



Monsoon 2025 Recap

Daniel Henz

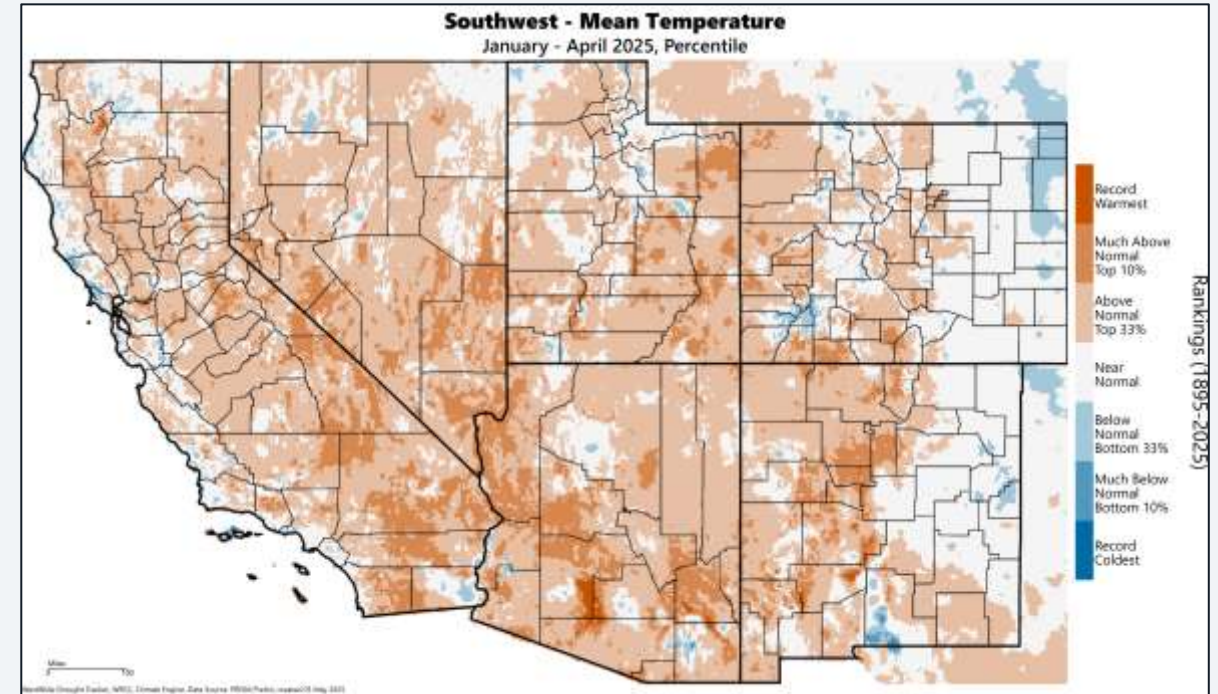
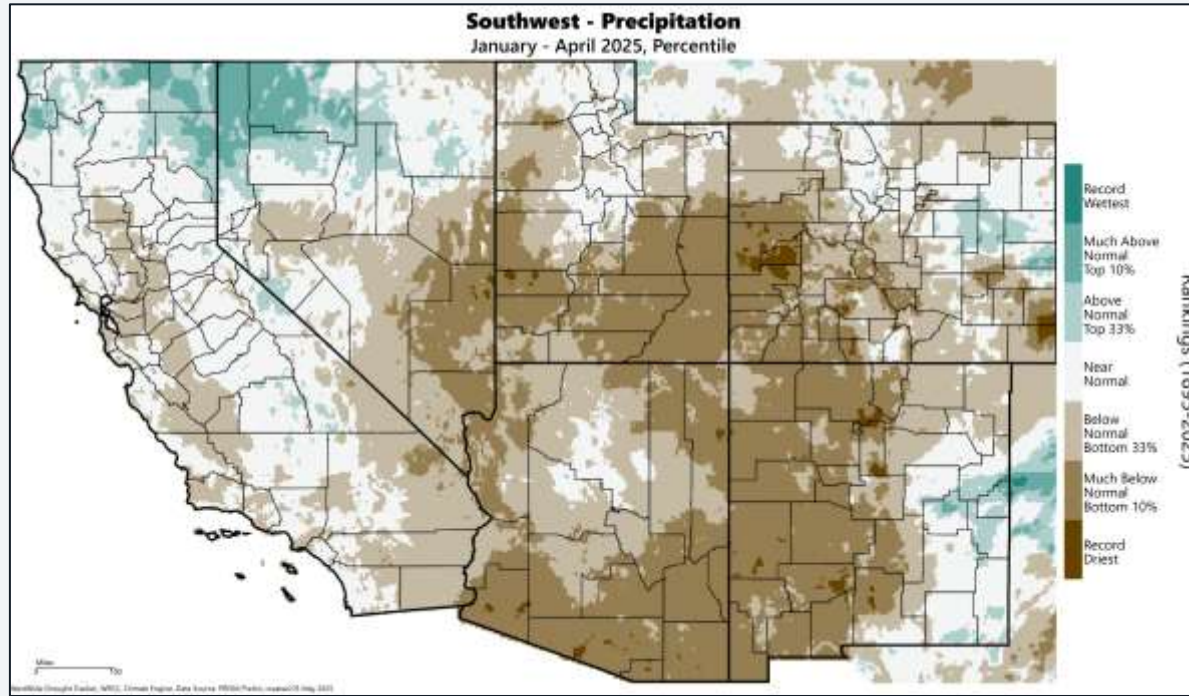
Flood Warning Program Manager





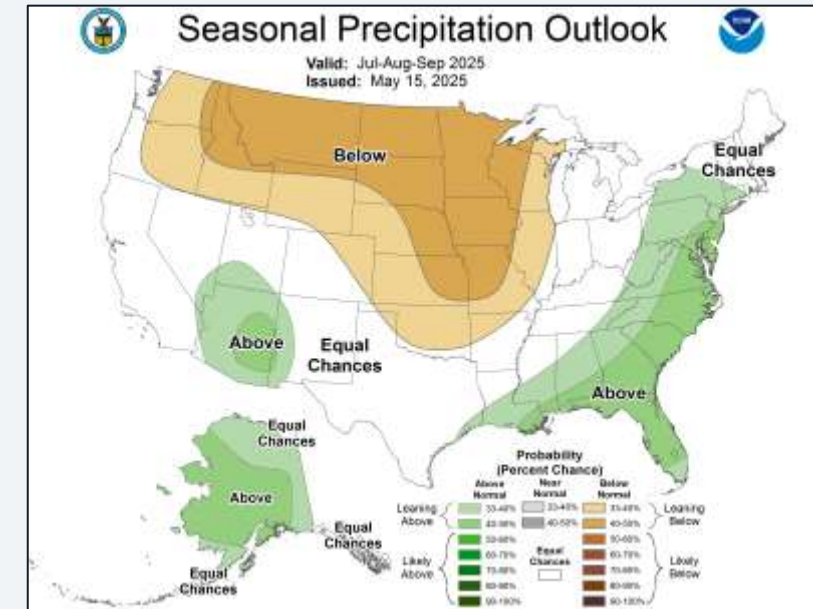
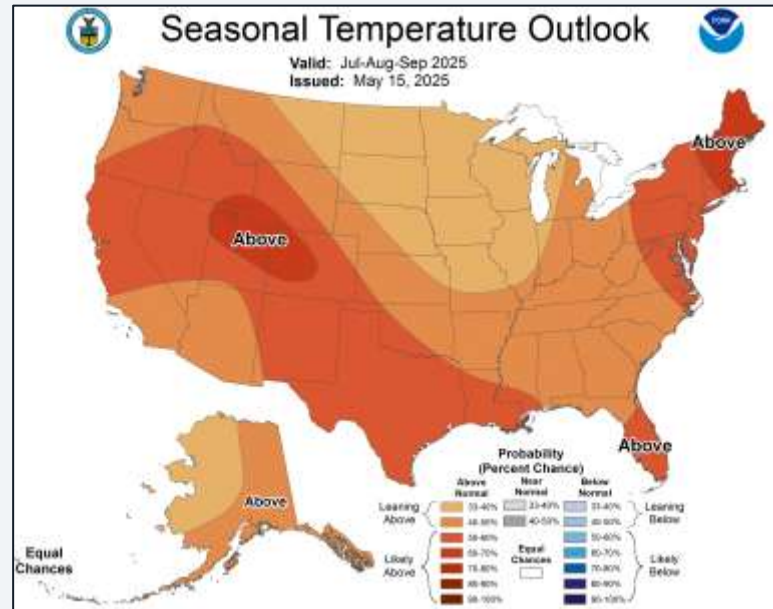
Monsoon Outlook

What we were thinking...



Hot and Dry antecedent Winter/Spring Seasons

NOAA/CPC 3-Month Outlook (JAS)



From Monsoon Outlook: 6/11/25

- Odds favor **Above Normal Temperatures** and **Above Normal Rainfall**
 - Conceptual evidence supports an established Monsoon Ridge with favorable southern Rockies placement (e.g., "Four Corners" region).
 - Normal onset anticipated (~ first week of July), but brief tropical moisture influxes beforehand can provide "false starts".
 - **ALERT rain days (>46)**
 - **Interior Phoenix Valley rain days (>18)**
 - **ALERT mean rainfall (>2.17")**



Monsoon Off To A Normal Start...

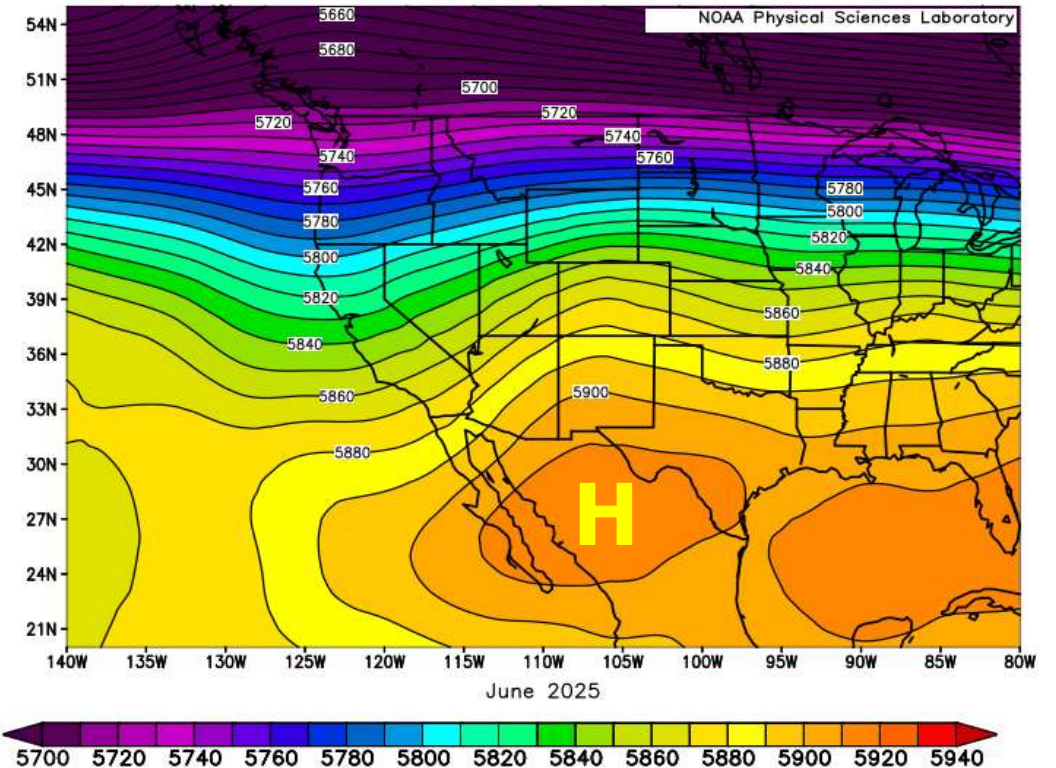
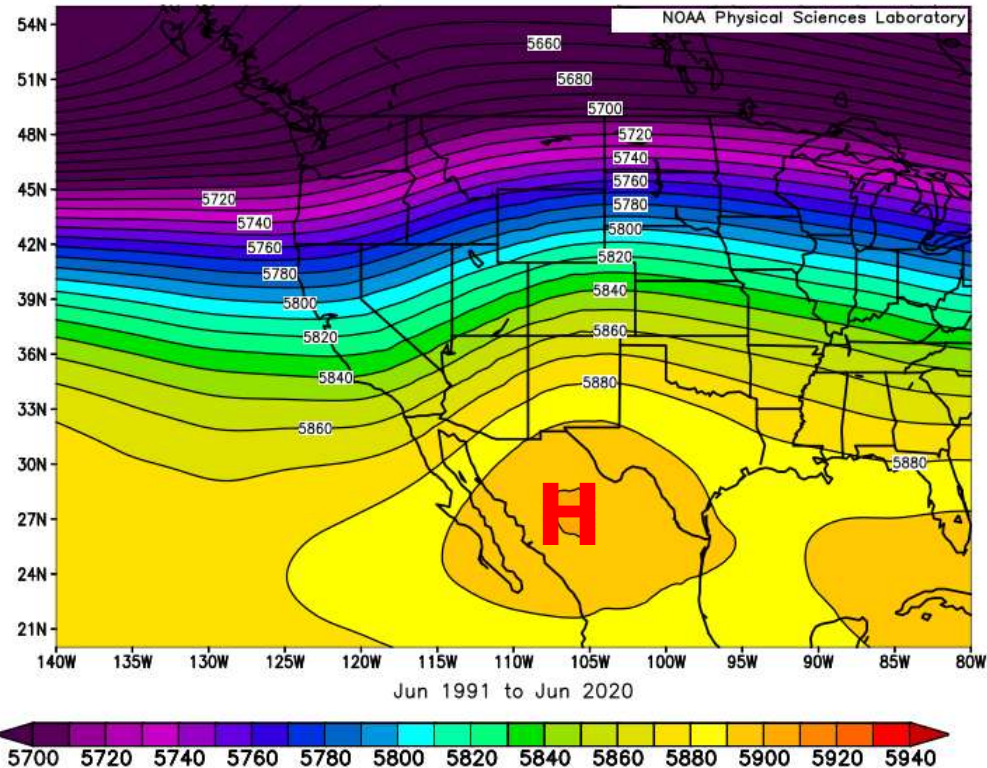
June Ridge Placement

June 1991-2020 Climatological Mean

June 2024 Mean Position

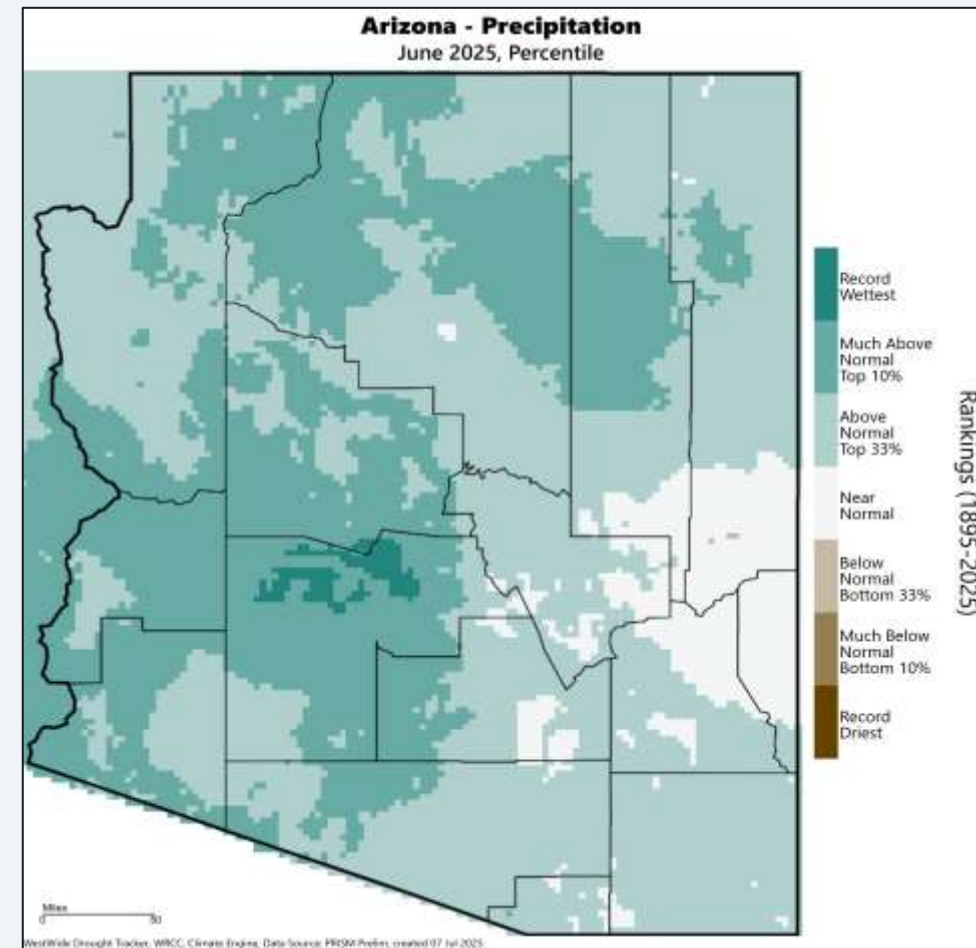
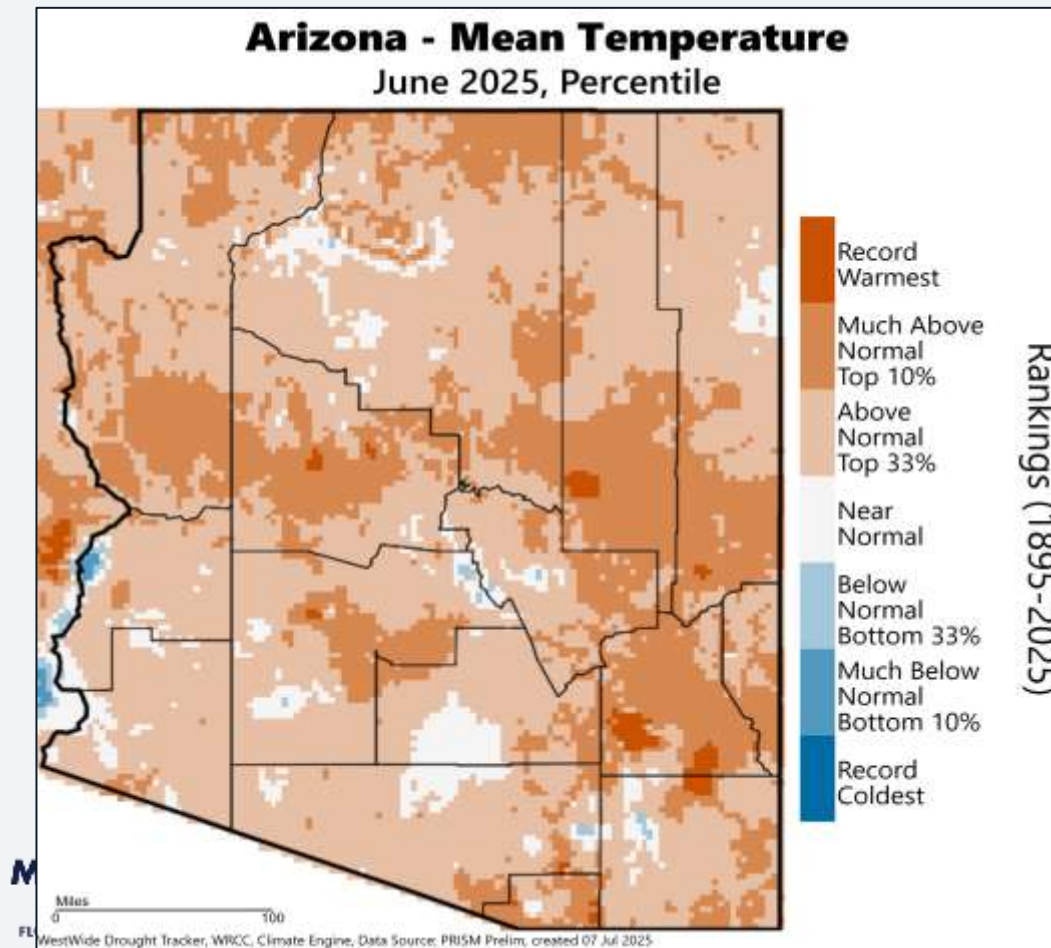
NCEP North American Regional Reanalysis
Geopotential Height (m) Composite Mean

NCEP North American Regional Reanalysis
Geopotential Height (m) Composite Mean



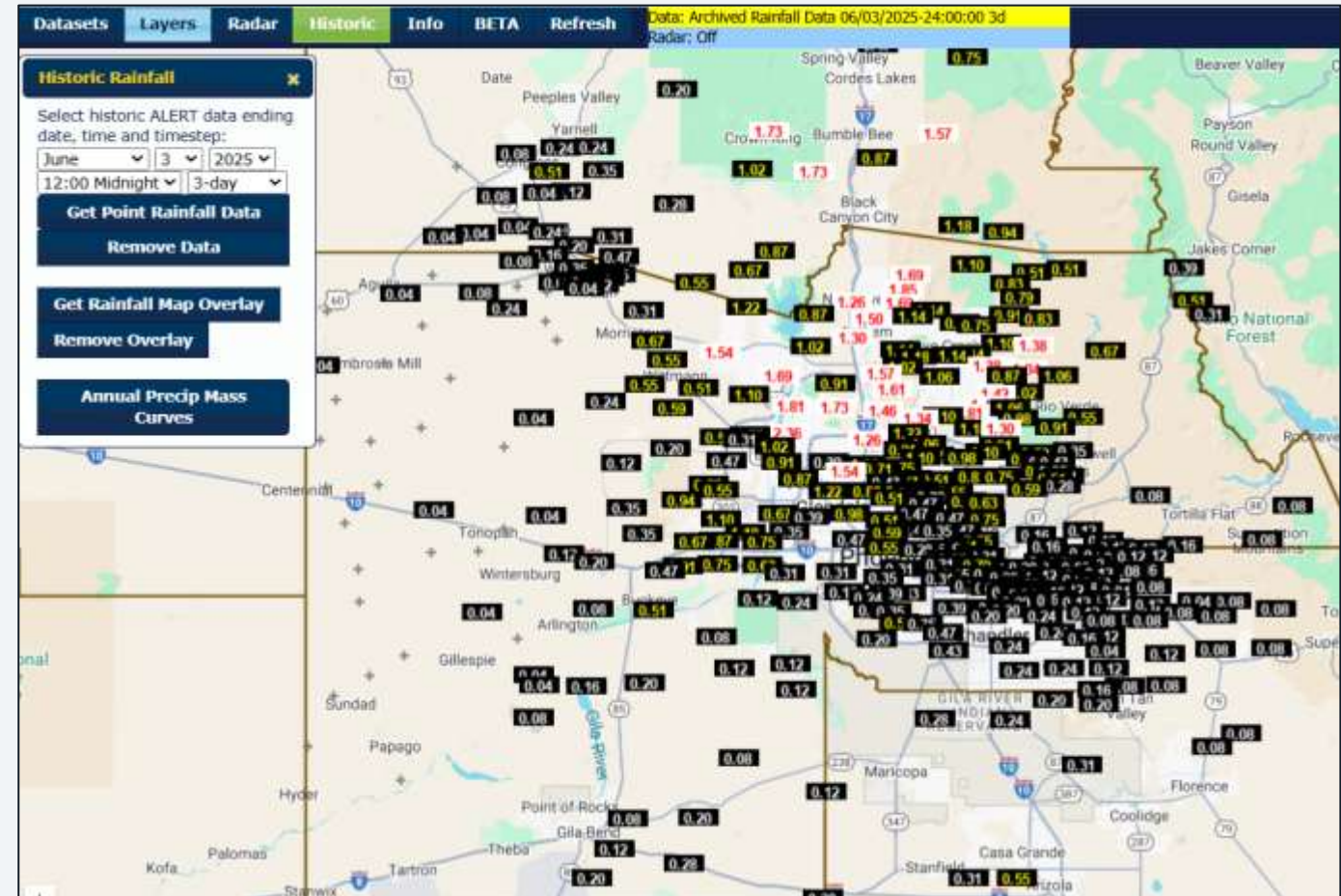
June was Hot and Active...

Above Normal Temperatures and Rainfall for most of AZ

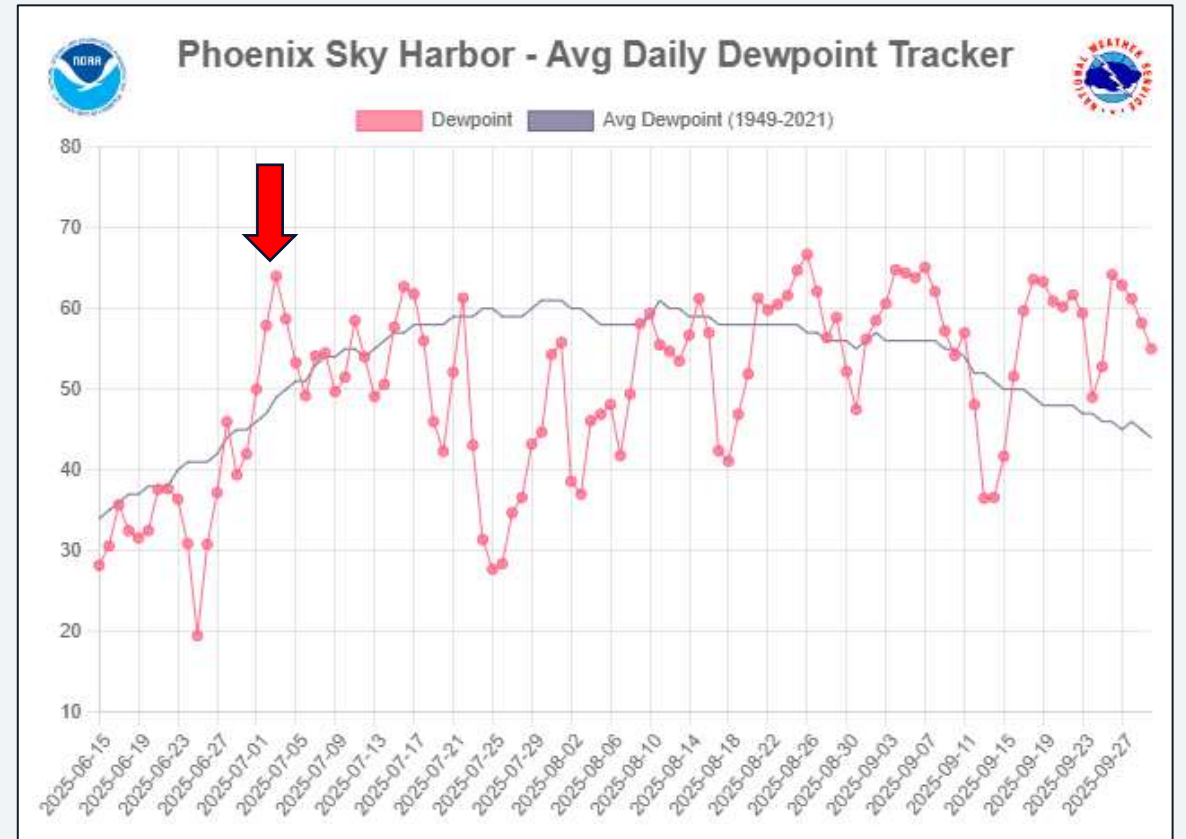
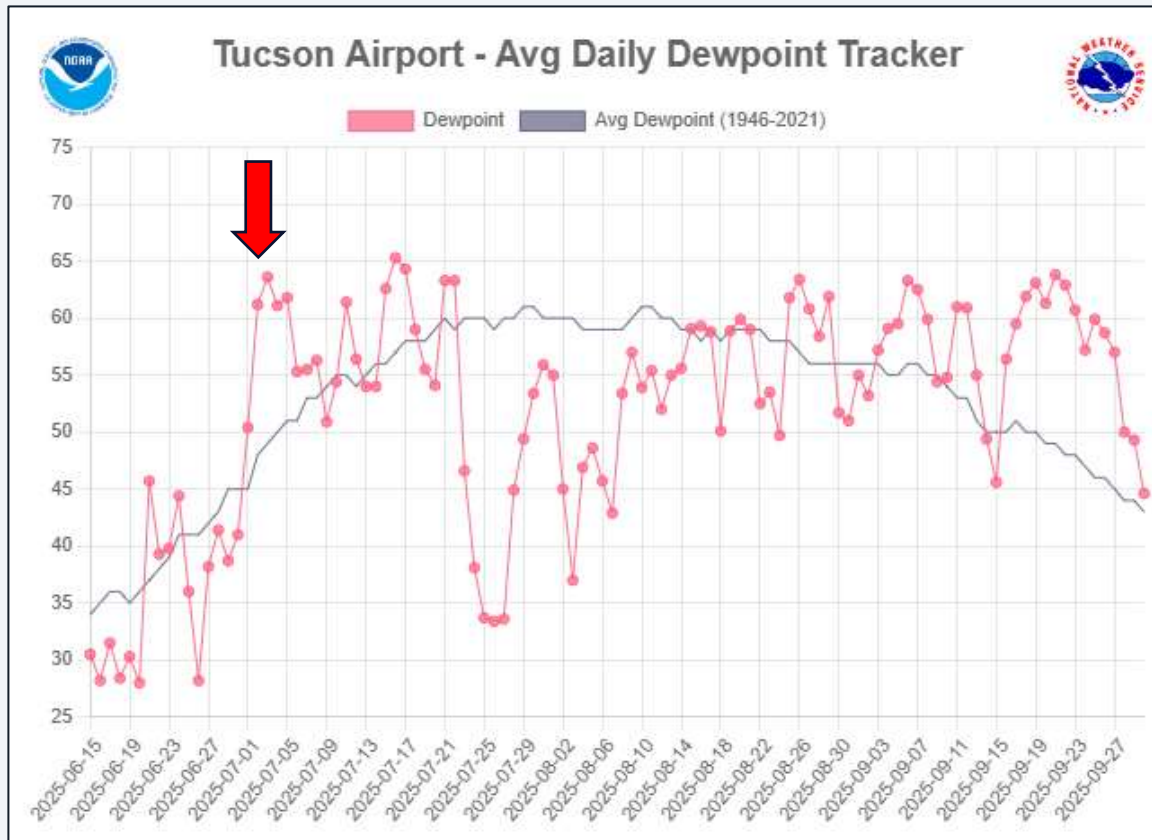


Large Assist From TS Alvin...

Alvin's Track



Monsoon Moisture Tracker





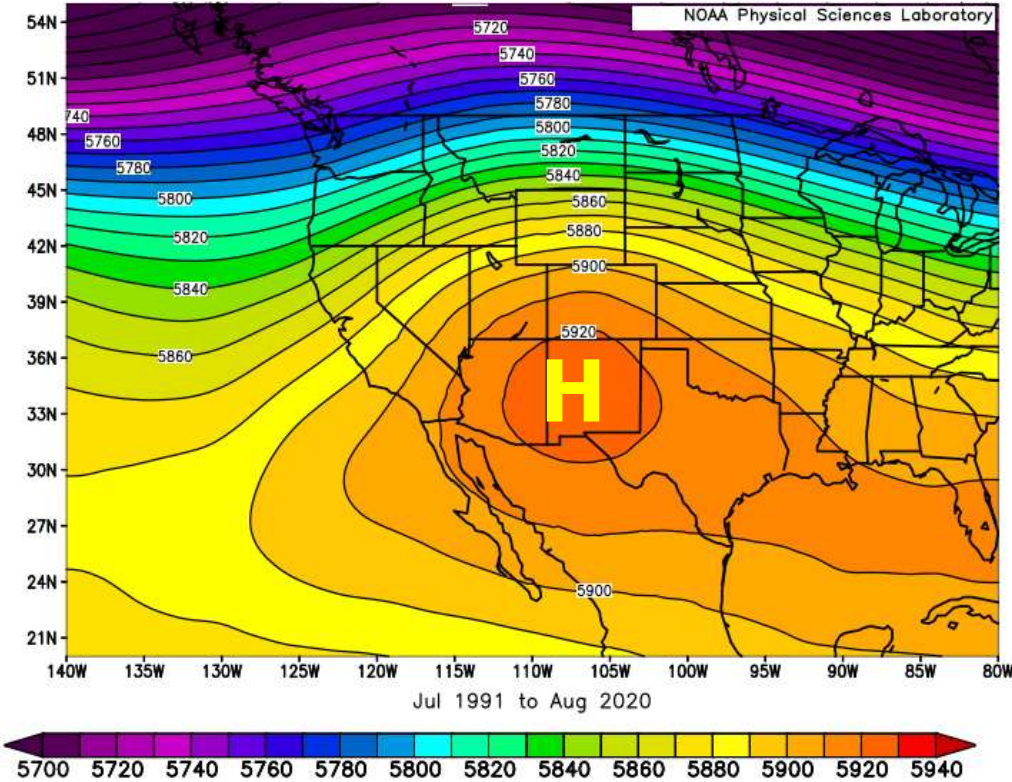
Another Hot Summer?

Sentiment: Kind of...
Reality: It was HOT!

Monsoon Ridge Seasonal Placement

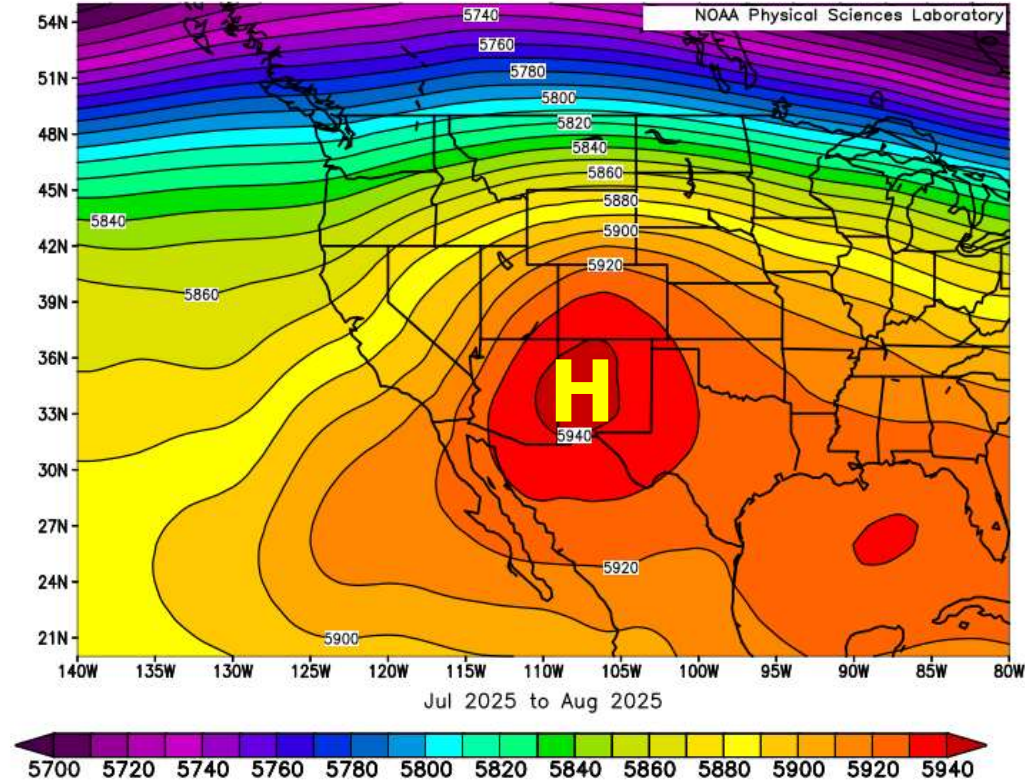
July-August 1991-2020 Mean

NCEP North American Regional Reanalysis
Geopotential Height (m) Composite Mean



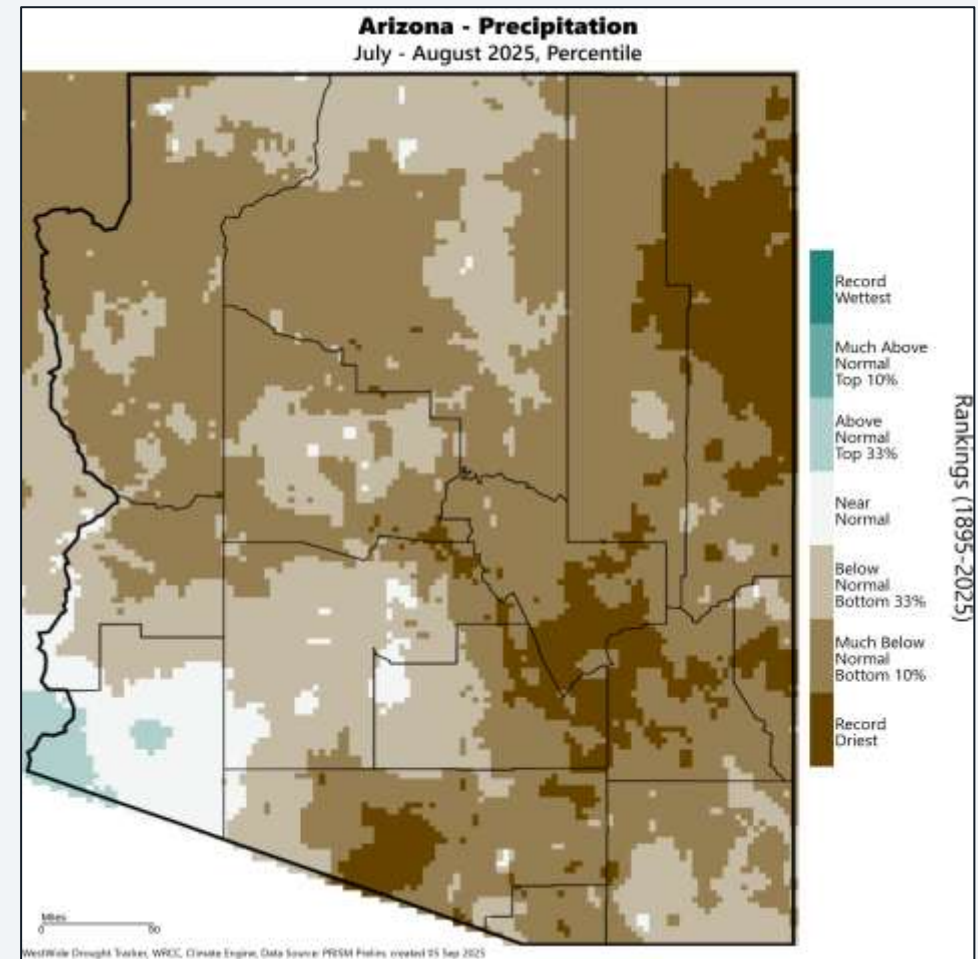
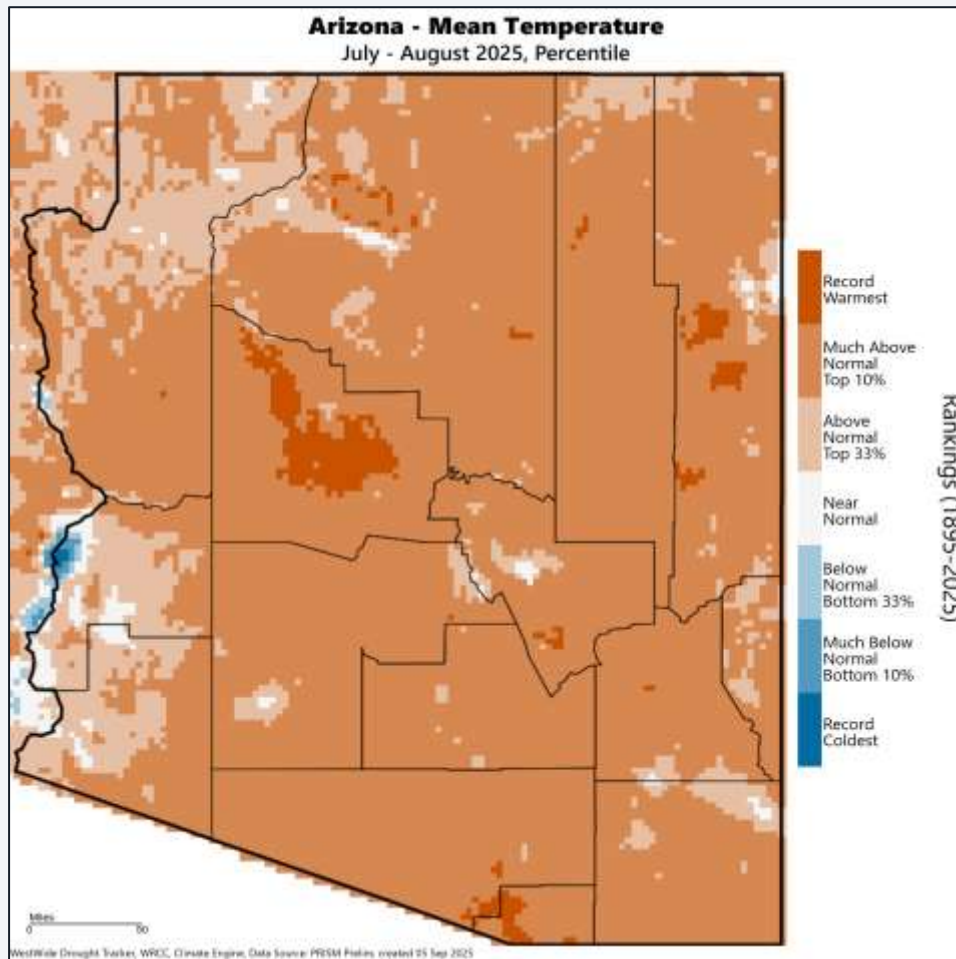
July-August 2025 Mean Position

NCEP North American Regional Reanalysis
Geopotential Height (m) Composite Mean



July and August were hotter than you remember...

Well Above Normal Temperatures & Drier Conditions Prevail



June - August 2025



NWS Phoenix
@NWSPhoenix



Many people have commented they thought this summer was rather "mild". This is what acclimation & recency bias does when considering the past couple summers. In fact, summer 2025 was the 3rd warmest on record (since 1895) for the state w/ most counties in the top 5. #azwx

2:13 PM · Sep 9, 2025 · 34.1K Views

Phoenix, Arizona

Hottest Meteorological Summer (June-July-August) on Record**

Average Temperature	
Year	Average Temperature
2024	98.9 °F
2023	97.0 °F
2020	96.7 °F
2025	96.2 °F
2015 & 2013	95.1 °F

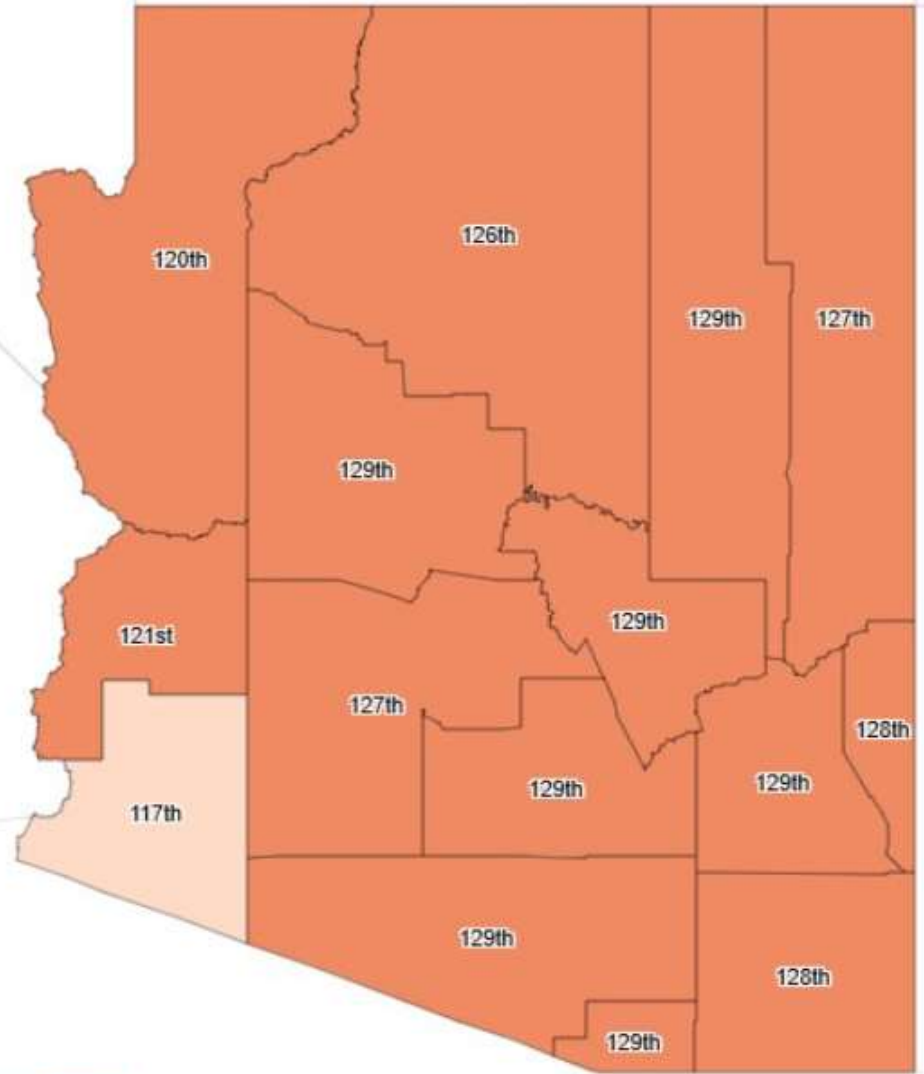
**Phoenix, AZ Records date back to 1896



NWS PHOENIX



County Average Temperature Rank (131 years)

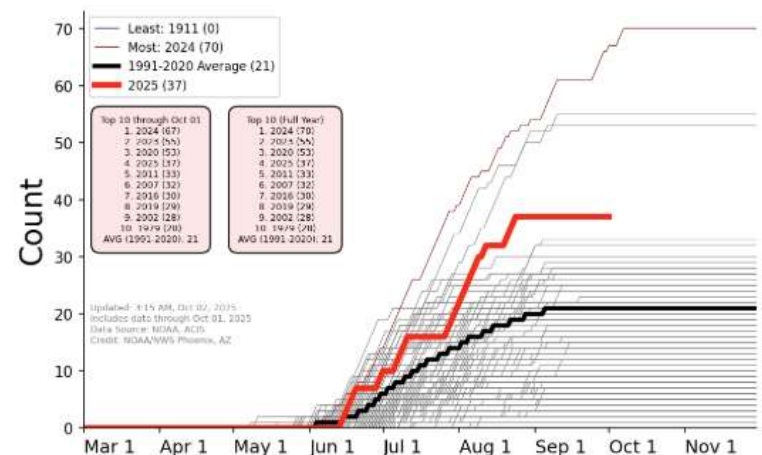


Coldest Near Normal Warmest

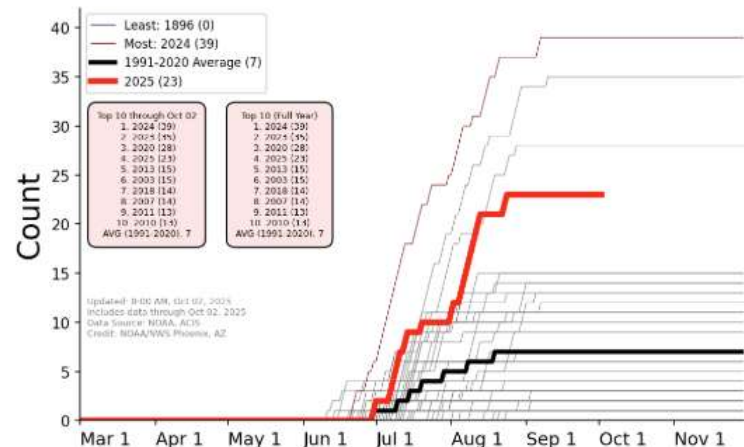
Arizona (Hover over a County)

Temp Anomaly:3.4°F Rank:3rd Warmest Mean:77.3°F

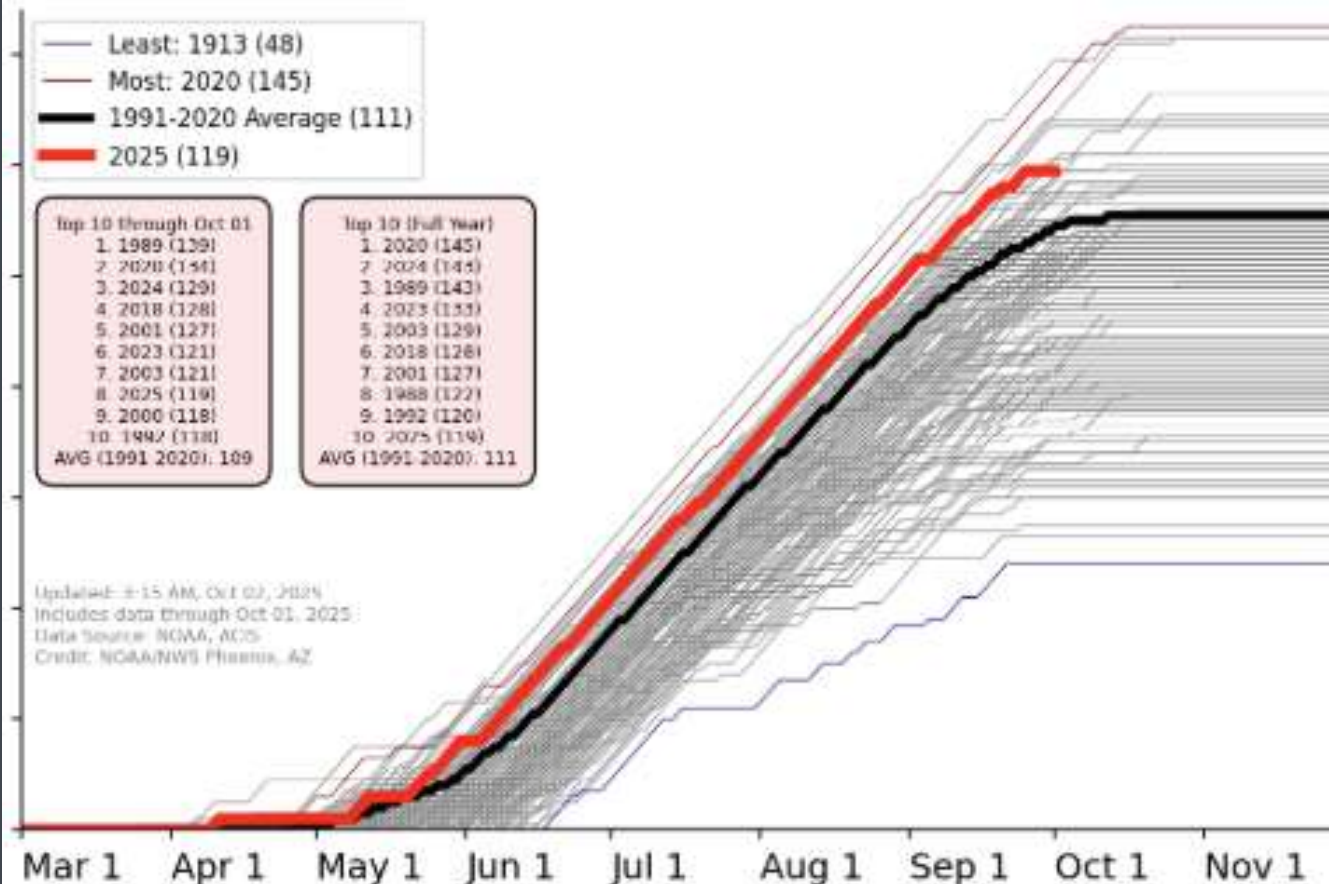
Days with Maximum Temperatures 110 ° F+ in Phoenix, AZ



Days with Minimum Temperatures 90 ° F+ in Phoenix, AZ



Days with Maximum Temperatures 100 ° F+ in Phoenix, AZ

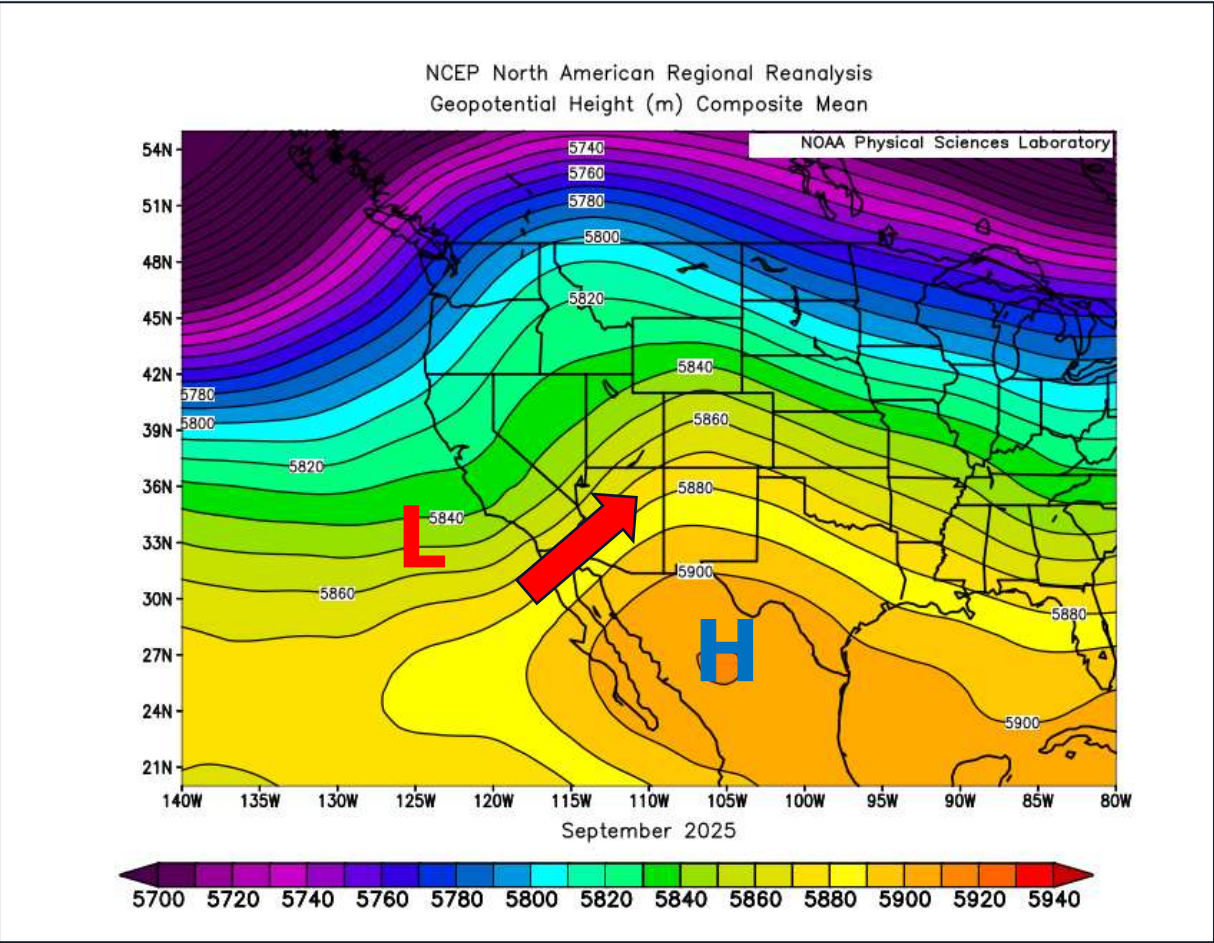




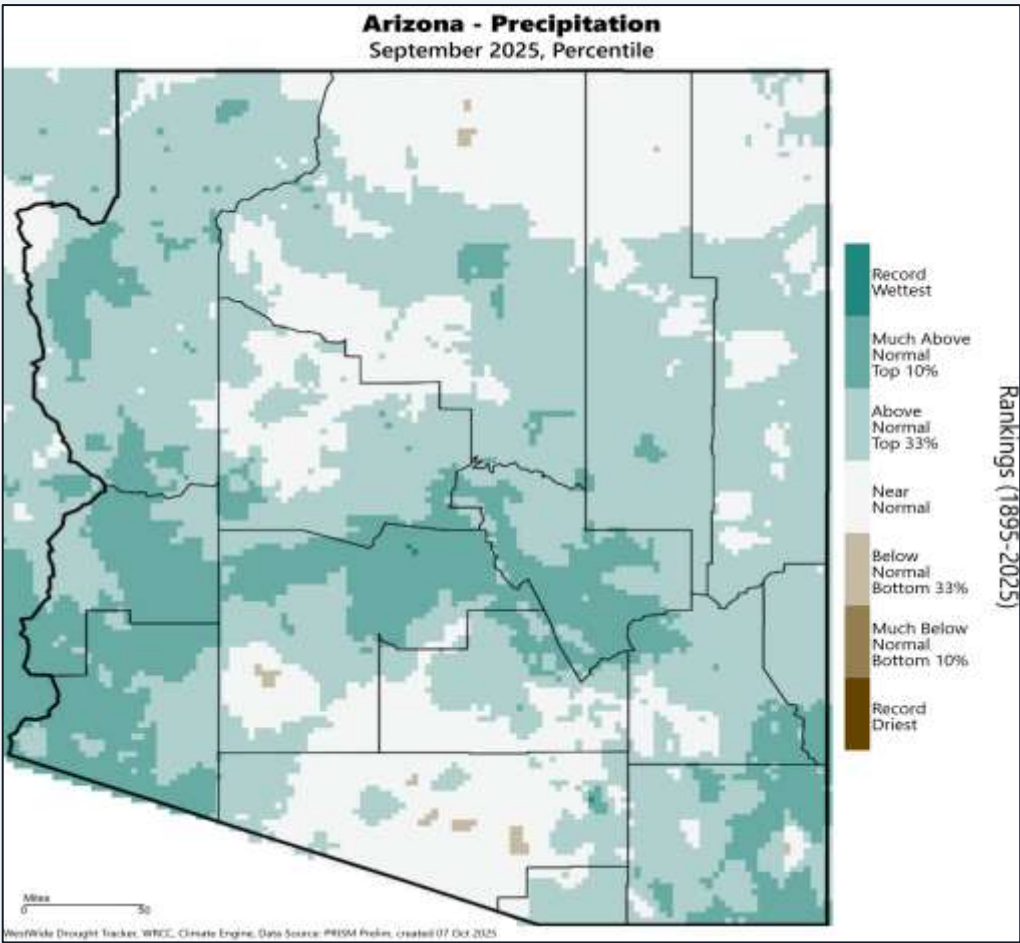
September
Turn on the Faucet...

Monsoon Type IV Pattern in Sept

September 2025 Mean Position



September Precipitation Percentile



Historic Rainfall ✕

Select historic ALERT data ending date, time and timestep:

September 27 2025

12:00 Midnight 3-day

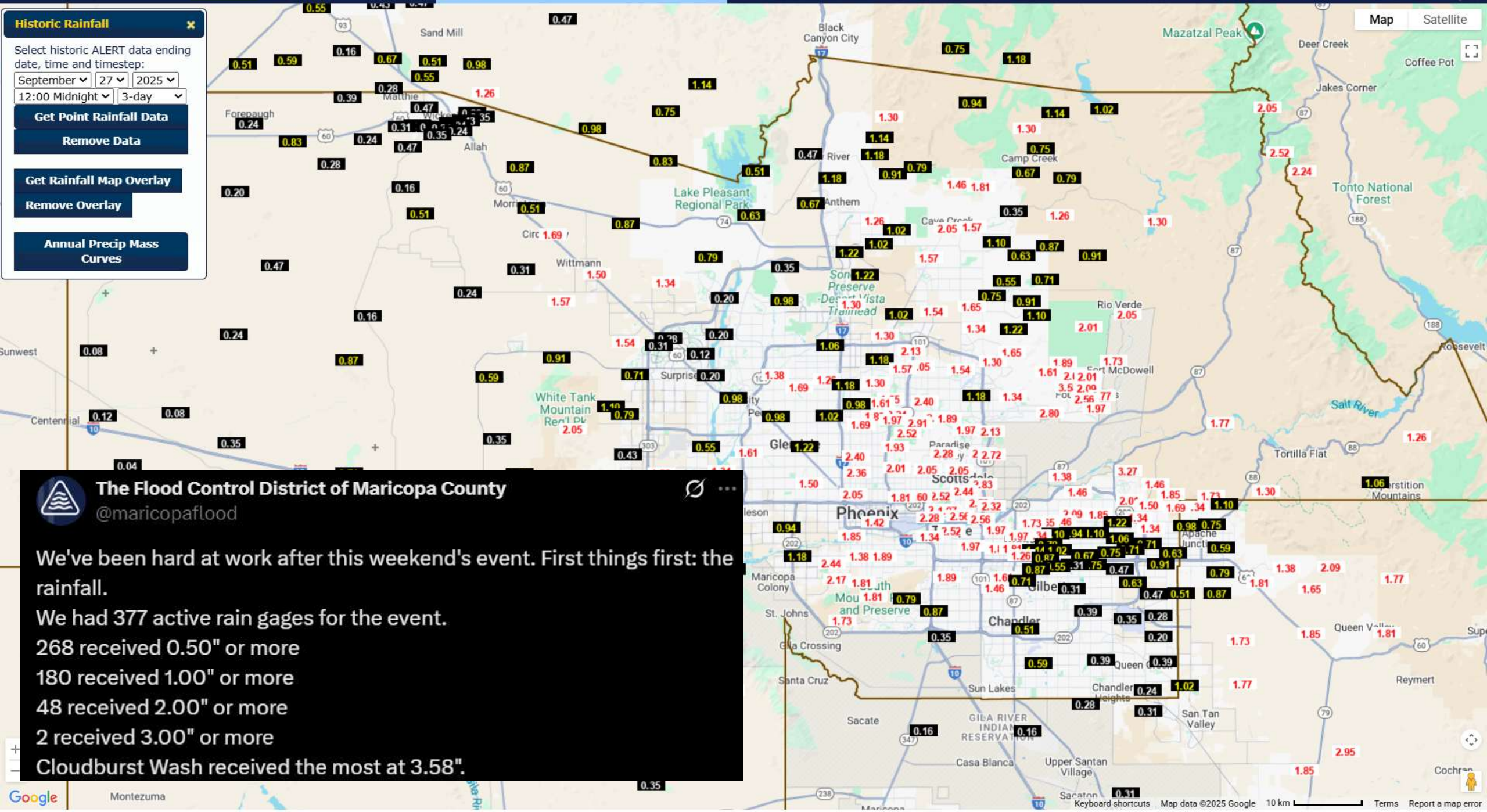
Get Point Rainfall Data

Remove Data

Get Rainfall Map Overlay

Remove Overlay

Annual Precip Mass Curves



The Flood Control District of Maricopa County
@maricopaflood

We've been hard at work after this weekend's event. First things first: the rainfall.

We had 377 active rain gages for the event.

268 received 0.50" or more

180 received 1.00" or more

48 received 2.00" or more

2 received 3.00" or more

Cloudburst Wash received the most at 3.58".



Monsoon Rainfall...

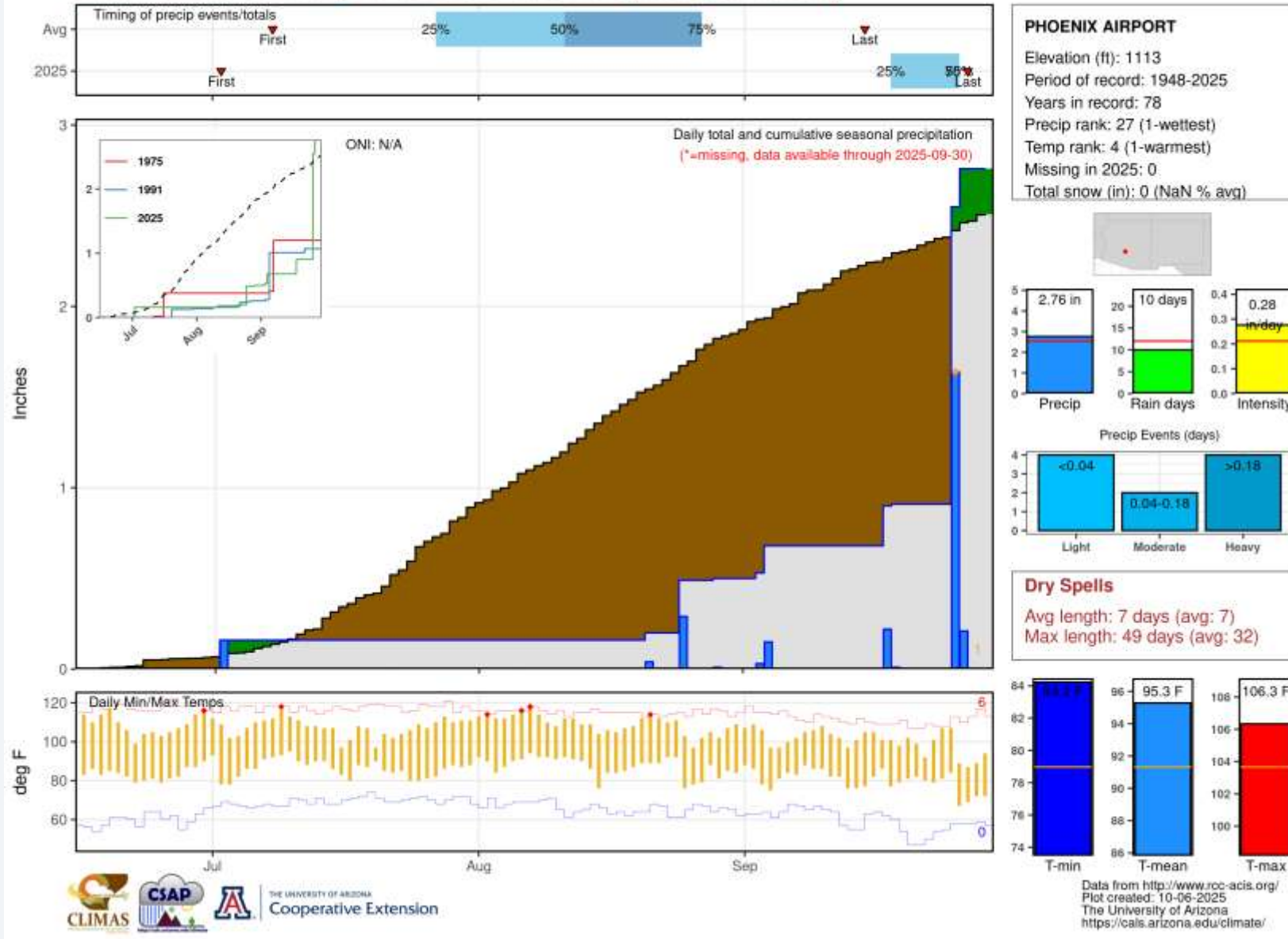
How did we compare?

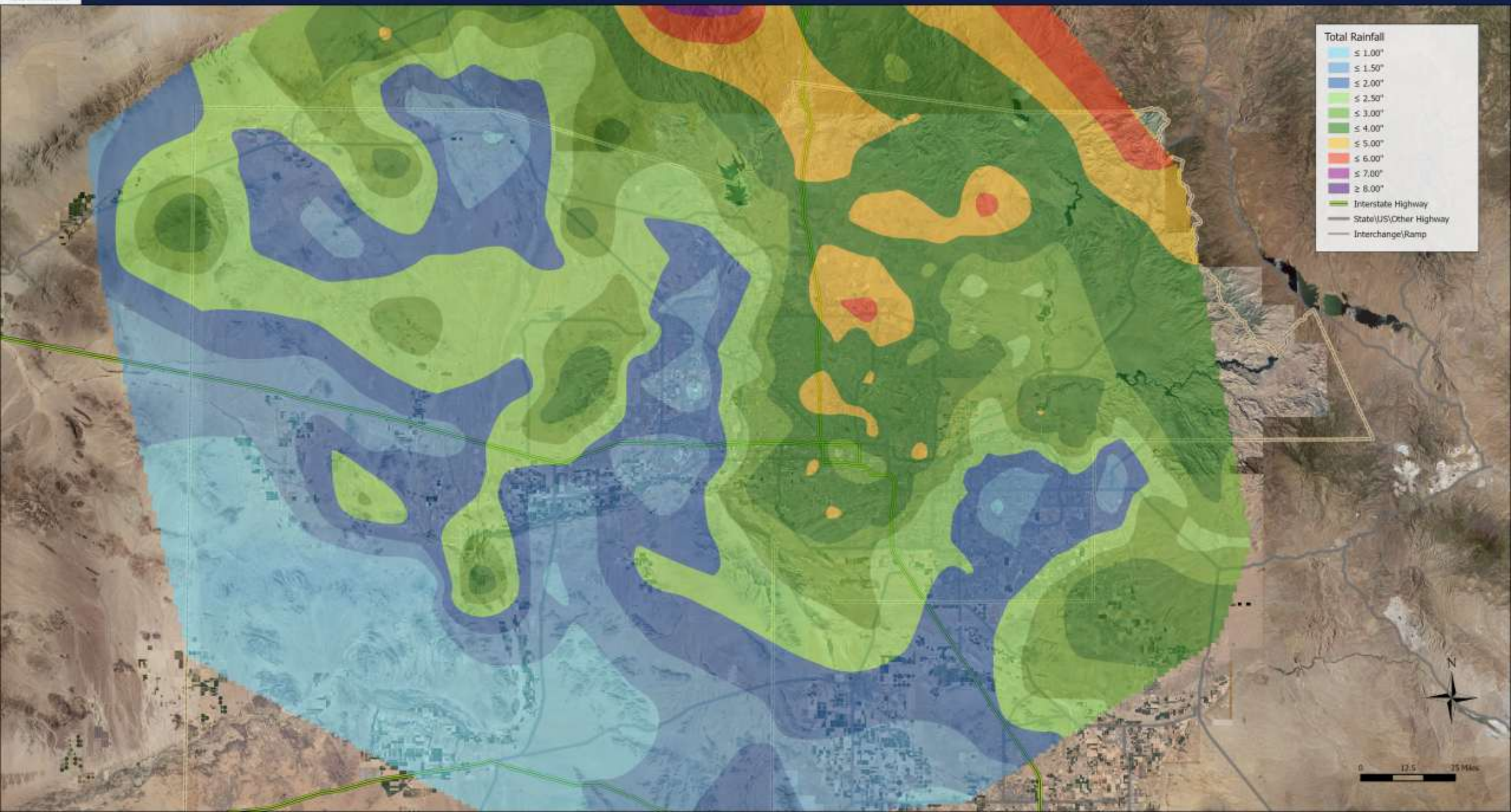
Starting with Phoenix Sky Harbor...

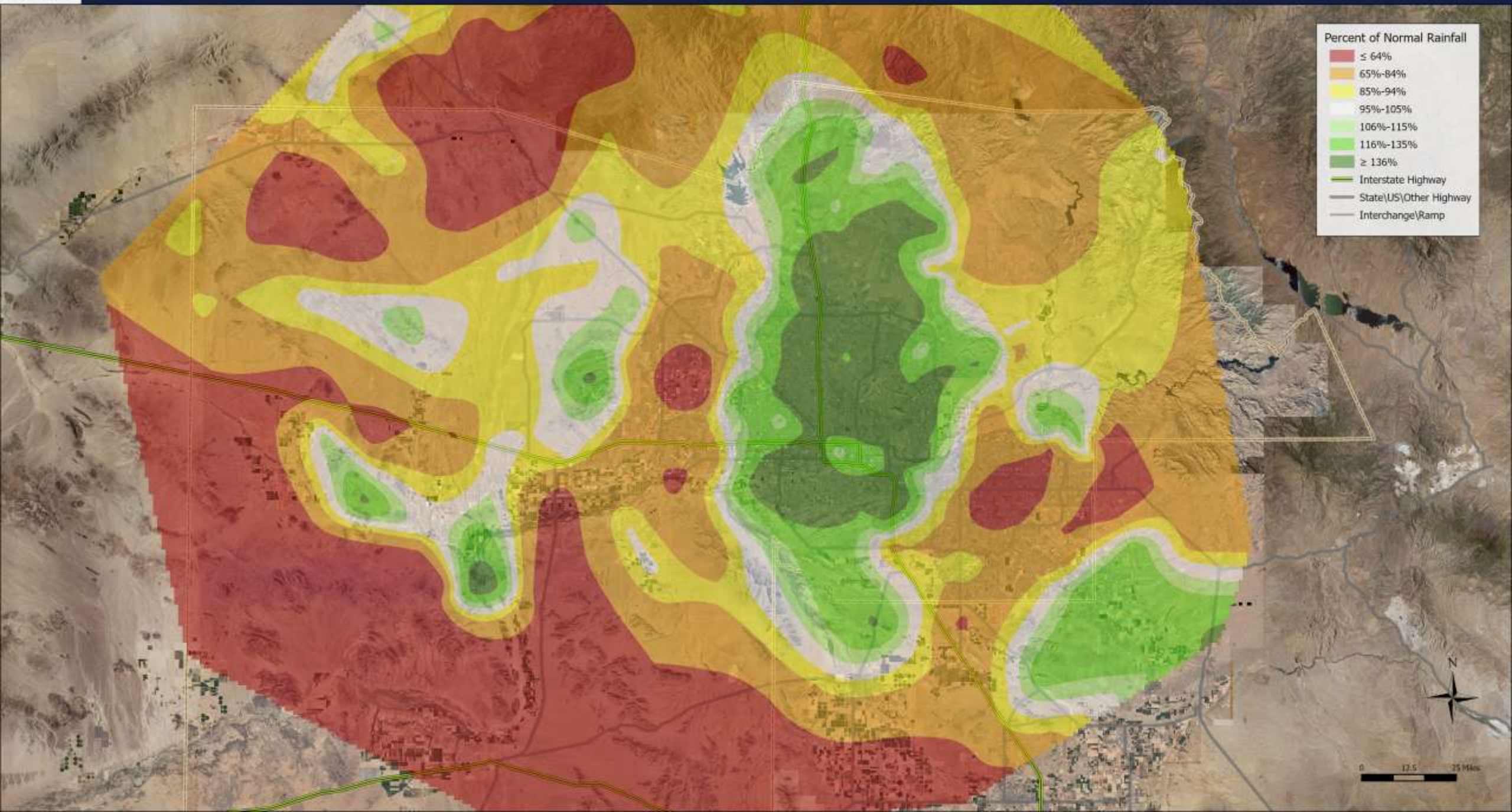
Monsoon Statistics for Phoenix Sky Harbor (1896 - 2024)

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

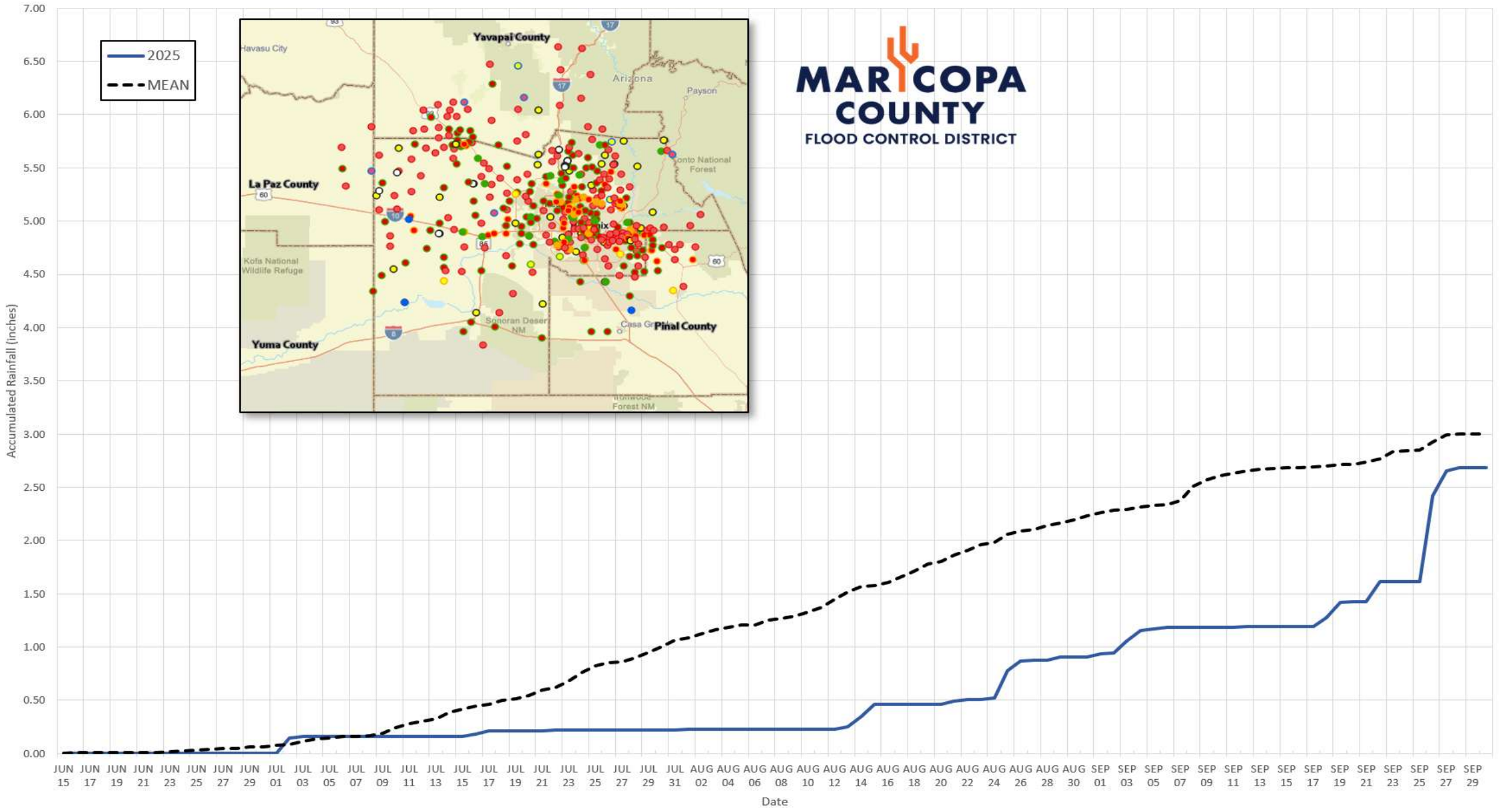
Station Climate Summary: 06-15-2025 to 09-30-2025 (Monsoon Season)



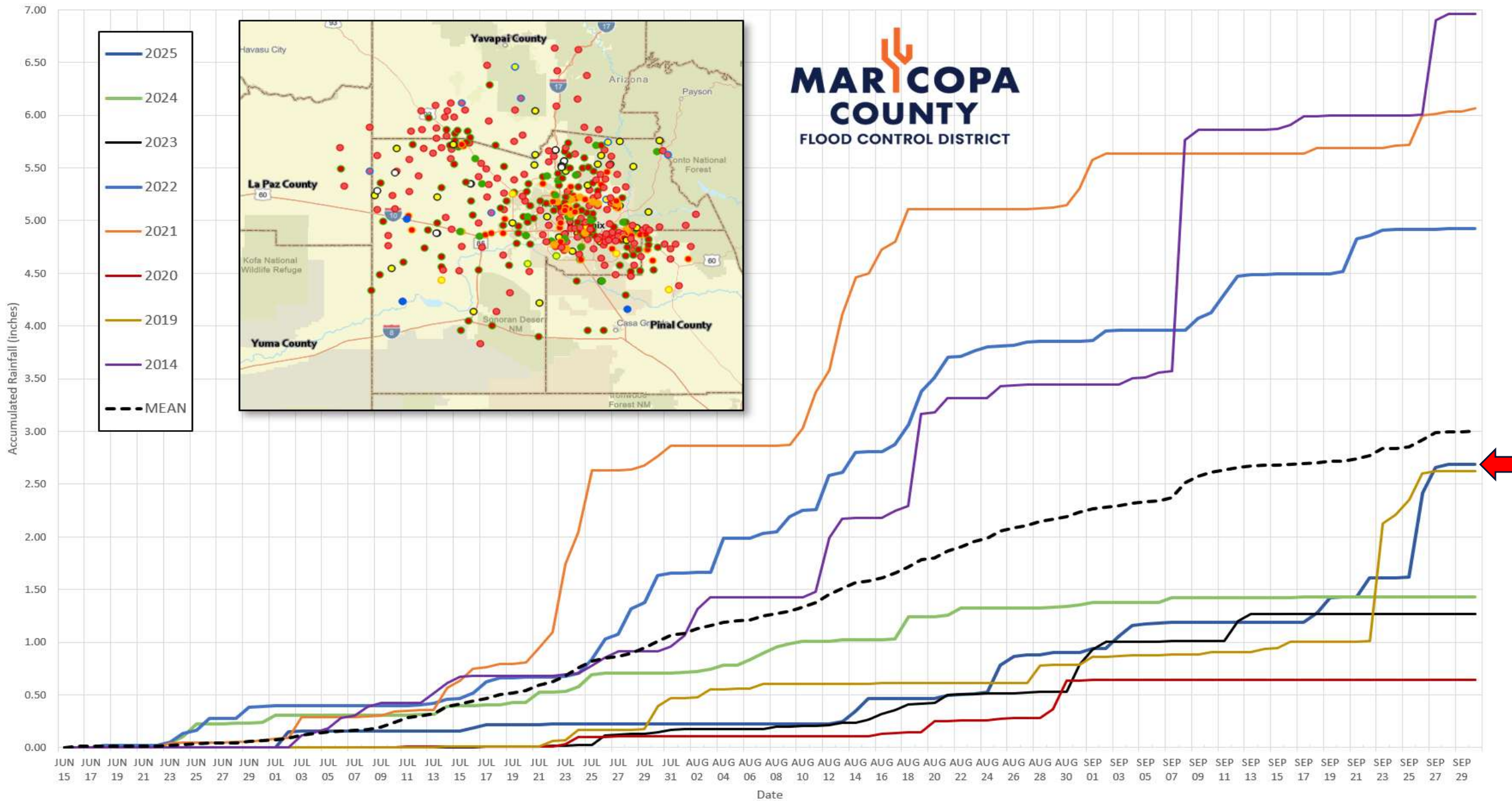




Central AZ Accumulated Mean Monsoon Rainfall - 2025 and 18-Year Mean (297 Index Gages)

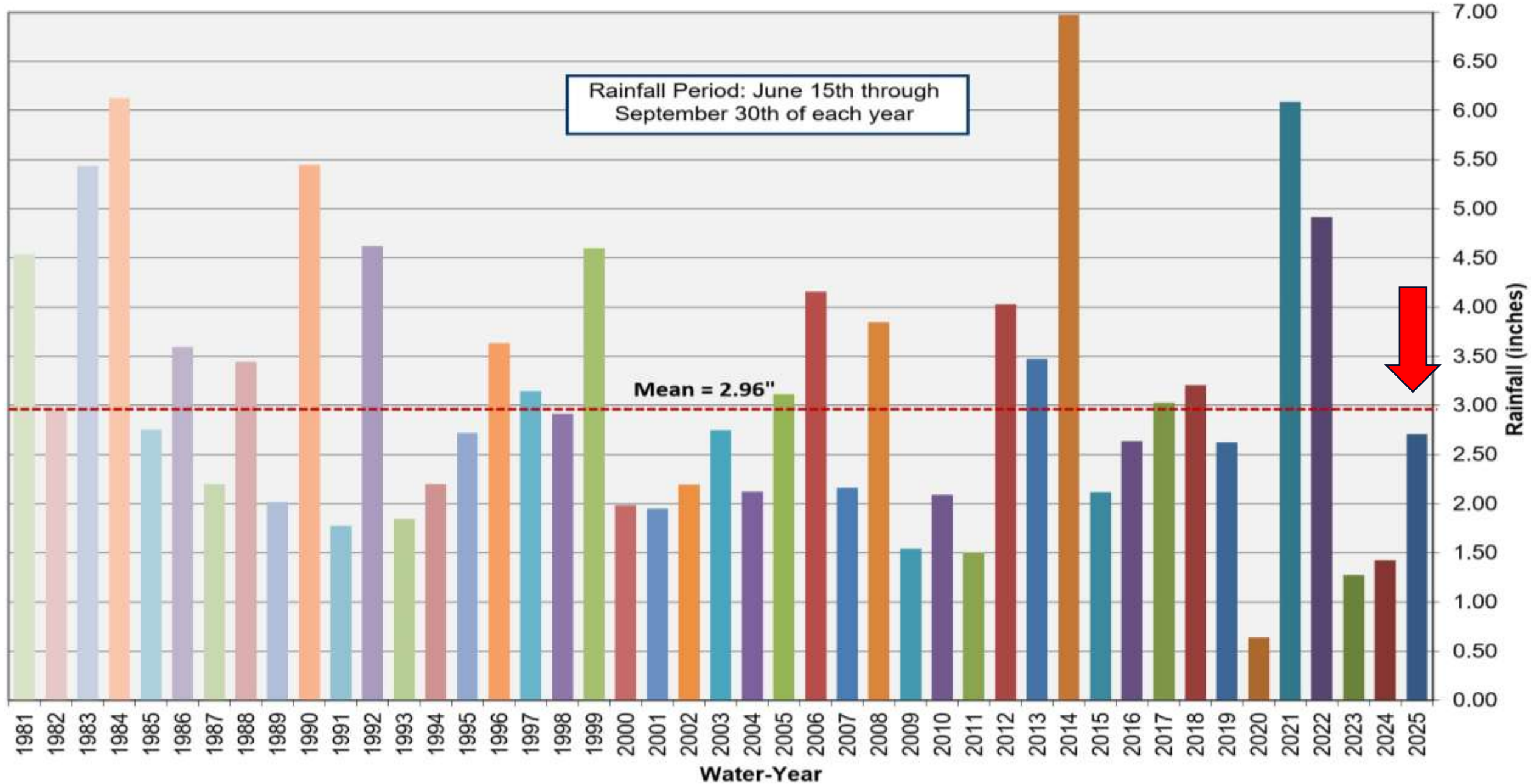


Central AZ Accumulated Mean Monsoon Rainfall - Years of Note (297 Index Gages)



Average Summer Thunderstorm (Monsoon) Season Rainfall - Past 45 Years

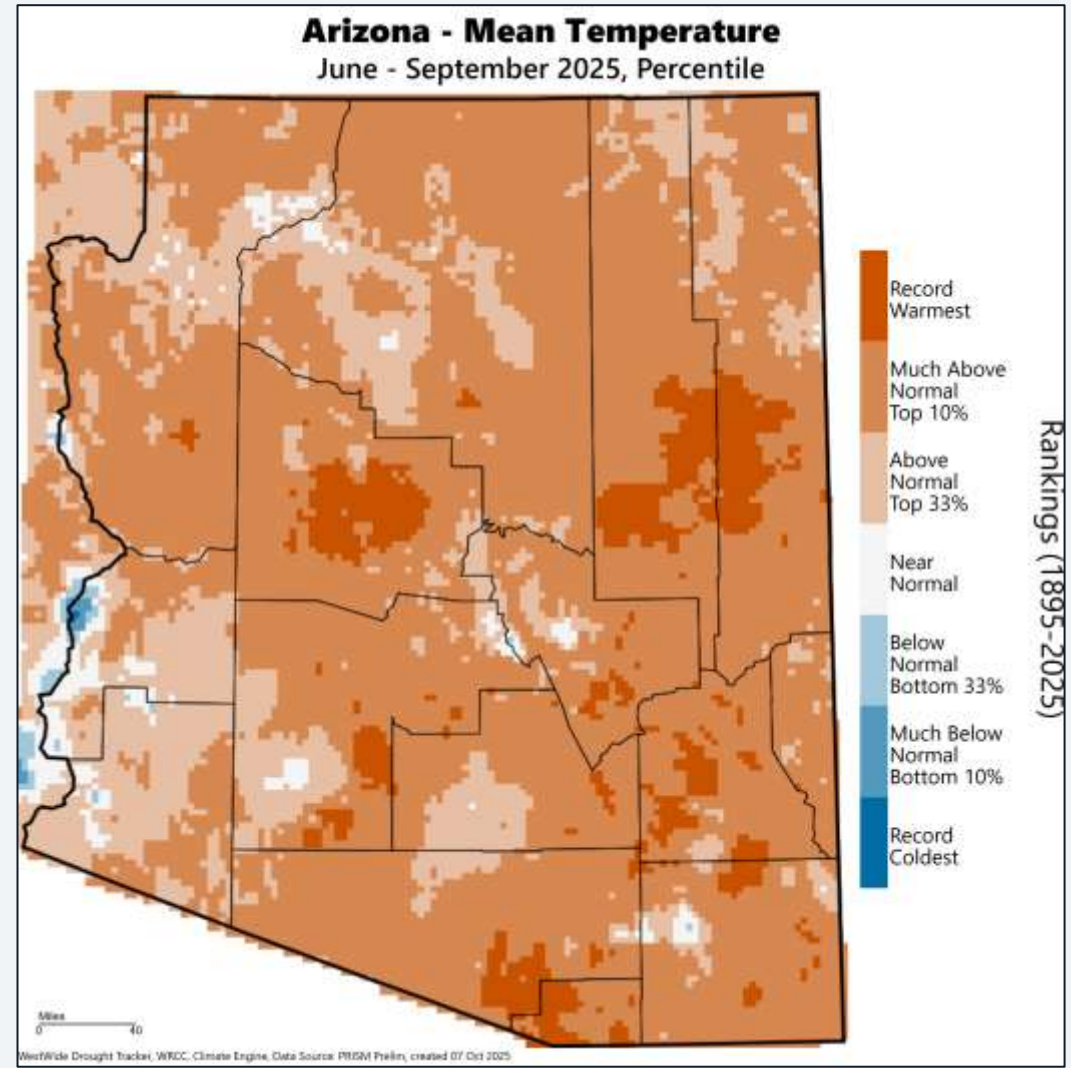
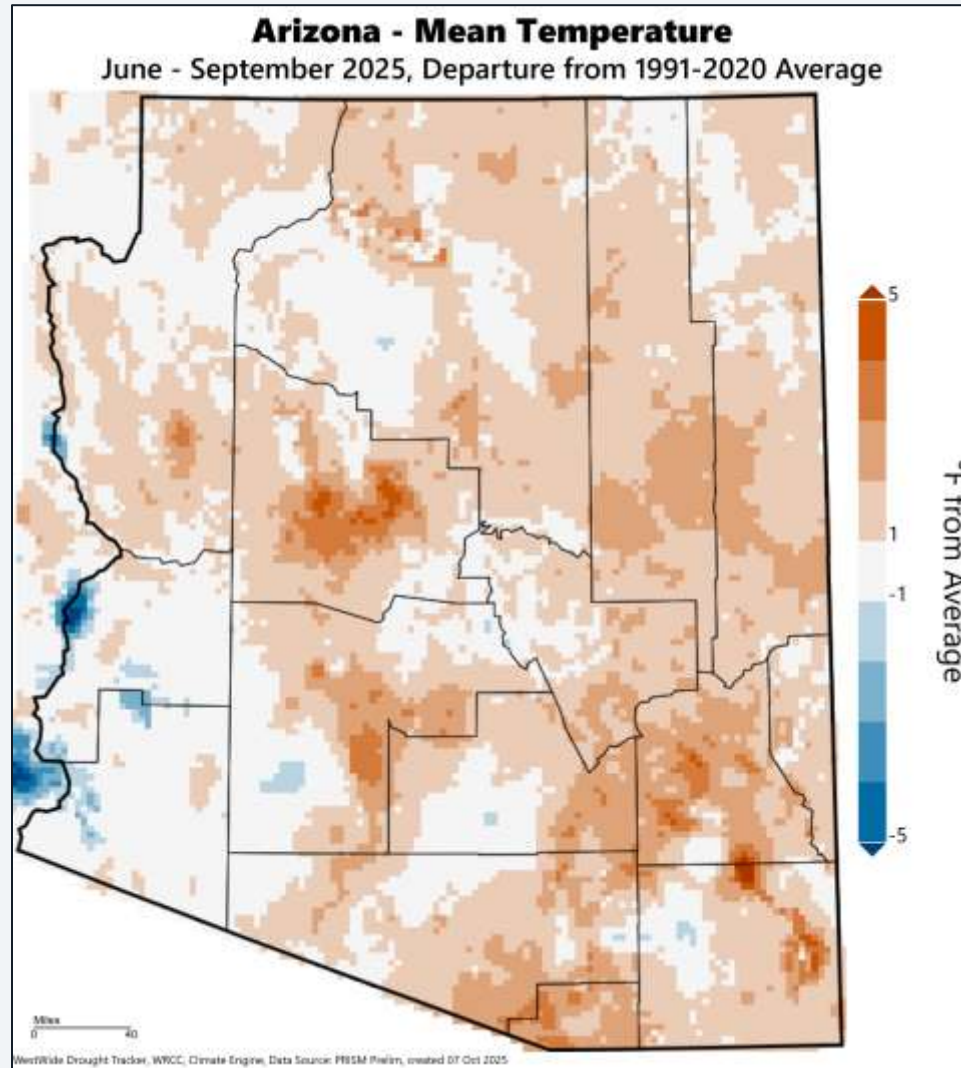
Flood Control District of Maricopa County ALERT Rain Gages



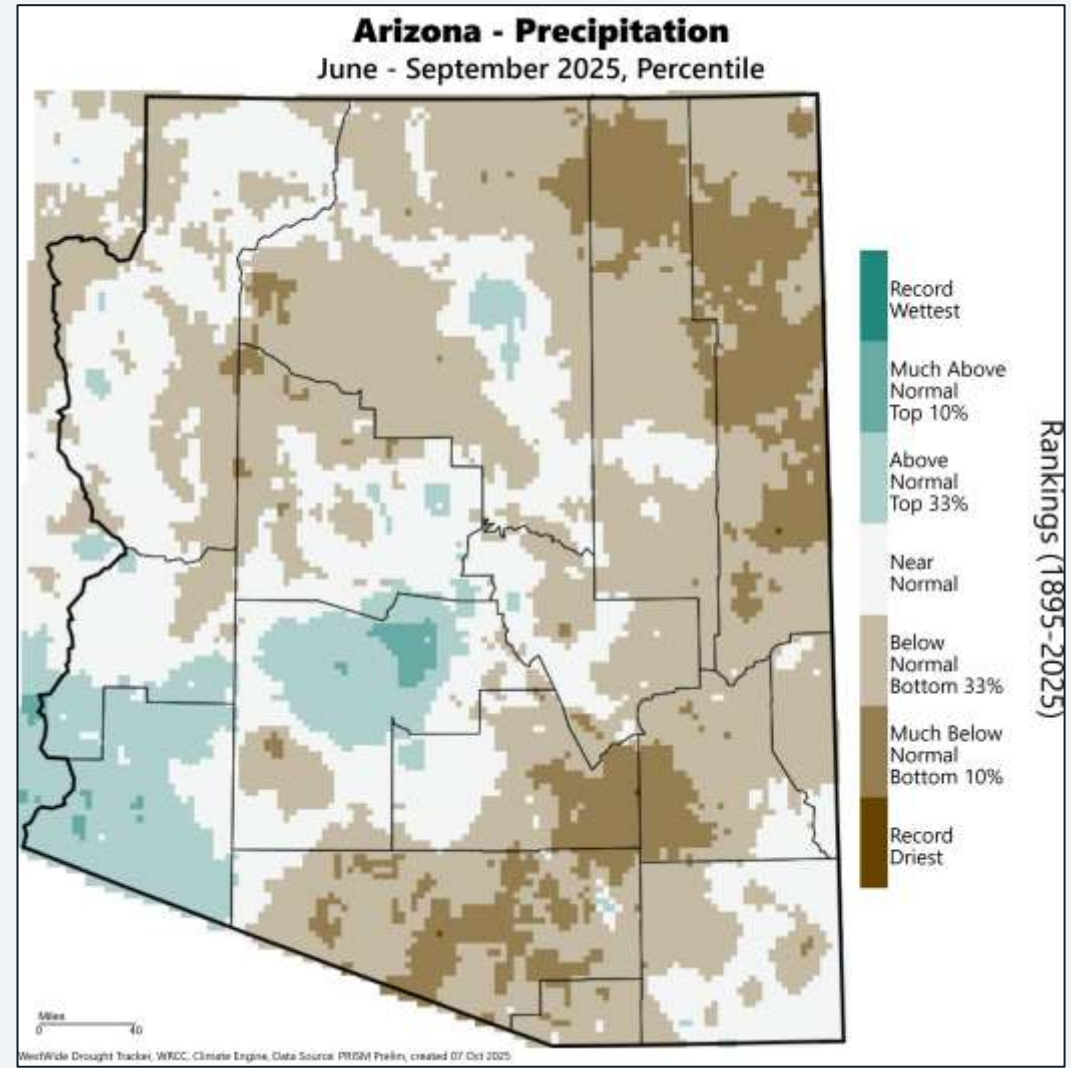
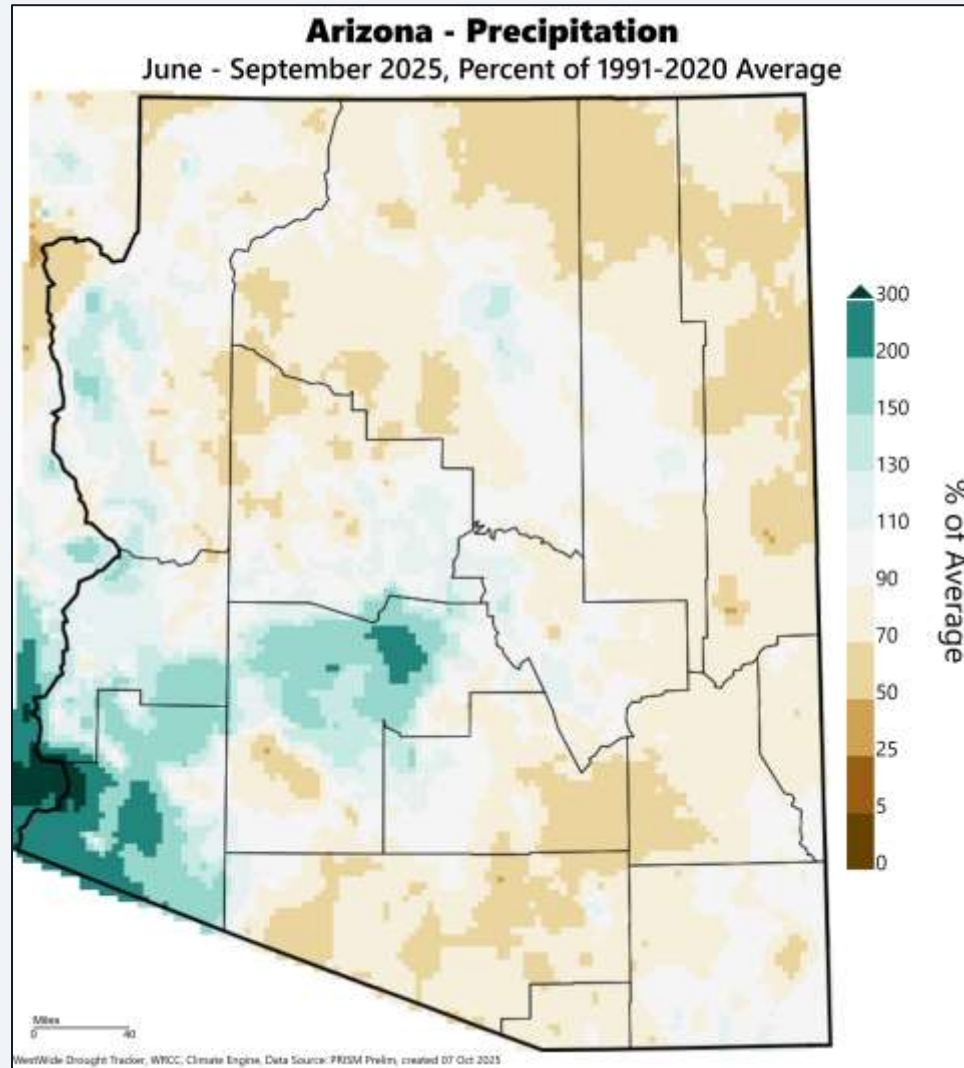


Full Arizona Monsoon Summary

Full Arizona Monsoon Summary



Full Arizona Monsoon Summary



Final Thoughts

- A return to a more active & wet monsoon for Maricopa County “heavily” aided by late season events. Summer 2025 was **HOT** across most of AZ, despite feeling like a reprieve from 2023 & 2024.
- Fun Facts: 80% of the Maricopa County season total fell after 8/15, 63% after 9/1, and 53% of season total was from the 9/25-9/27 event.
- Monsoon Recap & Forecast Verification Report available in October here: <https://www.maricopa.gov/759/Publications>

Shameless Plug...

Monsoon Recap - Deep dive including several major rain/flood events from this summer and fall



CENTRAL ARIZONA CHAPTER
American Meteorological Society
National Weather Association

Monsoon Wrap-Up!
Dan Henz,
Flood Warning
Program Manager,
Flood Control District
of Maricopa County



Wednesday,
October 22nd
6:00pm - 8:00pm

Salt River Project
1500 N Mill Ave, Tempe
FREE PARKING

 Central AZ AMS |  @CentralAZAMS | nwas.org | ametsoc.org

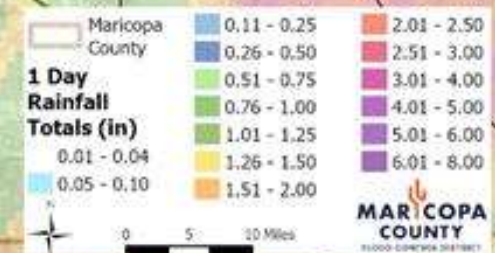
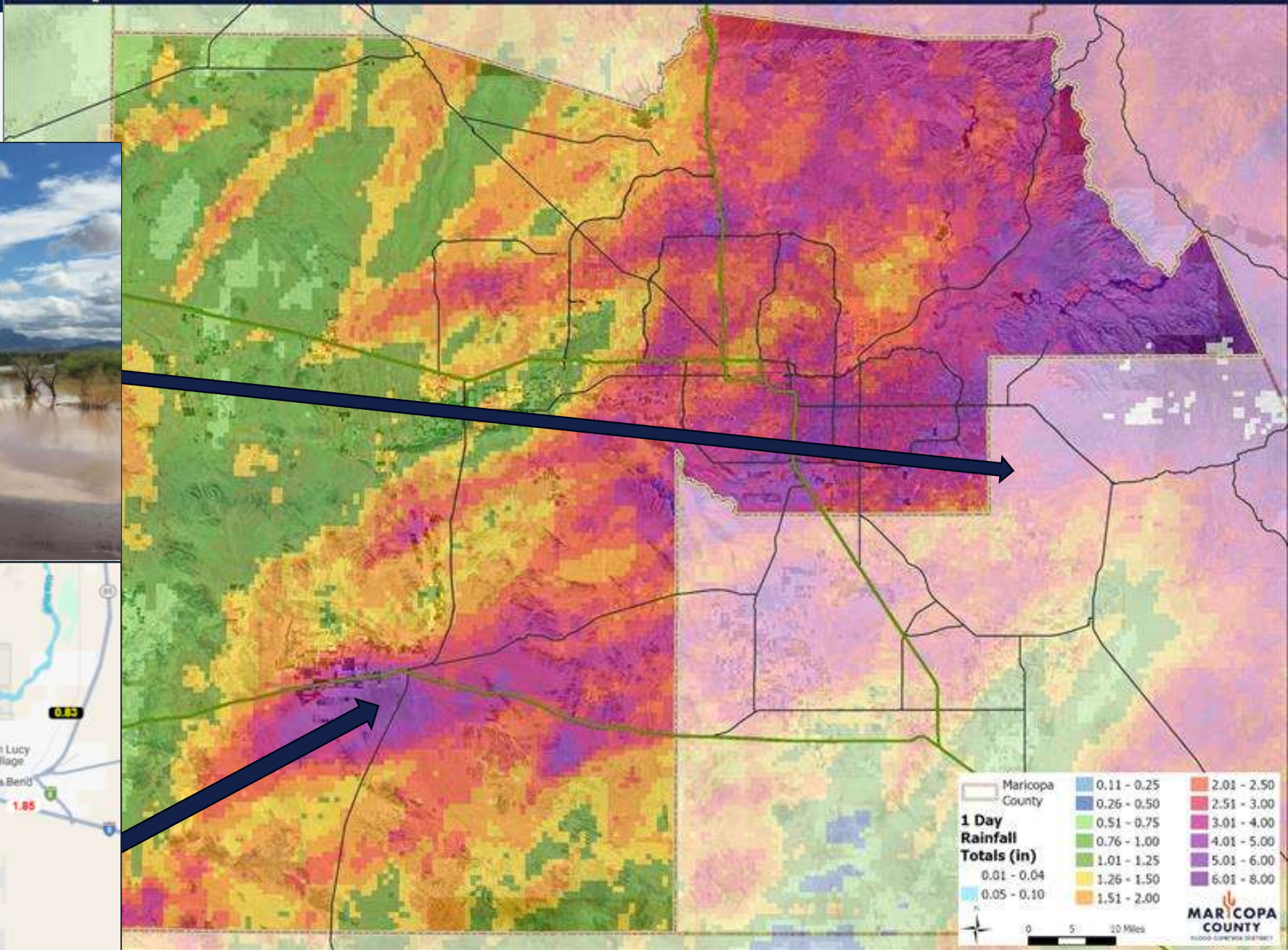
 centralazams@gmail.com |      

Teaser...



5 Day Rainfall Totals

October 9, 2025 12pm - October 14, 2025 12pm





What Questions Do You Have?



Alert Room: (602) 506-8701



Daniel.Henz@maricopa.gov



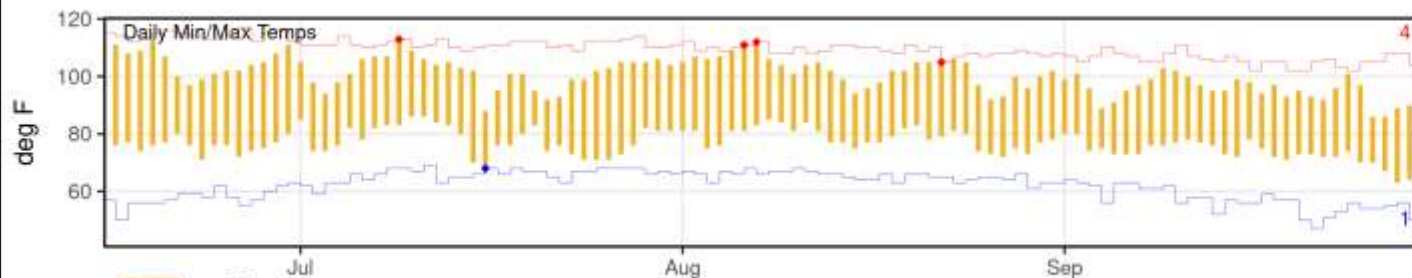
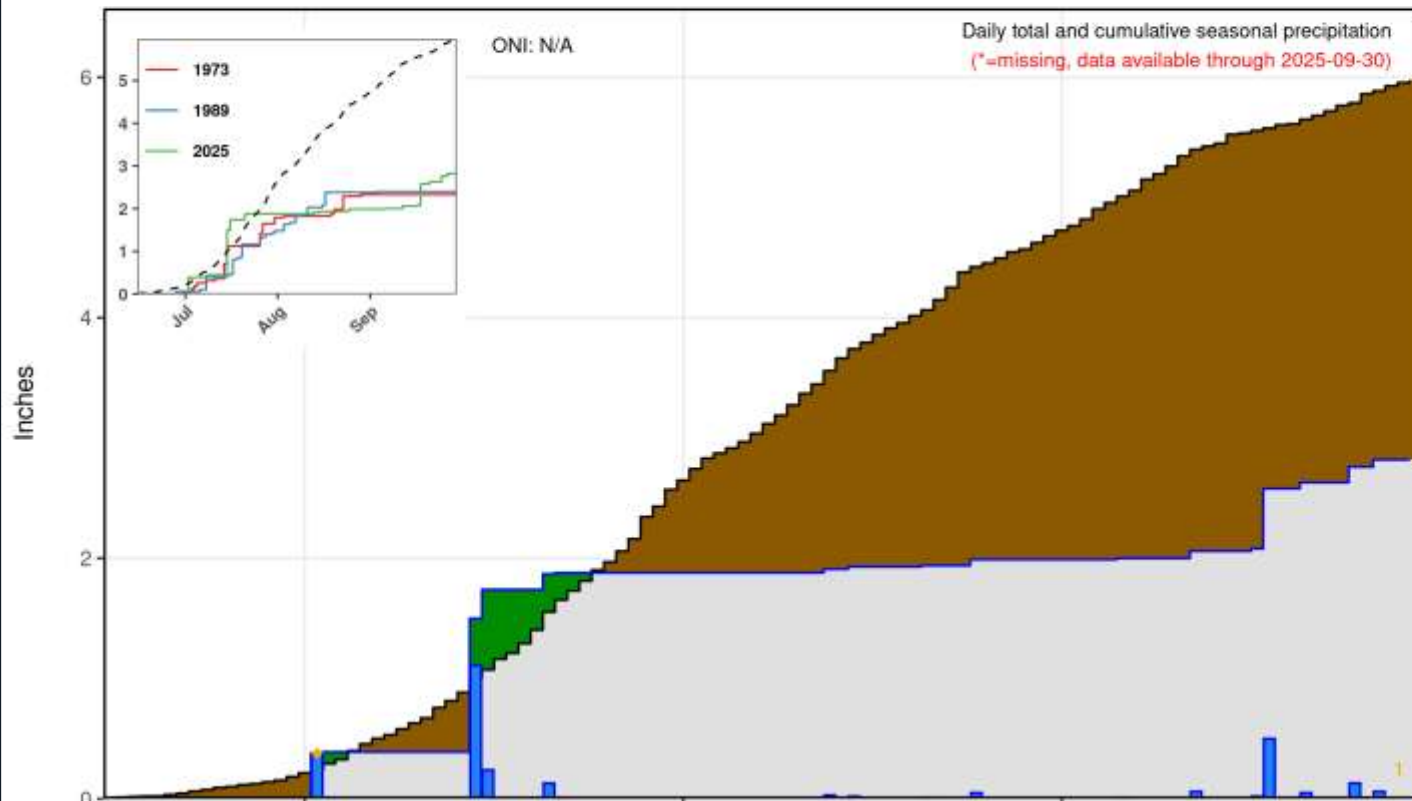
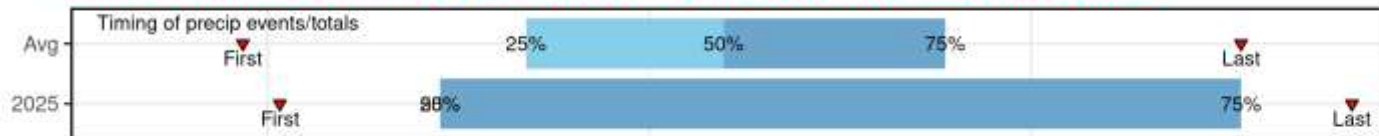
maricopa.gov/weather



@maricopaflood

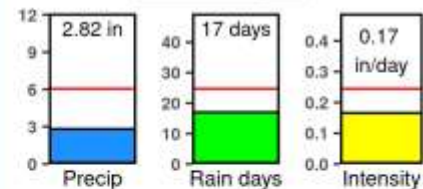


Station Climate Summary: 06-15-2025 to 09-30-2025 (Monsoon Season)

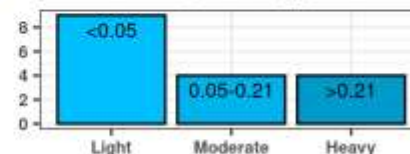


TUCSON INTERNATIONAL AIRPORT

Elevation (ft): 2551
Period of record: 1949-2025
Years in record: 77
Precip rank: 71 (1-wettest)
Temp rank: 5 (1-warmest)
Missing in 2025: 0
Total snow (in): 0 (NaN % avg)

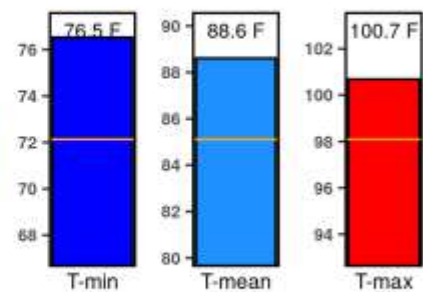


Precip Events (days)



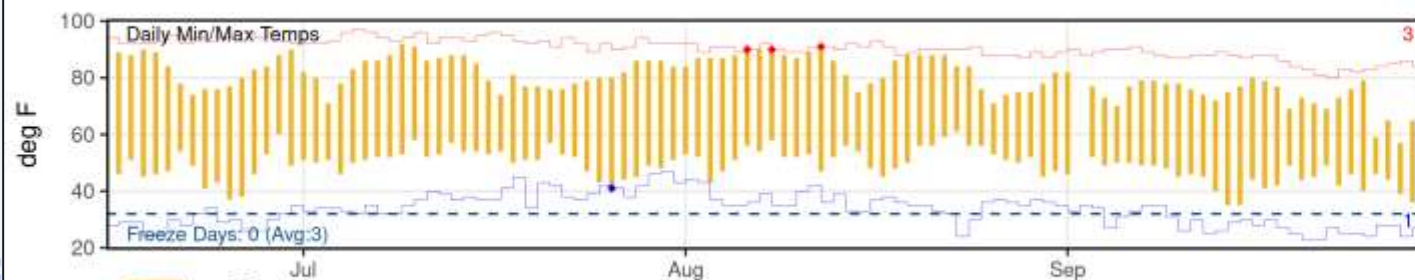
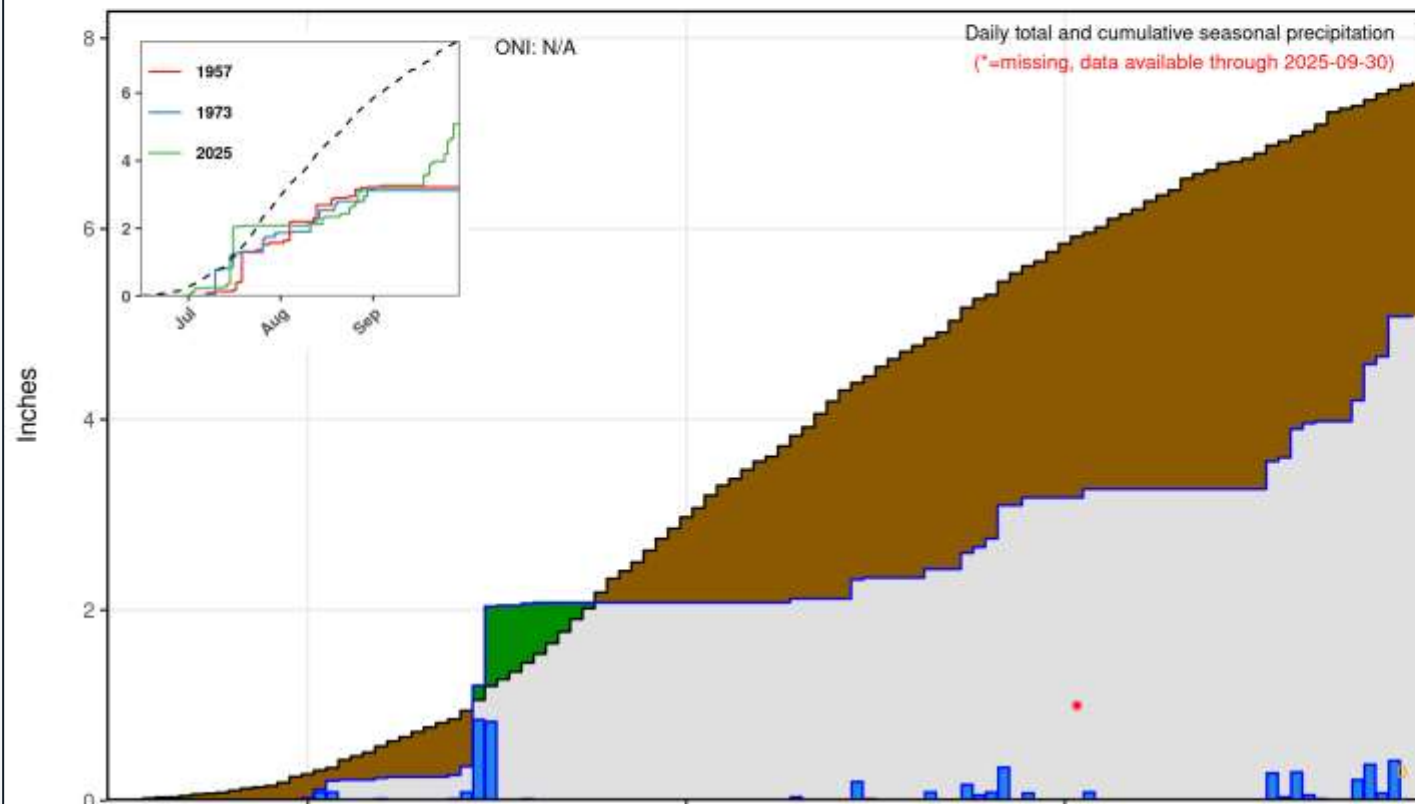
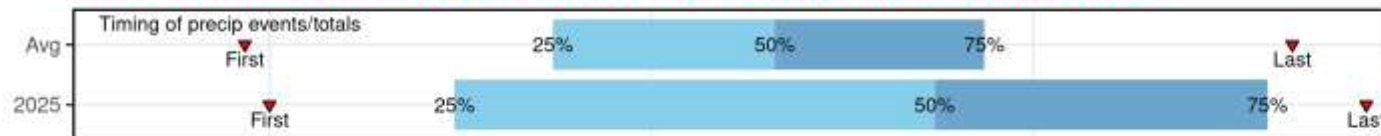
Dry Spells

Avg length: 4 days (avg: 4)
Max length: 21 days (avg: 21)



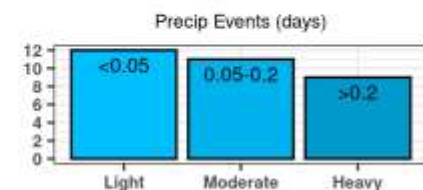
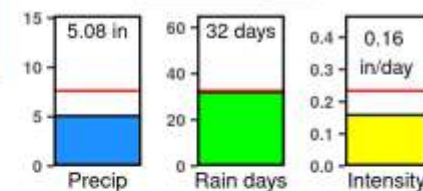
Data from <http://www.rcc-acis.org/>
Plot created: 10-15-2025
The University of Arizona
<https://cals.arizona.edu/climate/>

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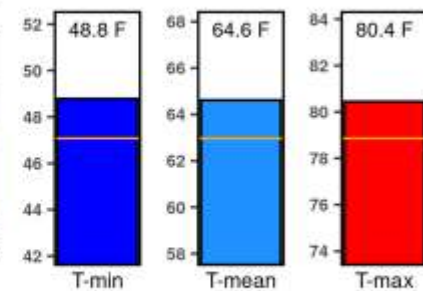
FLAGSTAFF AP

Elevation (ft): 6999
 Period of record: 1950-2025
 Years in record: 76
 Precip rank: 63 (1-wettest)
 Temp rank: 9 (1-warmest)
 Missing in 2025: 1
 Total snow (in): 0 (0 % avg)



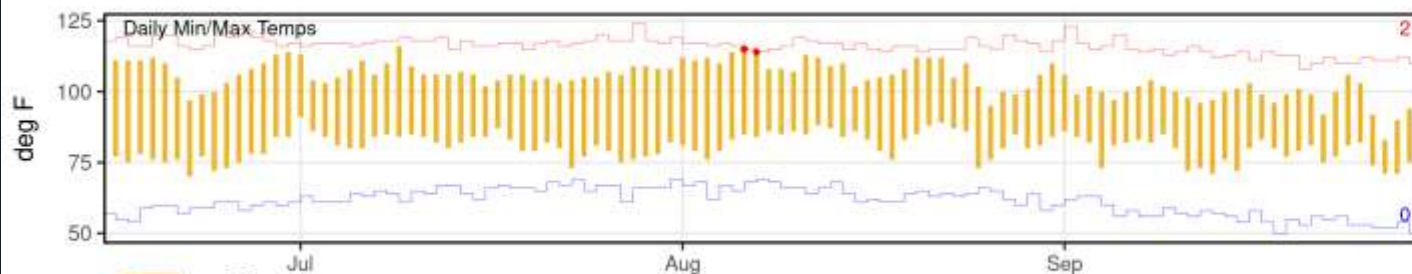
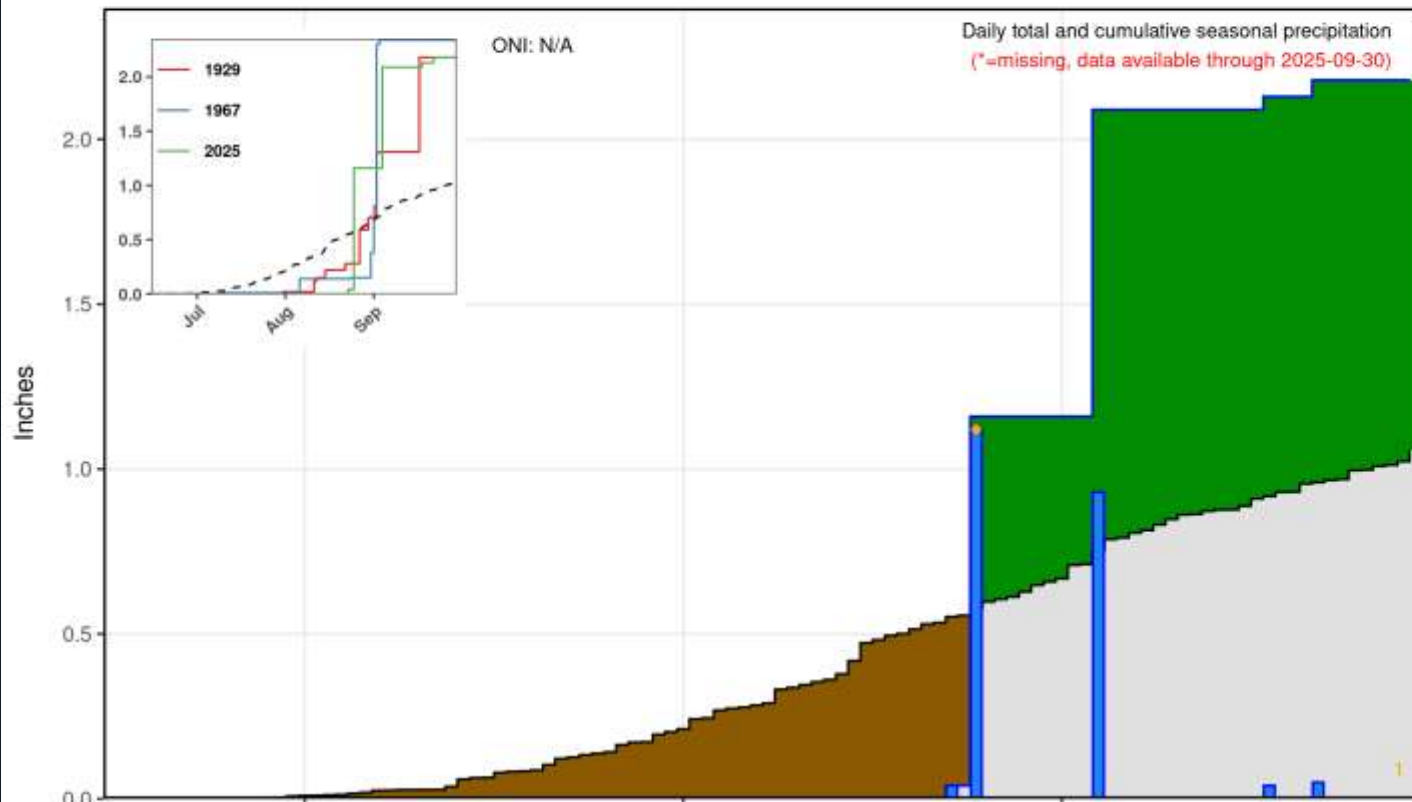
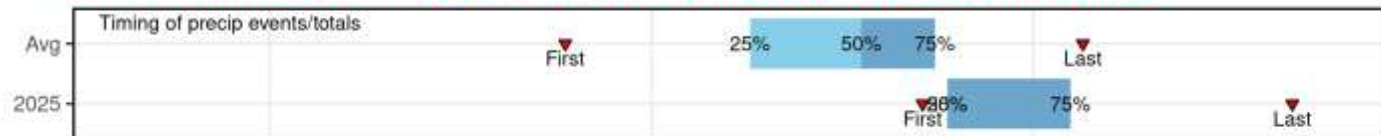
Dry Spells

Avg length: 4 days (avg: 4)
 Max length: 20 days (avg: 20)



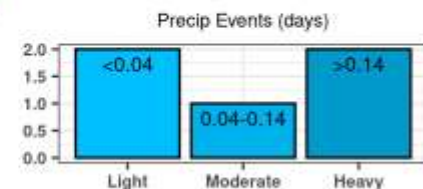
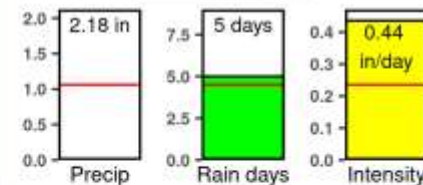
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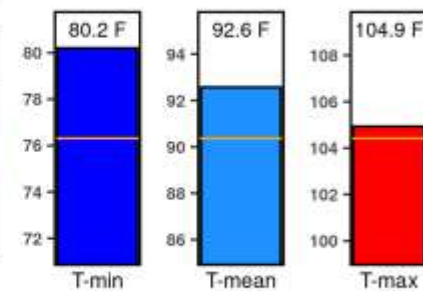
Yuma Area

Elevation (ft):
Period of record: 1876-2025
Years in record: 150
Precip rank: 21.5 (1-wettest)
Temp rank: 34 (1-warmest)
Missing in 2025: 0
Total snow (in): 0 (NaN % avg)



Dry Spells

Avg length: 10 days (avg: 19)
Max length: 69 days (avg: 51)



Data from <http://www.rcc-acis.org/>
Plot created: 10-15-2025
The University of Arizona
<https://cals.arizona.edu/climate/>

**THE DISTRICT OPERATES AN ALERT
SYSTEM WITH OVER 400 ENVIRONMENTAL
MONITORING STATIONS.**

**MARICOPA
COUNTY**
FLOOD CONTROL DISTRICT

TO VIEW LIVE DATA SCAN QR CODE

**GET REAL-TIME RAINFALL, STREAMFLOW AND
WEATHER INFORMATION USING OUR
INTERACTIVE DATA MAP**

<https://bit.ly/fcdmcmgmap>



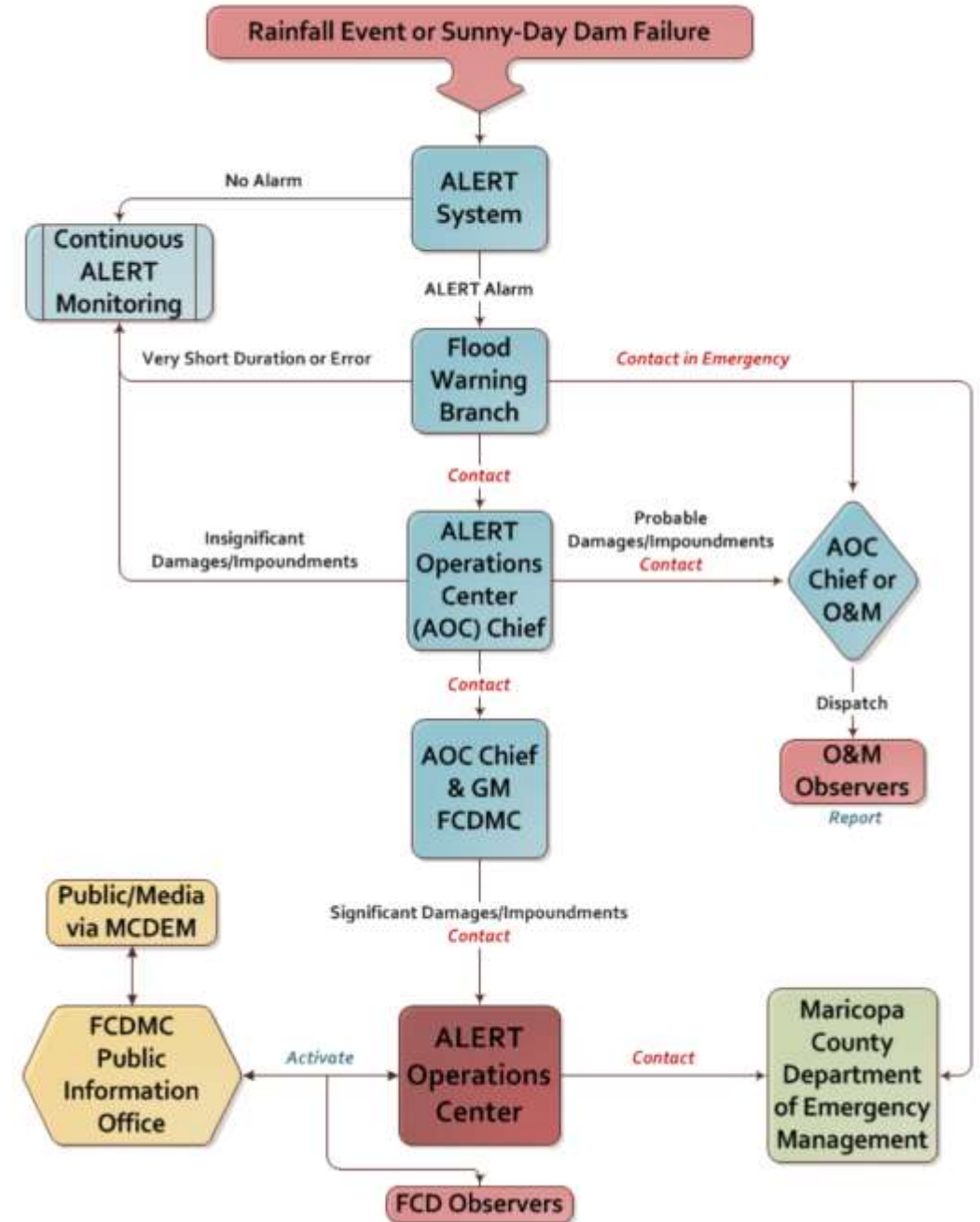
Flood Warning Program

ALERT Data System, FRPs, EAPs, & Meteorological Services Program

“We warn the agencies that protect the public”

- **Planning**
 - Data Collection
 - Research
 - Flood Response
- **Detection**
 - Data-driven Decisions
 - How much rain? Where is the water going?
- **Communication**
 - How do people receive the information?
- **Action**
 - How do people respond when they receive the information?
- **Maintenance**
 - Equipment, Infrastructure, & Communication Plans
- **Exercises**

FCDMC Flood Emergency Procedures Flowchart

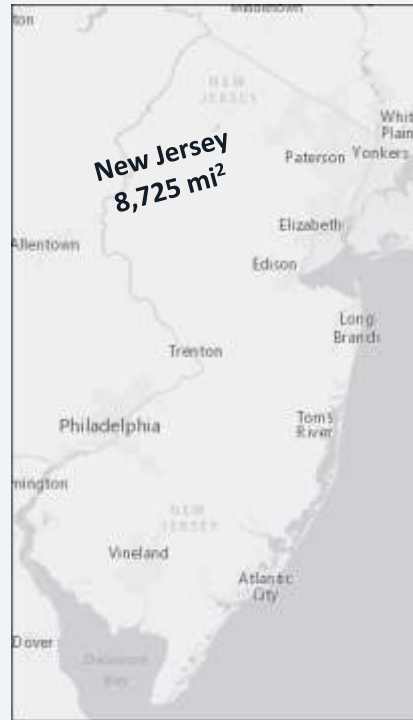
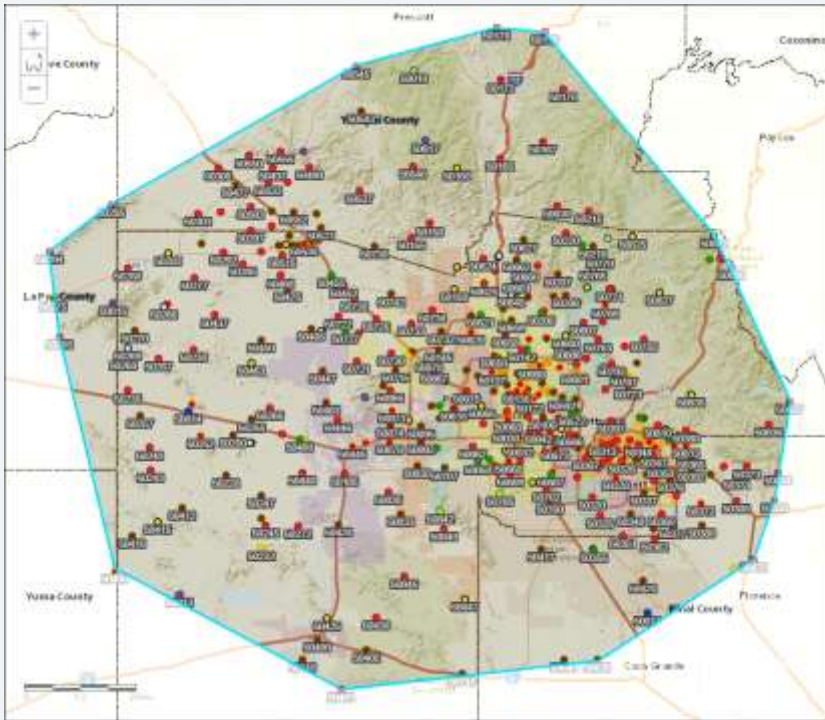


FCDMC **ALERT** System Inventory

Automated **L**ocal **E**valuation in **R**eal **T**ime

Area: 11,505 mi²

Perimeter: 395 mi



ALERT Stations – 416

- Rain Sensors – 362
 - *Density: 1 gage per 31.8 mi²*
- Water-level Sensors – 219
 - *On Rivers, Washes & Channels – 143*
 - *On Dams & Basins – 70*
 - *Status Sensors (dry/wet) – 6*
- Weather Stations – 40
 - *Temperature/Humidity Sensors – 40*
 - *Wind Speed/Direction Sensors – 35*
 - *Barometric Pressure Sensors – 24*
 - *Solar Radiation Sensors – 23*
- Flashing Roadway Signs – 7 pairs