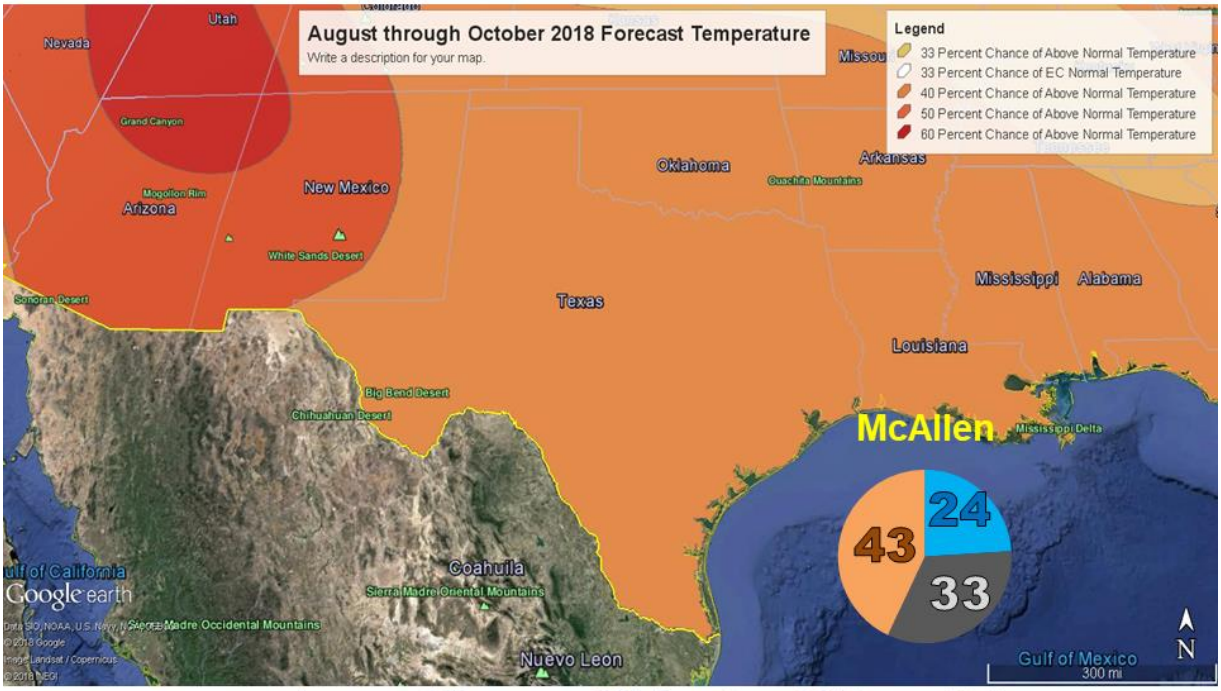
RGV August-October 2018 Outlook

Endless Summer...

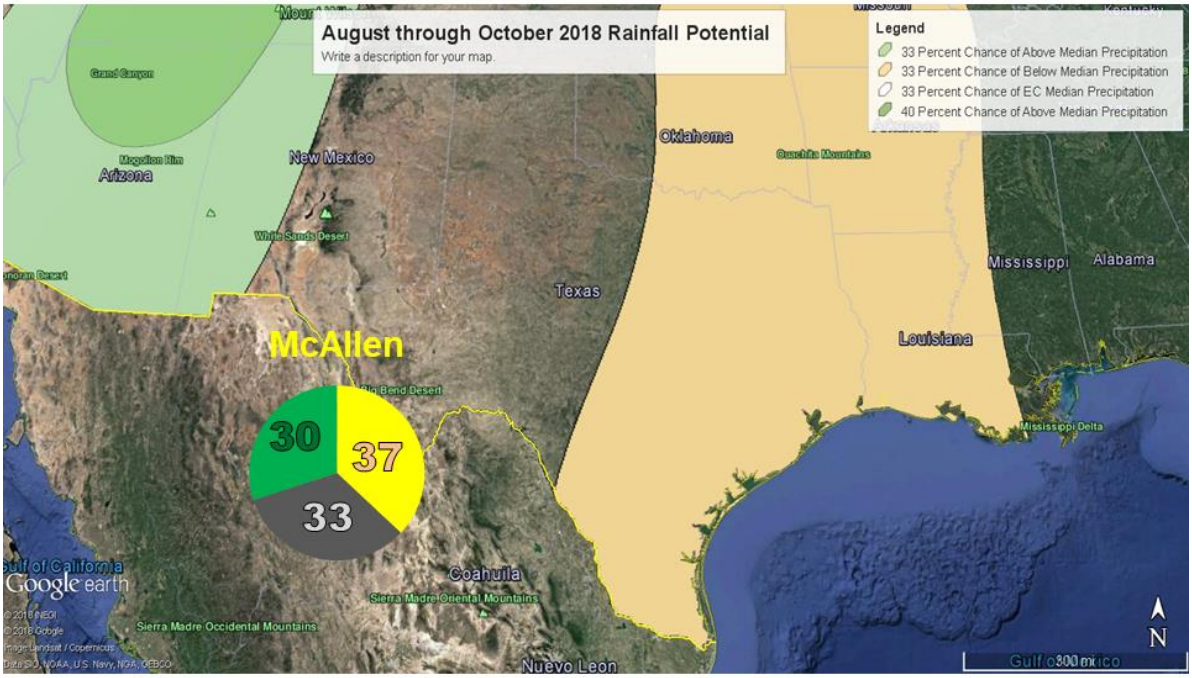


Based on 1981-2010:

Average Afternoon: 88° Beaches, 90° Lower Valley, 94° Mid-Upper Valley

Average Wake-Up: ~75° Beaches, 72 Lower/Mid Valley, 68 Ranches

From Drought to Flood To...Drought?



Based on 1981-2010:

Average Rainfall:
7 to 9 Inches West
9 to 12 inches East

More Heat, Less Rain?

Dry Pattern Could Combine with Hostile Tropical Environment to Return RGV to Drought

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Still, #ItOnlyTakesOne!

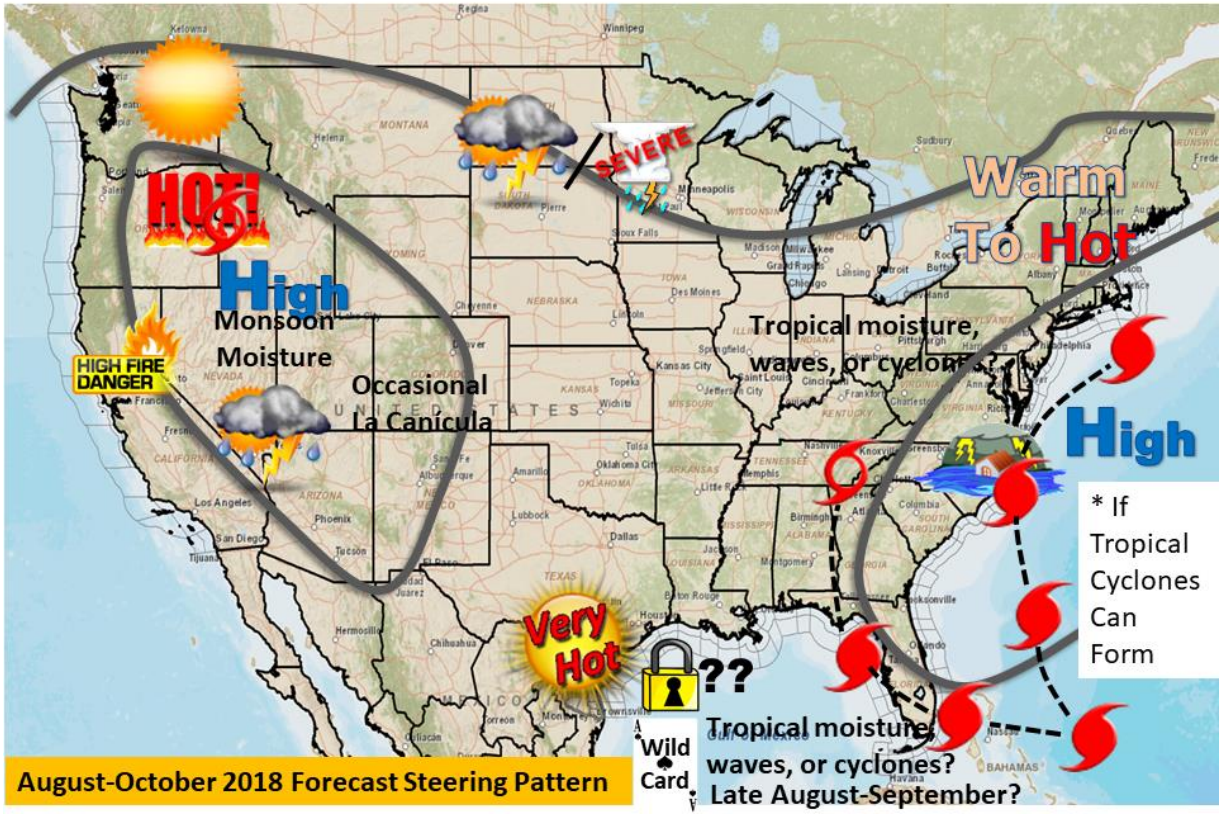
Overview

La Canícula, the pattern of high pressure centered over northern Mexico and stretching into west and south Texas, fed the record heat – dominated July 2018 and was a key reason for several new records to be set between the 20th and 25th . By month's end, most Rio Grande Valley recording stations were headed into the top twenty warmest for the calendar year so far, with Brownsville (since 1878) and McAllen (since 1941) locking in on the top ten for a third consecutive January through July period. Post-Fourth of July isolated to scattered rains were little help to soil moisture which, despite record rainfall from the Great June Flood of 2018, would dry up under the oppressive sunshine and return brown and yellow to grasses and brush. Temperatures would end up 1 to more than 3 degrees above average for a third consecutive July. At least the dry air and heat kept the mosquito population in check, and refreshingly cool Gulf waters and low waves/currents made South Padre Island a destination for locals and visitors far from the Valley.

How will the remainder of the Texas hurricane season fare, particularly for the Valley? After an early burst of tropical activity that brought two brief Atlantic Basin Hurricanes (Beryl and Chris) through early July, the combination of persistent Saharan Dust, Caribbean wind shear, unusually cool eastern Atlantic sea surface temperatures, and a developing El Niño (read below) present hostilities that may limit the impact of the 2018 season. In addition, should La Canícula continue to dominate the late summer and early autumn pattern, any cyclones that can form in the western Atlantic/Caribbean would tend to be forced to track well south of Texas – with more "Veracruisers" in store.

All this said, **Valley residents cannot forget** that just a small crack in the door could allow the next Hurricane Harvey to "thread the needle". As we saw with Harvey, and most recently with the Great Flood of June 2018, the forecast average steering pattern could well take another one week "break" between August and early October to allow such an event. Whether a tropical cyclone or just an energy wave, we can't emphasize enough that **#ItOnlyTakesOne**. June's flood, the the drought that preceded it followed by abnormally dry conditions that followed just five weeks later, exactly matched the wise early 20th century meteorologist who stated prophetically: "Texas is a State of perpetual drought broken by the occasional [devastating] flood". He reminds us to stay prepared, remain aware, even while beating the heat and staying hydrated as summer stretches long once again in 2018.

A Warm to Hot Late Summer and Early Fall



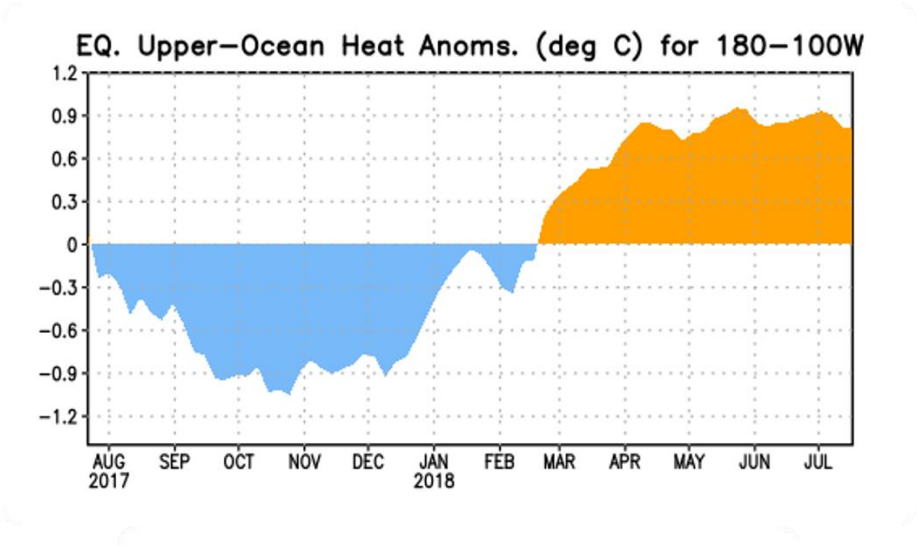
Pattern Matters

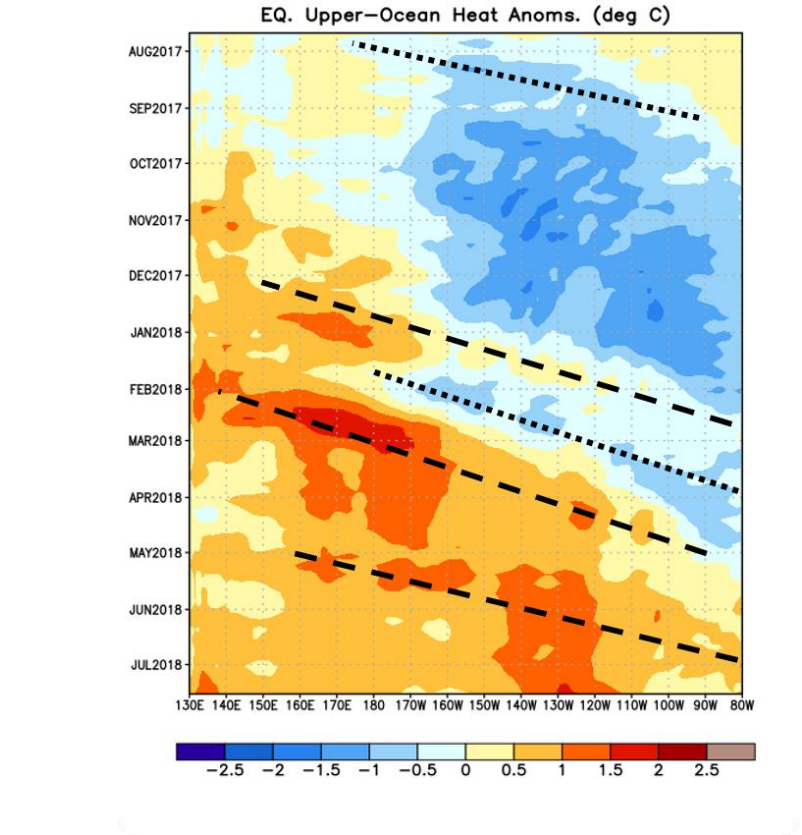
Hotter and (leaning) Drier than Average into October

- **Hot to very hot days** and warm, muggy overnights will dominate deep into August.
- **Rainfall** should be on the dry side through August. But, as June showed, just one brief pattern shift can change all of the outcomes. The rainfall of 12 to 18 inches in many areas was **more than double** the June to August average; in some instances, the June 18-22 rainfall was higher than the **June to September** average!
- McAllen/Miller Airport had reached 36 100˚F maximum temperatures by the end of July, and ended the month with a 15 day streak that continued into early August. Should August continue to favor "La Canícula" over a more pronounced Bermuda High, the tally will be more than 60 before Labor Day, with the potential to reach **70 or more such days in calendar year 2018** – for a third consecutive year.
- **September** is always a wild card as the month with the best opportunity for tropical energy and/or cyclones to impact the region, providing the "spike" in average rainfall (4.5 to 6 inches overall). There is a bit more uncertainty on the evolution of the upper level pattern – will a broad east to west ridge dominate the southern U.S. and allow the tropical "window" to open for multiple energy impulses, or will the beginning of El Niño support a persistent end of summer Canícular ridge which, combined with wind shear across the western half of the tropical Main Development Region (MDR)? The betting odds are leaning toward at least "occasional La Canícula" with an increasing likelihood of below average rainfall and above average heat.
- **October** tends to lean dry and warm to hot during developing El Niño episodes. However, the eastern Pacific may continue to ebb and flow with tropical cyclone activity; one pattern shift to allow a hurricane or tropical storm to flow northeast, particularly if a tropical "atmospheric river" event sets up as it did in 2015 as a strong El Niño episode was getting underway, could bring the rain.

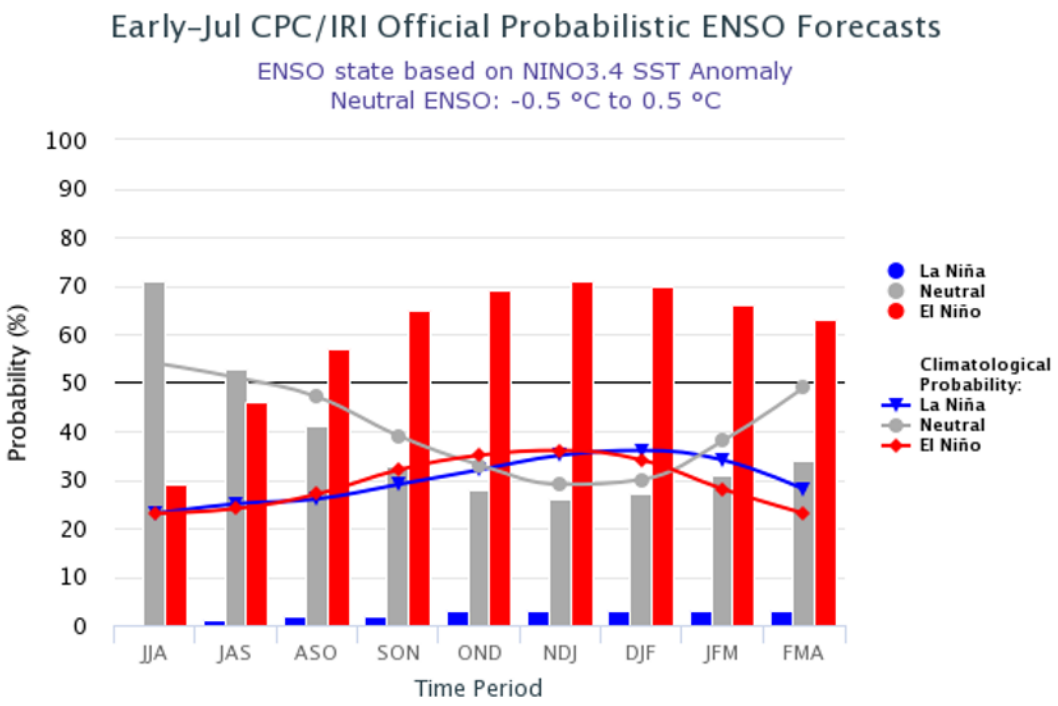
Teleconnections: El Niño Developing. In Time to Suppress Tropics?

At the end of July, central tropical Pacific Ocean water temperatures near the equator (the Niño 4 region, key to future expectations of El Niño/Southern Oscillation trends) remained solidly above average, with additional Kelvin waves (second graphic) indicating more robustness to the down-welling pattern signifying a continued warming of the region which had reached the Niño 3 region (just to the east of Region 4) as well. A weak El Niño could do two things: 1) Aid in maintaining wind shear in the western tropical Atlantic/Caribbean Sea, knocking down the potential number of tropical cyclones, and 2) combine with the persistent steering pattern to maintain the hot and drier than average weather through much of the period. A weak El Niño that developed in early summer 2009 may have assisted the searing heat, though the correlation becomes a bit less clear by late summer (August) and into September. Other summer teleconnections show weaker correlations when compared with autumn, winter, and spring, and are not discussed here.





Above: Top: Upper Oceanic heat anomalies in the ENSO 1 to 4 region, showing a persistent building of positive departures from average from April-July 2018. **Bottom:** Strong down-welling Kelvin Wave(s) continue to spread slowly toward the eastern Tropical Pacific and appear to continue through autumn. El Niño is becoming a near certainty by late summer or early autumn.



Multi-model consensus forecasts now forecast neutral-leaning El Niño by the beginning of autumn (September), with a solid lean toward at least a weak El Niño as early as mid-autumn 2018 and winter 2018/19, to continue into spring 2019.

What to Watch For: More Heat, Return of Drier Ground, Wild Cards in Deck

Overall, for late summer 2018, the following situations are expected to predominate:

- *Hot with Below Average Rainfall.* August could continue the 2 to 3˚F above the 1981-2010 average temperatures and range within the top five or ten August, August-September, or August-October combination temperature records including 1998, 2009, 2016, and 2017. The Great Flood of June 2018, which left enough water for a few weeks of evapotranspiration to slow the daily heat machine, will keep summer (June-August) 2018 shy of records from 1998, 2009, and 2016-2017 – though it may be close. June and July 2018 combined ranked among the top five hottest across the Rio Grande Valley

- *Dryness Continuing, drought redeveloping?* Should significant rain not develop through early October, the high sun angle and hotter than average temperatures will return abnormally dry conditions by early August, with moderate to severe drought to possibly follow especially if September ends up at <50% of average. A couple of quick hitting events would be able to keep dryness parameters from returning. Unknown is whether rainfall forming near the Sierra Madre can reach into Zapata and Jim Hogg County by late summer into September; if so, moderate to severe drought conditions would be kept in check but if not, severe to extreme drought may develop in this corner of the Rio Grande Plains.

- *Another Flood?* Even without an organized system, just a few days of tropical energy from one or more "waves" can turn drying ground back to a new, temporary lake just about anywhere in the Valley. It is always relevant to be prepared for flooding in Texas, even in the middle of a drought.

- *Tropics?* **#ItOnlyTakesOne**. As Harvey showed in 2017 – and the Great June Flood of 2018 as the solstice arrived, a "La Canícula" summer can see a one-week "crack" in the pattern to allow such a system to thread the needle and create devastation in Texas. Harvey used very warm water temperatures as fuel for its open wave, which built a very robust engine from a pocket of very low wind shear along the Texas coast and deep tropical moisture that overspread the wave. A briefly weakened La Canícula that initially slid into the Baja region before fading allowed Harvey's weakened state to pump continuous deep tropical moisture from the southeast Gulf and Caribbean into southeast Texas, with record rainfall and eventually $100 billion in property damage from flooding alone. Will a window open for the Texas or northeast

Mexican coast to do the same in 2018? Recall that in the months following Harvey, dry high pressure returned and southeast Texas returned to "abnormally dry" and moderate drought later in autumn 2017. Be prepared.

Outlook: Late Summer and Early Autumn 2018

August: With La Canícula likely to appear from time to time and perhaps be the more dominant ridge (vs. a westward extension of the Bermuda ridge) when the persistent western/southwestern U.S. ridge slides east, hotter and slightly drier than average conditions are most likely. The slight relocation of the general ridge farther west (i.e. Great Basin/Intermountain West) could allow some cracks to open for individual tropical or easterly waves to slide underneath; these may be relatively low in moisture when compared with a full blown cyclone or broader, slower moving system such as the one that resulted in the Great June Flood of 2018.

In 2017, the "break" from bypassing Harvey was brief, and worse – westerly flow on the backside of the cyclone's circulation brought even more heat to close the month, locking in a Top ten hottest month for the primary Rio Grande Valley sites, including McAllen at #2, Harlingen at #7, and Brownsville at #6. Of course, any "thread the needle" system – wave, storm or hurricane – that breaks the pattern in time (see Allen, August 8th 1980) would ensure no return of dryness and knock down temperature averages, as well as reduce the number of triple-digit highs in the mid/upper Valley.

September is always a wild card, but perhaps more this year than recently. How western Atlantic and Gulf sea surface temperatures, as well as depth of the water will provide just how much "jet" or "rocket" fuel will be available for any cyclones. The jet fuel was available for nearly the entire Gulf in August, but the first two weeks looked to see a paucity of waves. Available moisture in the Main Development Region will depend on factors such as Saharan dust, water temperatures in the eastern third of the region, and more.

Finally, will wind shear maintain its hold on the Caribbean? Is the persistent wind shear the first sign of an El Niño warming signal – or will the existing shear meld with the developing El Niño? Or will there be a "thread the needle" event from the southern Gulf/Bay of Campeche/northwest Caribbean to become a storm of memory? Finally, will the Canícula pattern return or spread back to the southeast from a source ridge in the *western* U.S? Needless to say, confidence is low to medium on outcomes.

October would tend to once again favor warm to hot temperatures and below average rainfall on balance, but the aforementioned wild card of the Eastern Tropical Pacific in the form of a hurricane crossing Mexico from southwest to northeast and bringing an abrupt end to the dryness. Could the Gulf window open early in the month? Rare, but possible; in years past under varying ENSO conditions, tropical cyclones or waves have come close to the Lower Texas coast and provided ample rainfall, coastal flooding from the sea.

In fact, a continuation of the "ridge in the west, trough in the east" atmospheric steering pattern can lead to early season cold fronts in the Midwest and Northeast; sometimes, strong surface high pressure systems follow these fronts when an upper level trough lifts out. Such surface ridges, extending from New England and southeast Canada through the eastern Gulf can develop a long period easterly swell in the Gulf which can bring the threat for tidal overwash and minor coastal flooding, as we saw the first weekend of October, 2017, prior to the development and arrival of Hurricane Nate on the northern Gulf coast.

Preparedness, Awareness

- ***Heat and Hydration.*** June's top five temperature value may be a harbinger of more to come in July and August, which already see average tempertures ranging from the mid to upper 90s at most Valle locations. Any humidity added to June-August temperatures nearing or exceeding the century mark could push "feels like" temperatures between 110 and 120. Hydration is critical for people, pets, and plants right through summer – but more than what would be "typical" of an already hot region of the nation. For heat safety tips, check our local heat awareness page and the NWS national page. **Often!**

- ***All Things Tropical!*** Become hurricane ready in June and July! Harvey showed Texas that even during a prolonged period (almost 7 years) where "Veracruisers" dominated, one storm that cracks the code and opens the window can be a historic event for Texas.

  As the Great Flood of June 2018 showed, and with credit to the great Bob Dylan, "It doesn't take a hurricane to know which way the water flows"! A foot of rainfall leading to 3 to 5 feet of water depth can happen just as easily for an unnamed wave as it can for a full-fledged hurricane. July is the month to wrap everything up. **Everyone** should consider a flood insurance policy; most people here impacted by June's floods were likely not in a designated flood hazard zone. The average cost for insurance is that of a soda per day. Remember that an approved policy does kick in until 30 days after signing, so do not wait until August.

  - **Become HurricaneStrong Today!**
  - **Adjust Your Plans at http://hurricanes.gov/prepare**
  - **Are you insured? Start your coverage at http://twia.org**
  - **How about for floods? Floods can inundate *anyone*** in the Valley. Insurance is less expensive outside of a designated flood zone, but no less important. Learn more at **http://floodsmart.gov**
  - **Check out more with our hurricane guides, in English and Spanish.**

- ***Autumn Coastal Impacts: Rip Currents and Tidal Flooding.*** Strong surface high pressure systems can develop along the U.S. Atlantic coast following the first cold fronts of autumn. These highs, which descend

on New England and sometimes the mid-Atlantic coast by mid to late September, and into the Deep South (U.S.) by October, can combined with resident low pressure over the southern Gulf of Mexico and western Caribbean to build an east to west swell of Gulf water toward the Lower Texas shoreline, resulting in locally high surf, occasional tidal run-up or overwash, and frequent and very dangerous rip currents. For more on rip current reasons and safety, go to our **rip/longshore current page** or check out **http://ripcurrents.noaa.gov**.