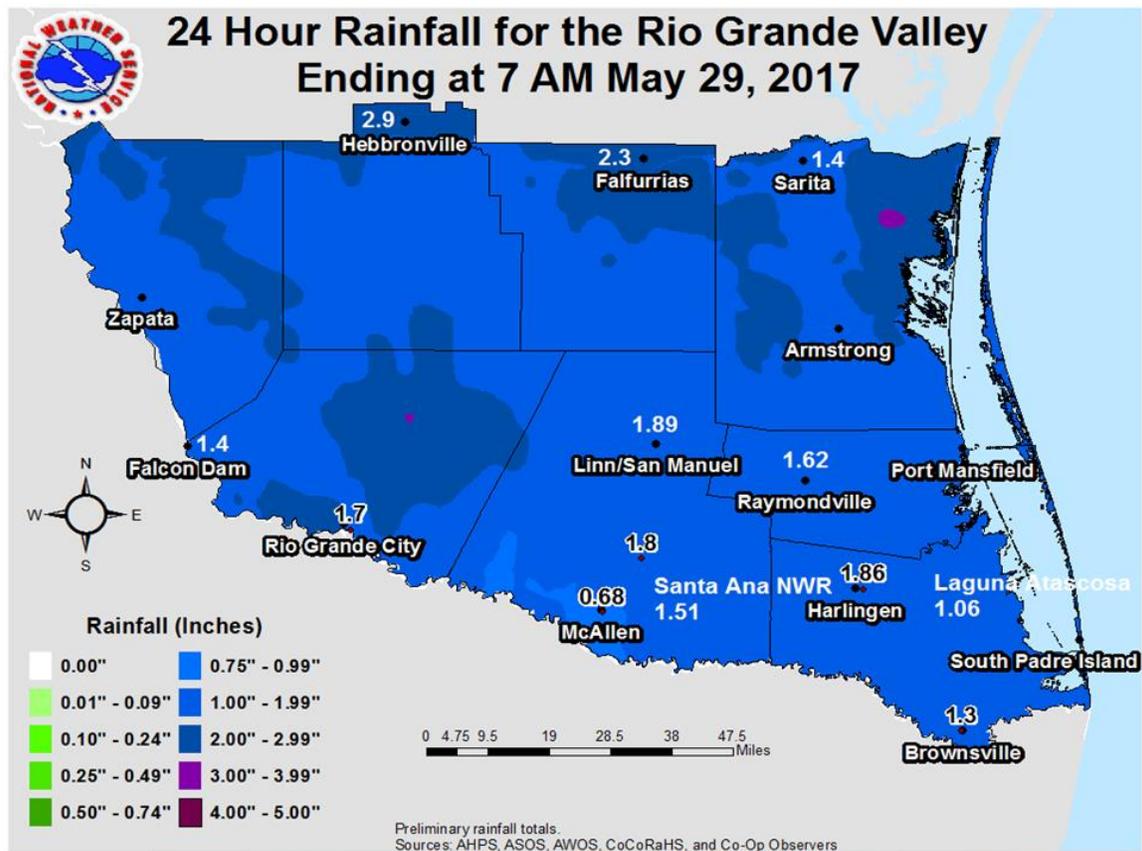


May 26-29 Quick Summary



Above: A trifecta of dangerous heat: Shown are peak heat index ("feels like" temperature) values, for May 26, 27, and 28 (left to right for each location).



Heat Reigns...Before the Rain “Reigns”

Temperatures Percolate to Start Memorial Day Weekend; Atmosphere Percolates into Lightning Storms With Welcome Rain to End It

Overview

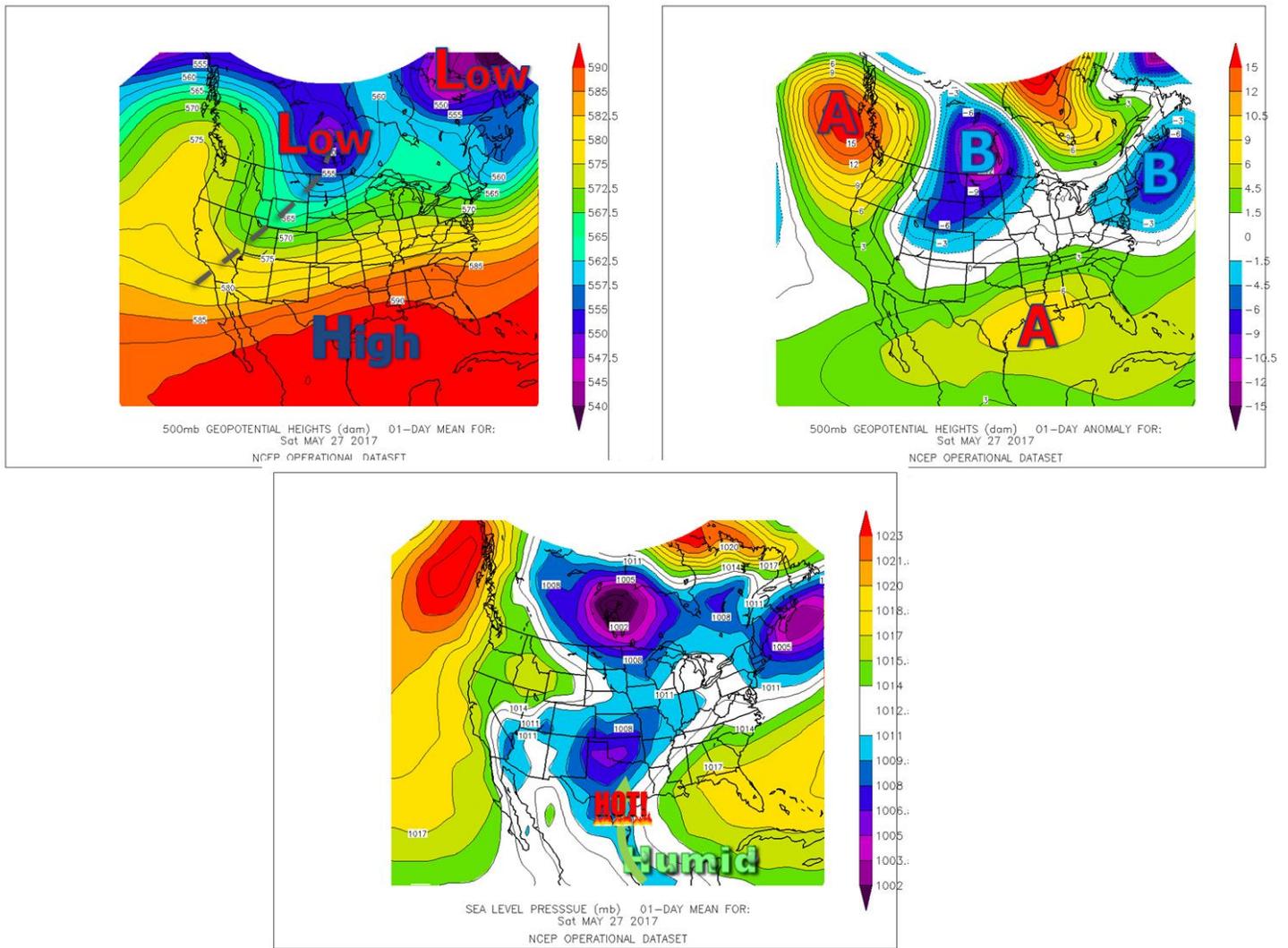
It was all building up to something.

Calendar year 2017, already ranking among the top ten warmest (through April) for the Rio Grande Valley, locked in yet another above average month in May with a brief but oppressive heat wave to open the holiday weekend. Then, the atmosphere provided a relief valve in the form of the season's first Valley-wide squall line and “mesoscale convective system” overnight on Sunday and into early Memorial Day. The squall will be remembered for an unwelcome wake-up for much of the Valley, with a light(ning) show and power outages the primary impact. Minor flooding of poor drainage areas was also noted, but for much of the Valley's population, the rain was a most welcome sight, particularly in the Lower Valley (Cameron County) where significant rainfall was last seen between March 4 and 12, nearly three months, while heat dominated much of the time. Drought, which had become severe around Greater Brownsville, was dented by the 1 to 2 inches of rain in the area (above).

The Heat...

Rio Grande Valley summers (June through August, often extending into September) are known for their searing heat. But late May can “feel” hotter than any mid-July stretch. Why? You just need to ask the atmosphere. Unlike mid-summer, when high pressure (including La Canícula) dominates from top to bottom of the atmosphere and actually reduces the flow of oppressive humidity with generally lighter southeast to east wind near the surface and light westerly flow above the surface, a May pattern of flat ridging across the Gulf with an approaching upper level disturbance moving through the Great Basin/Southwest U.S. can bring forced humidity on strong southerly surface flow. Haze/soot from late season Mexican agricultural burning can latch onto the moisture, reducing visibility and making breathing difficult for those with respiratory ailments. A similar setup occurred just prior to Memorial Day in 2008. In 2017, the pattern seemed appropriate in a year with at least one unusually hot or oppressively hot period in each month – from late January's 90s to a four day period in February where 100 was reached along/west of IH 69C, and brief heat waves in March and late April.

In this event, while McAllen recorded a three-spot of 100°F+ days in a row (May 26-28) and several other locations away from the coast touched 100°F on at least one of the three days, the bigger story was the combination of heat with oppressive (for late April) humidity. Along the Rio Grande, heat index, or “feels like” temperature, broke above 110°F from Cameron to southern Zapata County on May 26th, and continued in pockets during the heart of the Memorial Day Weekend (May 27 and 28). Dew points held in the 70s through the afternoon near the Rio Grande and generally east of US 281/IH 69C even as actual temperatures edged toward or just over 100°F. The culprit was the pattern, mentioned above, and described in the images below.



Above: Pattern matters. Top left: 500 mb (~18,000 feet) pattern at the peak of the heat wave on May 27. Right: Departure from average of the pattern, showing the key elements that induced strong flow of very humid air from the oppressive source of southern Mexico and coastal Central America (vs. the Caribbean Sea in a summer pattern, which moderates the condition a bit) – below, center. Note the “tightness” of the lines between lower pressure across the Dakotas/Montana and south Texas, as well as the difference between below average (B) and above (A) on the right. In summer, these sharp gradients do not typically exist.

...The Storms

The aforementioned upper level disturbance swung quickly through the Great Plains and into the Mississippi Valley by Memorial Day. The tail of the disturbance was robust enough to flatten the ridge and return the values to near “normal” by the end of the weekend. The contrast of air masses and the energy flowing between them lifted available moisture – first, along the lee of the Sierra Madre during the evening of the 28th. Individual storms soon lined up and moved perpendicular to the mean flow (from the west-northwest). With an uncapped (fully unstable and ready to percolate) atmosphere ahead, including the entire South Texas region, the line was able to maintain and rain all the way into the western Gulf. Fortunately for Valley residents, the line came with gusts below damaging levels and more welcome rainfall than anything else. A bit more rain – in some areas exceeding 3 inches – fell across the ranches of Zapata, Starr, Jim Hogg, and Brooks County. Mainly nuisance flooding occurred in poor drainage areas across communities such as Hebbronville; some arroyo flooding may have occurred along/near US 83 in Starr County. As of this writing, just a few tree limbs had fallen; a peak wind gust of 46 mph was recorded at Hebbronville/Jim Hogg County Airport northwest of town at 1:35 AM; similar winds may have surged through southern Brooks and into southern Kenedy and Willacy County a few hours later.

In addition to the rainfall shown on the map above, the following rain totals (preliminary) were reported (inches):

San Manuel/Hidalgo County:	2.3
South Padre/Sea Turtle Rescue	2.3
Weslaco	1.75
Escobas (Zapata Co.)	1.67
Weslaco (ASOS)	1.45
Brownsville/Cooperative	1.42
La Joya	0.90

25 Stations with 40 Reports over 2 Days

Station Number	Station Name	Daily Precip Sum in.
TX-CMR-94	Brownsville 12.6 E	2.38
TX-CMR-58	Laguna Vista 0.3 N	2.28
TX-CMR-92	San Benito 8.7 ENE	1.91
TX-CMR-8	Brownsville 6.4 SE	1.78
TX-CMR-101	San Benito 0.9 SSE	1.76
TX-CMR-105	Los Fresnos 2.1 NNE	1.63
TX-CMR-21	Los Fresnos 0.3 NE	1.59
TX-CMR-36	Harlingen 4.7 WSW	1.56
TX-CMR-97	Rio Hondo 7.9 E	1.56
TX-CMR-93	Harlingen 4.4 W	1.54
TX-CMR-84	Brownsville 2.2 WNW	1.51
TX-CMR-103	Brownsville 1.5 SW	1.47
TX-CMR-85	Harlingen 0.4 N	1.45
TX-CMR-90	Brownsville 1.5 WNW	1.41
TX-CMR-51	Brownsville 0.1 SSE	1.36
TX-CMR-67	San Benito 7.8 E	1.35
TX-CMR-31	Brownsville 7.0 NW	1.34
TX-CMR-100	Harlingen 6.2 WSW	1.27
TX-CMR-89	Brownsville 1.7 NNE	1.24
TX-CMR-13	Brownsville 2.2 W	1.11
TX-CMR-45	Bayview 2.9 N	1.11
TX-CMR-96	San Benito 6.3 ENE	1.09
TX-CMR-43	Brownsville 4.1 ENE	1.08
TX-CMR-1	Rancho Viejo 0.7 E	1.05
TX-CMR-22	Brownsville 0.4 WSW	0.90

6 Stations with 6 Reports over 2 Days

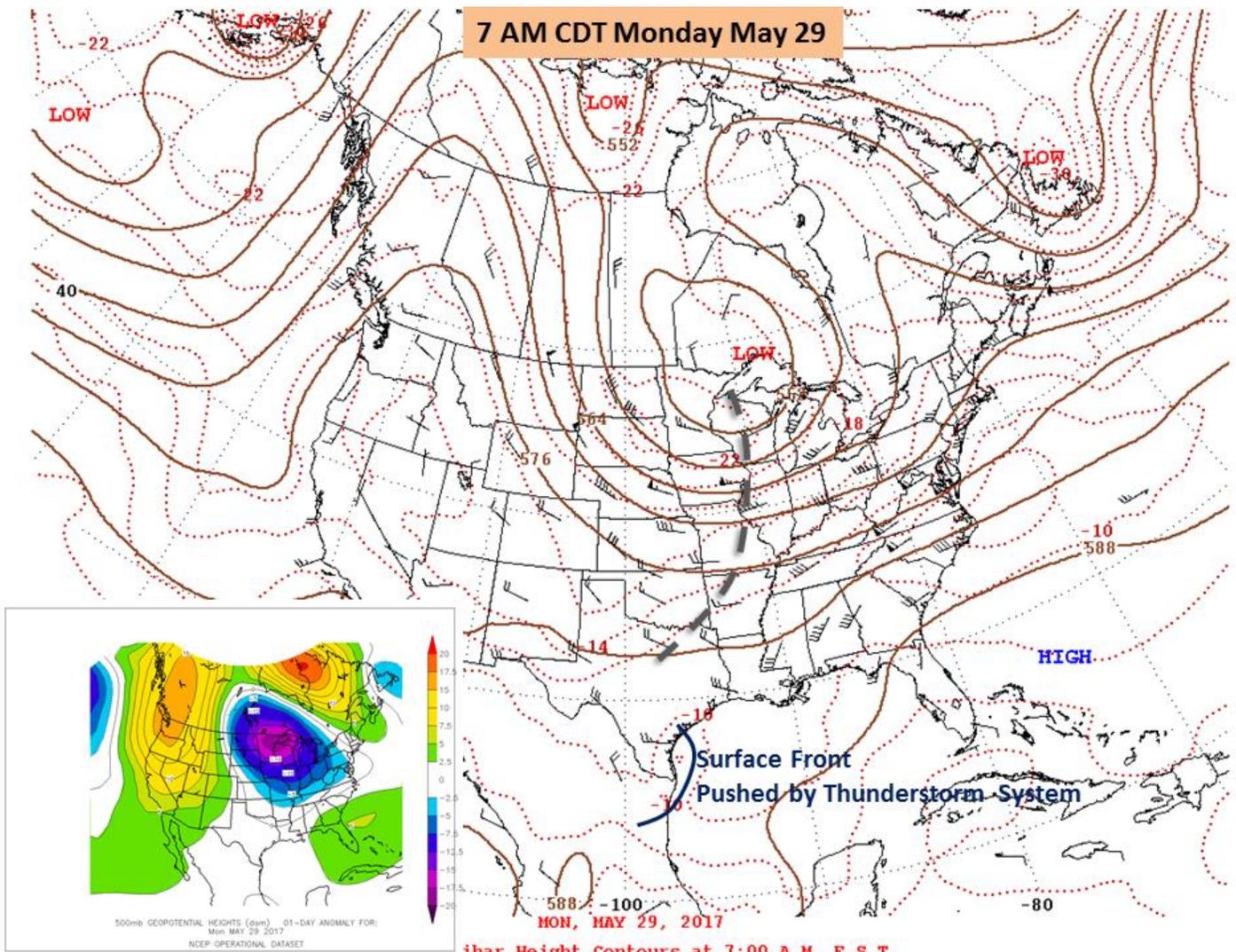
Station Number	Station Name	Daily Precip Sum in.	Multi-Day Precip in.
TX-HDL-32	Linn 8.4 WNW	2.20	
TX-HDL-41	Edinburg 2.4 N	2.15	
TX-HDL-40	Mission 9.6 N	1.89	
TX-HDL-5	La Joya 11.1 N	1.00	
TX-HDL-14	La Joya 0.6 W	0.87	
TX-HDL-9	Mission 1.9 ENE	0.71	

3 Stations with 4 Reports over 2 Days

Station Number	Station Name	Daily Precip Sum in.	M D P in.
TX-BRK-6	Falfurrias 0.8 SSW	2.30	
TX-BRK-5	Falfurrias 0.4 WNW	2.25	
TX-BRK-3	Falfurrias 8.9 SSW	1.32	

3 Stations with 4 Reports over 2 Days

Station Number	Station Name	Daily Precip Sum in.
TX-ST-2	Rio Grande City 17.7 NE	2.81
TX-ST-1	Rio Grande City 2.8 W	2.00
TX-ST-3	Rio Grande City 13.8 NNW	1.50



Above: Pattern change. The upper level ridge that dominated May 25-28 was flattened by the passing trough (dashed gray line) by May 29th. The lift provided by the southern “tail” of the trough helped form up the squall line (below), which helped drag a surface front through all of South Texas with much lower temperatures on Memorial Day and a seasonable day on May 30th.

