

September 2023 Weather Digest



September 2023 Weather Summary

Main headline for September was the record heat and below normal precipitation, a continuation of the pattern most of the region has been experiencing since mid-June. Monthly average temperatures ran 4-6 degrees above normal, resulting in several new monthly records. The heat wave peaked around September 8th, with 6 consecutive daily record highs set at El Paso and a new all-time monthly record of 106 degrees. Drought conditions deteriorated rapidly across southern New Mexico with most locations now in Severe Drought (D3) status.

Precipitation amounts varied greatly across New Mexico, with well below normal rainfall for far west Texas and the International Border. Higher rainfall focused on central New Mexico, due primarily to showers and thunderstorms Sept 11-13. El Paso County's heaviest rain fell on Sept 27 with a strong thunderstorm downtown. Monsoon pattern flow ended early this year with mid-latitude flow returning in mid-Sept.

September 2023 Weather Summary

Looking ahead, October accelerates the cooling trend as lower sun angles and a series of backdoor cold fronts usher in the fall season. Outlooks continue to suggest near or above average rainfall this month, despite continued above normal temperatures.

El Paso's average high on Oct 1st is 84 degrees and on the 31st it drops to 74 degrees. The length of daylight on Oct 1 is 11 hours 51 minutes, and on Oct 31 is shrinks to 10 hours 56 minutes. October's New Moon will occur on the 14th, with the Full Moon on the 28th. An annular solar eclipse will occur on October 14th with max obscuration of 85% around 10:30am that day.

8-09-13 04:33:00

Sep 13 Night time storm Silver City



Sep 1 Dust storm near Lordsburg BURG @ MM1.1



Sep 13 Flooding in Las Cruces



Sep 20 Dust El Paso



KFOX 14 SEVERE WEATHER LIVE ONLINE WEATHER NETWORK FOX 14



LIVE

Wednesday Sep. 13, 2023

Storms of Sep 12

Hail to 1.25"

Hail to 1.25"

Hail to .50"

Hail to .50"

Hail to .75"

Hail to 1.50"

Several strong thunderstorms on Tuesday left lengthy hail tracks across southern New Mexico. Hail size from about one-half to as large as one and one-half inches likely fell in these areas.

SATURDAY SEP 30

Hail up to 1.30"

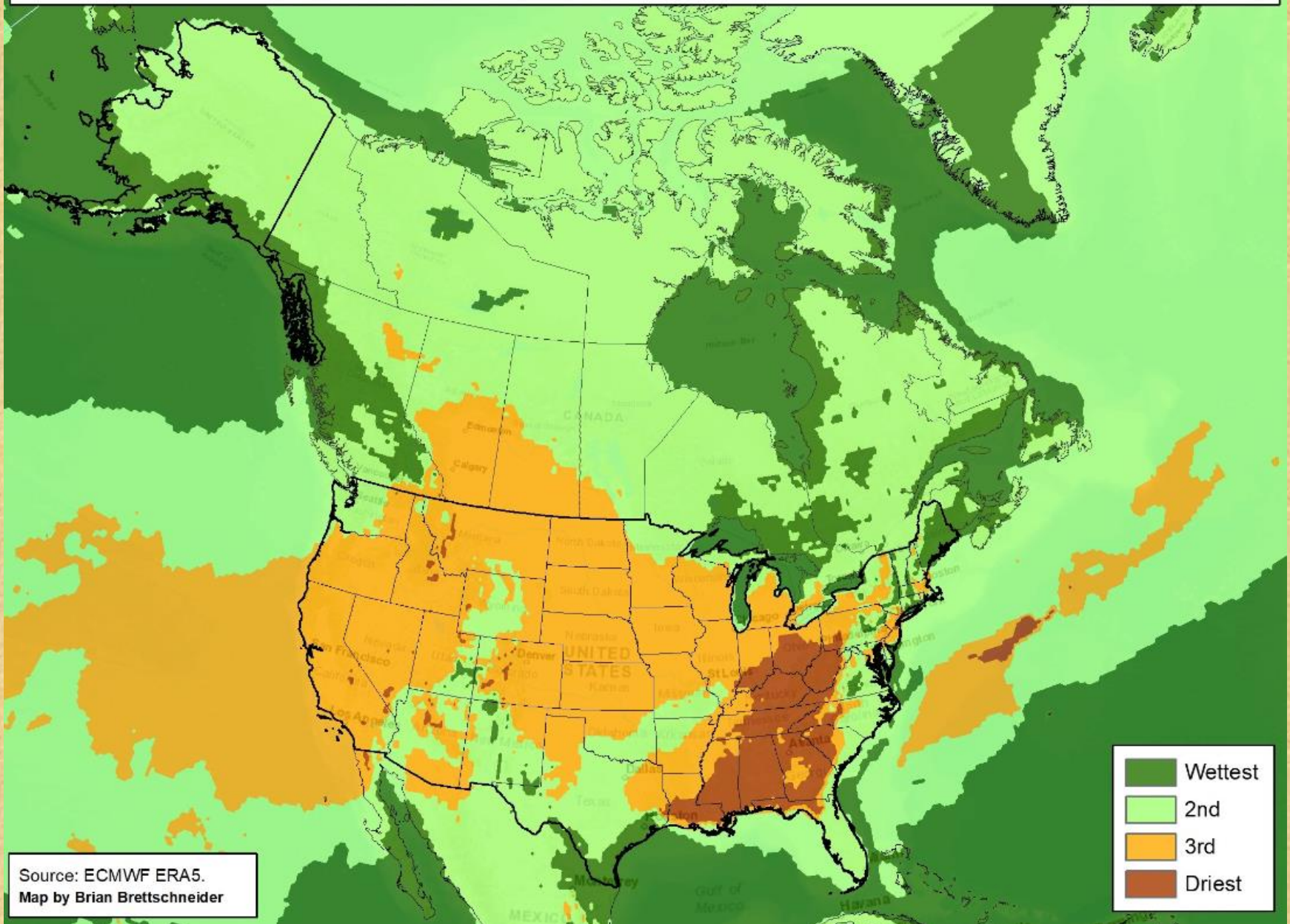
Hail up to 1.30"

Hail up to 1.90"

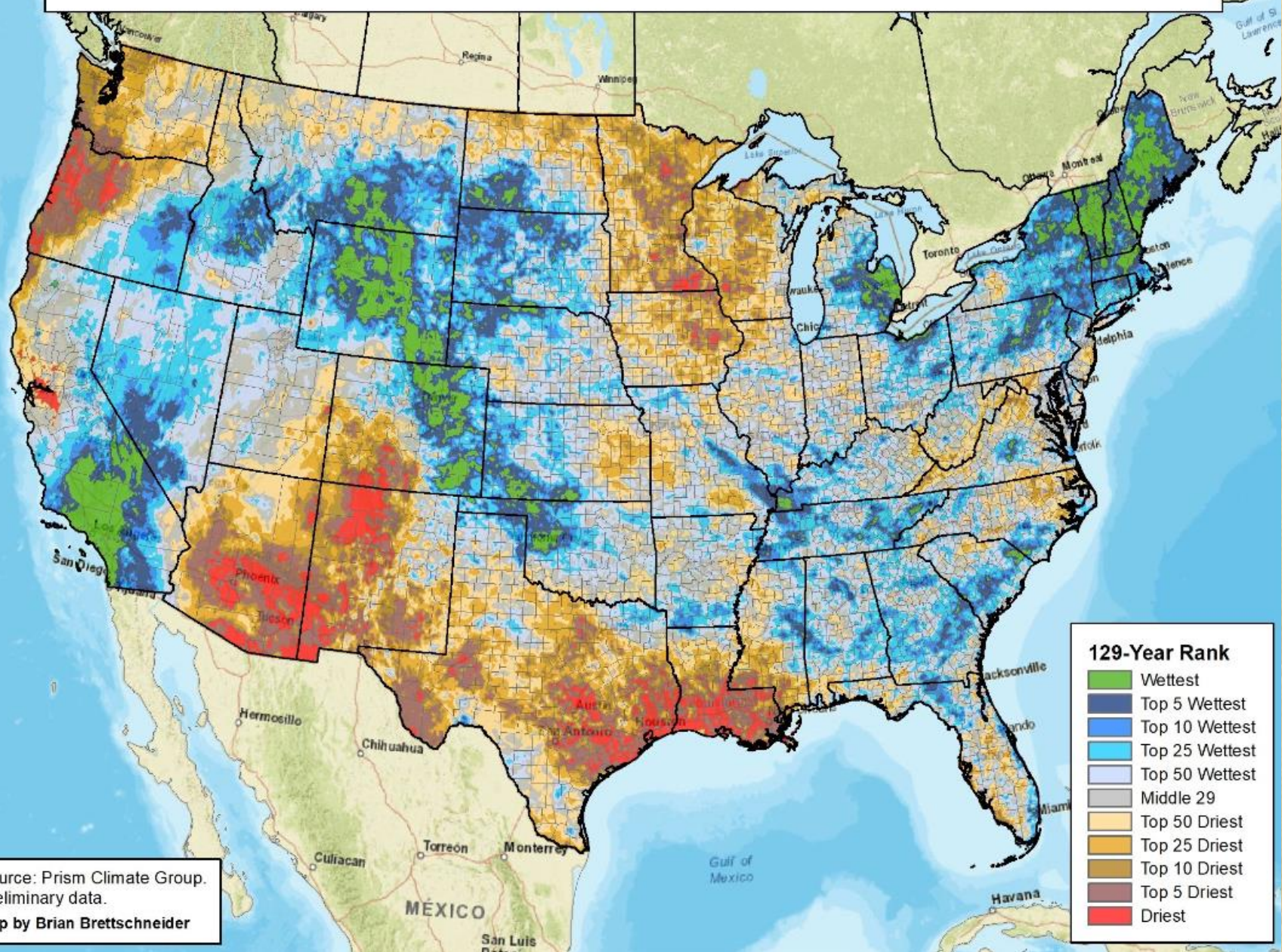
Hail 1.50-2.00"

3 Severe thunderstorms tonight and the hail tracks they left behind

Fall (Sep-Nov) Precip Climatology: Rank From Wettest to Driest



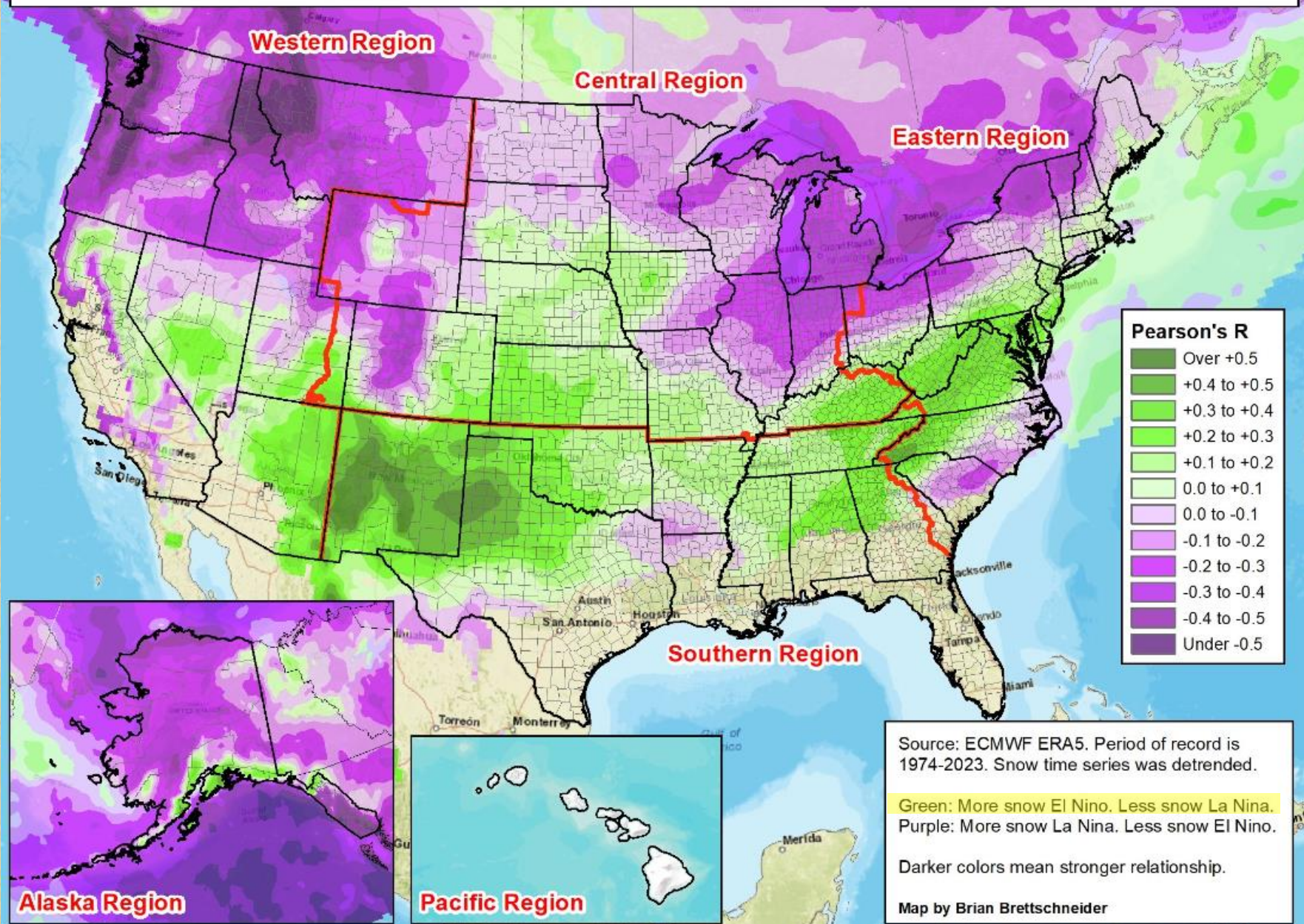
June - August 2023 Precipitation Ranking (Since 1895)



Source: Prism Climate Group.
Preliminary data.

Map by Brian Brettschneider

Correlation Between Dec-Feb Snow and Dec-Feb ENSO (ONI)



ENSO Alert System Status: El Niño Advisory is in Effect

ENSO Alert System

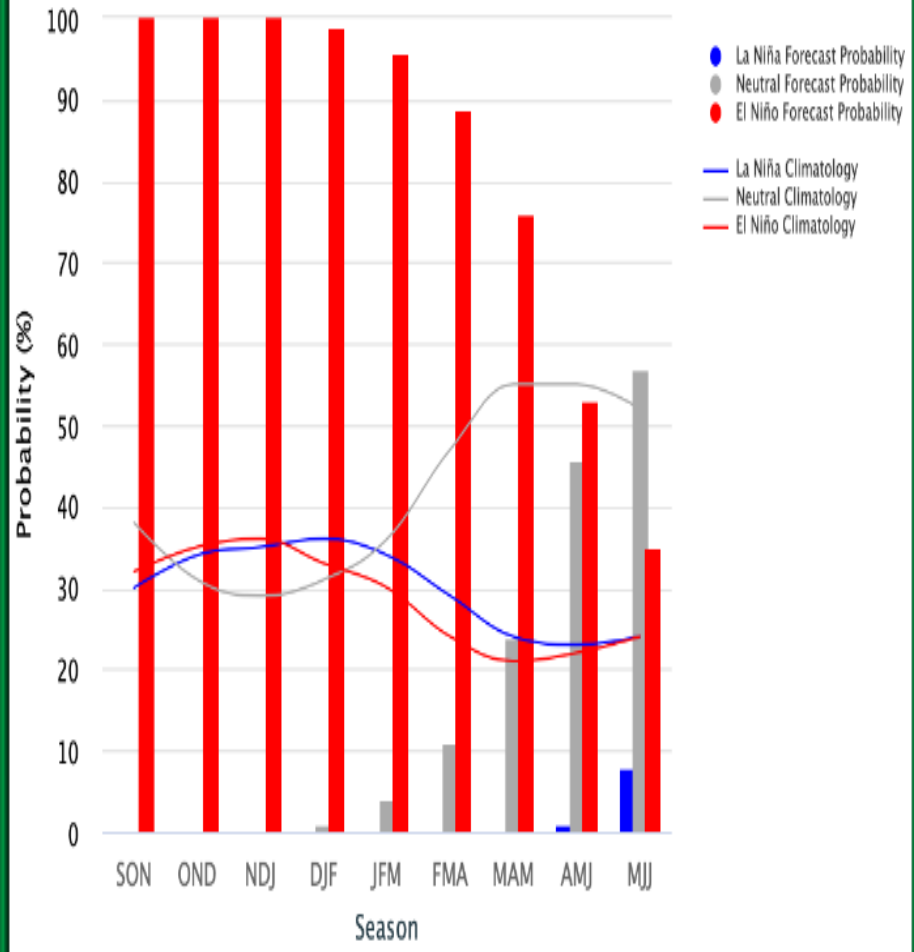
- **El Niño or La Niña Watch:** Issued when conditions are favorable for the development of El Niño or La Niña conditions in the next six months.
- **El Niño or La Niña Advisory:** Issued when El Niño or La Niña conditions are observed and expected to continue.

ENSO Forecast

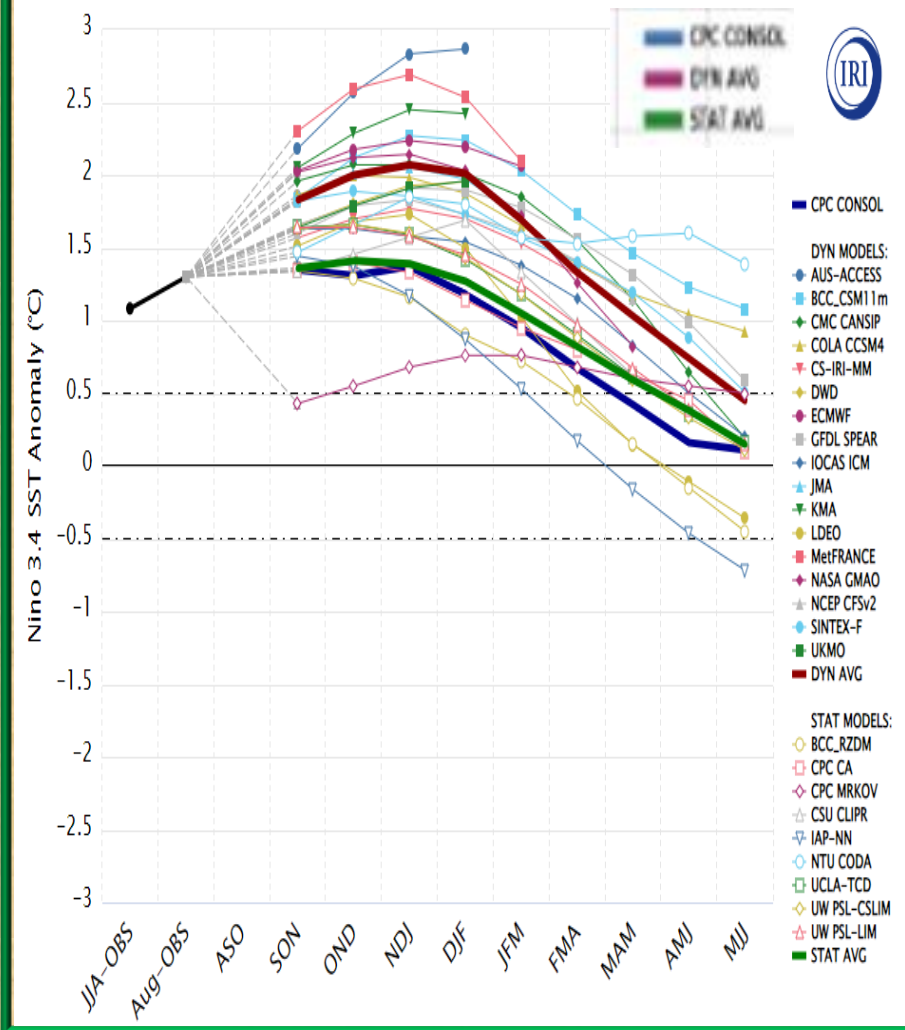
ENSO is in El Niño status and is expected to increase in strength over the next several months. Expected to remain through at least the spring of 2024.

Mid-September 2023 IRI Model-Based Probabilistic ENSO Forecasts

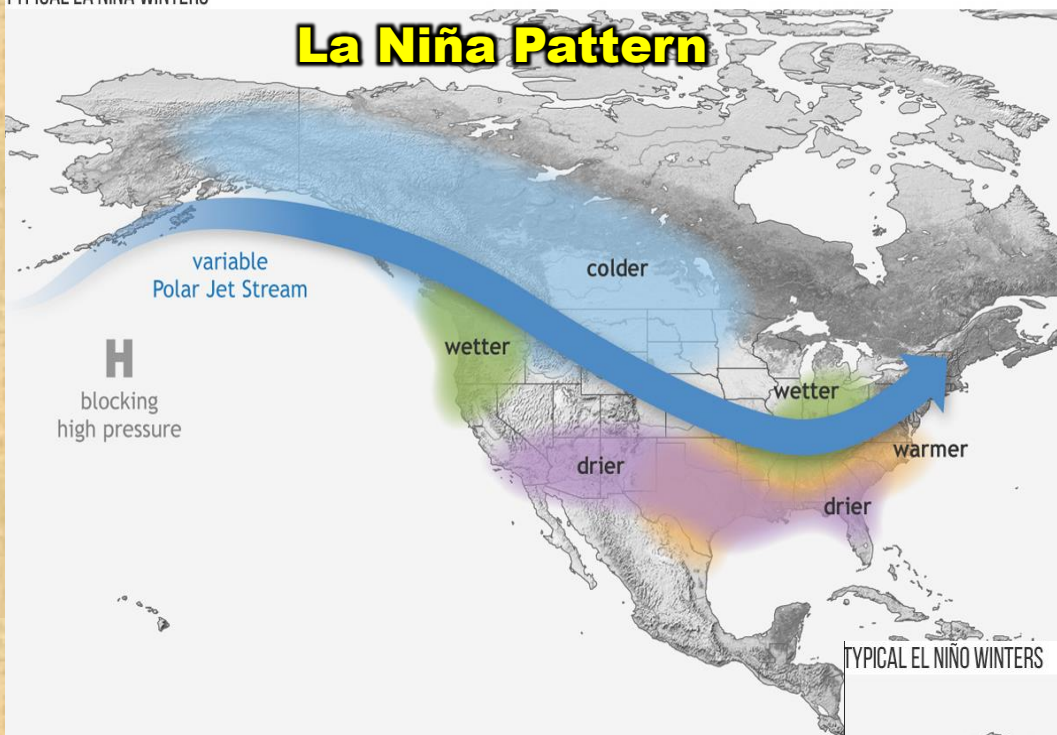
ENSO state based on NINO3.4 SST Anomaly Neutral ENSO: -0.5 °C to 0.5 °C



Model Predictions of ENSO from Sep 2023

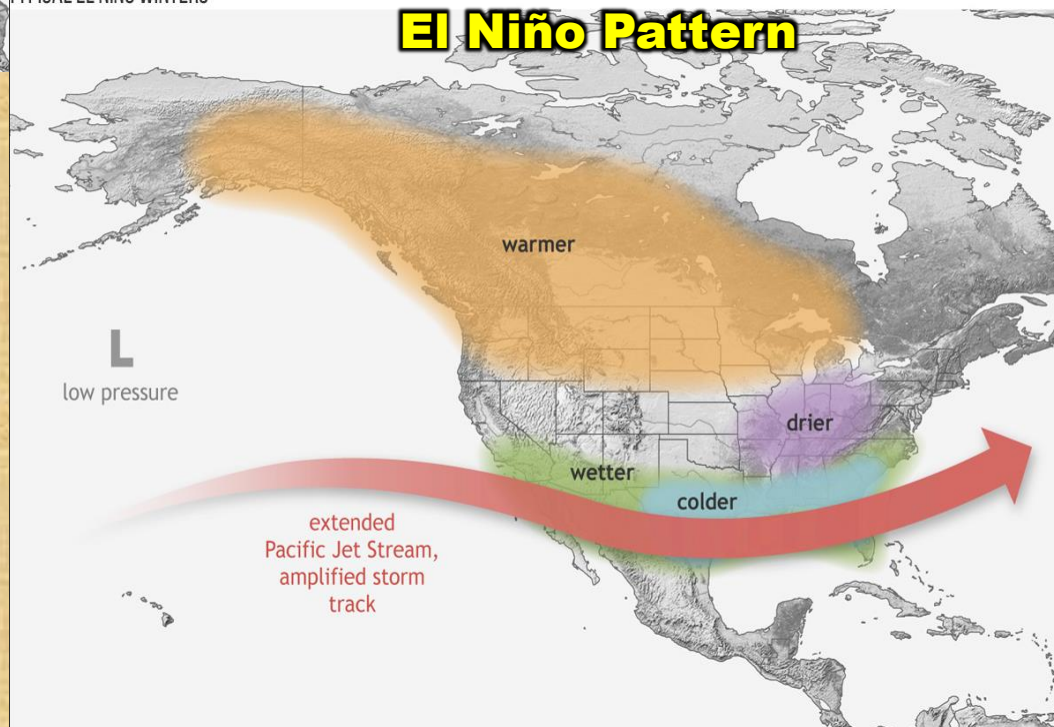


La Niña Pattern



With a La Niña pattern, a ridge of high pressure tends to build off the west coast of the U.S., blocking most of our Pacific winter storm systems. These storms tend to end up moving across the northern Plains and down to the southeastern part of the country. Of course it is important to remember that these patterns are only what typically happens and are not guaranteed to occur.

El Niño Pattern



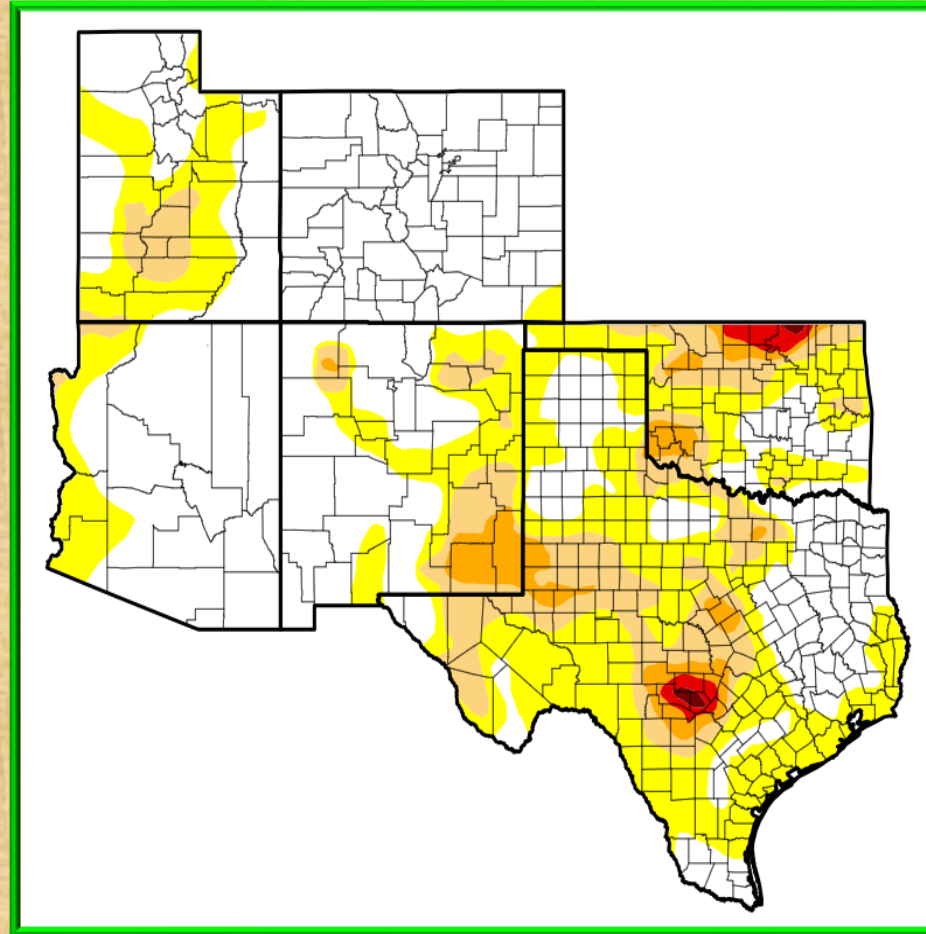
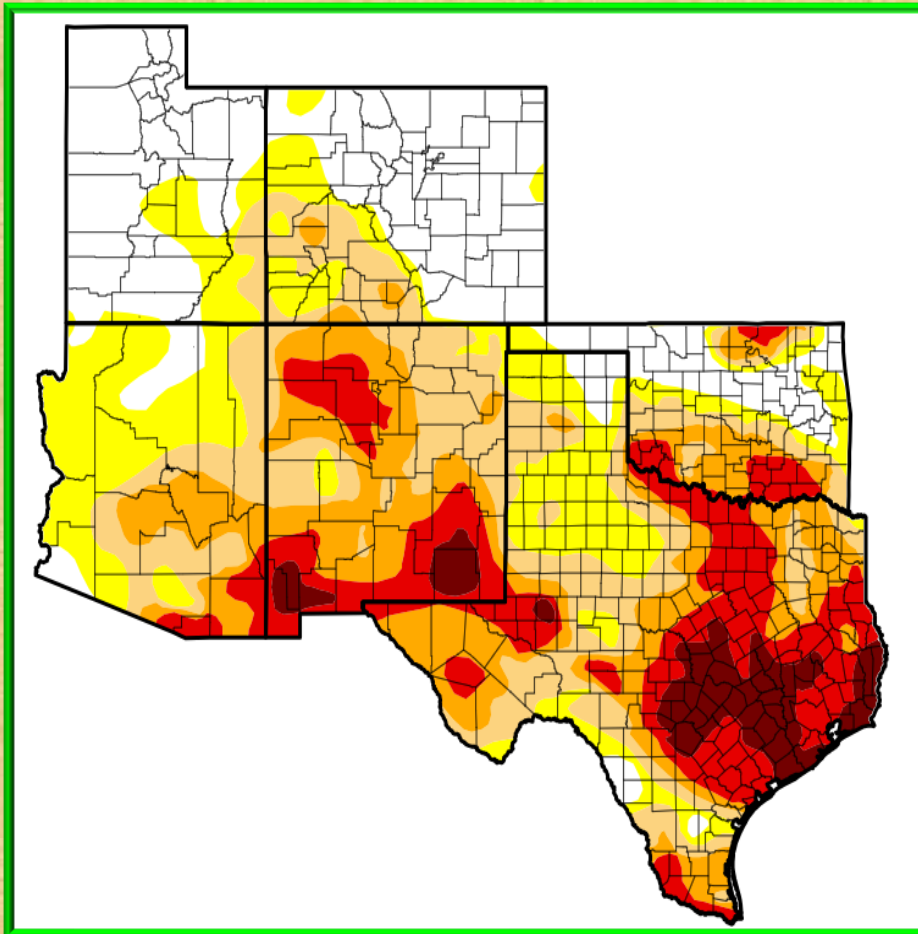
With El Niño, we often see the opposite pattern where the eastern Pacific ridge of high pressure is often weak or non-existent, allowing winter storms to sweep across the southern U.S. This typically will give the southwestern U.S. above normal precipitation.

Current drought conditions and 3 month change

- Abnormally Dry – D0
- Moderate Drought – D1
- Severe Drought – D2
- Extreme Drought – D3
- Exceptional – D4

Sep 26, 2023

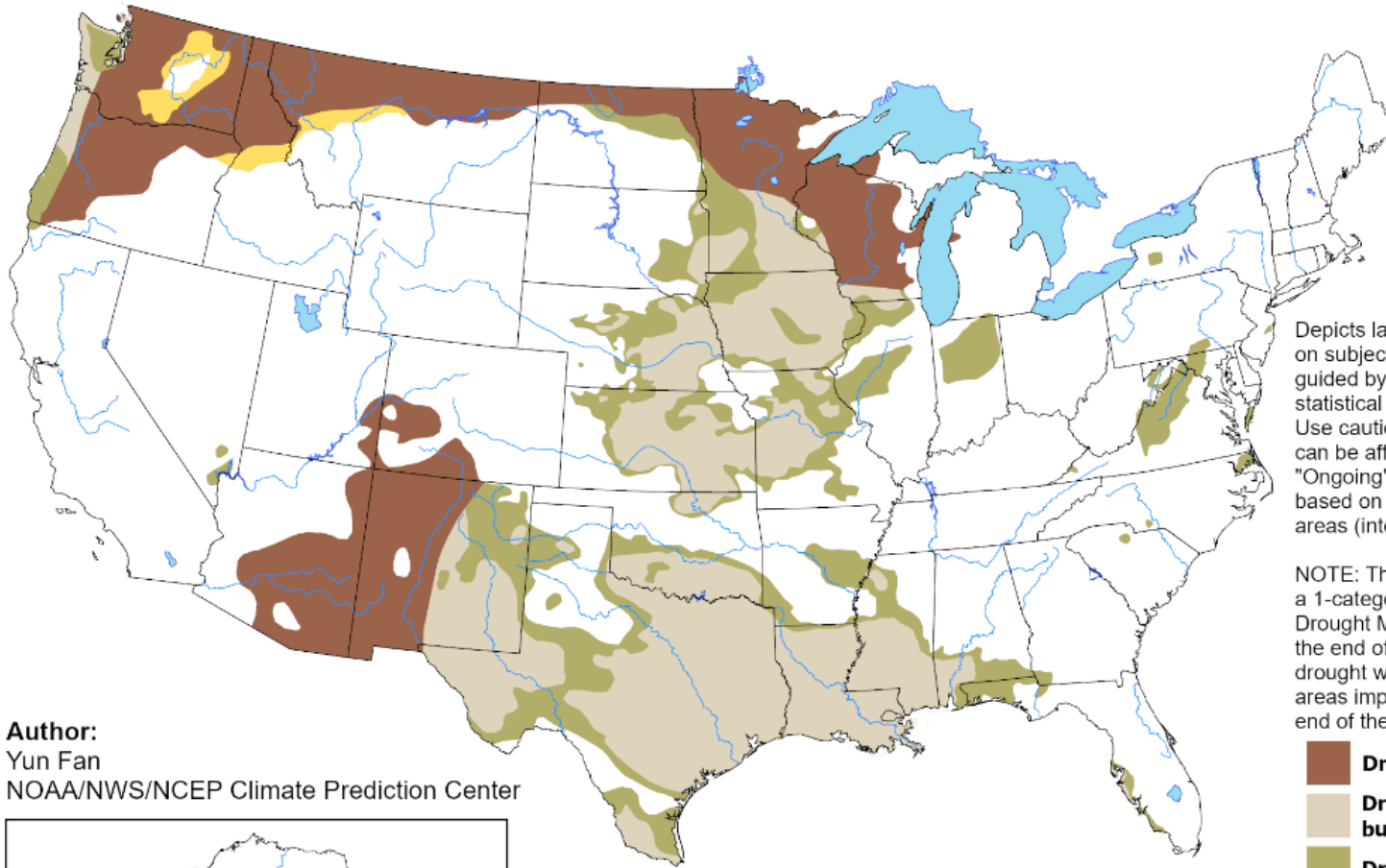
Jun 27, 2023



U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

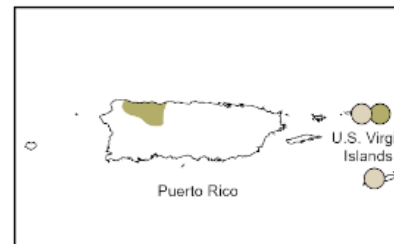
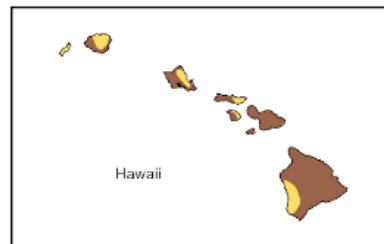
Valid for September 21 - December 31, 2023
Released September 21, 2023








Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

Author:
Yun Fan
NOAA/NWS/NCEP Climate Prediction Center



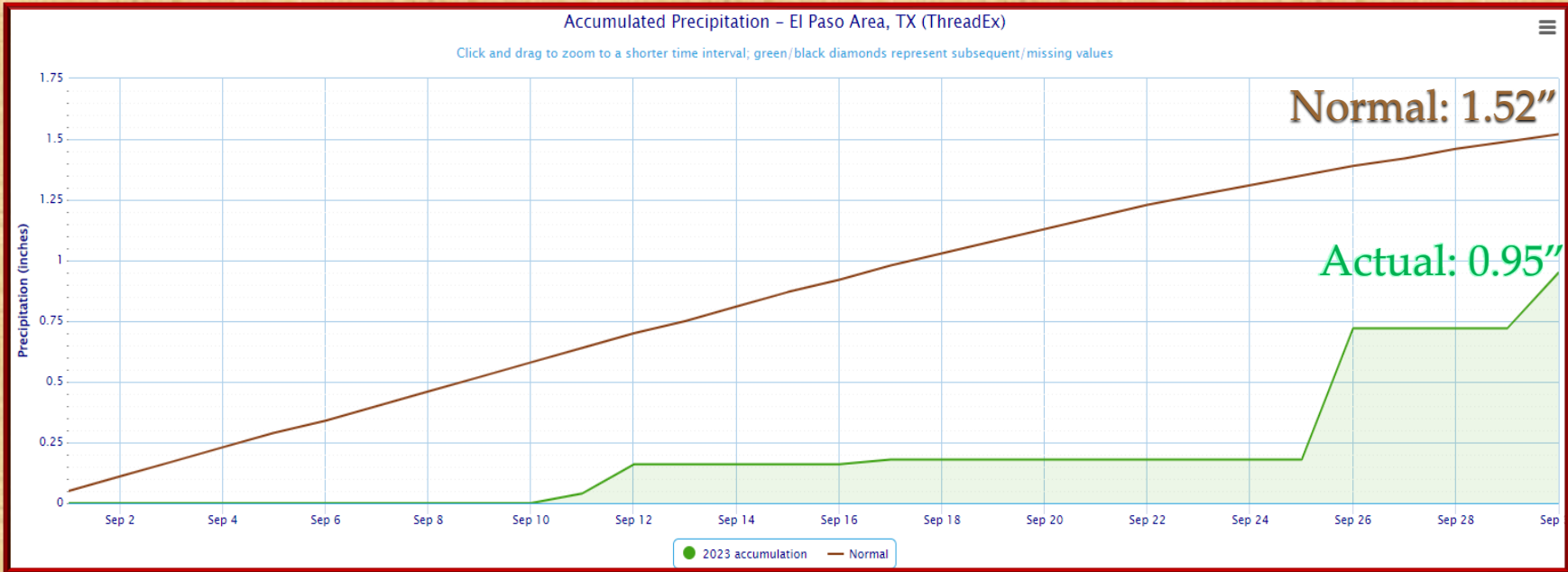
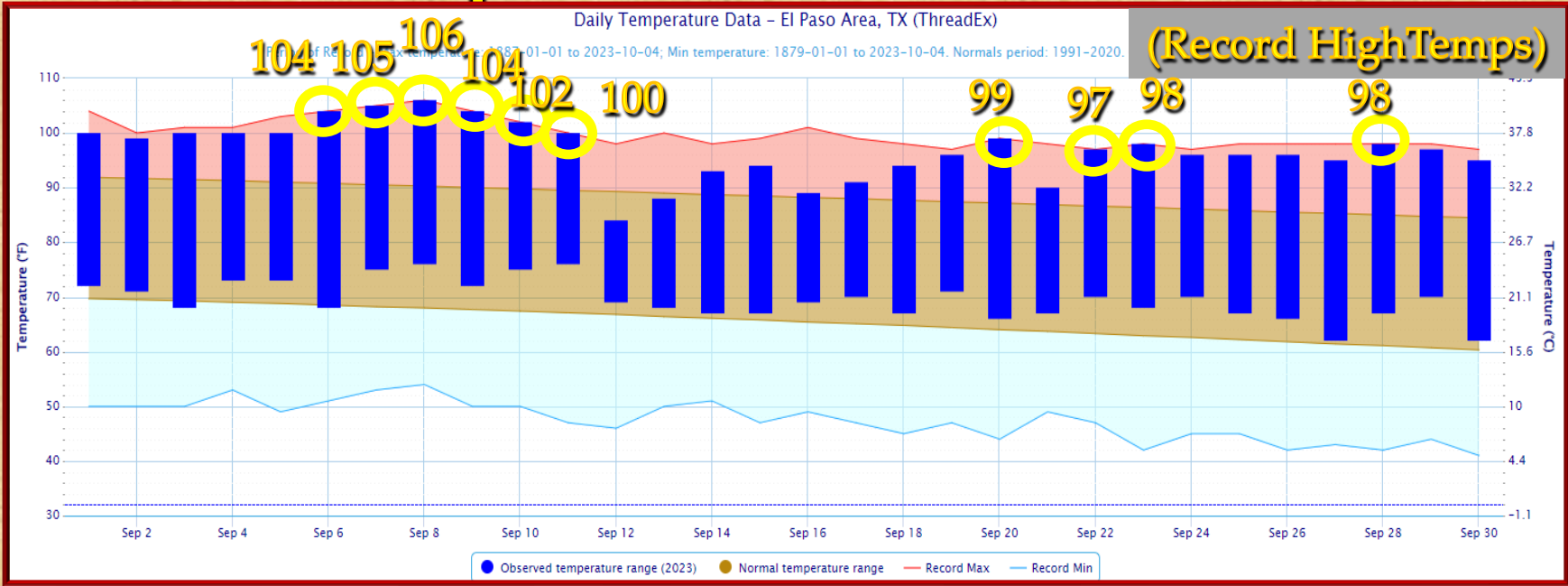
-  **Drought persists**
-  **Drought remains, but improves**
-  **Drought removal likely**
-  **Drought development likely**
-  **No drought**



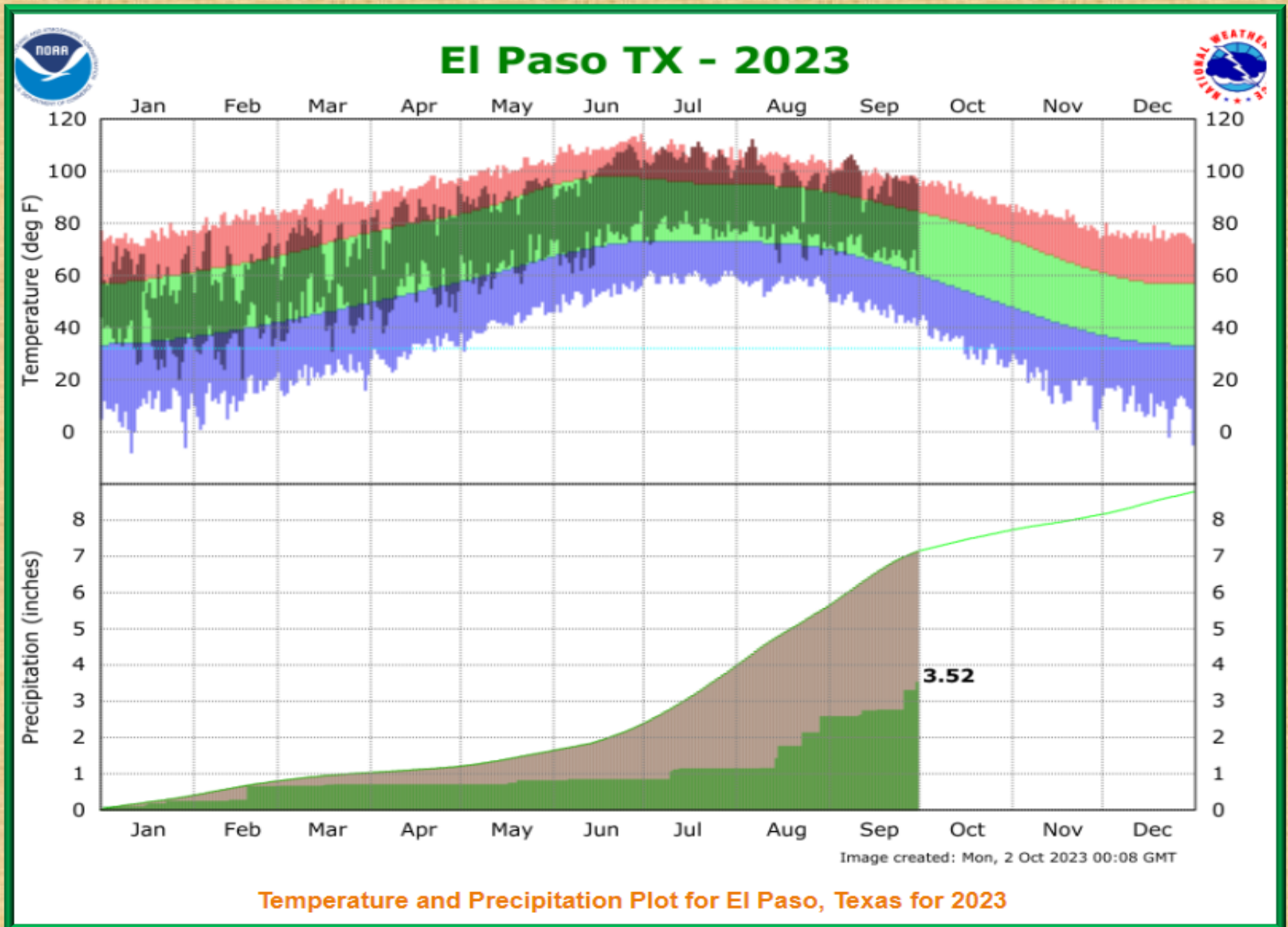
<https://go.usa.gov/3eZ73>

Temperature and precipitation data for September 2023 in El Paso

○ = record

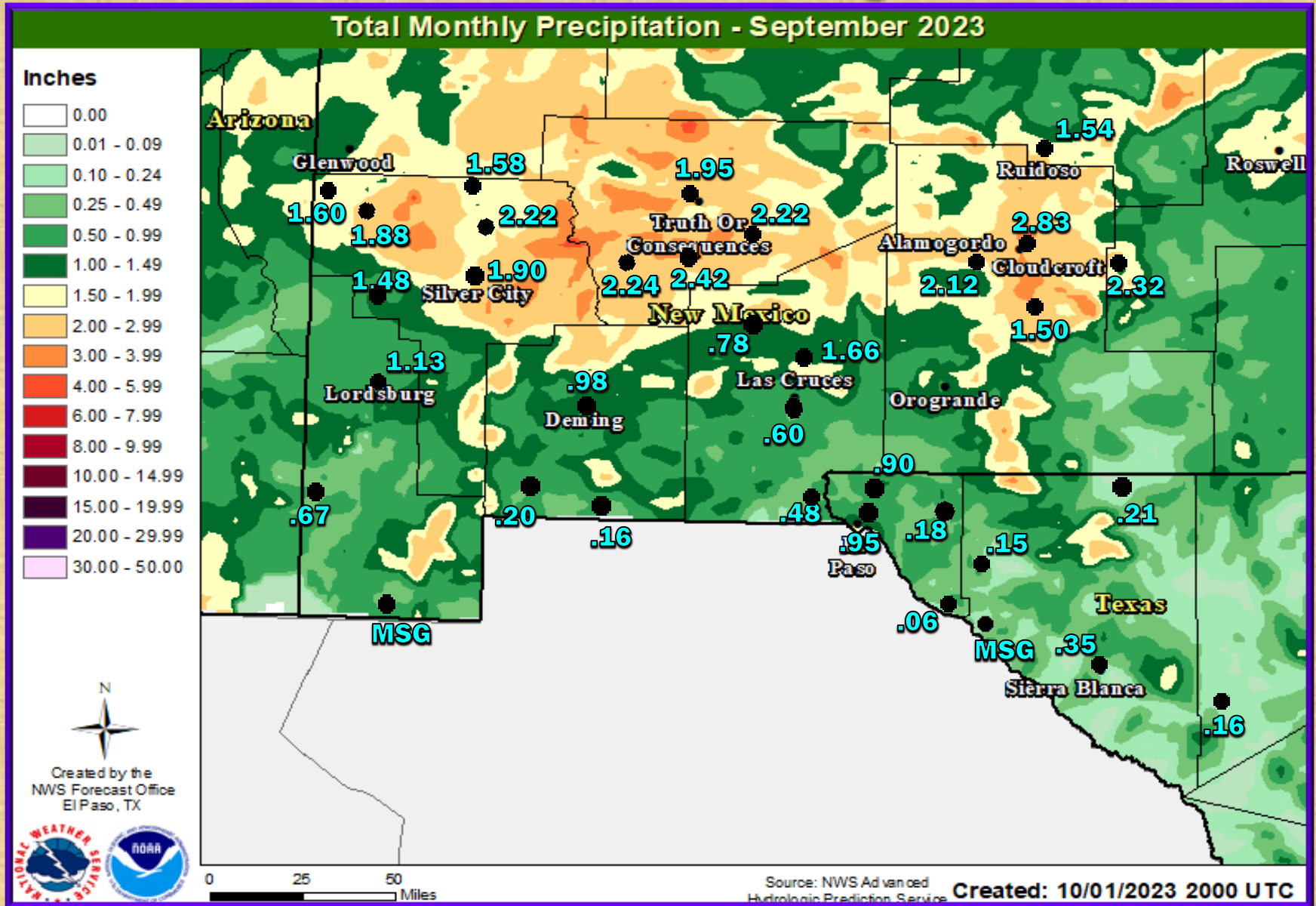


Temperature and Precipitation for 2023 YTD for El Paso

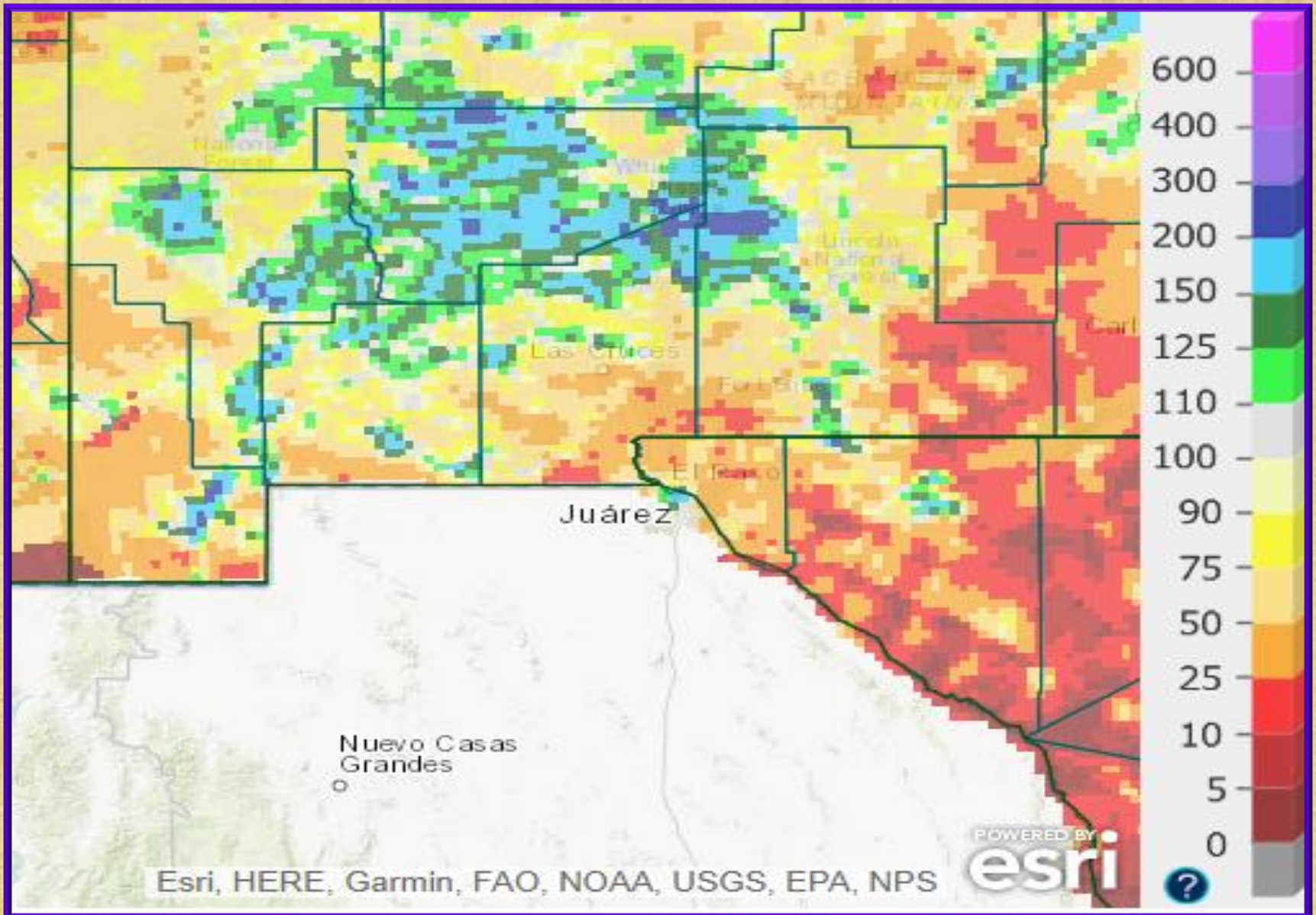


Temperature and Precipitation Plot for El Paso, Texas for 2023

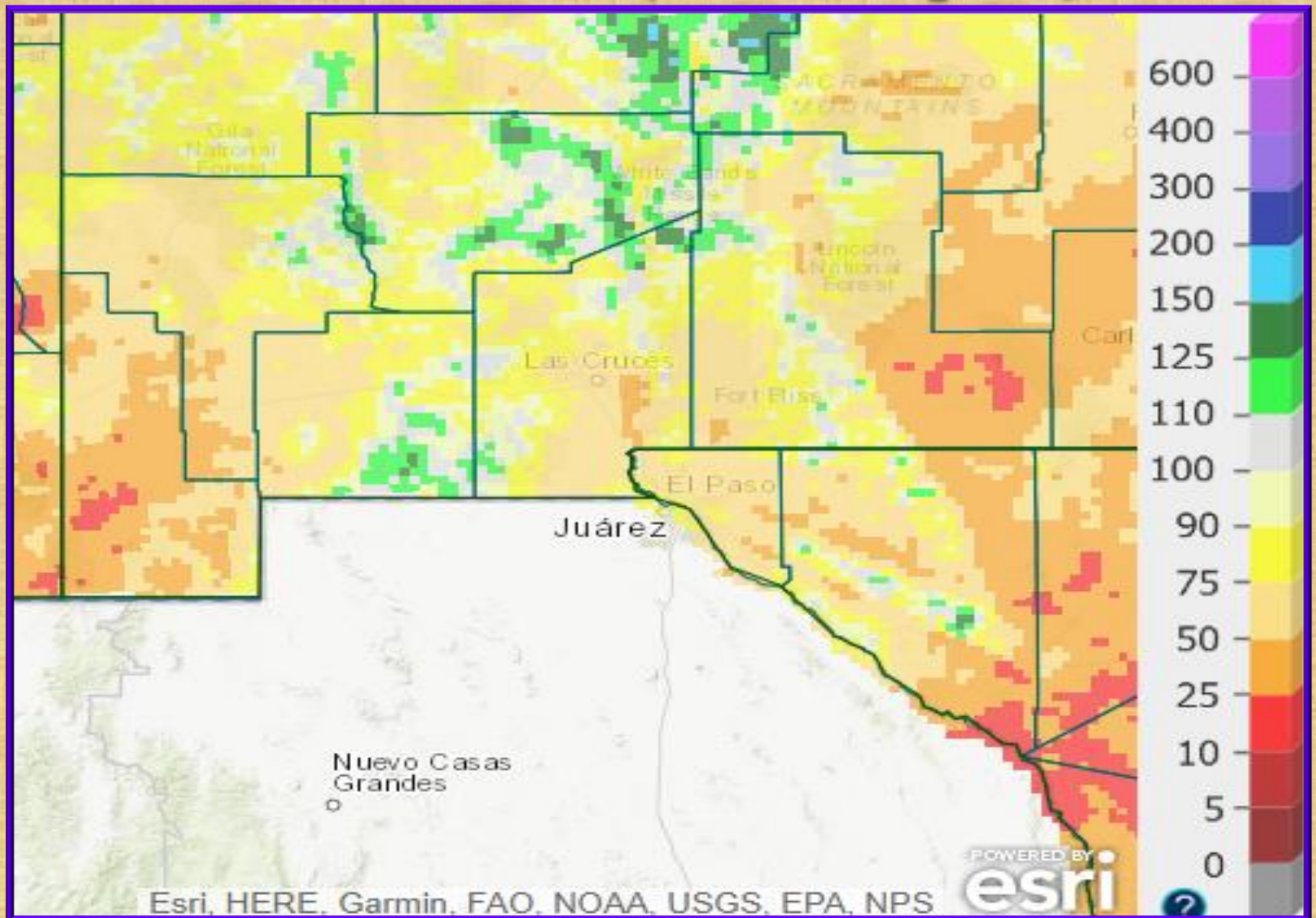
September 2023 radar rainfall estimate with surface rainfall reports



September 2023 rainfall estimate percent of normal



Radar rainfall estimate percent of normal for the Water Year (Oct 1 – Sept 30)



Tracking the 2023 Monsoon Season across the El Paso Forecast Area

A transition to monsoon flow began right on time this year with winds shifting to the south and east the first week of July [see fig 1] and the first round of precipitation following the next week [see fig 2]. This flow remained rather consistent throughout July across south-central New Mexico and far west Texas with occasional southwesterly winds over western New Mexico.

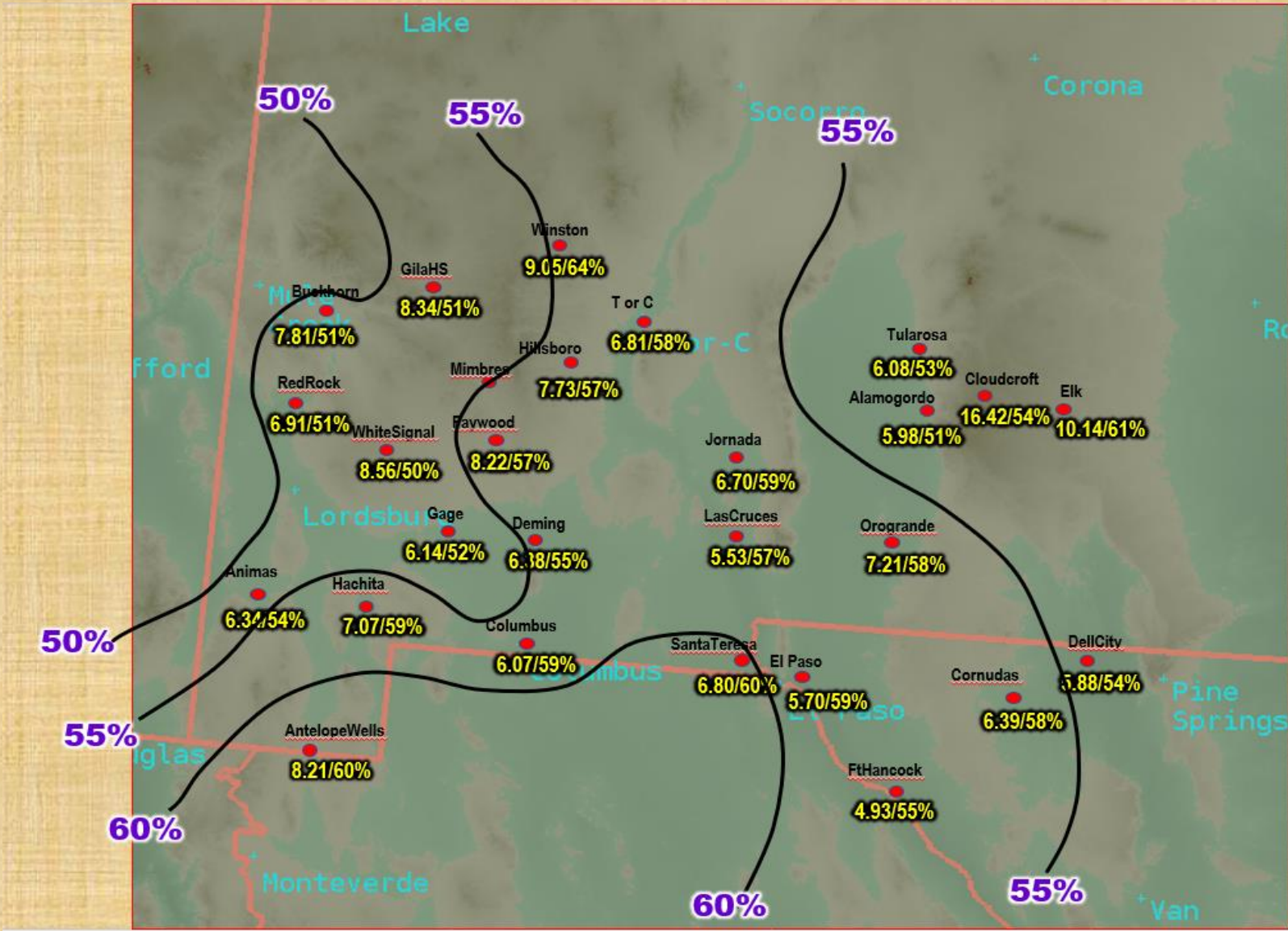
Main headline for the 2023 Monsoon so far is well below precipitation across much of the U.S. Southwest. Seasonal precipitation totals range from 0.25-1.00" across much of the desert floor with 2.00-4.00" over the high terrain. This is leading to rainfall deficits of 1-2" compared to climate normals and growing, which is only 20-50% of expected monsoon rainfall.

Sea surface temperatures of the northern Gulf of California and western Gulf of Mexico are a good indicator of how far we've progressed through the monsoon. SSTs reaching 29 degrees typically indicate the 1/3 progress mark, which was quickly reached on July 17th [see fig 4]. This suggests we're already well into the second half of the season. Mid-latitude flow may resume earlier than usual, bringing this year's monsoon to an end in mid-September. Thus, confidence is high that 2023 will finish well below normal for precipitation.

Tracking the 2023 Monsoon Season across the El Paso Forecast Area

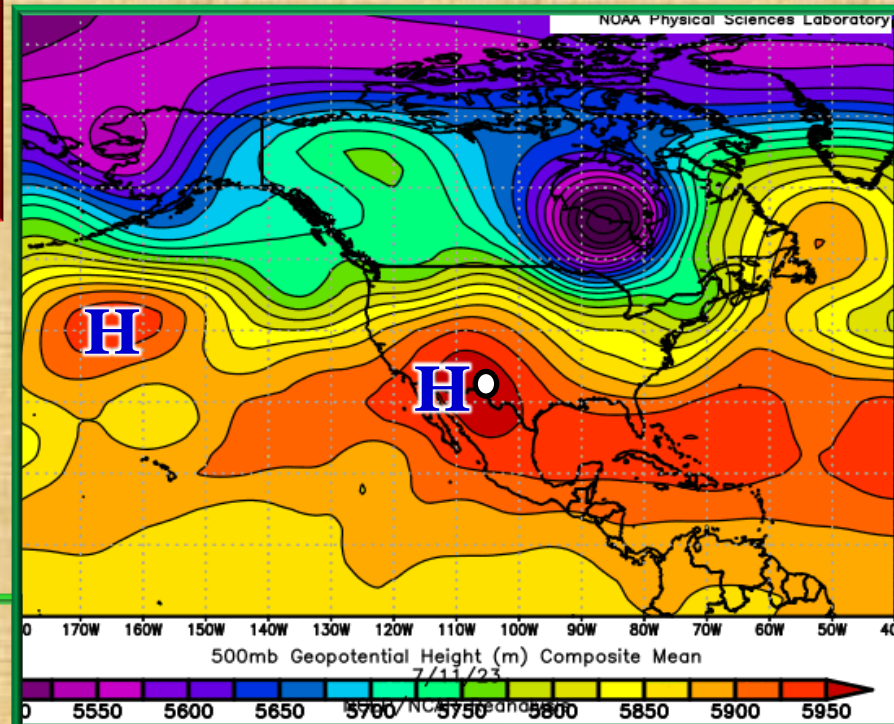
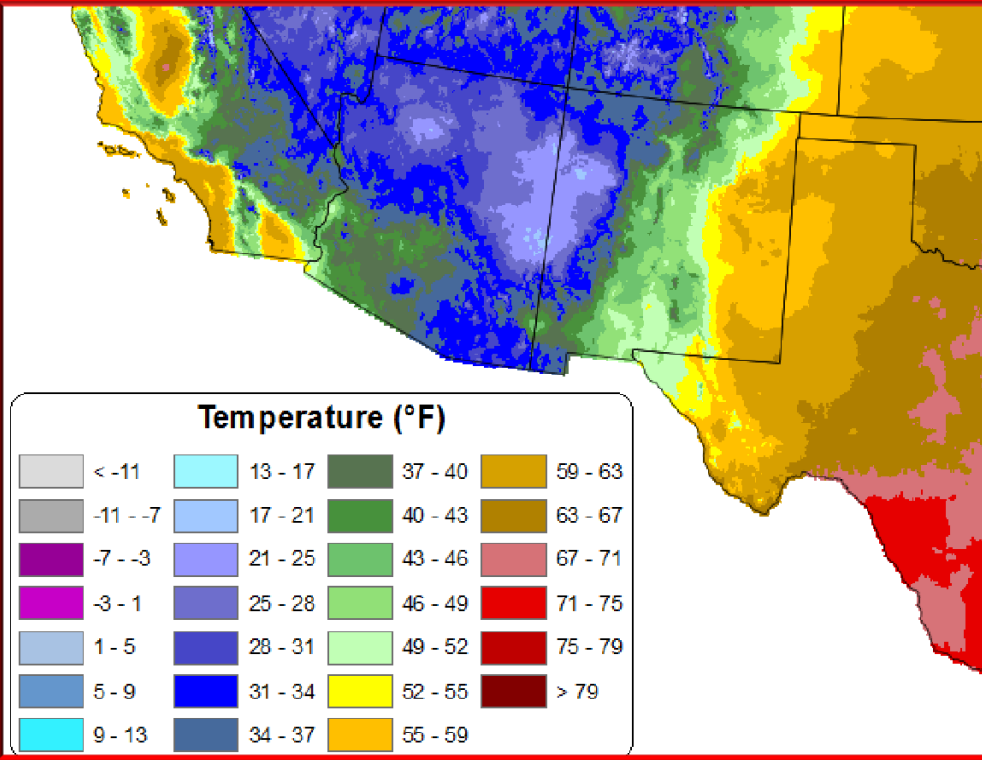
Updating our monsoon season through the end of August; we did increase the coverage and amount of rain some but still below normal for the season. As of the end of August dewpoint temperatures remained at the low end of typical monsoon values This is one of the first parameters to fall out of favor when the monsoon ends [see fig 4]. A look at the pattern aloft still shows the monsoon firmly in place. The average last day of the monsoon over southern New Mexico and west Texas occurs on about September 24, so we are looking at 3 weeks or less.

Percent of Annual Precipitation Falling During the Monsoon Season (Jun15-Sep 30)



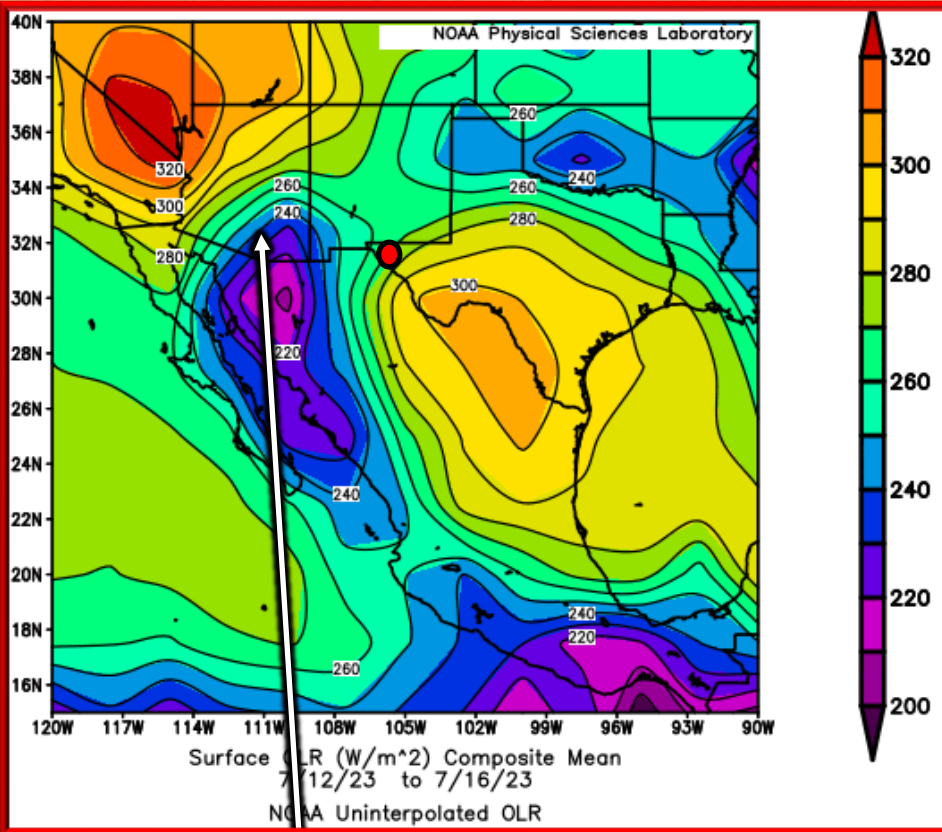
Tracking the 2023 Monsoon Season across the El Paso Forecast Area. Fig 1

July 3 – Dewpoints reach into the upper 40s to lower 50s across the area



By July 5, 500mb (18,000 ft) sub-tropical high reaches the Desert Southwest

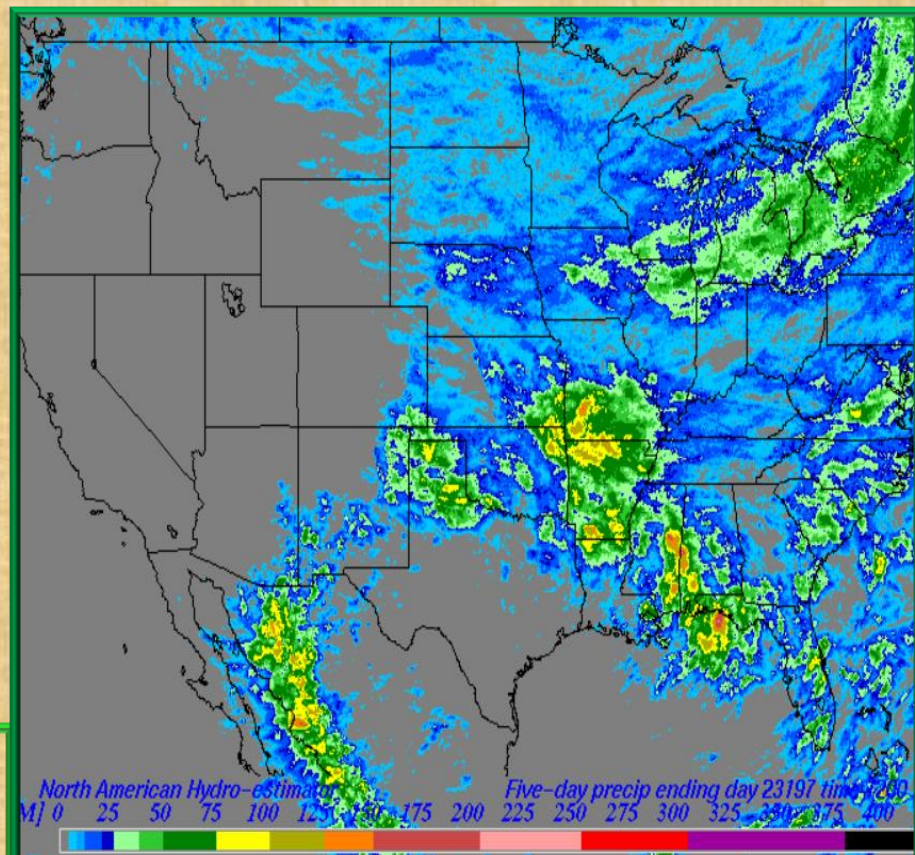
Tracking the 2023 Monsoon Season across the El Paso Forecast Area. Fig. 2



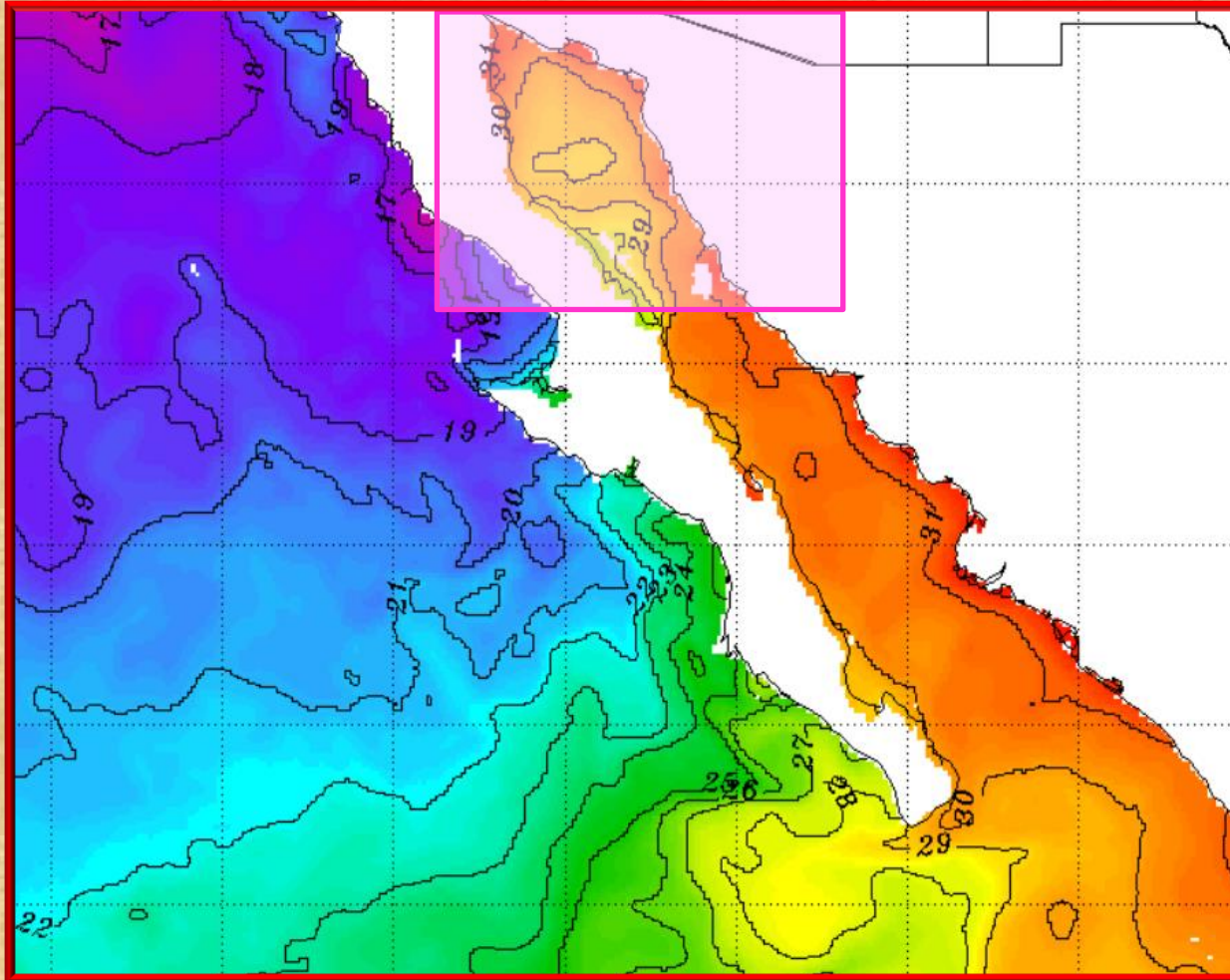
240 W/m²

July 12-16 - Outgoing Longwave Radiation (OLR) diminishes to less than 240 W/m² in the area though not over New Mexico. Thick clouds and anvil tops from thunderstorms diminish the OLR values, often indicative of the monsoon moisture and thunderstorms moving into the area. (Pentad data Jun 26-30)

By July 11-16, the first area wide Monsoon precipitation occurs



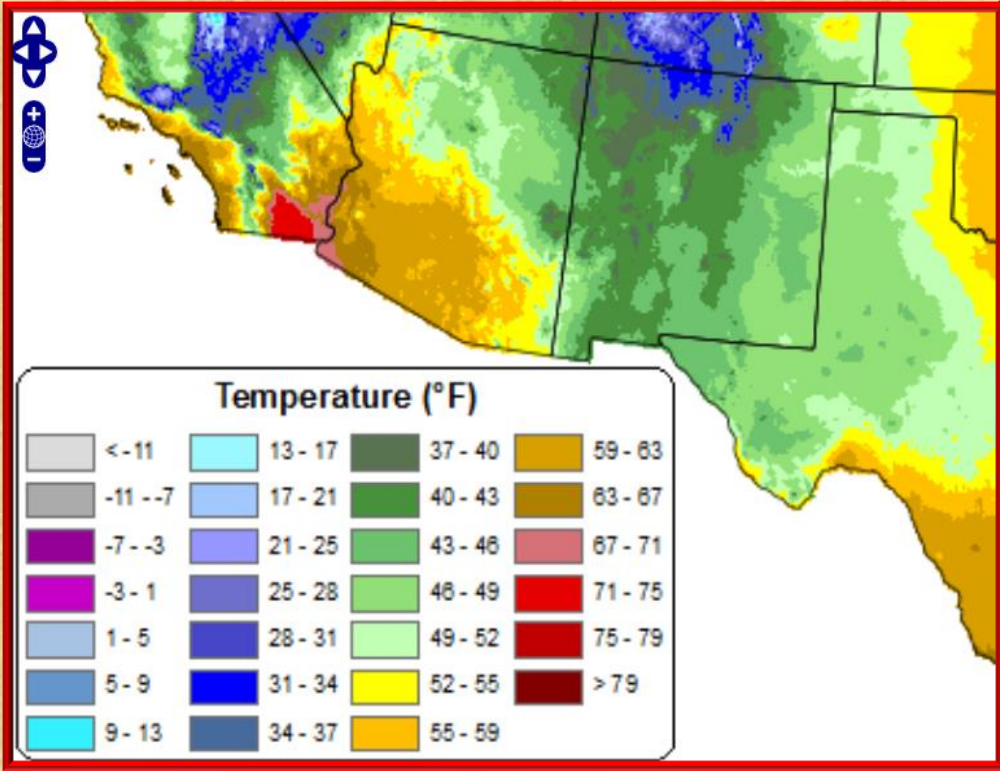
Tracking the 2023 Monsoon Season across the El Paso Forecast Area. Fig. 3



July 17 – Sea surface temperatures in the northern Gulf of California reach 29C deg (84F)

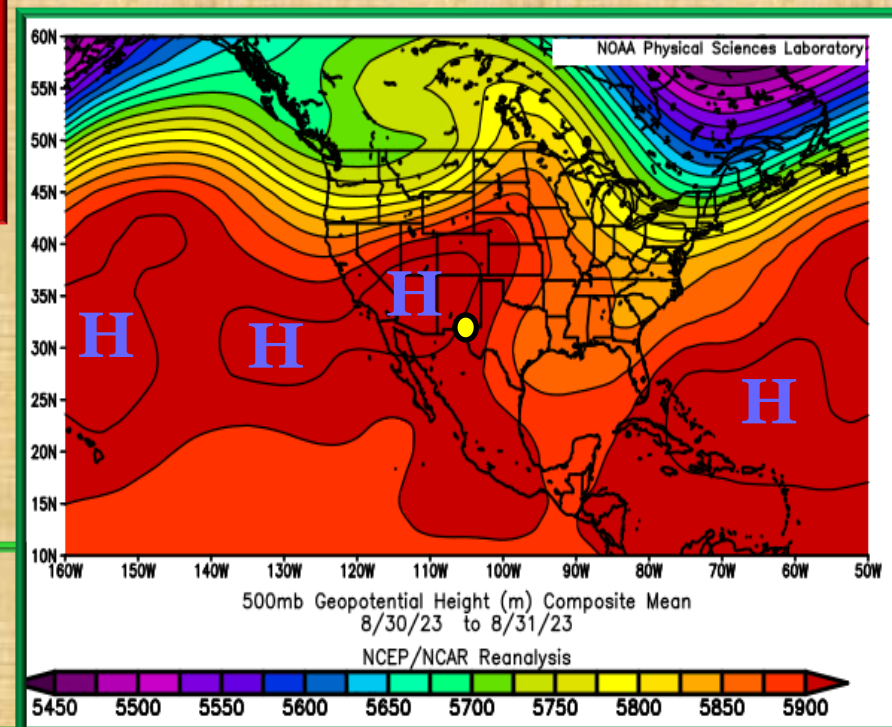
Studies have shown that once northern Gulf of California sea surface temperatures reach 29C, New Mexico/Arizona will receive around 65-70% of their total summer rainfall.

As we near the end of the 2023 Monsoon Season. Fig 4



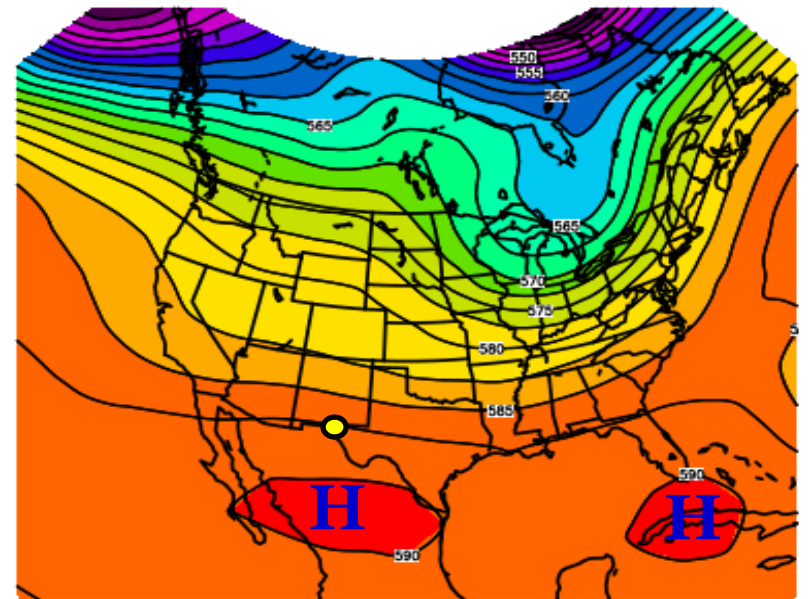
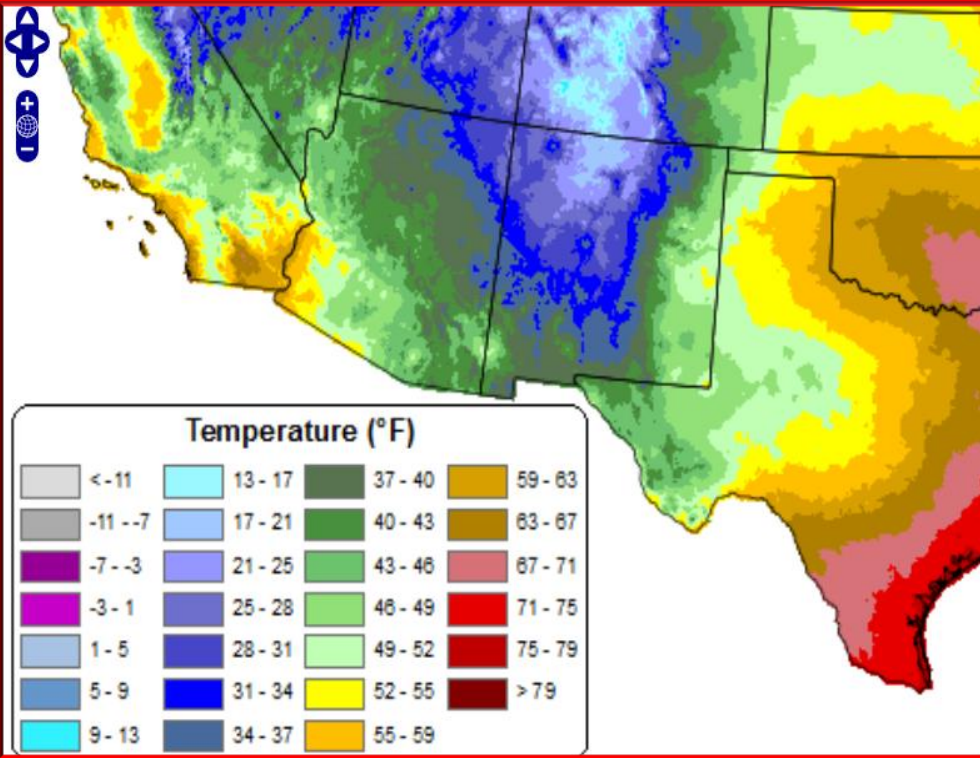
Sep 1– Dewpoints remain in the mid 40s, indicating the monsoon season is likely nearing the end.

As of the end of August, the 500mb (18,000 ft) upper flow is still well in the Monsoon pattern.



The end of the 2023 Monsoon Season. Fig 5

Sep 9 – Dewpoints fell into the 30s to 40 degrees. Higher dewpoints not related to the monsoon did reappear briefly after this.



By September 14, the 500mb (18,000 ft) upper flow had transitioned from a monsoon pattern to an autumn mid-latitude flow

500mb GEOPOTENTIAL HEIGHTS (dam) 03-DAY MEAN FOR:
Tue SEP 12 2023 - Thu SEP 14 2023
NCEP OPERATIONAL DATASET

Fig. 4**Percent of monsoon rainfall after 29C**

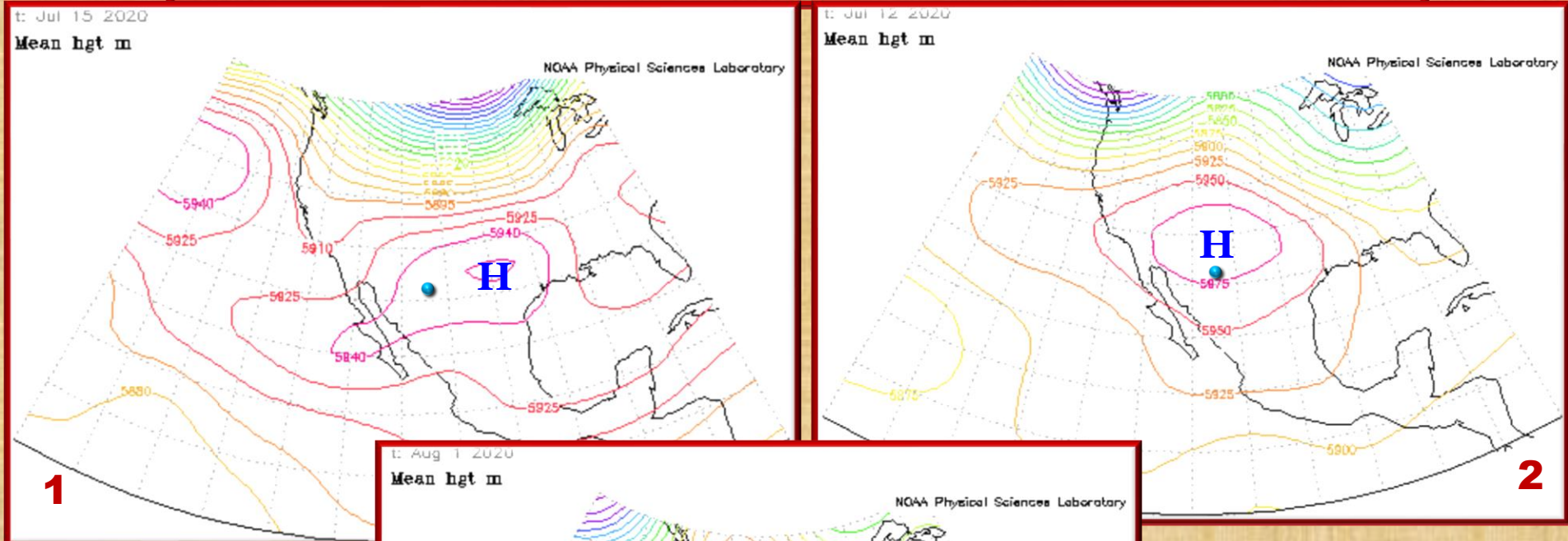
Year	29C Date	ELP	DMN	CLD	TCS	HIL	BKN
2023	Jul 17	89	100	83	97	100	81
2022	Jun 29	85	82	85	67	74	80
2021	Jul 16	51	75	68	60	63	71
2020	Jul 22	88	65	67	98	89	86
2019	Aug 8	83	91	62	67	71	34
2018	Jul 21	59	46	74	80	62	61
2017	Jul 23	58	67	66	88	61	64
2016	Aug 3	93	92	71	79	85	73
2015	Jul 27	63	43	56	53	61	57
2014	Jul 23	92	82	77	91	89	MSG
2013	Aug 8	61	68	61	88	75	MSG
2012	Jul 24	53	64	73	42	52	80
2011	Jul 29	37	90	36	86	62	68
2010	Jul 29	47	31	43	33	47	32
2009	Jul 24	54	61	47	56	65	56
2008	Jul 27	48	39	54	46	58	58
2007	Jul 26	65	62	60	91	72	100
2006	Jul 29	84	81	73	86	85	MSG
2005	Jul 30	95	79	72	83	87	80
AVE	Jul 25	68	68	64	72	69	67

ELP=El Paso Intl Airport
DMN=Deming Airport
CLD=Cloudcroft COOP
TCS=T or C Airport
HIL=Hillsboro COOP
BKN=Buckhorn COOP

The northern Gulf of California sea surface temperature this year reached 29C on July 17. Research has shown that, on average, around 65-75% of the total Monsoon rainfall will fall after that date. As this table shows, this year even exceeded the average figures.

Tracking the 2023 Monsoon Season across the El Paso Forecast Area. Fig. 5

Position of NAM upper high determines our rainfall potential. Blue dot represents El Paso.

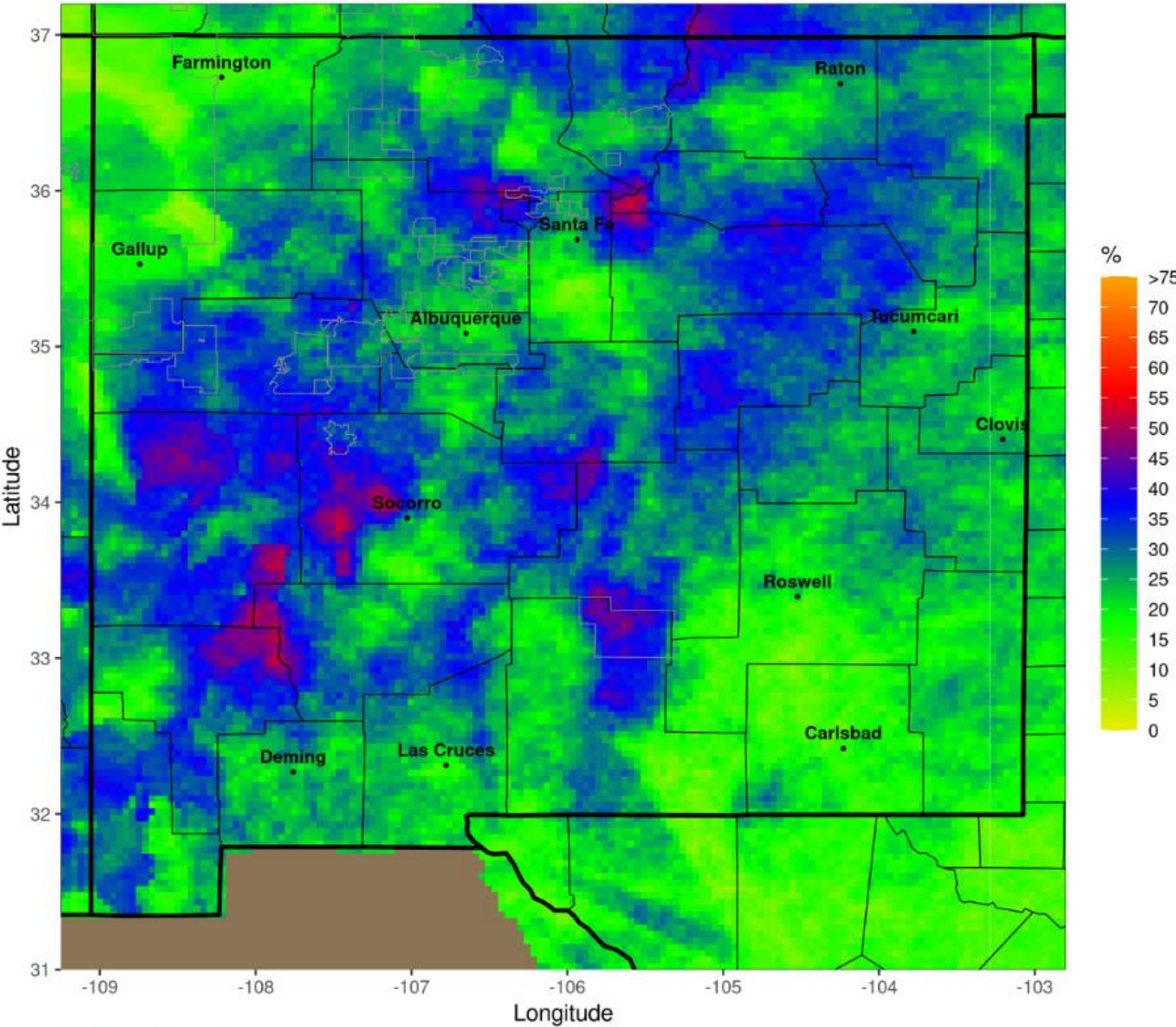


No. 1 High center east of New Mexico. Often brings ample tropical moisture and widespread heavy rain and flooding to the area under southerly flow.

No. 2 High center over New Mexico. Often brings very hot temperatures and little if any rain (usually limited to the mountains).

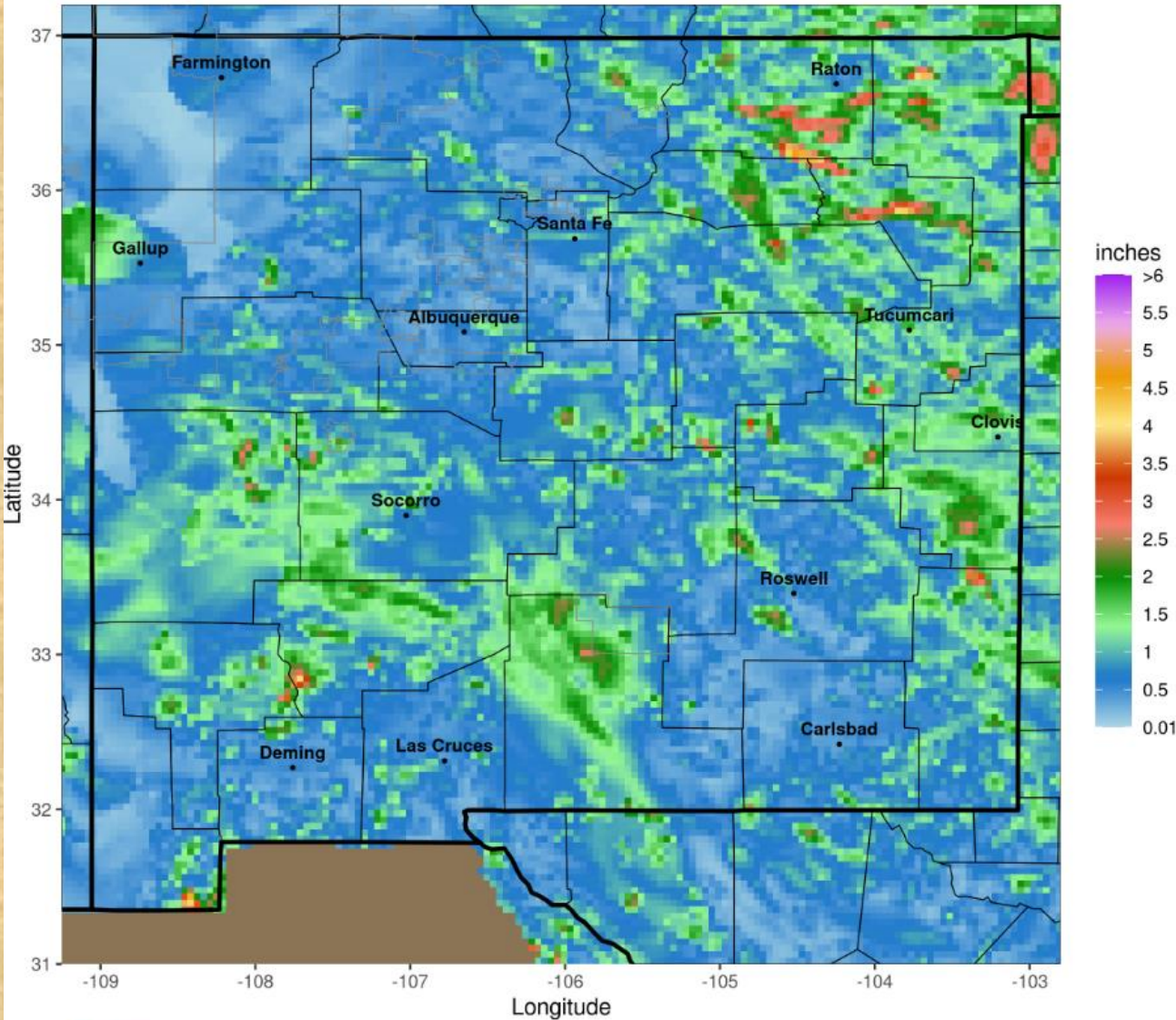
No. 3 High center west of New Mexico. Often brings scattered storms with hit and miss heavy rains and large hail and strong wind potential.

Percent of days with rain (>0.01 in): 2023-06-15 to 2023-09-30



This map shows the percentage of measurable rainfall days so far during the Monsoon season. Courtesy of Climate Assessment for the Southwest.

Max 1-day Precipitation (in.): 2023-06-15 to 2023-09-30



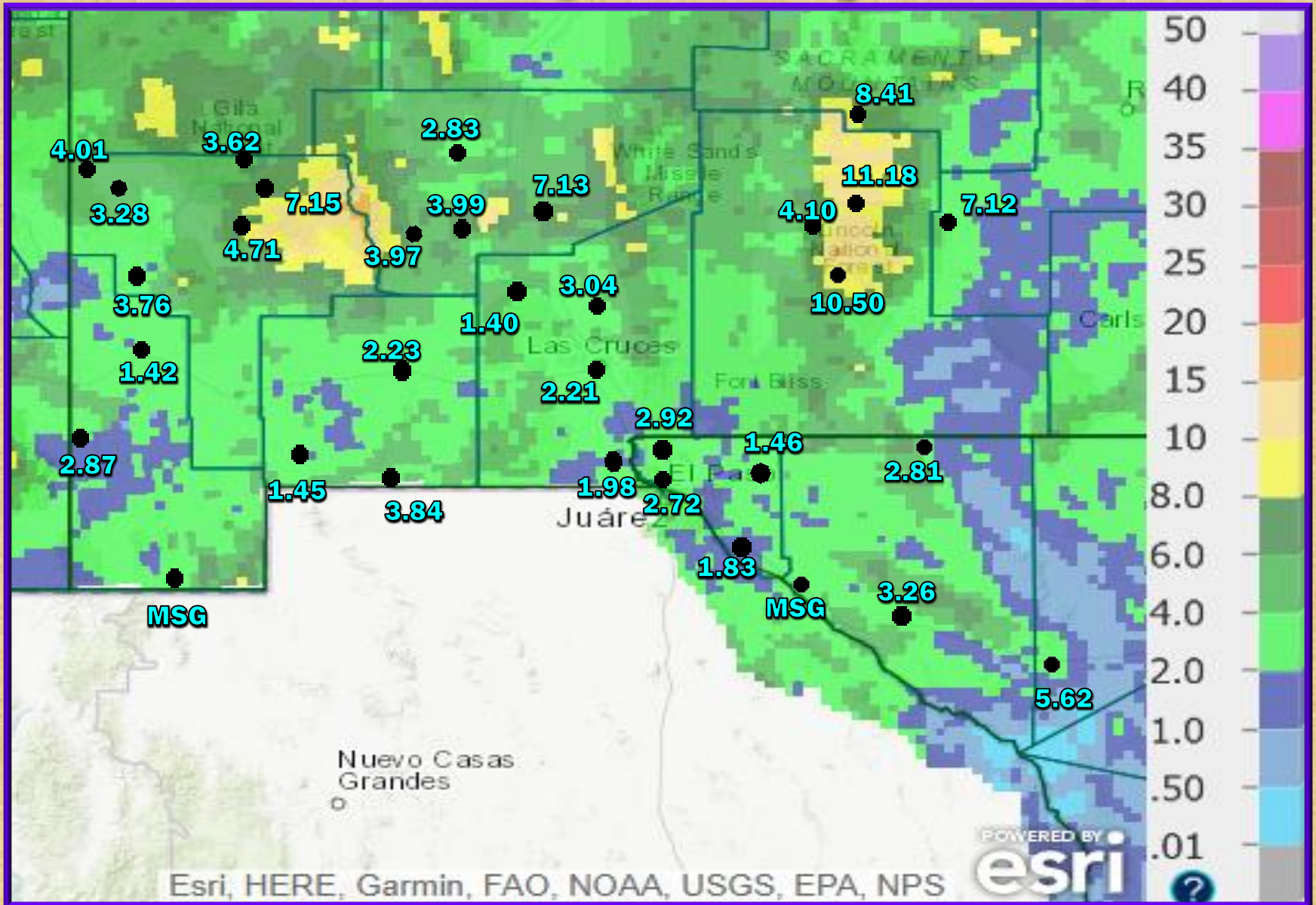
This map shows greatest one day rainfall total so far during the Monsoon season. Courtesy of Climate Assessment for the Southwest.



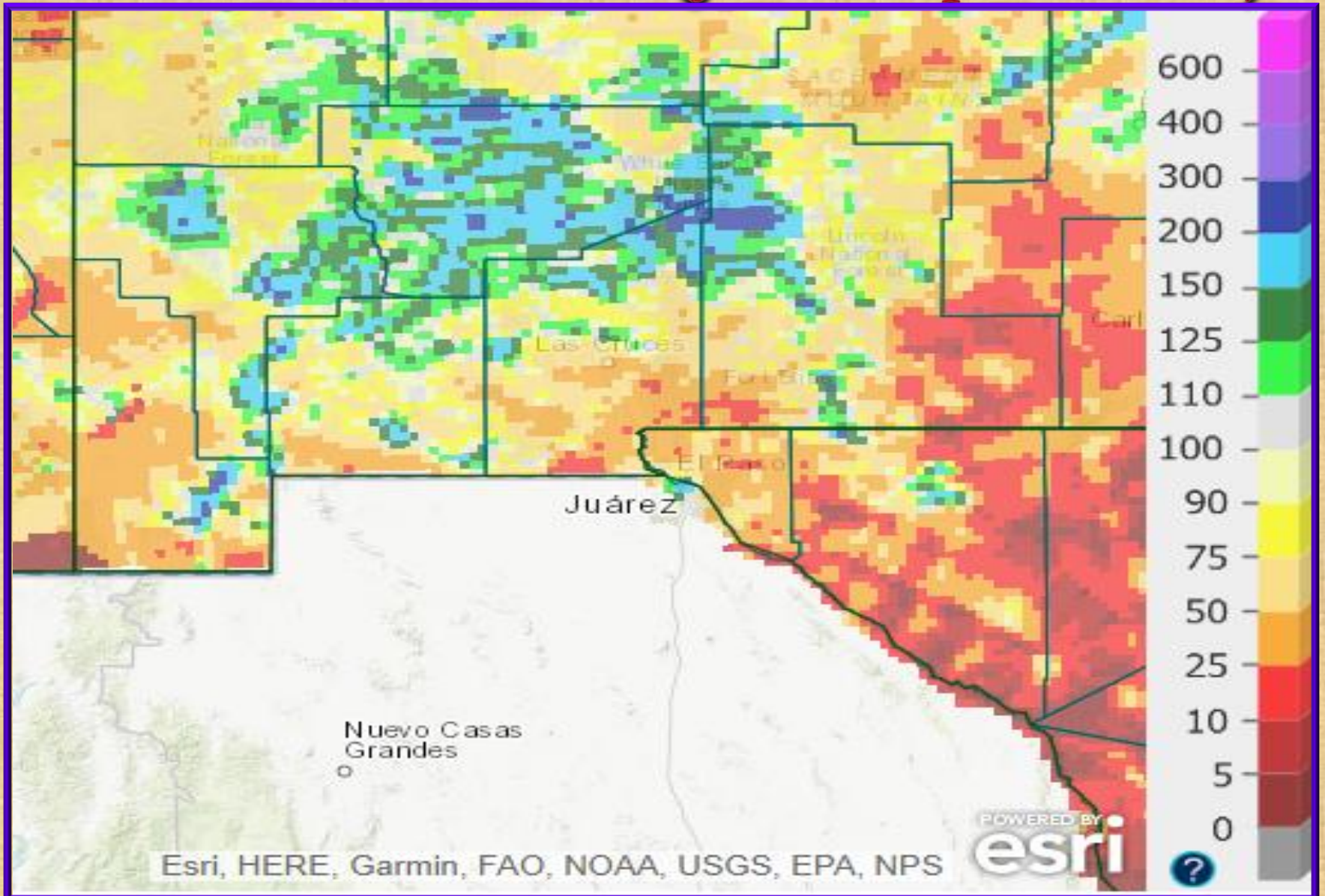
THE UNIVERSITY OF ARIZONA
Cooperative Extension

Plot created: 2023-09-30
The University of Arizona
<https://cals.arizona.edu/climate/>
Data Source: NOAA MPE Analysis
<https://water.weather.gov/precip/>

Radar rainfall estimate for the Monsoon Season 2023 (June 1 – Sep 30, 2023)



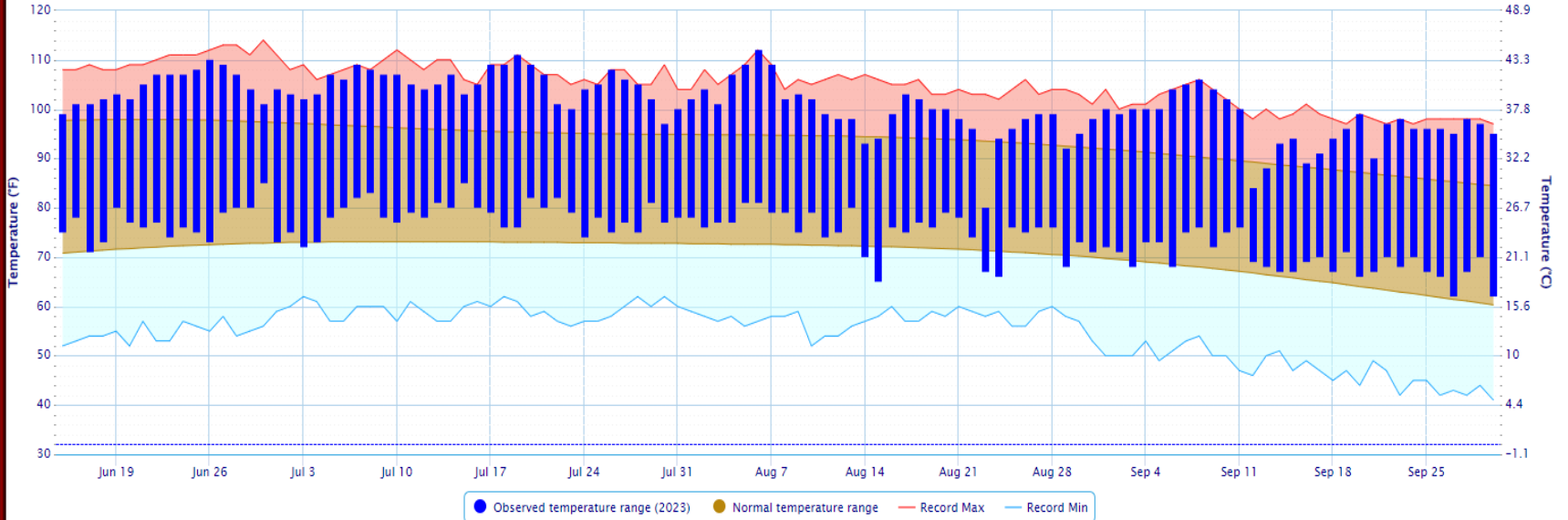
Radar rainfall estimate percent of normal for Monsoon season 2023 (June 1-September 30)



Temperature and precipitation data through September 30, 2023 Monsoon Season in El Paso

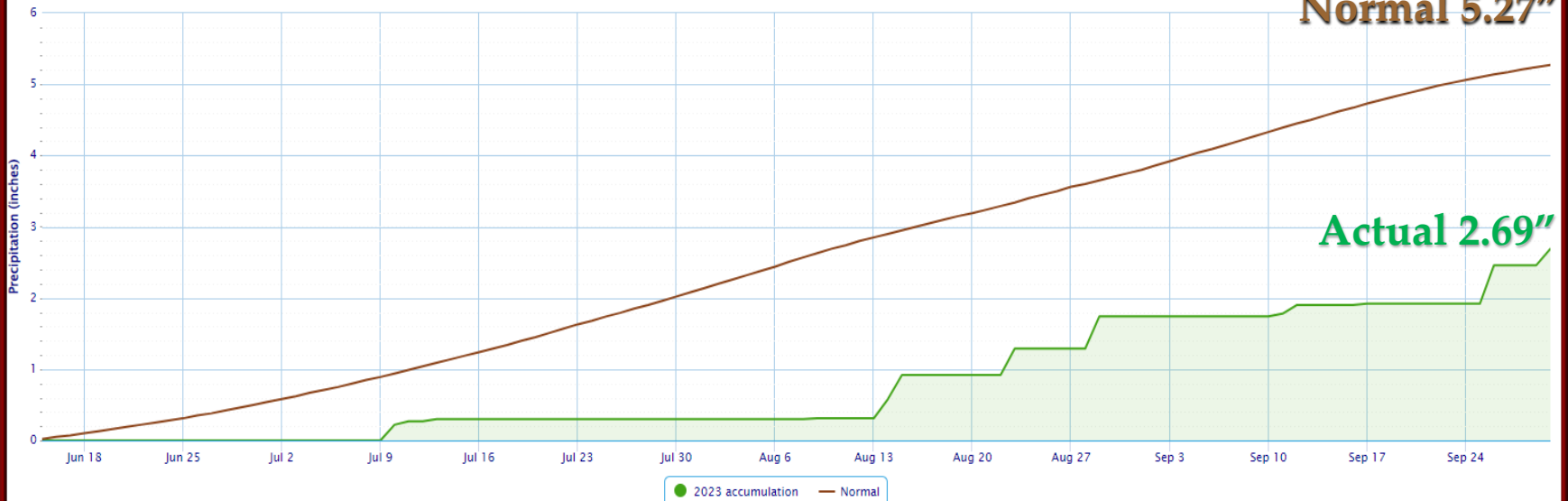
Daily Temperature Data - El Paso Area, TX (ThreadEx)

Period of Record - Max temperature: 1887-01-01 to 2023-10-04; Min temperature: 1879-01-01 to 2023-10-04. Normals period: 1991-2020. Click and drag to zoom chart.



Accumulated Precipitation - El Paso Area, TX (ThreadEx)

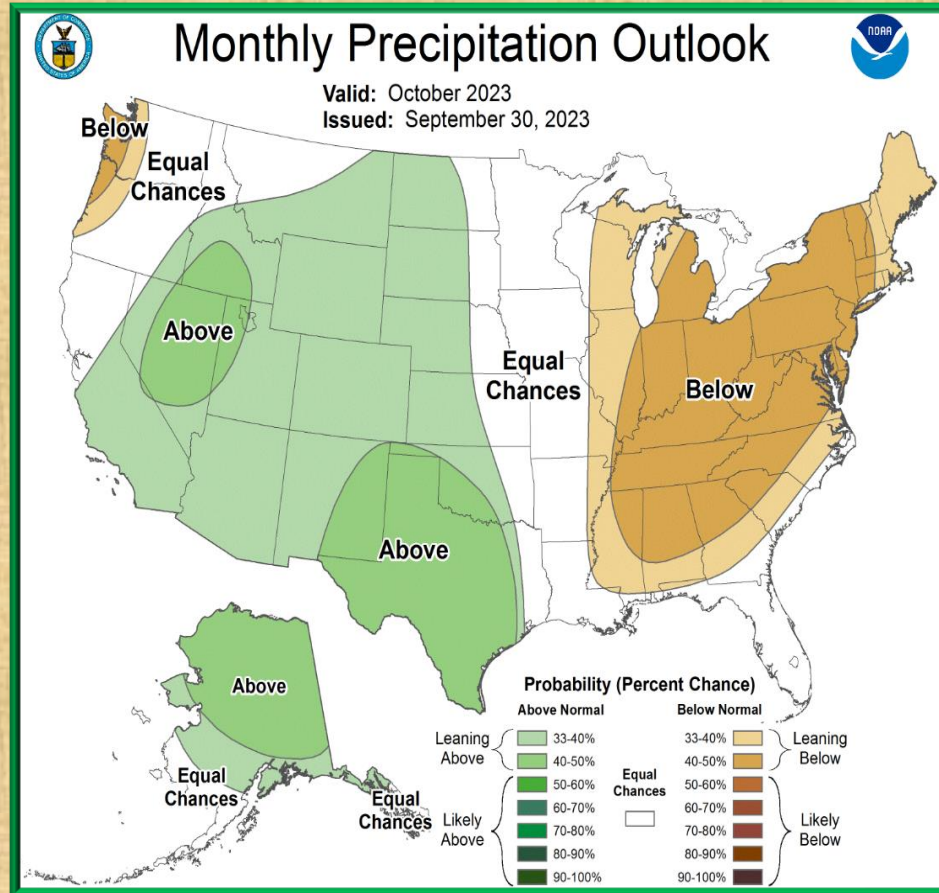
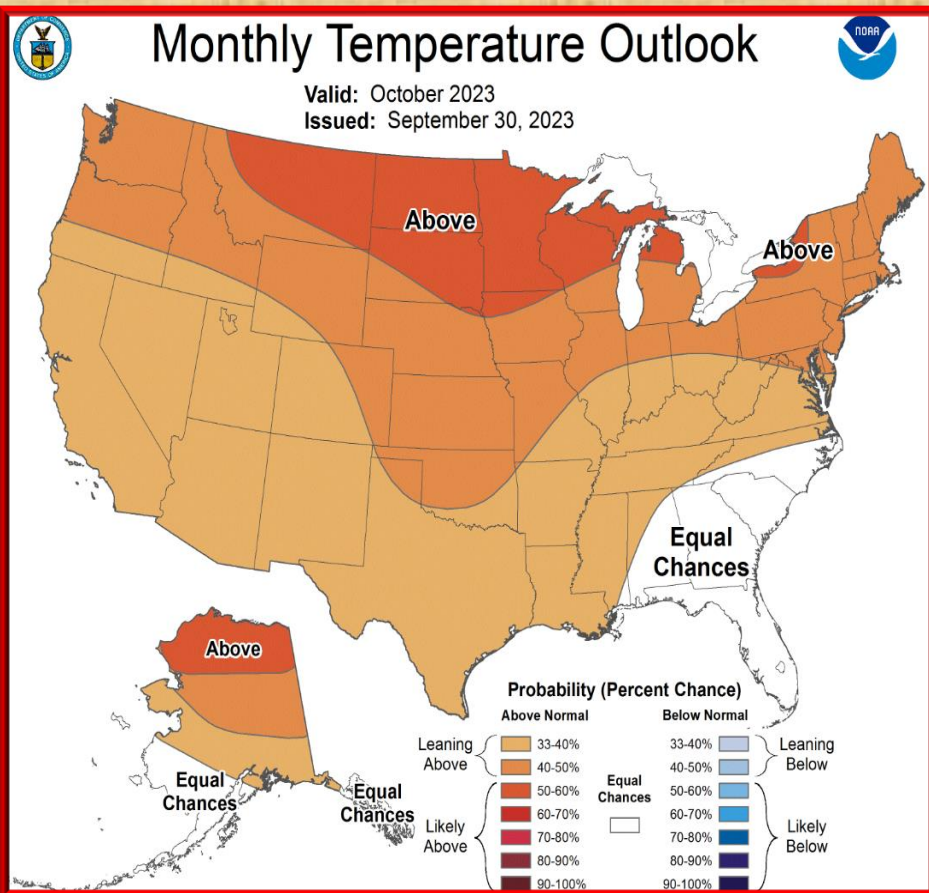
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Temperature and precipitation outlook For October 2023

Temperature

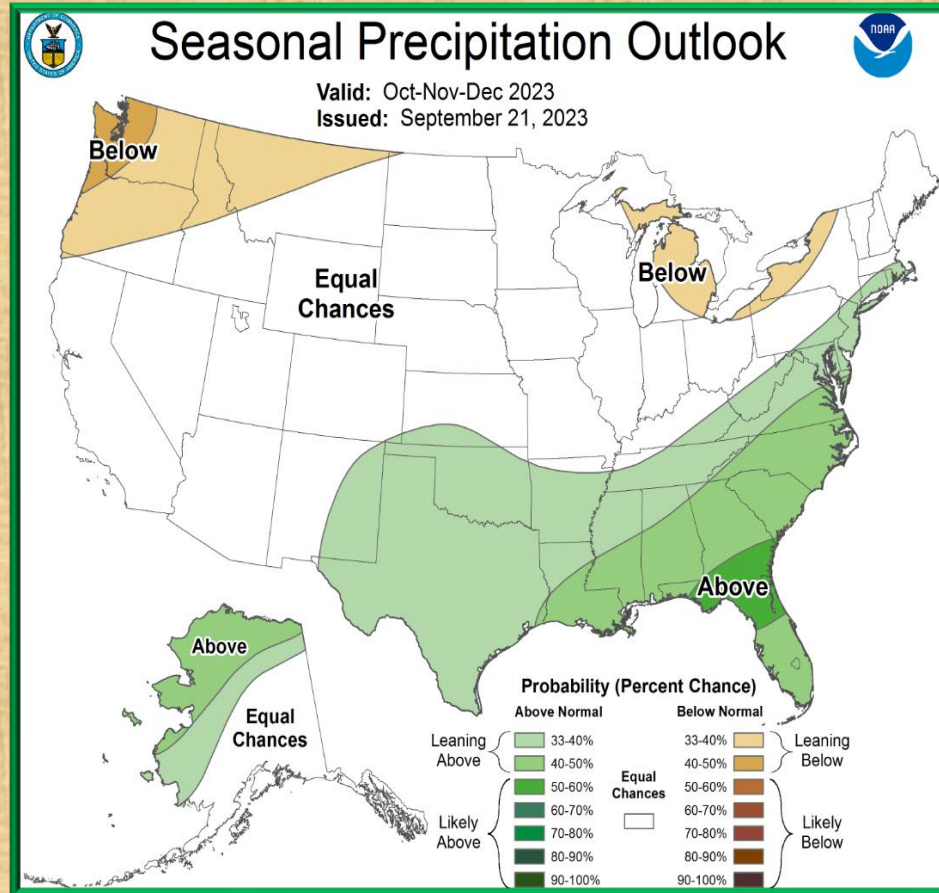
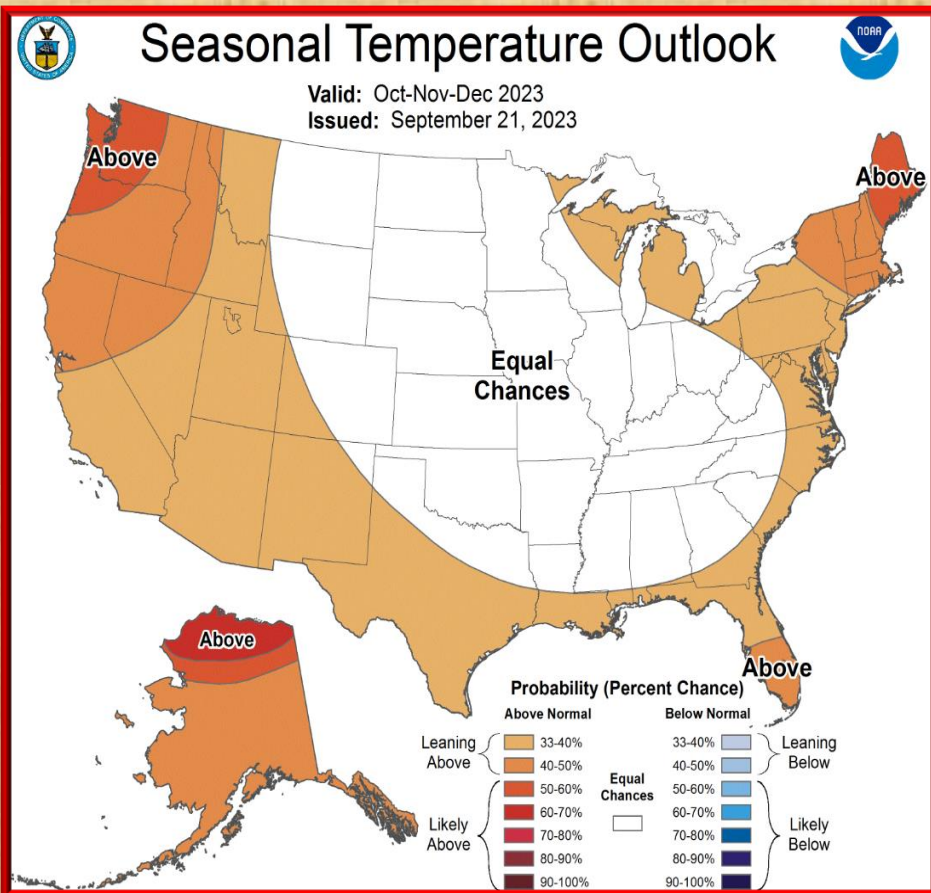
Precipitation



Temperature and precipitation outlook for Oct-Dec 2023

Temperature

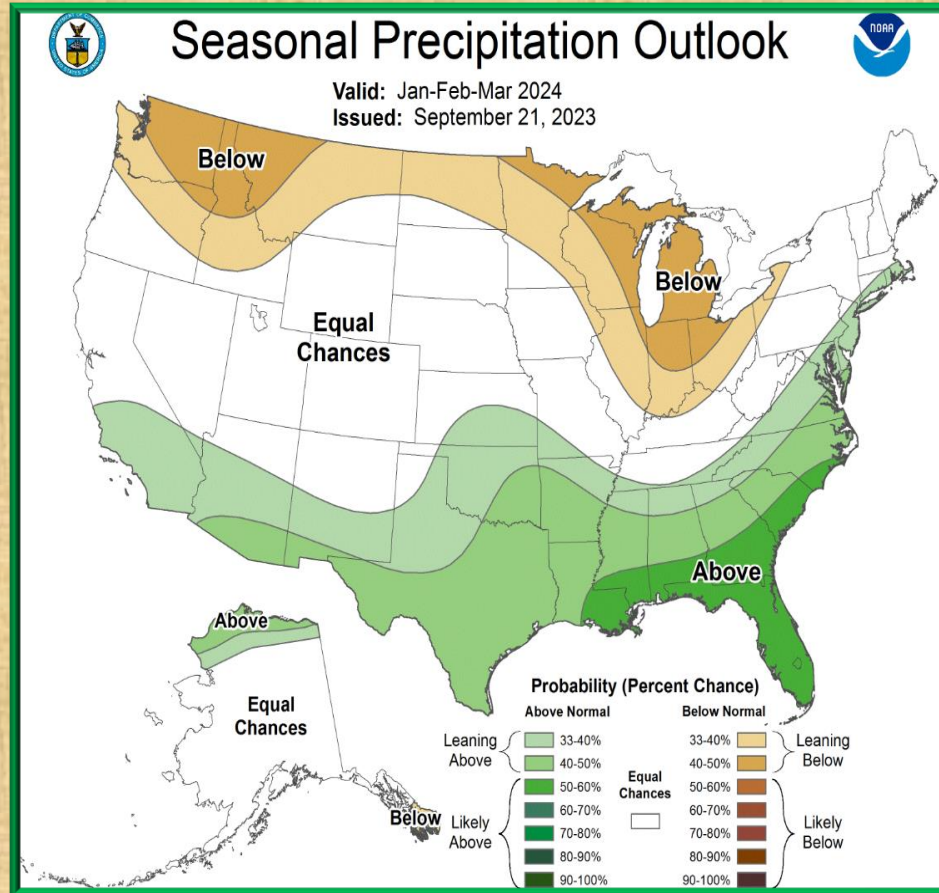
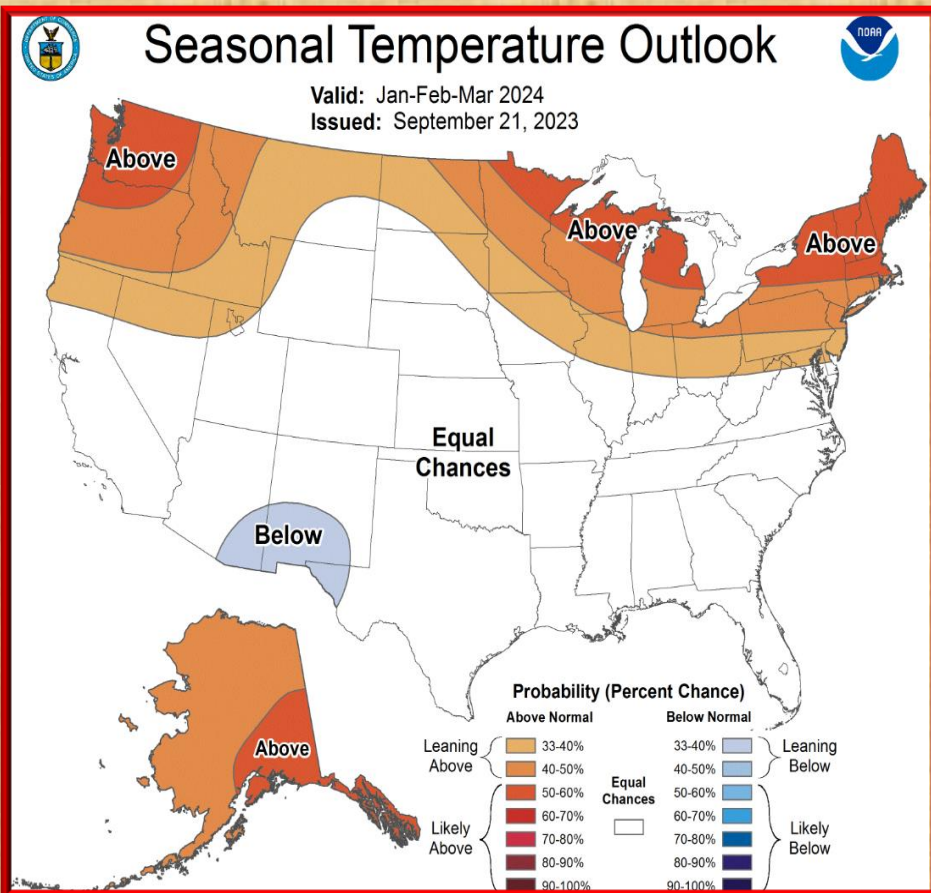
Precipitation



Temperature and precipitation outlook for Jan-Mar 2024

Temperature

Precipitation

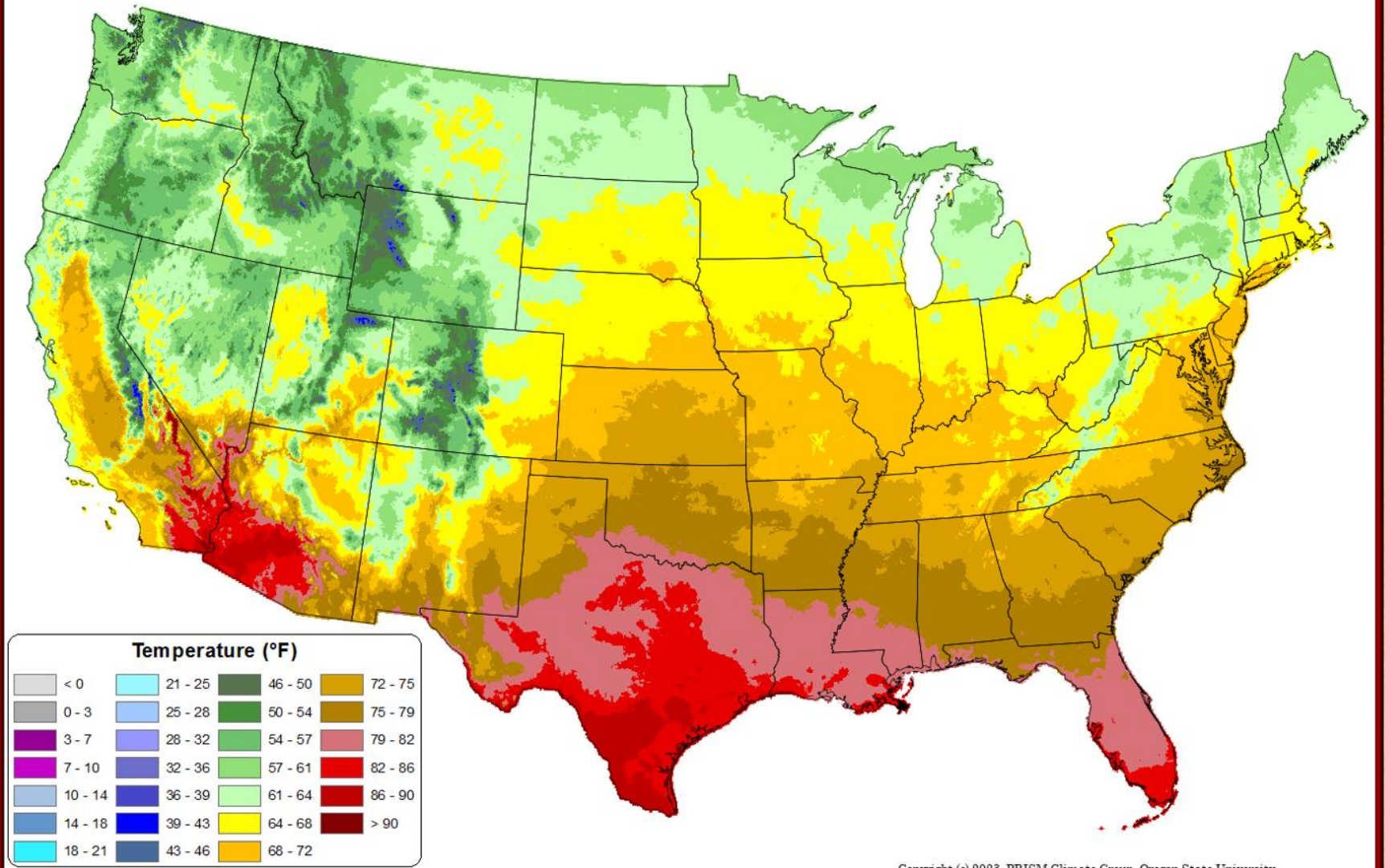


Average Daily Mean Temperature for September 2023

Average Daily Mean Temperature: Sep 2023

Period ending 7 AM EST 30 Sep 2023

(Map created 02 Oct 2023)

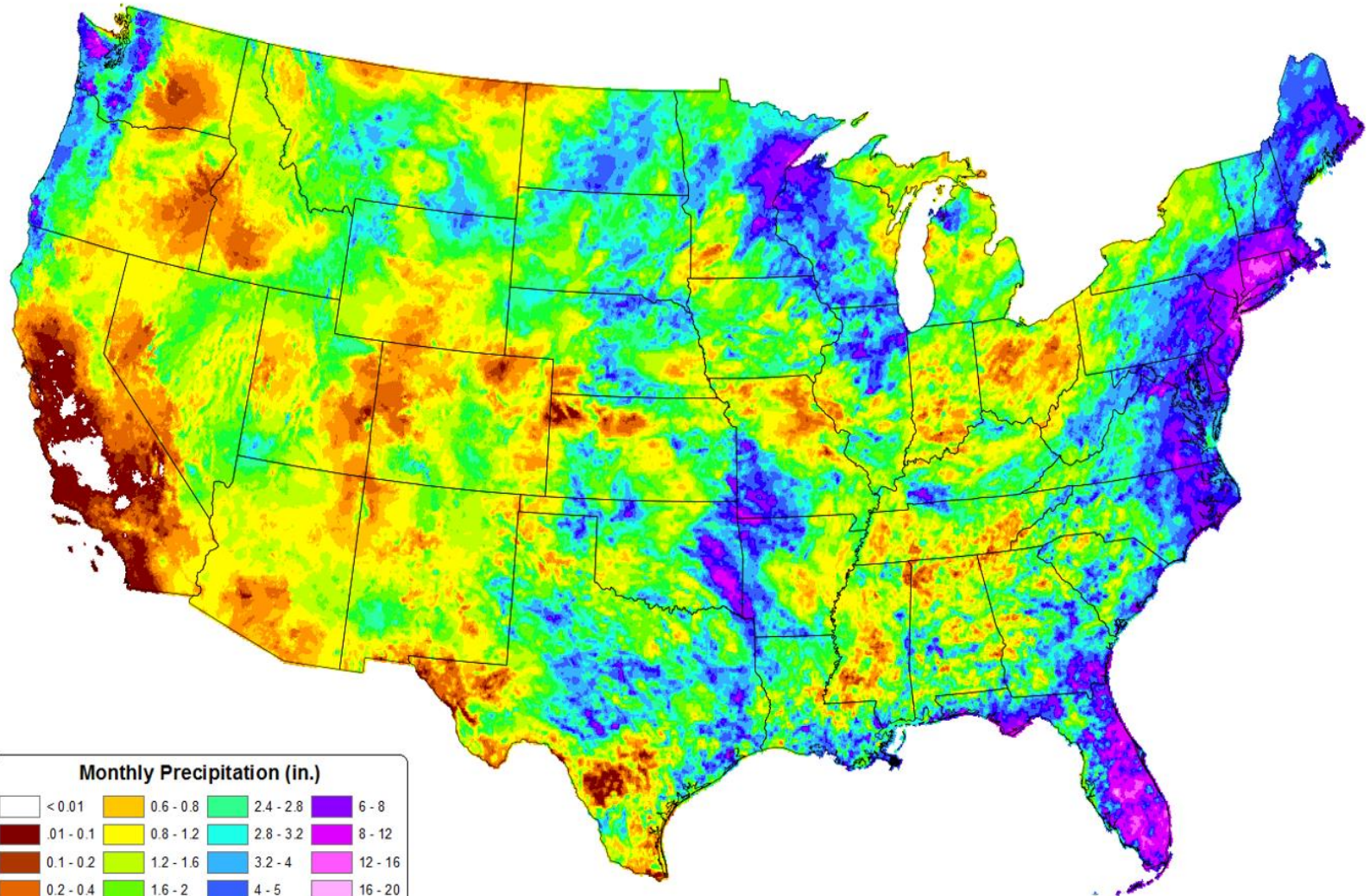


Total Precipitation for September 2023

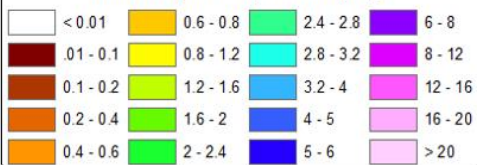
Total Precipitation: Sep 2023

Period ending 30 Sep 2023

(Map created 02 Oct 2023)



Monthly Precipitation (in.)



Selected Weather Reports September 2023

Date/Time	Location (County)	Event
SEP 17 445 PM	LORDSBURG 7SW-HIDALGO	64 MPH PEAK WIND GUST
SEP 17 315 PM	WINSTON 8W-SIERRA	2.00 INCH HAIL

Special Features

www.weather.gov/epz/elpwindrosedata

Month: **SEPTEMBER**

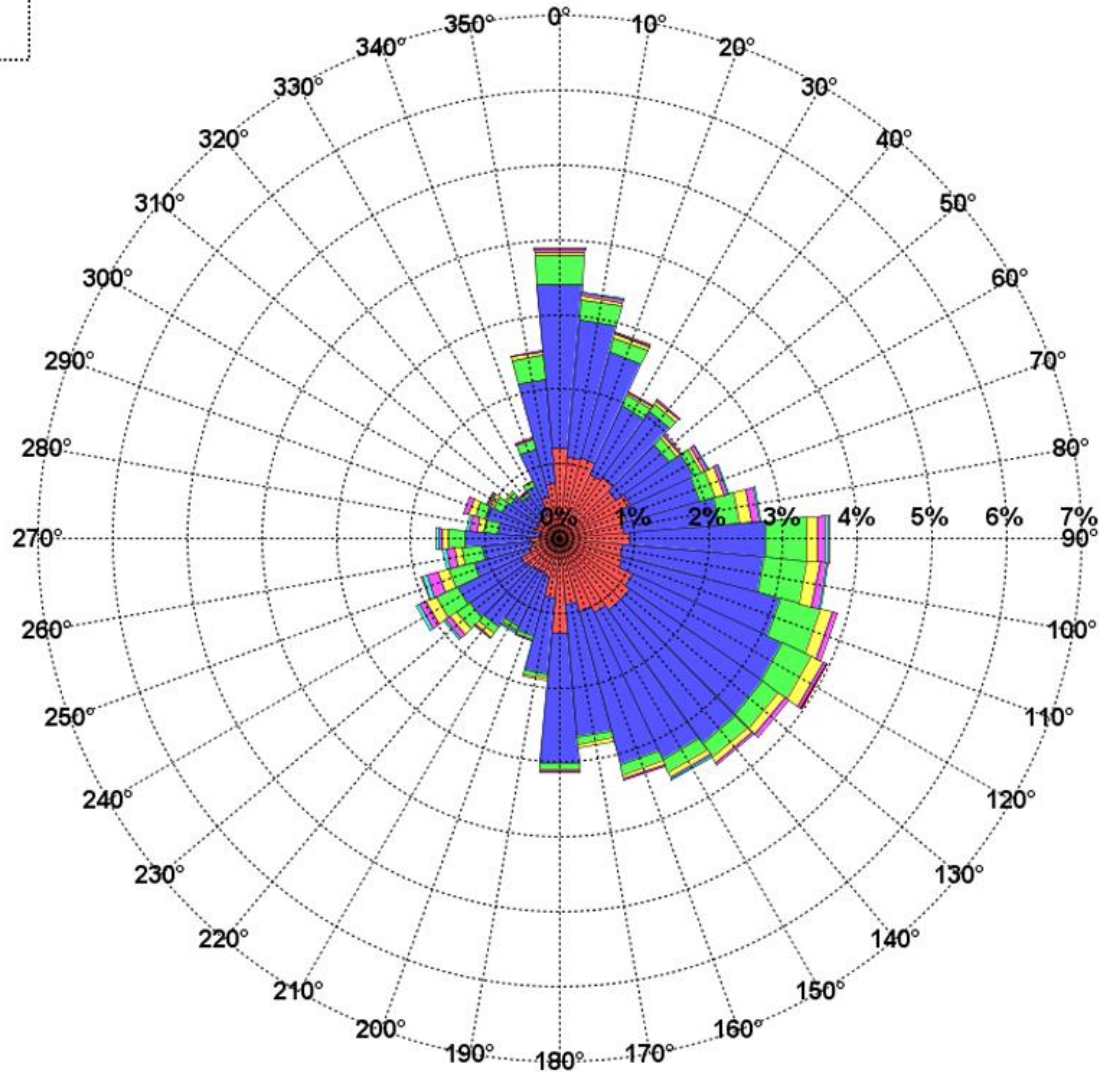
Calm: 11.68%

Variable: 3.28%

WindRose - KELP - EL PASO INTL

% Frequency of Wind Speed from a Direction

POR:19730101-20140602



Local forecast by "City, St" or ZIP code
 Enter location ...
[Location Help](#)

Heavy Rain and Flash Flooding Possible Over Parts of the Eastern United States
 Heavy rainfall is expected over portions of the eastern United States through Thursday. Flooding and flash flooding will be possible in some areas. Click the "Read More" link for excessive rainfall forecasts from the Weather Prediction Center. [Read More >](#)

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NWS El Paso
[Weather.gov > El Paso, TX](#)

El Paso, TX
 Weather Forecast Office

Current Hazards Current Conditions Radar Forecasts Rivers and Lakes Climate and Past Weather **Local Programs**

Today

Wednesday
 Warmer with a Few Afternoon Storms
 Weather Forecast Office
 El Paso, TX
 September 27, 2016 4:43 PM

Local forecast by "City, St" or ZIP code
 Enter location ...
[Location Help](#)

Heavy rain expected across the Mid-Atlantic region and central Appalachians.
 Heavy rainfall is possible over portions of the eastern United States today, with the highest risk across the Mid-Atlantic and central Appalachians. Click the "Read More" link for excessive rainfall forecasts from the Weather Prediction Center. Afternoon showers and thunderstorms are possible over portions of the Southwest and southern Rockies through Friday. [Read More >](#)

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[Weather.gov > El Paso, TX > Monthly Weather Digest](#)

El Paso, TX
 Weather Forecast Office

Current Hazards Current Conditions Radar Forecasts Rivers and Lakes Climate and Past Weather **Local Programs**

Southern New Mexico and Far West Texas has a variety of weather from month to month. Conditions can range from extreme drought, to heavy flooding rains, from record breaking heat to bone chilling cold. Below you will find past weather highlights from the area that the NWS office in Santa Teresa NM covers. This area includes the following counties in New Mexico: Hudspeth, Grant, Luna, Sierra, Doña Ana and Otero and the following counties in Texas: El Paso and Hudspeth.

[weather.gov/epz](#)

Don't Forget-Current and past issues of our Weather Digest are available on our website at www.weather.gov/epz/

Just click on "Local Programs>Weather Digest", then choose which month's Digest to view. Also, though discontinued, don't forget to check out our back issues of Southwest Weather Bulletin.

WEATHER DIGESTS AND BULLETINS	
Weather Digest	Southwest Weather Bulletins
January	2005 Spring Fall
February	2006 Spring Fall
March	2007 Spring Fall
April	2008 Spring Fall
May	2009 Spring Fall
June	2010 Spring Fall
July	2011 Spring Fall
August	2012 Spring Fall
September	2013 Spring Fall
October	2014 Spring Fall
November	
December	