# Climate and Drought Update – Pueblo County and surrounding areas

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June 16, 2022

COLORADO CLIMATE CENTER

ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY

# what are we going to talk about tonight?

**what's happened**

We'll go over how the Water Year started, and the evolution through winter and spring

**where are we now**

Next, we'll look at the current conditions

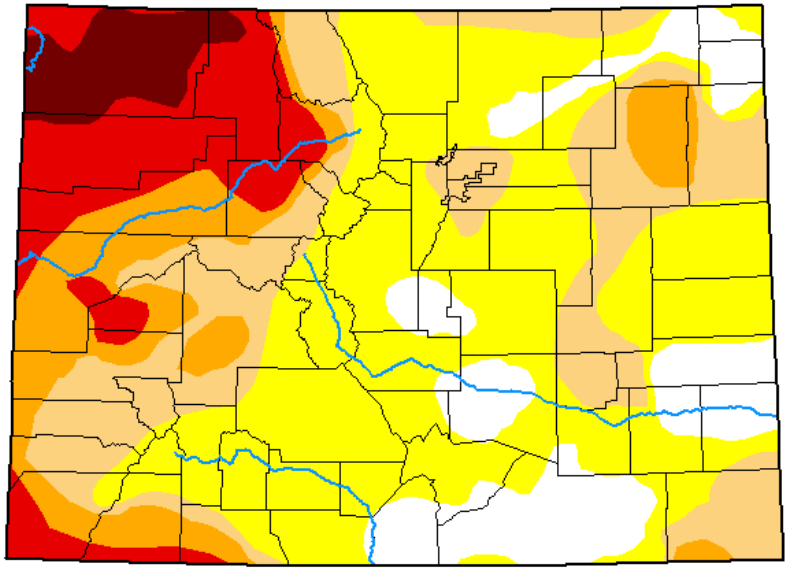
**what's coming**

We'll wrap up with what could potentially happen for the rest of the Water Year

We started Water Year 2022 (October 2021 – September 2021) with drought conditions, the worst in the Yampa valley.

87% of western CO was in a drought category.

## *U.S. Drought Monitor*
# Colorado



**September 28, 2021**
***(Released Thursday, Sep. 30, 2021)***
**Valid 8 a.m. EDT**

*Drought Conditions (Percent Area)*

| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|---|---|---|---|---|---|
| **Current** | 12.72 | 87.28 | 46.42 | 26.30 | 15.05 | 3.91 |
| **Last Week** *09-21-2021* | 16.92 | 83.08 | 40.94 | 24.58 | 15.05 | 3.91 |
| **3 Months Ago** *06-29-2021* | 54.48 | 45.52 | 41.62 | 36.37 | 29.95 | 17.52 |
| **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** *09-29-2020* | 0.00 | 100.00 | 99.29 | 89.35 | 52.88 | 2.64 |

*Intensity:*

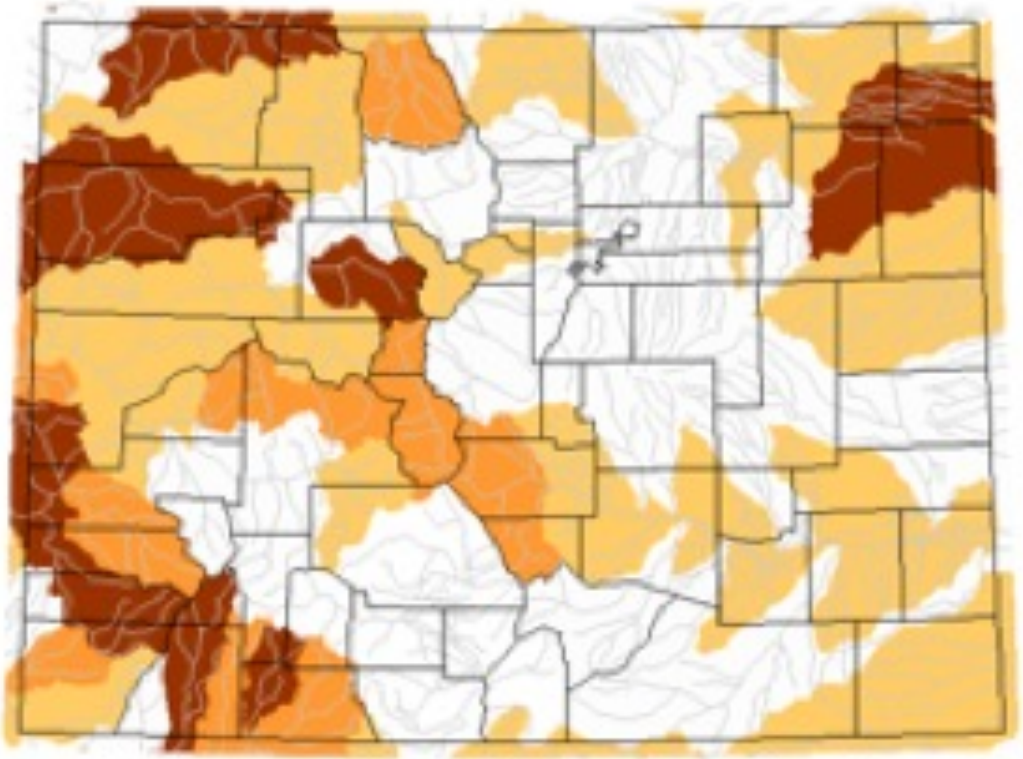
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

*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**

Tuesday, September 28, 2021



USGS

| Explanation - Percentile classes | | | |
|---|---|---|---|
| Low | <=5 | 6-9 | 10-24 |
| Extreme hydrologic drought | Severe hydrologic drought | Moderate hydrologic drought | Below normal |

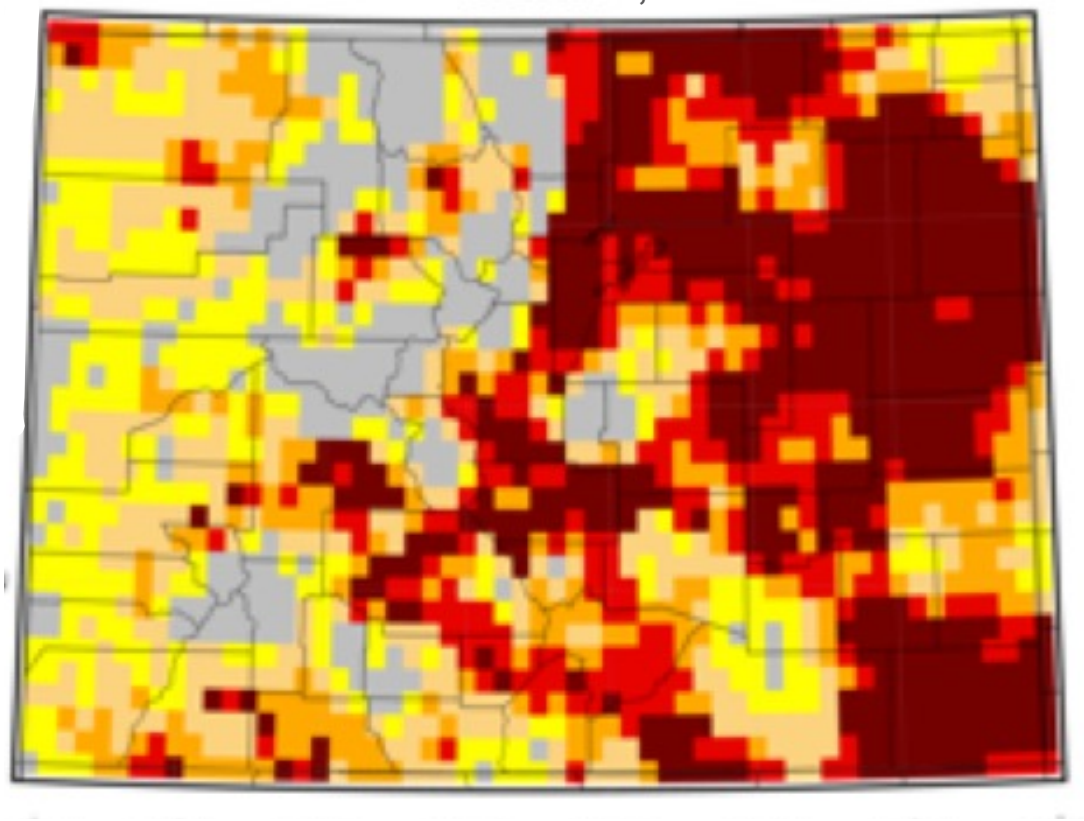
Base flows at the beginning of Water Year 2022 were well below average. This was mostly due to poor snowpack the previous spring.

waterwatch.usgs.gov

Fall soil moisture in the high elevations was dry. Those dry soils are "locked in" during the cold season and need to be considered for the next spring.

That is the first bucket that will be filled. If it's empty, more snowpack goes to that than downstream and to reservoirs.

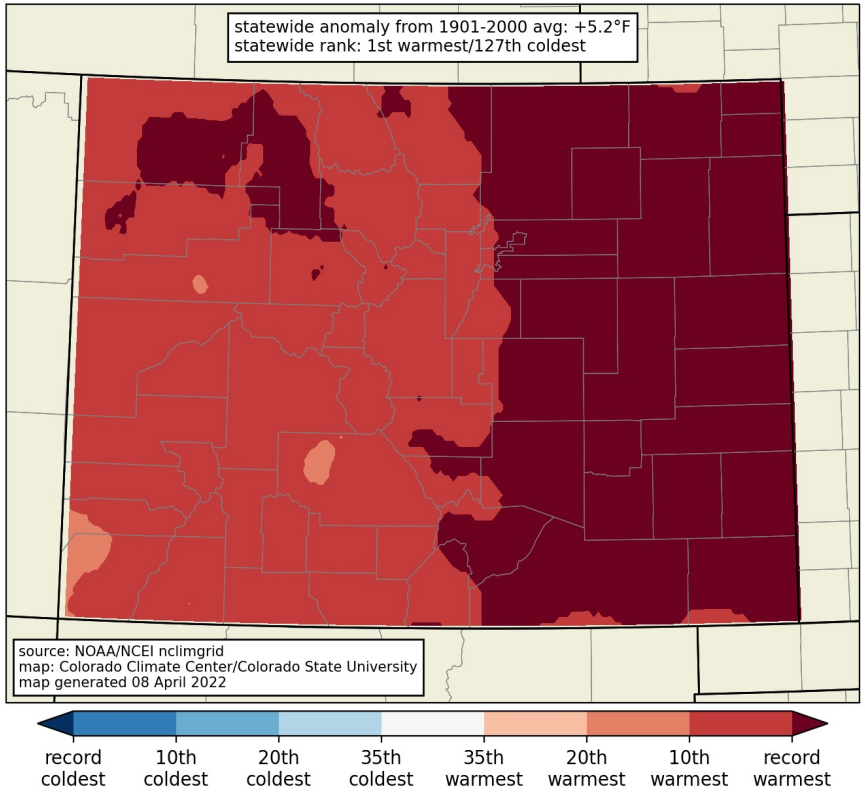
November 23, 2021



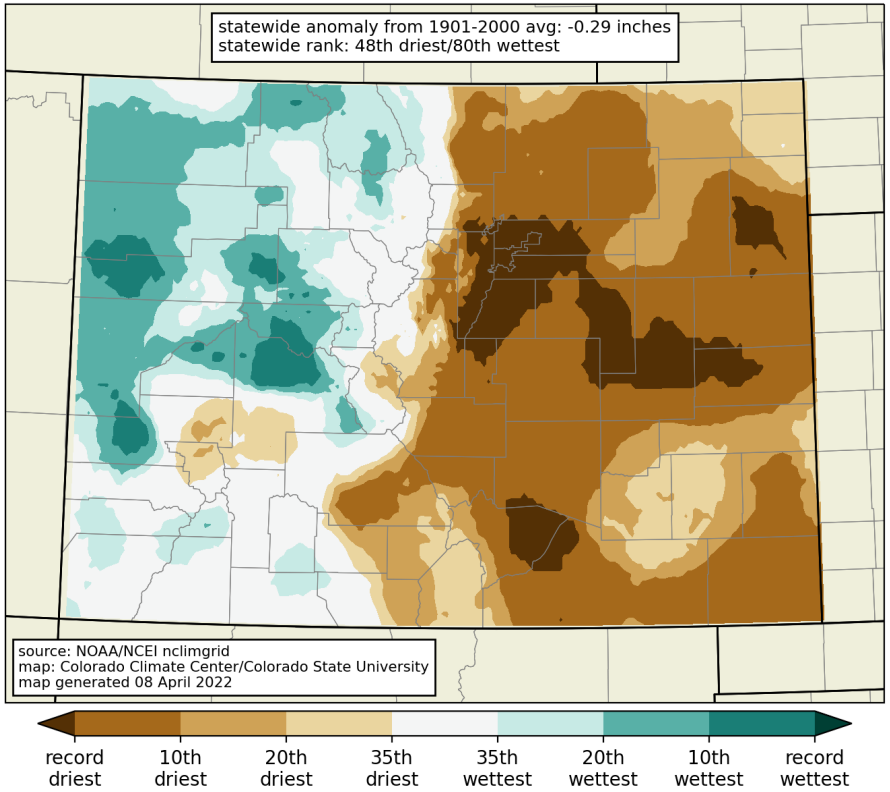
Top 10cm Soil Moisture Percentile

**what's happened** | where are we now | what's coming

average temperature rank: 3 months ending December 2021 (Oct-Dec)



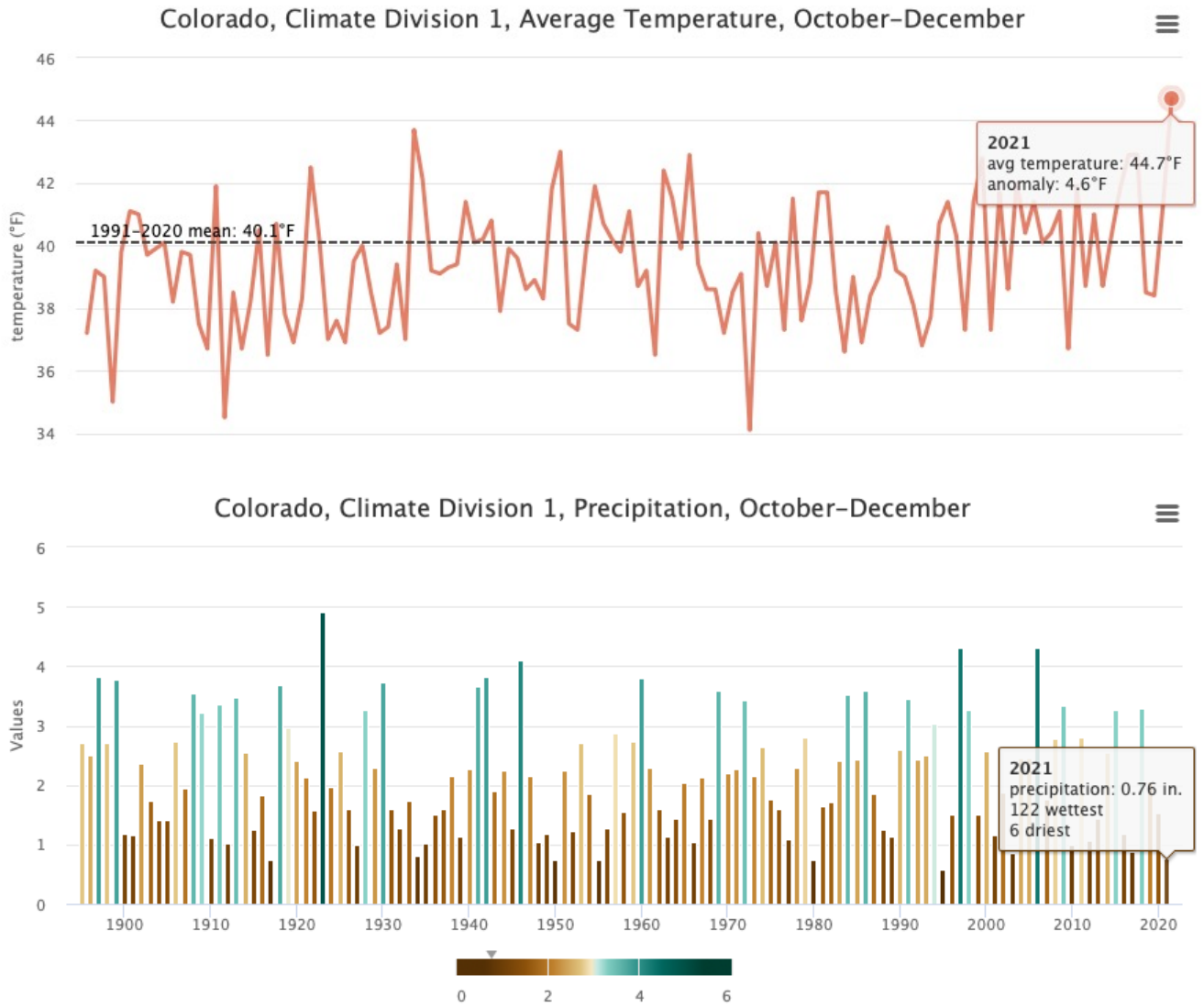

precipitation rank: 3 months ending December 2021 (Oct-Dec)




Water Year 2022 started off extremely warm. An atmospheric river helped boost moisture west of the Divide, but the east side of the state was very dry.

https://climate.colostate.edu/co_cag/rank_maps.html

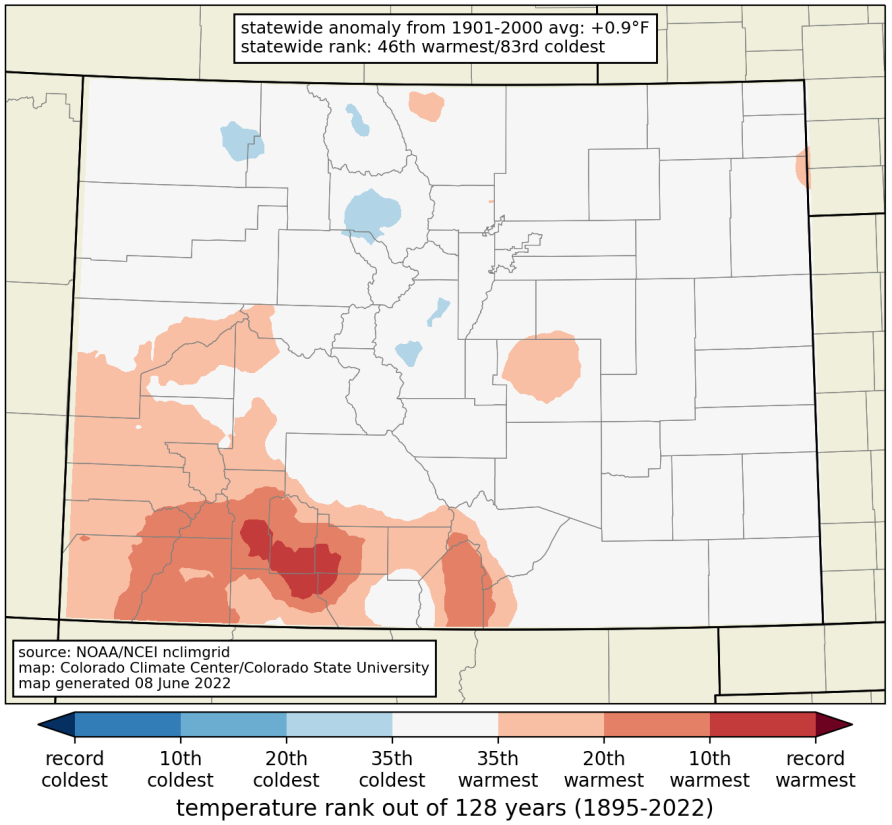
what's happened | where are we now | what's coming



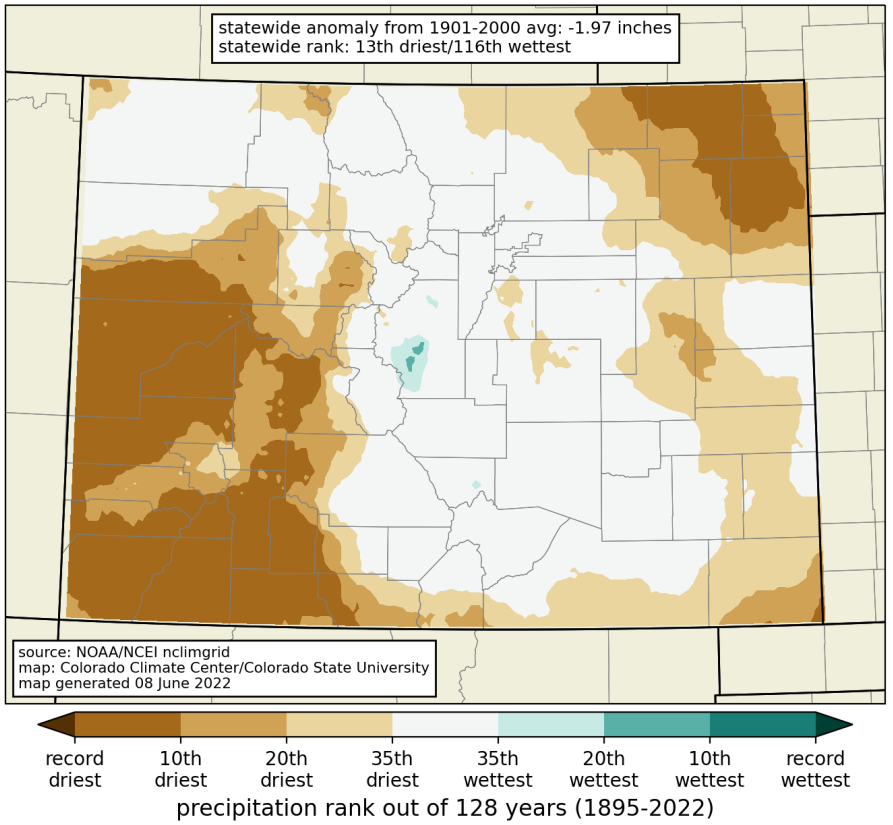

https://climate.colostate.edu/co_cag/cag_time.html

**what's happened** → where are we now → what's coming

average temperature rank: 5 months ending May 2022 (Jan-May)




precipitation rank: 5 months ending May 2022 (Jan-May)

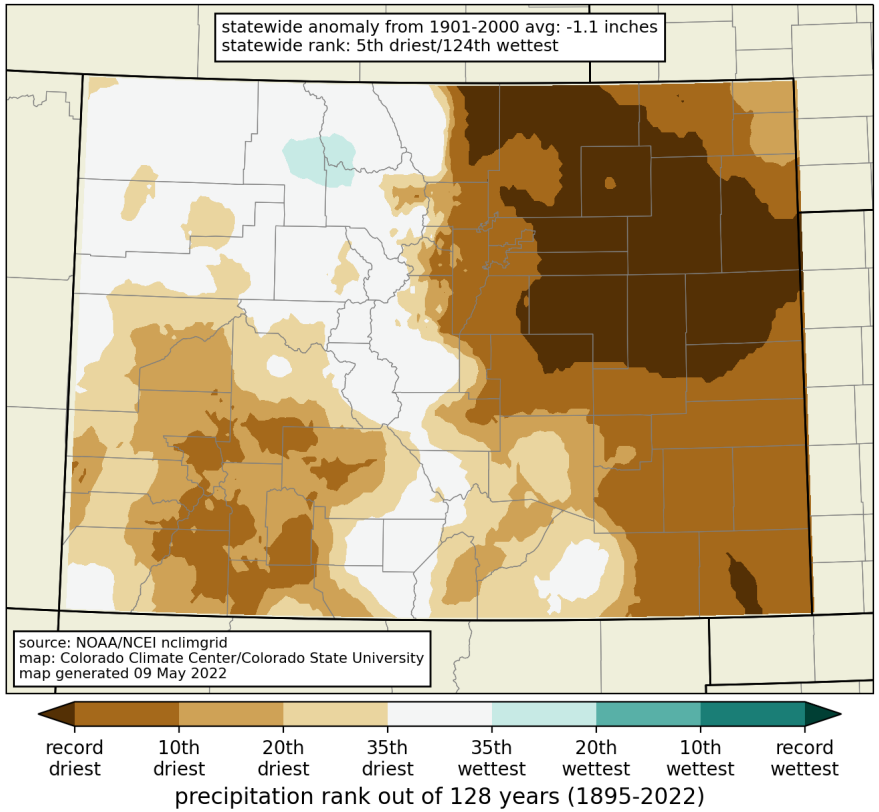



Since the beginning of the calendar, warm and dry anomalies have popped up over the southwest. In the Arkansas basin, conditions have been pretty close to average…. a caveat to that though…

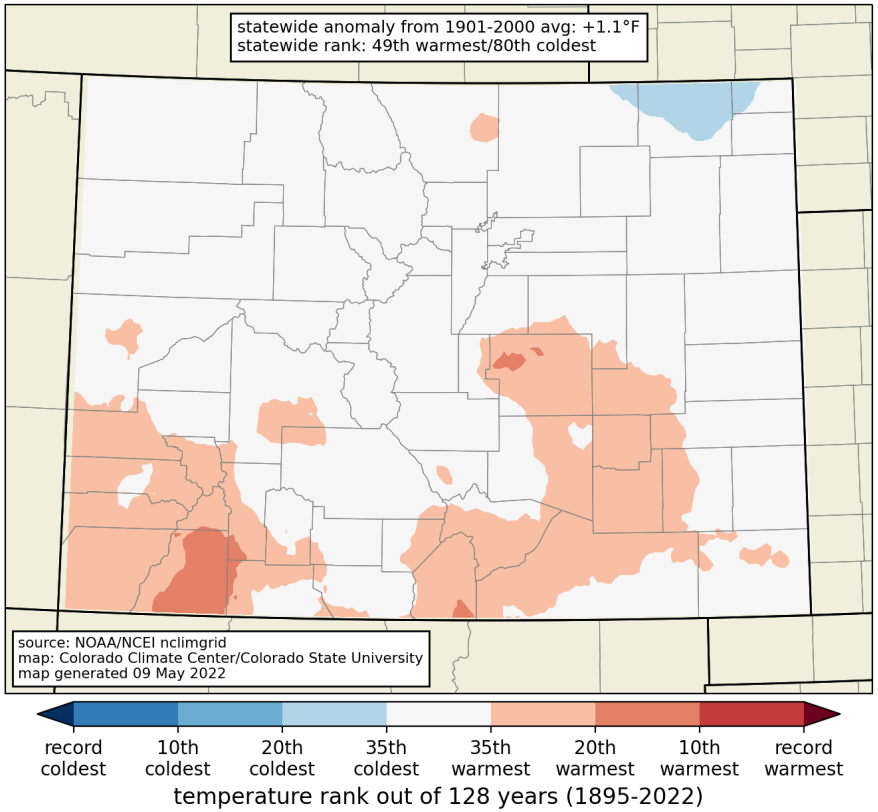
https://climate.colostate.edu/co_cag/rank_maps.html

what's happened | where are we now | what's coming

precipitation rank: April 2022



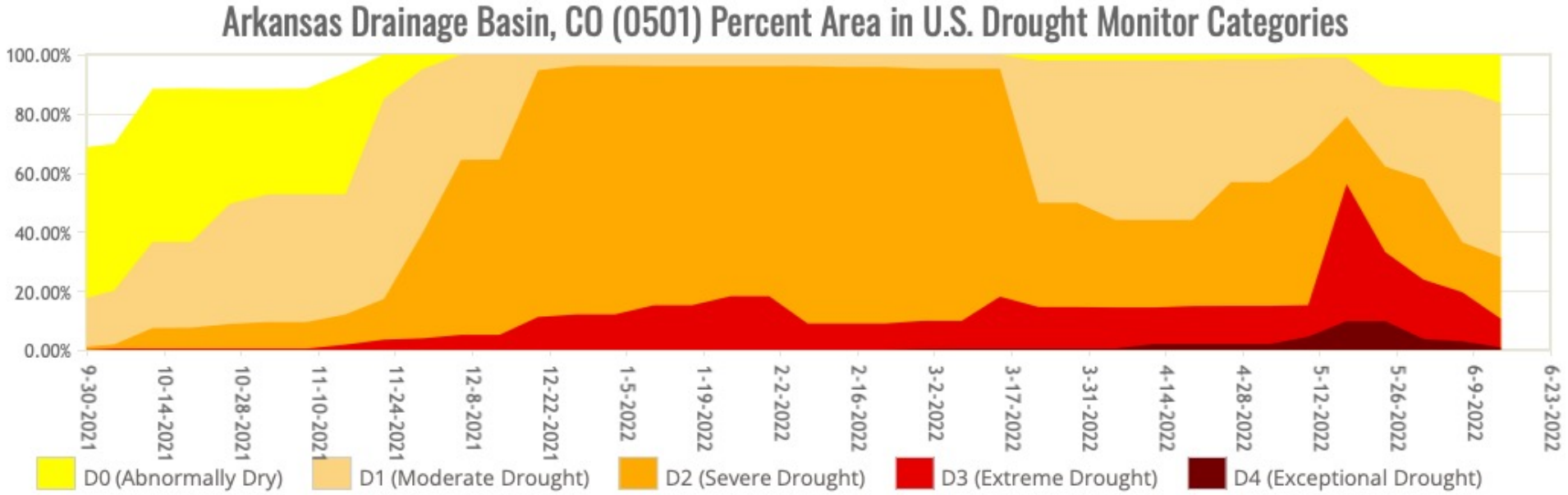

average temperature rank: April 2022




April 2022 was the 5th driest for the state. Record dry over northeast plains, and 6th driest on record for the Arkansas basin.

https://climate.colostate.edu/co_cag/rank_maps.html

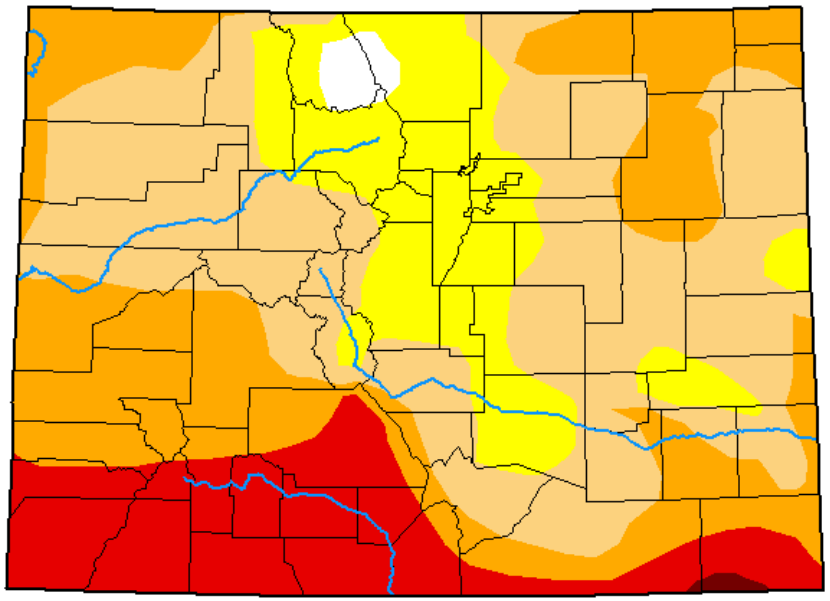
what's happened | where are we now | what's coming




Drought conditions increased in the fall, with the majority of the Arkansas basin staying in severe drought through the winter and into the spring.

https://droughtmonitor.unl.edu

## U.S. Drought Monitor
# Colorado



**June 14, 2022**
*(Released Thursday, Jun. 16, 2022)*
**Valid 8 a.m. EDT**

*Drought Conditions (Percent Area)*

| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|---|---|---|---|---|---|
| **Current** | 1.09 | 98.91 | 81.75 | 42.97 | 15.89 | 0.23 |
| **Last Week** 06-07-2022 | 1.09 | 98.91 | 83.55 | 42.56 | 13.27 | 0.78 |
| **3 Months Ago** 03-15-2022 | 0.00 | 100.00 | 91.57 | 56.87 | 8.30 | 0.13 |
| **Start of Calendar Year** 01-04-2022 | 0.00 | 100.00 | 95.49 | 67.08 | 22.25 | 0.00 |
| **Start of Water Year** 09-28-2021 | 12.72 | 87.28 | 46.42 | 26.30 | 15.05 | 3.91 |
| **One Year Ago** 06-15-2021 | 54.98 | 45.02 | 41.42 | 35.54 | 29.86 | 17.53 |

*Intensity:*

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
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*Author:*
Adam Hartman
NOAA/NWS/NCEP/CPC

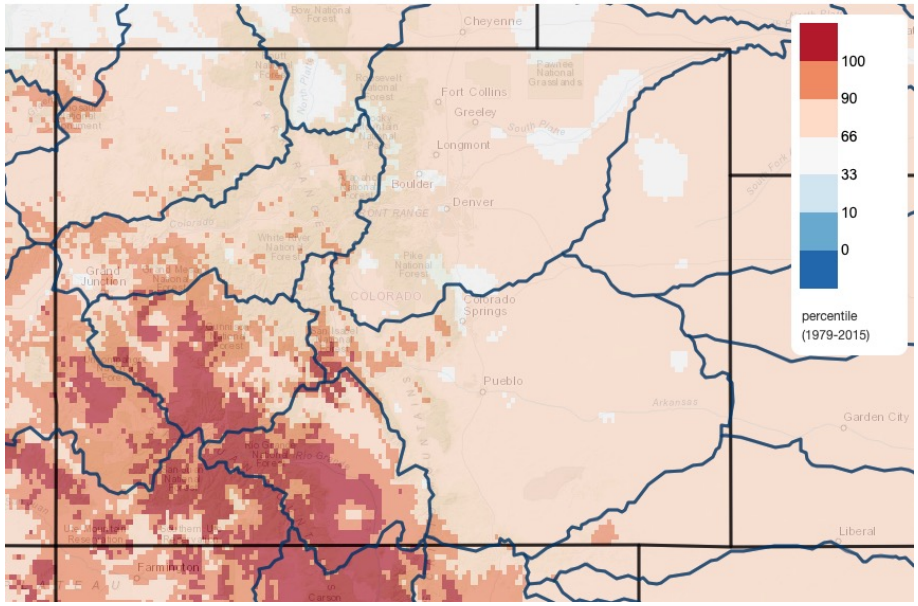
**droughtmonitor.unl.edu**

31% of the basin remains in D2 drought or worse

what's happened | **where are we now** | what's coming

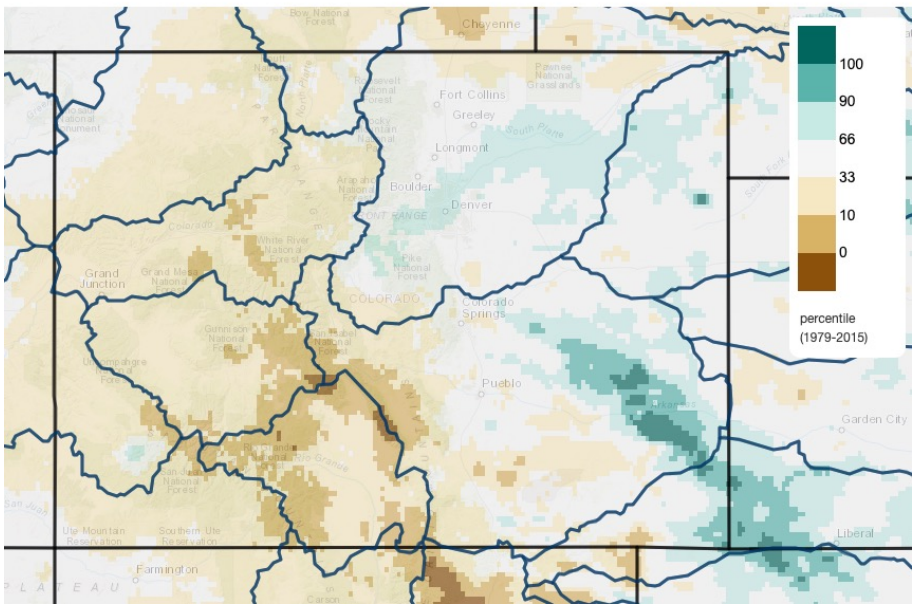
Mean Daily Temperature Percentile, Last 15 Days

2022/05/31 - 2022/06/14




Total Precipitation Percentile, Last 15 Days

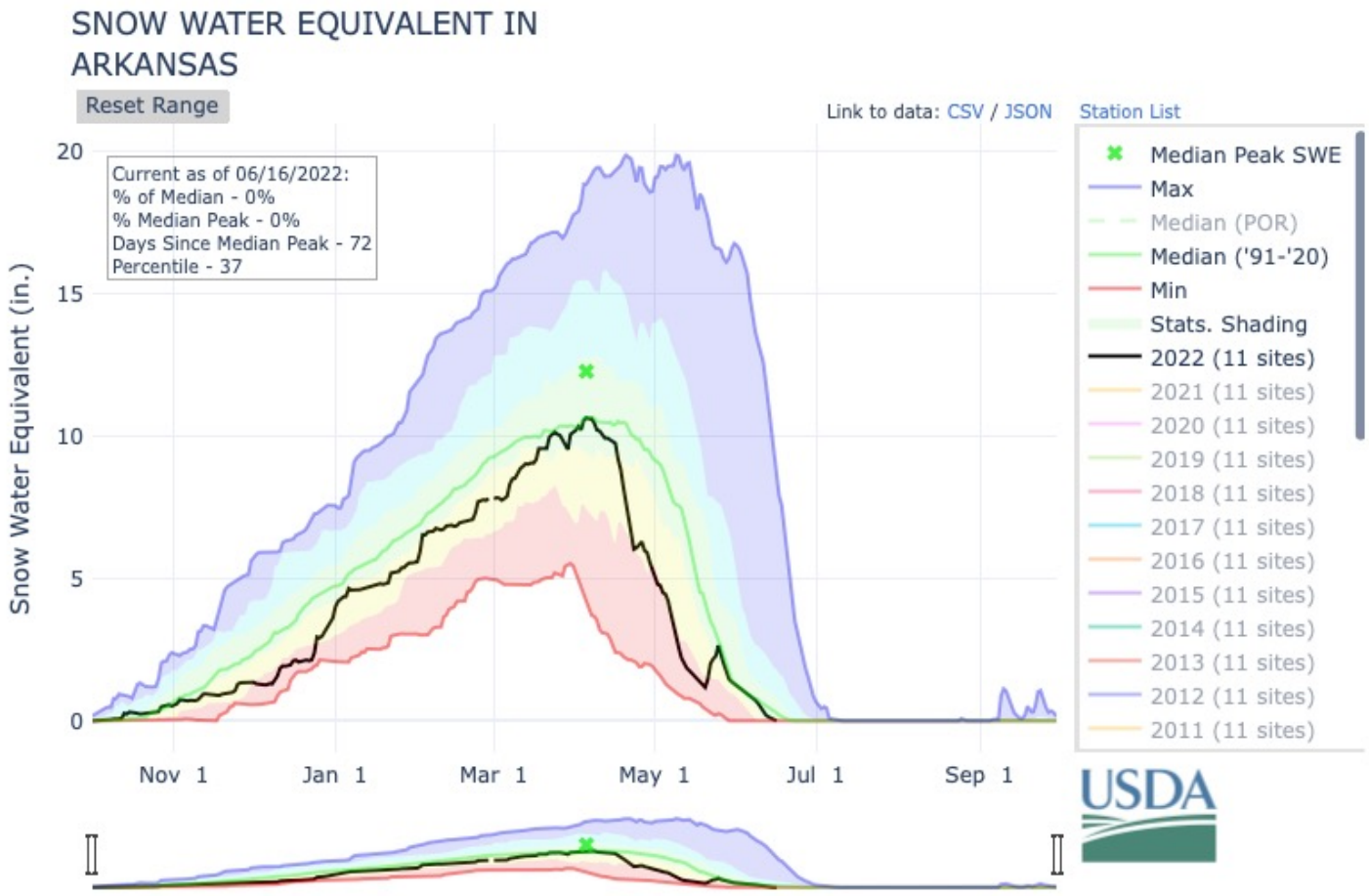
2022/05/31 - 2022/06/14




As is typical for the beginning of summer, thunderstorms have hit some spots and missed others. The mountains have not seen much moisture.

https://climatetoolbox.org/tool/climate-mapper

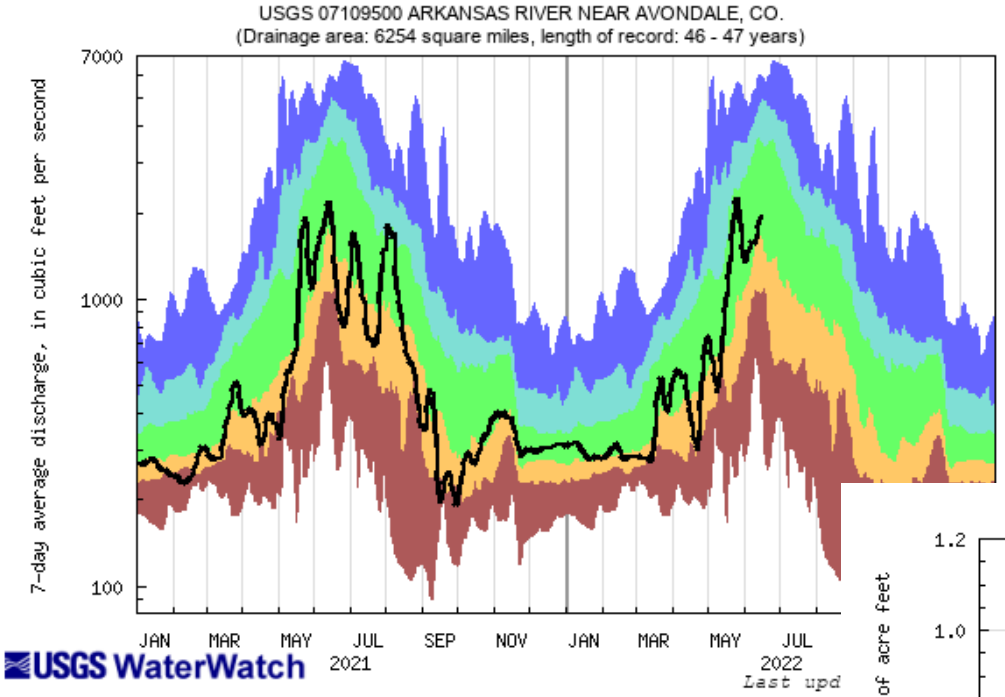
what's happened | **where are we now** | what's coming

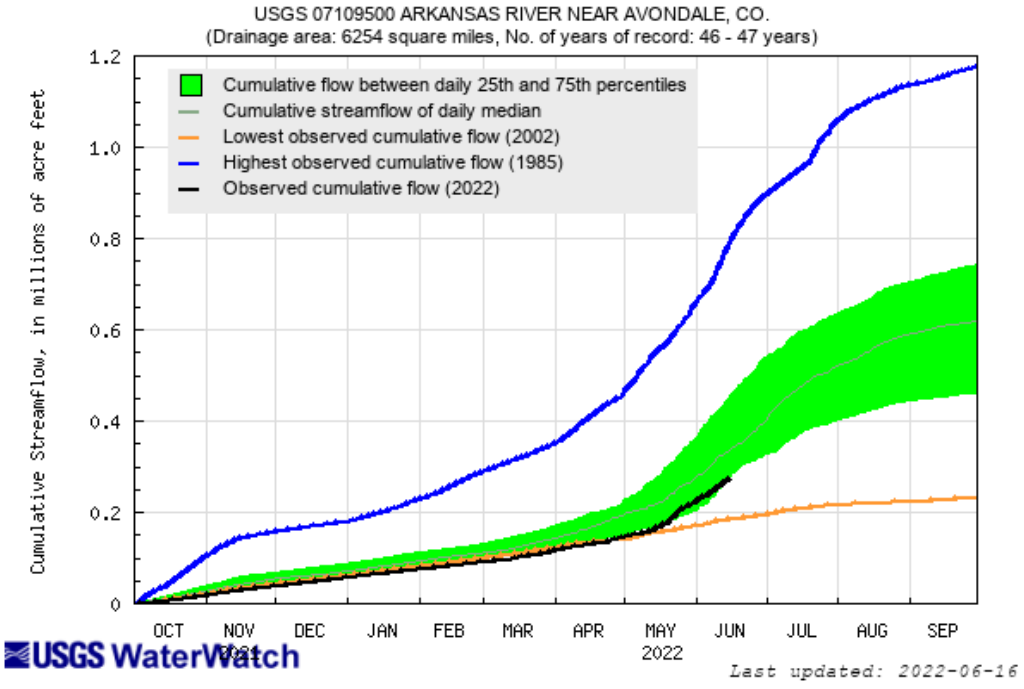



The basin peaked at 86% of normal peak. Meltout was right on time though.

https://www.nrcs.usda.gov/wps/portal/nrcs/main/co/snow/

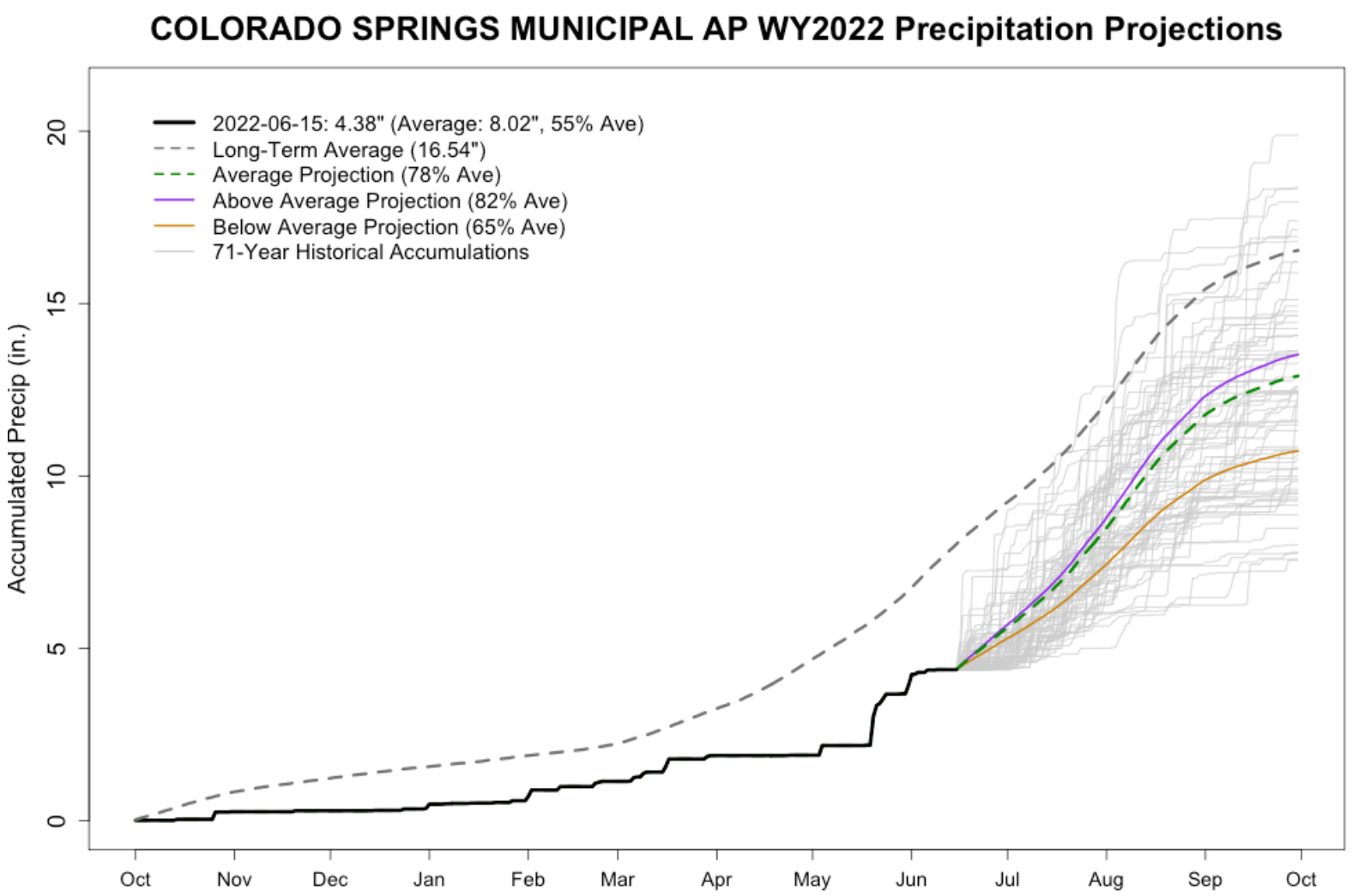
what's happened | **where are we now** | what's coming




https://waterwatch.usgs.gov/

what's happened | where are we now | what's coming

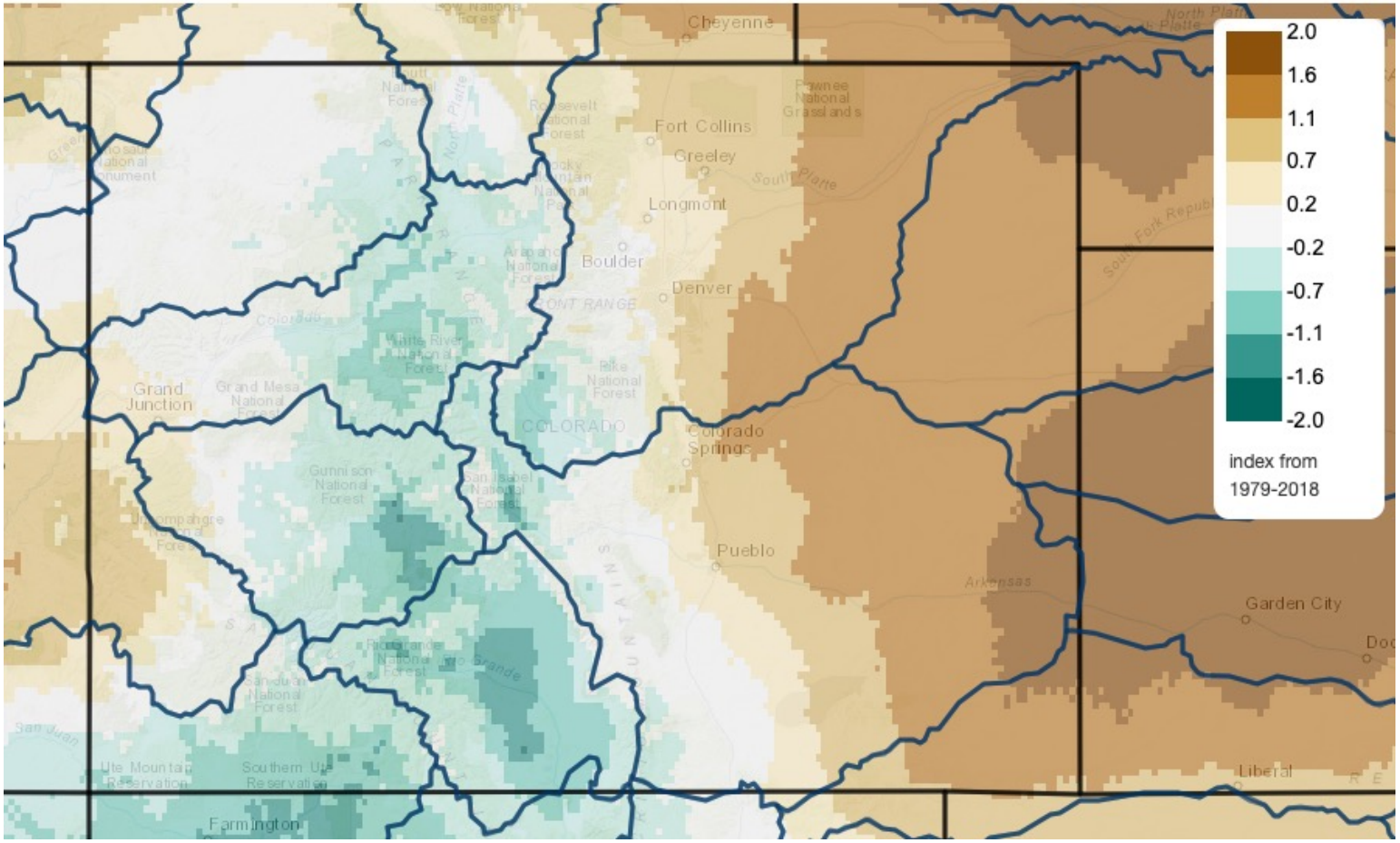



https://climate.colostate.edu/precip_proj.html

## Evaporative Drought Demand Index (EDDI), Week 1-2, Next 1-14 Days

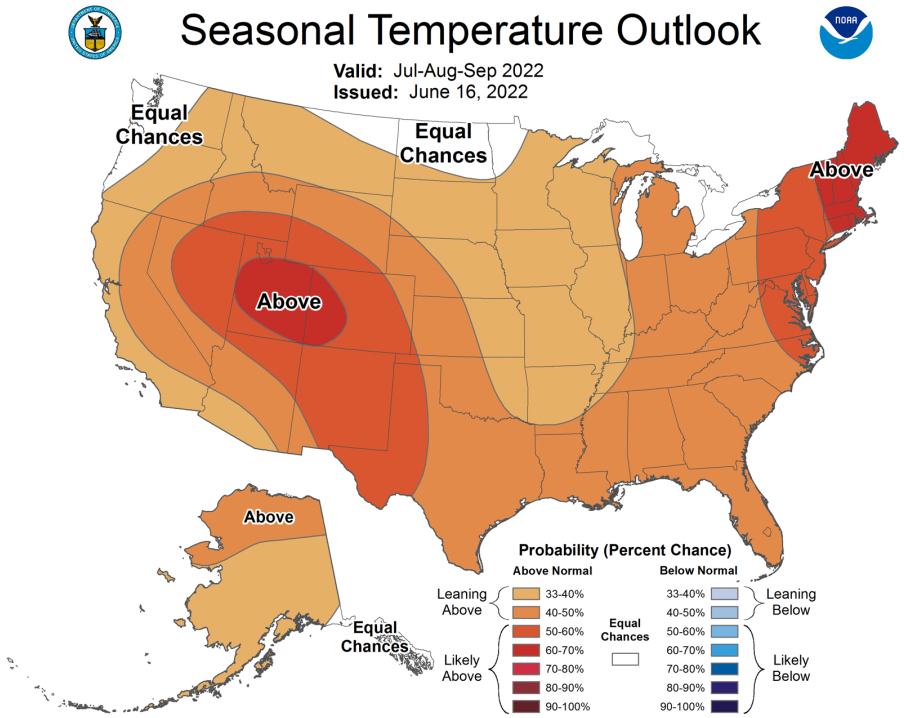
2022/06/17 - 2022/06/30

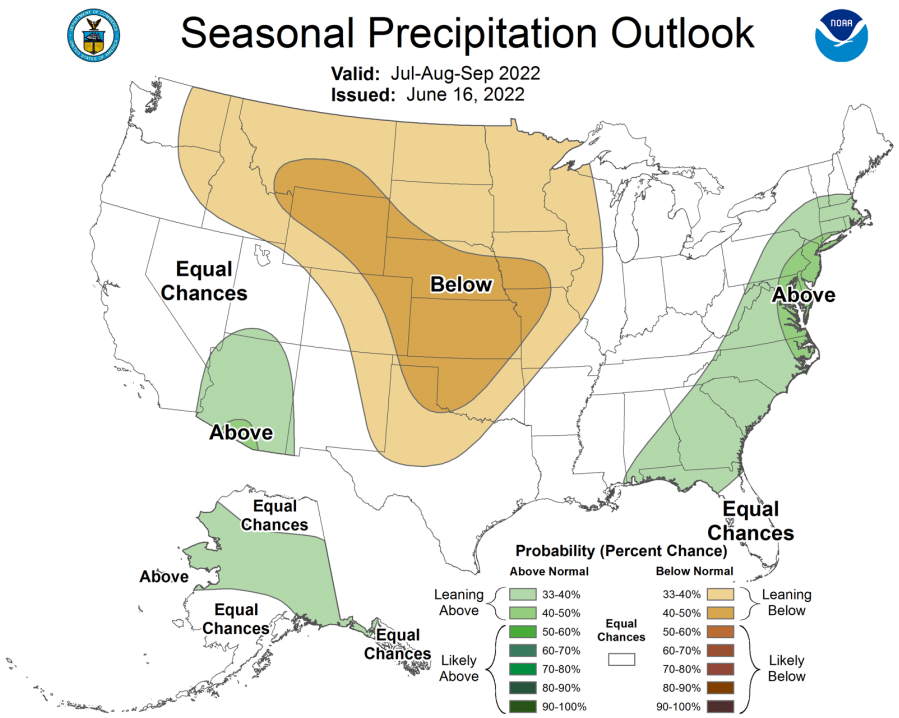
Multi-ensemble median from 48 downscaled CFSv2 ensemble forecasts - forecast made 12Z-13-Jun-2022 to 6Z-16-Jun-2022




https://climatetoolbox.org/tool/climate-mapper

what's happened | where are we now | what's coming



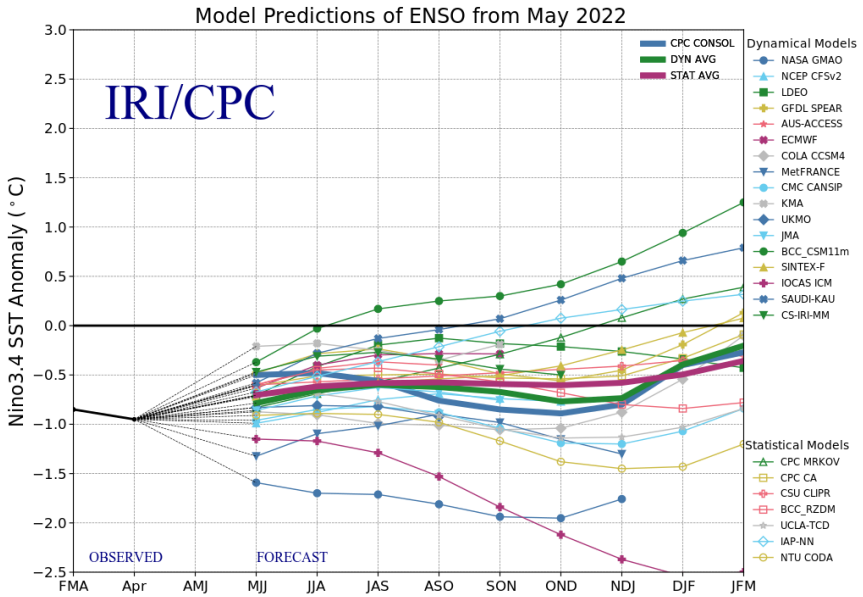



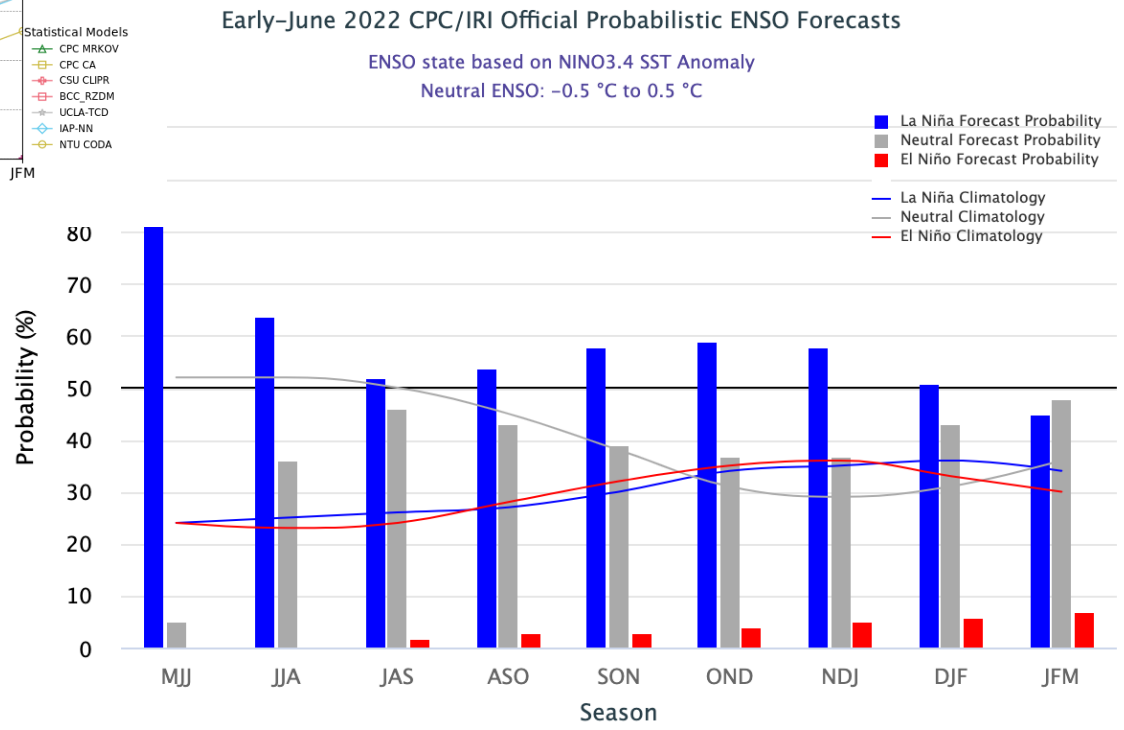

The seasonal outlook is very confident in above average temperatures for all of Colorado. It is unlikely that the summer will be cooler than average.

cpc.ncep.noaa.gov

The seasonal models are leaning toward drier than average for the summer. But they do indicate a strong monsoon. May be a possibility that extends into CO, but eastern CO could miss out.

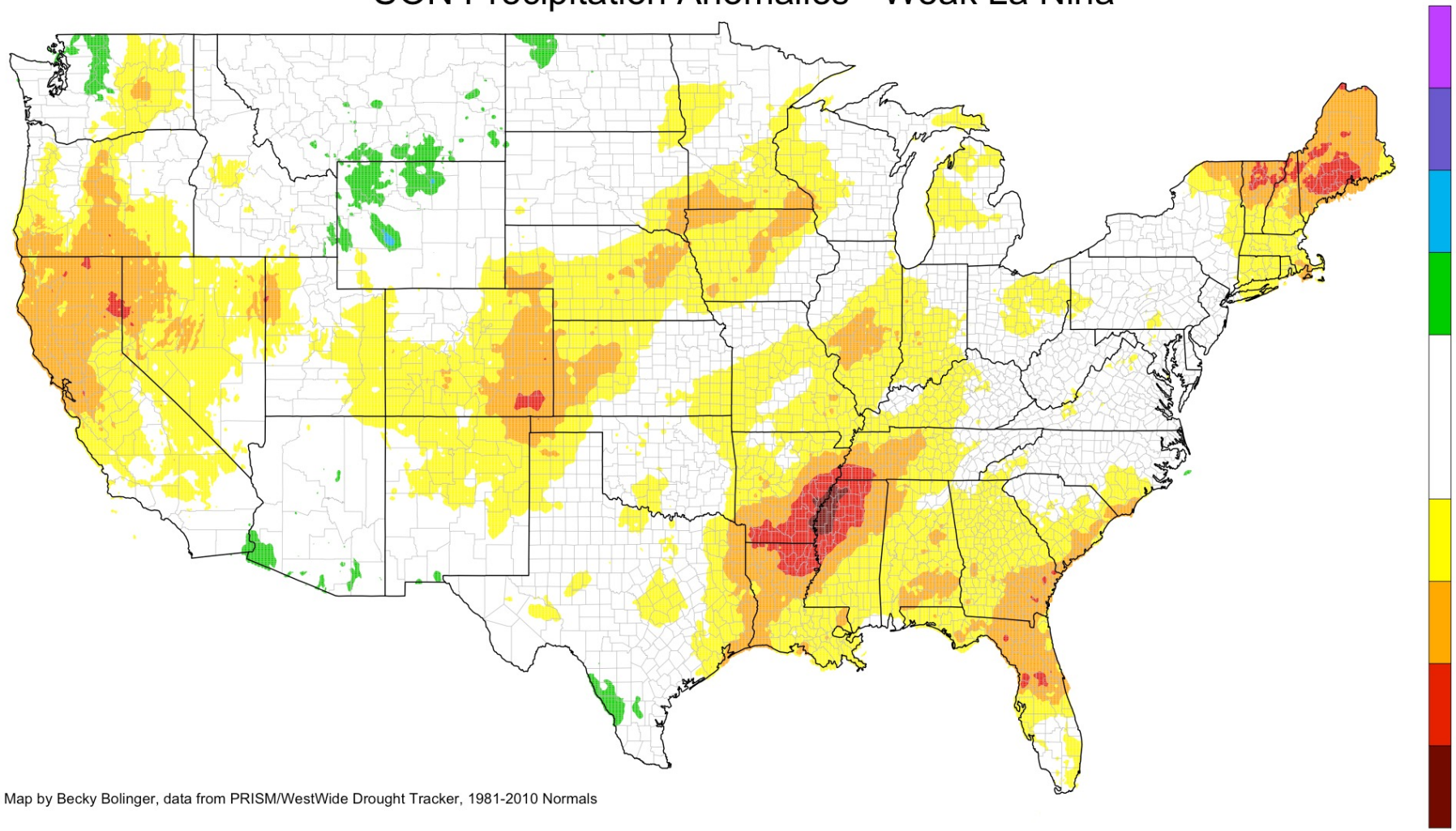
what's happened | where are we now | **what's coming**




It is likely that La Nina will last through the summer and into the fall. Possibility that we could return to neutral conditions though.

## SON Precipitation Anomalies - Weak La Niña

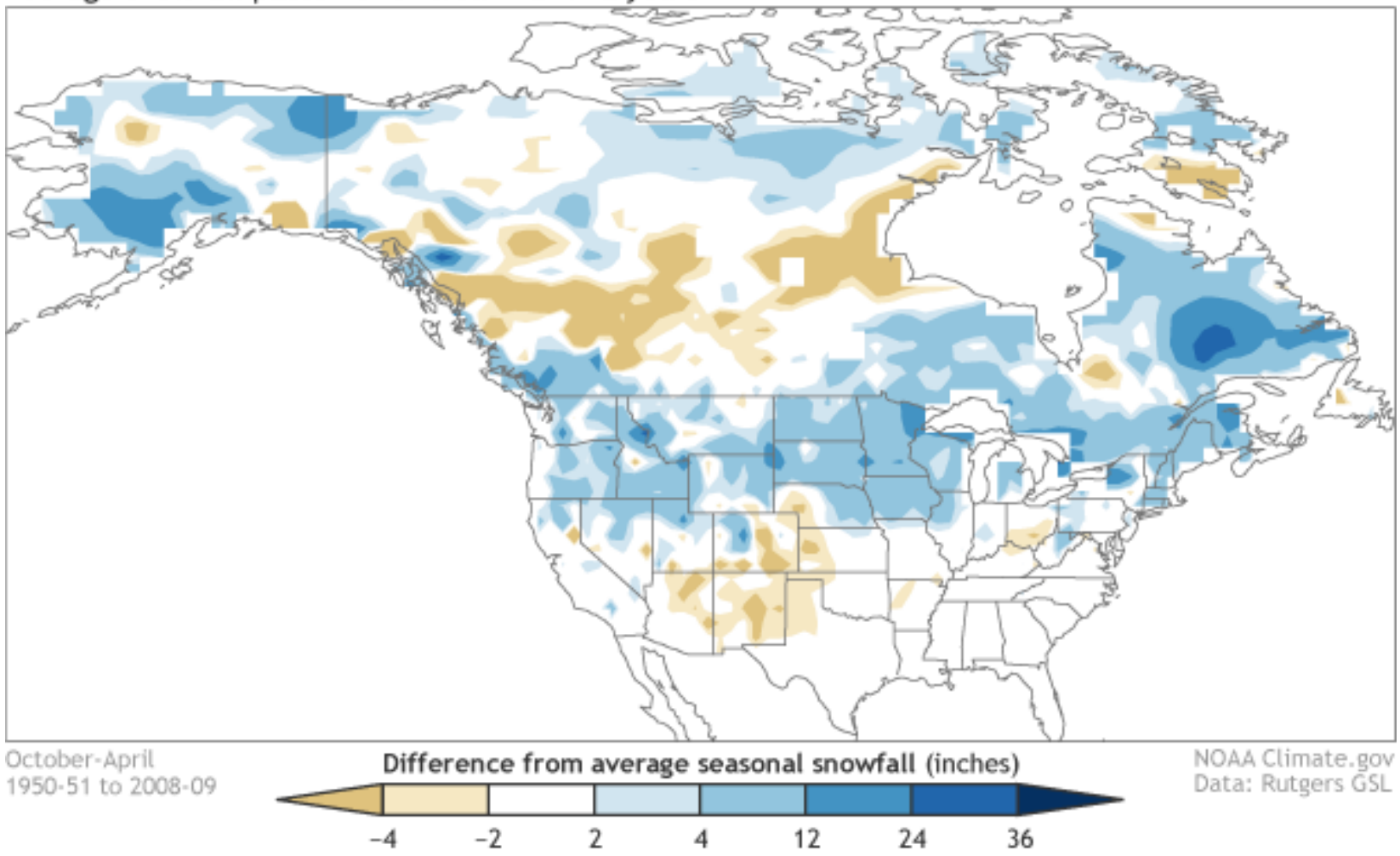


Map by Becky Bolinger, data from PRISM/WestWide Drought Tracker, 1981-2010 Normals

What does La Nina mean for fall precipitation? Not great news.

what's happened | where are we now | **what's coming**

Average snowfall patterns for weak La Niña years




Snowfall can be less than average during a La Nina winter too.

# Key Takeaways

- Long-term drought conditions remain a consistent feature of our landscape
- The start of snowpack season is occurring over low streams and dry soils
- The snowpack season has had its ups and downs, but has done okay
- Unfortunately, we needed an above average year to recover
- Summer heat is going to be a big concern
- Hot temperatures exacerbate drought conditions. With a string of dry days, could increase risk for large wildfires
- July and August are a wet period for the Arkansas basin
  - Getting average precipitation would help with drought recovery
  - If the dry forecast pans out, drought conditions would persist/worsen
- A third year La Nina could put us in line for another drier and warmer fall and winter, with decreased likelihood of drought recovery.

# Thank you

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