Rio Grande Valley Winter 2024/2025 Review

Winter 2024/2025 Weather Story for the Rio Grande Valley: Record Warm December is Followed by January/February Fronts and an Arctic Express

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Wetness for Brownsville, Harlingen, and Raymondville; **Drought** Closes the Season Elsewhere
Sea Turtles along Lower Laguna Madre experience three cold stun events

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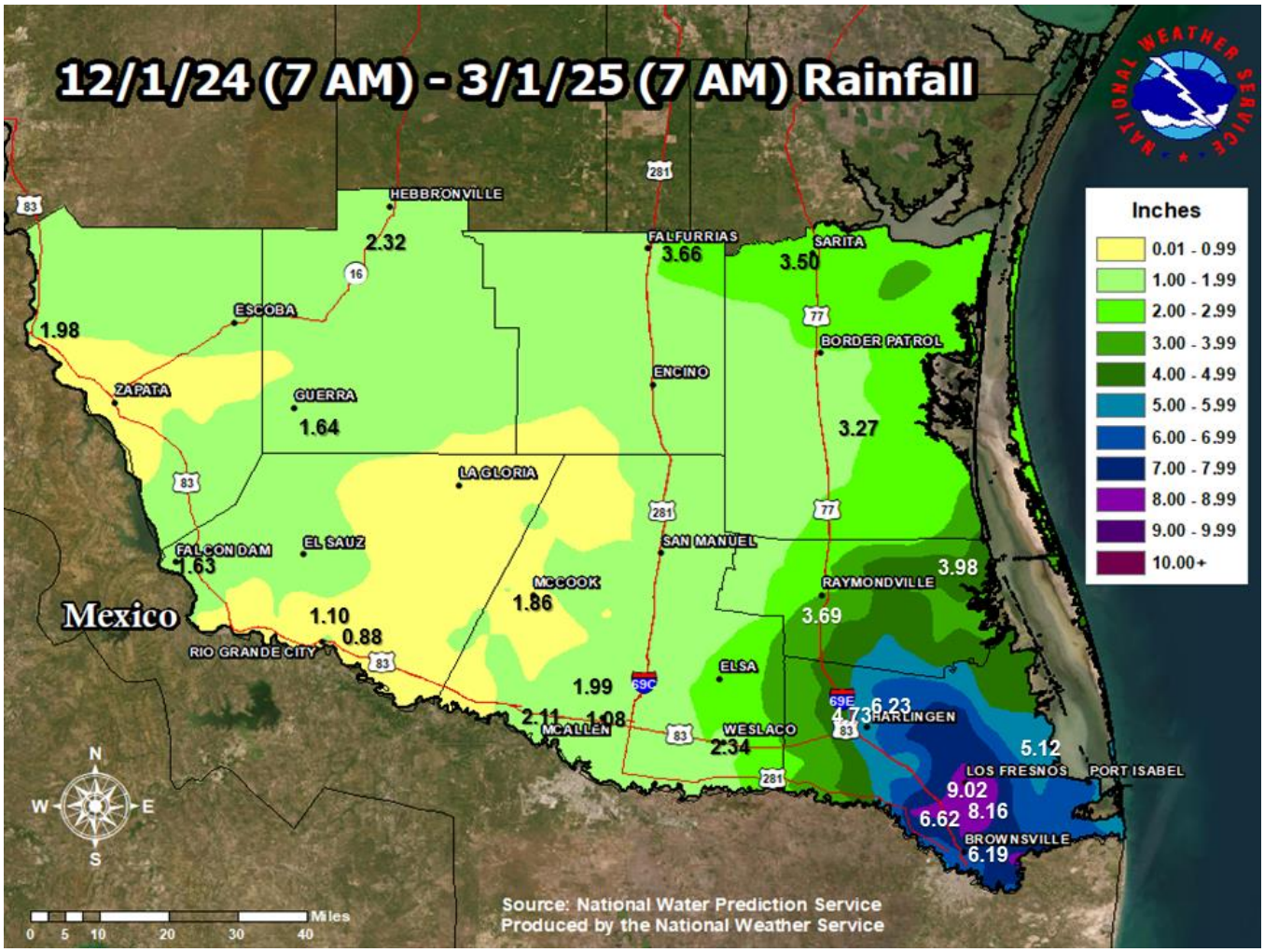


Figure 1. Winter's rainfall hit the "jackpot" once again across Cameron and Willacy County, as the area's interaction with several post-frontal surface low pressure systems/troughs over the Gulf east or just southeast of the US/Mexico border produced the necessary lift to create above-average rainfall there. Farther inland, drier air associated with post-frontal high pressure systems killed off most of the rainfall, with below to much below average rainfall elsewhere.

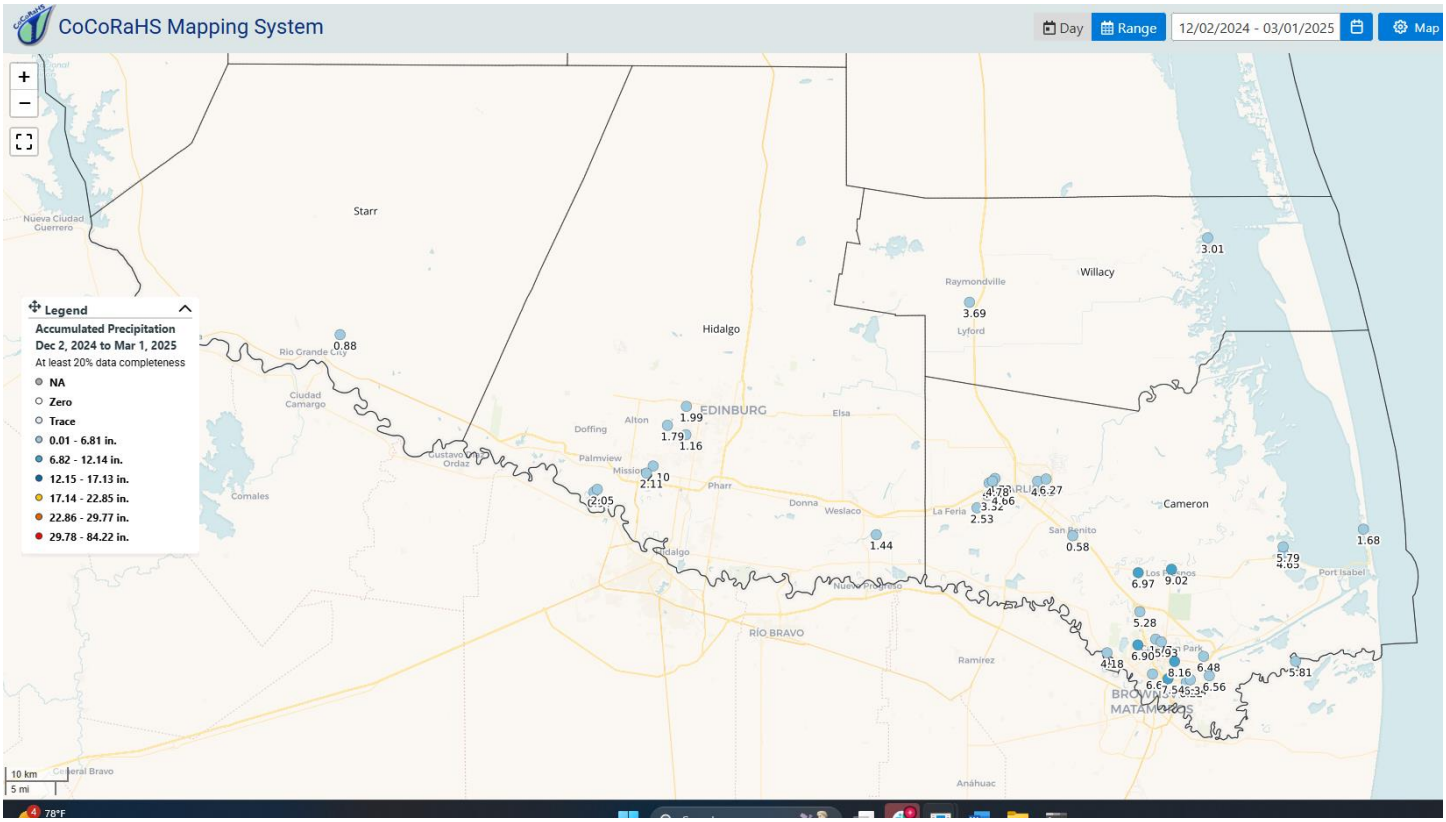


***Figure 2*:** Winners…and losers (again): Above-average rainfall once again fell across the "lower" Valley (Cameron and Willacy), while below average rainfall occurred in the mid/upper Valley (Hidalgo and Starr), for winter 2024/2025. This was the third consecutive season for these trends, which had a direct impact – and sharp gradient – on the drought condition across just 20 to 30 miles by season's end. At the end of February, locations along/east of IH-69E turned green and somewhat lush, while grasses and brush remained brown/yellow in Hidalgo and Starr County following the one hard freeze event on January 22.

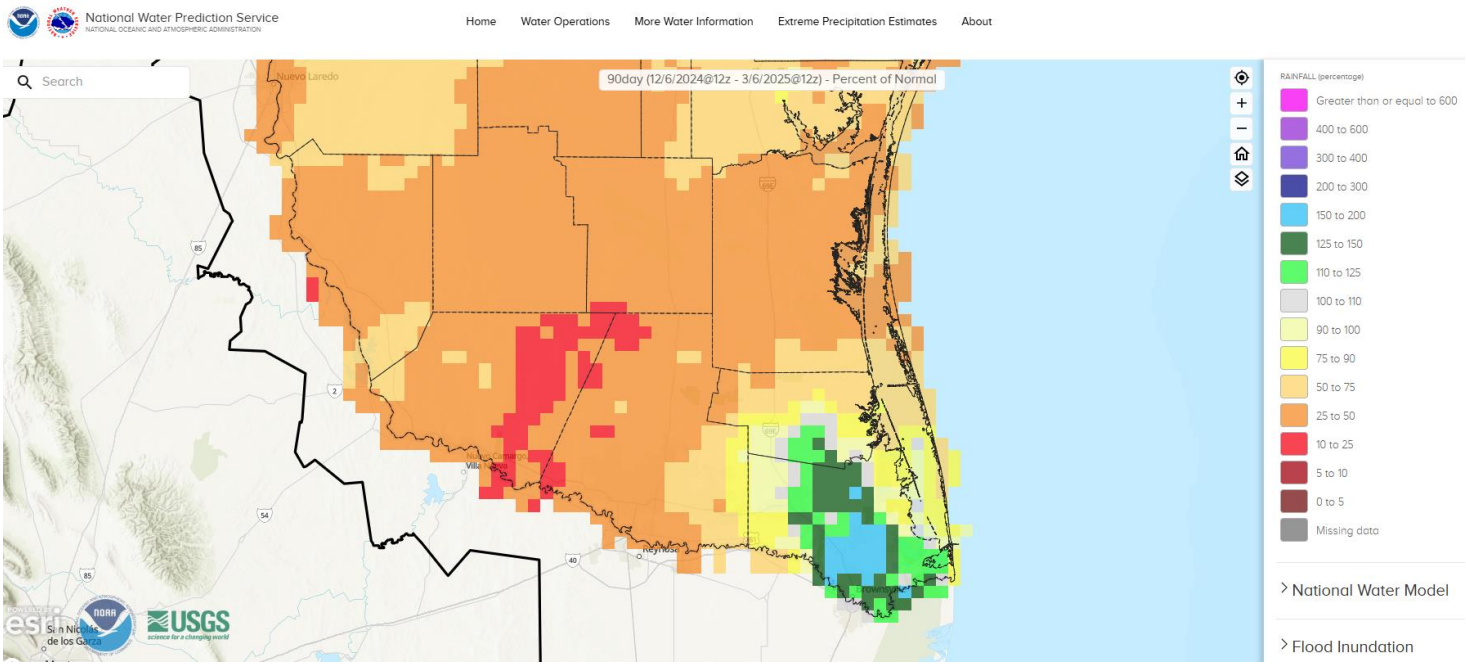


Figure 3: The sharp demarcation of above (100 to 200 percent of average) to below/much below (10 to 50 percent of average) between central Cameron/Willacy and the remainder of the Rio Grande Valley/Deep S. Texas ranch country is very apparent for winter 2024/2025.

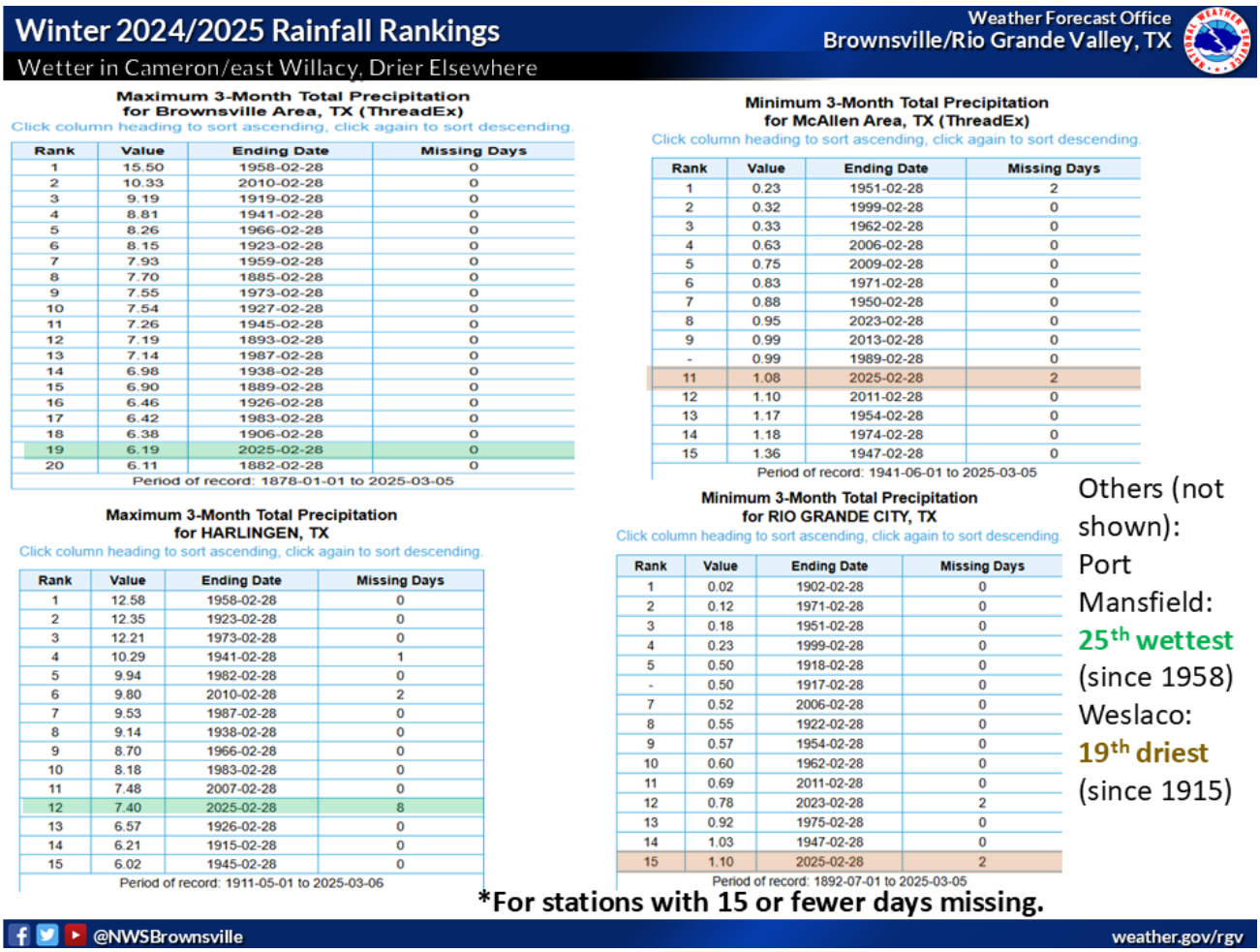


Figure 4. "Winners and Losers", again: Brownsville and Harlingen finished among their top 20 ***wettest*** winters of all time, and Port Mansfield landed in 25th. Just one and two counties to the west, McAllen finished 11th ***driest***, and Rio Grande City 15th driest. A tale of two "Valleys", indeed.

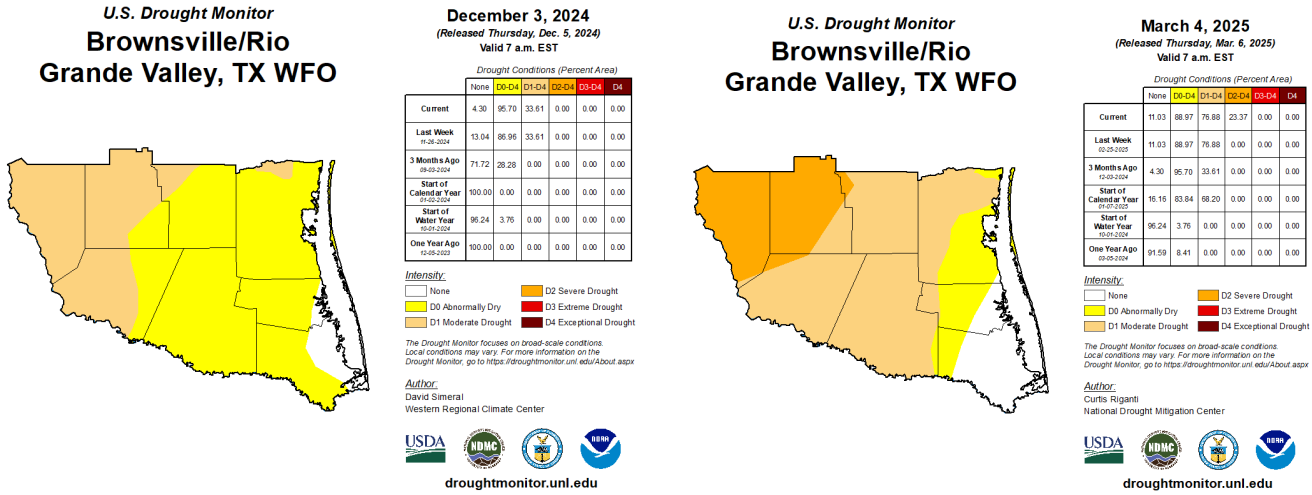


Figure 5. U.S. Drought Monitor showed dryness/drought conditions across most of the region on December 3. Helpful rainfall, mostly in December, removed the dryness in Cameron and part of Willacy County – but lack of rainfall led initially to an expansion of

Moderate (D1) Drought across most other areas to begin 2025. Severe (D2) Drought arrived across the Brush Country/Rio Grande Plains to start March, and spring.

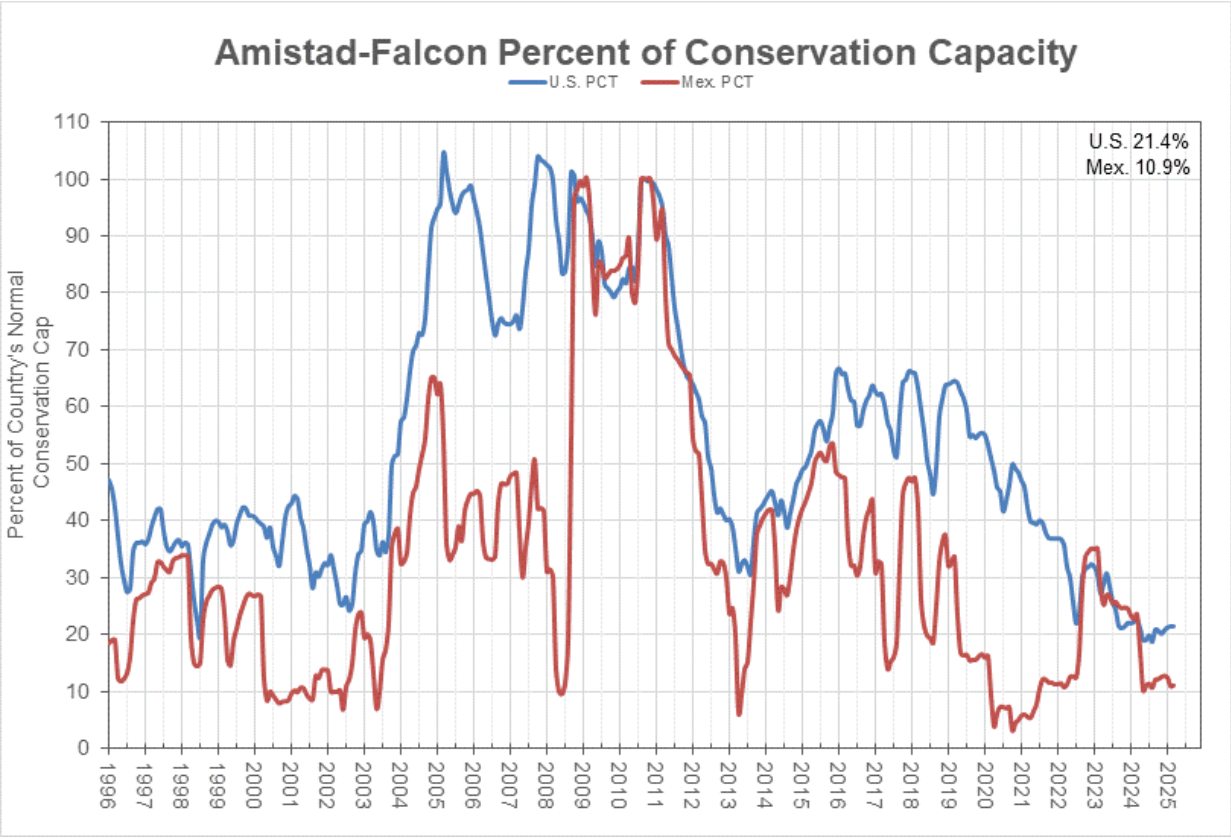


Figure 6. U.S. International Boundary and Water Commission (IBWC) combined percentage of conservation capacity for Amistad and Falcon International Reservoirs, as of the start of March 2025. The combined low values remained near the lowest on record for early March – nearly identical since earl December - since each dam was constituted (Falcon in 1954; Amistad in 1971) – as meager inflows remained. Water levels for the Rio San Juan basin (El Cuchillo and Marte Gomez) – set up to maximum storage by Tropical Storm Alberto, a follow-up wave in late June, and additional rains in July – dipped below 100 percent. Water use restrictions continued for several communities and agricultural use through winter.

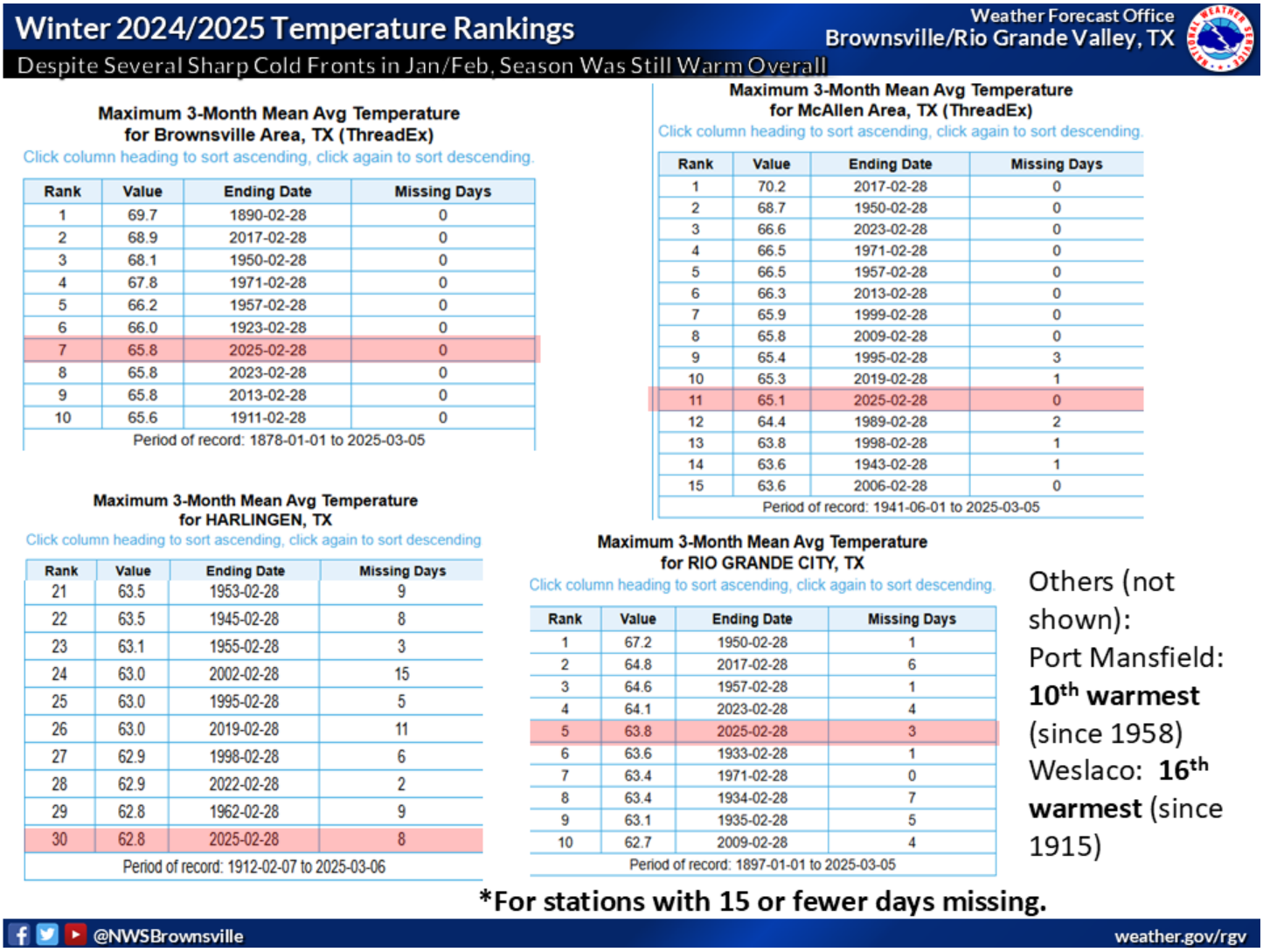


Figure 7: Temperature rankings for December 2024-February 2025. Despite several notable cold snaps in January and February, most available locations ranked among the top decile (10 percent) all-time. The exception was Harlingen, but the 30th ranking (since 1912/1913) may have been related to how minimum temperatures are recorded on consecutive calendar days.

Month-by-Month Summary

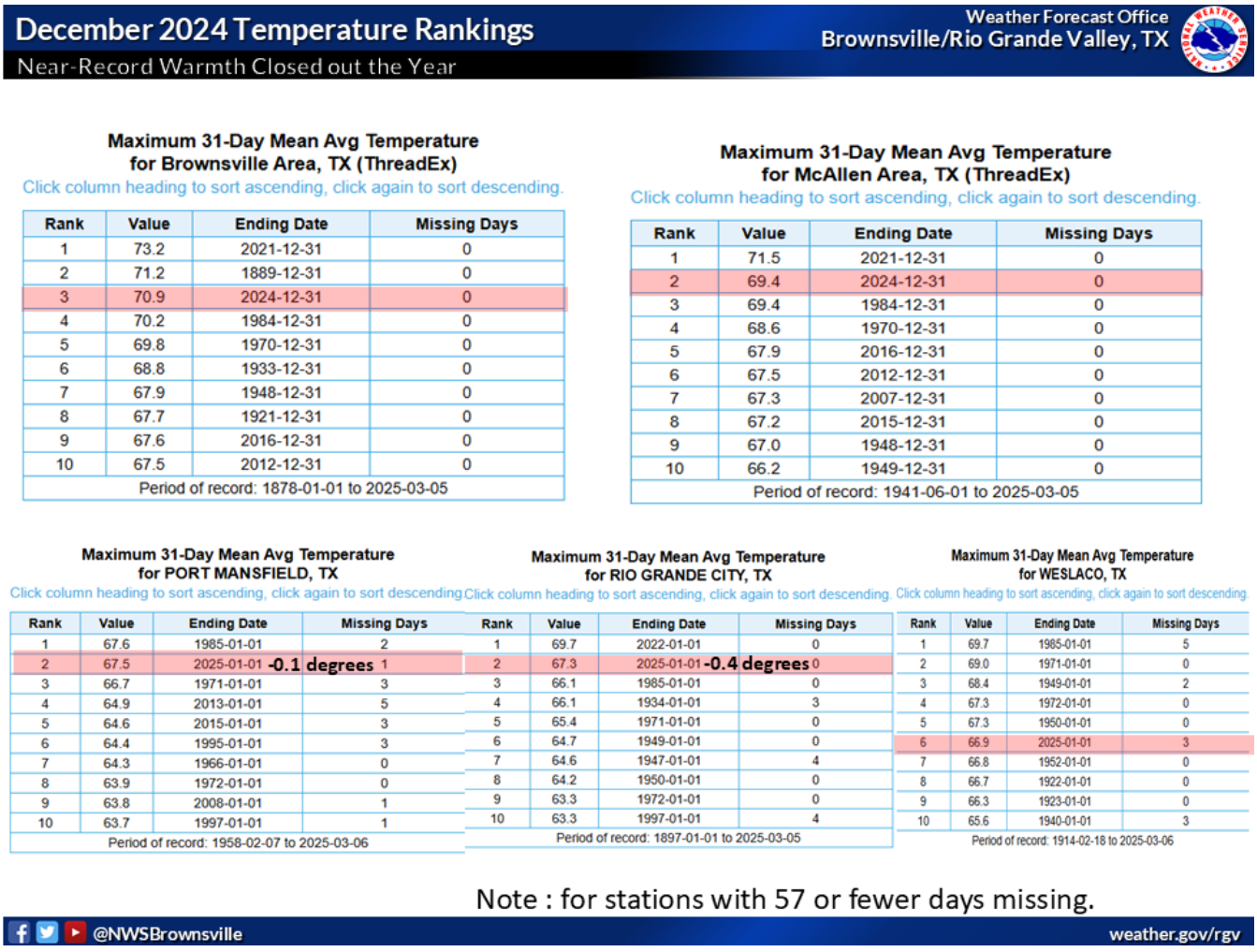
December closed a record-warmest year (2024) with a near record-warm month (Figure 8), as an anomously warm pattern at all levels of the atmosphere ensured late October/early November-like temperatures for the month. The dominance of southeasterly low level flow ensured a sizable number of warm/humid overnights, which contributed to the temperature trends.

A couple of weak cold fronts crossed the region, one on the 6th and another on the 10th. The front on the 6th was notable, as a surface coastal trough set up just off the shoreline into the 7th – and combined with sufficient atmospheric forcing and moisture to produce winter's heaviest rainfall, which favored Cameron and Willacy County as so many events since June 2024 had done. Brownsville/South Padre Island International Airport set a new daily record with 2.04", and Harlingen did likewise (reported on the 7th due to the 7 AM to 7 AM cooperative observation posting), with 2.40". For Cameron and southern Willacy, these values were up to two times the *monthly* average. While Cameron and southern Willacy "feasted" on this welcome rainfall, every other county suffered a "famine" of little to no rainfall – just 30 miles to the west and north. McAllen recorded only 0.29" for the event, and Rio Grande City a paltry 0.12".

This would be a trend that continued through the rest of winter – though there were no other rainfall events of significance. The rainfall accounted for at least one-third of the December 2024-February 2025 total in these areas.

For the month, the heavy rainfall of December 6-7 resulted in top-five wet finishes, as follows:

- Brownsville (4.93") finished 5th wettest (records since 1878)
- Harlingen (5.11") finished 3rd wettest (since 1912)
- Port Mansfield (2.09") finished 18th (since 1958)



December 2024 Temperature Rankings

Near-Record Warmth Closed out the Year

Weather Forecast Office
Brownsville/Rio Grande Valley, TX

Maximum 31-Day Mean Avg Temperature for Brownsville Area, TX (ThreadEx)

Click column heading to sort ascending, click again to sort descending.

Rank	Value	Ending Date	Missing Days
1	73.2	2021-12-31	0
2	71.2	1889-12-31	0
3	70.9	2024-12-31	0
4	70.2	1984-12-31	0
5	69.8	1970-12-31	0
6	68.8	1933-12-31	0
7	67.9	1948-12-31	0
8	67.7	1921-12-31	0
9	67.6	2016-12-31	0
10	67.5	2012-12-31	0

Period of record: 1878-01-01 to 2025-03-05

Maximum 31-Day Mean Avg Temperature for McAllen Area, TX (ThreadEx)

Click column heading to sort ascending, click again to sort descending.

Rank	Value	Ending Date	Missing Days
1	71.5	2021-12-31	0
2	69.4	2024-12-31	0
3	69.4	1984-12-31	0
4	68.6	1970-12-31	0
5	67.9	2016-12-31	0
6	67.5	2012-12-31	0
7	67.3	2007-12-31	0
8	67.2	2015-12-31	0
9	67.0	1948-12-31	0
10	66.2	1949-12-31	0

Period of record: 1941-06-01 to 2025-03-05

Maximum 31-Day Mean Avg Temperature for PORT MANSFIELD, TX

Click column heading to sort ascending, click again to sort descending.

Rank	Value	Ending Date	Missing Days
1	67.6	1985-01-01	2
2	67.5	2025-01-01	1
3	66.7	1971-01-01	3
4	64.9	2013-01-01	5
5	64.6	2015-01-01	3
6	64.4	1995-01-01	3
7	64.3	1966-01-01	0
8	63.9	1972-01-01	0
9	63.8	2008-01-01	1
10	63.7	1997-01-01	1

-0.1 degrees

Period of record: 1958-02-07 to 2025-03-06

Maximum 31-Day Mean Avg Temperature for RIO GRANDE CITY, TX

Click column heading to sort ascending, click again to sort descending.

Rank	Value	Ending Date	Missing Days
1	69.7	2022-01-01	0
2	67.3	2025-01-01	0
3	66.1	1985-01-01	0
4	66.1	1934-01-01	3
5	65.4	1971-01-01	0
6	64.7	1949-01-01	0
7	64.6	1947-01-01	4
8	64.2	1950-01-01	0
9	63.3	1972-01-01	0
10	63.3	1997-01-01	4

-0.4 degrees

Period of record: 1897-01-01 to 2025-03-05

Maximum 31-Day Mean Avg Temperature for WESLACO, TX

Click column heading to sort ascending, click again to sort descending.

Rank	Value	Ending Date	Missing Days
1	69.7	1985-01-01	5
2	69.0	1971-01-01	0
3	68.4	1949-01-01	2
4	67.3	1972-01-01	0
5	67.3	1950-01-01	0
6	66.9	2025-01-01	3
7	66.8	1952-01-01	0
8	66.7	1922-01-01	0
9	66.3	1923-01-01	0
10	65.6	1940-01-01	3

Period of record: 1914-02-18 to 2025-03-06

Note : for stations with 57 or fewer days missing.

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Figure 8: Temperature rankings for December 2024. All available locations ranked among the top ten warmest on record.

January picked up where December left off, with the first five days feeling more like late October than the start of a new year, with temperatures for the first five days near all-time records for that window. That all came crashing down with the season's first legitimate **cold** front overnight on the 5th. Strong Canadian high pressure pushed across the southern Great Plains and combined with energy from an upper-level disturbance over the New Mexico and Arizona to enhance a coastal trough just offshore of the international border. Light rain/drizzle accompanied the situation, to the tune of 0.1" to 0.3" across the populated Rio Grande Valley. More importantly, temperatures struggled to escape the 40s between the morning of the 6th and the morning of the 11th – including locations near the coast – which was enough to bring Lower Laguna Madre bay water temperatures to around 50°F. These conditions were sufficient for the first sea-turtle "cold stun" event here since January 17-20, 2024. At least 190 turtles were rescued between the 8th and 11th.

The early-month chill was just a preview of what would arrive about ten days later, when a true "Arctic Express" event slammed through all of Texas and deep into northern Mexico, beginning late on the 19th and peaking on the 21st through early on the 22nd.

After a steel-gray sky was joined with light rain/drizzle in the mid/upper Valley for part of January 20th, temperatures dropped into the 30s and "feels like" temperatures into the mid to upper 20s with a stiff north wind. In fact, very light icing occurred across the Brush Country region of northwest Brooks through northern Jim Hogg before temperatures sneaked into the mid 30s during the afternoon. The more pronounced round of icing (freezing rain) developed around midnight on the 21st, beginning with colder temperatures across the Brush Country and transitioning into the mid and upper Valley overnight and through mid-morning on the 21st (Figure 10). The coldest wind chills occurred during the early morning of the 21st, when values fell into mid to upper teens across all locations where winds were strongest (Figure 9).

Skies cleared quickly from west to east during the afternoon and early evening, setting the stage for the season's only hard freeze early on the 22nd (Figure 11) with minimum temperatures ranging from the upper teens and lower 20s across the ranchlands and upper Valley, to the mid and upper 20s elsewhere, except low to mid 30s at the Cameron County beaches.

Another round of sea turtle cold stuns ensued with this Arctic Express, as lower Laguna Madre Bay water temperatures plunged into the lower to mid 40s at their coldest. Unfortunately, sustained gale-force winds and very rough waves precluded boaters from conducting rescues on the 21st, so it is unknown how many more turtles could have been recovered – but in the end, around 375 turtles were recovered – and later released (on the 26th) back into the Gulf.

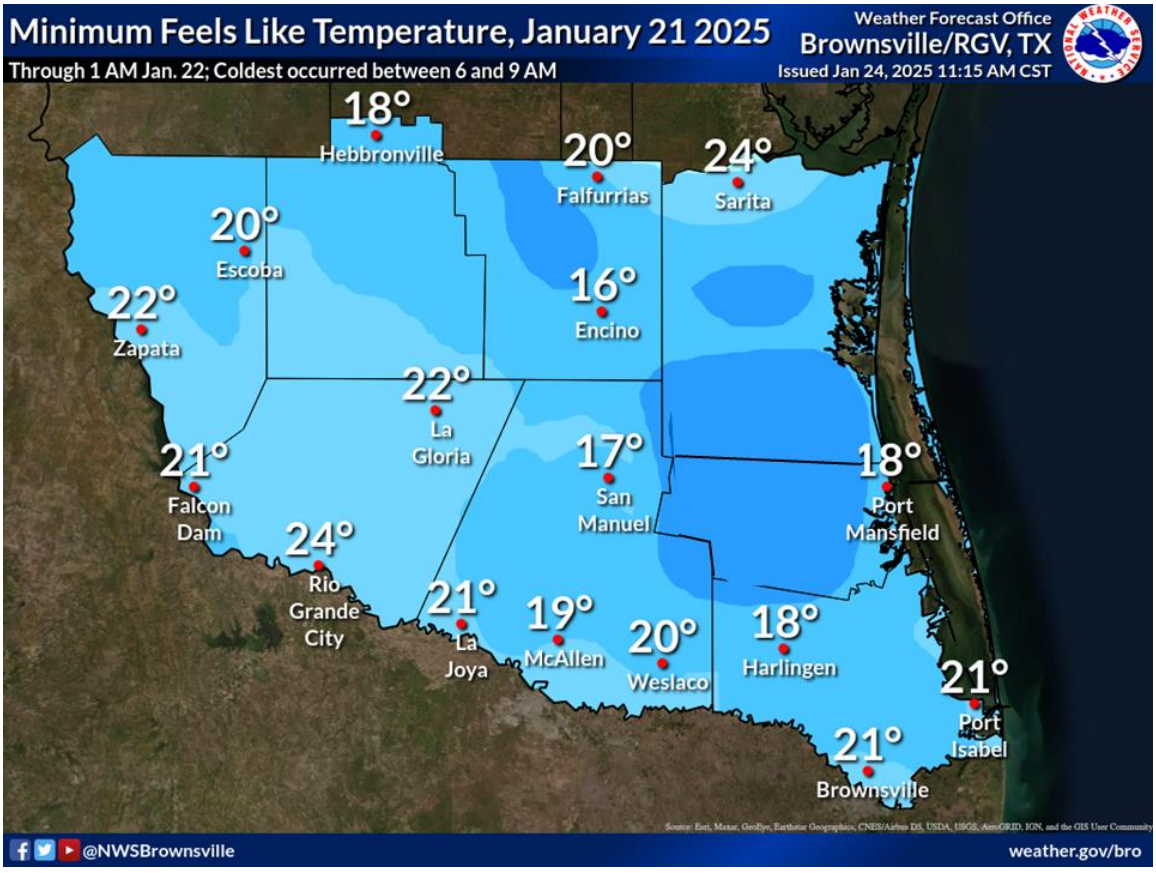

Figure 9. Lowest wind chill (apparent temperature) on January 21, 2025.

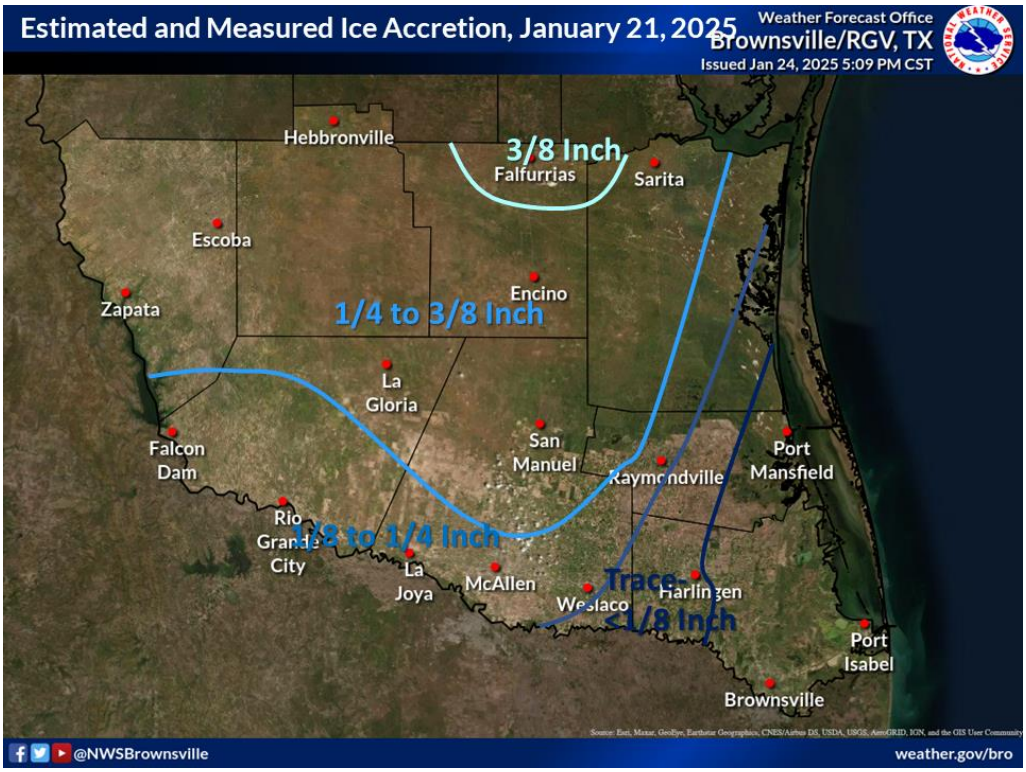

Figure 10. Measured and estimated ice accretion on January 21st, 2025. Accretion of 1/8 inch or higher occurred for all but the lower Texas coast, as well as Cameron County. Most of the accretion was on fences, grass, tree limbs, and vehicles parked outdoors; brining of elevated roads and bridges kept most of them wet except in one instance near La Joya.

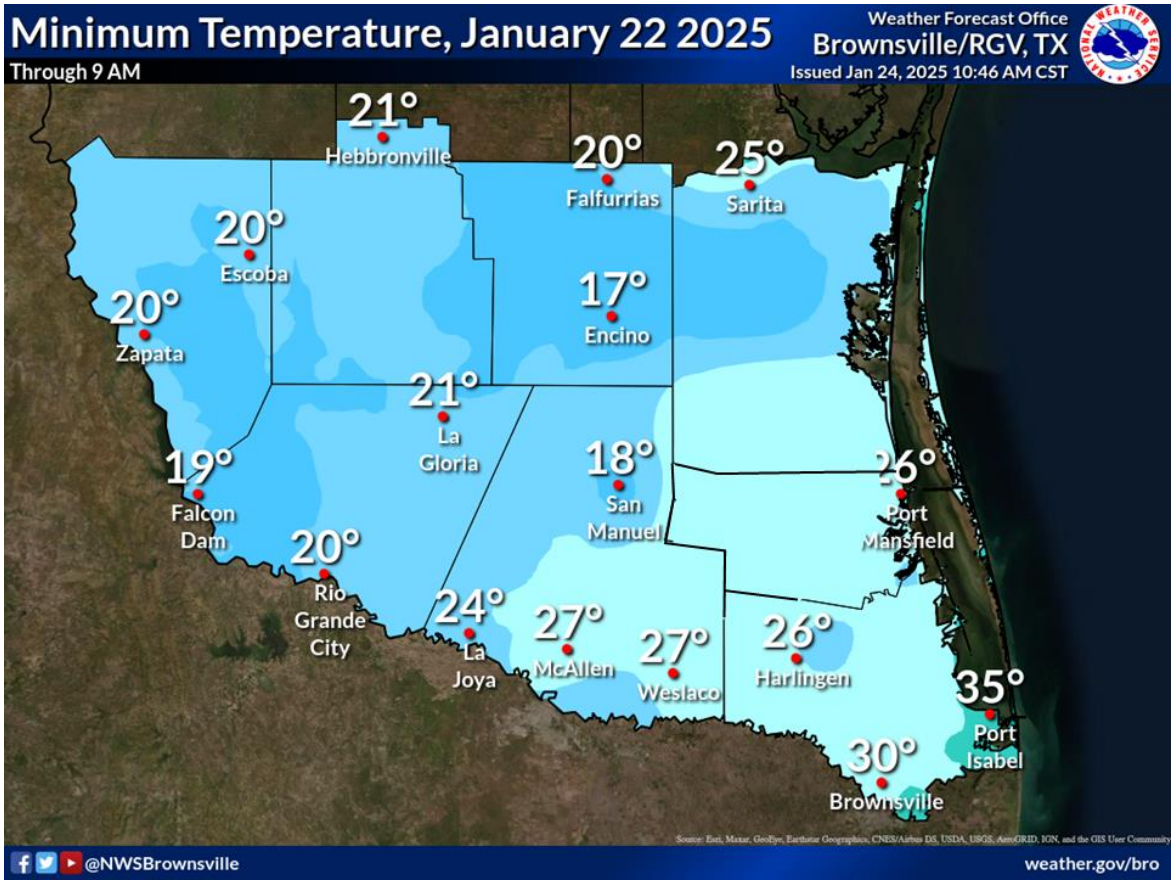

Figure 11. Minimum temperatures on January 22, 2025.

The pair of cold/very cold snaps in the heart of January turned the early month record warm start to a cooler than average final, with temperatures generally running between 2 and 4°F below the 1991-2020 average. A warm close to the month ensured that it would not rank among the top twenty coldest on record.

February re-ramped up the warmth and made the January 20-22 "Arctic Express" a distant memory; very warm to even hot and humid conditions along with the increasing sun angle turned freeze-cured grasses green in the Cameron/Willacy area, with spring's initial buds appearing on many trees by the 10th. This included a rapid early bloom of citrus groves. By the 12th, the following records were broken or neared for this window across the Valley:

- Brownsville (since 1878): 75.9°F, 1.9° above the prior record (2017).
- McAllen (since 1942): 77.6°F, 1.3°F above the prior record (1957)
- Harlingen (since 1912): 74.7°F, 0.4°F below the prior record (1957)
- Rio Grande City (since 1897, but mostly since 1928): 75.7°F, 0.5°F above the prior record (1957)
- Weslaco (since 1915): 75.3°F, 0.8°F above the prior record (1957)
- Port Mansfield (since 1958): 71.0°F, 1.1°F below the prior record (2017).

And then…the pattern shifted (again), and cooler – then colder – weather returned. The first front brought three days of misty chill (February 13-14) with daytime temperatures largely in the 50s to lower 60s. This shift began the period of "roller coaster" temperatures, which would prevail through month's end. After a quick surge back into the 80s, a second weak front briefly took temperatures back into the 60s through the 18th. And then, the bottom fell out for the second time this winter.

Though not as sharply cold as the Arctic Express, the season's second significant cold snap plunged temperatures back into the upper 30s to lower 40s before daybreak on the 19th, and these readings would continue almost unchanged for the next 72 hours, before partial sunshine returned by the afternoon of the 23rd and put the final end to the season's cold snaps. The situation – a strong ridge of high pressure that originated in northwest Canada before diving southeast across the Great Plains and Mississippi Valley, then joined by a three-day coastal trough east of the U.S./Mexico border – was somewhat similar to the January 6-11 event, only a few degrees colder. On the morning of February 20th, a light freeze was noted in Jim Hogg, northern Zapata, and northern Brooks County – and temperatures nudged to the freezing point across the remainder of Brooks and Jim Hogg, northern Starr, northwest Cameron, much of Hidalgo, western Willacy, and much of Kenedy – with a second light freeze across northern Jim Hogg on the morning of the 21st.

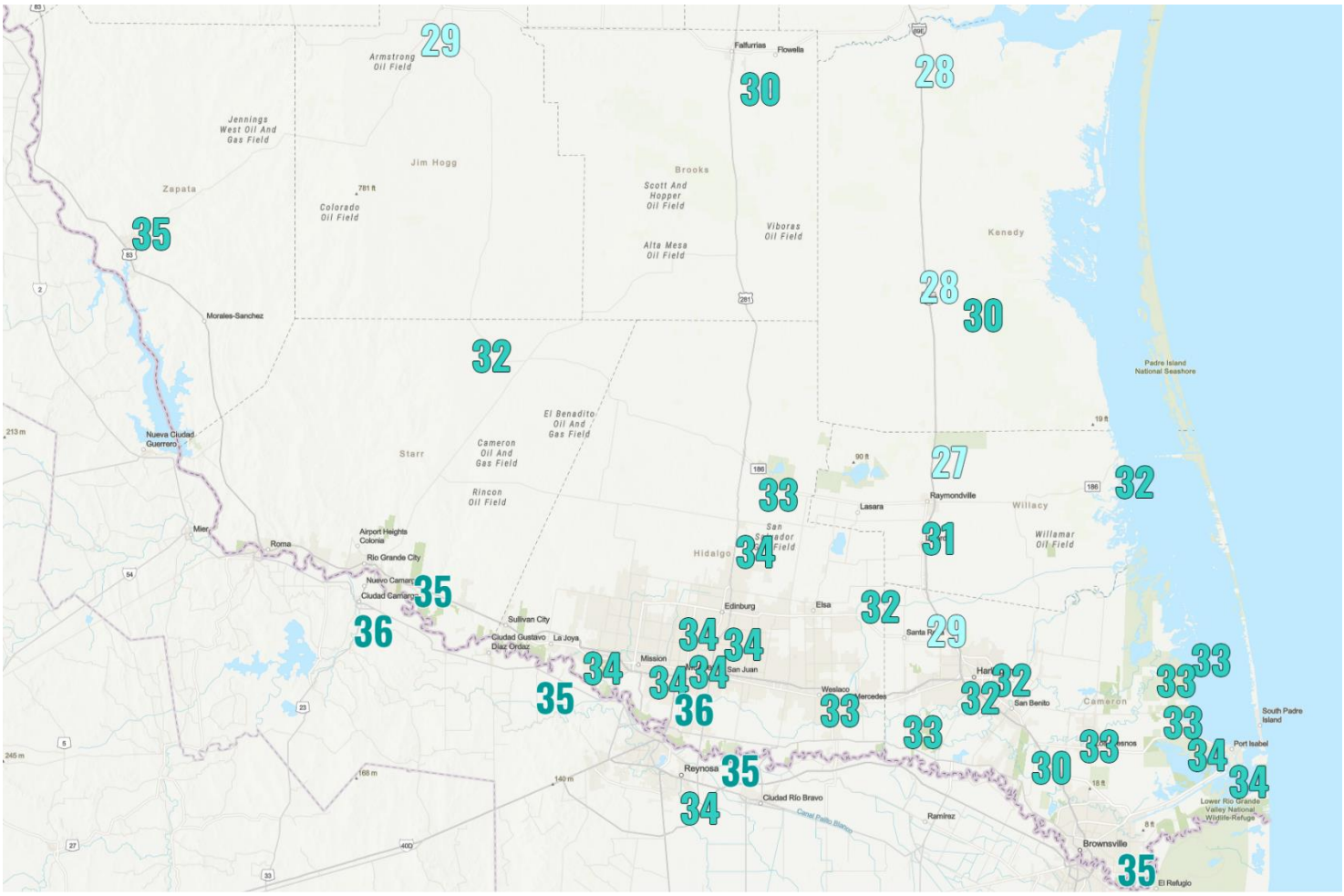

Figure 12. Observed and estimated minimum temperatures on February 20th, 2025. Slightly higher temperatures were observed on the morning of February 21st, 2025.

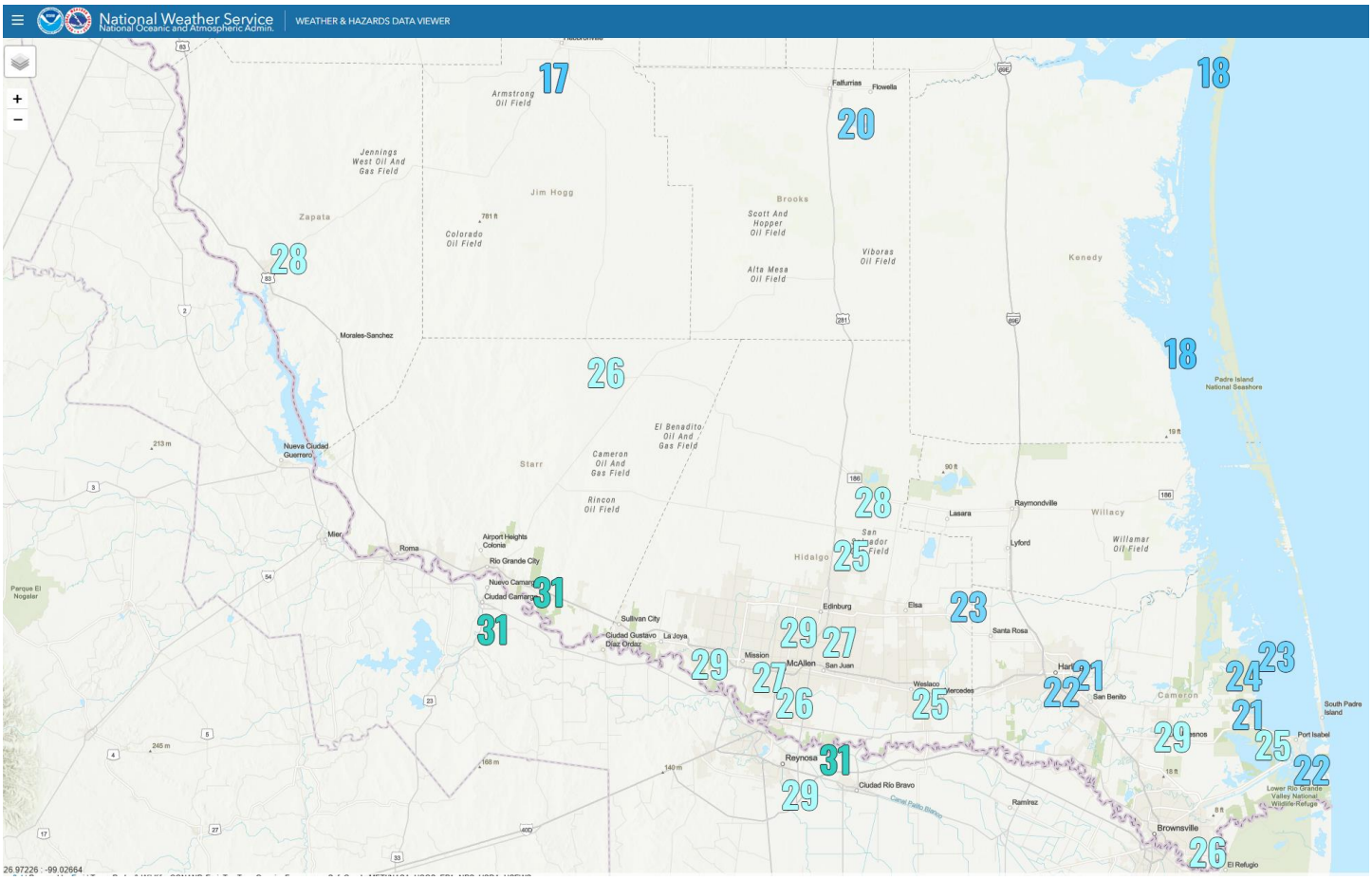

Figure 13. Observed and estimated wind chill (apparent) temperature at 8 AM on February 20th, 2025. Slightly higher, but still similar, wind chill temperatures were felt on the mornings of the 21st and 22nd, with upper 20s to lower 30s values persistent from the 19th through the 22nd.

The persistence of temperatures in the upper 30s to lower 40s for 72 hours once again brought lower Laguna Madre water temperatures to or just below 50°F for several periods on the 21st – 22nd, and a third round of sea turtle cold-stun occurred in just six weeks, this time with 200 known rescues. A new cold record was set for the particular calendar-day window (Feb. 20-22).

Temperature recovered to or just above seasonal levels to close out the month. The roller-coaster of record to near-record heat followed by the record late month cold largely cancelled each other out – and the month finished right around the 1991-2020 average at all locations. This just proved the point that the only thing "normal" about the weather for February was the week-to-week mood changes…all ending up right around the most recent 30-year average!

Overall, when comparing the seasonal forecasts for "warmer and drier than average", the forecast verified almost perfectly. The sole exception was in Cameron and southern Willacy, where December's rain and a bit more in January and February locked in an above-average winter season. Still, residents of the Valley will remember winter 2024/2025 as the season that "couldn't make up its mind". From near record heat of December, to a warm start in January – quickly followed by a cold outbreak and an Arctic Express – then a record-breaking warm start to February before a final late-month temperature plunge – December 2024-February 2025 was – in a word – fickle.

All this said, we were able to describe this fickleness in our seasonal outlooks, where we gave a peak of 40% chance that at least one “Arctic Express” would arrive between December 20th and February 15th. Sure enough, that’s exactly what happened…and we were not surprised to see several sharp cold fronts along the way, denting the otherwise mild to warm winter overall.