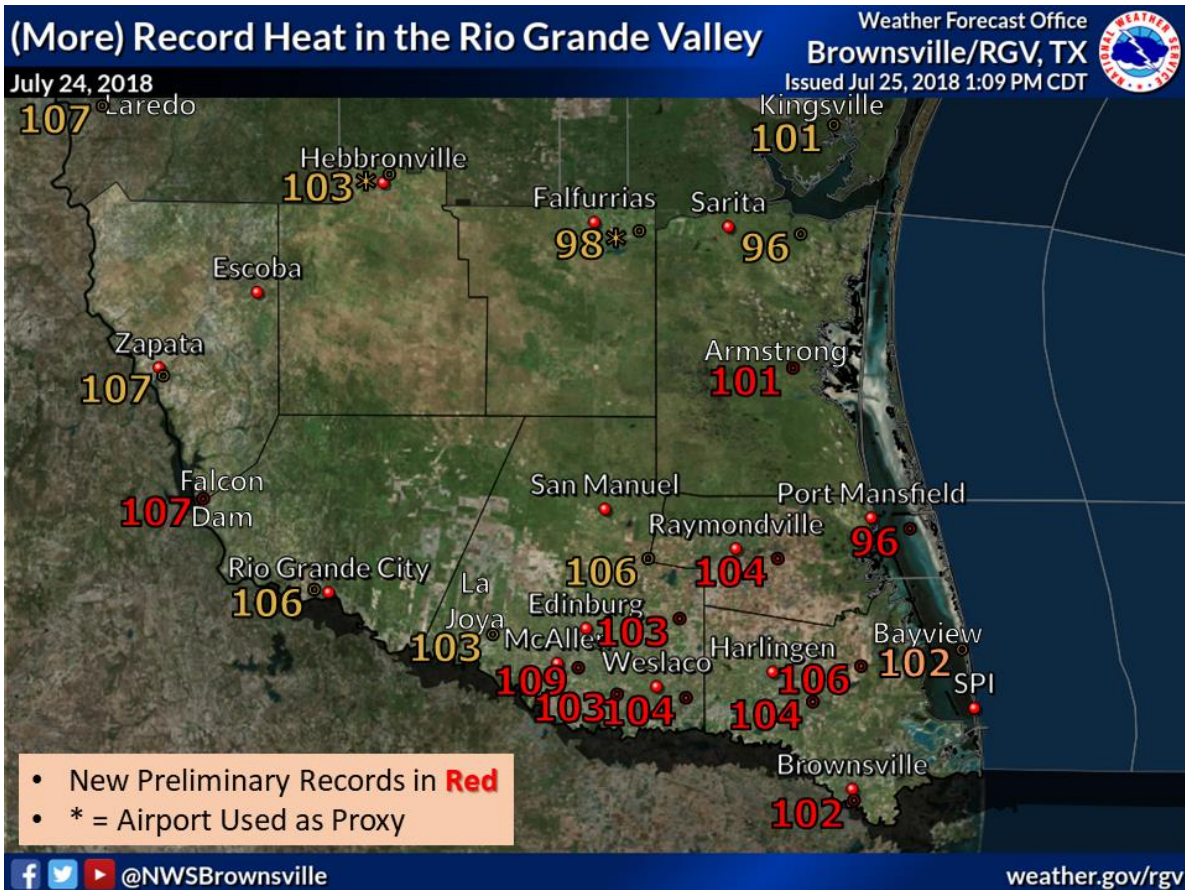
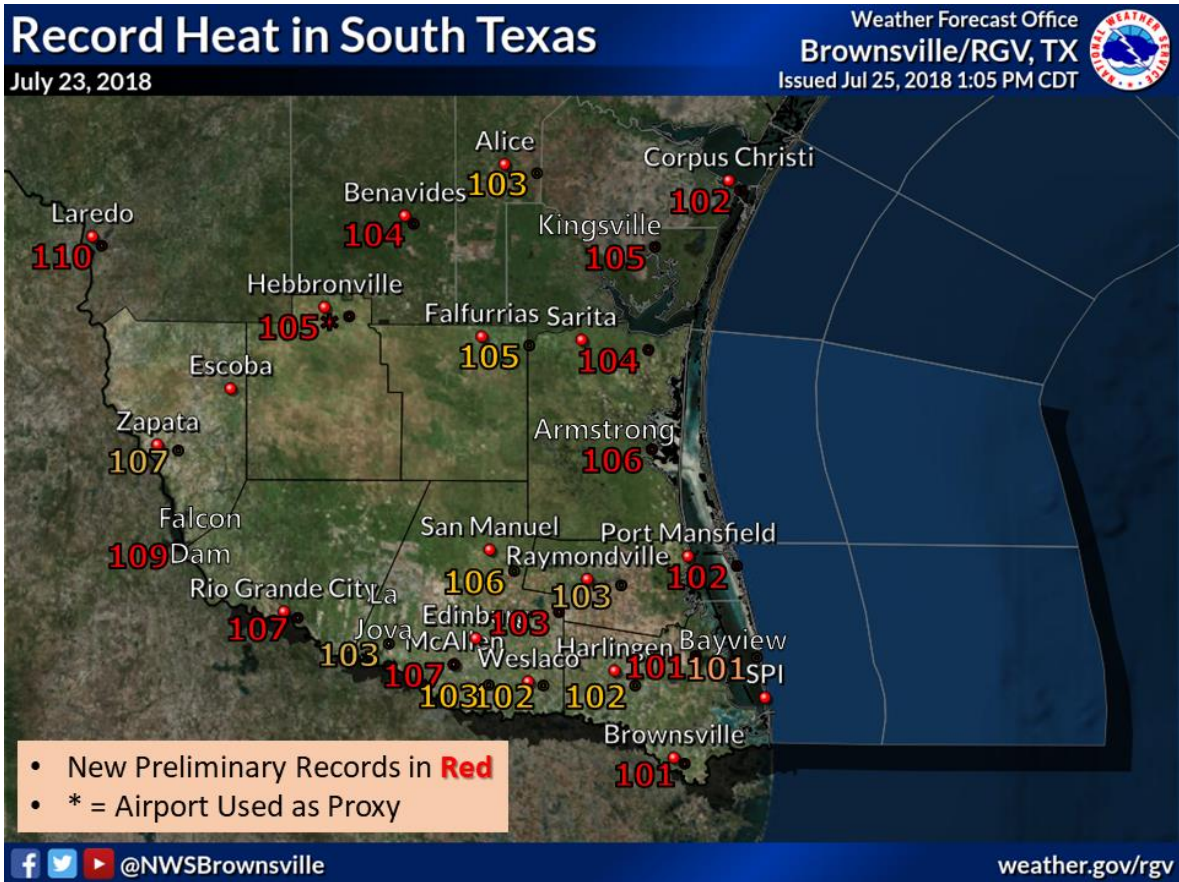


RGV Mid-July 2018 Heat Wave



La Canícula, on “Steroids”

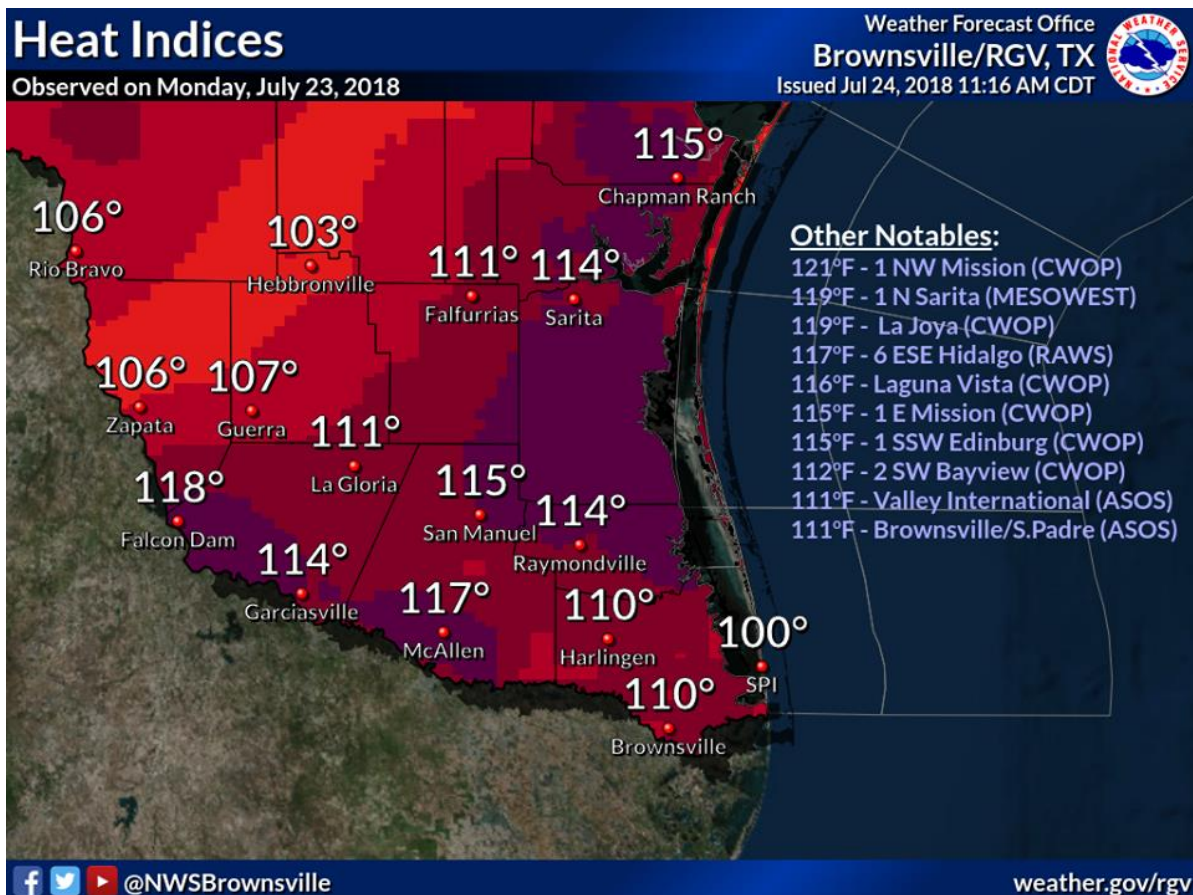
Summer’s “Dog Days” Panting at Record Levels in July, 2018 in South Texas

Summary

As [forecast](#) before the summer (June-August) of 2018 began, the pattern of [“La Canícula”](#) dominated much of the season through the end of July, with the sole exception a one week period in late June that led to the [Great Flood of June 2018](#) across the Rio Grande Valley. True to expectations, the pattern – which is generally typical between July 3 and August 11 – hit its own “mountain peak” right in the middle of the period, with days of record to near record heat and several days in a row of oppressive heat index, or “feels like”, temperatures, that peaked between 110 and 117 in highly populated portions of the Rio Grande Valley.

The hottest days were July 23 and 24 for the Rio Grande Valley, where new records were set during a window that included the hottest all-time July record for parts of the region set in 2009, 2016, and 1998. July 23rd was the hottest, region-wide, since June 22, 2017 – a day when new all-time records were set in Hidalgo County as temperatures soared above 110°F in several areas. A surge of low level southerly flow on the 23rd assisted both the heat and the heat *index*, whose values reached a consensus 111 to 117 across Cameron, Hidalgo, and Starr County close to the Rio Grande. Similar heat index values (not shown) spiked across the lower Valley during the afternoon of the 24th, with values between 111 and 115 in a stripe of Cameron, Willacy, and likely into southern Kenedy County in front of and wind shift line but also where southeast flow associated with sea breeze enhancement developed between 3 and 5 PM.

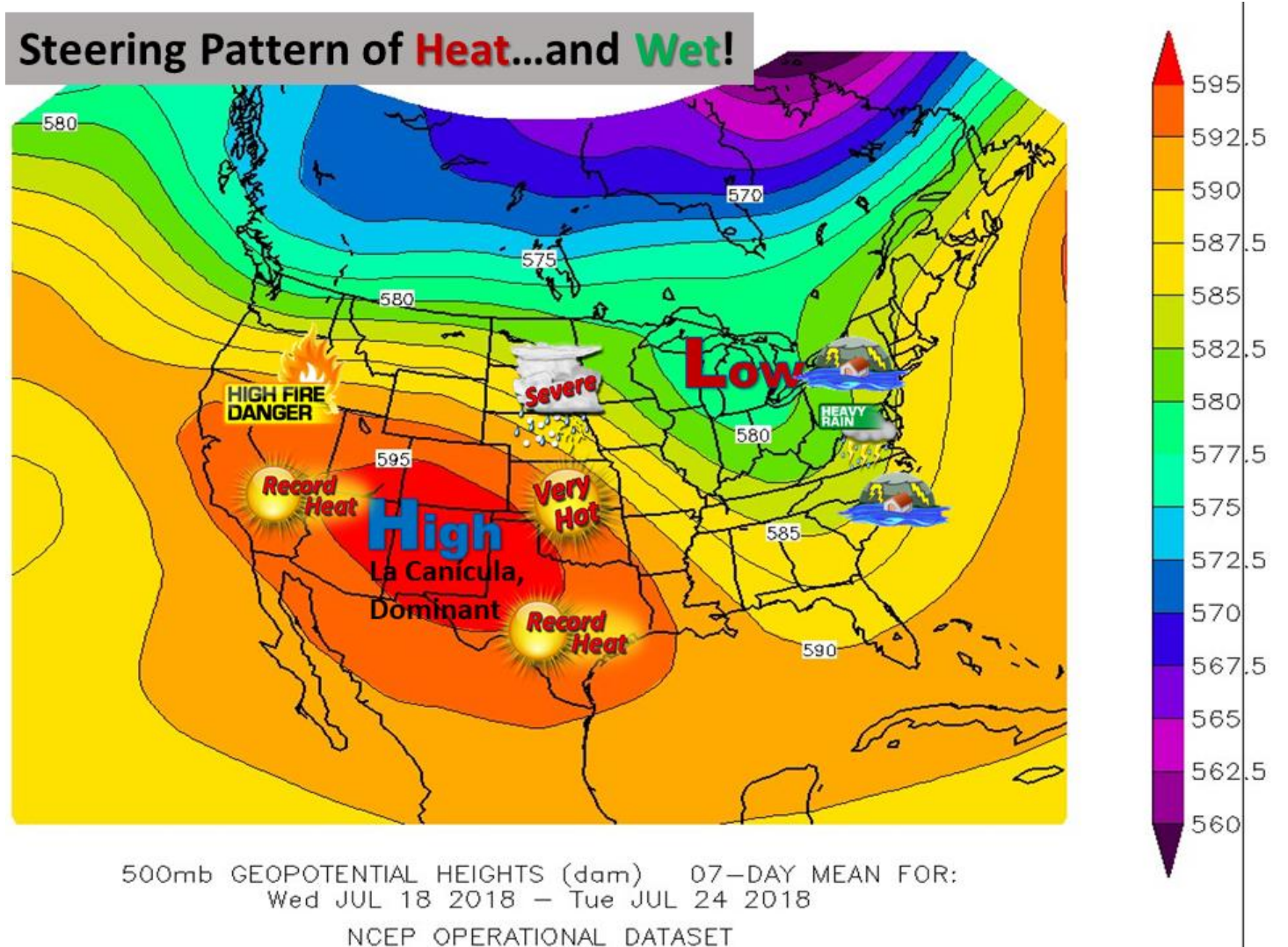
Stressors on people increased, even in an area acclimatized to some of the hottest temperatures in the nation. More than a dozen migrants were treated for heat exhaustion, dehydration, and heat stroke between July 20th and 24th mainly in Brooks and Hidalgo County; two Valley fire fighters working at a construction site in Hidalgo County were also treated for similar symptoms on July 24th. Several shelters opened as cooling centers, including the Salvation Army in McAllen, Loaves and Fishes in Harlingen, and the Good Neighbors Settlement House in Brownsville.



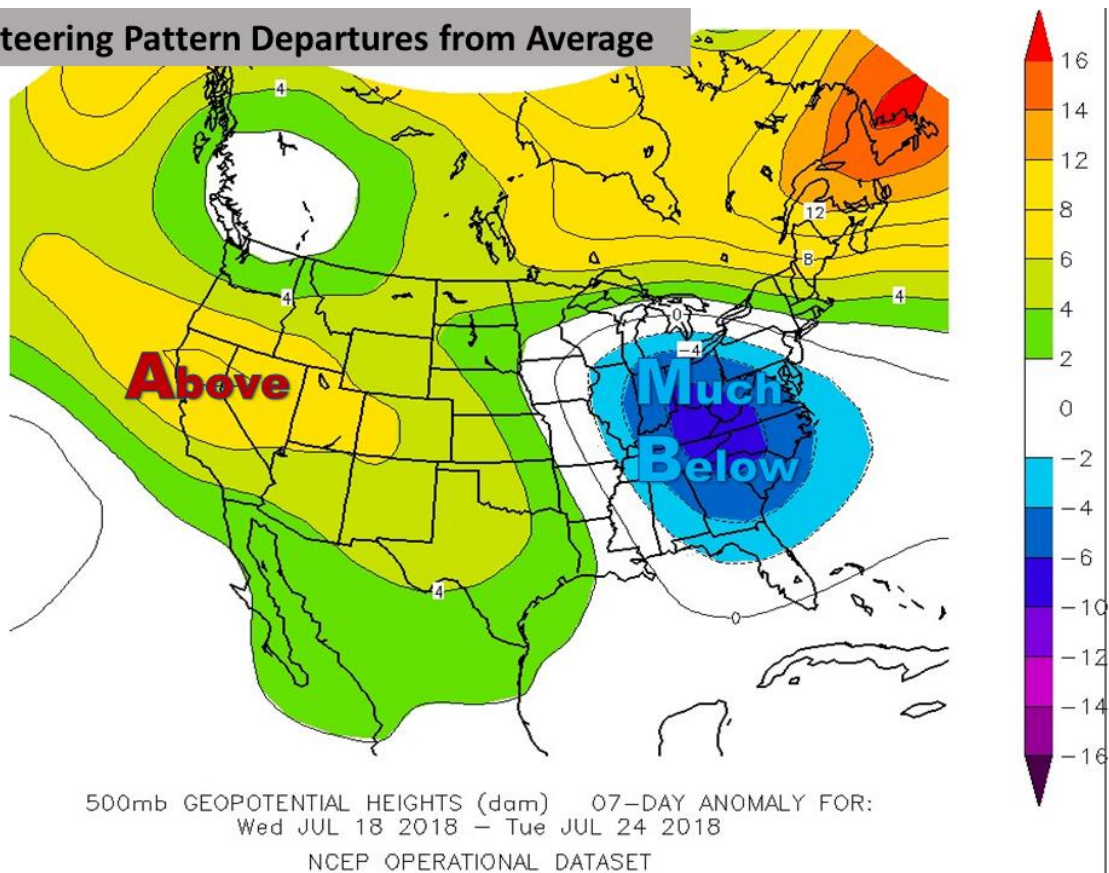
Pattern Matters

La Canícula, the Dog Days of summer, features a typical pattern of an atmospheric high pressure ridge centered somewhere between west Texas/central New Mexico and northern Mexico generally over Chihuahua or Coahuila State, from early July to mid-August. The pattern brings the hottest temperatures of the calendar year as well as a dip in rainfall to 0.05" or less per day, similar to daily rainfall rates seen in March, April, and November. Clockwise circulation of air around the ridge brings dry atmospheric air from the western mountains and deserts into the Valley, suppressing rainfall and most tropical activity; the position of the ridge also steers higher tropical moisture and any embedded waves well south of the Valley, mostly into southeast Mexico and northern Central America. For mid to late July 2018, the already "toasty" pattern got downright brutal, with a notably stronger ridge increasing the heat and dryness. That ridge was also locked into place by a developing trough of low pressure along the east coast, which set up an "atmospheric river" of tropical moisture and heavy rainfall from North Carolina to New York (state).

At the start of the peak temperatures (which began around the 18th in the Valley), the entire state of Texas was under record to near record heat, with locations from San Antonio to Dallas and Houston pushing above 105°F in actual temperature, with "feels like" temperatures higher still. For the Valley, the combination of the heat, pure sunshine, and high sun angle quickly erased the lush green landscapes that existed for a few weeks in the wake of the June 18-22 Great Flood period; by the week of July 22, yellows and browns had replaced the greenery – another indication of the 1927 Lone Star State meteorologist who was legendary for his truth telling: "Texas is a State of perpetual drought broken by the occasional (devasting) flood.". The RGV went from expanding moderate to severe drought in mid-June to lush green by month's end, only to return to increasing dryness less than a month later.



Steering Pattern Departures from Average



Above, Top: “La Canícula” on Steroids: The values for the 500 mb height across the scope of the ridge (High) area are substantially above what is expected in July, which is already a hot month across the southwest U.S. Bottom: Departures from average, generally 4 to 8 decameters above what they should be. The result has been excessive heat not only in Texas, but through New Mexico, Arizona, and inland southern California.

A String of Hot July's: A New Normal?

While the afternoon temperatures through the heat wave ranged from 5 to 7 degrees above average, with peak heat wave days nearly 8 to 10 degrees above average, when compared with recent mid to late July's, both temperature and even the heat index are only incrementally higher than the levels observed for much of the decade that began in 2011. Using McAllen/Miller airport as an example, the following maximum temperatures were observed between July 20th and 24th. Values in red indicate above average days.

Year	July 20 (avg: 97)	July 21 (avg: 97)	July 22 (avg: 97)	July 23 (avg: 98)	July 24 (avg: 98)
2011	100	97	98	98	99
2012	101	103	102	102	102
2013	97	99	99	99	101
2014	101	100	102	102	103
2015	102	101	100	100	101
2016	101	98	101	104	104
2017	104	103	103	102	101
2018	102	103	105	107	109

Data from the Southern Climate Impacts Planning Program, or SCIPP, show this trend as well with many of the July's since 1990 running above the historical average (dating back to 1900, but not for all stations) with a markedly upward trend since the most recent prolonged “cooler” period in the late 1970s. While the upward

trend since around 1980 is concerning, a longer period of data is required to get a better sense on how much of the rise may be attributed to climate change.