



NEBRASKA STATE  
CLIMATE OFFICE

# 2021 Climate Outlook: Drought Management for Irrigators



MARTHA D SHULSKI  
MSHULSKI3@UNL.EDU  
402-472-6711

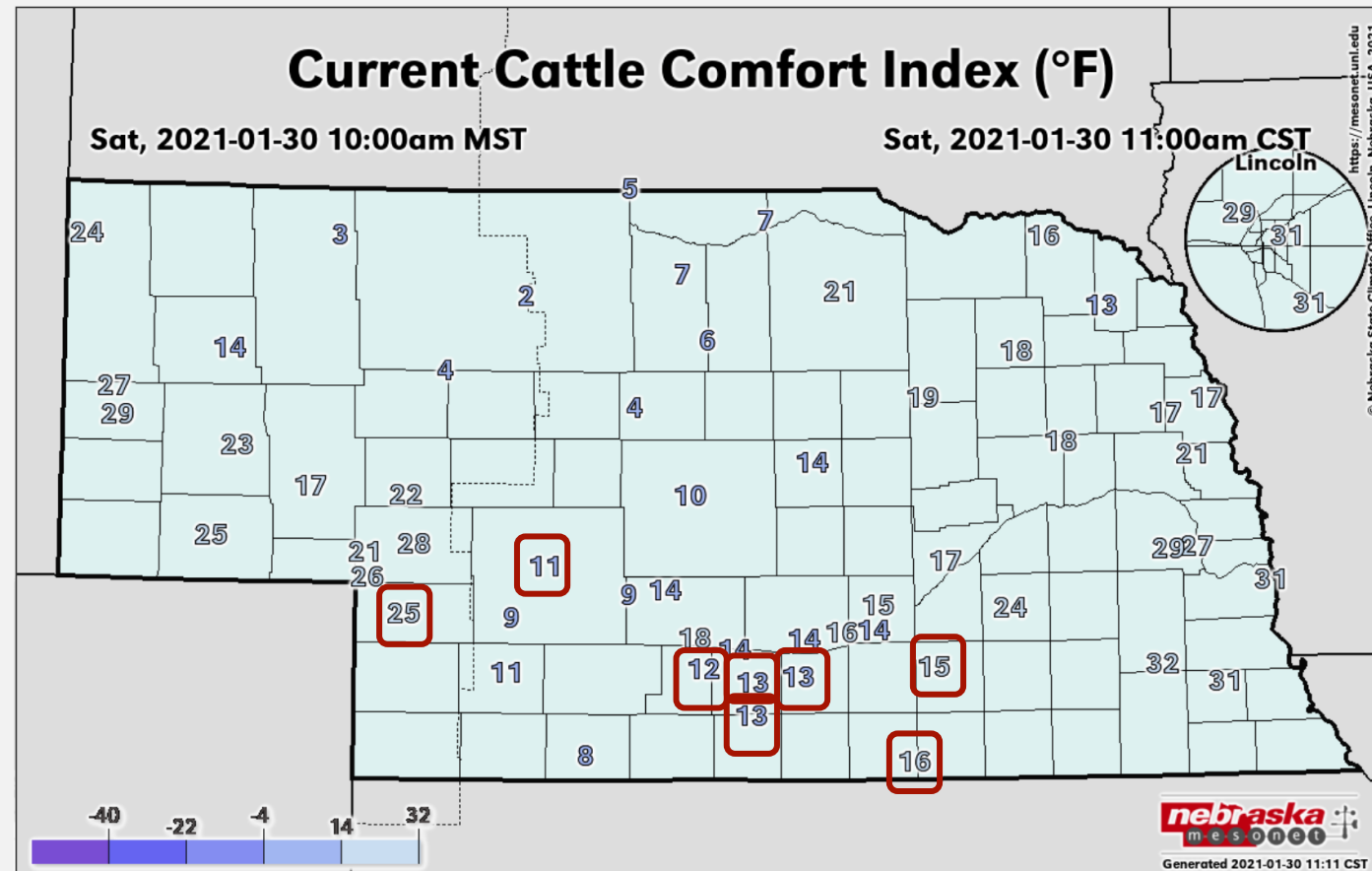
South Central Water Conference  
2 February, 2021

SCHOOL OF NATURAL  
RESOURCES  
UNIVERSITY OF NEBRASKA  
LINCOLN

# Thank you to weather station sponsors

- Tri Basin NRD, Lower Republican NRD, CNPPID, Nebraska Extension

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Axtell, Harvard, North  
Platte, Grant





# Today's presentation

- **Recap of 2020 and recent conditions**
- **Drought assessment**
- **Outlook**  
**cold and wet in the near-term (February),**  
***cautiously optimistic* for wet spring and decent moisture**  
**recharge**

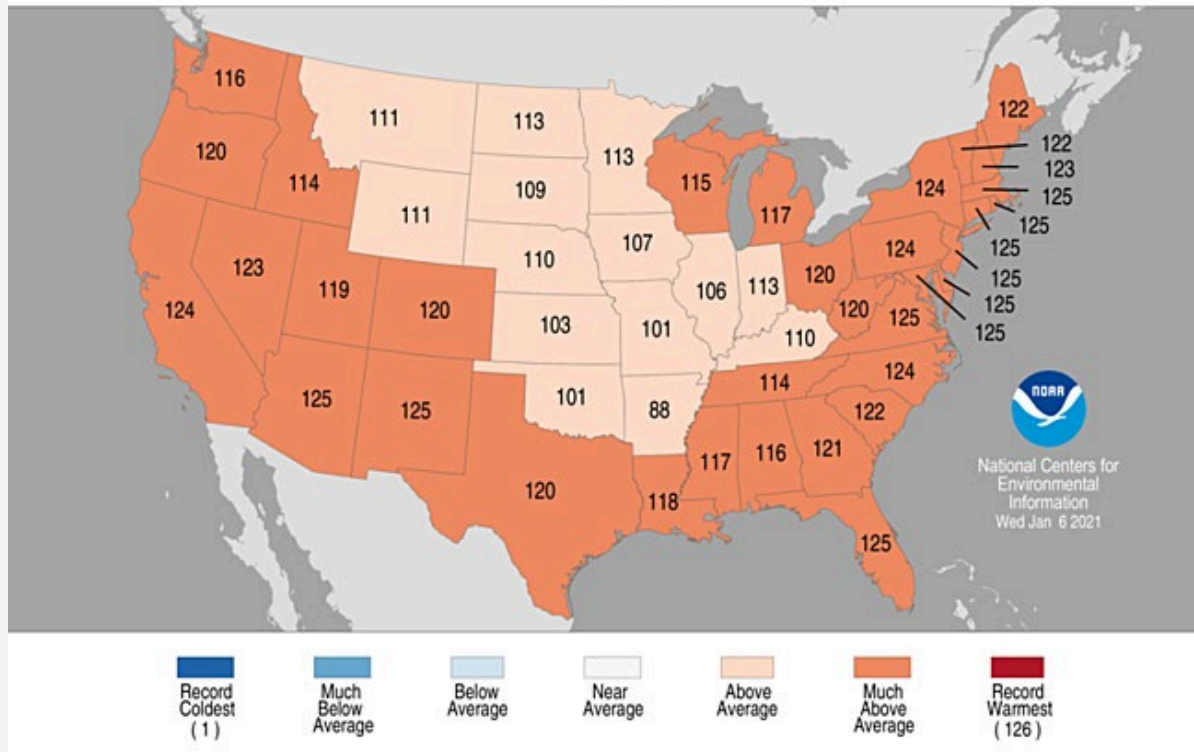


# Recap

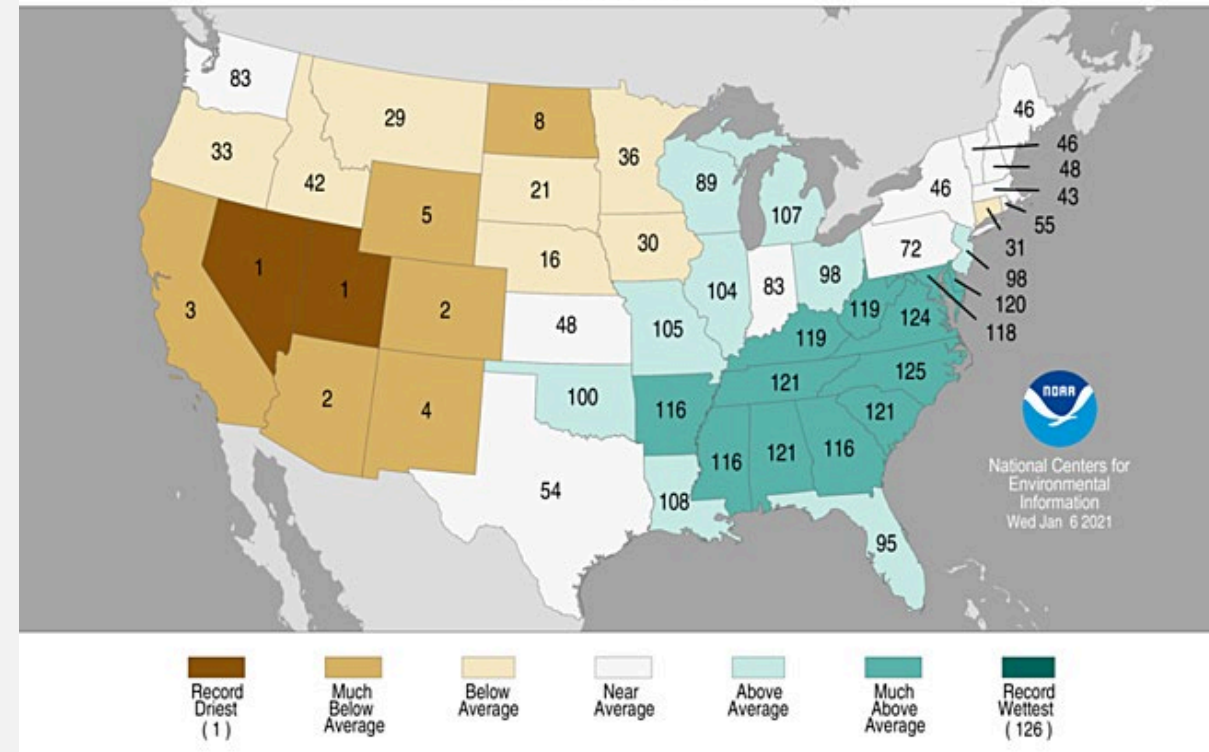
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**2020 YTD | above average temperatures; 16<sup>th</sup> driest**

Statewide Average Temperature Ranks  
January – December 2020  
Period: 1895–2020

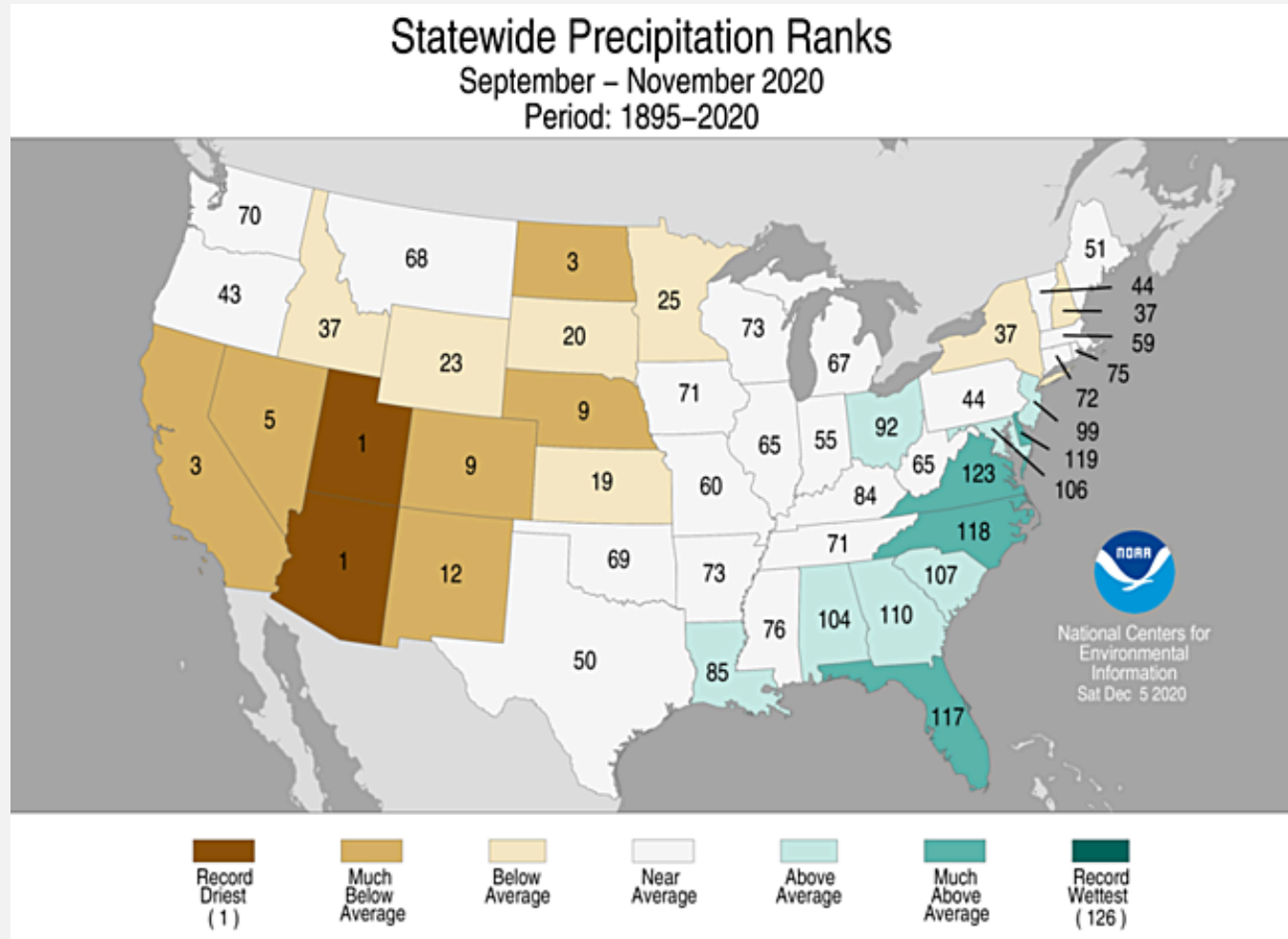


Statewide Precipitation Ranks  
January – December 2020  
Period: 1895–2020



# Recap

Sep-Oct-Nov | **mostly warm and very dry fall**



Source: <https://ncdc.noaa.gov/temp-and-precip/us-maps/>

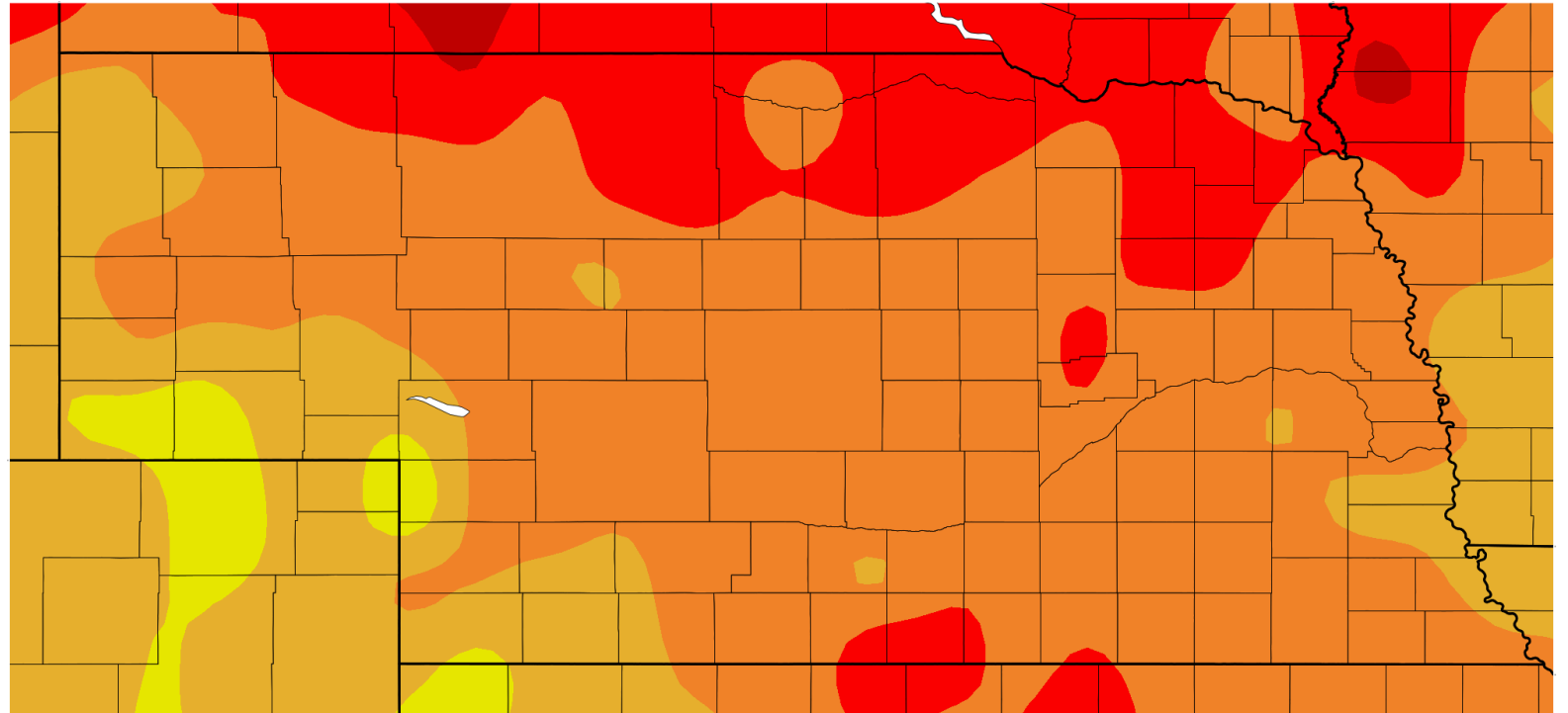
# Recap

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Dec - Jan temperature

|

**Much warmer than  
normal overall  
(2 – 8°F)**



Generated 1/30/2021 at HPRCC using provisional data.

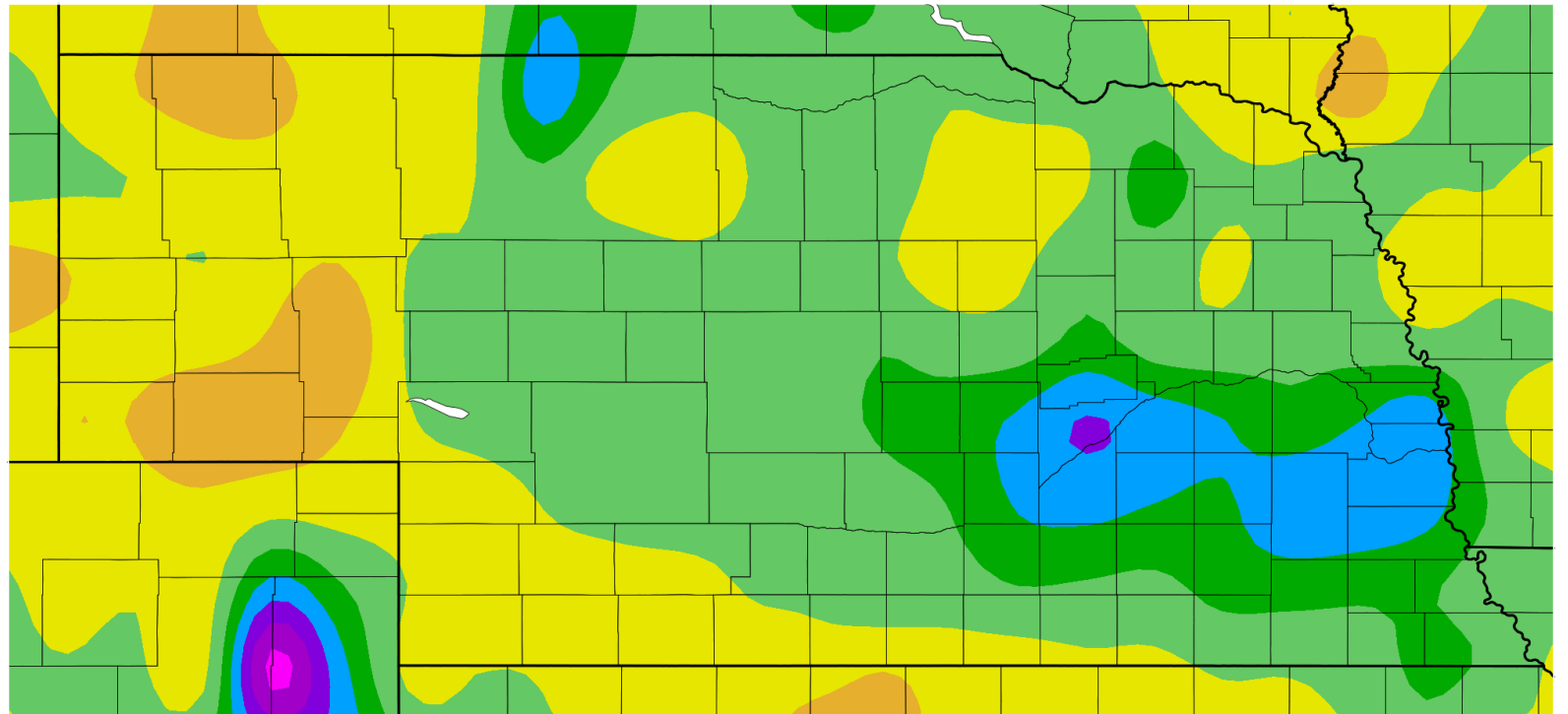
NOAA Regional Climate Centers

# Recap

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Dec - Jan precipitation  
departure |

**Overall wetness in the  
central and east  
(0.5 – 1.5in)**



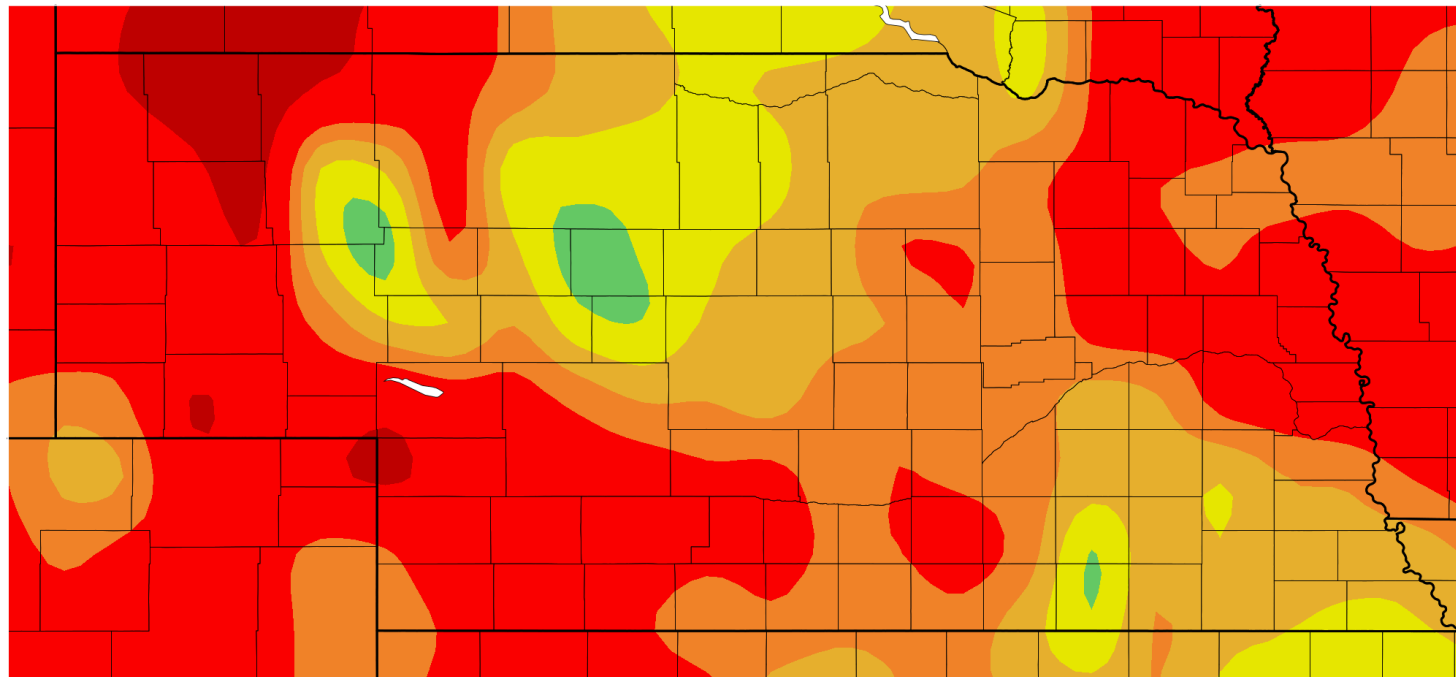
Generated 1/30/2021 at HPRCC using provisional data.

NOAA Regional Climate Centers

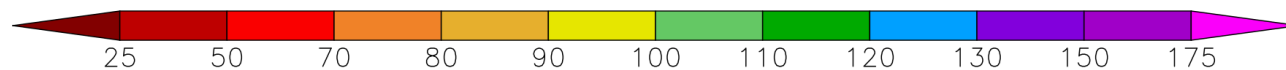
# Recap

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## Precipitation | 12 month percent of normal



365 day precipitation  
percent of normal  
*30 Jan 2020 – 29 Jan 2021*



Generated 1/30/2021 at HPRCC using provisional data.

NOAA Regional Climate Centers

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

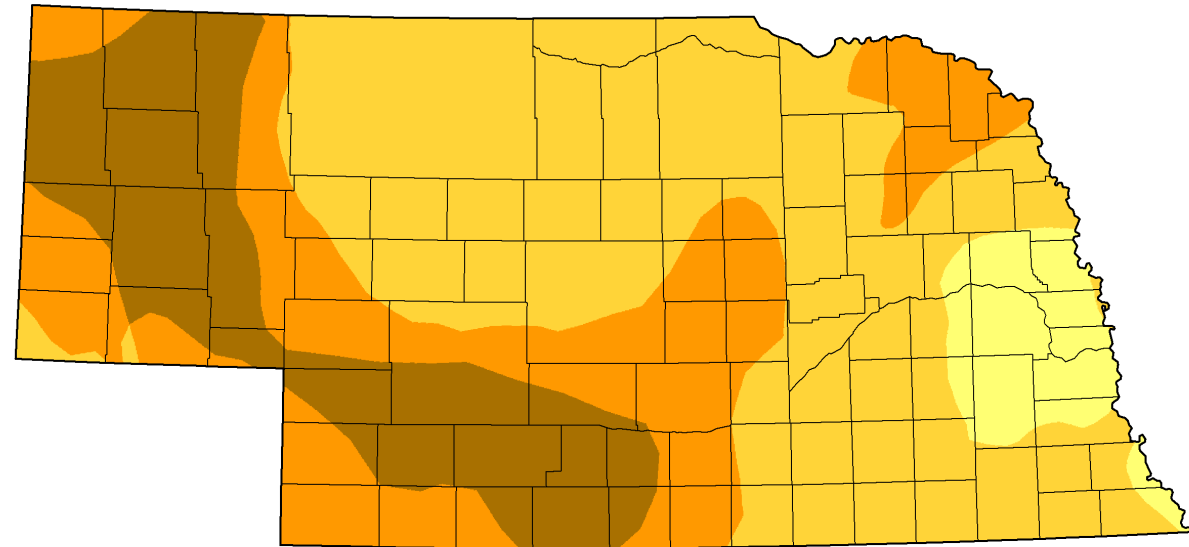


# Recap

## Drought |

- one to four class degradations over the past year

U.S. Drought Monitor Class Change - Nebraska  
1 Year

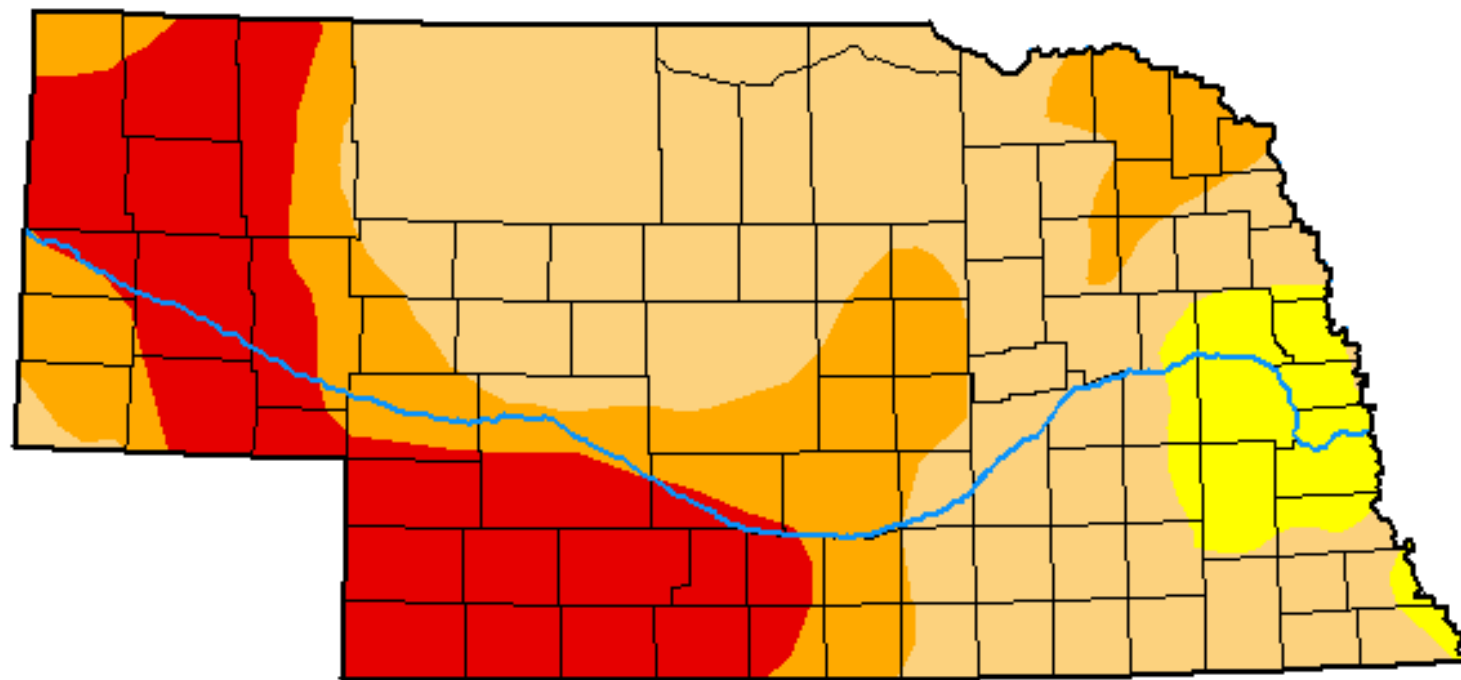


January 26, 2021  
compared to  
January 28, 2020

# Recap

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Drought | current conditions  
- 24% in Extreme drought (D3)



**January 26, 2021**

*(Released Thursday, Jan. 28, 2021)*

Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	0.00	100.00	93.69	45.61	24.41	0.00
<b>Last Week</b> <i>01-19-2021</i>	0.00	100.00	100.00	51.03	24.41	0.00
<b>3 Months Ago</b> <i>10-27-2020</i>	0.00	100.00	85.77	49.61	11.96	0.00
<b>Start of Calendar Year</b> <i>12-29-2020</i>	0.00	100.00	99.13	50.99	24.41	0.00
<b>Start of Water Year</b> <i>09-29-2020</i>	1.64	98.36	77.26	32.68	7.56	0.00
<b>One Year Ago</b> <i>01-28-2020</i>	95.61	4.39	0.00	0.00	0.00	0.00

Intensity:

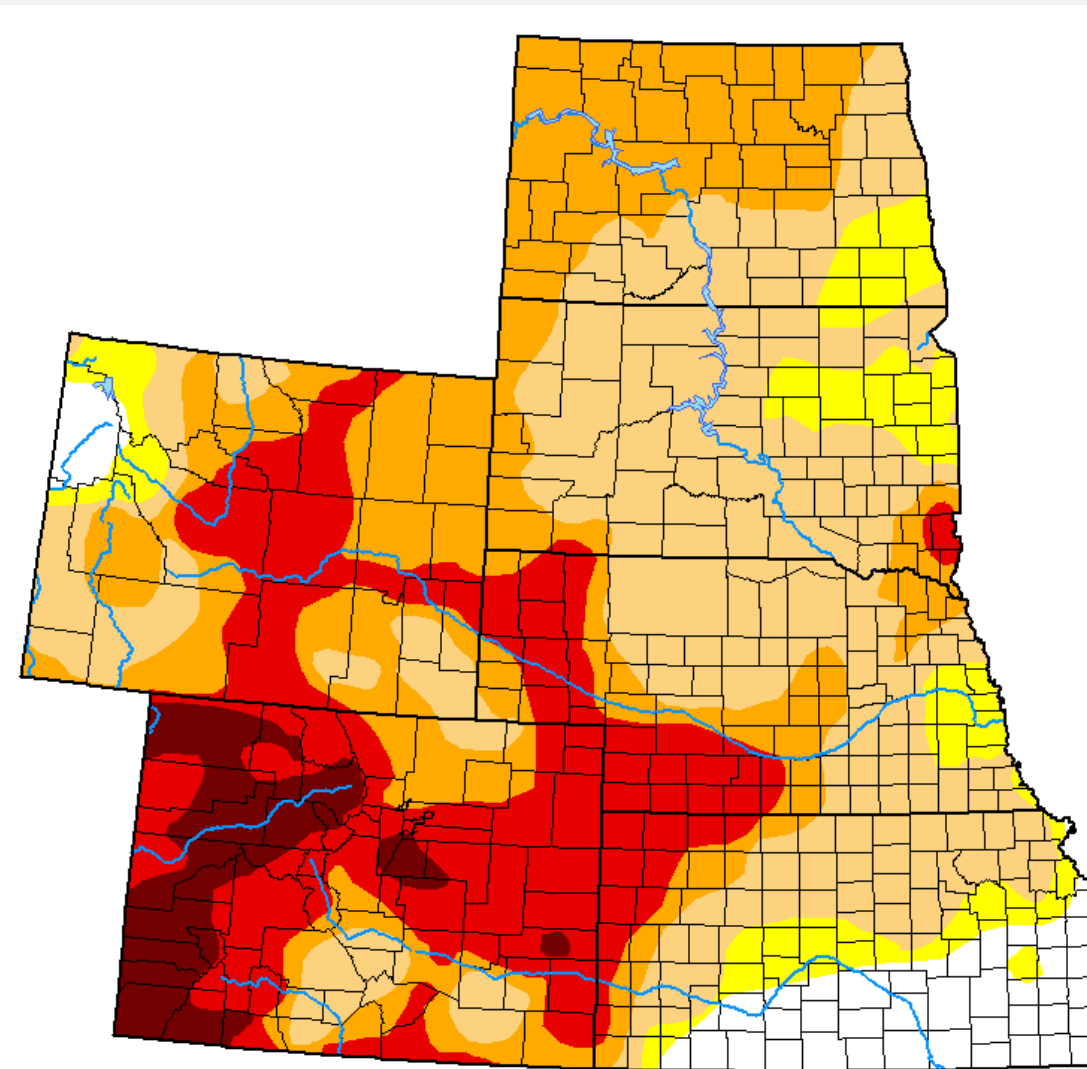
None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

*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>*

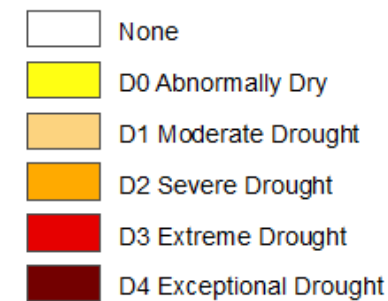
# Recap

Drought | current  
conditions

- Dry across the high  
plains



## Intensity:



*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 Tinker  
CPC/NOAA/NWS/NCEP



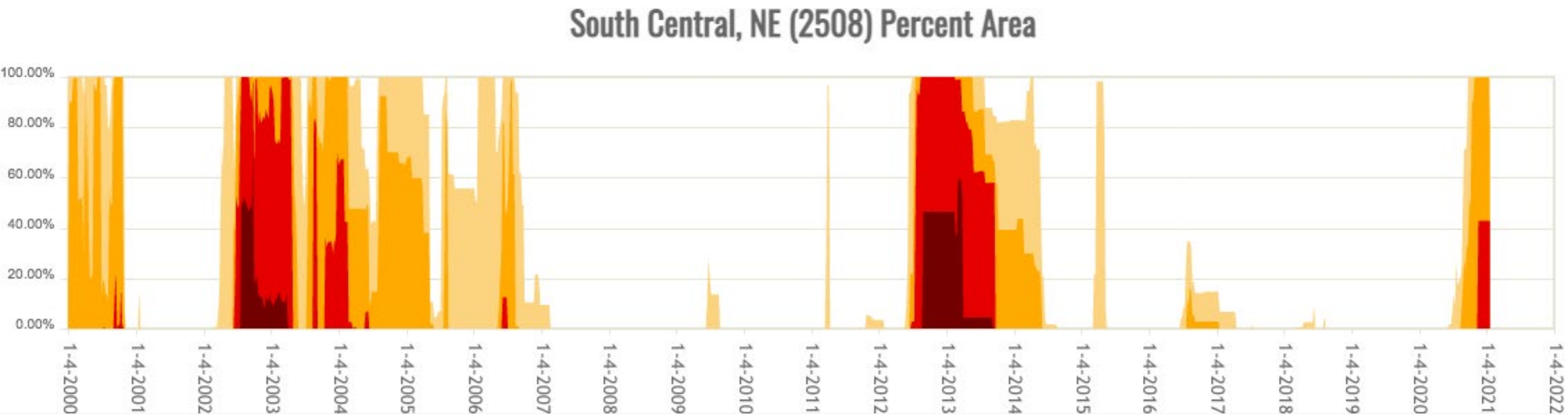
[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

# Recap

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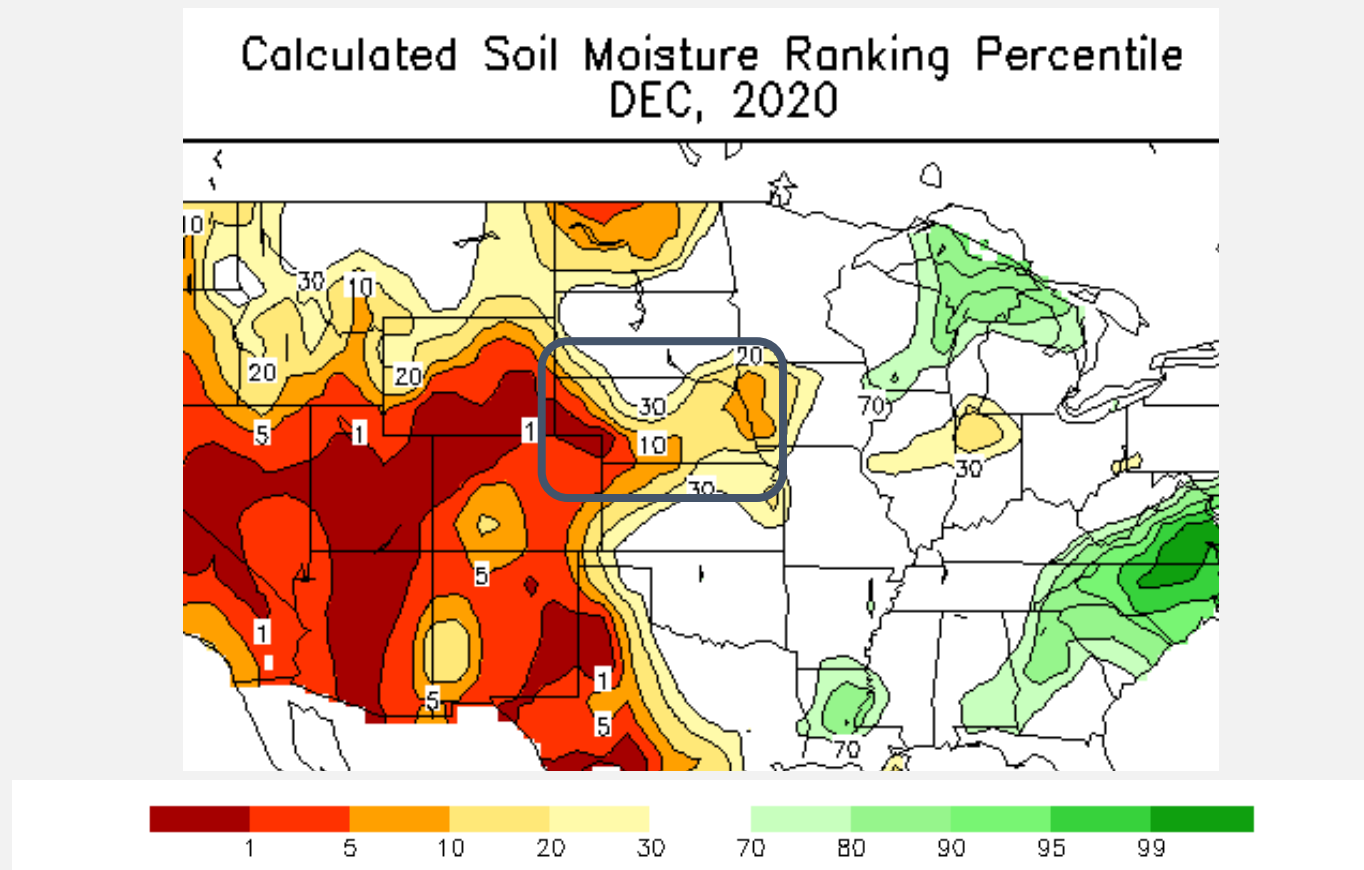
## Drought history |

- Percent of southcentral Nebraska experiencing drought



Source: <https://droughtmonitor.unl.edu/maps/>

Soil moisture (model) | **Dryness apparent in moisture profiles across Nebraska. 10<sup>th</sup> percentile or less for southcentral and west.**



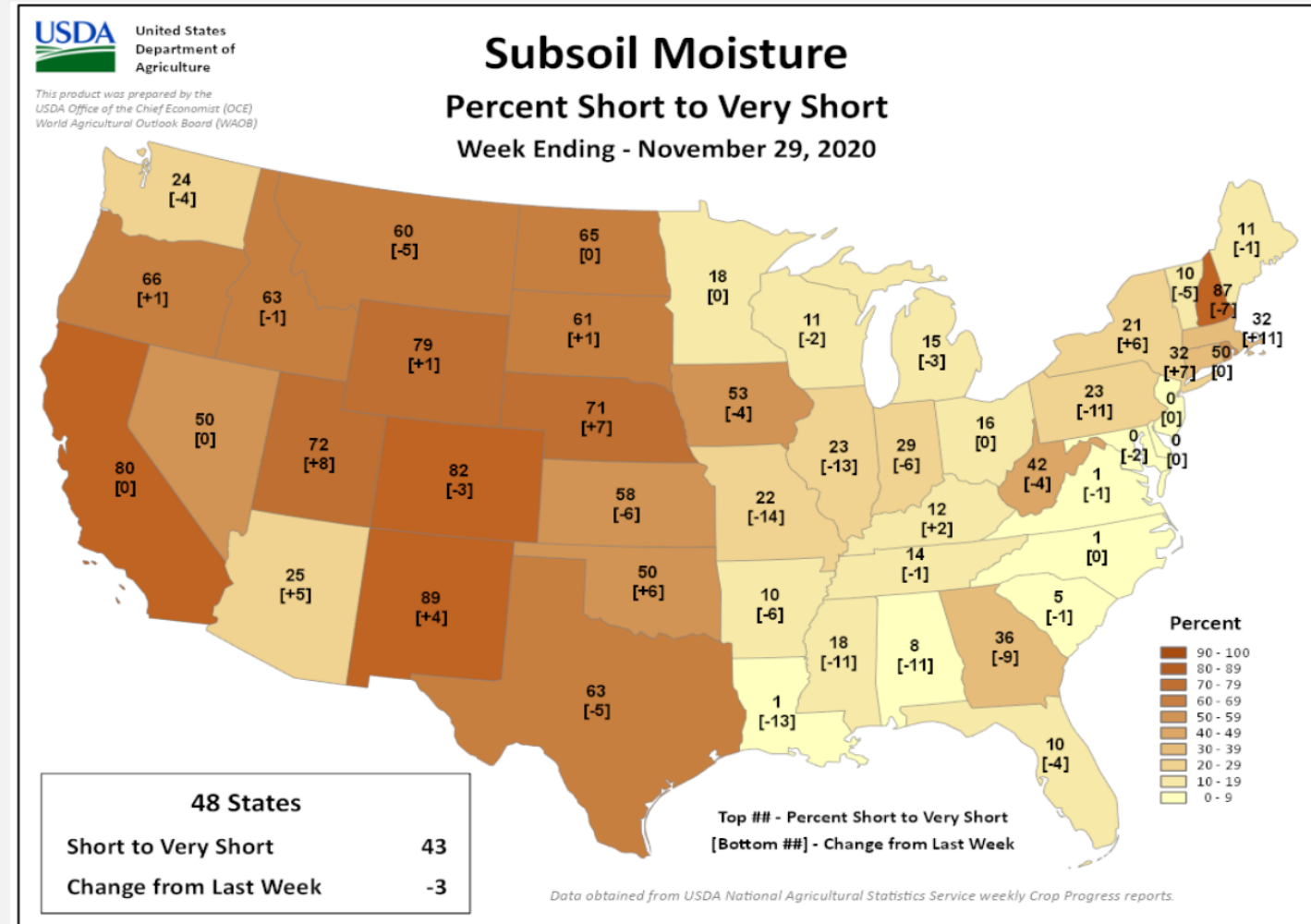


# Soils

## Soil moisture |

- topsoil (6") moisture  
65% short to very short
- subsoil at 71% short to very short)

\* short-very short: normal crop growth curtailed  
visible signs of stress

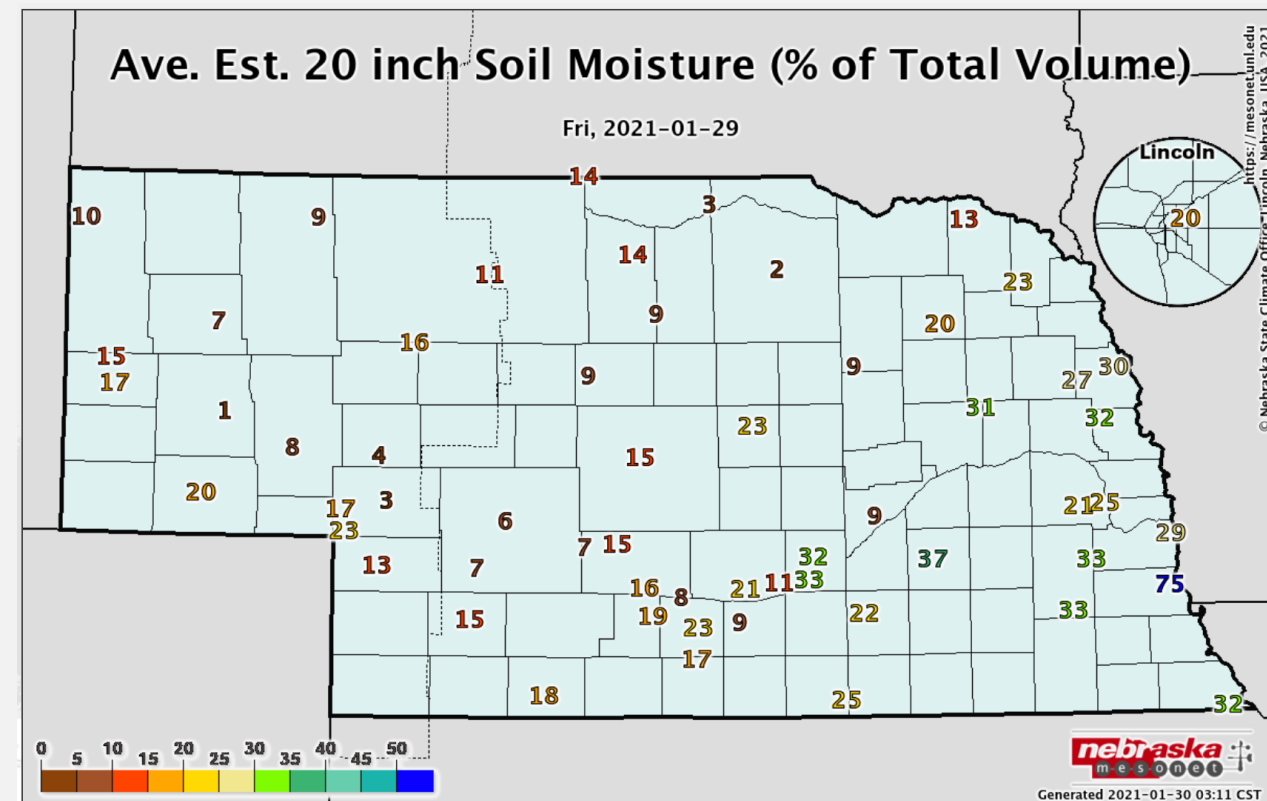
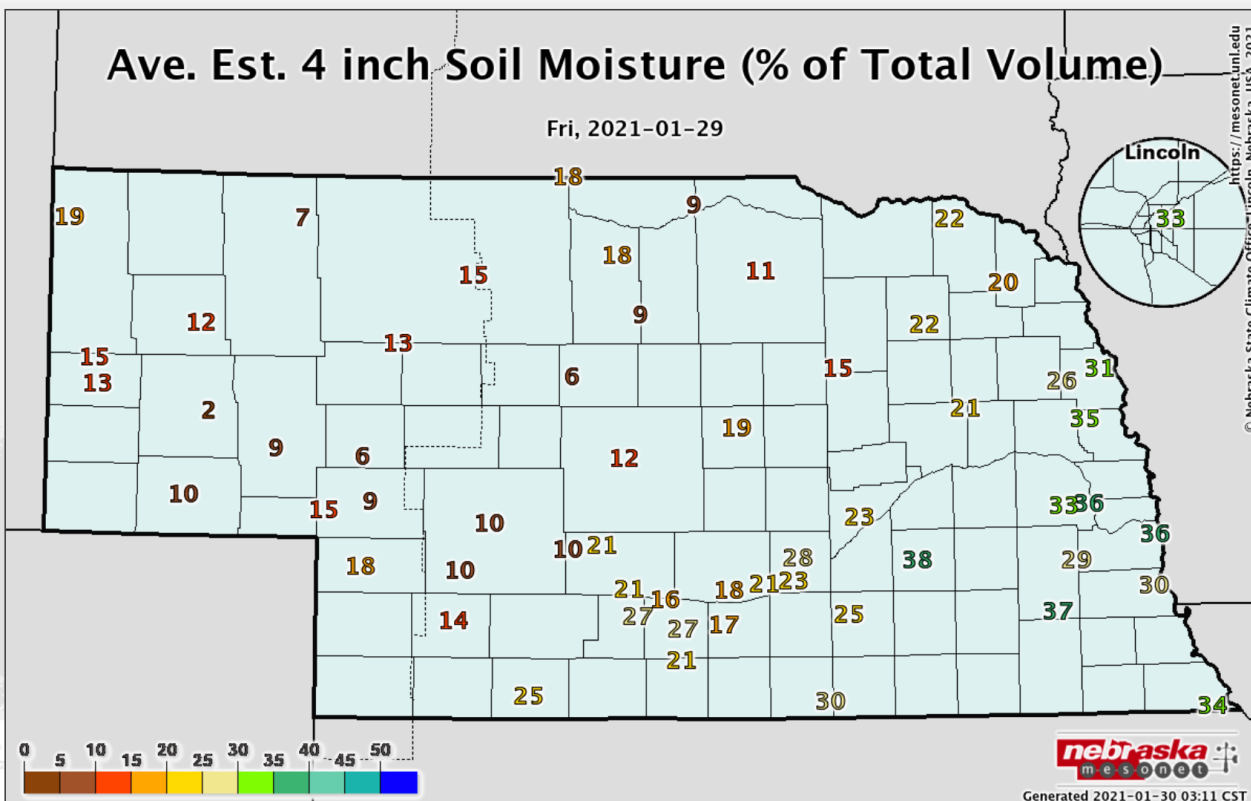


Thank you to Brad Rippey and USDA-OCE

<https://www.usda.library.cornell.edu/concern/publications/cj82k728n?locale=en>

# Soils

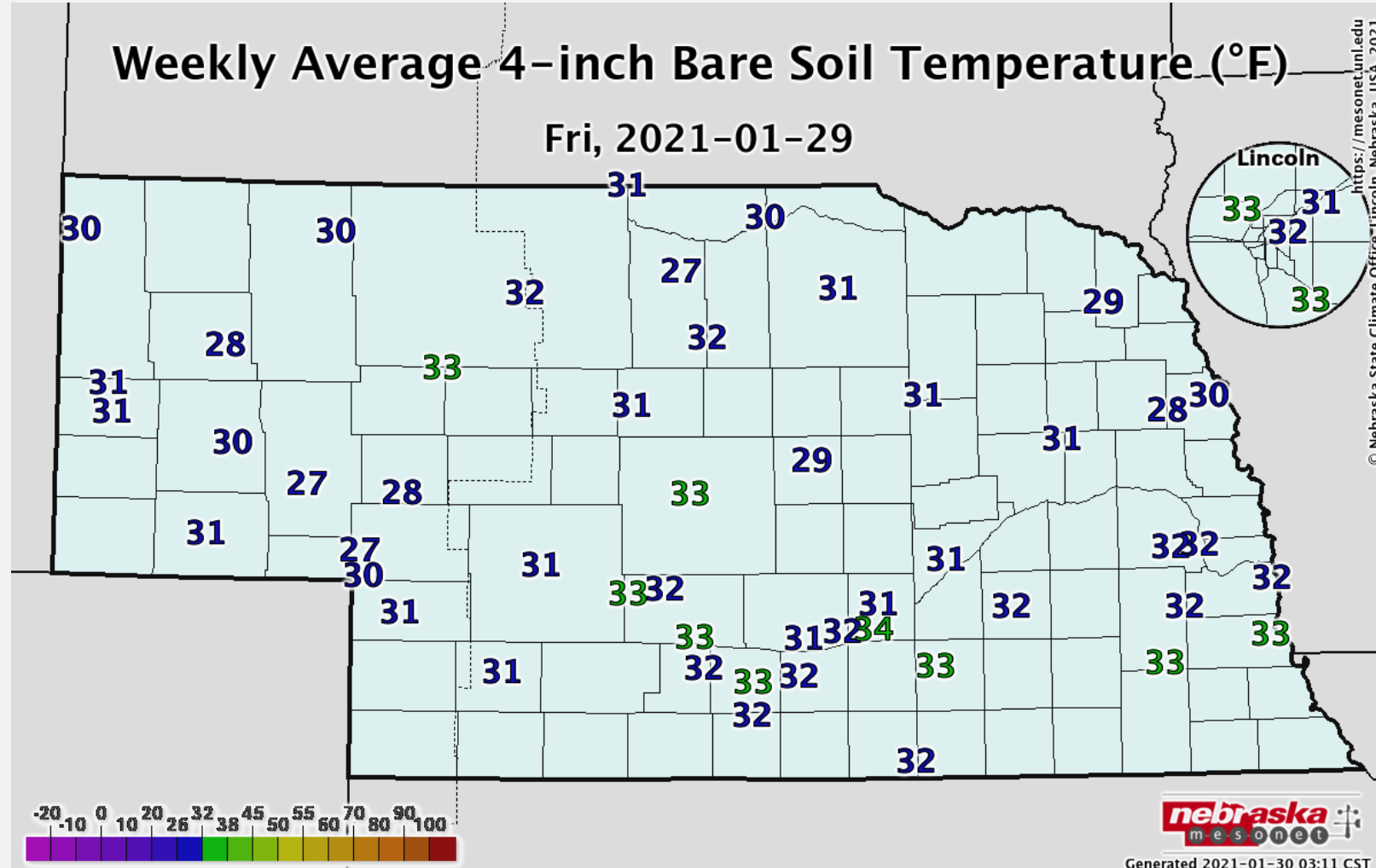
Soil moisture | Daily moisture snapshot at 4 and 20 inches.  
Grass cover, not agricultural fields.



# Soils

Soil temperature |

- Weekly average temperatures right around freezing.



# Snowpack

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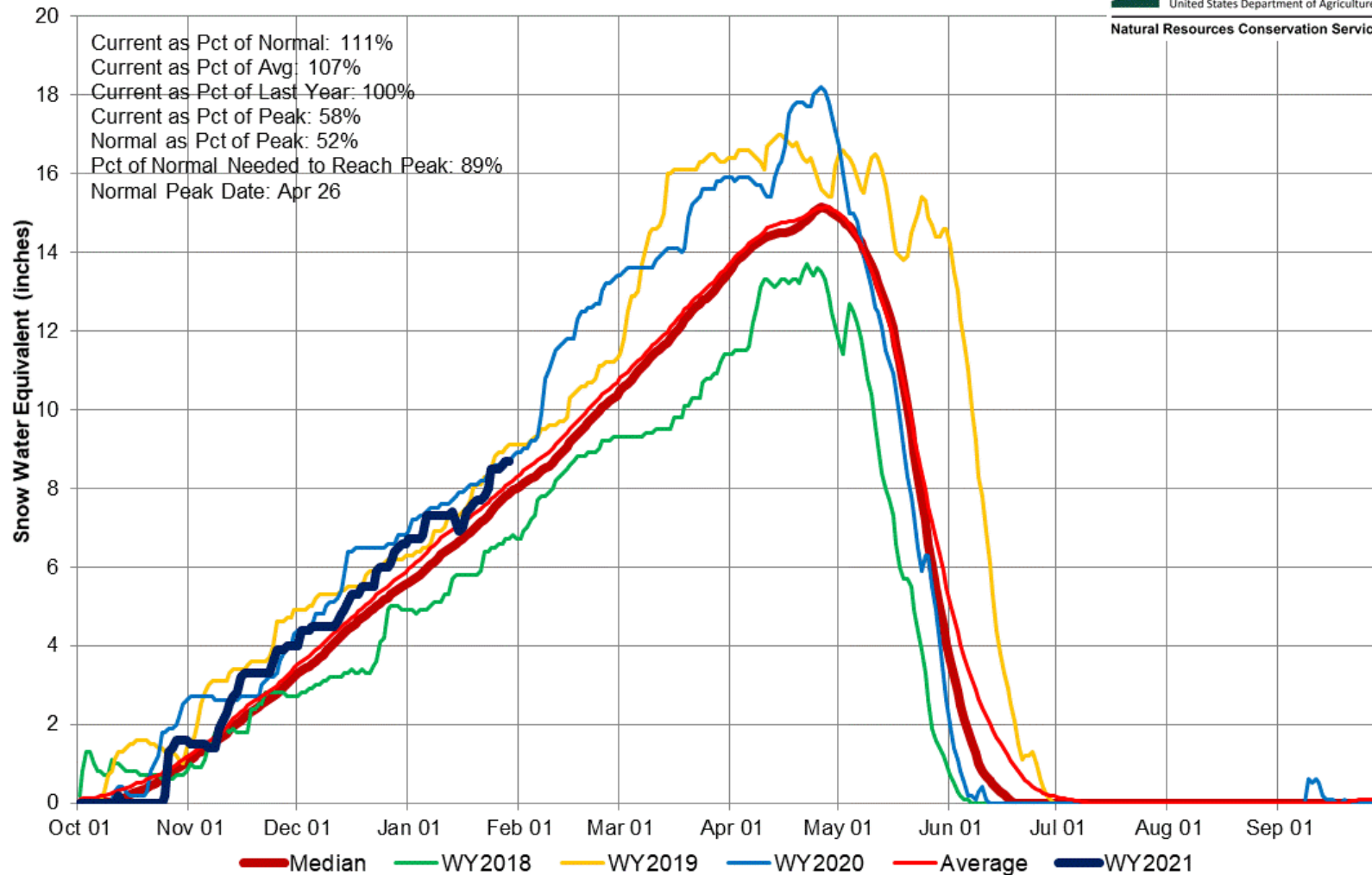
## South Platte River Basin Time Series Snowpack Summary

Based on Provisional SNOTEL data as of Jan 29, 2021



United States Department of Agriculture

Natural Resources Conservation Service



South Platte |

- Running slightly  
above average.

# Snowpack

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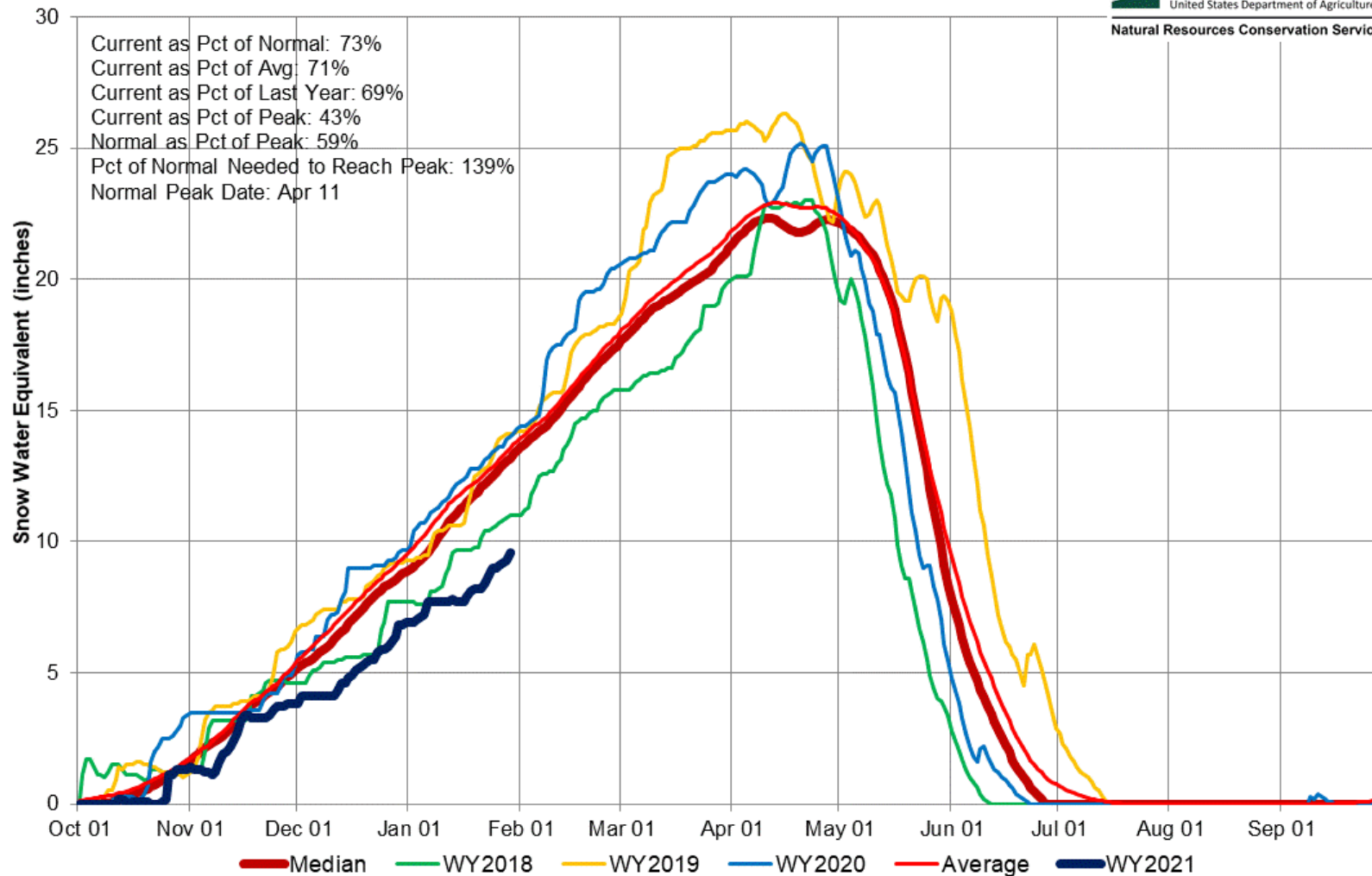
## Laramie & North Platte River Basins Time Series Snowpack Summary

Based on Provisional SNOTEL data as of Jan 29, 2021



United States Department of Agriculture

Natural Resources Conservation Service



North Platte |

- Running below  
average.

[https://www.weather.gov/bou/co\\_snowpack](https://www.weather.gov/bou/co_snowpack)

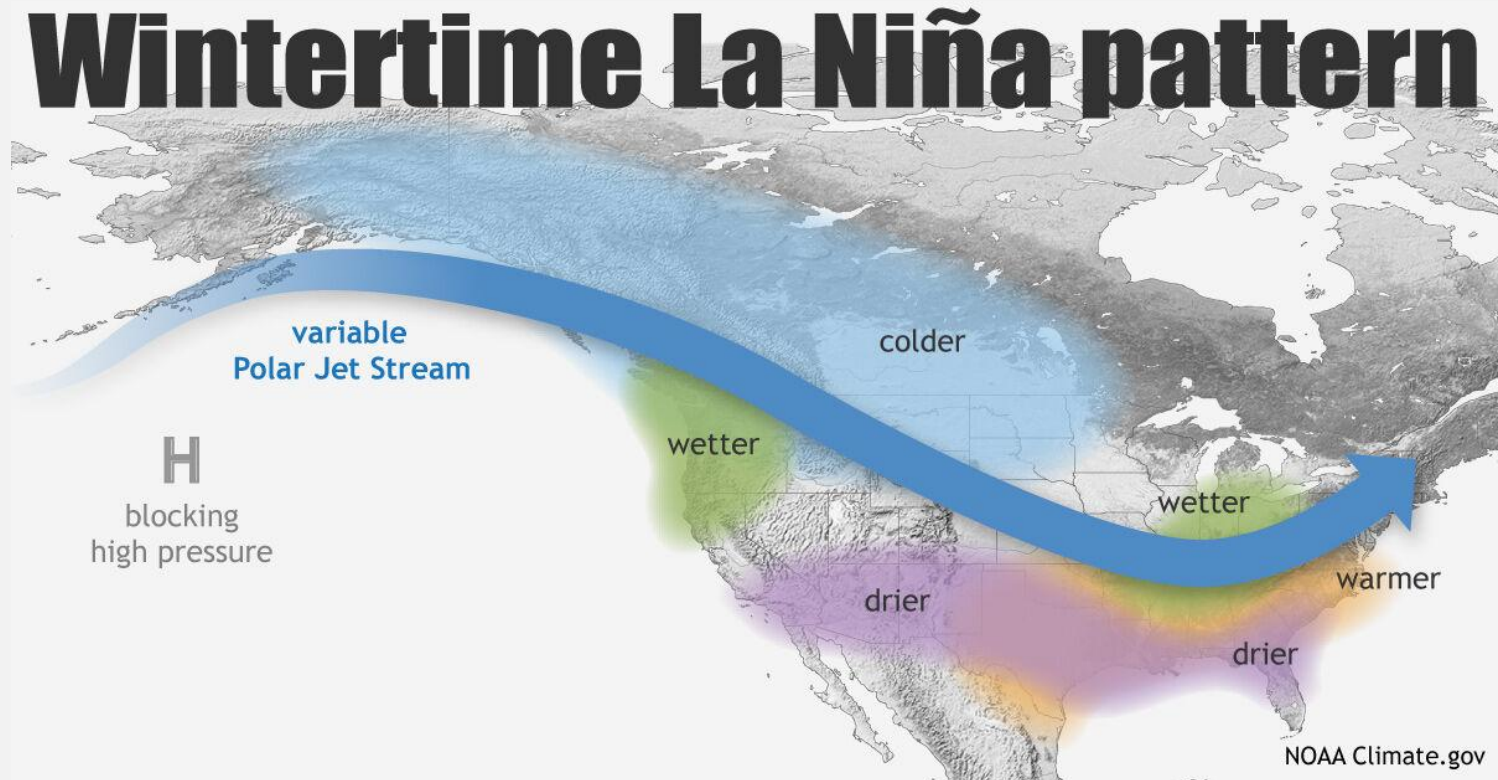


# Pacific climate pattern

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La Niña |

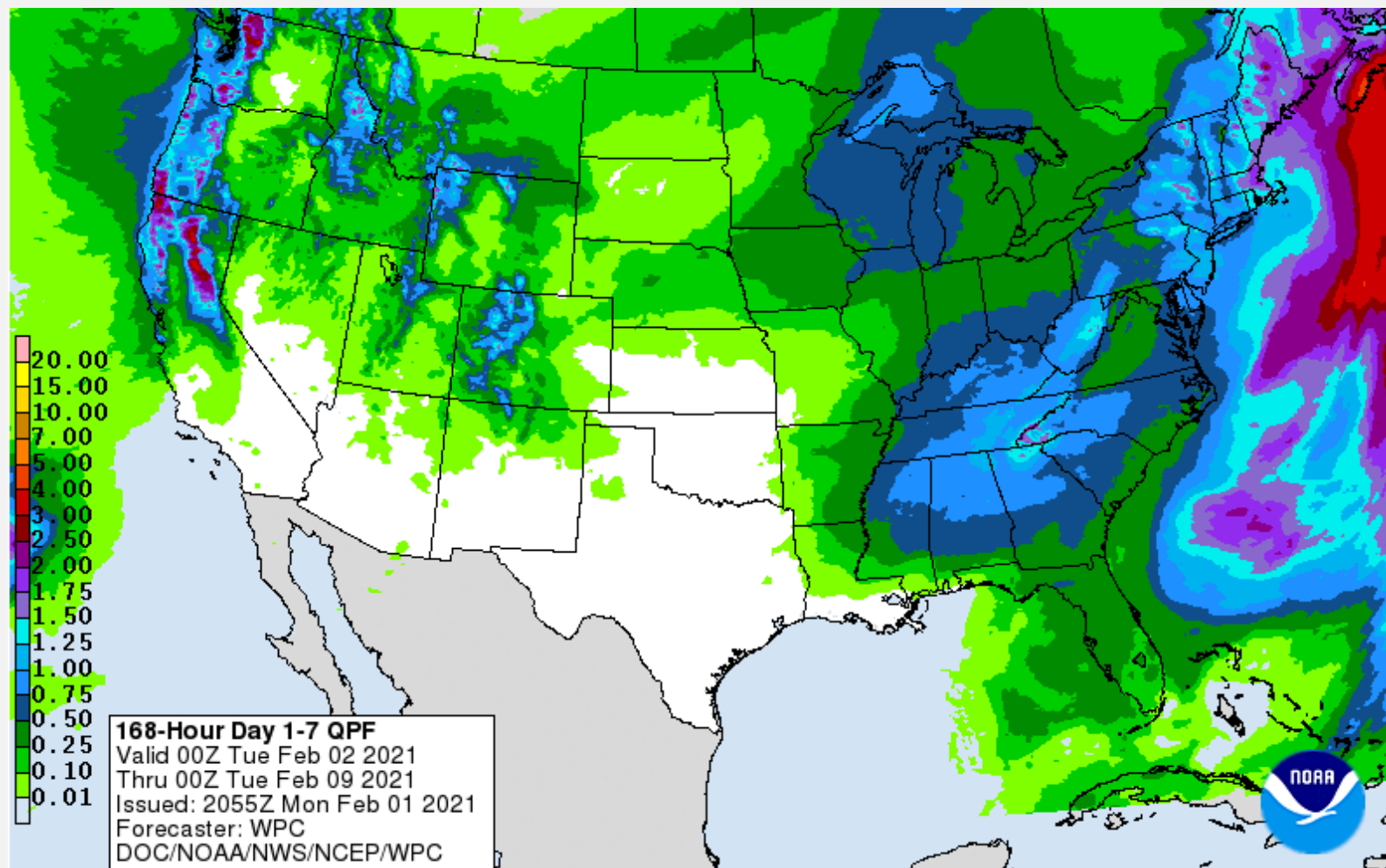
- La Niña conditions expected through winter
- Possible shift to 'neutral' conditions by late spring



# Precipitation outlook

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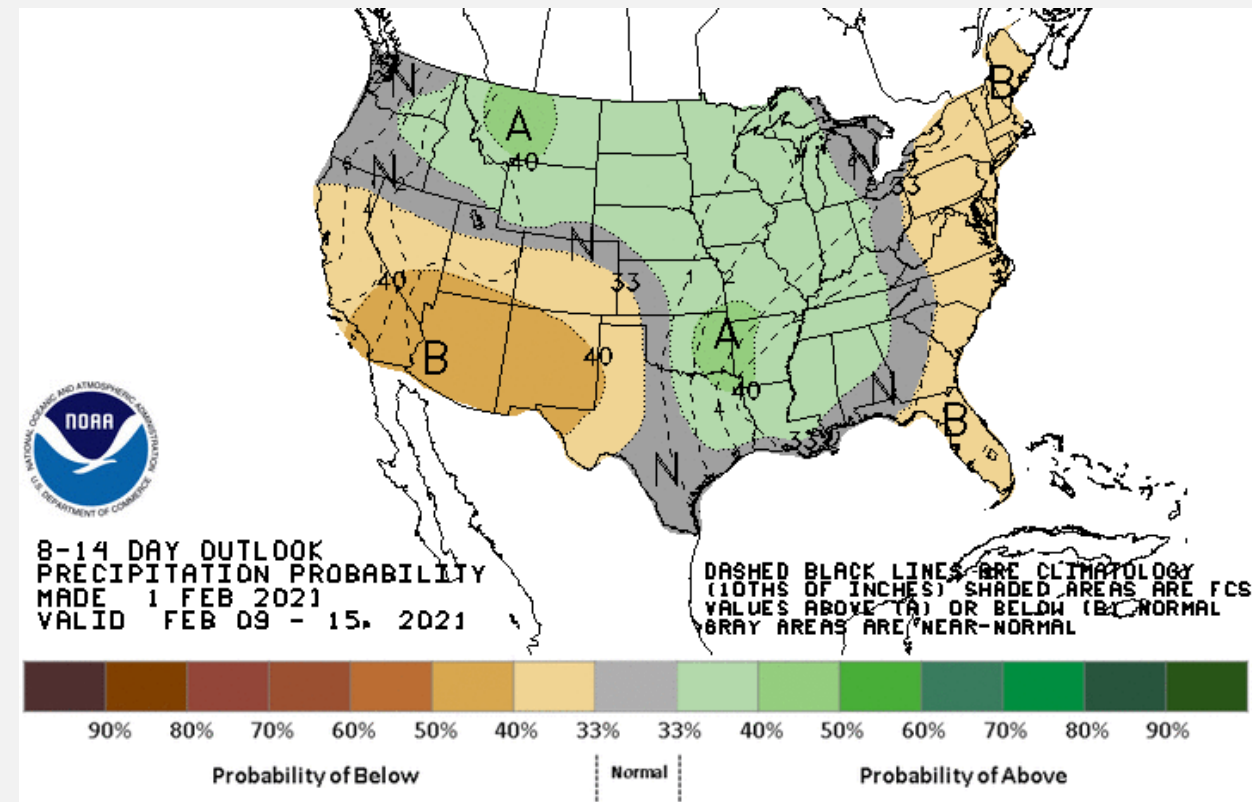
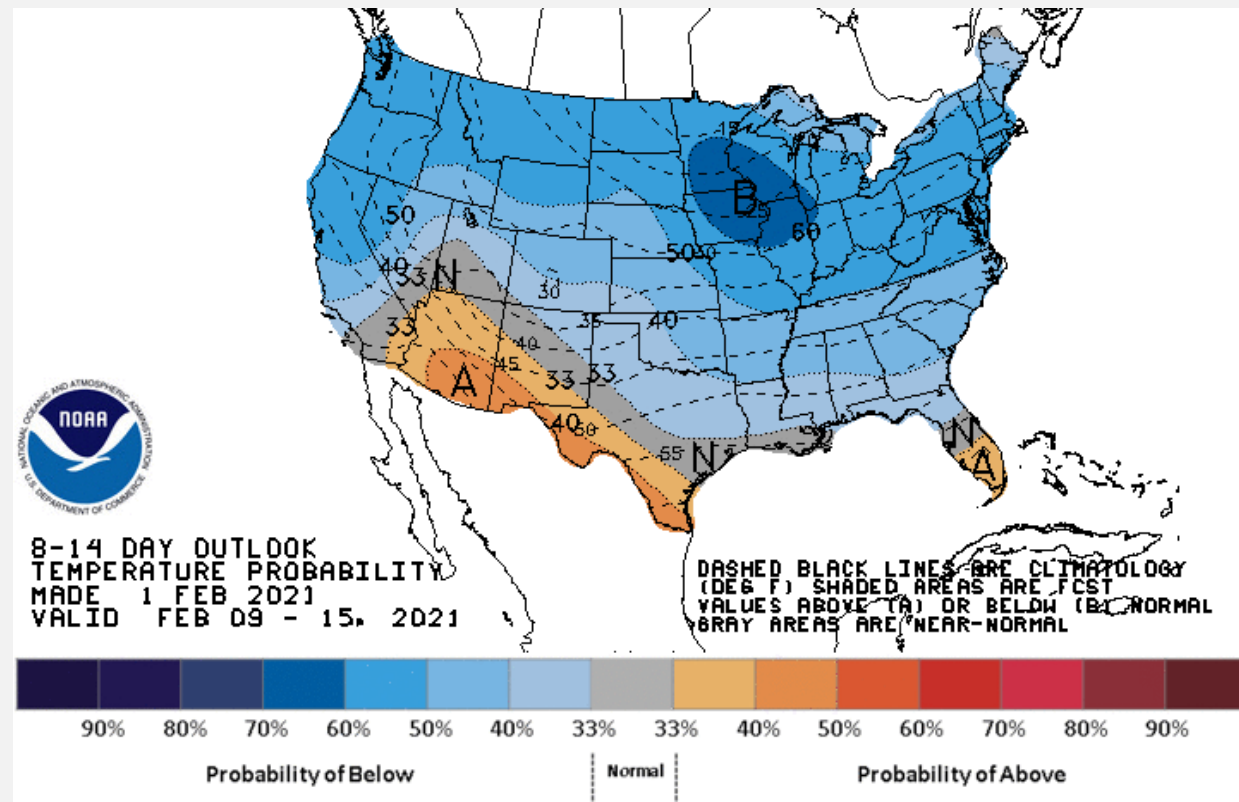
First week of Feb |  
- **Light precipitation**  
**across Nebraska.**



# Short-term outlook

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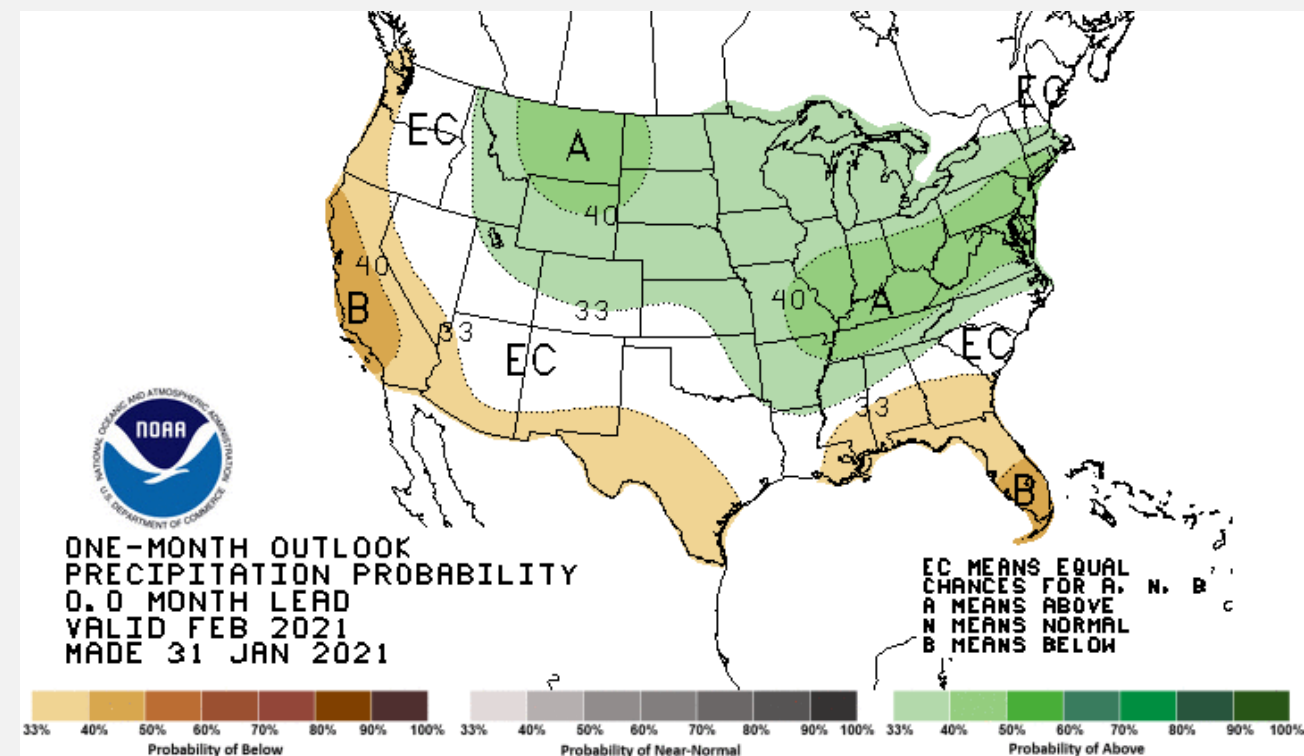
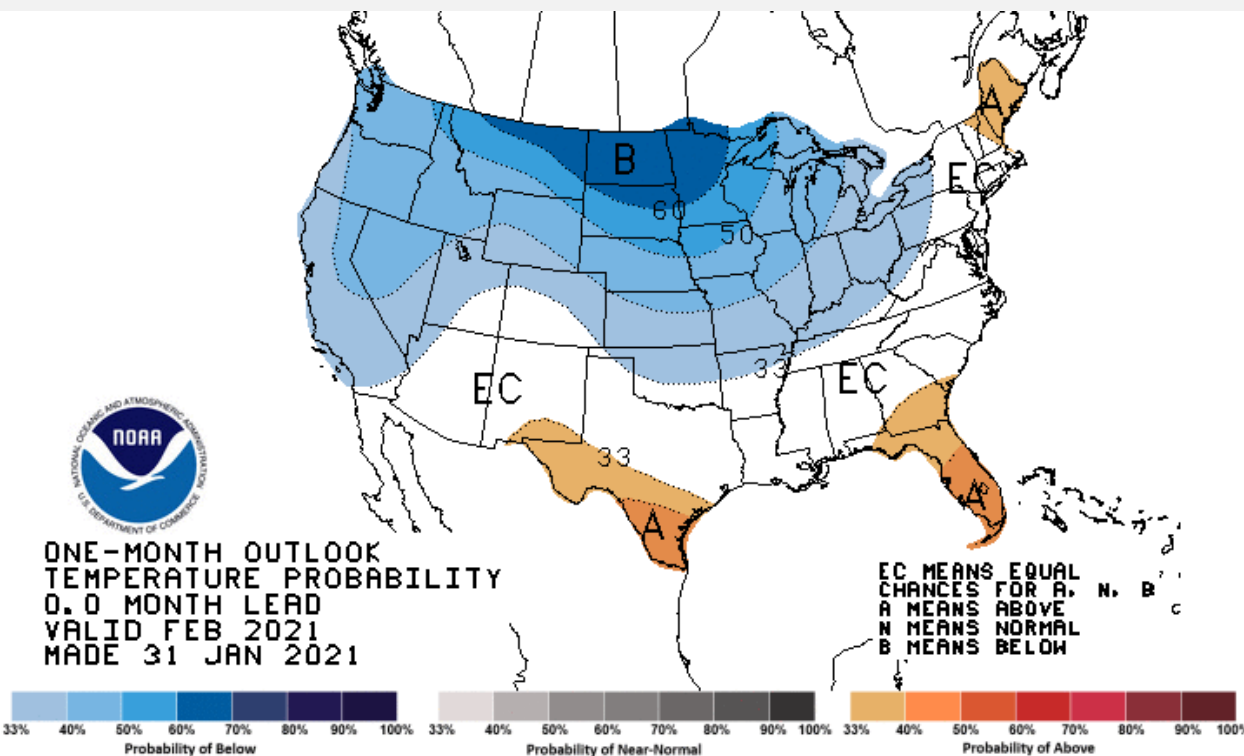
- Entering an active weather pattern for early February.



# February outlook

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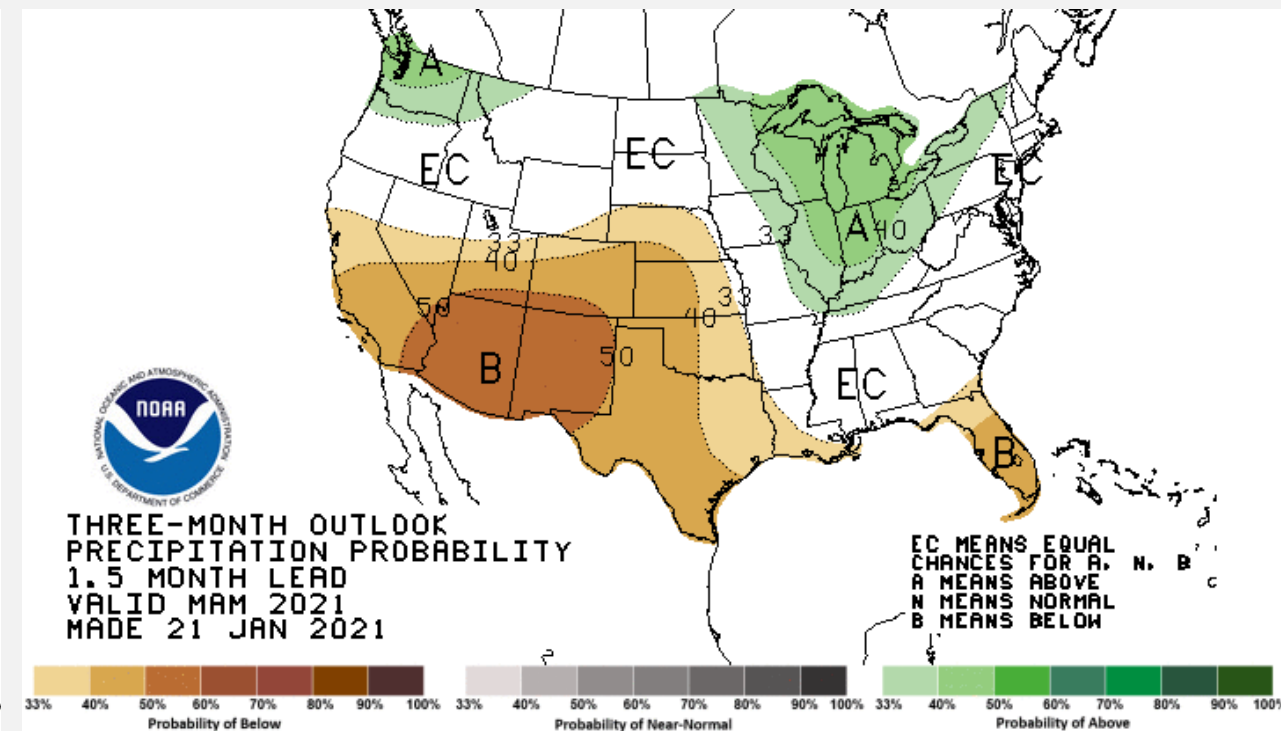
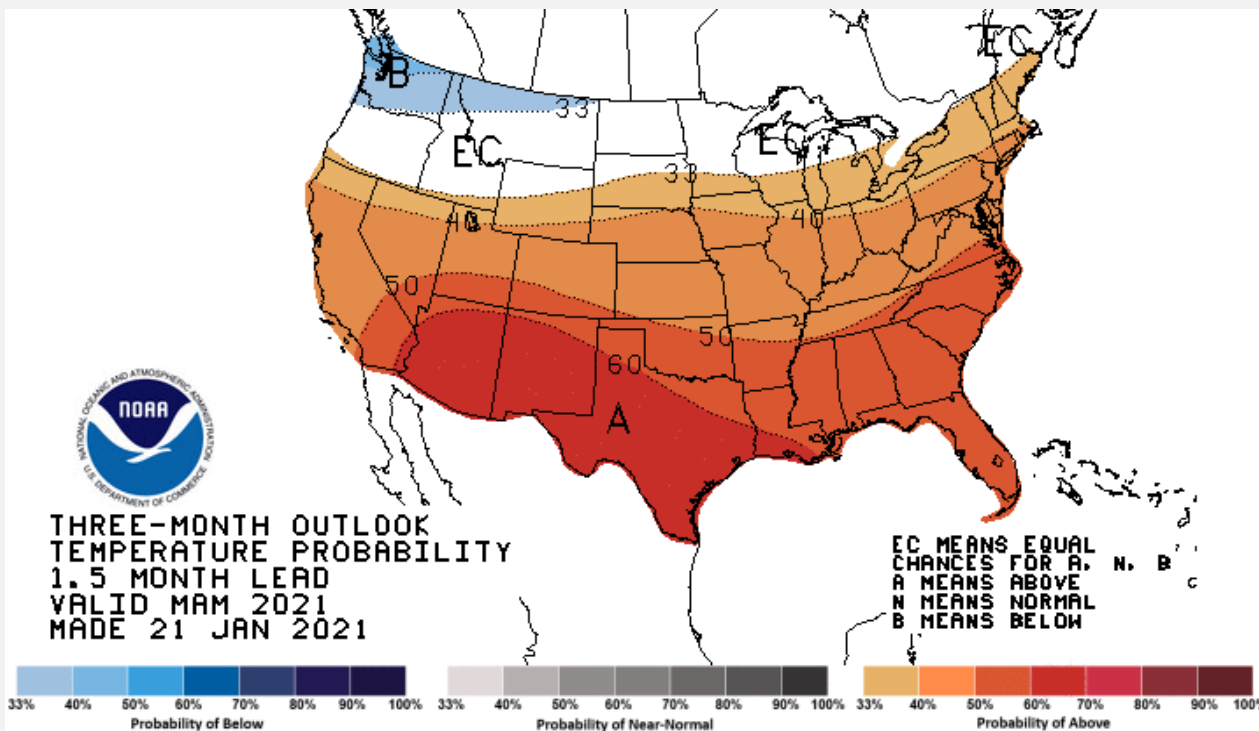
- Cooler and wetter than normal signal for Nebraska and much of the U.S.
- Climatologically, this is our snowiest month.



# Mar-Apr-May outlook

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- Dry signal creeping into Nebraska. Warmer than normal temperatures.

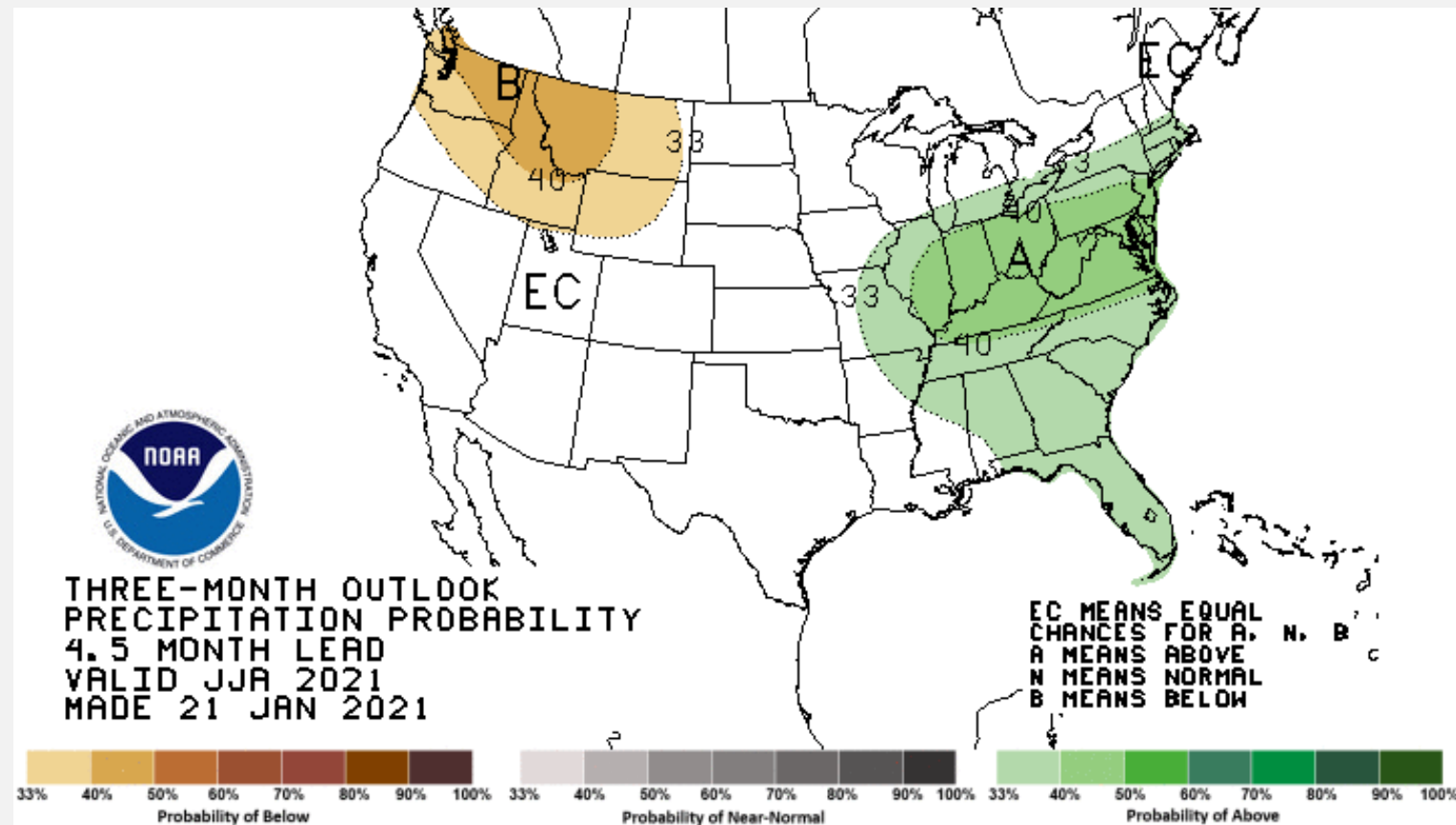




# Further into 2021

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- Warmer than normal temperatures overall.
- Precipitation signal keeps Nebraska in the “equal chances” category.
- Wet to the east and dry to our west.

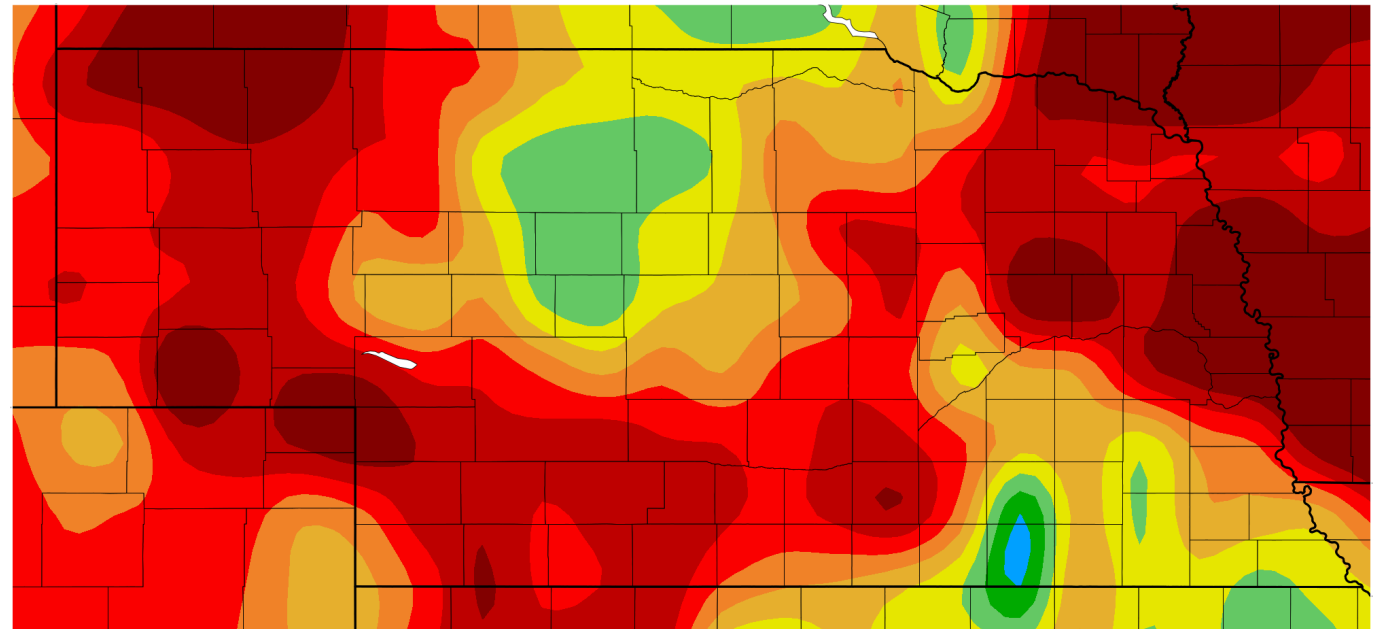


# Precipitation deficits

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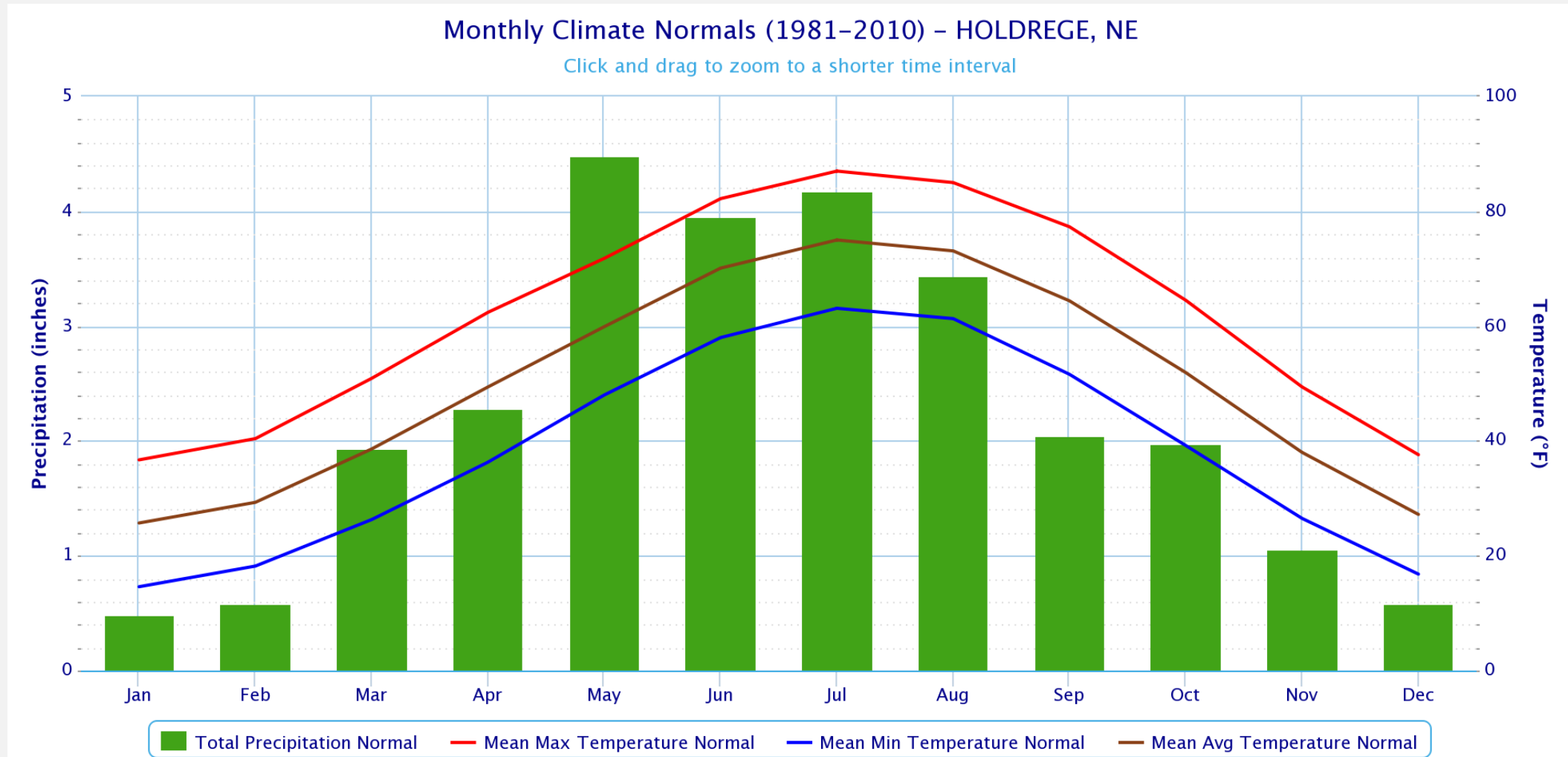
- **Deficits over the past 9 months are in the 5 to 8 inch range.**
- **Some areas of Nebraska are faring better.**

Departure from Normal Precipitation (in)  
4/30/2020 – 1/29/2021



# Precipitation climatology

- **‘Normal’ Feb – May precipitation provides 8.5 inches.**



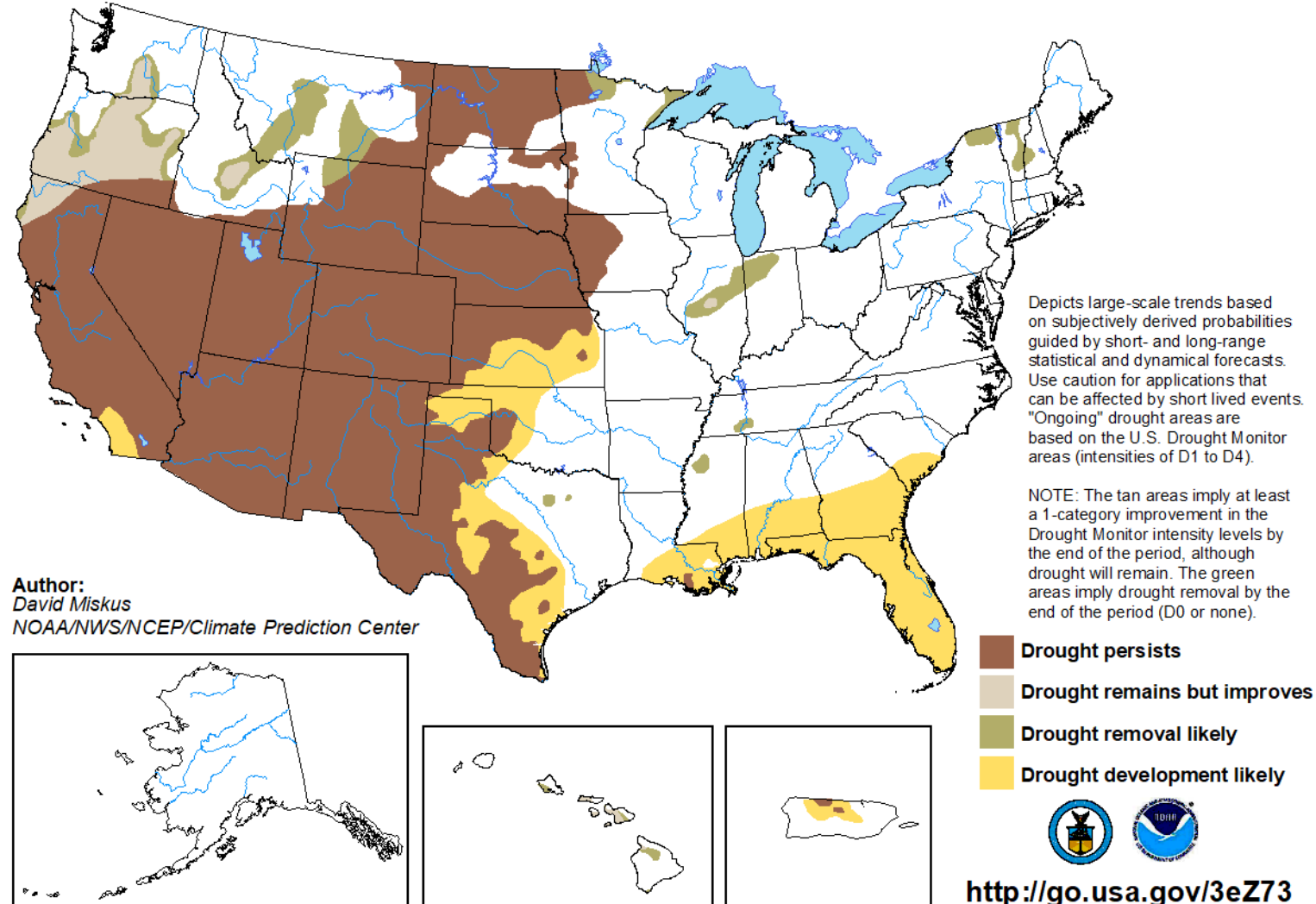
# Drought outlook

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- Persistence across Nebraska and much of the region

## U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for January 21 - April 30, 2021  
Released January 21





# Outlook summary

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- **Widespread cool and wet signal for February (Nebraska has cooled significantly over the past 30 years during Feb).**
- **Winter signal is less clear for Nebraska. Seasonal conditions dependent on storm track.**
- **With La Niña weakening, ridge in western U.S. should wane, allowing for better moisture chances during spring.**
- **Drought conditions likely won't see major improvements in Nebraska. Expect to start 2021 growing season with low soil moisture reserves.**



# Questions

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**Martha Shulski:** mshulski3@unl.edu, 402-472-6711







NSCO.UNL.EDU



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E | NSCO.UNL.EDU

P | 402.472.5206

 @MSHULSKI3

