

THE COASTAL BREEZE

Volume XI, Issue 3

Fall 2023

Happy Fall!

Finally we are getting some cooler weather and much needed rain! I am sure most of us are happy for a break from the oppressive heat we have seen this summer.

We have a great issue for you this season. We will look back on the heat from this summer, Tropical Storm Harold as well as recapping a visit from our new regional service hydrologist.

We also said goodbye to some of our forecasters and welcomed a new Lead Forecaster!

Happy Reading!

We want to hear from you!

Do you have suggestion for articles or weather photos you want to show off? Send them our way! For any photos make sure to include: date, time, location and name of photographer for credit!

Email us at sr-bro.awareness@noaa.gov



Brownsville/Rio Grande Valley

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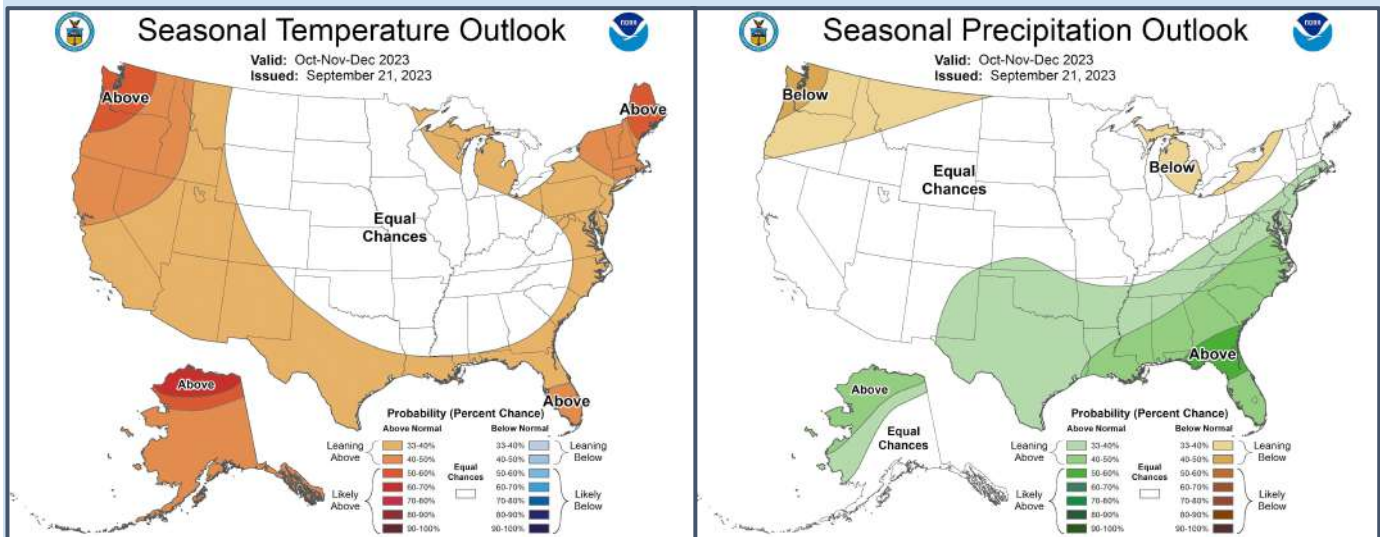
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MIC Minute

By Mike Buchanan

Although Fall is upon us here in Deep South Texas, the weather pattern that has produced above normal temperatures since early June is still expected to continue to affect our area through at least early October and possibly beyond. The Climate Prediction Center is continuing to forecast above normal temperatures this Fall for our area. That does not mean we won't see any cooler conditions due to cold fronts and/or any potential rainfall. Typically, cold fronts begin impacting our area in October, although sometimes fronts can arrive in September albeit weaker. As we progress through the Fall period, cold fronts tend to become more frequent and stronger.

Lingering tropical moisture can sometimes interact with these Fall fronts to produce heavy rain and flooding. Oftentimes, 5 to 10 inches or more of rainfall can occur in a short period of time during these situations. A stalled front and copious amounts of moisture produced 8 to 10 inches of rainfall in Brownsville, most of which fell in two hours, back on October 1, 2021. Although it has been dry since June 2023, our weather pattern can quickly transition into a wet one with the right weather set-up. With ongoing El Niño conditions expected to strengthen through the Fall and Winter, there is an increased potential for a wetter than normal Fall (and Winter) across our area. Given the worsening drought conditions, decreasing reservoir levels, and community water restrictions, most rainfall would be welcomed across our area.



The Climate Predictions Centers Seasonal Temperature and Precipitation Outlook October-December 2023

Tropical Storm Harold: Where Did All the Rain Go?

By Dr. Jeremy Katz

Starting on August 16th, meteorologists at WFO Brownsville along with the National Hurricane Center in Miami, Florida started to monitor an area for potential development in the Gulf of Mexico that would develop into Tropical Storm Harold. Ahead of the storm potential tropical impacts were well communicated by the meteorologists on various social media graphics even changing the “5 Day” weather forecast graphic to include some of the potential impacts and what was known about the developing storm. However, as we got closer and closer to landfall, forecast models started to pick up on a particular trend with Harold. They started to shift the heavier rainfalls from the valley further north. While this was something that forecasters started to mention in their messaging ahead of time, the drought has been particularly harsh this year, so the potential rainfall associated with Harold could have been a big help. Sadly, that was not to be. As when Harold made landfall on Tuesday, August 22nd in central Kenedy County, the structure of Harold was sheared so that the northern half of the storm was where the majority of the rainfall was located. Thus, there was very little rain that fell in the valley. So how much rain did fall in the Northern Ranchlands then? Some of the highest observations range between 2.5 to 3.7 inches in the Hebbronville area. Port Mansfield and Falfurrias had observations of 2.55 and 3.62 inches respectively. There were even reports of minor street flooding in Hebbronville and Falfurrias due to the rainfall. What about other impacts from Harold? Well, given that Harold was a weak tropical storm when it made landfall the other impacts were very limited. The highest sustained winds were 42 knots was observed at buoy 54 nautical miles east-northeast of Port Mansfield. The strongest gust in wind speed was 53 knots observed by the AWOS station in Falfurrias.

That buoy that was previously mentioned also saw the lowest pressure from Harold as well with the pressure reading 995.6 mb. The impacts from Harold are pretty much in line with what one would expect with a low end fast moving tropical storm.

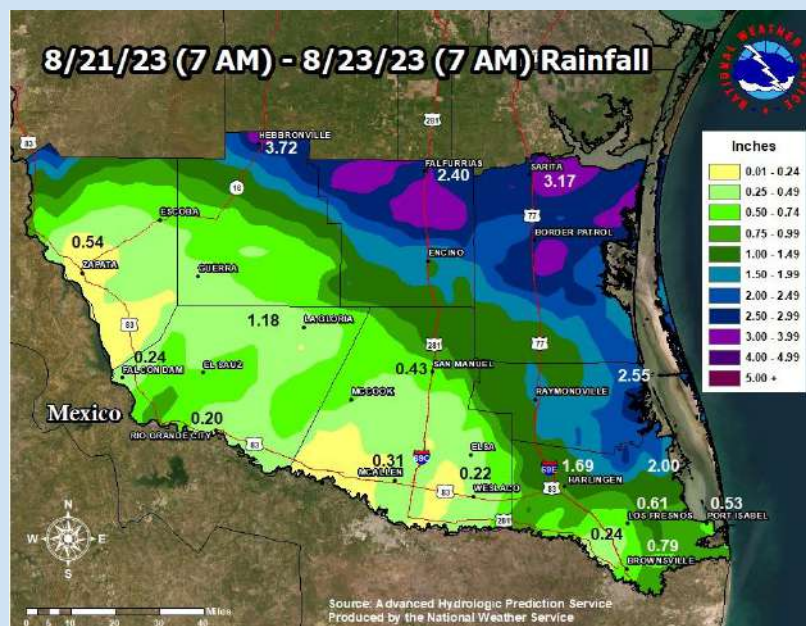


Figure 1: Rainfall totals from Tropical Storm Harold

Blazing Heat Smashes Summer Records Across the Rio Grande Valley in 2023: Severe to Extreme Drought Impacts Crops and Livestock

By Barry Goldsmith



Dried up grassland, north Brownsville, late September 2023.

Following a stormy period from [March through May](#), where rainfall was plentiful and temperatures were kept in check, the atmospheric pattern transitioned rapidly beginning on June 9th, with a “heat dome” developing across south Texas and northern Mexico by June 12th. Searing heat and dangerous apparent, or “feels-like” temperatures, when humidity is factored in, dominated the next 100+ days through the end of September. The heat was nearly non-stop, with brief breaks in early July, in late August (Tropical Storm Harold), and mid September. By the end of the period, new records were set for nearly every available Valley observing station with a sufficient long-term (60 years or more) record. Most of the records shattered prior records by at least 1°F or more - quite an impressive feat.

Impacts on the Community

Rio Grande Valley residents, farmers, and ranchers are accustomed to summer heat - after all, the pattern of [“La Canícula” \(The “Dog Days”\)](#), when the constellation known as Sirius, or Alpha Canis Majoris (the “dog star”) rises with the sun between July 3 and August 11, typically produces plenty of heat with

limited rainfall. In 2023, the pattern of “La Canicula” (Figure 1) was both stronger and *much* longer, beginning around June 9th and continuing through September.

The early onset of the heat and apparent temperatures, which reached 111°F or higher beginning June 12th and continued on consecutive days through the 27th for much of the populated Valley, increased heat-related stress on people. That stress was due to two factors: first, people who were acclimated to relatively cooler weather, especially overnight, between late March and early June.

Second, people were not yet ready for the early onset of “La Canícula”, nearly a month ahead of schedule. According to [media reports](#), hospitalizations due to heat-related emergency room visits jumped 16 percent in June and early July compared with the same time in 2022. 2022 was also a top-ten hottest June. A press release at the beginning of August from the South Texas Health System, which includes medical facilities from Weslaco to the McAllen metro, noted 153 heat-related hospital visits in June-July 2023, more than double the amount of visits for the same time in 2022.

Farmers and ranchers took a big hit on crop production and livestock management as the combination of heat, limited rainfall, and unavailability of irrigation water from a very low Falcon International Reservoir and drainage conduits into thirsty fields. As of [late September](#), the USDA National Agricultural Statistical Service reported 99 percent of topsoil and subsoil moisture was “short” or “very short”; topsoil “very short” values were 82 percent on September 24th, by far the highest in Texas. Valley representatives from Texas Citrus Mutual, the Texas International Produce Association, and the USDA Farm Service Extension office (Edinburg) confirmed these values through on-the-ground impacts. These included:

- Lack of hay and bare rangelands/pastures, forcing cattle ranchers to cull their herds at high rates, with an increase in cattle prices
- Citrus fruit production was lower, in number and the size of the harvestable fruit
- Sugar cane production was also lower due to irrigation limitations

Final dollar values of crop and cattle production/loss will be available later in 2023 and early 2024.



Photo of dried detention pond just north of Harlingen in mid July 2023. Photo credit: Dale Murden, Texas Citrus Mutual.

“Super” La Canícula

The pattern of “La Canícula” (Figure 1), which features atmospheric high pressure centered between southwest Texas and northern Mexico (Coahuila/Chihuahua), was not only longer (more than twice the typical number of days) but stronger as well. The ridge allows air masses to dry out (in the atmospheric column) and heat up; lack of rainfall underneath the “heat dome” dries up soil moisture and allows solar energy to convert straight into heat. Such was the story from June through September 2023. The persistence of “La Canícula” through September reduced rainfall to a fraction of average, at 10 to 50% of what should typically occur - 4.5” over the Rio Grande Plains to 6” over southern/eastern Cameron County (Figure 2). Lowest

percentages were in southern/eastern Cameron.

The combination of the searing heat and below average rainfall produced very high daily evaporation rates, which led to a steady worsening of drought conditions through September. By the end of the month, Severe (Level 2) and Extreme (Level 3) Drought covered nearly all of the region (Figure 3).

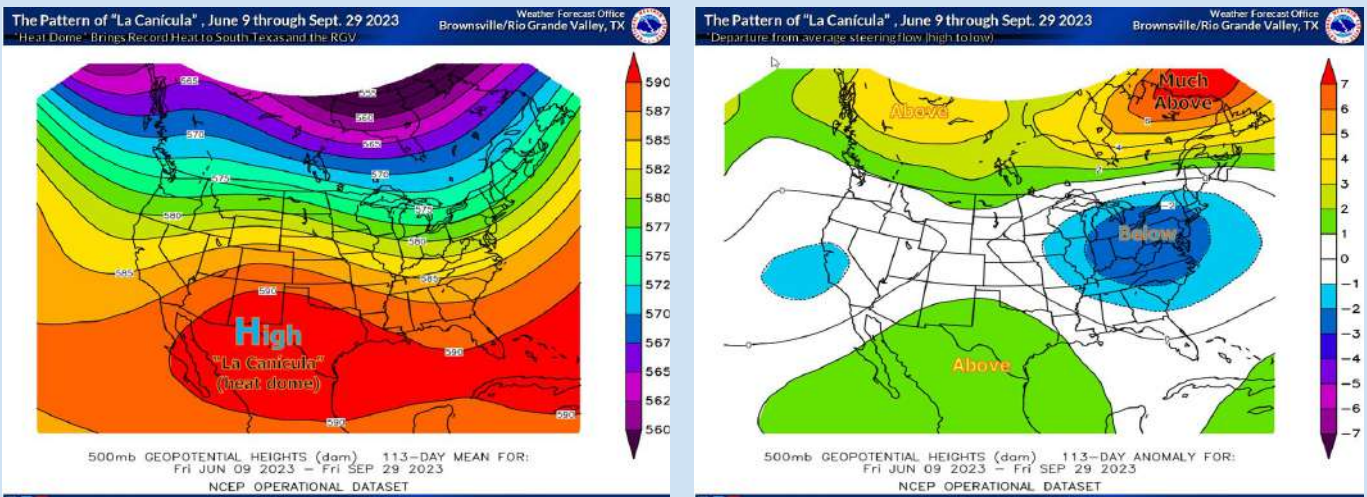


Figure 1: Left - Mean steering pattern (500 mb, or ~18,000 feet) for June 9-Sept. 29, 2023, showing the strength of “La Canícula”. Right: Anomalies (departure from the 1991-2020 average) of the height levels, clearly showing the contrast between the La Canícula ridge and lower height levels across the mid Atlantic region.

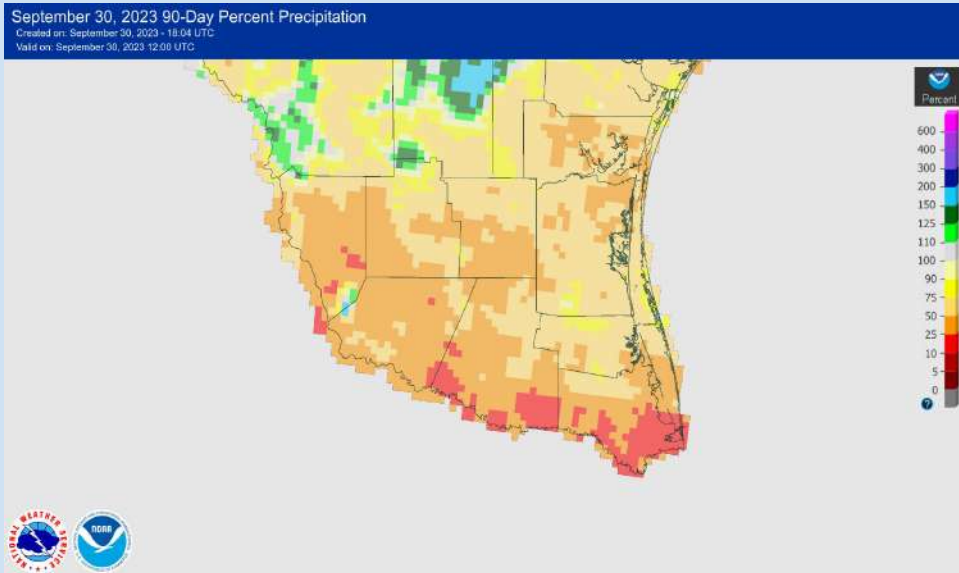


Figure 2: Percentage of average rainfall for July-September. This was a continuation of the situation that began on June 9th. All but portions of Kenedy and Willacy were at 10 to 50% of average; Kenedy/Willacy had their percentage increased by rainfall associated with Tropical Storm Harold on August 22, 2023.

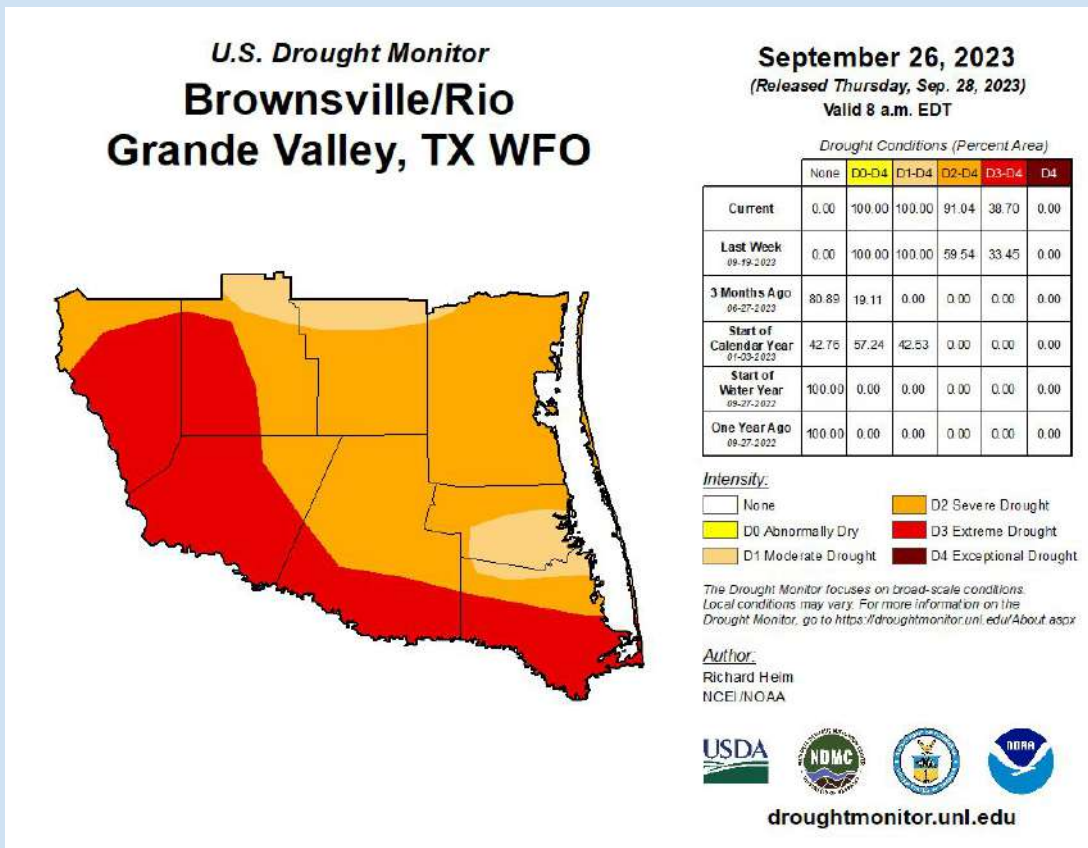



Figure 3: Drought monitor, September 26, 2023, showing nearly all of the Lower Rio Grande Valley/Deep S. Texas Ranch country in Severe to Extreme Drought (91 percent).

How Oppressive was the Summer of 2023?

The numbers below tell the tale.

- For June through September:
 - New records were set, some by more than 1°F above prior records (Figure 4) for astronomical summer (June 21 through September 22, 2023)
 - The number of 100°F days broke prior records at most Valley locations, some by a lot (Figure 5)
 - NWS Brownsville/Rio Grande Valley issued **55 Heat Advisories** (for 111°F for 2 or more hours within a 12-hour period across a majority geographic area or population of a forecast zone) between June 12 and September 24, and an additional 6 Excessive Heat Warnings (for 116°F for the same time duration and area). In a typical year, the office issues **between 3 and 6 Advisories and around one Warning!**
 - Preliminary verification, through late September, showed 327 verified zones (counties or portions of counties) for heat events (111°F or higher) on a **total of 54 days!**

Summer (June 21-Sept. 22) Shatters Heat Records for Most of RGVB				Weather Forecast Office Brownsville/Rio Grande Valley, TX
New Records ~1 Degree (Fahrenheit) Above Prior Records				
Location Records Since (Year)	2023 Value (Rank)	Prior Record (Year)	Departure (Degrees F)	Total temperature (day and night)
Brownsville (1878)	89.2 (1)	87.3 (2019)	+1.9	*Missing complete summer data from 1898-99, 1907-1927, 1945, and 1949 **Actual departure from prior record is likely closer to +1 degree based on more than 33% of data from hot summers between 2011 and 2020
Harlingen (1912)	88.8 (1)	87.8 (2016)	+1	
McAllen (1941)	90.0 (3)	90.6 (2009)	-0.6	
Rio Grande City (1897)*	90.4 (1)	89.1 (1946)	+1.3	
Raymondville (1913)	89.2 (1)	88.0 (1947)	+1.2	
Weslaco (1914)	89.2 (1)	86.9 (1998)	+2.3**	
Port Mansfield (1958)	86.2 (1)	85.3 (2016)	+0.9	
Edinburg (2000)	90.0 (1)	88.4 (2009)	+1.6	

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Figure 4: June 21 through September 22, 2023 temperature rankings across the Rio Grande Valley. Only McAllen came up just short of a new all-time record.



Location Records Since (Year)	2023 Number of 100 Degree Days (Summer)	Prior Record (Year)
Brownsville (1878)	40	12 (2019)
Harlingen (1912)	57	41 (1943)
McAllen (1941)	82	77 (2016)
Rio Grande City (1897)*	81 (Number 3)	86 (1957)
Raymondville (1913)	56	55 (1953)
Weslaco (1914)	57	45 (1998)**
Port Mansfield (1958)	2 (Number 2)	3 (2017)
Edinburg (2000)	75	56 (2009)***

*Missing complete summer data from 1898-99, 1907-1927, 1945, and 1949

**Difference from prior record is likely closer based on more than 33% of data from hot summers between 2011 and 2020

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Figure 5. Record/near record number of 100°F days during astronomical summer (June 21 - September 22) 2023 across the Rio Grande Valley.

A Hot Trend?

A look at the top ten hottest astronomical summers across the anchor cities of the Rio Grande Valley - Brownsville, since 1878; Harlingen, since 1912; McAllen, since 1941 - showed that a majority of the hottest summers have occurred since 2011.

- Brownsville: Five years ranked in the top five hottest (in order: 2023, 2019, 2018, 2022, and 2016).
- McAllen: Seven years ranked among the top ten hottest (2016, 2023, 2018, 2017, 2019, 2012, 2015). 2009 (1st), 1998 (9th), and 1980 (10th) were the only years to finish in the top ten prior to 2012.
- Harlingen: Seven years ranked among the top ten hottest (2023, 2016, 2019, 2022, 2018, 2017, 2020). 1998 (4th), 2009 (6th) and 1957 (9th) were the only years to finish in the top ten prior to 2012

As of September 29th, 2023, this year ranked first warmest/hottest all-time at Harlingen and Brownsville, and fourth at McAllen. We'll have a story on the final 2023 calendar year rankings - and what they might mean - in the winter or spring (2024) edition.

New Senior Service Hydrologist Visits NWS Brownsville/RGV

By Rick Hallman

The new Senior Service Hydrologist (SSH), Chris Morris, responsible for the Hydrologic Service Areas of NWS Austin/San Antonio, NWS Corpus Christi, and NWS Brownsville/RGV, visited our office the first week of September.

This visit was focused on some familiarization of Deep South Texas and the Rio Grande Valley, including retention dams and channels along the Rio Grande, the floodways, resacas, arroyos, and multiple creeks across the Northern Ranchlands.

In particular, a site survey was conducted along the Los Olmos Creek near Falfurrias with our local hydrology team of Rick Hallman and Kirk Caceres. A new gauge had been installed by the United States Geological Survey and a site survey was needed to confirm or update relevant information about the site in our hydro database. The team did verify multiple potential flood impact statements and add the height at which the Los Olmos Creek would reach the base of the bridge on U.S. 281.



Pictured: Survey equipment deployed on the bridge over US 281, north of Falfurrias at the Los Olmos Creek with SSH Chris Morris and Meteorologist Kirk Caceres surveying upstream.

While in Falfurrias, the team was also able to briefly visit the Cibolo and Palo Blanco creeks, which both have a history of causing flooding issues within the city. Additional information, including prior evacuations, high water marks, and flood dates related to these two creeks may lead to better flood warnings within Falfurrias. Depending on the availability of this data, our team may be able to help obtain gauges or eventual forecast points where needed to improve hydrologic services across the area.

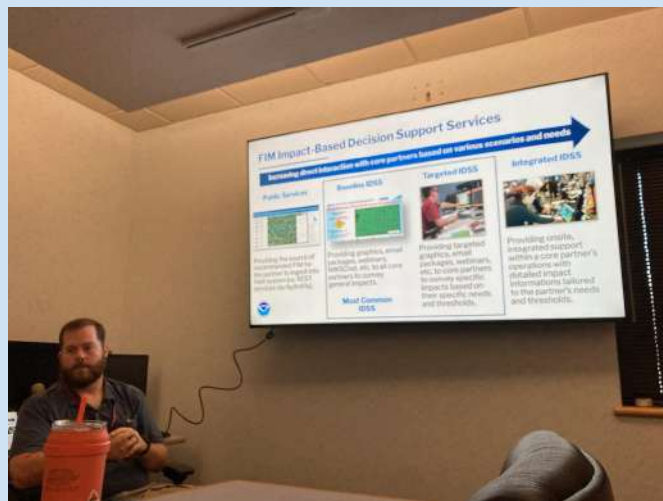
Chris, Rick, and Kirk were joined by the NWS Brownsville Meteorologist in Charge, Mike Buchanan, for a familiarization tour of Anzalduas Dam, south of Mission, TX and a brief meeting with International Boundary and Water Commission (IBWC) staff. The IBWC is a core partner of the National Weather Service and hydrologic data shared between the NWS and IBWC is essential to



Pictured left to right: Chris Morris, Mike Buchanan, Rick Hallman, and Kirk Caceres visiting the Anzalduas Dam over the Rio Grande and International Border between the United States and Mexico.

both of our operations. The Anzalduas Dam has been in operation since 1960, diverting the U.S. share of floodwaters to the interior floodway while also enabling the diversion of waters into Mexico's main irrigation channel.

On his final day in the office, Chris presented the latest in experimental Flood Inundation Mapping (FIM) services and related impact-based decision support options to available staff. FIM services are gradually being rolled out over the next few years, and will undoubtedly help the NWS and core partners save lives.



Pictured above: Chris Morris presenting FIM services to staff.

Returning to the Rio Grande Valley as a Lead Meteorologist

by Bianca Garcia

Howdy, everyone! My name is Bianca Garcia, and I am from Los Fresnos, Texas. I graduated from Texas A&M University with my Bachelor's Degree in Meteorology in 2014 and graduated from Millersville University with my Master's Degree in Emergency Management in 2017. My husband and I have two sweet boys, a 3-year old and 2-year old.

My interest in meteorology started when I was in elementary school. I didn't really have a "defining" weather event where I knew this was the area of study I wanted to pursue, but I would spend every hurricane season picking up a hurricane guide and track all of the tropical systems in the Gulf of Mexico, Caribbean, and Atlantic Ocean. I always knew the NWS existed, but I didn't realize how close the office was until I attended a physics presentation at UTB (yes... before it became UTRGV). I met the Science and Operations Officer at the time, learned about volunteer opportunities with the NWS, and spent several years volunteering at NWS Brownsville while studying meteorology.

My NWS career officially began about 7 years ago at NWS Fort Worth/Dallas. I experienced all types of weather in North Texas, except for tropical weather! From extreme heat/cold, flash flooding, fire weather, ice/snow, and of course severe thunderstorms/tornadoes, I learned a lot from each event, the public, and our partners. During quieter weather, I spent time attending outreach events, career days, planning workshops, and working closely with emergency management and broadcast media. One of the more unique opportunities I had as a forecaster in Fort Worth/Dallas was being deployed to the AT&T Stadium for highly attended events and concerts, including the Dallas Cowboys!



While my family and I loved North Texas, my husband and I knew that we would eventually make our way back to the RGV to be closer to our families and to continue our careers. I'm looking forward to helping the office grow and to continue to learn from the public, our partners, and my colleagues.

I'm very happy to be back home and to be one of the newest Lead Meteorologists at NWS Brownsville. It's exciting to not only be the first female Lead here, but also the first female Hispanic Lead Meteorologist at NWS Brownsville!

A Fond Farewell

5 years at WFO Brownsville. What a ride. I just want to thank all of my coworkers, both past and present, at BRO for being so welcoming to me. It was a very memorable 5 years working at this office, with lots of memorable weather events that I will not forget! If I had to choose, my three most memorable weather events were: the entire 2020 hurricane season, the arctic freeze in February 2021, and Brownsville flood event on October 1, 2021 where over 8 inches of rain fell in the city in just a few hours. Although I look forward to my next adventure at another office in the National Weather Service, I will never forget my time here in Brownsville.

-Brian Mejia



My time here in Brownsville has been a challenging, yet rewarding one. Challenging that I had to learn a whole new way of doing things after being in the broadcast side of meteorology for over a decade. Oh, and I had to learn how to deal with rotating shift work. However, it was super rewarding learning how the NWS works and to work and collaborate as a team. Honestly, the teamwork aspect of the

NWS was the most rewarding part as I could chat with other meteorologists about the weather or what I was seeing on satellite, the radar, or models in person instead of by myself in a studio. Anyway, off to Tallahassee I go to be much closer to family and friends. Until next time, Brownsville!

-David Reese

A Fond Farewell (Continue)

I started as a new National Weather Service (NWS) meteorologist at the Weather Forecast Office in Brownsville, TX (WFO BRO) in October of 2018...I can't believe that 5 years have come and gone since then! The BRO family was really welcoming and provided a great environment for me to grow in my career. As I went through the process of being trained to be able to provide NWS products and services for Deep South Texas and the RGV, I learned so much from my colleagues and my managers who helped build my operational forecasting foundations and taught me what it meant to serve the community and our core government partners by providing for their weather forecasting needs. Outside of the office, I enjoyed being a part of Brownsville Community Fellowship Church, serving with CASA of Cameron and Willacy Counties and surfing at South Padre Island.

Over my time at WFO BRO, I discovered that I really enjoyed the marine forecasting side of things (winds over the waters, waves, coastal inundation, rip currents, etc.). When I saw a job opening for a meteorologist in Hawaii at WFO Honolulu (one of the meccas of marine and surf forecasting!), I decided to go for it so I could gain some valuable marine forecasting experience. While I'm enjoying my new job in Hawaii, I miss my BRO family and Deep South Texas!



-Laura Farris



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**PROVIDE WEATHER, WATER, AND CLIMATE DATA,
FORECASTS AND WARNINGS FOR THE PROTECTION
OF LIFE AND PROPERTY AND ENHANCEMENT OF
THE NATIONAL ECONOMY**

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