SPOTTER NEWSLETTER

NWS PHOENIX SKYWARN NEWSLETTER

JUNE 2024

What's Inisde

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  - Lightning
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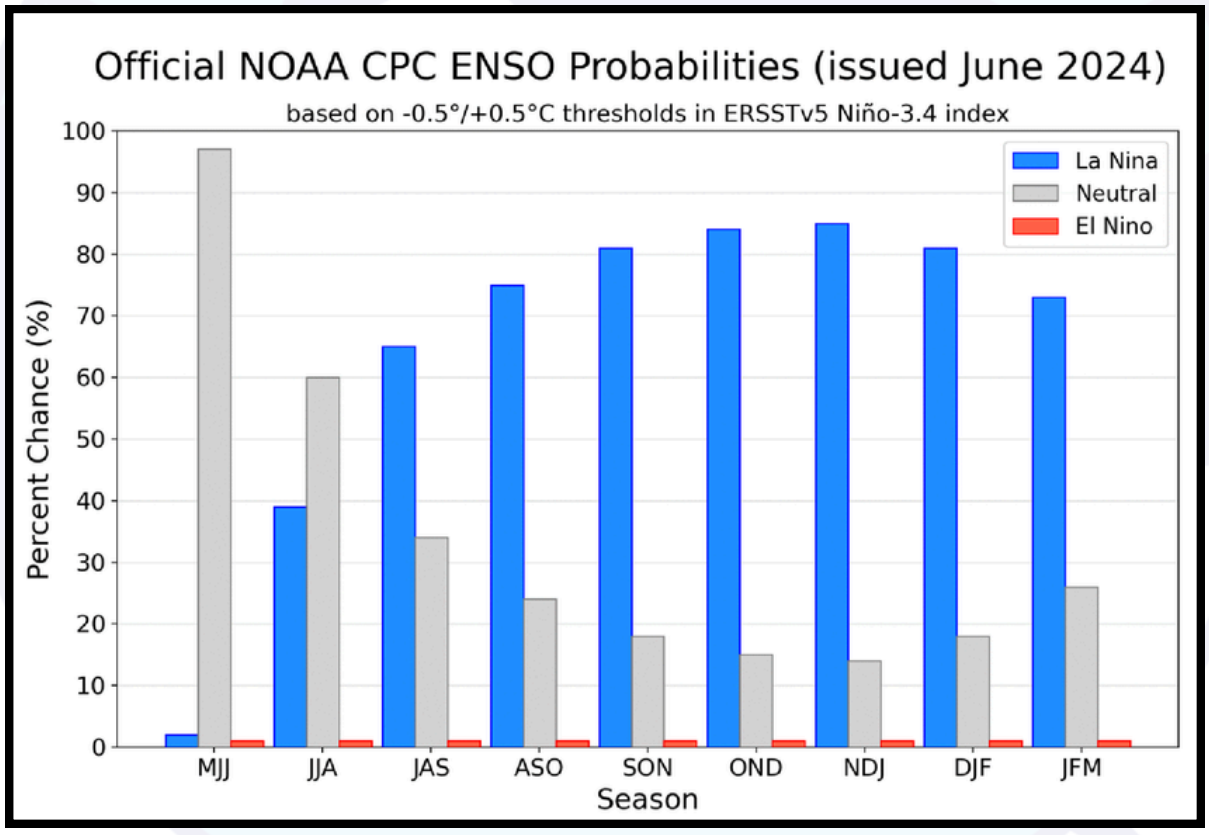
- Update your contact information

Monsoon season has begun and for the Desert Southwest, it runs from June 15th through September 30th. Much of the year's hazardous weather (not counting heat) occurs during this time frame due to thunderstorms. It is also an important time of year for precipitation and can bring a welcome break from hot and very dry conditions in May and June. So, what might the Monsoon wind up looking like for overall seasonal rain and temperatures? We'll take a look at the long range forecast for July-September which covers the large majority of the Monsoon.

MONSOON OUTLOOK (CONT.)

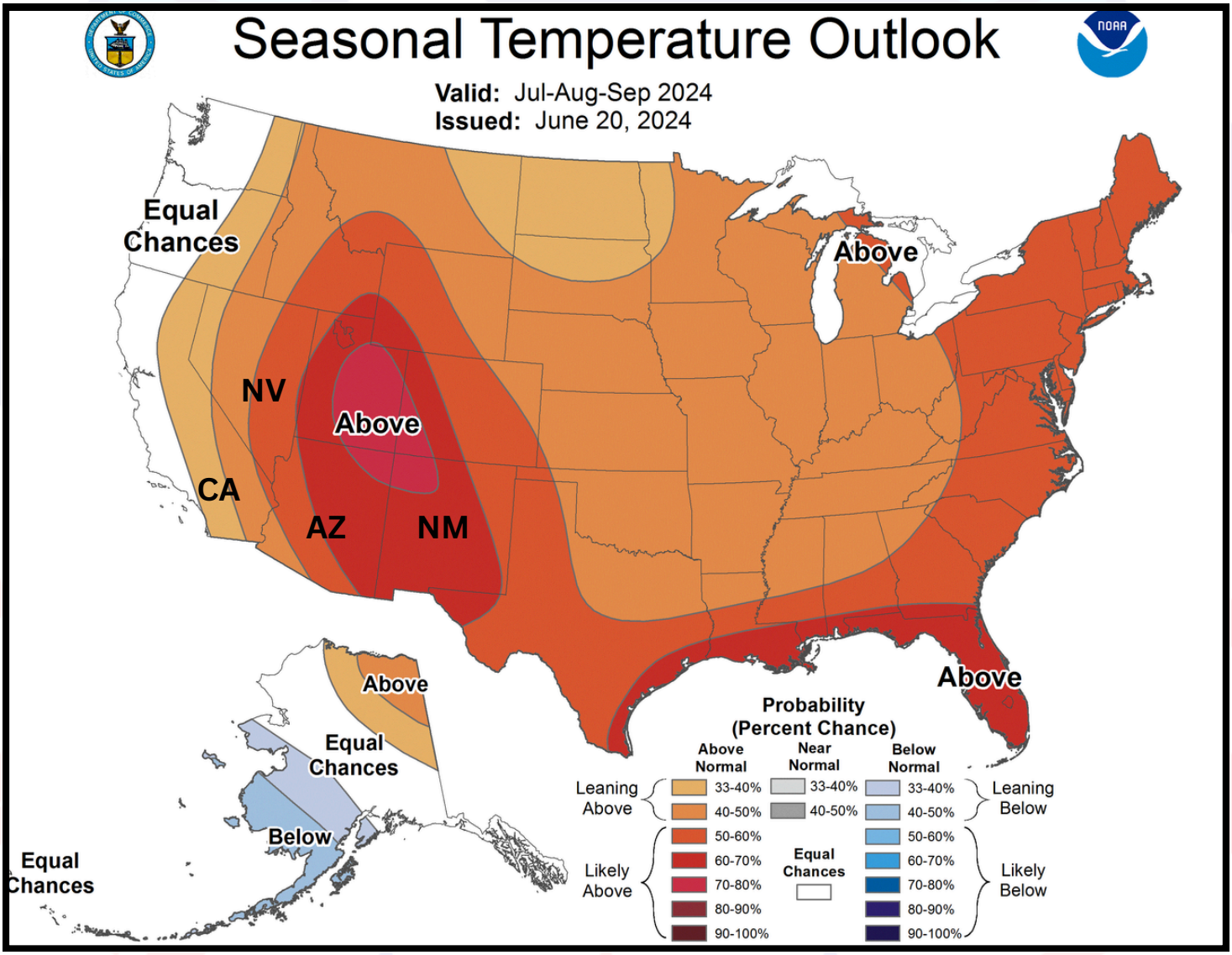
Oftentimes when it comes to long range forecasts, El Nino or La Nina may be a consideration. Currently, El Nino is over and we are in neutral conditions for El Nino/La Nina (ENSO). But, it looks like La Nina is expected to develop in the July-September time frame and persist into Winter and thus a La Nina Watch is in effect. That being said, El Nino and La Nina tend to have more discernible impacts in the cool season and not as much in the summer months.



The NWS's Climate Prediction Center evaluates a number inputs beyond ENSO when making the long range forecasts. The two main parameters for which projections are made are temperature and precipitation. The basic approach is to try to figure out the probabilities for each of the following categories: Above Normal, Near Normal, and Below Normal.

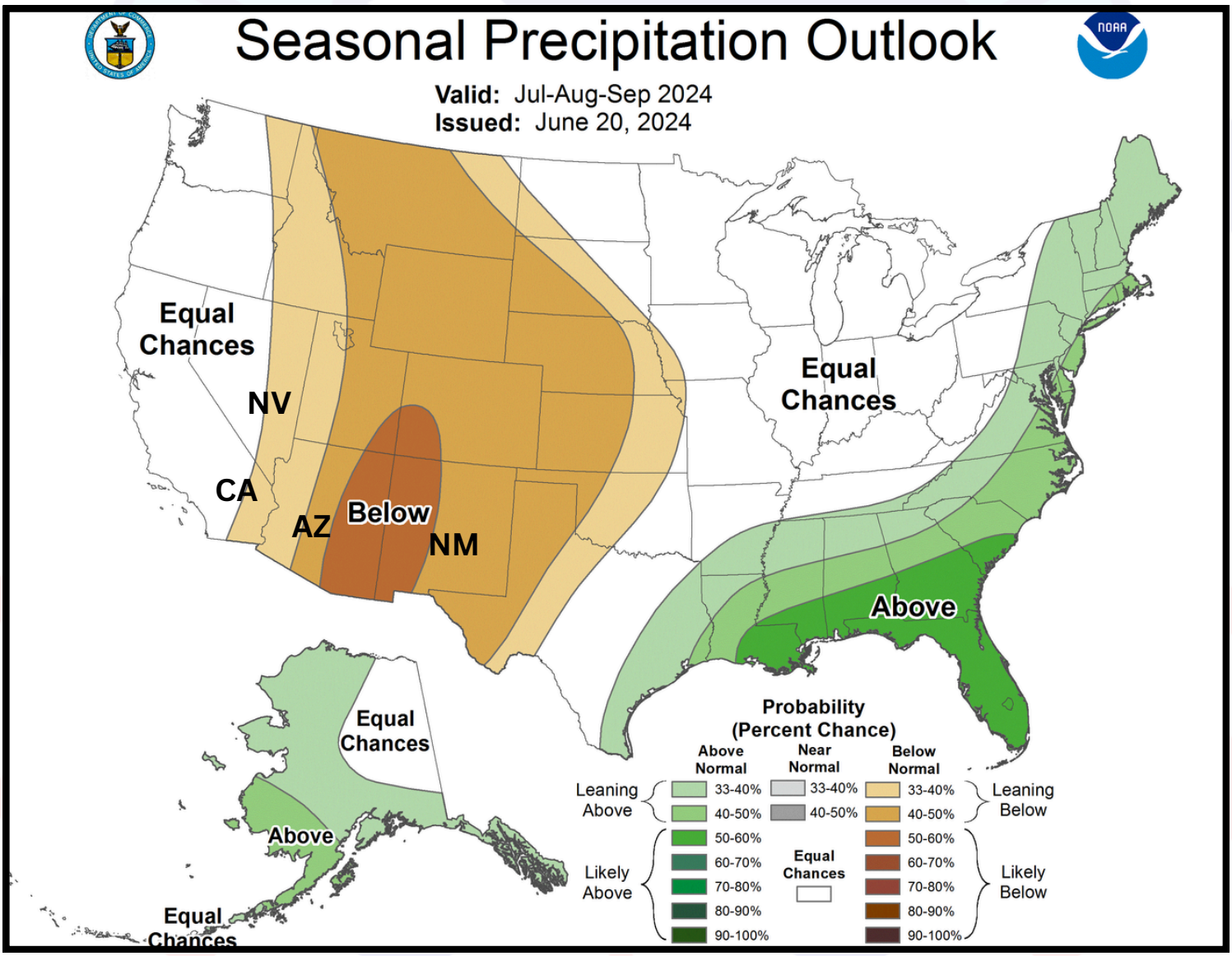
MONSOON OUTLOOK (CONT.)

Let's start off with temperatures first. The map below is showing the most likely category out of the three (Above, Near, Below) and color coding the probability of occurrence. As you can see, there is a distinct tilt in the odds of the July - September period turning out Above Normal when taken as a whole. It's not indicating just how much above normal. This is significant though because heat is the number 1 weather related killer across the country - especially in the Desert Southwest.



MONSOON OUTLOOK (CONT.)

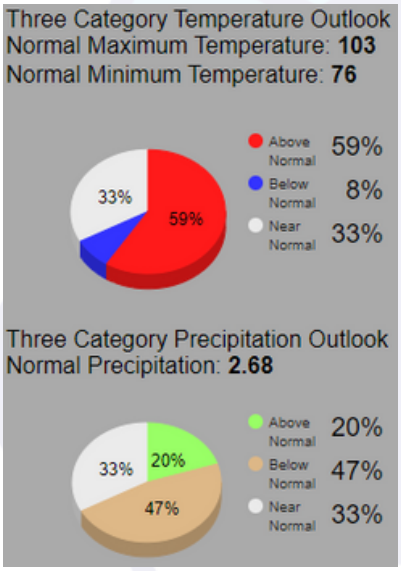
Now let's look at precipitation. From the map below, there is a tilt in the odds favoring Below Normal though not as much the further west you go. This doesn't mean that there won't be thunderstorm impacts for this Monsoon season. We still need to be prepared for dust storms, damaging winds, and even flash flooding. Note, the white/blank areas represent "Equal Chances." This means that each of the three categories have just as much chance of happening as the others (33.33% chance for each). In other words, it's a shoulder shrug.



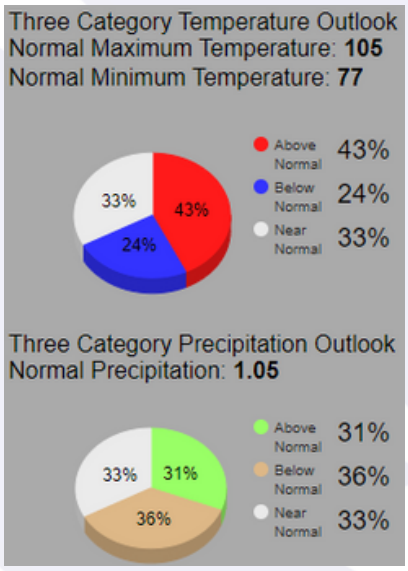
MONSOON OUTLOOK (CONT.)

Something to keep in mind about the maps is that they don't show the probabilities of the other possible outcomes. It can be more helpful to think of a pie chart of probabilities. The maps are simply showing you the biggest of the three pieces but not the other two pieces. Another analogy is having three baskets of eggs and trying to pick which basket to put more of your eggs in - but still having some eggs in the other baskets. Below, are the pie charts from a few select places.

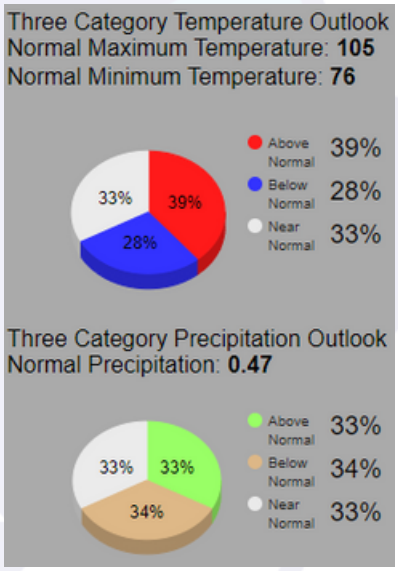
Phoenix



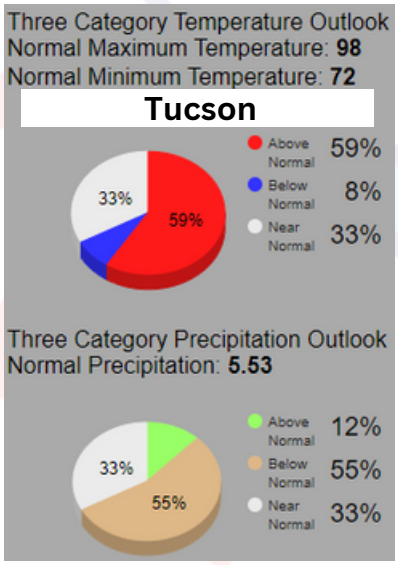
Yuma



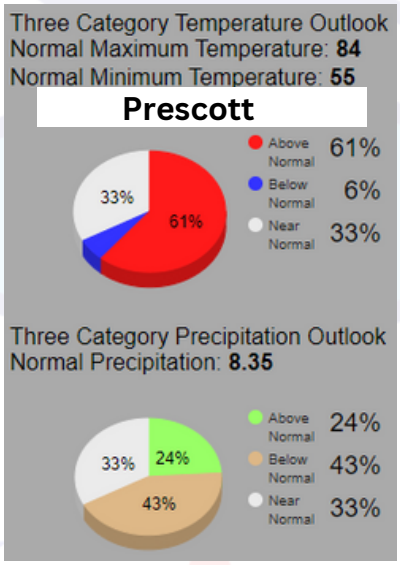
El Centro



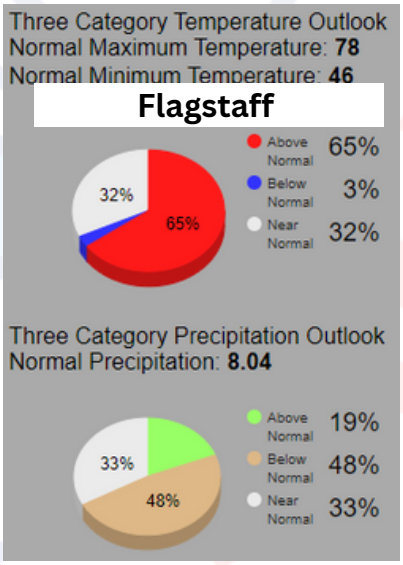
Tucson



Prescott

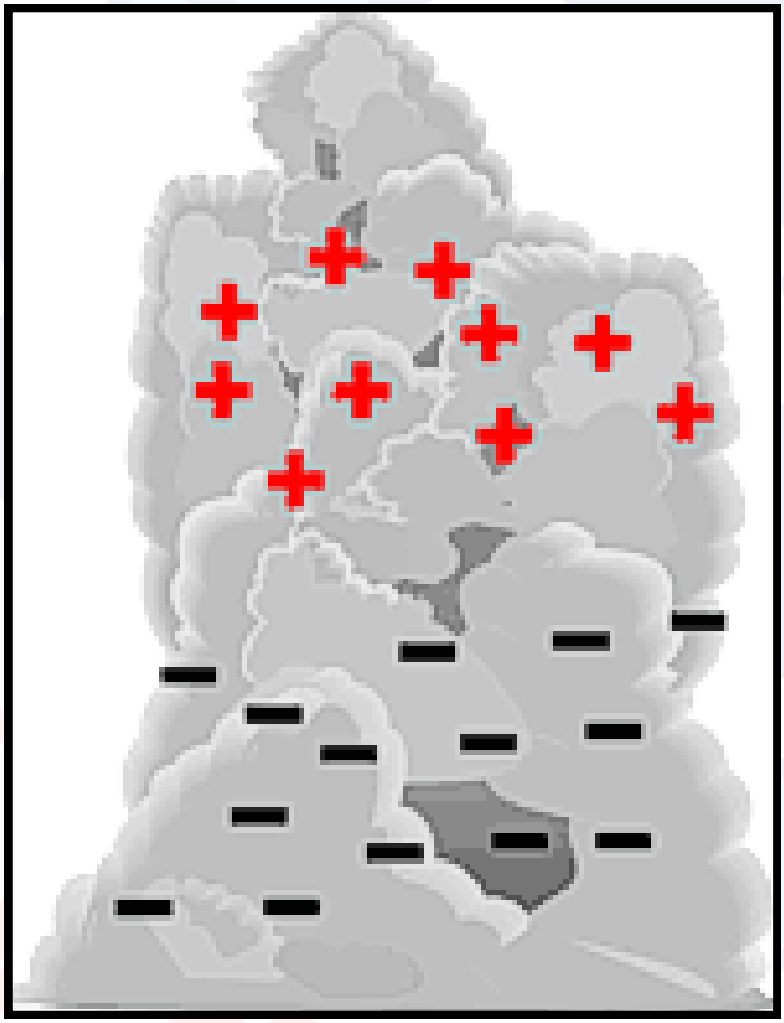


Flagstaff



LIGHTNING

By definition, thunderstorms have lightning. So, how is electricity generated by a cloud? It starts with the formation of ice crystals and in turn hail. The frozen particles result from an updraft lofting liquid droplets to high enough altitudes to get ice crystals to form. Hail develops when the crystals come into contact with supercooled liquid which freezes onto the crystal ("accretion"). The type of hail that is of key importance is small "soft" hail known as graupel.



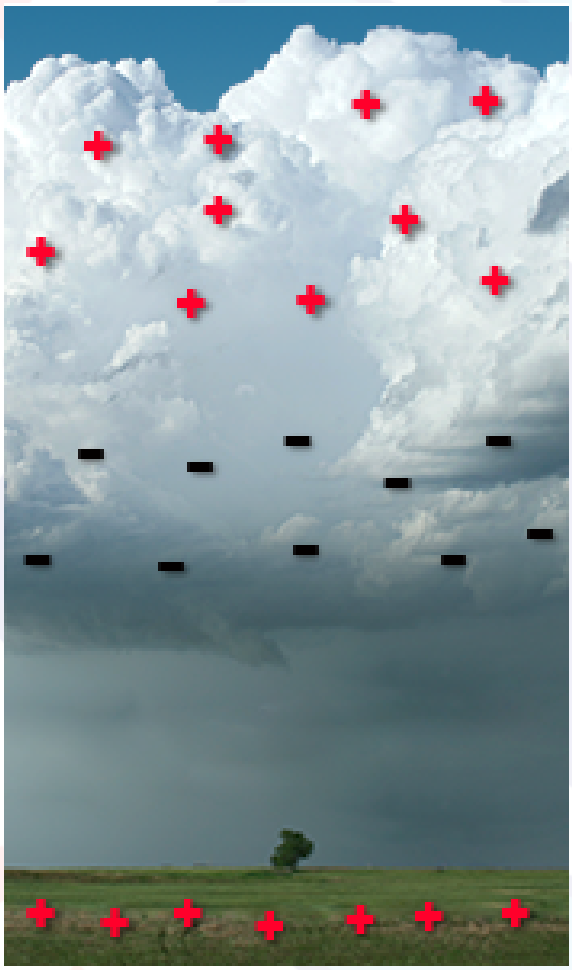
Lightning graphics courtesy of JetStream

The next step is charge separation. Within a thunderstorm, there is at least one couplet of updraft and downdraft which are adjacent to one another. When graupel collides with liquid droplets and other ice particles, electrons are sheared off of the ascending particles and collect on the descending particles.

Because electrons carry a negative charge, the result is a storm cloud with a negatively charged base and a positively charged top.

LIGHTNING GENERATION (CONT.)

The next key step is field generation. A pool of positive charges separated from a pool of negative charges creates an electric field. The more the respective charges accumulate, the stronger the field and in essence the higher the voltage (electric potential).



Lightning graphics courtesy of JetStream

When the electric field has become strong enough, lightning results. But, the atmosphere tends to act as an insulator between charges so it takes an incredible amount of charge to build up in order for lightning to occur.

Most lightning occurs within the cloud. But, the pool of negative charges in the lower part of the cloud induces a pool of positive charges within the surface of the ground. This positive charge will shadow the storm wherever it goes and and lead to another electric field which is responsible for cloud-to-ground lightning.

LIGHTNING GENERATION (CONT.)

Though in-cloud lightning is most common, cloud to ground lightning is of most interest due to the hazard it creates for us on the ground.

Step 1

As the differences in charges continue to increase, positively charged particles rise up taller objects such as trees, houses, and telephone poles.

Step 2

A channel of negative charge, called a "stepped leader", will descend from the bottom of the storm toward the ground. It is invisible and shoots to the ground in a series of rapid steps.

Step 3

As the negative leader approaches the ground, positive charge collects in the ground and in objects on the ground. This positive charge "reaches" out to the approaching negative charge with its own channel, called a "streamer" .
When these channels connect, the resulting electrical transfer is what we see as lightning.

STORM SAFETY

There are a variety of thunderstorm related hazards that occur each Monsoon. Here are some basic tips that apply to weather hazards in general. Keeping these tips in mind will help you stay safe.

- Plan ahead, that includes knowing where you'll go for safety.
- Listen to the forecast.
- Cancel or postpone activities if thunderstorms are in the forecast.
- Monitor weather conditions.
- Take action early so you have time to get to a safe place.

There are also some specific tips for some of the more common hazards.

Lightning

When Thunder Roars, Go Indoors!
If you can hear thunder, you are within range of being struck. It's even possible for lightning to strike before you even hear the first rumble.


Spotter Ed Mitchell

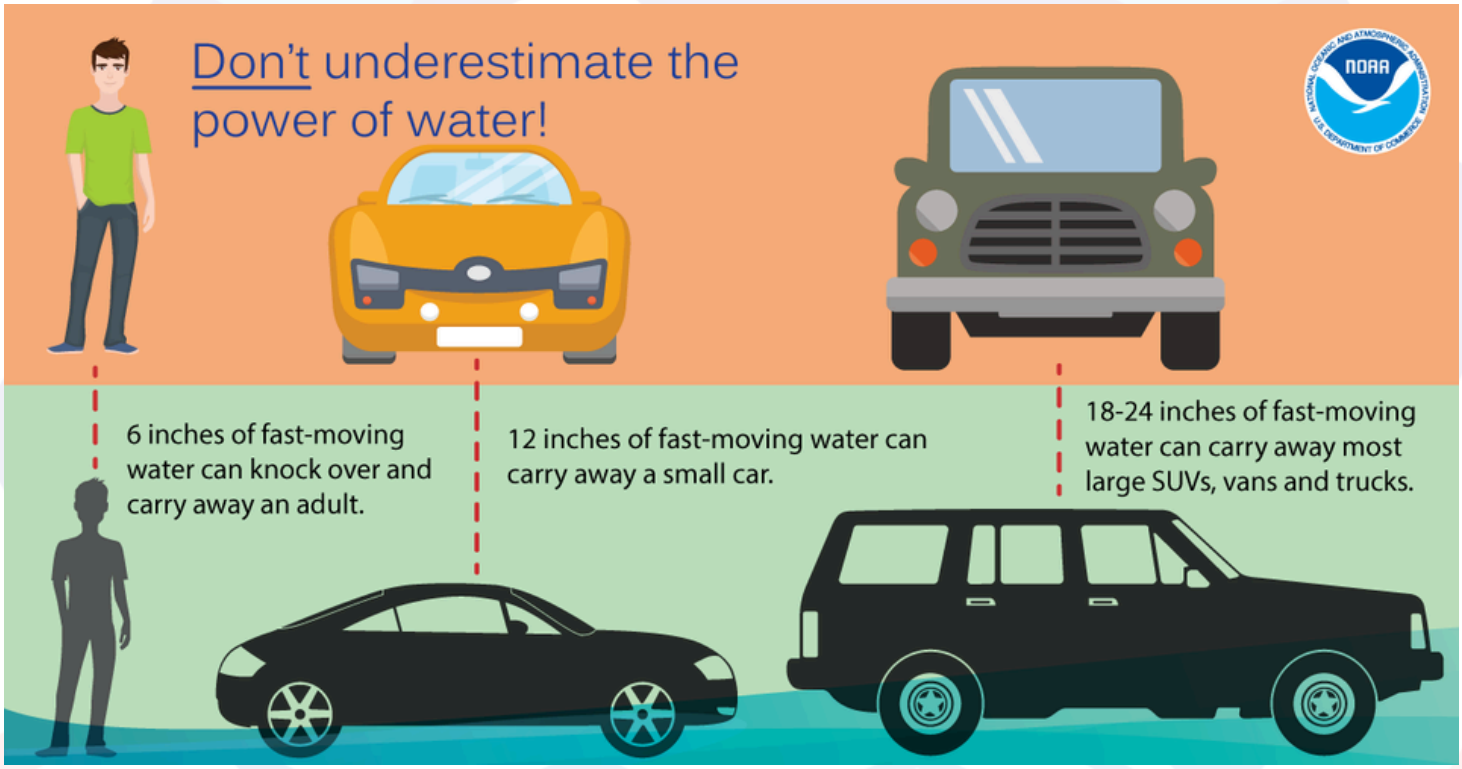
- If caught outside...
  - Get inside of sturdy shelter or a hard topped car immediately.
  - Until then, don't be, or be near, the tallest objects in the area.
  - Don't shelter under tall or isolated trees.
- If indoors...
  - Stay off corded phones. You can use cellular or cordless phones.
  - Don't touch corded appliances; you can use remote controls safely.
  - Avoid plumbing such as faucets and showers.

STORM SAFETY (CONT.)

Flooding

Turn Around, Don't Drown! The most common type of flooding related danger is flooded roadways. Over half of all flash flood deaths occur with people in their vehicles.

Spotter Nancy Rollins



- Get to Higher Ground: If you live in a flood prone area or are camping in a low lying area, get to higher ground immediately.
- Obey Evacuation Orders: If told to evacuate, do so immediately. Lock your home when you leave.
- Practice Electrical Safety: Don't go into any room if water covers the electrical outlets or if cords are submerged.

STORM SAFETY (CONT.)

Dust Storm

Pull Aside, Stay Alive! Ideally, you want to be aware of Advisories and Warnings to avoid encountering a dust storm. But, if you are on the road already and dense dust is observed blowing across or approaching a roadway:

1) Pull your vehicle off the pavement as far as possible (the shoulder isn't far enough!).
2) Stop.
3) Turn off lights.
4) Set the emergency brake.
5) Take your foot off of the brake pedal to be sure the tail lights are not illuminated.

Spotter Clinton Bancroft

SPOTTER REPORTS

Though a weather system 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.

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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.

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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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