



# Climate Update

Peter Goble  
Colorado Climate Center

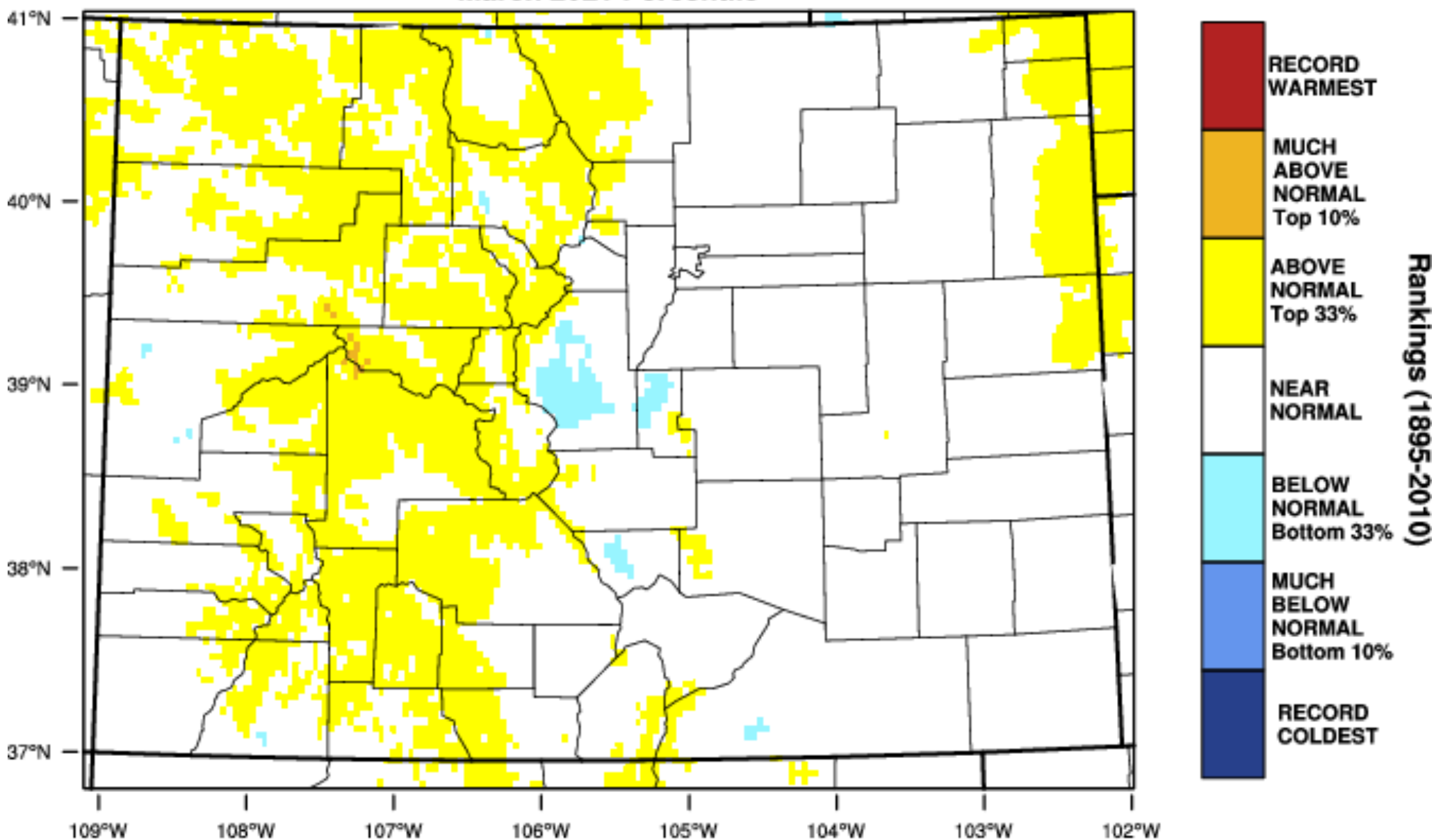
Presented to  
Water Availability Task Force  
April 20, 2021  
Denver, CO

# Agenda

- Current seasonal climate conditions update
- Soils and drought update
- Seasonal Forecast info (are we done with snow?)

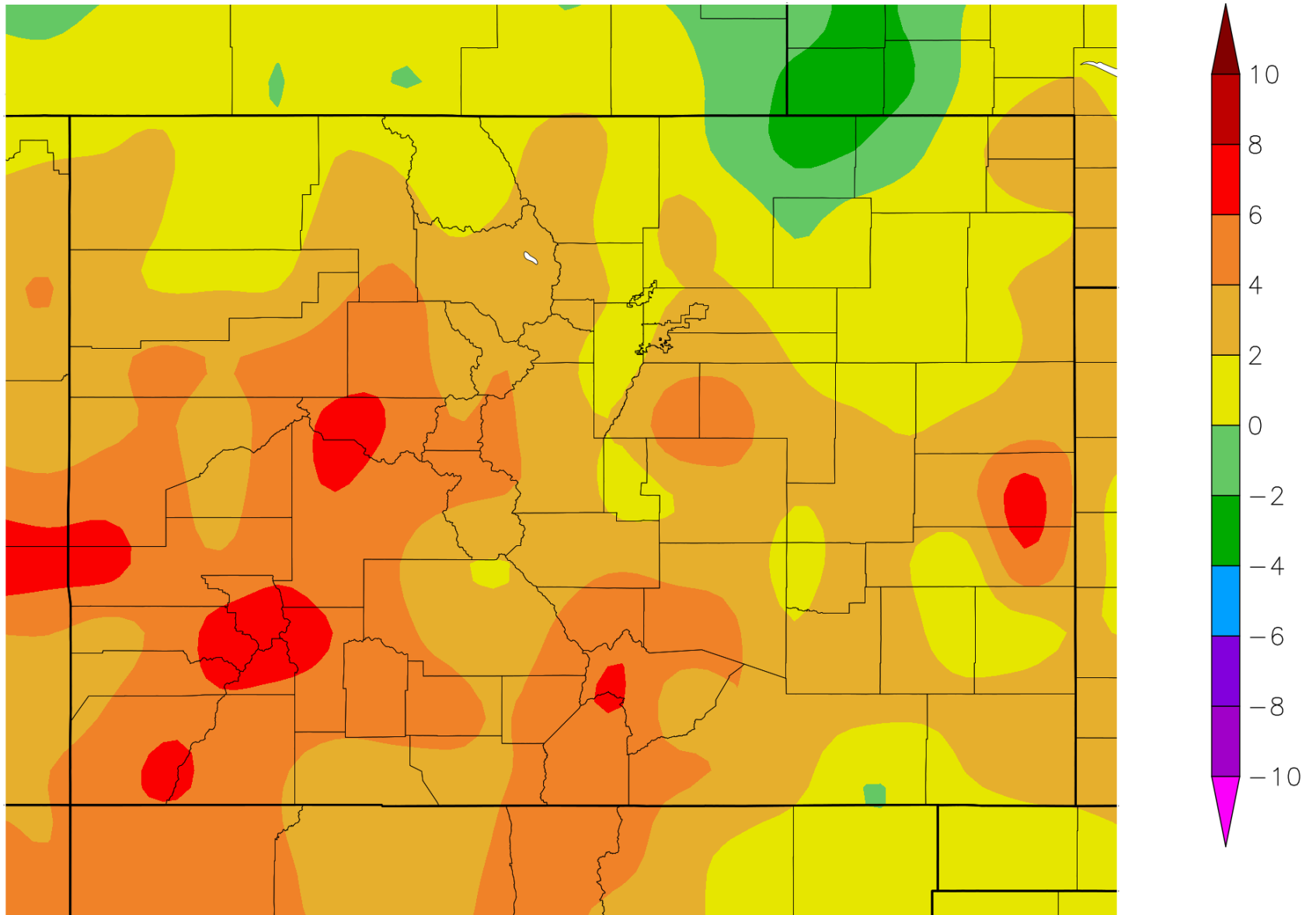
# Colorado - Mean Temperature

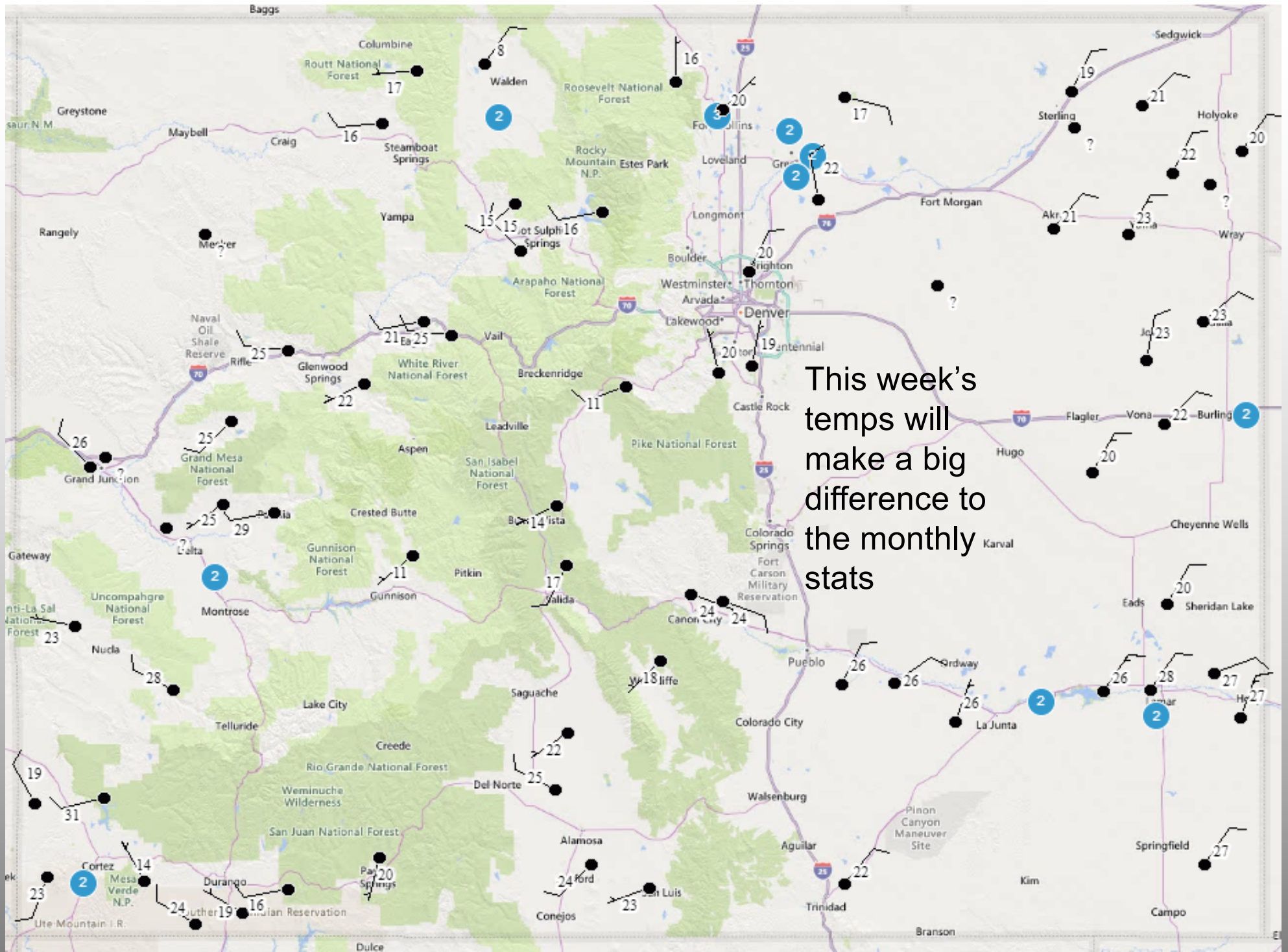
## March 2021 Percentile



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 APR 2021

# Departure from Normal Temperature (F) 4/1/2021 – 4/15/2021

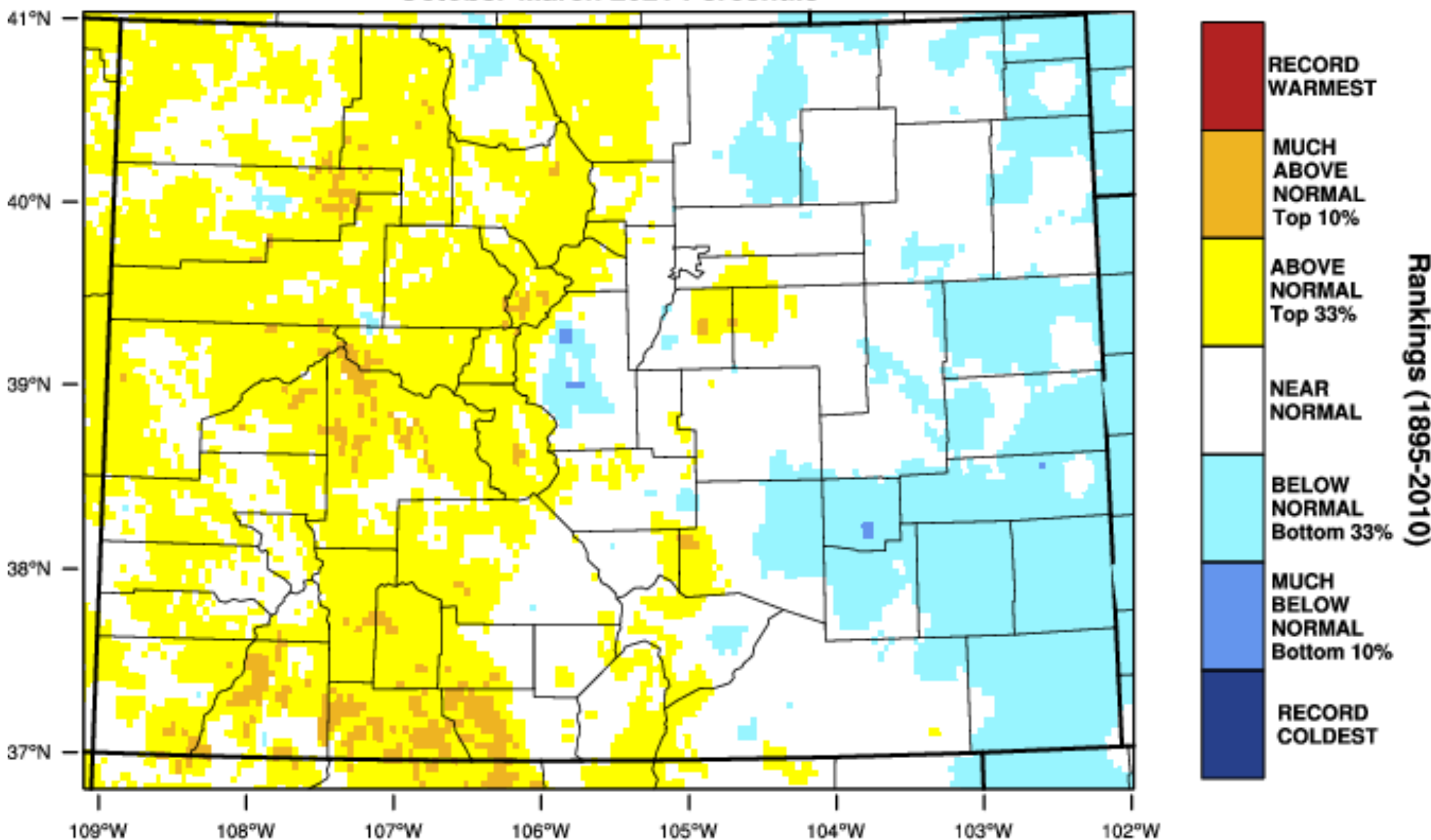




This week's temps will make a big difference to the monthly stats

# Colorado - Mean Temperature

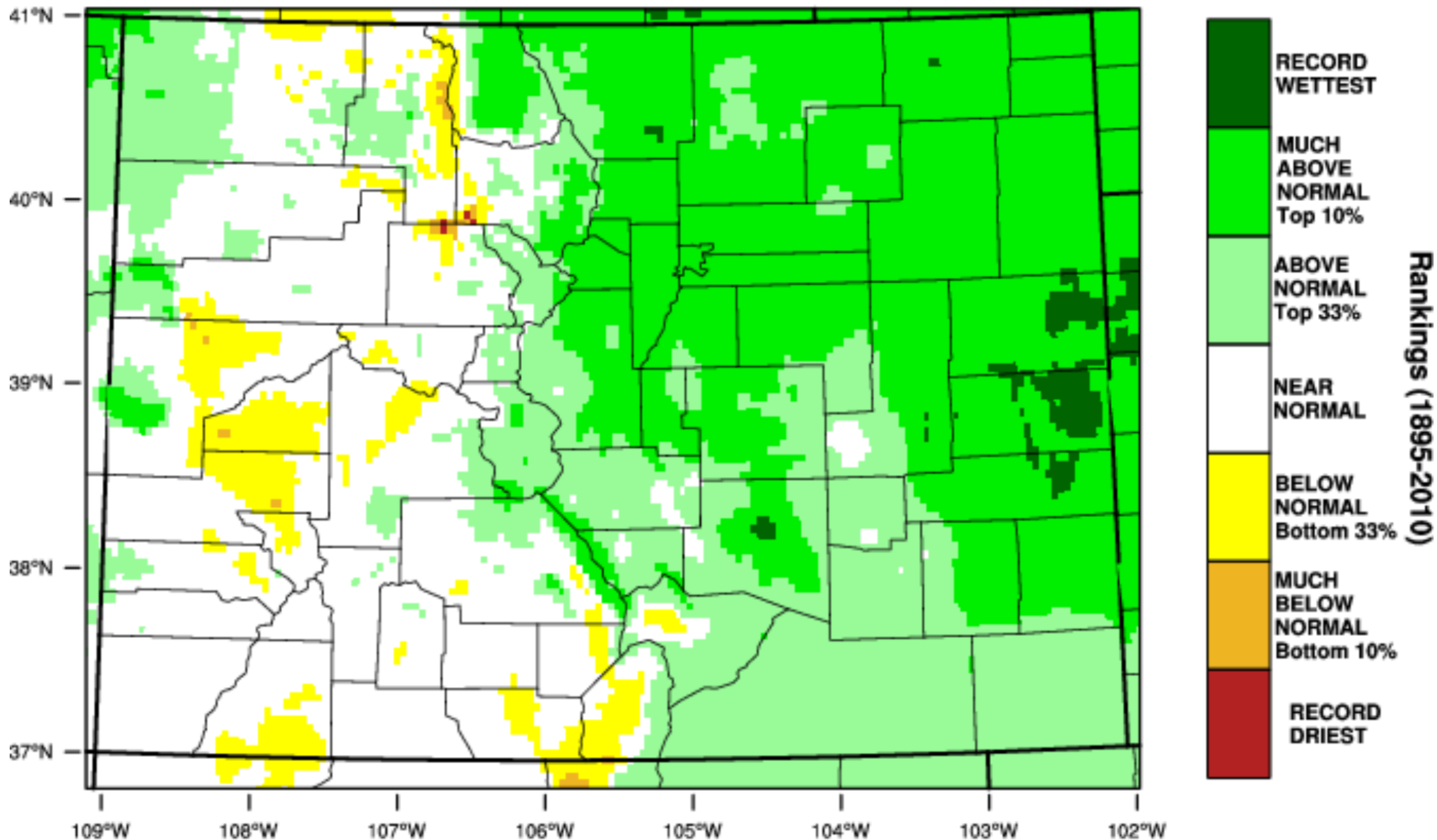
## October-March 2021 Percentile



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 APR 2021

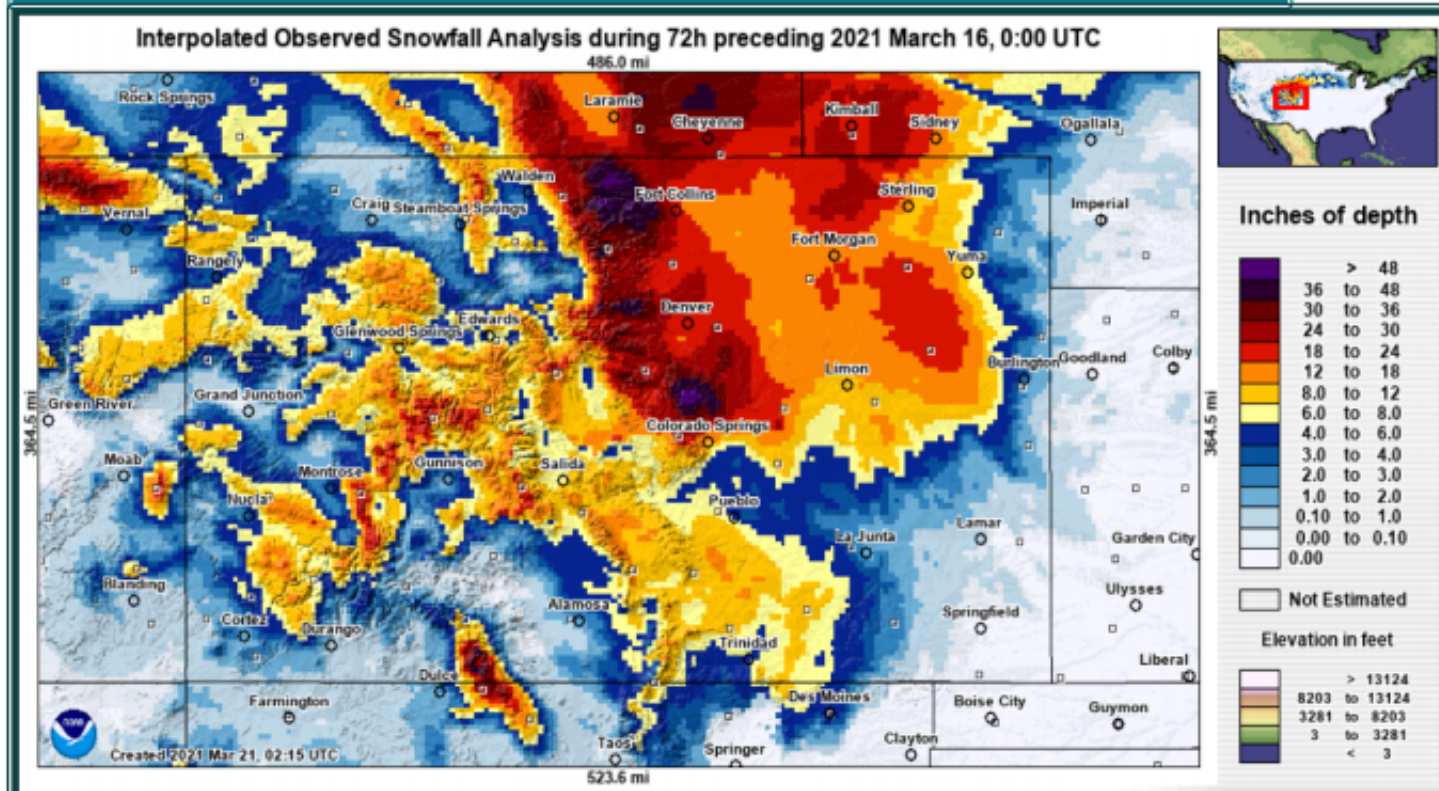
# Colorado - Precipitation

## March 2021 Percentile



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 APR 2021

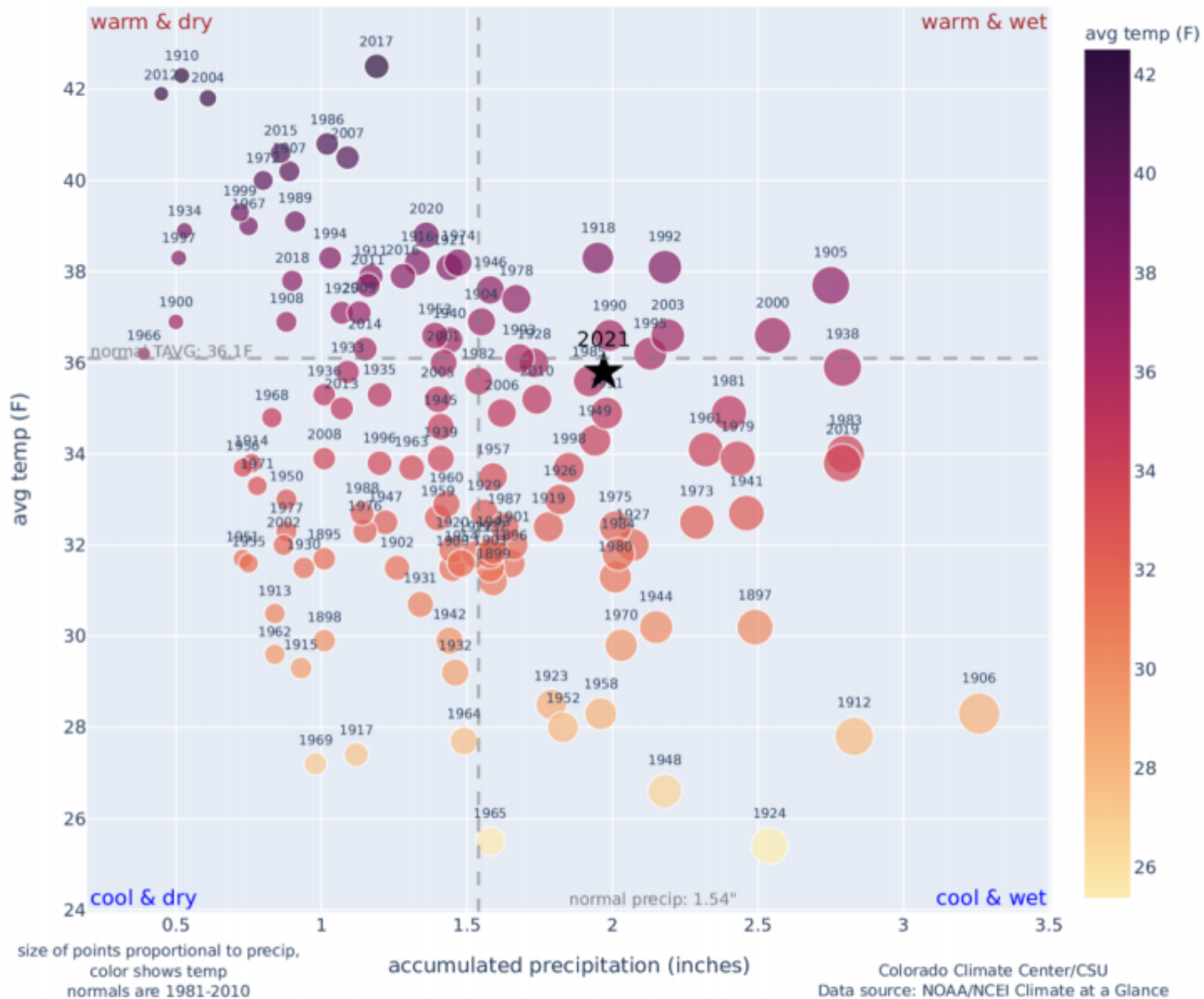
# March 2021 Epic Snowstorm



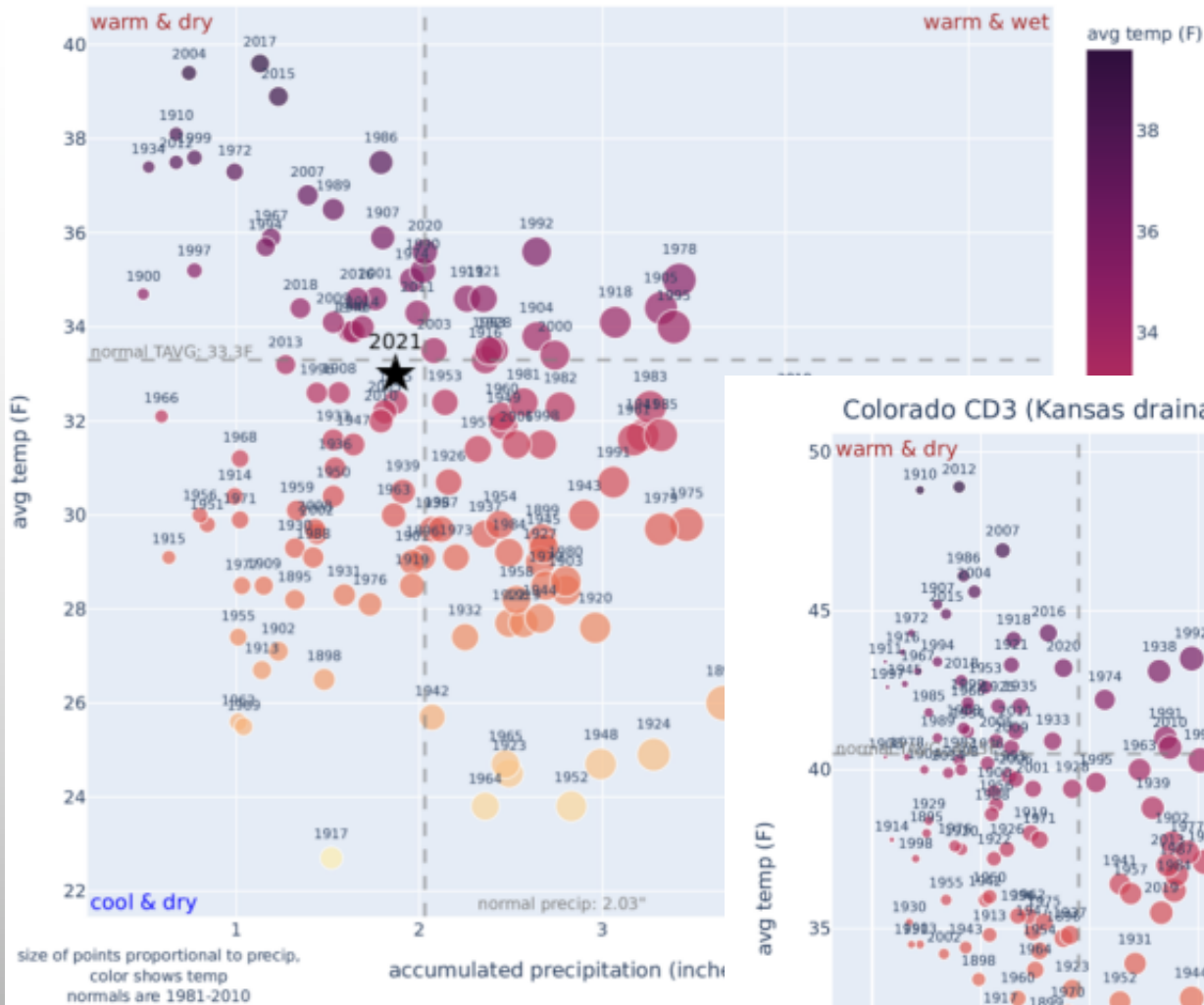
From March 13-15 widespread snow fell across most of the state, with the largest amounts in the northern Front Range mountains and the urban corridor. The state's largest total was at Buckhorn Mountain, which reported 48 inches of snowfall!



# Colorado average temperature and precipitation, March



Colorado CD2 (Colorado drainage) average temperature and precipitation, March



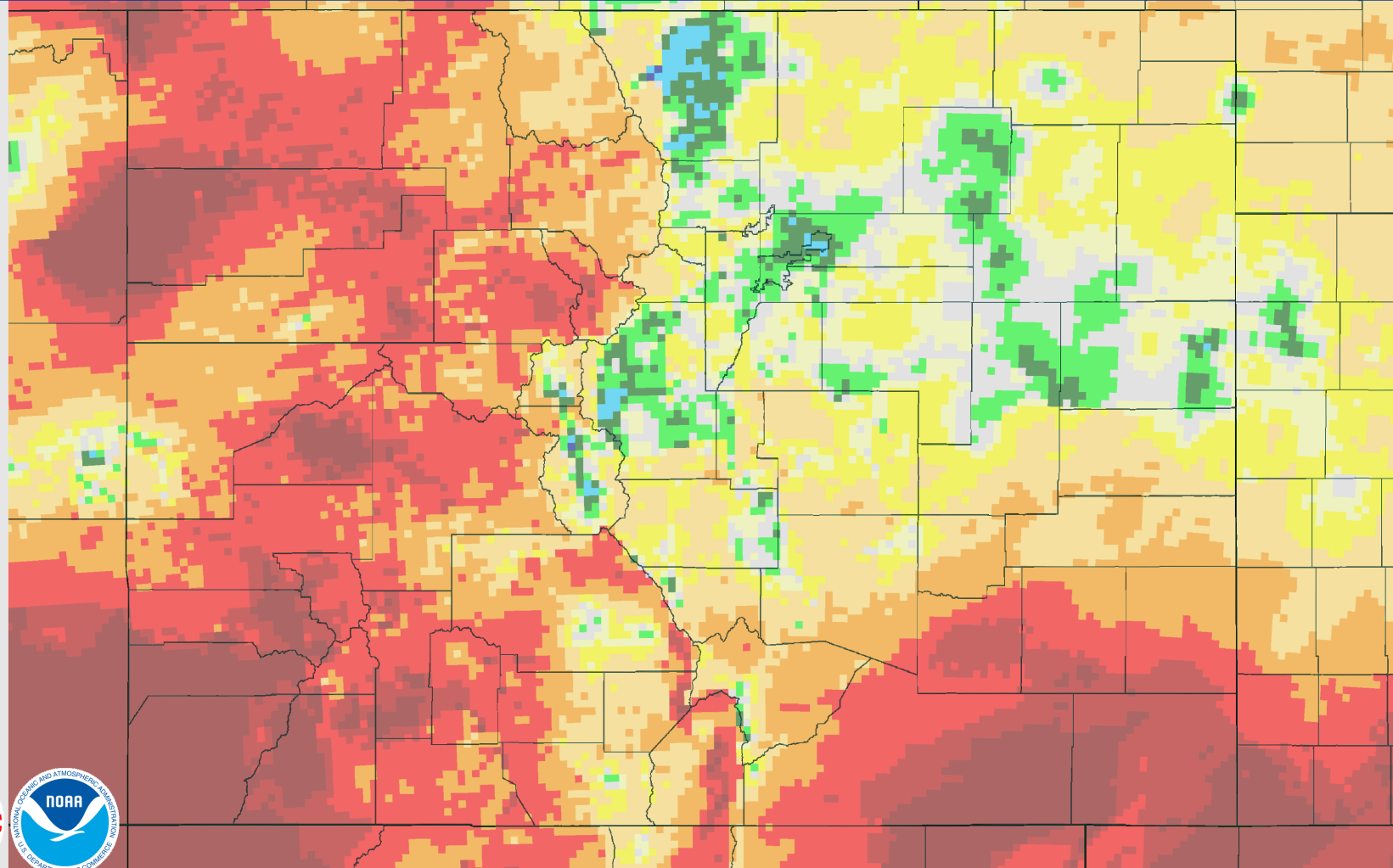
Colorado CD3 (Kansas drainage) average temperature and precipitation, March



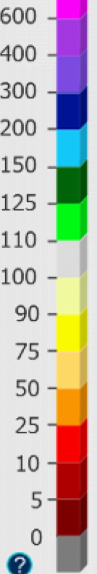
# April 20, 2021 Month to Date Percent Precipitation

Created on: April 20, 2021 - 13:46 UTC

Valid on: April 20, 2021 12:00 UTC

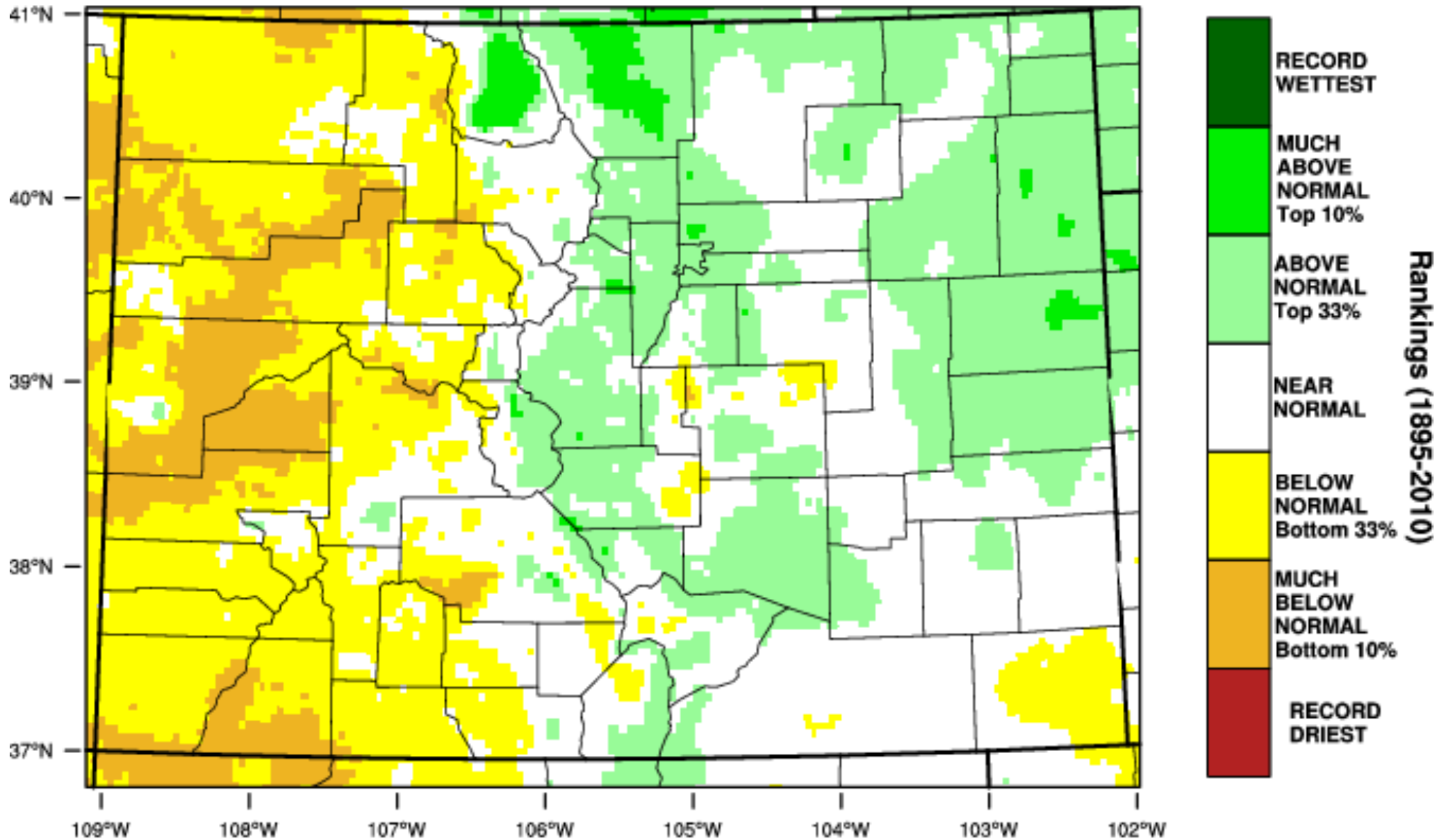


Percent



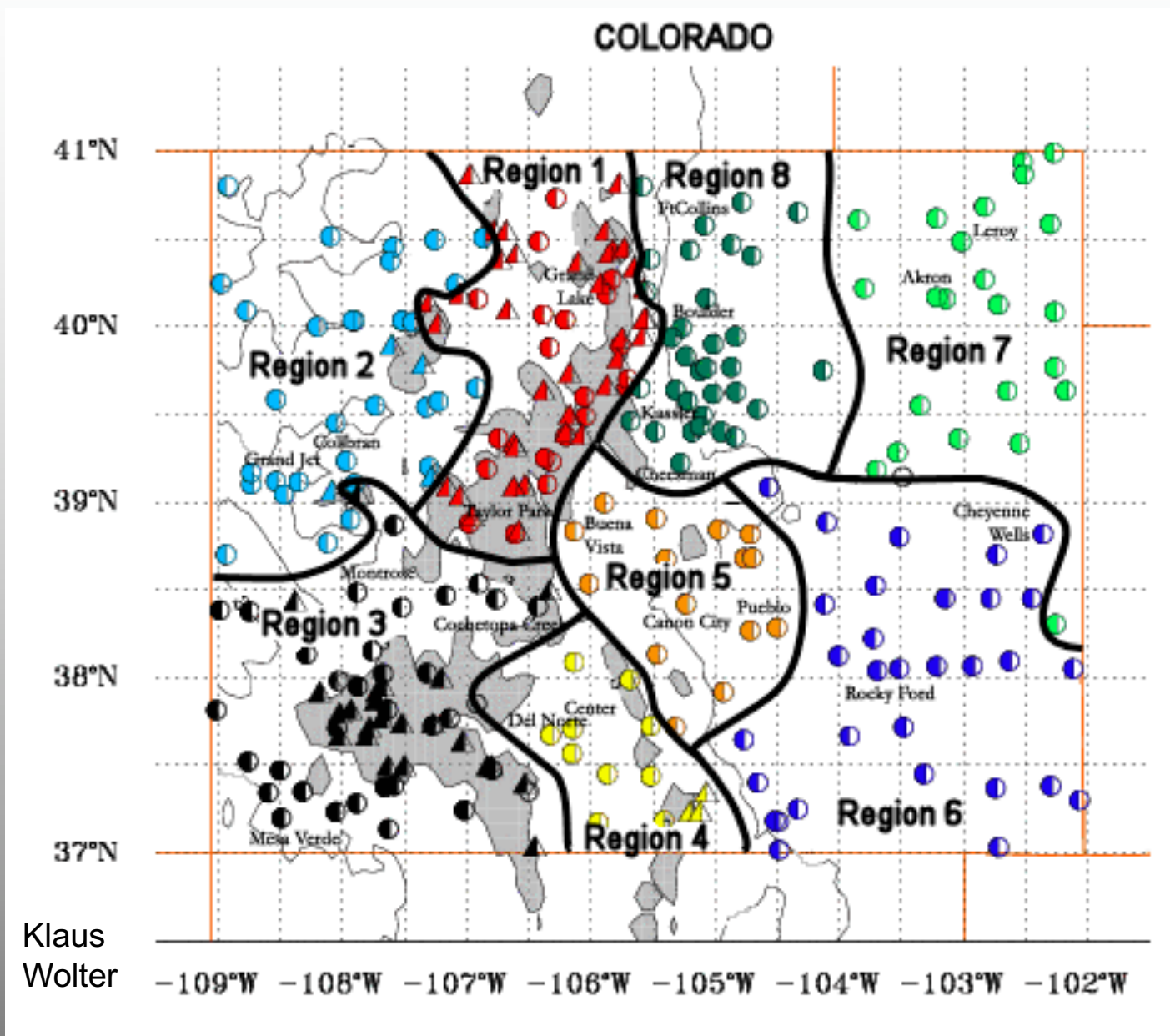
# Colorado - Precipitation

## October-March 2021 Percentile

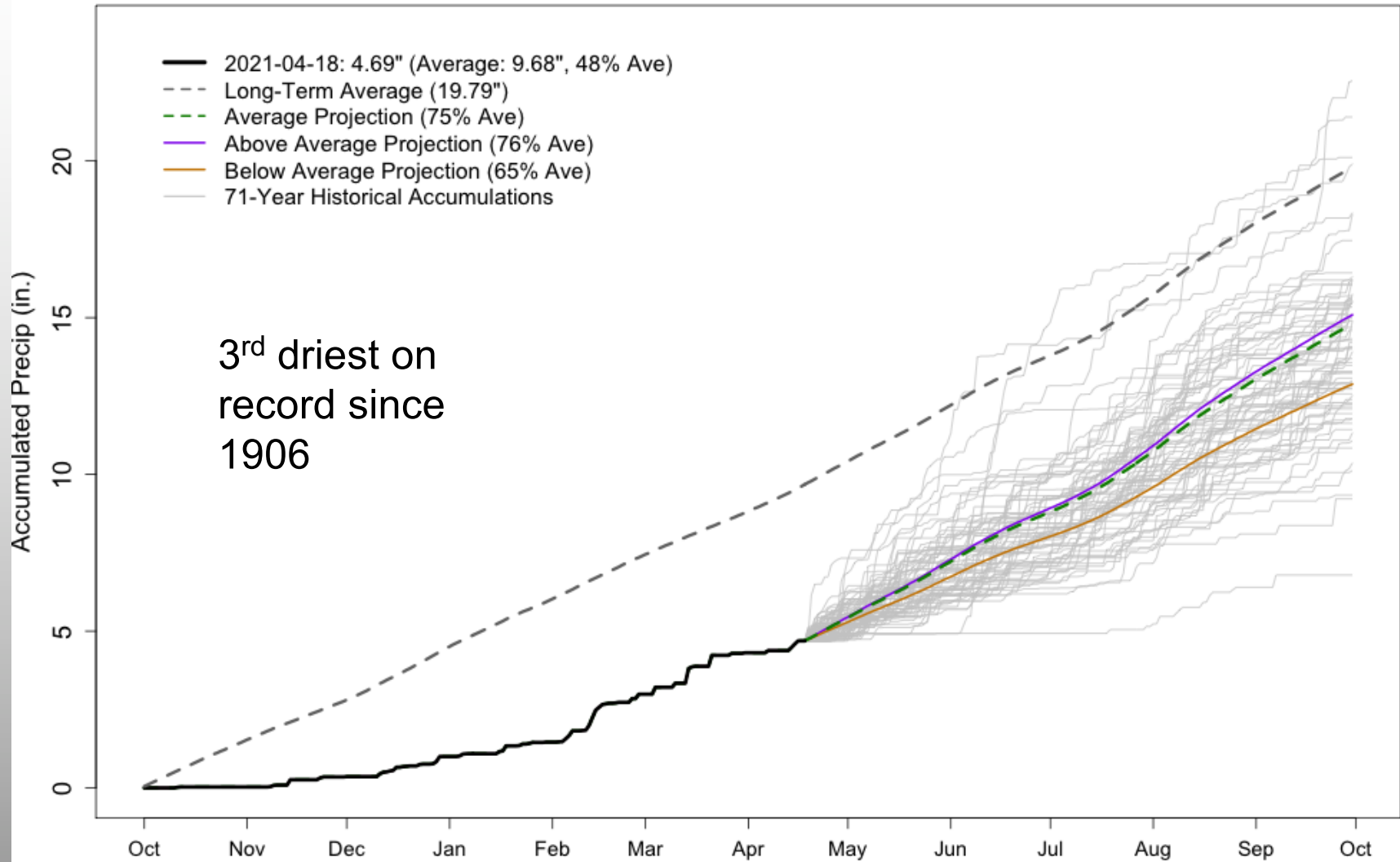


WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 APR 2021

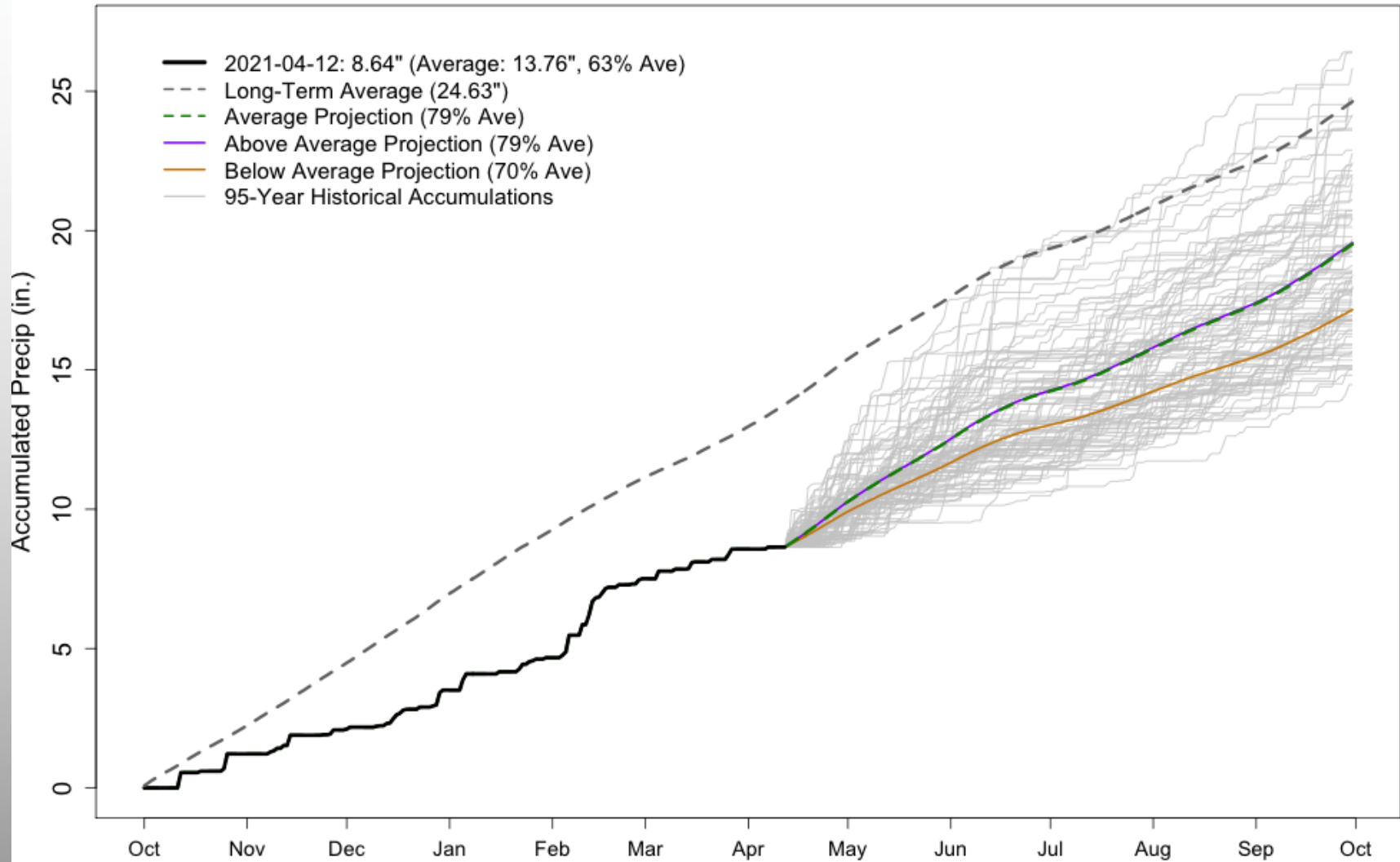
# Climate divisions defined by Dr. Klaus Wolter of NOAA's Climate Diagnostic Center in Boulder, CO



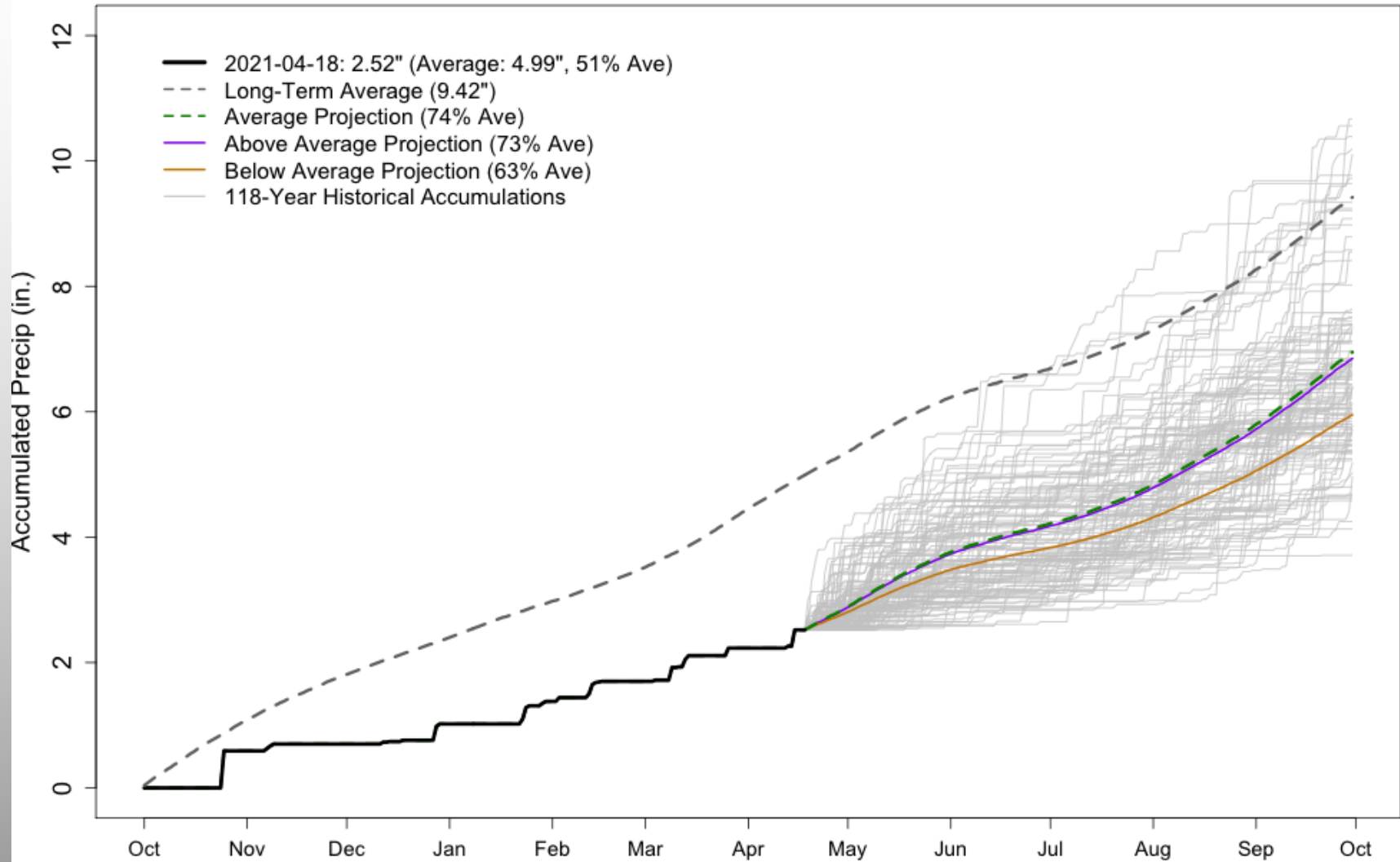
## GRAND LAKE 1 NW WY2021 Precipitation Projections



## STEAMBOAT SPRINGS WY2021 Precipitation Projections

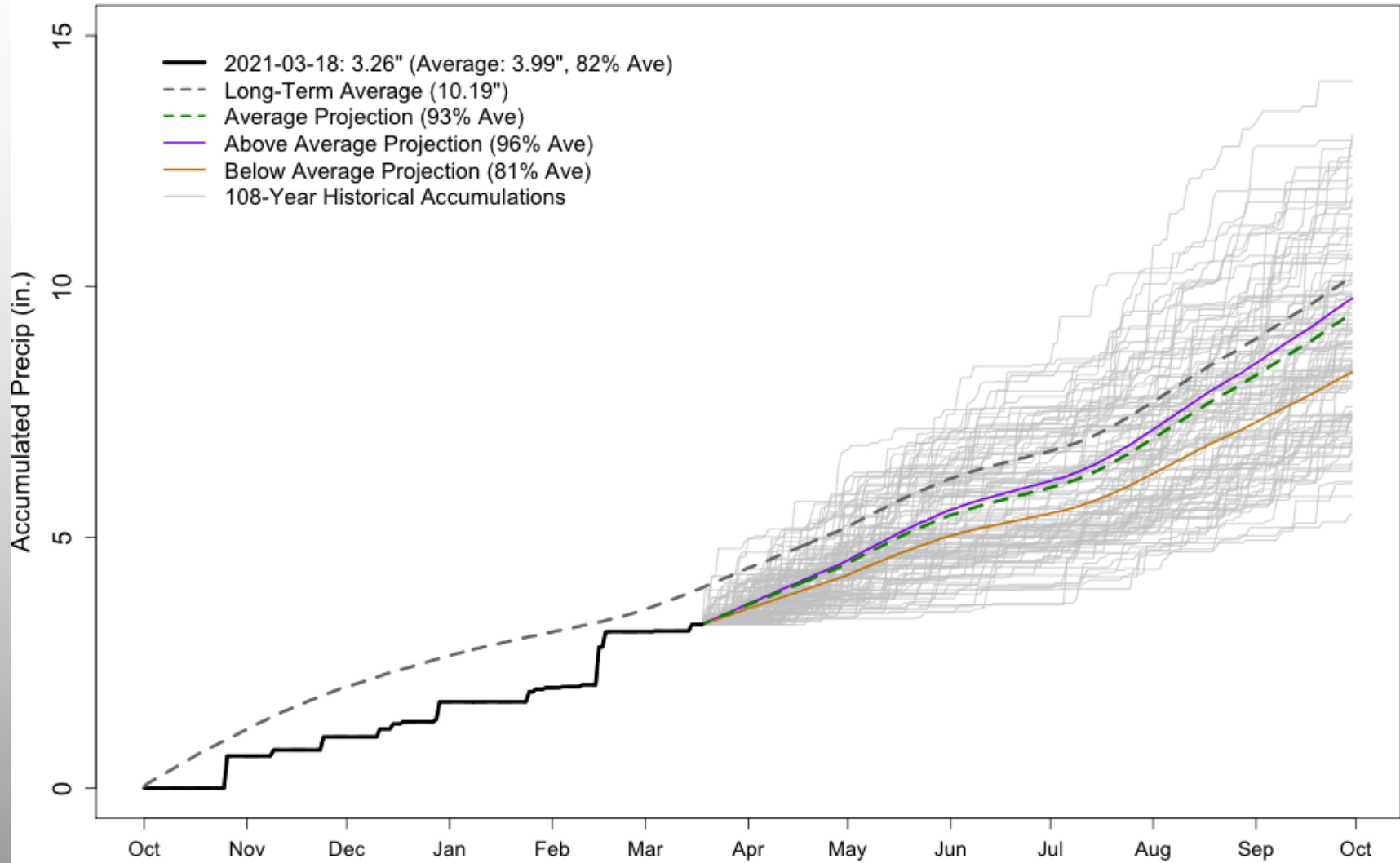


## GRAND JUNCTION WALKER FIELD WY2021 Precipitation Projections

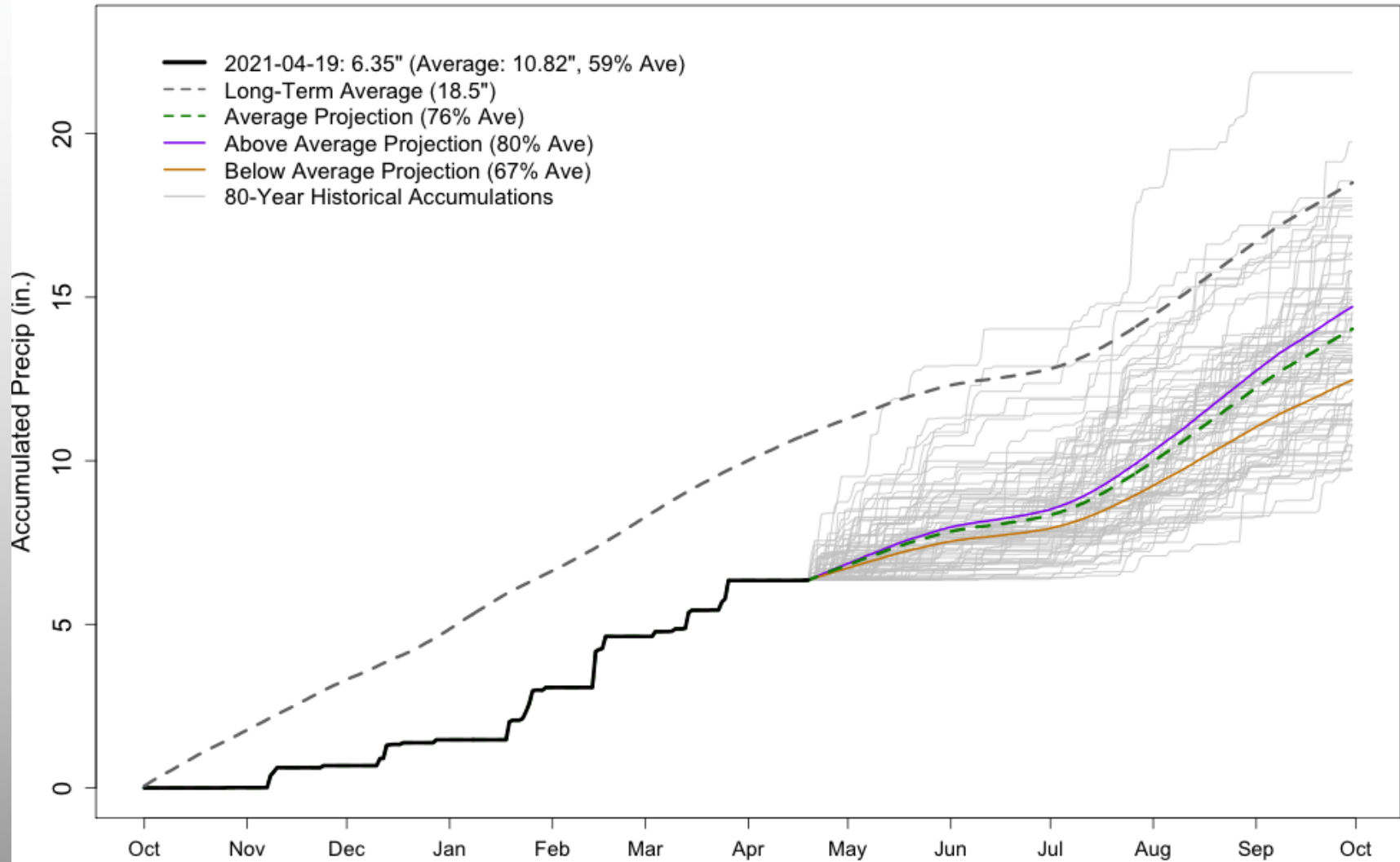




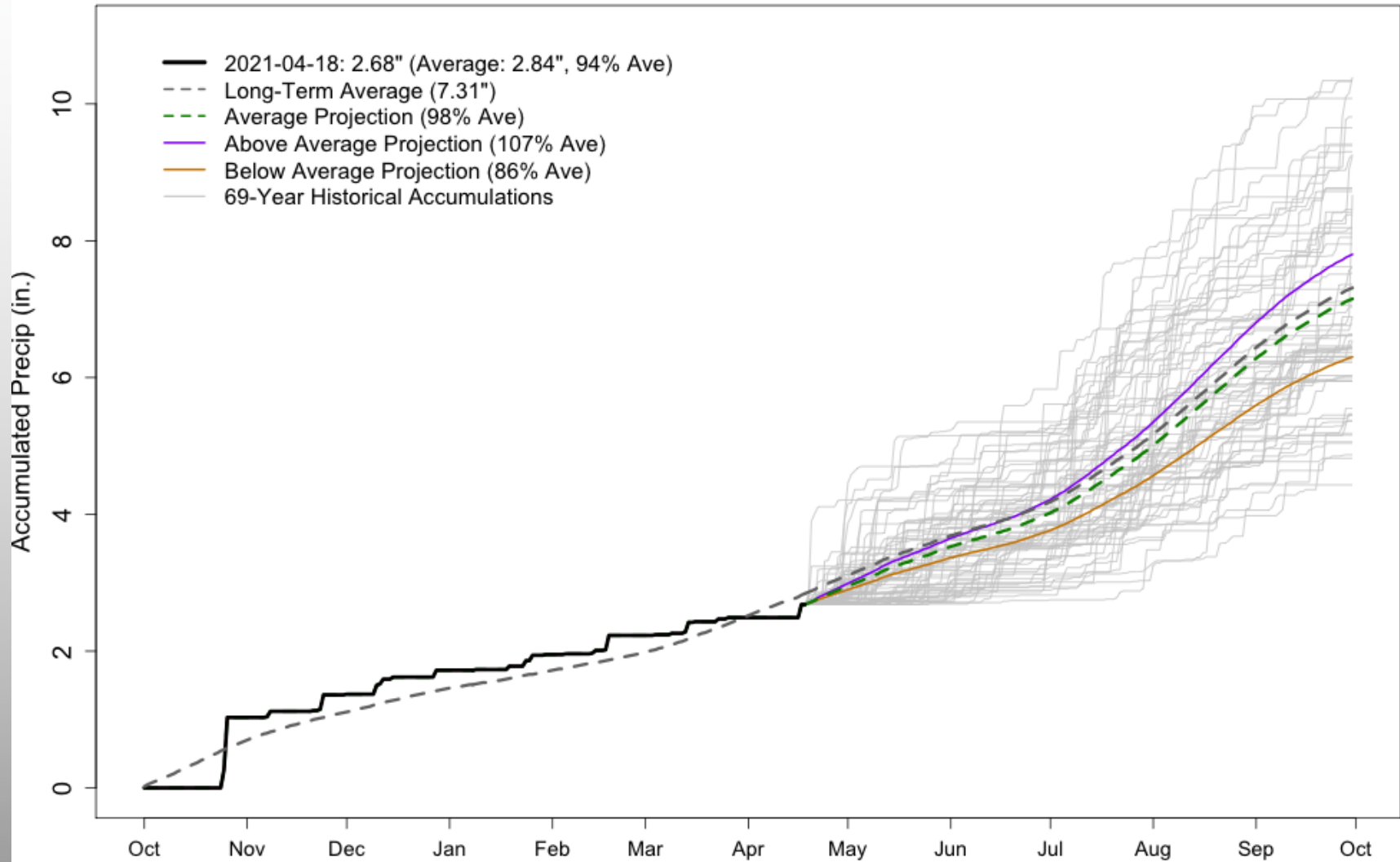
## MONTROSE NO 2 WY2021 Precipitation Projections



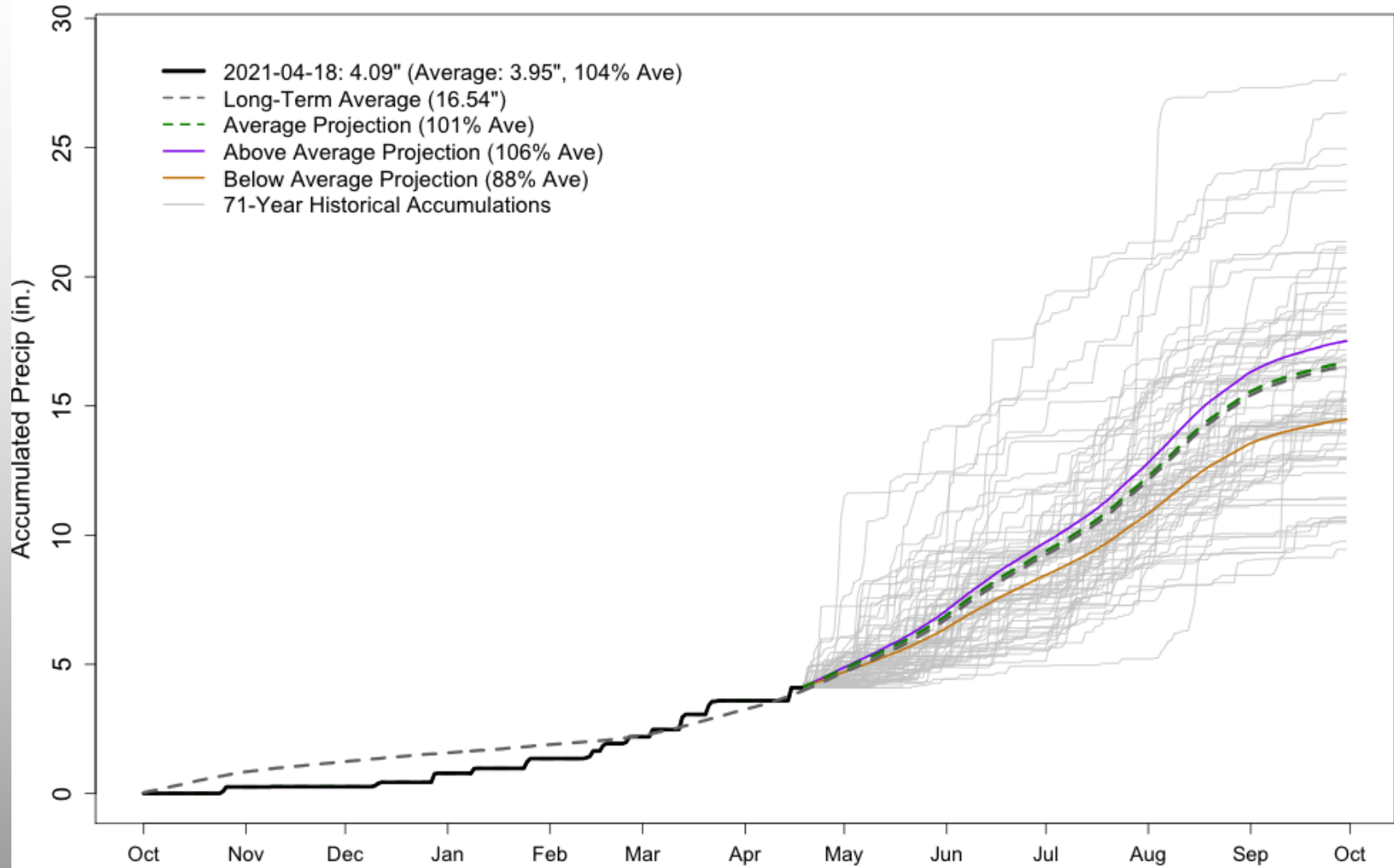
## MESA VERDE NP WY2021 Precipitation Projections



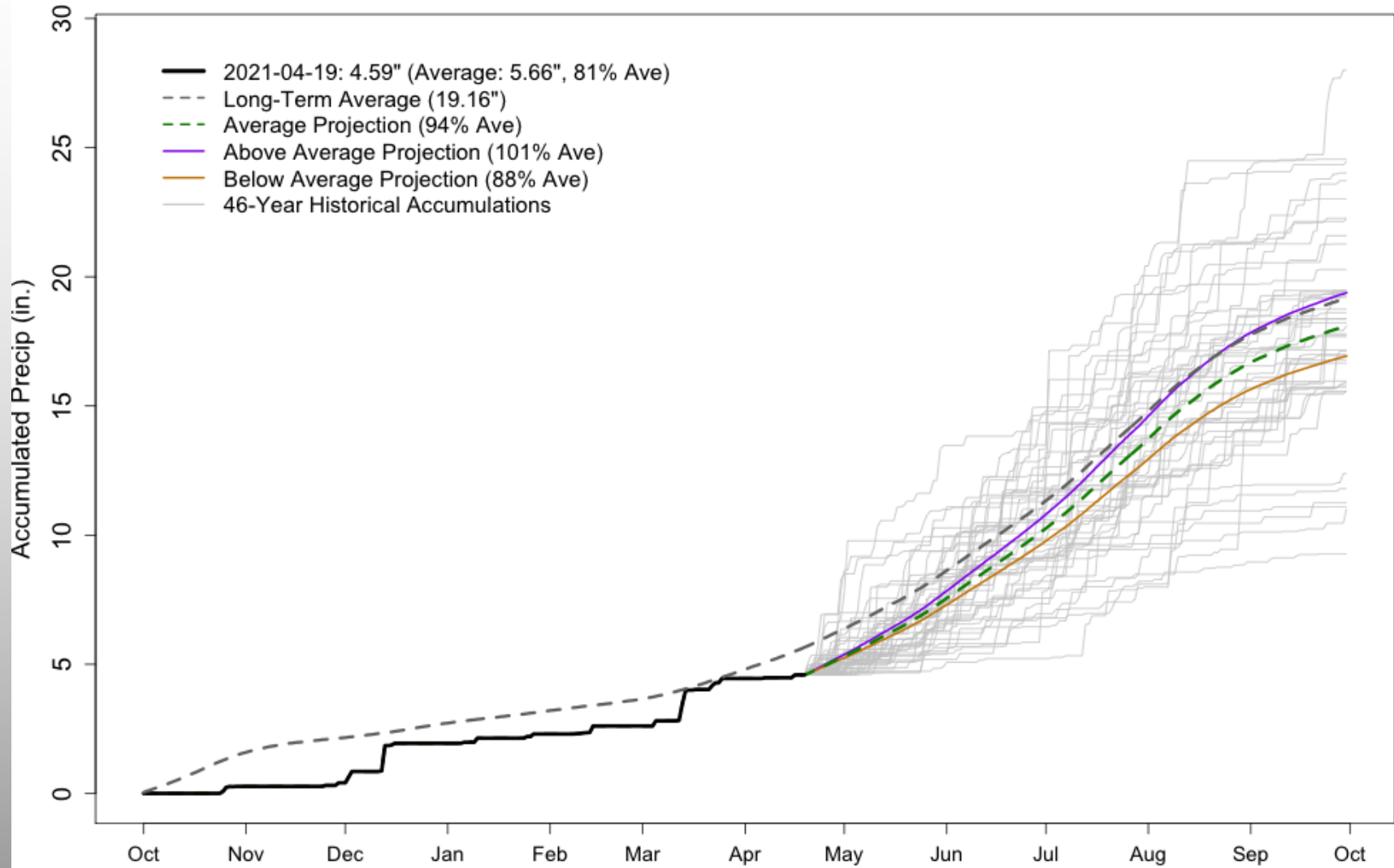
## ALAMOSA-BERGMAN FIELD WY2021 Precipitation Projections



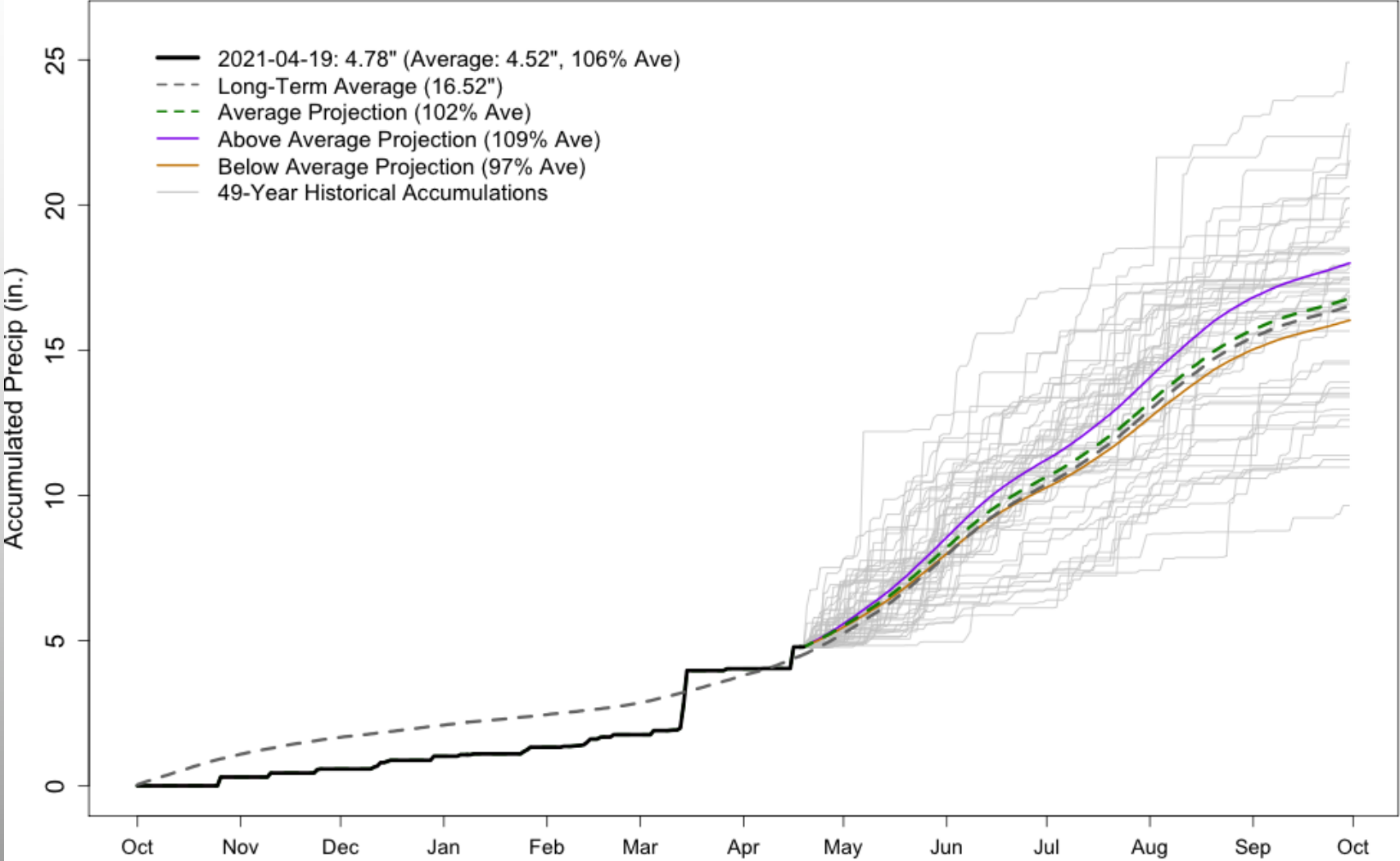
## COLORADO SPRINGS MUNICIPAL AP WY2021 Precipitation Projections



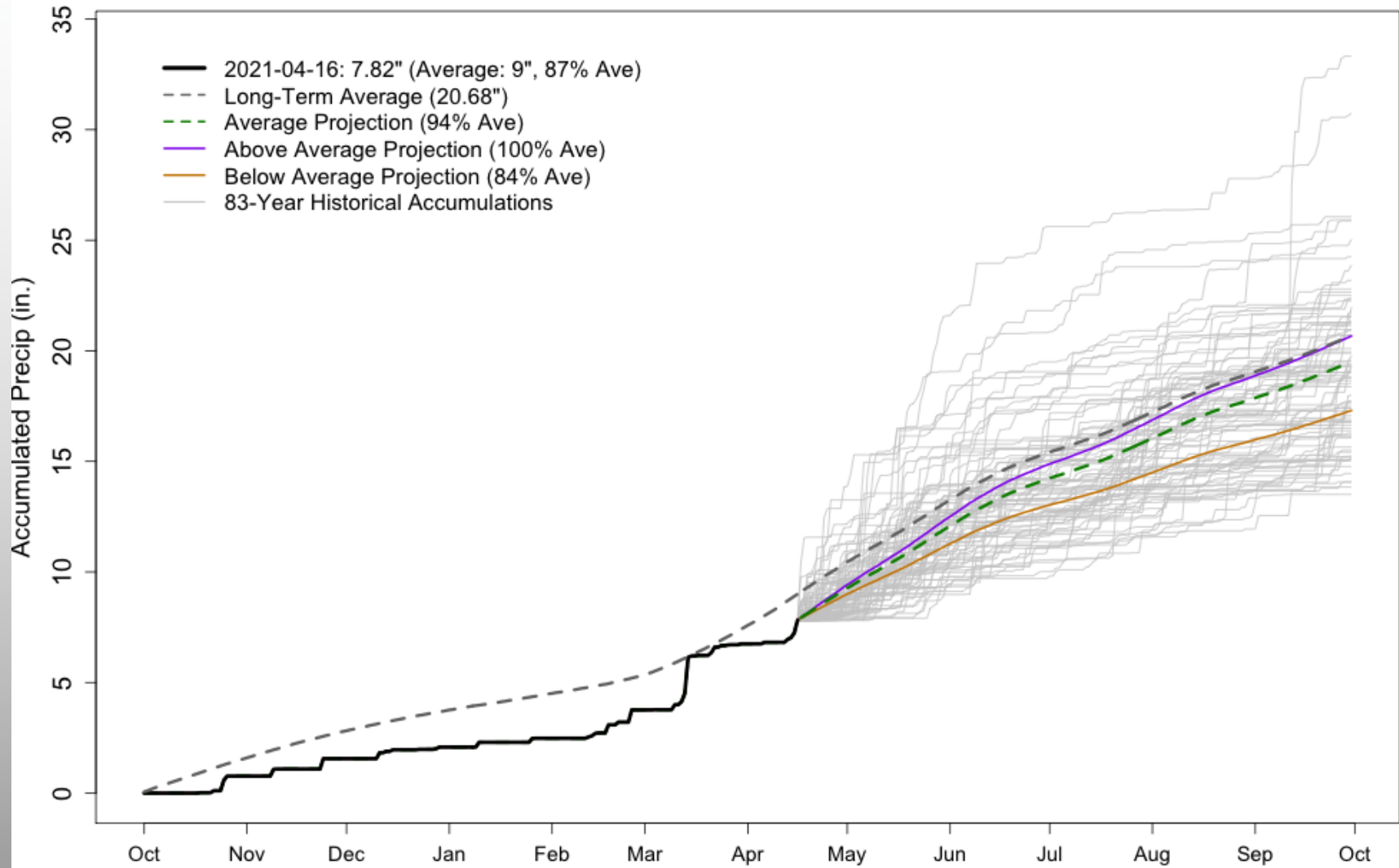
## WALSH 1 W WY2021 Precipitation Projections



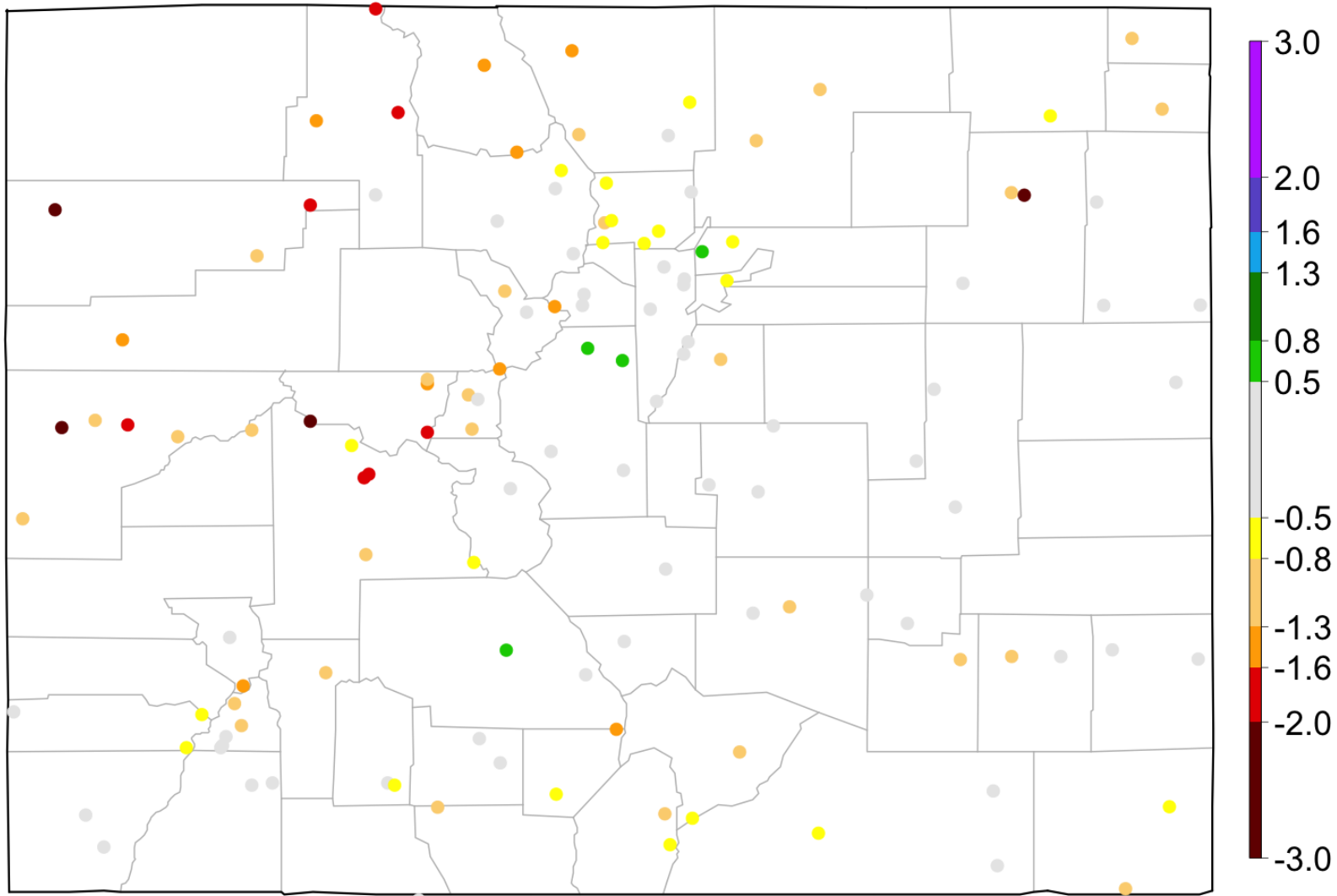
# AKRON 4 E WY2021 Precipitation Projections



## BOULDER WY2021 Precipitation Projections



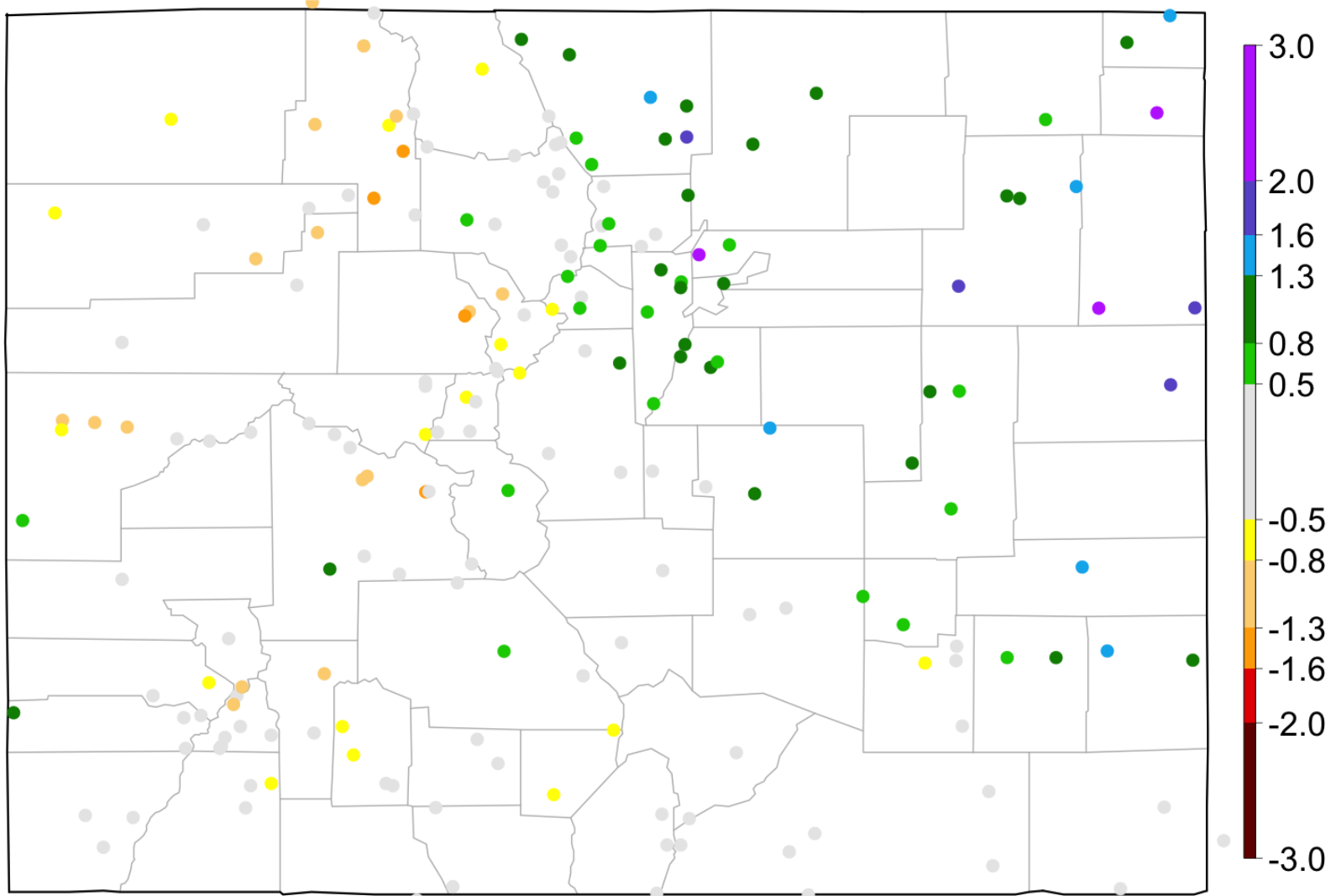
### 30-day SPI: 2021/03/18 - 2021/04/16



Data from High Plains Regional Climate Center and ACIS

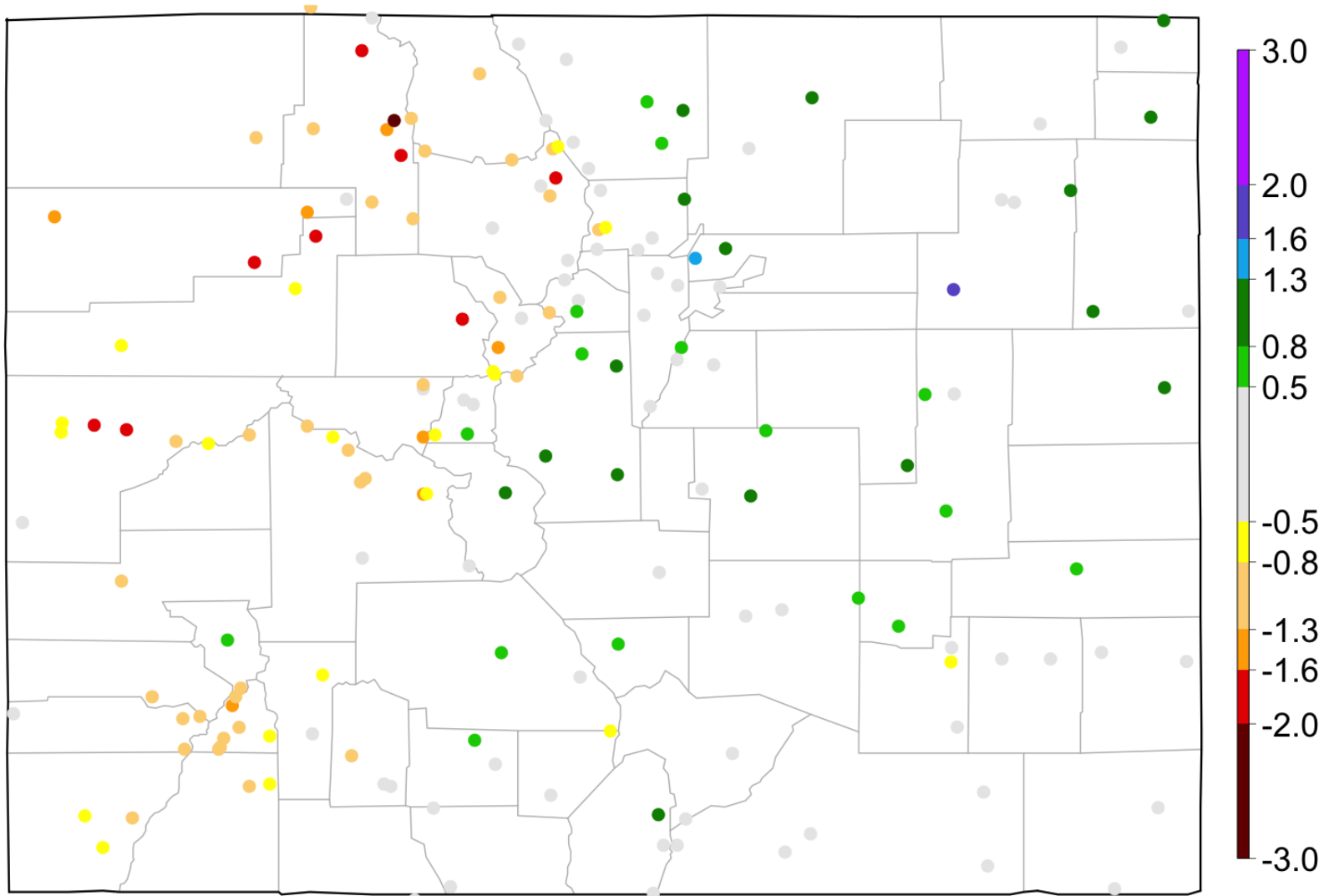


# 90-day SPI: 2021/01/11 - 2021/04/11



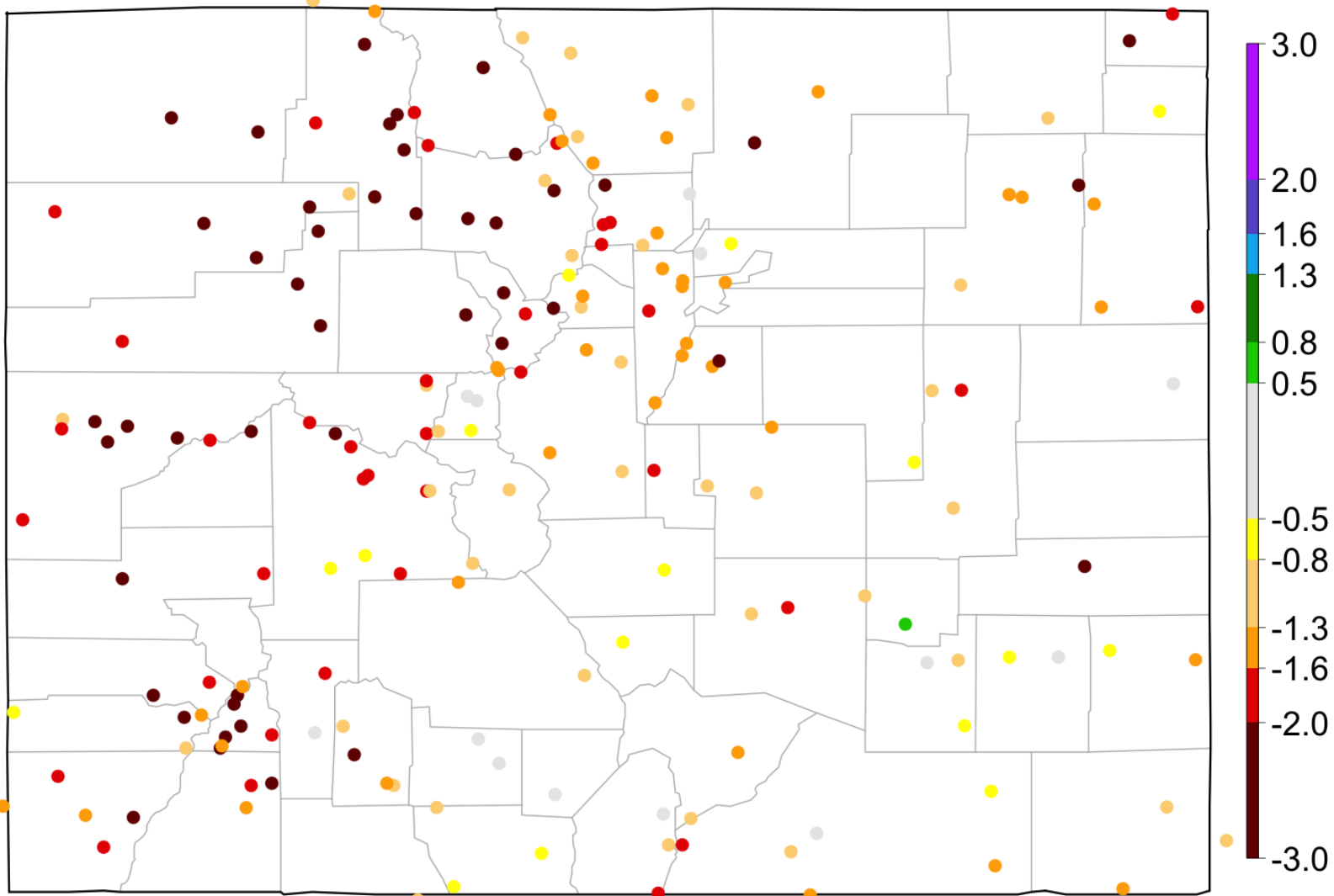
Data from High Plains Regional Climate Center and ACIS

# 6-month SPI: 2020/10/17 - 2021/04/16



Data from High Plains Regional Climate Center and ACIS

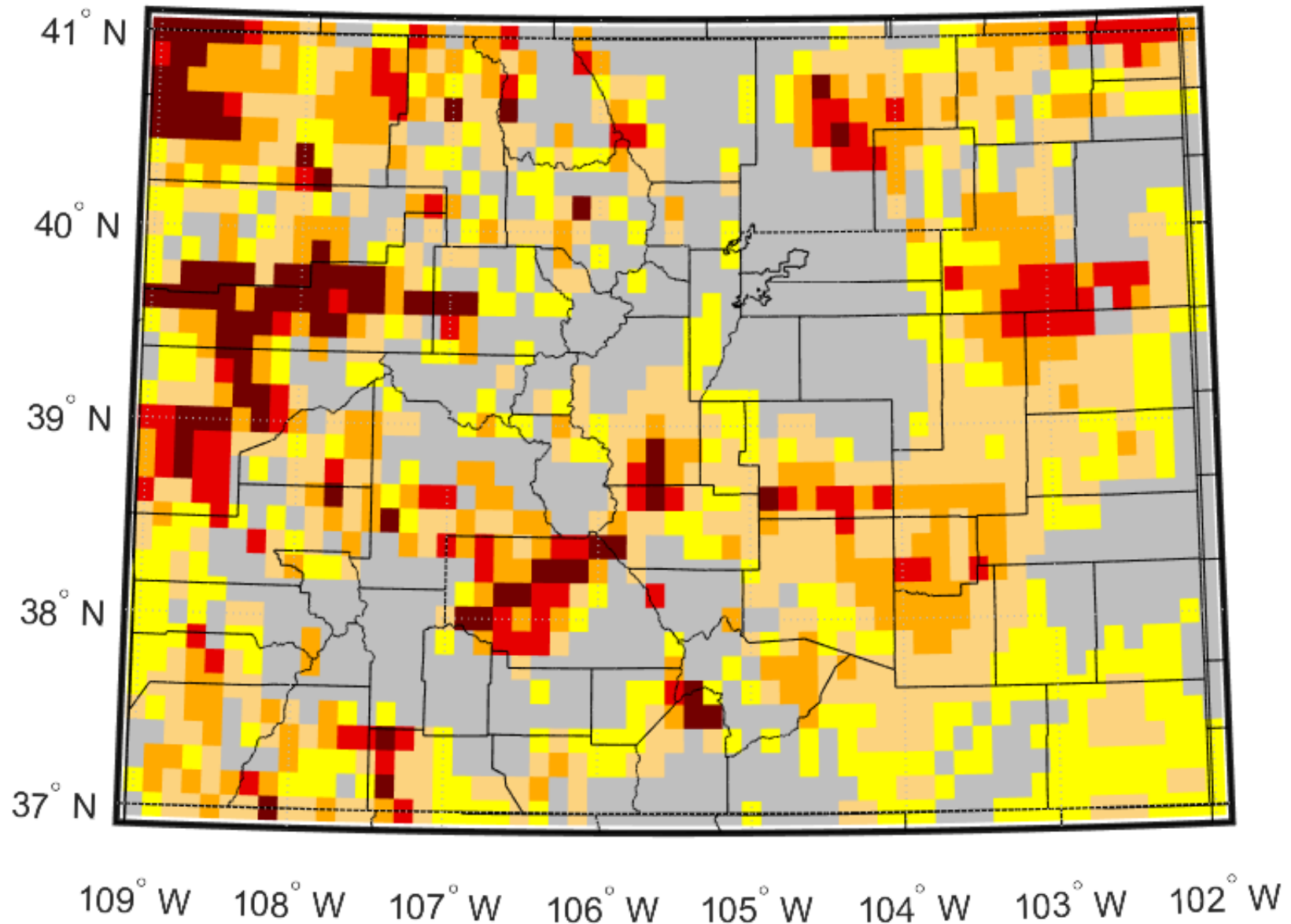
12-month SPI: 2020/04/17 - 2021/04/16



Data from High Plains Regional Climate Center and ACIS

# Top 10cm Soil Moisture Drought Category

04/13/2021

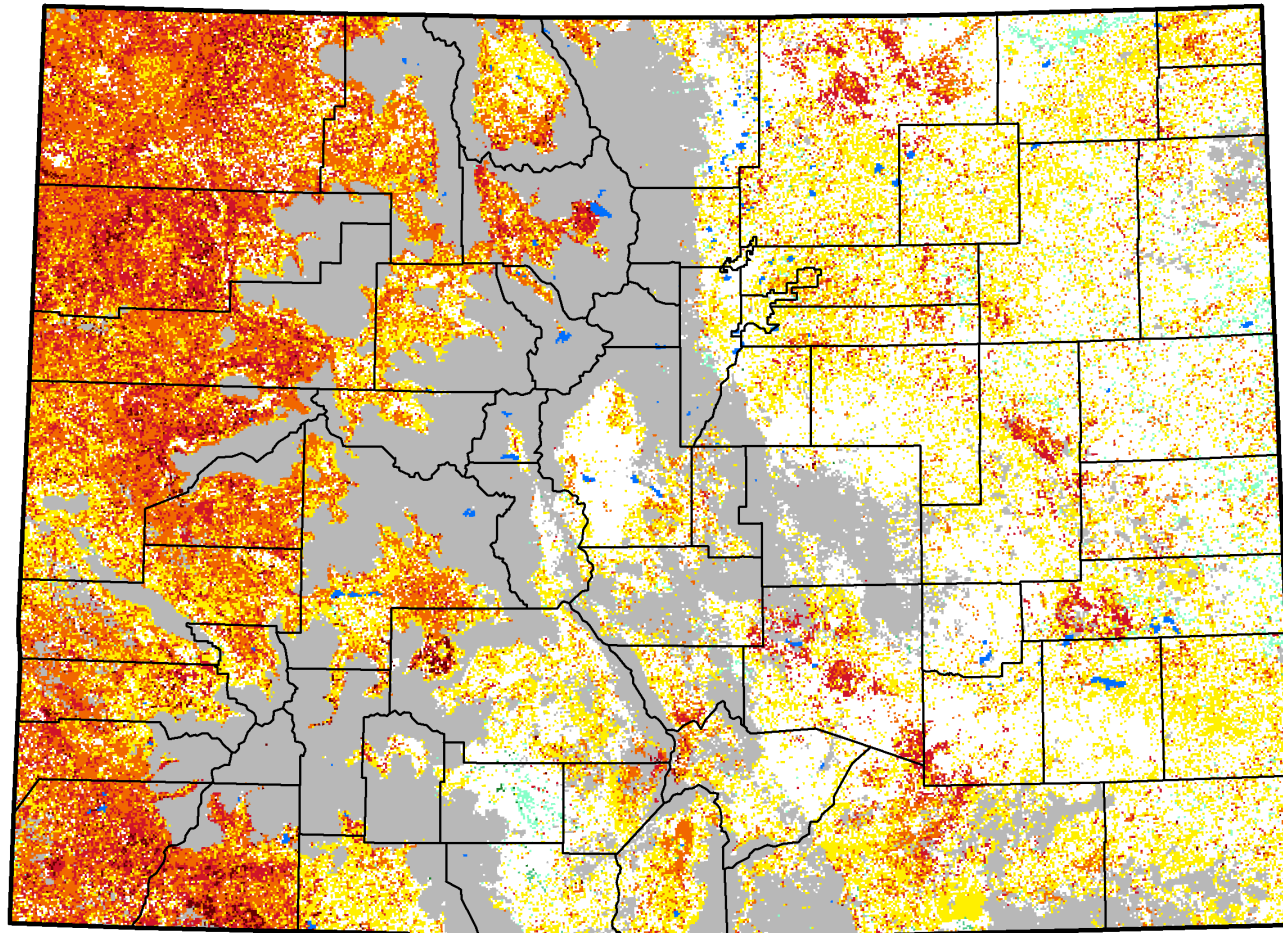




# Vegetation Drought Response Index

Complete: Colorado

April 18, 2021



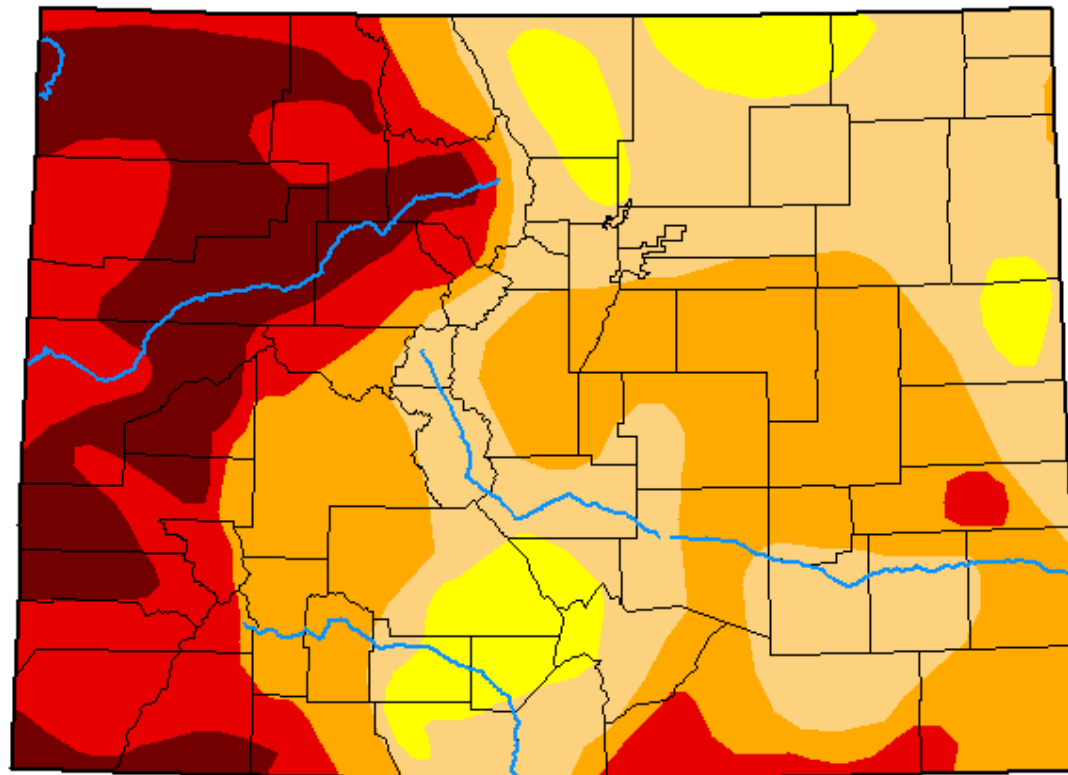
## Vegetation Condition

- Extreme Drought
- Severe Drought
- Moderate Drought
- Pre-drought stress
- Near Normal
- Unusually Moist
- Very Moist
- Extreme Moist
- Out of Season
- Water



# U.S. Drought Monitor Colorado

**April 13, 2021**  
(Released Thursday, Apr. 15, 2021)  
Valid 8 a.m. EDT



*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	0.00	100.00	92.31	61.69	32.13	14.65
<b>Last Week</b> <i>04-06-2021</i>	0.00	100.00	92.31	61.69	32.13	14.65
<b>3 Months Ago</b> <i>01-12-2021</i>	0.00	100.00	100.00	91.03	73.63	27.59
<b>Start of Calendar Year</b> <i>12-29-2020</i>	0.00	100.00	100.00	93.73	76.17	27.60
<b>Start of Water Year</b> <i>09-29-2020</i>	0.00	100.00	99.29	89.35	52.88	2.64
<b>One Year Ago</b> <i>04-14-2020</i>	33.26	66.74	53.23	12.88	0.00	0.00

*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:*

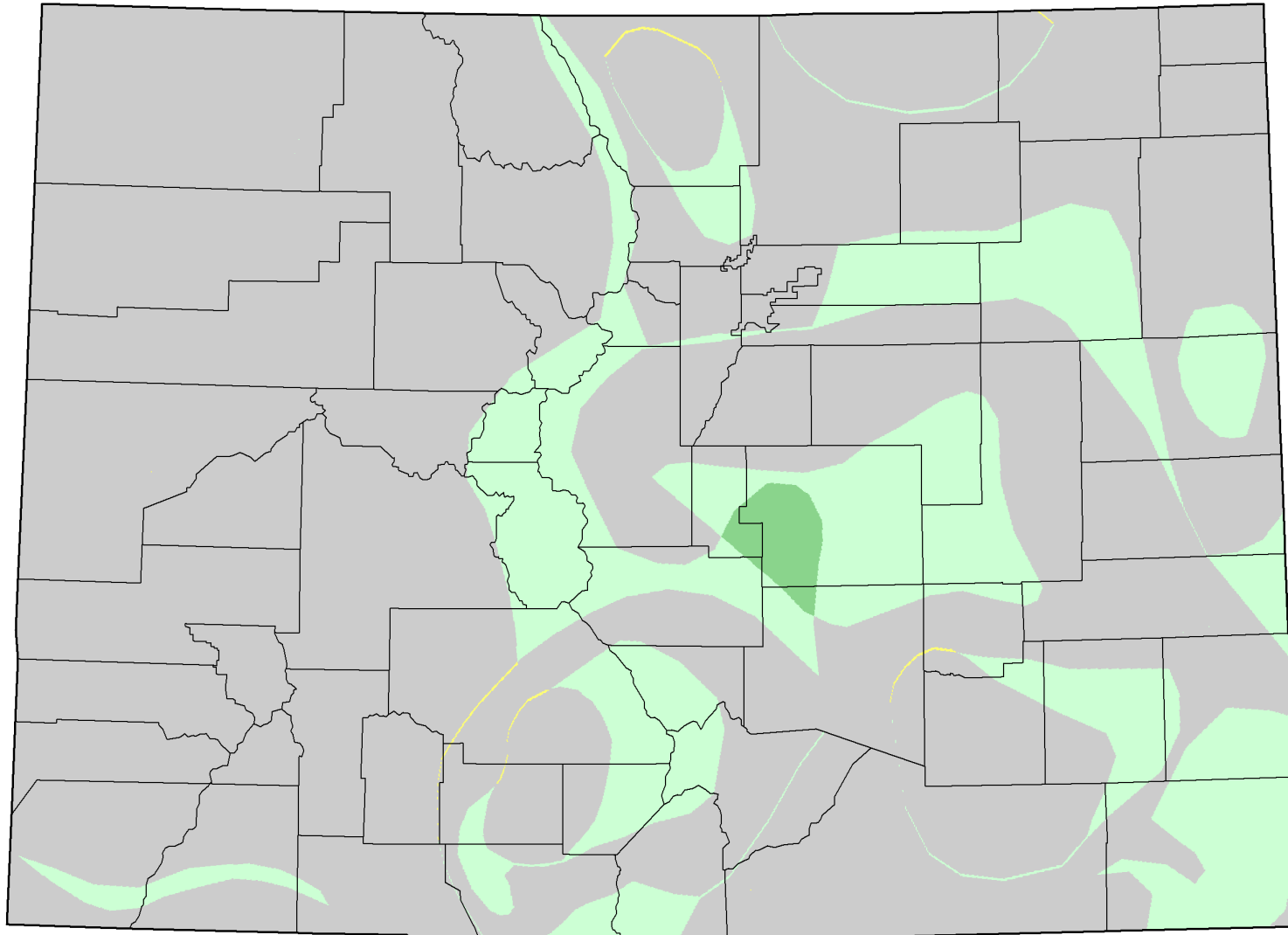
Deborah Bathke  
National Drought Mitigation Center














**droughtmonitor.unl.edu**

# U.S. Drought Monitor Class Change - Colorado

## 1 Month



-  5 Class Degradation
-  4 Class Degradation
-  3 Class Degradation
-  2 Class Degradation
-  1 Class Degradation
-  No Change
-  1 Class Improvement
-  2 Class Improvement
-  3 Class Improvement
-  4 Class Improvement
-  5 Class Improvement

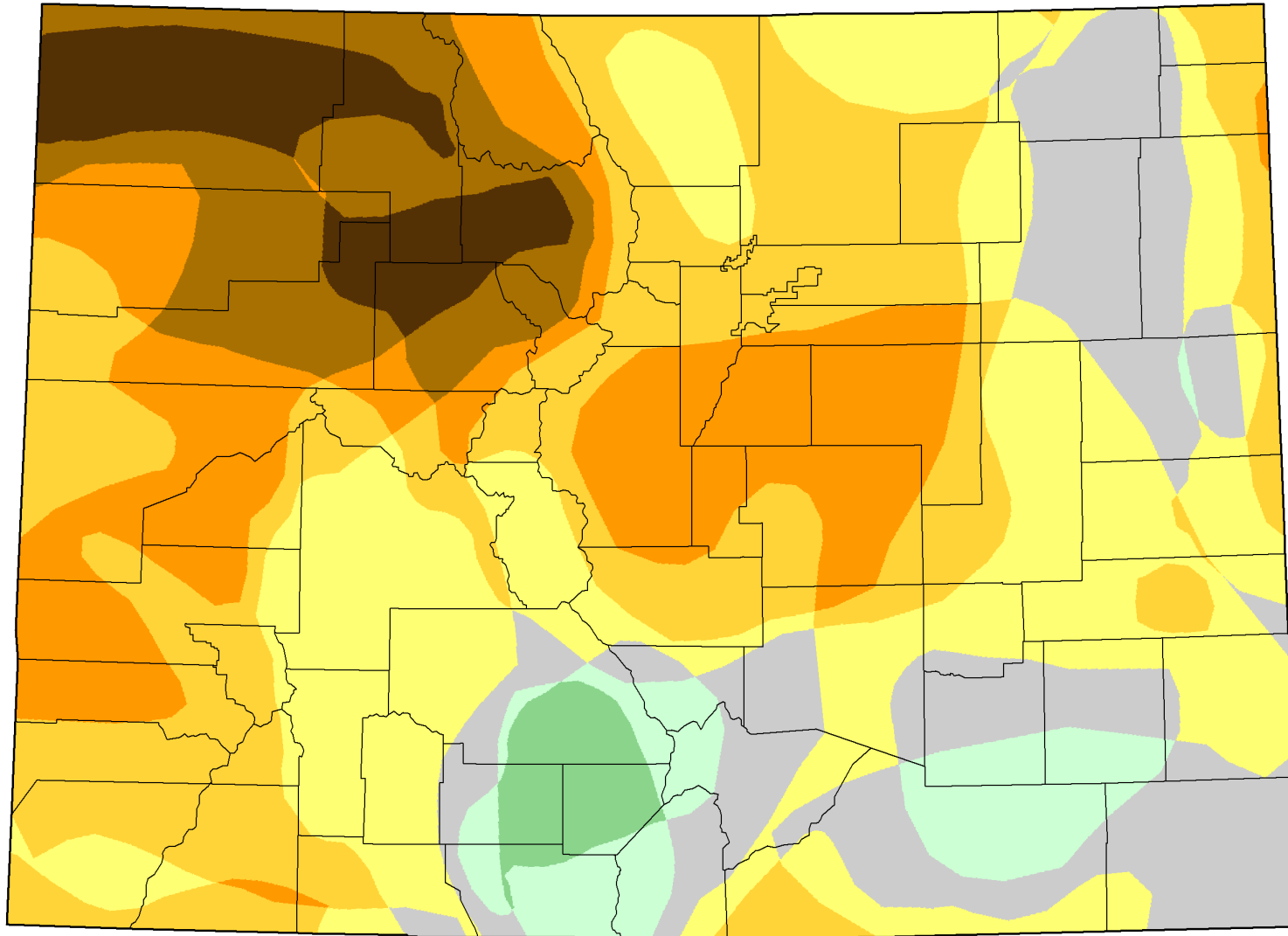
**April 13, 2021**  
**compared to**  
**March 16, 2021**












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



# U.S. Drought Monitor Class Change - Colorado

## 1 Year



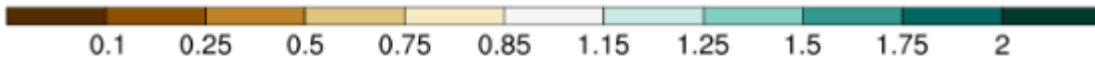
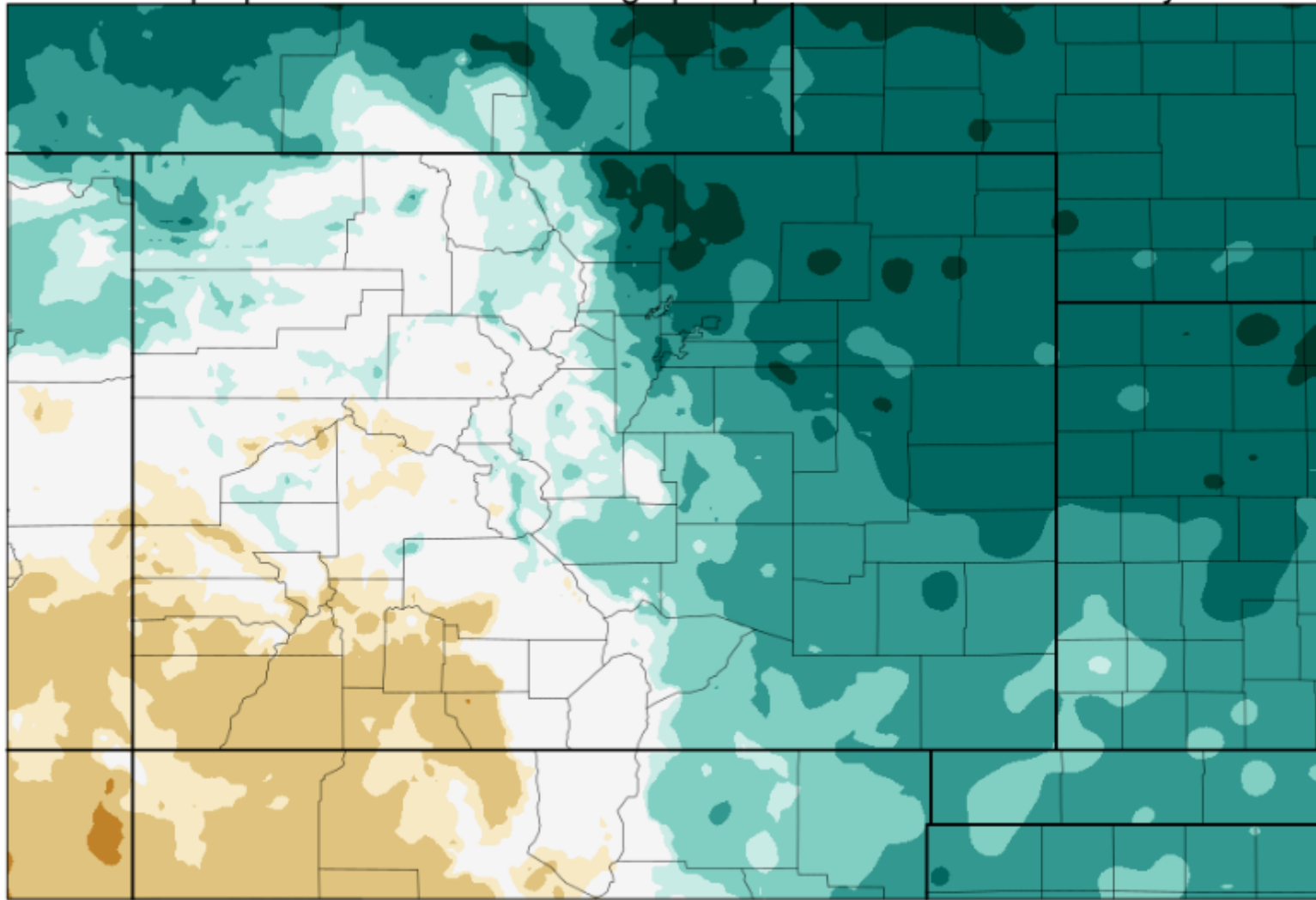
-  5 Class Degradation
-  4 Class Degradation
-  3 Class Degradation
-  2 Class Degradation
-  1 Class Degradation
-  No Change
-  1 Class Improvement
-  2 Class Improvement
-  3 Class Improvement
-  4 Class Improvement
-  5 Class Improvement

April 13, 2021  
compared to  
April 14, 2020

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

# Seasonal Outlook

PRISM proportion of annual average precipitation in this month: May



Russ Schumacher/Colorado Climate Center

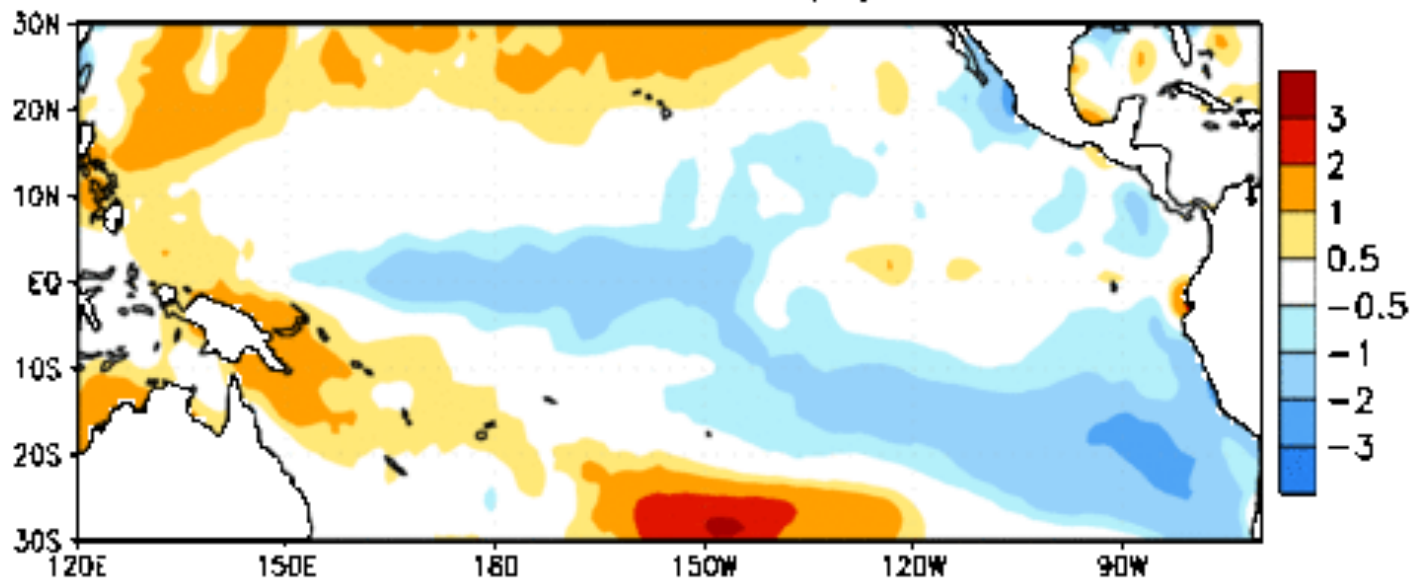
Proportion of precip relative to 1/12th

The wet season is mostly over for the high country. We now wait to see how temperatures impact demand

The wet season is just beginning for the eastern plains. Next six weeks are critical

# Current Sea Surface Temperature Pattern

Week centered on 27 JAN 2021  
SST Anomalies (°C)

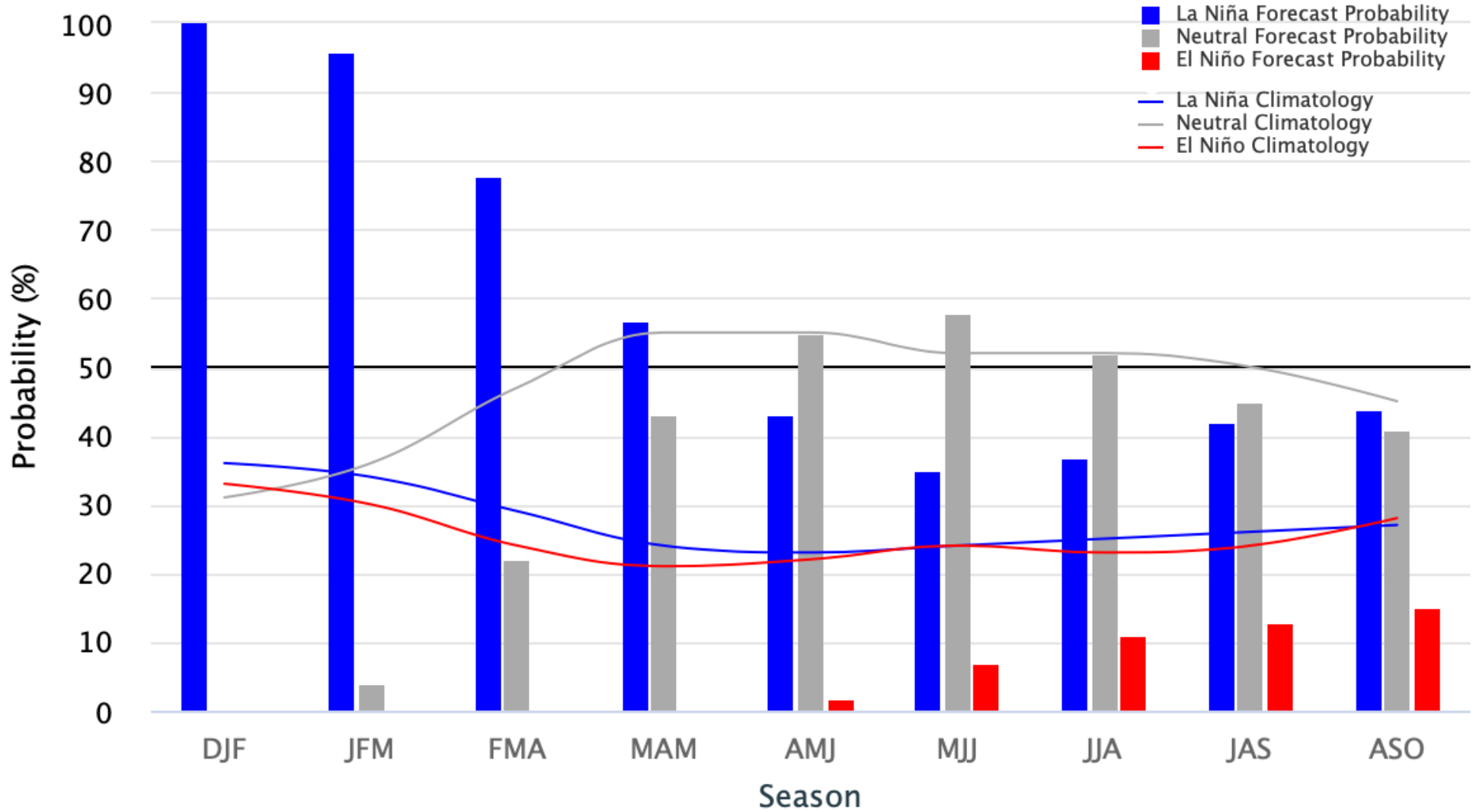


- La Niña weakening
- Neutral conditions likely for summer
- Development of 2<sup>nd</sup> year La Niña favored in fall

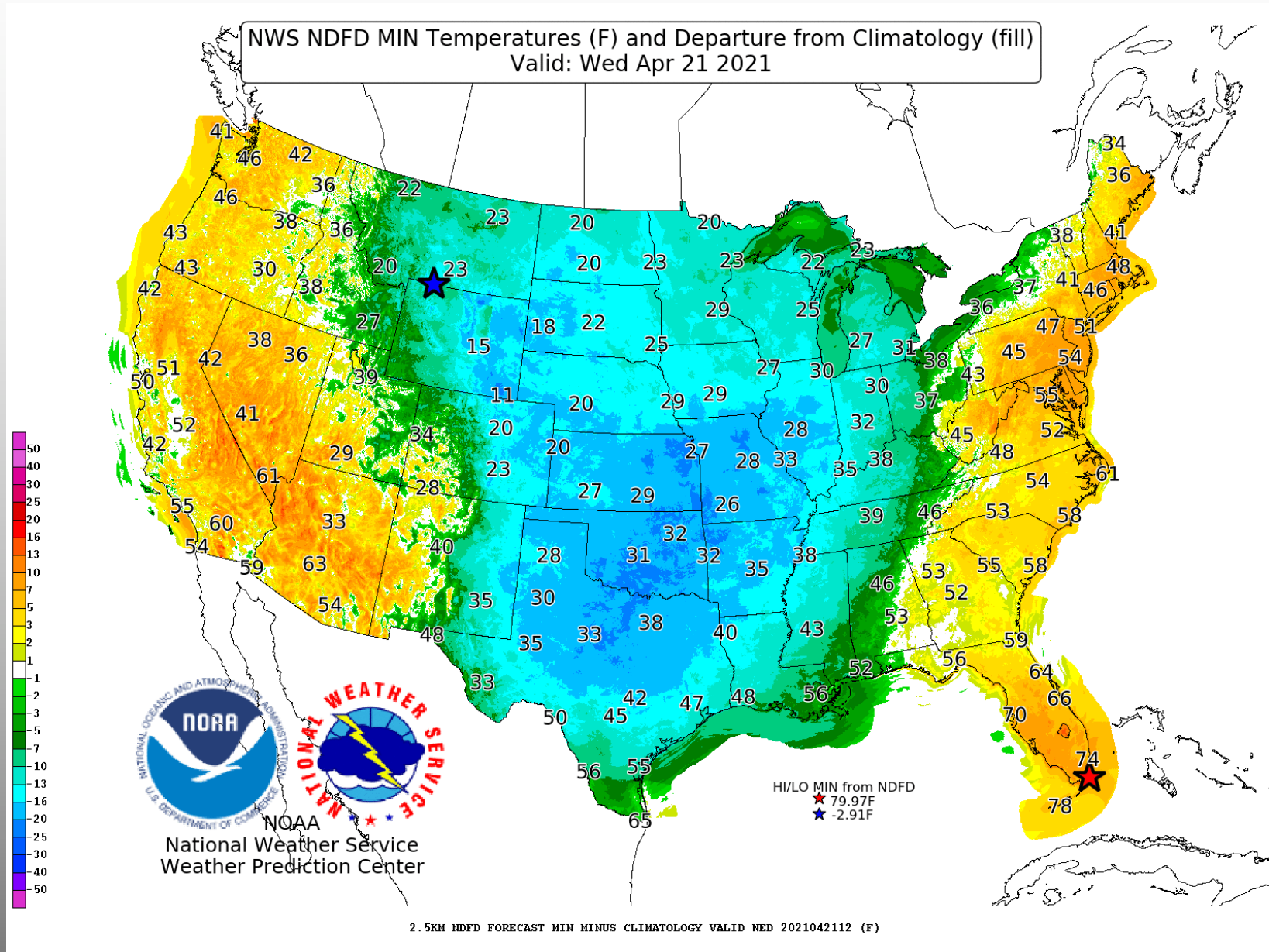
# Early-January 2021 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly

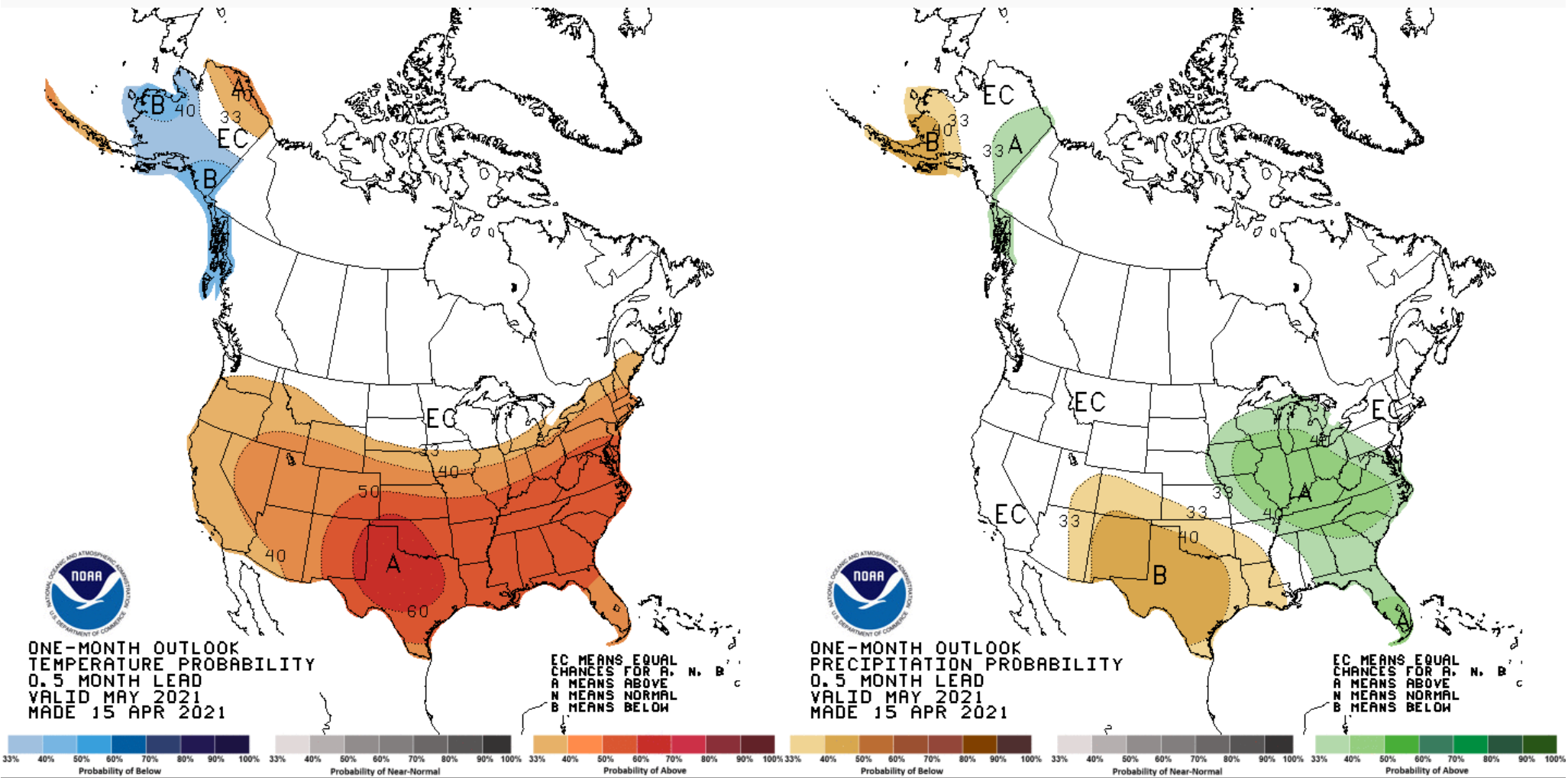
Neutral ENSO:  $-0.5\text{ }^{\circ}\text{C}$  to  $0.5\text{ }^{\circ}\text{C}$



# The Near-Term Is Cold. Potential trouble for specialty crops!

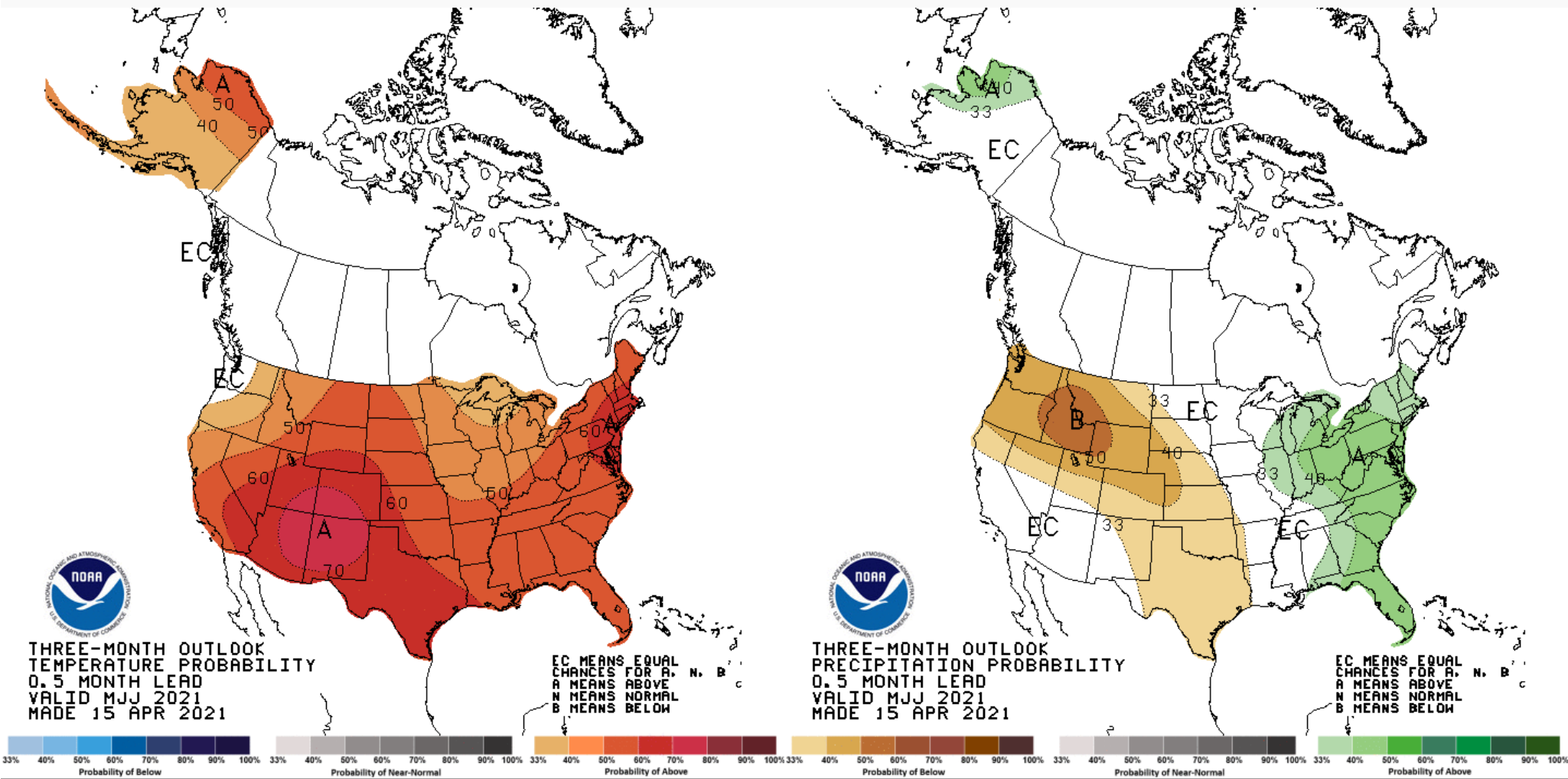


# May Forecast



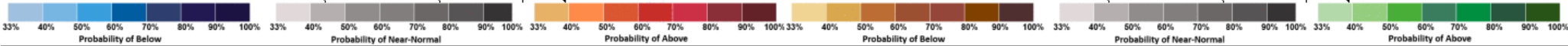
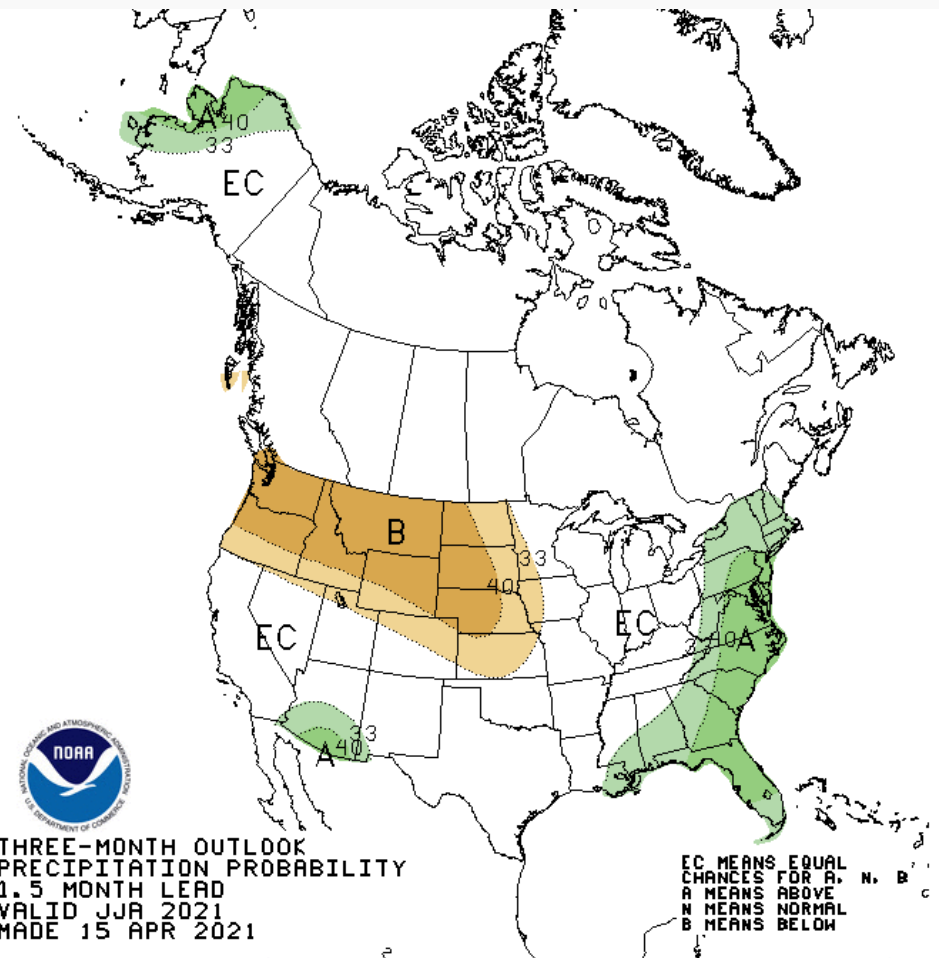
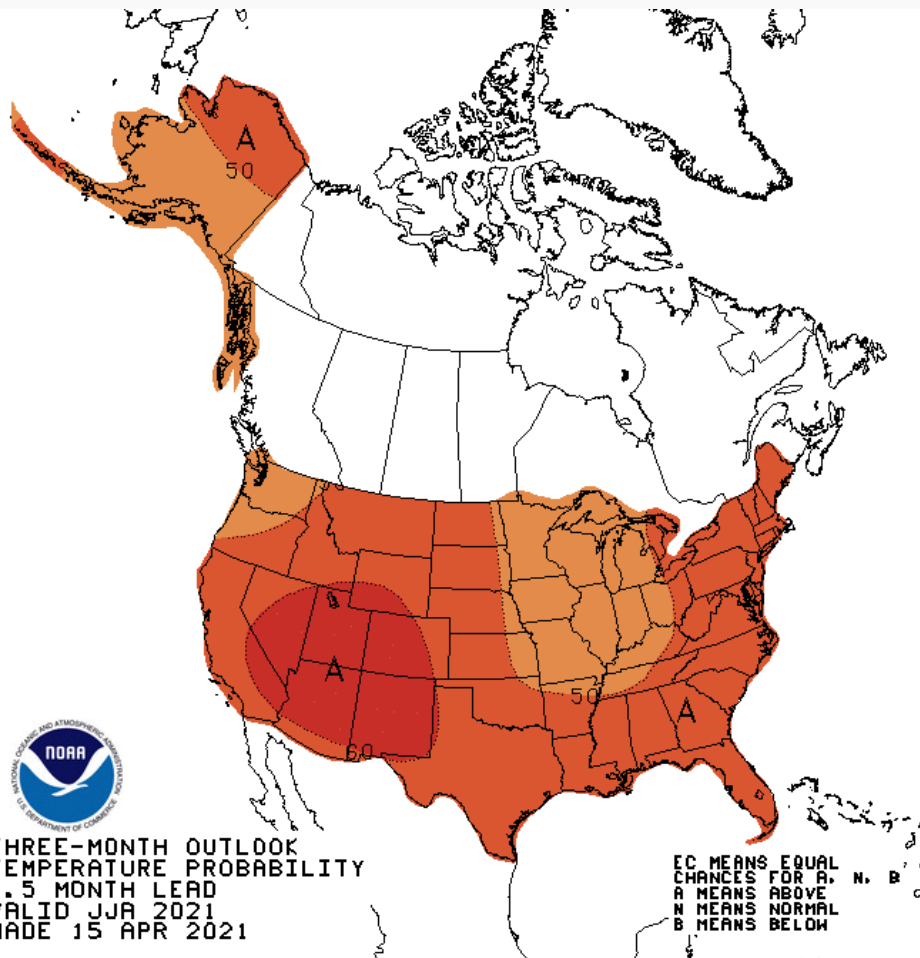
Dynamical Models Continue to favor excess ridging over the spring/summer. Ridge axis moves north through summer

# CPC May-July Outlook



- Our 30-year climate normal are getting long in the teeth given our unstable climate
- The most important factor in these summer forecasts is trend signal:noise ratio

# June-August Outlook Influenced Heavily by Trends

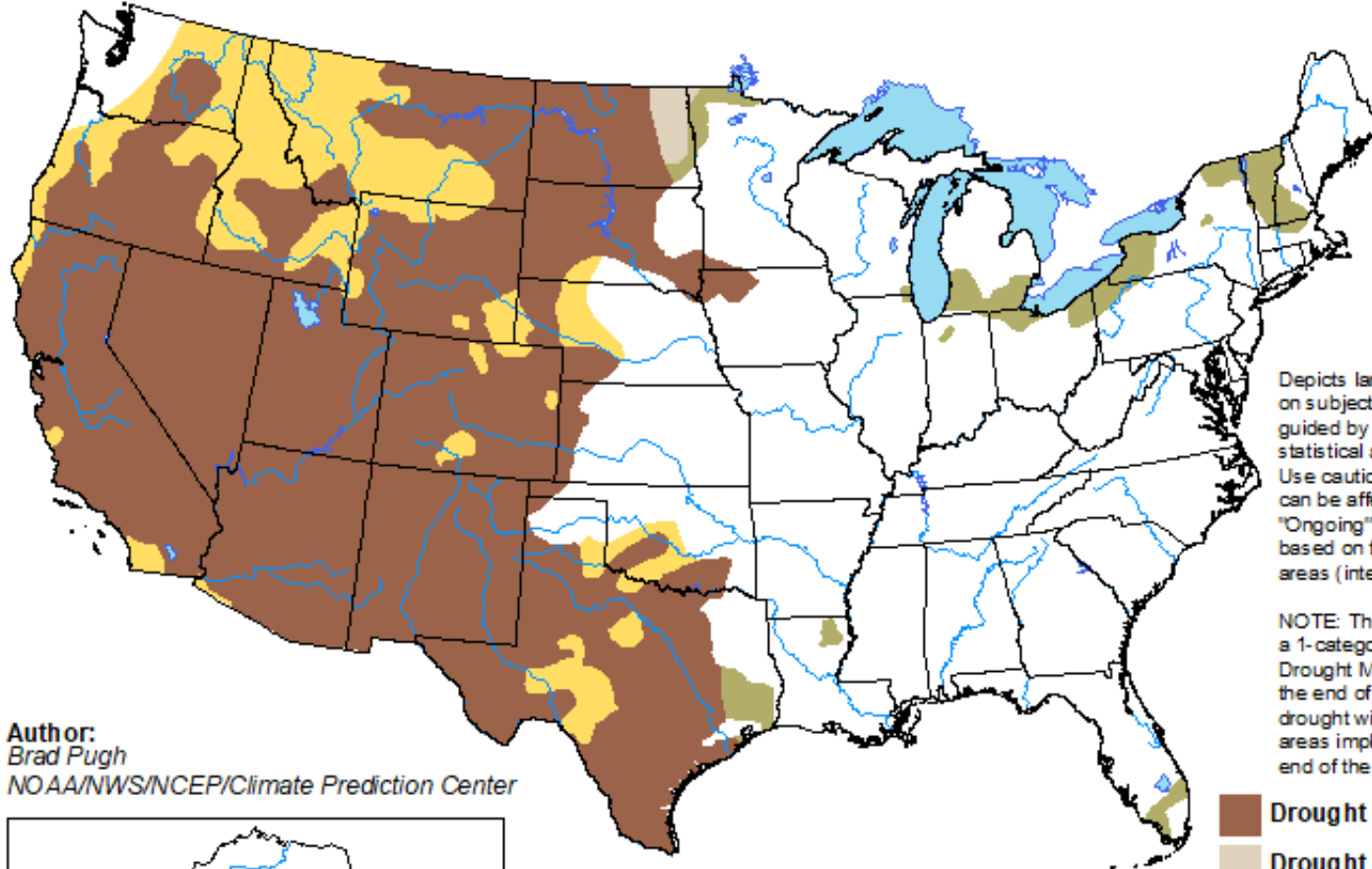




# U.S. Seasonal Drought Outlook

## Drought Tendency During the Valid Period

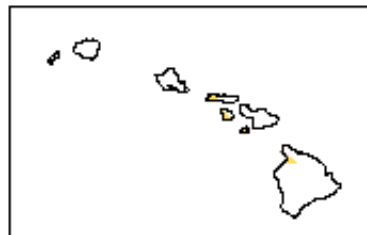
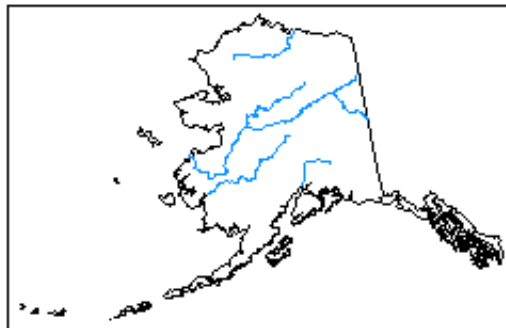
Valid for April 15 - July 31, 2021  
Released April 15







Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

Author:  
Brad Pugh  
NOAA/NWS/NCEP/Climate Prediction Center

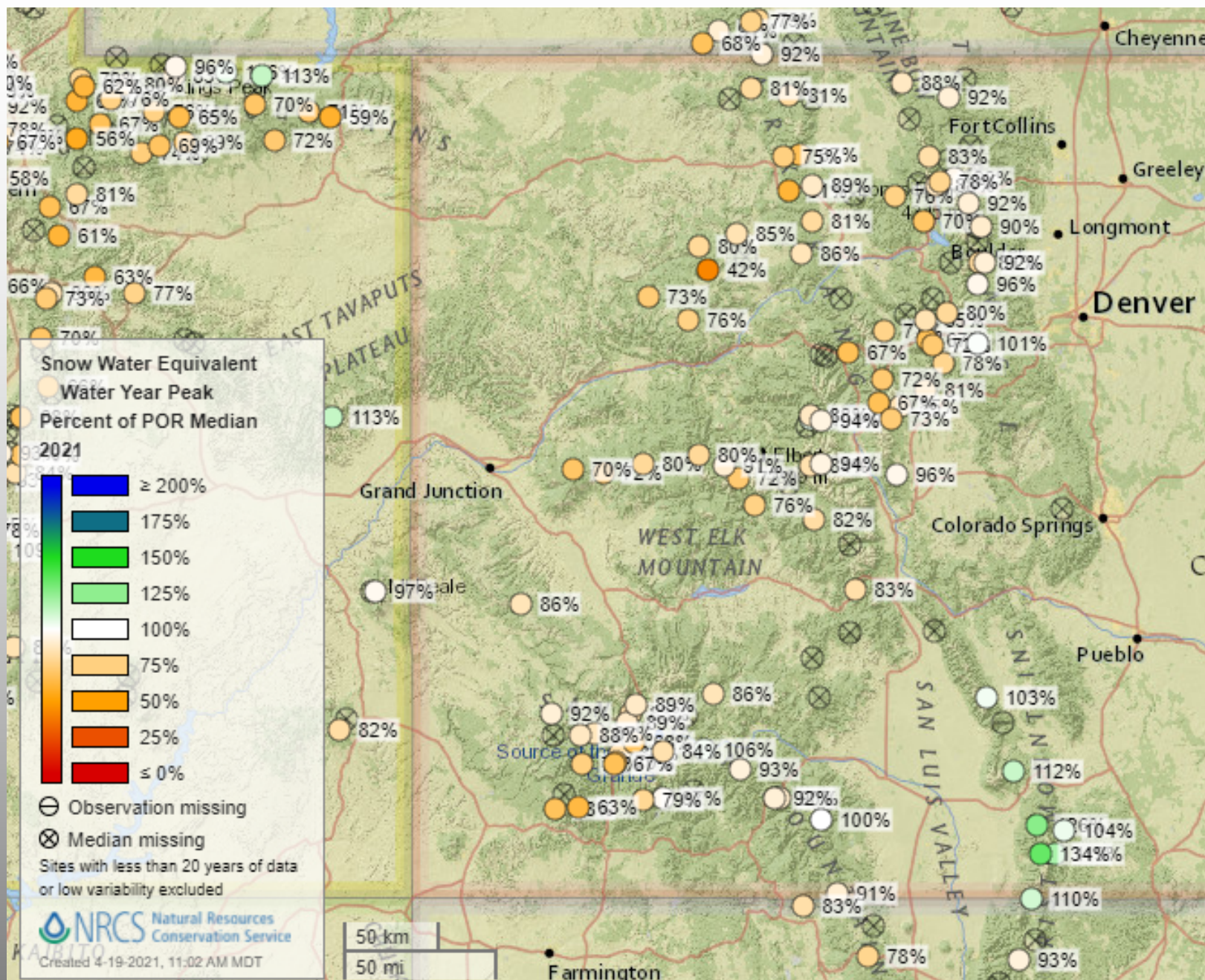


-  Drought persists
-  Drought remains but improves
-  Drought removal likely
-  Drought development likely



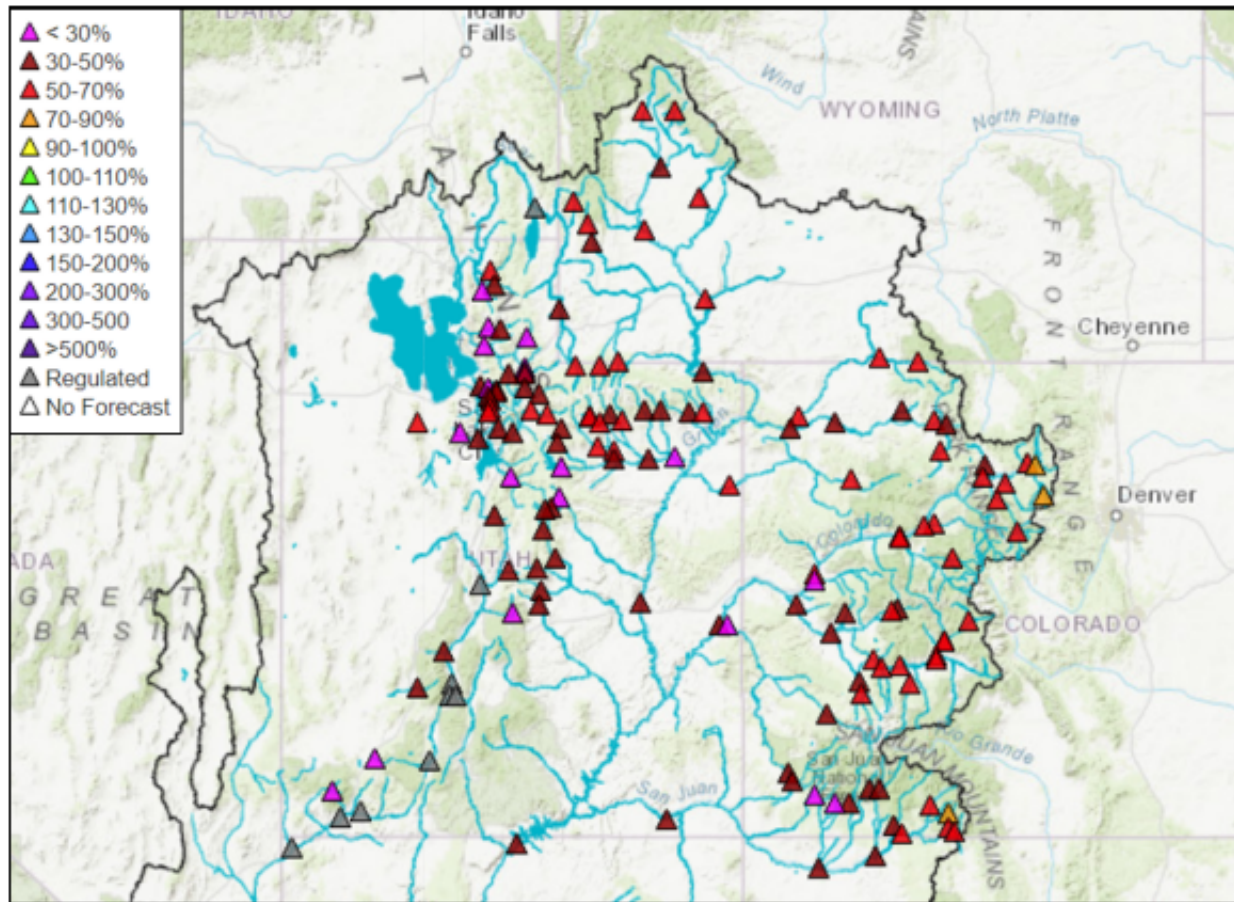
<http://go.usa.gov/3eZ73>

# 2021 Percent of Normal Peak Snowpack



# Colorado Basin River Forecast Center Season Water Supply Forecasts

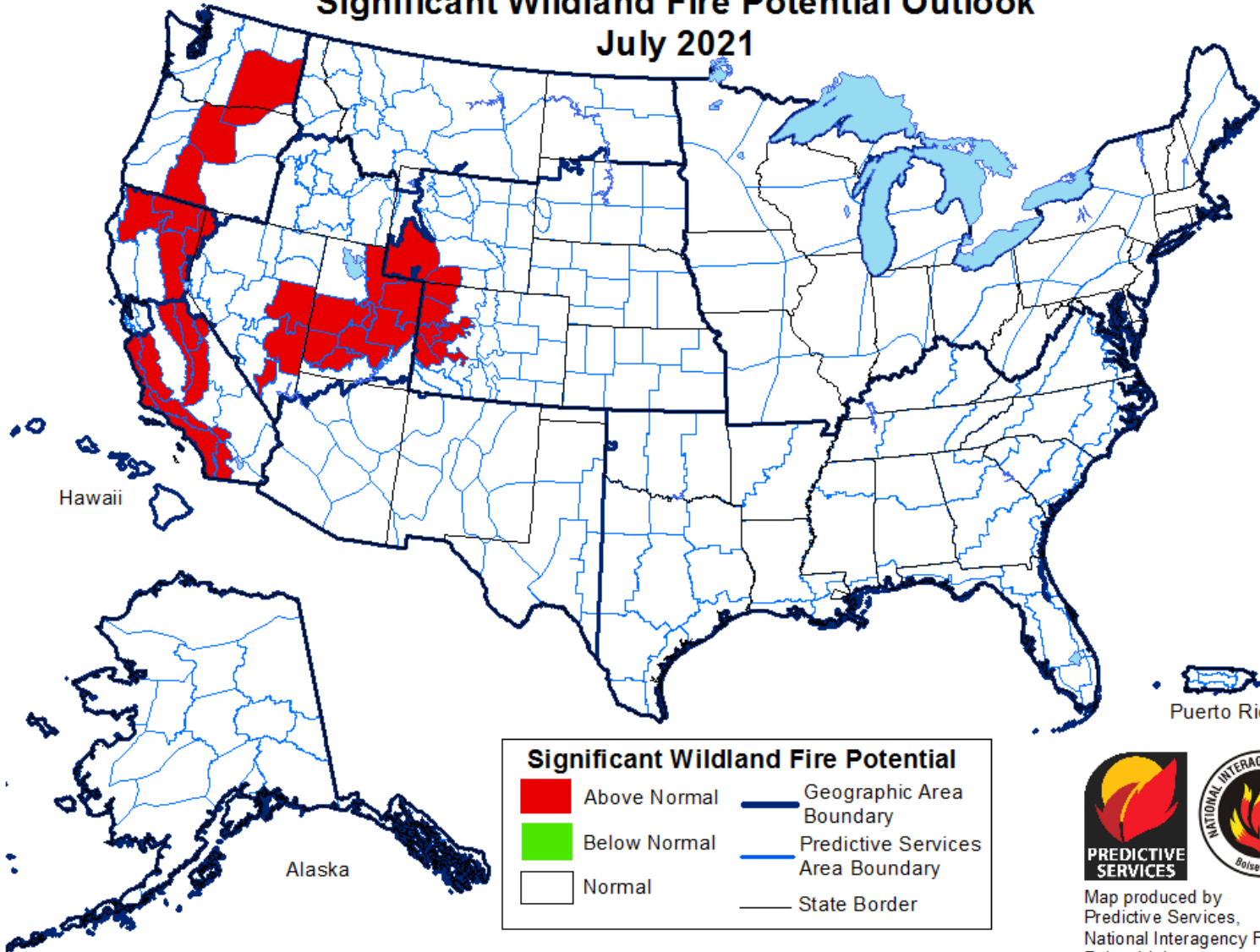
## Seasonal Water Supply Forecasts



Upper Colorado, Great, Virgin River Basins: April-July runoff volume guidance as of April 15, 2021  
(percent of 1981-2010 average)

Streamflows will be much below normal west of the Continental Divide

## Significant Wildland Fire Potential Outlook July 2021



Above normal significant wildland fire potential indicates a greater than usual likelihood that significant wildland fires will occur. Significant wildland fires should be expected at typical times and intervals during normal significant wildland fire potential conditions. Significant wildland fires are still possible but less likely than usual during forecasted below normal periods.



Map produced by  
Predictive Services,  
National Interagency Fire Center  
Boise, Idaho  
Issued April 1, 2021  
Next issuance May 1, 2021

An early melt and a warm, dry summer forecast leaves us vulnerable to another big fire year

# Takeaways

- March was a good month for eastern Colorado. Snow wasn't heavy or widespread enough to be a miracle, but it was a magnanimous month. The western slopes have continued to struggle
- Long-term conditions are still well on the dry side of normal. This is reflected in soils, plant stress, and surface water
- Snowmelt in western Colorado is coming early, but so far runoff is still low. This is likely in part because of antecedent soil conditions
- Our summers are getting hotter. The current seasonal forecast is a reflection of this. Dynamical models also favor dry conditions and anomalous ridging over the NW US
- The coming season will come with above normal risk for fires and water shortages in western Colorado

# Summer Levels of Concern

- Fire Season: **High**
- Western Slopes Water Availability: **High**
- Eastern Plains Agriculture: **Above Normal**
- Front Range Water Availability: **Normal**

# Colorado Climate Center

Thanks, and let's keep in touch!

Peter Goble – [peter.goble@colostate.edu](mailto:peter.goble@colostate.edu)

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Becky Bolinger – [becky.bolinger@colostate.edu](mailto:becky.bolinger@colostate.edu)

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Viewing this, and previous WATF Briefings:

[http://climate.colostate.edu/ccc\\_archive.html](http://climate.colostate.edu/ccc_archive.html)

