

Rio Grande Valley Winter 2022/2023 Review

Winter 2022/2023 Weather Story for the Rio Grande Valley: Drought Worsens Due to Lack of Rain; Pre-Christmas Cold Wave Punctuates Otherwise Top-Ten Warm and Dry Season

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Left: Damaged leafy-green vegetables following the December 23-25, 2022 freeze and hard freeze across the Lower Rio Grande Valley. **Right:** Frozen fountain in Brownsville, near the Brownsville and Matamoros Bridge, on December 23, 2022

Month-by-Month Summary

December was a temperature roller-coaster, with record warmth for the first thirteen days of the month as day/night combined temperatures averaged in the mid 70s. The heat was a fool's errand, as the month's first cool-down arrived by mid-month with combined temperatures slipping back into the mid 50s to lower 60s from the 14th through the 22nd, leading up to the coup-de-gras, a fast-moving dry arctic front which arrived just before Christmas, making the Valley matched more closely with advertising campaigns showing people in sweaters, winter jackets, gloves, and hats. The pre-Christmas chill, which was the coldest actual and apparent

temperatures since 1989, saw actual temperatures in the 20s and 30s for most areas from just after midnight on the 23rd through the mid-morning Christmas Day.

A hard freeze (temperatures below 28°F for 2 hours or more) greeted people, pets, and plants on December 23, and daytime temperatures struggled to get above freezing in most areas, with locations near the coast holding below freezing due to thicker cloud cover. Wet-bulb temperatures fell into the lower 20s for the first half of December 23rd, causing concern for citrus fruit should the situation last for more than a day. Slight warming of air temperatures into the lower 30s allowed wet-bulb temperatures to rise into the upper 20s during the afternoon and evening. The clouds which kept daytime temperatures from rising also insulated the ground as December 23 turned into Christmas Eve Day. While temperatures held at or just below freezing overnight, they did not fall below 28°F across the Valley's "fruit belt" – sparing significant loss of fruit and the trees that grow it. Wet-bulb temperatures generally held in the mid and upper 20s from late on the 23rd into early on the 24th, which was sufficiently "warm" enough to keep fruit membranes from icing. The same could not be said for herbs and some vegetables, as crops such as cilantro were largely wiped out due to their lower threshold for cold-weather survival.

The full story of the pre-Christmas 2022 Cold Outbreak in the Lower Rio Grande Valley can be found [here](#).

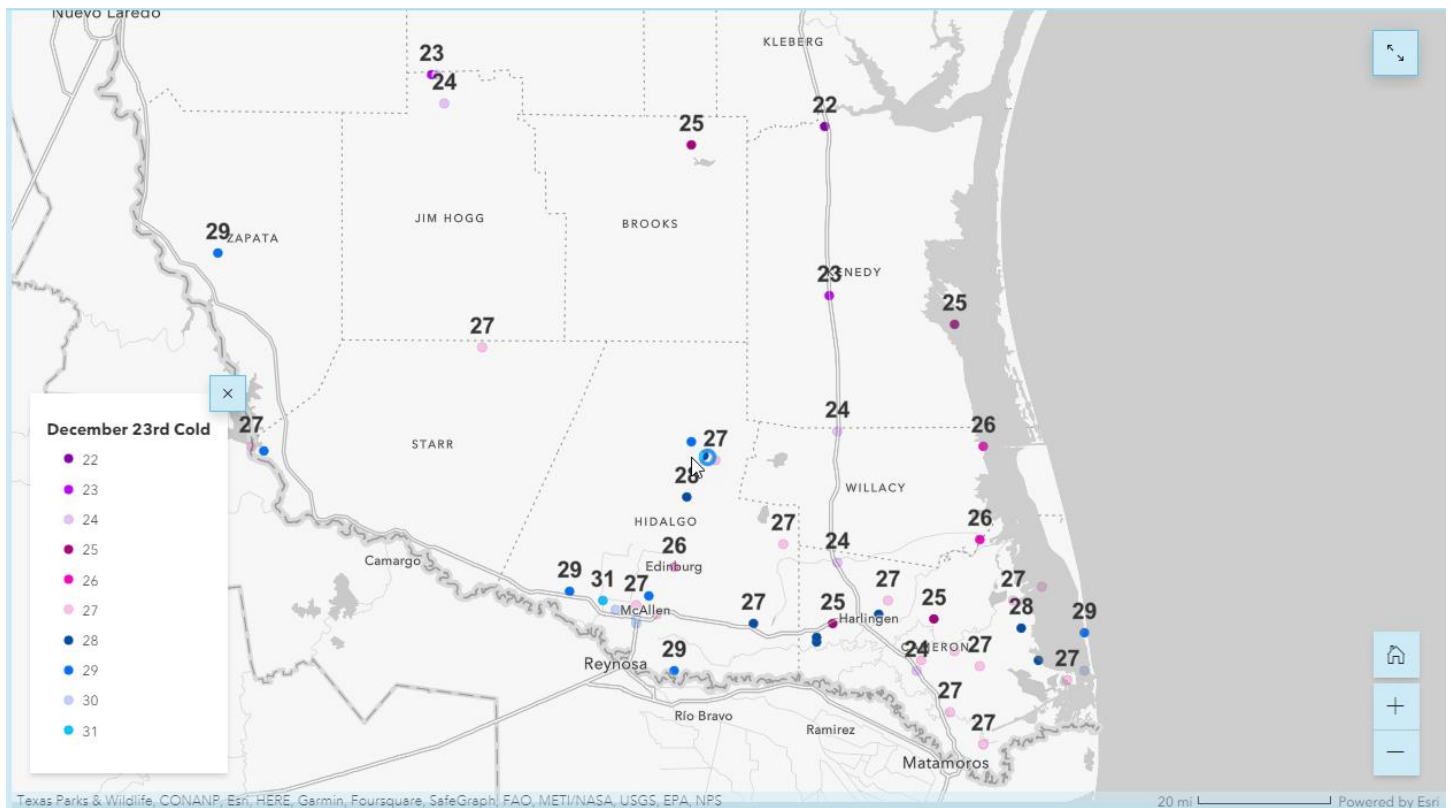


Figure 1. Observed actual minimum temperatures on December 23rd, 2022, for the Lower Rio Grande Valley and Deep South Texas Brush Country/Rio Grande Plains/Coastal Plains.

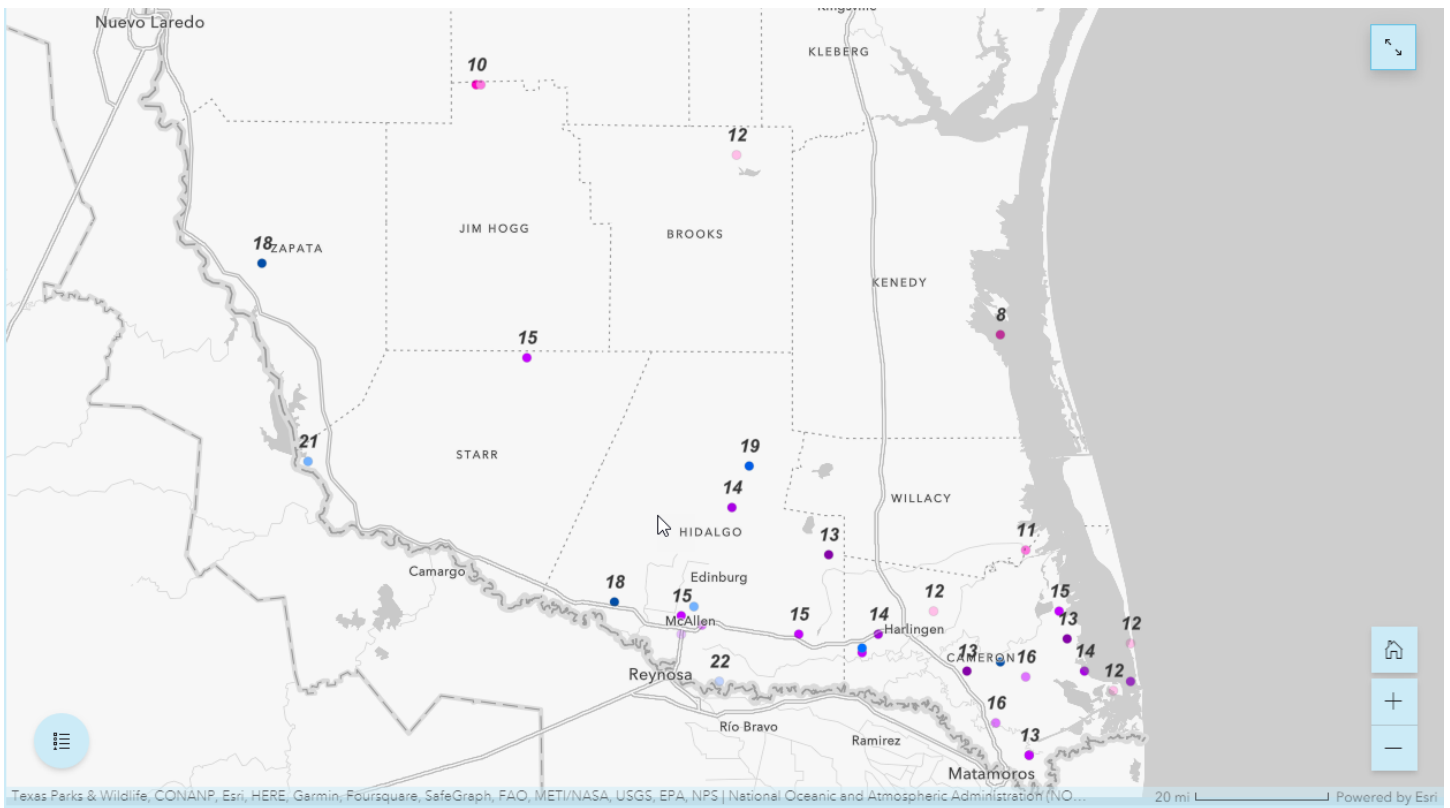


Figure 2. Same as Figure 1, except for apparent , or "feels like" (wind chill index) temperatures.

The record warm start, followed by the top-20 percent coldest finish, brought the overall December temperatures to right around the 1991-2020 averages. The warm-trending autumn and early winter nudged the annual average temperatures back into the top quartile all-time. While 2022 broke a five-year streak of top ten warmest finished, ending on the warm side of the ledger was still remarkable. Brownsville (since 1878) rallied to a 12th warmest finish; Harlingen (since 1912) ended up 25th warmest, McAllen (since 1942) finished 27th warmest, and Rio Grande City (1897 – missing 1907 to 1927) finished 25th warmest.

The dry pattern, whether in the initial record heat or the close-out cold, produced very little rainfall, and moderate drought conditions slowly expanded across the Deep South Texas ranchlands north of the populated Lower Rio Grande Valley. “Just-in-time” rains, combined with the colder temperatures at the end of the month, slowed the drought degradation across the populated Rio Grande Valley. One notable – and surprising – event occurred during the late afternoon and early evening of December 3rd, when a weak warm front combined with just enough atmospheric moisture, instability (due to heating) and a weak upper level disturbance to drop between 2 and 3.5” of rainfall around the McAllen/metro region (Figure 3). The bulk of the rainfall, which produced local nuisance flooding, missed the annual McAllen Holiday Parade route – an event drew more than 200,000 attendees. Notable CoCoRaHS reports included 3.37” 9.6 miles north of Mission, 2.82” 4.4 miles north of McAllen, and 2.66” 3.5 miles north of McAllen. McAllen/Miller Airport, close to the end of the parade route, only received 0.19”!

December 04, 2022 1-Day Observed Precipitation

Created on: March 12, 2023 - 20:24 UTC

Valid on: December 04, 2022 12:00 UTC

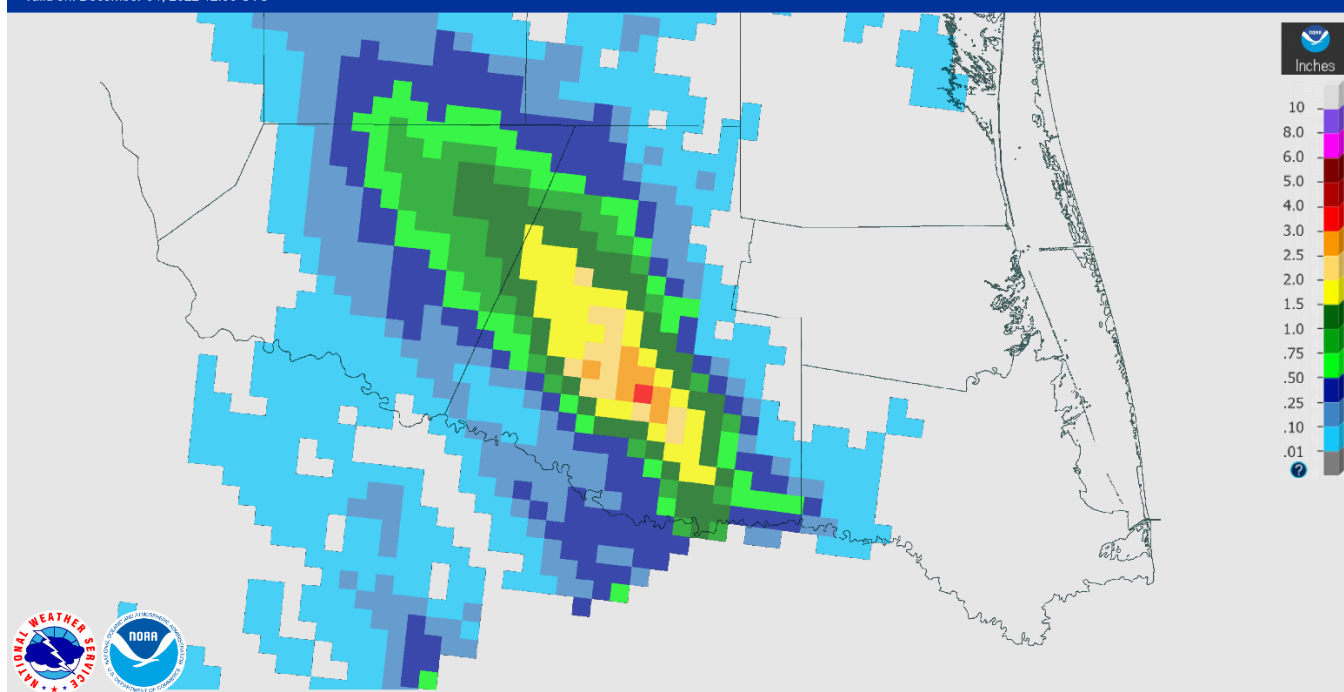


Figure 3. Band of torrential thunderstorm rains that fell during the late afternoon and early evening across the McAllen/metro region (AHPS estimates).

January was less eventful than December regarding sharp temperature changes. For Winter Texans visiting from northern climes such as the Dakotas, upper Mississippi Valley, and the Canadian Prairies, January was heavenly. Filled with mainly sunny, mild to warm days, mild to warm evenings, and pleasantly cool mornings, the weather was ideal for outdoor outings which draw so many here each year. A mid-month (January 13th/14th) cold front dropped morning temperatures into the 30s (14th) with another minor front doing the same around the 25th to 27th. The first significant “nasty ‘norther” arrived late on the 30th, with biting chill and drizzle/light rain closing the month. Rainfall was paltry across the region, with the sole exception along the Cameron and Willacy County coast, where an estimated and measured 0.25 to 0.75” fell. Peak rainfall included 0.63” 12.6 miles east of Brownsville, and 0.61” 1.8 miles northwest of Laguna Vista. Percentage of rainfall ranged from 0 to 5 percent across Starr, Jim Hogg, and Zapata, to 5 to 25 percent across most of the populated Lower Rio Grande Valley, with 50 percent in the areas mentioned above.

The warm temperatures ranked among the top ten warmest Januaries, including Brownsville (8th warmest), Harlingen (warmest on record), McAllen (5th warmest), and Rio Grande City (7th warmest).

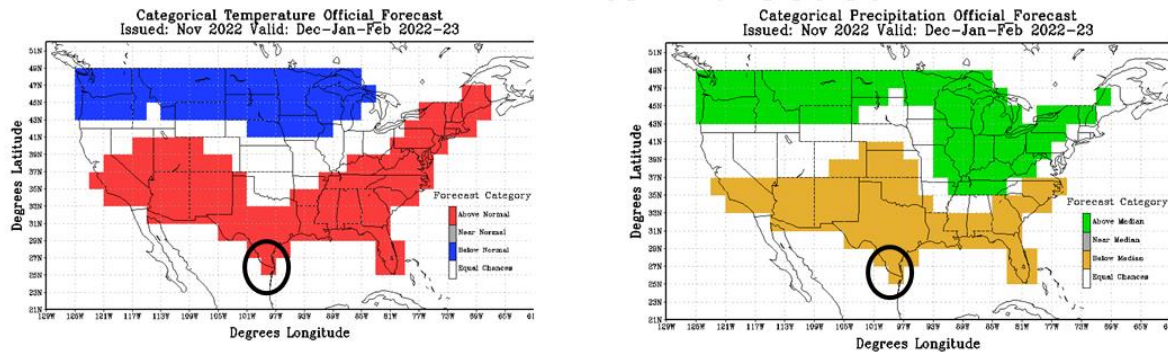
February opened with a three-day continuation of the nasty chill that ended January; on the 1st, temperatures barely budged from 40°F all day and evening; combined with stiff north winds, it felt closer to 30°F during this time especially along and east of U.S.77/IH-69E in Cameron, Willacy, and Kenedy County. Between the 4th and 18th, the weather was a temperature roller-coaster that leaned cool (for the period). Beginning on the 19th, and continuing through month’s end, much above average temperatures and humidity dominated the region as a broad subtropical high pressure ridge aloft stretched from the Bahamas to the Lower Texas coast and northeast Mexico. The persistent heat for those final 10 days turned a notably below-average month into an above average month, with temperatures up to 2°F above average for most.

As had been the story for winter, rainfall was few and far between, with very light amounts during the “nasty ‘norther” on the 1st and 2nd, and a thin stripe of rain from Weslaco through the Willacy/Hidalgo line on the 8th and a small area of rain along the Rio Grande near Brownsville on the 10th. Most areas were virtually rain-free

through the month. The warmth and prolonged lack of notable rain continued to worsen drought levels as the sun angle rose and evaporation rates steadily increased. By the start of March, Level 2 to 3 drought dominated the ranchlands, and moderate (Level 1) the remainder of the Lower Valley.

For Winter Overall, the main story was the low rainfall combined with enough warm periods, despite short-lived cold outbreaks, to verify the season's forecast as "warm and dry" for the Lower Rio Grande Valley/Deep South Texas Brush Country and Coastal Plains with precision.

Winter Forecast



Winter Observed

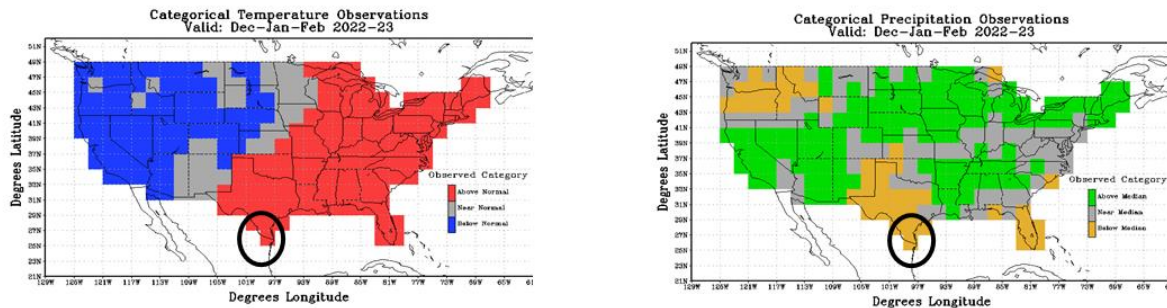
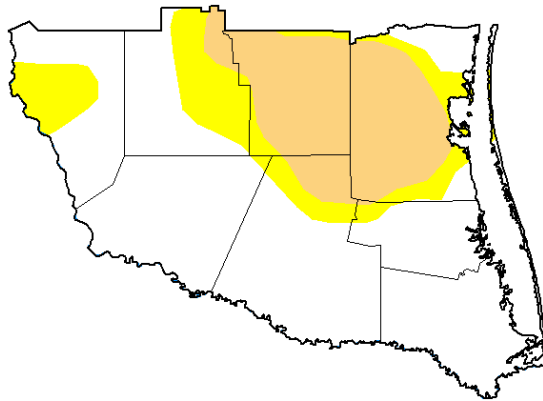


Figure 4. NOAA Climate Prediction Center Winter (December 2022-February 2023) forecast (top) vs. observed (bottom) temperature and precipitation. Black circle represents the south Texas/Lower Rio Grande Valley region.

Drought gradually, then more rapidly, worsened across the region; even the Lower Valley, which had been receiving "just in time" rainfall, failed to receive necessary rains as February closed. Though February saw full green-up of trees and florals, the rangeland/unirrigated grass and brush continued to turn yellow and brown – albeit much slower than across the ranchlands from Zapata through Kenedy County (Figure 5 and 6, below).

U.S. Drought Monitor
Brownsville/Rio
Grande Valley, TX WFO



December 6, 2022

(Released Thursday, Dec. 8, 2022)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	62.27	37.73	22.64	0.00	0.00	0.00
Last Week 11-29-2022	62.27	37.73	8.67	0.00	0.00	0.00
3 Months Ago 09-06-2022	88.77	11.23	4.71	0.00	0.00	0.00
Start of Calendar Year 01-04-2022	72.63	27.37	4.09	0.00	0.00	0.00
Start of Water Year 09-27-2022	100.00	0.00	0.00	0.00	0.00	0.00
One Year Ago 12-07-2021	81.77	18.23	0.00	0.00	0.00	0.00

Intensity:

None D2 Severe Drought
D0 Abnormally Dry D3 Extreme Drought
D1 Moderate Drought D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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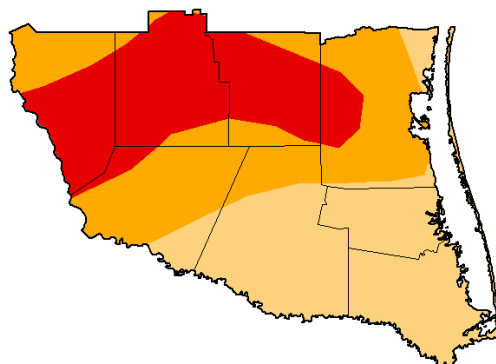


droughtmonitor.unl.edu

Figure 5. US Drought Monitor, Brownsville/Rio Grande Valley NWS service area, on December 6, 2022. At this point, the Brooks/Kenedy County ranchlands were a rainfall "hole" and had reached moderate (D1) drought status.

For the season, rainfall totals ranked among the top ten percent driest. Brownsville (2nd driest, at 0.80"), Harlingen (2nd driest, at 0.63"), McAllen (8th driest at 0.95"), and Rio Grande City (12th driest at 0.78") and, combined with the overall warmth, were the catalysts for the worsening drought. Temperature ranks were similar, with Brownsville at 7th warmest winter (65.8°F), Harlingen* at 4th warmest (66.9°F), McAllen at 3^d warmest (66.6°F), and Rio Grande City* at 4th warmest (64.1°F).

U.S. Drought Monitor
Brownsville/Rio
Grande Valley, TX WFO



February 28, 2023

(Released Thursday, Mar. 2, 2023)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	64.03	30.51	0.00
Last Week 02-21-2023	0.00	100.00	100.00	50.51	0.00	0.00
3 Months Ago 11-29-2022	62.27	37.73	8.67	0.00	0.00	0.00
Start of Calendar Year 01-03-2023	42.76	57.24	42.53	0.00	0.00	0.00
Start of Water Year 09-27-2022	100.00	0.00	0.00	0.00	0.00	0.00
One Year Ago 03-01-2022	52.18	47.82	33.03	6.73	0.44	0.00

Intensity:

None D2 Severe Drought
D0 Abnormally Dry D3 Extreme Drought
D1 Moderate Drought D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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Figure 6. U.S. Drought Monitor, NWS Brownsville/Rio Grande Valley service area, February 28, 2023. Severe (D2) to Extreme (D3) Drought covered the ranchlands, with Moderate (D1) drought having reached the populated Rio Grande Valley.

March 12, 2023 90-Day Percent Precipitation

Created on: March 12, 2023 - 21:42 UTC

Valid on: March 12, 2023 12:00 UTC

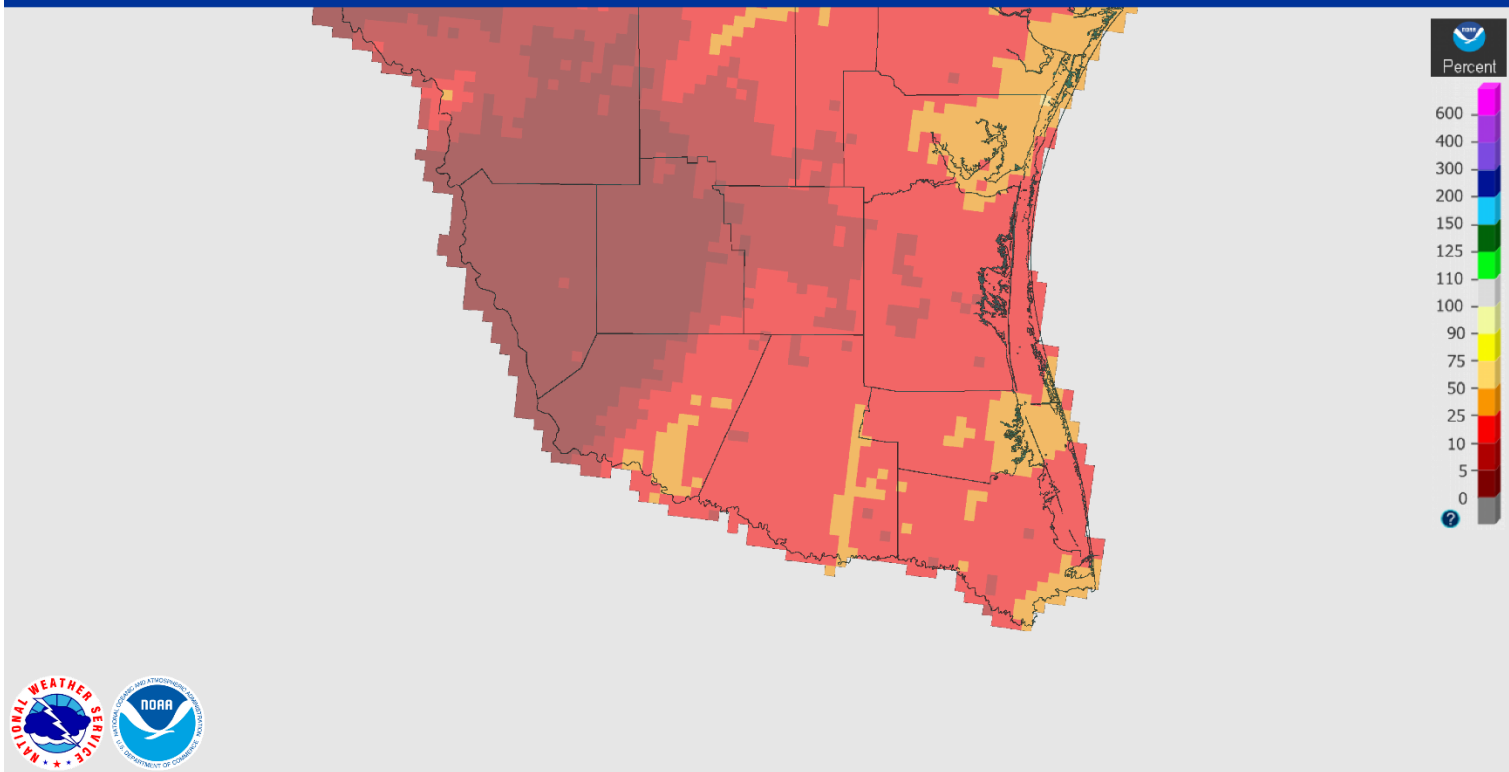


Figure 7. Percentage of average rainfall for mid December 2022 through mid March 2023. Note the near-zero amounts across the western third of the region (Starr, Jim Hogg, Zapata), with 10 to 25 percent in most other locations.

For Falcon International Reservoir, the benefits of heavy rainfall in mid to late August was all dried up by the end of February, with the only hope potentially to come from a significant release of water from still nearly-full reservoirs along the Rio Grande, Rio Conchos, and Rio San Juan watersheds in Mexico. The Texas share of water in Falcon International Reservoir remained below 30 year low benchmarks to begin the year; the total share had dropped from 18.4 percent in January to 16.4 in mid March – a result of accelerating evaporation rates due to record heat from February 20th through March 12th.

The combination of worsening drought, record/near record low water levels in Falcon International Reservoir, and top ten warmth implies urgency for wildfire prevention activities and water conservation across the Lower Rio Grande Valley and the ranch country to the north, as spring moves forward. Perhaps there will be some notable rain relief at some point after mid April and especially May, but uncertainty remains very high.