



Let's Take a Look Back at Yesterday



Yesterday's Observed Weather Conditions			
Location	Wind (mph)	Highest Wind Gust (mph)	Lowest Relative Humidity
Zapata	26	38	9%
Hebbronville	36	47	12%
Falfurrias	35	51	9%
Edinburg	30	39	5%
McAllen	30	43	9%
Harlingen	35	43	9%
Brownsville	29	41	10%
Port Isabel	37	46	9%

Strong winds and low humidity values were conducive for the spread of fires. This picture courtesy of Sheriff Eddie Guerra shows the large wildfire from Brooks County yesterday.



**National Weather Service
Brownsville/Rio Grande Valley**

Figure 1. Peak sustained wind, wind gusts, and minimum relative humidity across the Rio Grande Valley and South Texas Brush Country on January 22, 2017.

First “Dry” Front of 2017 Assists Explosive Wildfire 8,000 Acres of Brush and Grass Burn in Hours in western Brooks County

Overview

The setup was nearly perfect.

First, high pressure with polar origins motored through all of Texas and deep into Mexico on January 5th and 6th, followed by the [coldest morning temperatures in the Rio Grande Valley](#) since February 2011 on the 7th and 8th. The chill was accompanied by very dry air; humidity at the time of the freeze was between 60 and 70 percent, and fell into the 20 to 30 percent range each afternoon especially west of US 281 (dew points in the teens). The dry freeze turned grass and brush into “crispy”, cured tinder, which largely remained so for the following two weeks even though daytime and overnight humidity rose to provide some moisture, including morning fog and wetting dew. The higher low level moisture closer to the coast helped matters between January 12 and 19; between 0.” and 1.5” of rainfall from southeast Hidalgo through Willacy County on the 18th and early on the 19th helped matters there.

Any assistance from the unusually warm and humid week (temperatures 10 to 15°F above average, nighttime temperatures in the 60s and 70s) ended abruptly on the weekend of January 21-22.

January 21: Heat Spike Sets the Table

After a generally hazy and warm week, the 21st dawned with areas of dense fog that quickly burned off into brilliant blue skies. Very dry atmospheric air (below) was surging in from the Sierra Madre; ahead of an intensifying low pressure system diving into the southern Plains, west to southwest winds just above the surface both pushed the dry air eastward and produced a “downslope” effect of compressional heating. By mid-afternoon, all-time monthly high temperature records were shattered, including 96°F at McAllen/Miller Airport Rio Grande City, and Falcon Dam; and 95°F at Brownsville International Airport and Falfurrias.

West of U.S. 281/Interstate 69C, gusty winds from the west helped drive surface humidity below 15 percent; the combination of record heat, very low humidity, and gusty winds above 25 mph produced a “flash drought” condition that erased whatever limited moisture had accrued from several mornings of fog and wetting dew across the ranchlands of the Upper Valley and Rio Grande Plains. Hebbronville peaked at 91°F with a low humidity below 10 percent and wind gusts 29 mph; similar low humidity values and gusty winds were noted in Starr, Zapata, northern/western Hidalgo, and Brooks County. Fortunately, no wildfires began; any would have spread rapidly as the soil moisture dissipated rapidly in the full sunshine, heat, and low humidity.

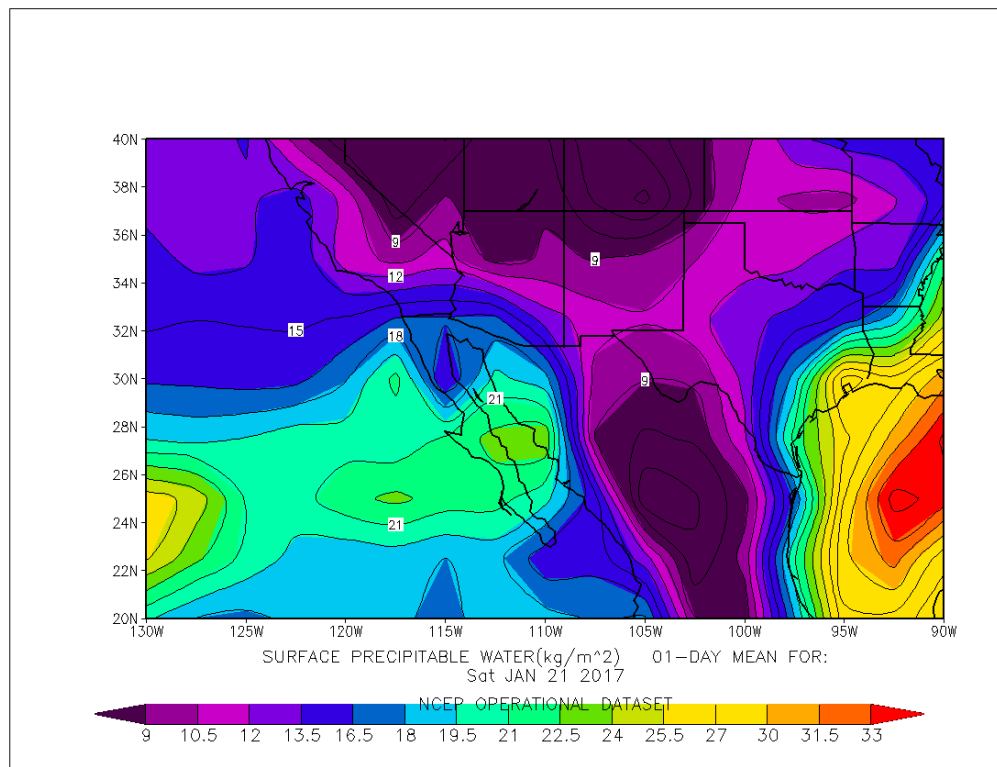


Figure 2. Mean surface precipitable water (in kg/m^2) on January 21, 2017. Note the very low values (below 9) along the Sierra Madre; these values would push rapidly east during the afternoon and reach the ranchlands and Upper Valley.

January 22: Event is Realized

Overnight, a front surged through the Rio Grande Valley as the low pressure intensified and moved across Oklahoma. Gusty northwest winds brought a slight cooldown but also kept humidity low (for the overnight), ranging from the mid-20s to the lower 40s (percent) along and west of U.S. 281/IH 69C, and 35 to 45 percent elsewhere. As the low moved into western Tennessee (and unfortunately produced deadly tornadoes across Mississippi, Alabama, and Georgia), a second surge of even stronger winds – 30 to 40 mph with gusts 45 to 50 mph – moved into all of South Texas by mid-morning and would continue into the late afternoon before rapidly diminishing. Still warm temperatures (80s) combined with the winds and very dry air (humidity fell to or below 10 percent in many locations; see chart at the top of the article) on top of very dry grasses and brush were the ingredients for explosive wildfire spread. All that was needed was a spark, and that spark appeared to be

provided by a downed power line near the Hopper Ranch in western Brooks County. The resultant wildfire by late morning (11 AM) grew to 500 acres in less than an hour, 1500 acres by early afternoon – then split into two separate complexes that eventually covered 8,000 acres by late afternoon.

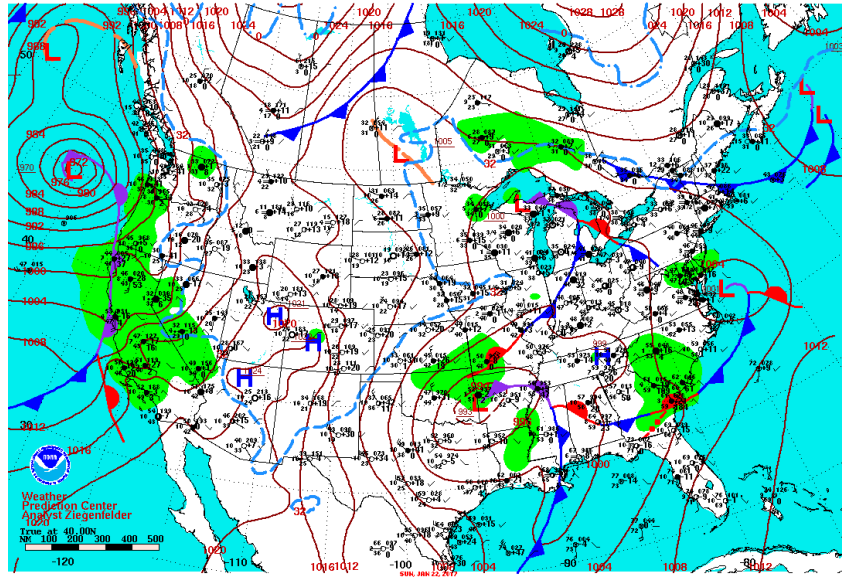


Figure 3. Intensifying low pressure racing into Arkansas at 6 AM CST January 22 pushed abundant dry air in its wake across Texas. The dry and warm air was accompanied by very strong winds in South Texas, where several large wildfires began, including an 8,000 acre conflagration in western Brooks County.



Figure 4. Aerial photo of the “Hopper Fire” from Brooks County Sheriff’s office (Credit: E. Guerra, via KRGV Channel 5 News)

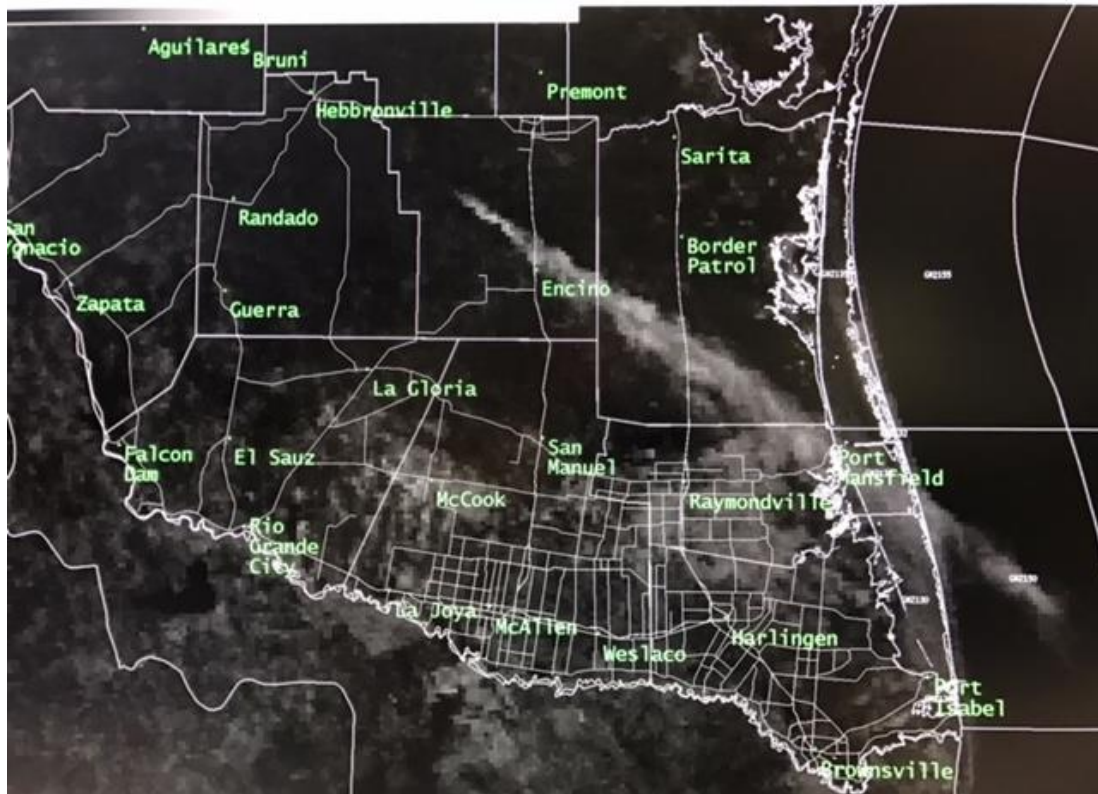


Figure 5. Smoke plume from the "Hopper Fire" stretching from western Brooks County southeast through the King Ranch, through Port Mansfield, and into the Gulf east of South Padre Island during the afternoon of January 22, 2017.

The Hopper Fire

Shortly after the fire began, the "hot spot" was clearly visible on infrared satellite (above); the large smoke plume was channeled from the source in western Brooks County all the way into the Lower Texas Gulf waters – more than 100 miles. Early warning of the potential, from a partner e-mail "blog" on Thursday, January 19, accompanied by a Fire Weather Watch, to graphics depicting the potential for rapid to explosive wildfire spread and Red Flag Warnings nearly 24 hours before the fire start likely helped the response speed of first responders/firefighters on the day; in all, at least 44 crews from the Rio Grande Valley and all of South Texas were on scene between the 22nd and 24th.

The hard work of the crews to contain and ultimately control the blaze paid off with full containment less than 48 hours after the firestart. Rapidly diminishing winds during the evening of the 22nd allowed crews to get on top of the fire and stop it from actually reaching the Hopper Ranch, for which the conflagration was named. Despite the control and contain efforts, mother nature threw very low humidity (below 15 percent) at the situation on the 23rd, which resumed a brief flare-up. Additional containment efforts were applied on the 24th – another "heat spike" day with humidity falling to around 20 percent in the afternoon; these efforts were provided to ensure containment prior to another critical wildfire spread day on the 25th, which followed another dry front – though winds were much lower than those on the 22nd.



High Fire Danger on Sunday

Saturday, January 21, 2017



Red Flag Warning

Where: All of Deep South Texas

When: Sunday 9 AM to 6 PM CST

Conditions: Relative Humidity Values falling to 10-25%.
NW winds at 25-35 mph.
Gusts up to 45 mph.

Action:

- ✓ Dispose of cigarettes in ashtrays
- ✓ Avoid outdoor burning
- ✓ Avoid activities using open flame
- ✓ Avoid parking vehicles in grassy areas
- ✓ Visit www.ready.gov/wildfires for safety tips and information



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