NWS Grand Forks
Spring Flood Outlook

NATIONAL WEATHER SERVICE

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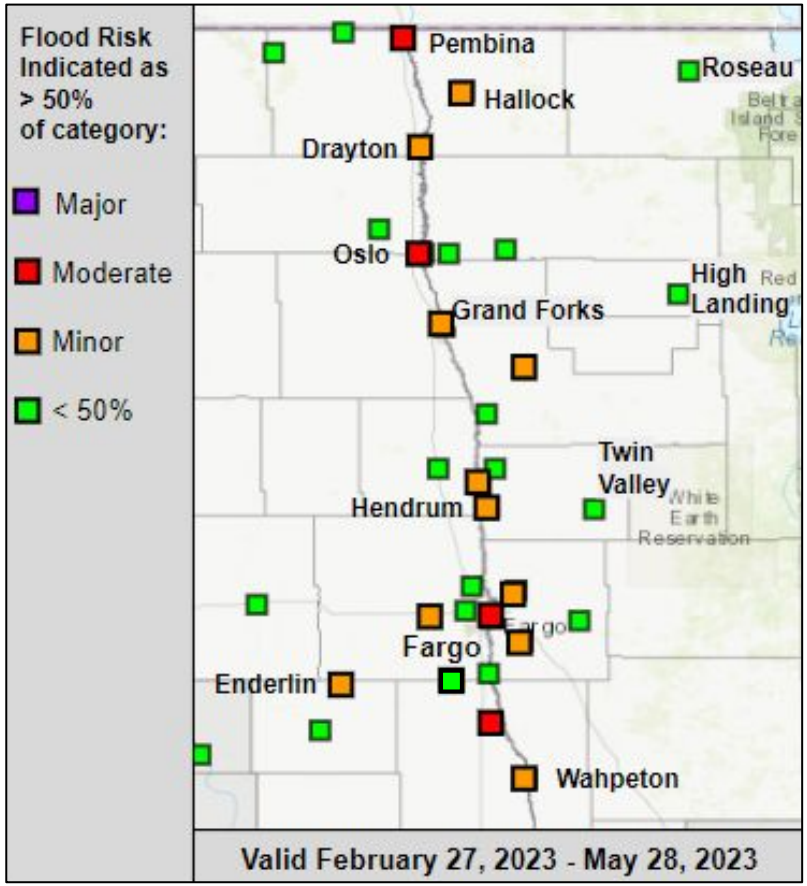
February 23, 2023

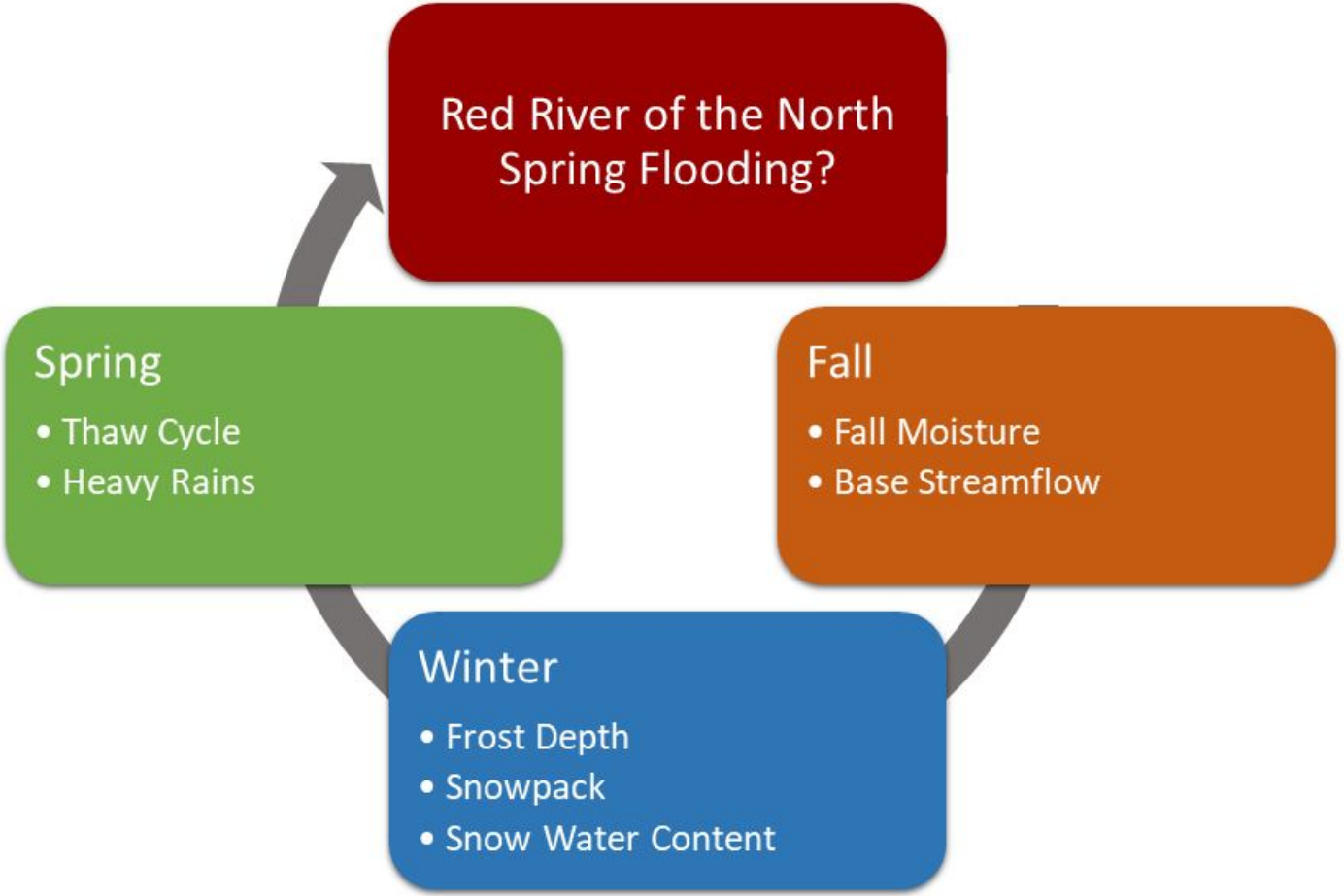
Key Message

The risk for significant (moderate or higher) spring flooding has increased slightly (especially along the mainstem Red River) but still generally remains below or near long-term historical averages across the basin.



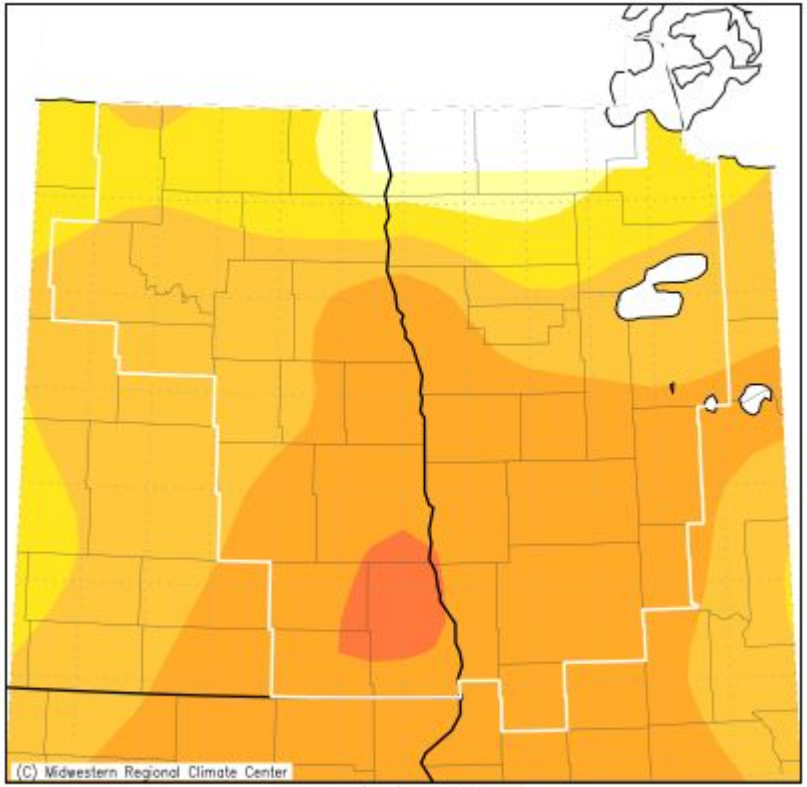
Key Points

- Minor to isolated moderate spring flooding (50% exceedance probability).
- Below normal soil moisture and near normal streamflows heading into freeze-up.
- Normal to above normal snowfall and precipitation has been recorded thus far this winter season.
- **As always: late winter snowfall, spring precipitation, and snowmelt timing/thaw cycle will be the most important factors for spring flooding.**

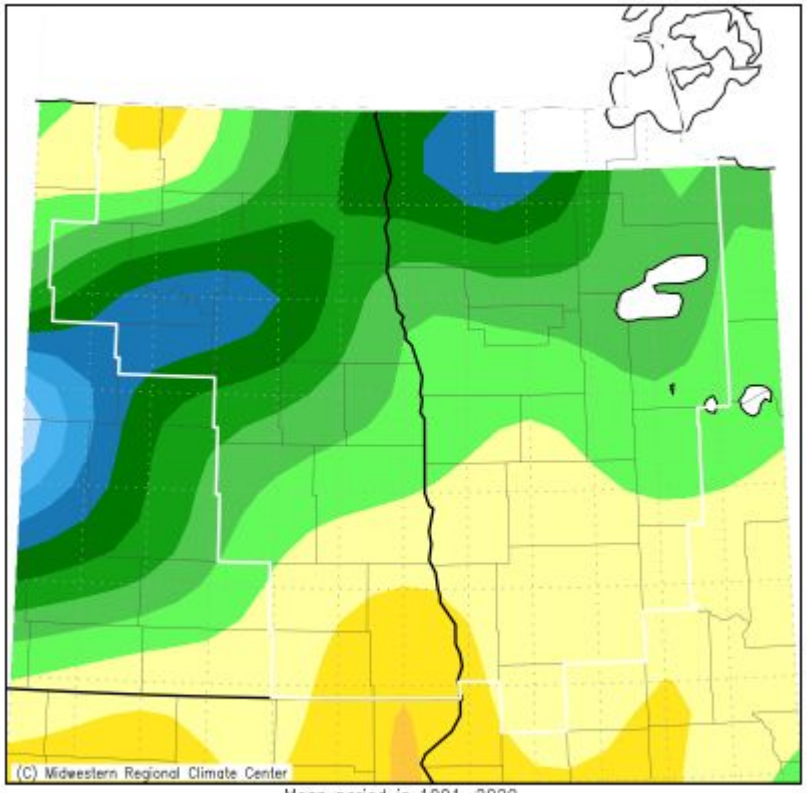


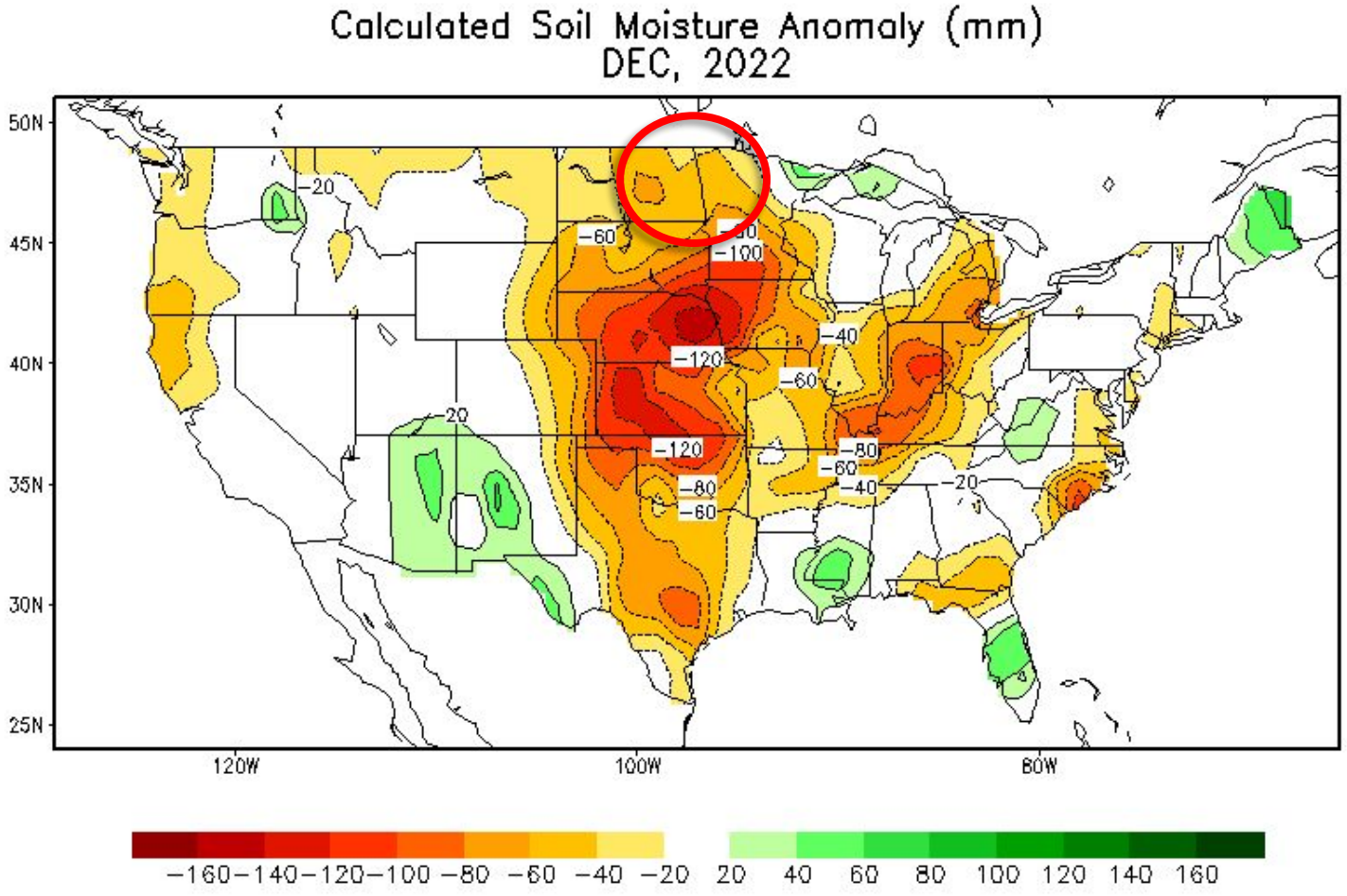
[Bluemle: Factors Affecting Flooding in the Red River Valley, 1997]

Accumulated Precipitation (in): Departure from Mean
September 1, 2022 to November 30, 2022



Accumulated Snowfall (in): Departure from Mean
September 1, 2022 to November 30, 2022




Calculated Soil Moisture Anomaly (mm)
DEC, 2022
50N
45N
40N
35N
30N
25N
120W
100W
80W
-20
-60
-100
-40
-120
-60
20
-120
-80
-60
-80
-60
-40
-20
-160 -140 -120 -100 -80 -60 -40 -20 20 40 60 80 100 120 140 160

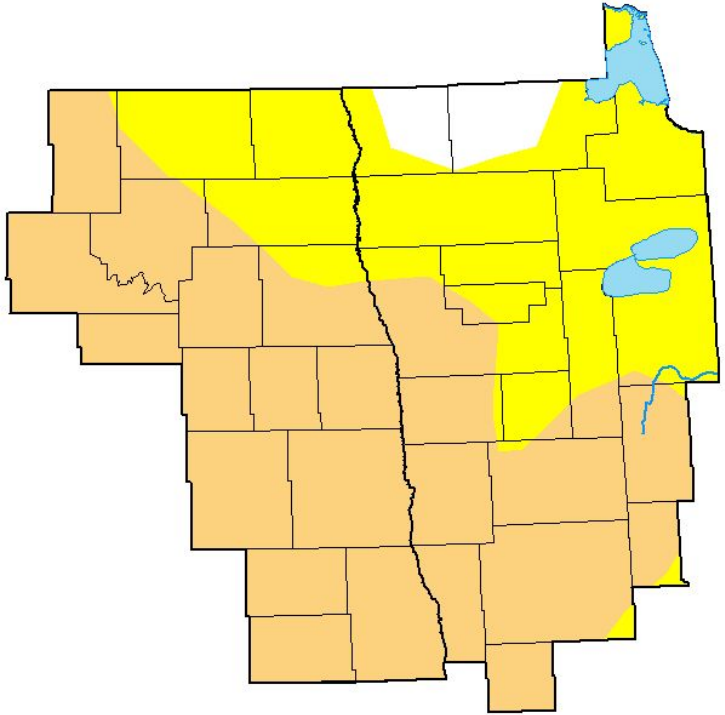
U.S. Drought Monitor

Grand Forks, ND WFO

February 21, 2023

(Released Thursday, Feb. 23, 2023)

Valid 7 a.m. EST



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

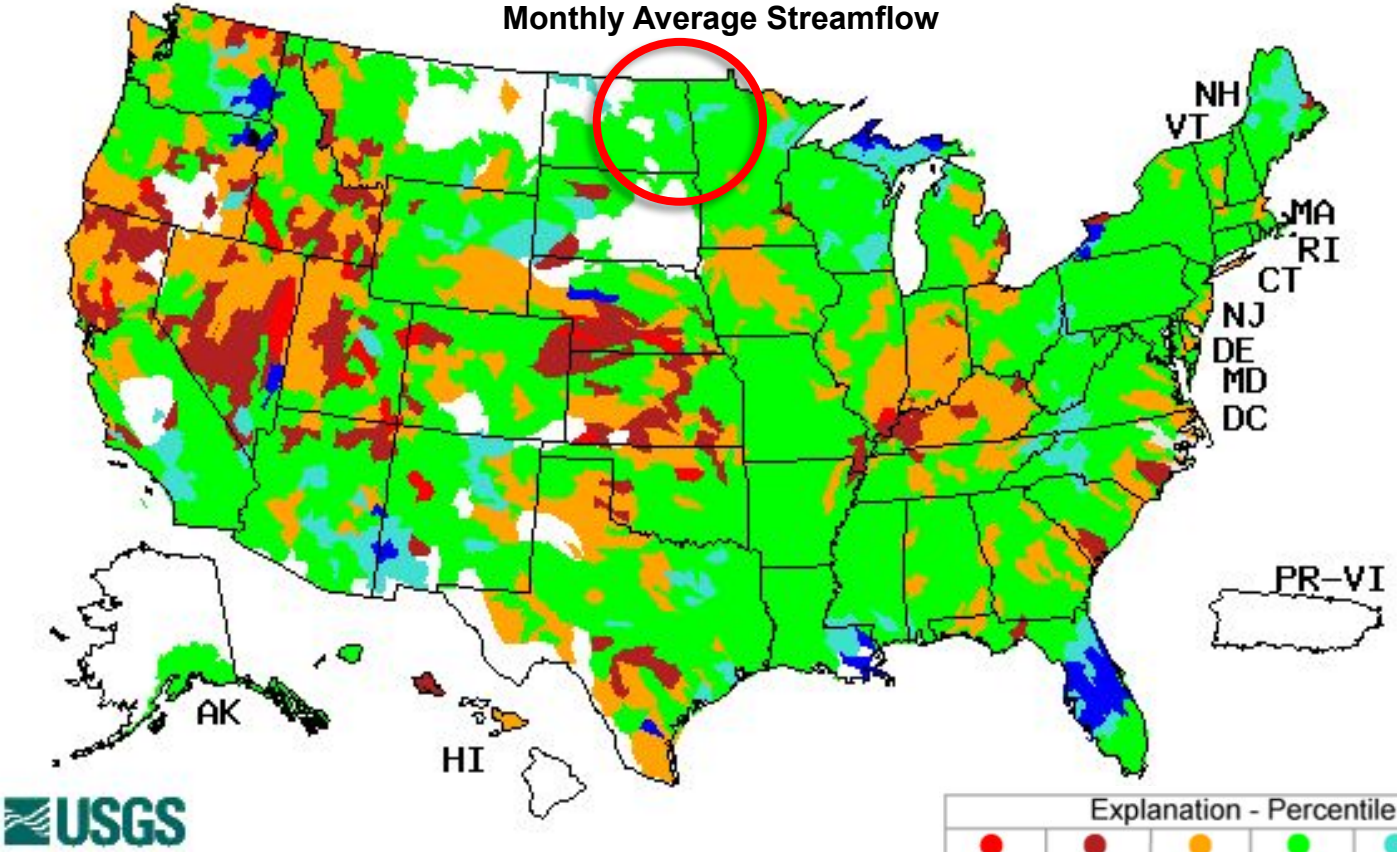
Author:

Richard Heim
NCEI/NOAA

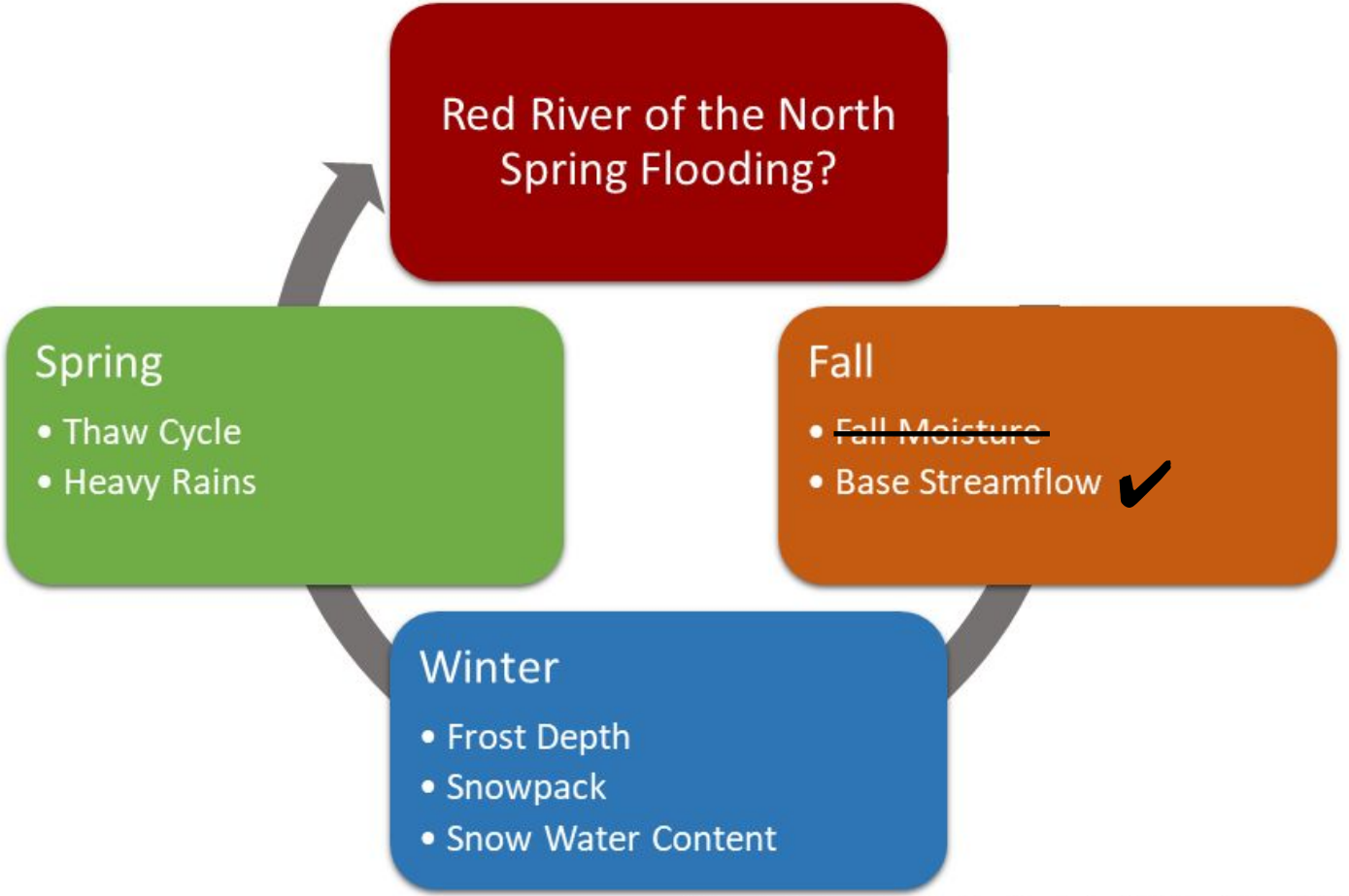
droughtmonitor.unl.edu

November 2022

Monthly Average Streamflow

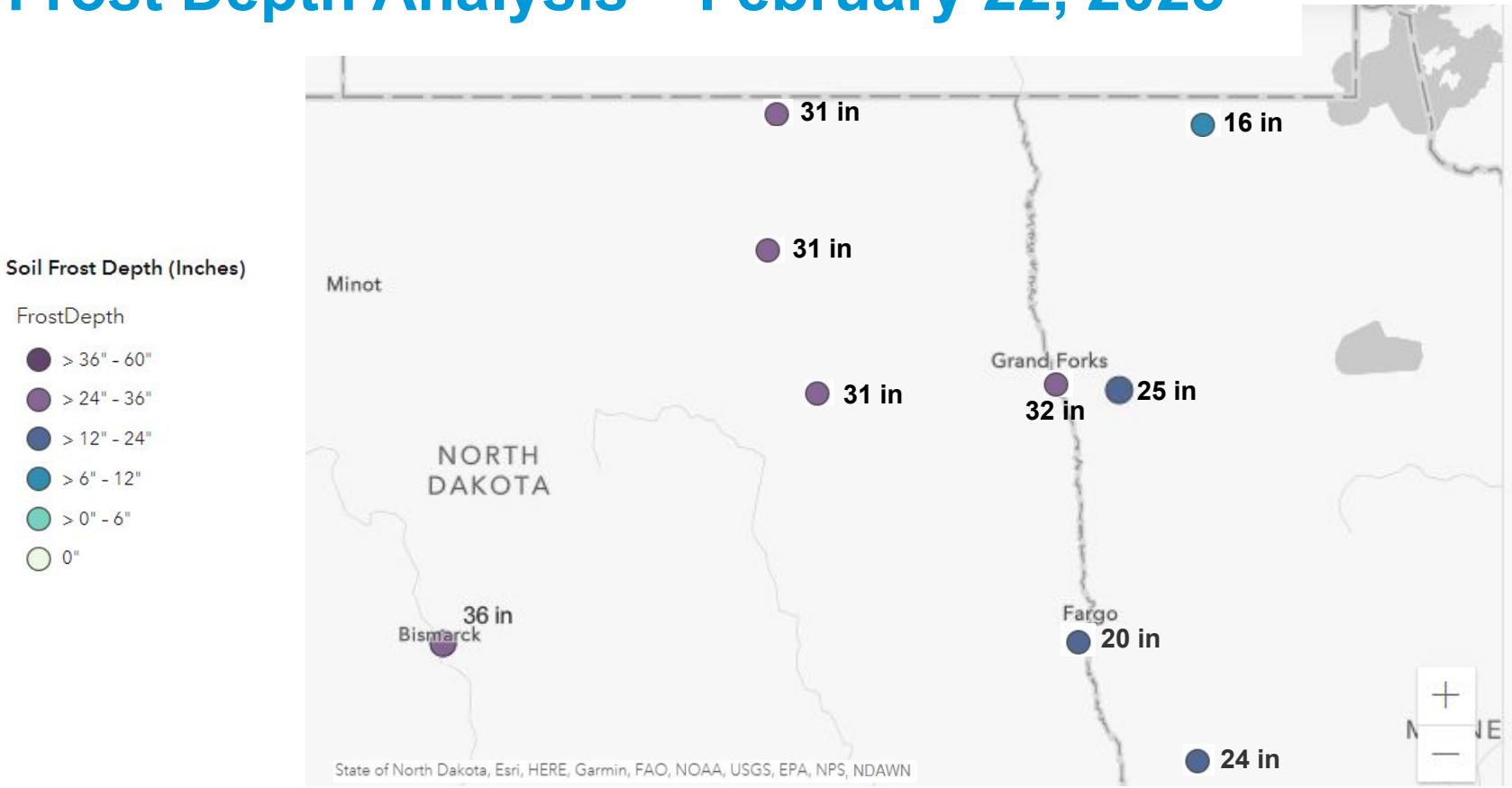


Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

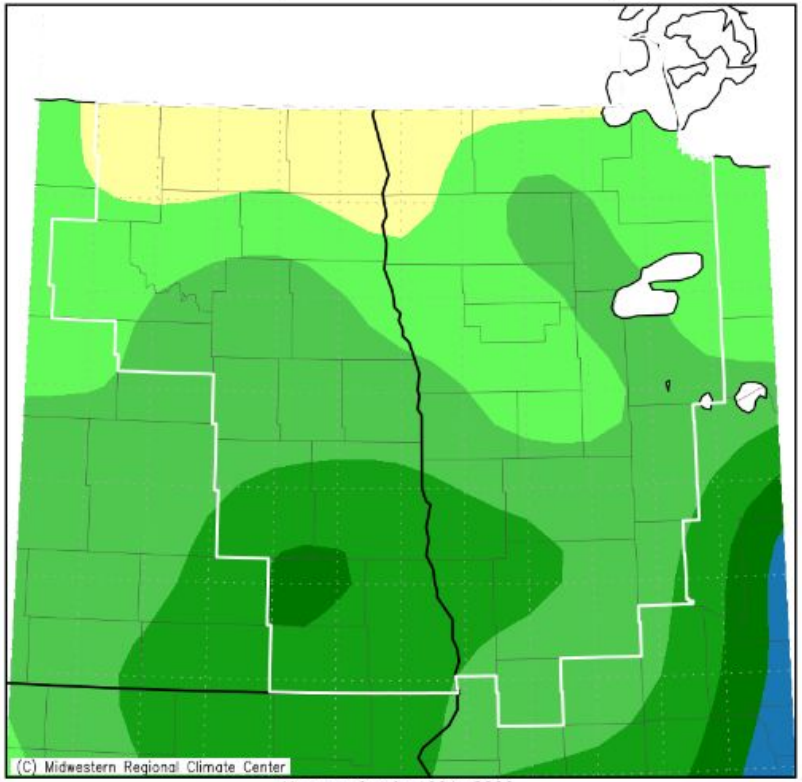


[Bluemle: Factors Affecting Flooding in the Red River Valley, 1997]

Frost Depth Analysis – February 22, 2023

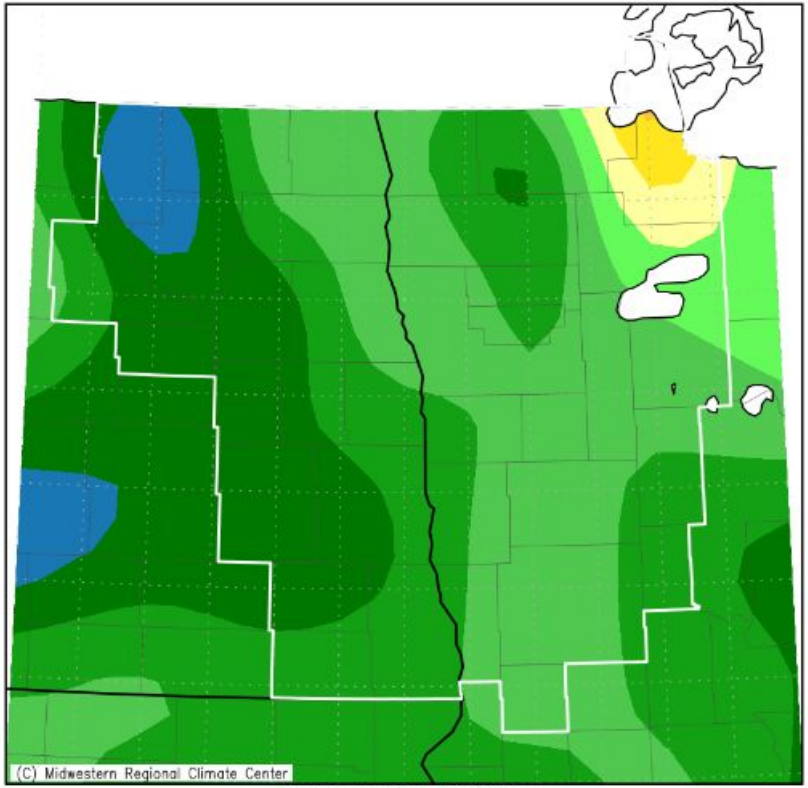


Accumulated Precipitation (in): Departure from Mean
December 1, 2022 to February 22, 2023

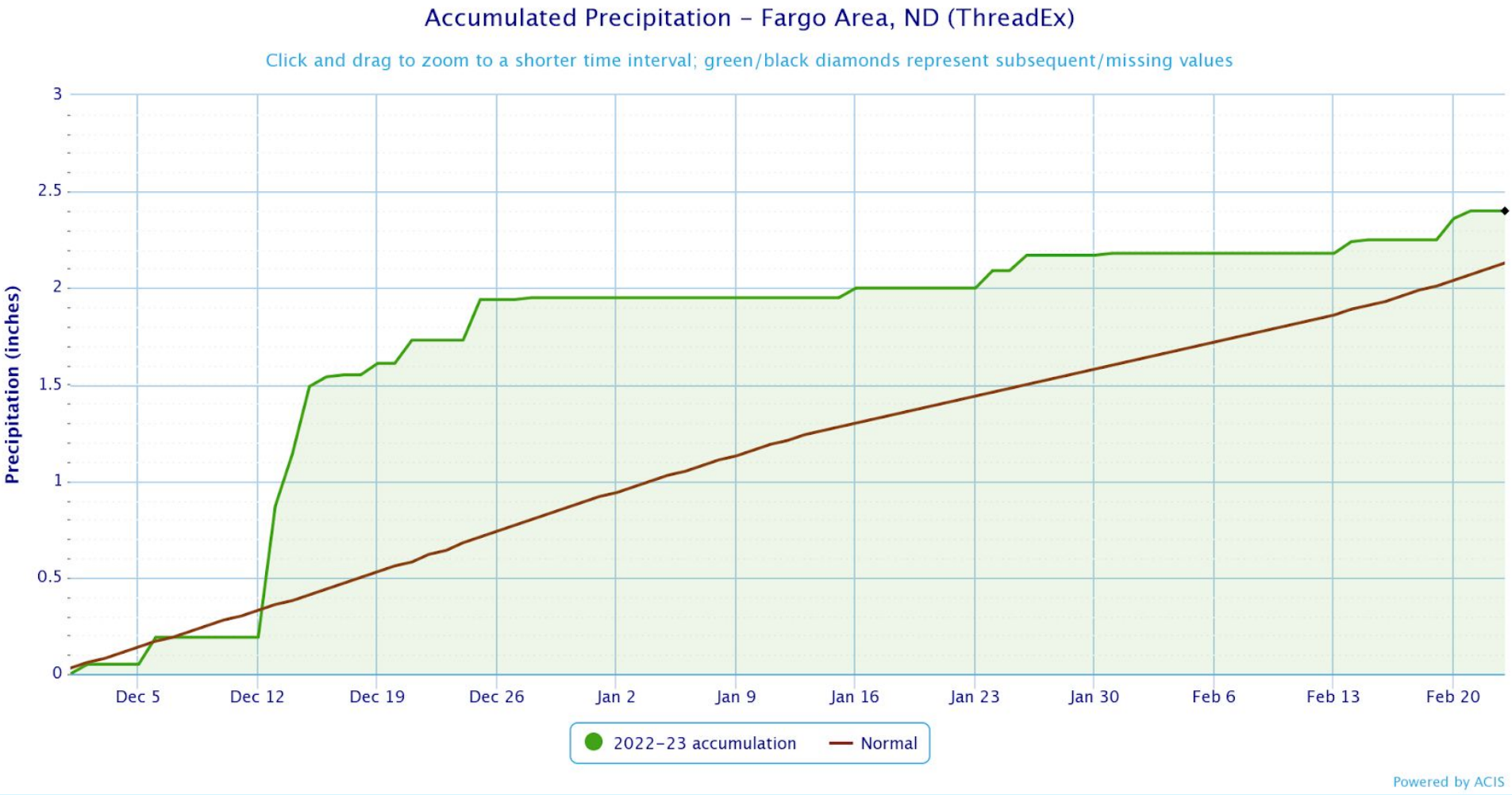


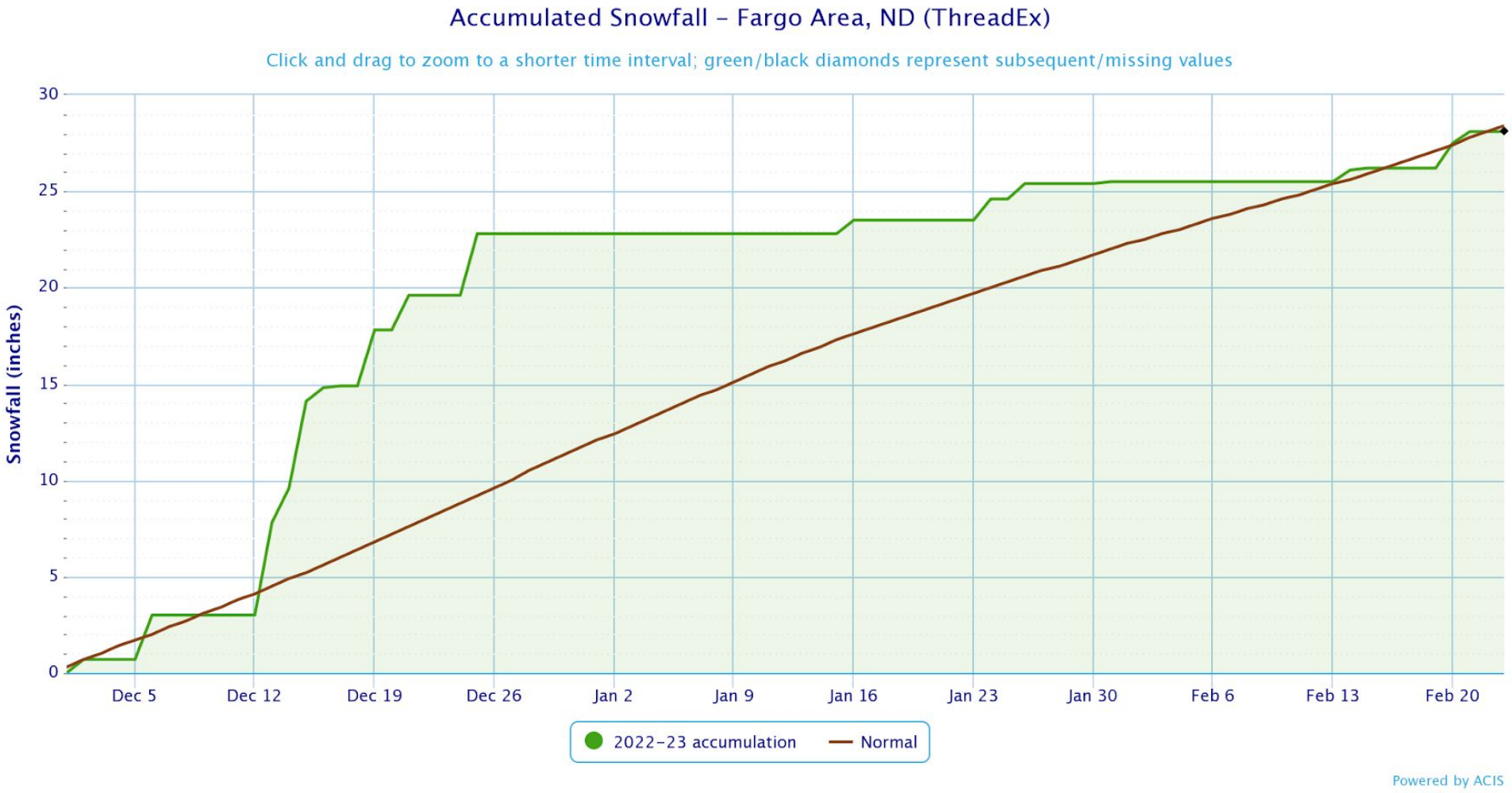
Mean period is 1991–2020.

Accumulated Snowfall (in): Departure from Mean
December 1, 2022 to February 22, 2023

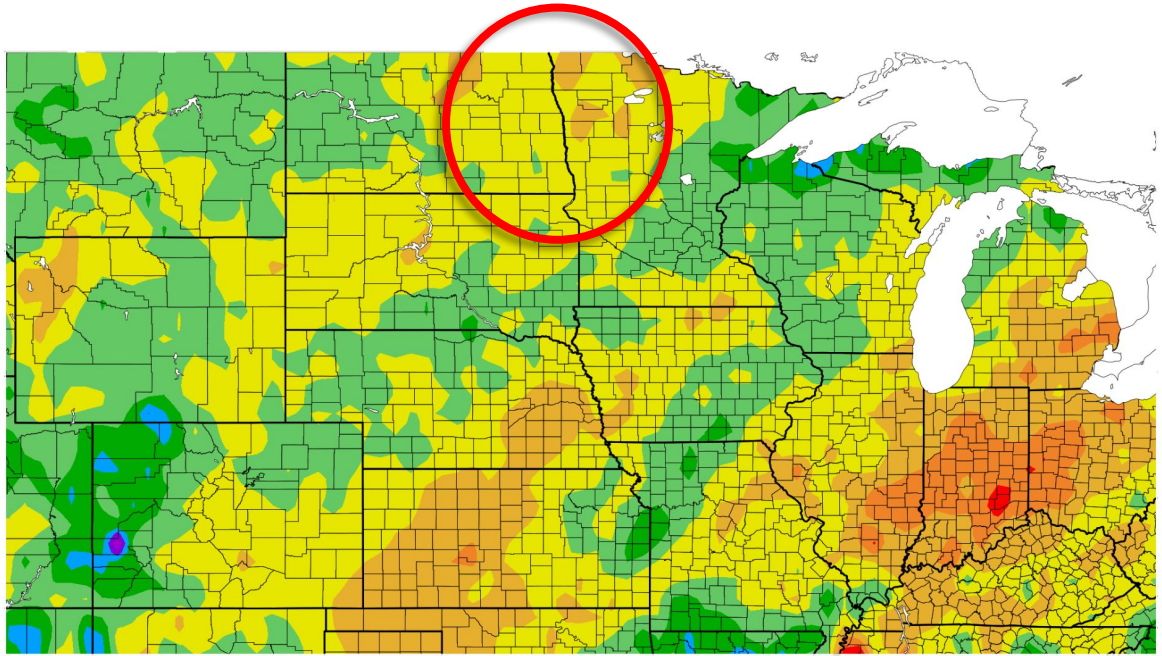


Mean period is 1991–2020.


Accumulated Precipitation – Fargo Area, ND (ThreadEx)
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values
Precipitation (inches)
3
2.5
2
1.5
1
0.5
0
Dec 5
Dec 12
Dec 19
Dec 26
Jan 2
Jan 9
Jan 16
Jan 23
Jan 30
Feb 6
Feb 13
Feb 20
2022-23 accumulation
Normal
Powered by ACIS


Accumulated Snowfall – Fargo Area, ND (ThreadEx)
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values
Snowfall (inches)
30
25
20
15
10
5
0
Dec 5
Dec 12
Dec 19
Dec 26
Jan 2
Jan 9
Jan 16
Jan 23
Jan 30
Feb 6
Feb 13
Feb 20
2022-23 accumulation
Normal
Powered by ACIS

Departure from Normal Precipitation (in)
10/1/2022 – 2/20/2023

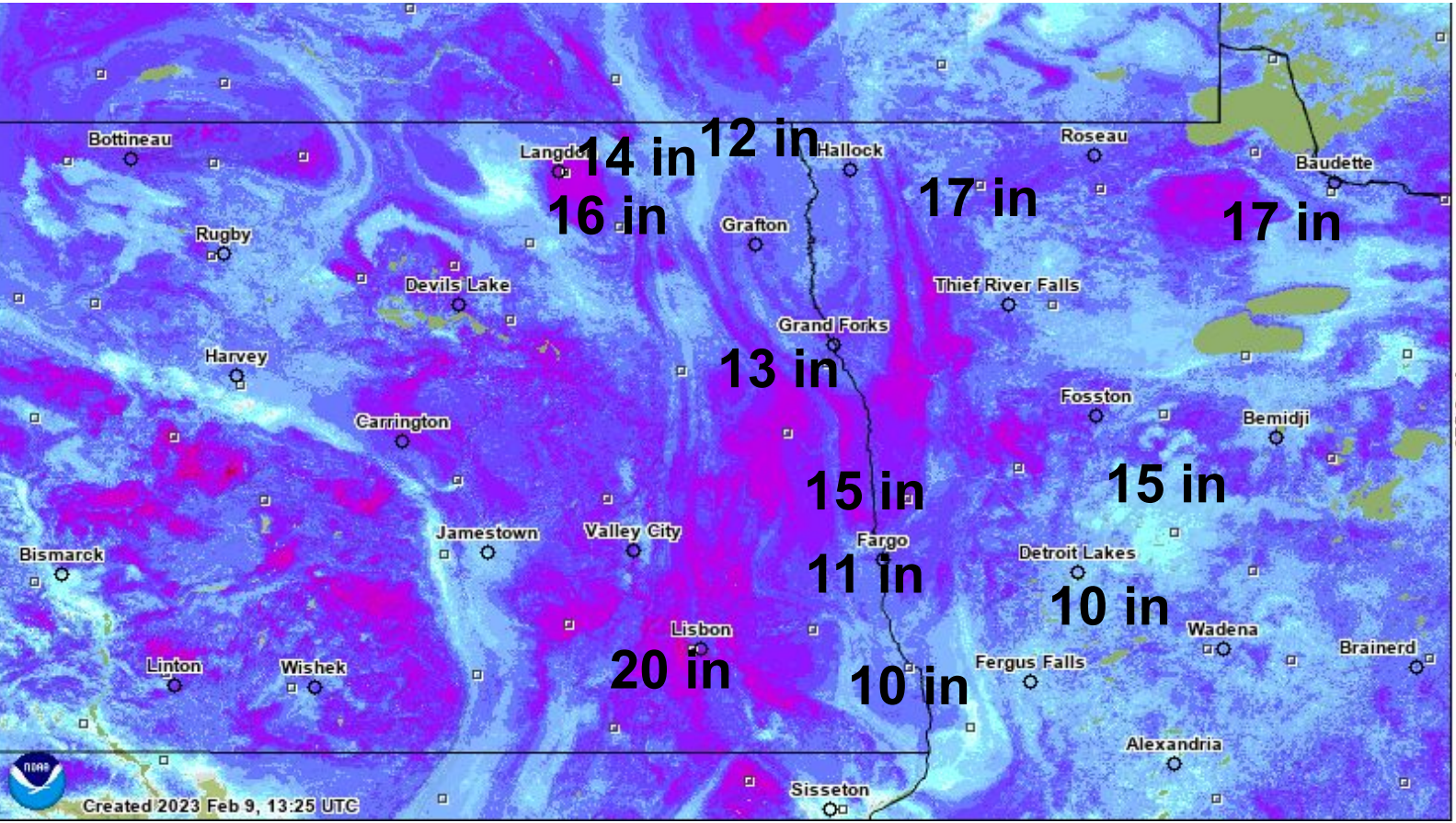


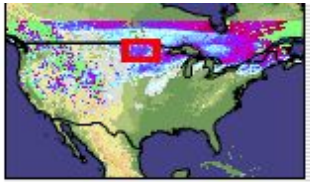
−10 −8 −6 −4 −2 0 2 4 6 8 10

Generated 2/21/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Modeled Snow Depth - February 9, 2023





Inches of depth

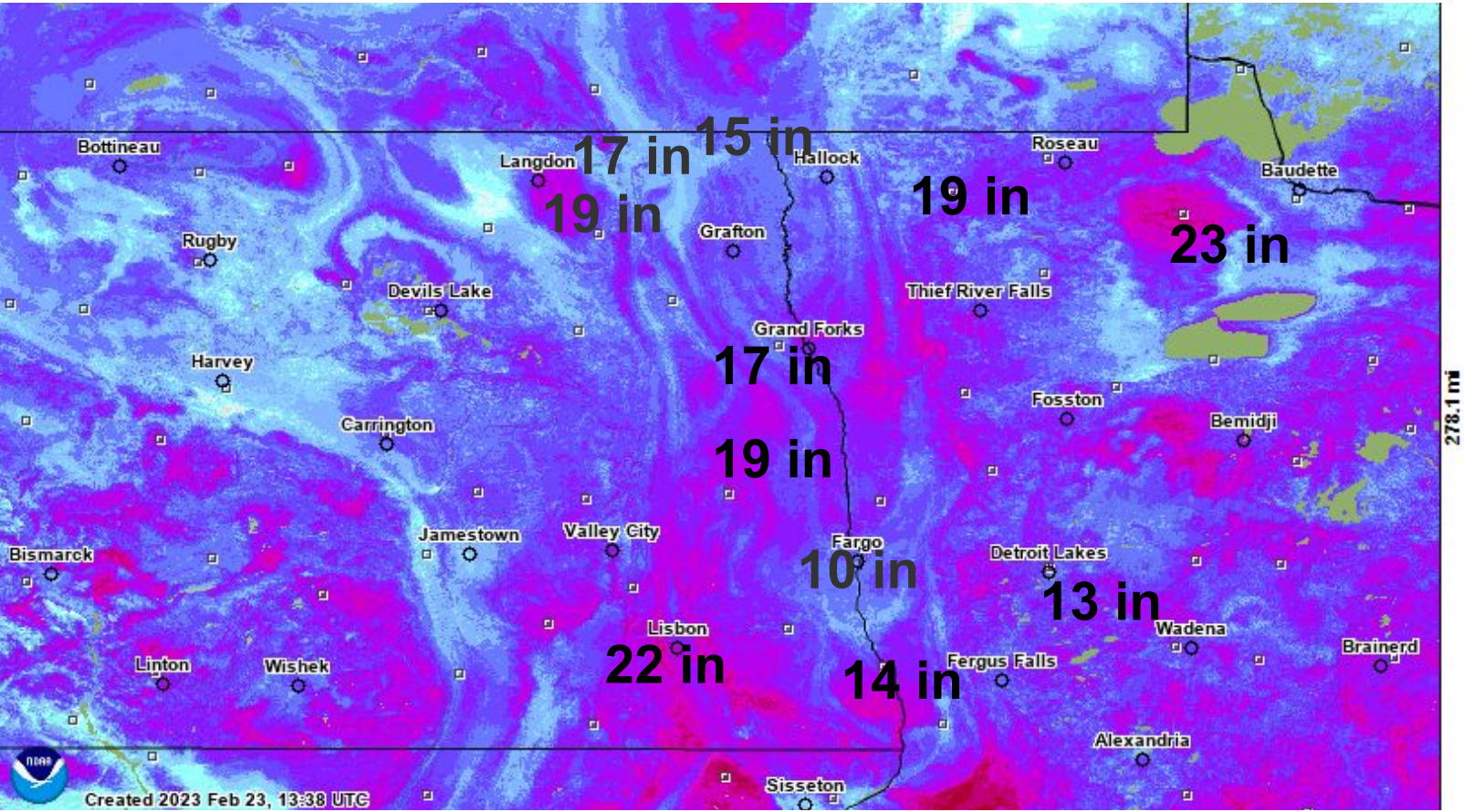
	>	24	
22	to	24	
20	to	22	
18	to	20	
16	to	18	
14	to	16	
12	to	14	
10	to	12	
8	to	10	
6	to	8	
4	to	6	
2	to	4	
trace	to	2	

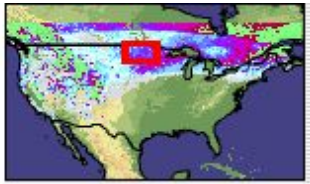
Not Estimated

Elevation in feet

	>	13124	
8203	to	13124	
3281	to	8203	
3	to	3281	
	<	3	

Modeled Snow Depth - February 23, 2023





Inches of depth

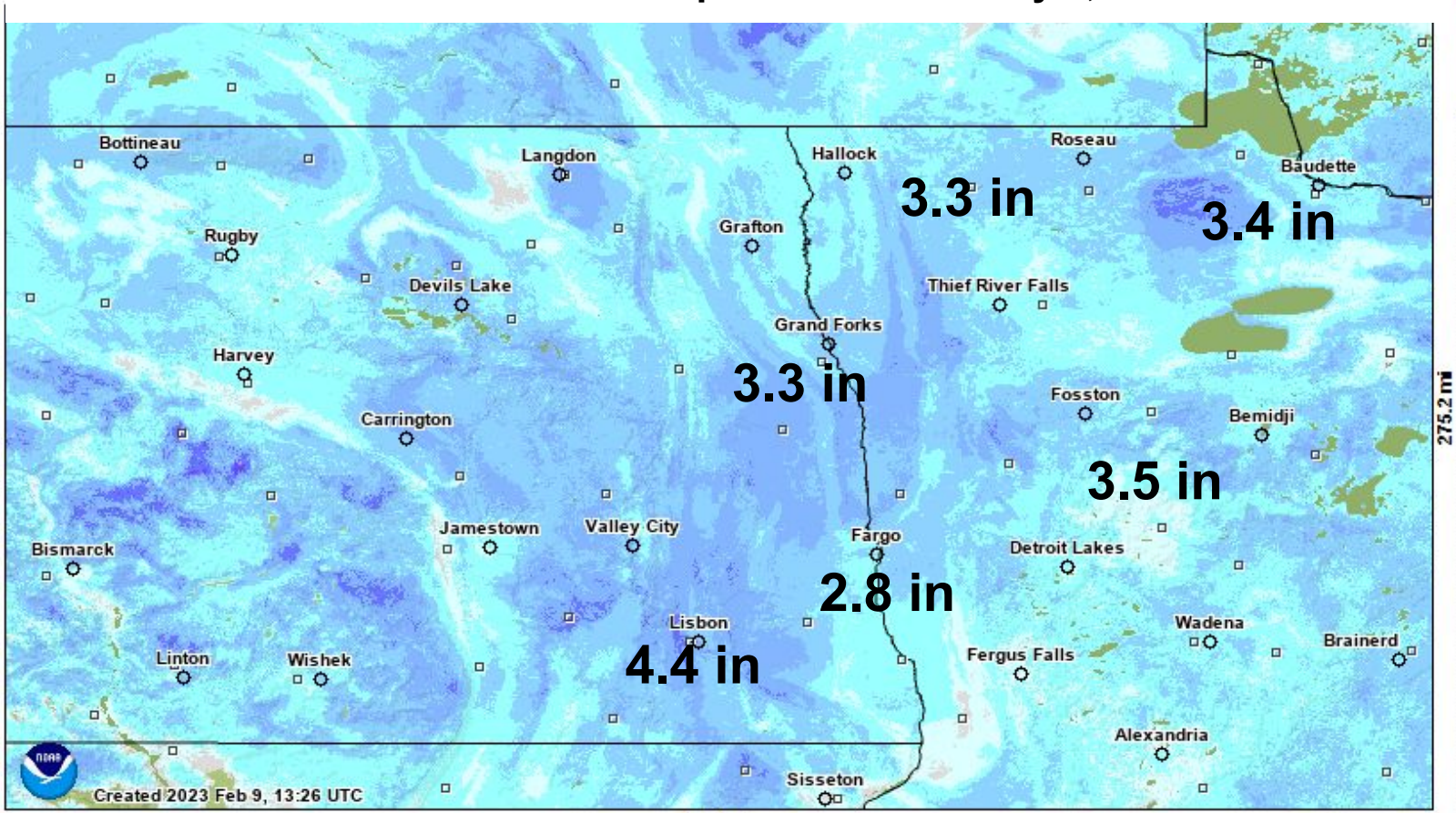
	>	24	
22	to	24	
20	to	22	
18	to	20	
16	to	18	
14	to	16	
12	to	14	
10	to	12	
8	to	10	
6	to	8	
4	to	6	
2	to	4	
trace	to	2	

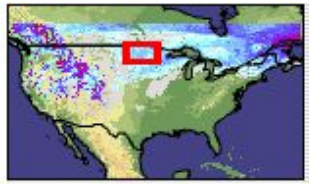
Not Estimated

Elevation in feet

	>	13124	
8203	to	13124	
3281	to	8203	
3	to	3281	
	<	3	

Modeled Snow Water Equivalent - February 9, 2023





Inches of water equivalent

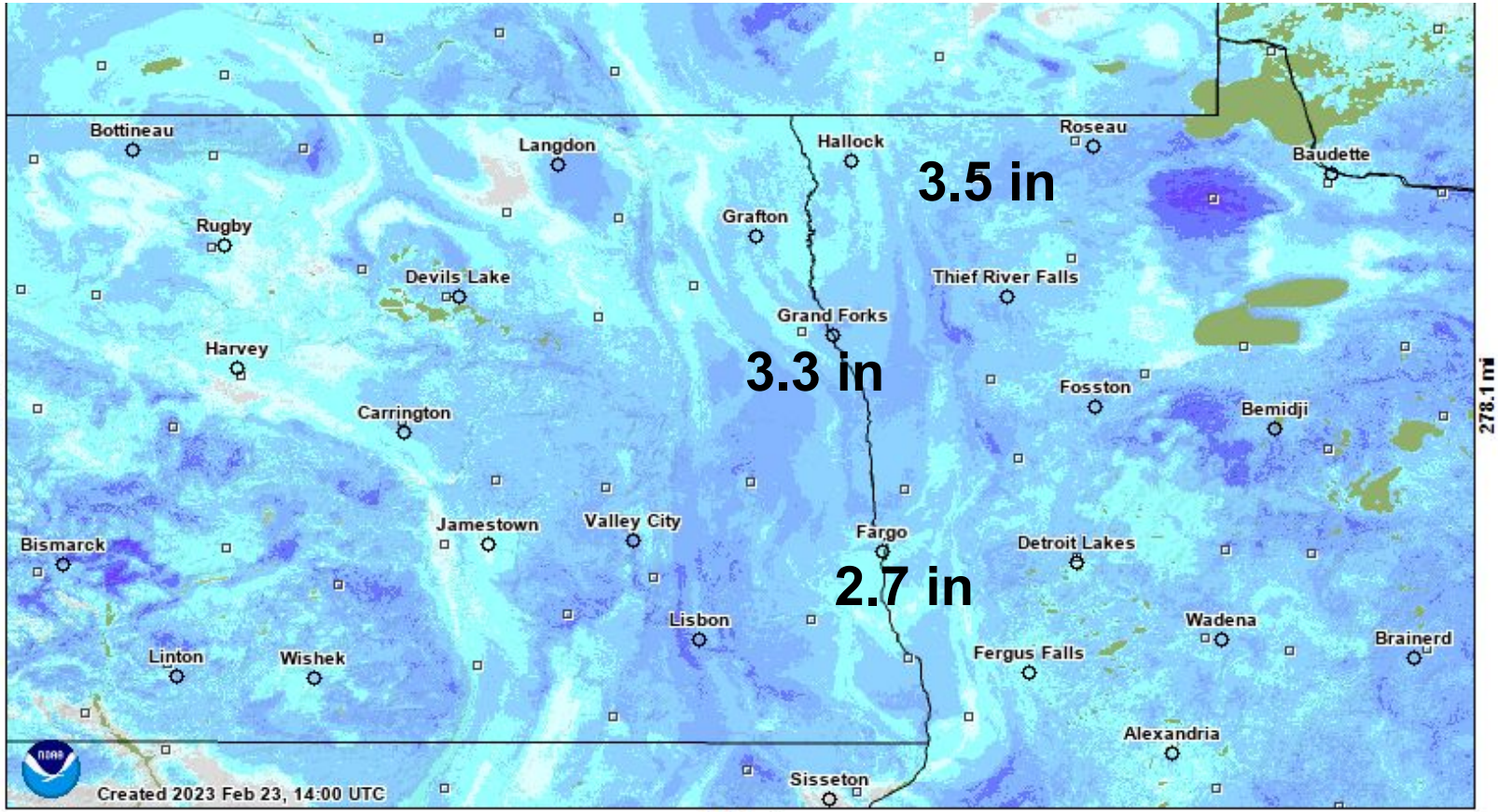
	>	18	
16	to	18	
14	to	16	
12	to	14	
10	to	12	
8	to	10	
6	to	8	
5	to	6	
4	to	5	
3	to	4	
2	to	3	
1	to	2	
trace	to	1	

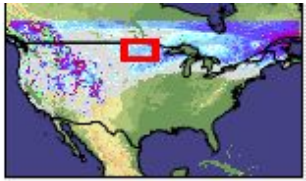
Not Estimated

Elevation in feet

>	13124	
8203	to	13124
3281	to	8203
3	to	3281
<	3	

Modeled Snow Water Equivalent - February 23, 2023





Inches of water equivalent

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16	to	18
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12	to	14
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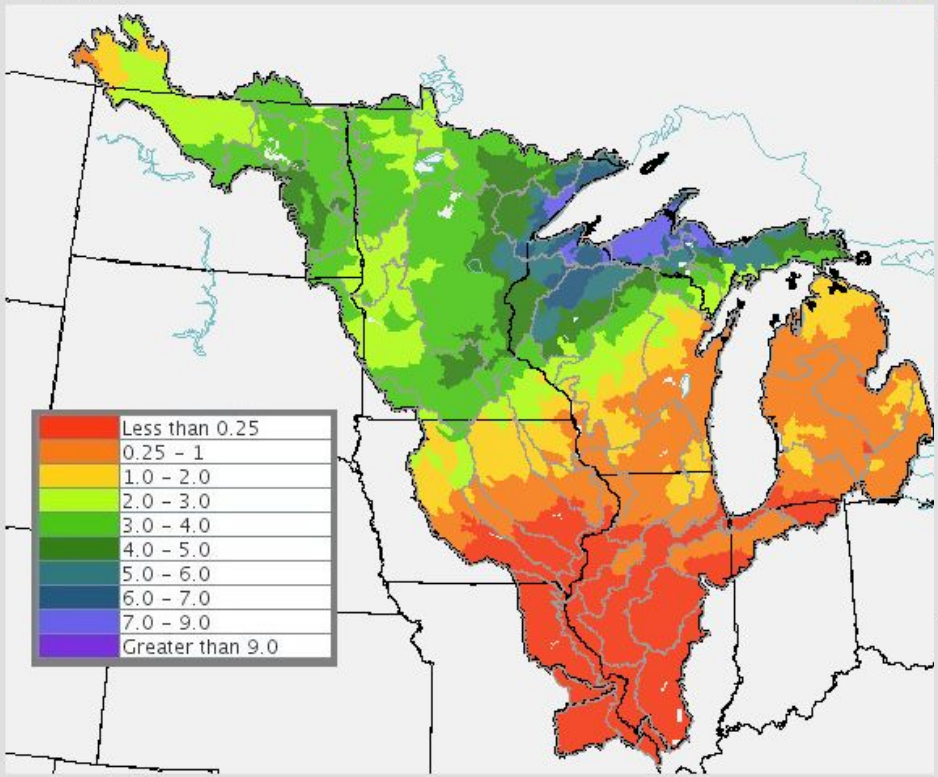
8	to	10
6	to	8
5	to	6
4	to	5
3	to	4
2	to	3
1	to	2
trace	to	1

Not Estimated

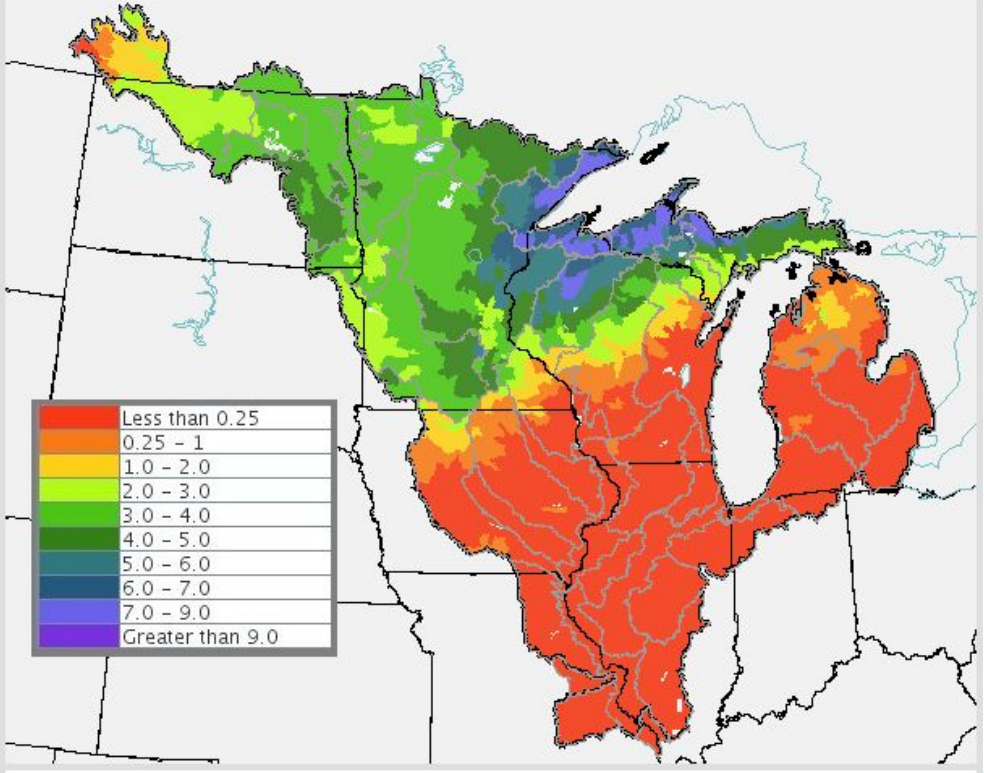
Elevation in feet

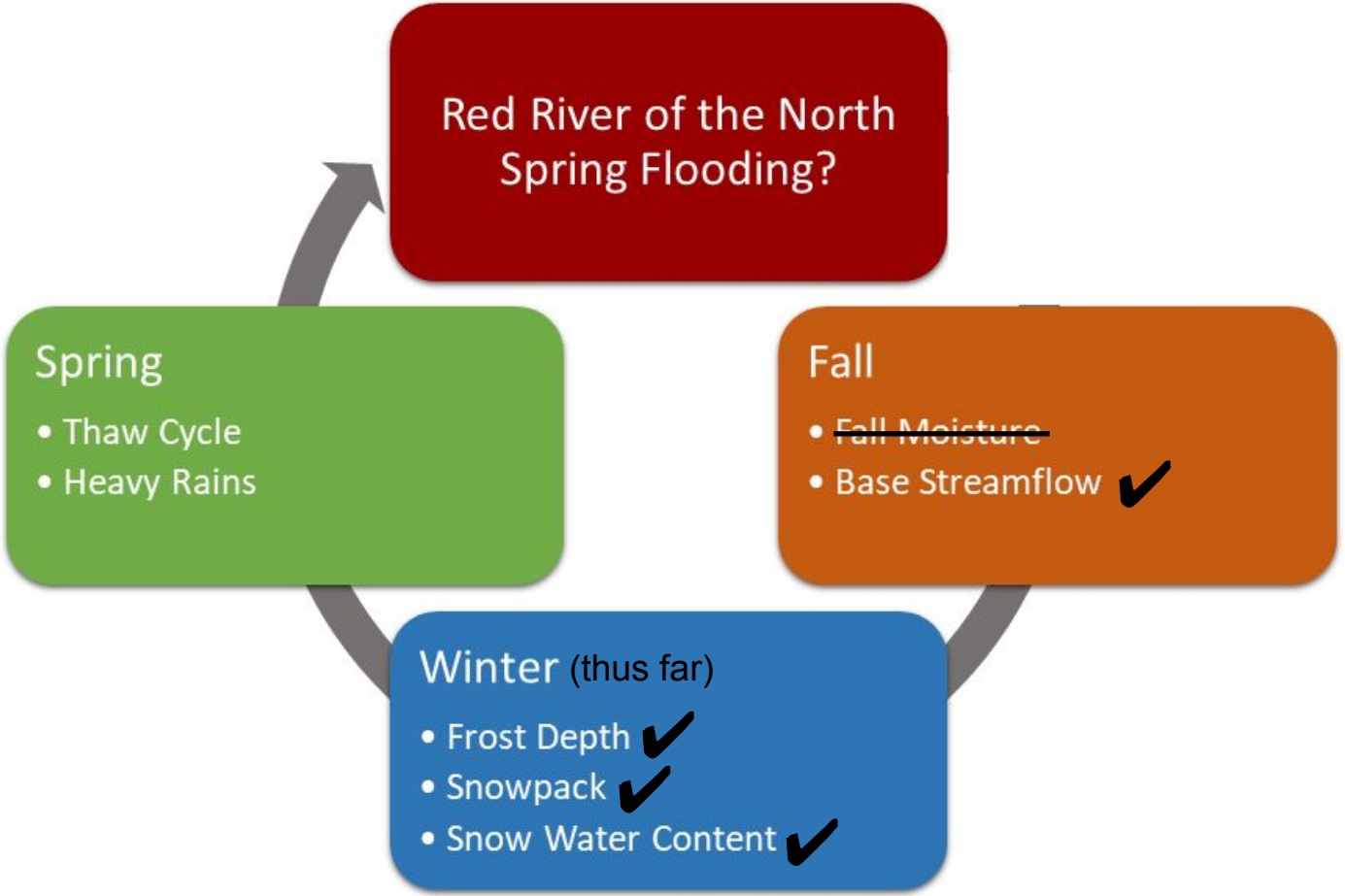
>		13124
8203	to	13124
3281	to	8203
3	to	3281
<		3

North Central River Forecast Center
Model Simulated Snow Water Equivalent
Valid for 02/06/2023 12 GMT



North Central River Forecast Center
Model Simulated Snow Water Equivalent
Valid for 02/20/2023 12 GMT

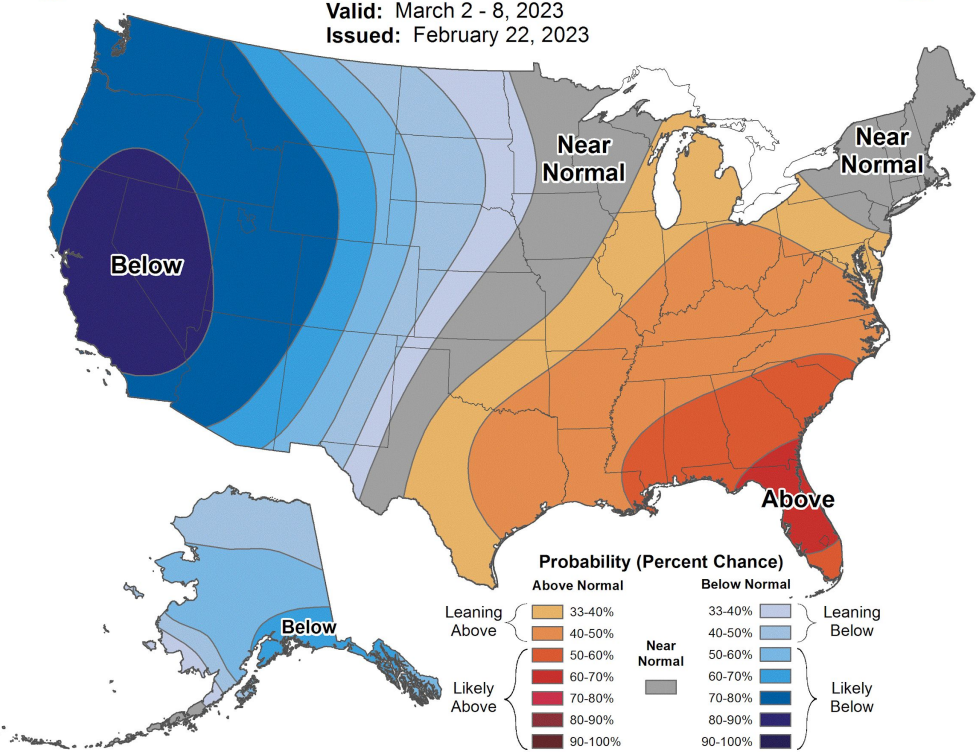




[Bluemle: Factors Affecting Flooding in the Red River Valley, 1997]

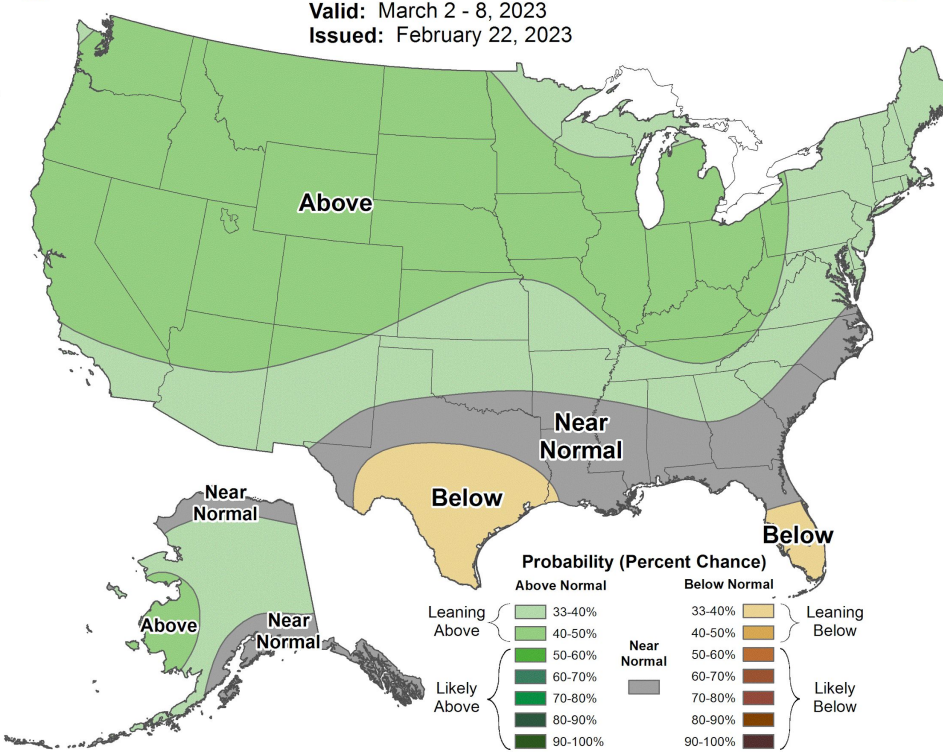
8-14 Day Temperature Outlook

Valid: March 2 - 8, 2023
Issued: February 22, 2023



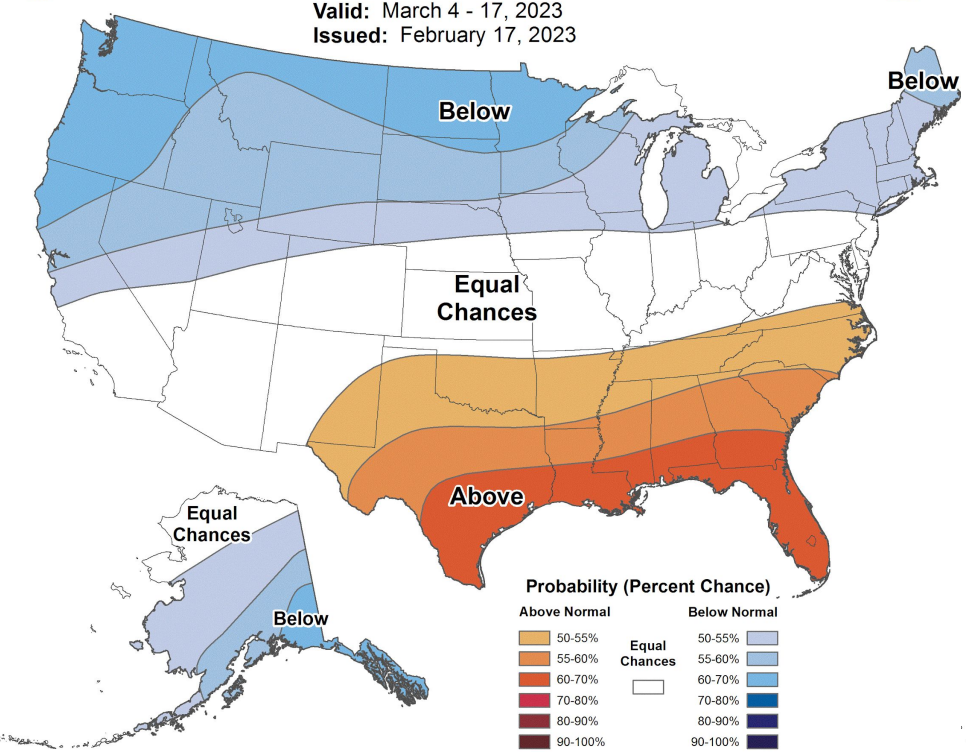
8-14 Day Precipitation Outlook

Valid: March 2 - 8, 2023
Issued: February 22, 2023



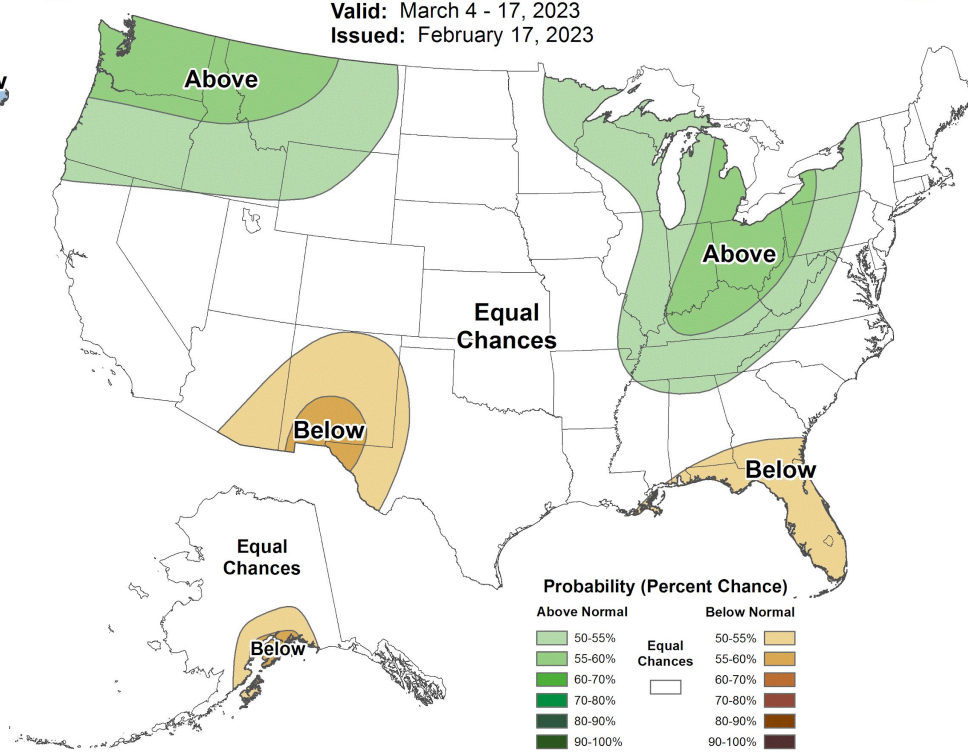
Weeks 3-4 Temperature Outlook

Valid: March 4 - 17, 2023
Issued: February 17, 2023



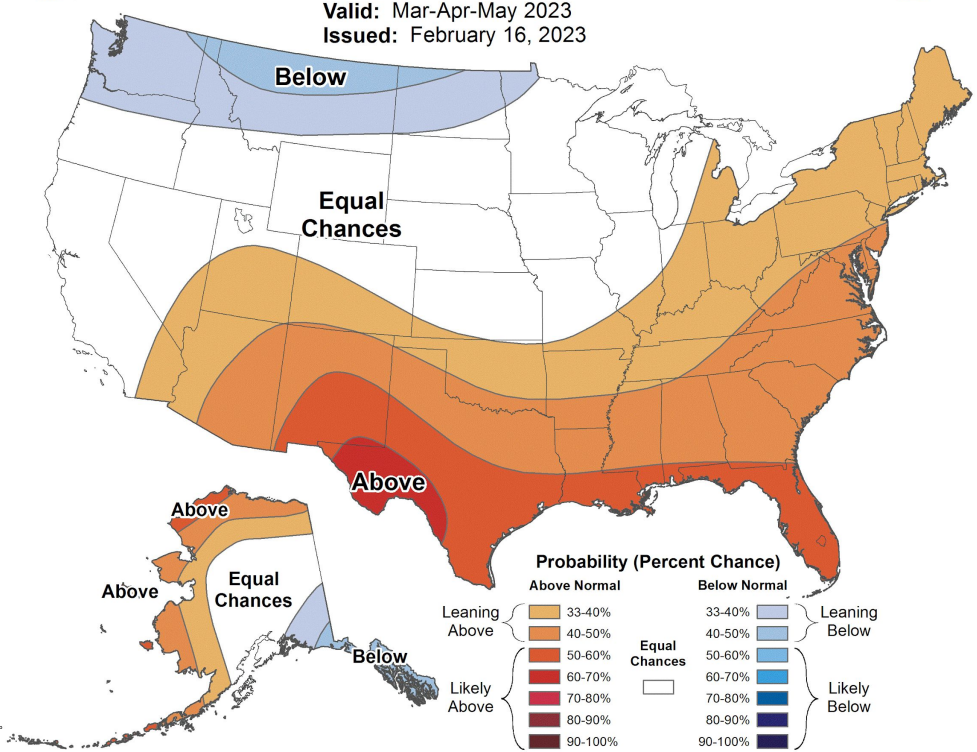
Weeks 3-4 Precipitation Outlook

Valid: March 4 - 17, 2023
Issued: February 17, 2023



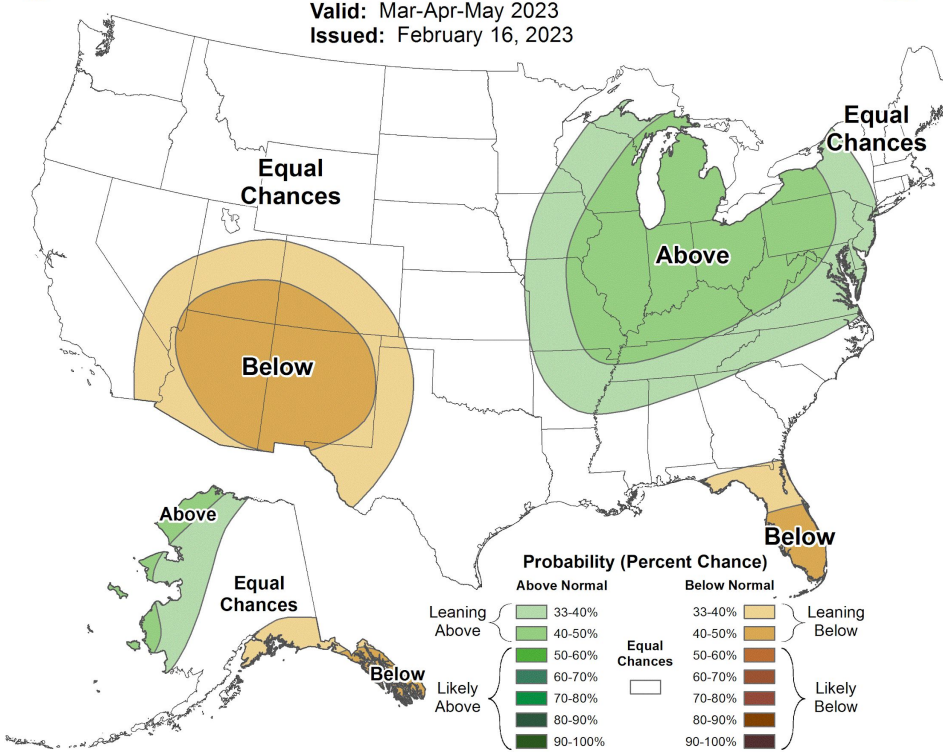
Seasonal Temperature Outlook

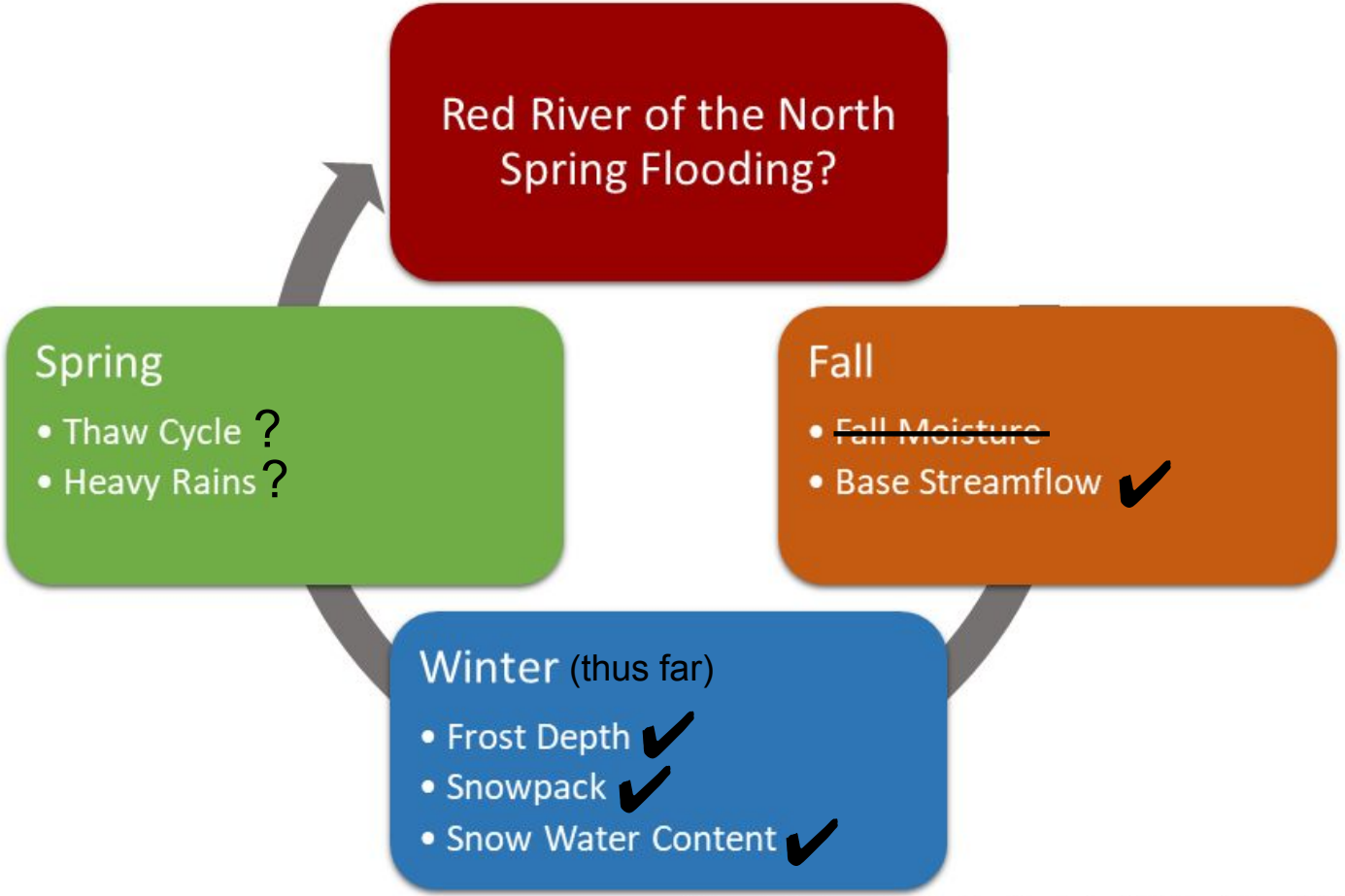
Valid: Mar-Apr-May 2023
Issued: February 16, 2023



Seasonal Precipitation Outlook

Valid: Mar-Apr-May 2023
Issued: February 16, 2023





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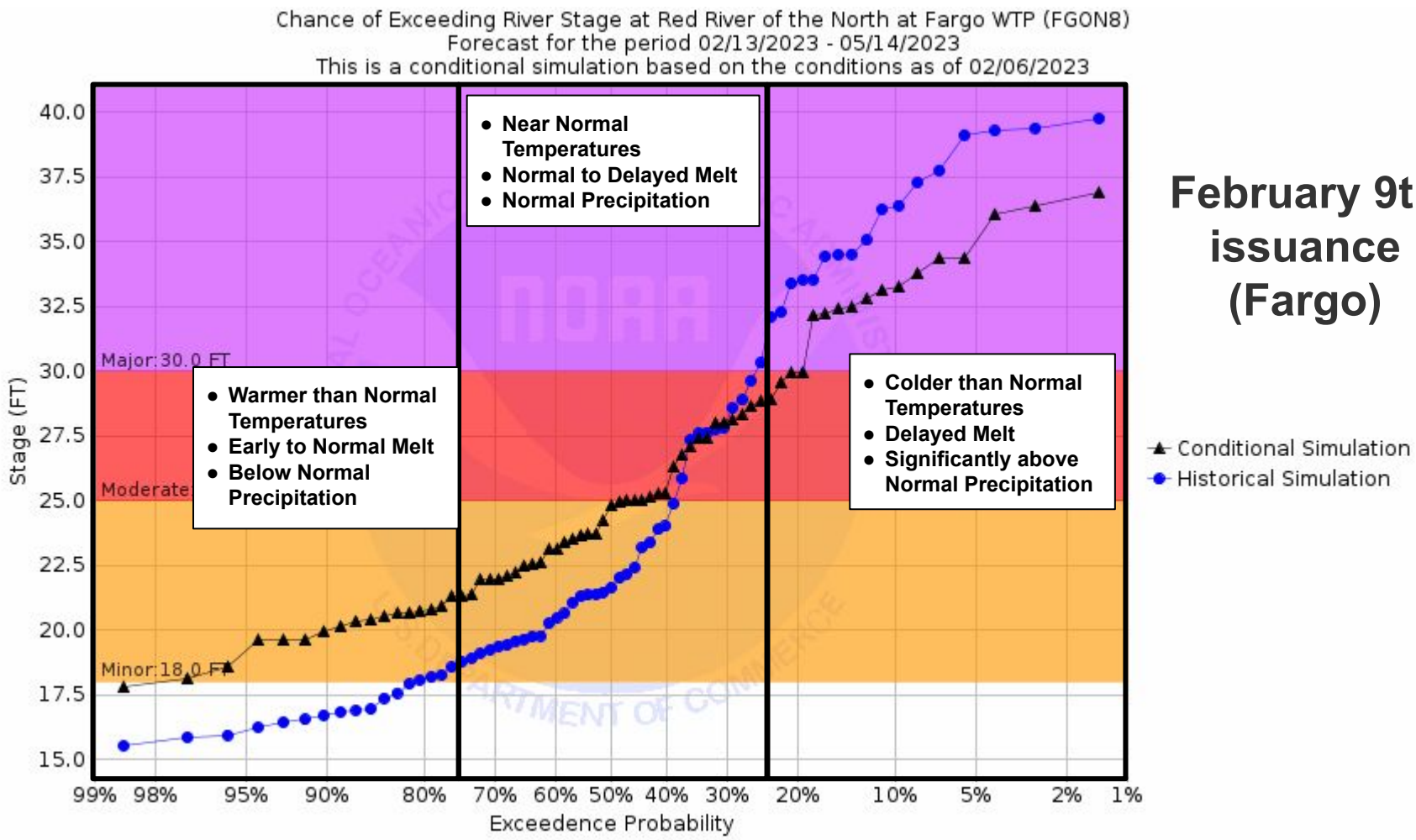
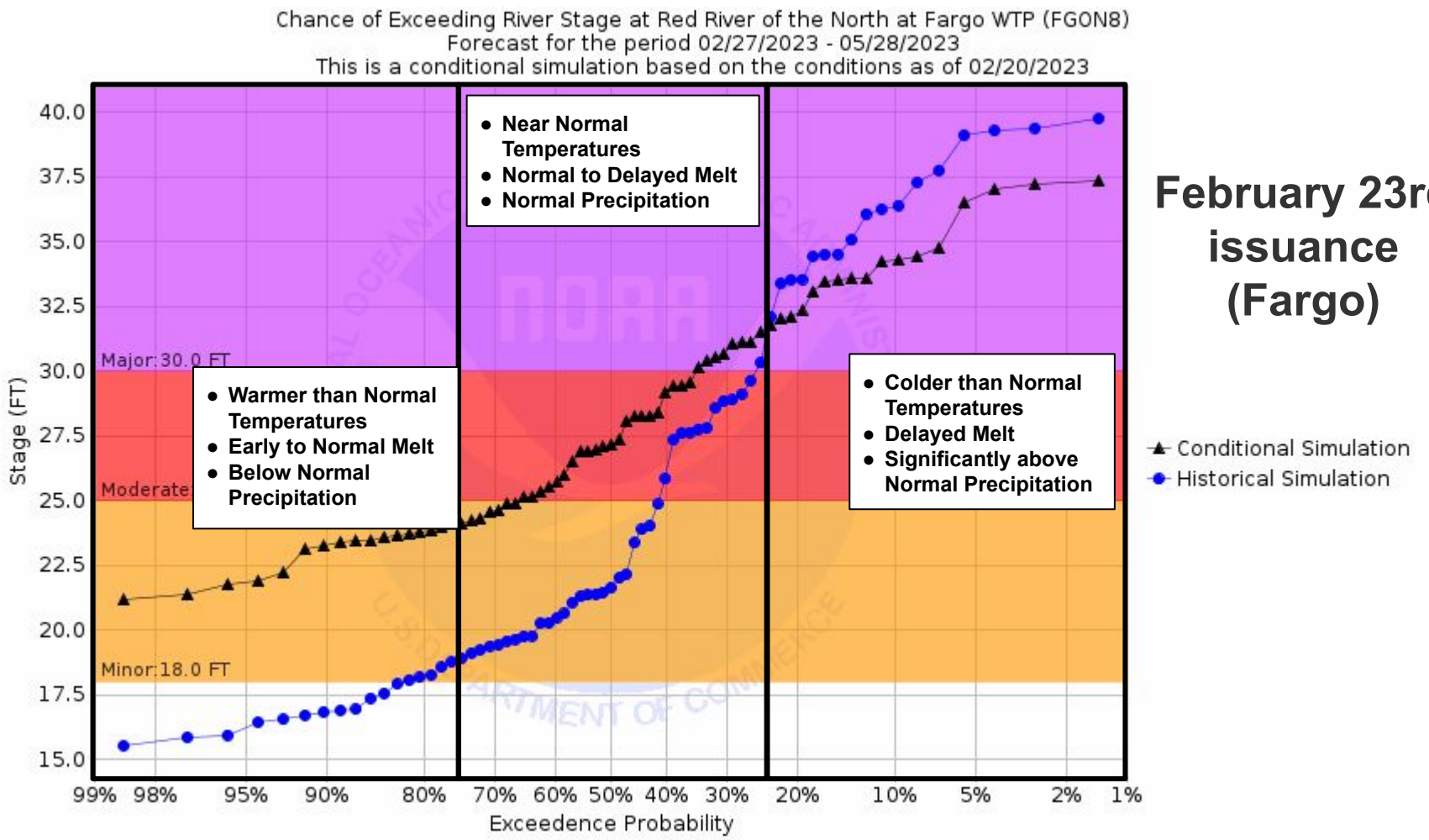
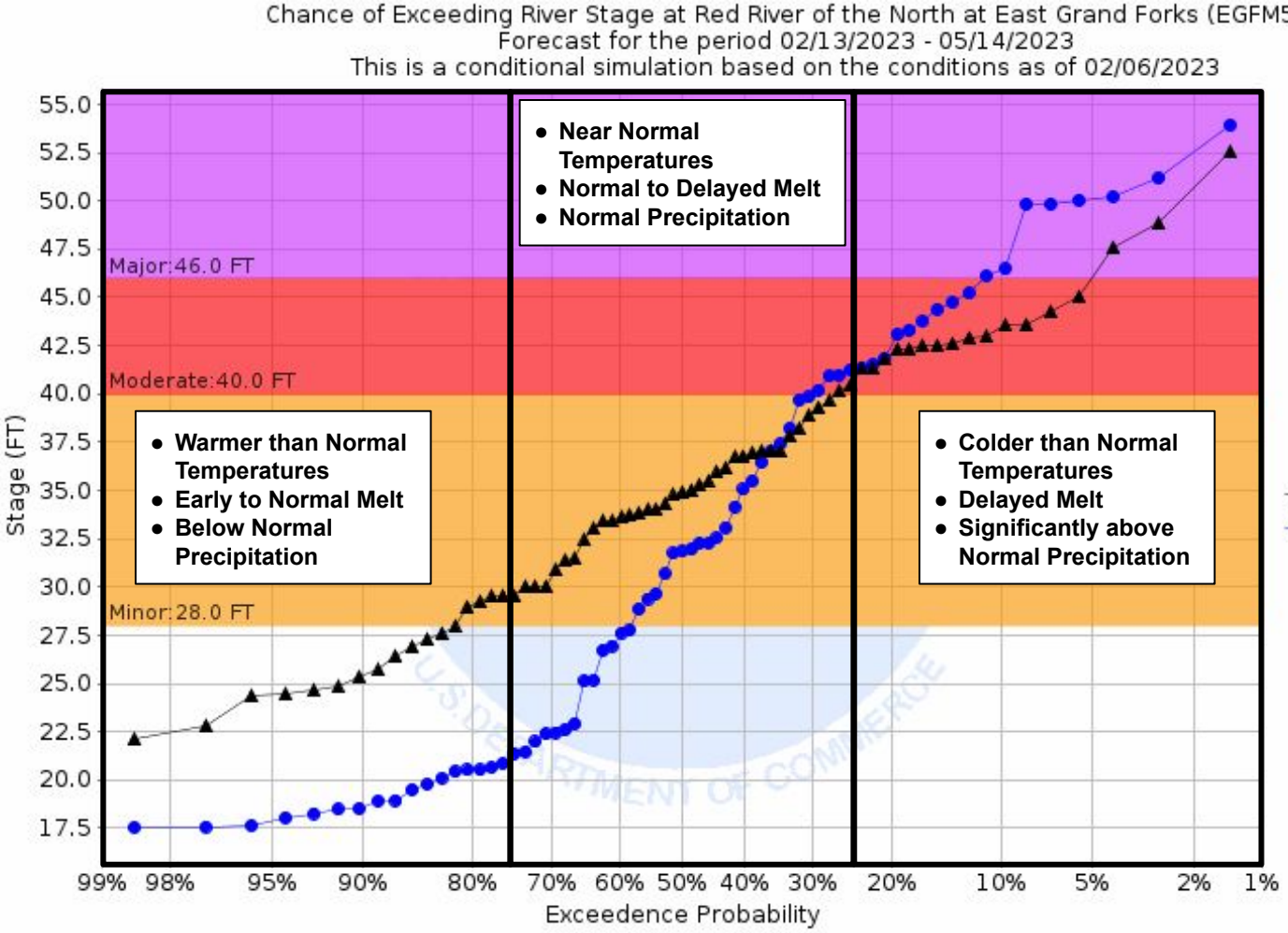


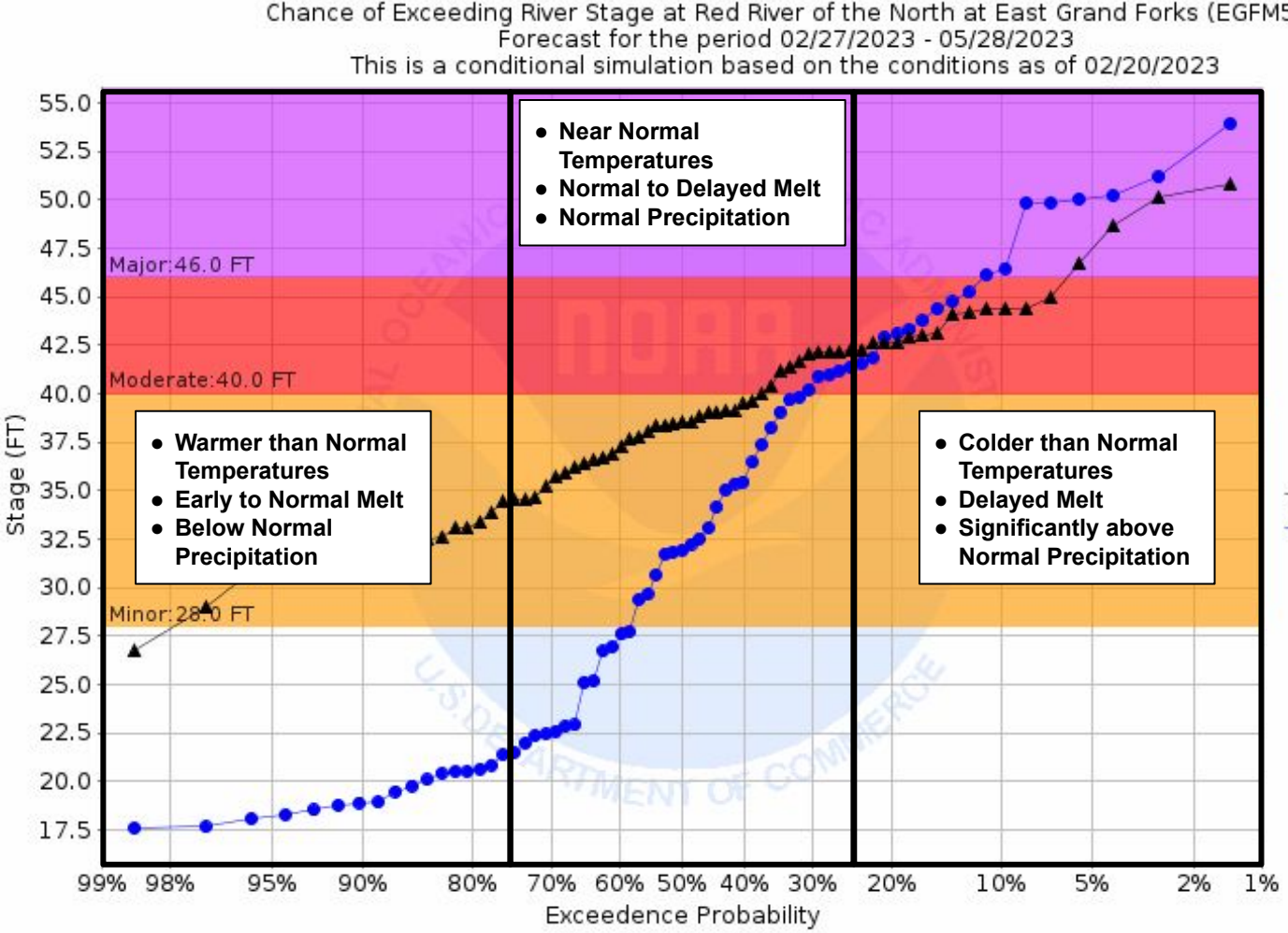
February 9th issuance (Fargo)



February 23rd issuance (Fargo)



February 9th issuance (Grand Forks)



February 23rd issuance (Grand Forks)

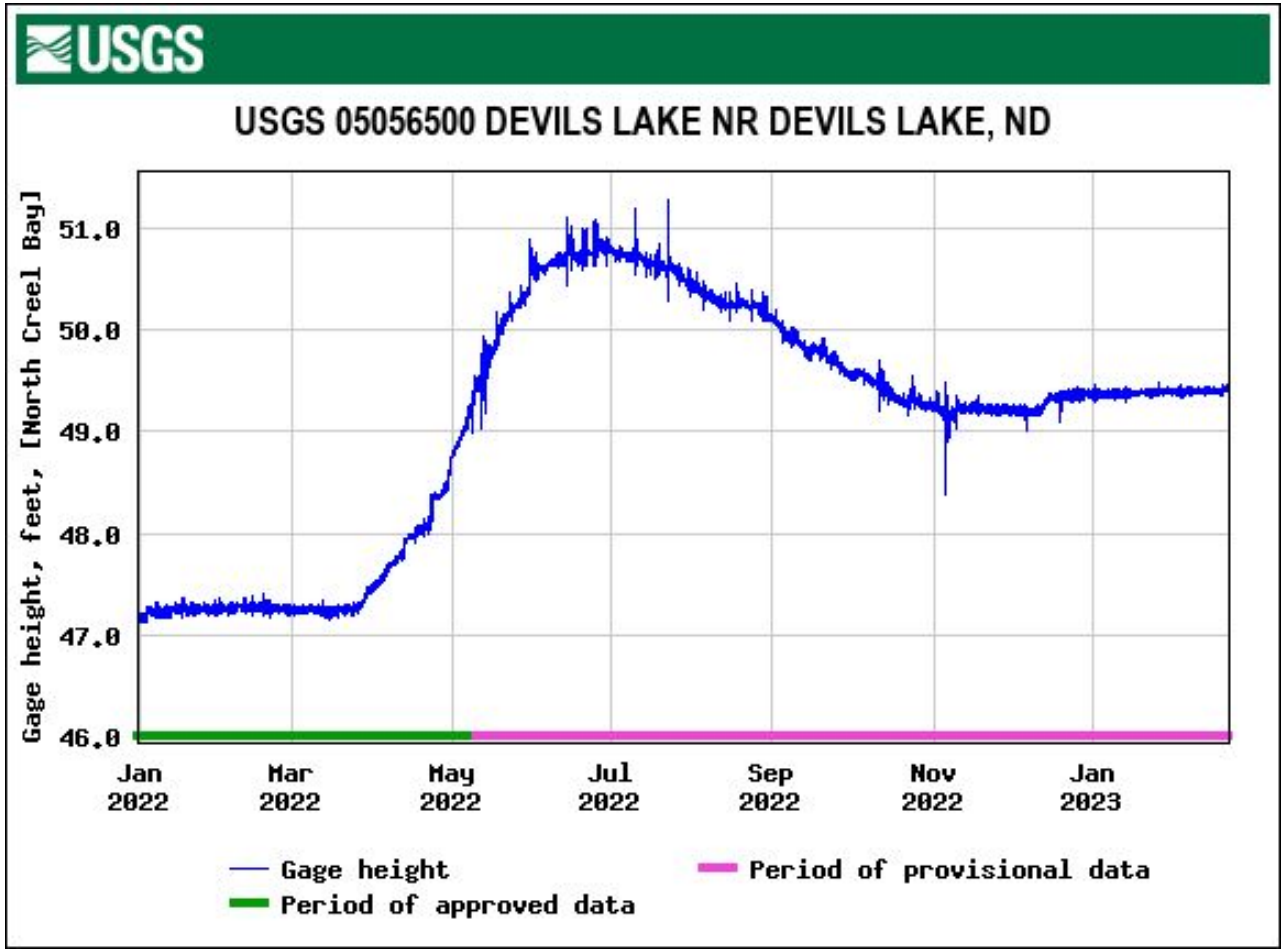
Valid February 27, 2023 - May 28, 2023

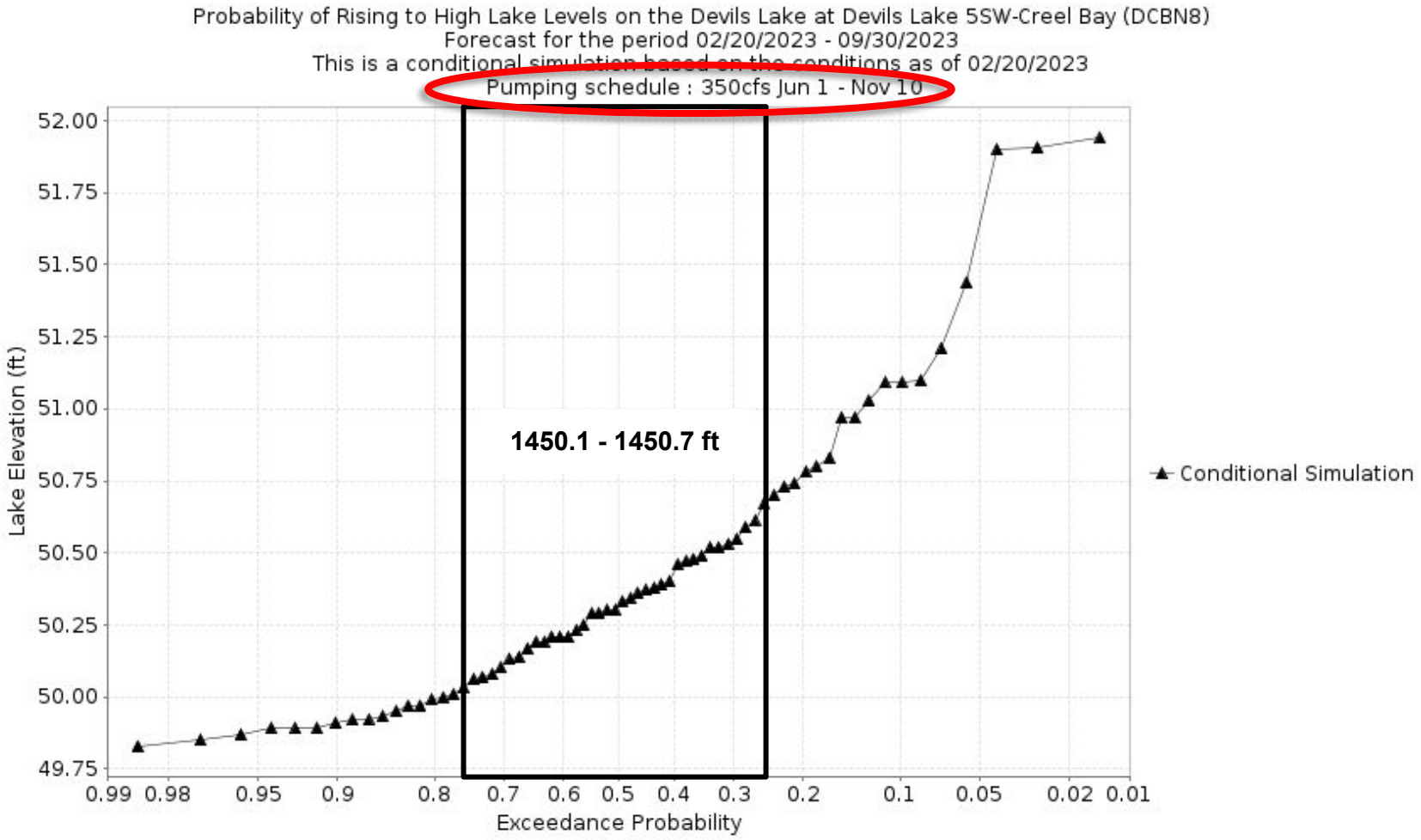
RED RIVER MAINSTEM	95%	90%	75%	50%	25%	10%	5%
Wahpeton	11.1	11.3	11.7	12.0	13.7	15.0	15.8
Hickson	21.7	23.0	24.7	26.5	31.1	34.1	34.7
Fargo	21.9	23.3	24.1	27.2	31.5	34.3	36.7
Halstad	21.7	22.2	24.2	28.1	33.3	36.3	39.1
Grand Forks	31.0	32.1	34.5	38.5	42.2	44.4	47.5
Oslo	31.3	32.1	33.4	34.4	35.4	36.3	37.7
Drayton	29.9	30.8	32.1	36.3	40.0	40.8	42.1
Pembina	37.2	38.1	40.5	44.8	48.2	50.2	51.5

NORTH DAKOTA TRIBUTARIES	95%	90%	75%	50%	25%	10%	5%
Wild Rice River							
Abercrombie	8.5	9.5	10.8	13.3	17.3	19.0	21.9
Sheyenne River							
Valley City	8.0	8.5	9.6	11.6	12.6	13.6	14.4
Lisbon	8.1	8.3	10.0	11.6	13.5	14.8	17.3
Kindred	11.2	12.0	13.1	15.5	17.5	19.8	20.8
West Fargo Diversion	12.5	13.0	13.0	15.1	17.2	19.8	21.3
Harwood	78.8	79.3	80.7	83.4	89.5	91.2	91.8
Maple River							
Enderlin	8.8	9.2	10.4	11.0	11.8	12.7	13.6
Mapleton	15.8	16.8	18.6	19.8	21.6	22.3	22.8
Goose River							
Hillsboro	5.6	6.0	7.8	9.6	12.2	14.0	14.6
Forest River							
Minto	3.4	3.6	4.1	4.8	5.8	6.4	6.9
Pembina River							
Walhalla	4.6	5.0	5.6	6.3	8.1	11.1	12.0
Neche	7.1	8.2	9.6	11.4	15.3	20.3	20.9

Valid February 27, 2023 - May 28, 2023

MINNESOTA TRIBUTARIES	95%	90%	75%	50%	25%	10%	5%
South Fork Buffalo River							
Sabin	13.0	13.2	13.6	14.2	15.0	15.8	16.2
Buffalo River							
Hawley	5.4	5.7	6.3	7.4	8.9	9.5	10.1
Dilworth	14.1	14.3	16.3	17.7	20.1	21.7	22.3
Wild Rice River							
Twin Valley	5.4	5.8	6.5	7.6	8.6	9.8	10.8
Hendrum	19.4	20.0	21.8	24.8	28.0	29.4	31.6
Marsh River							
Shelly	9.4	9.9	10.8	11.6	13.0	16.3	17.3
Sand Hill River							
Climax	11.9	11.9	12.6	16.0	20.4	23.9	27.8
Red Lake River							
High Landing	5.9	6.4	7.1	8.3	9.4	10.5	11.7
Crookston	11.2	11.8	13.5	15.8	18.4	20.9	22.5
Snake River							
Above Warren	62.3	62.5	62.8	63.5	64.4	65.1	66.4
Alvarado	98.0	98.5	99.0	101.1	103.0	104.8	106.5
Two Rivers River							
Hallock	799.1	799.6	800.6	803.8	806.4	808.0	808.7
Roseau River							
Roseau	7.6	7.9	8.5	10.1	12.6	14.5	15.5


USGS
USGS 05056500 DEVILS LAKE NR DEVILS LAKE, ND
Gage height, feet, [North Creel Bay]
51.0
50.0
49.0
48.0
47.0
46.0
Jan 2022
Mar 2022
May 2022
Jul 2022
Sep 2022
Nov 2022
Jan 2023
Gage height
Period of approved data
Period of provisional data

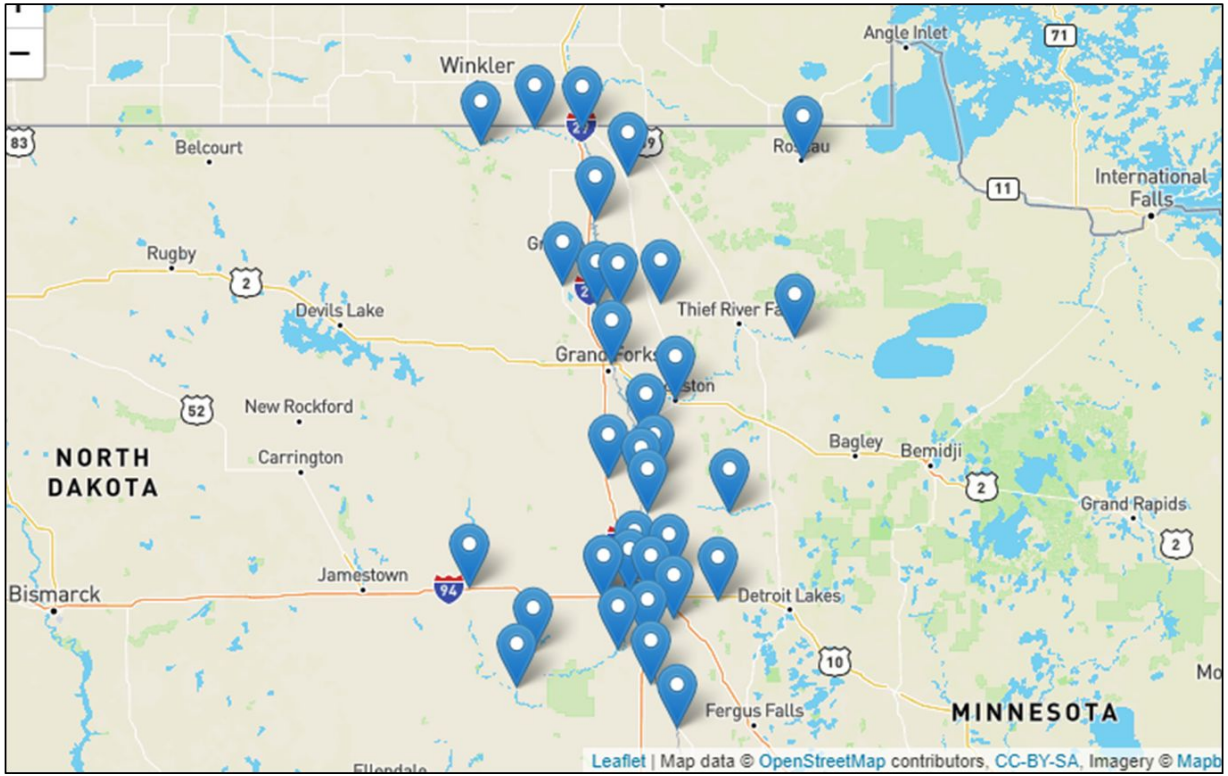

Probability of Rising to High Lake Levels on the Devils Lake at Devils Lake 5SW-Creel Bay (DCBN8)
Forecast for the period 02/20/2023 - 09/30/2023
This is a conditional simulation based on the conditions as of 02/20/2023
Pumping schedule : 350cfs Jun 1 - Nov 10
1450.1 - 1450.7 ft
Lake Elevation (ft)
52.00
51.75
51.50
51.25
51.00
50.75
50.50
50.25
50.00
49.75
0.99 0.98 0.95 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1 0.05 0.02 0.01
Exceedance Probability
Conditional Simulation

Probabilistic Flood Outlook Summary (PFOS)

- Same probabilistic data, just in a different format
- Includes all Red River mainstem and tributary forecast points
- At a glance, relates current risk to:
  - flood categories
  - recent crests
  - floods of record

Use the map below to view forecast point PFOS Graphics

(click a site marker below, then click on the image to expand)



www.weather.gov/fgf/PFOS

Probabilistic Flood Outlook Summary (PFOS)

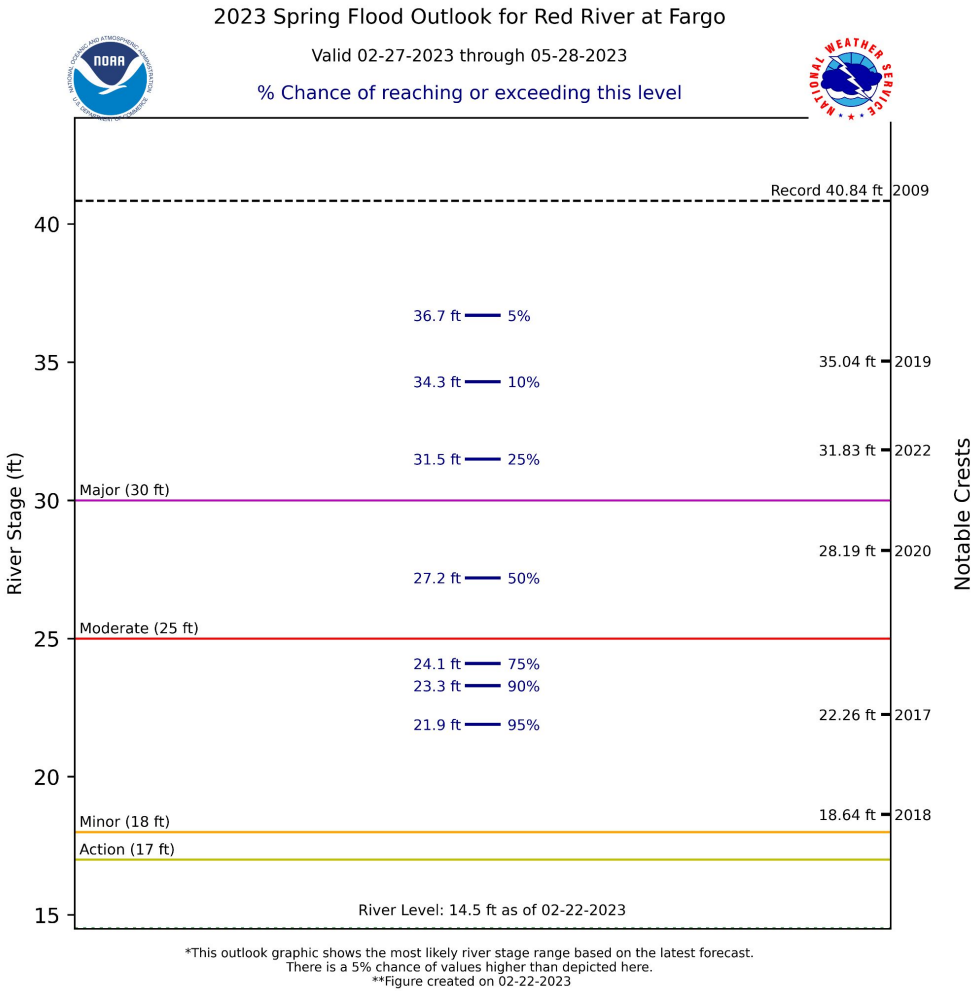
Please provide feedback!

amanda.lee@noaa.gov

or

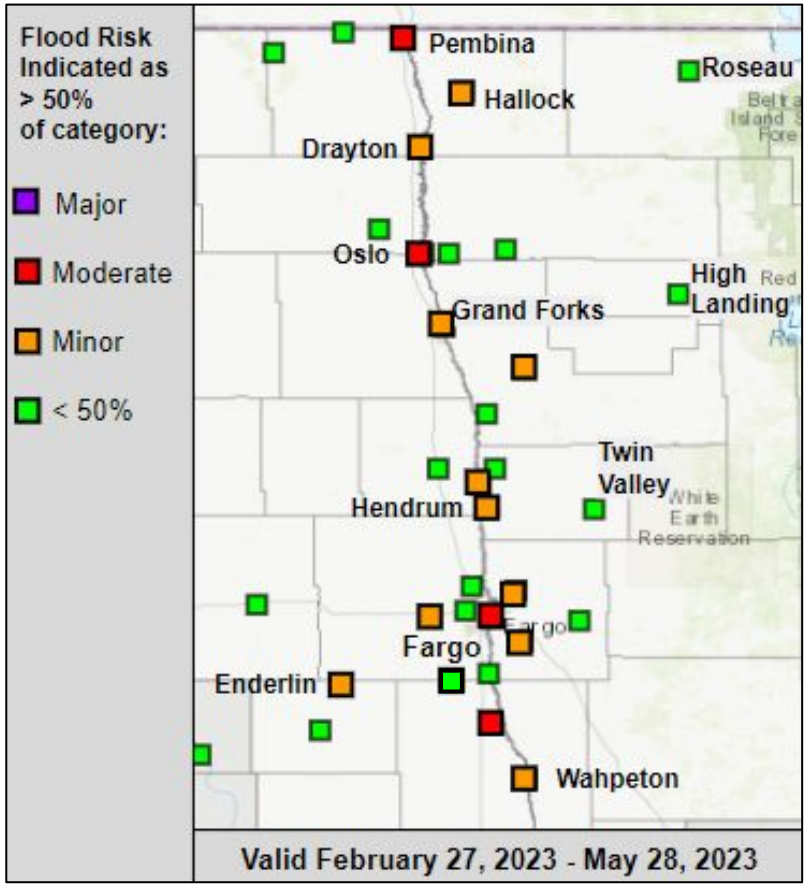
Survey link via website

www.weather.gov/fgf/PFOS



Key Message

The risk for significant (moderate or higher) spring flooding has increased slightly (especially along the mainstem Red River) but still generally remains below or near long-term historical averages across the basin.



Upcoming 2023 Probabilistic Outlooks:

Thursday, March 9th

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