OF NEBRASKA



United States Department of Agriculture
Midwest Climate Hub



ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY

General Information

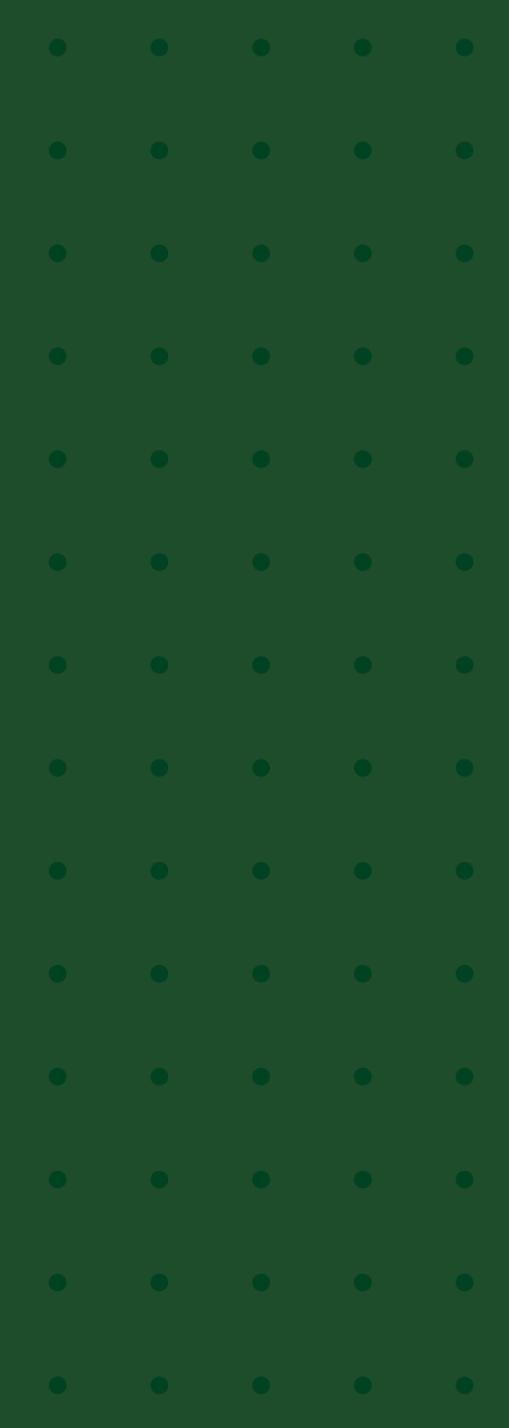
- **Providing climate services to the Central Region**
 - Collaboration Activity Between:
 - State Climatologists/American Association of State Climatologists
 - NOAA NCEI/NWS/OAR/NIDIS/
 - USDA Climate Hubs
 - Midwest and High Plains Regional Climate Centers
 - National Drought Mitigation Center
- **Next Regular Climate/Drought Outlook Webinar**
 - Thursday, March at 17th 1:00 CDT – Speaker: Trent Ford (IL State Climatologist)
- **Access to Future Climate Webinars and Information**
 - <https://www.drought.gov/regional-activities/north-central-region-climate-summary-and-outlook-webinars>
- **Recordings of Past Webinars**
 - <https://mrcc.purdue.edu/multimedia/webinars.jsp>
 - <https://hprcc.unl.edu/webinars.php>
- **Open for questions at the end**



Today's Agenda

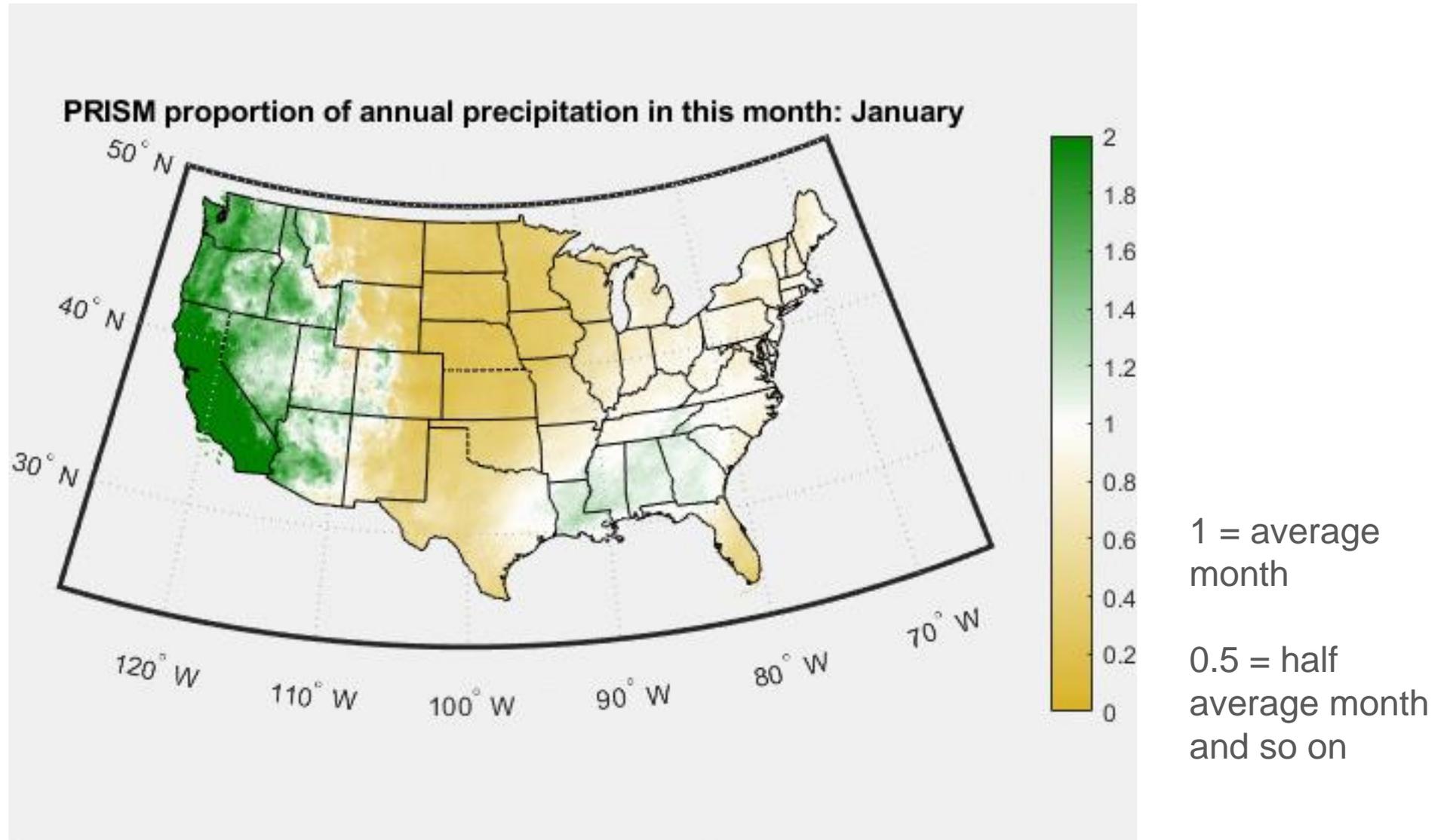
- **Recent Conditions**
 - Last 30,90 days
 - Snowpack, soils, streams
- **Longer-term Conditions**
 - Last 6+ months
 - Drought Monitor, Great Lake levels
- **Impacts**
 - Mix of concerns about wet and dry for this winter
 - Snow-free ground raises water supply and agriculture concerns in Montana, Wyoming, Dakotas, Nebraska, portions of Kansas
 - High river volumes and potential flooding in Illinois, Indiana, Ohio
- **Outlooks**
 - Ongoing snowstorm
 - La Niña likely on its way out
 - A warm spring for most. A wet spring for some.





Recent Conditions...

What is normal?

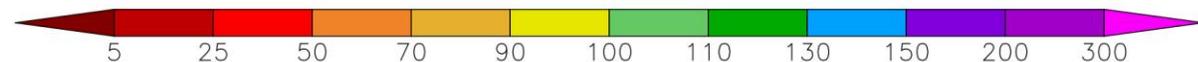
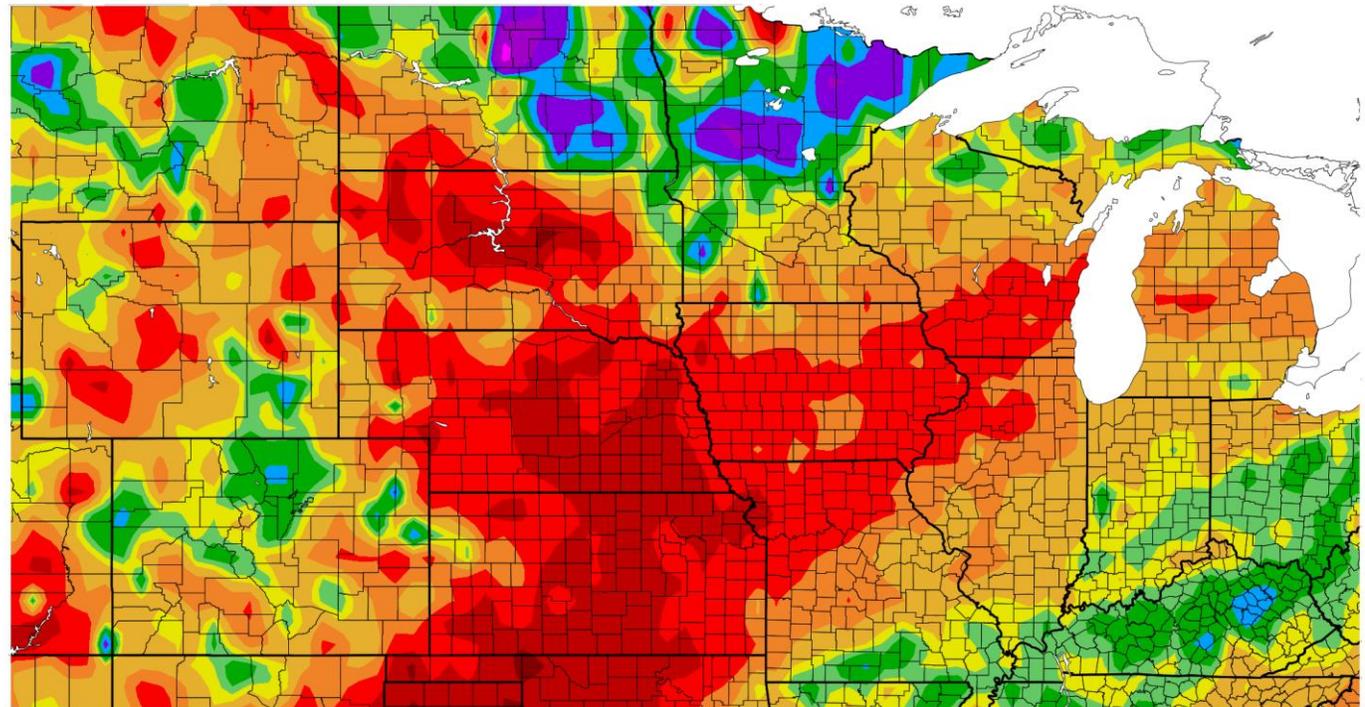


Mixed 90 day conditions

- Wet weather in December in Missouri Basin headwaters, but drier than normal in recent weeks
- Typical La Niña signal in Ohio River Valley (wet)

<https://hprcc.unl.edu/maps.php?map=ACISClimateMaps>

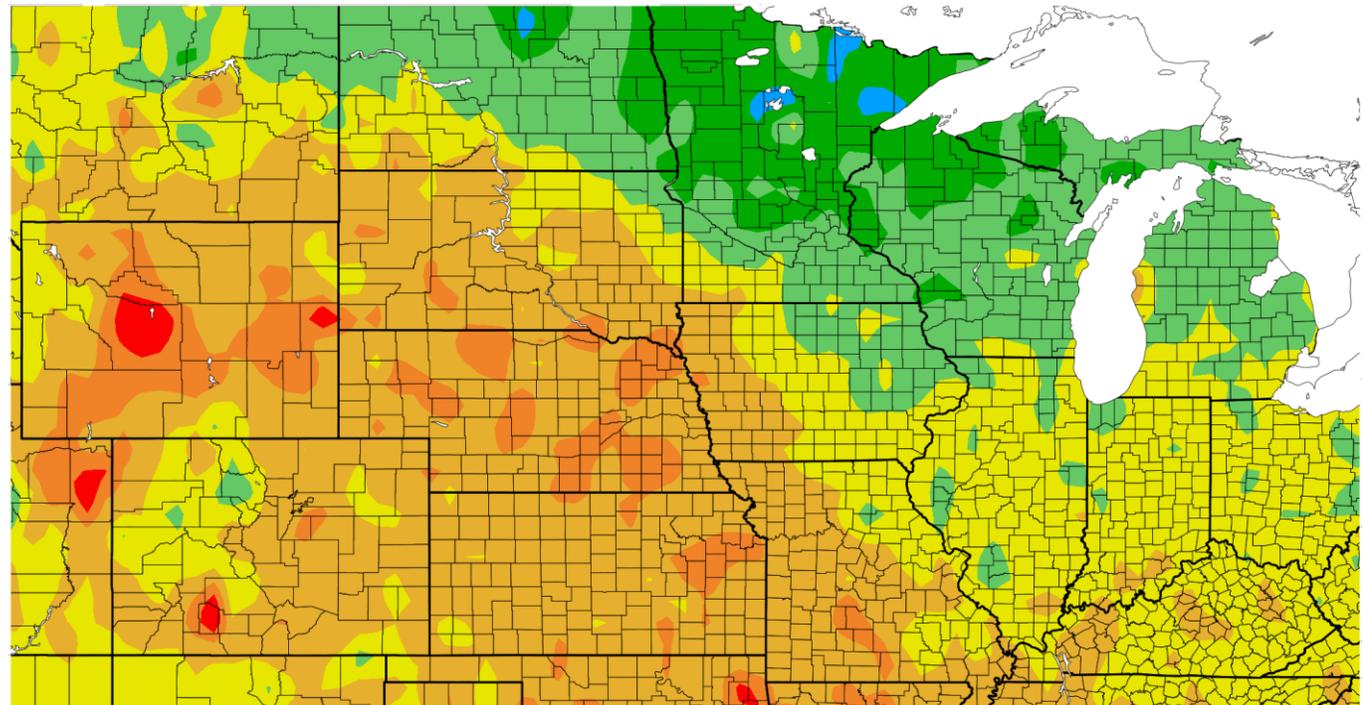
Percent of Normal Precipitation (%)
11/19/2021 – 2/16/2022



A stronger than normal temperature gradient: Cooler than normal to the north, warmer than normal to the south

- Temperature conditions this winter looking a lot like La Niña, with influence from climate change
- 2nd year La Niñas are often weaker than 1st year events, and warmer across the Central US

Departure from Normal Temperature (F)
11/17/2021 – 2/14/2022



<https://hprcc.unl.edu/maps.php?map=ACISClimateMaps>



But winter did come

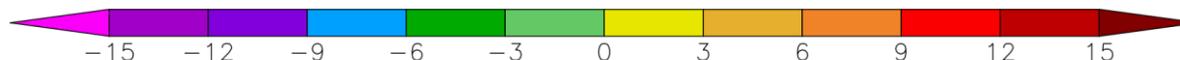
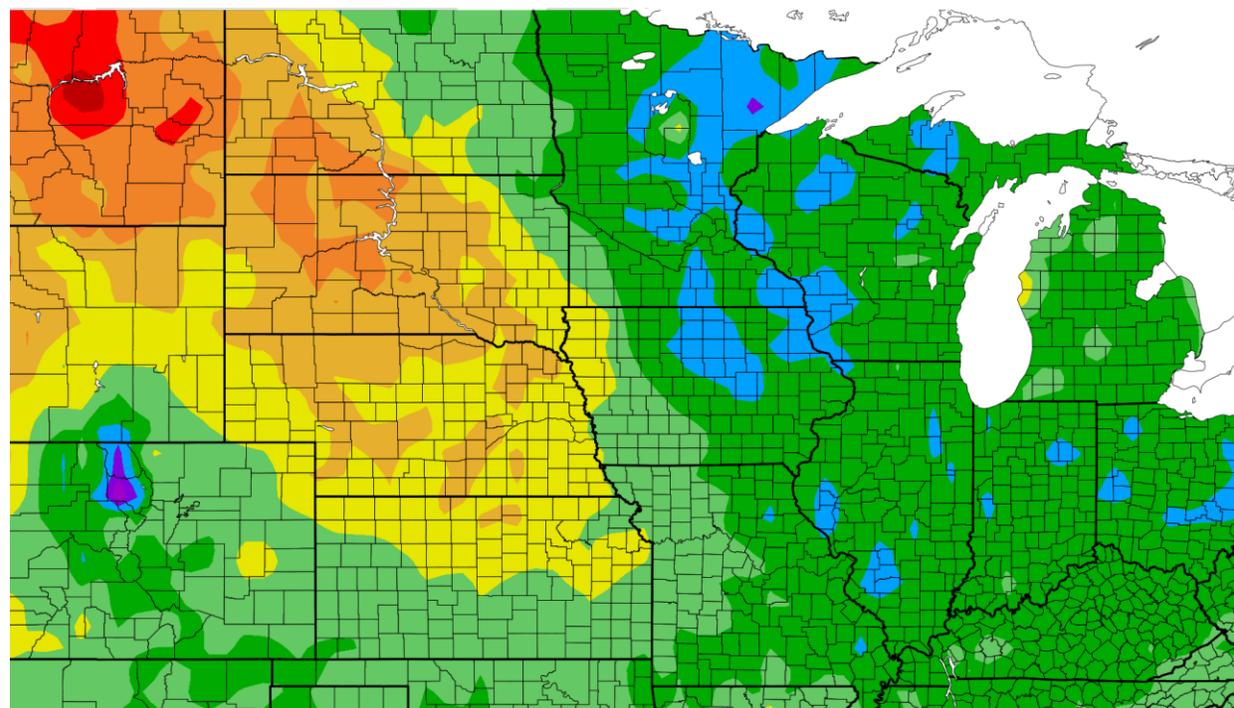
<https://hprcc.unl.edu/maps.php?map=ACISClimateMaps>

Departure from Normal Temperature (F)
1/16/2022 – 2/14/2022

Data for MINNEAPOLIS-ST. PAUL INTERNATIONAL AIRPORT, MN

Click column heading to sort ascending, click again to sort descending.

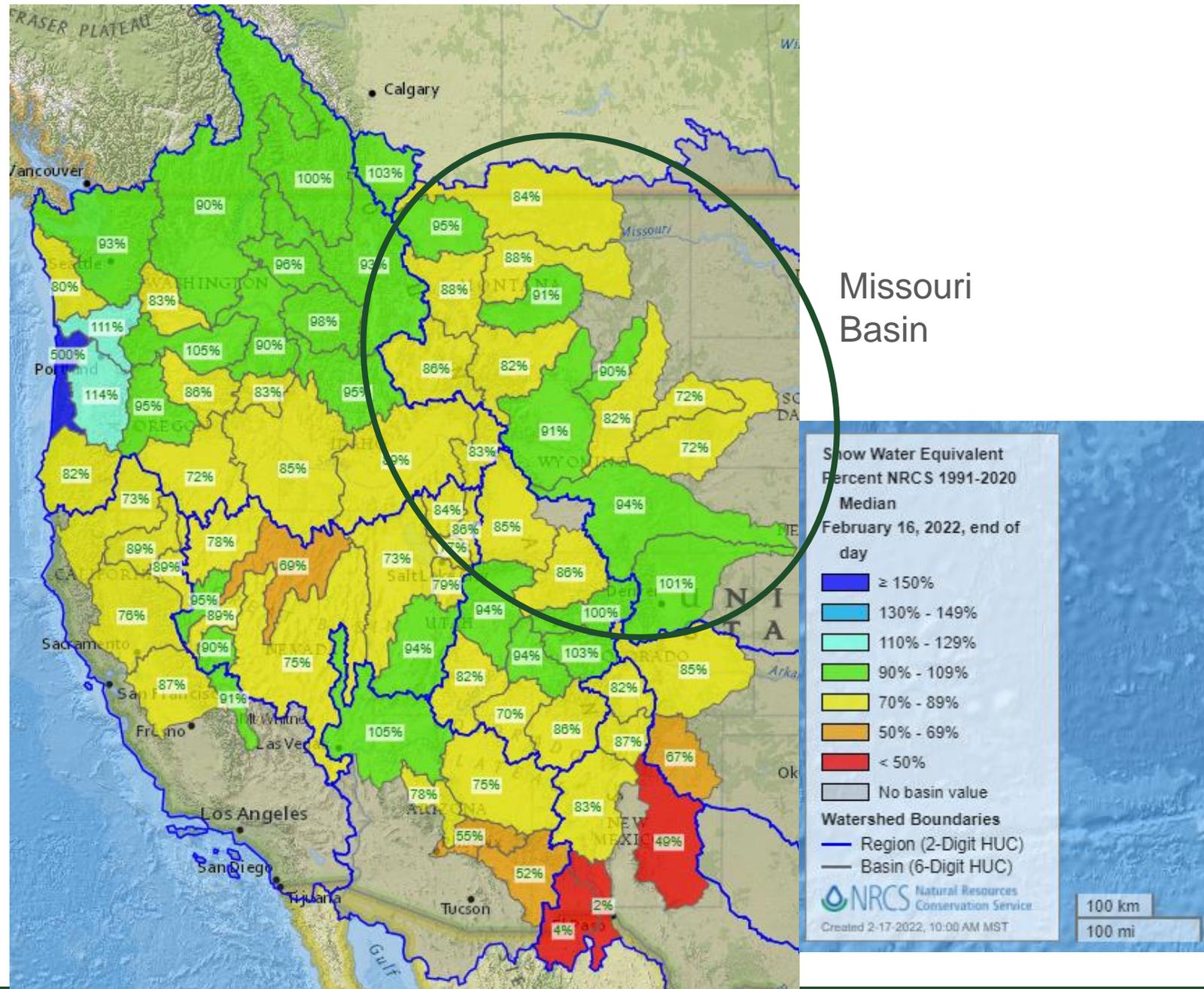
Date	Max Temperature	Min Temperature
2022-02-04	9	-4
2022-02-03	7	-9
2022-02-02	7	-4
2022-02-01	37	3
2022-01-31	31	11
2022-01-30	23	13
2022-01-29	27	5
2022-01-28	12	-5
2022-01-27	33	6
2022-01-26	29	-16
2022-01-25	4	-13
2022-01-24	11	-5
2022-01-23	8	-7
2022-01-22	24	7
2022-01-21	23	-8
2022-01-20	3	-11
2022-01-19	9	-5



Mountain Snowpack

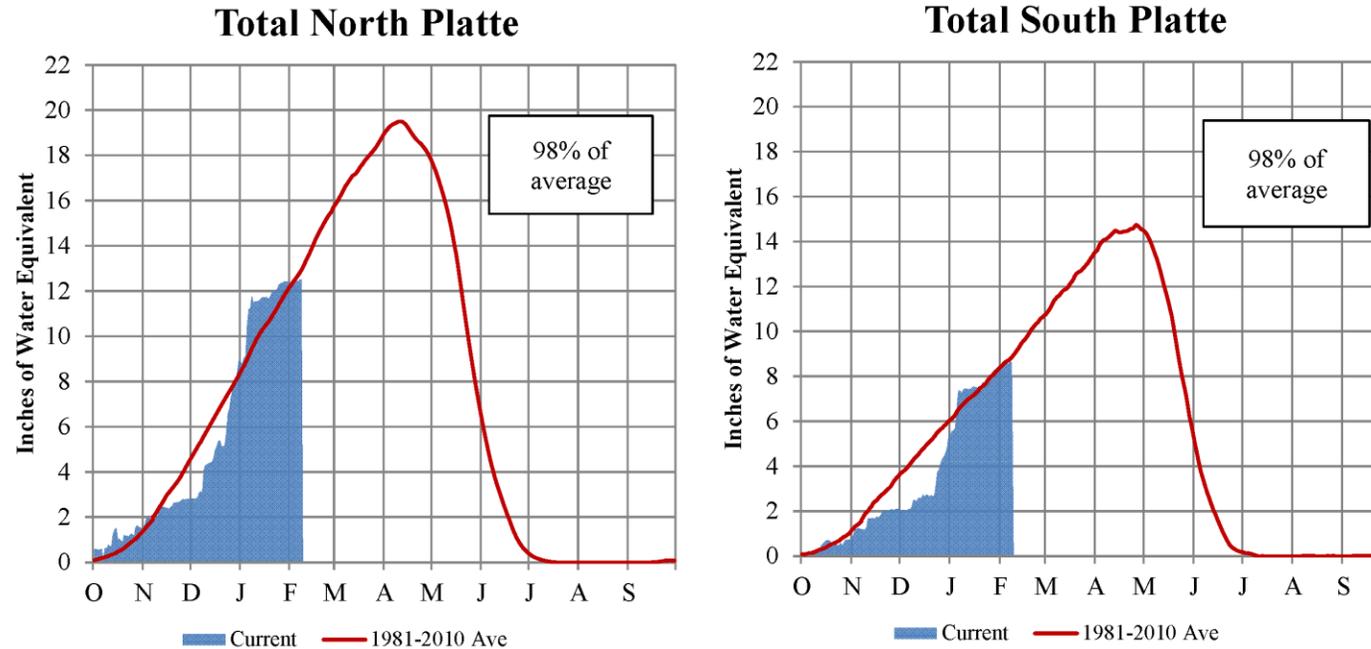
- Headwaters of Missouri Basin are lagging normal snowpack values (80-100%)
- Lowest snowpack values in Black Hills (75%)

<https://www.nrcs.usda.gov/wps/portal/wcc/home/quicklinks/imap>



Platte River Basin - Mountain Snowpack Water Content Water Year 2021-2022

February 08, 2022



The North and South Platte River Basin mountain snowpacks normally peak near April 15 and the end of April, respectively. As of February 8, 2022, the mountain snowpack SWE in the "Total North Platte" reach is currently 12.5", 98% of the (1981-2010) average. The mountain snowpack SWE in the "Total South Platte" reach is currently 8.6", 98% of the (1981-2010) average. The 30-year average lines (1981-2010) for both reaches will be updated when the data becomes available to (1991-2020).

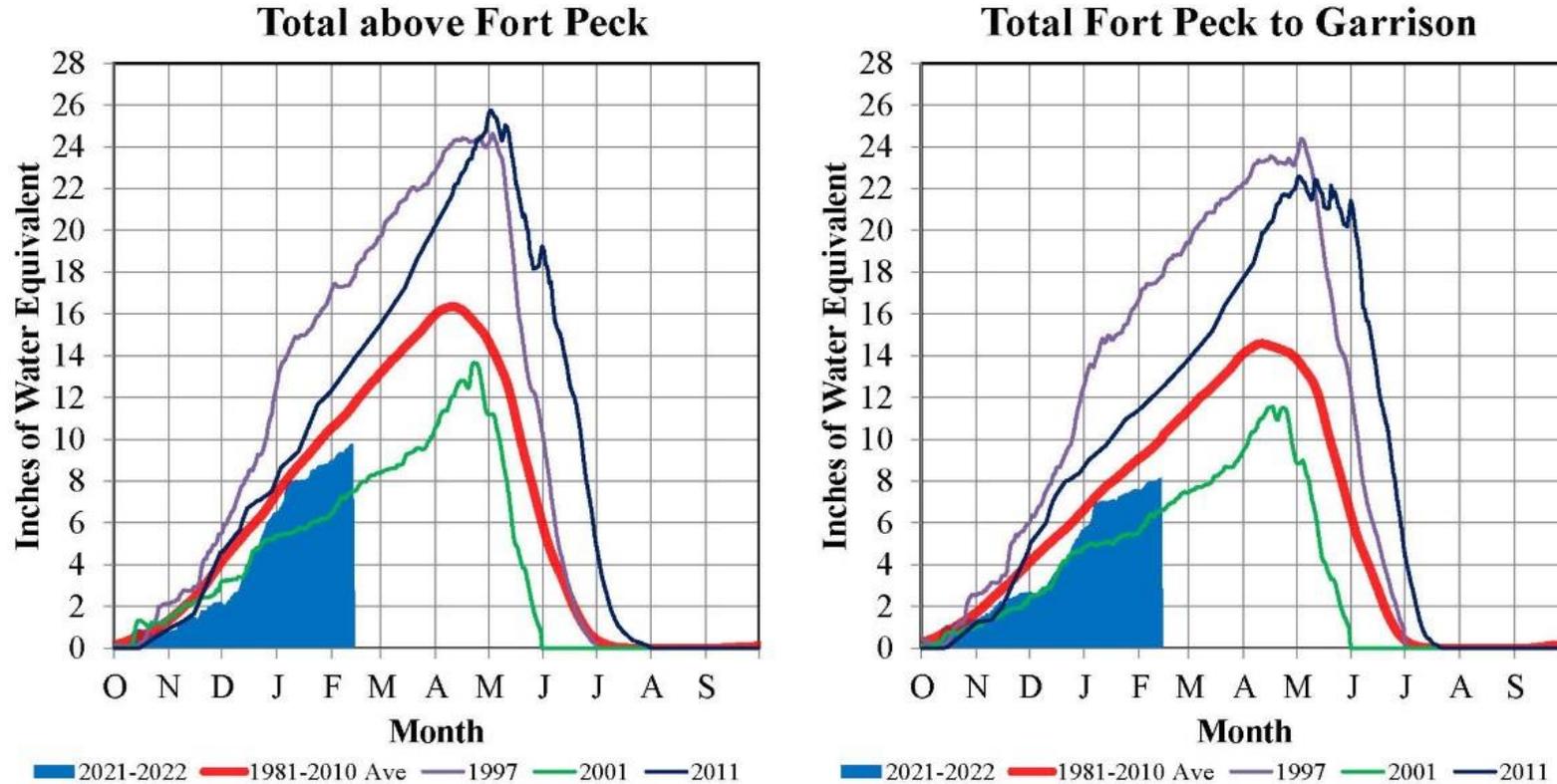
Source: USDA, Natural Resource Conservation Service

Provisional Data. Subject to Revision



Missouri River Basin – Mountain Snowpack Water Content 2021-2022 with comparison plots from 1997, 2001, and 2011

13-Feb-2022



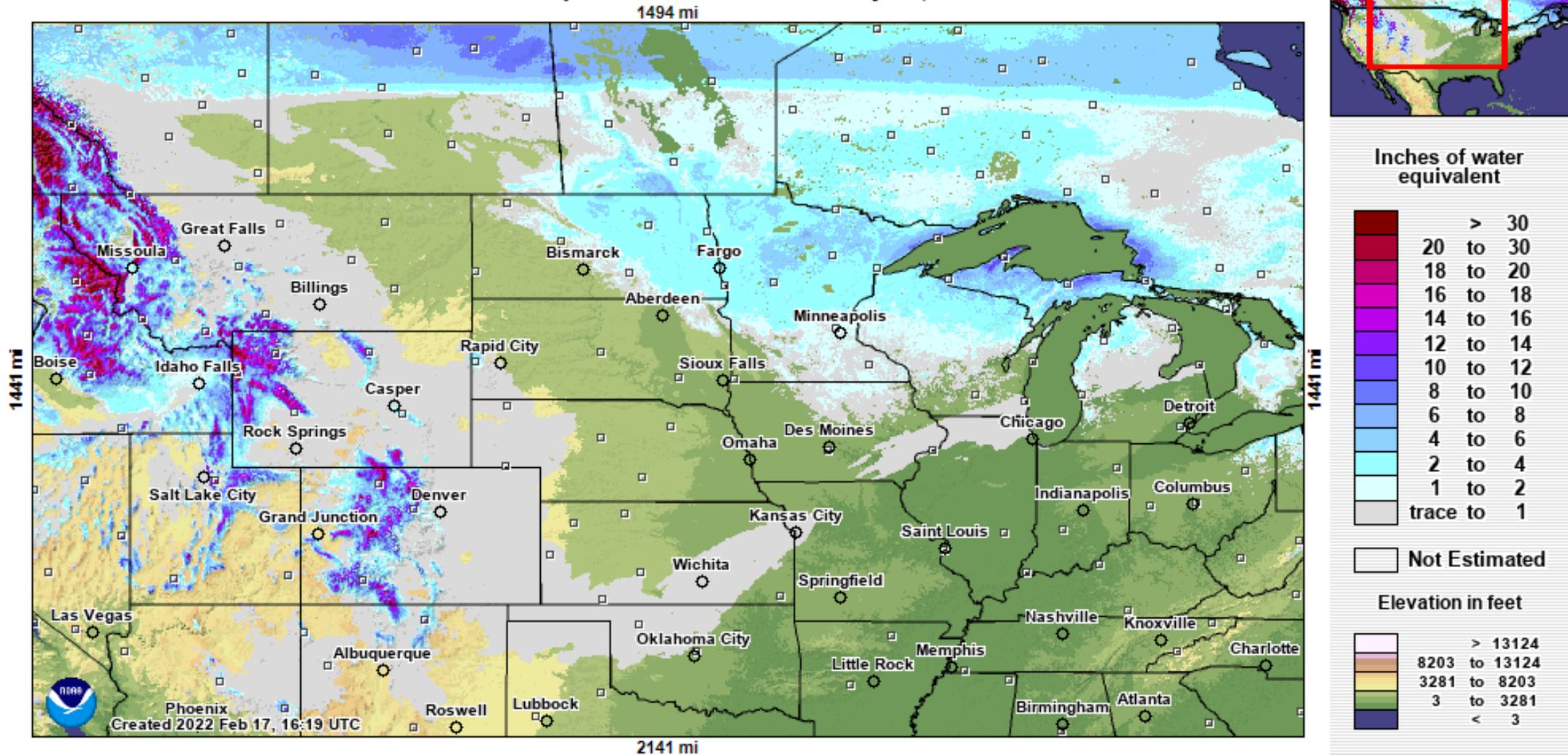
On February 13, 2022 the mountain Snow Water Equivalent (SWE) in the “Total above Fort Peck” reach is 9.8” and 84% of the (1981-2010) average. The mountain SWE in the “Fort Peck to Garrison” reach is 8.1” and 81% of the (1981-2010) average. The normal peak for both reaches occurs near April 15. The 30-year average lines (1981-2010) for both reaches will be updated when the data becomes available to (1991-2020).

Provisional data. Subject to revision.



Bare snowcover over northern and central plains

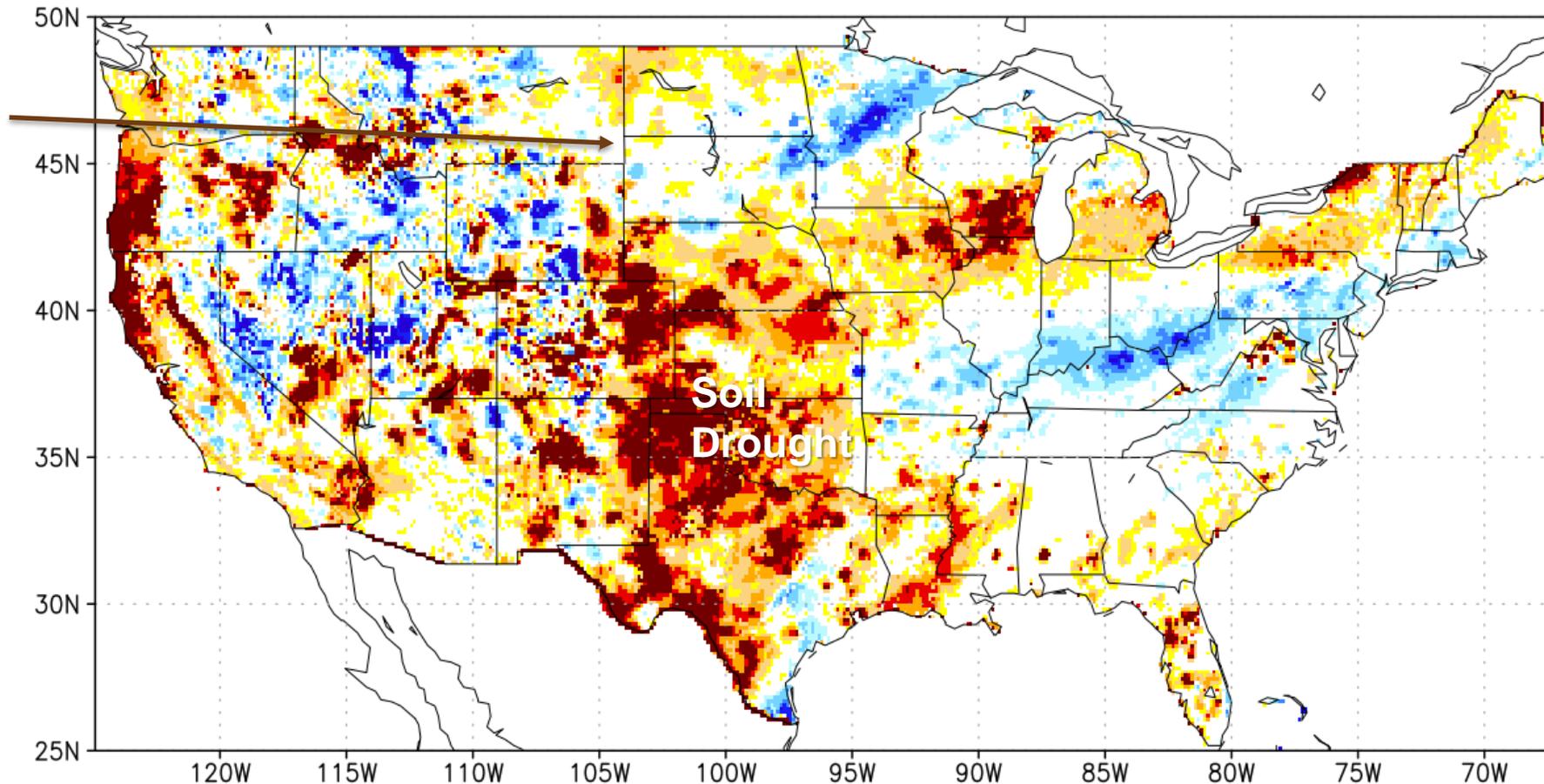
Modeled Snow Water Equivalent for 2022 February 17, 12:00 UTC



<https://www.nohrsc.noaa.gov/nsa/>



NLDAS Noah: Past Week Top 1-meter Soil Moisture Percentile
Valid: 12 Feb 2022

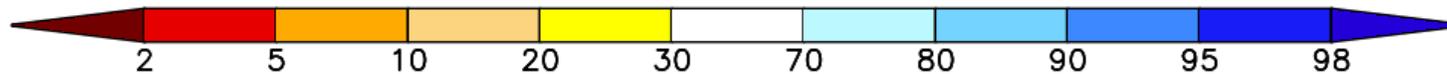


Low confidence here

Feb 13-17 precipitation not included

Soil Drought

Soil Moisture Percentile [0-100]



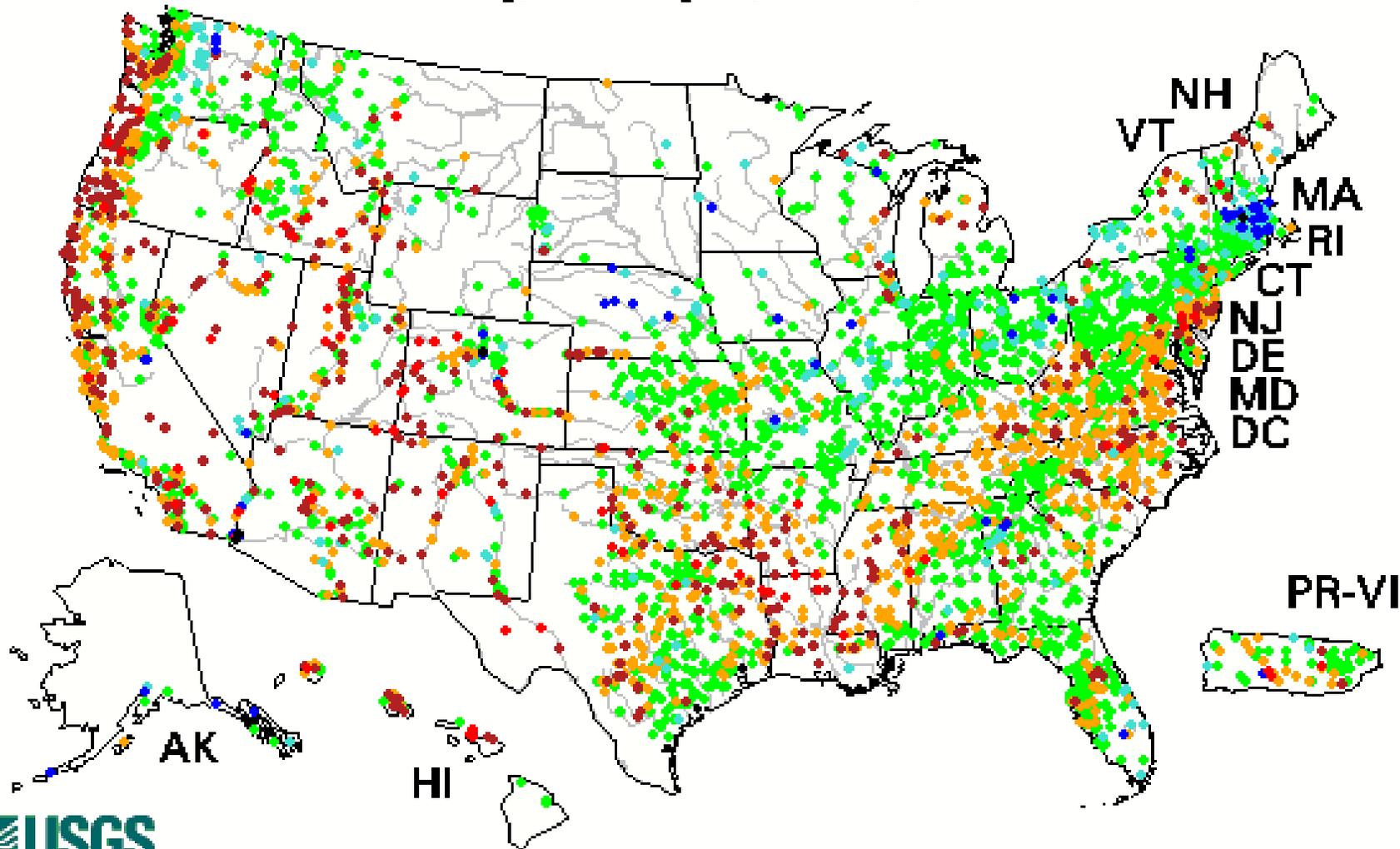
Noah

https://portal.nccs.nasa.gov/lisdata_pub/NLDAS/monitor/drought/NLDAS_NOAH_0125_1MSM_weekly-perc.png



28-day averaged streamflow

Tuesday, February 15, 2022 16:30ET

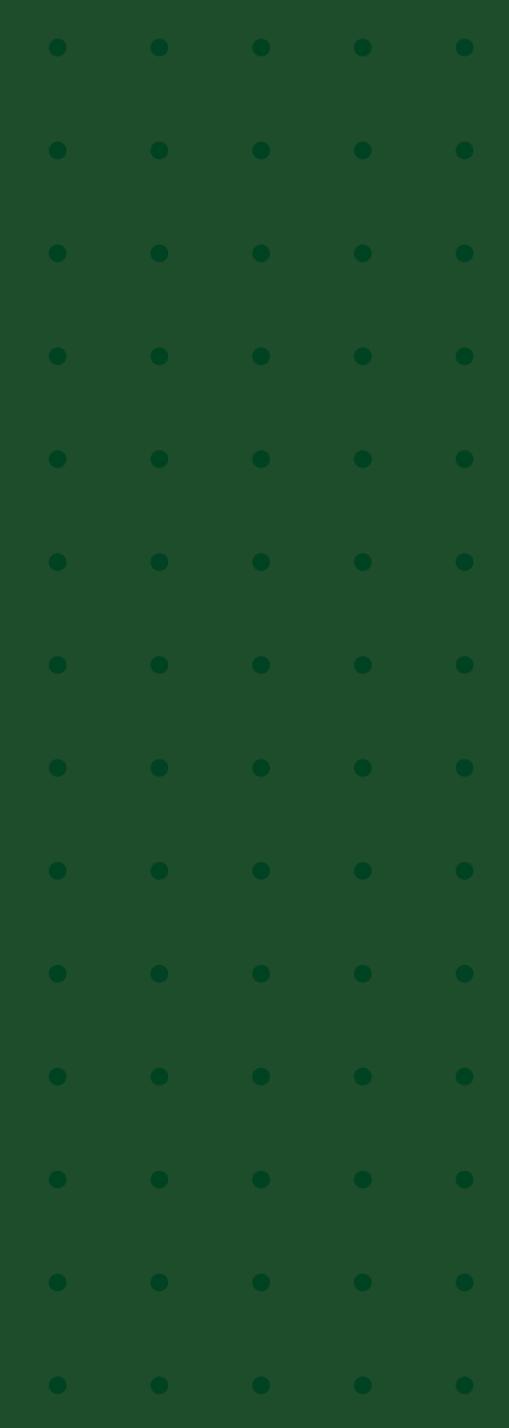


- Ice affected flows in Upper Missouri Basin
- Normal flows across Kansas
- High flows through Missouri, Illinois, Indiana



<https://waterwatch.usgs.gov>

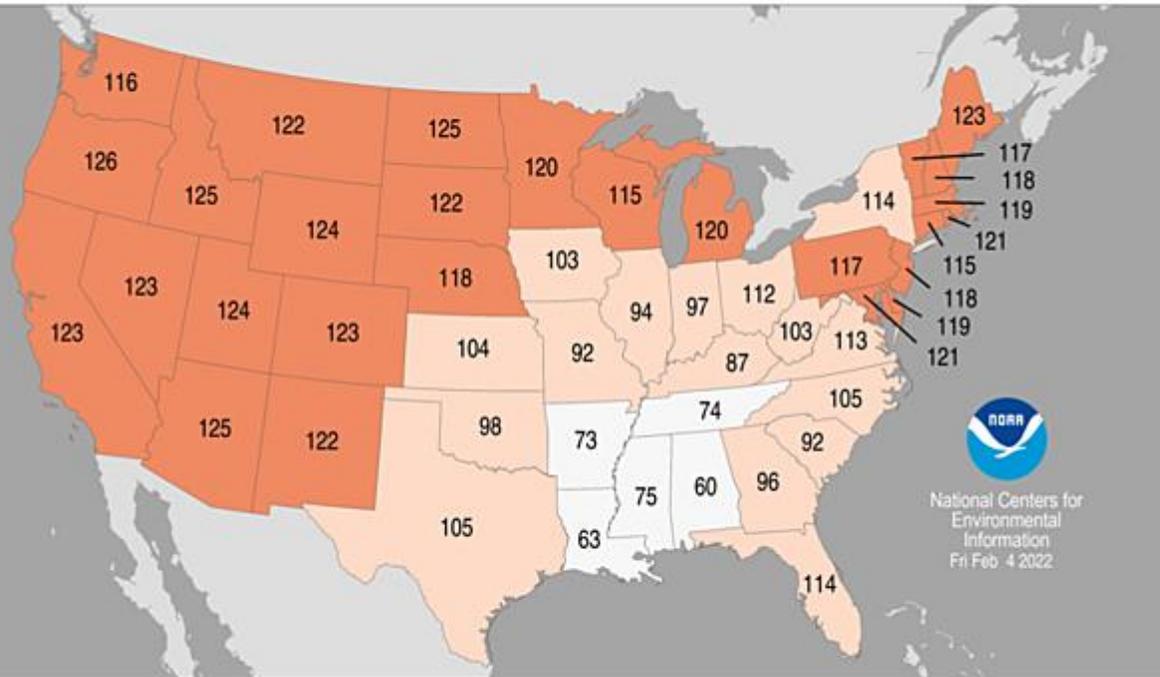




Long-term Conditions

Statewide Maximum Temperature Ranks

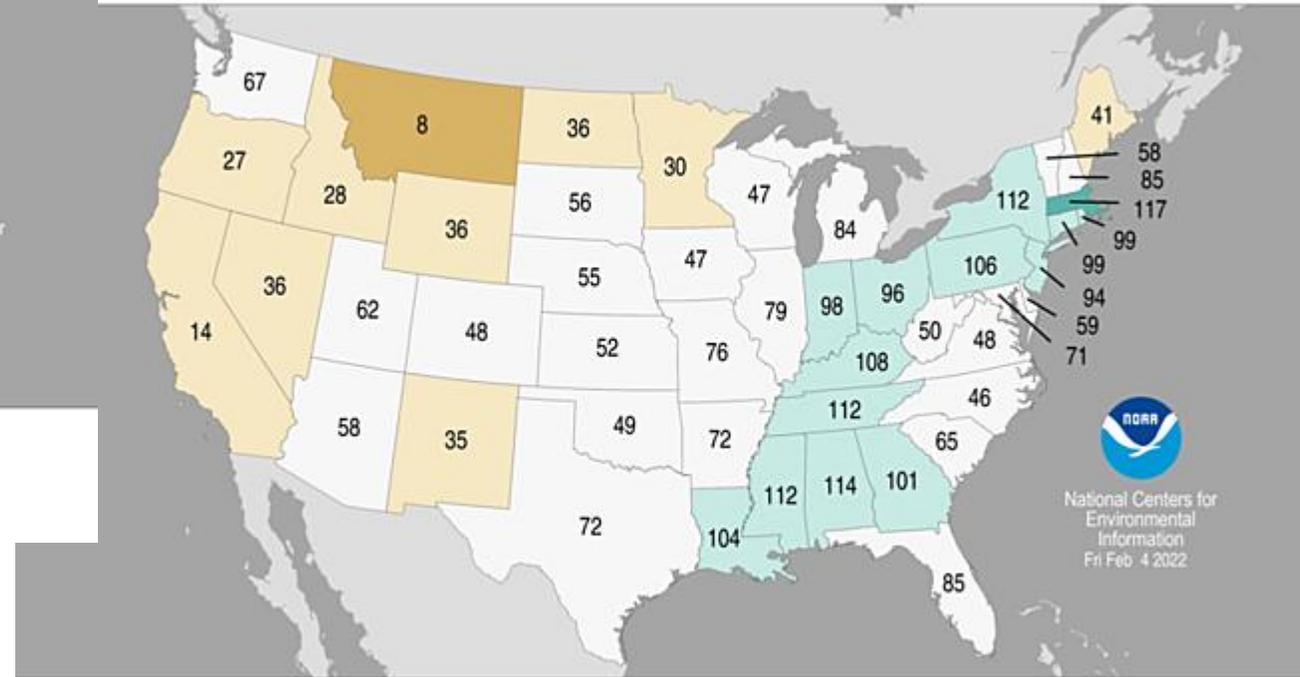
February 2021 – January 2022
Period: 1895–2022



Long-term Temperature and Precipitation

Statewide Precipitation Ranks

February 2021 – January 2022
Period: 1895–2022



<http://www.ncdc.noaa.gov/temp-and-precip/us-maps/>

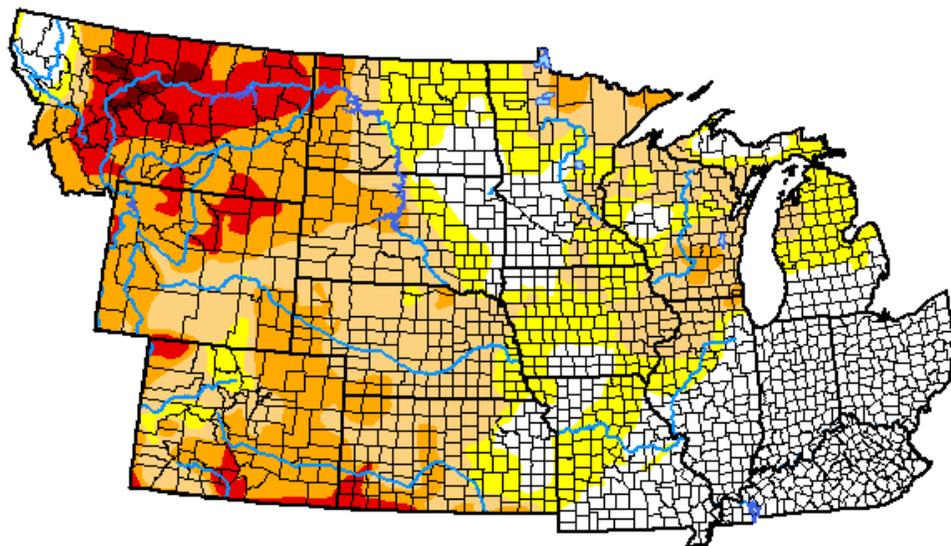


U.S. Drought Monitor NWS Central

February 15, 2022
(Released Thursday, Feb. 17, 2022)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	27.11	72.89	54.84	28.60	8.68	0.72
Last Week <i>02-08-2022</i>	28.55	71.45	51.43	27.77	8.36	0.97
3 Months Ago <i>11-16-2021</i>	37.58	62.42	46.16	27.16	11.17	2.95
Start of Calendar Year <i>01-04-2022</i>	33.94	66.06	46.53	27.27	10.67	1.77
Start of Water Year <i>09-28-2021</i>	31.08	68.92	50.85	37.30	18.35	3.17
One Year Ago <i>02-16-2021</i>	28.50	71.50	47.39	22.73	9.02	1.60



Intensity:

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

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

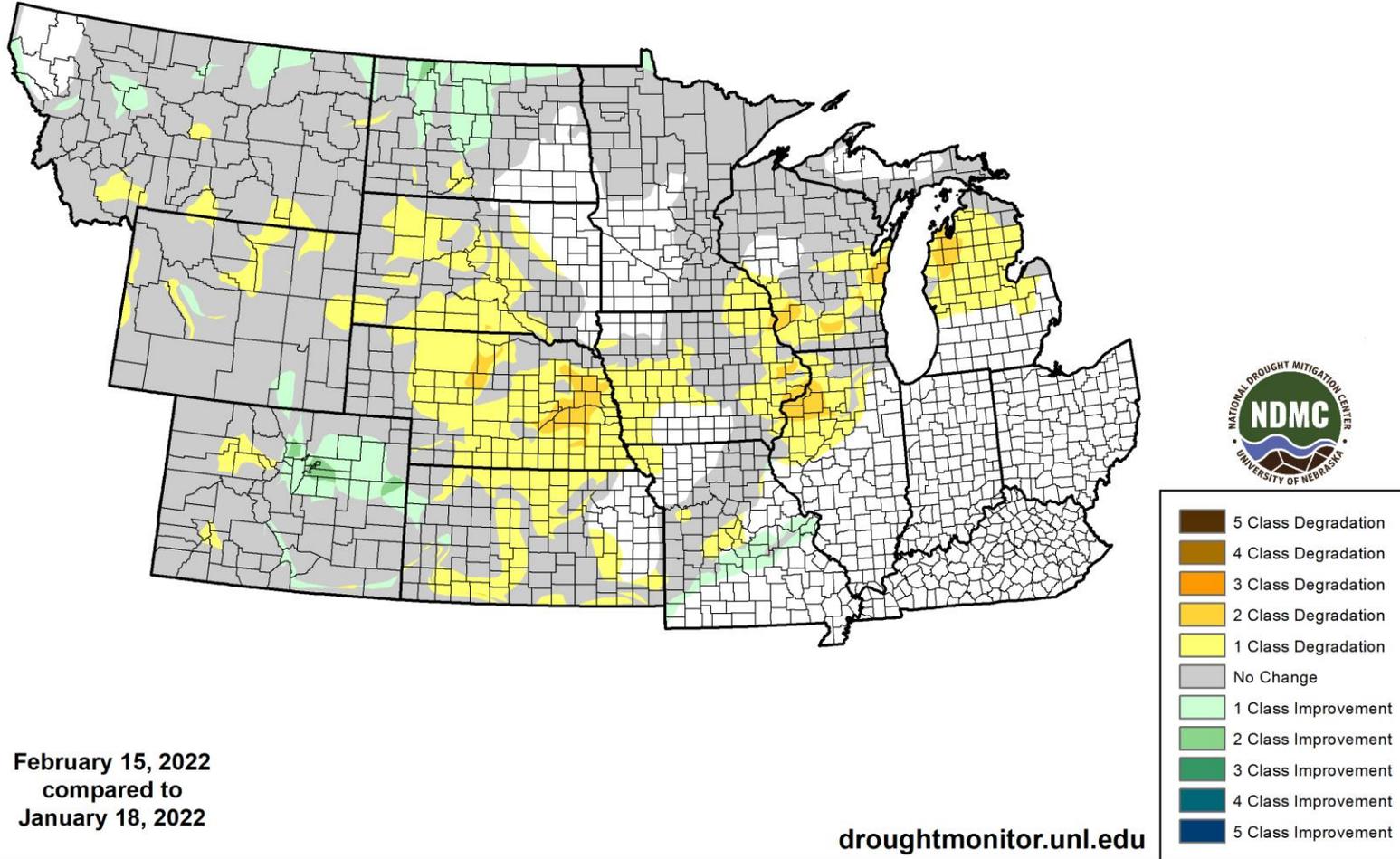
Brad Pugh
CPC/NOAA



droughtmonitor.unl.edu



U.S. Drought Monitor Class Change - NWS Central 4 Week



- Winter USDM changes are usually slow
- Persistence across most of the region
- Degrations across Central Plains
- Improvement pockets in CO, MT, WY

GREAT LAKES SURFACE ENVIRONMENTAL ANALYSIS (GLSEA)

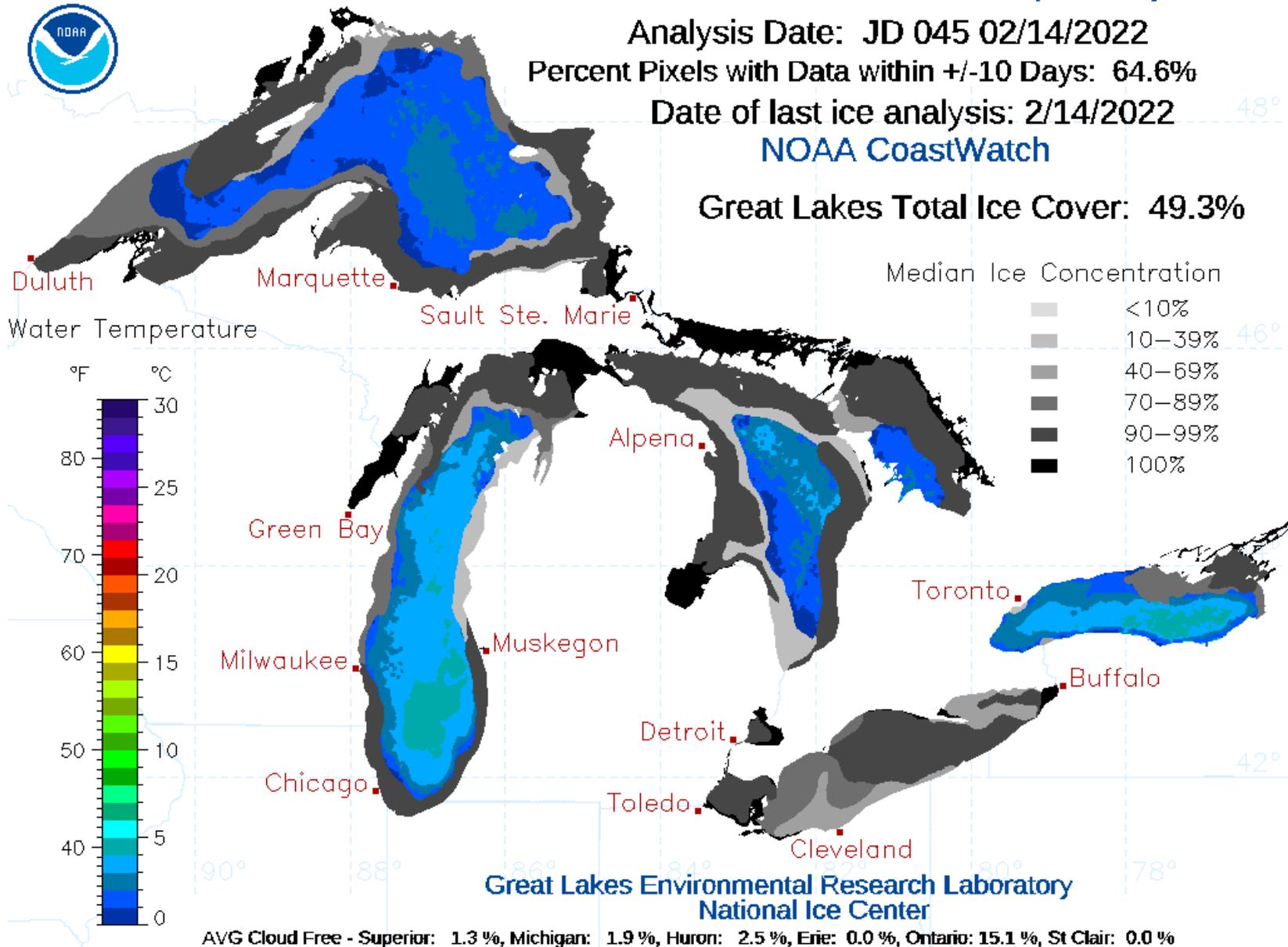


Analysis Date: JD 045 02/14/2022
 Percent Pixels with Data within +/-10 Days: 64.6%

Date of last ice analysis: 2/14/2022

NOAA CoastWatch

Great Lakes Total Ice Cover: 49.3%



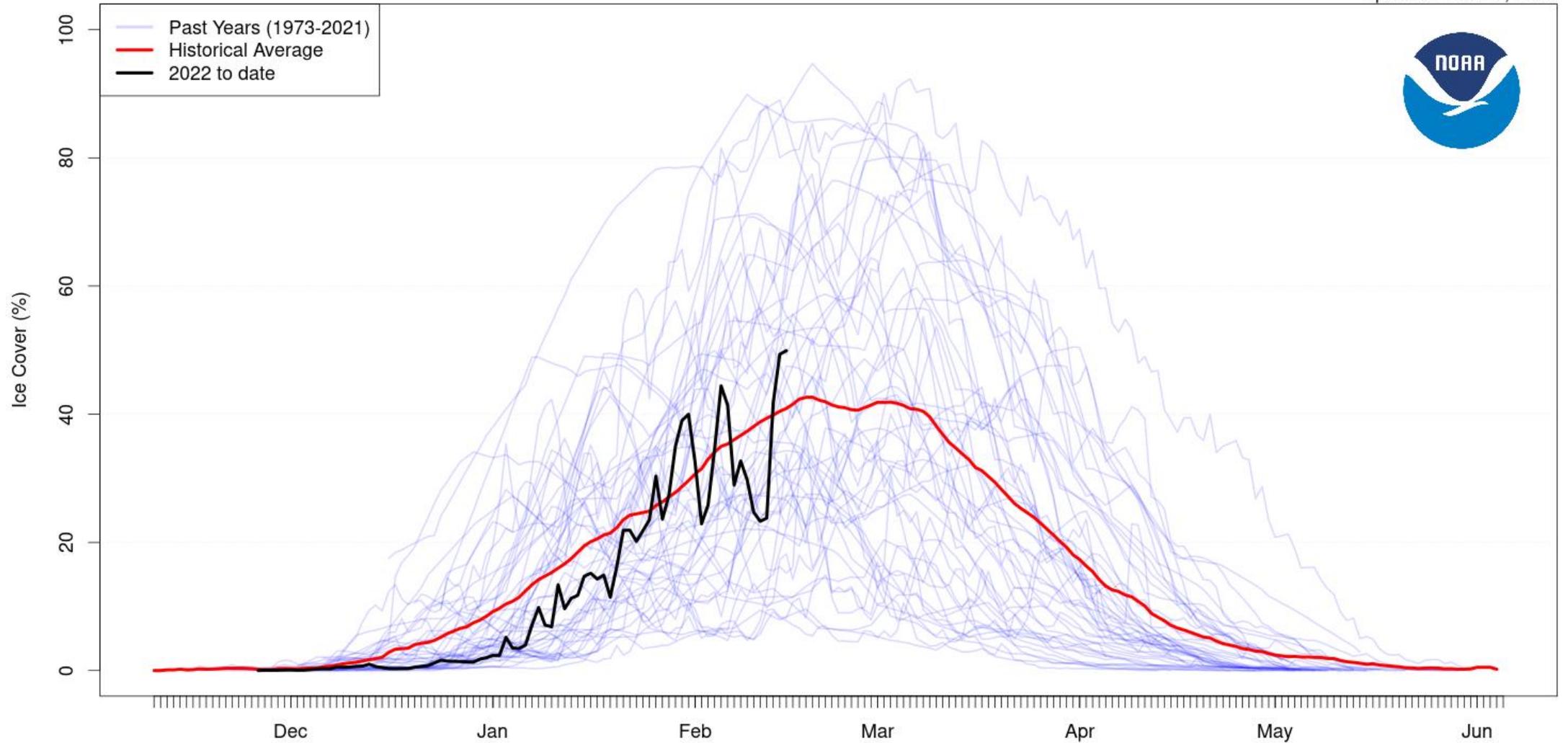
- All lakes undergoing freeze
- Fraction of lakes frozen below average for all lakes except Erie (65%, but up-and-down)
- Nearing peak ice season

<https://www.glerl.noaa.gov/data/ice/>



Great Lakes Average Ice Cover

updated: Feb 15, 2022



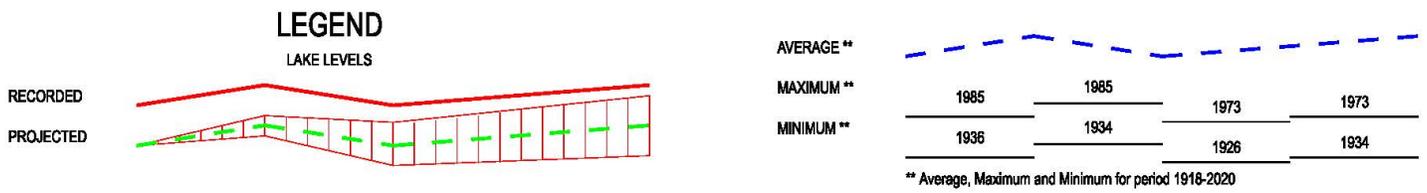
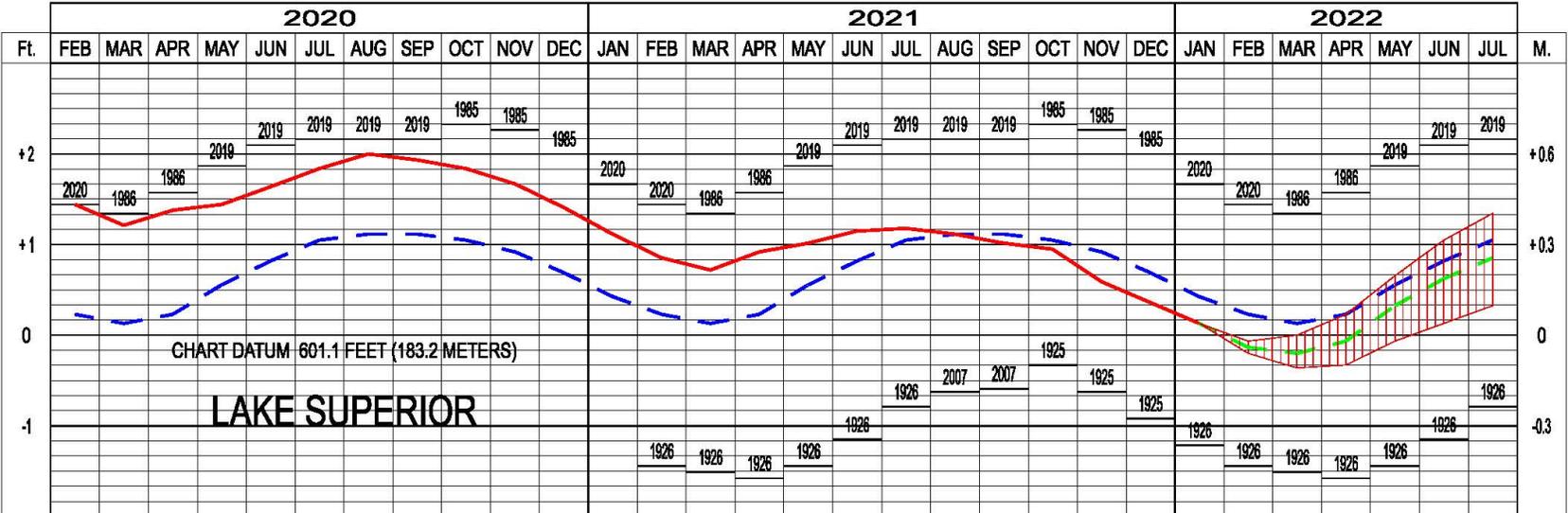
<https://www.glerl.noaa.gov/data/ice/>



Lake Superior
back below
historical
average
depth

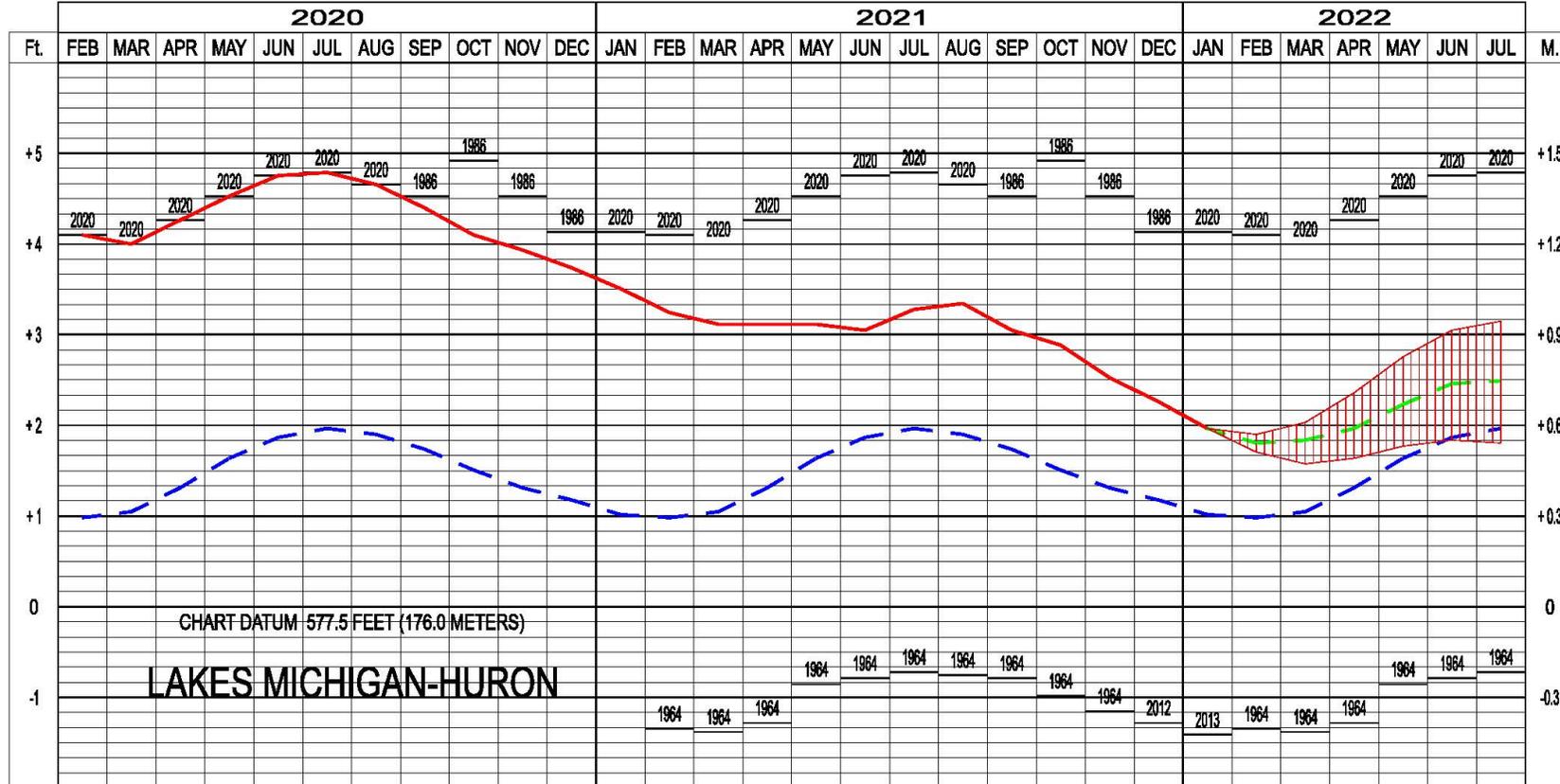
Great Lakes
at lowest
levels in over
two years, in
some cases
over five
years

LAKE SUPERIOR WATER LEVELS - FEBRUARY 2022



<https://www.lre.usace.army.mil/Missions/Great-Lakes-Information/Great-Lakes-Water-Levels/Water-Level-Forecast/Monthly-Bulletin-of-Great-Lakes-Water-Levels/>

LAKES MICHIGAN-HURON WATER LEVELS - FEBRUARY 2022



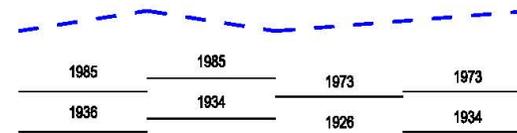
LEGEND

LAKE LEVELS

RECORDED
PROJECTED



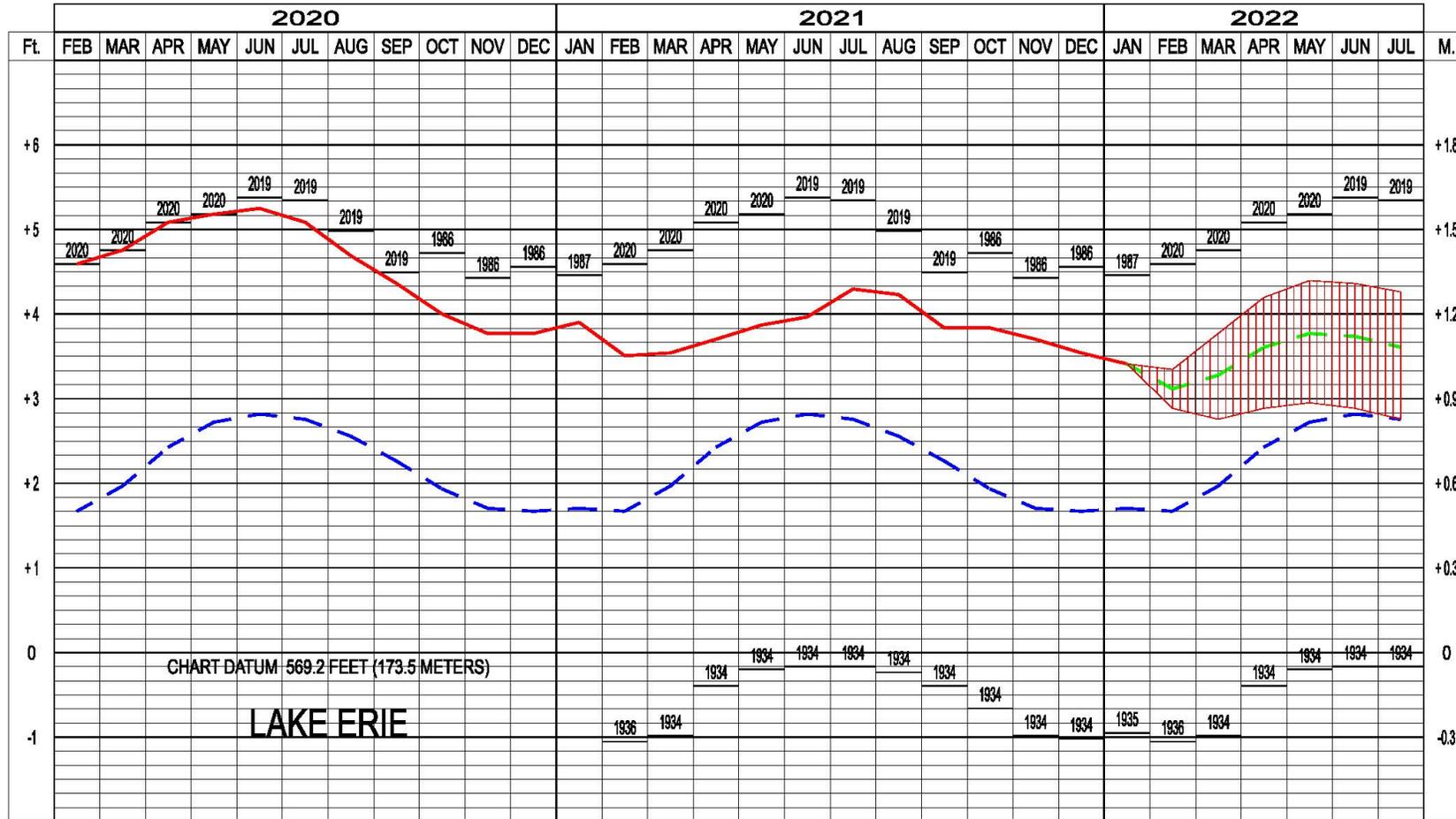
AVERAGE **
MAXIMUM **
MINIMUM **



** Average, Maximum and Minimum for period 1918-2020



LAKE ERIE WATER LEVELS - FEBRUARY 2022

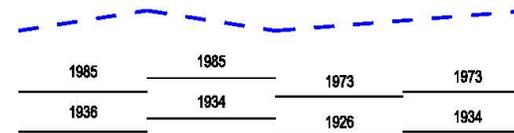


LEGEND LAKE LEVELS

RECORDED
PROJECTED

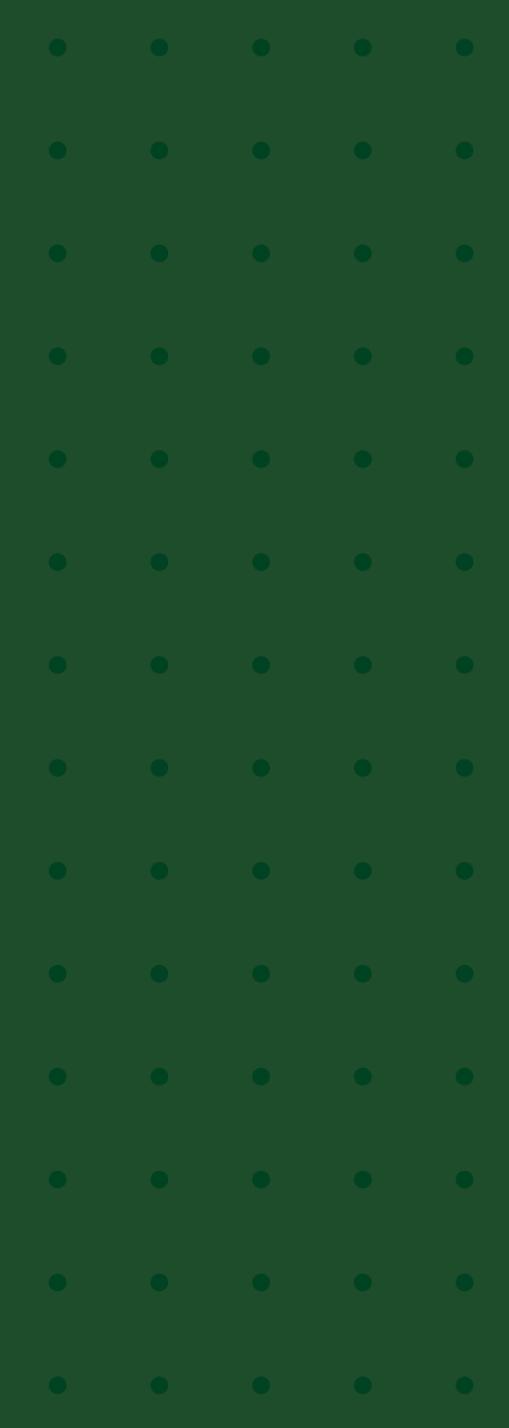


AVERAGE **
MAXIMUM **
MINIMUM **



** Average, Maximum and Minimum for period 1918-2020





Impacts



Albright Fire burns over 1000 acres and forces evacuations in Kansas



Low ponds and dry creeks in SW KS



Heavy snowband
in Colorado and
Kansas drops
27" of snow on
Mt. Sunflower

This storm
impacted transit
on I70



Courtesy- Ed Harold

6:00 30°
KAKE News



Agricultural Impacts

- Winter Wheat
 - SE CO and SW KS crops had dry soils during planting season
 - Wheat loss Dec 15 with extreme wind in KS and CO
 - Moisture is needed before spring green-up for crop success
 - Poor stands in OH, but still in “wait and see” mode
- Cattle
 - Low Cattle numbers across us. Poor year in MT/ND/SD
- Hogs
 - Low moisture in northwest Iowa leading to drinking and feeding concerns
- Wet conditions in Ohio River Valley threaten to delay planting season
- Brush fires and some early grass green up in Kansas

Winter Wheat Condition, Week Ending January 23, 2022

<u>State</u>	<u>VP</u>	<u>P</u>	<u>F</u>	<u>G</u>	<u>EX</u>	<u>VP/P Change</u>
Montana	19	46	21	14	0	+9
S. Dakota	3	6	60	30	1	-17
Nebraska	8	11	45	33	3	+6
Colorado	14	26	40	20	0	+7
Kansas	8	23	39	29	1	+21
Oklahoma	20	23	41	15	1	+27
Texas	46	25	22	7	0	+26

“VP/P Change” represents percentage change in those two categories between November 28, 2021, and January 23, 2022.



Transportation Impacts

- Typical winter storm impacts
- Blizzard first week of February created major wrecks from St. Louis to Chicago, and temporarily shut down I55
- Flooding problems in urban areas of Illinois Feb. 16-17
- Freezing rain event January 20th created traffic problems in Denver Metro area.
- Heavy snow band Friday, February 11th also impacted traffic in Denver/Boulder



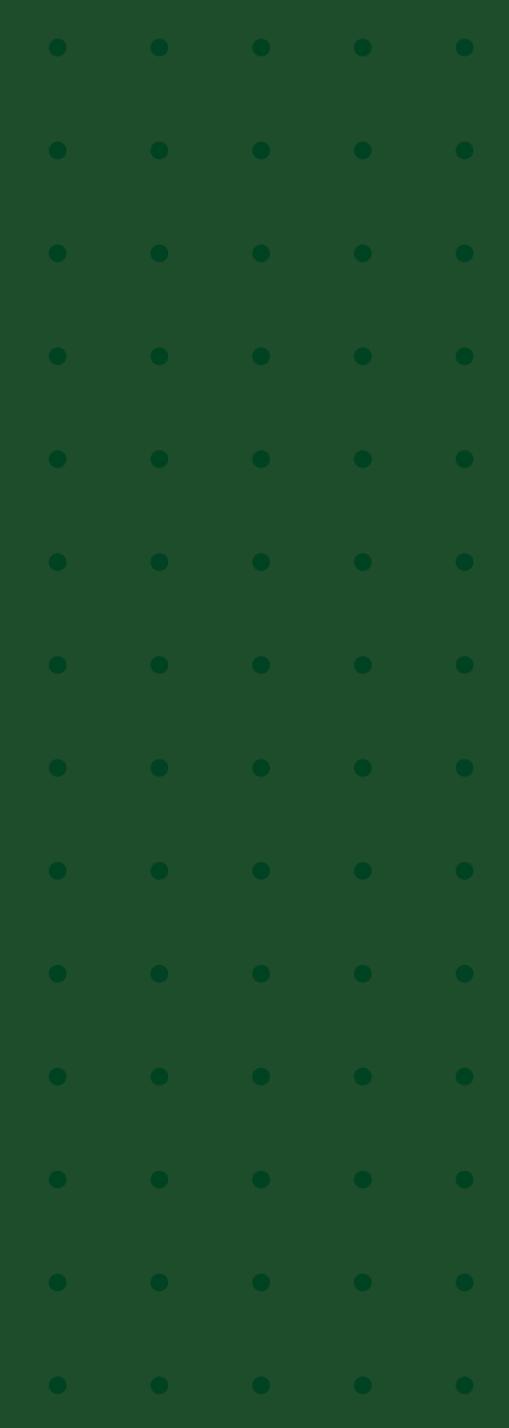
Hydrologic Impacts

- Both wet and dry impacts in basin
- Heavy rain/snow with frozen soils expected to cause ice jam issues in southern Illinois, Indiana, and Ohio
- Low snowpack leading to runoff concerns for Montana, Wyoming, Colorado, and the Dakotas



Ice affecting shipping along the Illinois River Feb 4, 2022

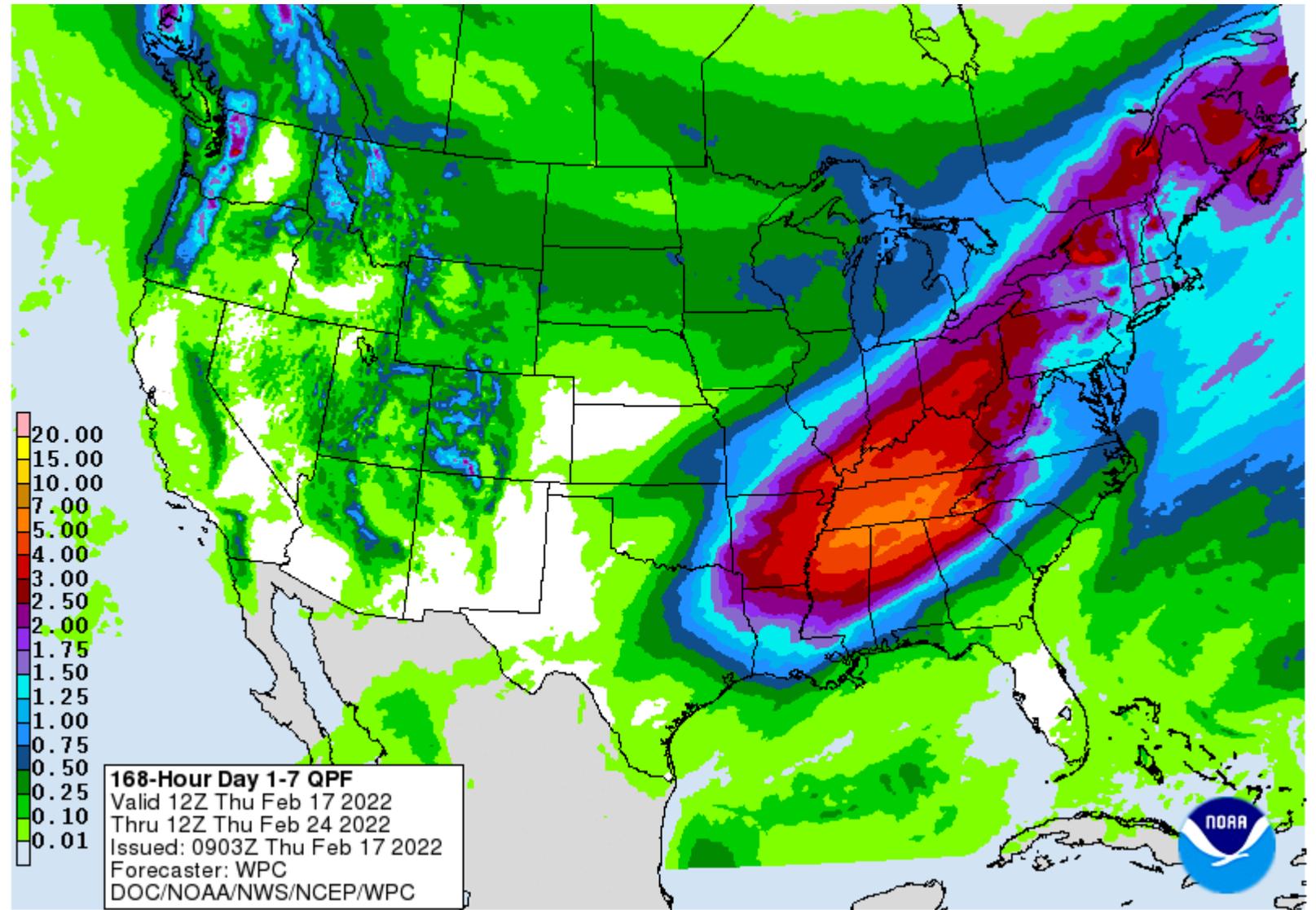




Outlook

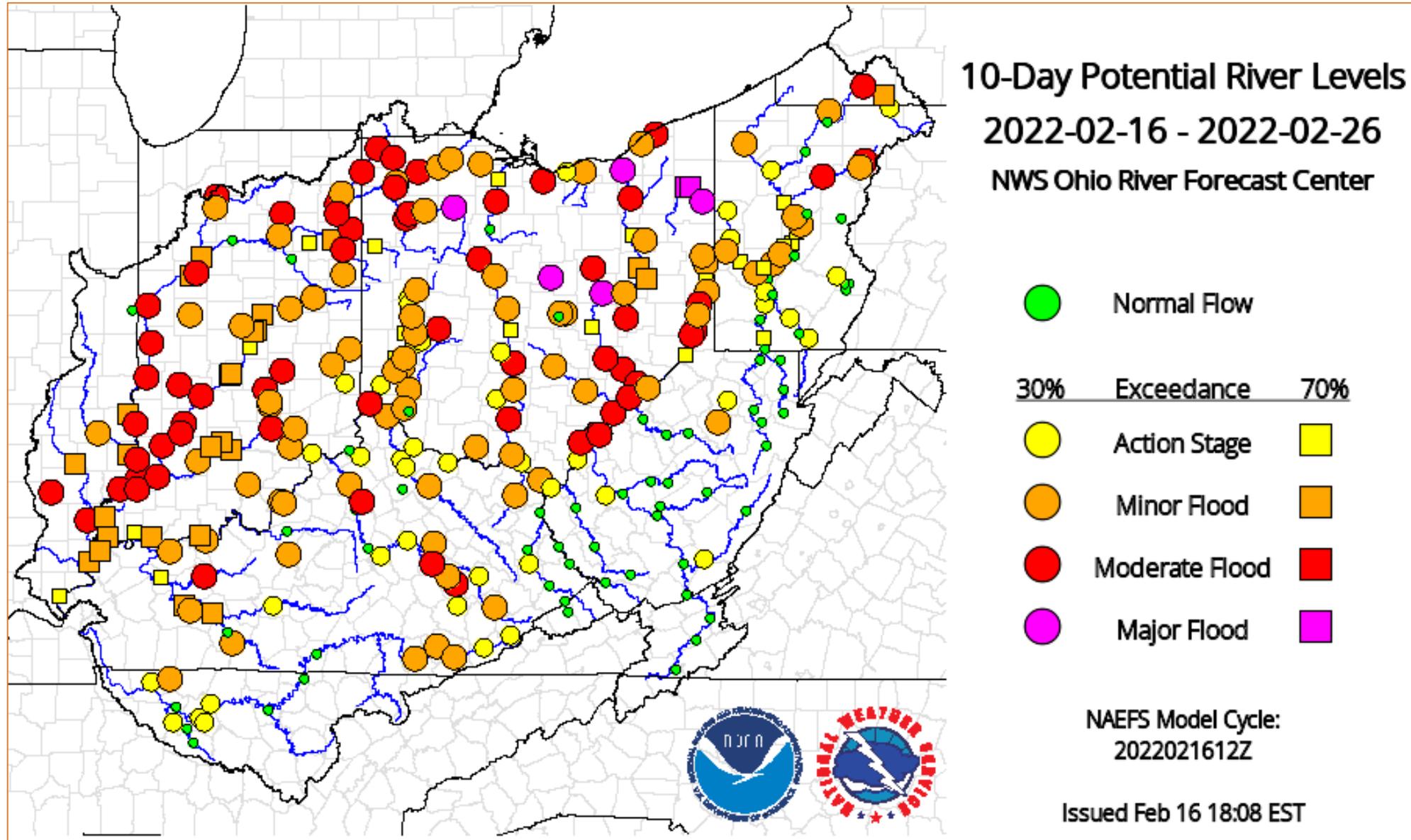
7-day Precip Forecast

- More wet condition in the Ohio River Valley
- Snowfall returns to the Rockies. Moderate snow on the plains in MT, ND, SD



<https://www.wpc.ncep.noaa.gov>

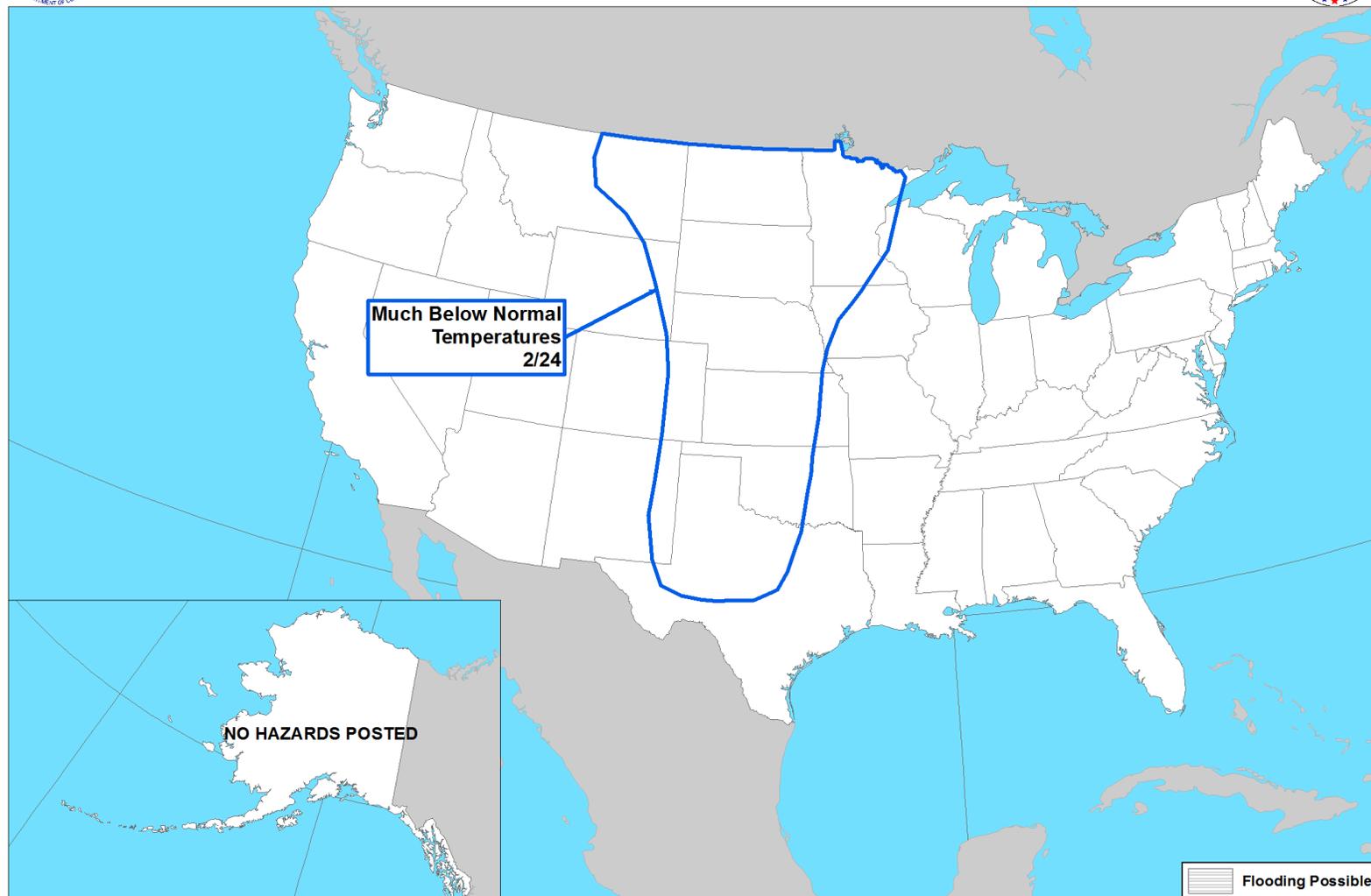
Ohio River Basin Near-Term Flood Potential – February 16-26, 2022





Winter is Not Over

- High confidence in much below normal temperatures across the plains next week
- Temps could be as cold as -30 F for MN, ND, SD. As cold as 0 F as far south as OK



Climate Prediction Center

Made: 02/16/2022 3PM EST

Follow us:  

www.cpc.ncep.noaa.gov

<https://www.cpc.ncep.noaa.gov/products/predictions/threats/threats.php>

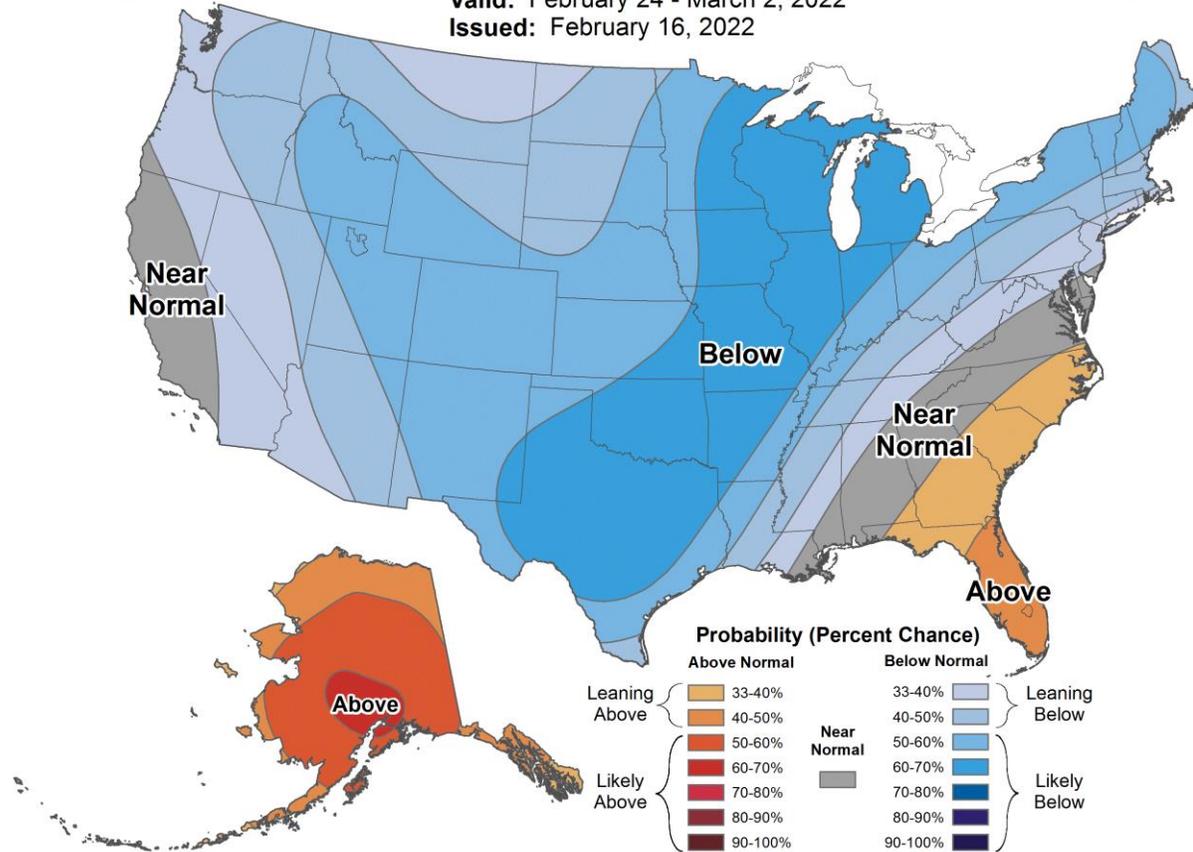




8-14 Day Temperature Outlook



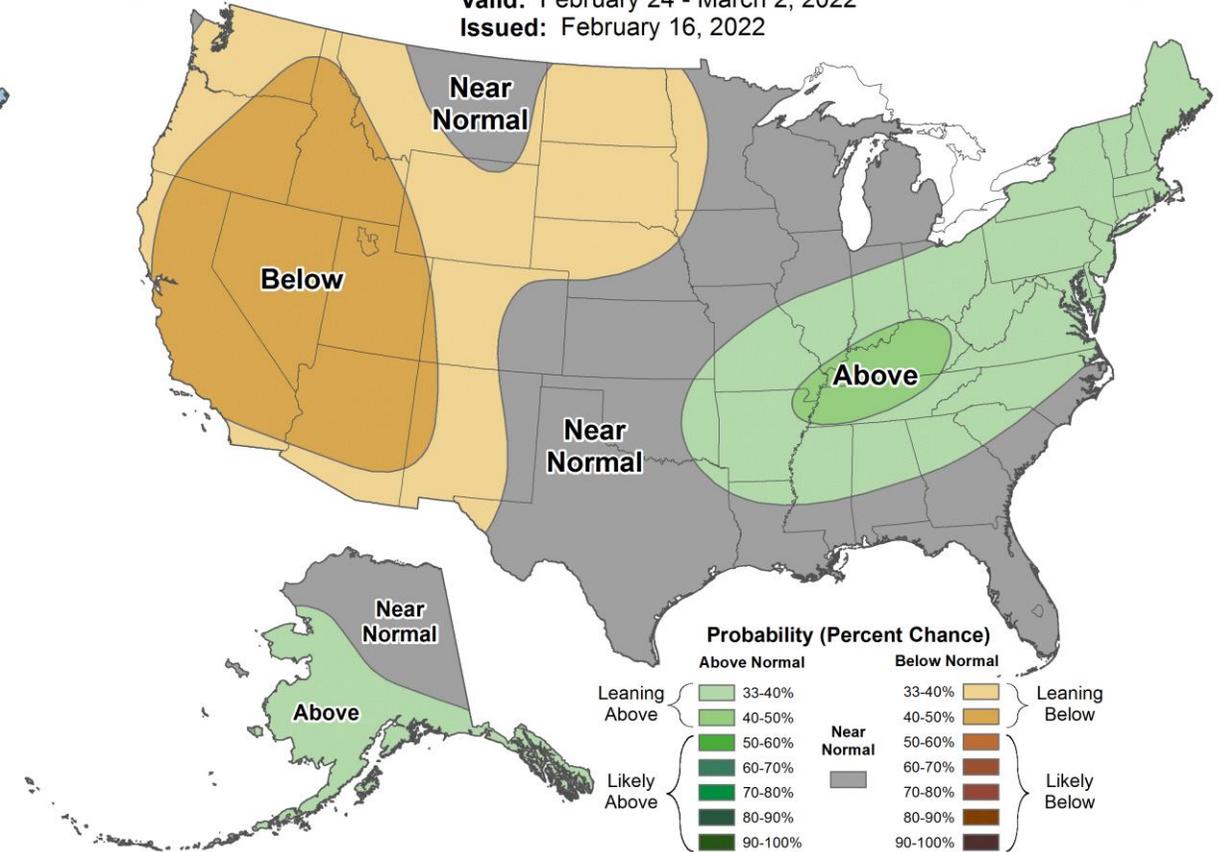
Valid: February 24 - March 2, 2022
 Issued: February 16, 2022



8-14 Day Precipitation Outlook



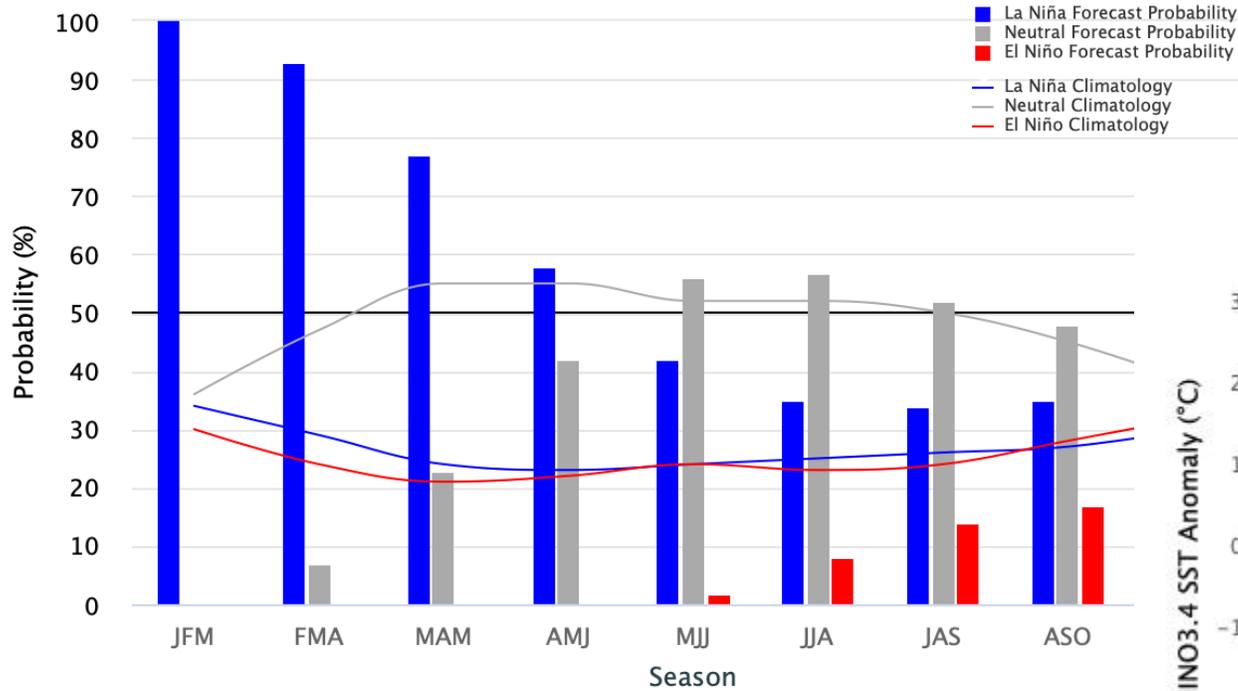
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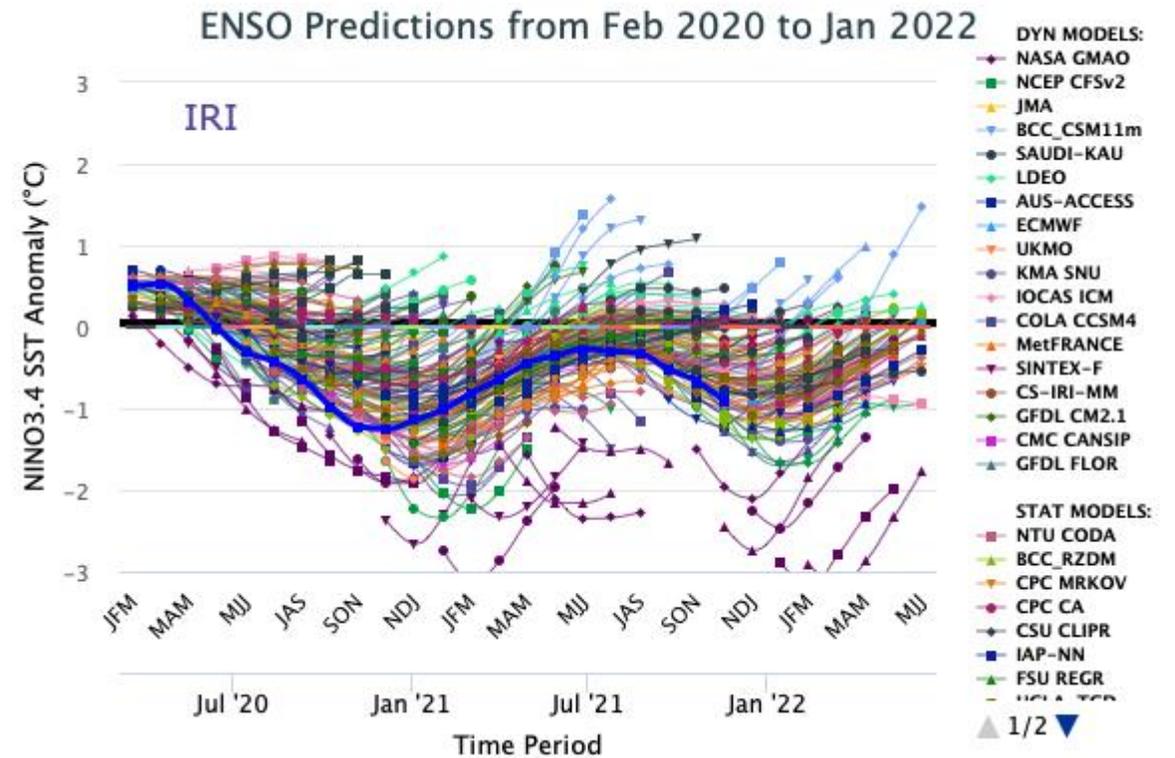
La Niña Projections

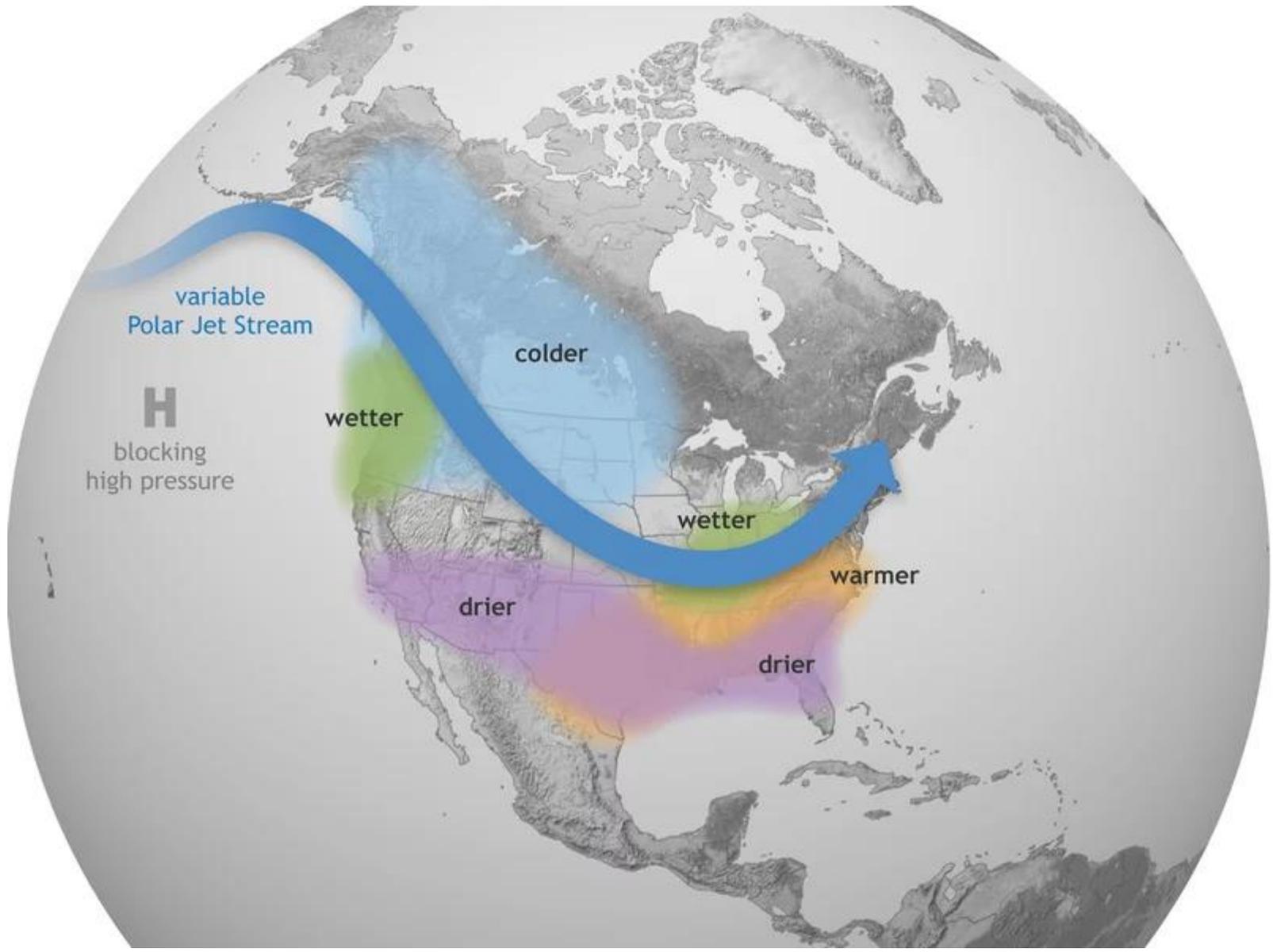
Early-February 2022 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: -0.5 °C to 0.5 °C



IRI/CPC ENSO Forecasts:
<https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/>





La Niña Impacts:
usually colder and
wetter

Climate.gov

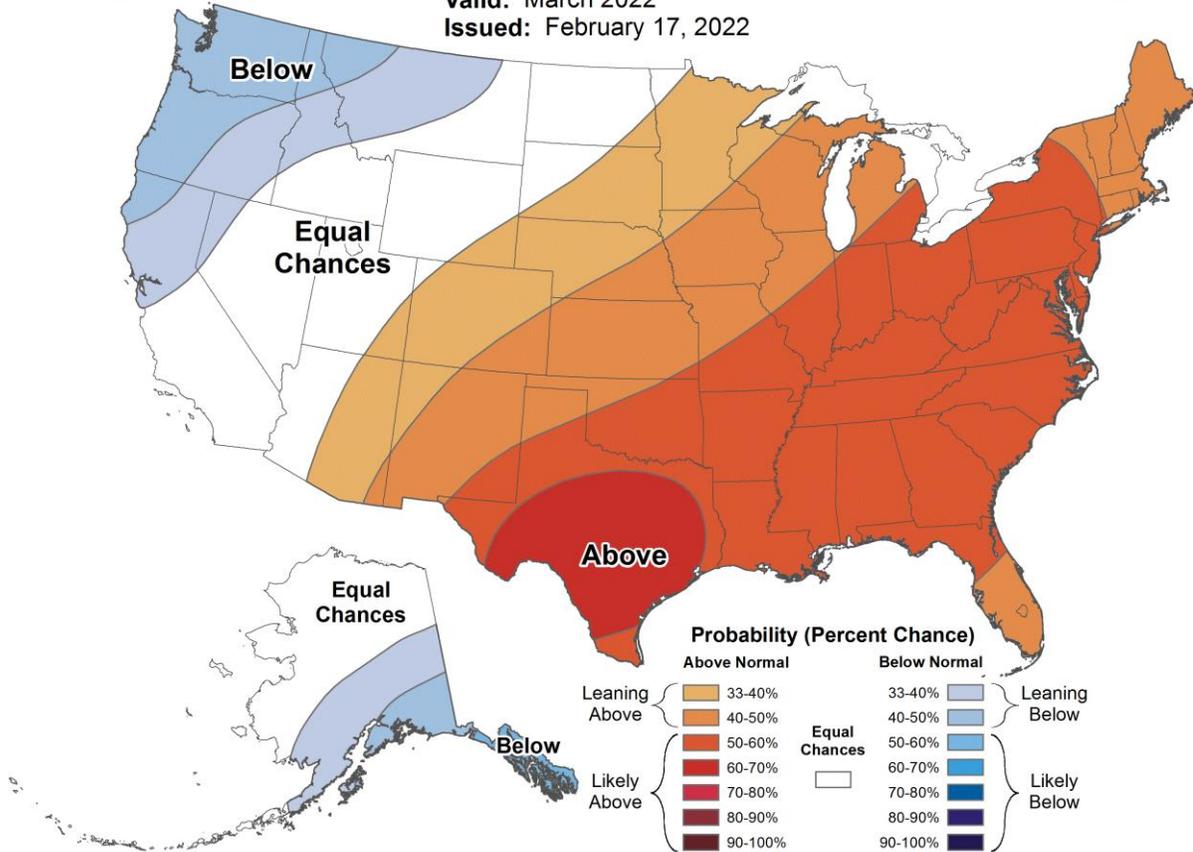




Monthly Temperature Outlook



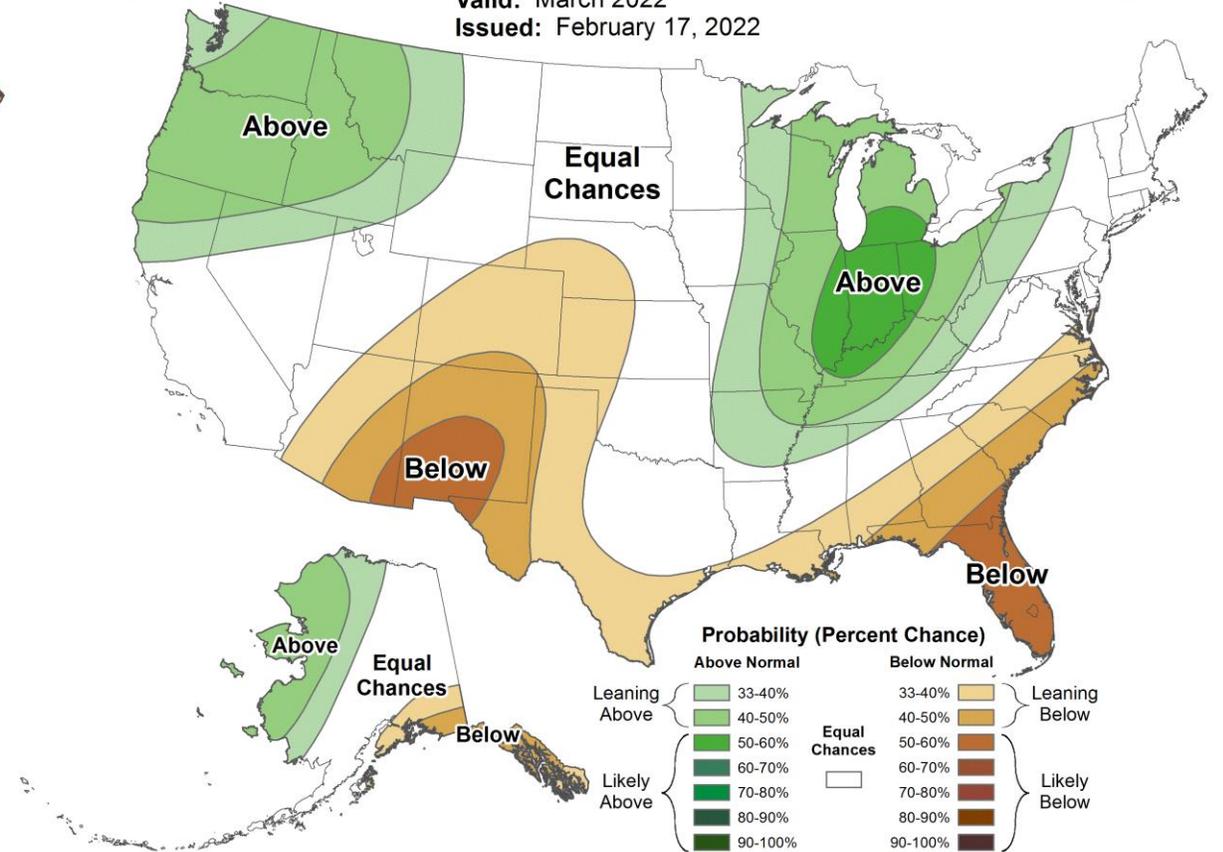
Valid: March 2022
Issued: February 17, 2022



Monthly Precipitation Outlook



Valid: March 2022
Issued: February 17, 2022

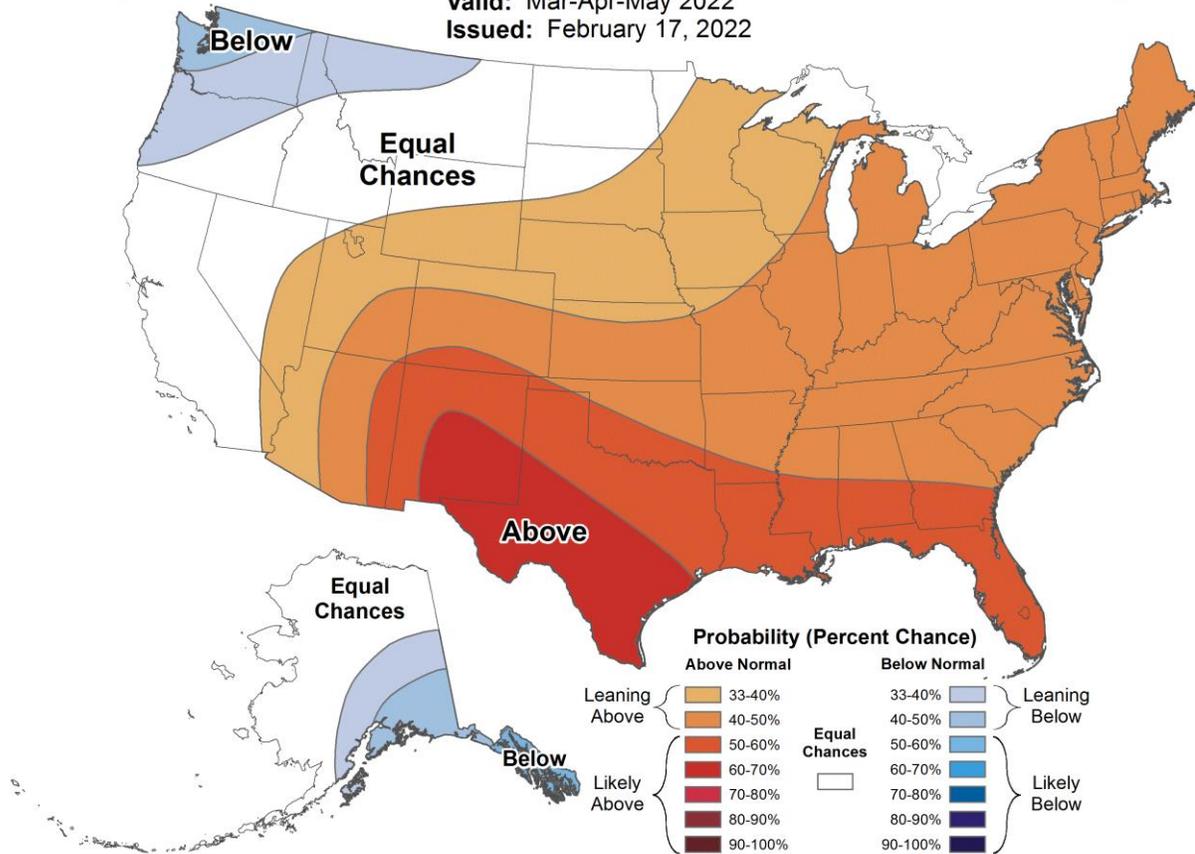




Seasonal Temperature Outlook



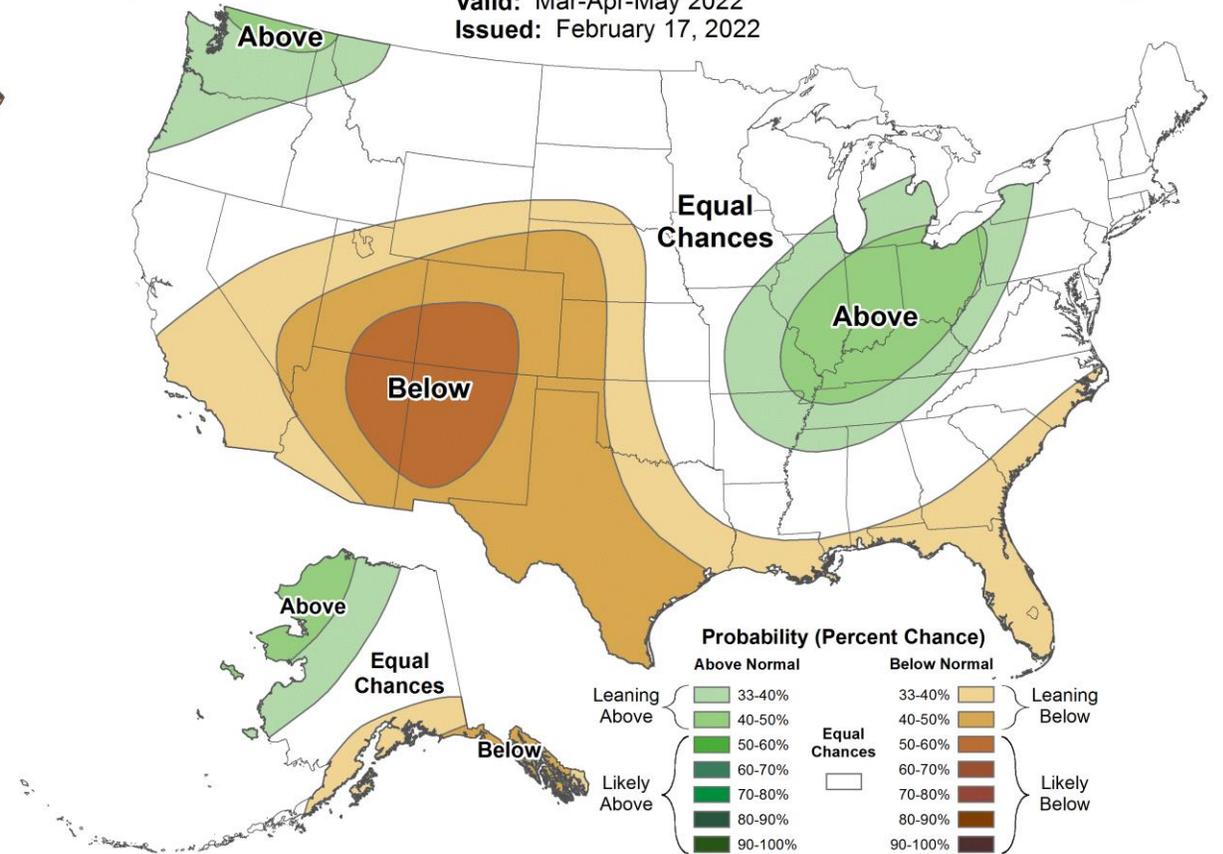
Valid: Mar-Apr-May 2022
 Issued: February 17, 2022



Seasonal Precipitation Outlook



Valid: Mar-Apr-May 2022
 Issued: February 17, 2022

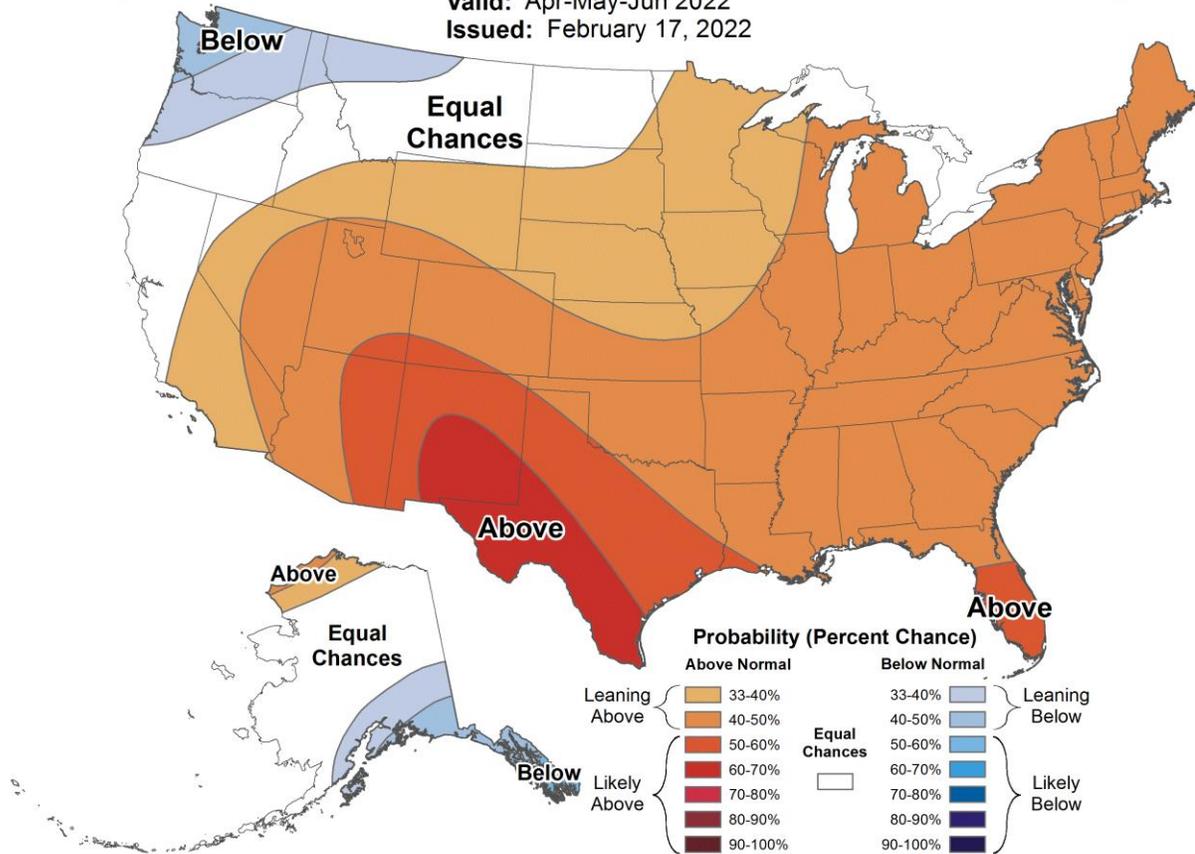




Seasonal Temperature Outlook



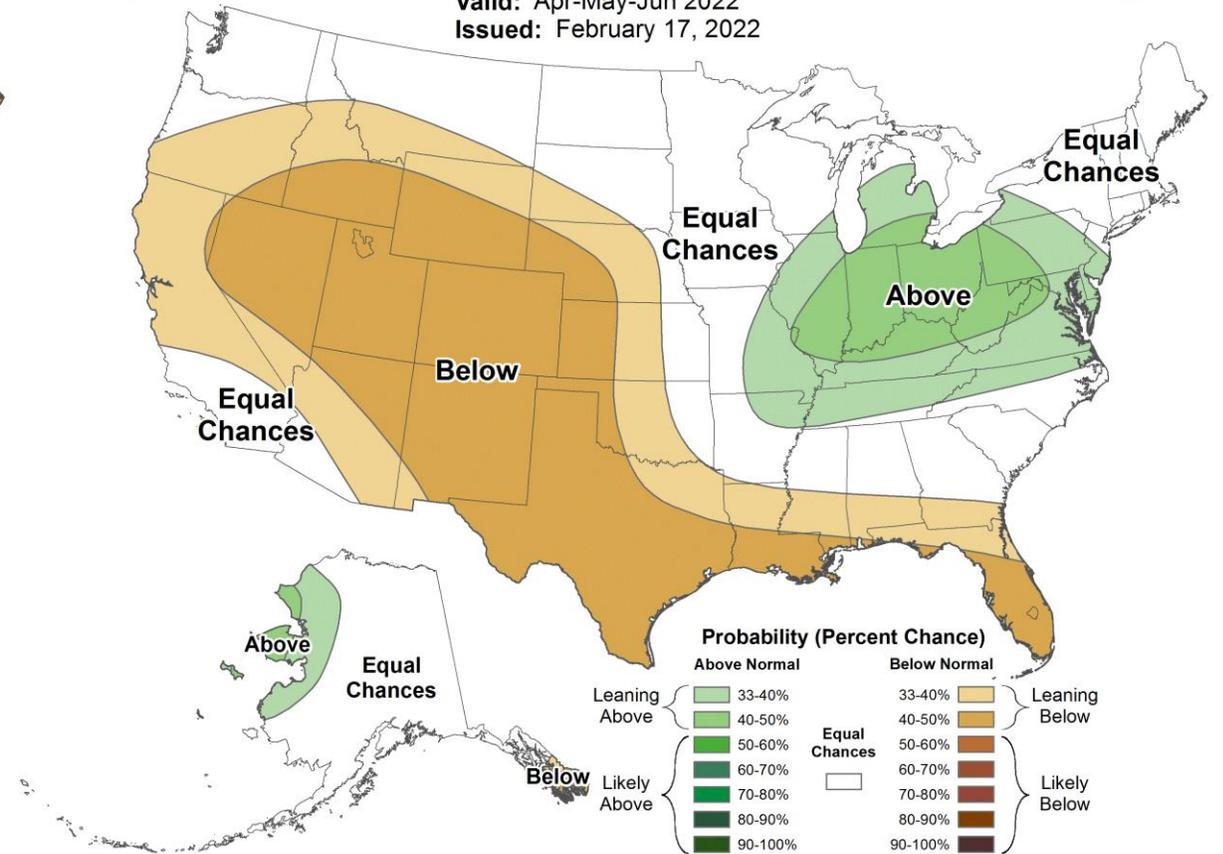
Valid: Apr-May-Jun 2022
 Issued: February 17, 2022

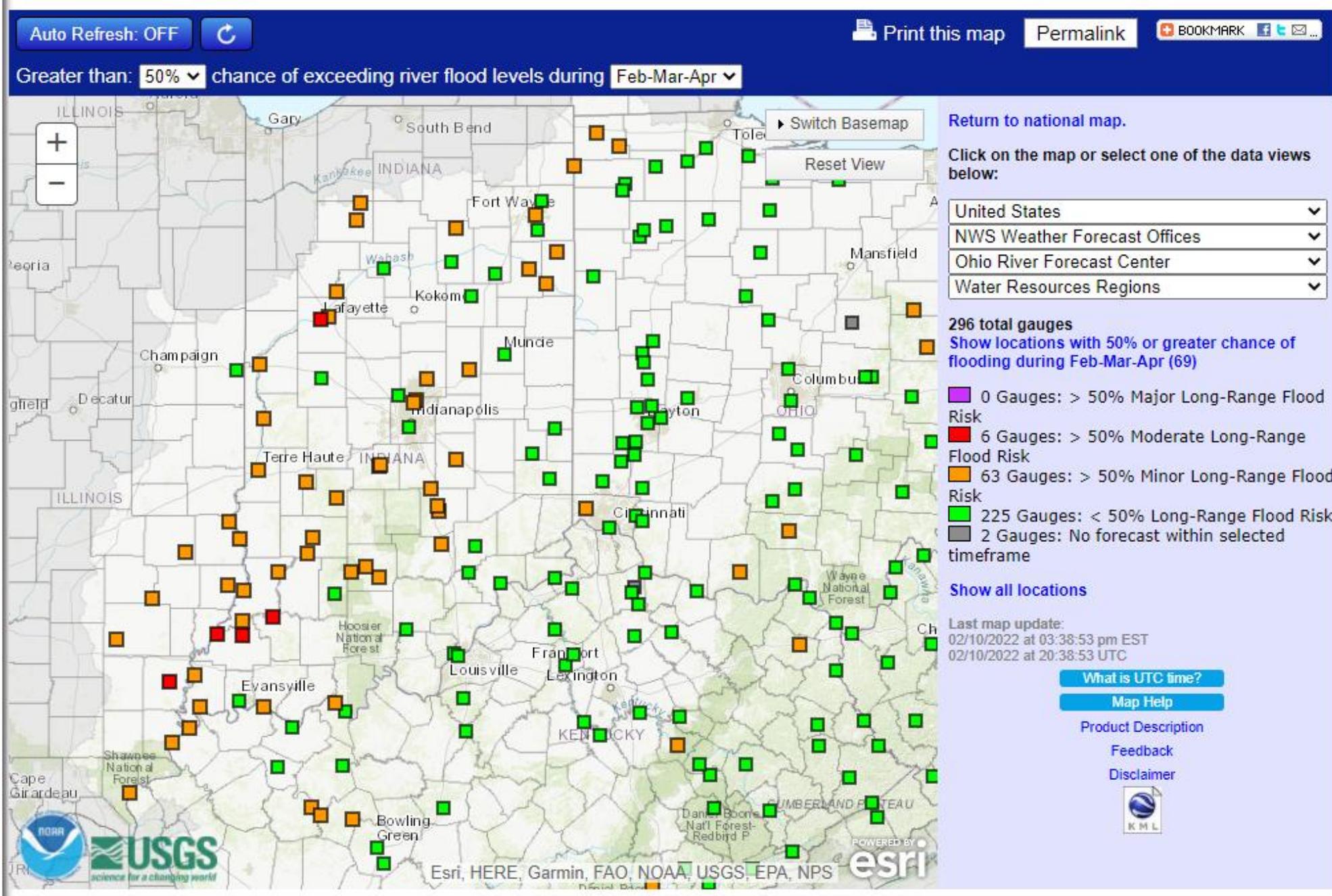


Seasonal Precipitation Outlook



Valid: Apr-May-Jun 2022
 Issued: February 17, 2022





50+% chance of minor-to-moderate flooding on Wabash River

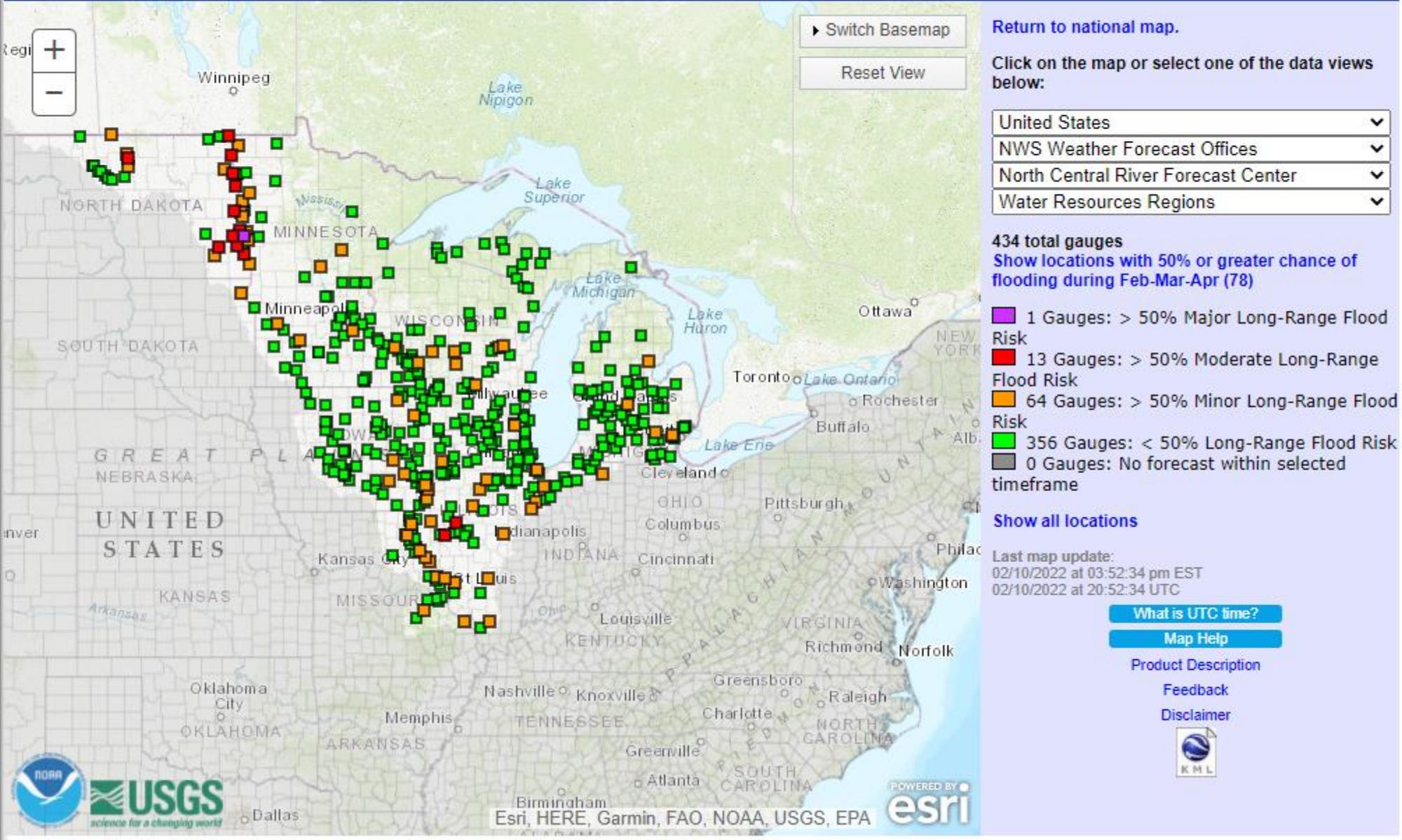
Major flooding is possible in Ohio River Valley



Greater than: 50% chance of exceeding river flood levels during Feb-Mar-Apr

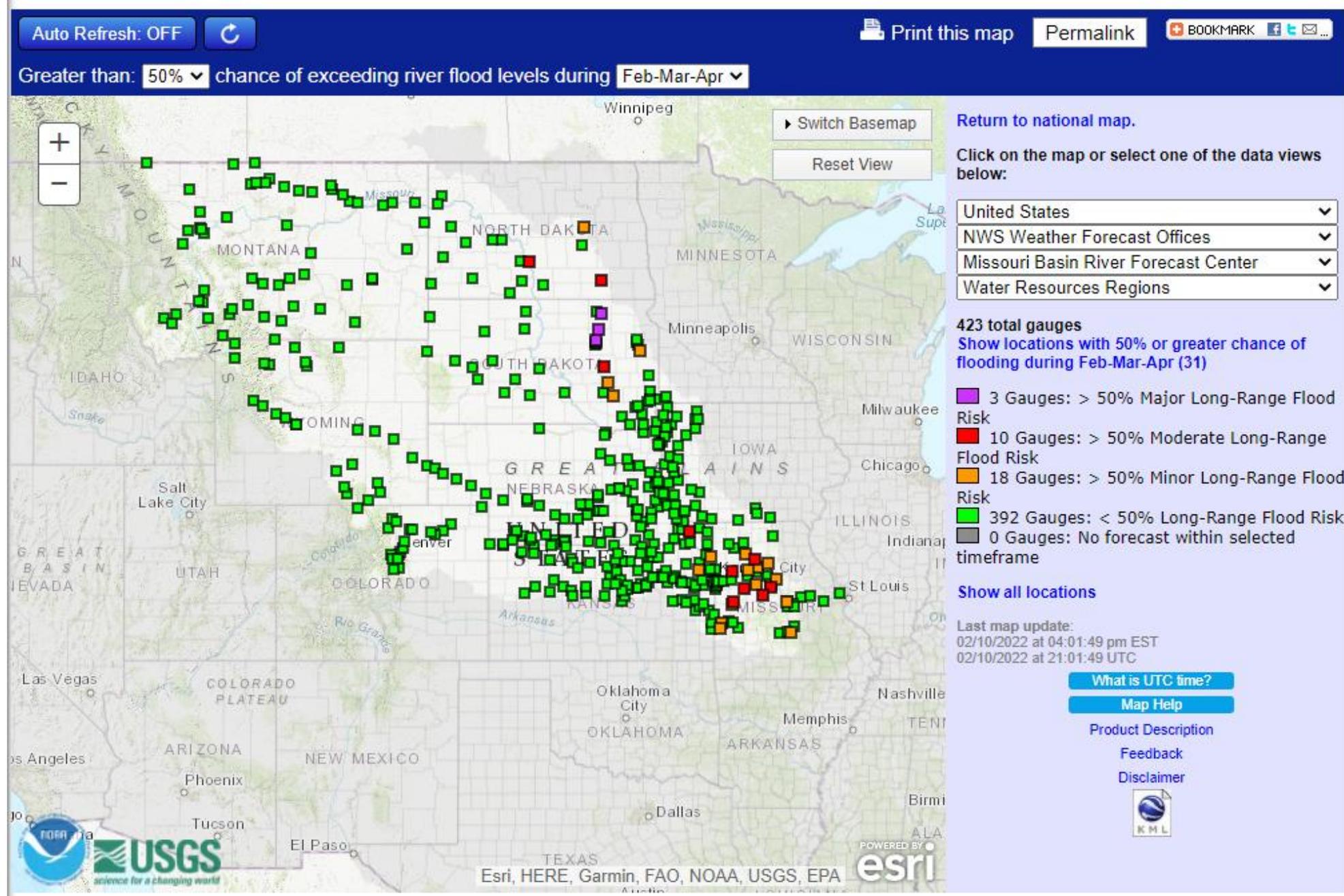
North central region showing largely normal streamflows

Red River valley at critical flood stage



Some flooding anticipated this spring on the Missouri River mainstem downstream of Kansas City

Flooding likely on James River



In Summation

- Most of the Central Region is coming off a dry year. We are in the hydrological recharge phase of the year, but soils are still dry across much of Montana, Wyoming, and the Dakotas
- Lack of snow on the Northern Plains will impact agriculture and Missouri River runoff this spring
- Dry soils persist across much of the corn belt IA, IL, MN, WI
- Meanwhile, wetter than normal weather has occurred from Illinois eastward. Some Ohio River tributaries likely to reach flood stage this spring
- La Niña is weakening, but it will take some time of the atmosphere to respond. The CPC outlook shows a typical La Niña pattern for spring. If this verifies, it could make wet areas wetter and dry areas drier.



Further Information - Partners

- • Today's and Past Recorded Presentations:
<https://mrcc.purdue.edu/multimedia/webinars.jsp>
- • <http://www.hprcc.unl.edu>
- NOAA's National Centers for Environmental Information: www.ncdc.noaa.gov
- Monthly climate reports (U.S. & Global): www.ncdc.noaa.gov/sotc/
- NOAA's Climate Prediction Center: www.cpc.ncep.noaa.gov
- Climate Portal: www.climate.gov
- U.S. Drought Portal: www.drought.gov
- National Drought Mitigation Center: <http://drought.unl.edu>
- State climatologists • <http://www.stateclimate.org>
- Regional climate centers • <https://mrcc.purdue.edu> • <http://www.hprcc.unl.edu>





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- Brian Fuchs: bfuchs2@unl.edu, 402-472-6775 (drought)

- **Weather**

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Thank you
