Colorado Climate C[illegible]er

WATF Climate Upd[illegible]

Russ Schumacher, state climatologist

Water Availability Task Force

February 16, 2021

COLORADO CLIMATE CENTER

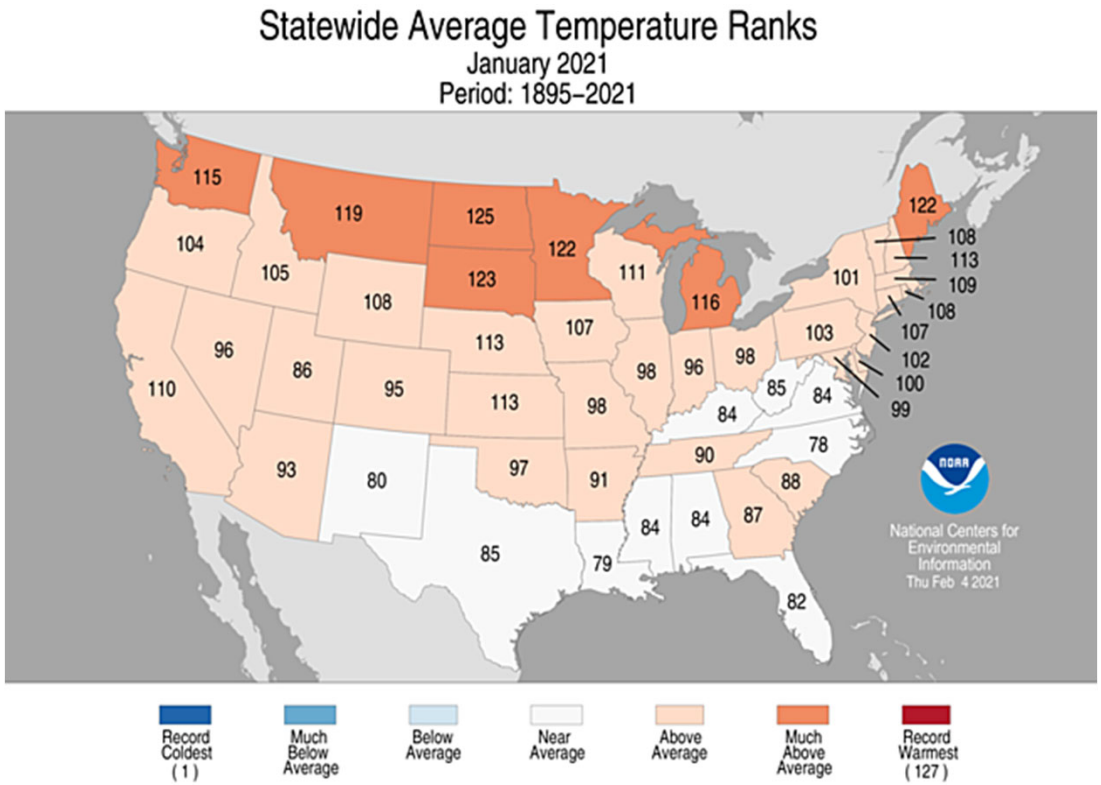
[illegible]OSPHERIC SCIENCE

[illegible]DO STATE UNIVERSITY

Water year 2021 to date:

temperature, precipitation, snow, evaporative demand

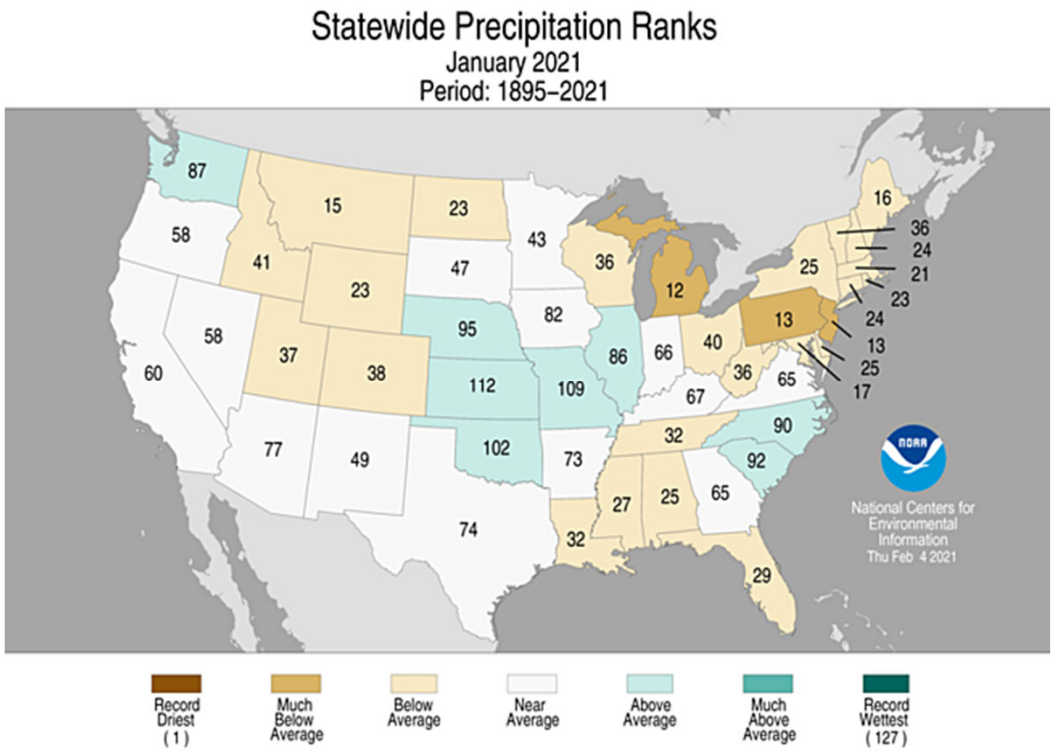
Photos by Henry Reges & Russ Schumacher



Statewide: 15th warmest October – January
2.5°F above 20th century average

Month	T Rank (of 127 years)	Above, below, or near avg?
Oct	54th warmest	near avg
Nov	7th warmest	much above
Dec	46th warmest	near avg
Jan	33rd warmest	above

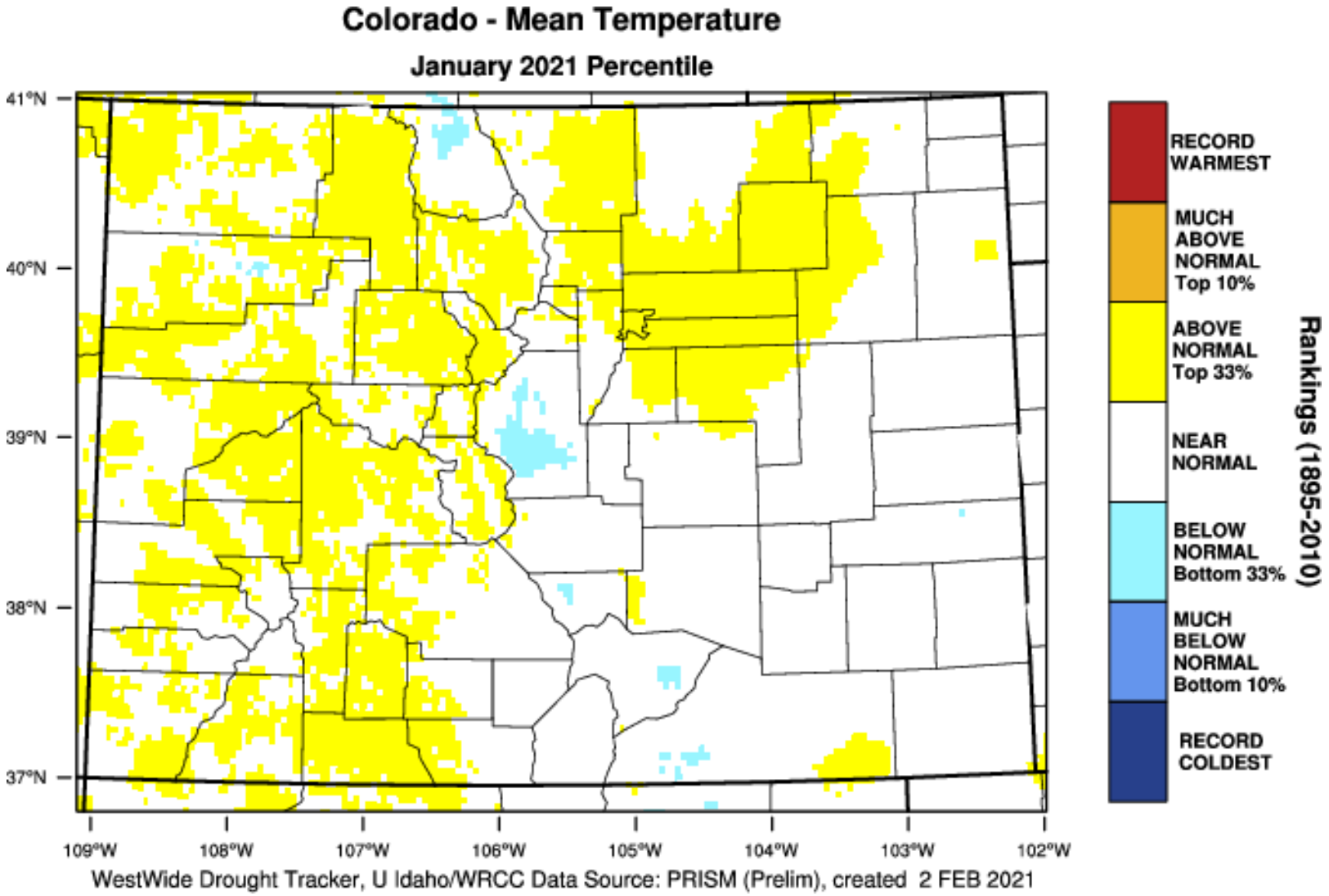
9 straight months of above-average temperature (April 2020 was last below-average month)

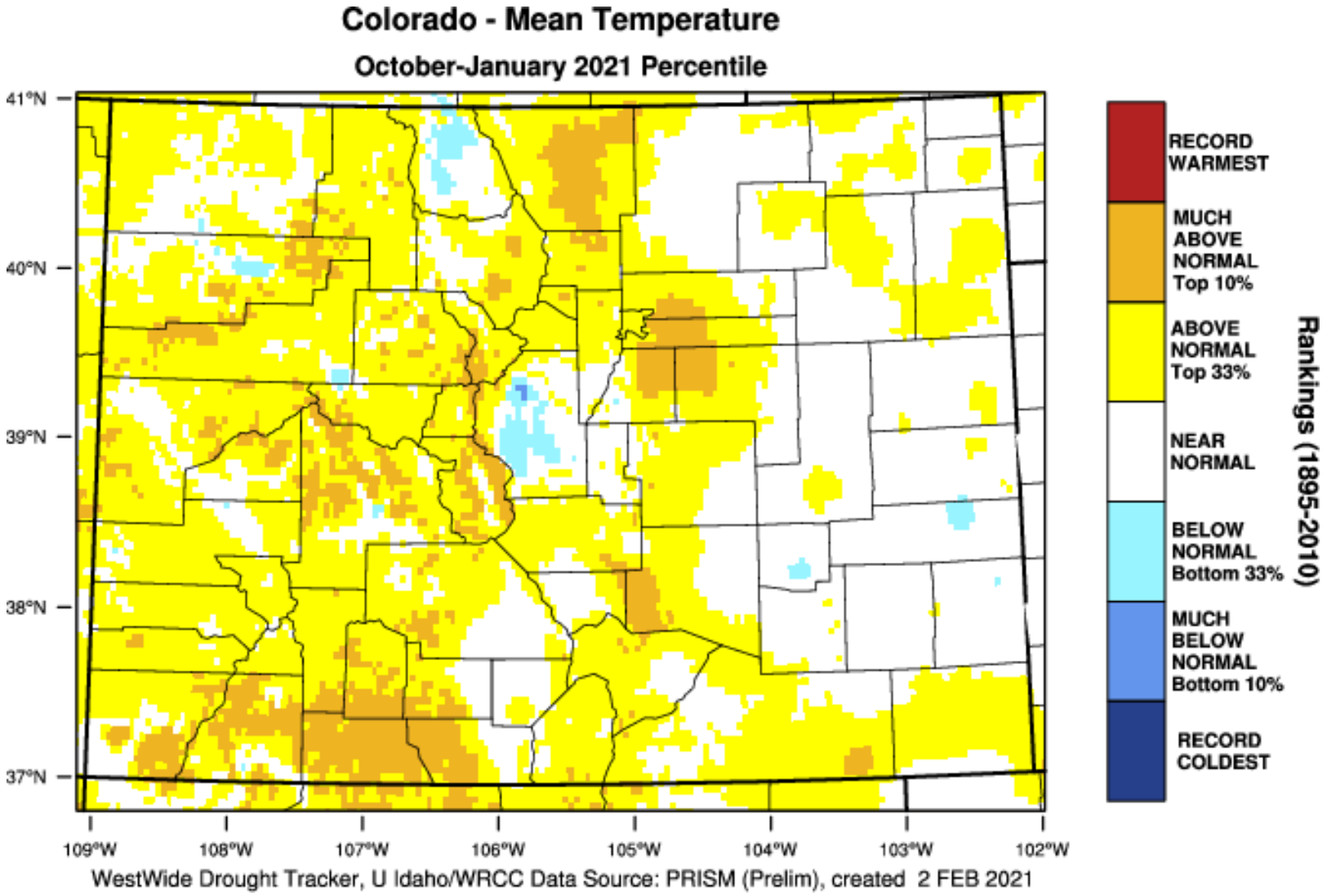


Statewide: 15th driest October-January
1.38” below 20th century average

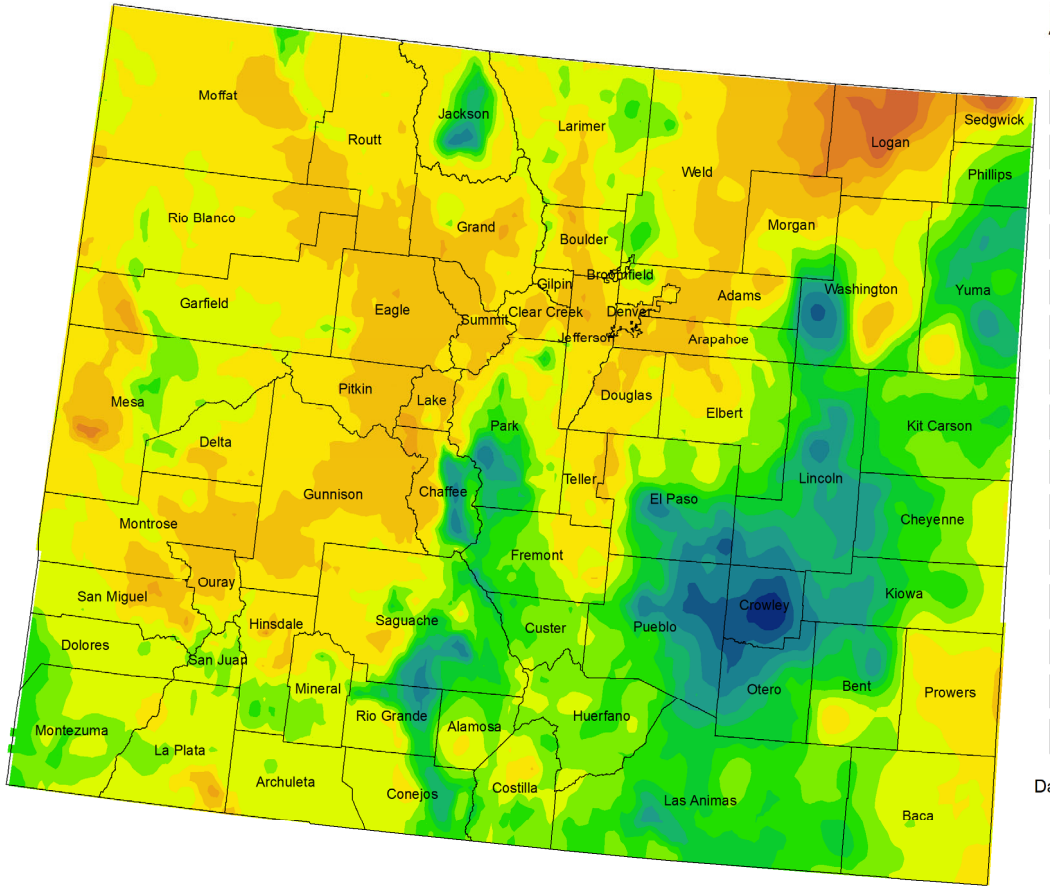
Month	P Rank (of 127 years)	Above, below, or near avg?
Oct	16th driest	below
Nov	44th driest	near avg
Dec	56th driest	near avg
Jan	38th driest	below

11 straight months of below-average precip (February 2020 was last above-average month)


Colorado - Mean Temperature
January 2021 Percentile
41°N
40°N
39°N
38°N
37°N
109°W
108°W
107°W
106°W
105°W
104°W
103°W
102°W
RECORD WARMEST
MUCH ABOVE NORMAL Top 10%
ABOVE NORMAL Top 33%
NEAR NORMAL
BELOW NORMAL Bottom 33%
MUCH BELOW NORMAL Bottom 10%
RECORD COLDEST
Rankings (1895-2010)
WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 2 FEB 2021


Colorado - Mean Temperature
October-January 2021 Percentile
41°N
40°N
39°N
38°N
37°N
109°W
108°W
107°W
106°W
105°W
104°W
103°W
102°W
RECORD WARMEST
MUCH ABOVE NORMAL Top 10%
ABOVE NORMAL Top 33%
NEAR NORMAL
BELOW NORMAL Bottom 33%
MUCH BELOW NORMAL Bottom 10%
RECORD COLDEST
Rankings (1895-2010)
WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 2 FEB 2021

Colorado January 2021 Precipitation as a Percentage of Normal



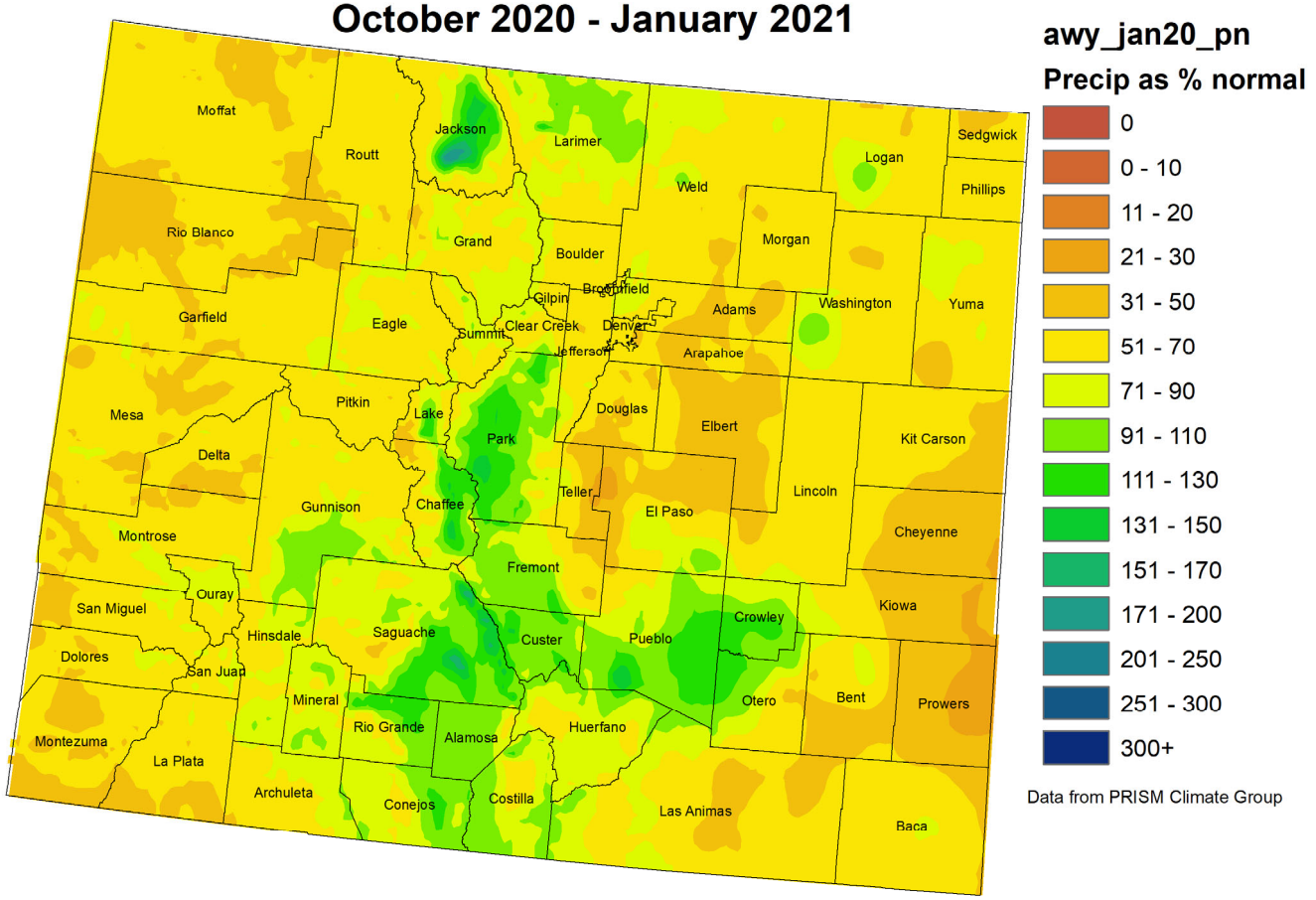
jan21_pn

Precip as % normal

- 0
- 0 - 10
- 11 - 20
- 21 - 30
- 31 - 50
- 51 - 70
- 71 - 90
- 91 - 110
- 111 - 130
- 131 - 150
- 151 - 170
- 171 - 200
- 201 - 250
- 251 - 300
- 300+

Data from PRISM Climate Group

Colorado Water Year 2021 Precipitation as a Percentage of Normal October 2020 - January 2021

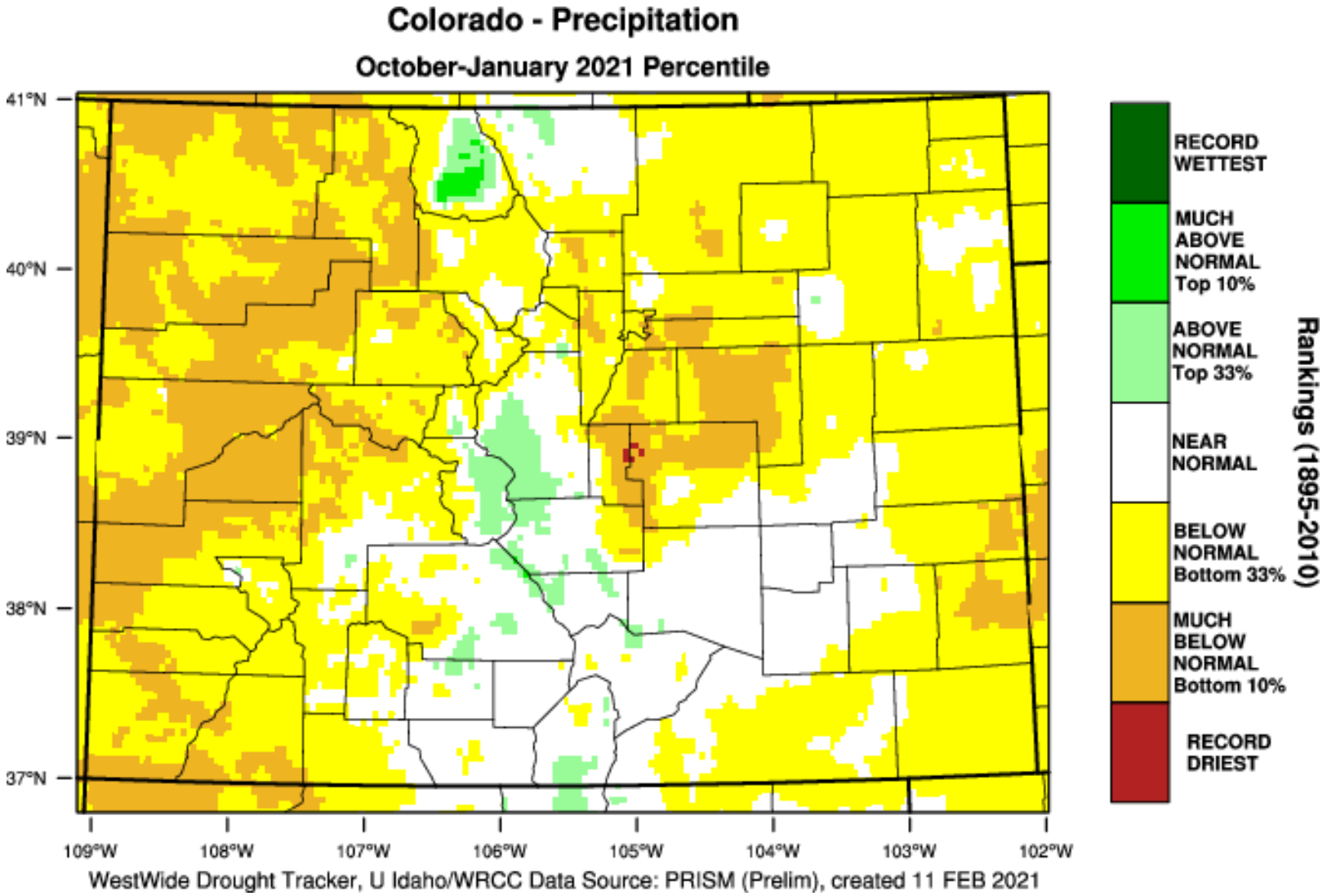


awy_jan20_pn

Precip as % normal

- 0
- 0 - 10
- 11 - 20
- 21 - 30
- 31 - 50
- 51 - 70
- 71 - 90
- 91 - 110
- 111 - 130
- 131 - 150
- 151 - 170
- 171 - 200
- 201 - 250
- 251 - 300
- 300+

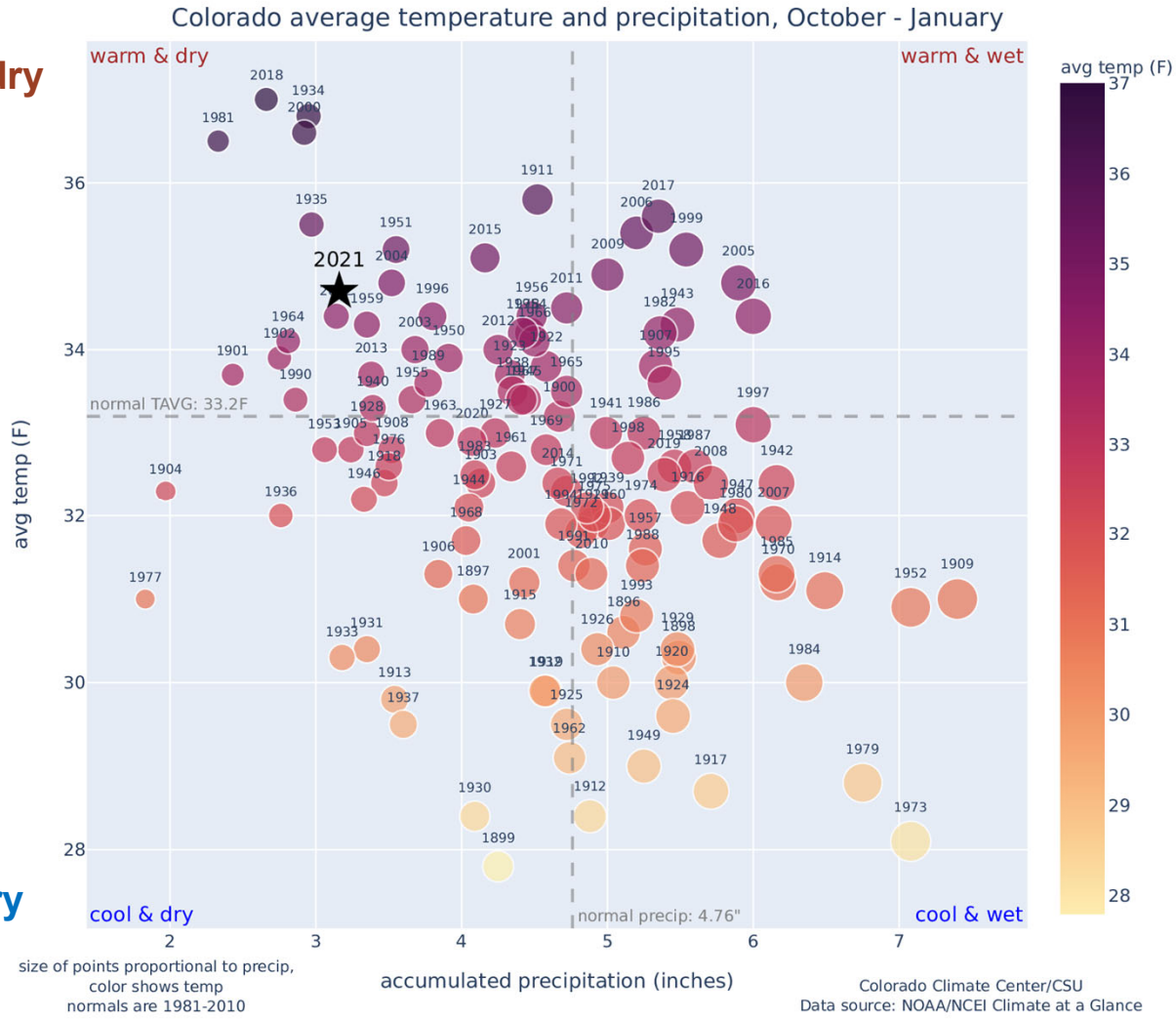
Data from PRISM Climate Group


Colorado - Precipitation
October-January 2021 Percentile
41°N
40°N
39°N
38°N
37°N
109°W
108°W
107°W
106°W
105°W
104°W
103°W
102°W
RECORD WETTEST
MUCH ABOVE NORMAL Top 10%
ABOVE NORMAL Top 33%
NEAR NORMAL
BELOW NORMAL Bottom 33%
MUCH BELOW NORMAL Bottom 10%
RECORD DRIEST
Rankings (1895-2010)
WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 11 FEB 2021

Warm & dry

Warm & wet

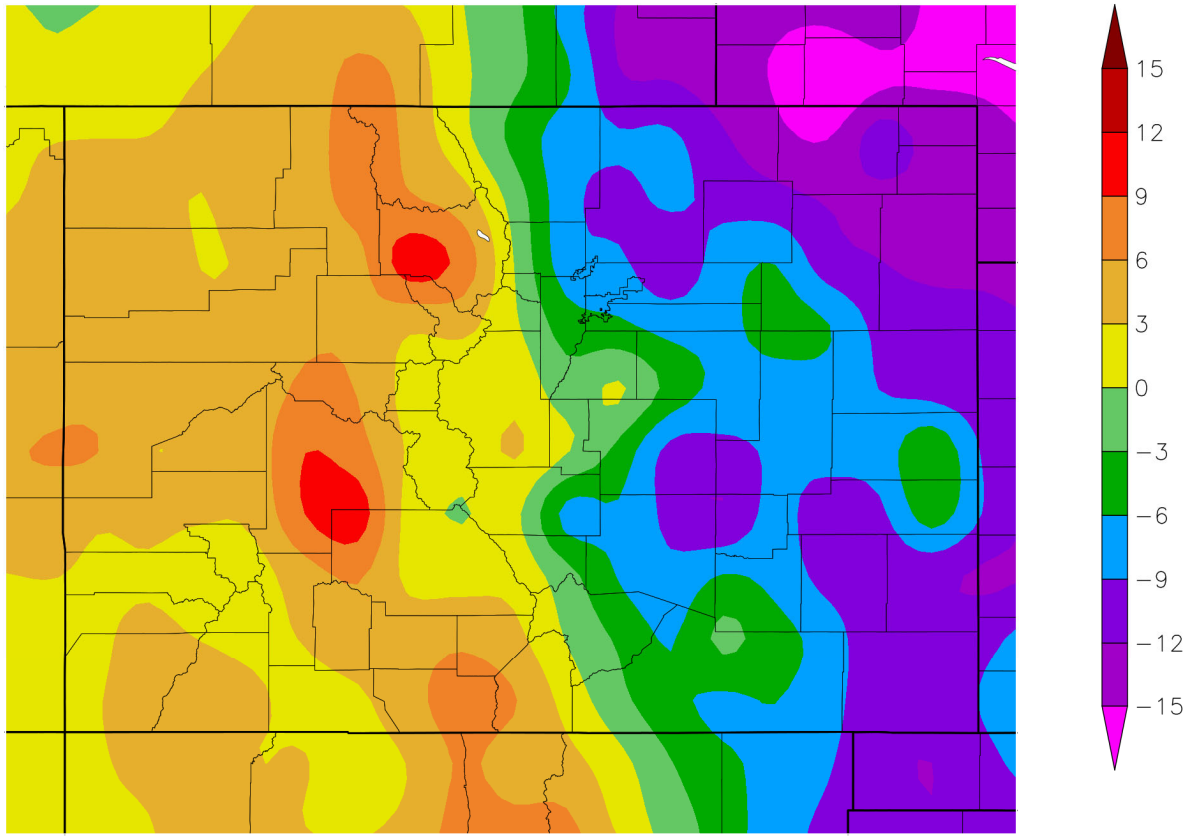
Water year 2021 through January



Cool & dry

Cool & wet

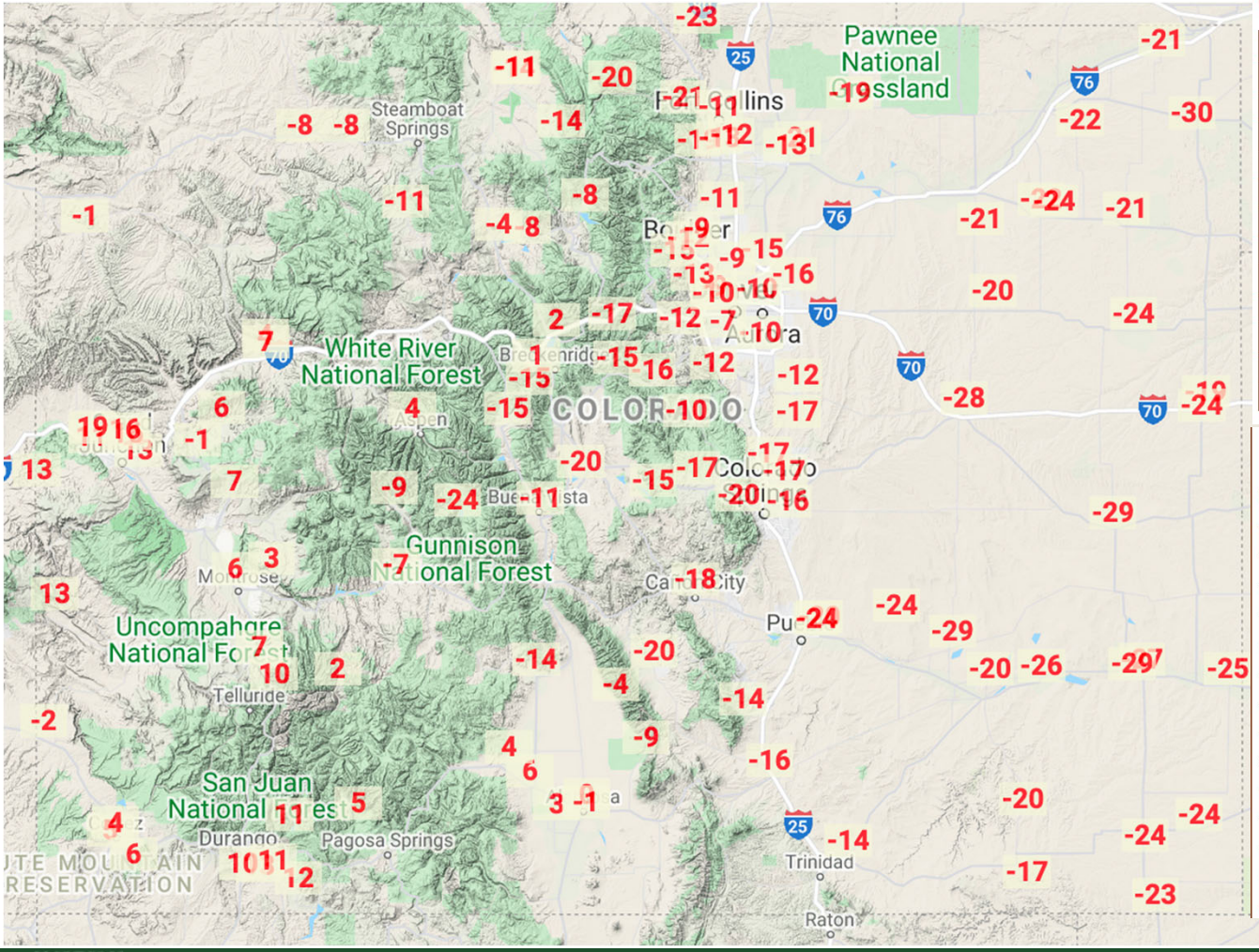
Departure from Normal Temperature (F)
2/1/2021 – 2/15/2021



Generated 2/16/2021 at HPRCC using provisional data.

NOAA Regional Climate Centers

Minimum temps on 14-15 February



Minimum 1-Day Mean Min Temperature for HOLYOKE, CO

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

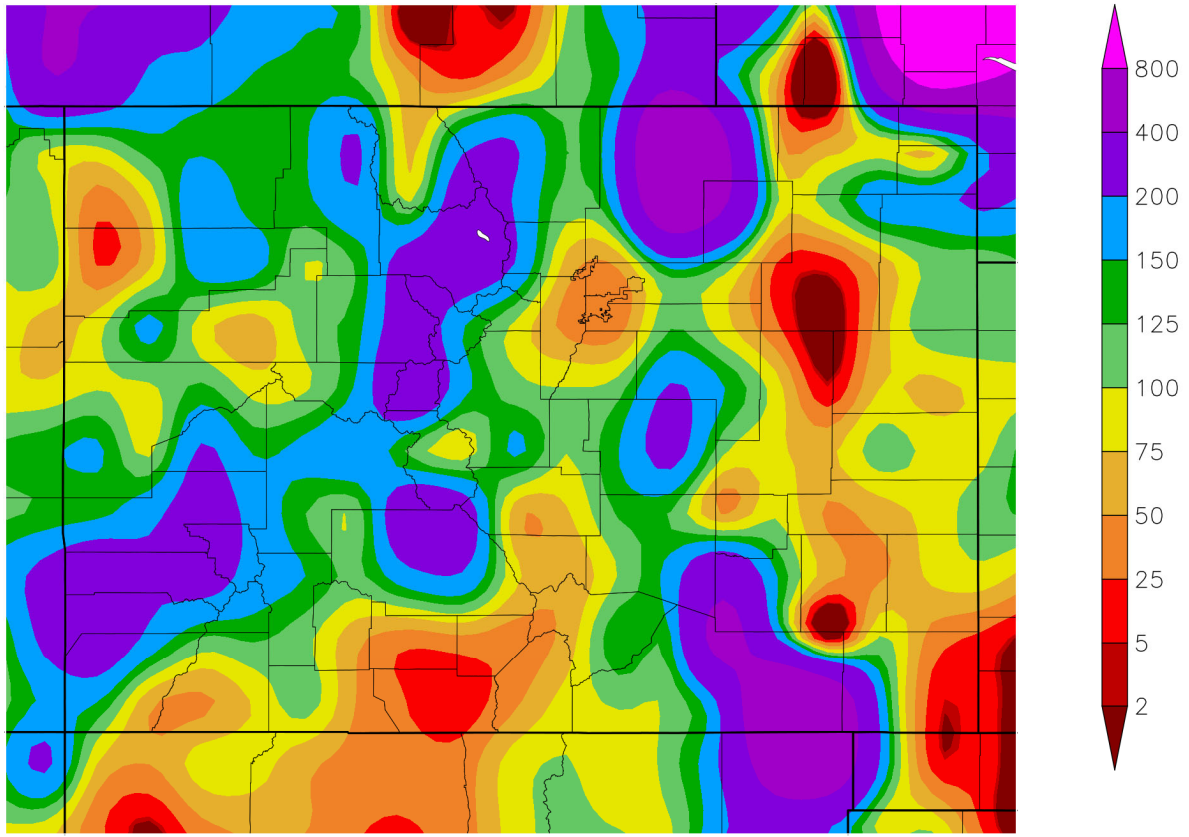
Rank	Value	Ending Date
1	-36.0	1899-02-12
2	-35.0	1919-12-09
3	-33.0	1989-12-23
-	-33.0	1989-12-22
5	-30.0	2021-02-15
-	-30.0	1901-12-15
-	-30.0	1901-12-14
8	-28.0	1919-12-10
-	-28.0	1899-02-11
10	-27.0	1933-02-08
Last value also occurred in one or more previous years.		
Period of record: 1897-02-15 to 2021-02-15		

Minimum 1-Day Mean Min Temperature for LAMAR, CO

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

Rank	Value	Ending Date
1	-30.0	1899-02-12
2	-29.0	1949-01-30
3	-27.0	2021-02-15
-	-27.0	1948-01-28
5	-24.0	1942-01-05
6	-23.0	1989-12-22
-	-23.0	1961-12-12
-	-23.0	1948-03-10
-	-23.0	1932-12-12
10	-22.0	1984-01-19
Last value also occurred in one or more previous years.		
Period of record: 1893-01-01 to 2021-02-15		

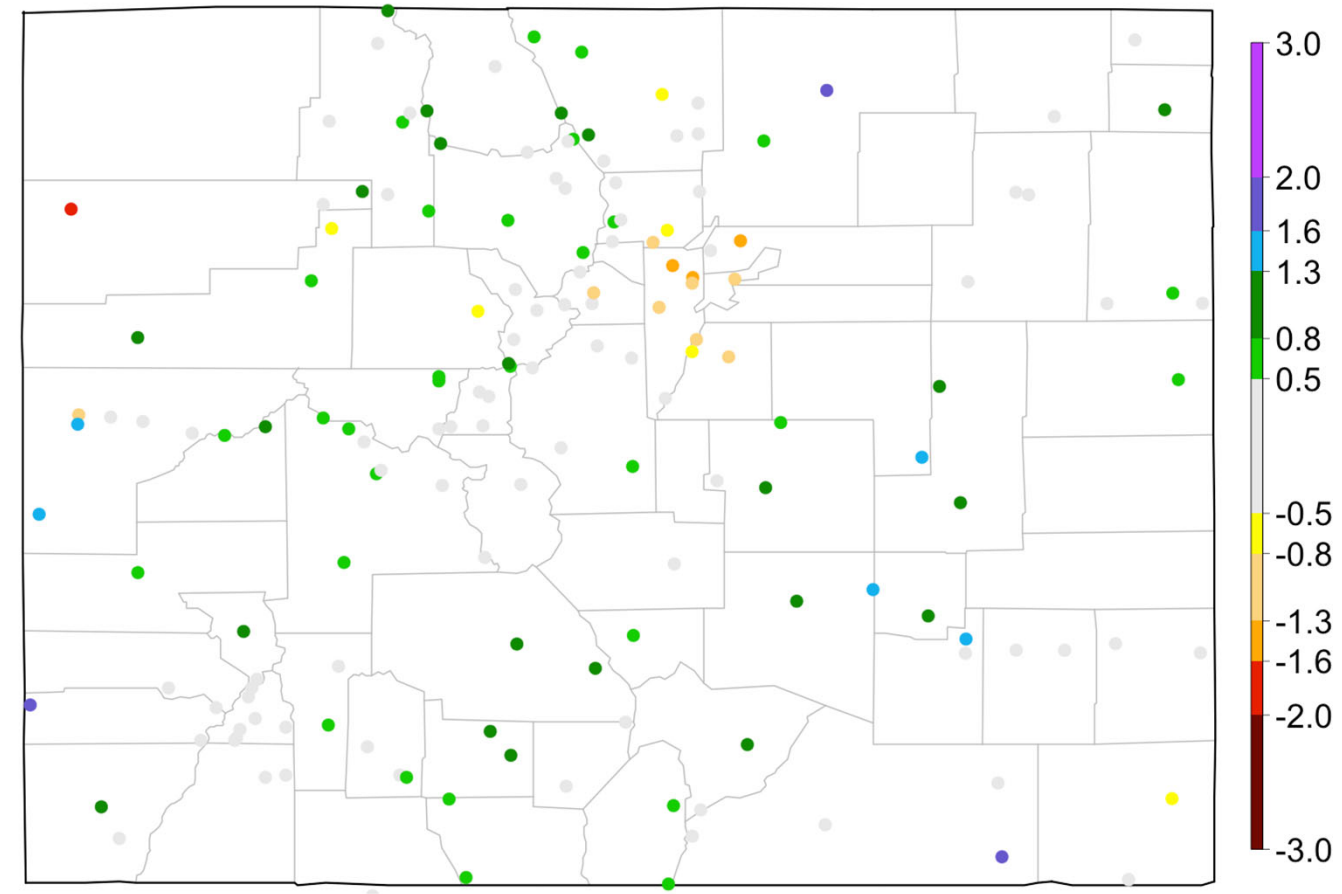
Percent of Normal Precipitation (%)
2/1/2021 – 2/14/2021



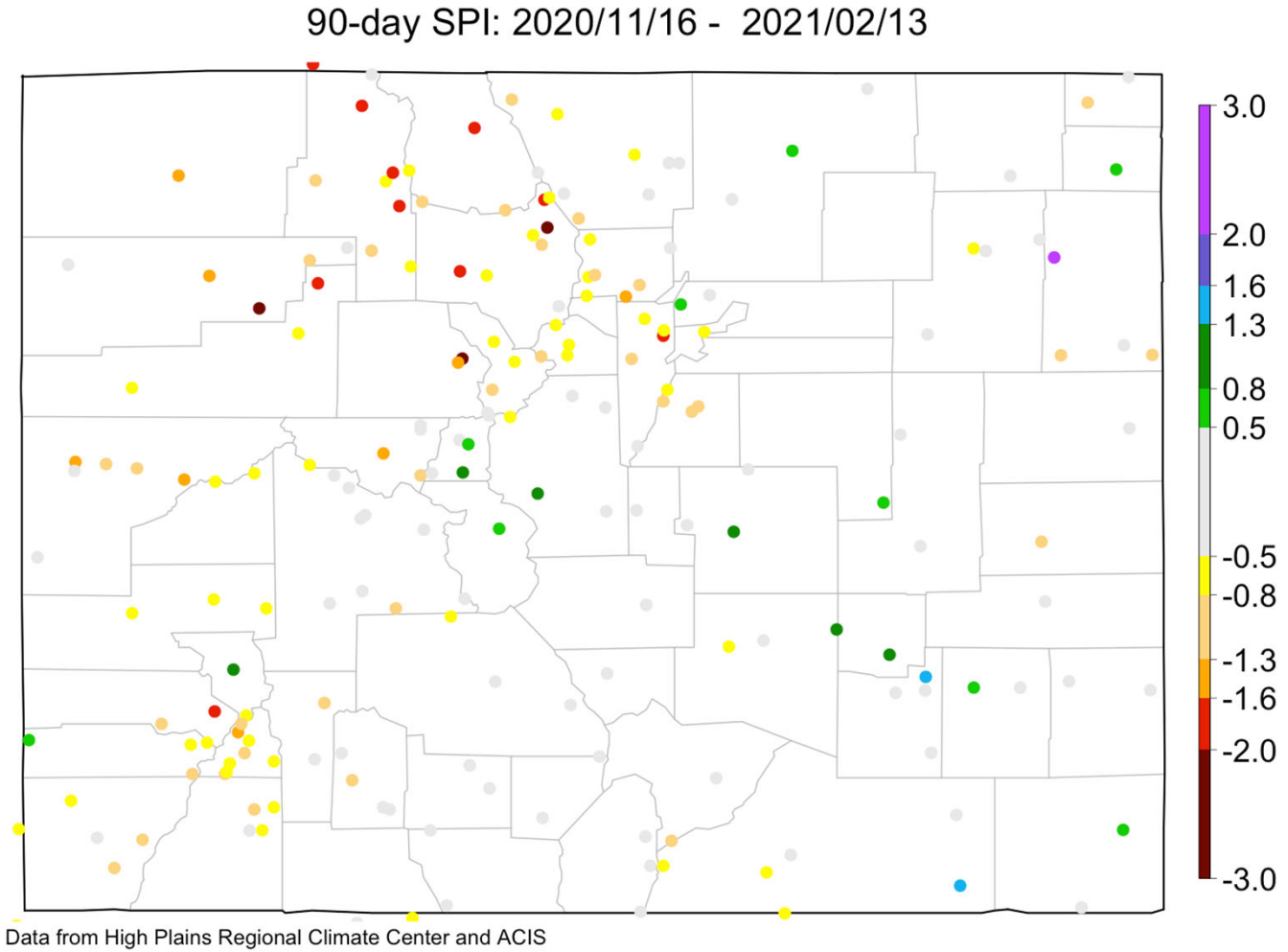
Generated 2/15/2021 at HPRCC using provisional data.

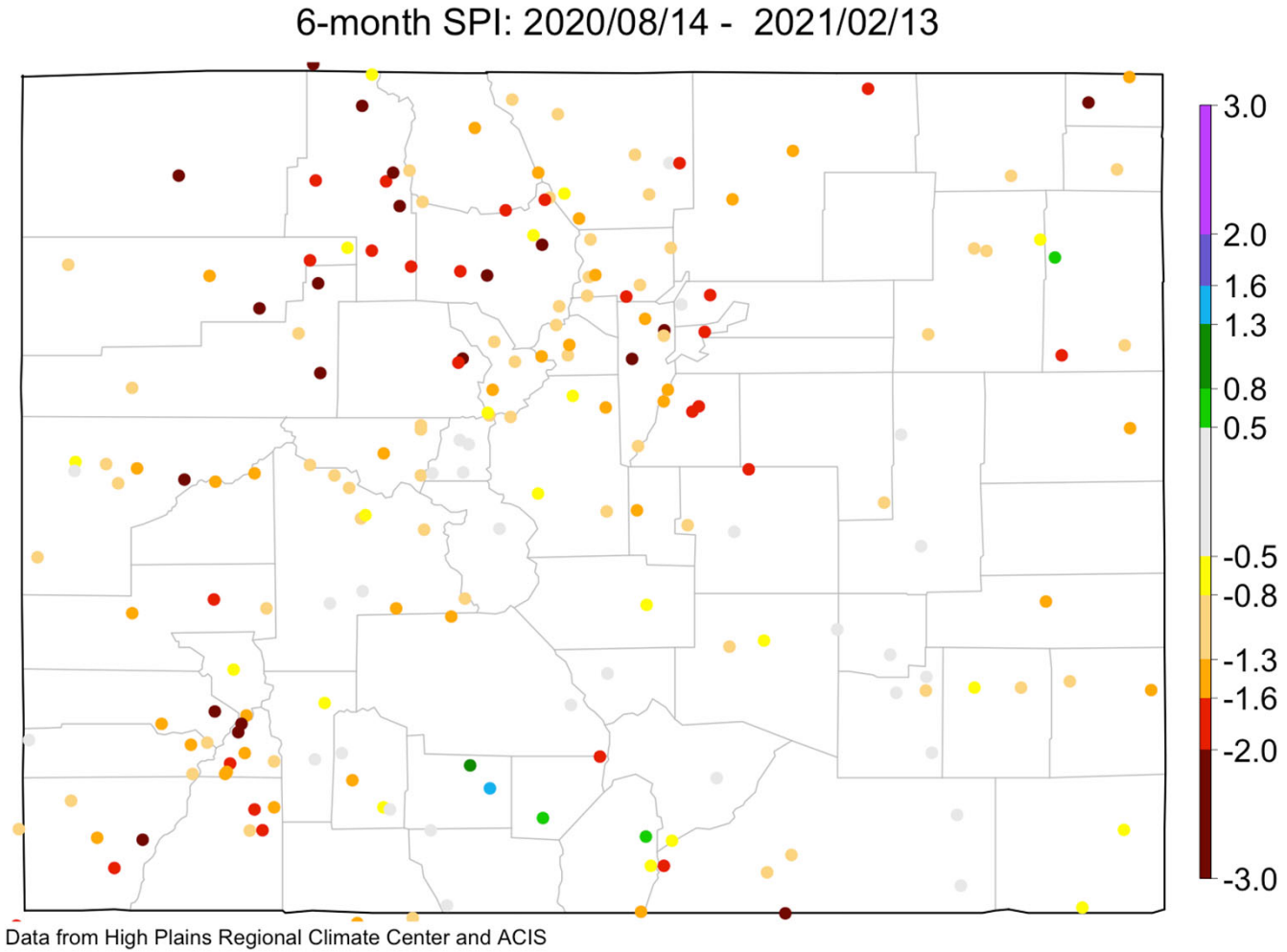
NOAA Regional Climate Centers

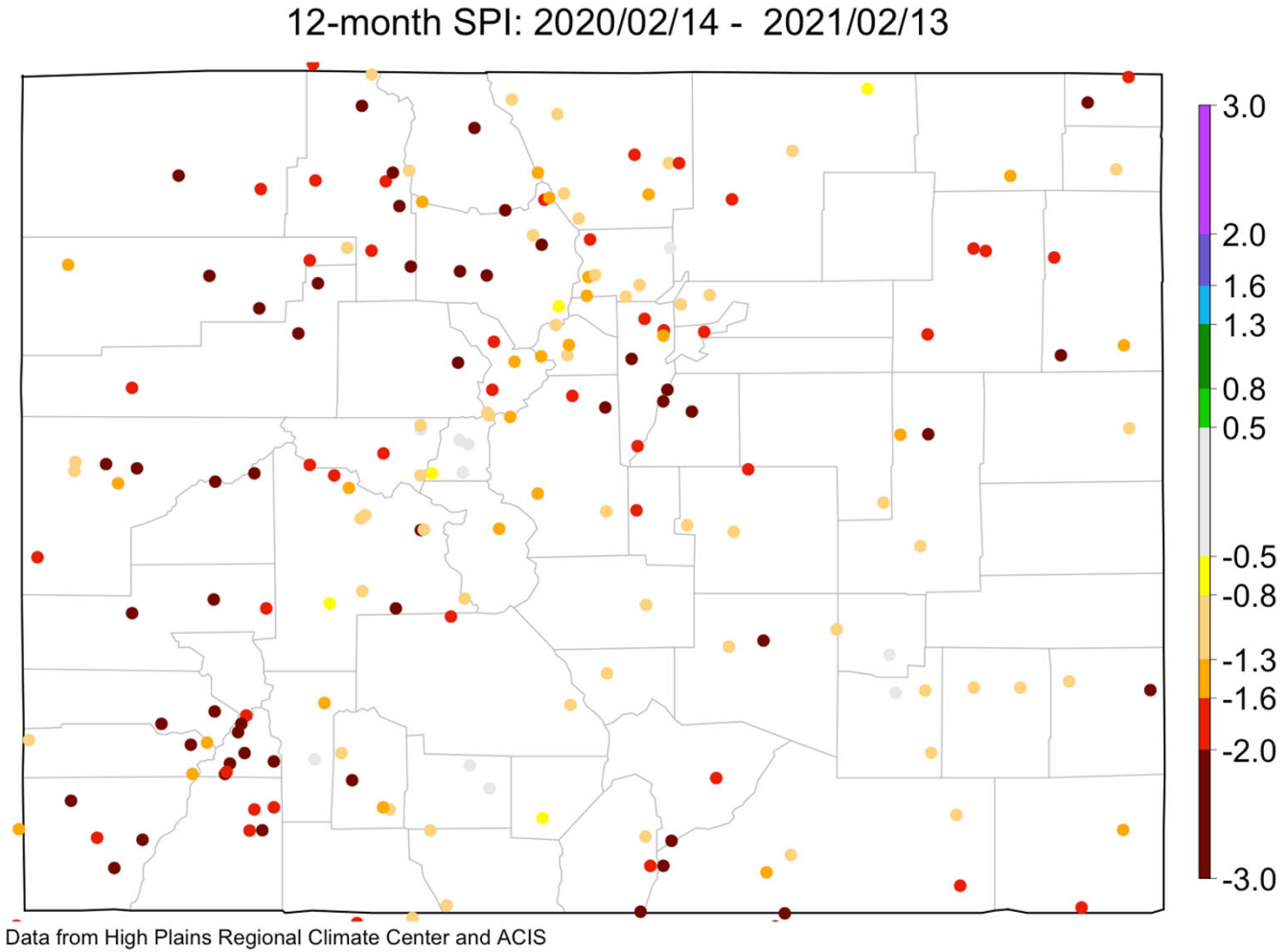
30-day SPI: 2021/01/15 - 2021/02/13



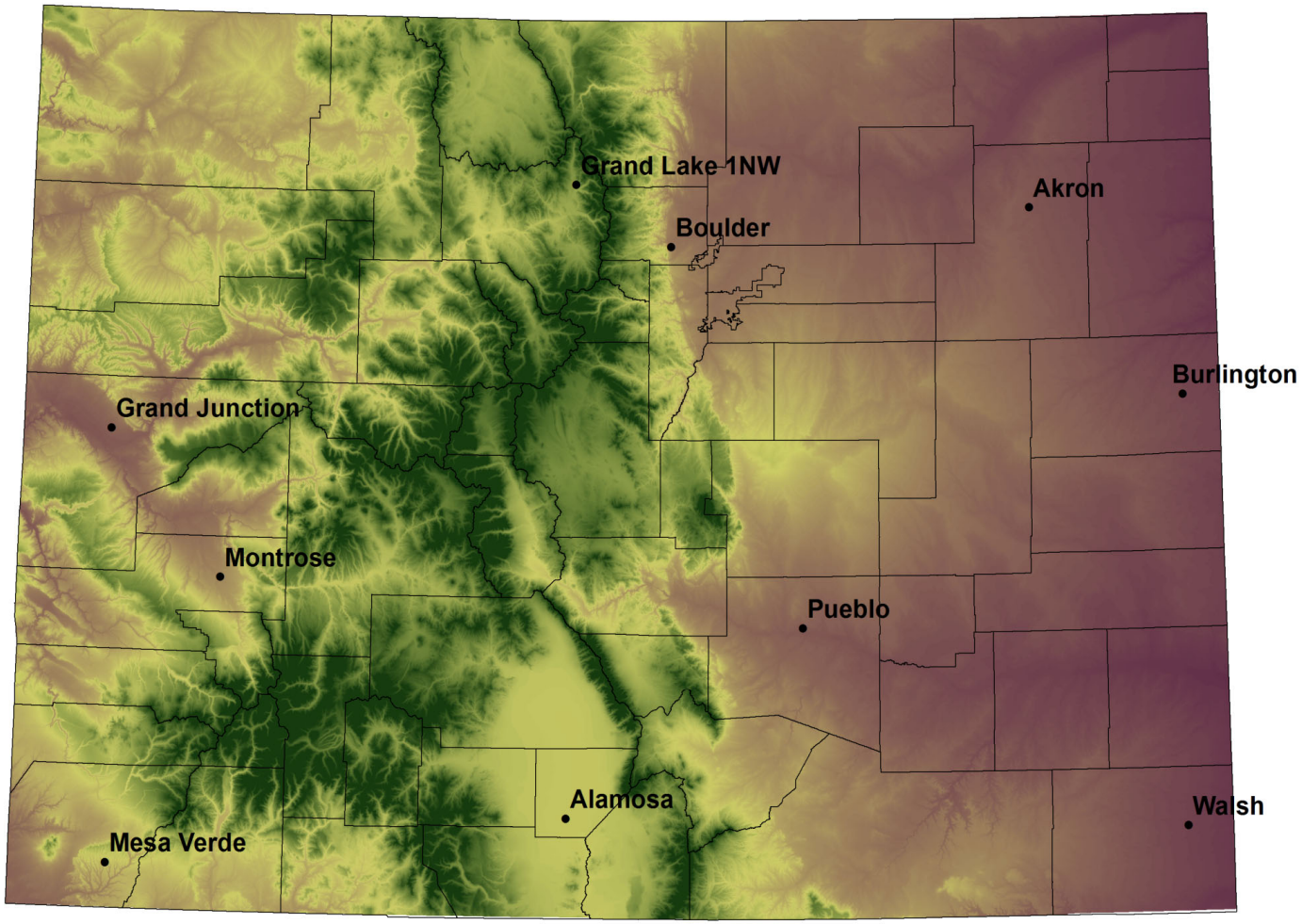
Data from High Plains Regional Climate Center and ACIS


90-day SPI: 2020/11/16 - 2021/02/13
3.0
2.0
1.6
1.3
0.8
0.5
-0.5
-0.8
-1.3
-1.6
-2.0
-3.0
Data from High Plains Regional Climate Center and ACIS


6-month SPI: 2020/08/14 - 2021/02/13
3.0
2.0
1.6
1.3
0.8
0.5
-0.5
-0.8
-1.3
-1.6
-2.0
-3.0
Data from High Plains Regional Climate Center and ACIS


12-month SPI: 2020/02/14 - 2021/02/13
3.0
2.0
1.6
1.3
0.8
0.5
-0.5
-0.8
-1.3
-1.6
-2.0
-3.0
Data from High Plains Regional Climate Center and ACIS

NWS Cooperative Stations for WATF



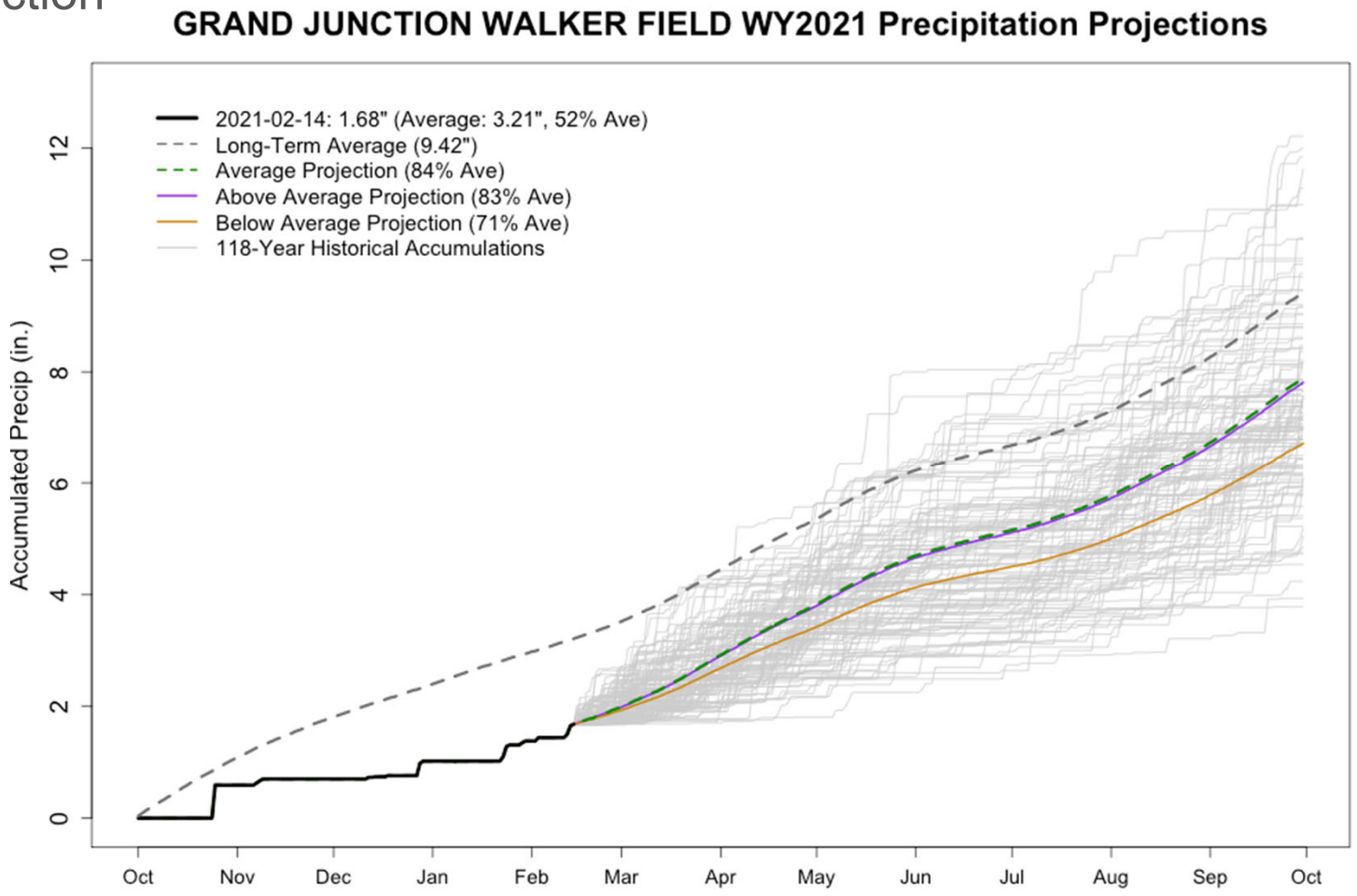
COLORADO CLIMATE CENTER

Water Year 2020 – Station Updates

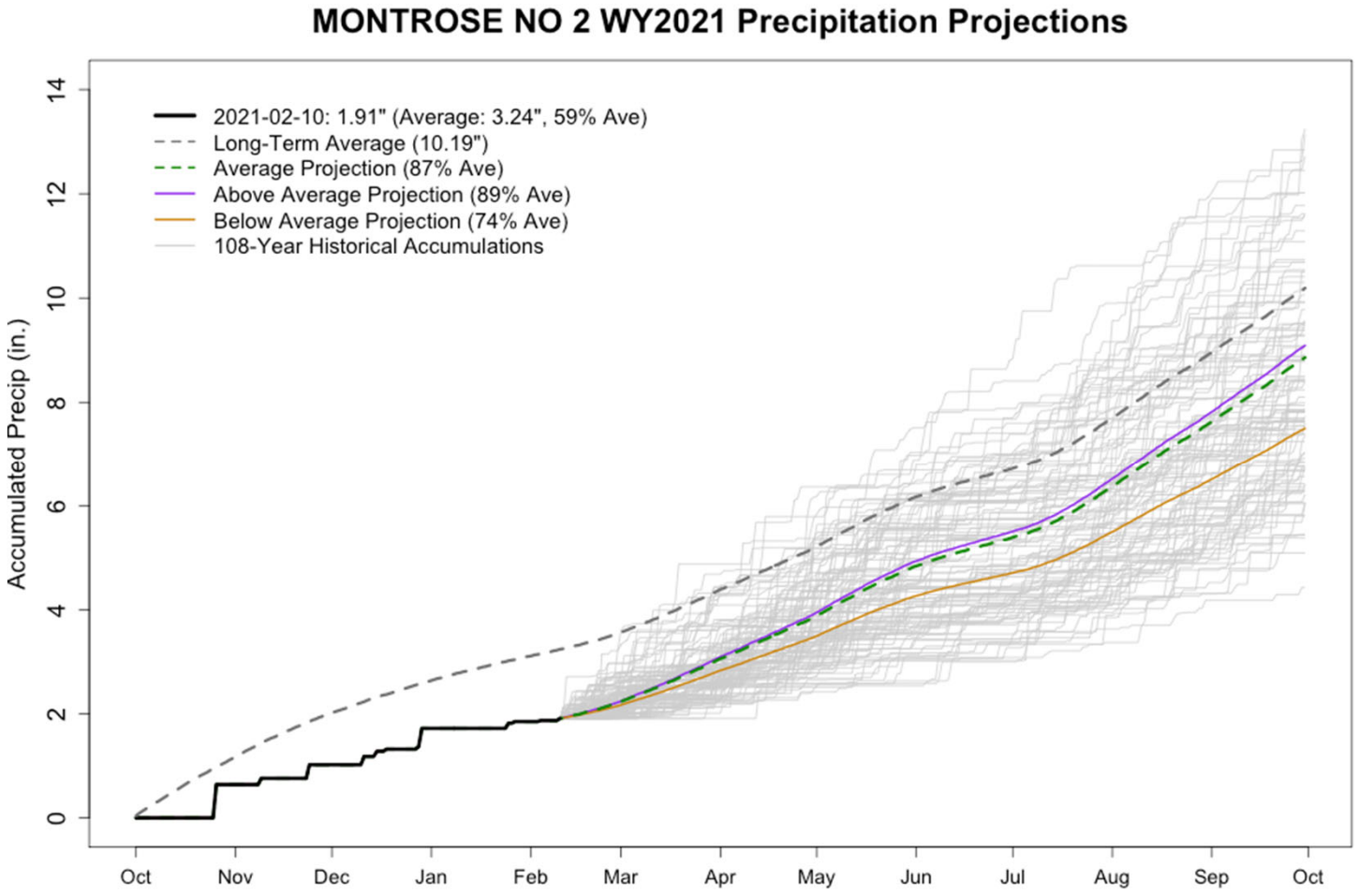
Grand Lake

(A lot of missing data from the fall – won't show this month)

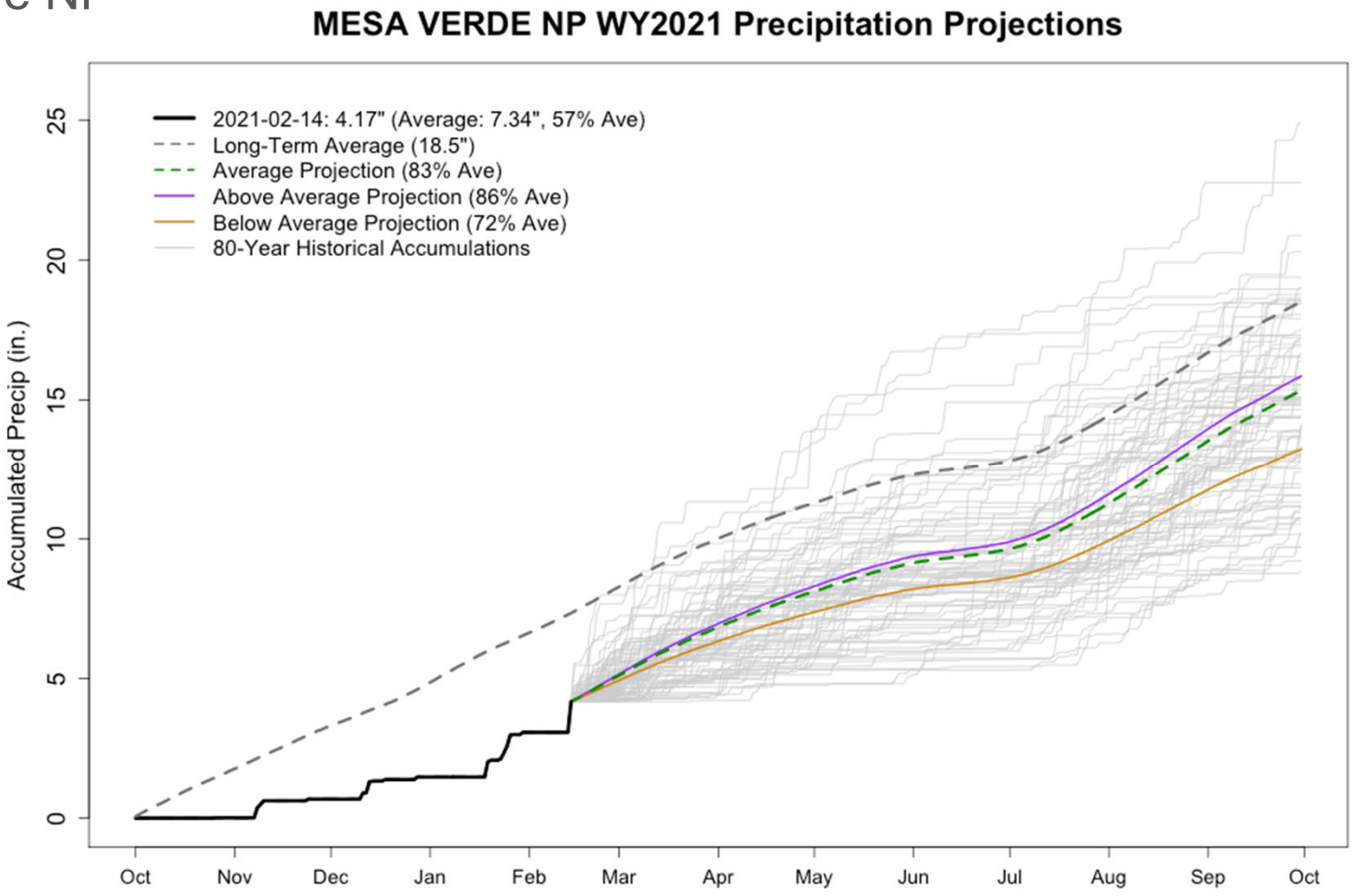
Grand Junction



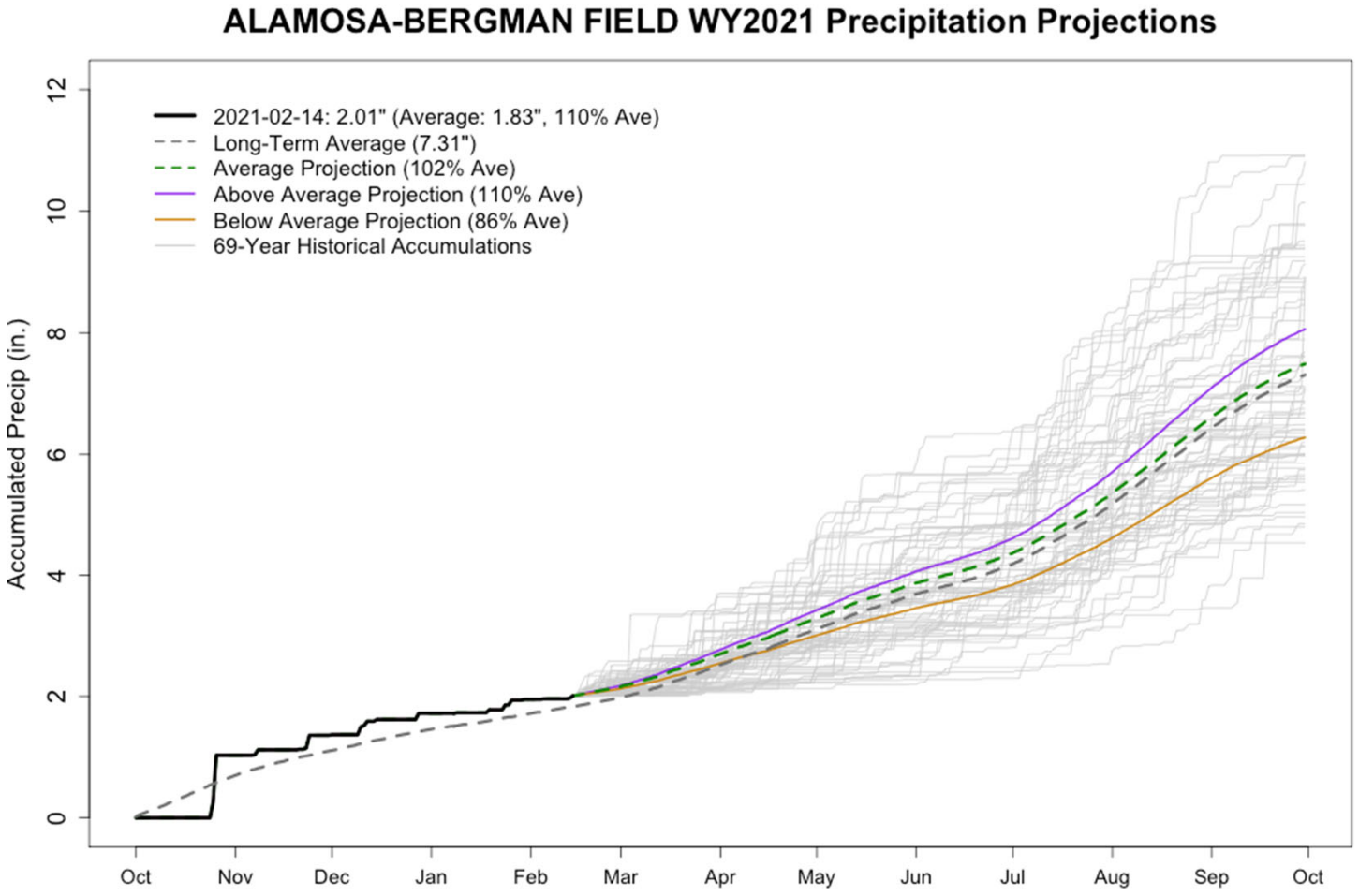
Montrose


MONTROSE NO 2 WY2021 Precipitation Projections
2021-02-10: 1.91" (Average: 3.24", 59% Ave)
Long-Term Average (10.19")
Average Projection (87% Ave)
Above Average Projection (89% Ave)
Below Average Projection (74% Ave)
108-Year Historical Accumulations
Accumulated Precip (in.)
0
2
4
6
8
10
12
14
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct

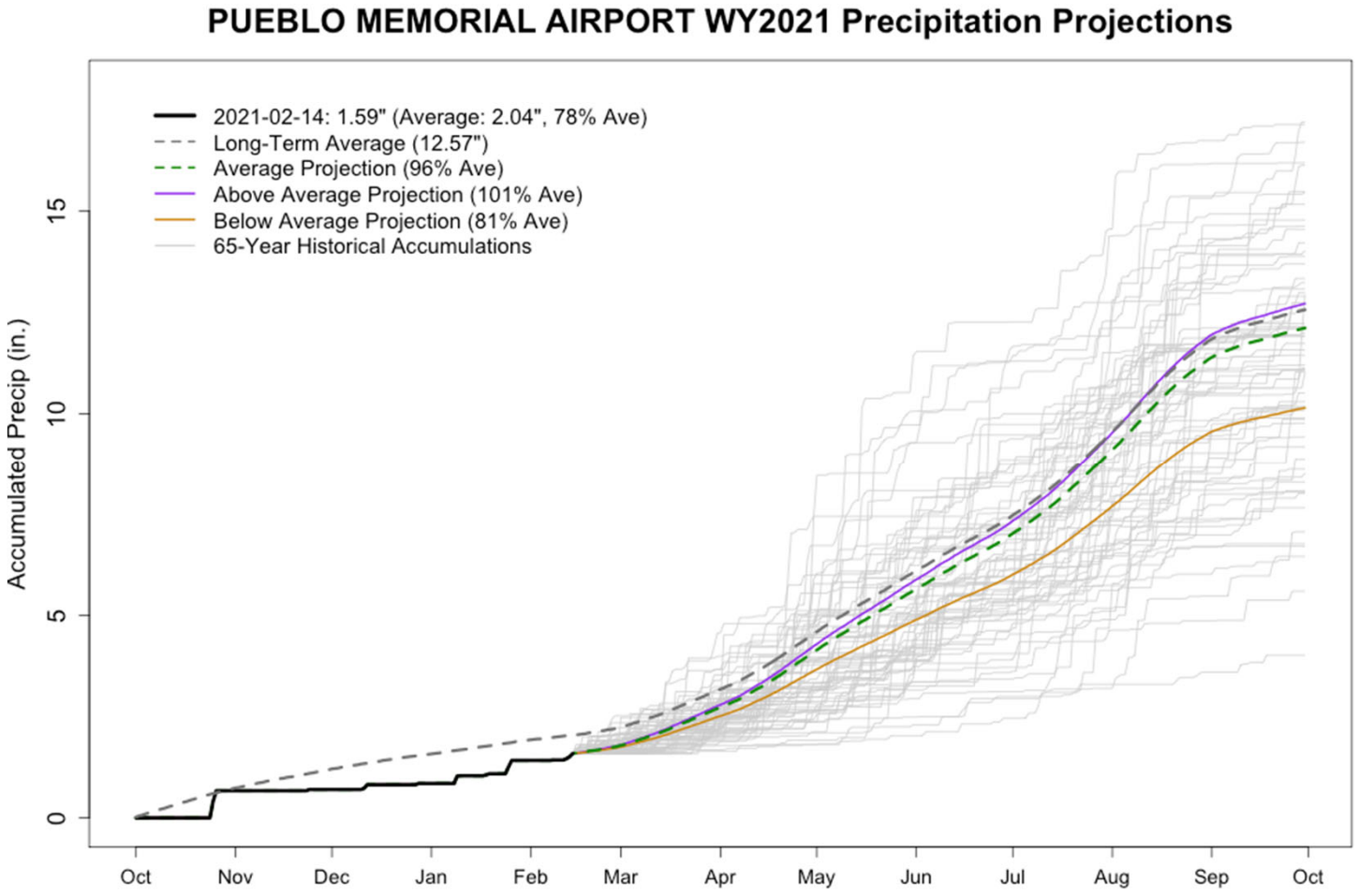
Mesa Verde NP



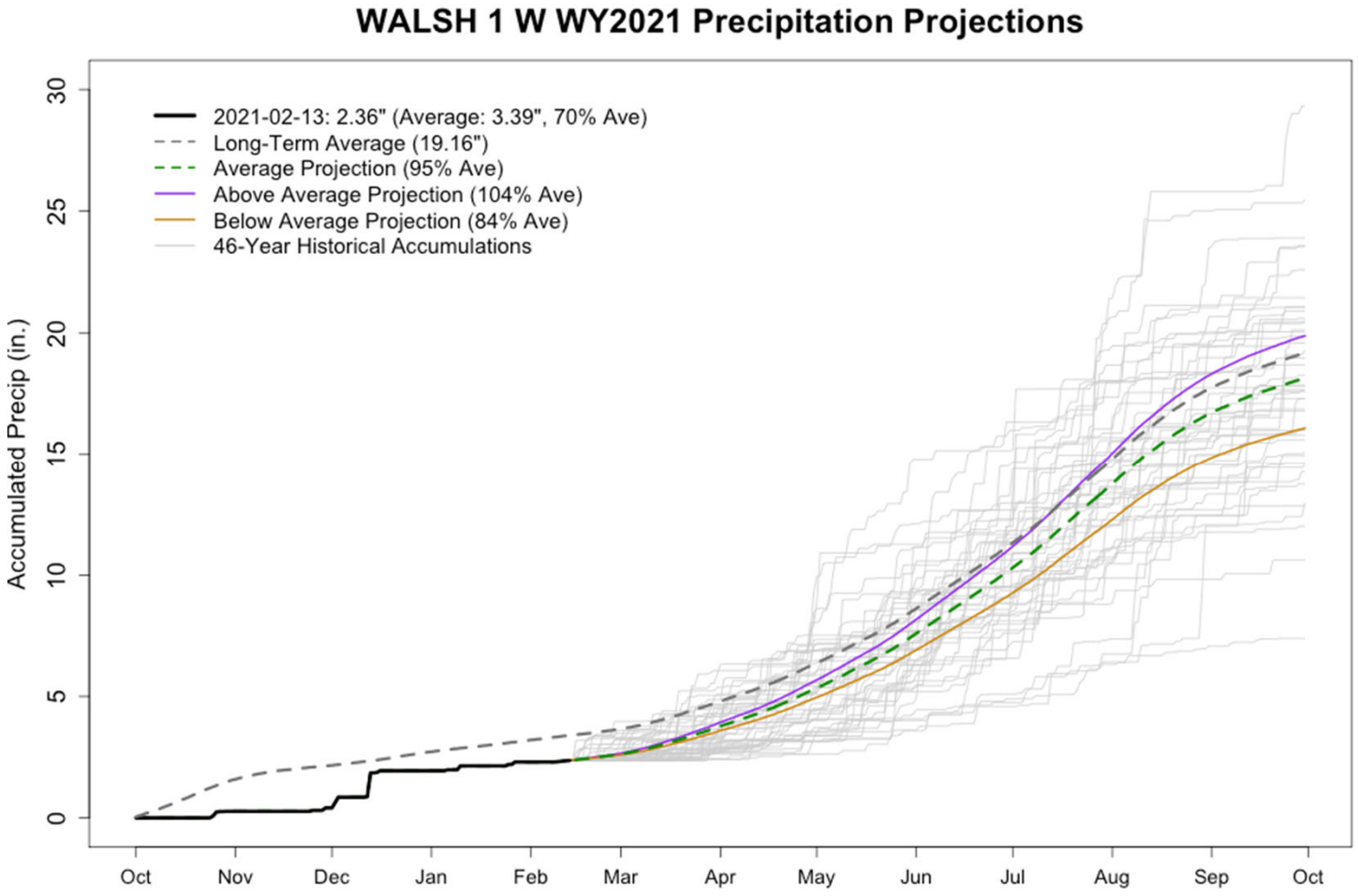
Alamosa


ALAMOSA-BERGMAN FIELD WY2021 Precipitation Projections
2021-02-14: 2.01" (Average: 1.83", 110% Ave)
Long-Term Average (7.31")
Average Projection (102% Ave)
Above Average Projection (110% Ave)
Below Average Projection (86% Ave)
69-Year Historical Accumulations
Accumulated Precip (in.)
0
2
4
6
8
10
12
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct

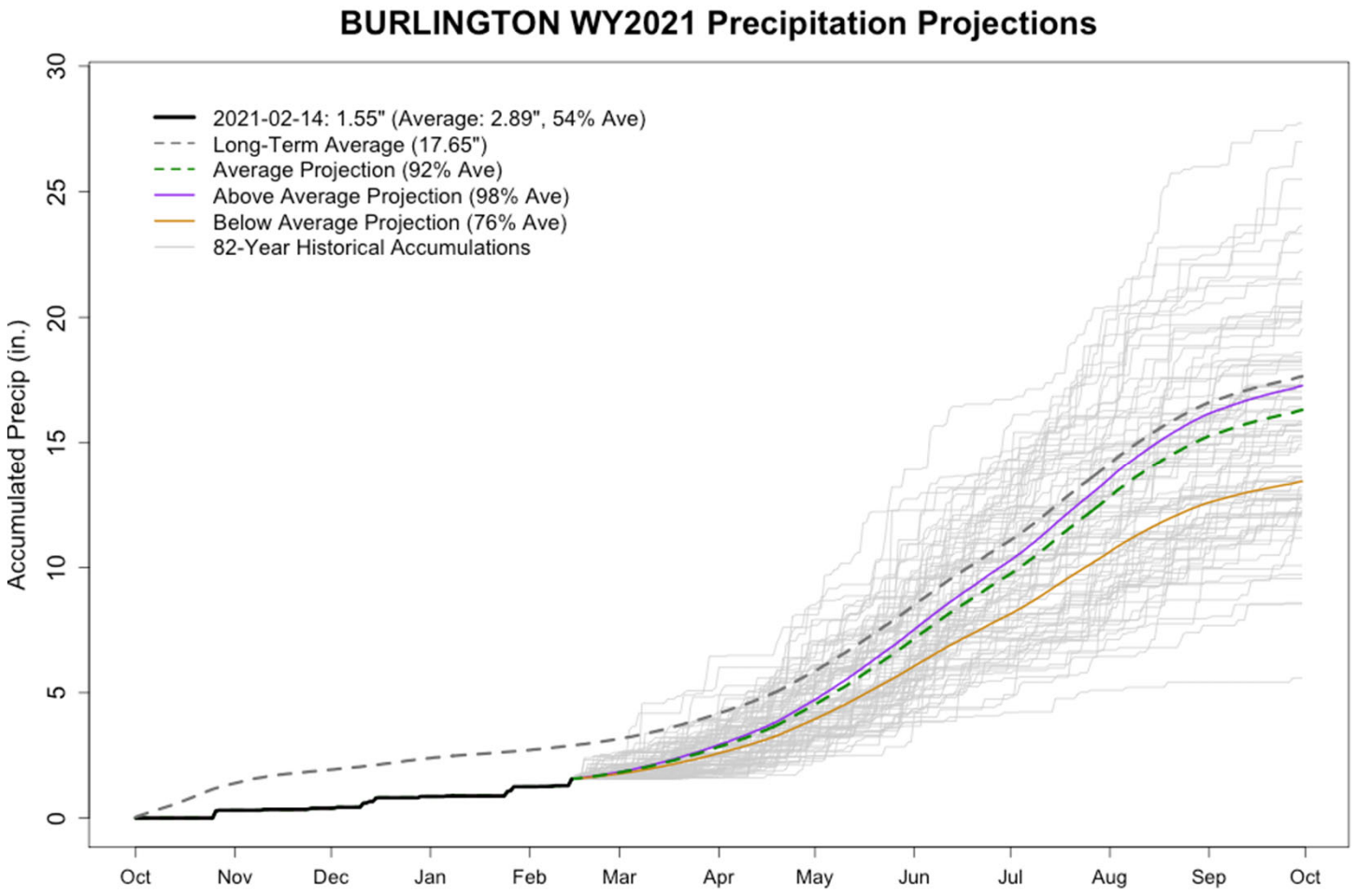
Pueblo


PUEBLO MEMORIAL AIRPORT WY2021 Precipitation Projections
2021-02-14: 1.59" (Average: 2.04", 78% Ave)
Long-Term Average (12.57")
Average Projection (96% Ave)
Above Average Projection (101% Ave)
Below Average Projection (81% Ave)
65-Year Historical Accumulations
Accumulated Precip (in.)
0
5
10
15
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct

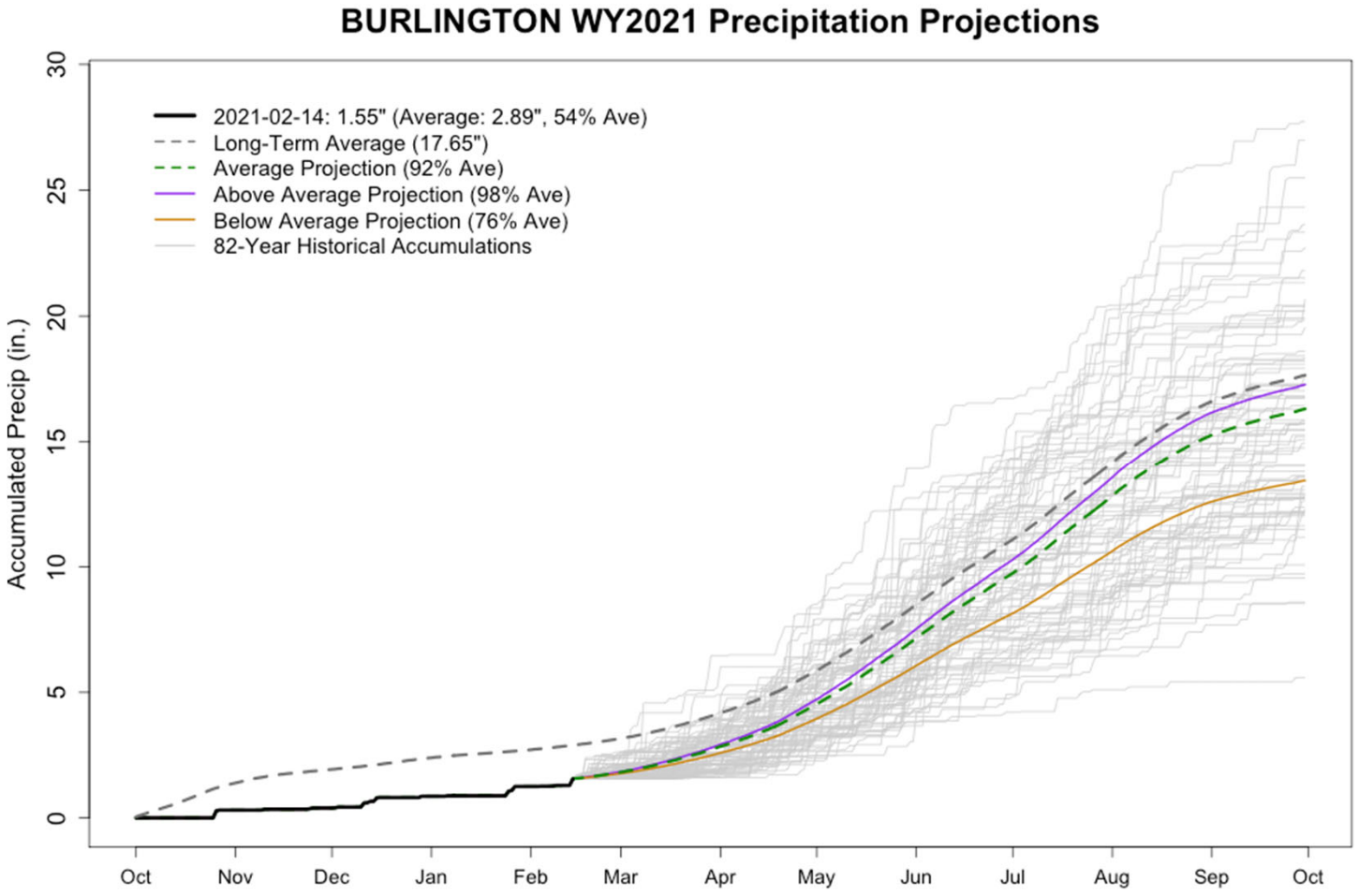
Walsh


WALSH 1 W WY2021 Precipitation Projections
2021-02-13: 2.36" (Average: 3.39", 70% Ave)
Long-Term Average (19.16")
Average Projection (95% Ave)
Above Average Projection (104% Ave)
Below Average Projection (84% Ave)
46-Year Historical Accumulations
Accumulated Precip (in.)
0
5
10
15
20
25
30
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct

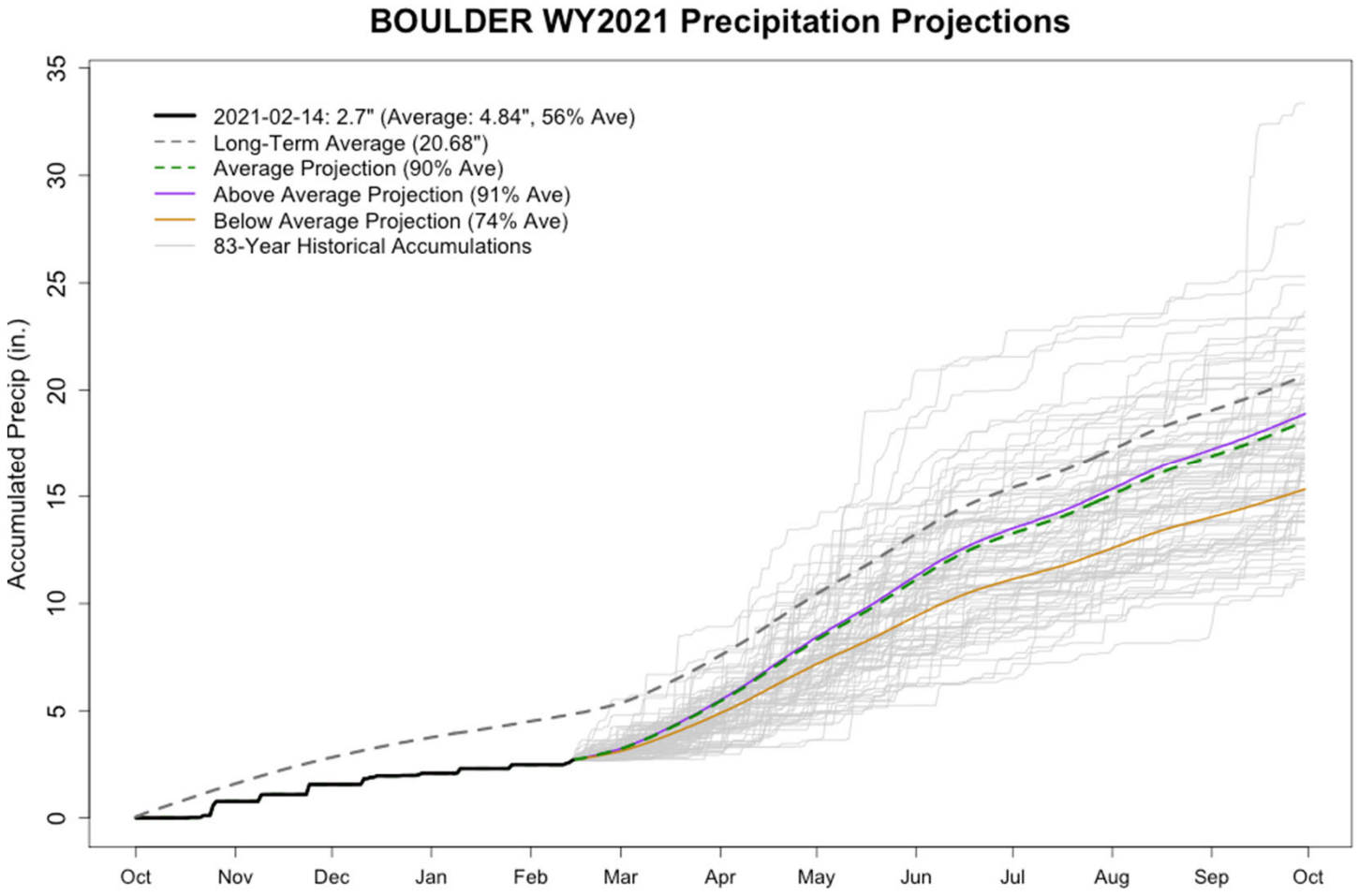
Burlington

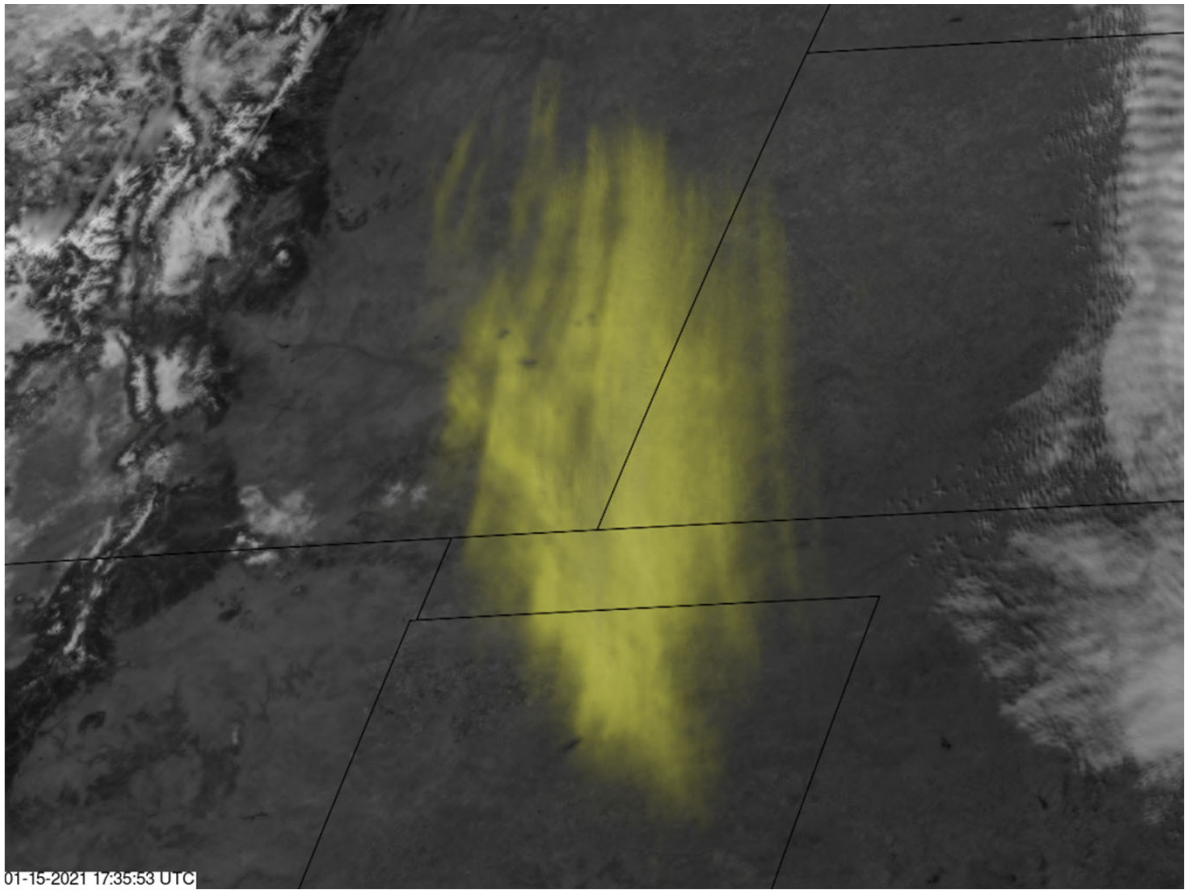

BURLINGTON WY2021 Precipitation Projections
2021-02-14: 1.55" (Average: 2.89", 54% Ave)
Long-Term Average (17.65")
Average Projection (92% Ave)
Above Average Projection (98% Ave)
Below Average Projection (76% Ave)
82-Year Historical Accumulations
Accumulated Precip (in.)
0
5
10
15
20
25
30
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct

Akron


BURLINGTON WY2021 Precipitation Projections
2021-02-14: 1.55" (Average: 2.89", 54% Ave)
Long-Term Average (17.65")
Average Projection (92% Ave)
Above Average Projection (98% Ave)
Below Average Projection (76% Ave)
82-Year Historical Accumulations
Accumulated Precip (in.)
0
5
10
15
20
25
30
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct

Boulder


BOULDER WY2021 Precipitation Projections
2021-02-14: 2.7" (Average: 4.84", 56% Ave)
Long-Term Average (20.68")
Average Projection (90% Ave)
Above Average Projection (91% Ave)
Below Average Projection (74% Ave)
83-Year Historical Accumulations
Accumulated Precip (in.)
0
5
10
15
20
25
30
35
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct



Dust storm on the eastern Plains, January 15, 2021

http://rammb.cira.colostate.edu/ramsdis/online/loop.asp?data_folder=loop_of_the_day/goes-16/20210115000000&number_of_images_to_display=200&loop_speed_ms=50

COLORADO CLIMATE CENTER

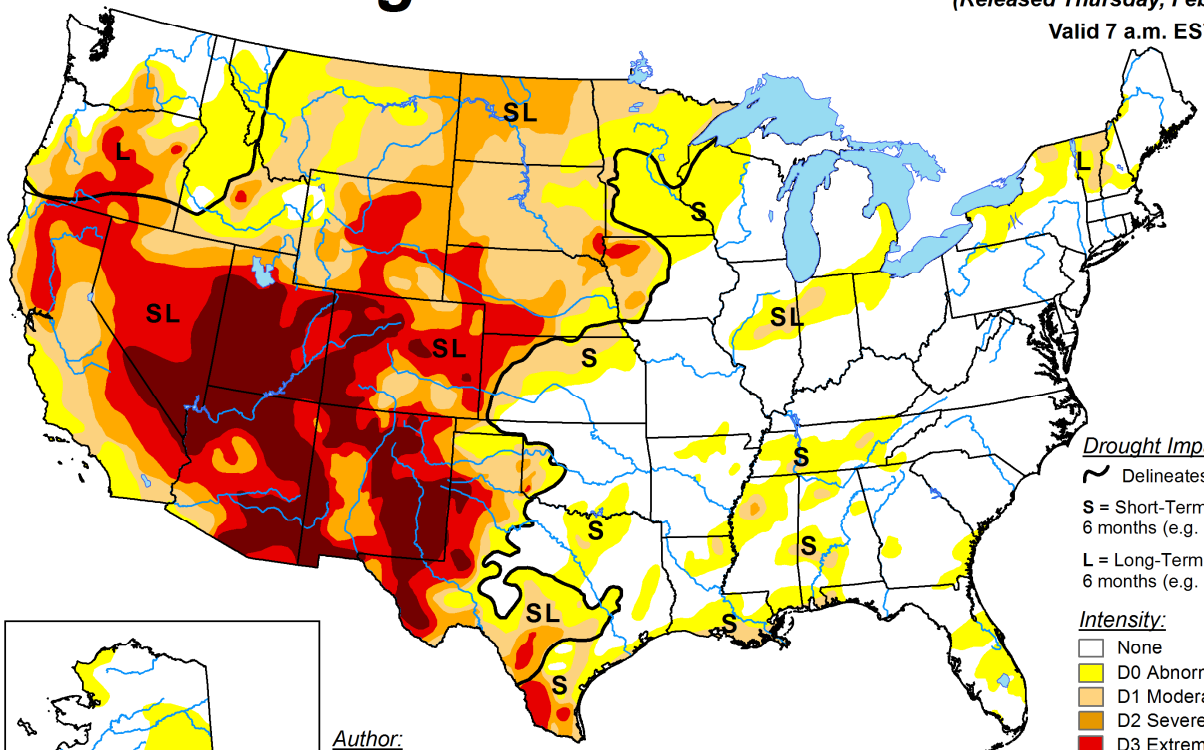
Drought Conditions

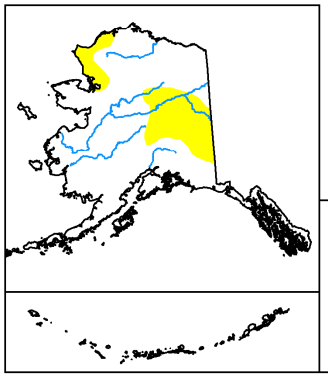
U.S. Drought Monitor

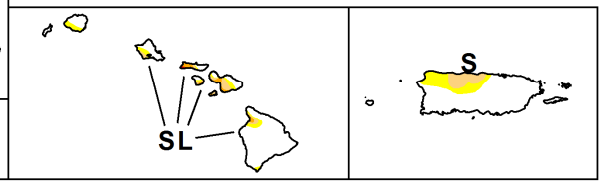
February 9, 2021

(Released Thursday, Feb. 11, 2021)

Valid 7 a.m. EST







Drought Impact Types:

Delineates dominant impacts

S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

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

Author:

Brad Rippey

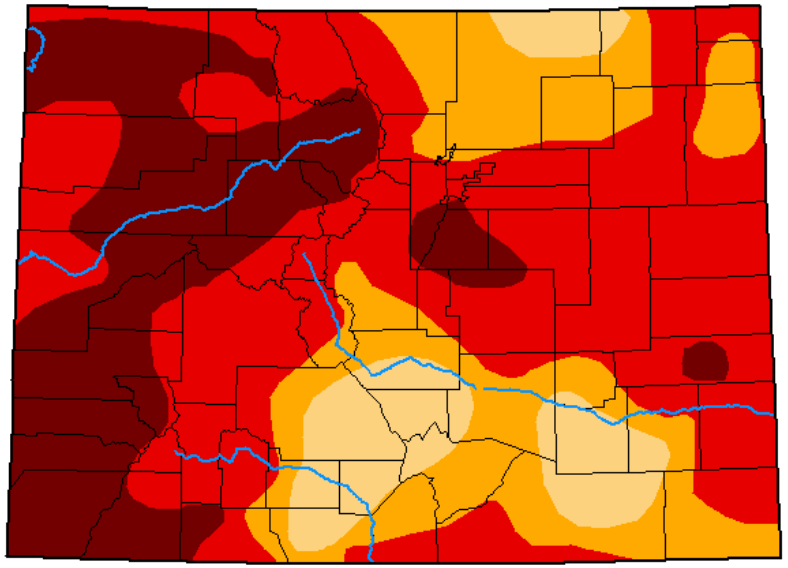
U.S. Department of Agriculture

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

droughtmonitor.unl.edu

U.S. Drought Monitor

Colorado



February 9, 2021

(Released Thursday, Feb. 11, 2021)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	90.24	70.11	24.79
Last Week *02-02-2021*	0.00	100.00	100.00	90.24	70.73	24.79
3 Months Ago *11-10-2020*	0.00	100.00	100.00	93.71	74.08	24.64
Start of Calendar Year *12-29-2020*	0.00	100.00	100.00	93.73	76.17	27.60
Start of Water Year *09-29-2020*	0.00	100.00	99.29	89.35	52.88	2.64
One Year Ago *02-11-2020*	27.72	72.28	43.82	3.30	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

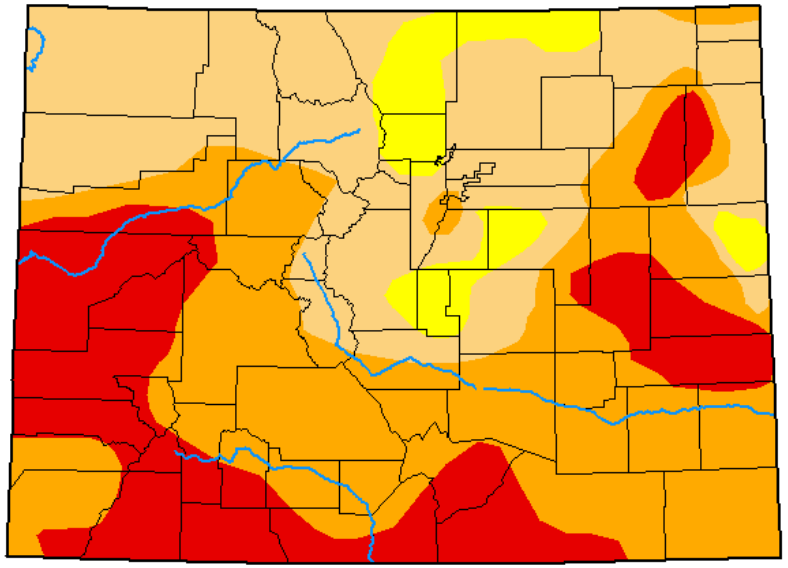
Author:

Brad Rippey
U.S. Department of Agriculture

droughtmonitor.unl.edu

Six months ago

U.S. Drought Monitor
Colorado



August 11, 2020
(Released Thursday, Aug. 13, 2020)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	93.87	61.43	23.66	0.00
Last Week *08-04-2020*	0.00	100.00	85.88	58.79	26.64	0.00
3 Months Ago *05-12-2020*	20.76	79.24	62.66	46.09	14.65	0.00
Start of Calendar Year *12-31-2019*	31.72	68.28	51.19	20.11	0.00	0.00
Start of Water Year *10-01-2019*	30.14	69.86	27.53	0.00	0.00	0.00
One Year Ago *08-13-2019*	93.35	6.65	0.00	0.00	0.00	0.00

Intensity:

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

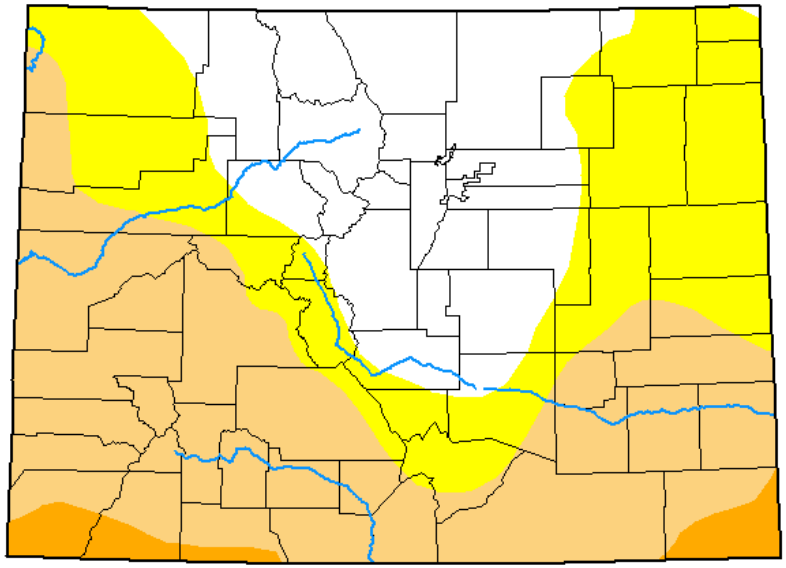
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:
Brian Fuchs
National Drought Mitigation Center

droughtmonitor.unl.edu

One year ago

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
Current	27.72	72.28	43.82	3.30	0.00	0.00
Last Week *02-04-2020*	22.39	77.61	51.12	3.30	0.00	0.00
3 Months Ago *11-12-2019*	25.74	74.26	55.27	31.02	0.00	0.00
Start of Calendar Year *12-31-2019*	31.72	68.28	51.19	20.11	0.00	0.00
Start of Water Year *10-01-2019*	30.14	69.86	27.53	0.00	0.00	0.00
One Year Ago *02-12-2019*	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

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Author:
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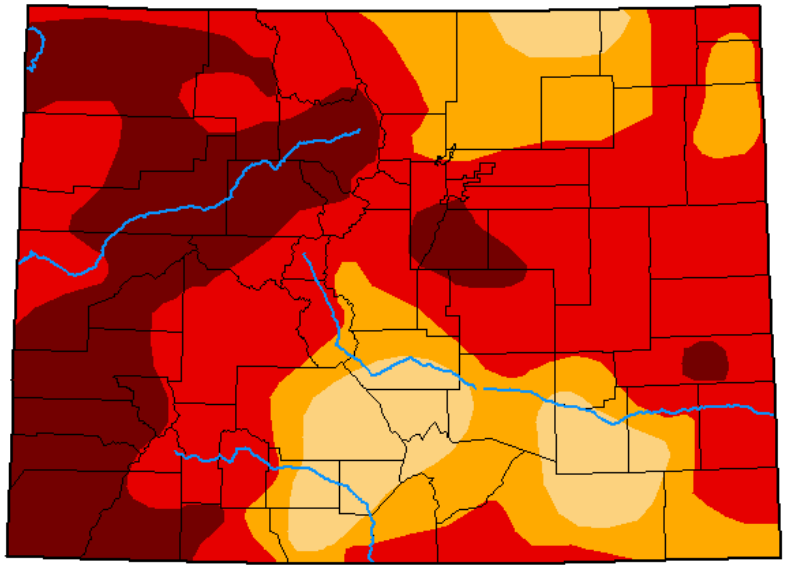
droughtmonitor.unl.edu

U.S. Drought Monitor

Colorado



February 9, 2021

(Released Thursday, Feb. 11, 2021)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	90.24	70.11	24.79
Last Week *02-02-2021*	0.00	100.00	100.00	90.24	70.73	24.79
3 Months Ago *11-10-2020*	0.00	100.00	100.00	93.71	74.08	24.64
Start of Calendar Year *12-29-2020*	0.00	100.00	100.00	93.73	76.17	27.60
Start of Water Year *09-29-2020*	0.00	100.00	99.29	89.35	52.88	2.64
One Year Ago *02-11-2020*	27.72	72.28	43.82	3.30	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:

Brad Rippey
U.S. Department of Agriculture

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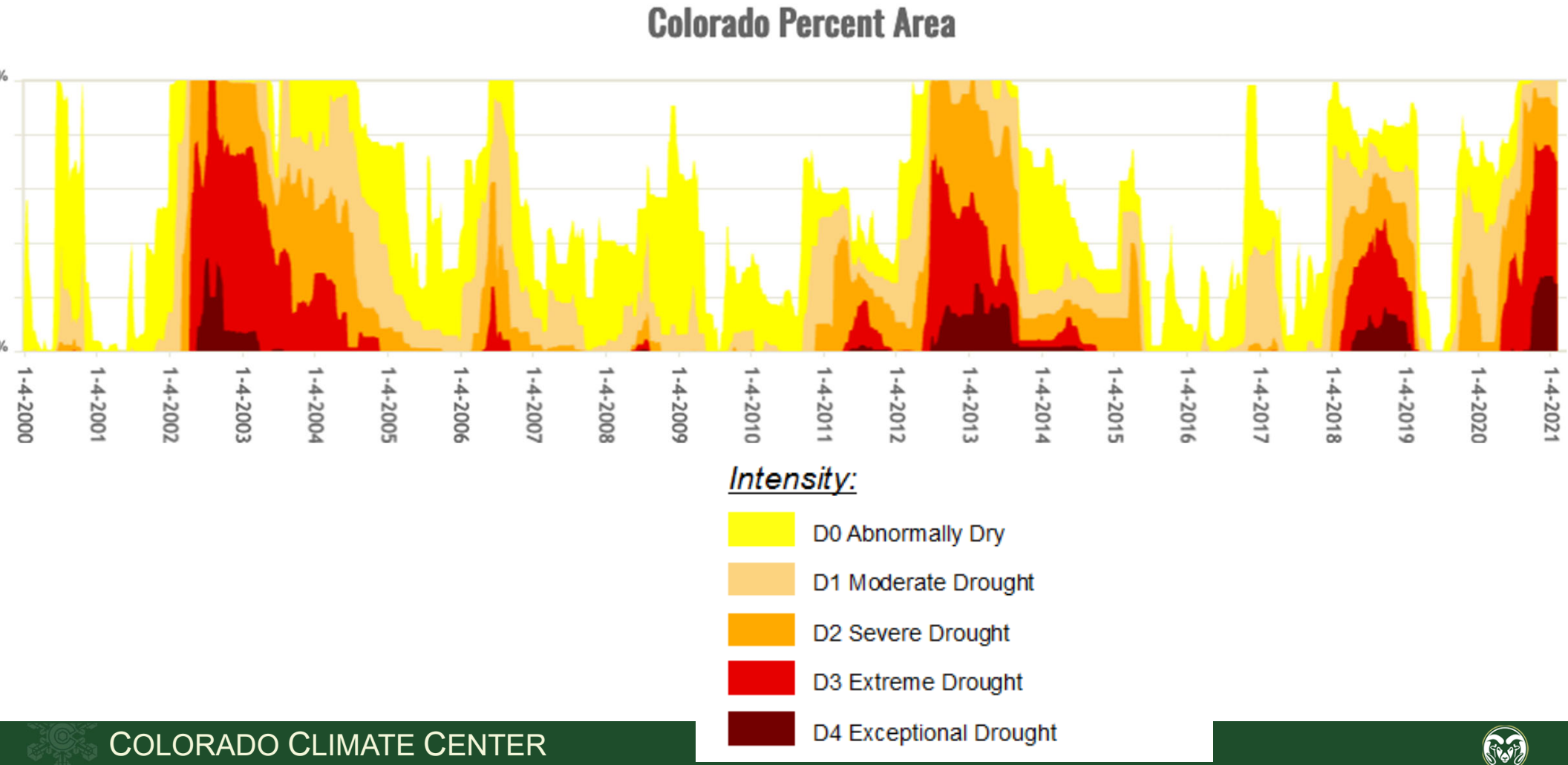
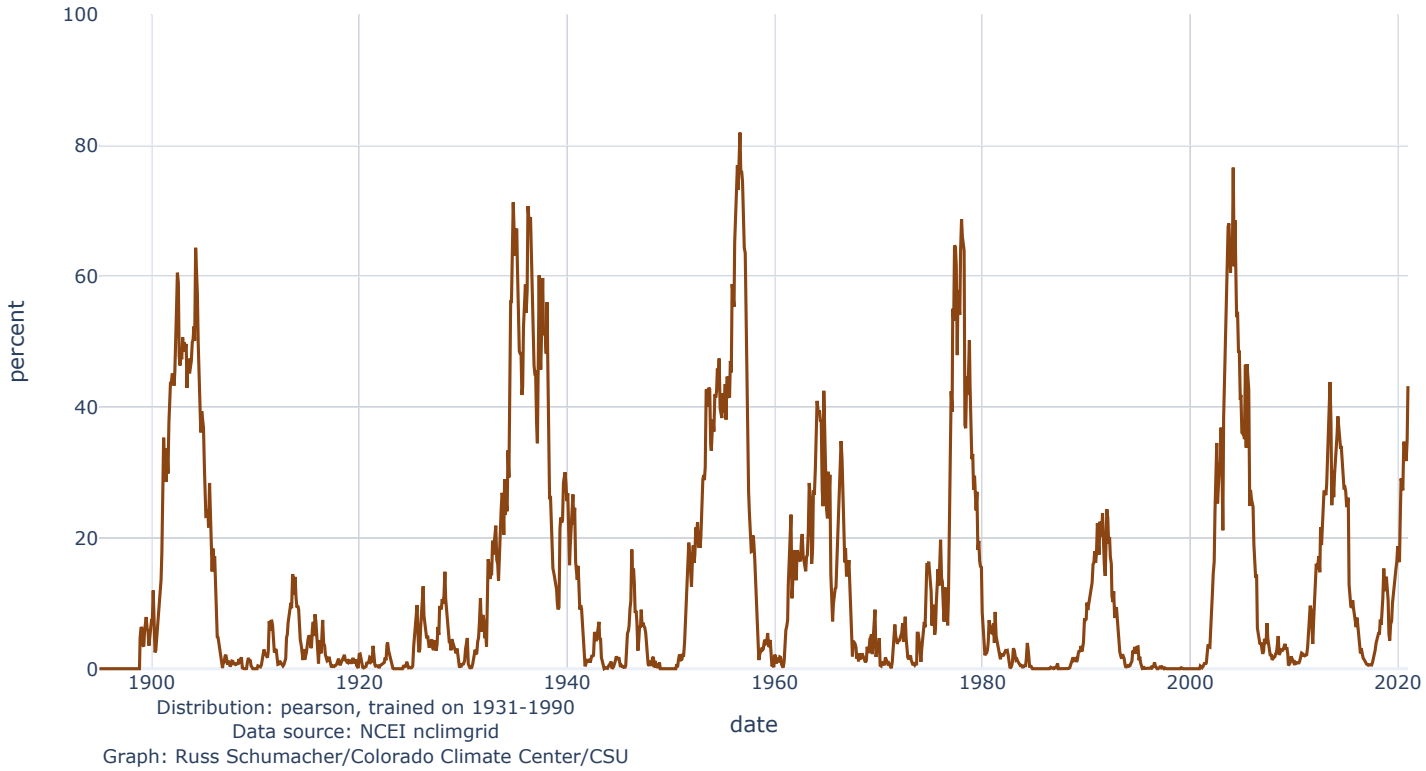
Percent of Colorado in drought (since 2000)

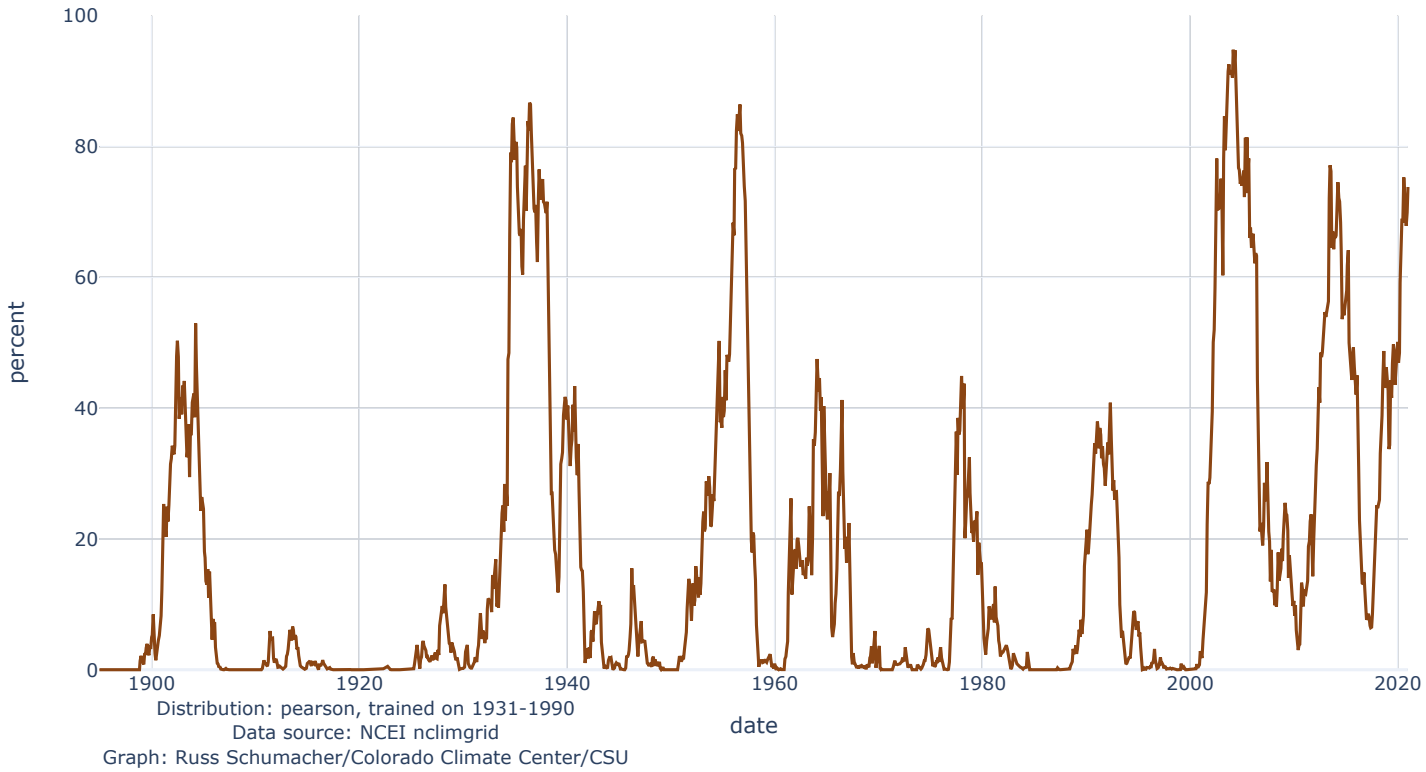


Percent of Colorado in long-term drought (since 1895) based on 48-month SPI < 1



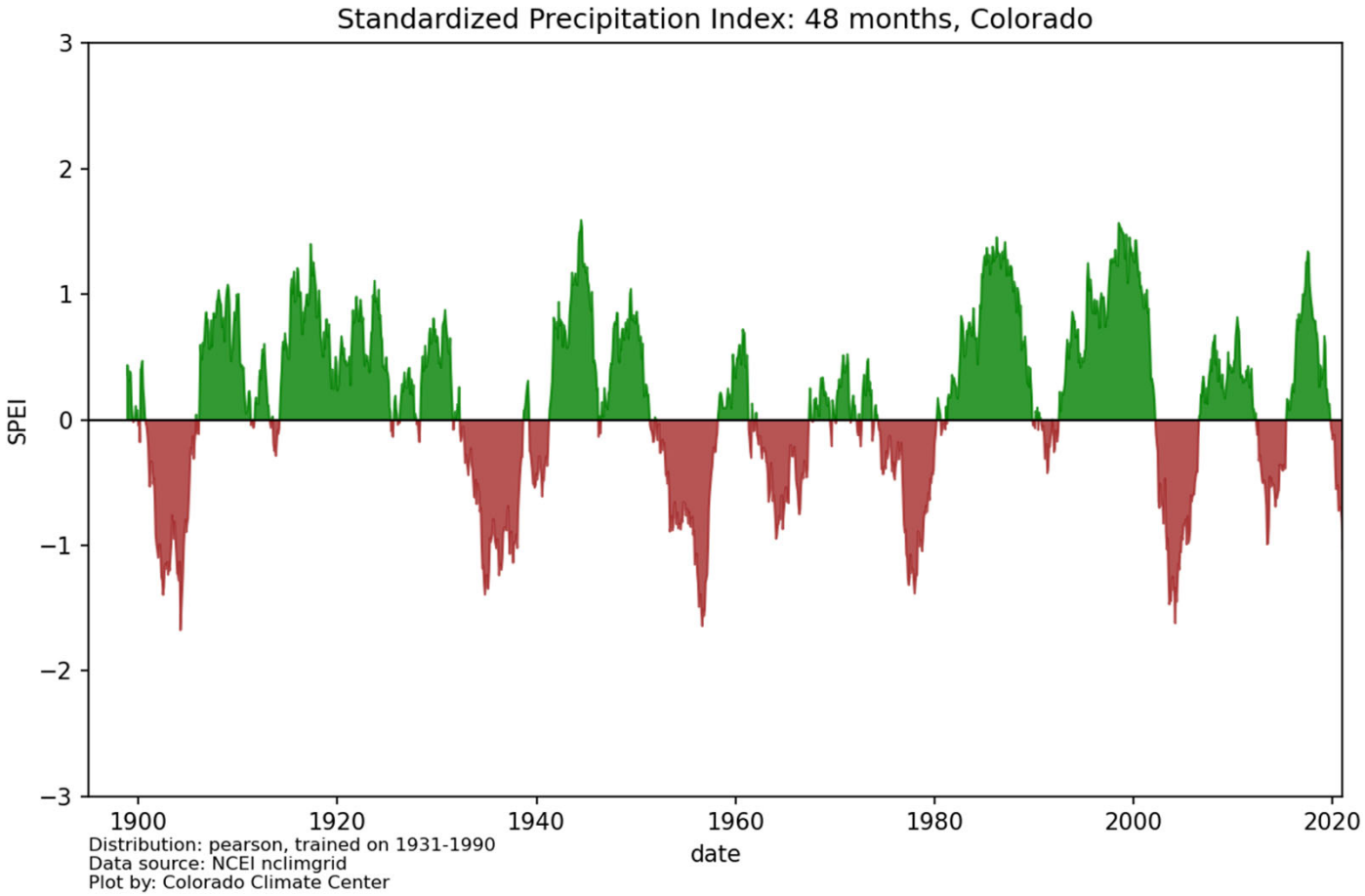
Considers precip only

Percent of Colorado in long-term drought (since 1895) based on 48-month SPEI < 1



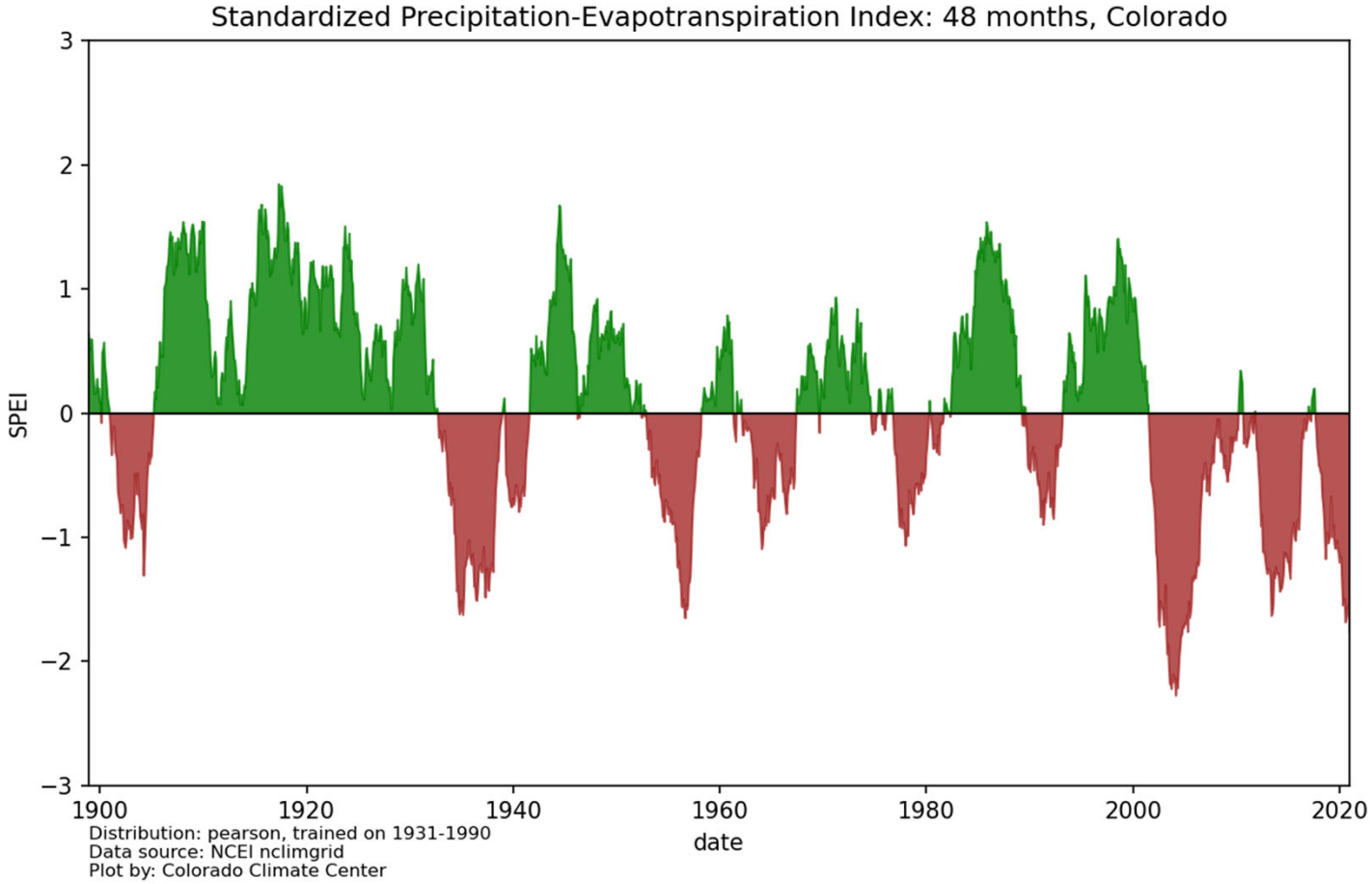
Considers precip + temperature

Standardized precipitation index (48 months)

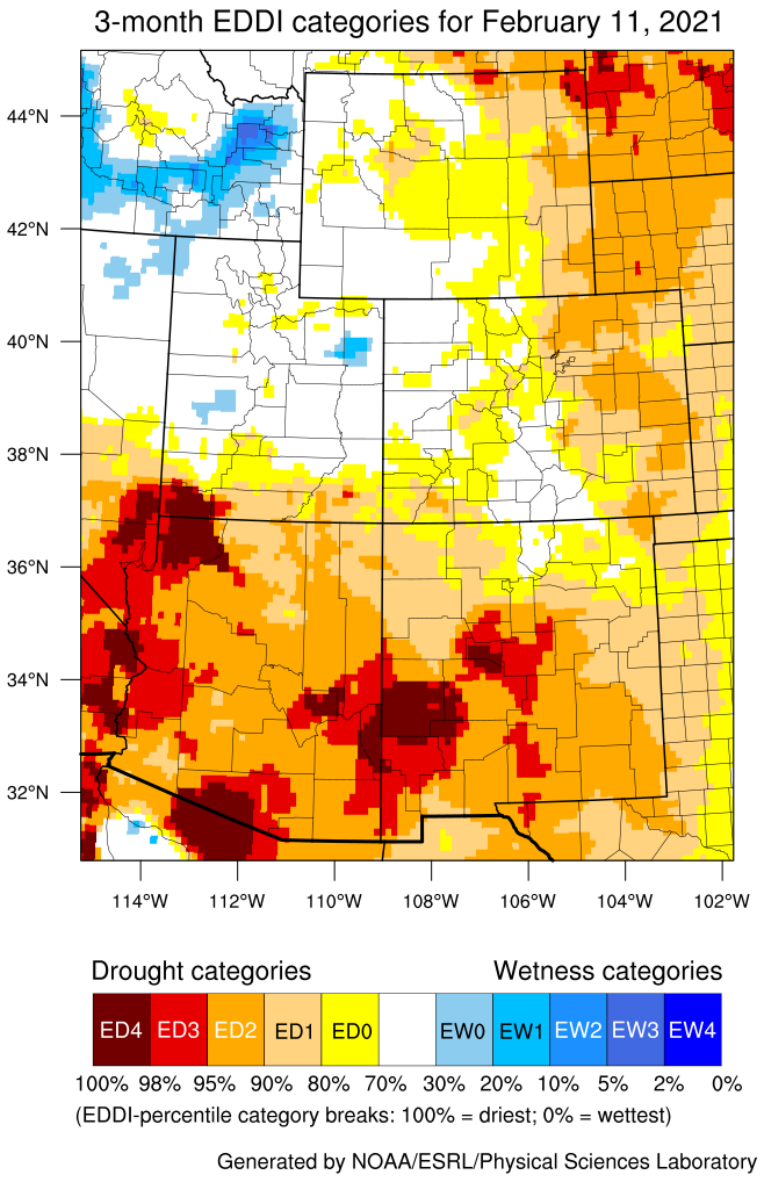


Considers precip only

Standardized precipitation-evapotranspiration index (48 months)



Considers precip + temperature



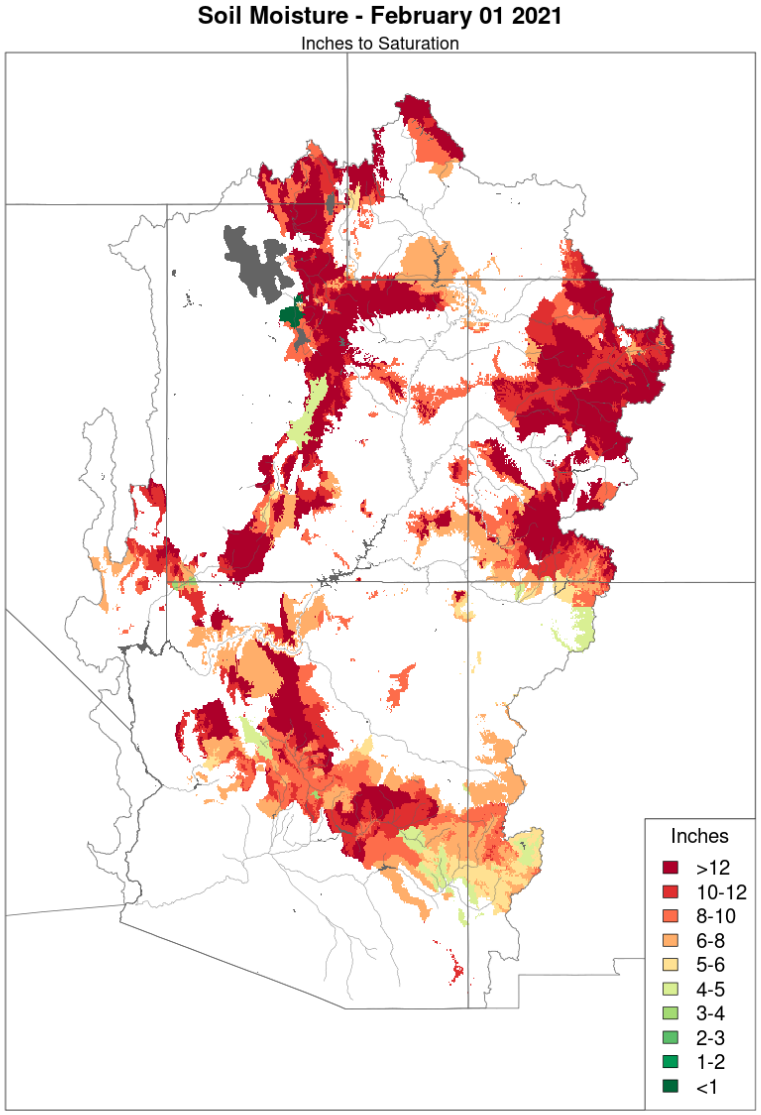
COLORADO CLIMATE CENTER

Evaporative Demand Drought Index

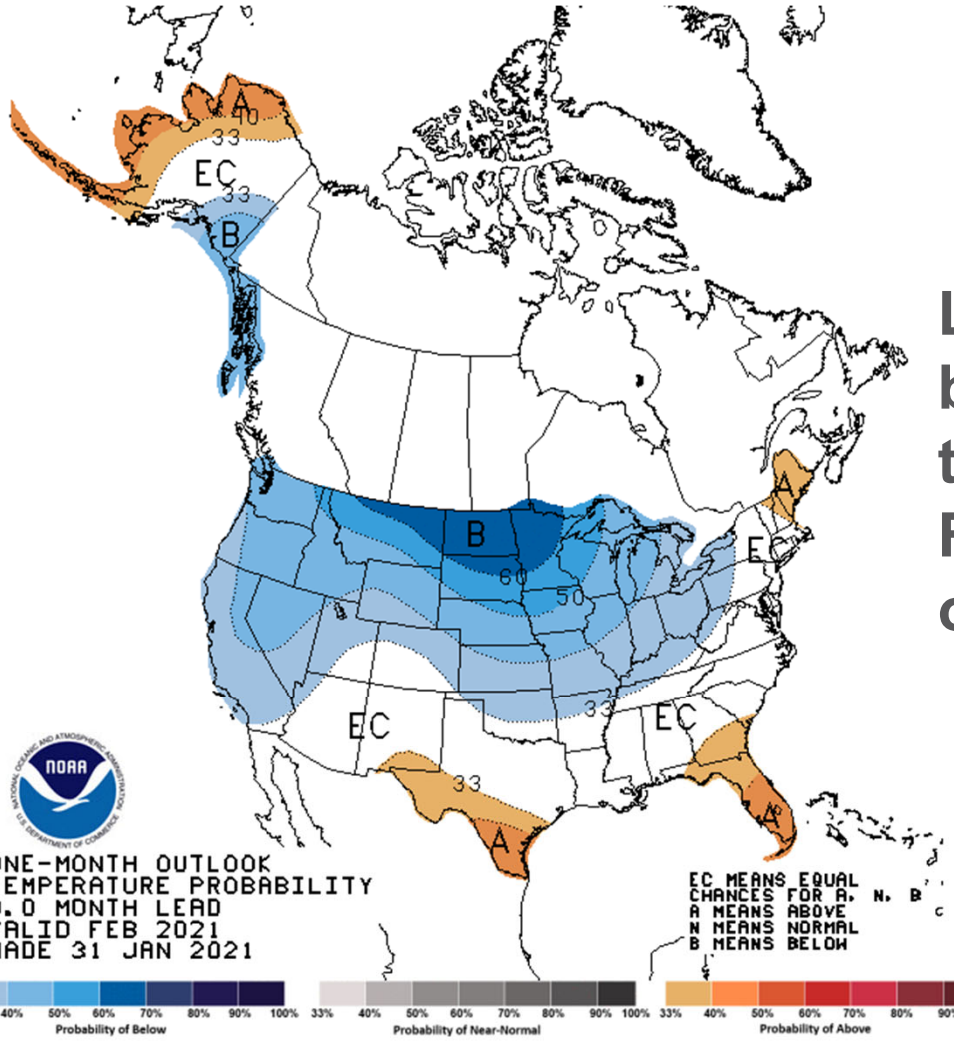
Over last 3 months, near-normal in western Colorado, above-normal evaporative demand on eastern Plains (but “normal” is pretty low in winter)

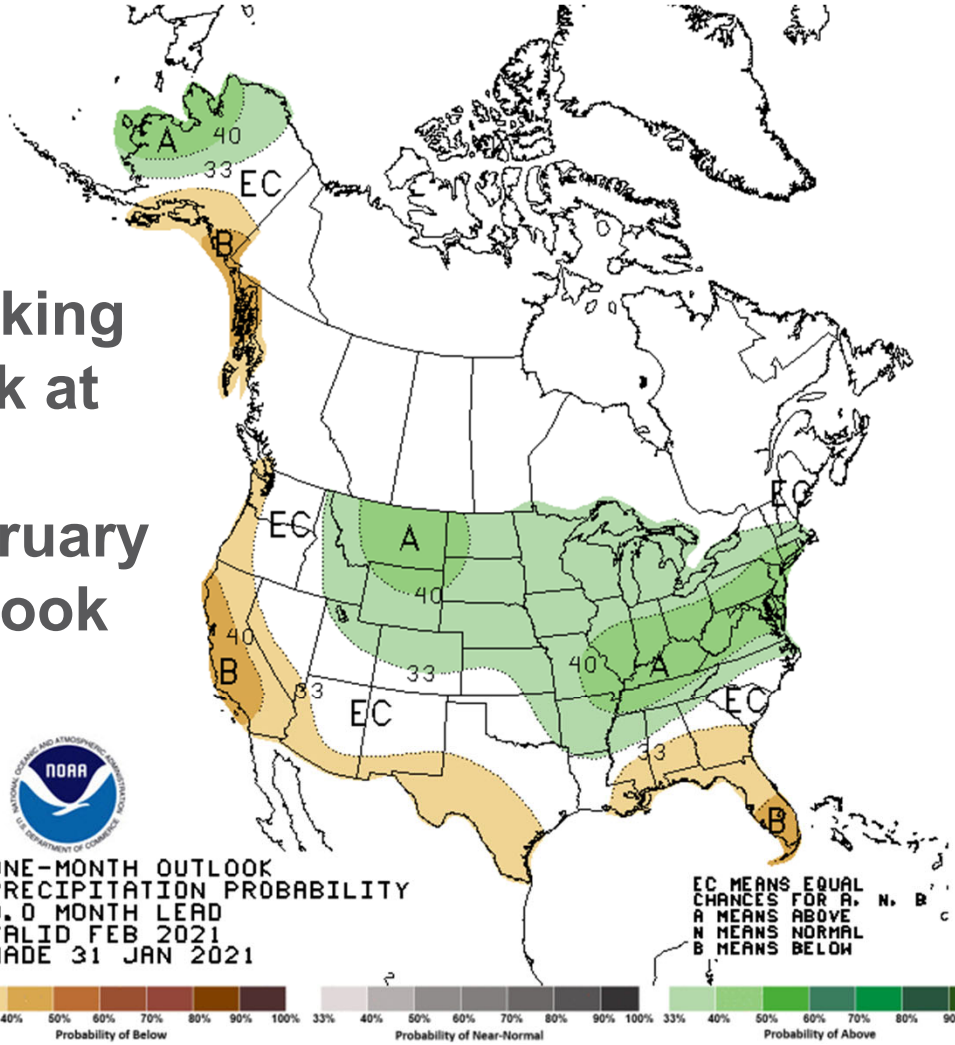
CBRFC soil moisture: inches to saturation

10+ inches across much of the Colorado River Basin (as of February 1)

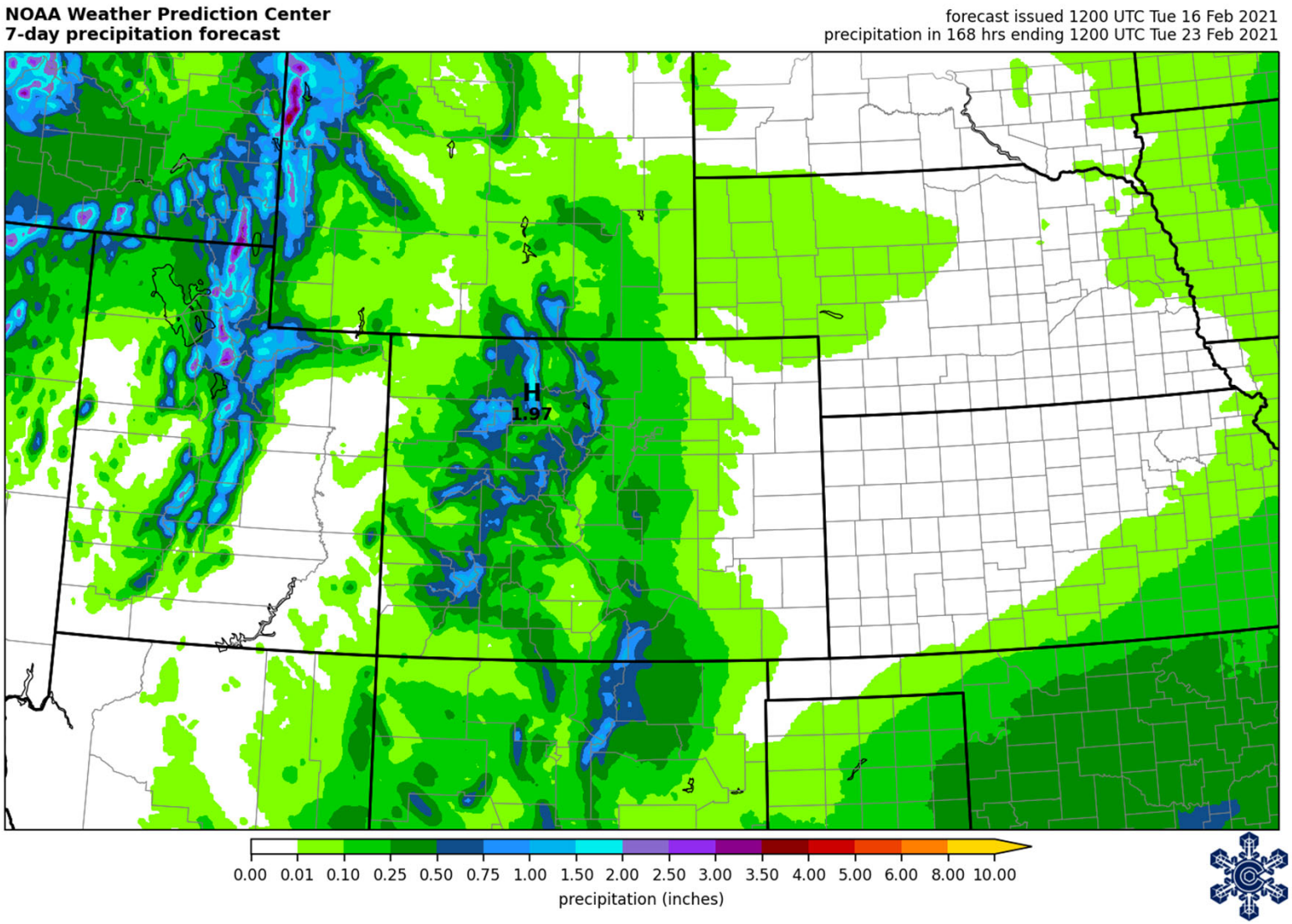


Looking back at the February outlook

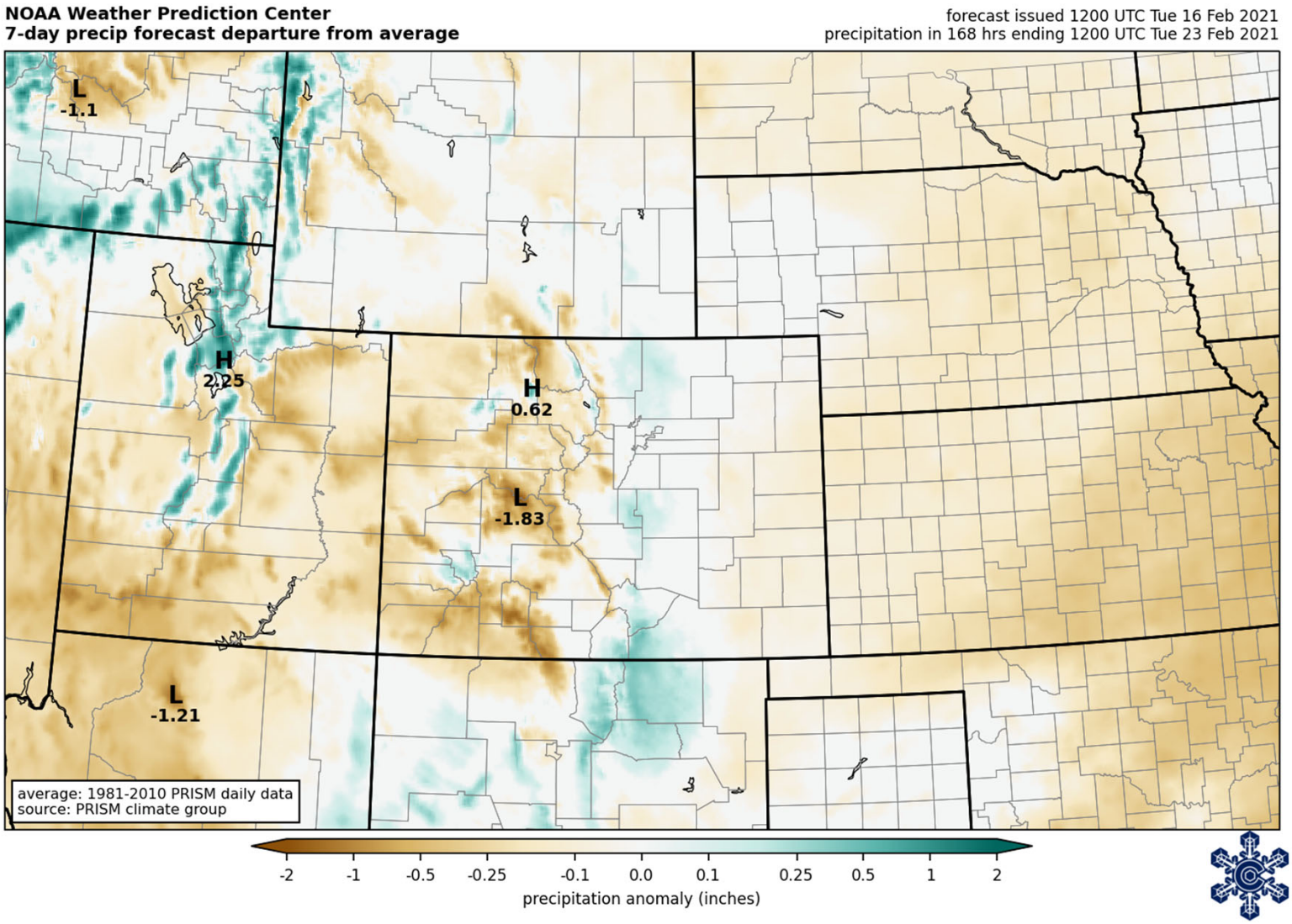




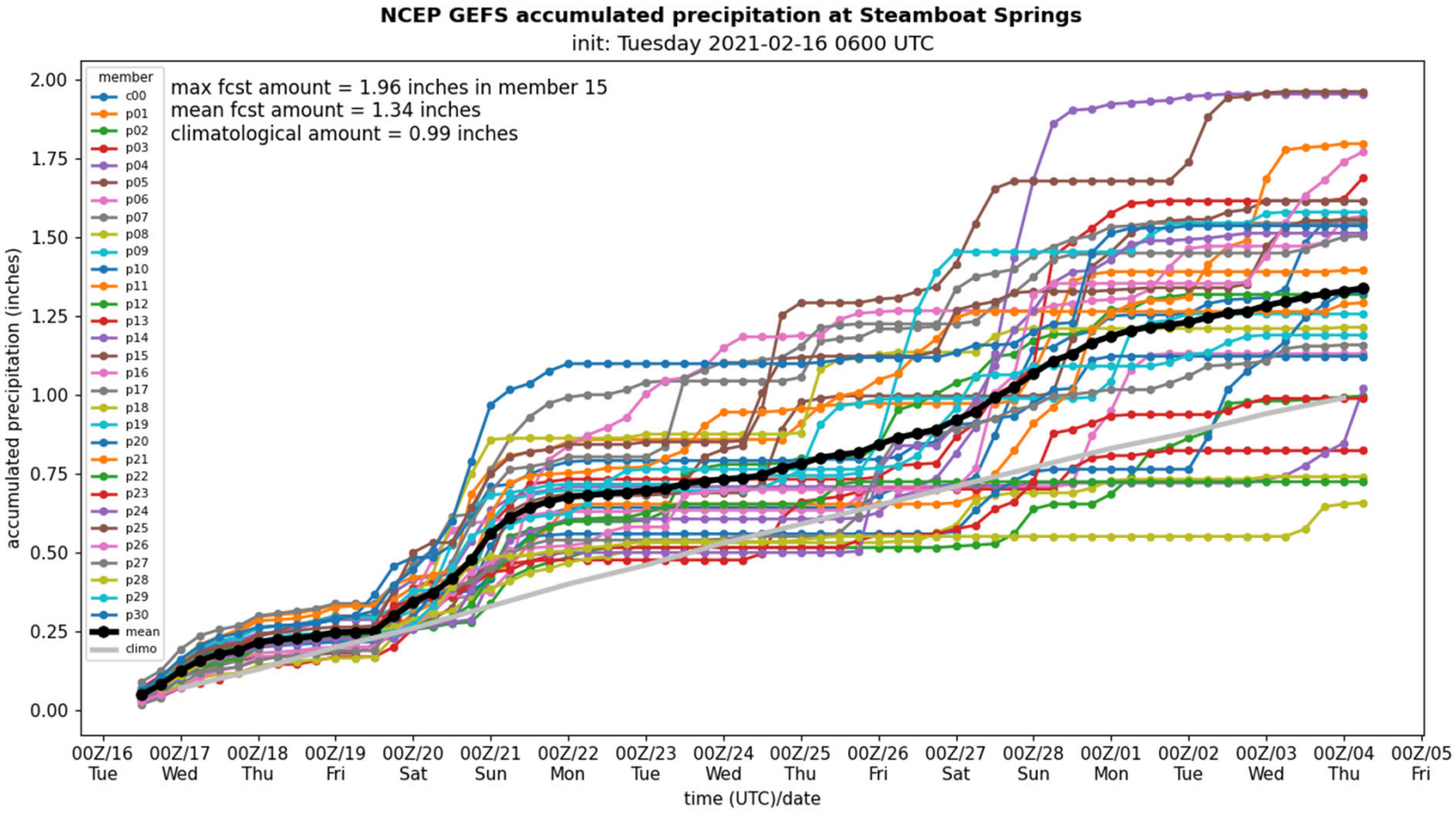
NOAA 7-day precipitation forecast



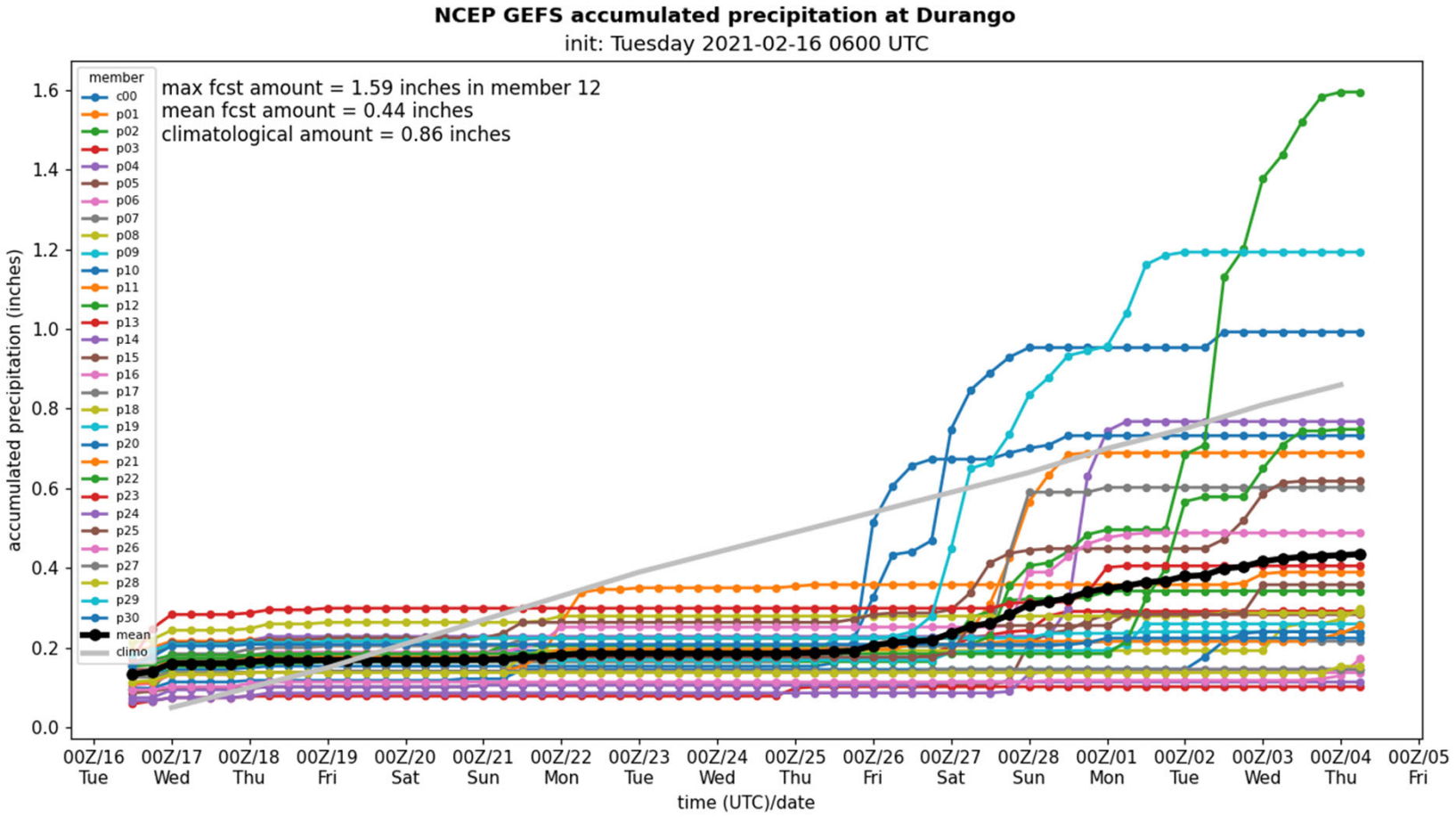
NOAA 7-day precipitation forecast (difference from average)



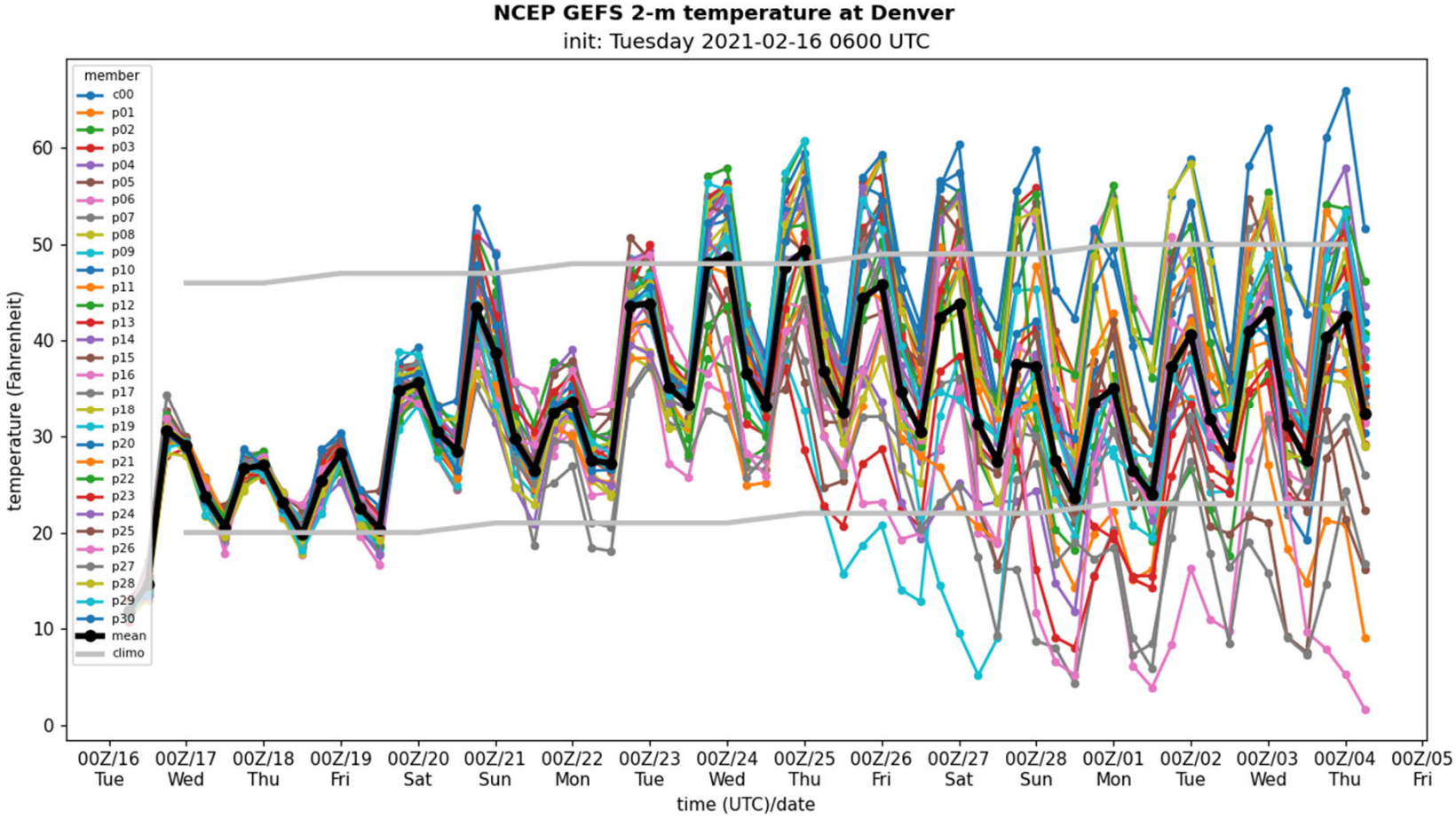
Northern mountains look to stay pretty active, not as much to the south



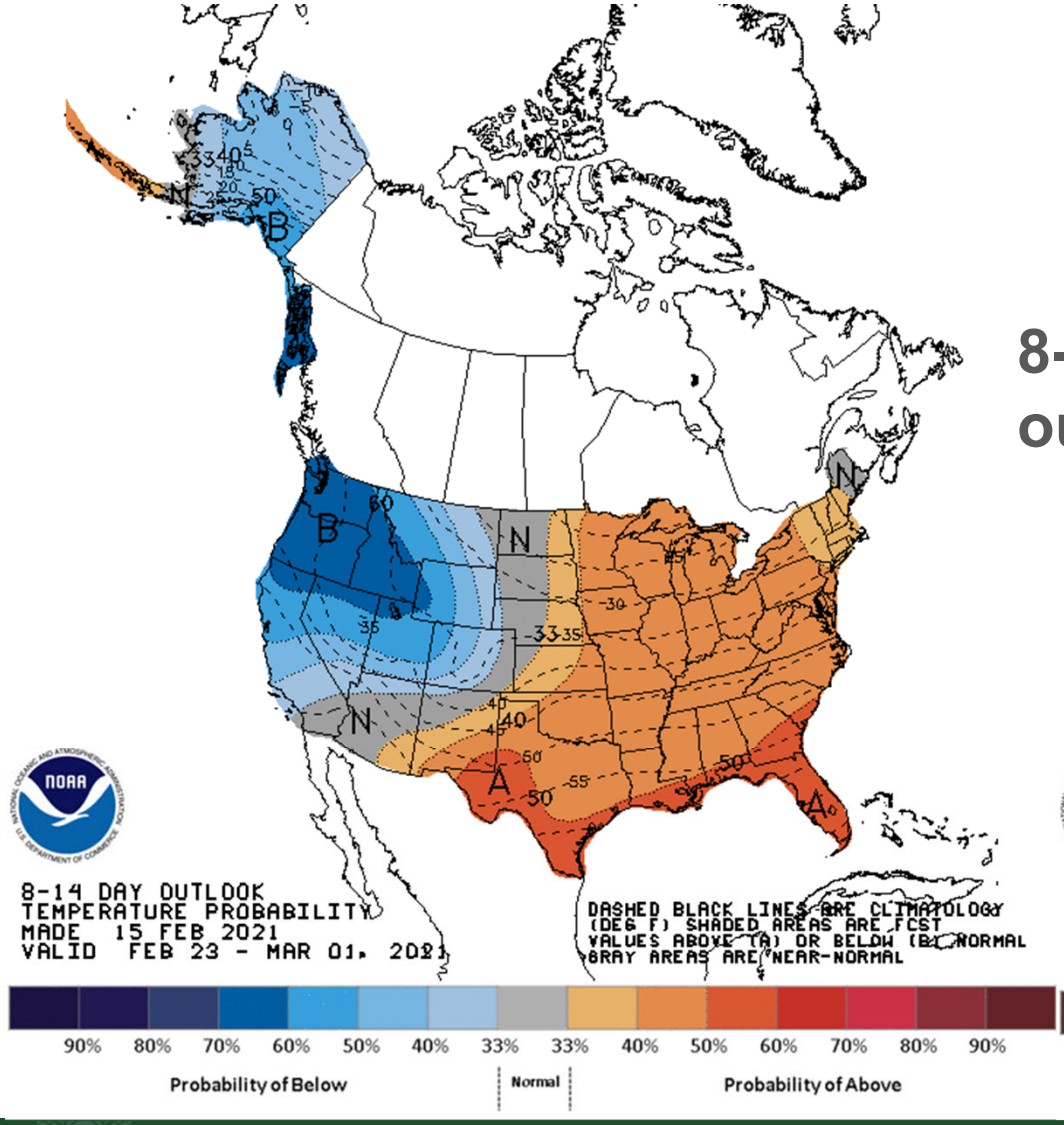
Northern mountains look to stay pretty active, not as much to the south

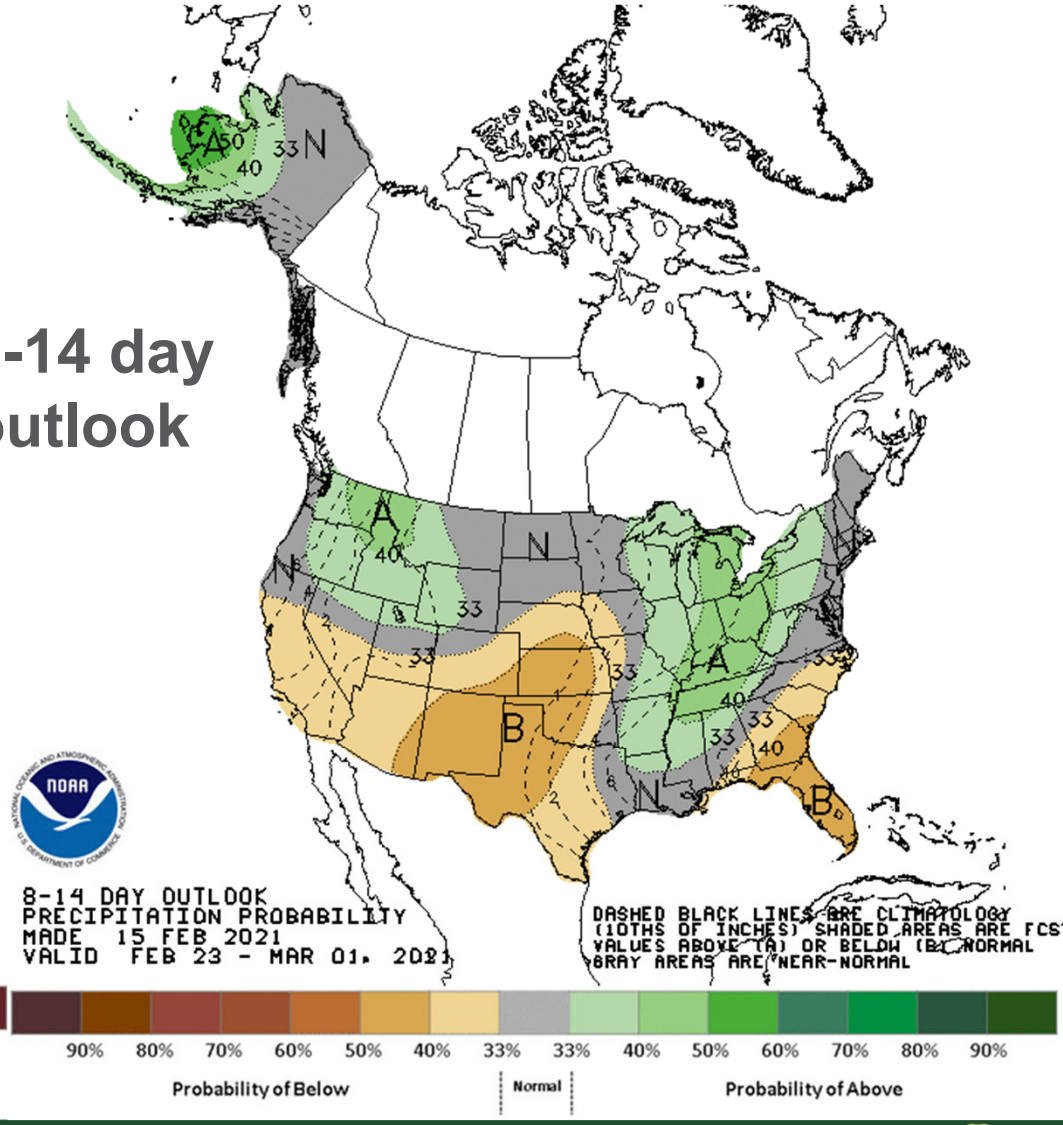


We'll be slowly climbing out of the deep freeze, still cold the rest of this week, near-normal temps returning by the weekend/next week

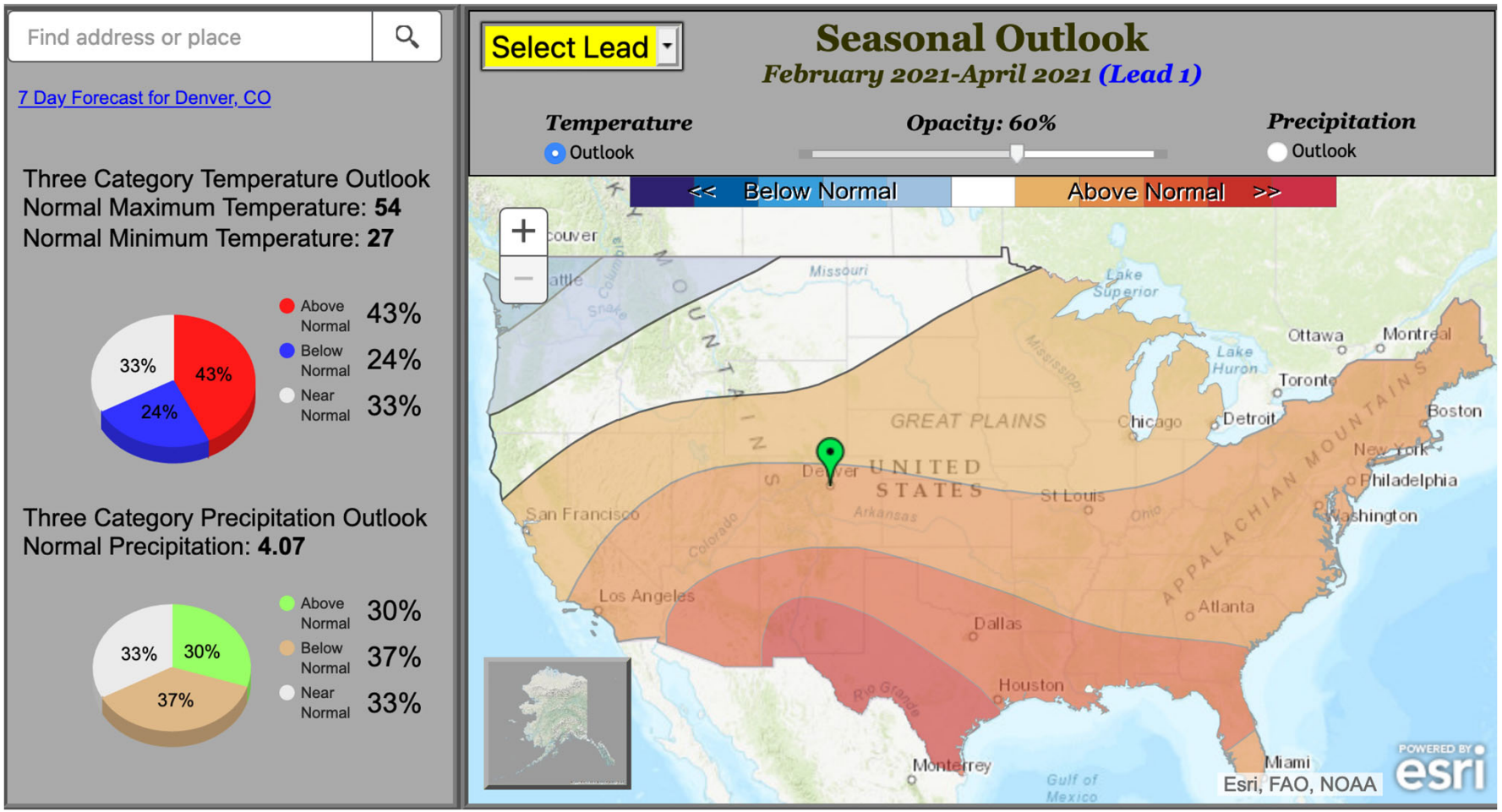


8-14 day outlook

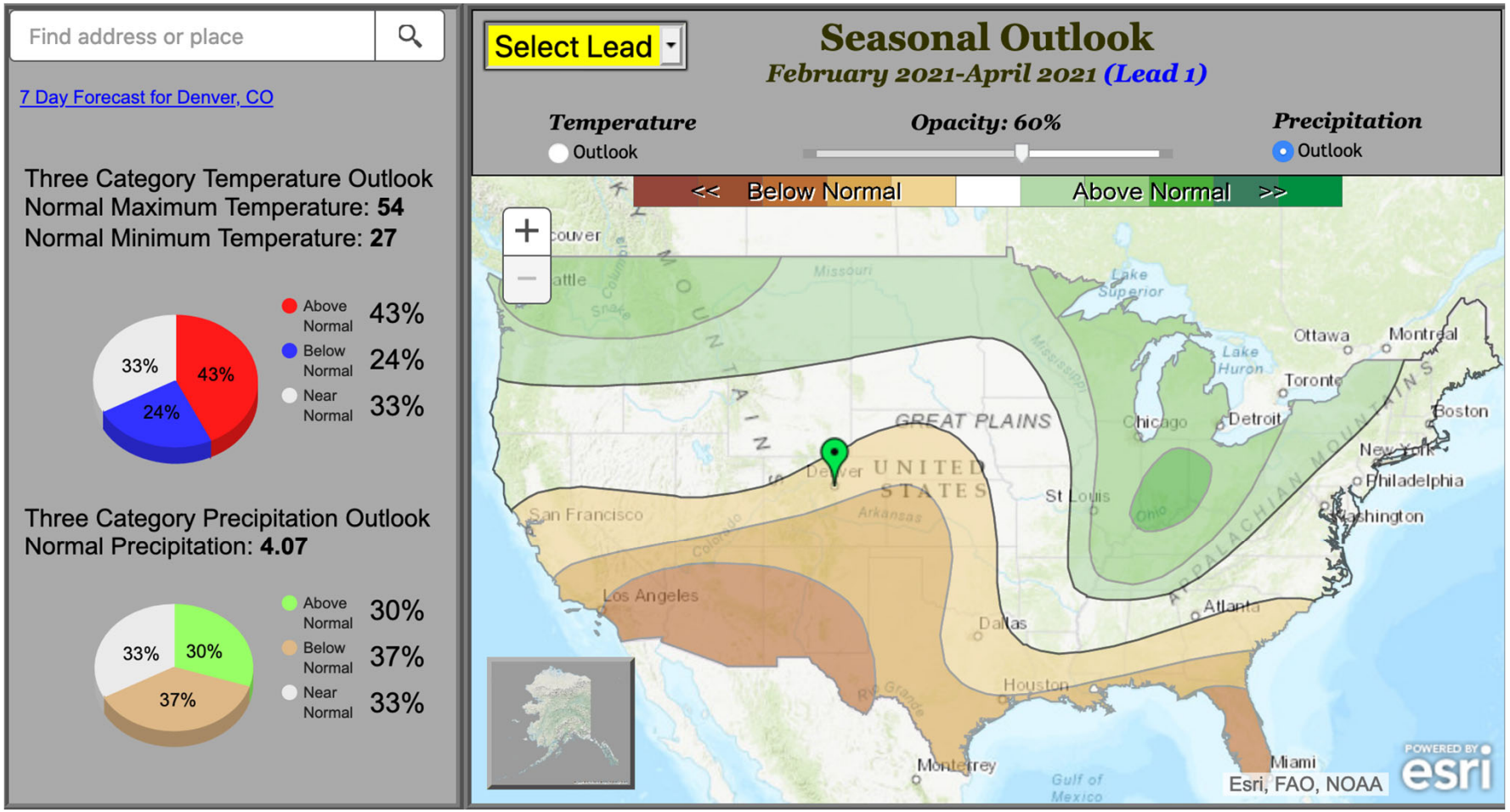




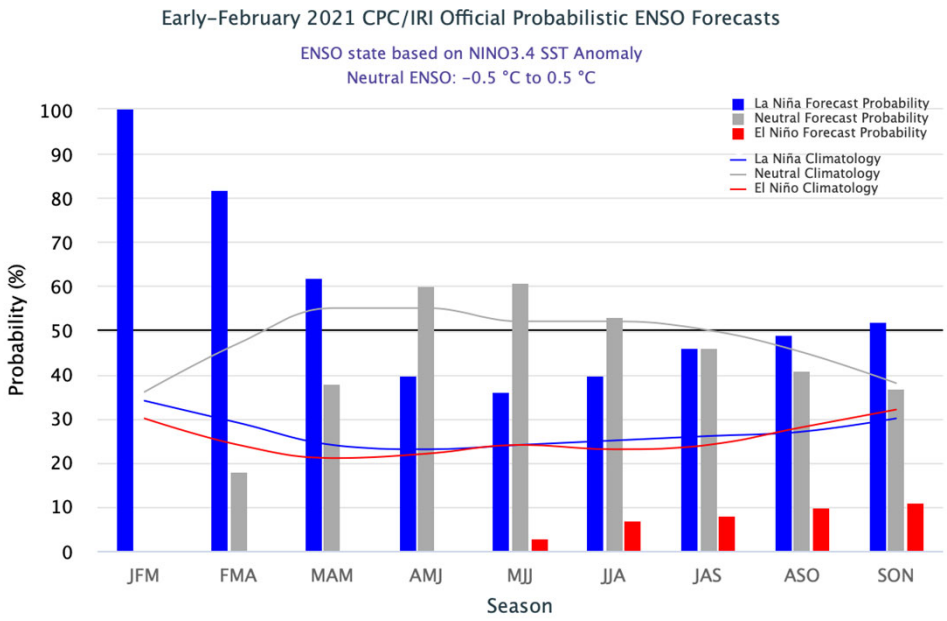
February-March-April outlook



February-March-April outlook



La Niña ongoing; may weaken by spring



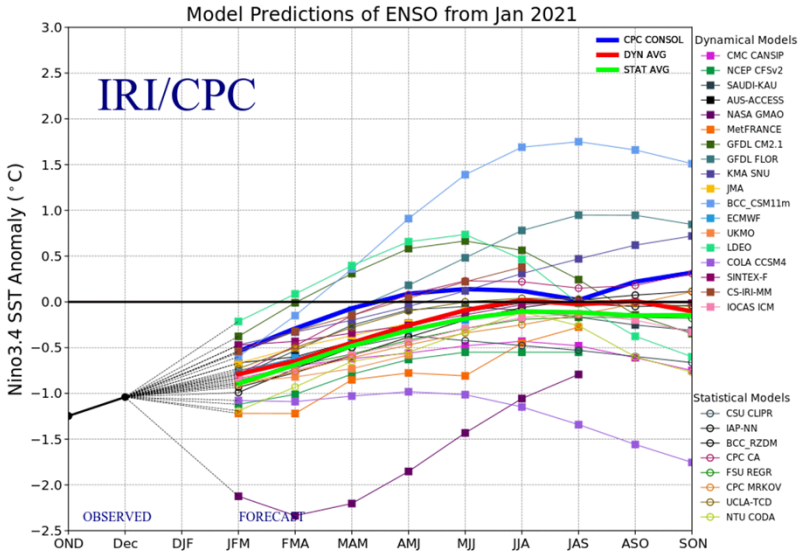
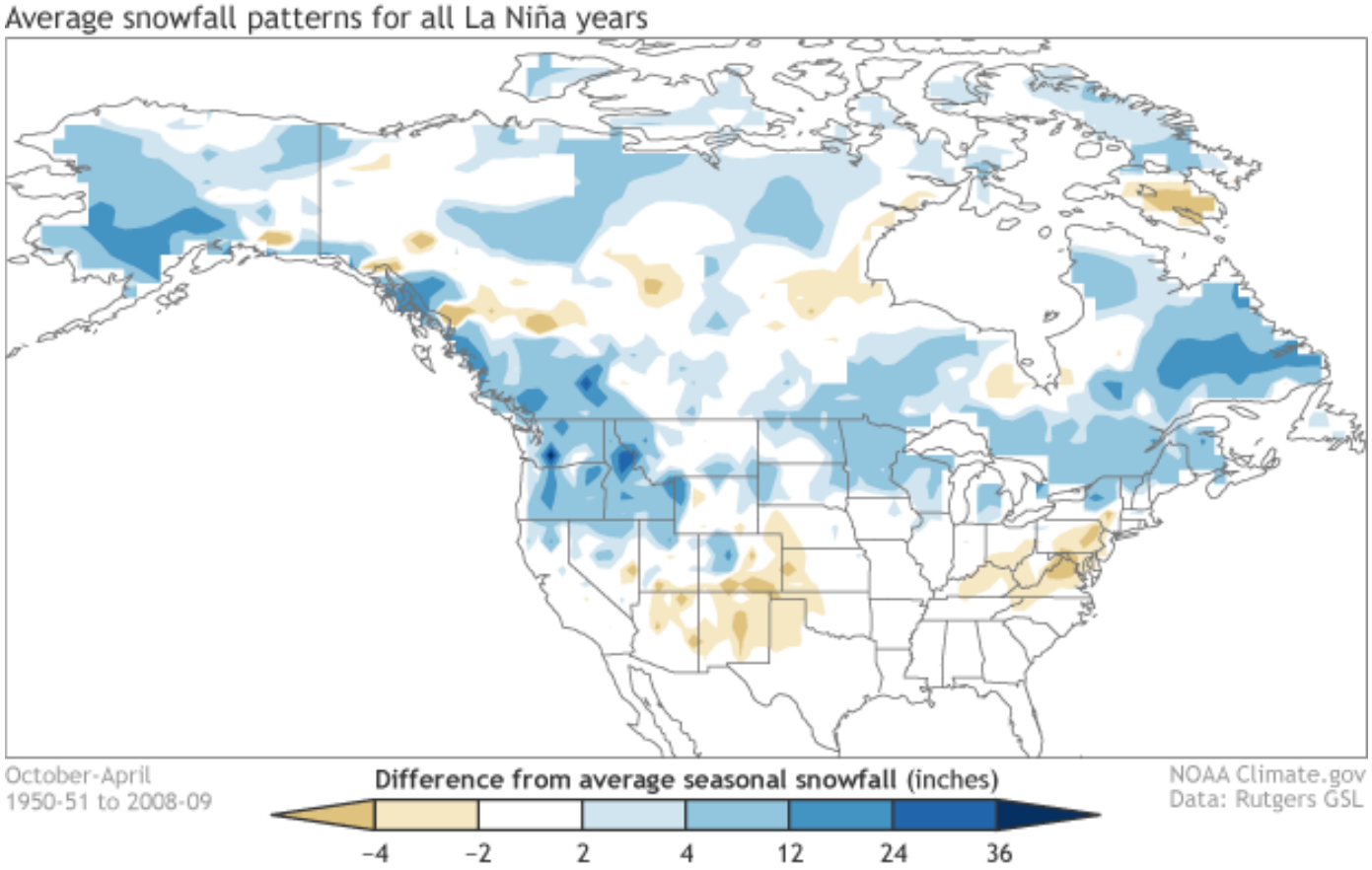


Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W). Figure updated 19 January 2021.

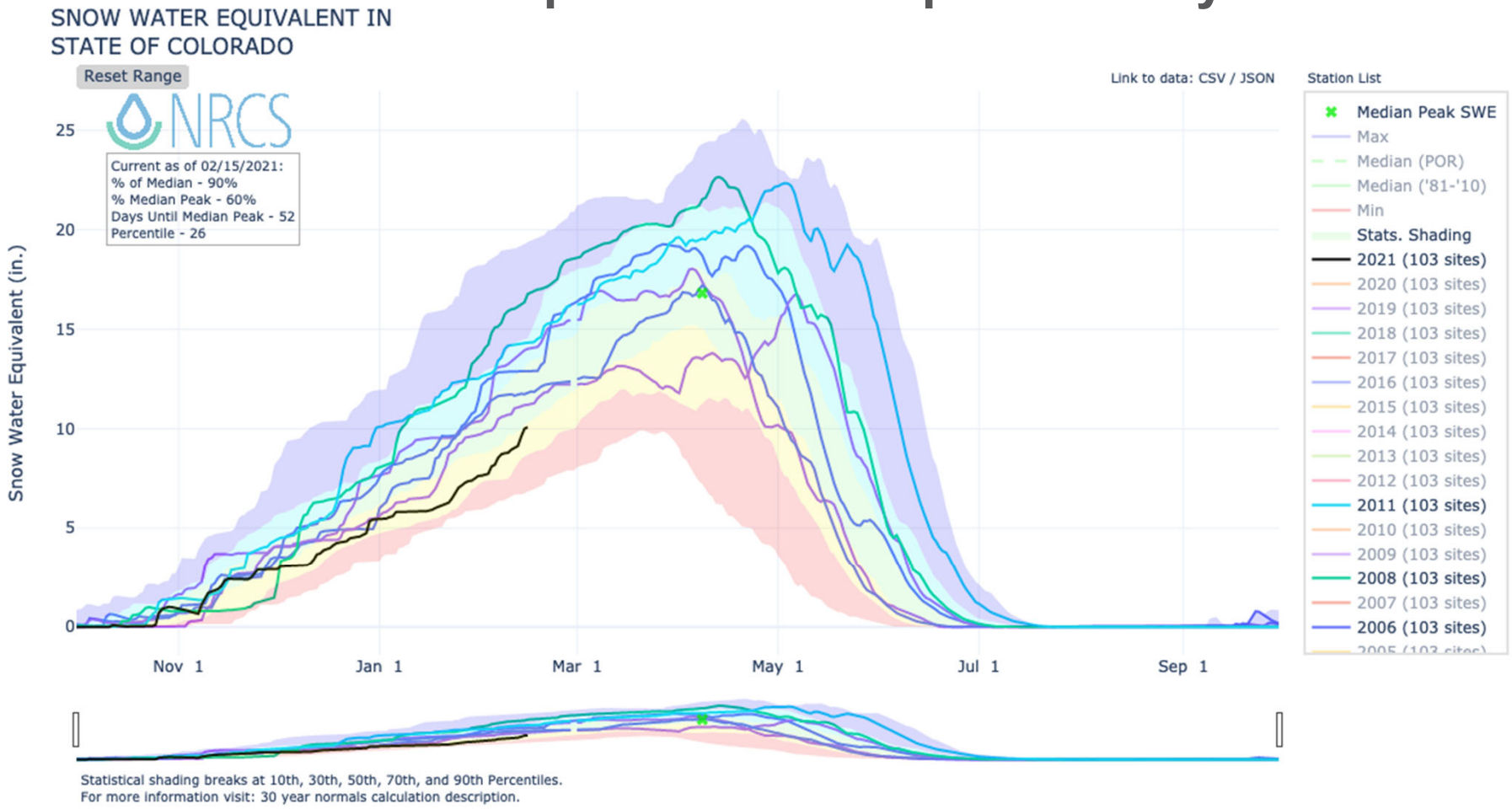
We've been in La Niña for several months; 60% chance conditions transition back to neutral in the spring

La Niña winters are usually good for snow in northern mountains (but not so far) – will we see a comeback?



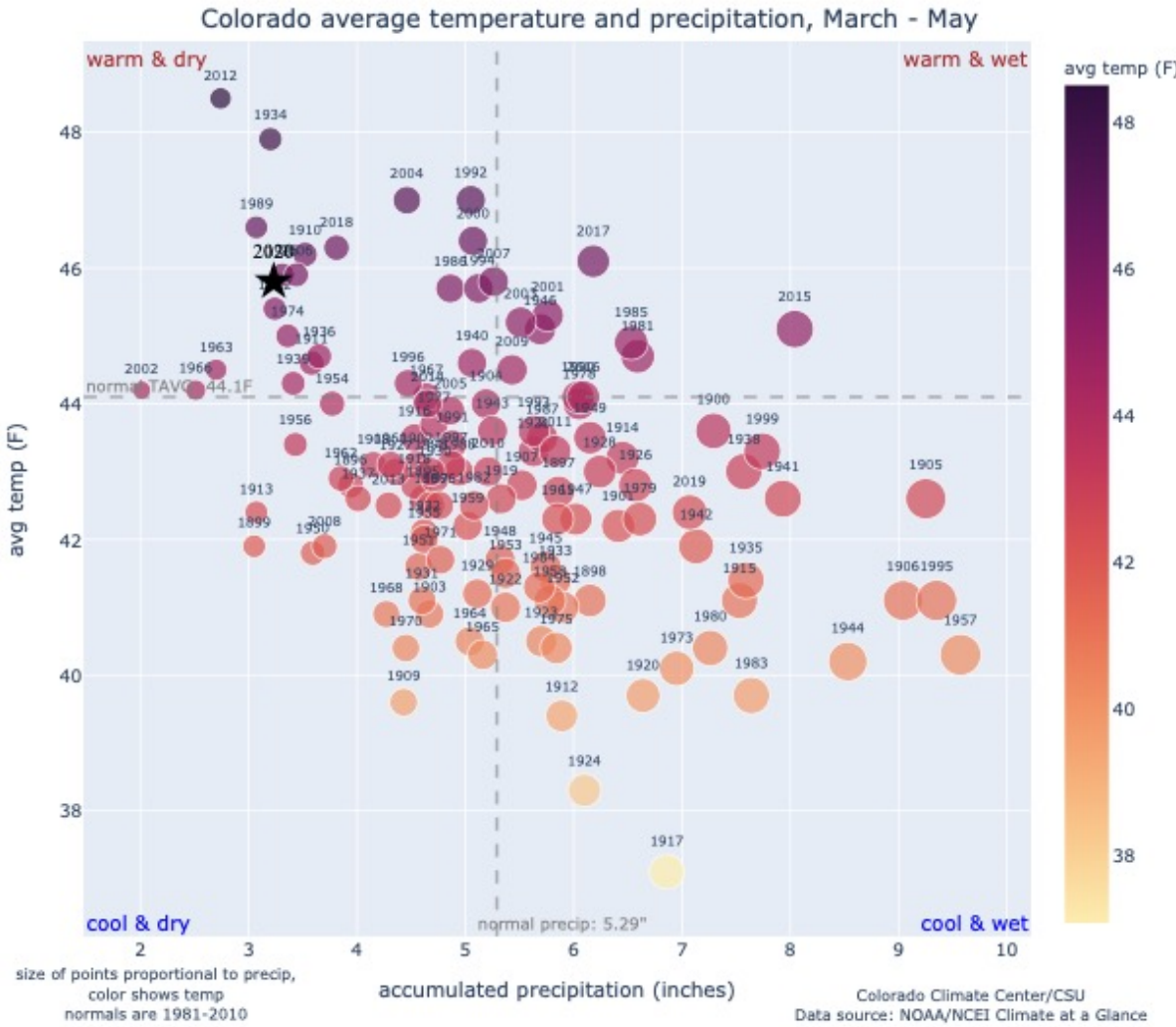
https://www.climate.gov/news-features/blogs/enso/what-about-snow-during-la-niña-winters

Statewide snowpack in “first dip” La Niña years



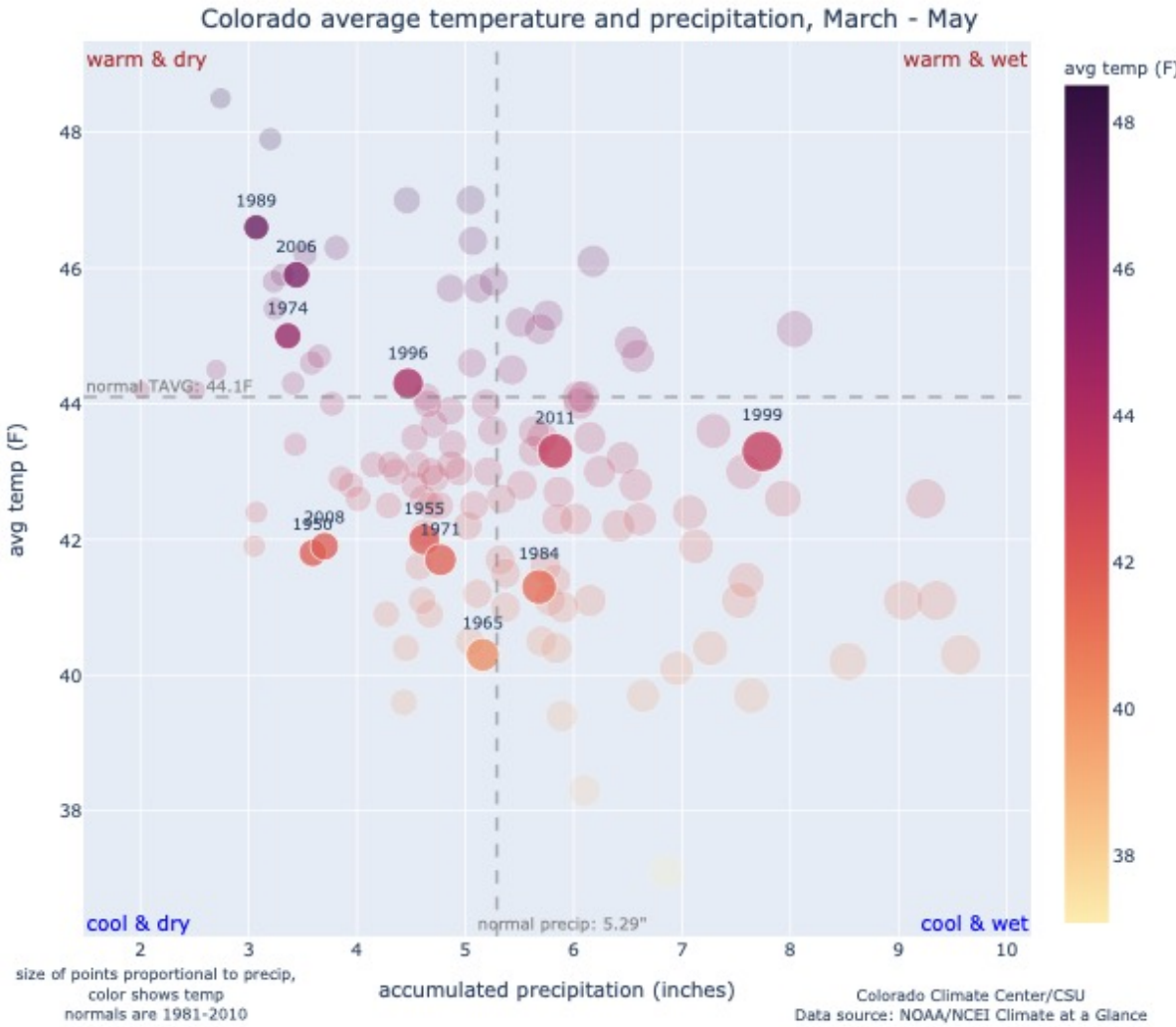
Other years: 1989, 1996, 1999, 2006, 2008, 2011

Statewide temp/precip, March-April-May



Statewide temp/precip, March-April-May in “first dip” La Niña years

years: 1950, 1955, 1965, 1971, 1974, 1984, 1989, 1996, 1999, 2006, 2008, 2011



Takeaways

- Drought persists. January was again warm and dry, though we've had a great start to February so far.
- Drought impacts to this point have been largely agricultural and ecological, but the hydrologic impacts may be imminent
- We remain in a La Niña pattern, but this La Niña has not been typical. Expectation is that we transition back to neutral conditions in the spring.
- La Niña in winter is supposed to be a good thing for NW CO snowpack, but hasn't been so far. La Niña springs tend to lean dry, and rarely see a wet extreme
- We should be prepared for a low runoff year

Thank you!

http://climate.colostate.edu/

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ATMOSPHERIC SCIENCE

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