THE COASTAL BREEZE

Brownsville/Rio Grande Valley

FALL 2020

IN THIS ISSUE

WE'RE BACK!

We have an exciting issue for you. In this issue you will be introduced to our staff who work 24/7 to provide you with weather information, forecasts, and decision support services. Have you ever wondered how the radar works? Meteorologist Matt Brady describes the inner workings of the WSR-88D radar and how we utilize it. Meteorologist Rick Hallman shares some wonderful information on strides for pelican safety as the weather turns cooler, plus much more!

Happy reading!

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MIC MINUTE

By Mike Buchanan

Let me introduce myself. I am the Meteorologist-in-Charge (MIC) at the National Weather Service (NWS) office located in Brownsville, Texas. On behalf of the entire staff at our office, I would like to welcome the return of "The Coastal Breeze" newsletter. The Coastal Breeze newsletter will be produced periodically throughout the year and contain various articles related to the weather that affects Deep South Texas including the Rio Grande Valley and Northern Ranchlands. Many of these articles will explain past, recent, and even future weather events. Basic meteorological terms and weather phenomena will be explained so you can better understand how weather plays an integral role in your daily life. Hopefully, you will find these articles enjoyable and informative.

Our area can experience a wide variety of extreme weather events throughout the year including hurricanes, flooding, damaging thunderstorms with wind, hail, and a few tornadoes, drought and critical fire weather conditions, extreme heat, beach flooding and erosion from waves, dangerous rip and longshore currents, dense fog on land and at sea, gale force winds and rough seas, freezes, ice storms, and even some snow!

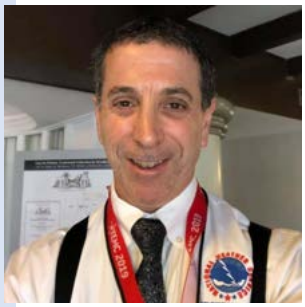
Some of these extreme weather events can affect our area more than several times in a year and others may not affect our area for several years or longer. To be better prepared for not only extreme weather conditions but also more common weather conditions, go to our homepage at weather.gov/rgv. You can also find us on Facebook, Twitter and YouTube @NWSBrownsville. Our homepage and social media pages will always have the latest forecast and warning information you need to help you make better decisions that are affected by the weather.

The Office of the National Weather Service Brownsville/Rio Grande Valley

MEET OUR STAFF

MICHAEL BUCHANAN – *Meteorologist-In-Charge (MIC)*
Mike is from Quincy, Massachusetts and received his Bachelor of Science (B.S.) in Meteorology from Rutgers University. He began his career as a Meteorologist at the Weather Forecast Office (WFO) Houston/Galveston in 1992. He then became Journey Forecaster at WFO Morristown TN in 1994, Senior Forecaster at WFO Corpus Christi in 1998, Science and Operations Officer at WFO Corpus Christi in 2010 before coming to Brownsville as Meteorologist in charge on Sept. 1, 2019.

BARRY GOLDSMITH - *Warning Coordination Meteorologist (WCM)*
Barry has served as the WCM at WFO Brownsville for the past 13 years. He is from the Washington DC metro area and graduated from Penn State with a B.S. in Meteorology. His career began as a statistical guidance equation developer and then a verification specialist at the NWS HQ. He then spent five years as a forecaster at WFO Baltimore/Washington and nine years at WFO Tampa Bay before coming to Brownsville as WCM.



JOSHUA SCHROEDER - Science and Operations Officer (SOO)
Joshua is from in Mendota, IL and attended the University of Illinois at Urbana-Champaign where he received a B. S. in Astronomy and an M. S. in Atmospheric Sciences. He was a Meteorologist and Chief Forecaster for the Dept. of Defense before becoming SOO at NWS Brownsville/Rio Grande Valley in Feb 2016.

GEOFFREY BOGORAD - Senior Meteorologist
Geoff is a graduate of Texas A&M University with a B.S in Meteorology and began his career in the private sector in 1988. In 1994 he became a meteorologist with the NWS New Orleans WFO, then transferred to the Albuquerque NWS WFO in 1998 serving 8 years before coming to Brownsville. Geoff serves as NWS Employees Organization (NWSEO) Steward, CocoRaHS Lead, Cooperative Observer Lead, and Intranet Lead.

TIMOTHY SPEECE – Senior Meteorologist
Tim hails from Union Grove, NC and received his B.S. in Atmospheric Science from the University of North Carolina-Asheville. He started his career at the NWS in Waterloo, Iowa in 1990 transferring to Brownsville in 1995. His program lead roles include the Advanced Weather Interactive Processing System (AWIPS), Tsunami, Office Recycling, Service Backup, Forecast Verification, and WarnGen.

MEET OUR STAFF

MICHAEL DAVID CASTILLO SR. - Senior Meteorologist
Mike is originally from Houston and went to Texas A&M University where he received a B.S. in Meteorology. After working for 5 years in the private sector, he began his career at the NWS here in Brownsville with a brief stint at the Houston WFO. He is the Hydrology Program Manager, Tropical Program Co-Leader, Office Awards Team Leader, Building Leaders for a Solid Tomorrow (BLAST) Team Leader, and NWSEO Vice-Steward.

BRIAN MILLER – Senior Meteorologist
Brian hails from Wisconsin where he received his B.S. in Chemistry before becoming a U.S. Navy officer. He received his Master of Science (M.S.) in Meteorology and Physical Oceanography from the Naval Post Graduate School, where he then became the Supervisory Oceanographer. He then became a U.S. Navy Meteorologist before joining the NWS in 1998. Brian also serves as the program lead for Amateur (Ham) Radio and Satellite.

KIRK CACERES – Meteorologist
Kirk has worked at the NWS in Brownsville for 9 years. He is originally from Louisiana and graduated with a B.S. in Meteorology from the University of South Alabama. Before arriving in the Rio Grande Valley, he previously worked at weather service offices in New Orleans, LA; Mobile, AL and Williston, ND. He also serves as the Aviation and Climate program leader.

CHRIS BIRCHFIELD – Meteorologist
Chris is originally from Ohio and earned his B.S. in Atmospheric Science from The Ohio State University. His NWS career started as a student volunteer with the Baltimore/Washington WFO before accepting a full-time position in Brownsville, TX, where he has been since mid-2014. His program leadership duties include Marine, Cooperative Observers Program, Upper Air, Social Media and Goodwill.

RICK HALLMAN – Meteorologist
Rick has been a meteorologist at the Brownsville WFO since October 2016. Rick received his B.S. in Meteorology from Penn State then worked as a meteorologist in the private sector for 12 years before joining the NWS in 2016. He is the program manager for the Winter Weather and Fire Weather programs and assistant manager of the Upper Air and Hydrology programs.

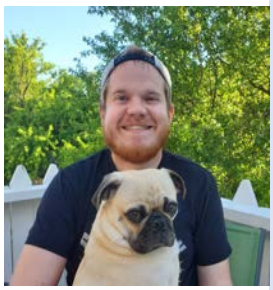
MEET OUR STAFF

MATTHEW BRADY - Meteorologist
Matt is from Orlando, Florida and graduated with a B.S. in Meteorology from Florida State University. Matt worked as a meteorologist in the private sector for 3 years prior to joining the NWS in Brownsville in 2016. He served as program leader/co-lead of the Tropical, Decision Support Services and the Doppler Radar programs. Matt said goodbye to the RGV transferring to the New Braunfels WFO serving the Austin/San Antonio area in late October.

BRIAN MEJIA - Meteorologist
Brian is from the RGV and went to school at the University of Oklahoma where he earned a B.S. in Meteorology. After college he worked as a weather producer at Channel KRGV 5 before moving to Oklahoma serving as a weather observer for the OKC airport. In 2016 he joined the NWS in the Monterey/Bay Area transferring to the Brownsville office in 2018. He serves as the focal point for Graphical Forecast Editor/Interactive Forecast and Prediction System.

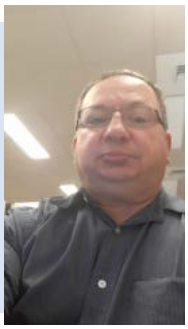
LAURA FARRIS – Meteorologist
Laura joined the NWS in Brownsville in 2018. She is originally from Katy, TX and went to school at Texas A&M University where she earned her B.S. in Meteorology. She also received her M.S. in Oceanography also from Texas A&M. After graduation she joined the NWS here in Brownsville.

AMBER MCGINNIS – Meteorologist
Amber is originally from Omaha, NE and went to school at the University of North Carolina-Charlotte earning a B.S. in Meteorology. Once she graduated, she accepted a job in the private sector in Kansas where she worked for over 5 years. In February of this year she joined the NWS Brownsville/Rio Grande Valley.



BRIAN ADAMS – Meteorologist
Brian is our newest meteorologist here in Brownsville. He is originally from Reading, PA and went to school at Penn State. After graduating with a B.S. in Meteorology he worked in the private sector for a company first as an intern, then as a full-time meteorologist for over 5 years. He started his career here at the Brownsville/Rio Grande Valley WFO in June.

MEET OUR STAFF



PABLO GONZALEZ - Information Technology Officer (ITO)
Pablo earned his B.S. in Computer Science from University of Texas at Austin, Masters in Management Information Science from Texas A&M University and a Masters in Computer Science from the University of Texas-RGV. He served 3 years enlisted in the Army, 20+ years as an Army Officer and served in Grenada, 1st and 2nd Gulf Wars. He has been with the NWS here in Brownsville for 7 years.

ALAN DEL CASTILLO - Electronic Systems Analyst (ESA)
Alan joined the NWS in 1994 here in Brownsville. After high school Alan joined the Navy going into the electronics program, then advancing into the computer science field. He went to UT and received training in Computer Science. Alan retired from the Navy in 1994 before joining the NWS Brownsville. He took an ESA position at NWS Corpus Christi in 2005 returning to Brownsville in 2018. Alan will be retiring in August 2021 after 26 years, 7 months of service.

GREGORY SAUNDERS -Electronics Technician
Greg was in the USAF from 1979 to 1995 where he specialized in air traffic control radar maintenance. After he retired from the Air Force, he continued in the field of repairing weather transmitters, where he met numerous employees of the NWS. In 2018 he joined the NWS here in Brownsville.

MICHAEL GONZALES –Electronics Technician
Michael is from Brownsville and after high school he joined the Air Force. When stationed in Abilene, TX he began his foundation of Radio Frequency. In 2007 he became a defense contractor in the US drone program before L-3 Communications recruited him. At L-3 he worked satellite communications and networks for every branch of the service as well as other agencies. In 2017 he joined the NWS in Boulder, CO before transferring to Brownsville in 2020.

RACHEL GIL- Administrative Support Assistant
Rachel began her federal career at the Immigration & Naturalization Office in January 1993. In 2000 she began her career here at the NWS in Brownsville where she has been for 20 years.

FIRST HURRICANE

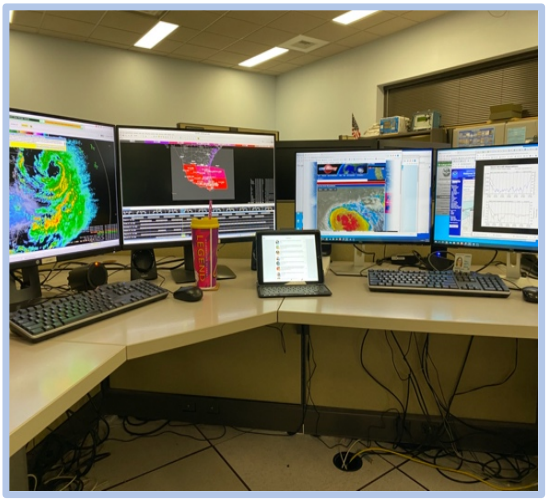
By Amber McGinnis

This past July Hurricane Hanna made landfall along the Padre Island National Seashore as a Category 1 hurricane, this season's first hurricane and the first landfalling hurricane to the Rio Grande Valley/Deep South Texas region since Hurricane Dolly in 2008. This storm was my first landfalling hurricane as a Meteorologist for the NWS. I started my career at the NWS Brownsville in early February after nearly 6 years as a private sector forecaster where I have forecasted and prepared others for Tropical Storm and Hurricane impacts from the safety of a landlocked state.

On July 22nd it was evident that Tropical Depression 8 would strengthen and soon become a Tropical Storm headed towards the Lower Texas Coast. I got a call that afternoon that Tropical Operations and 12-hour shifts were going to be implemented through the storm. I had no idea what I was getting into, and to be honest I was nervous.

Going into the office just before midnight, I was pumped, my first tropical system. This seemed more "real" to me since the storm was headed for the Lower Texas Coast. I quickly acclimated to the fast-paced environment and was impressed with the level of internal and external coordination that took place. My duties for the storm were to keep up with social media, making graphics and assisting in any way I could. I was busier than I have ever been. We had staff working on short- and long-term forecasts, hurricane forecasts and warnings, and thunderstorm and flood warnings. We were collaborating with the National Hurricane Center and neighboring NWS offices, coordinating with emergency managers and elected officials, collecting storm reports, and more. It was a flurry of activity with twelve hours feeling like two.

Ready for a 12-hour shift!



My set up during Tropical Operations

All Hands-on Deck! Photo taken by Chris Birchfield.

Damage from Port Mansfield on day 1 of storm surveys.

On the morning of July 26th, things got more exciting in the office. Just before 3:30 AM radar indicated a tornado in Mexico moving north. This storm had what we refer to as a Correlation Coefficient (CC) drop - telling us debris was being lofted into the air. We had a confirmed tornado, and it was headed straight for our office. A tornado warning was issued, and we took shelter, leaving the Lake Charles office to take over temporary operations for us. I remember going into shelter wondering if I would hear the tornado and if my car would still be in the parking lot when we got out. As a Midwest girl, I must admit I was excited. Fortunately, we did not take a direct hit, but a tornado was confirmed about one-half mile from the office.

When tropical operations ended and the storm passed, I assisted on storm surveys for two days. We began in Port Mansfield and Raymondville, where we saw evidence of the storm's surge, structural damage, powerlines down, and debris left over from the relentless winds. On the second day we went into western Cameron and eastern Hidalgo Counties to document extensive flooding. Everywhere you looked there was evidence from Hanna's force, it was surreal. I had so many emotions talking with locals and seeing the loss wishing I could do more to help. I also knew how lucky we were, it could have been so much worse.

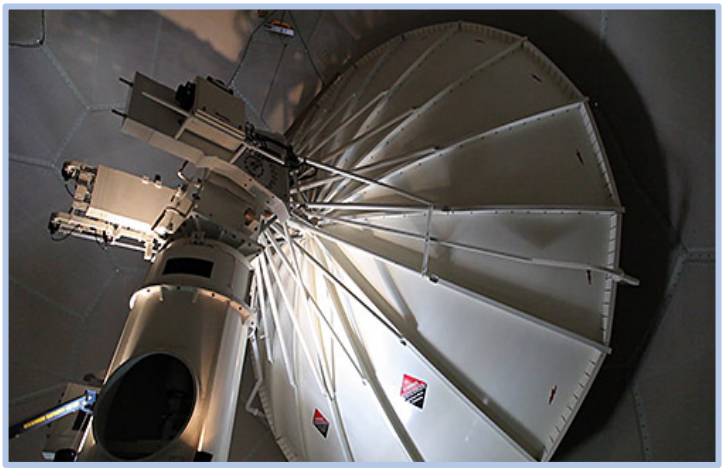
Afterwards, it took a few days to settle back into normalcy as I had been in a constant "go" mode for a week with the 12-hour shifts, little sleep, lots of coffee and activity all around. I cannot praise my coworkers enough for all their hard work and dedication throughout the entire event, it truly was inspiring. While it was exhausting, it was also the most rewarding experience in my career thus far. No matter how many Tropical Storms or Hurricanes I will be a part of here at the NWS, Hanna will always be the storm that bonded me to the Rio Grande Valley and solidified the mission to protect life and property.

For more information on Hurricane Hanna please visit:
https://www.weather.gov/rgv/2020event_hanna

DOPPLER RADAR

By Matt Brady

Brownsville Radome



Radar Antenna

Have You Wondered How the NWS WSR-88D Doppler Radar Works and how meteorologists receive and use data?

The Weather Surveillance Radar - 1988 Doppler (WSR-88D) is composed of a large antenna inside a radome (pictured) that sends out short bursts of radio waves, called pulses, as the antenna rotates 360 degrees. When the WSR-88D transmits vertical and horizontal pulses of radio waves, the system keeps track of the phase (shape, position, and form) of the transmitted radio waves. These transmitted radio waves move across all directions of the atmosphere at about the speed of light until it hits a hydrometeor/target and reflects or returns the radio waves back to the radar in all directions across the atmosphere.

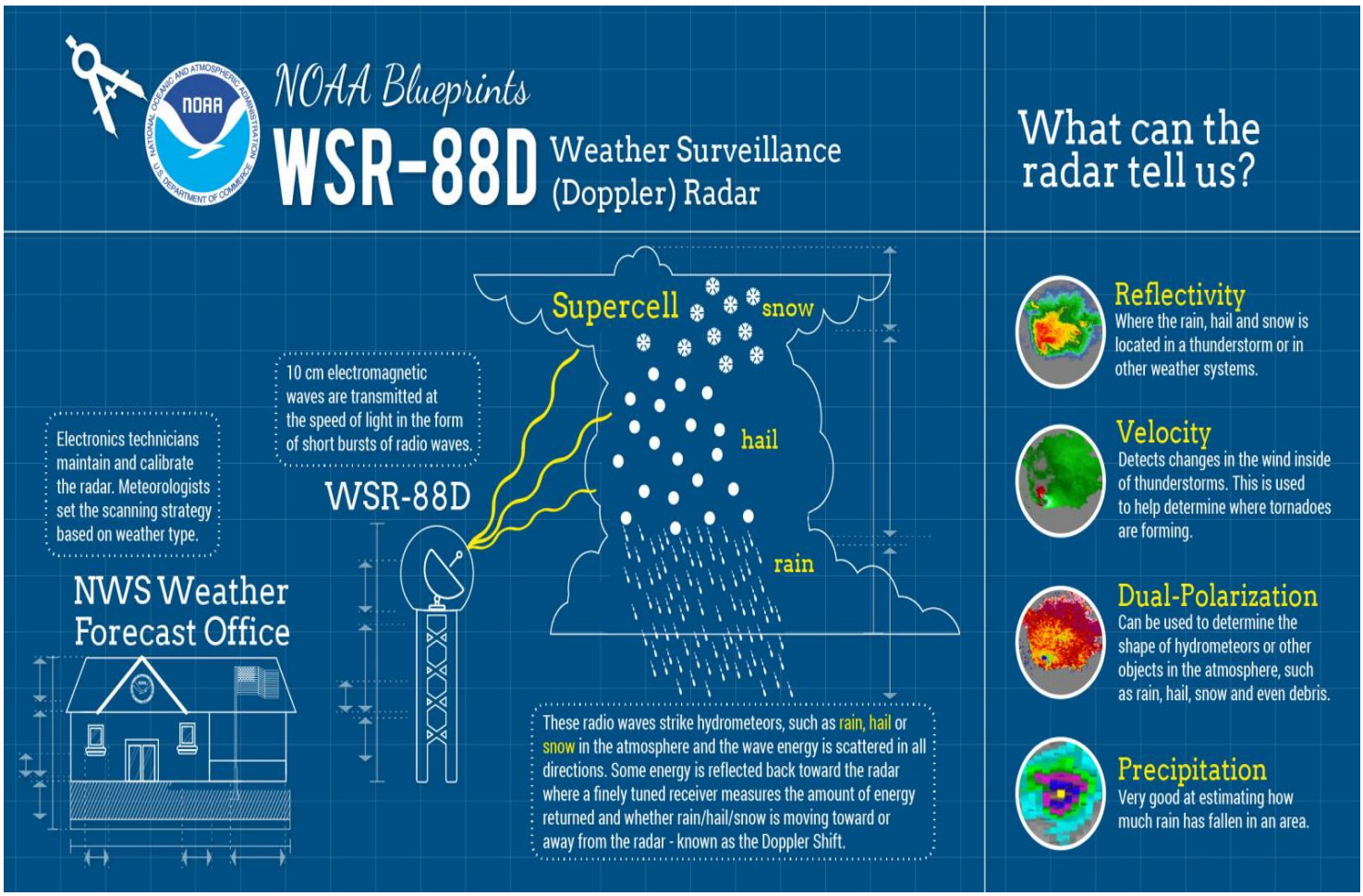
The WSR-88D features a long period to “listen” for the returned radio waves back to the antenna. By determining the direction in which the antenna was pointed when receiving the returned radio waves, the direction and distance of the hydrometeor/target is known. Generally, the better the hydrometeor/target is at reflecting radio waves (i.e., more raindrops, larger hailstones, etc.), the stronger the echo, will be. As a result of stronger reflected radio wave energy, the WSR-88D can determine the shape and size of the reflected radio waves.

DOPPLER RADAR CON'T

The WSR-88D can also detect the movement and velocity characteristics of the various reflected radio waves as a result of how close or far away the target is from the WSR-88D based on the frequencies of the returned radio waves. Due to this process, this gives the ability to calculate the movement and velocity of the hydrometeor/target as well.

Meteorologists at the NWS analyze these returned echoes or reflected radio waves to determine what type of weather is occurring, such as snow, strong winds, thunderstorms, hail, and tornadoes. The WSR-88D is a very important tool to NWS operations as it helps allow meteorologists determine when impactful weather events are occurring, such as severe thunderstorms and tornadoes. to provide weather, water, and climate data, forecasts and warnings. This helps the agency meet its mission or the protection of life and property and enhancement of the national economy.

For more information on the Doppler Radar, visit:
https://www.weather.gov/jetstream/doppler_intro



PELICAN WATCH

By Rick Hallman

On December 8th, 2016, an arctic cold front arrived with gale force winds gusting at 40 mph, light to moderate rain, and a temperature drop of nearly 40 degrees in 36 hours. Upon finishing the holiday luncheon at our office, a few of the newer employees to the NWS Brownsville/Rio Grande Valley office, including myself, wanted to travel to South Padre Island and experience gale conditions along the Gulf coast and across the Laguna Madre. Shortly after dark, while heading back to Brownsville, we encountered a gruesome scene along Highway 48. At least a dozen native Brown Pelicans were dead, dying, or standing along the roadway near the Carl "Joe" Gayman bridge and Bahia Grande. Unfortunately, by the next day, we learned over 70 pelicans were killed on the roadway.

We've all seen the "Watch for Pelicans" signs along the coastal roadways and bridges but had yet to experience any birds on the local roadways. Since the Bahia Grande and surrounding wetlands were brought back to life, the area has once again become a popular roosting ground for brown pelicans. After large pelican losses during the 2013-2014 winter season, the Texas Department of Transportation (TXDoT) installed multiple 8-foot-tall poles every 15 feet along some of the favored landing spots and bridges. Local social media posts blame the speed limit and concrete barriers in the middle of the highway, that had also been added in recent years, potentially creating turbulent wind fields or downdrafts along the bridge. The theory is these wind fields or downdrafts force pelicans to the ground or prevent pelicans from being able to take off in time to miss motor vehicles.

Photo Courtesy of Rick Hallman

Map highlighting areas where most pelican landing occur near the coast.

PELICAN WATCH CON'T

Ten days later, another strong cold front dropped temperatures over 40 degrees in 36 hours, with light drizzle and strong winds, gusting to 35 mph. Around a dozen pelicans were killed in the same location. Early January 2017 saw another front drop temperatures nearly 40 degrees in 36 hours with light rain and strong winds, gusting to 30 mph. Nearly two dozen pelicans were killed. In all, over 100 pelicans were lost during the 2016-2017 winter season. The first strong cold front of the 2017-2018 winter season brought a temperature drop of 39 degrees, winds gusting to 30 mph, and light to moderate rainfall. Over 30 pelicans were killed along near Bahia Grande. Setting any man-made cause aside, there's a very clear weather pattern associated with these events. During the winter of 2017-2018, our office began issuing graphics for a "Pelican Watch" during these cold fronts. While, technically, there is no official Pelican Watch product, our messaging was just as strong, and this effort will continue to be important to our office.

A Pelican Watch group was brought together on social media and staged near these areas for the remainder of the 2017-2018 winter season. Local law enforcement and mobile electric "Watch for Pelicans" signs were also in place to alert motorists. It was estimated that more than 300 pelicans were saved that season due to the efforts from volunteers, law enforcement, news media, and our office. The first strong cold front of the 2018-2019 winter season, in mid- October, coincided with over 40 pelicans being hit and killed. Last year, the first strong cold front, also in October, coincided with 16 pelican deaths.

I'm not sure how active the volunteer groups are today, as the story doesn't get as much publicity as it did a few winters ago. I do know that TxDOT has replaced the outer concrete barriers along these areas with a more open rail during the summer of 2020. This winter, I remain optimistic that these changes will alleviate the bulk of the issue, but we hope motorists remain vigilant. When the pattern emerges and we're fairly confident in a strong cold front bringing temperatures down nearly 40 degrees with strong winds, our office will begin messaging a Pelican Watch. We urge you to spread the word, share the graphics, remain cautious, and keep an eye out for our pelican friends when these strong cold fronts arrive.

Photo Courtesy of Rick Hallman

Photo Courtesy of Amber McGinnis

READY, RESPONSIVE, RESILIENT - AND *RECOVERY: PROTECTING LIFE AFTER LAURA*

By Barry Goldsmith

Just after midnight on August 27th, 2020, Hurricane Laura - the most impactful hurricane to strike the U.S. in a very busy 2020 Atlantic Hurricane season - slammed into southwest Louisiana. The eyewall - the area of strongest winds, soon ravaged the city of Lake Charles with wind gusts in excess of 130 mph. These winds heavily damaged or destroyed many structures in the area, and would rip out nine critical transmission lines, knocking out power to most of the region for weeks. On August 26th, hours prior to landfall, the staff at the NWS office in Lake Charles evacuated the facility for safer territory and shifted all forecast operations and telephone service to NWS Brownsville/Rio Grande Valley. The decision proved to be the right call, as the office's radar was destroyed, and communications capability was decimated. NWS Brownsville/Rio Grande Valley continued the critical pre-event message of urgency to evacuate and/or hunker down, then provided life-saving warnings for extreme wind and rainfall flooding as Laura ripped through.

Of equal or perhaps greater importance was what happened *after* Laura moved by. As the event was winding down, NWS Brownsville/Rio Grande Valley sprung into "recovery" message mode. Using our experience from Hurricane Hanna (July) and the knowledge that a majority of casualties from hurricanes occur *following* the storm (Rappaport and Blanchard, 2016, Figure 1), public safety information was provided for the following potential hazards:

Generator Safety Tips
Preventing Injury After Storms
Food and Water Safety
Heat Safety
Lightning and Flood Safety in Recovery

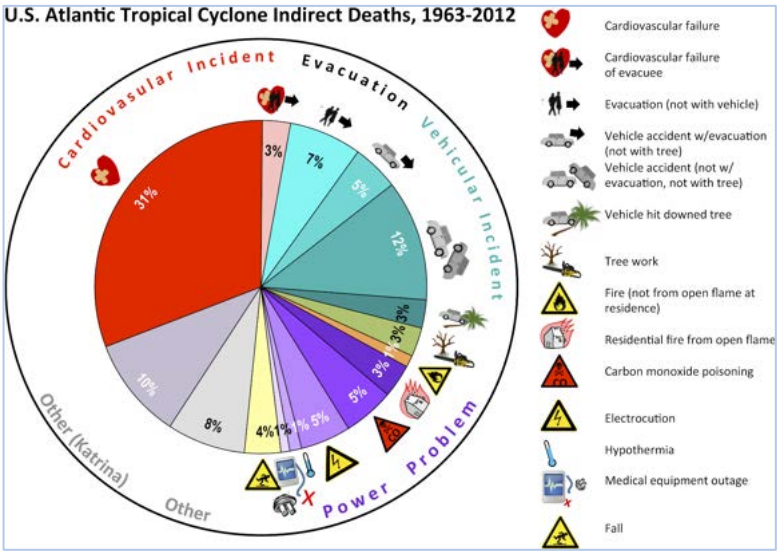


Figure 1: U.S. Atlantic Basin Indirect Tropical Cyclone deaths, 1963 to 2012 (from Rappaport and Blanchard, 2016)

The information was provided on all platforms for weeks following the storm, including social media, the NWS Lake Charles web page, and emergency management and media partner e-mails. Figures 2 and 3 show examples (slides) for Generator Safety Tips and Preventing Injury After Storms.

With power outages expected to last for weeks through the heat and humidity of September, critical messaging shifted to heat safety. Three NWS offices serving Louisiana and east Texas collaborated to temporarily adjust the southwest Louisiana and far southeast Texas Heat advisory threshold. NWS Brownsville/Rio Grande Valley would issue a dozen Heat Advisories using this new threshold between August 29th and September 15th, 2020.

Though there were an unfortunate number of indirect casualties from Laura, including 14 deaths and 18 injuries from carbon monoxide poisoning, 4 deaths from heat related illness, and 2 deaths from other causes, there could have been many more without the consistent and persistent safety messaging during the prolonged recovery phase. The efforts made by NWS Brownsville/Rio Grande Valley are a template for other NWS offices and key public safety partners to follow after future weather hazards - from hurricanes to heat.

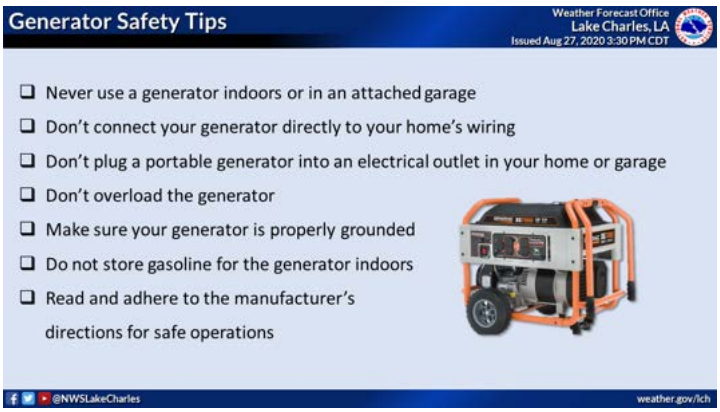


Figure 2: Generator Safety graphic used on the web and social media associated with the Lake Charles NWS Office during the recovery period after Hurricane Laura.

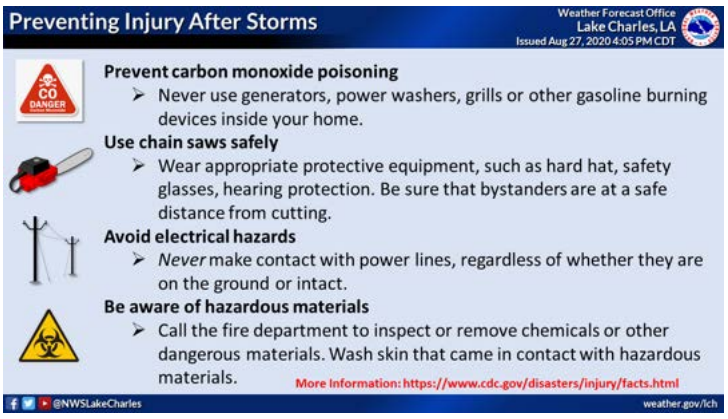


Figure 3: Same as Figure 2, except for Preventing Injury After Storms.

THE NATIONAL WEATHER SERVICE BROWNSVILLE/RIO GRANDE VALLEY
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NWS Mission

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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