



Monsoon 2024 Recap

Daniel Henz

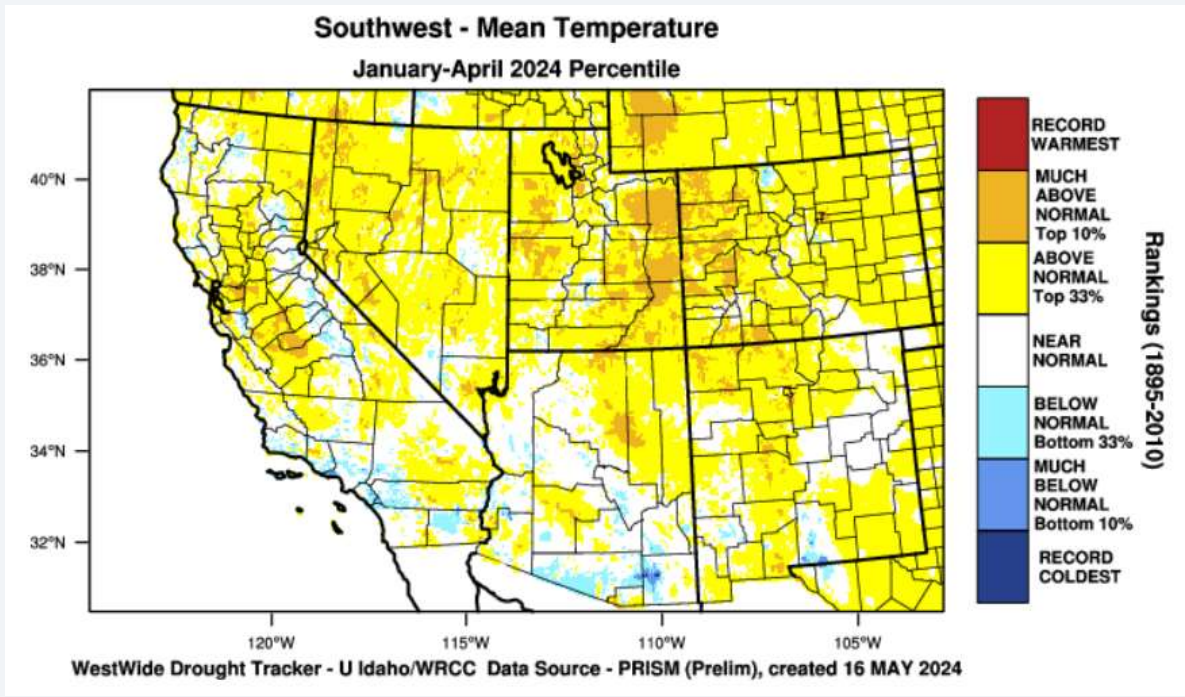
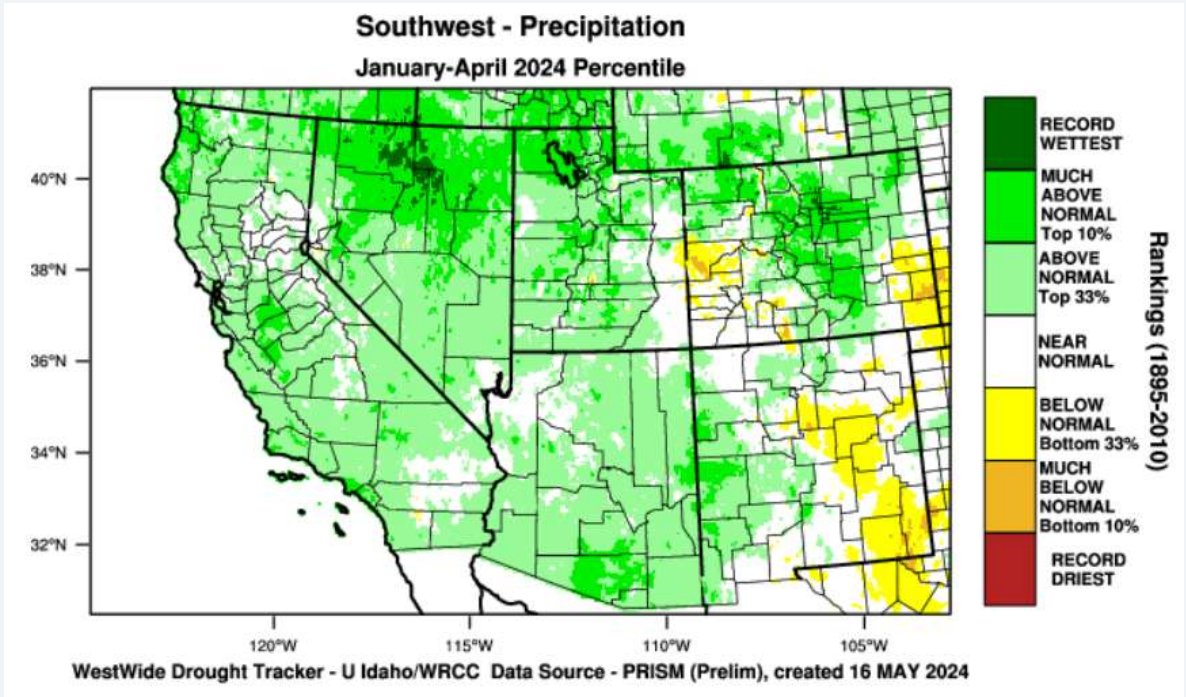
Flood Warning Program Manager





Monsoon Outlook

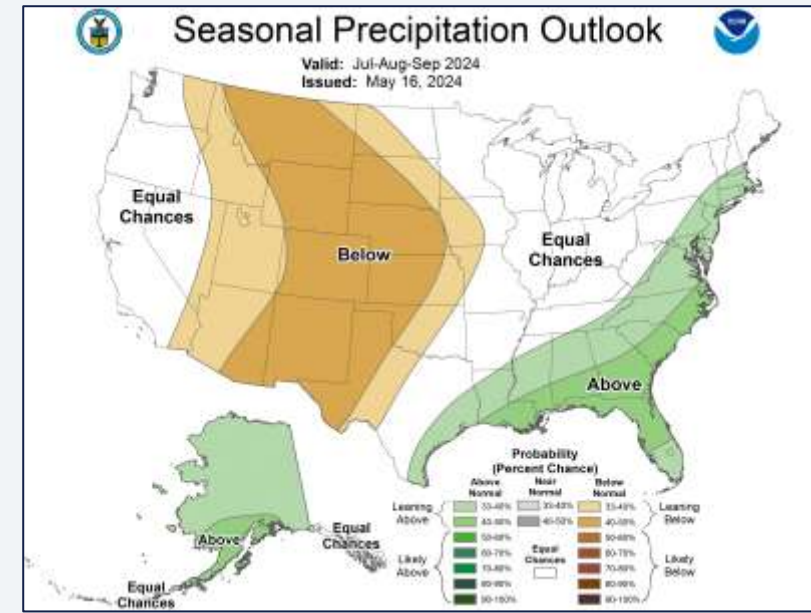
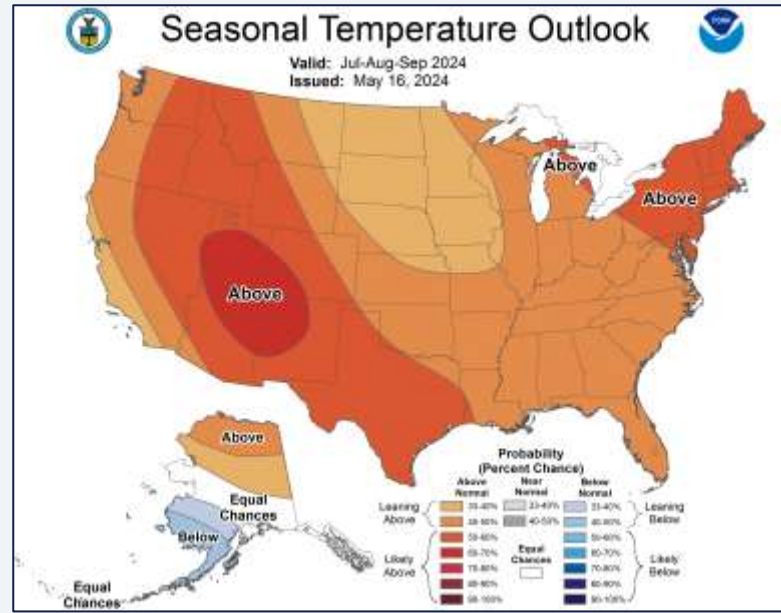
What we were thinking...



Warm and Wet antecedent Winter/Spring Seasons



NOAA/CPC 3-Month Outlook (JAS)



From Monsoon Outlook: 6/12/24

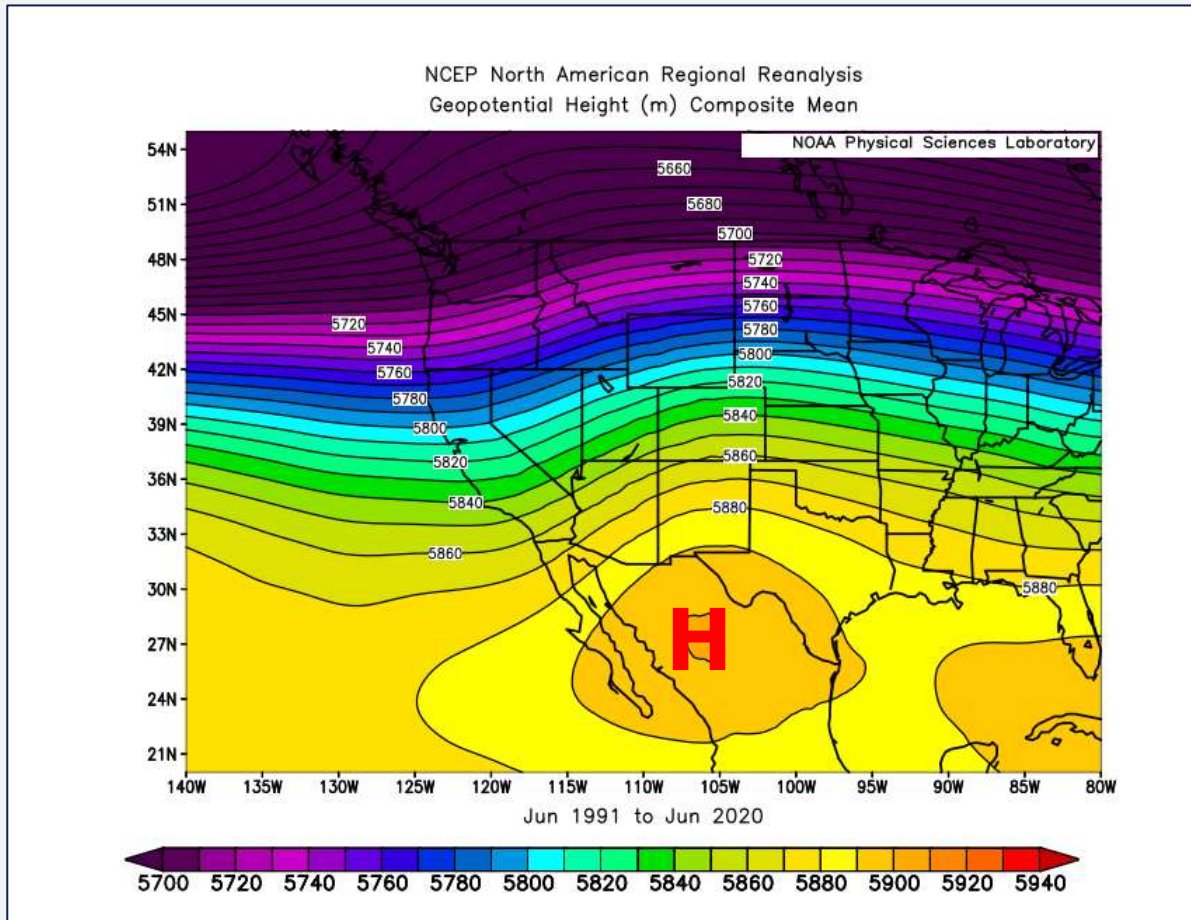
- Odds favor **Above Normal Temperatures** and **Below Normal Rainfall**; Possible early false start followed by normal onset; historical evidence supports more erratic placement of Monsoon Ridge and increased inverted trough activity from La Niña. We'll likely finish somewhere wetter than 2020/2023 but drier than 2021/2022.



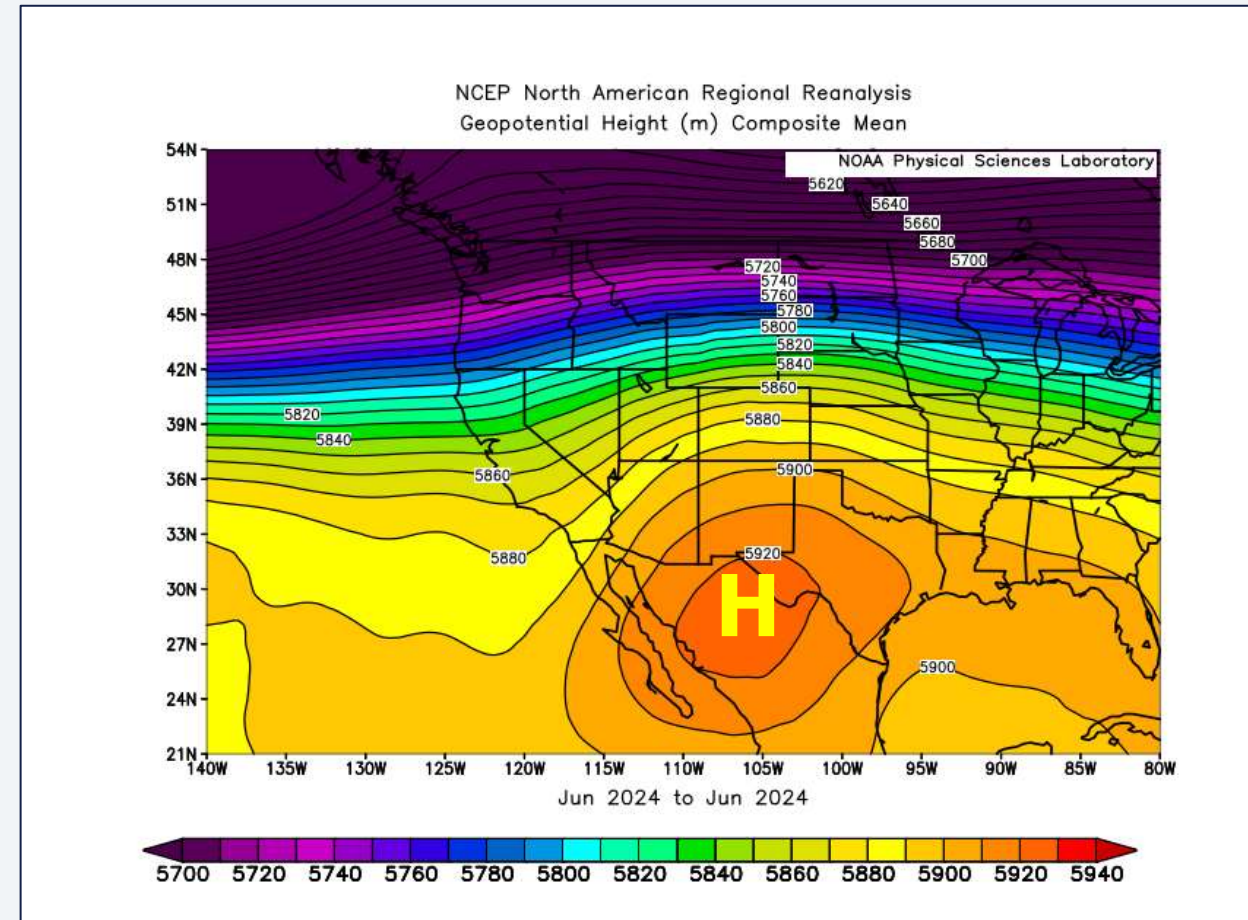
Monsoon Off To A Fast Start...

June Ridge Placement

June 1991-2020 Climatological Mean



June 2024 Mean Position

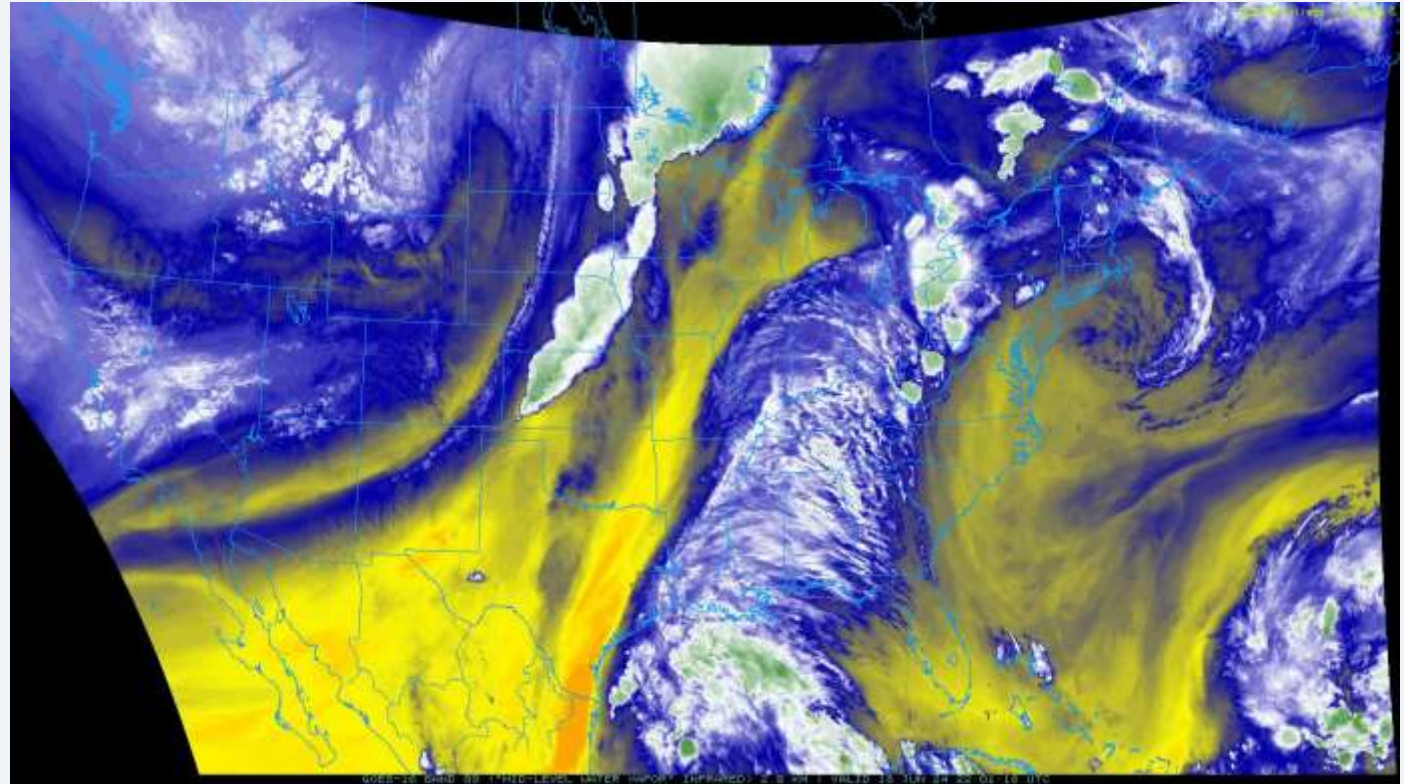


Large Assist From TC Alberto..

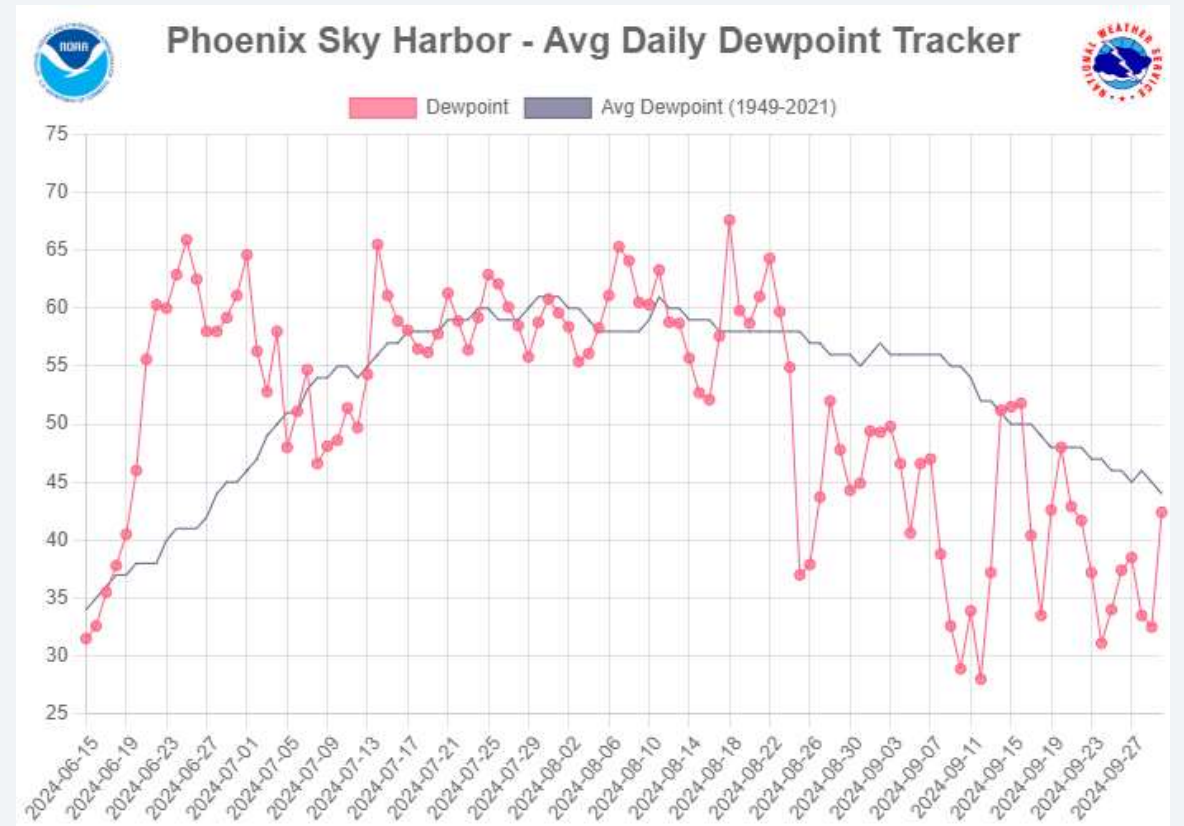
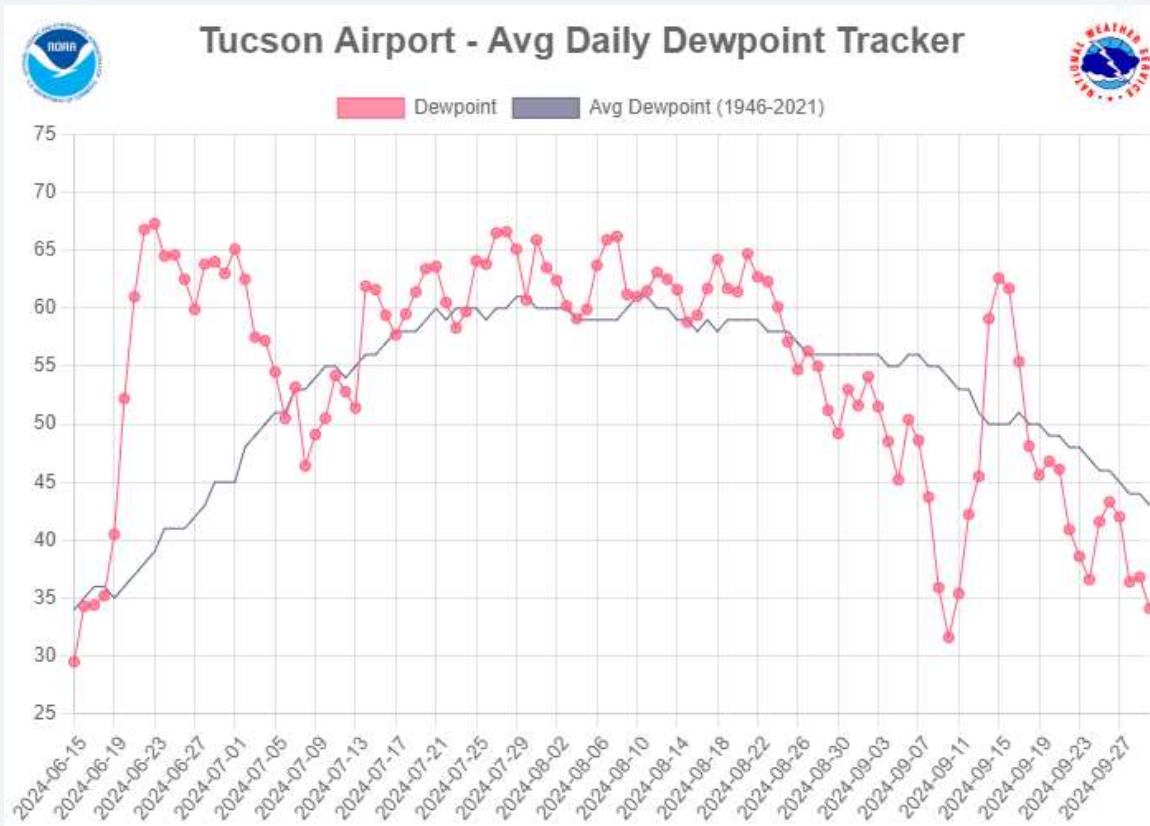
Alberto's Track



Priming Monsoon 2024..

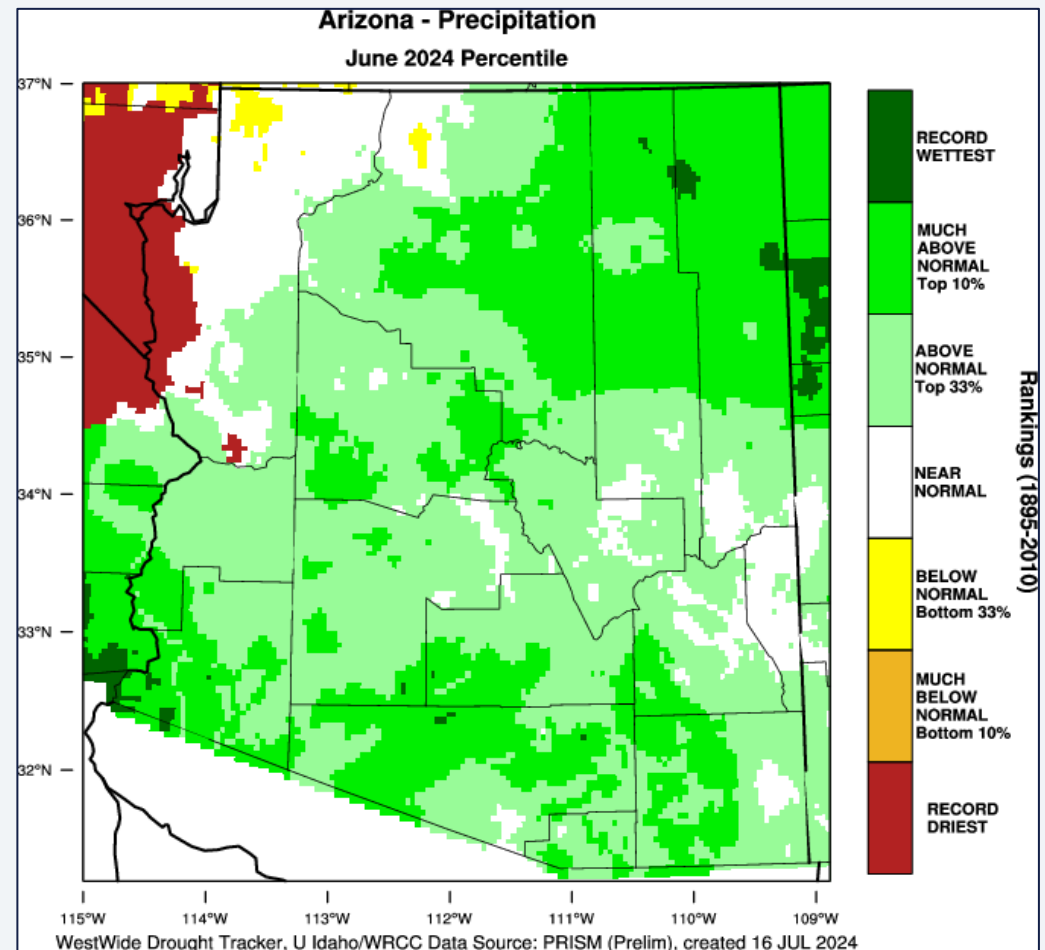
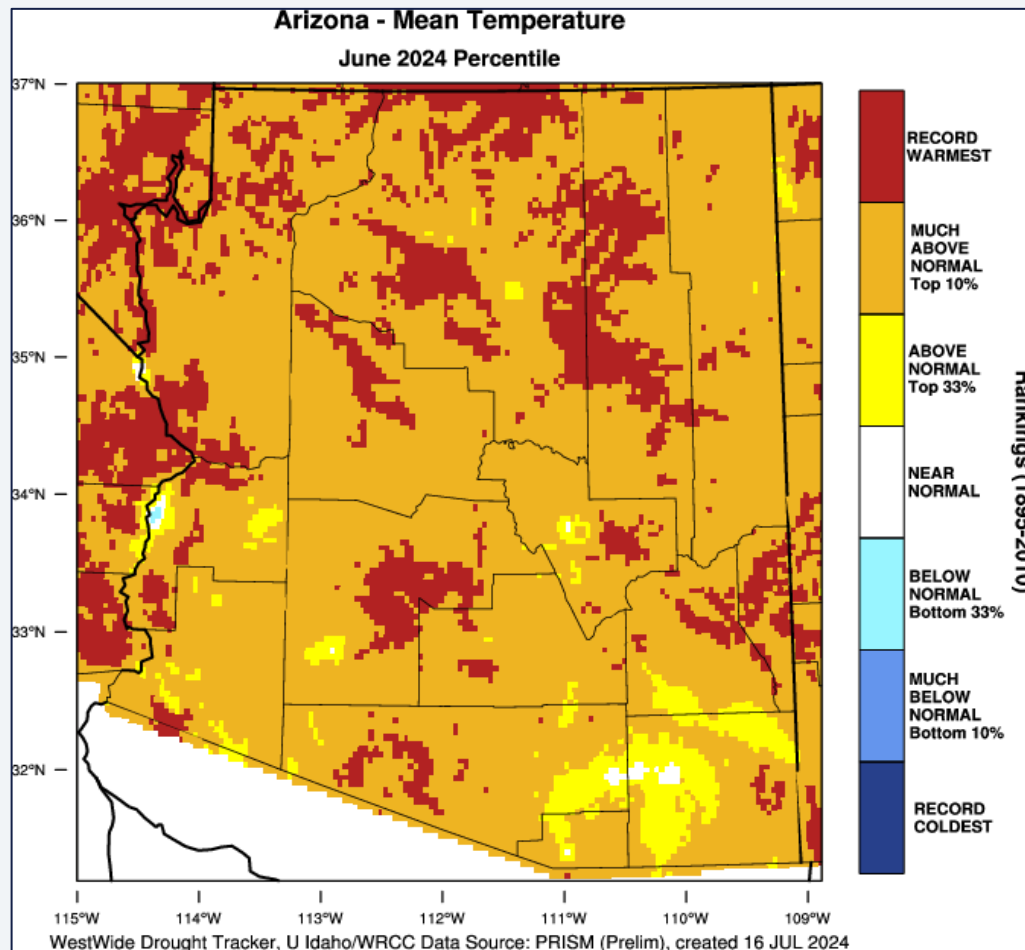


Monsoon Moisture Tracker



June was Hot and Active..

Well Above Normal Temperatures and Rainfall for most of AZ



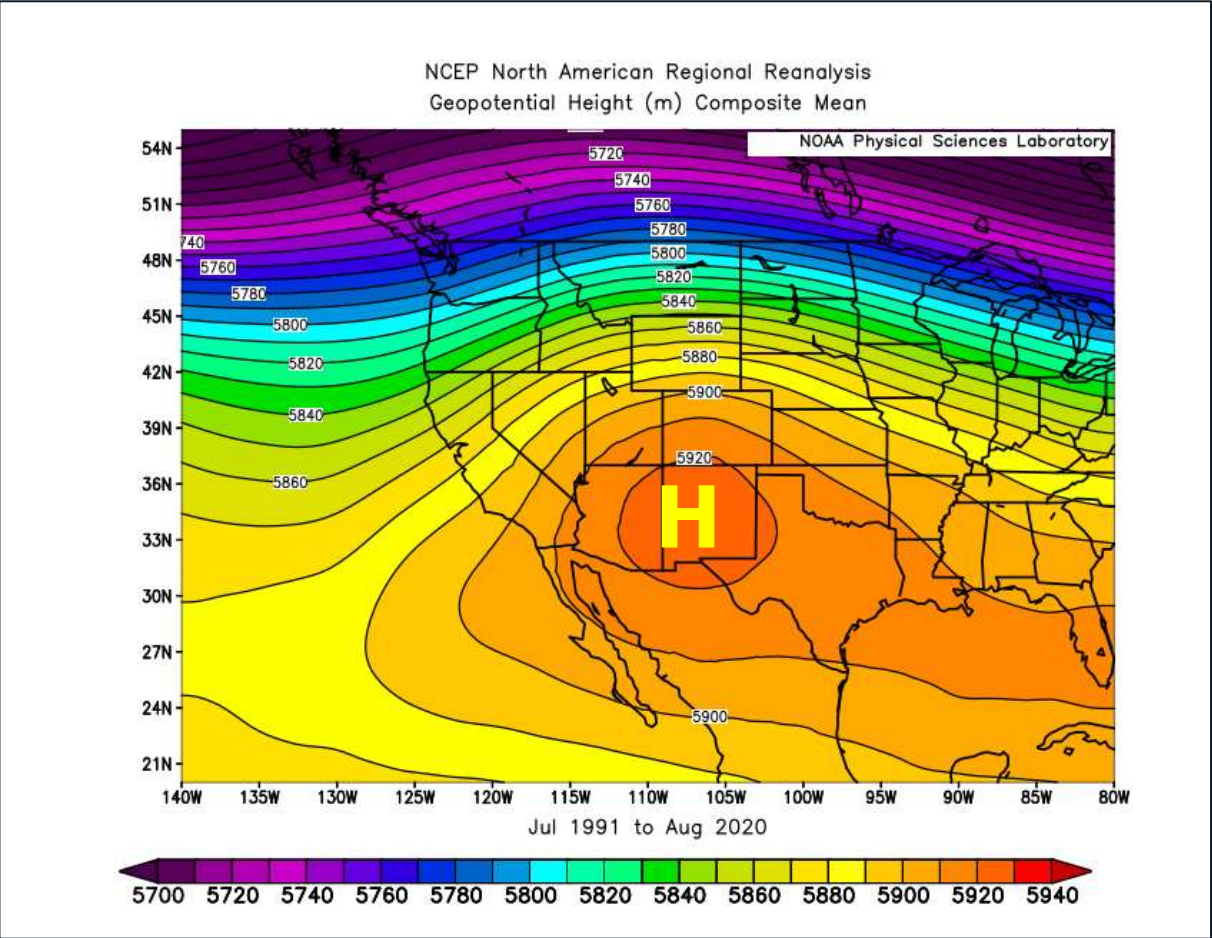


Monsoon Heatwave

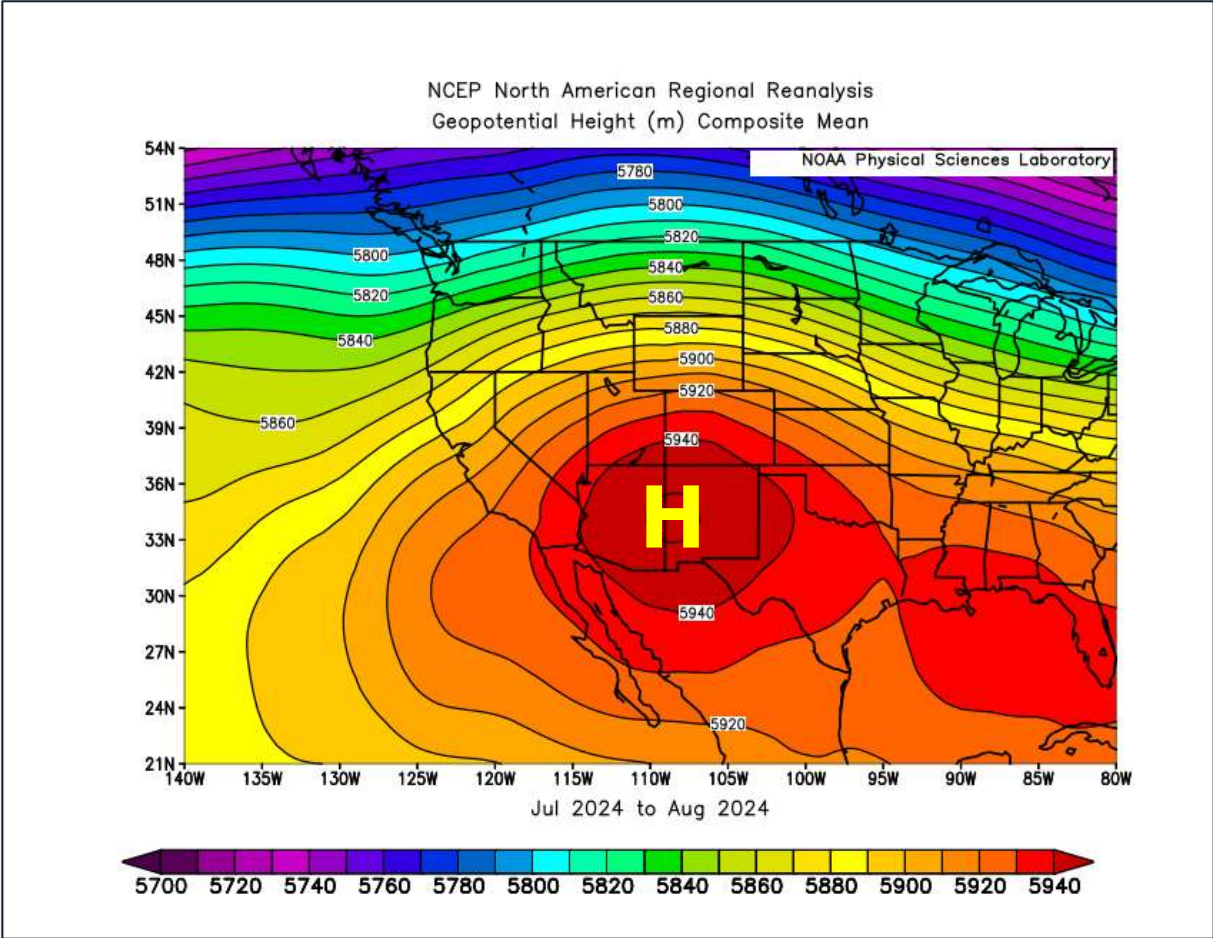
Did we seriously just outdo 2020 and 2023...?

Monsoon Ridge Seasonal Placement

July-August 1991-2020 Mean

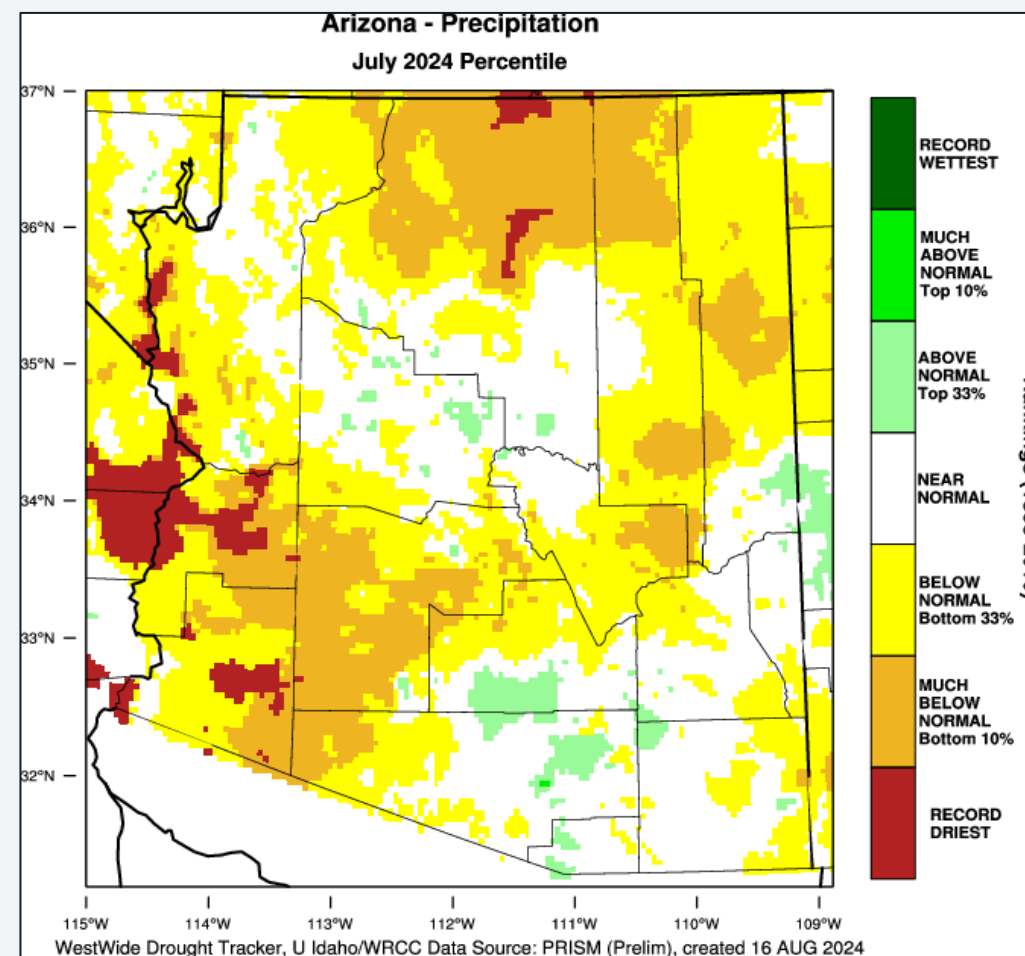
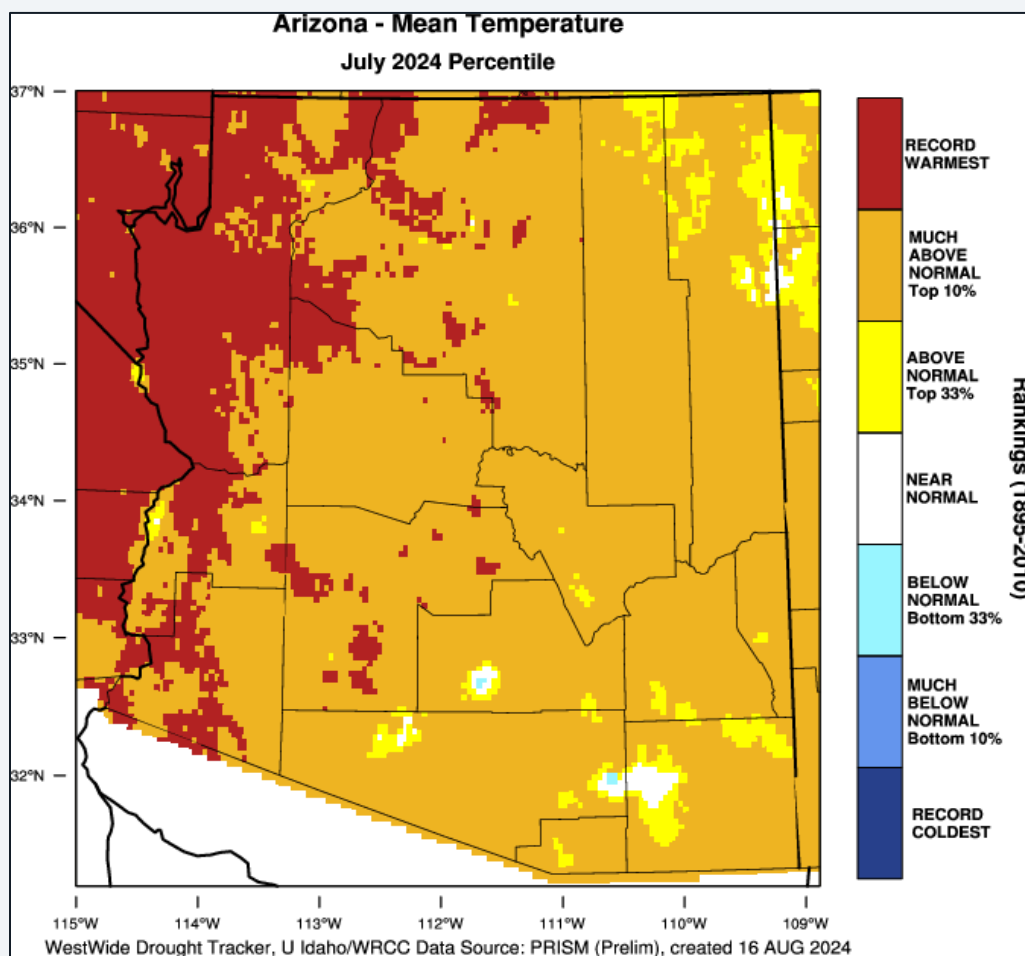


July-August 2024 Mean Position

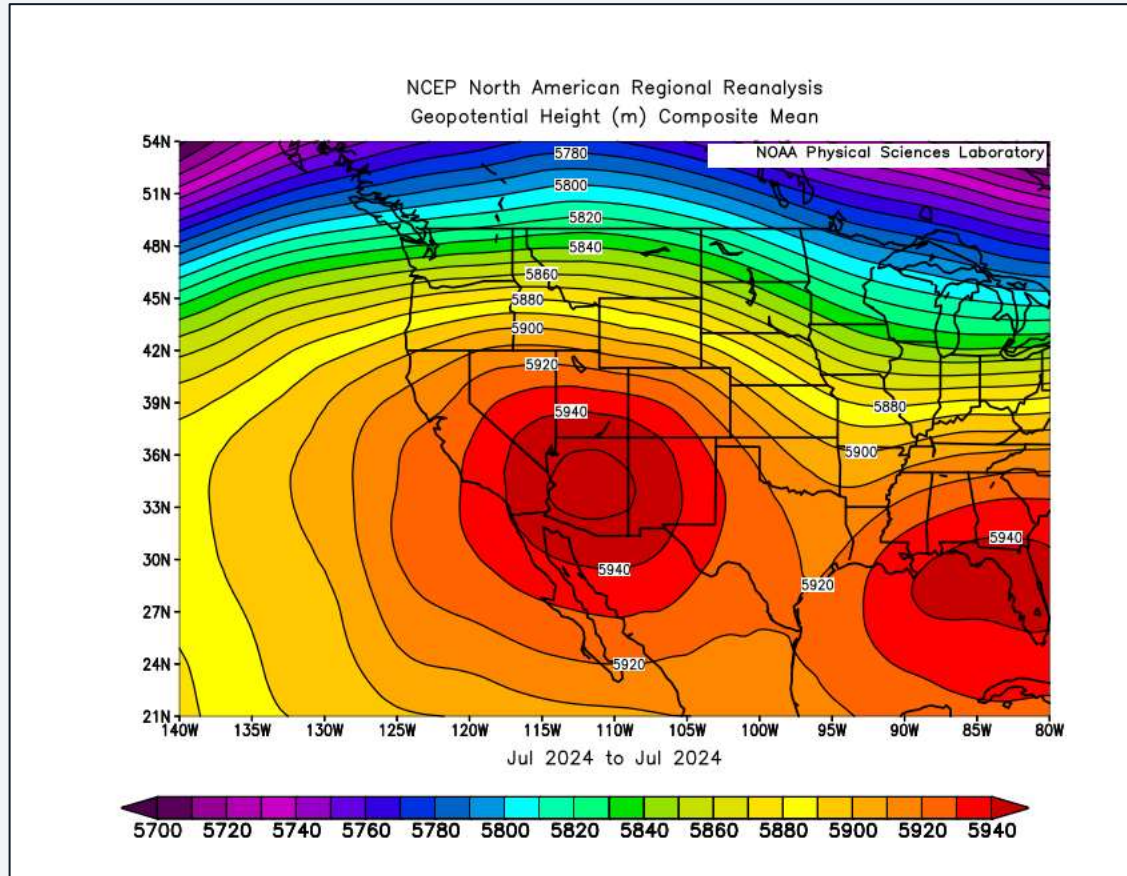


July was Hot and Active Across Portions of AZ...

Well Above Normal Temperatures Prevail



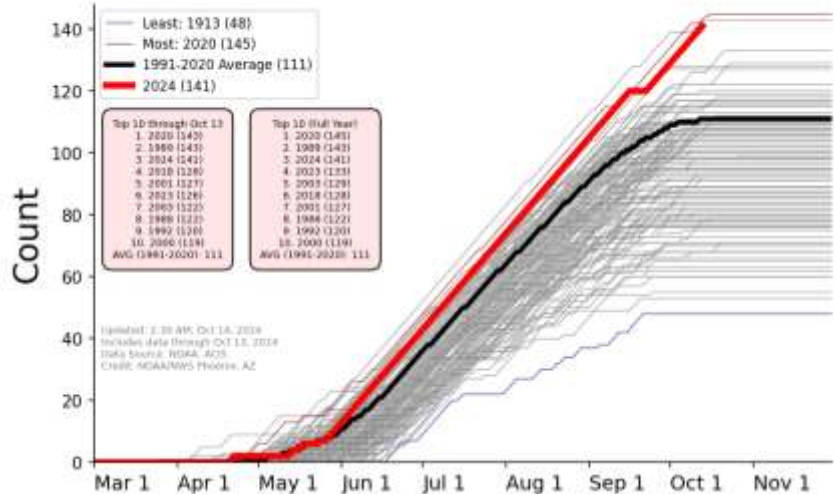
Historic June-September Heat!



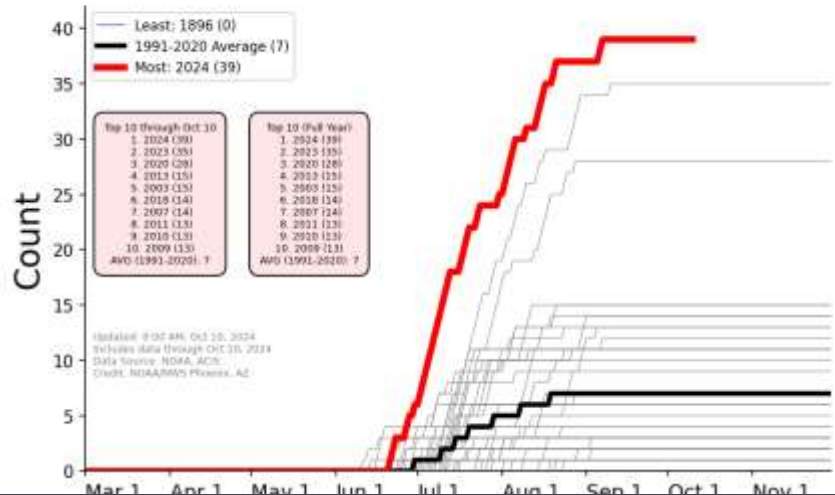
Phoenix Summer Heat Stats:

- 113 Day Streak of 100°F+ High Temperatures
 - (May 27th – September 16th)
- 18 Daily High Temperature Records Tied/Broken
- 28 Daily Warm Low Temperature Records Tied/Broken
- Total 110°F+ High Days: 62
- Total 115°F+ High Days: 12
- Total 90°F+ Low Days: 39
- Average Summer Temperature: 98.3°F
 - (Jun: 97.0°F, Jul: 101.1°F, Aug: 98.7°F, Sep: 94.6°F)
- Latest Observed Instance of 110°F (Oct 7th) and 115°F (Sept 28th)
- All Time High Temperature for Sep. (117°F, 29th) and Oct. (113°F, 6th)
- 21 Day Streak of Daily High Temperature Records Broken (National Record)

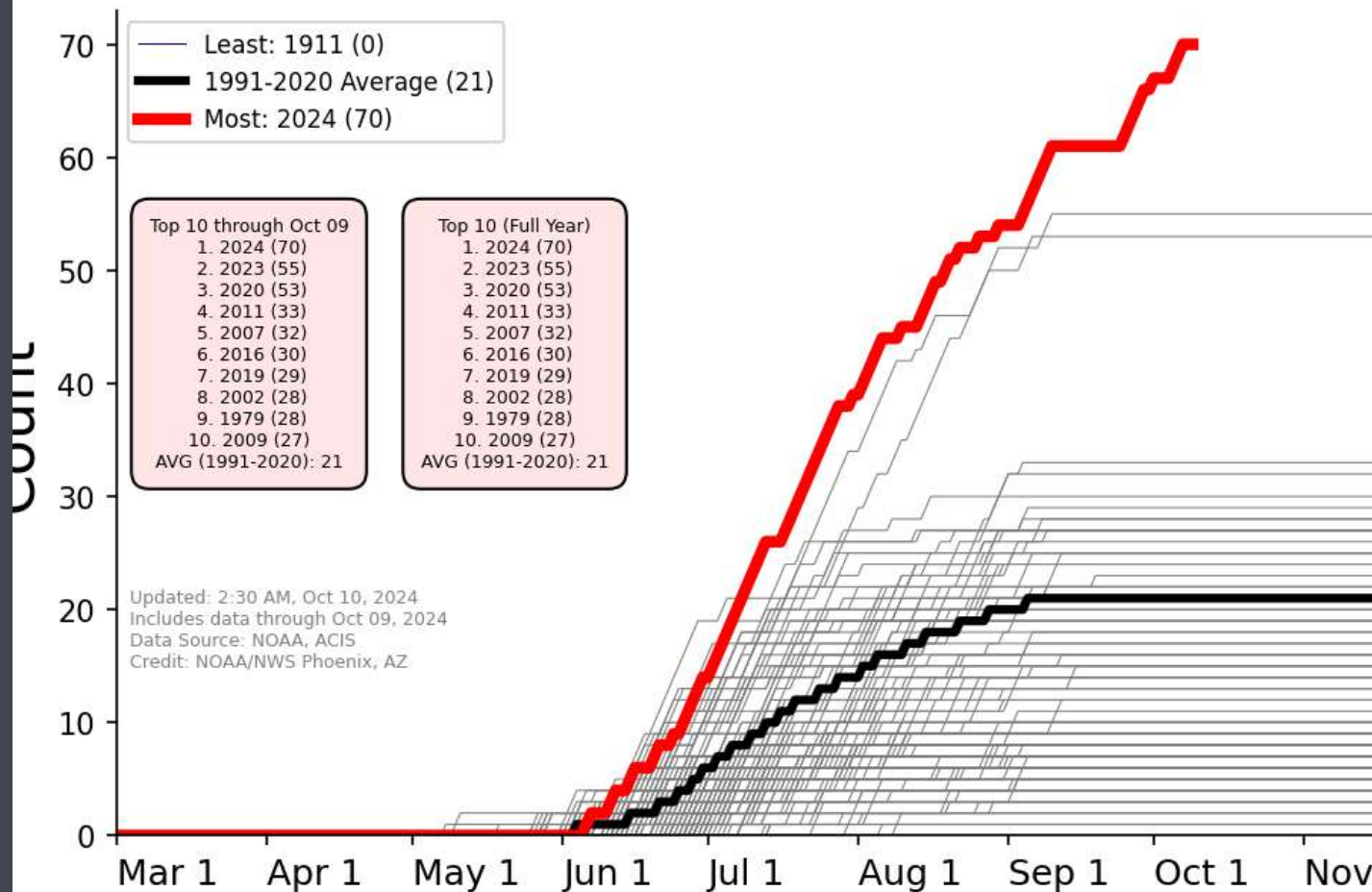
100 ° F+ in Phoenix, AZ



90 ° F+ in Phoenix, AZ



Days with Maximum Temperatures 110 ° F+ in Phoenix, AZ

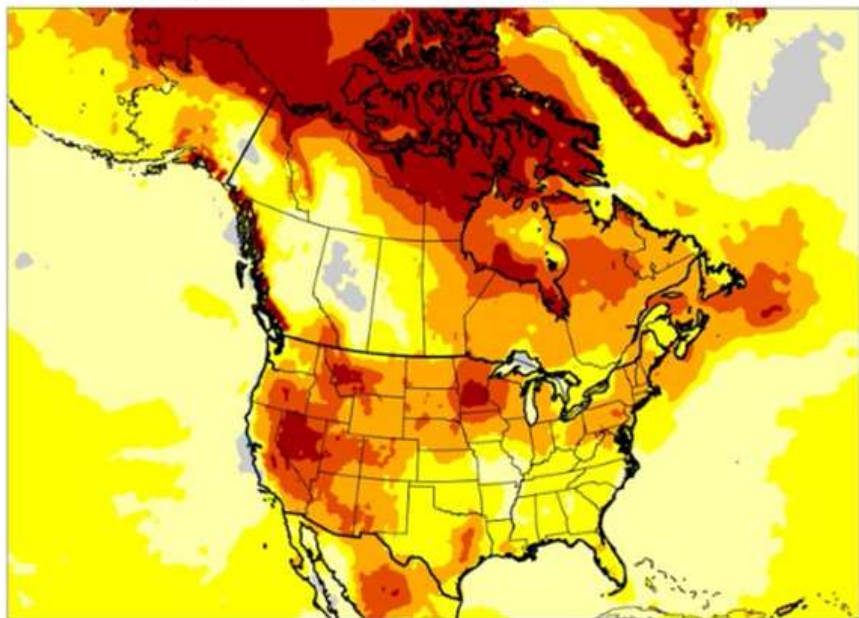




Brian Brettschneider
@Climatologist49

Now that September data has arrived, let's check in and see how September temperatures have changed over the last 85 years. 🔥🔥🔥

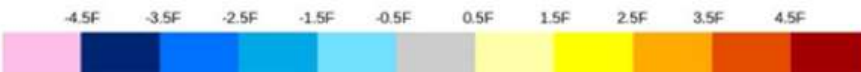
Temperature Trend for Sep (1940 - 2024)



ERA5 Reanalysis
OLS Regression

U.S.-Canada change is: +3.1F

Map by: Brian Brettschneider



Trend (85-Year Change) From 1940 to 2024 (F)

1:25 PM · Oct 8, 2024 · 2,363 Views

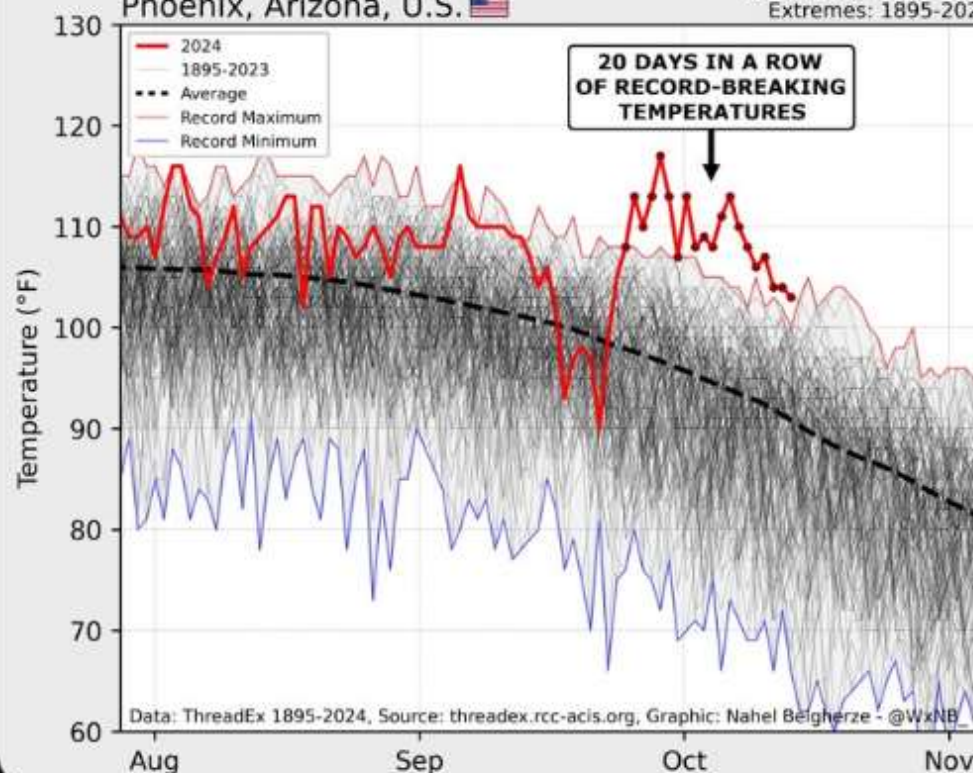


Nahel Belgherze @WxNB_ · Oct 14

Phoenix, Arizona is arguably facing one of the most extraordinary heatwaves ever recorded in American history, both in terms of duration and intensity. Yesterday marked the 20th CONSECUTIVE day on which the city either tied or set a record high temperature. Nearly *three straight [Show more](#)

Daily High Temperature Phoenix, Arizona, U.S.

Climatology: 1991-2020
Extremes: 1895-2024



Data: ThreadEx 1895-2024, Source: threadex.rcc-acis.org, Graphic: Nahel Belgherze - @WxNB_

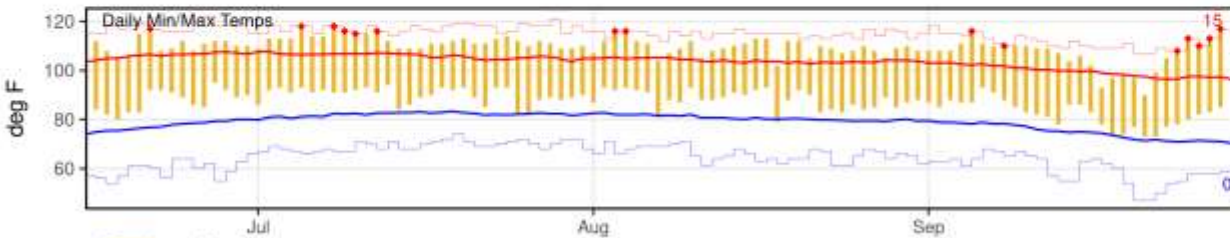
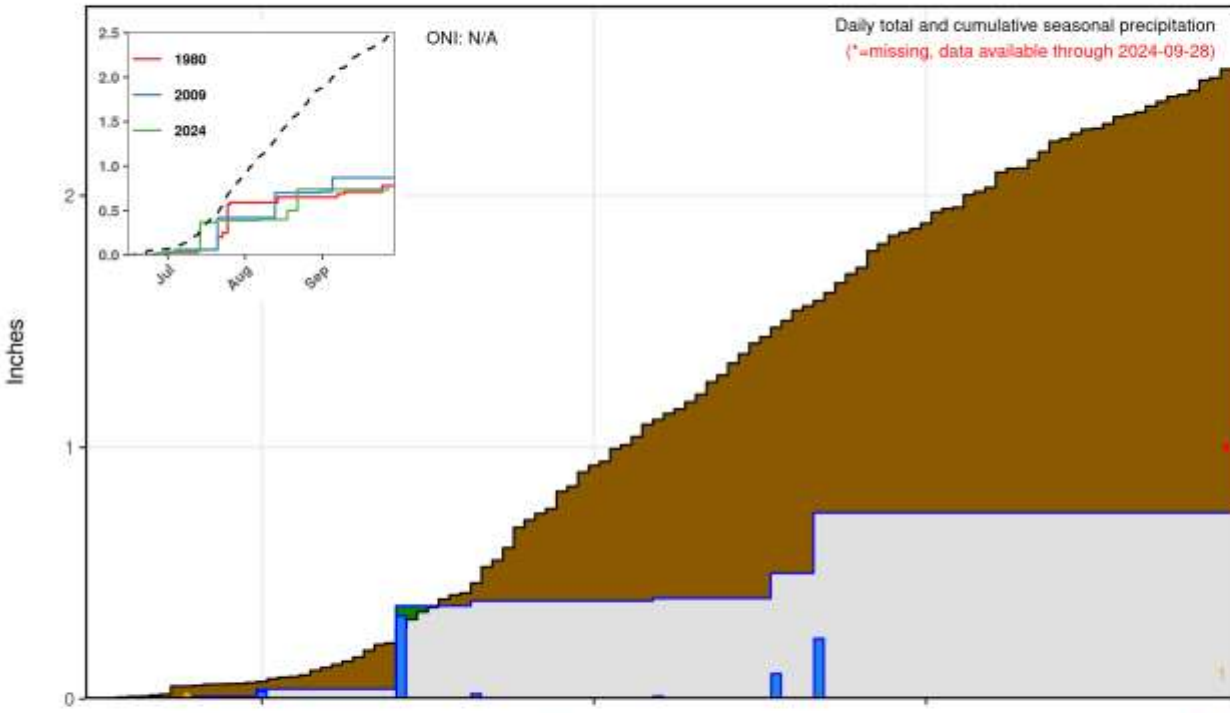
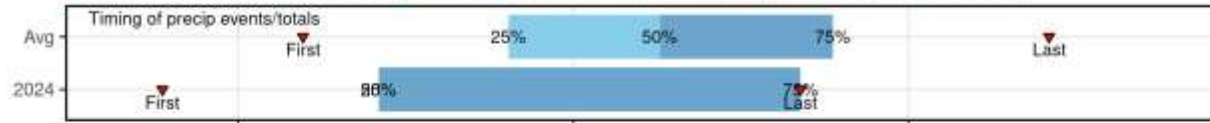
NWS Phoenix



Monsoon Rainfall...

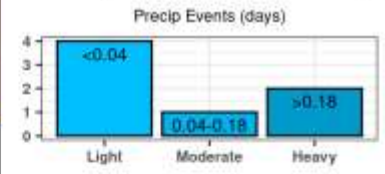
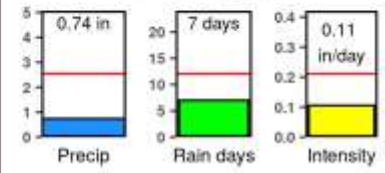
How did we compare?

Station Climate Summary: 06-15-2024 to 09-30-2024 (Monsoon Season)



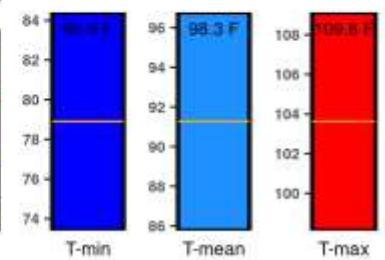
PHOENIX AIRPORT

Elevation (ft): 1113
 Period of record: 1948-2024
 Years in record: 77
 Precip rank: 73.5 (1-wettest)
 Temp rank: 1 (1-warmest)
 Missing in 2024: 2
 Total snow (in): 0 (NaN % avg)



Dry Spells

Avg length: 7 days (avg: 7)
 Max length: 37 days (avg: 31)



Data from <http://www.rcc-acis.org/>
 Plot created: 09-29-2024
 The University of Arizona
<https://cals.arizona.edu/climate/>

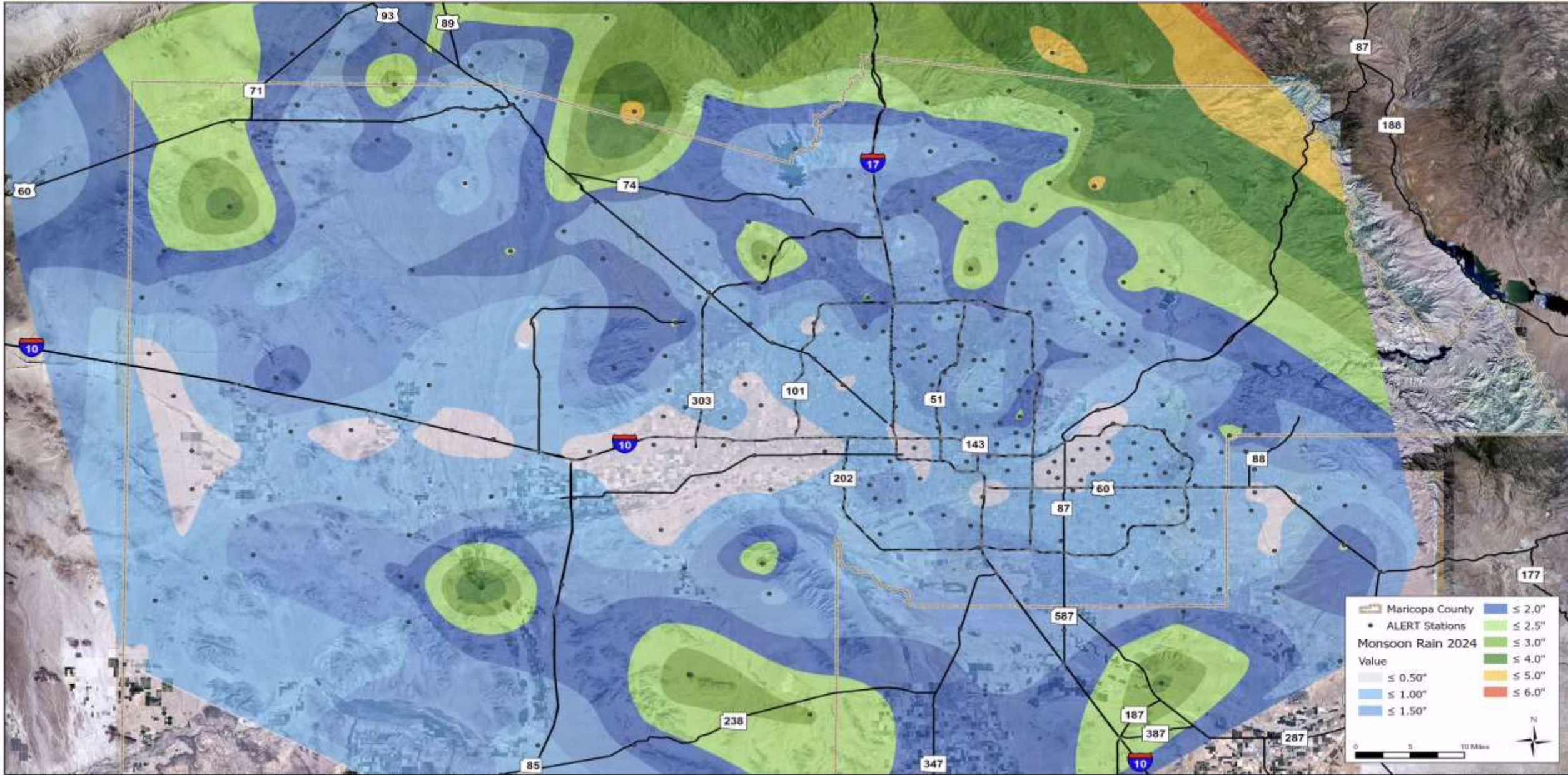


Starting with Phoenix Sky Harbor...

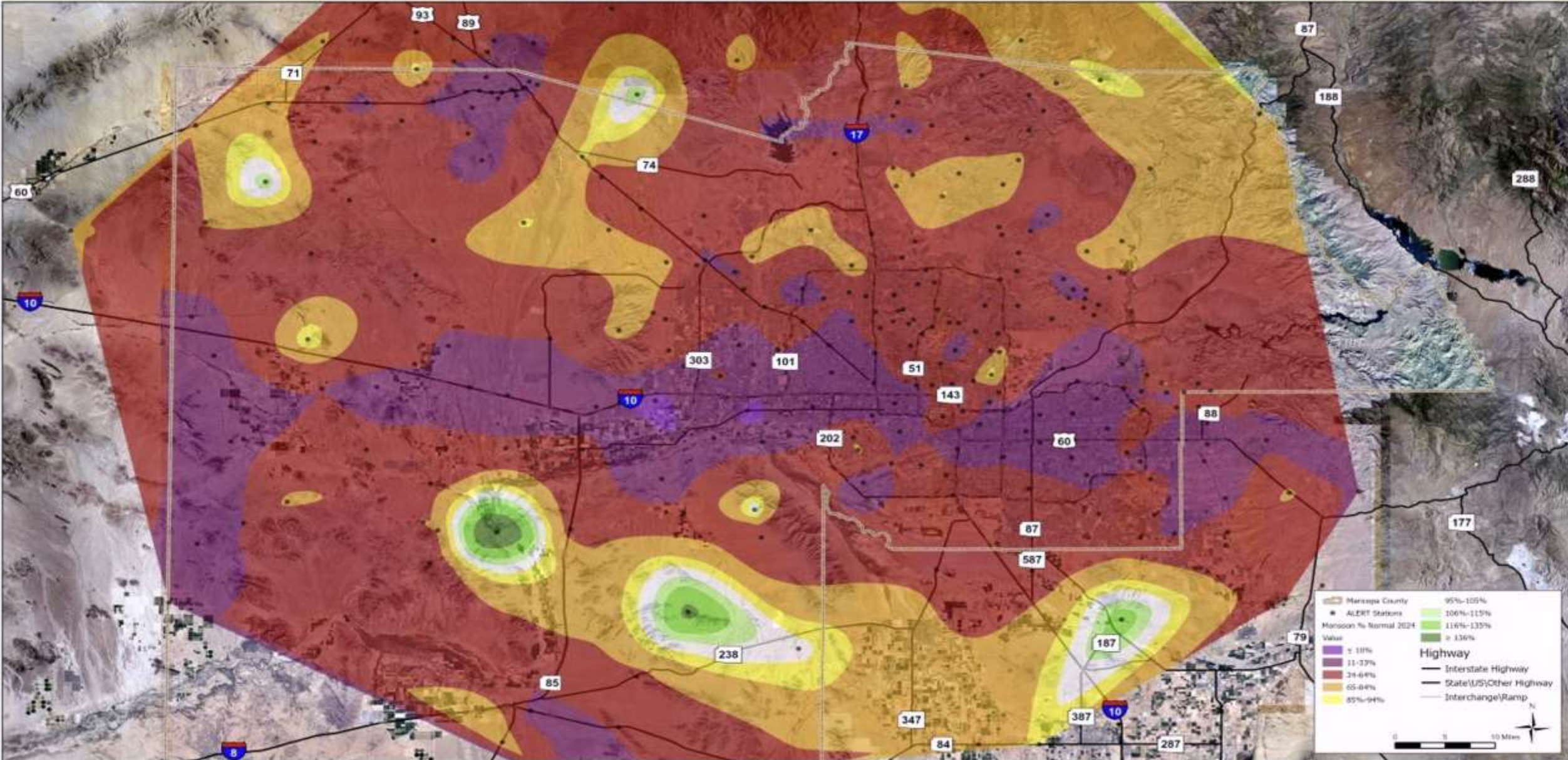
Monsoon Statistics for Phoenix Sky Harbor (1896 - 2024)

Top 10 Wettest Monsoons		Top 10 Driest Monsoons	
1) 9.56" / 1984	6) 6.96" / 1951	1) 0.15" / 2023	6) 0.66" / 2019
2) 9.31" / 1911	7) 6.34" / 2014	2) 0.35" / 1924	7) 0.74" / 2007
3) 7.45" / 1946	8) 6.15" / 1943	3) 0.51" / 1914	8) 0.74" / 2024
4) 7.30" / 1939	9) 6.03" / 1897	4) 0.61" / 1932	9) 0.78" / 1980
5) 7.20" / 1896	10) 5.99" / 1955	5) 0.61" / 1993	10) 0.79" / 1910

Monsoon Rainfall



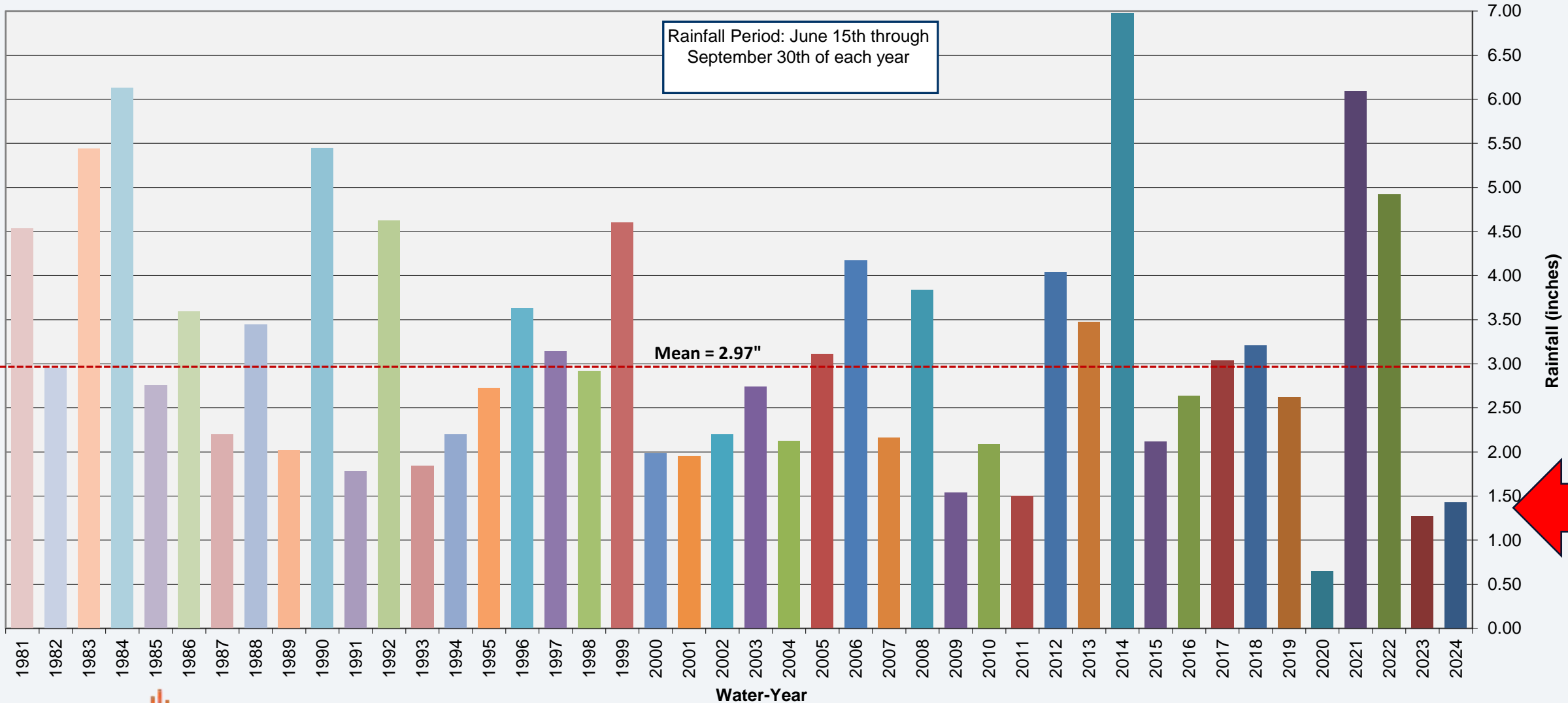
Monsoon Rainfall as Percent of Normal



DISCLAIMER: This map is a qualitative representation intended to provide a general overview of the data. It is not intended to be used for engineering or legal purposes. The data is based on the best available information and is subject to change without notice.

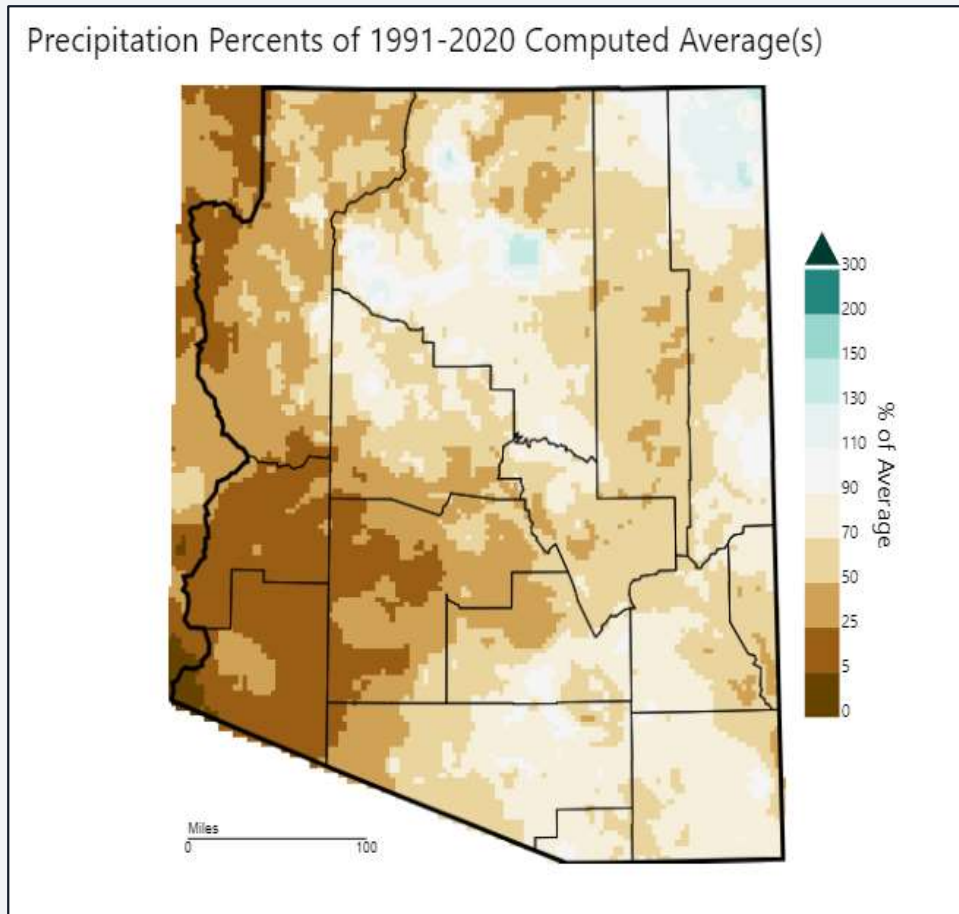
Average Summer Thunderstorm (*Monsoon*) Season Rainfall - Past 44 Years

Flood Control District of Maricopa County ALERT Rain Gages

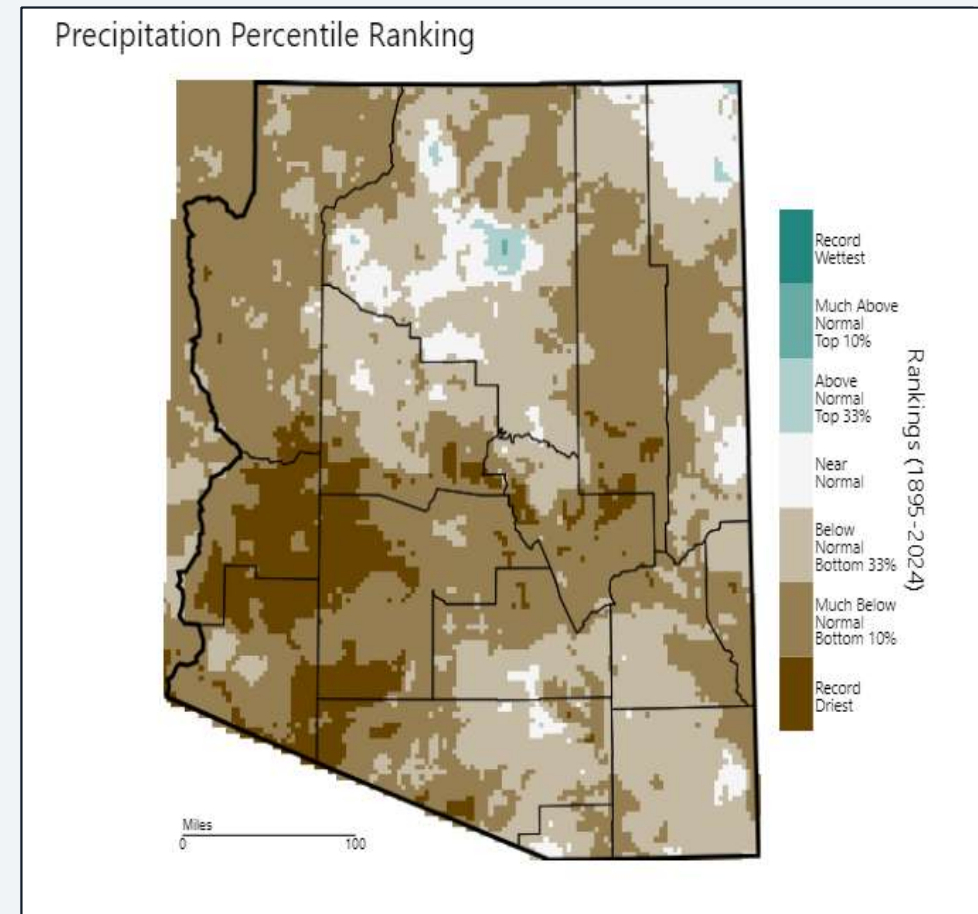


Full Arizona Monsoon Summary

June-September 2024



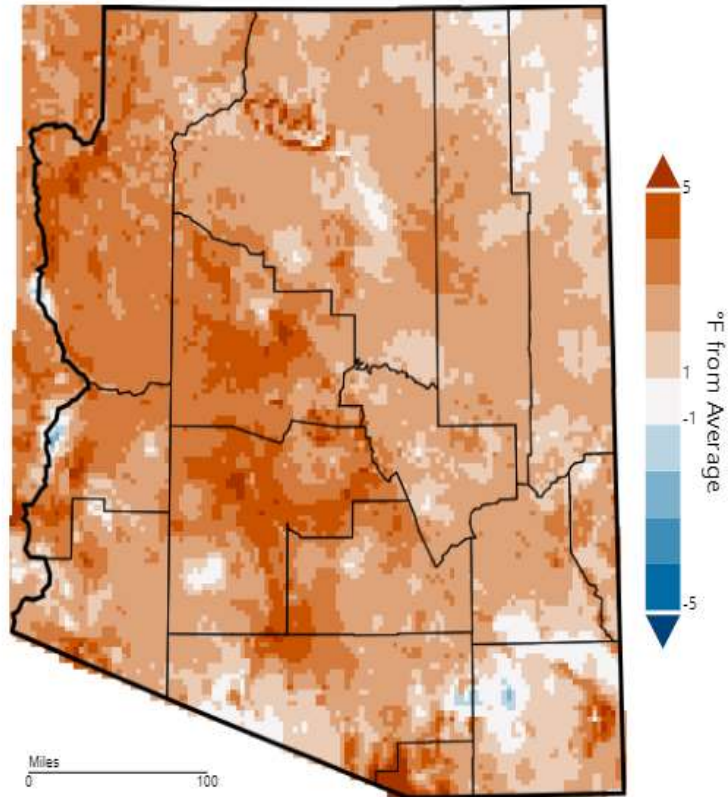
June-September 2024



Full Arizona Monsoon Summary

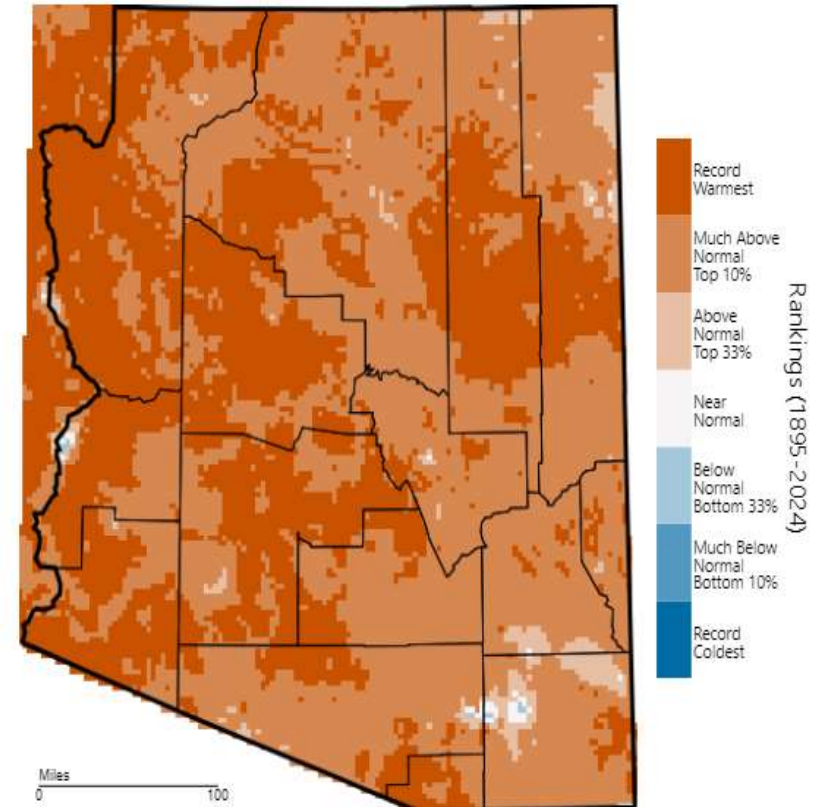
June-September 2024

Mean Temperature Departures from 1991-2020 Computed Average(s)



June-September 2024

Mean Temperature Percentile Ranking



Final Thoughts

- Another Monsoon dud for Maricopa County despite active and wet periods to the season for much of AZ. Summer 2024 was **HOT** and we continue break what many of us thought were unbreakable records.
- 2024 was the 3rd driest season across Maricopa County in 40+ years but still saw more than 2X the rainfall compared to 2020!
- Monsoon Recap & Forecast Verification Report available in October here: <https://www.maricopa.gov/759/Publications>



What Questions Do You Have?



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maricopa.gov/weather



@maricopaflood

