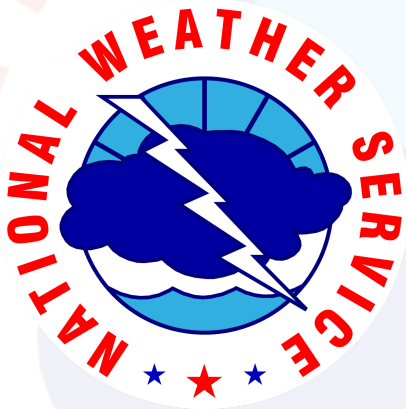


SPOTTER NEWSLETTER

NWS PHOENIX SKYWARN NEWSLETTER

MARCH 2025



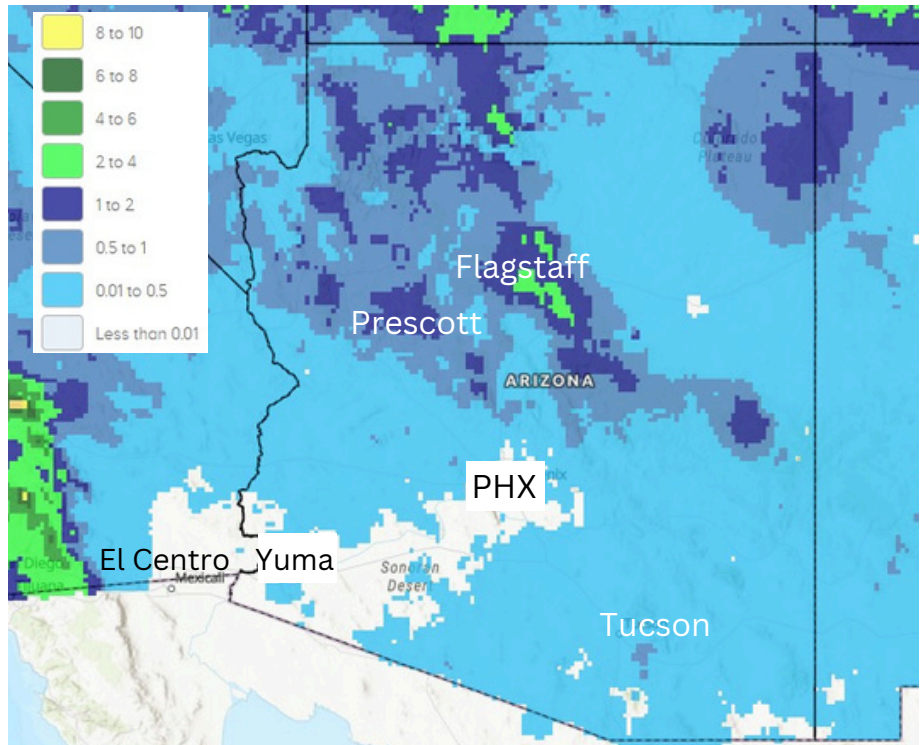
What's Inside

- Winter Review
- Drought Status
- Spring Outlook
- Lightning Climatology
- Learning More
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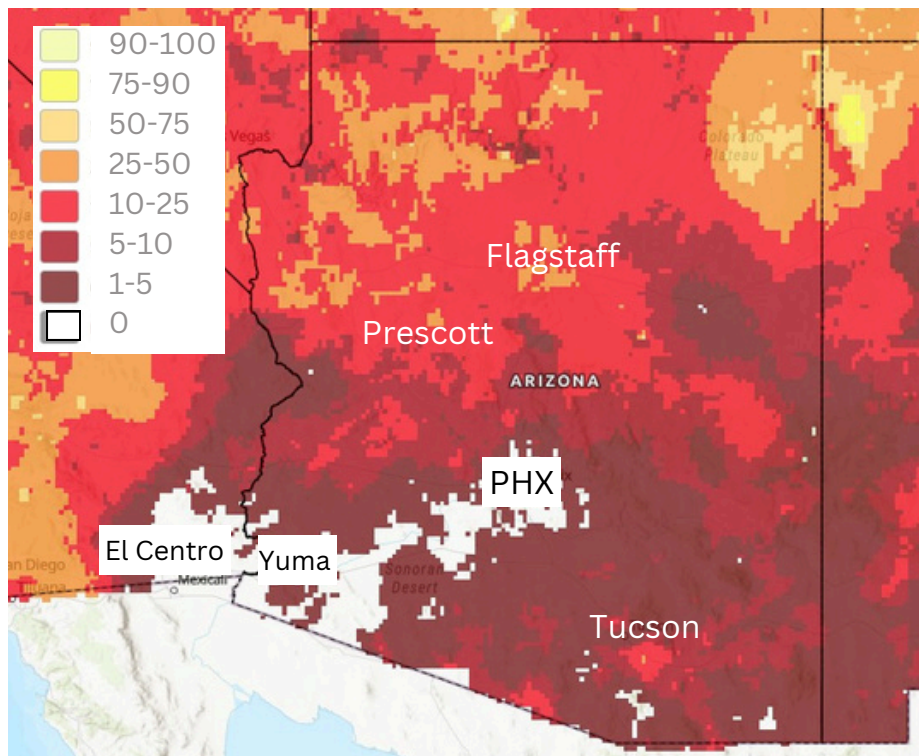
It took until March for the region to see any meaningful precipitation. As for meteorological winter (December - February) you might say this was the winter that wasn't due to abnormally warm temperatures and paltry rainfall - even relative to a desert region. We will examine some maps and data for more details. We will also look at the drought status as of late February and take a look at the long range forecast for Spring. This newsletter will also touch on lightning climatology and some sources to expand your knowledge of meteorology.

WINTER REVIEW

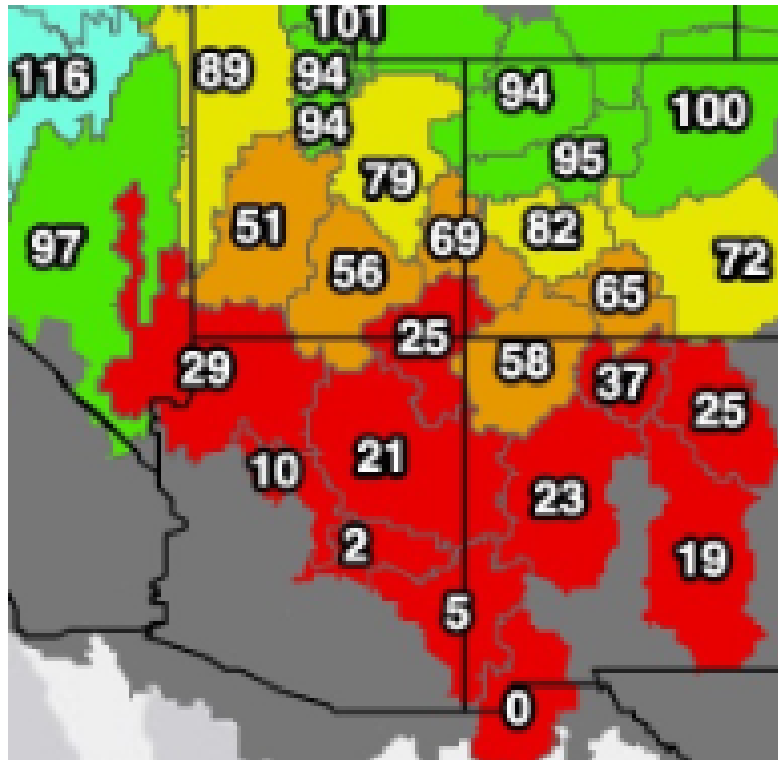
The map at the right is accumulated precipitation (liquid equivalent) for the 90 day period ending February 28th. Notice large swaths of the region had less than half an inch and even a lot of higher terrain areas had less than 1 inch. Large portions of the lower deserts struggled to see one hundredth! If you wondered what rain shadowing looks like, notice the sharp drop-off over far southern CA (from green to light blue). That's courtesy of the mountains.



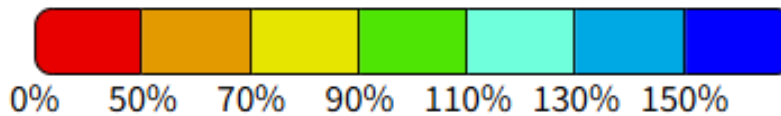
As you might imagine, the percent of normal precipitation for the winter was very poor as the map at the right reveals. Large portions of AZ and far southeast CA were less than 10% and some areas at zero. The highest percentages (only 50-75%) are very isolated. This isn't good news with drier and warmer months ahead.



WINTER REVIEW - CONTINUED

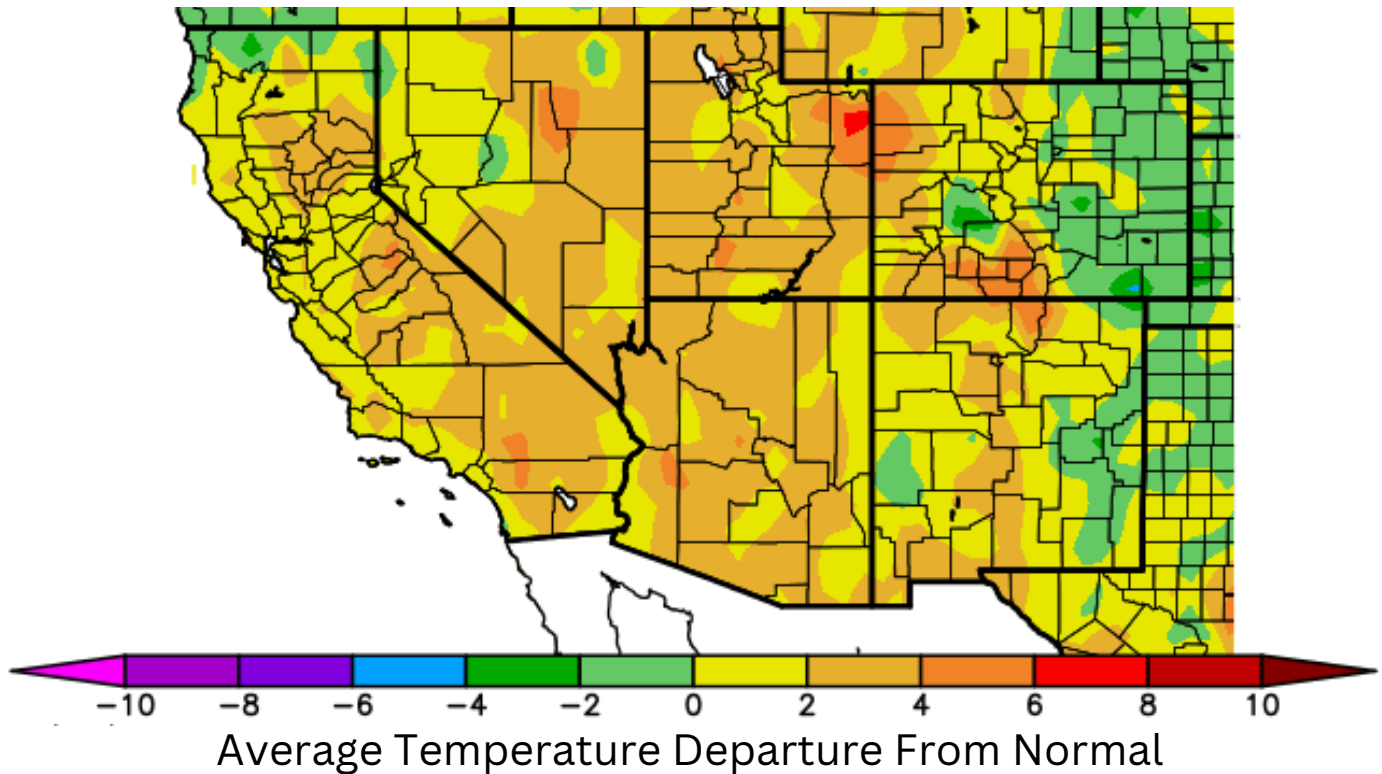


Percent of Median Snow Water Equivalent



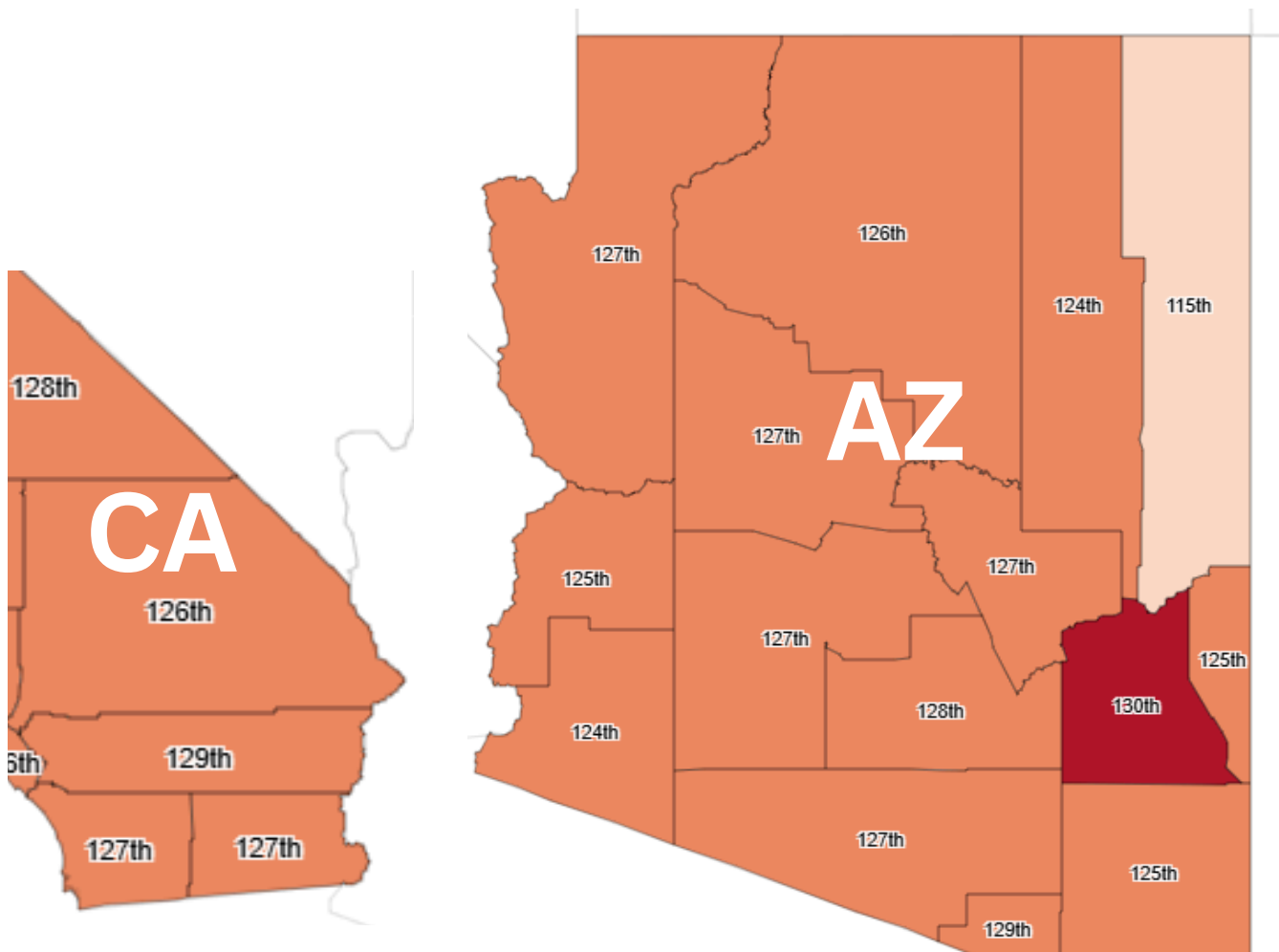
Given such dry conditions, mountain snowpack is suffering. The map above shows the percent of median of snow water equivalent (SWE) as of March 2nd. The area depicted includes AZ and surrounding states. SWE is essentially what the snow would measure out to in a rain gauge if you melted it. It's based on a network of both manual and automated snow gauges that measure the weight of the snow ([more info here](#)). In addition to AZ, New Mexico has been very dry as well. Things are well below median elsewhere in southern Utah and Colorado. One bright spot is northern Colorado. Though the recent precipitation in March will improve things, it won't bring things up to median in AZ and New Mexico.

WINTER REVIEW - CONTINUED



If you thought this winter was unusually mild, you were right! The map above shows how the average temperature for the period of December 2nd to March 1st departed from normal/average. All of AZ and nearly all of southern CA were above normal with most of those areas in the +2 to +4 degree range. And this includes January which was on the cool side. When any given location has a 90 day period that is multiple degrees above normal, that is noteworthy. As you can see from the map, the anomalous conditions affected most of the southwest quarter of the Lower 48 which is quite significant.

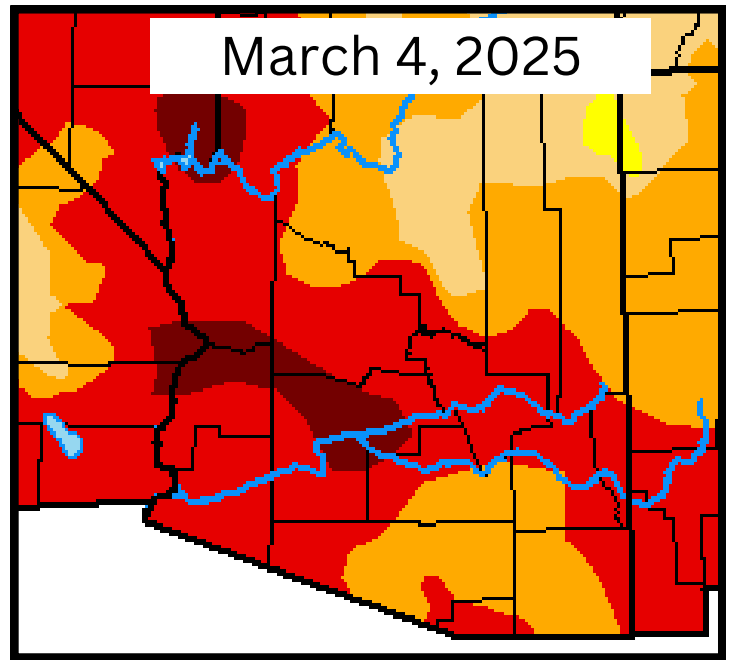
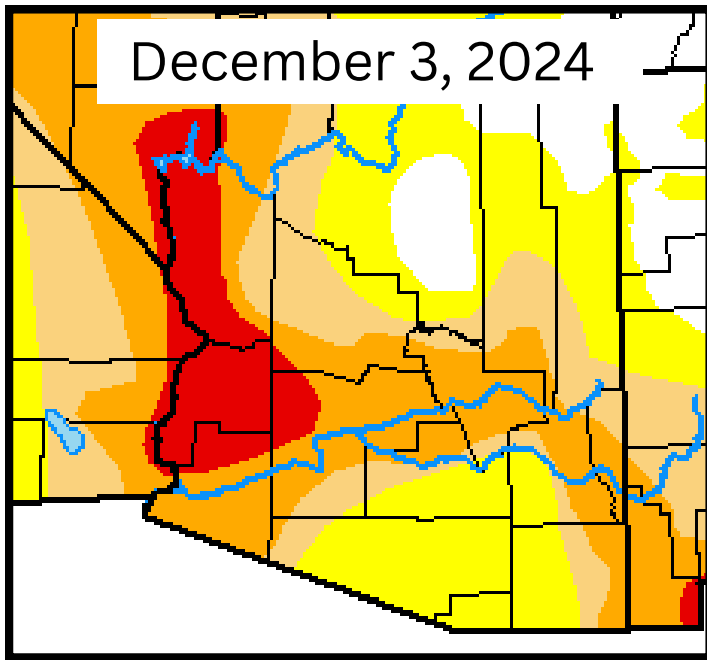
WINTER REVIEW - CONTINUED



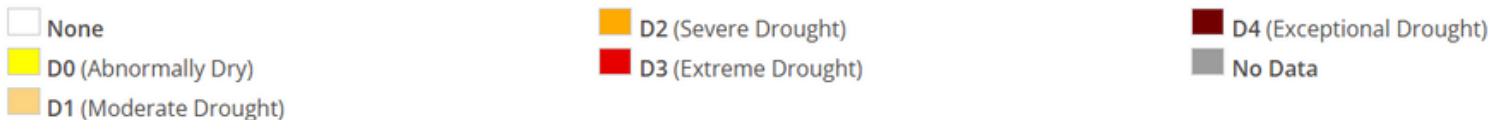
County-wide Temperature Rankings Dec-Feb

For some additional perspective on the temperatures, the maps above show how the average temperature for December through February ranked by County. Nearly all counties are in the top 10% warmest of the past 130 years (tan color) with Graham County having their warmest (red). The number labels show where they rank with respect to coldness. So, “127” means the 127th coldest winter which means the 4th warmest winter out of 130 years of record.

DROUGHT STATUS



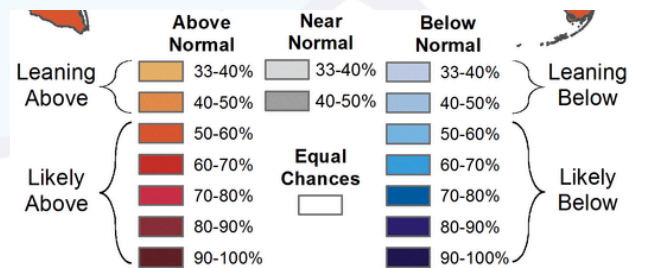
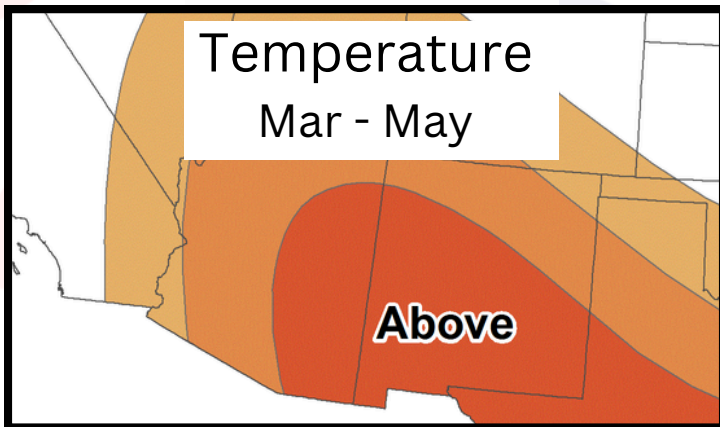
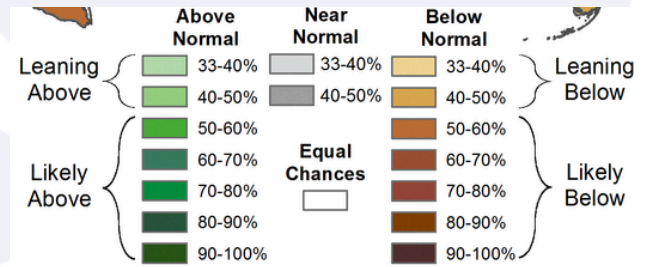
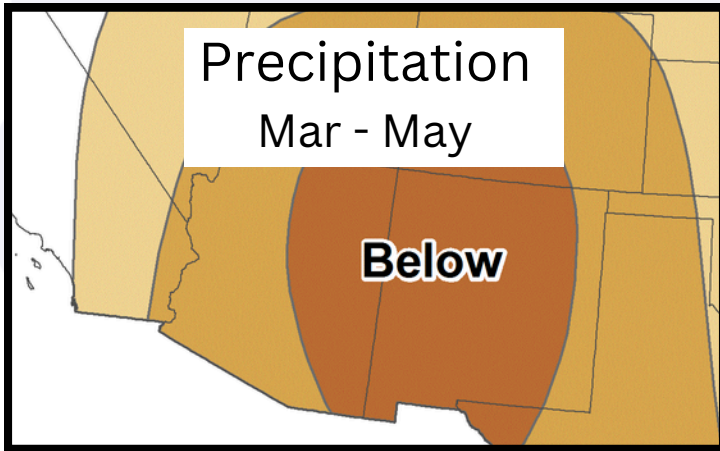
Drought Classification



With such meager precipitation and mild temperatures, you can expect drought conditions to have worsened over the region. The maps above depict drought status at two points of time. The left is for December 3, 2024. The right is from three months later (March 4, 2025). Virtually everywhere has worsened. In fact, large portions of the map including northeast and southeast AZ have degraded by two categories (see the legend below the maps). That has resulted in large swaths of the region now being in the Extreme category of drought (D3). There are also some pockets including the Greater Phoenix area that are in the most severe category: Exceptional (D4).

SPRING OUTLOOK - PRECIPITATION

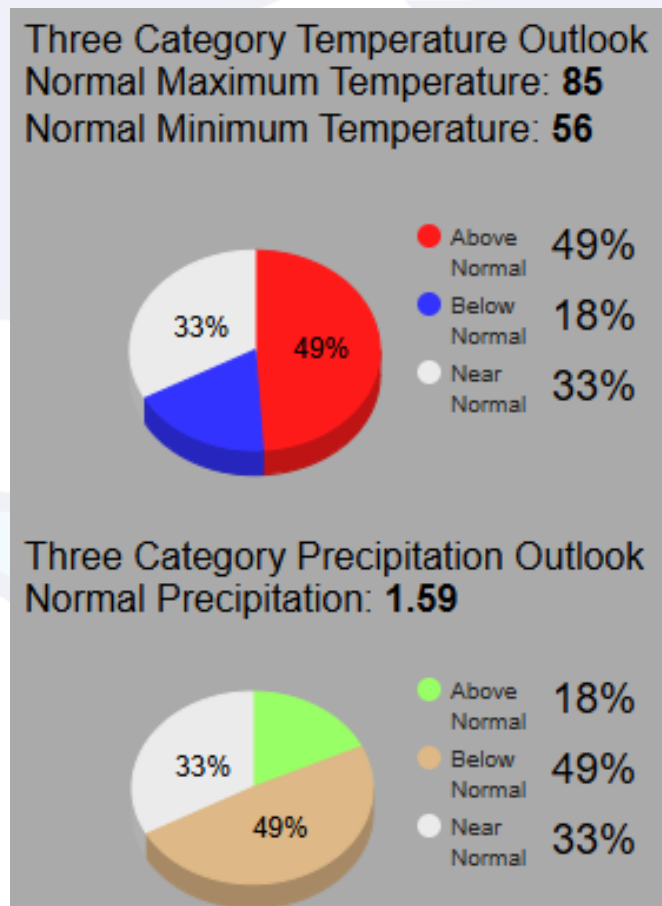
The maps below are forecasts covering the three month period of March through May when taken as one lump sum. It shows the most likely of three categories (and the associated probability of occurrence): Above Normal, Below Normal, and Near Normal. If none of the categories are more likely than another, then it's "Equal Chances" and isn't shaded on the map. That isn't the same thing as Near Normal being most likely. Instead, it is more of a 'shoulder shrug' since there aren't any distinct signals to latch onto. For our region, that isn't the case. Despite recent rains, the favored category for spring precipitation as a whole is Below Normal. And, the favored category for temperatures is Above Normal.



WINTER OUTLOOK (CONT.)

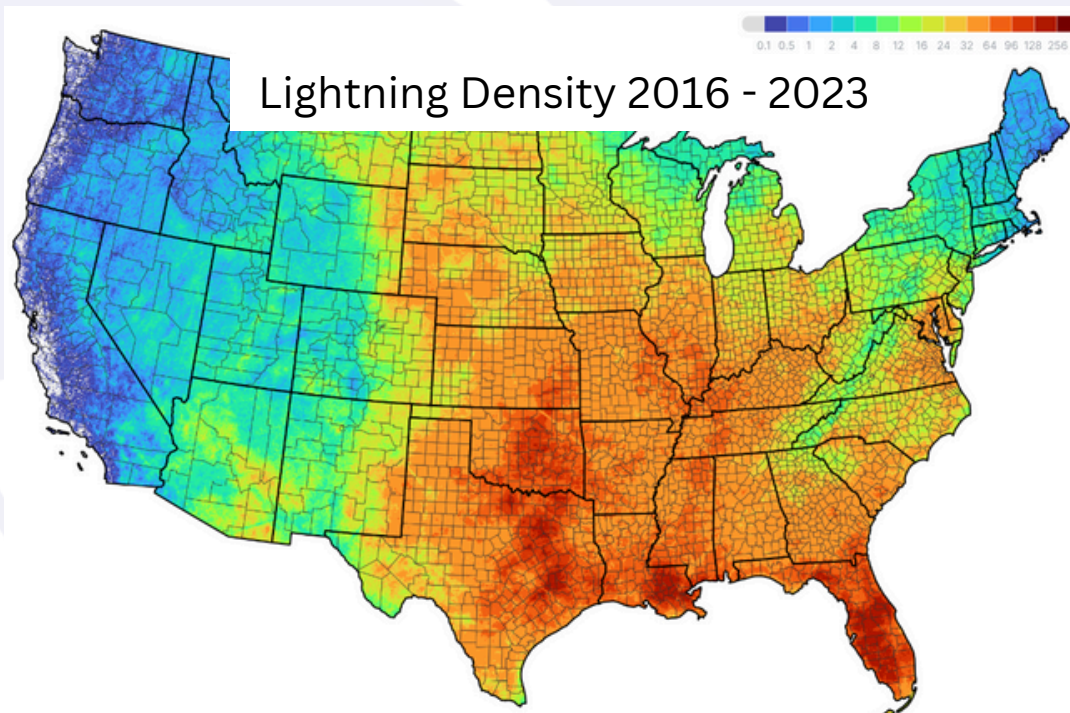
The maps on the preceding page depict the most likely outcome for total seasonal precipitation and average temperature respectively. But, as we know, there is more than one possible outcome when talking about the future state of the weather.

Below is what the forecast looks like for an individual location (Phoenix). By means of a pie chart, you can see what the probability of each category/outcome is. Looking at precipitation (bottom), you can see Below Normal is substantially more likely to occur than Above Normal. But, the potential for Above Normal is not zero. there is still a relatively decent chance of Near Normal. Similarly for temperature, Above Normal is much more likely but it isn't the only possibility.



LIGHTNING CLIMATOLOGY

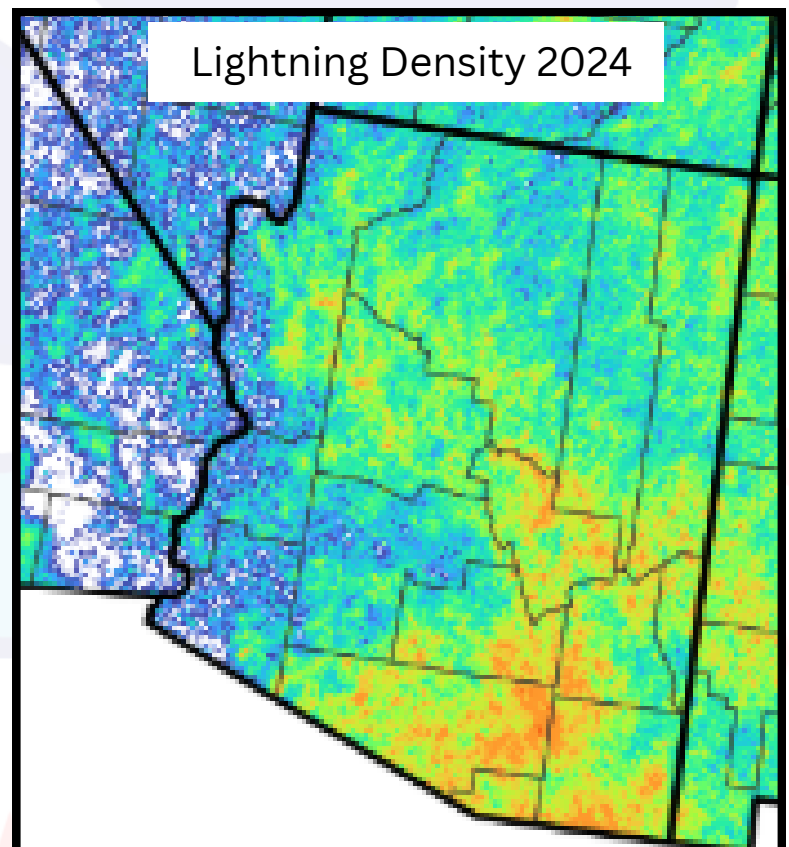
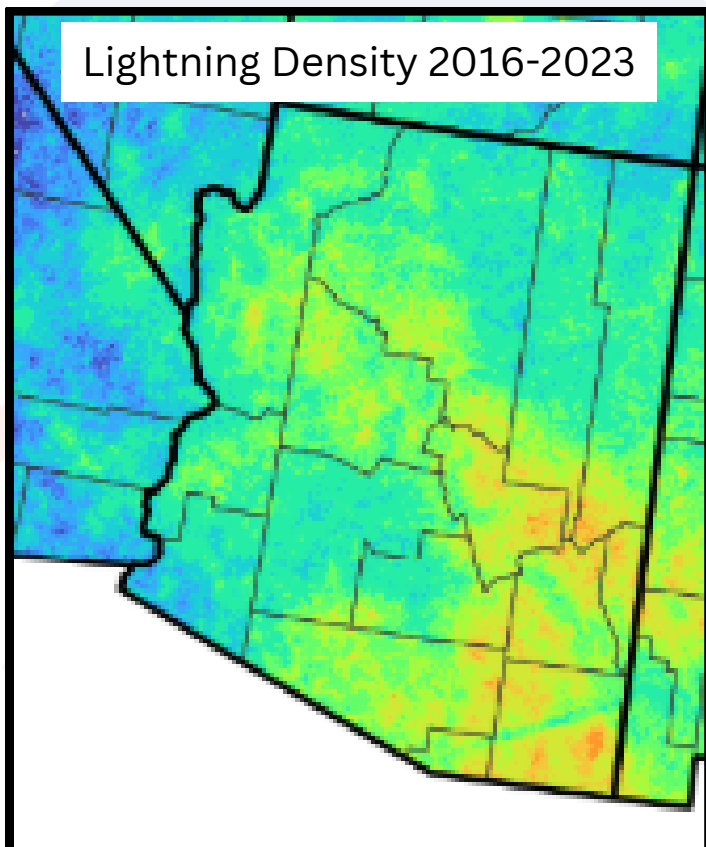
Have you wondered why lightning is NOT one of the things Spotters need to report to us? One factor is that every thunderstorm has lightning but it doesn't necessarily indicate storm severity. Another factor is that there are lightning detection arrays available to us. There are two main systems, both of which are run by private companies. One of them is the National Lightning Detection Network run by the Vaisala Company. Another is the Earth Network company's Total Lightning Network. These two systems work by detecting radio waves (sferics) emitted by fast electric currents (strokes) in lightning channels.



The map above shows the annual average number of lightning strikes per square kilometer (lightning density) for 2016-2023. The overall patterns are no surprise with the Plains, Midwest, and Southeast leading the way. Of the individual states, Florida has the highest density. Notice how Arizona stands out amongst many other western states.

LIGHTNING CLIMATOLOGY (CONT.)

Looking more closely at AZ and southeast CA, the map below on the left shows the annual average lightning density based on 2016-2023 (warmer colors are higher numbers; cooler colors are lower). You can see an uneven distribution of the lightning. It's primarily a function of elevation (easier to get storms to form over mountains) but also proximity to deeper Monsoon moisture. On the right, is 2024. A very similar spatial pattern is evident. However, there are some differences in the numbers. Of note, lower desert locations including Maricopa, La Paz, and Yuma Counties along with southeast CA and southern NV have lower numbers than average. Meanwhile, some were above that average such as Pima and Pinal Counties.



LEARNING MORE

If you are looking to learn more about weather, there are many resources available on the web. A starting point is the Spotter page on our website ([here](#)). If you scroll down to the Educational Resources section, there are a number of links to explore. The top half of that section includes previous issues of the newsletter and below that are websites to explore. Below are a few of note.

JetStream

This may be the best one because it has a wide array of topics with good foundational content and is presented in a way that is easy to understand.

Severe Thunderstorm Forecasting - Video Lecture Series

Here you have forecasters from the NWS's Storm Prediction Center giving university lectures about all things 'thunderstorm' including meteorological underpinnings.

MetEd

This site has hundreds of online tutorials for the geoscience community. This is where you might look for a deeper dive on a particular topic in the form of an interactive tutorial. In fact, some of our (NWS) ongoing professional development includes tutorials developed by MetEd.

SPOTTER REPORTS

Though a weather event may not bring much in the way of thunderstorms, it can still lead to other hazards. See below for a review of reporting criteria and methods.

Reporting Criteria:

- Tornado
- Funnel Cloud
- Storm Damage (broken tree limbs, shingles off roofs, etc.)
- Flooding (streets, running washes, etc.)
- Low Visibility
 - less than 1 mile due to dust, sand, fog, etc. (not rain though)
- Rotating Wall Cloud
- Heavy Rainfall
 - measured ½ inch or more accumulation in 30 min. or less
- Hail (diameter of largest stone - any size)
- Snow (accumulating or not)

Reporting Methods (for trained Spotters only):

- Web: <https://inws.ncep.noaa.gov/report/>
- Email: psr.spotters@noaa.gov
- Voice Hotline (unlisted - just for Spotters): 1-800-697-0655
- HAM Radio NET

Sector 2 - Maricopa and Pinal Counties: 443.050 MHz (PL 100.0)

Sector 6 - Southern Gila County: 147.200 MHz (PL 162.2)

Sector 7 - Yuma County: 146.780 MHz (PL 103.5)

Sector 8 - Imperial County: 146.670 MHz (PL 103.5)

Sector 9 - La Paz County and Blythe: 145.310 (PL 107.2) and 147.06 (PL 203.5)

STAYING CONNECTED

SOCIAL MEDIA

Be sure to stay up to date with the weather and our other programs by following us on social media.



/NWSPhoenix



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HAS YOUR INFORMATION CHANGED?

If your email, phone number, or address has changed since your last class, please click the link to help us keep that information up to date.

[GOOGLE FORM TO CHANGE CONTACT INFORMATION](#)

FORGOT YOUR SPOTTER ID?

It happens to the best of us! Send Austin an email he will email you back with your information.

AUSTIN.JAMISON@NOAA.GOV

NO LONGER WANT TO BE A SPOTTER?

If you would no longer like to be one of our trained weather spotters, you can fill out this google form and we will remove you from our database of spotters.

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