

Figure 1. High temperatures for February 23, 2017. All but Port Mansfield were new daily records, and some (McAllen/Miller, back to 1962) were new monthly records

Heat Spike, Flash Drought!

Highly Unusual Event Brings Torrid Heat, Desert Dry to RGV Feb 21-24, 2017

Overview

In a winter dominated by warmth and more sunshine than usual, the final ten days of February brought home the “sense” of the 2016/2017 season. Across the Valley and ranchlands, it felt more like the weather after a dry front in **May** than the end of **February**. By the middle of February, green-up was well underway across much of the populated Valley, particularly toward the coast where just enough winter rainfall helped with spring blooms. By month’s end, flora resembled that of April rather than February, with all trees, shrubs, and seasonable flowering plants at least six weeks ahead of schedule. For good reason, as the rising sun angle and length of day combined with average temperatures in line with mid-April “fooled” flora and fauna alike into full mid-spring glory. The Pennsylvania Groundhog may have seen his shadow on February 2, but six weeks of **spring** was the result in Deep South Texas. Record month-to-date temperatures, obliterating the prior record in February 1962, dominated the scene. The memory of February 2017 was encapsulated on February 23, when daily records fell in nearly all locations. Other notable statistics from that day:

- McAllen/Miller Airport had its earliest triple-digit reading since records have been kept. The prior record was February 28, 2009.
- The 103°F at Falcon Dam (cooperative, NWS) fell one degree shy of the *all-time Texas February record* (104°F, Rio Grande City in February 1902). A nearby remote automated observation location recorded 107°F).

- For February 1-24, average temperatures for a plurality of Valley locations were *more than two degrees above the prior record* set in February 1962!

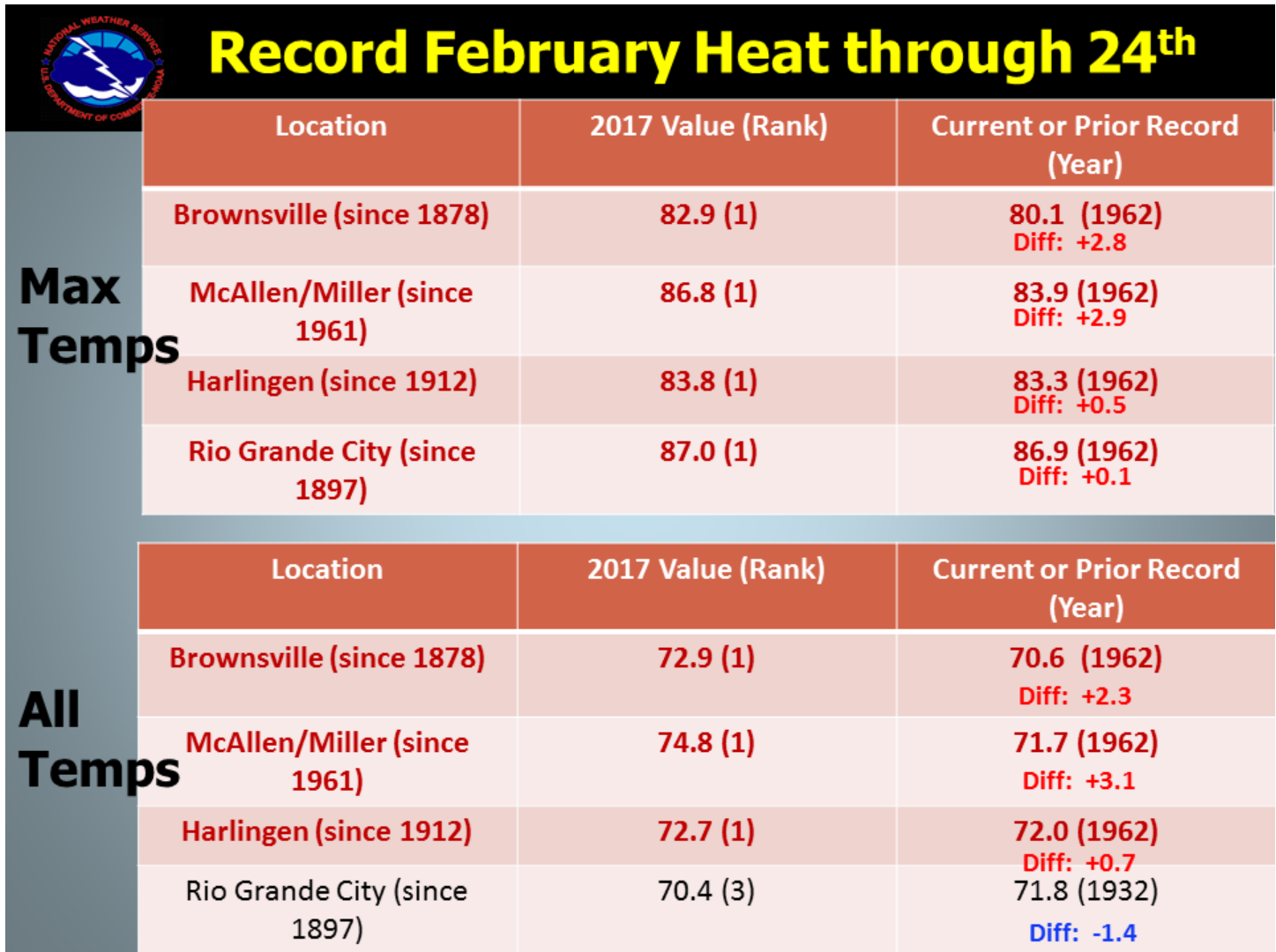


Figure 2. Year 2017 Rankings for high temperatures (top) and all temperatures (bottom) for February 1-24. Differences (“Diff”) between the 2017 and prior record in 1962/1932.

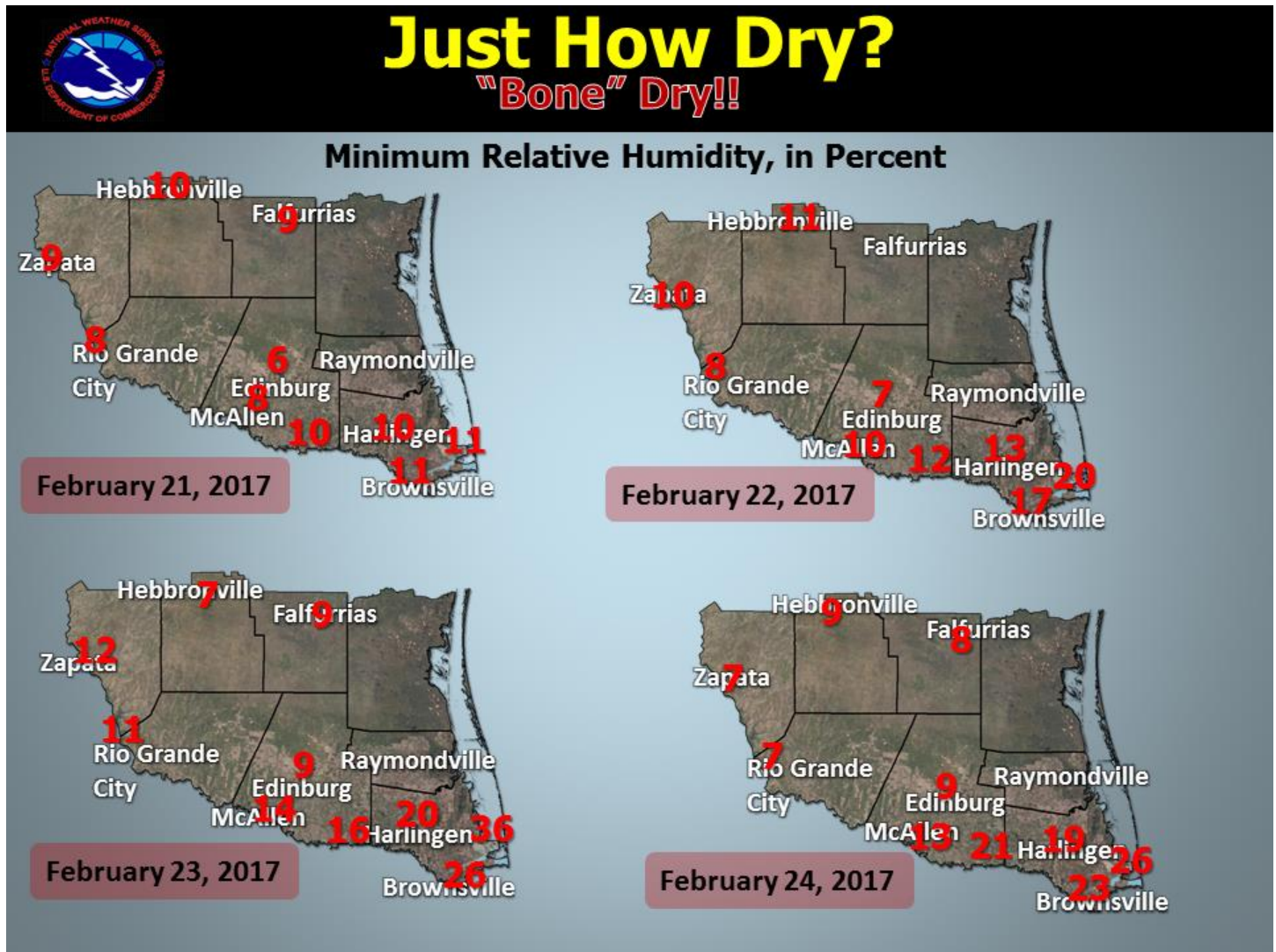
The “Dry’s” Have It, In Spades

While there are no prior winter data readily available to cross-check, it’s possible that the four consecutive calendar days (February 21-24) with **cloudless skies** is a new seasonal record – and perhaps an annual record – for a region mostly in a humid subtropical zone where cloud return, even of the fair weather variety, is a recurring theme on moist southerly winds between the Sierra Madre and the Gulf of Mexico. The atmospheric pattern favoring a downslope (northwest to west) mid and upper level flow pointing from the mountains toward the Gulf was the likely culprit to the desert-blue skies, as well as the buildup and persistence of impressive heat. Temperatures for nearly all inland areas, basically west of US 77, reached or exceeded 90°F each day, at a time of year when the typical 90°F+ day is a “one off” behind a dryline but ahead of a winter front, which drops temperatures back into the 60s, 70s, or 80s the following day.

The warm temperatures extended to the barrier island beaches, where lower 80s was the rule, and the surf/shoreline interface temperatures reached the mid-70s – also more like early to mid-April than late February.

Along with the cloudless skies came “bone dry” humidity. Fed at once by the impressively hot temperatures (20 to nearly 30 degrees above the low to mid 70s average) and low atmospheric moisture content, values fell to or below 10% each afternoon across a *majority swath of the RGV and Deep South Texas brush country.*

Locations that had received some notable rainfall of twice the monthly average in an evening (February 20th, Zapata County, where 1.5 to 2.5” of rain fell), had any benefits overwhelmed by the combination of hot, dry, and frequently breezy (February 22 and 24, for example) weather. The combination of hot temperatures, gusty winds, below 10% humidity, and lengthening days created “flash” drought conditions, most impactful in Starr and Jim Hogg County where the bigger rains ended before re-forming in Hidalgo and Brooks County. At least one large wildfire was noted in western Kenedy County on gusty but very dry southerly winds on the hottest day of the bunch (February 23rd).



Pattern Matters

The aforementioned west to northwest mid and upper level atmospheric flow was the primary contributor to the very dry and clear weather for the period. Immediately prior to the heat spike, a spring-like upper level disturbance had cruised through the area Sunday night and early Monday (February 20), bringing welcome rainfall along with some large hail and gusty winds (Zapata and Webb County). The system then moved steadily through the southeastern Gulf (low latitudes) with a “bump” of ridging following. The atmospheric ridging also helped the dry air machine. Actual “heights” of the ridge were just a hair above what they should be for late February, but it was likely enough to produce the additional heating necessary to shatter records and crash afternoon relative humidity on four consecutive afternoons.

February 20, 2017 1-Day Observed Precipitation

Created on: February 25, 2017 - 18:46 UTC
Valid on: February 20, 2017 12:00 UTC

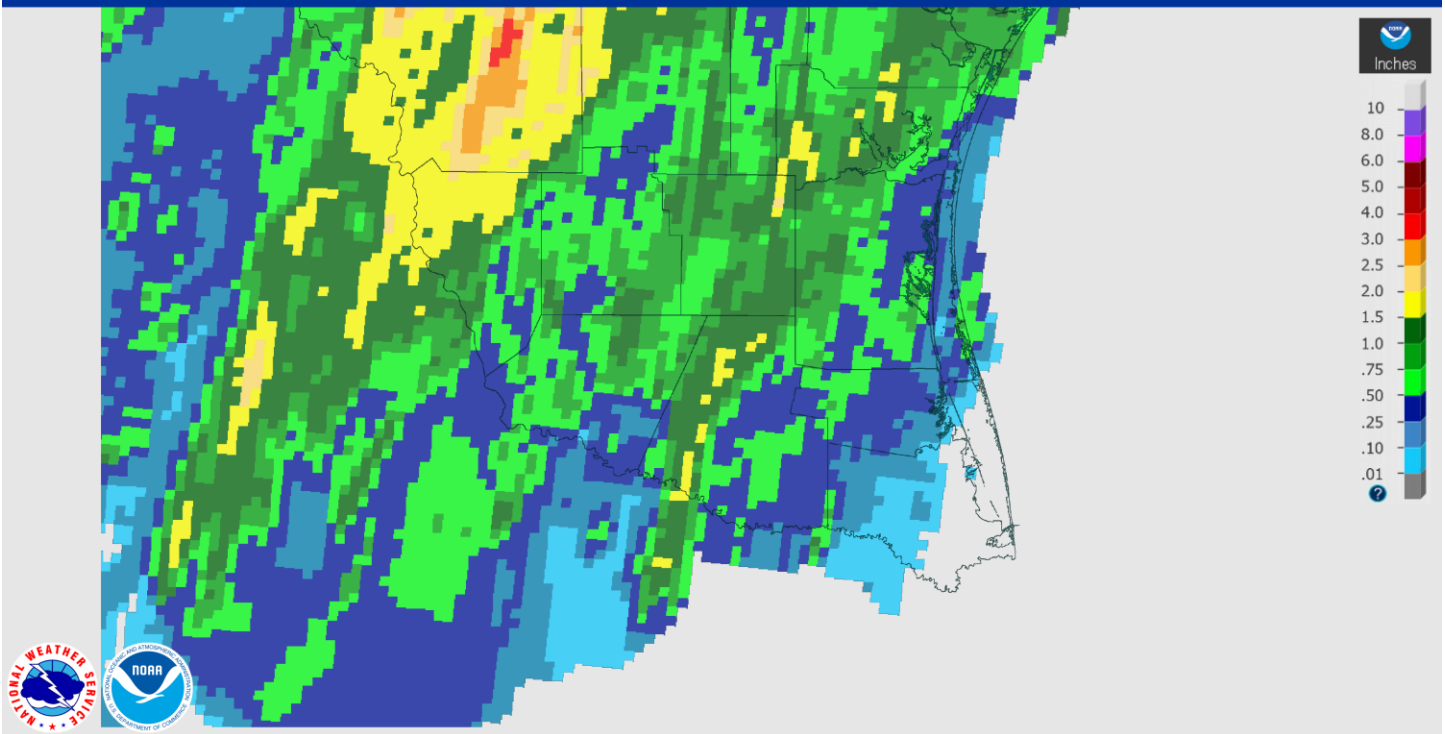
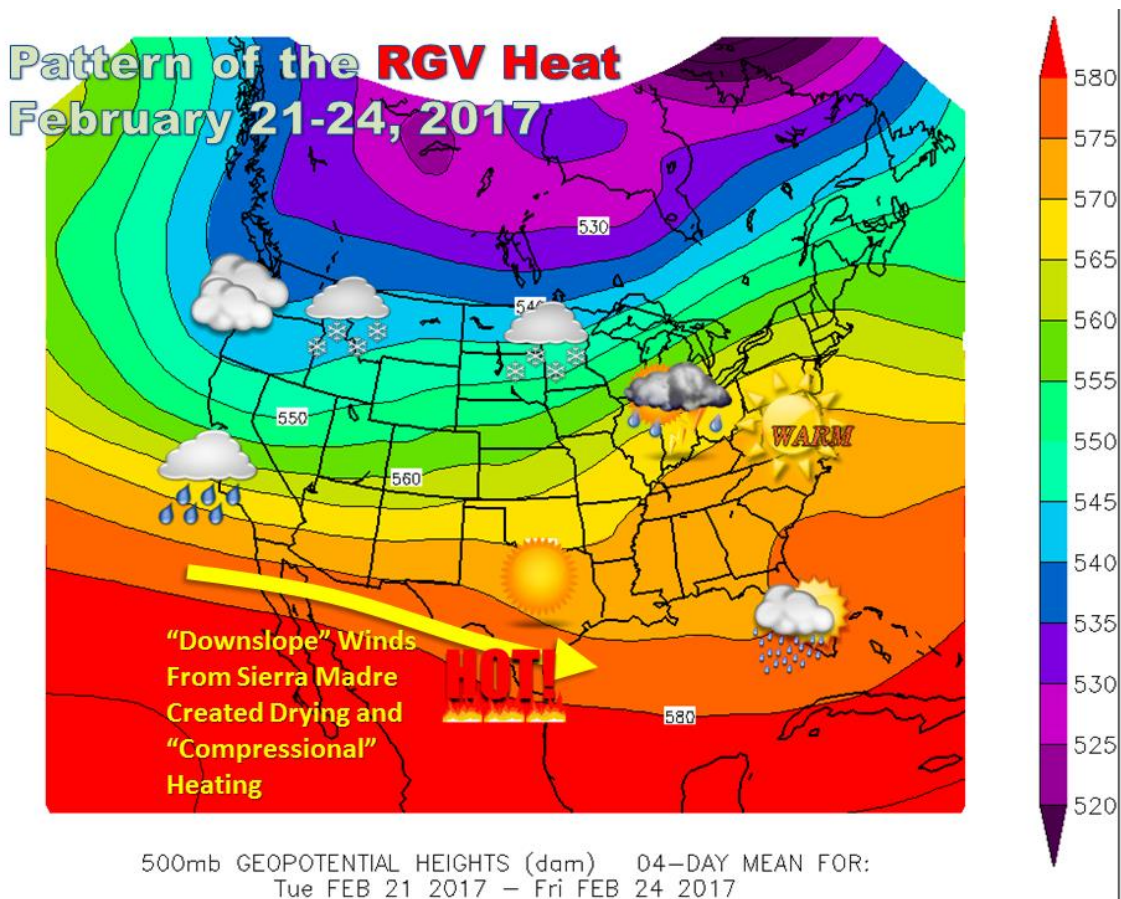


Figure 3. Bias-corrected rainfall for the overnight of February 19 and (early) 20, 2017, across Deep South Texas and the RGV.



500mb GEOPOTENTIAL HEIGHTS (dam) 04-DAY MEAN FOR:
Tue FEB 21 2017 - Fri FEB 24 2017

Figure 4. "Split" flow pattern dominated the period of February 21-24, 2017. Upper level disturbance that began with torrential California rains moved across northern Mexico and Texas on the 19th and 20th, then moved through the central and eastern Gulf on the 21st and 22nd, with atmospheric "ridging" that followed in northern Mexico that brought heat to the Rio Grande Valley.

Steering Pattern Anomaly February 21-24, 2017

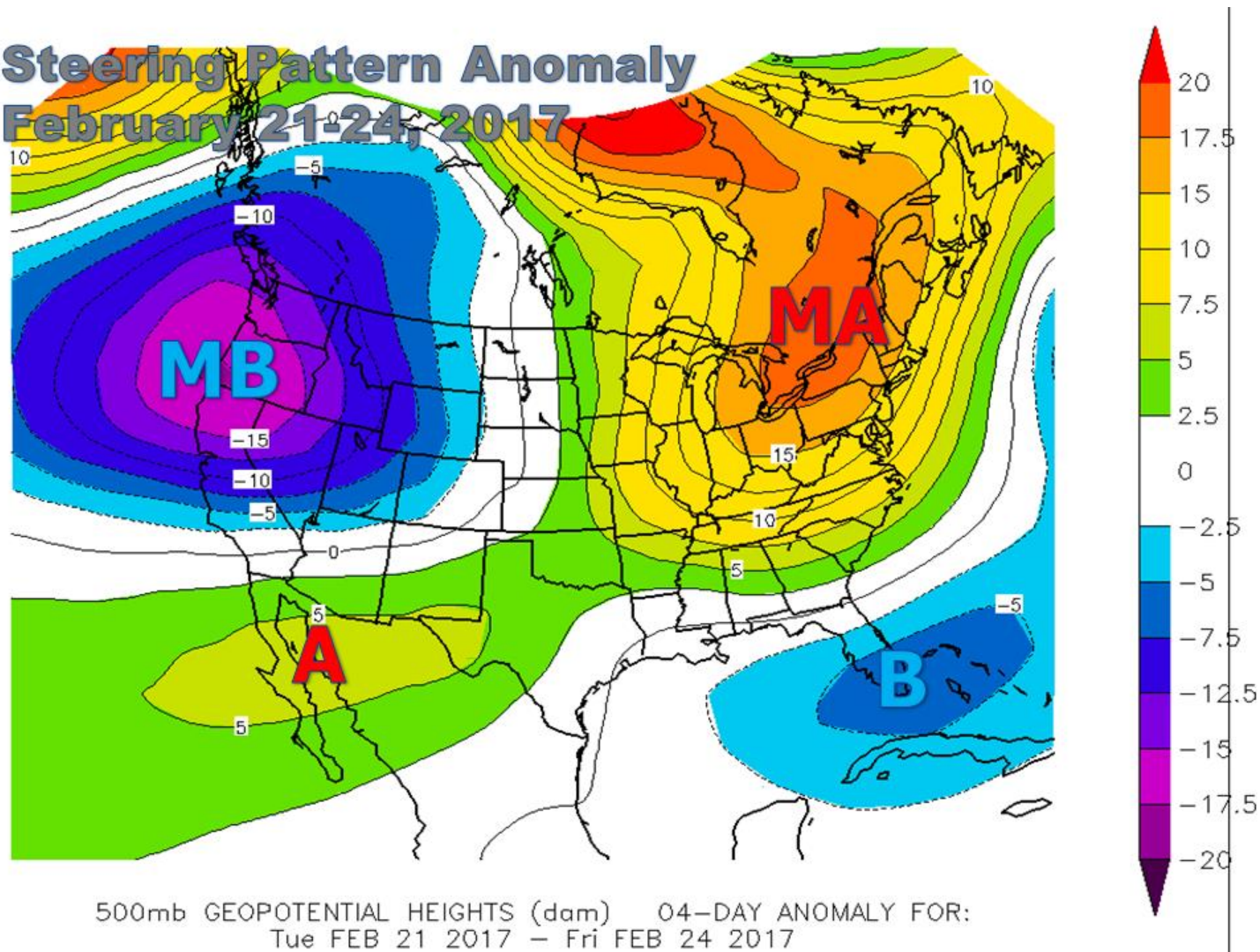


Figure 5. Anomaly steering pattern conditions. "B" and "MB" are Below and Much Below 30-year averages; "A" and "MA" are Above and Much Above the 30-year averages. Note the Above Average area in northwest Mexico, and the Below average area in Florida. The Above Average area in northwest Mexico was a response to the flat ridge that brought the heat; the Below area in Florida was directly related to the passage of the upper level disturbance at the same time.