

Weekly Climate Summary: 6/2/2024-6/8/2024

I. Climate in the News:

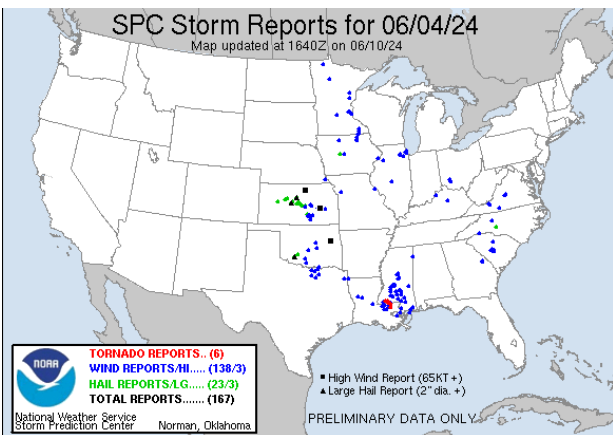
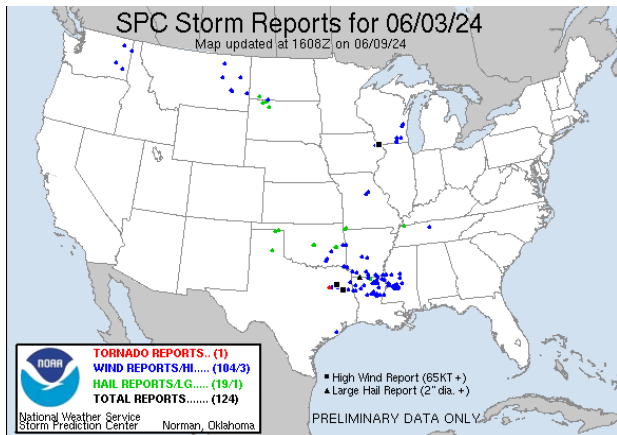
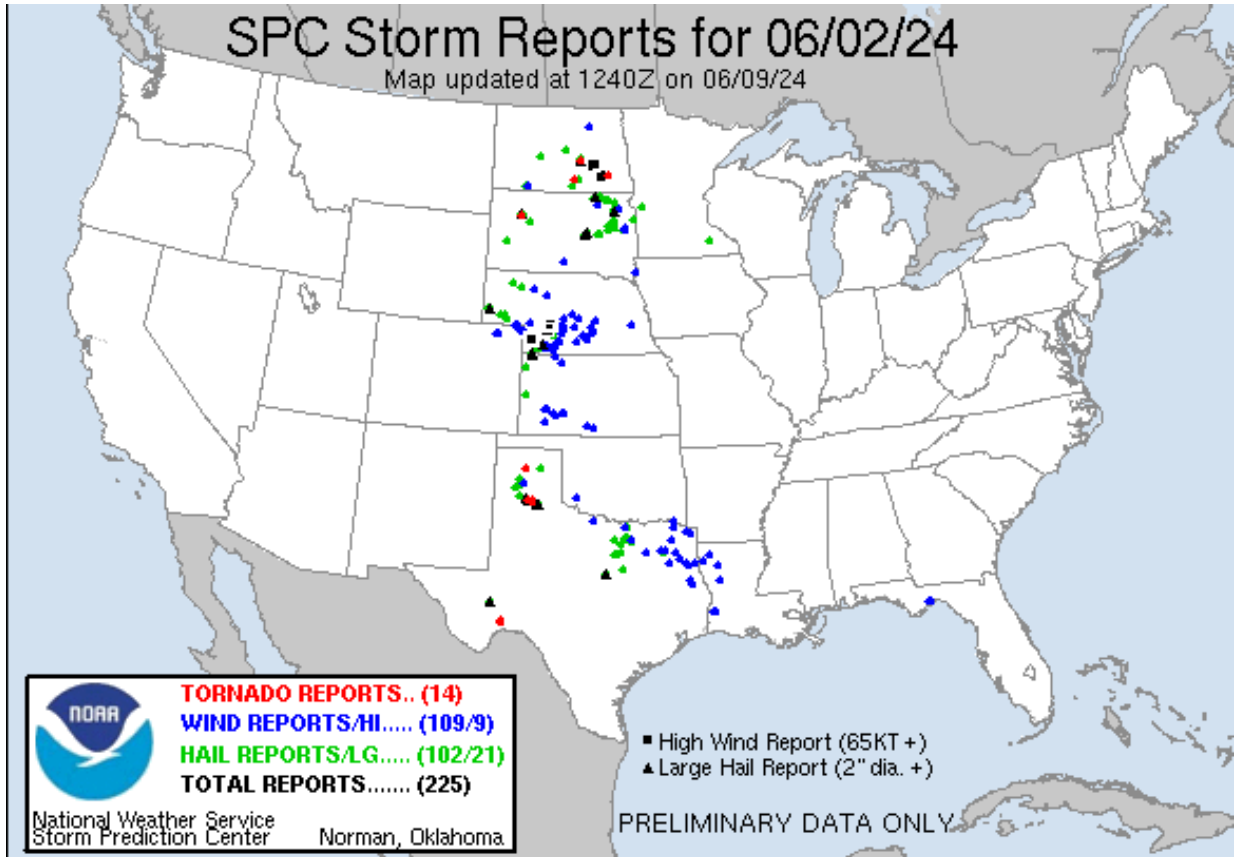
The first week of June welcomes the start of meteorological summer. The first part of June typically marks a transitional period between the rainy, mildly hot late spring to the drier, hotter climate that characterizes the latter portion of June. In keeping with that theme, the first full week of June 2024 was characterized by variable precipitation across the state where the western portions of Texas saw scant totals and the east saw appreciable rainfall. Severe weather was seen with the precipitation as a *mammoth hailstone* with a preliminary size of 6.00” was reported in Swisher County. This stone is being considered as a potential record breaking hailstone for Texas. The hail was claimed to be 7.00”+ by the photographer, however, these claims are still being verified for official records as visual effects could artificially inflate the size of hail in pictures. A more thorough investigation is underway to verify if this hailstone is in fact larger than the current record holder (6.42” diameter hail in Hondo, TX on April 28, 2021).

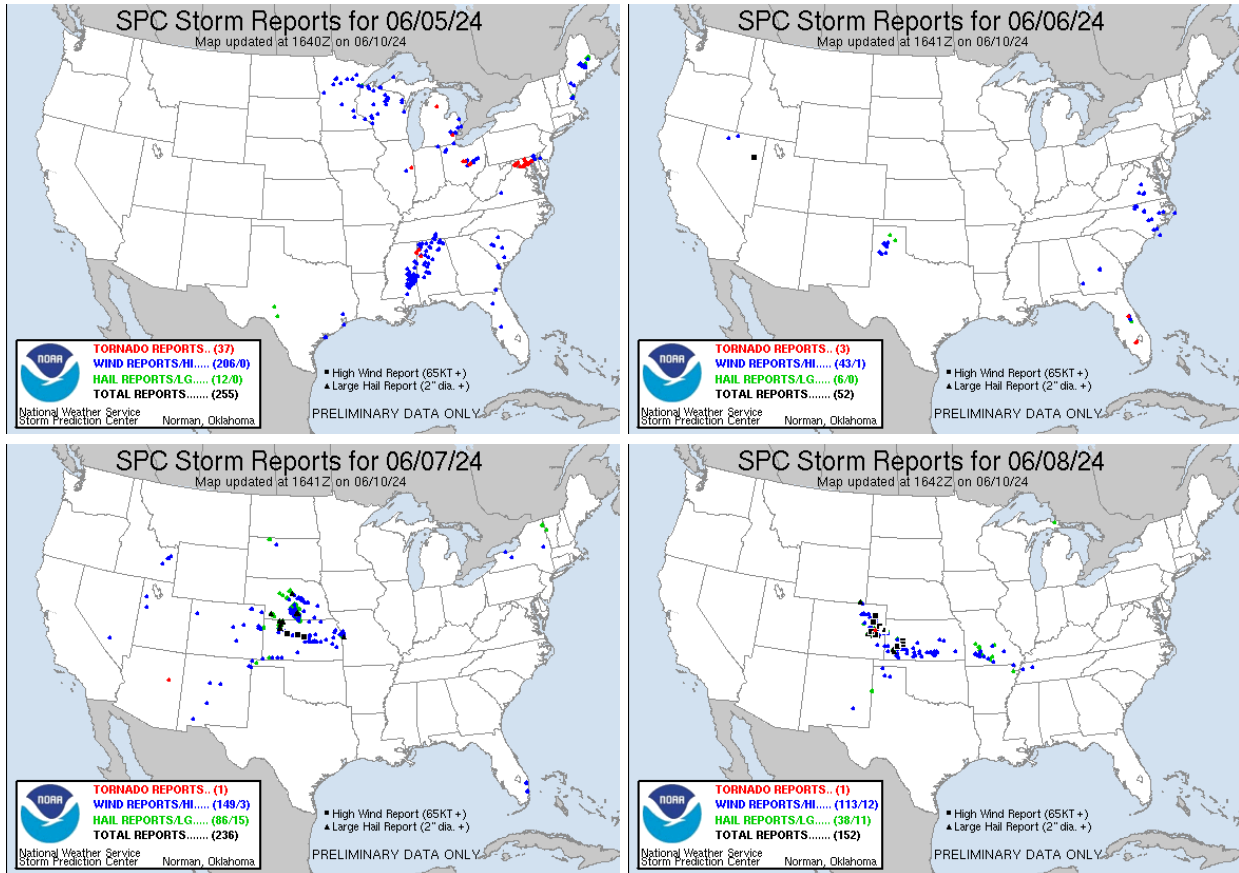
Severe Weather

The week of June 2-8, 2024 tapered *substantially* in terms of the severe weather count for the state. Like the week prior, every day of this week saw at least one severe weather report in Texas, but the count was far lower than last week (516 total reports). 116 total severe weather reports were noted across the state decomposed into 10 tornado reports, 61 wind reports, and 45 hail reports.

For June 2-8, the extremes in severe weather reports are as follows:

- An EF0 tornado was reported in Hutchinson County, however, a more powerful tornado may have occurred in Terrell. Damage surveys of this tornado are still underway, and a rating has not been assigned. Other tornados were not rated due to lack of damage indicators
- The highest *measured* wind gusts were *75 mph* in Smith and Rusk Counties
- The largest reported hail is conservatively estimated at 6.00” but may in fact be larger than this. Investigations on the hail size are underway to verify if these hailstones are in fact statewide records. Another report of hail this size was sent from Silverton, Tx (Briscoe County)





Maps showing the storm reports on the days when severe weather was reported in the State of Texas. Maps courtesy of the Storm Prediction Center.

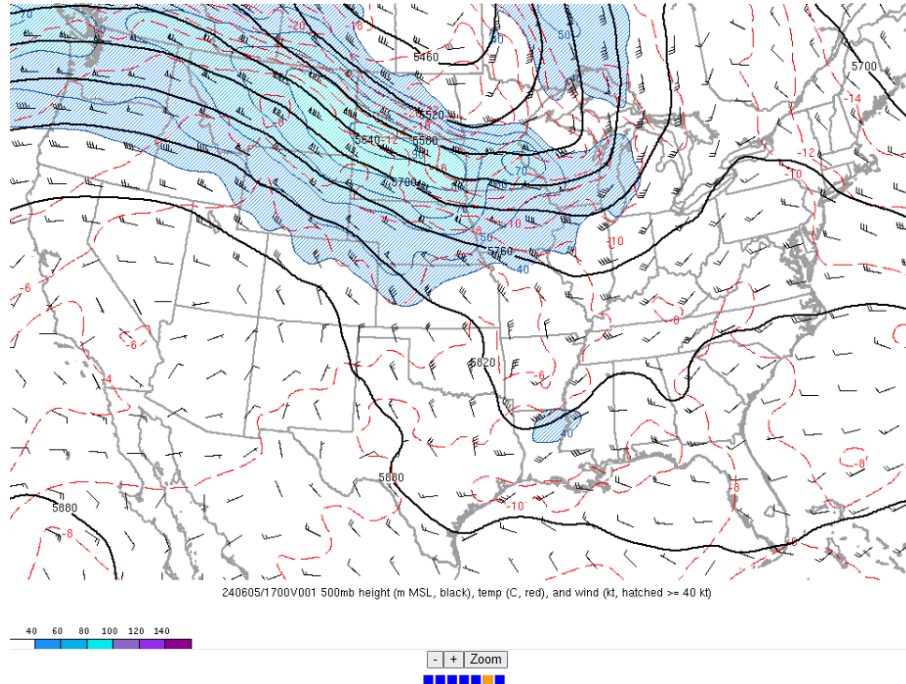


Facebook post by Val Castor showing the potential record-breaking hailstone. The images compare the hailstone to a Monster Energy drink can, showing its remarkable size.

II. Weather Synopsis:

A. Northwest Flow

A similar pattern to last week took hold across the state delivering rainfall predominantly to the northeastern reaches of Texas. Storms tend to ride around the edges of an area of high pressure, or so called 'heat dome' and are generally suppressed under it. With the high pressure meandering to the east, the precipitation skirted further away, resulting in a less active week from both a rainfall and severe weather standpoint for the state.



A map showing pressure heights, which can be thought of as isobars, or lines of equal pressure at 18,000 feet above the ground. The northward bulge in the ‘isobars’ across the western U.S indicates where the high pressure is located. Storms typically form up north and ride the flow in the atmosphere into Texas. This map is from June 5, 2024, arguably when the last significant storm complex affected Texas. Map courtesy of the SPC Mesoanalysis website.

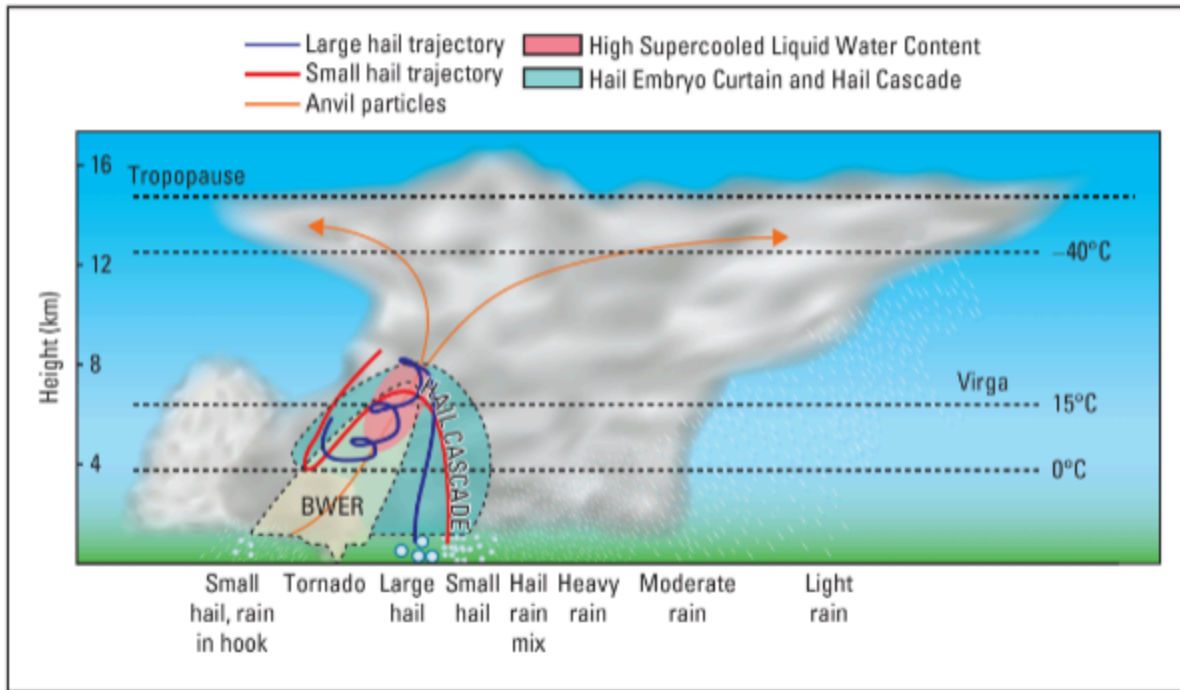
B. Anatomy of a Hailer

Thunderstorms are products of convection, a heat distribution mechanism that works through fluid (the atmosphere in this case) heated from below (the ground) rising and mixing with fluid that is colder aloft. This causes thunderstorms to have powerful ascending currents of air (updrafts) and descending currents of air (downdrafts; often responsible for strong surface winds).

The atmosphere cools rapidly with height, and so the air at a certain altitude is below the freezing point of water, known as the *freezing level*. Updrafts from a storm loft raindrops high into the atmosphere so that they become ice crystals. These hail embryos then grow as more water is deposited from below (blown upward by the updraft) and freezes on contact with the ice. Sometimes hailstones collide and coalesce with one another, resulting in a spiky appearance. The hailstone remains suspended in the storm growing until it becomes so heavy that the updraft can no longer support it. At this point, it falls to the Earth. Since a stronger updraft can support a heavier hailstone, hail sizes can be used to estimate the speed of a storm updraft.

Using a general equation that relates hail size to updraft speed, we come up with an updraft speed of ***almost 200 mph*** required to suspend a hailstone seven inches in diameter as the hailstone in Vigo Park allegedly was.

Hail Formation in Supercells



Two steps: Hail Embryo Formation and Hailstone Growth

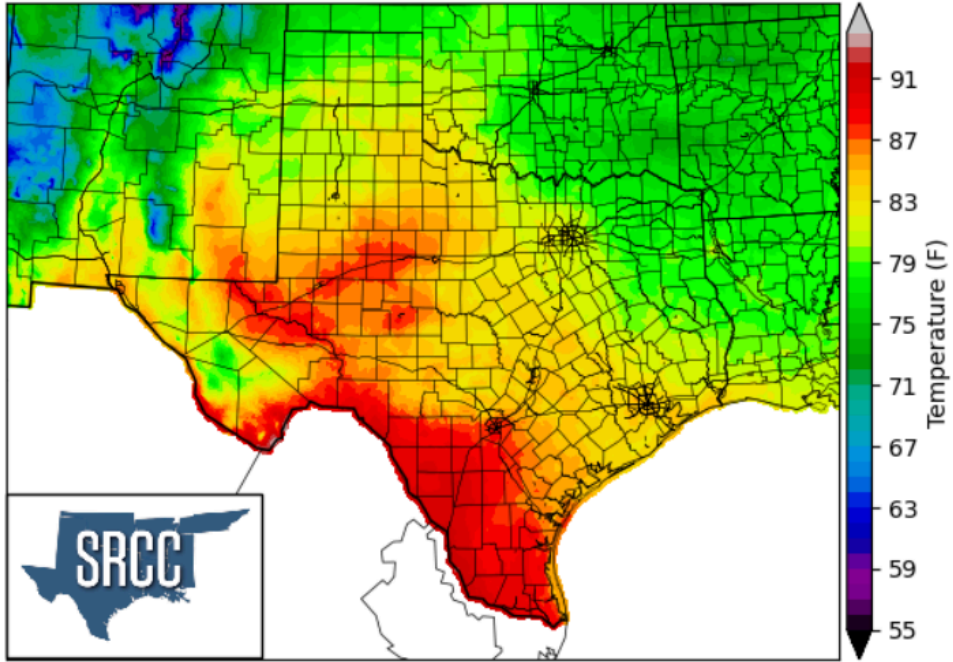
A diagram of a general cross-section of a supercell thunderstorm and where areas of large and small hail can be found. Supercell thunderstorms are rotating storms with powerful updrafts and are typically responsible for the largest hail produced by any type of storm.

III. Temperature:

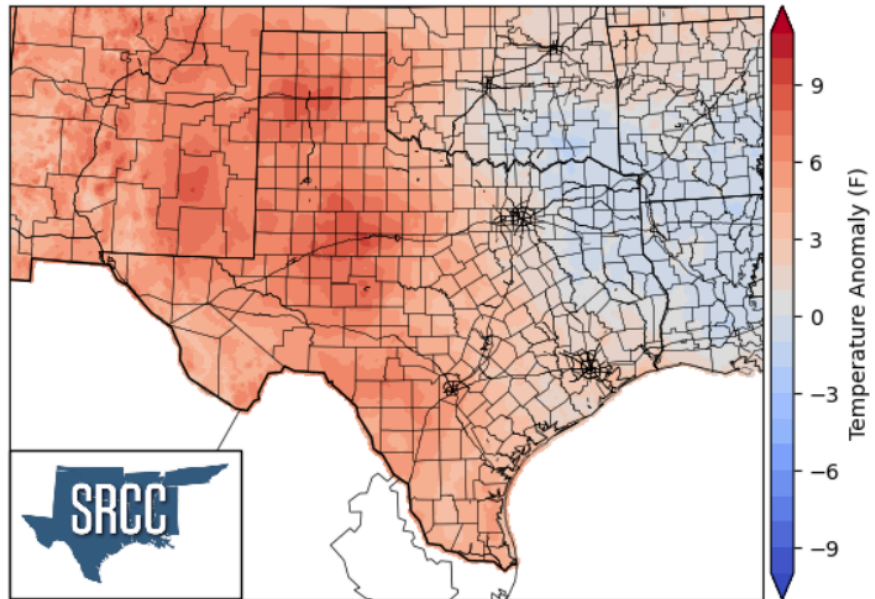
The temperature trend across the state followed the rain in a sense. Cooler temperatures (relative to normal) were seen in areas with ample precipitation, whereas areas with mainly dry conditions saw temperatures sneak above normal. This starts to become typical in the summertime as temperatures are more influenced by solar heating rather than the movement of different temperature air masses as is the case in other seasons for Texas. Average weekly temperatures typically ranged from 75°F to 90°F with the hottest locations seeing weekly averages above the 90°F mark. The statewide extremes in average temperatures are as follows:

- The Cooper Dam Co-op station in Hopkins County saw the lowest weekly average at 75.4°F
- The Del Rio Airport in Val Verde County saw the highest weekly average at 92.9°F

Average Temperature (F) June 2-8, 2024



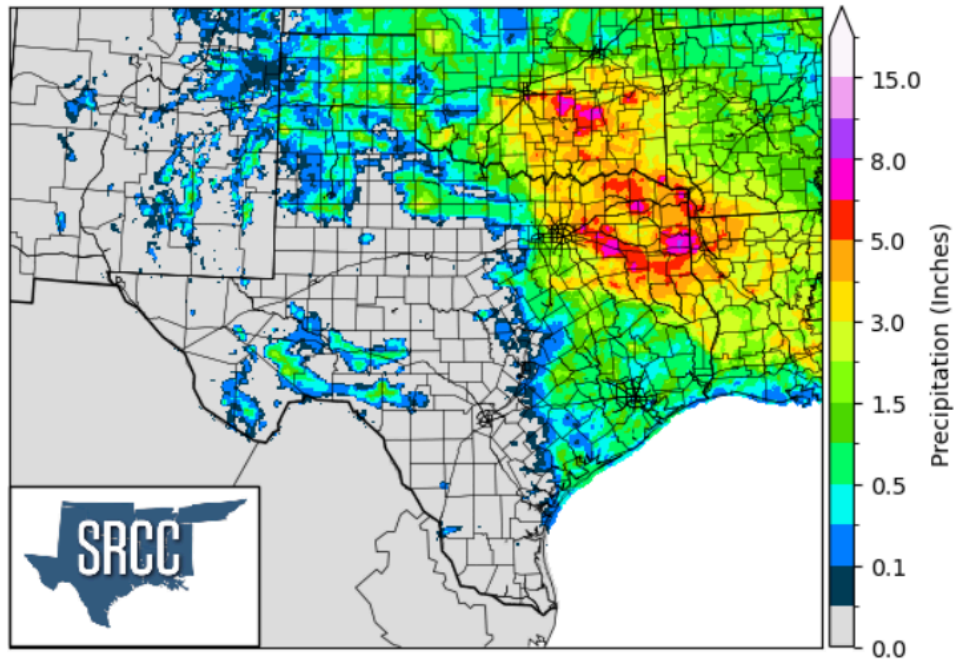
Mean Temperature Anomaly (F) June 2-8, 2024 vs 1991-2020 Normals



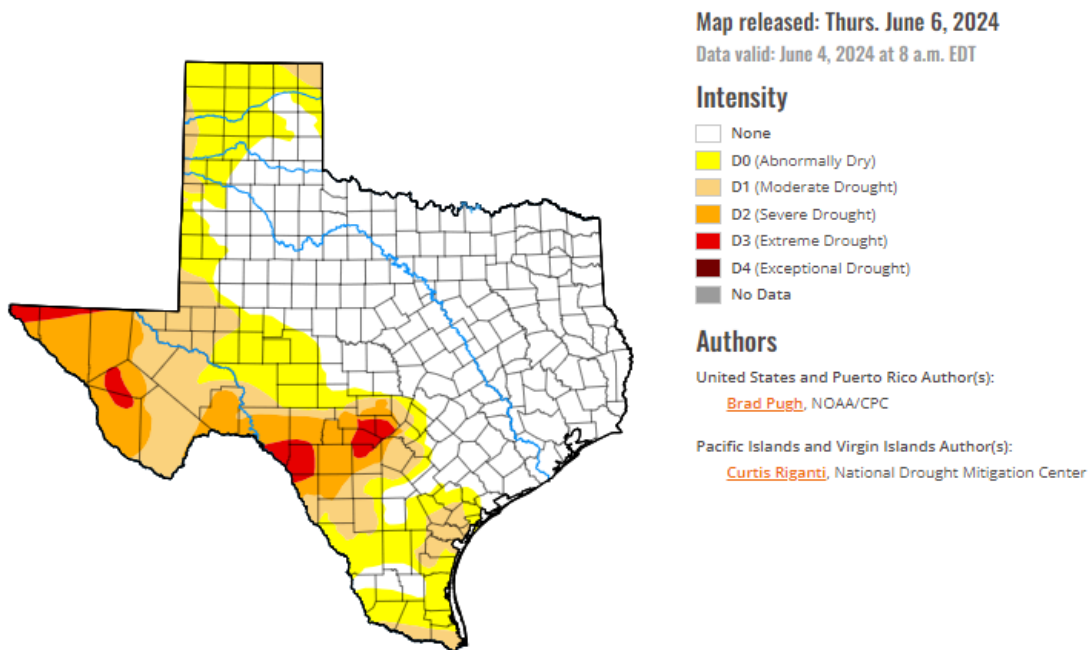
IV. Precipitation

As the ridge of high pressure migrated slightly to the east, the rainfall did as well resulting in only the eastern/northeastern parts of the state receiving appreciable rainfall.

Accumulated Precipitation (Inches) June 2-8, 2024



Now that we transition from the rainy spring season to the dry summer season, it is particularly important to pay attention to how drought evolves across the State of Texas. Currently, it is the western portions of the state that are seeing the most significant drought, but fortunately for some of these regions, the summer months tend to bring most of their annual rainfall due to the summertime monsoon.



V. Statewide extremes

- The hottest recorded temperature of the week was **115°F** at the Rio Grande Village Co-op site in Brewster County on June 6, 2024
- The coldest recorded temperature of the week was 51°F at the two of the Muleshoe sites in Bailey County
- The most precipitation recorded in the week of June 2-8, 2024 was **10.25"** at the Marshall Airport in Harrison county
- The rainiest day at any site across the State of Texas was June 4, 2024 where **5.37"** of rain was reported at the Marshall Airport in Harrison County