

# Colorado Climate Center – *WATF Climate Update*

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**Russ Schumacher, state climatologist**

**Water Availability Task Force**

**February 18, 2020**



**ATMOSPHERIC SCIENCE**  
**COLORADO STATE UNIVERSITY**

Certified 3ft bluebird pow day ☀️ #Breck



4:22 PM · Feb 8, 2020 from Breckenridge, CO · Twitter for iPhone

## Water Year 2020 To Date

temperature, precipitation, snow,  
evaporative demand







# Daily records

(Water year thus far:  
Oct 1 – Feb 15)

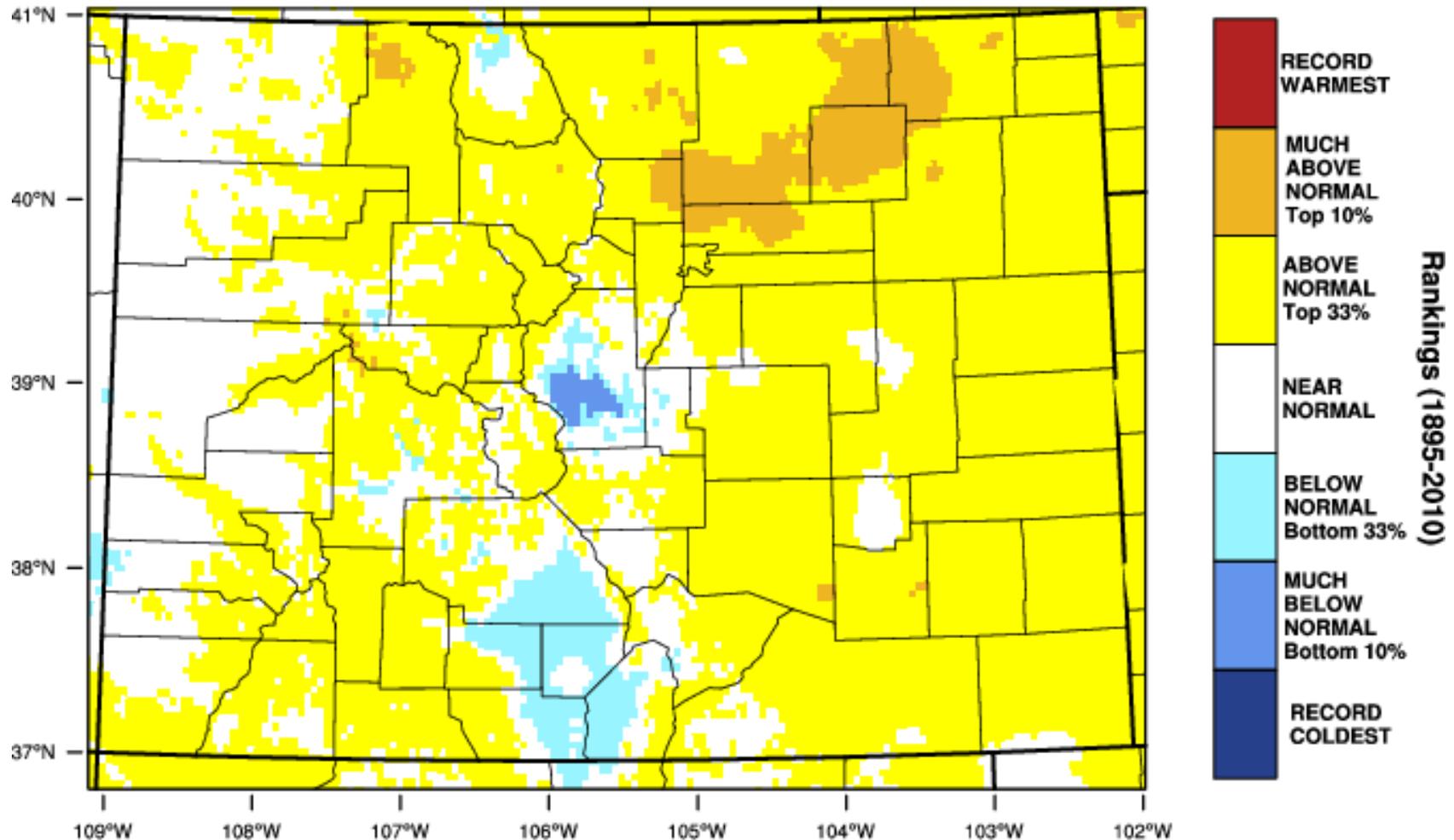
Weather Record Broken	Record broken for a day	Record broken for a month
Highest max temperature	297	17
Highest min temperature	331	10
Lowest max temperature	593	107
Lowest min temperature	743	121
Precipitation	391	15
Snowfall	220	10

Source: <https://www.ncdc.noaa.gov/cdo-web/datatools/records>

**Daily cold records outpacing warm records by about 2 to 1 so far this water year (around 10 to 1 for monthly records!), almost completely from the cold October**



# Colorado - Mean Temperature January 2020 Percentile



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 FEB 2020

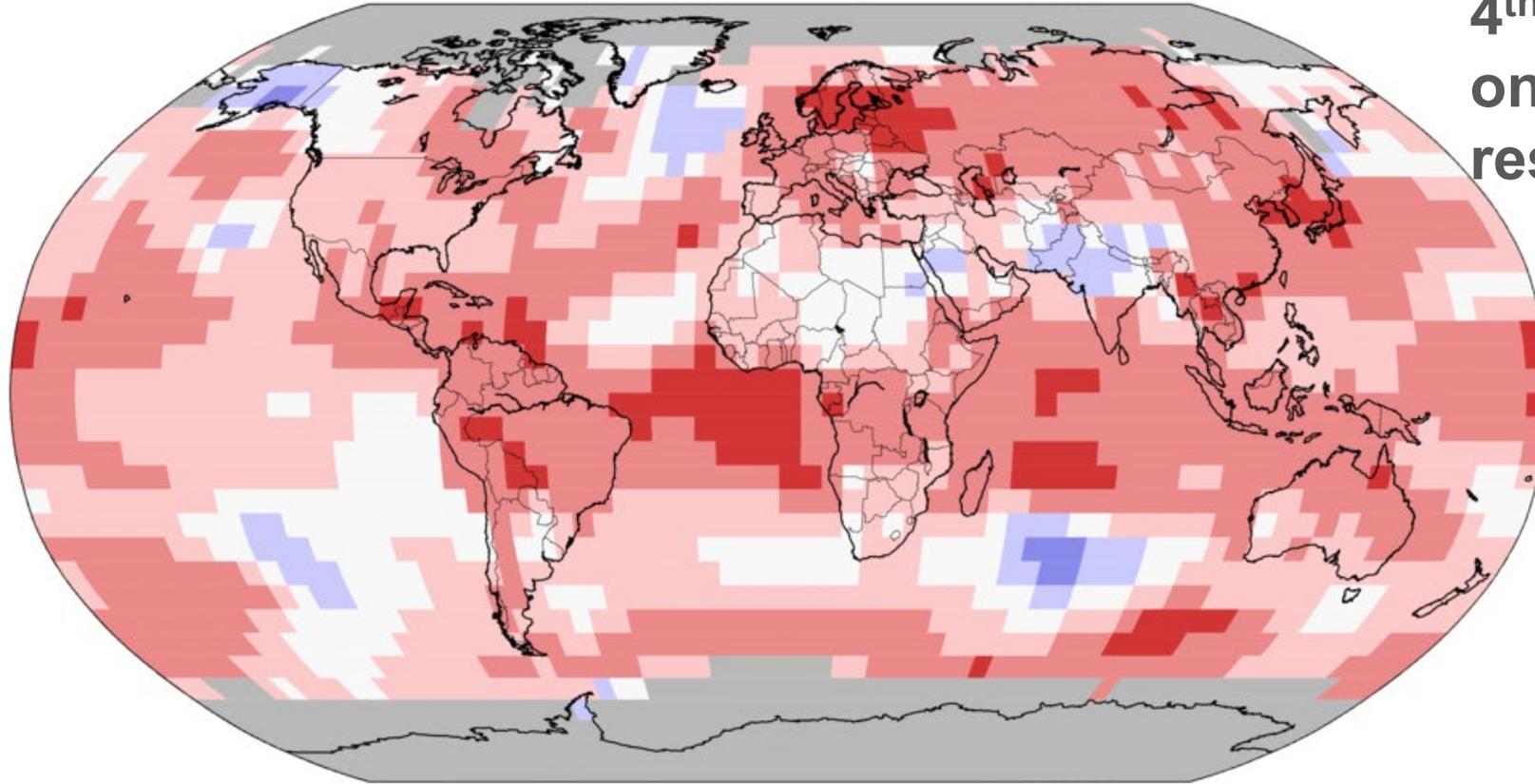


# Land & Ocean Temperature Percentiles Jan 2020

NOAA's National Centers for Environmental Information

Data Source: NOAA GlobalTemp v5.0.0-20200206

**Globally, warmest  
January on record;  
4<sup>th</sup> warmest month  
on record with  
respect to average**



Record Coldest

Much Cooler than Average

Cooler than Average

Near Average

Warmer than Average

Much Warmer than Average

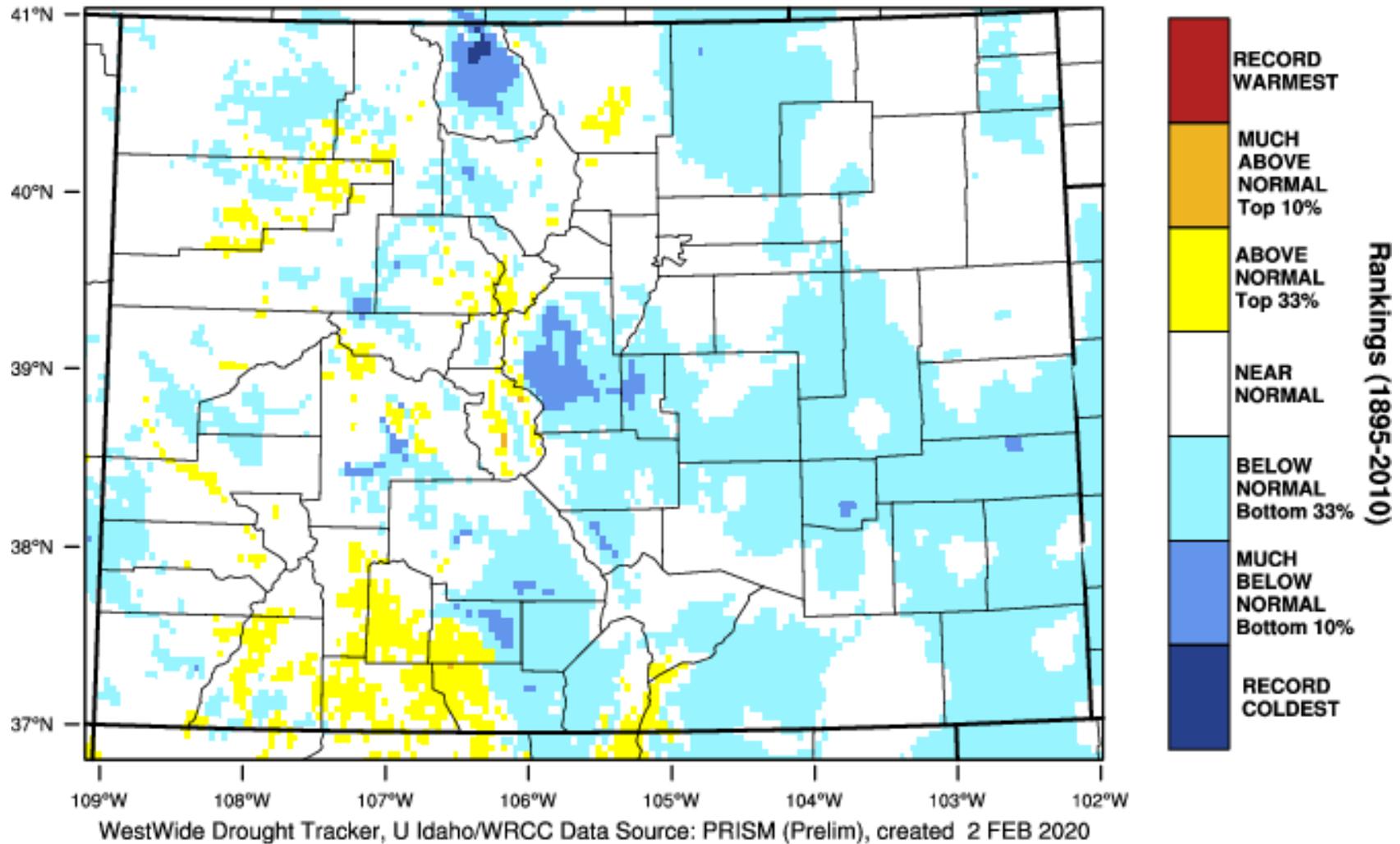
Record Warmest



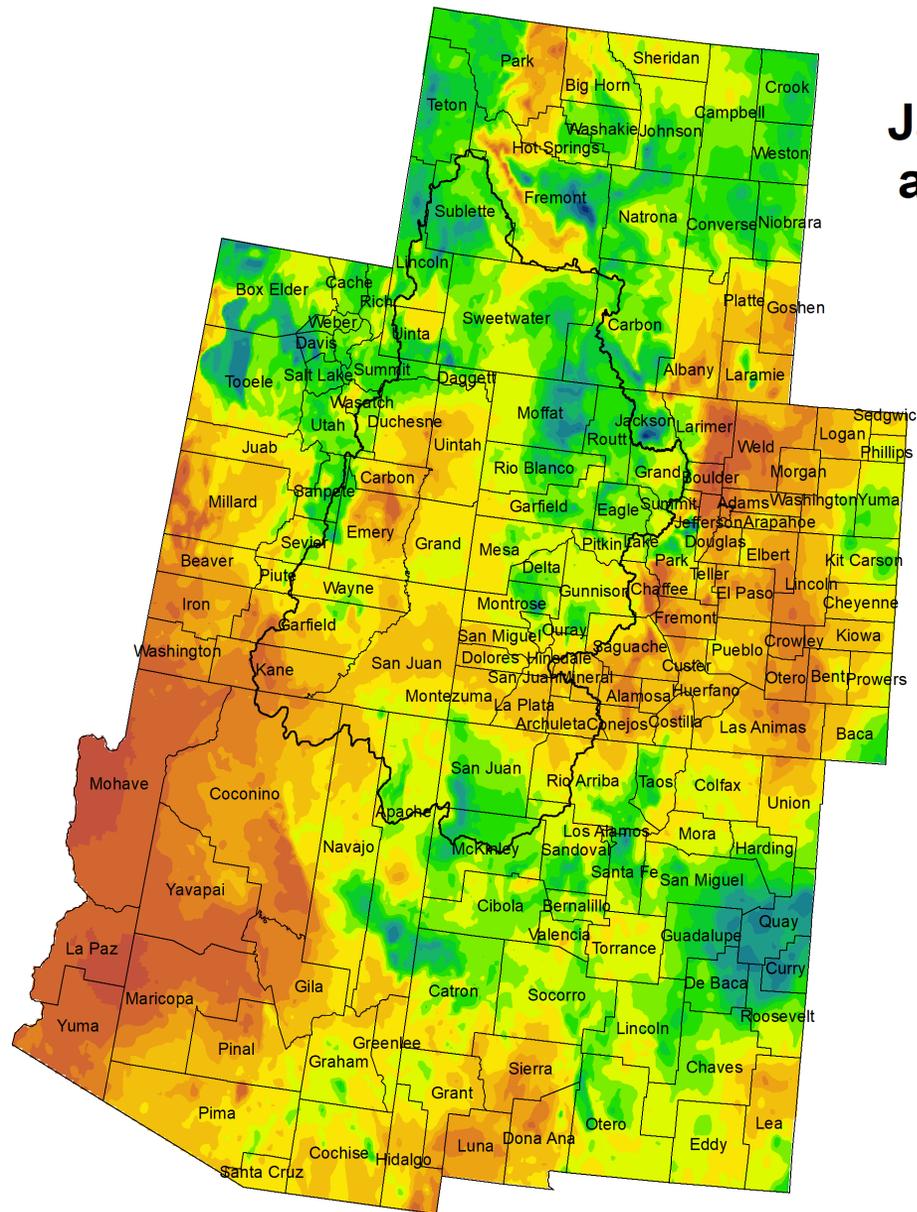
GHCNM v4.0.1.20200205.qfe



# Colorado - Mean Temperature October-January 2020 Percentile



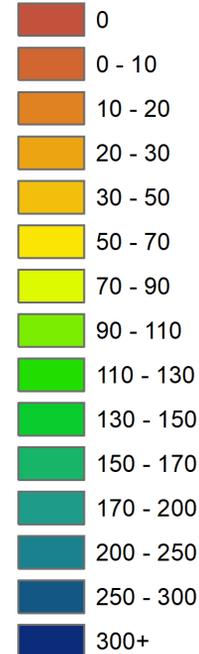
# Intermountain West January 2020 Precipitation as a Percentage of Normal



Upper Colorado River Basin

jan20\_pn

Precip as % of normal

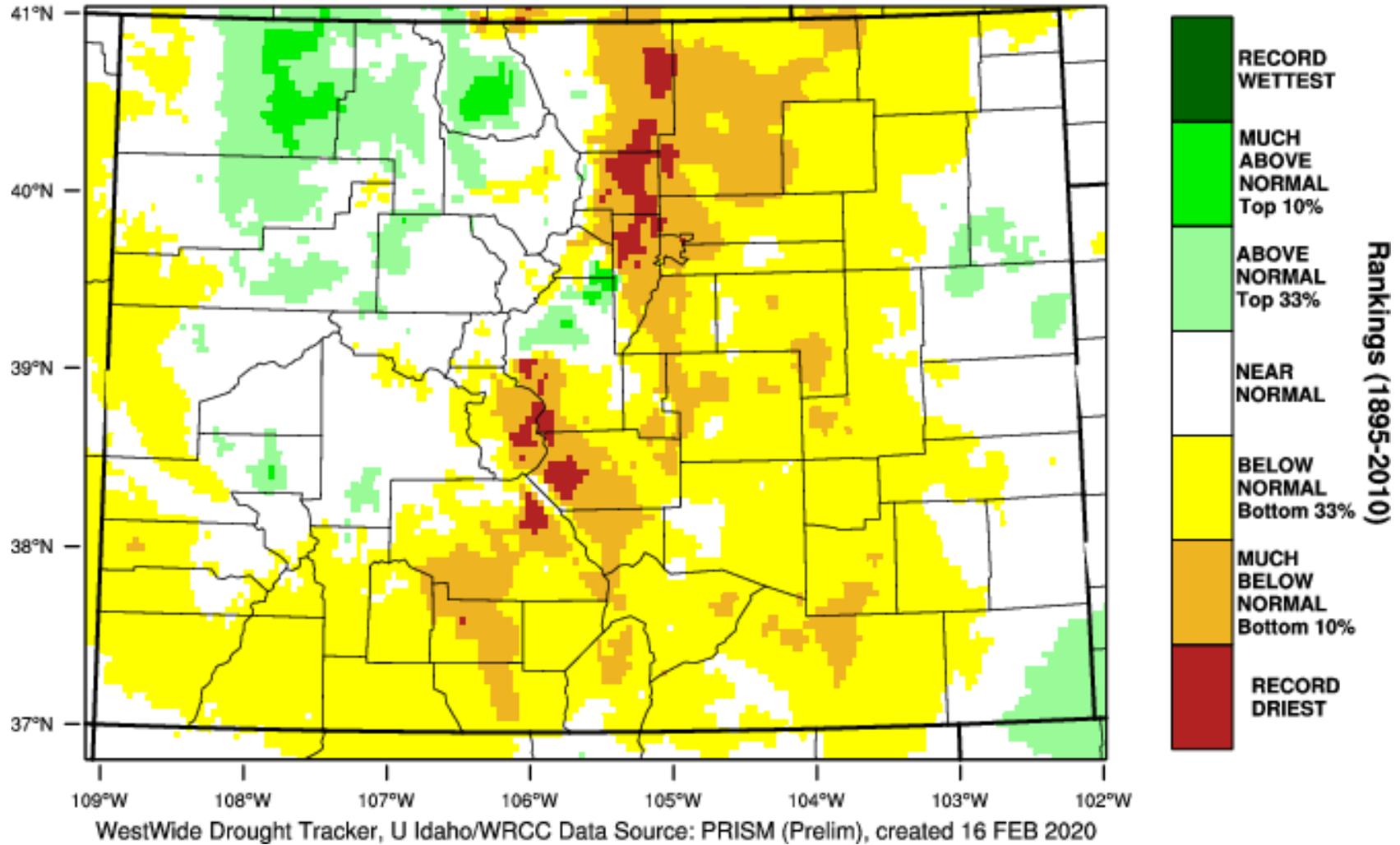


Data from PRISM Climate Group

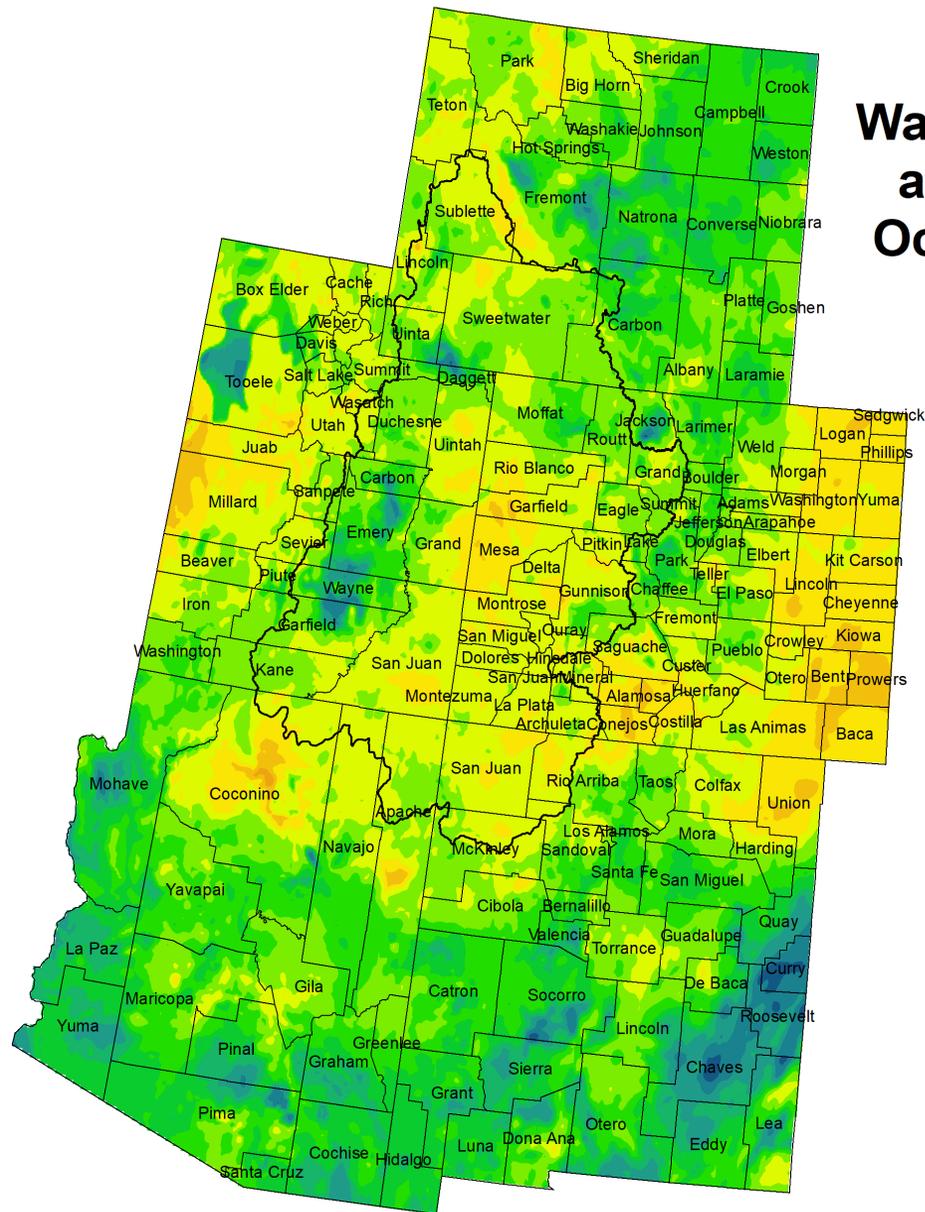


# Colorado - Precipitation

## January 2020 Percentile



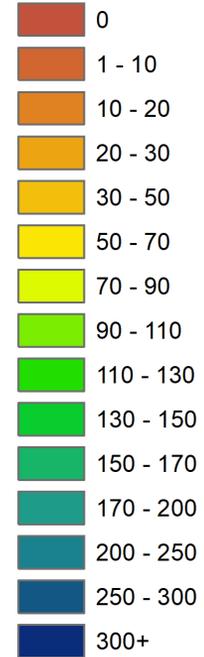
# Intermountain West Water Year 2020 Precipitation as a Percentage of Normal October 2019 - January 2020



Upper Colorado River Basin

awy\_jan20\_pn

Precip as % of normal

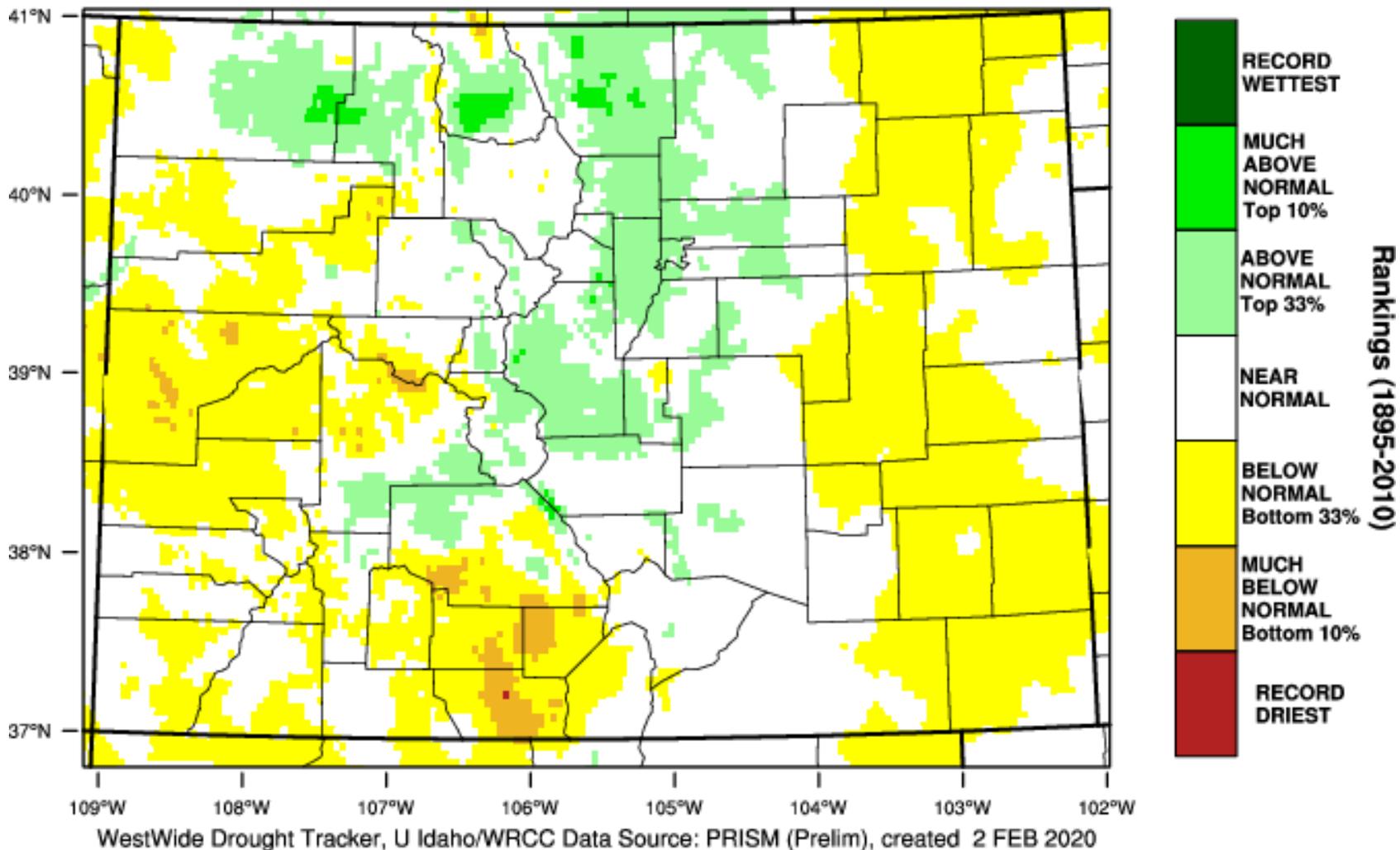


Data from PRISM Climate Group

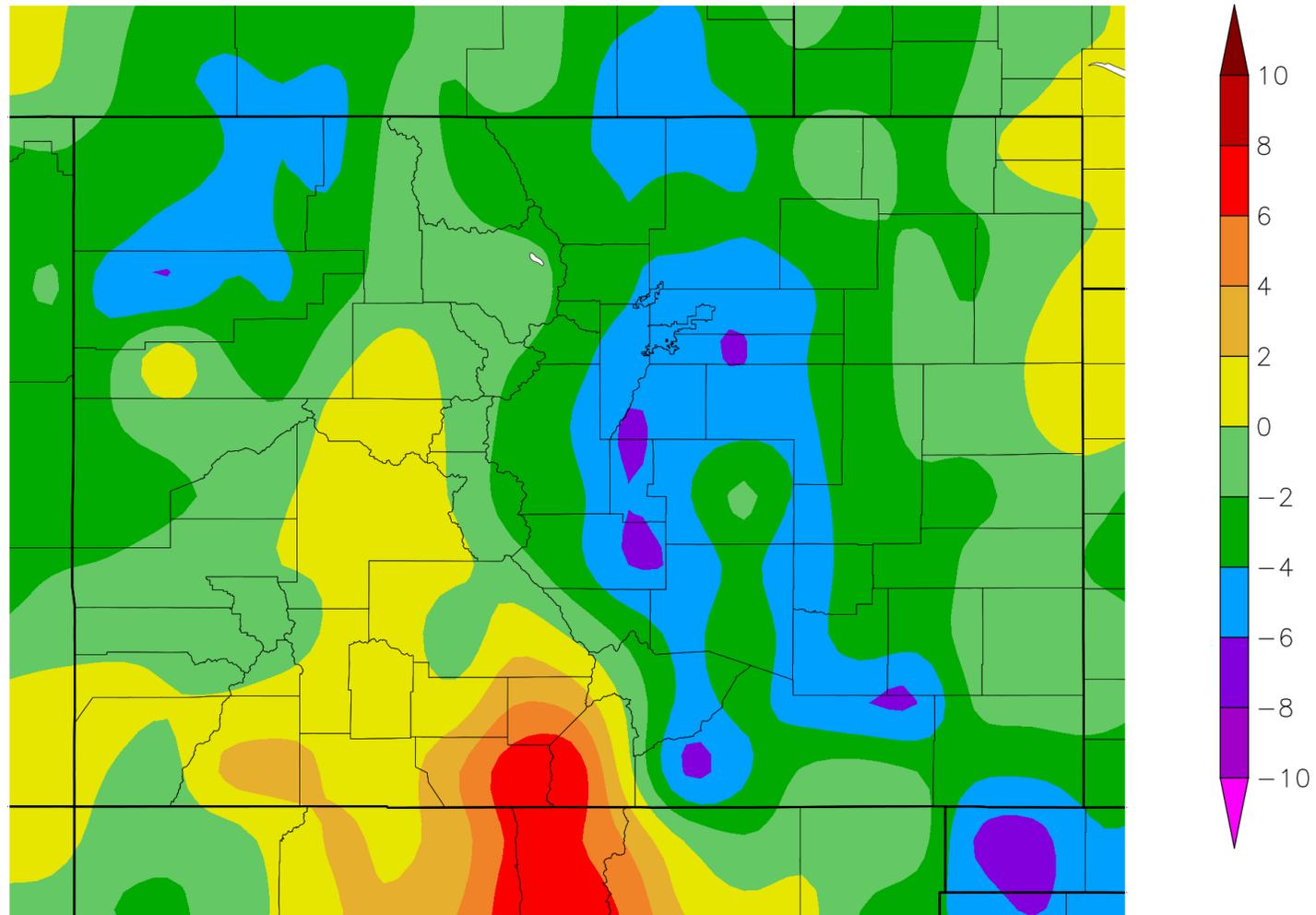


# Colorado - Precipitation

## October-January 2020 Percentile



# Departure from Normal Temperature (F) 2/1/2020 - 2/16/2020

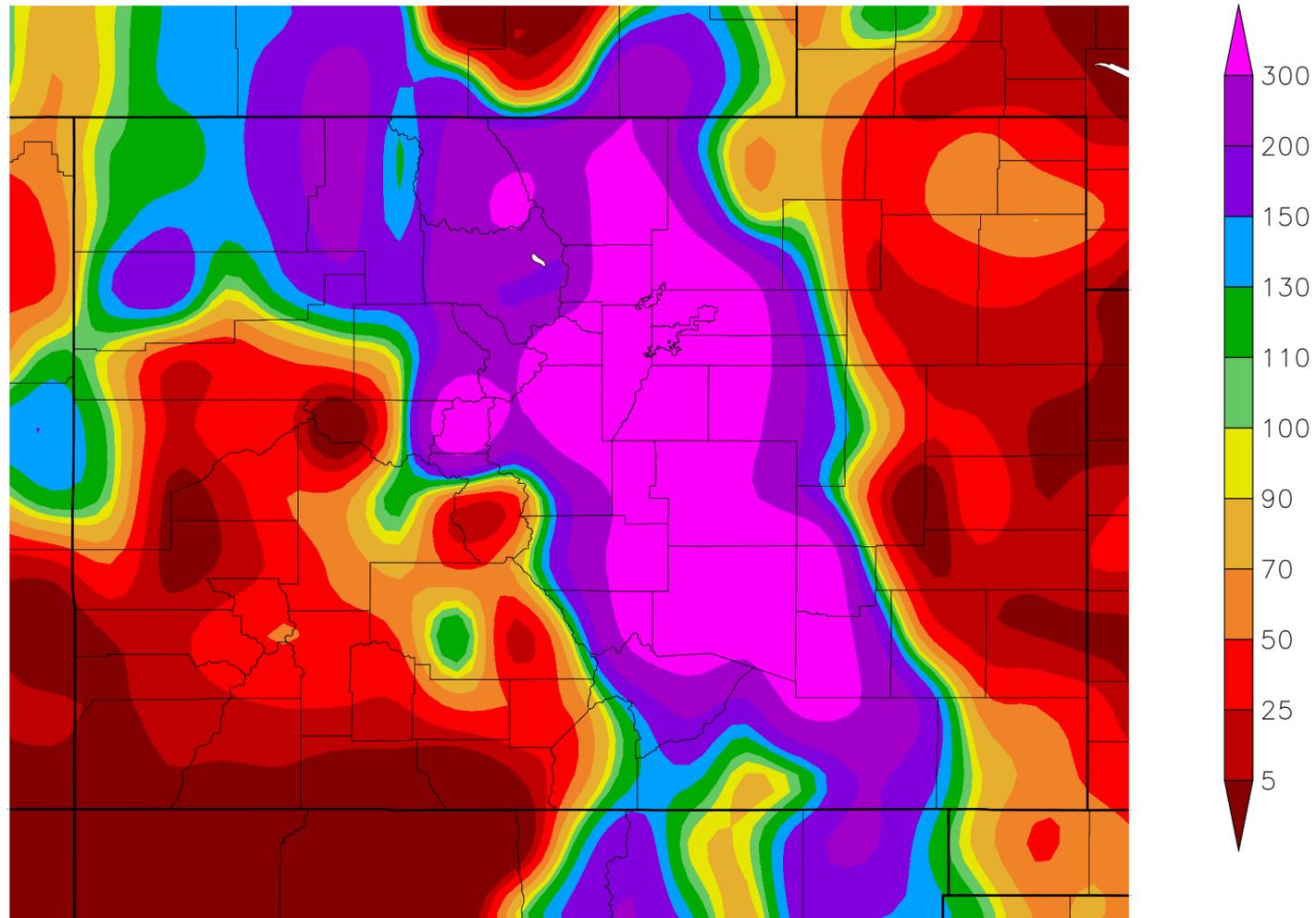


Generated 2/17/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers



# Percent of Normal Precipitation (%) 2/1/2020 – 2/16/2020

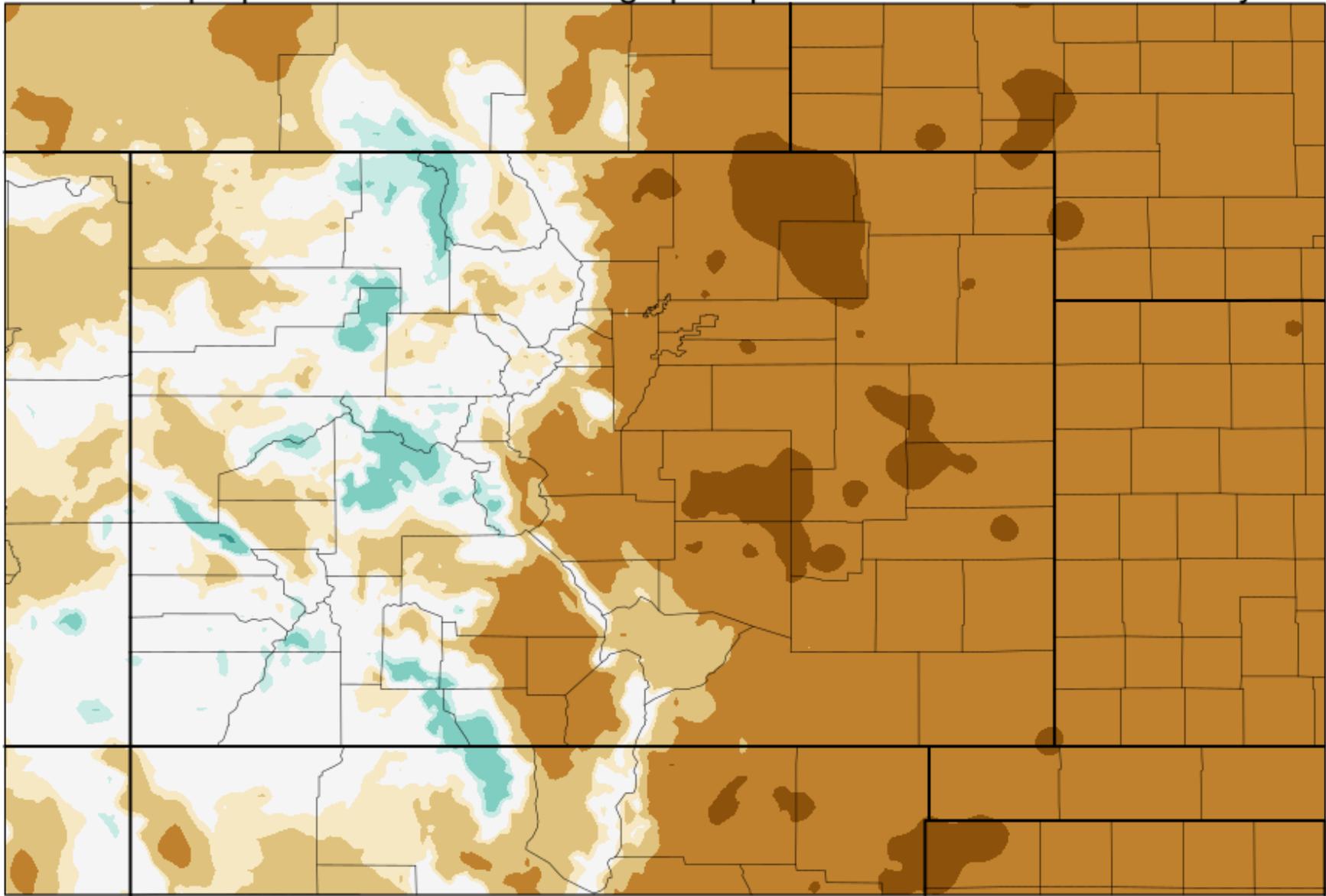


Generated 2/17/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers



# PRISM proportion of annual average precipitation in this month: February



0.1 0.25 0.5 0.75 0.85 1.15 1.25 1.5 1.75 2 Proportion of precip relative to 1/12th

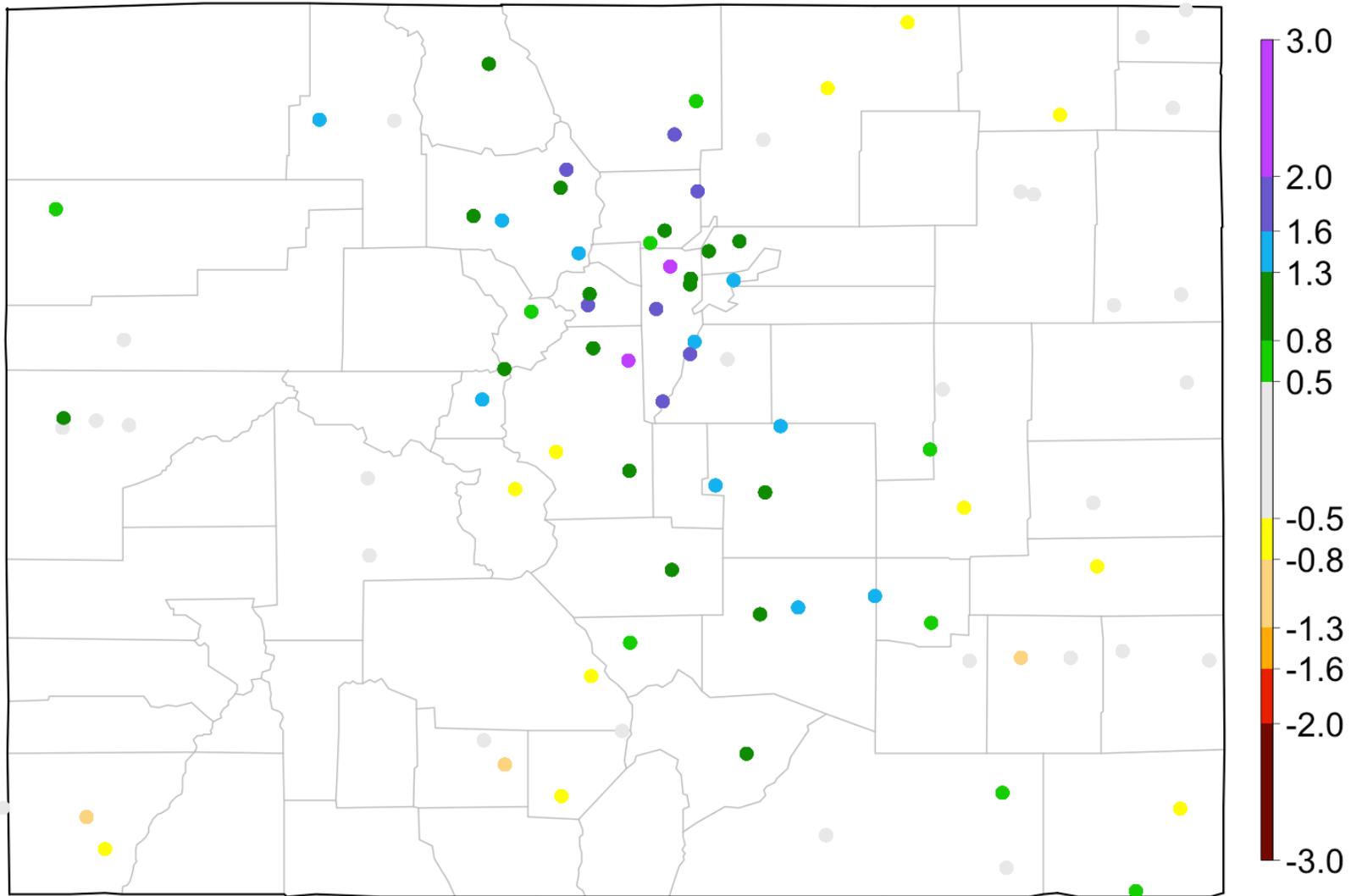
Russ Schumacher/Colorado Climate Center



COLORADO CLIMATE CENTER



# 30-day SPI: 2020/01/17 - 2020/02/15

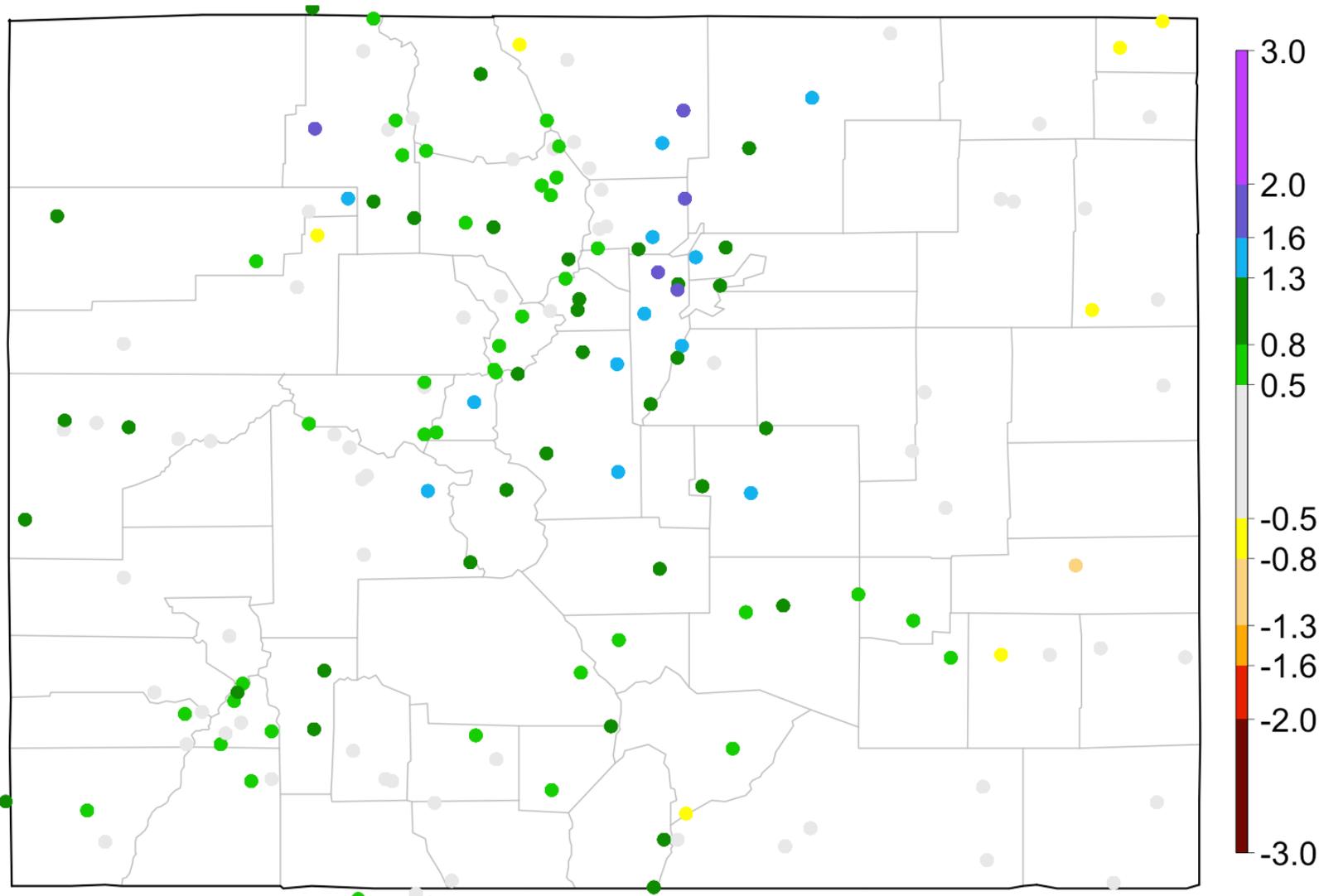


Data from High Plains Regional Climate Center and ACIS

[nl](#)



# 90-day SPI: 2019/11/18 - 2020/02/15

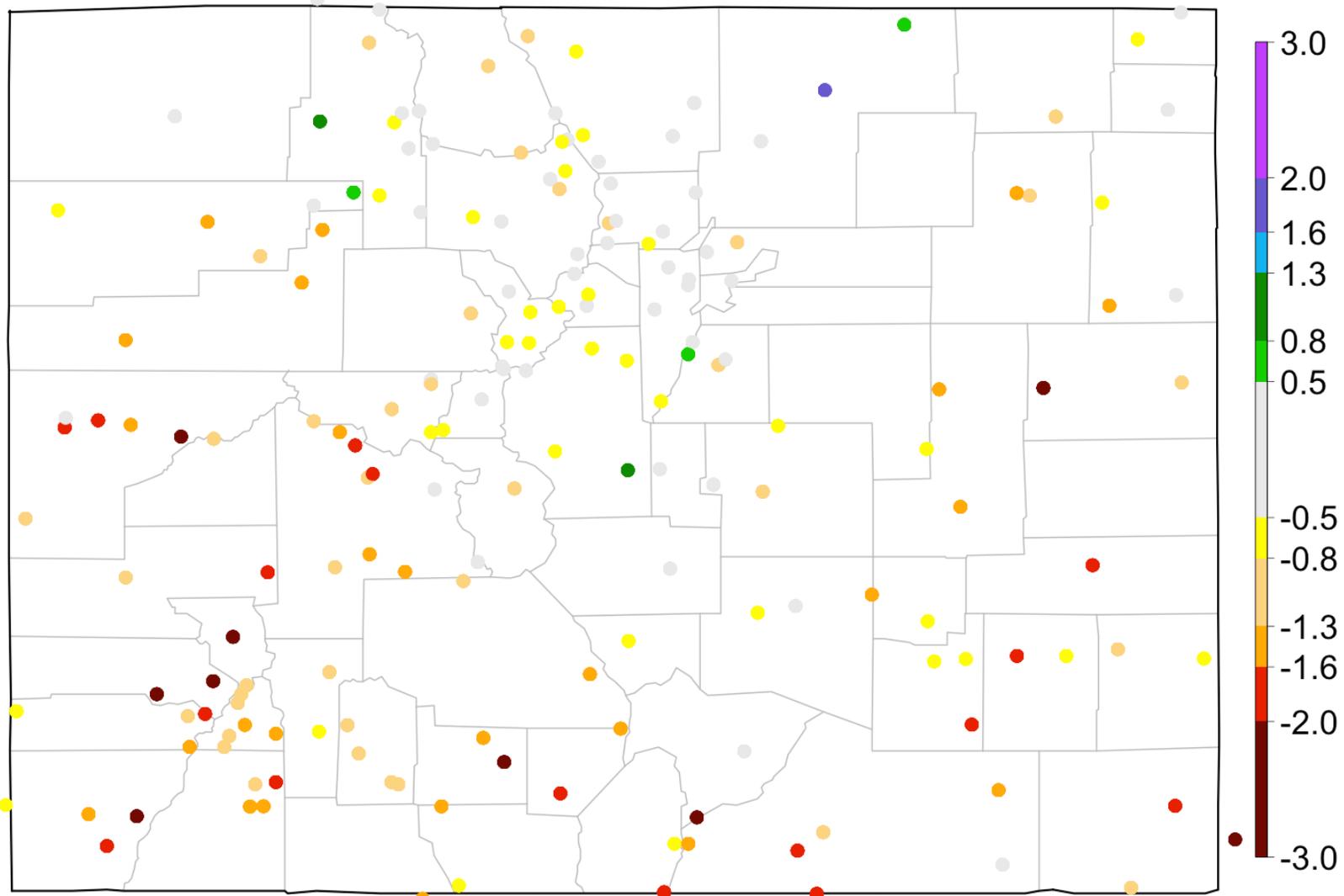


Data from High Plains Regional Climate Center and ACIS

[nl](#)



# 6-month SPI: 2019/08/16 - 2020/02/15

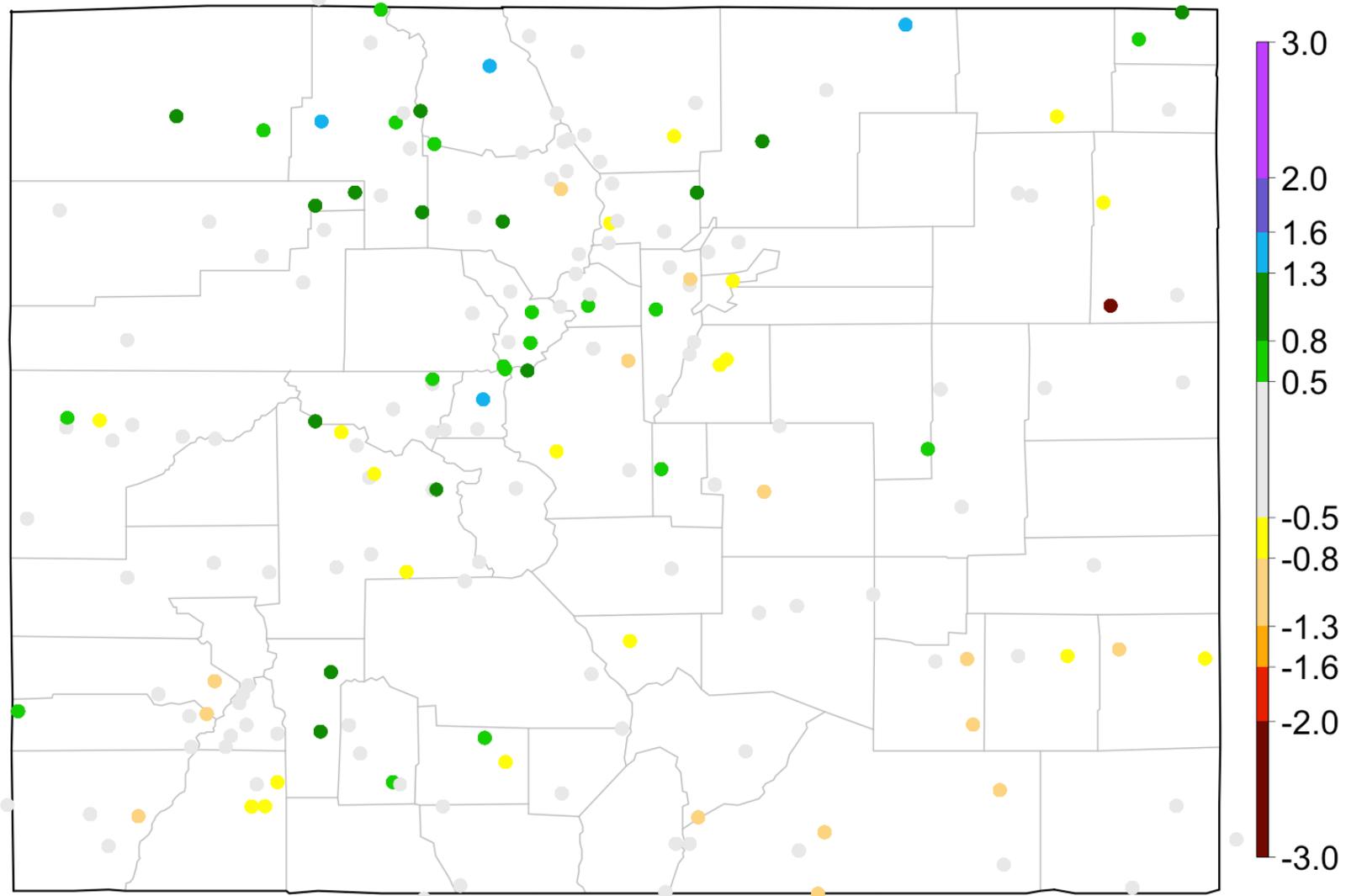


Data from High Plains Regional Climate Center and ACIS

[nl](#)



# 12-month SPI: 2019/02/16 - 2020/02/15



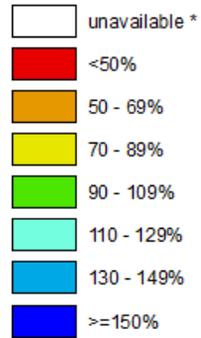
Data from High Plains Regional Climate Center and ACIS



**Colorado**  
**SNOTEL Current Snow Water Equivalent (SWE) % of Normal**  
 Laramie and North Platte

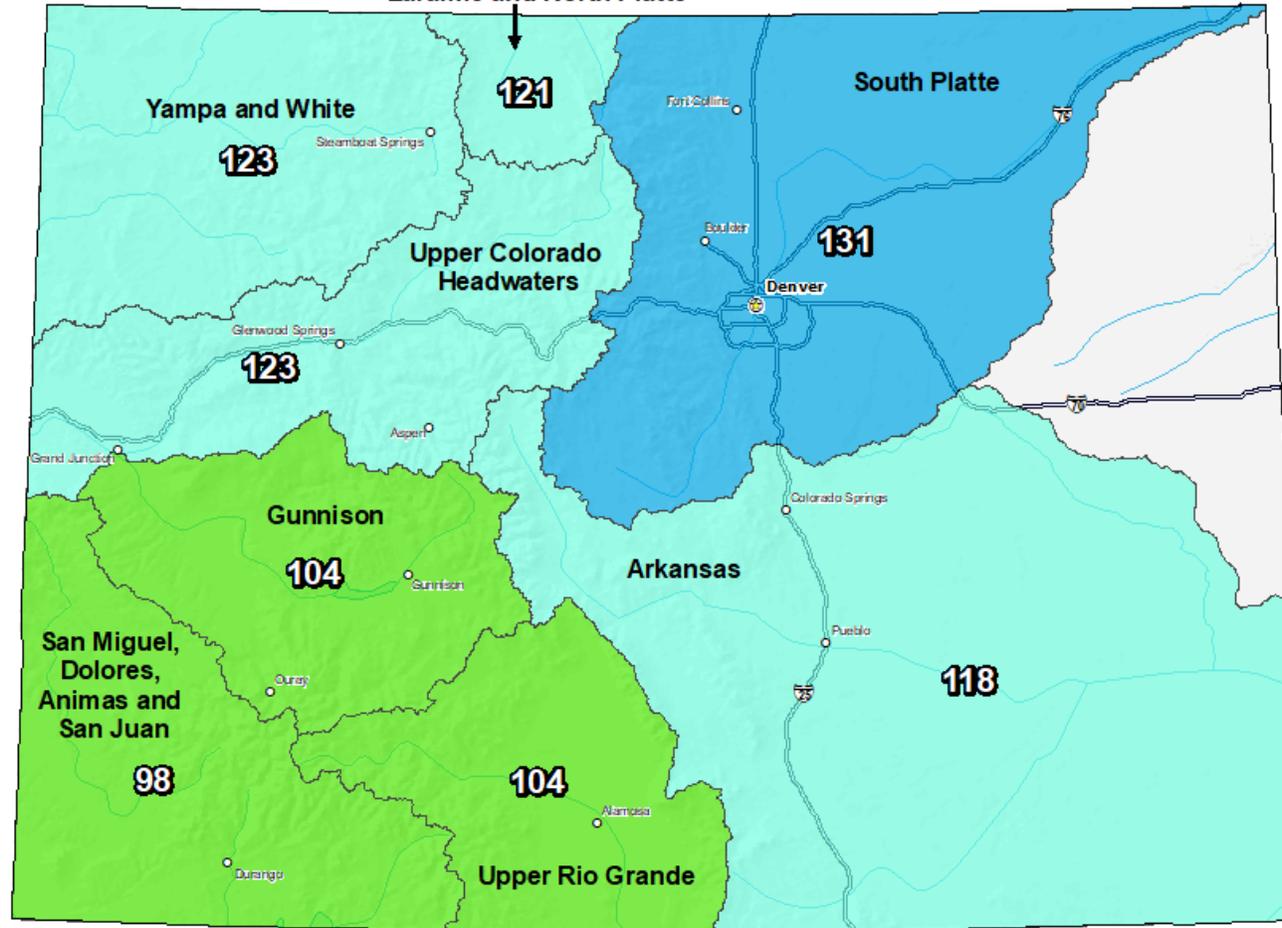
**Feb 17, 2020**

Current Snow Water Equivalent (SWE) Basin-wide Percent of 1981-2010 Median



\* Data unavailable at time of posting or measurement is not representative at this time of year

*Provisional Data  
 Subject to Revision*

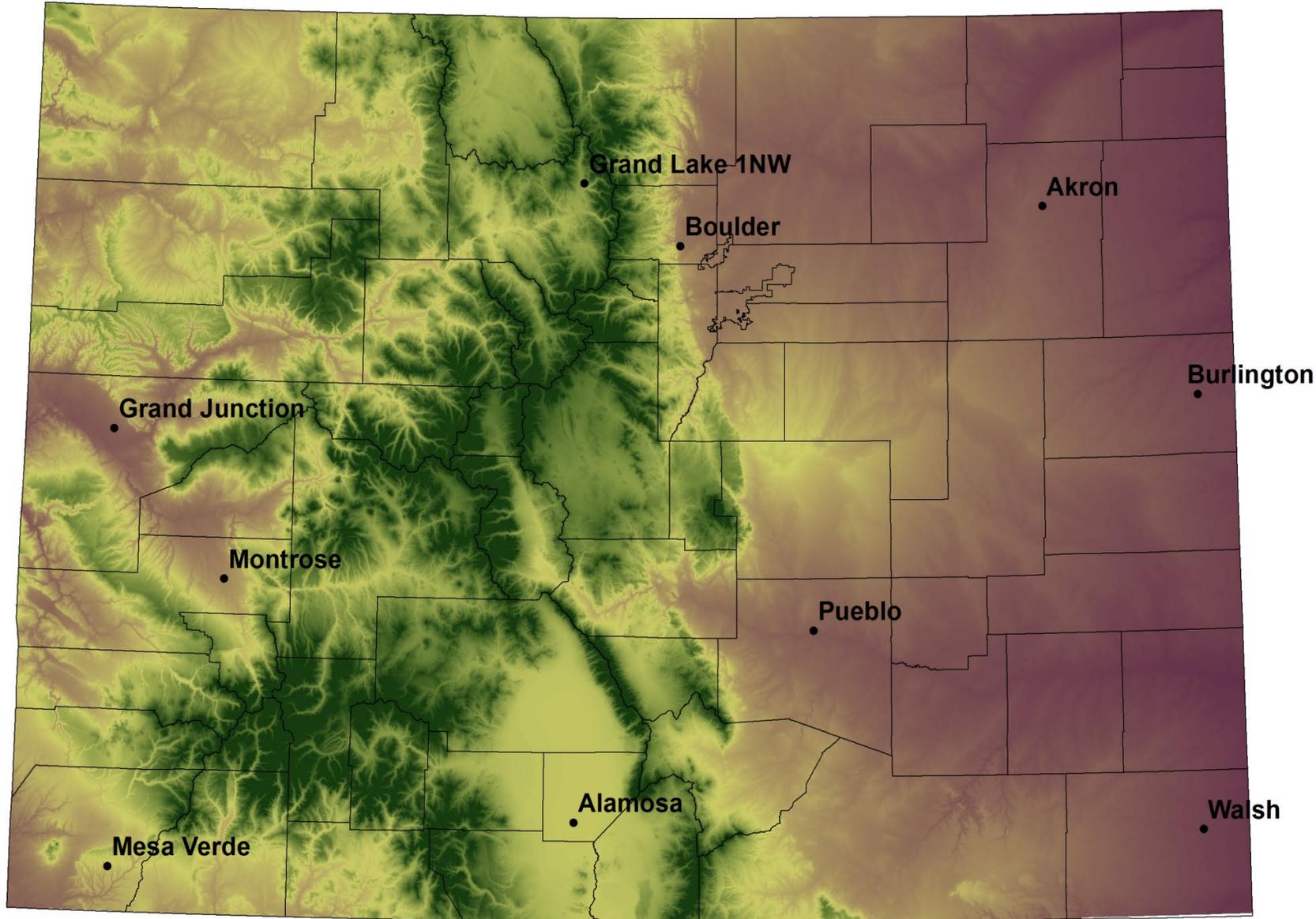


The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by:  
 USDA/NRCS National Water and Climate Center  
 Portland, Oregon  
<http://www.wcc.nrcs.usda.gov>



# NWS Cooperative Stations for WATF

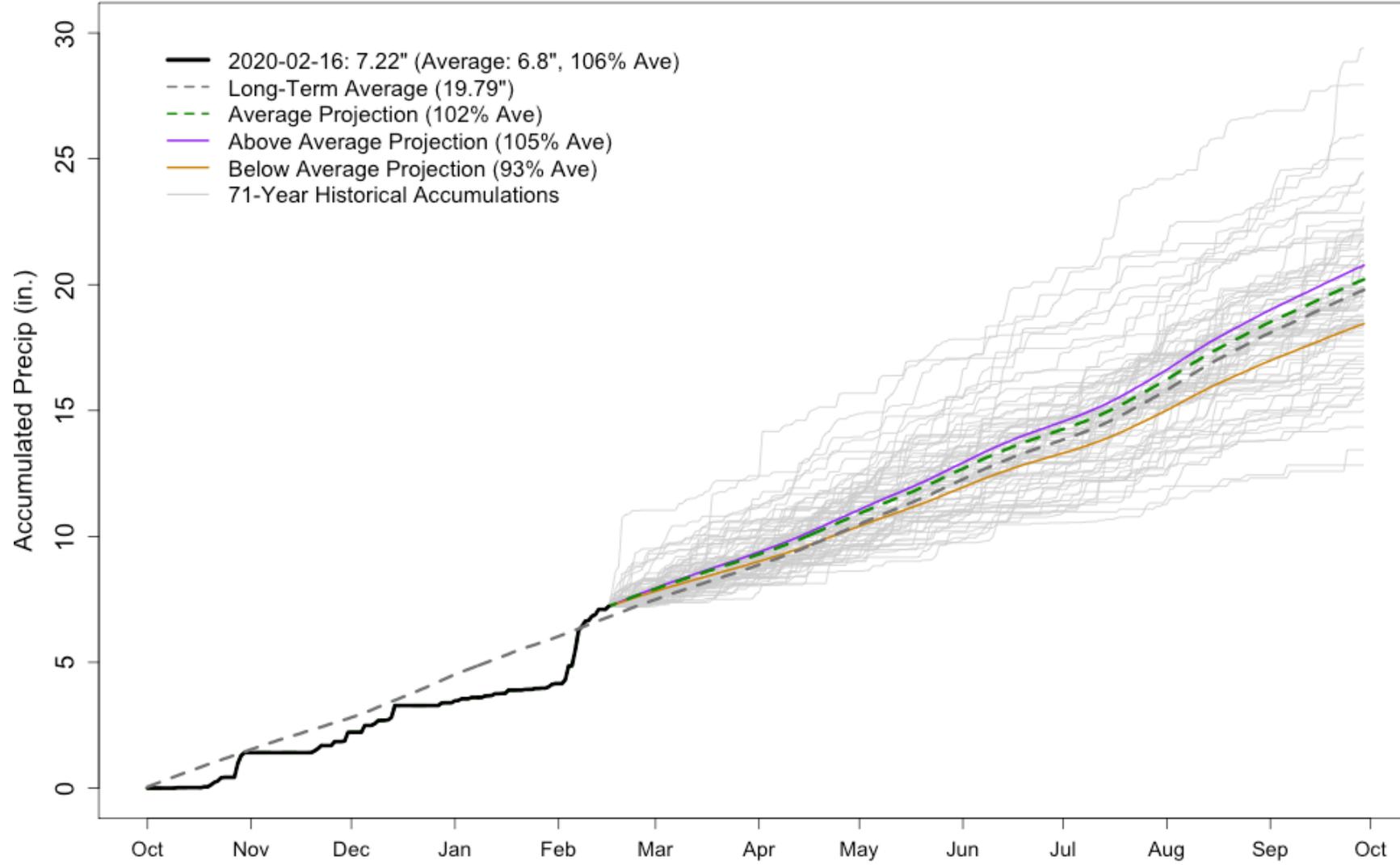


## Water Year 2020 – Station Updates



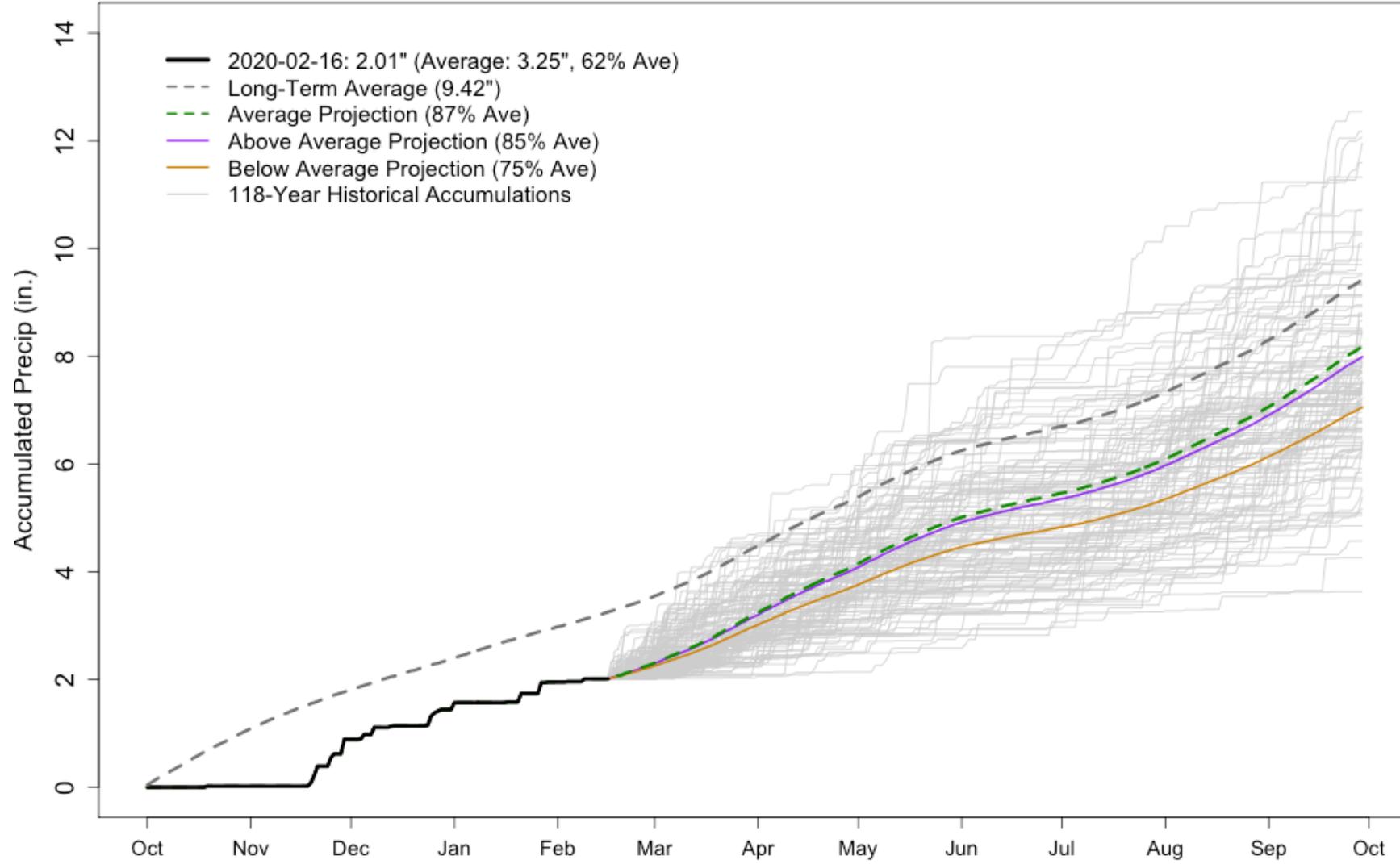
# Grand Lake

## GRAND LAKE 1 NW WY2020 Precipitation Projections

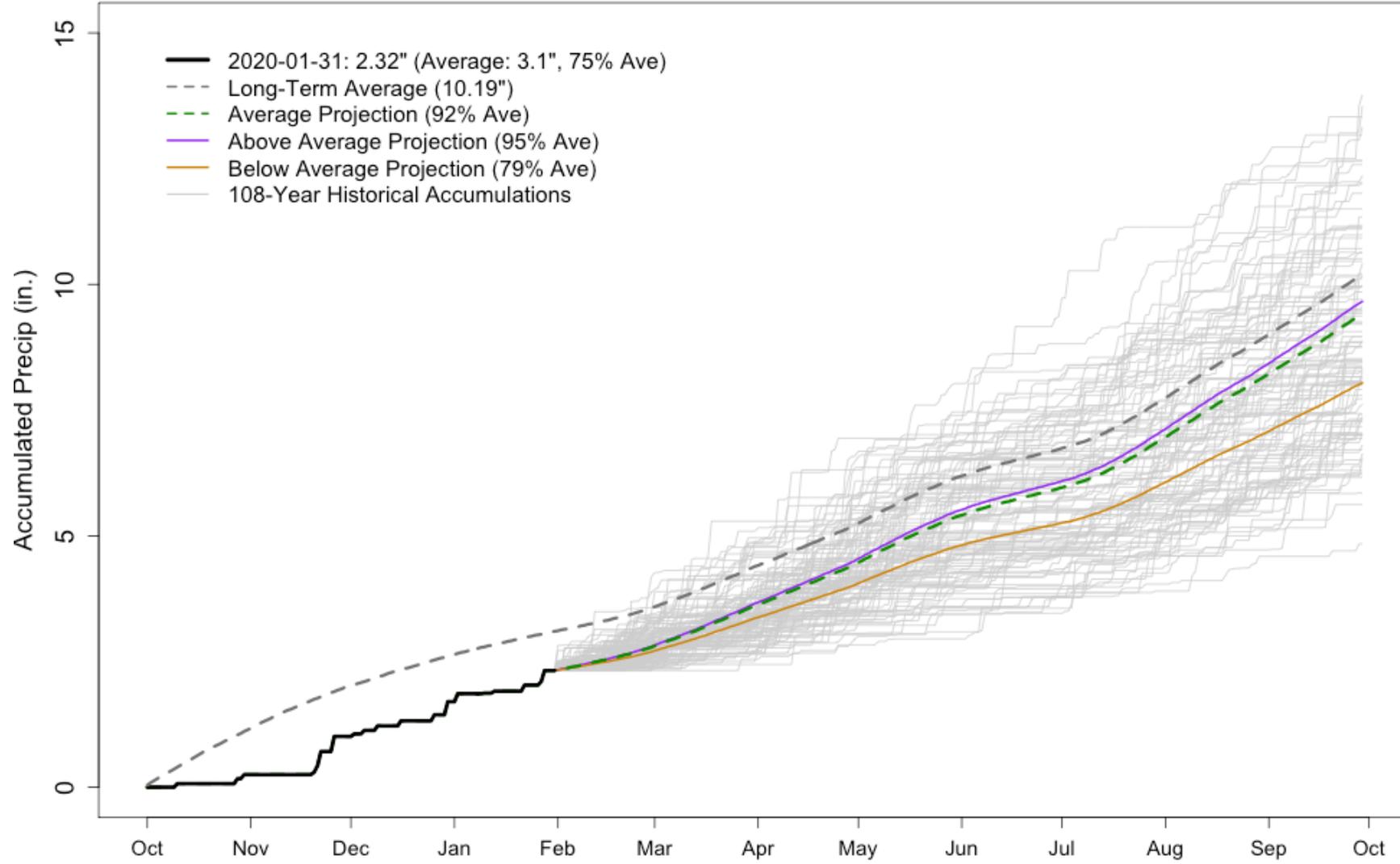


# Grand Junction

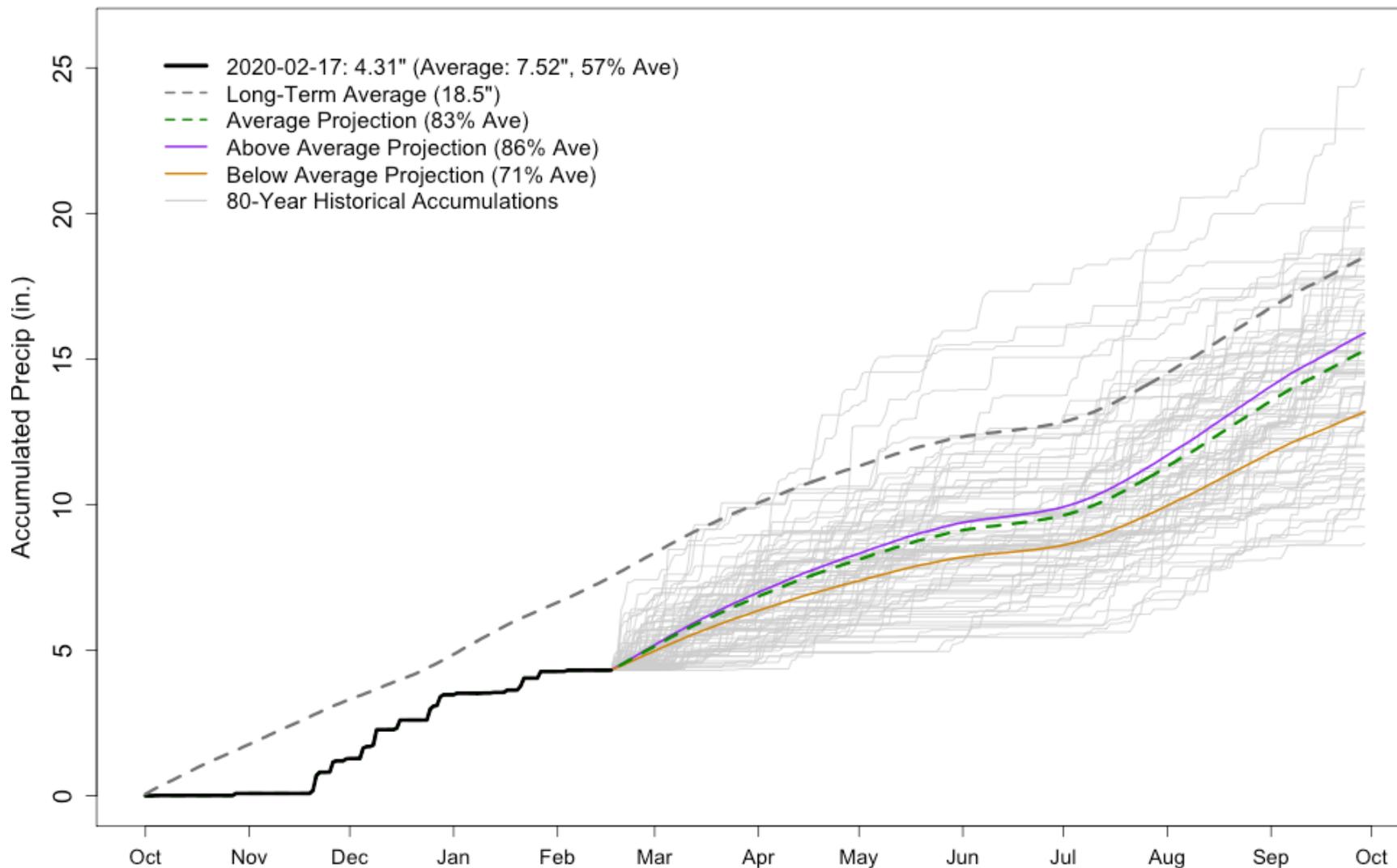
## GRAND JUNCTION WALKER FIELD WY2020 Precipitation Projections



## MONTROSE NO 2 WY2020 Precipitation Projections



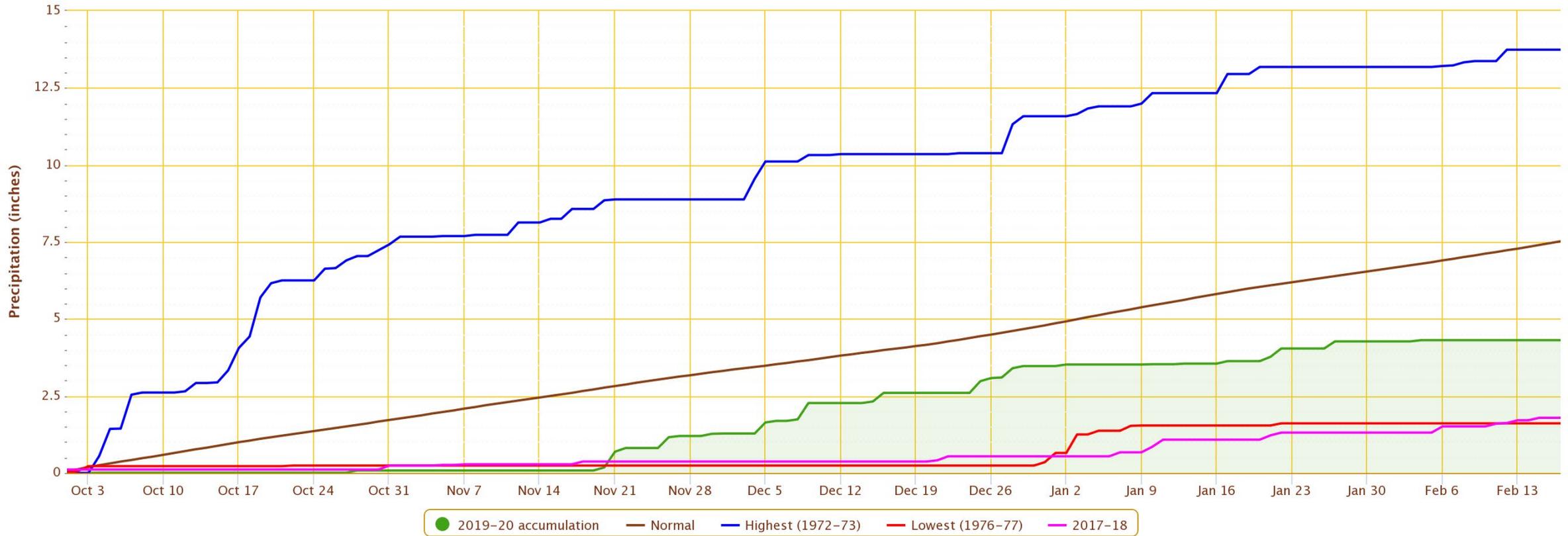
## MESA VERDE NP WY2020 Precipitation Projections



# Mesa Verde NP

## Accumulated Precipitation – MESA VERDE NP, CO

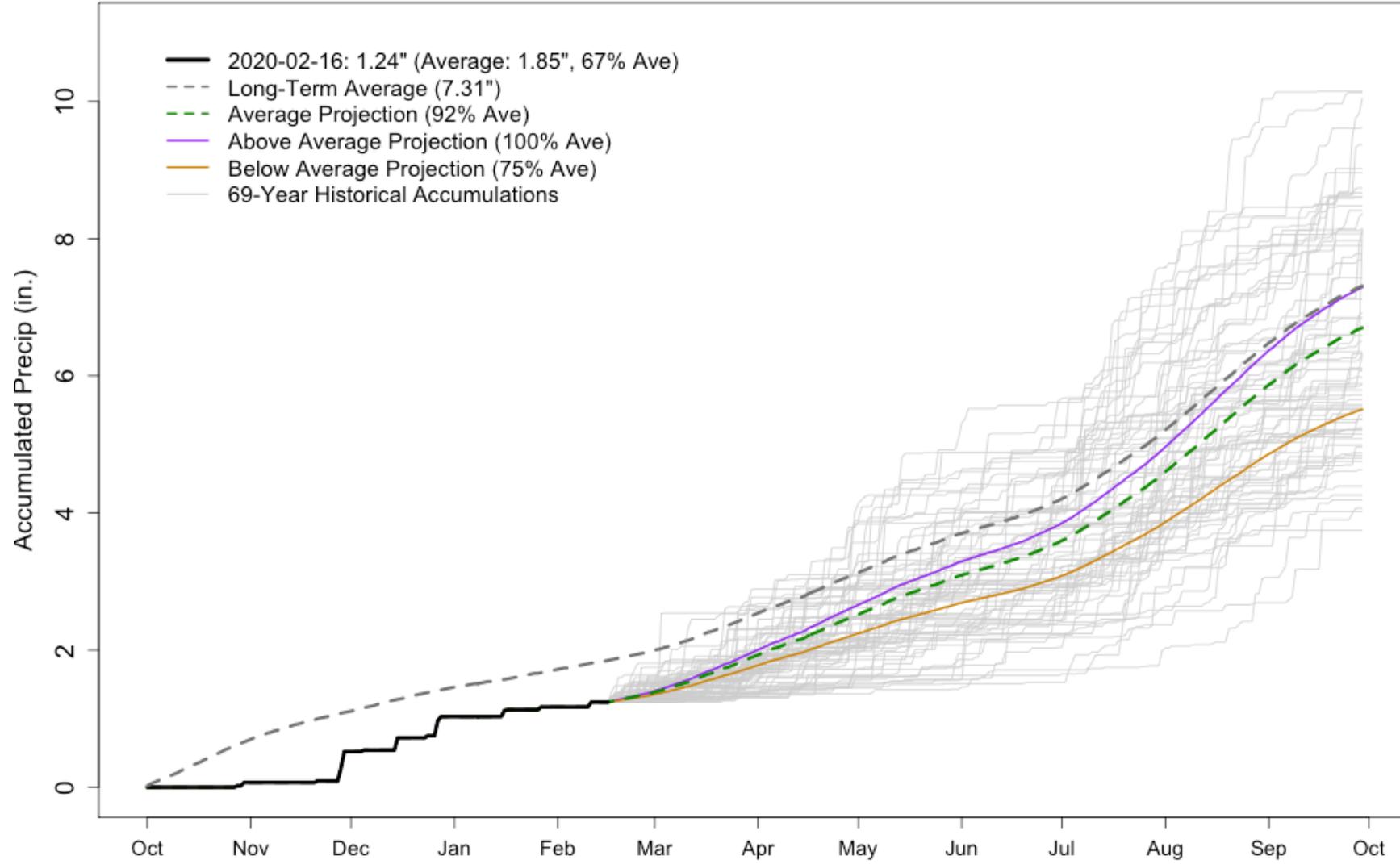
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



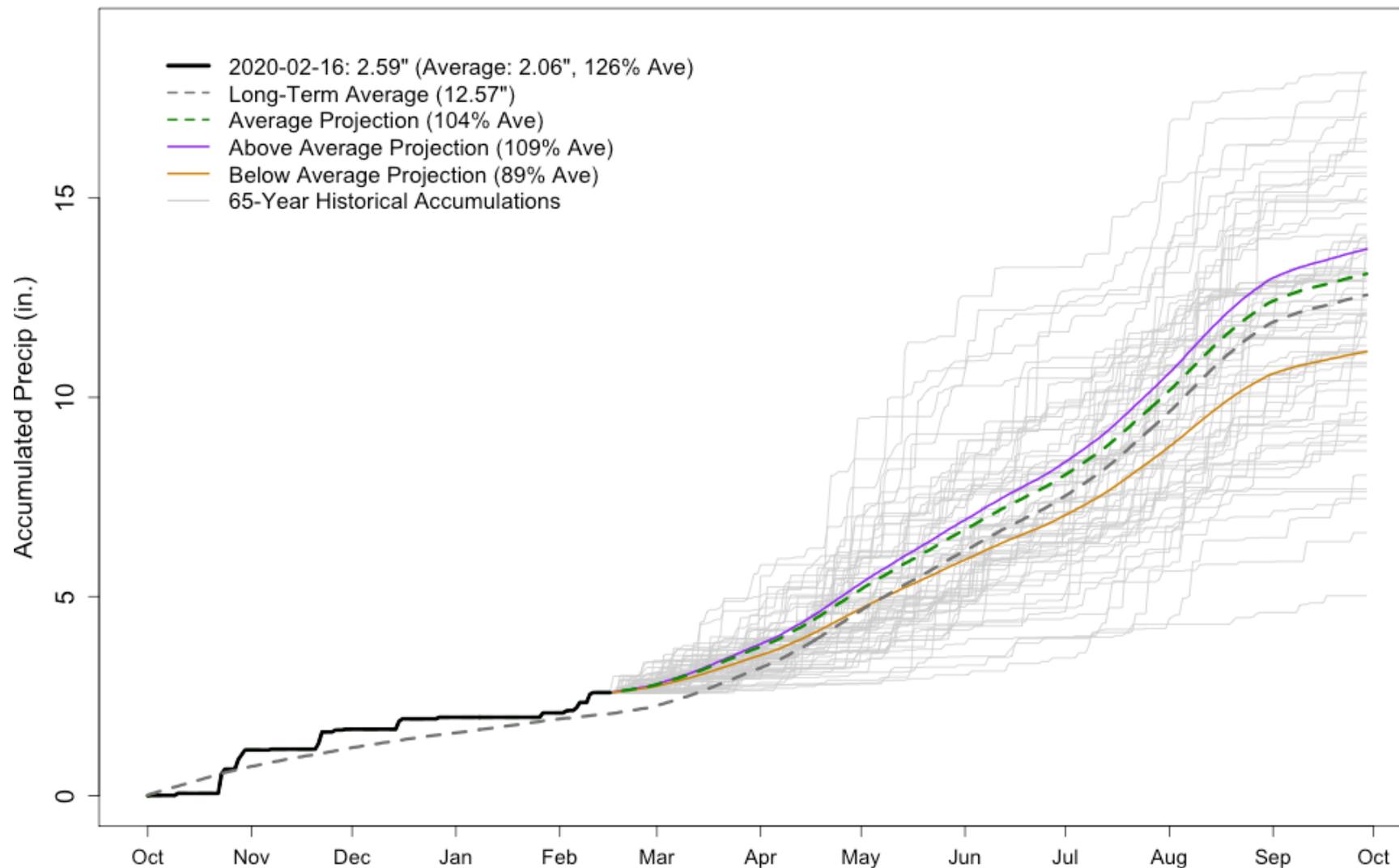
Powered by ACIS



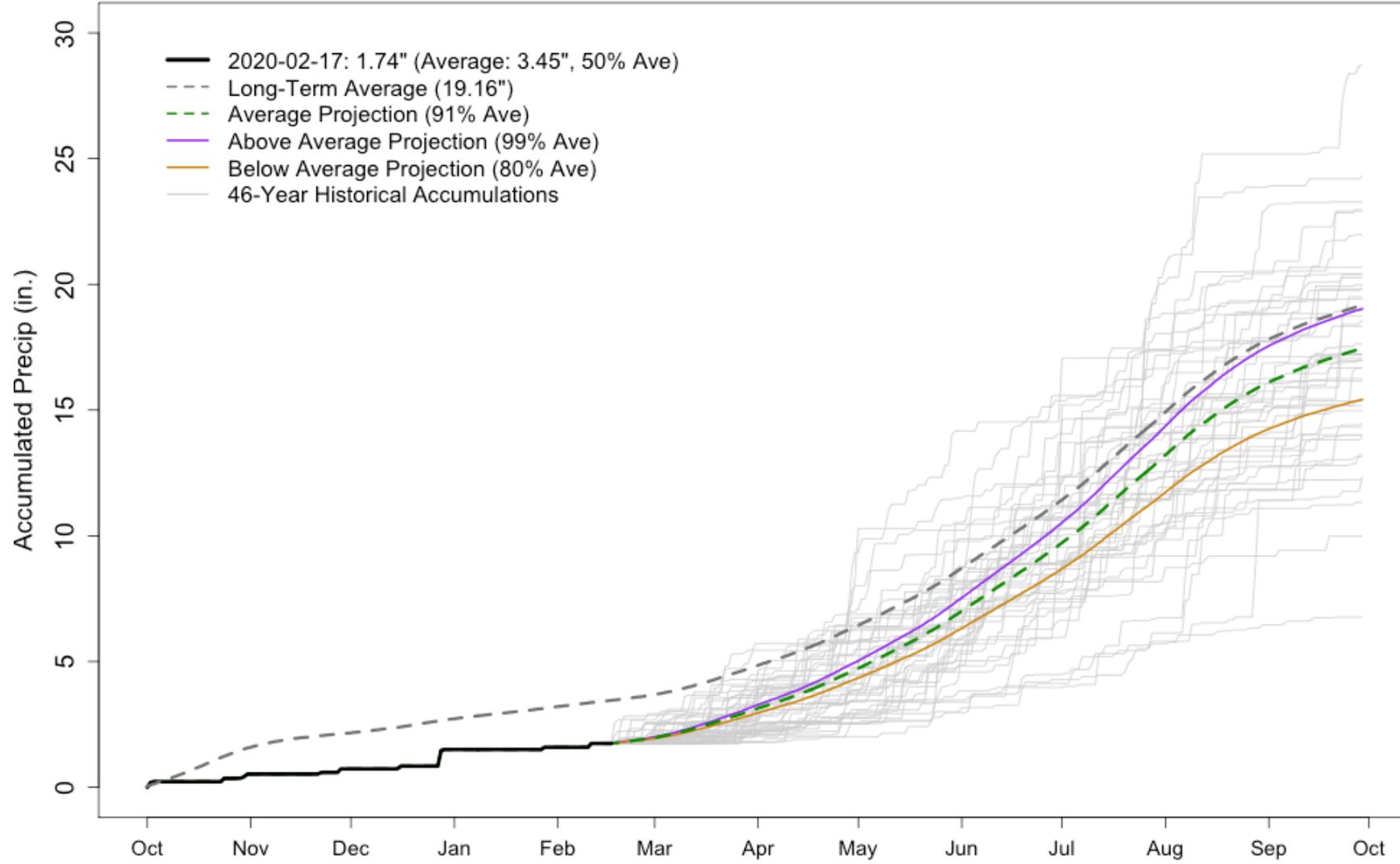
## ALAMOSA SAN LUIS VALLEY REGIONAL AP WY2020 Precipitation Projections



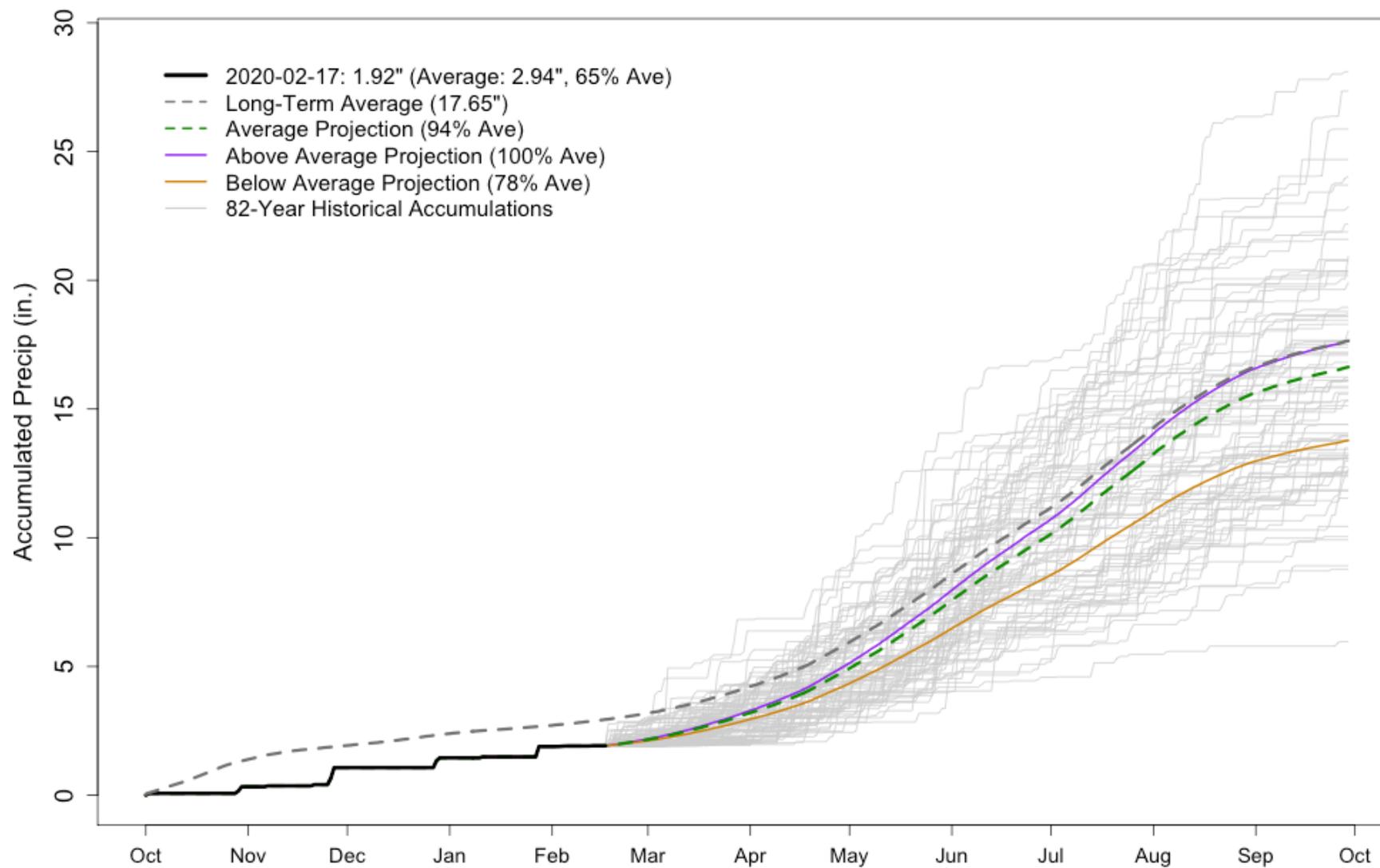
## PUEBLO MEMORIAL AP WY2020 Precipitation Projections



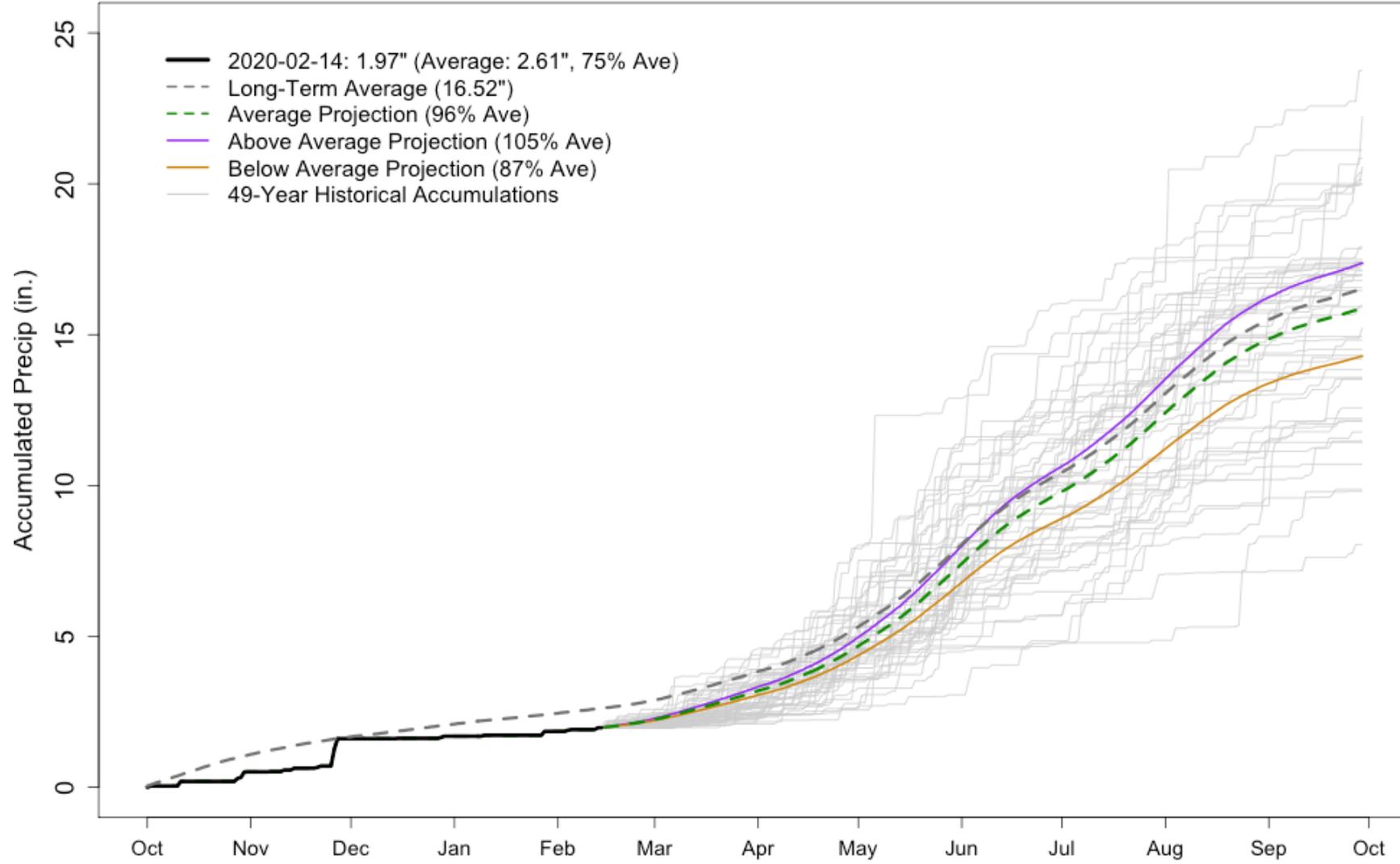
## WALSH 1 W WY2020 Precipitation Projections



## BURLINGTON WY2020 Precipitation Projections

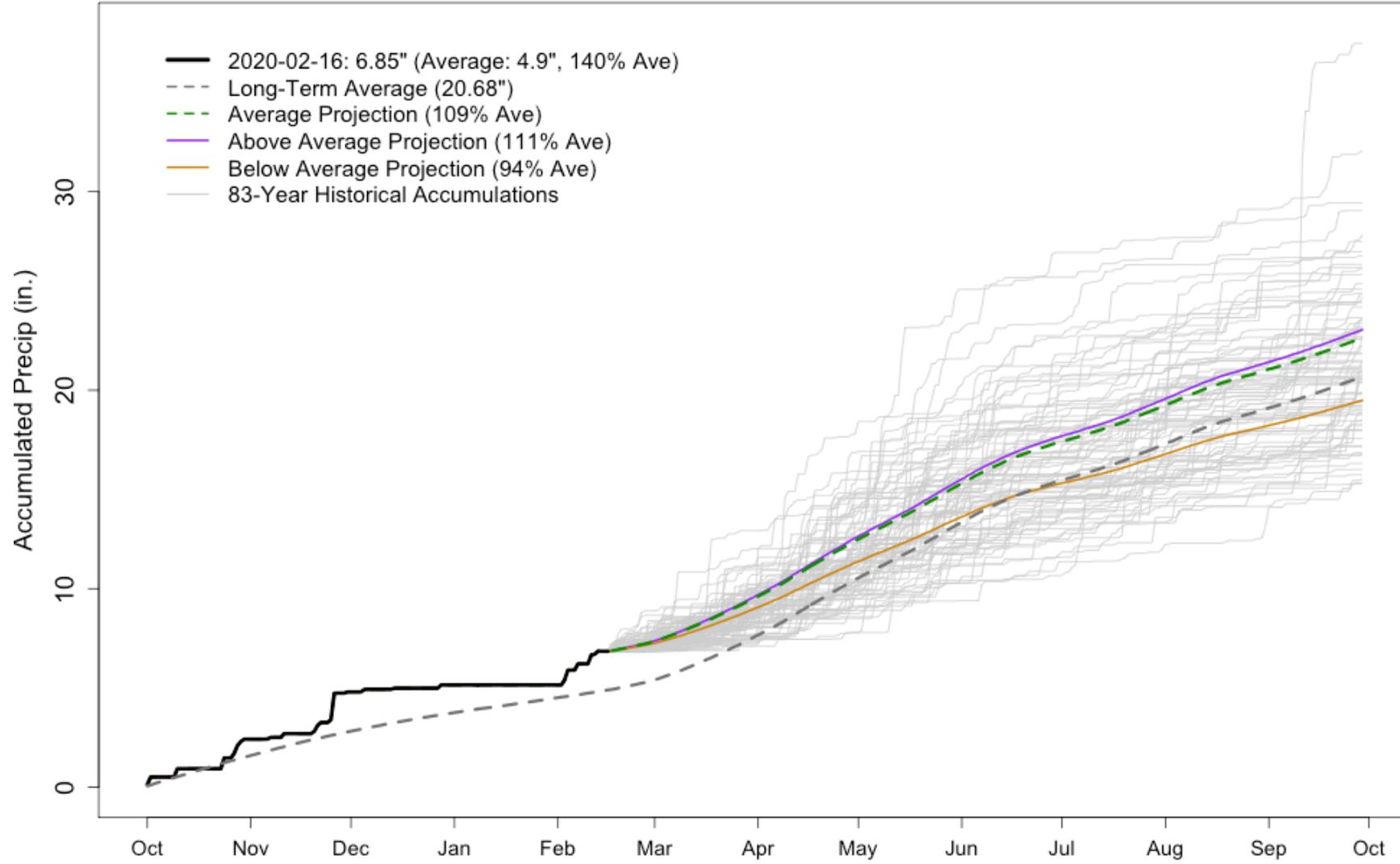


## AKRON 4 E WY2020 Precipitation Projections



# Boulder

## BOULDER WY2020 Precipitation Projections



Already a top-10  
February

November was  
6<sup>th</sup> wettest





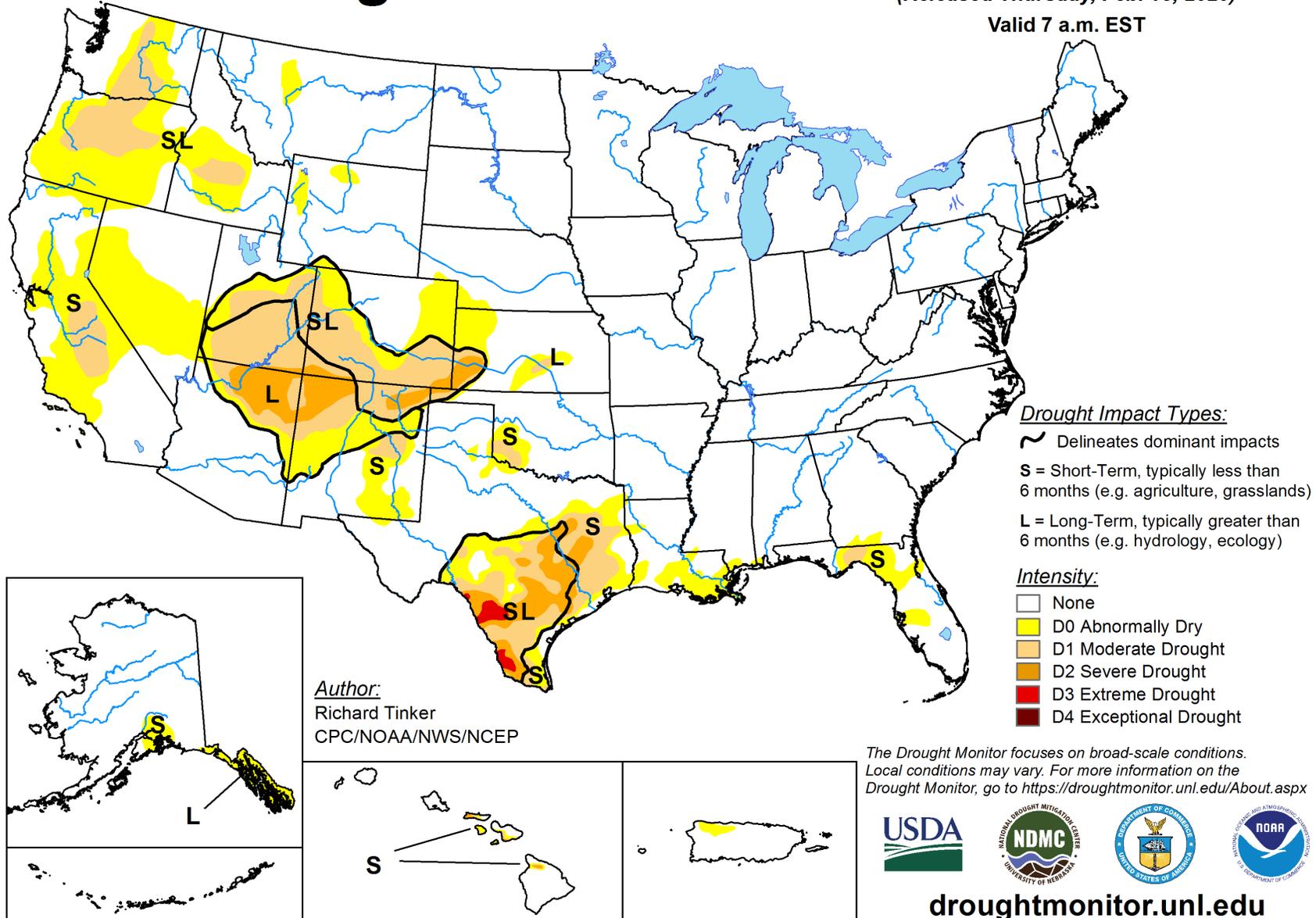
## Drought Conditions



# U.S. Drought Monitor

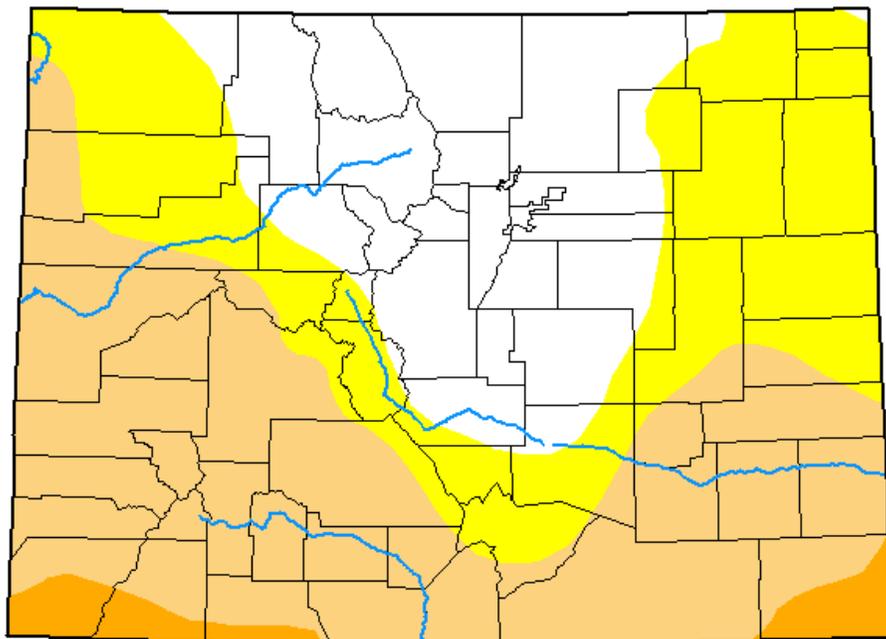
February 11, 2020  
(Released Thursday, Feb. 13, 2020)

Valid 7 a.m. EST



# U.S. Drought Monitor Colorado

**February 11, 2020**  
(Released Thursday, Feb. 13, 2020)  
Valid 7 a.m. EST



*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	27.72	72.28	43.82	3.30	0.00	0.00
<b>Last Week</b> <i>02-04-2020</i>	22.39	77.61	51.12	3.30	0.00	0.00
<b>3 Months Ago</b> <i>11-12-2019</i>	25.74	74.26	55.27	31.02	0.00	0.00
<b>Start of Calendar Year</b> <i>12-31-2019</i>	31.72	68.28	51.19	20.11	0.00	0.00
<b>Start of Water Year</b> <i>10-01-2019</i>	30.14	69.86	27.53	0.00	0.00	0.00
<b>One Year Ago</b> <i>02-12-2019</i>	8.15	91.85	67.16	39.69	21.84	0.11

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:

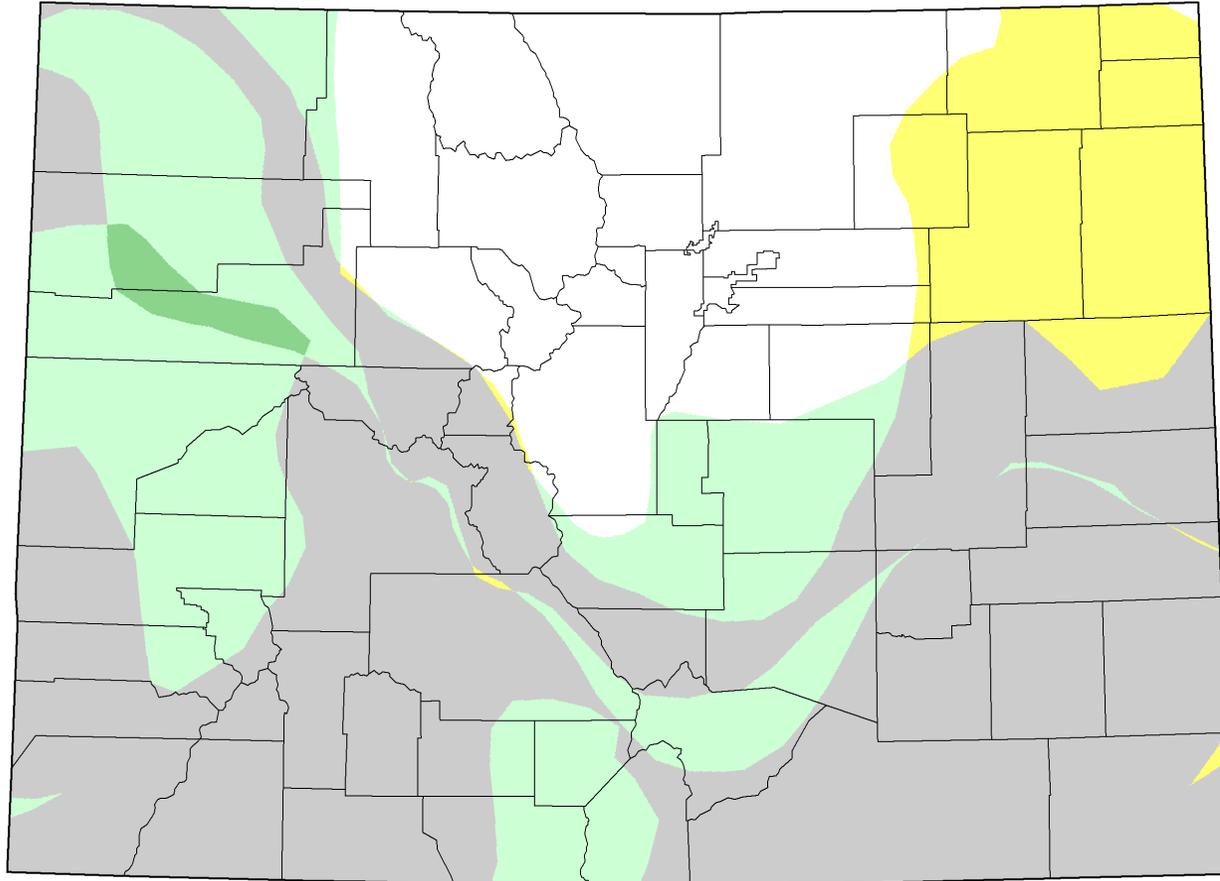
Richard Tinker  
CPC/NOAA/NWS/NCEP



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

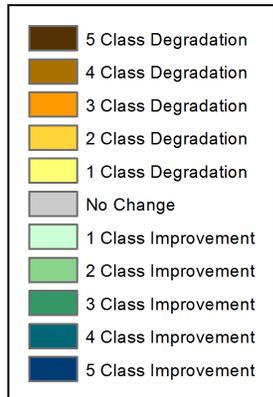


# U.S. Drought Monitor Class Change - Colorado 1 Month

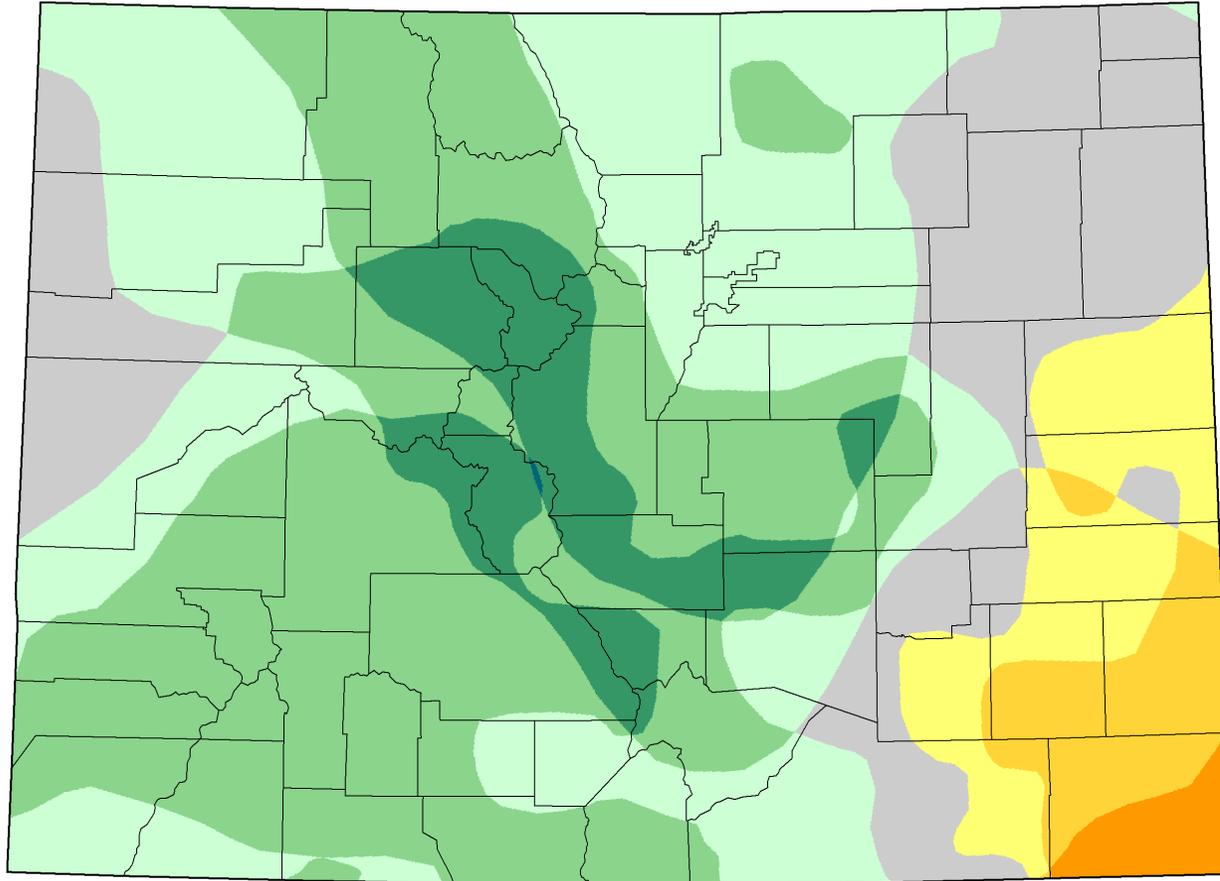


February 11, 2020  
compared to  
January 14, 2020

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



# U.S. Drought Monitor Class Change - Colorado 1 Year



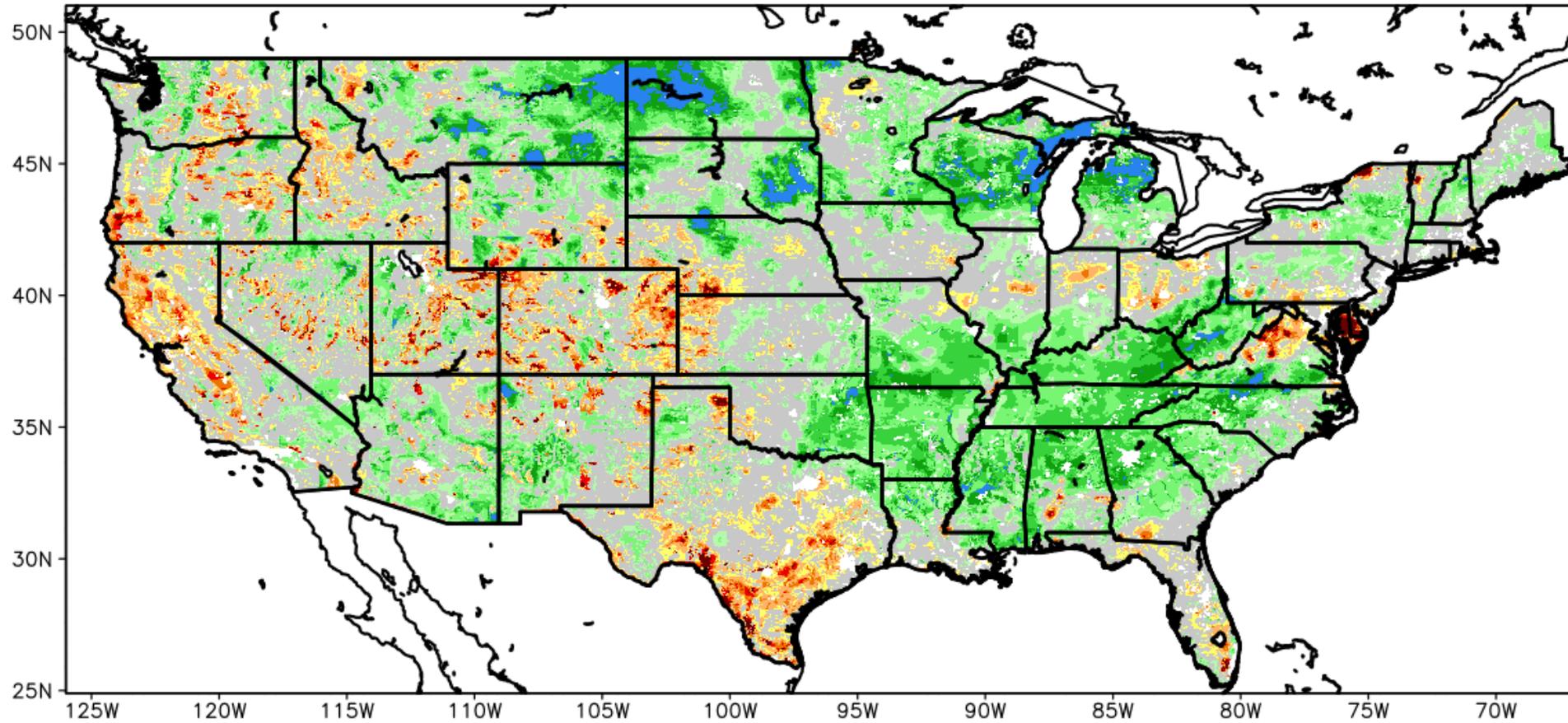
February 11, 2020  
compared to  
February 12, 2019

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

- 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



SPoRT-LIS 0-2 m RSM percentile valid 17 Feb 2020





## Outlook

Next 7 days

8-14 day Outlook

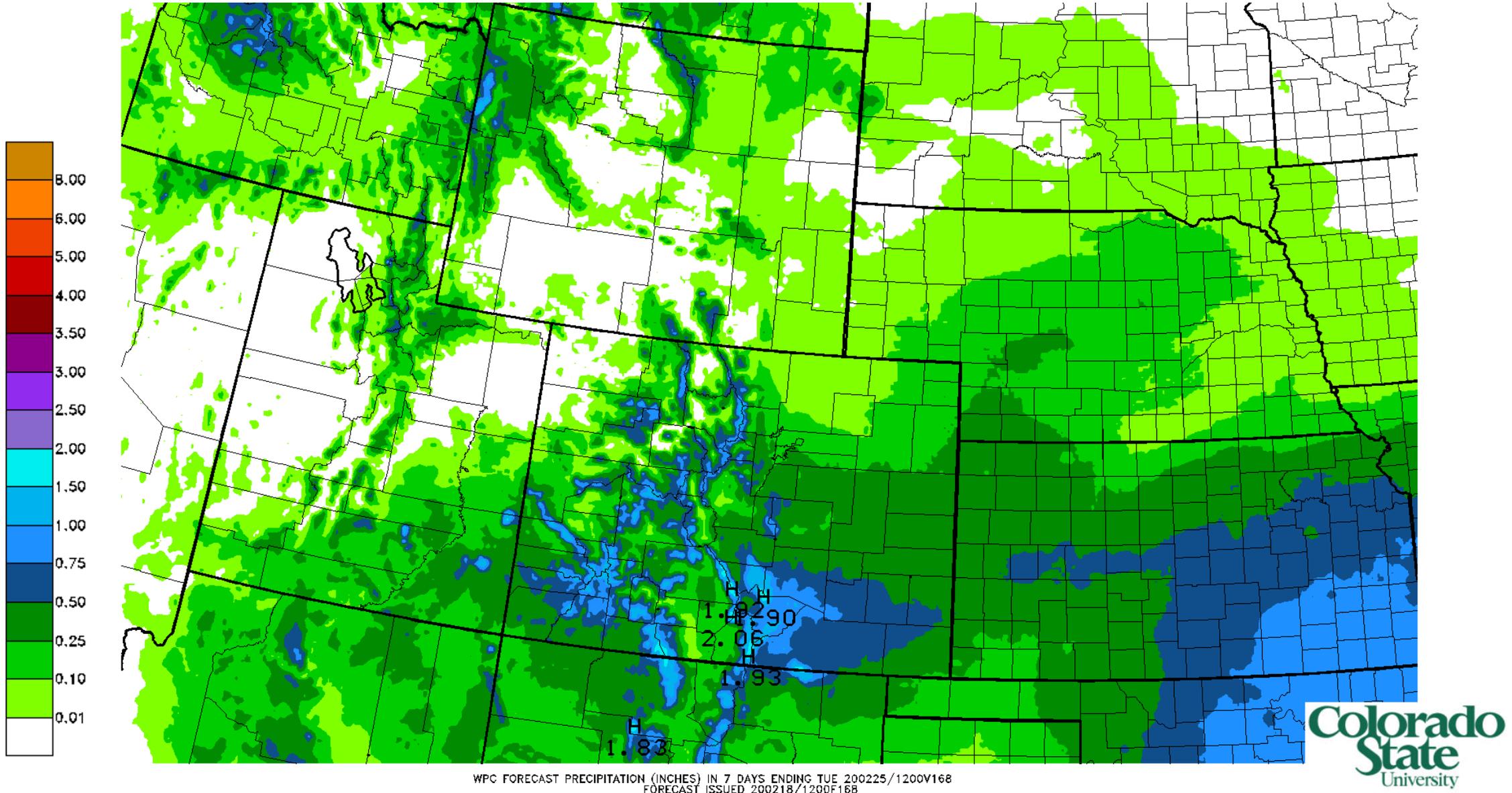
CPC Outlooks

Precipitation Projections

What is happening with El Niño?



# NOAA 7-day precip forecast

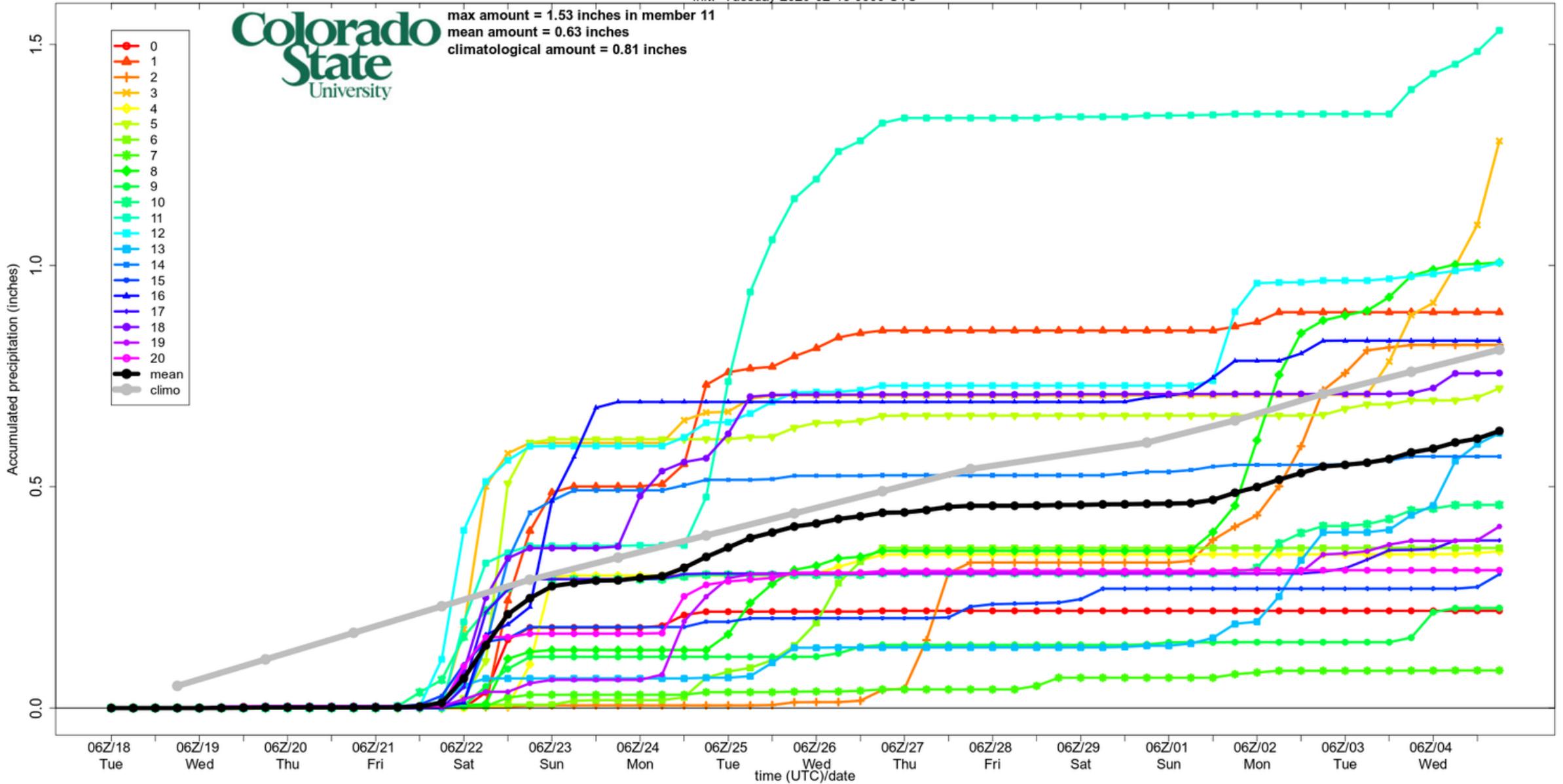


# NCEP GEFS accumulated precipitation at Durango

init: Tuesday 2020-02-18 0000 UTC



max amount = 1.53 inches in member 11  
mean amount = 0.63 inches  
climatological amount = 0.81 inches

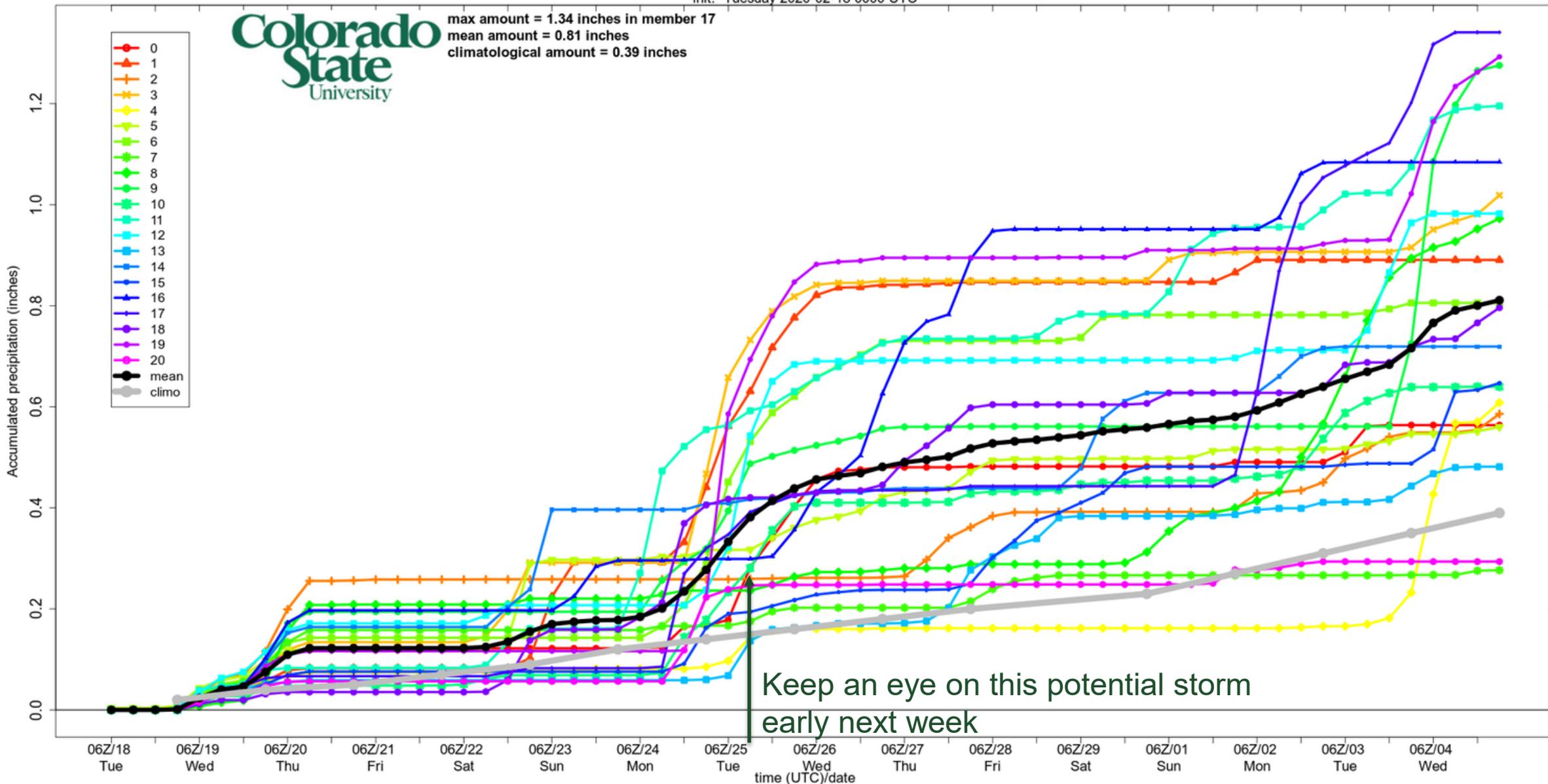


# NCEP GEFS accumulated precipitation at Fort Collins

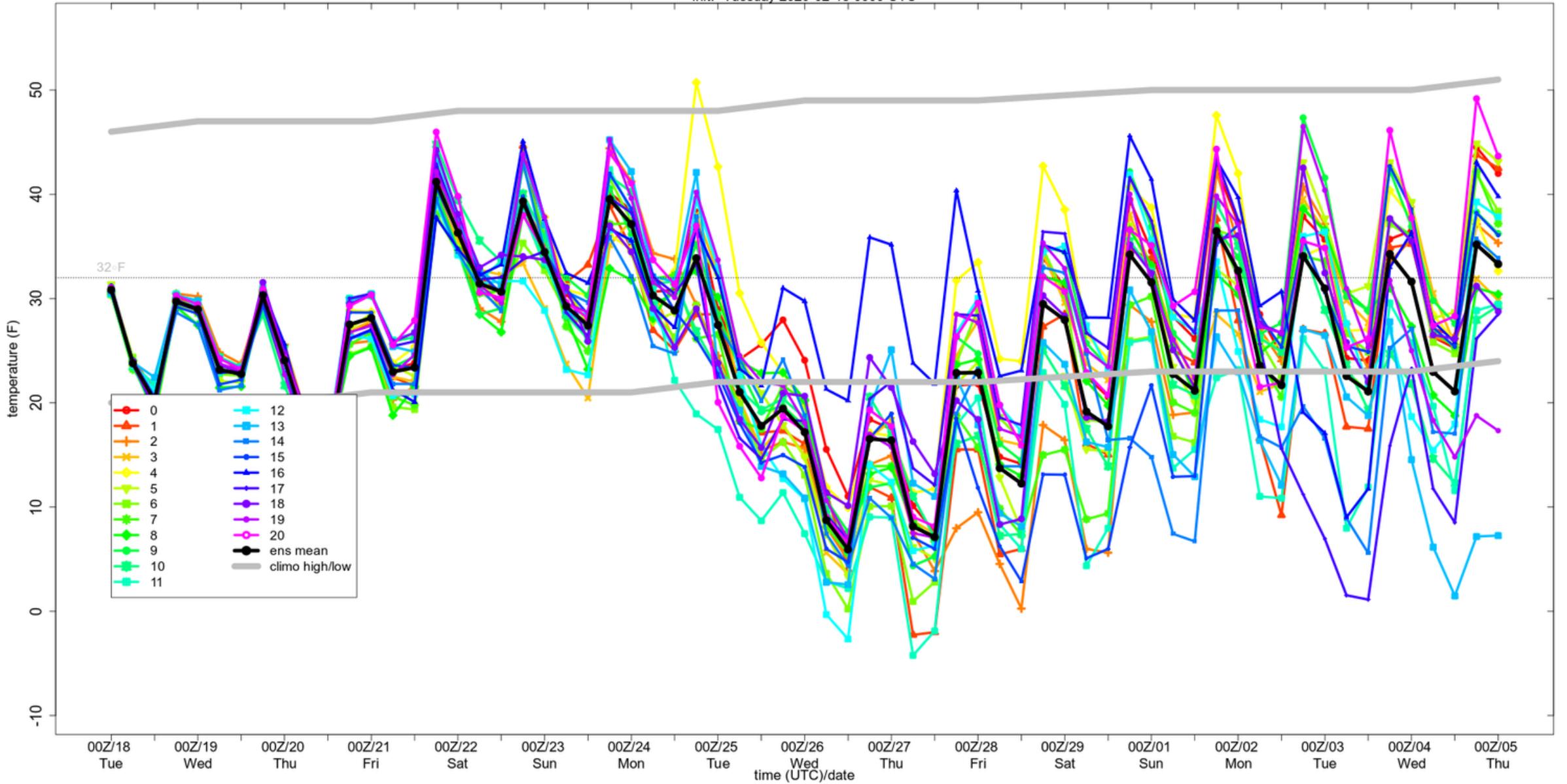
init: Tuesday 2020-02-18 0000 UTC



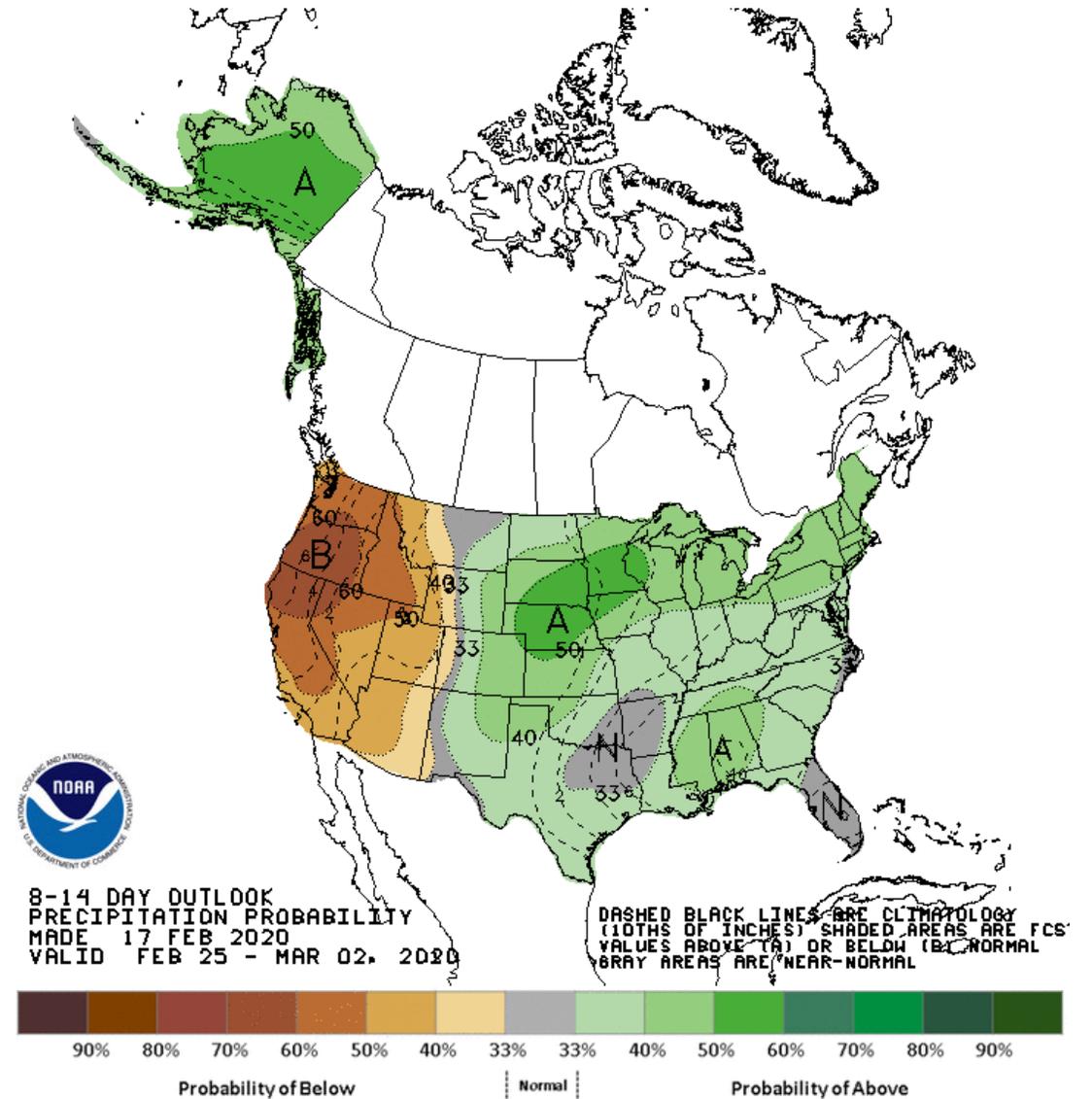
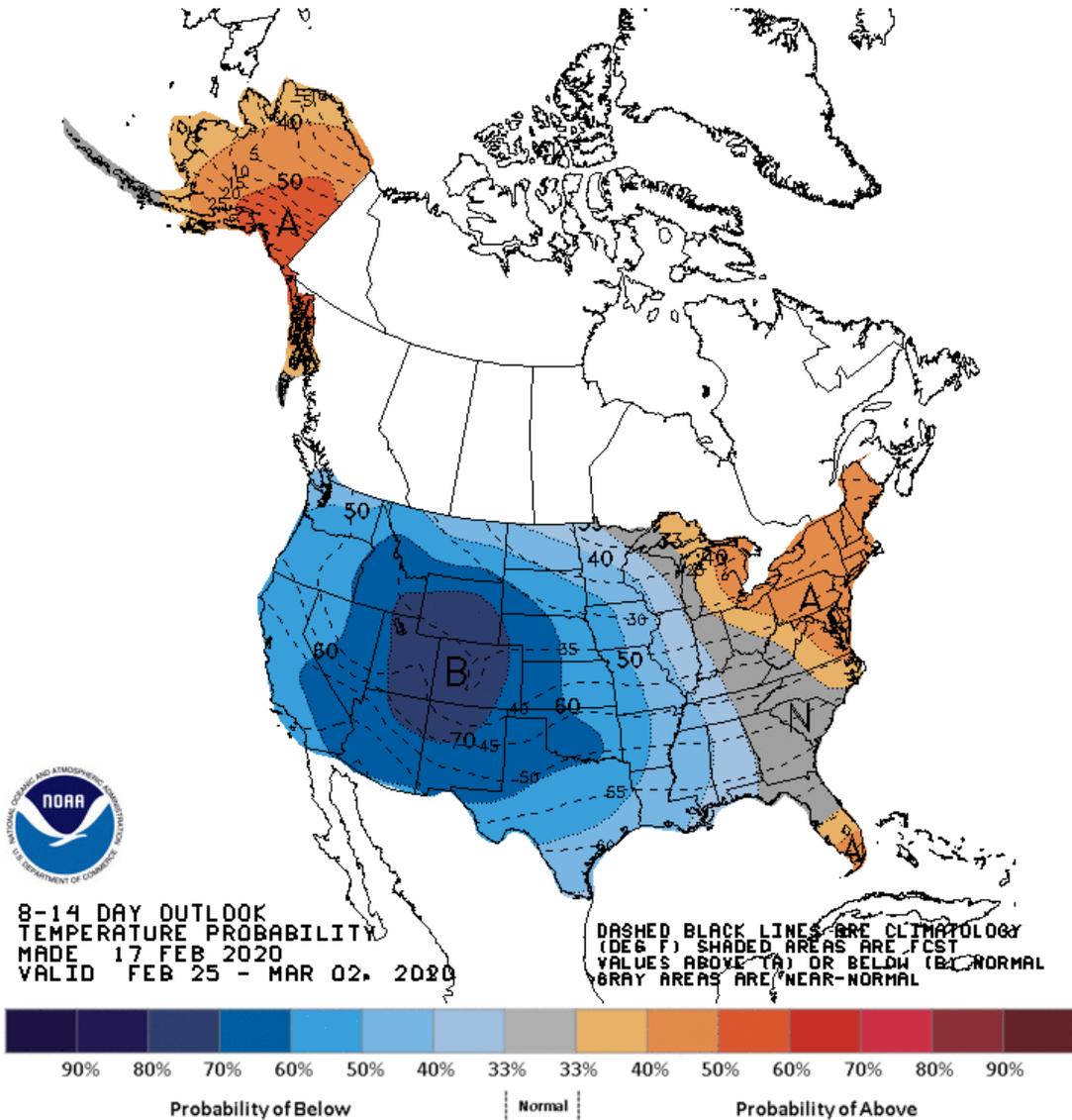
max amount = 1.34 inches in member 17  
mean amount = 0.81 inches  
climatological amount = 0.39 inches



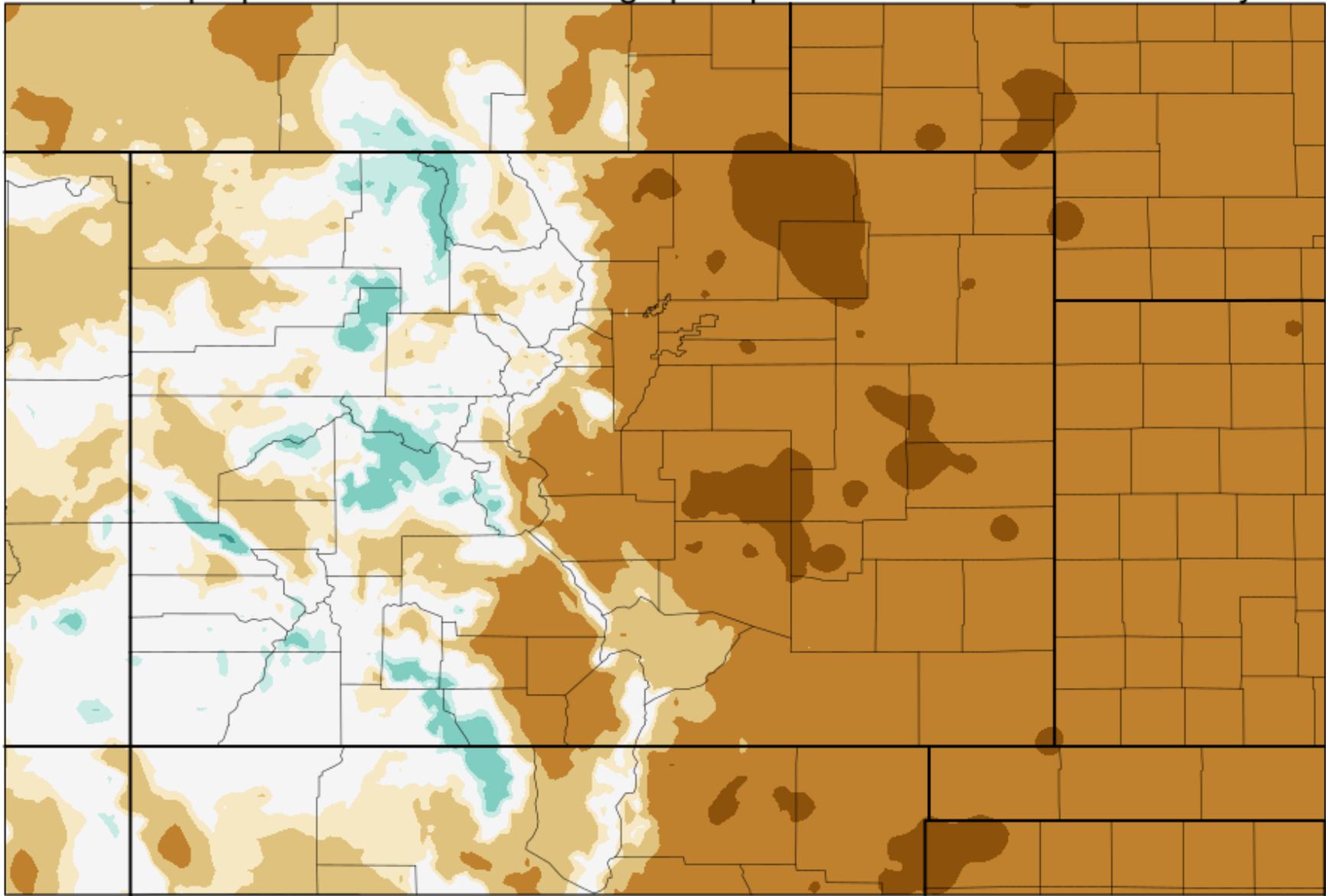
NCEP GEFS 2-m temperature at Denver  
init: Tuesday 2020-02-18 0000 UTC



# 8-14 day outlook



# PRISM proportion of annual average precipitation in this month: February

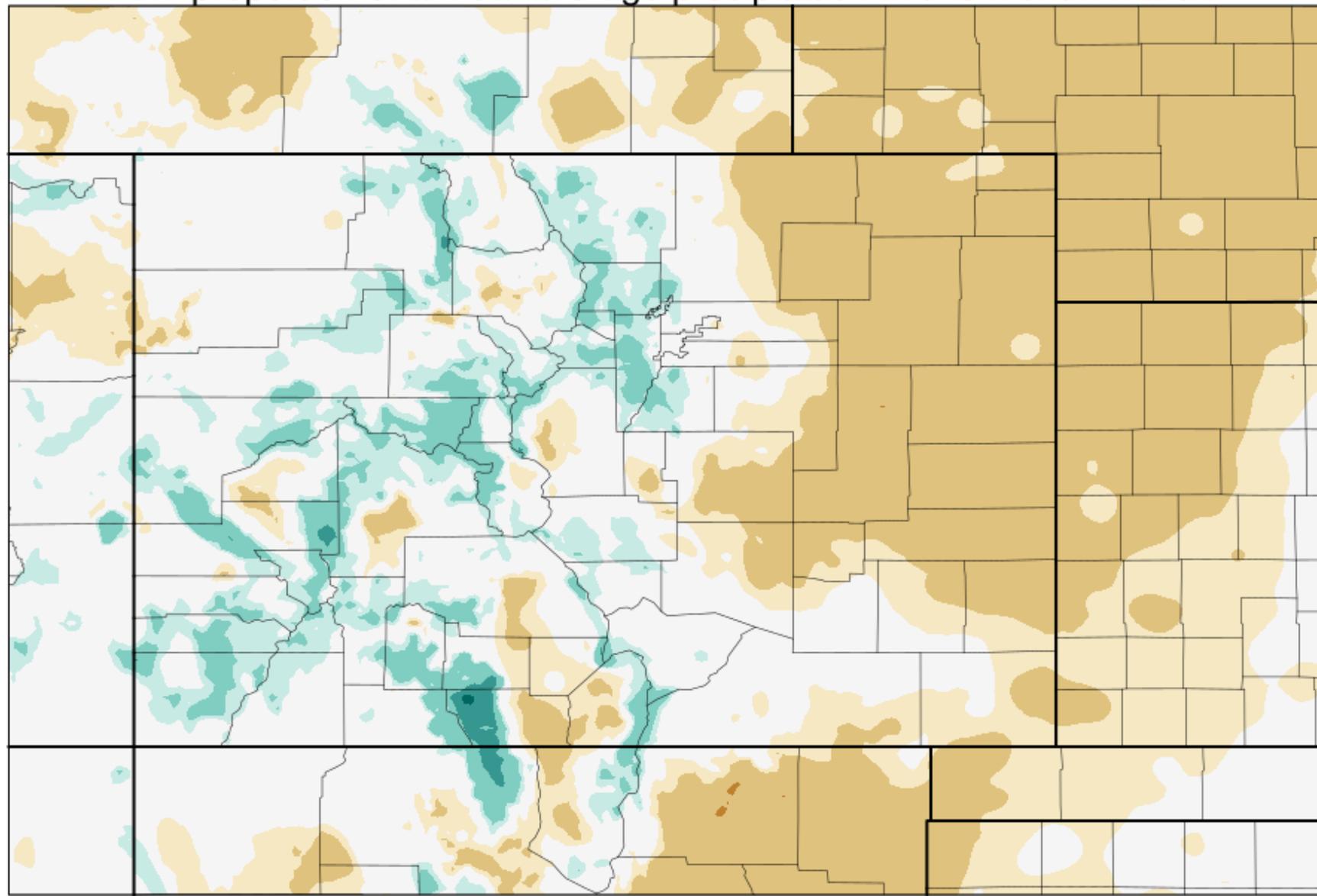


0.1 0.25 0.5 0.75 0.85 1.15 1.25 1.5 1.75 2 Proportion of precip relative to 1/12th

Russ Schumacher/Colorado Climate Center



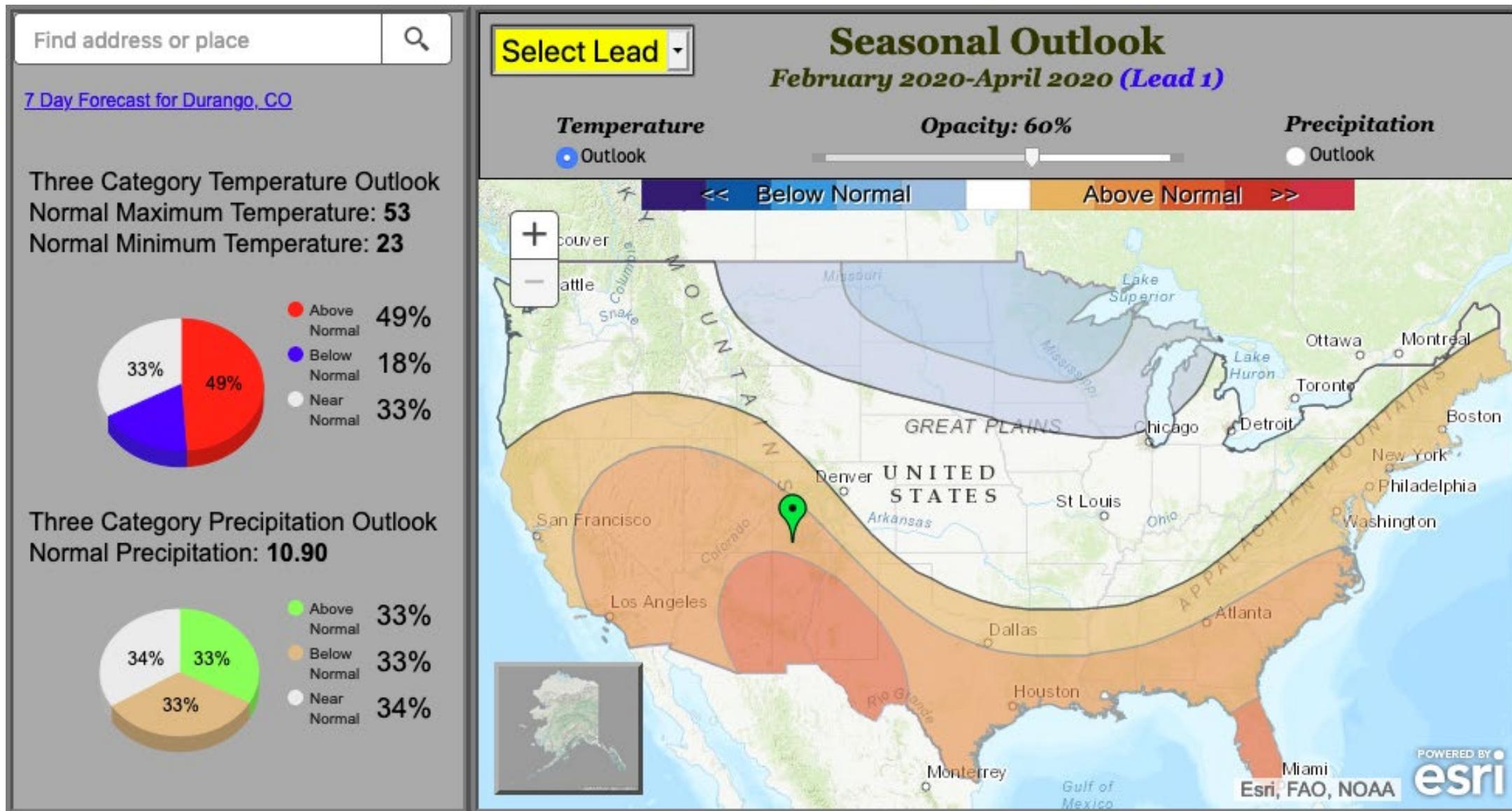
# PRISM proportion of annual average precipitation in this month: March



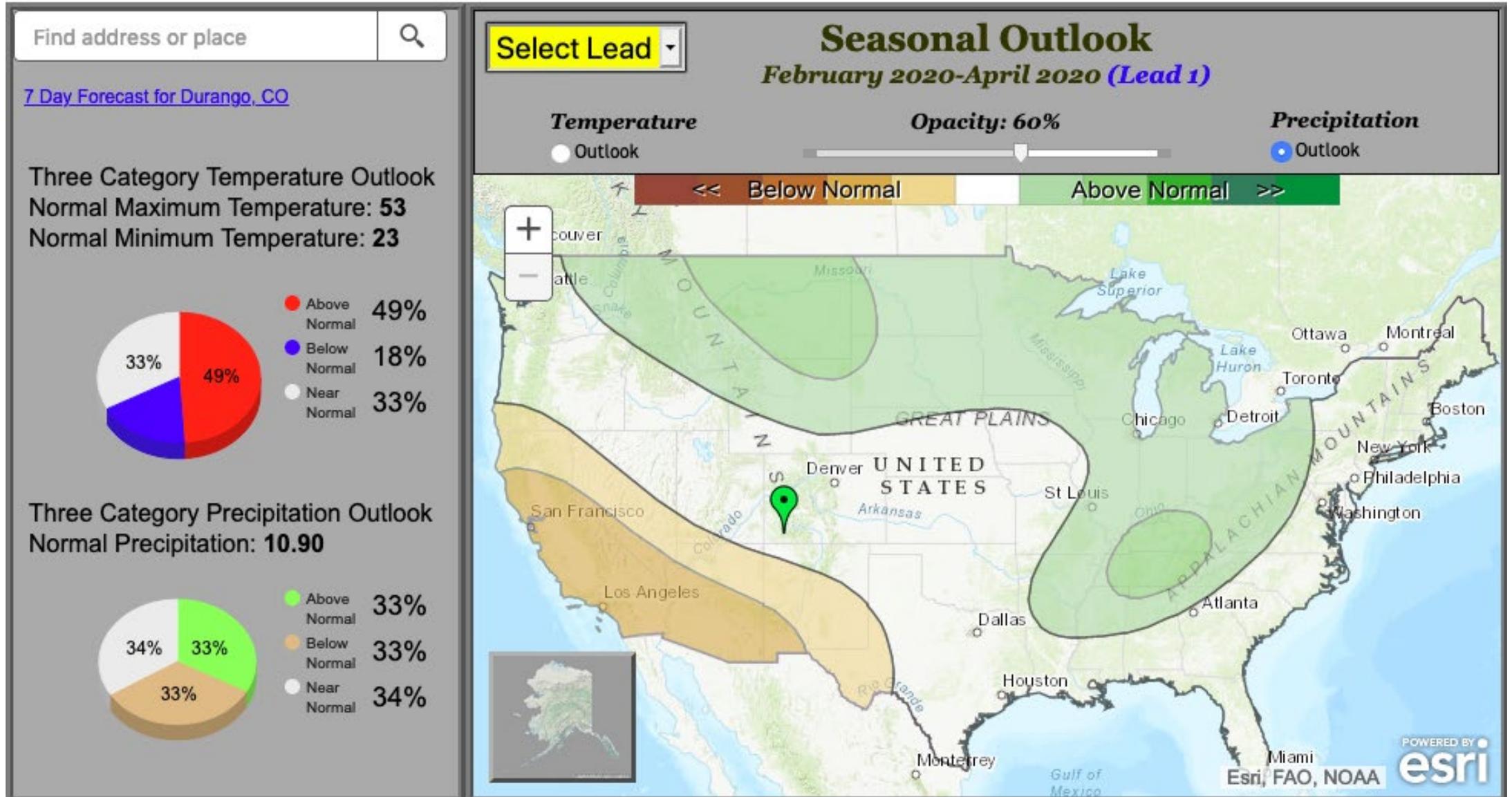
Russ Schumacher/Colorado Climate Center



# A look back at CPC outlooks...



# A look back at CPC outlooks...

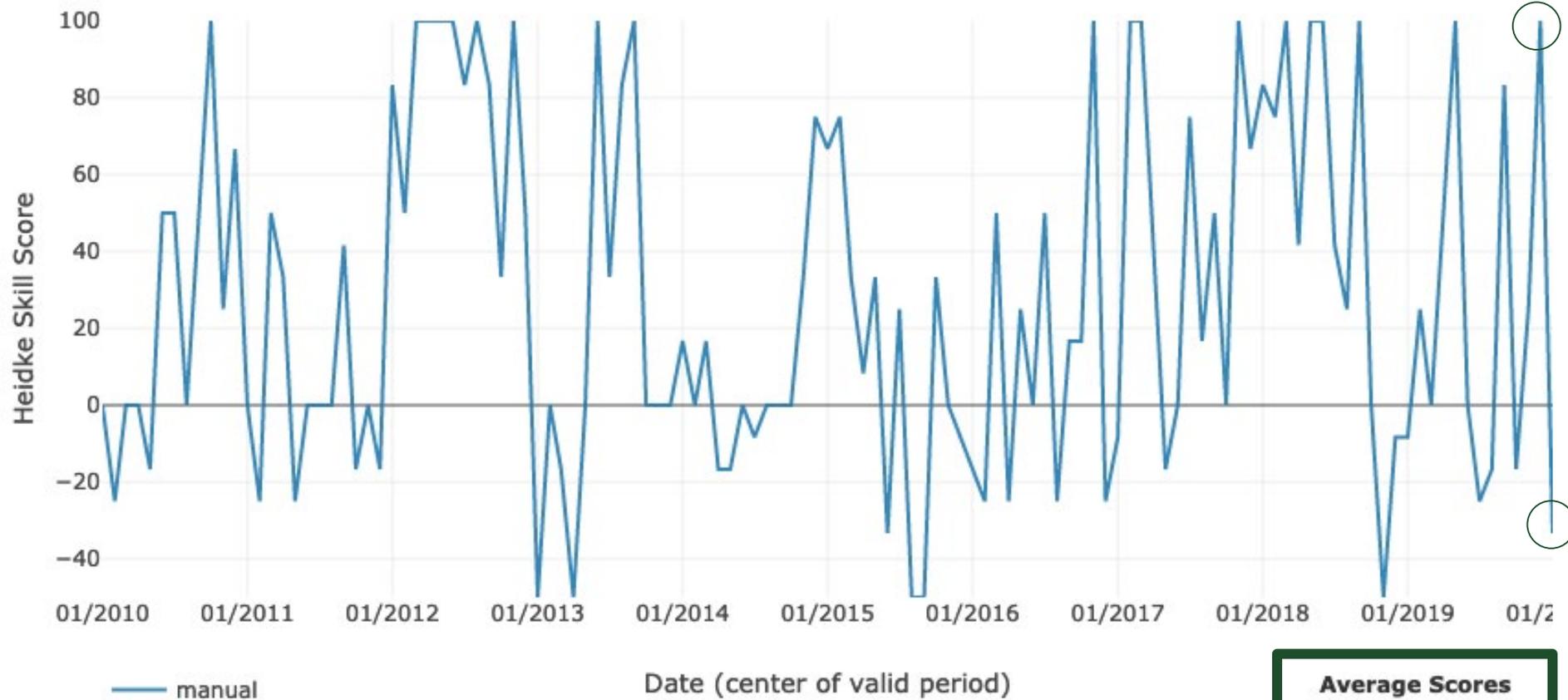


# A look back at CPC outlooks...

## 1-month temperature outlooks over Colorado

monthly Temperature Heidke Skill Score (Combined Categories)

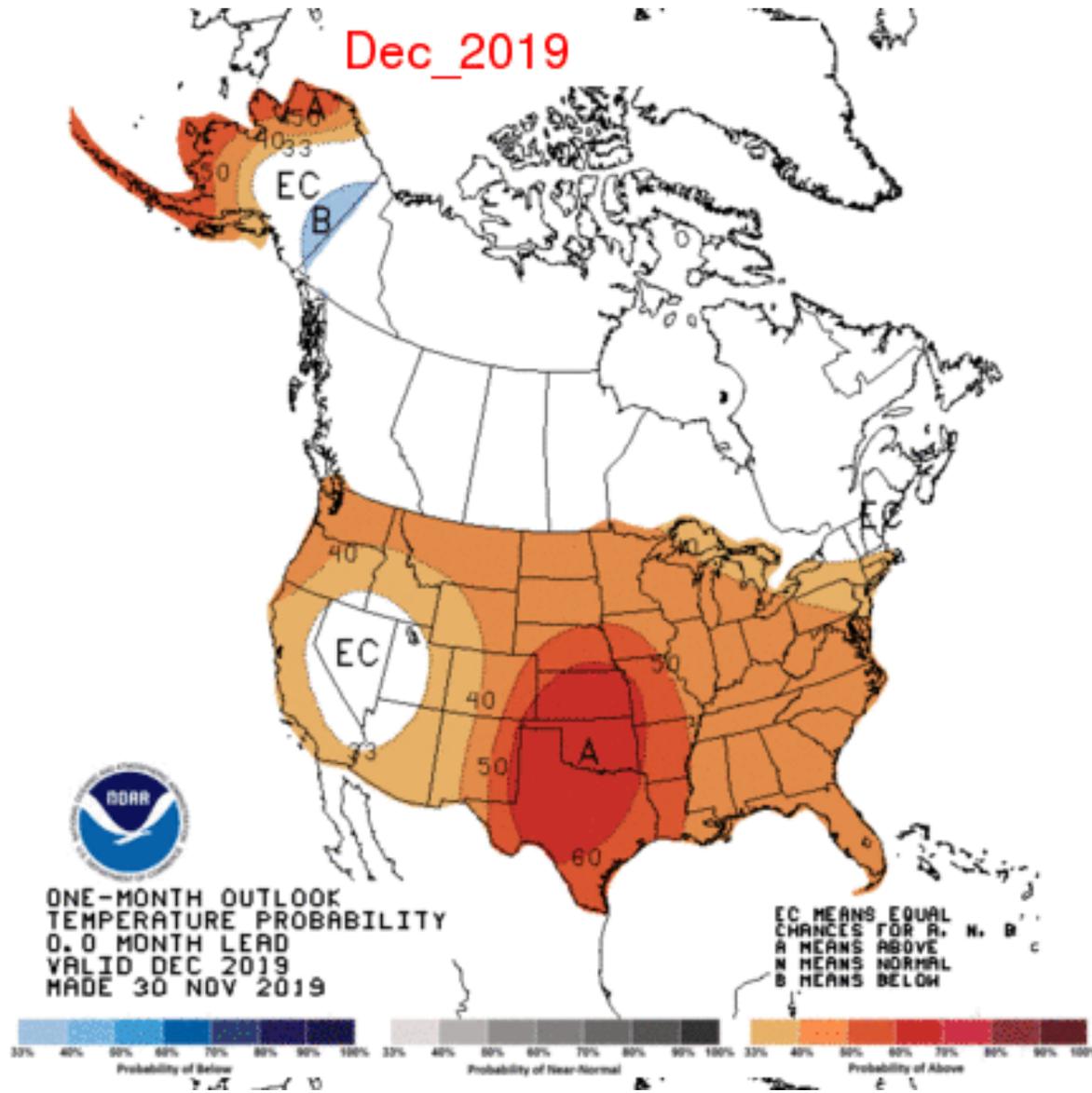
Higher score is better



**Average Scores**  
manual: 27.410

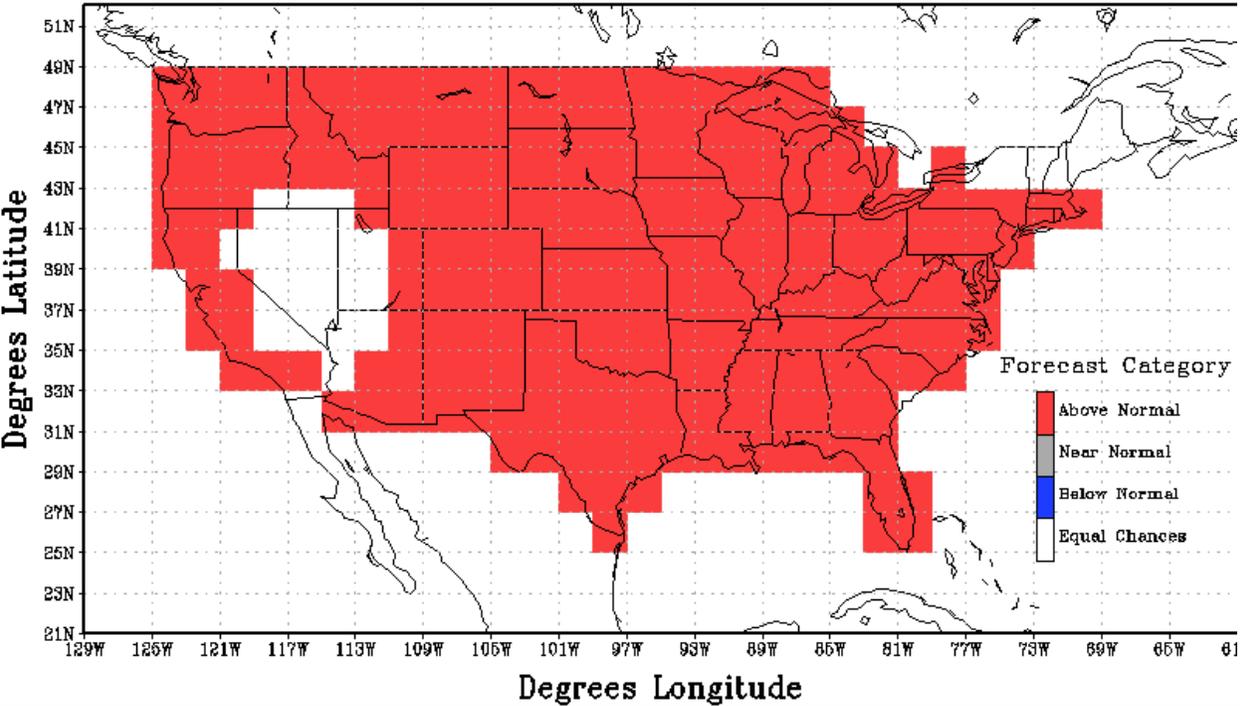


# A look back at CPC outlooks...

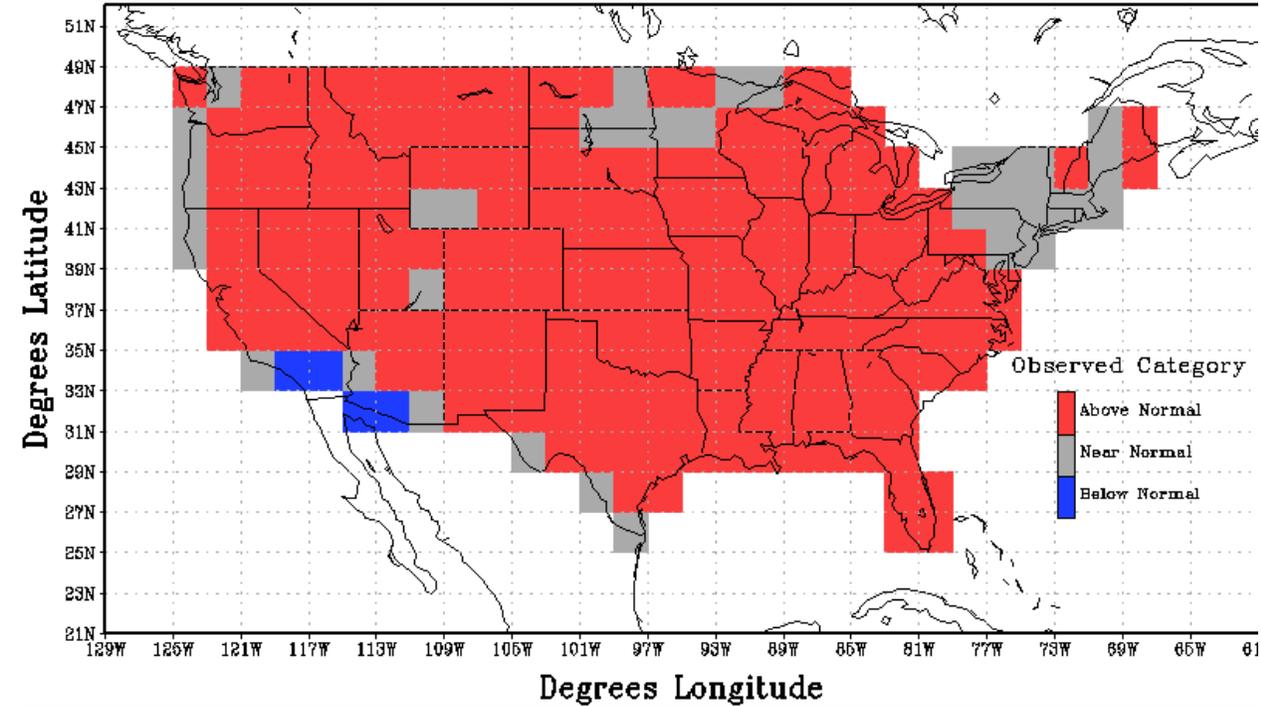


# A look back at CPC outlooks...

**Categorical Temperature Official Forecast**  
Issued: Nov 2019 Valid: December 2019

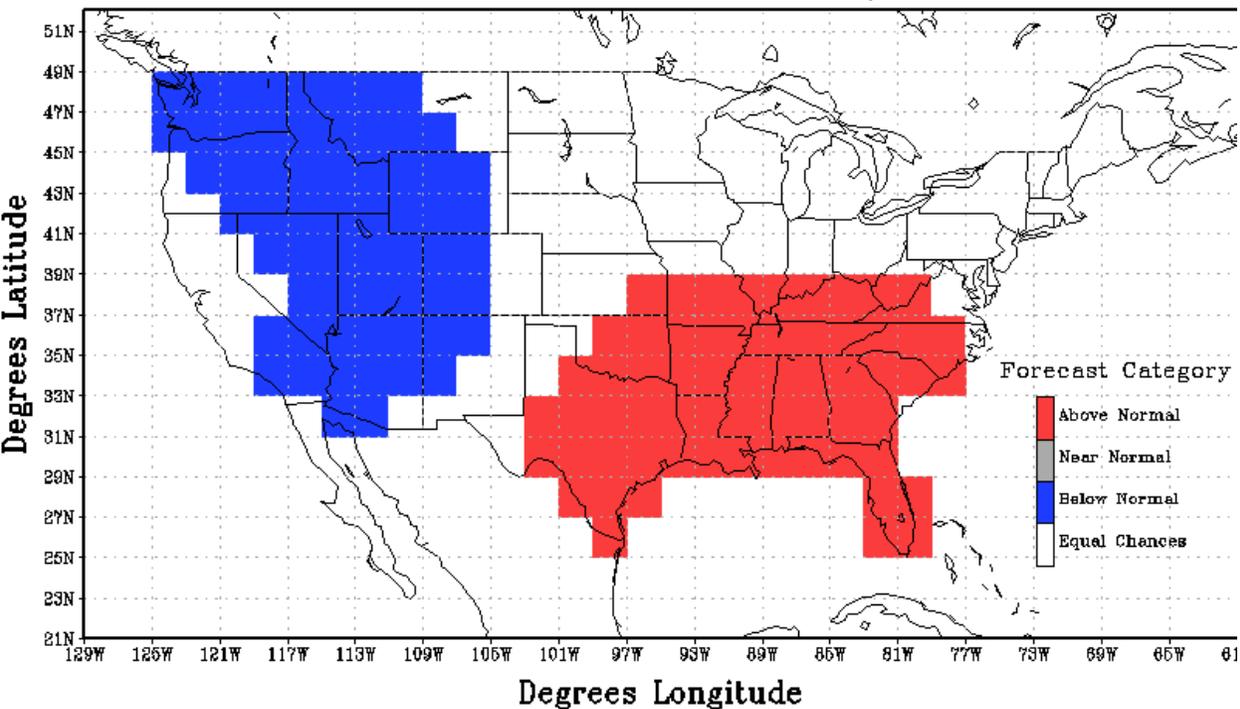


**Categorical Temperature Observations**  
Valid: December 2019

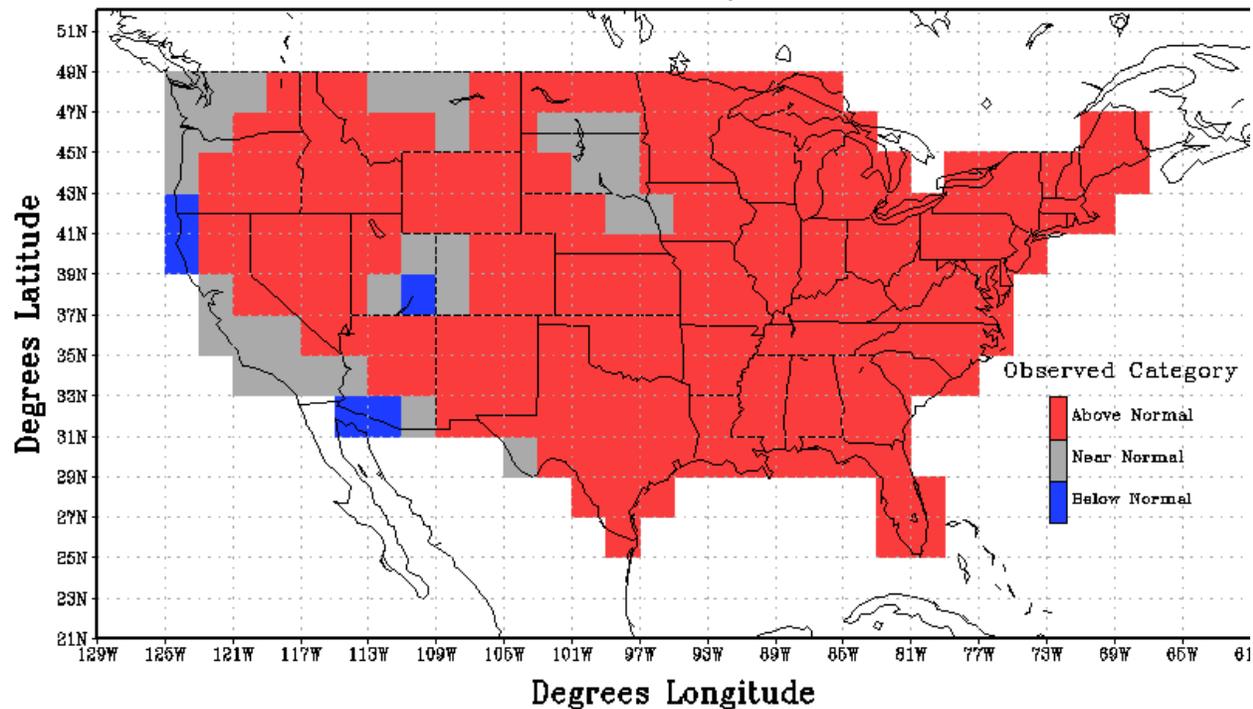


# A look back at CPC outlooks...

**Categorical Temperature Official Forecast**  
Issued: Dec 2019 Valid: January 2020



**Categorical Temperature Observations**  
Valid: January 2020

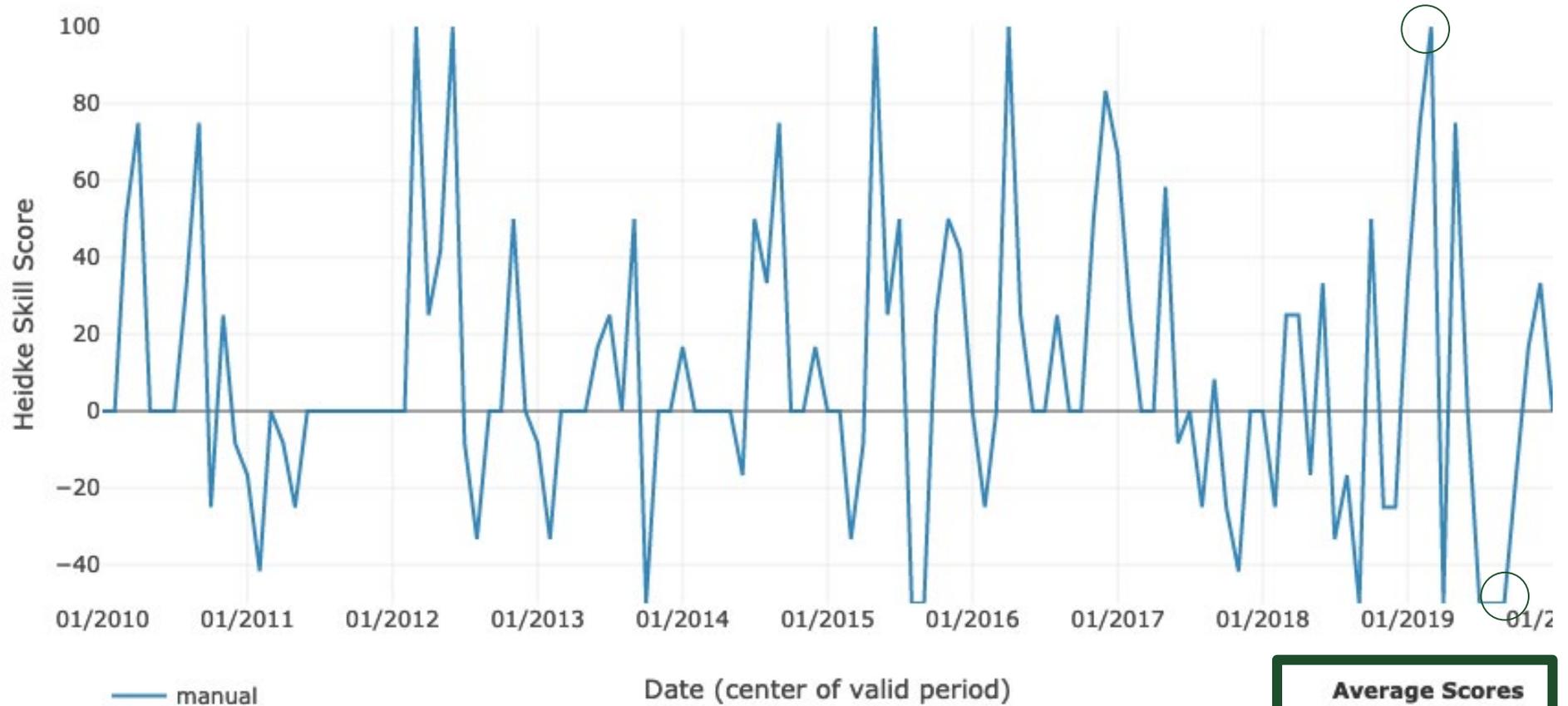


# A look back at CPC outlooks...

## 1-month precipitation outlooks over Colorado

monthly Precipitation Heidke Skill Score (Combined Categories)

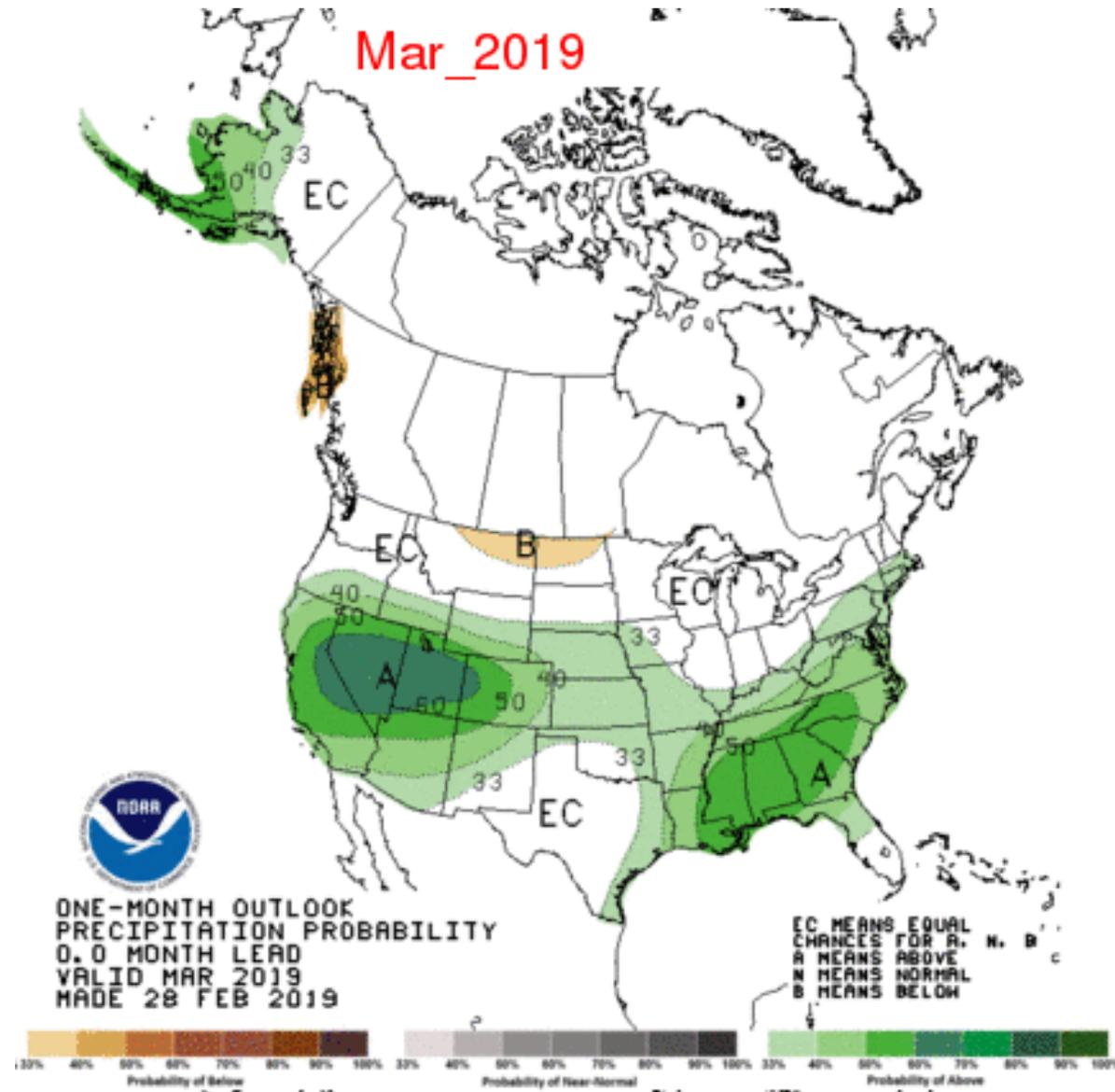
Higher score is better



**Average Scores**  
manual: 9.160

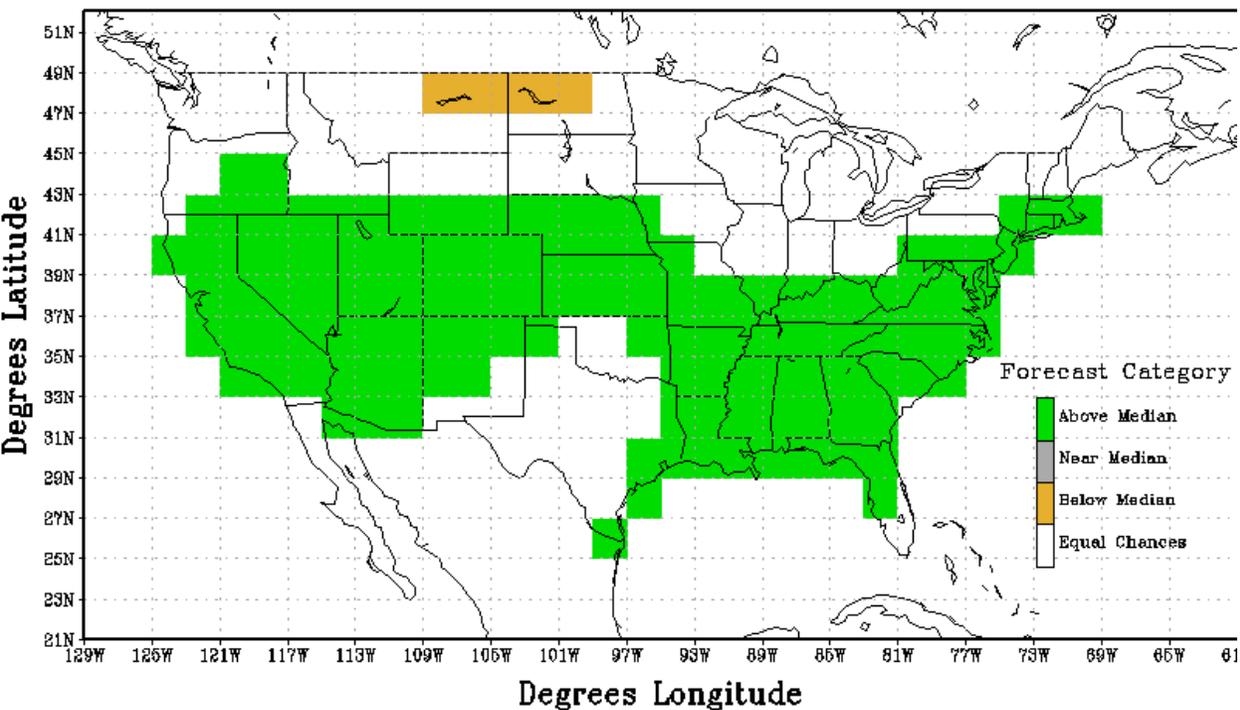


# A look back at CPC outlooks...

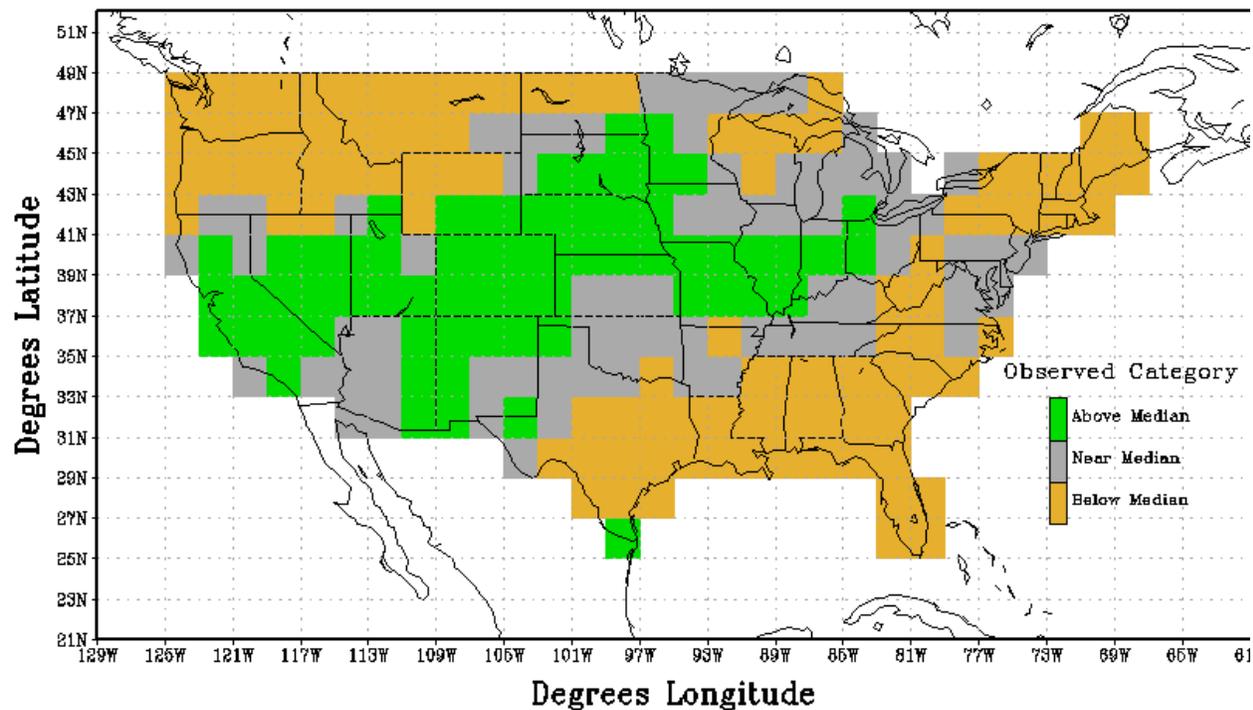


# A look back at CPC outlooks...

Categorical Precipitation Official Forecast  
Issued: Feb 2019 Valid: March 2019

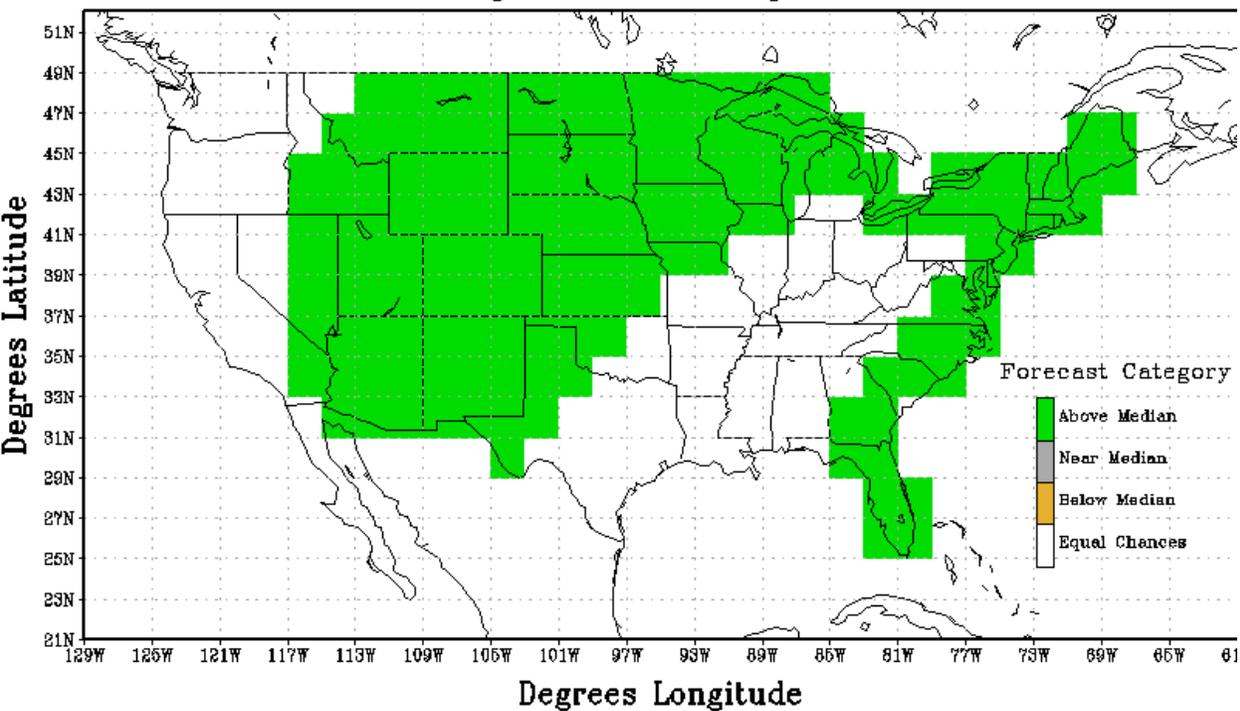


Categorical Precipitation Observations  
Valid: March 2019

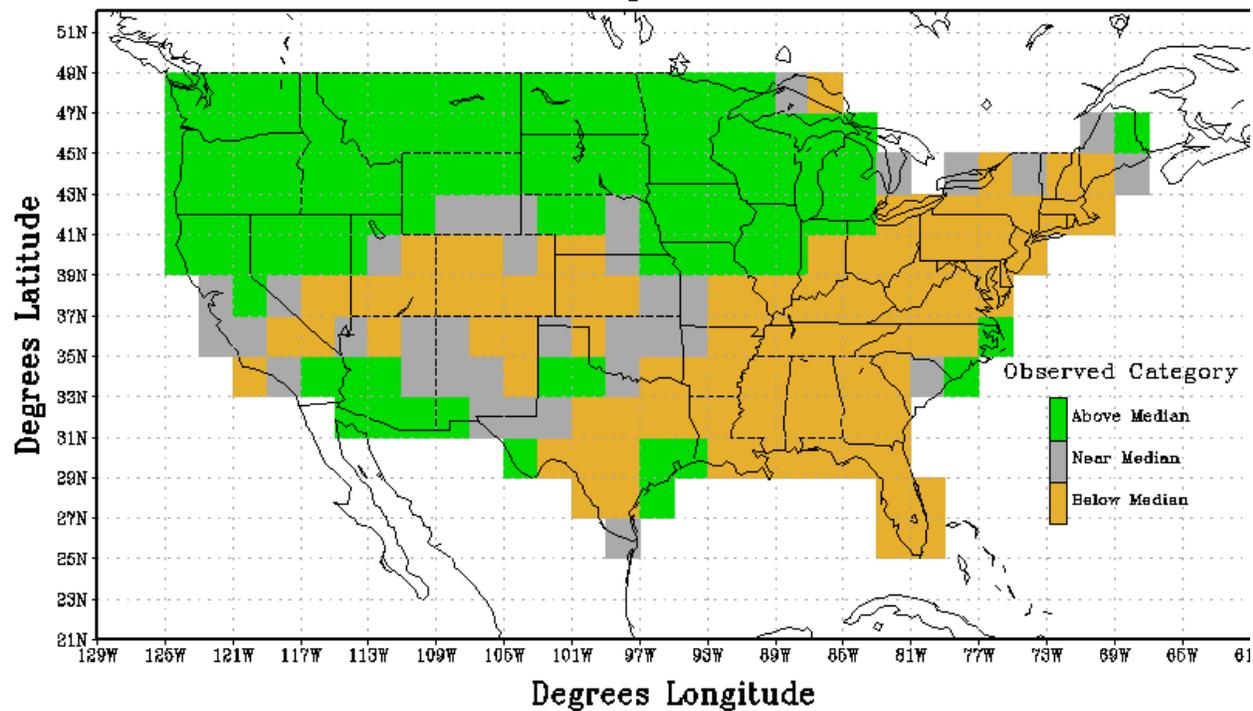


# A look back at CPC outlooks...

Categorical Precipitation Official Forecast  
Issued: Aug 2019 Valid: September 2019



Categorical Precipitation Observations  
Valid: September 2019

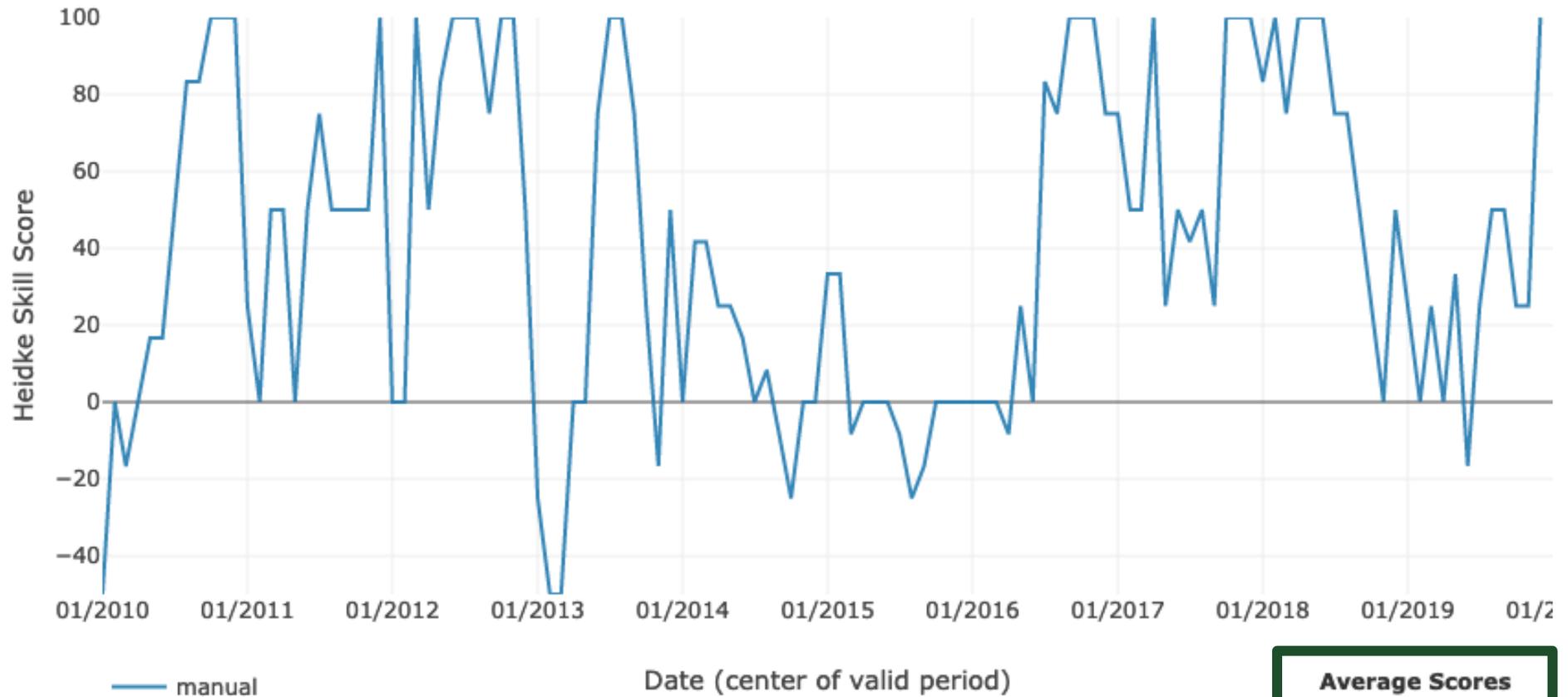


# A look back at CPC outlooks...

## 3-month temperature outlooks over Colorado

seasonal Temperature Heidke Skill Score (Combined Categories)

Higher score is better



**Average Scores**  
manual: 40.000

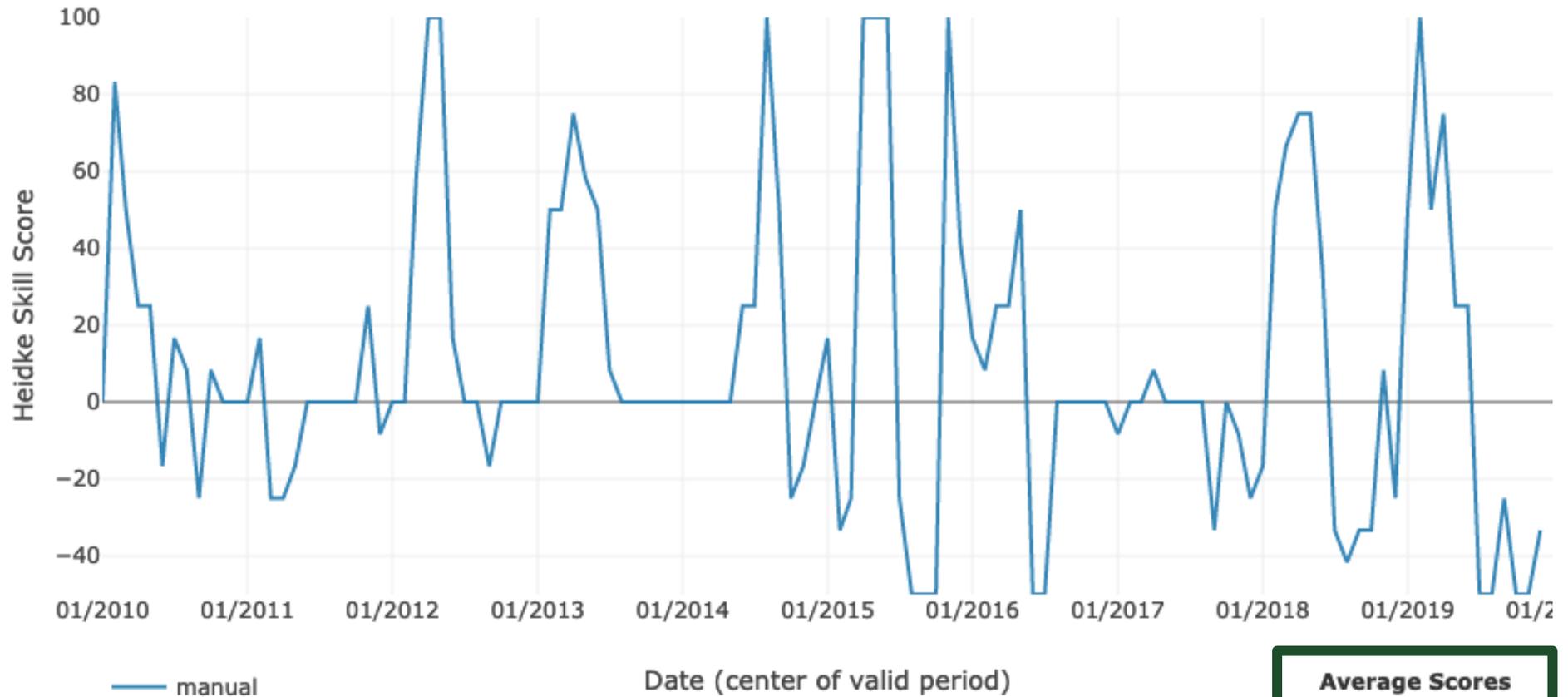


# A look back at CPC outlooks...

## 3-month precipitation outlooks over Colorado

seasonal Precipitation Heidke Skill Score (Combined Categories)

Higher score is better



**Average Scores**  
manual: 10.208



# What's the El Niño forecast?

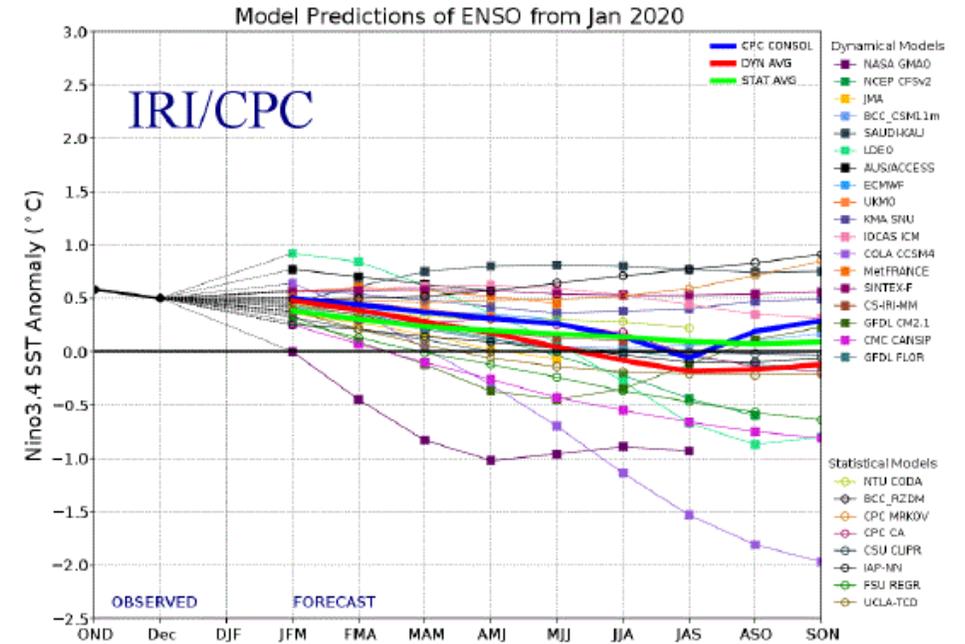
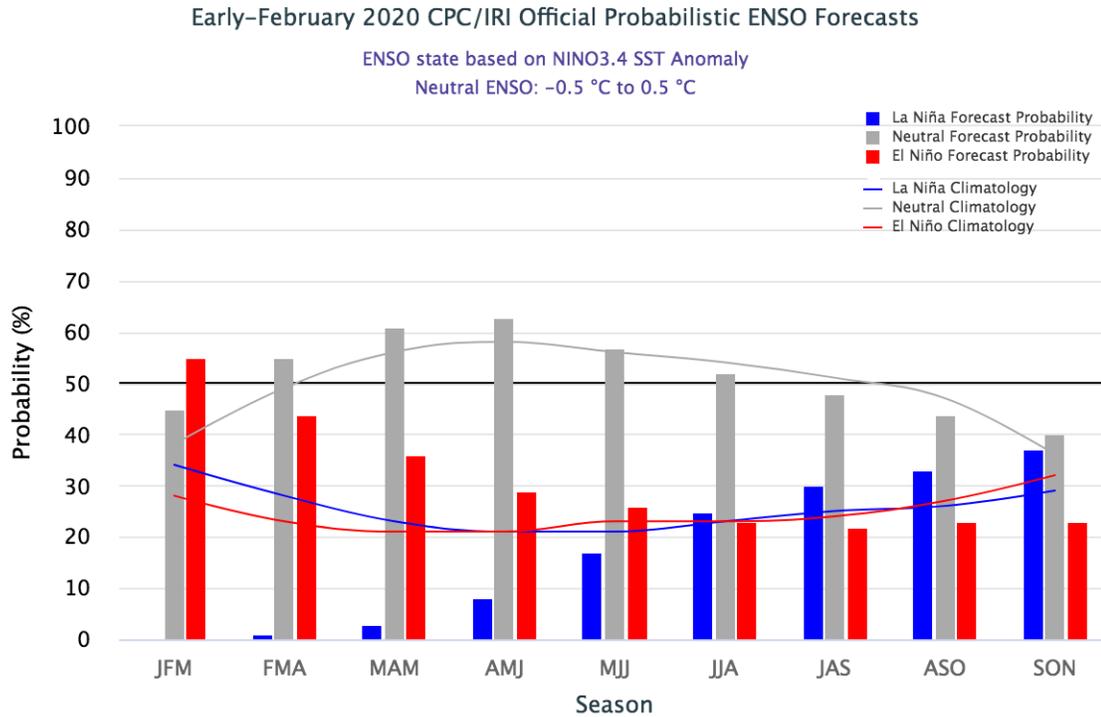


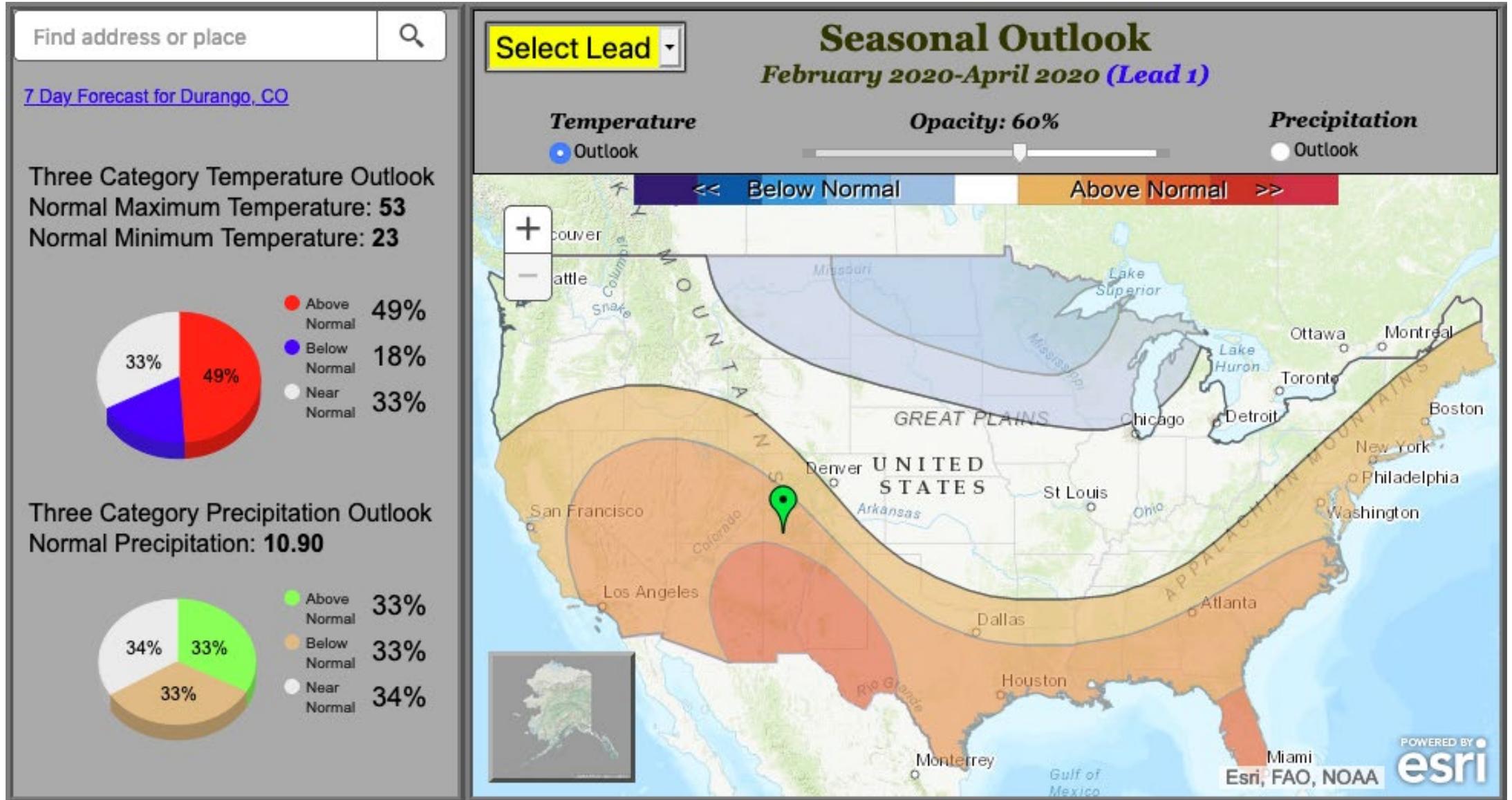
Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W). Figure updated 19 January 2020.

We've been on the borderline of El Niño the last few months, but models suggest conditions will revert back toward neutral



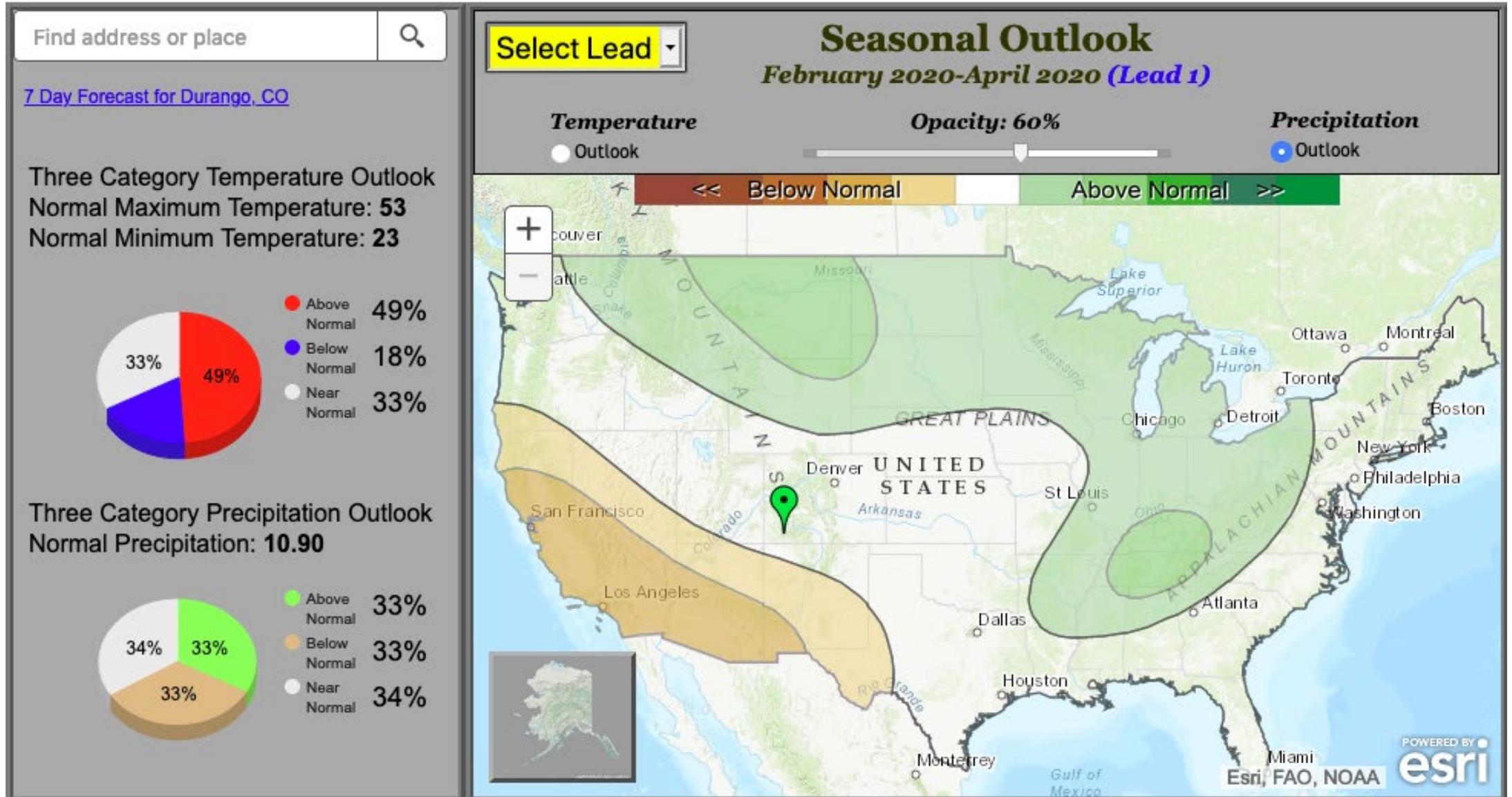
# Feb-March-April Outlook

\*these are a bit outdated now;  
new outlooks will be released on Thursday



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# Summary points

- Water year started with a very cold October (which followed an extremely hot and dry late summer)
- December and January were warm; February has been cold over most of the state
- Snowpack in great shape in northern mountains; hanging on near average in southern mountains
- Some areas of concern in the Four Corners and eastern Plains that have been warm and dry since late summer
- Pattern looks to stay active at least through end of the month, colder-than-average conditions will persist; looks snowier north than south
- ENSO conditions will remain neutral; no strong signals for the outlook into spring



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Thank you!

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