# THE COASTAL BREEZE

Volume XI, Issue 3 Summer 2023

Brownsville/Rio Grande Valley

## HAPPY SUMMER!

It's been quite busy here the the National Weather Service over the past few months. We have been gearing up for Hurricane season (which runs through November 30th), staying busy early in the season with multiple severe weather events and dealing with record-breaking heat!

In this issue you will learn about Hurricane formation and get a bit of a history lesson on past hurricanes (and events surrounding them), learn about streamer showers, which are quite common, especially across our coastal waters, and learning about some of the activities we have been participating in and more!

Hope you enjoy this issue and stay cool!

**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**

## *In this Issue*

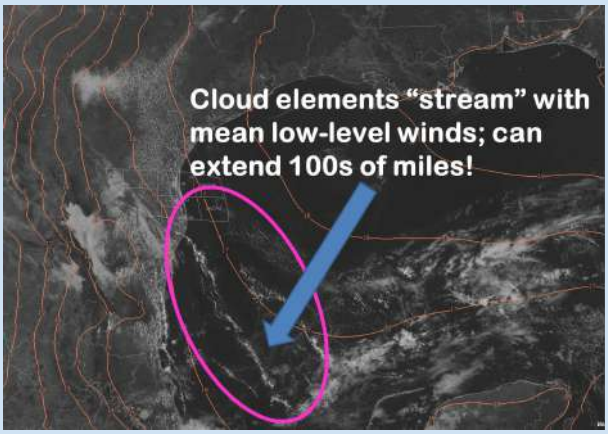
## (A)MIC MINUTE

By Joshua Schroeder, Science and Operations Officer at NWS Brownsville/RGV

Greetings! I hope everyone's summer is off to a great start. I am filling in for our Meteorologist-In-Charge(MIC),Mike Buchanan, while he takes some well-deserved vacation. Oftentimes, our focus in the summer months turns to hurricane season (with good reason!), but for this edition, we'll take a little different tack.

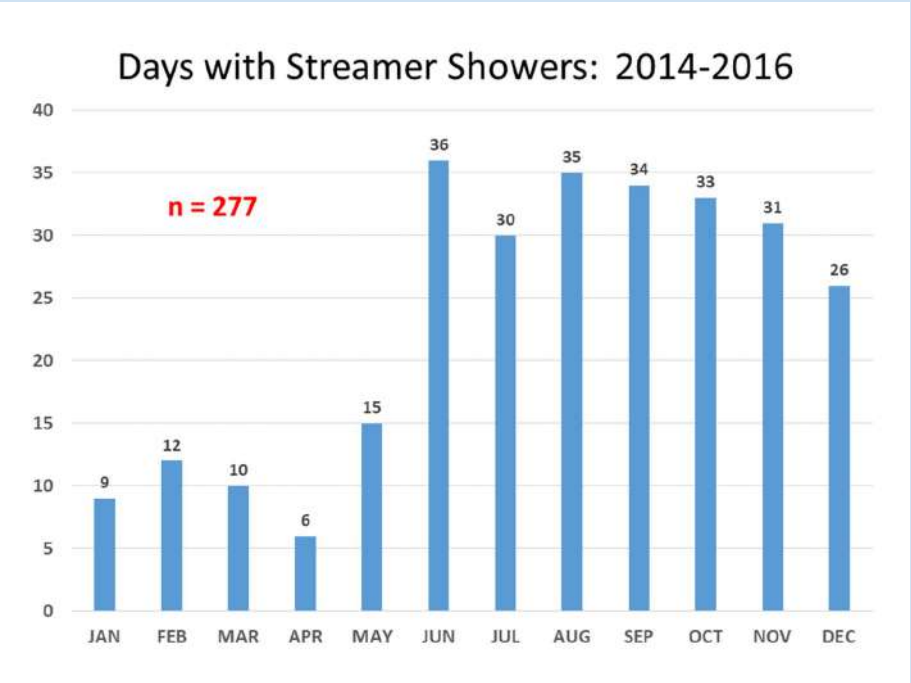
Have you ever been outside on a summer morning, usually within an hour or two of sunrise, and been surprised by a brief sprinkle or light rain shower? Chances are, you were hit with a "***streamer***" shower. In the weather business along the Gulf coast, these light, nocturnal showers, are known as streamers. Although no formal meteorological definition exists, the term "streamer shower" was included in local Area Forecast Discussions more than **900 times** during 2017! And more than 300 of these mentions were from your very own Weather Forecast Office Brownsville/Rio Grande Valley.

Streamer showers are colloquially named for their long, narrow, "twisting" appearance in satellite and radar imagery.They move with the winds in the lowest 3-4 thousand feet of the atmosphere, usually from southeast to northwest, and can extend for hundreds of miles across the Gulf of Mexico, under the right conditions. The southwest to northwest motion sometimes brings them inland, especially close to the coast. Streamers have been noted in all months of the year, but strongly favor the June through November timeframe when sea-surface temperatures are near or exceeding 80ºF. They are sometimes a harbinger of sea-breeze thunderstorms to come later in the day, but streamers can form without the depth of atmospheric moisture needed for daytime thunderstorms.




Above: Visible satellite image of streamr clouds in the Gulf of Mexico May 19,2018'

Below: Radar Image of "streamer" showers moving north on June 21st, 2020.




*Bar graph of the number of days with streamer showers evident in radar data for each month of the year during the 2014-2016 period.*

Some more facts about “streamer” showers:

- They are most common along the Lower Texas coast between the months of June through December (28-40% of days), with a minimum between January and May.
- Streamers are mainly a late night/early morning phenomenon, typically initiating between 4:00-5:00 am.
- They tend to last for 2 to 3 hours, though this time can vary considerably.

I hope to one day ensure that streamer showers are officially defined in the American Meteorological Society’s *Glossary*: https://glossary.ametsoc.org/wiki/Main_Page. In the meantime, for more information, you can view the complete results of a local office study on streamer showers conducted in 2019 on our webpage at https://www.weather.gov/media/bro/research/pdf/Schroeder_Streamer-NWA-2019.pdf.

Until next time,

Joshua Schroeder

**Hurricane Season, Now and Forever:**
**Are We Truly Ready for the "Big One?"**

By Barry Goldsmith

As the Atlantic Hurricane Season heads towards its August and September peak, residents of the Rio Grande Valley and Deep South Texas ranch country must ask ourselves: "How prepared are we, actually?" Consider the following notable events of the distant and recent past:

- 2023 marks the 90th anniversary of the famous "Labor Day Hurricane of 1933" (Also known as the Cuba to Brownsville Hurricane). Up to 40 persons died, and several hundreds were injured, across the Valley on both sides of the border. Read the story here.

- Spring 2023 saw severe weather between late April and early June that caused at least $50 million in damage, mostly from windstorms – but also the tragedy of the Laguna Heights tornado on May 13th, which killed one and injured eleven others in poorly built structures.

- Hurricanes Dolly (2008) and Hanna (2020) caused a total of more than $3 billion (estimated) property damage from flooding rains and wind.

    - Each were Category 1 wind events, with very little storm surge along the Cameron/Willacy County coast. The last notable storm surge events were from tropical cyclones that made landfall far away from our shores – Laura, Beta, and Delta (2020) and Ike (2008).

    - The last memorable hurricane-related storm surge was 43 years ago, when Hurricane Allen struck the Lower Texas coast.

**1933 Labor Day Hurricane, Today**

The long-track major (Category 3 or higher) hurricane tracked directly over the north side of the City of South Padre with 125 mph wind, then through Los Fresnos/San Benito, still with wind 105 mph or higher, then just south of La Feria/Mercedes. In 1933, reports from the U.S. side of the border confirmed that the majority of casualties were from heavily damaged or destroyed buildings. In 2023, the population over the area traversed by the eyewall has grown ten-fold, with up to 500 thousand persons at risk. Unfortunately, there may be an equal or higher percentage of substandard buildings along the track. The City of South Padre Island, once a sleepy beach with access to the mainland only by boat, is now filled with well over $1 billion in property for tens of thousands of visitors. An 8+ foot storm surge with violent waves would be unprecedented given the late 20th and 21st century development.

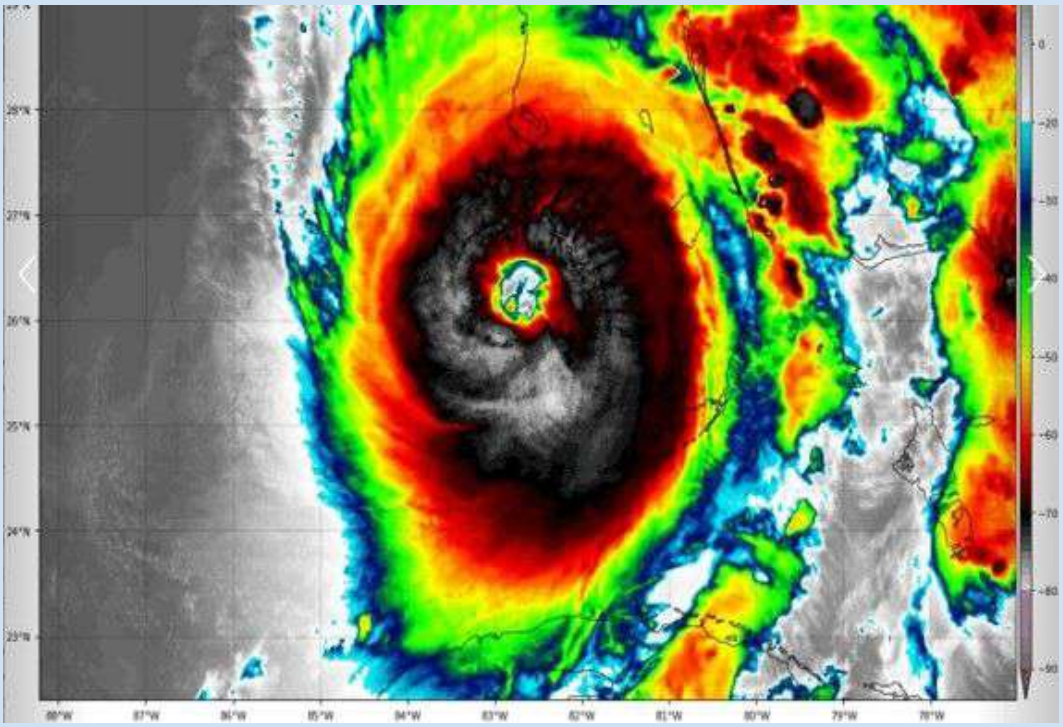
Above: Damage photos in Brownsville and Harlingen
from the 1933 Labor Day Hurricane.

The changes from 1933 to 2023 must be considered in context of preparedness/mitigation, response, and recovery should the next 1933 Labor Day Hurricane come this year or any year. Preparedness/mitigation (risk reduction through resilience building) is most important, especially for the thousands of buildings that may not be rated to sufficient wind code standards, especially in Cameron but also for much of populated southern Hidalgo County. Evacuation plans and decisions are second most important – ensuring the population that needs to leave is able to leave in ample time. Finally, recovery planning is crucial to ensure that these areas can “get back on their feet” as soon as possible – rather than weeks or months.

**Allen (1980), Meet Ian (2022)**

Hurricane Allen, on approach to the Lower Texas coast in early August, 1980, was the sum of all fears for the “lower” Valley. Less than 24 hours from a projected landfall near the mouth of the Rio Grande, Allen carried winds of 180 mph and a record low pressure (for the western Gulf near the U.S./Mexico border). The head of the Brownsville/Rio Grande Valley office at the time “signed off” with this memorable line very early on August 9: “May God Help Us All”. Fortunately, Allen slowed down, weakened (though still a dangerous Category 3 hurricane at landfall), and curved just far enough north for the eyewall to bypass the more populated lower Valley, which also pushed the highest storm surge to Port Mansfield and the southern end of Padre Island National Seashore.

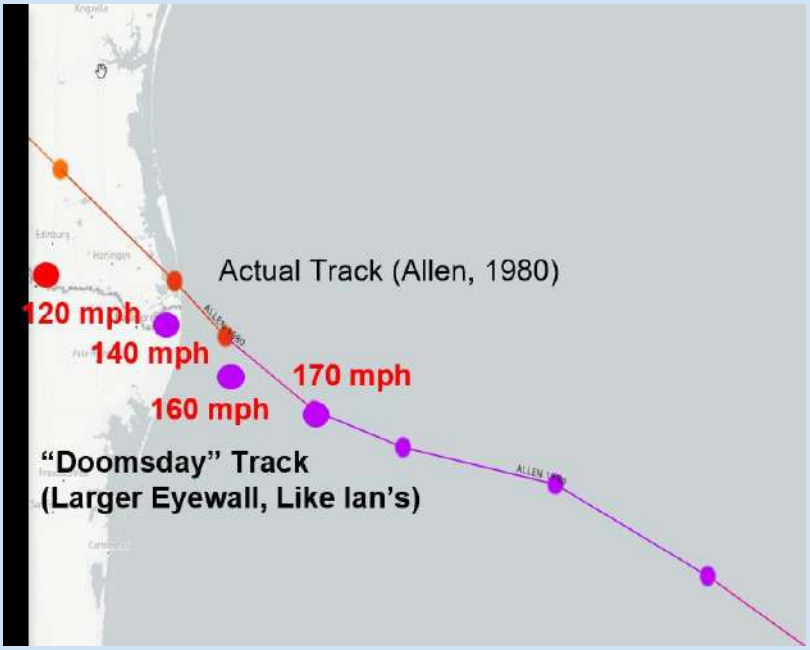
Hurricane Ian (2022) was a similar “sum of all fears” event for the Florida Suncoast in late September. On September 26th, the potential for “up to 10 feet” of storm surge inundation extended from Fort Myers to Tampa Bay. For Tampa Bay, such a level (storm surge alone) would have been an event of modern record, eclipsed only by the October 1921 hurricane more than 100 years earlier, when the population was a small fraction of 2022. Today’s Tampa Bay population has no direct experience with such a storm. Fortunately, Tampa Bay dodged the bullet – again – with Ian. Unfortunately, that was not the case around Fort Myers, where the fears for years of a massive storm surge became reality. The combination of devastating storm surge – upwards of 15 feet in some cases, winds over 100 mph, and record/near-record inland rainfall in south-central Florida led to the third-most destructive Atlantic hurricane to strike the U.S. on record ($112.7 billion), with only Harvey (2017) and Katrina (2005) with more dollar damage. The vast majority of Florida’s damage was from water, owing to the state’s very stringent windstorm code. Without that code, damage totals would have been much larger. Sixty-six persons died in Ian, most from water – not wind.



Above: Infrared satellite photo of Hurricane Ian just prior to landfall on the southwest Florida coast on September 28, 2022

Imagine, then, a version of Allen with a much larger eyewall and radius of maximum wind (like Ian) making a direct strike on Boca Chica Beach to the City of South Padre Island, then slowing down while moving through southern/central Cameron County before tracking along Interstate Highway 2. This would truly be our “sum of all fears” hurricane: Storm surge higher and more violent than

Beulah (1967); winds stronger, for a longer time, than the 1933 Labor Day Hurricane, and rainfall over 20 inches in many Valley locations – equal to or worse than Beulah.




Above: Actual (top line) and "doomsday" (bottom line) track and intensity for Hurricane Allen

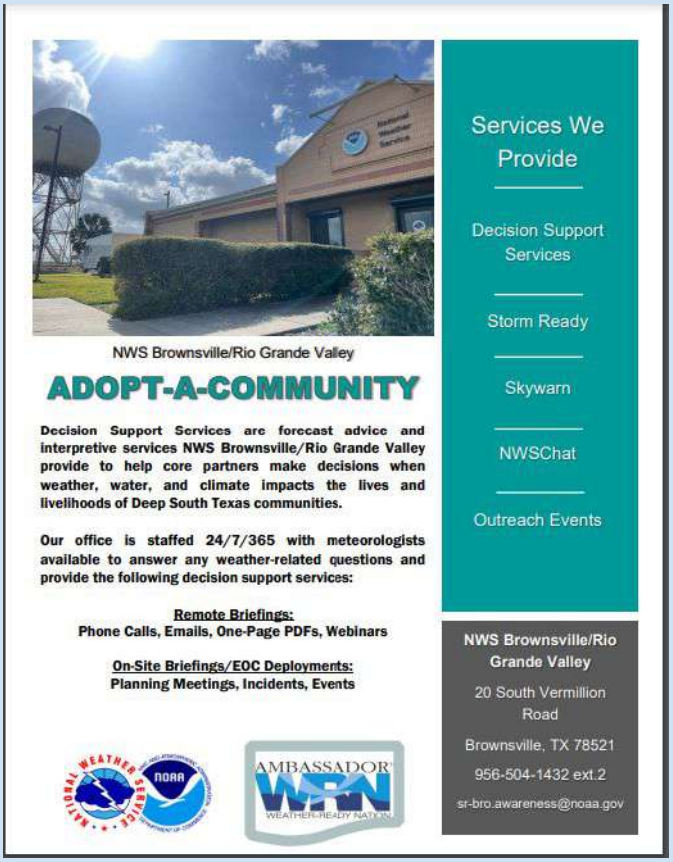
The potential devastation is almost unimaginable, as a population of more than 1 million residents would be directly impacted. The initial impact of widespread 100 to 125+ mph winds would create incredible damage to thousands of substandard-construction buildings; the one-two day period of flooding rain would create several feet of water in many poor drainage locations, and the combination of wind, rainfall, and storm surge would render South Padre Island and Boca Chica inaccessible and perhaps uninhabitable. Initial Valley-wide recovery would take weeks to months, with more permanent recovery at least a year.

It *might* not have to be quite this bad. Understanding the 1933 Labor Day Hurricane in context of the lower Valley in 2023 can create a canvass of potential worst-case scenarios. Layering a direct landfall of 1980's Hurricane Allen, then overlaying the size of 2022's Hurricane Ian, can paint the picture of the expected scope of devastation. At this point, the planning can begin. Planning to build regional resilience sufficient to minimize devastation, then upgrade readiness, response, and recovery plans to ensure life-safety first and foremost.

It's a daunting task. But incremental actions can make a difference in the long term. And make the entire Rio Grande Valley truly ready for the "Big One".

## CACERES AND MILLER BRIEF HARLINGEN CITY COUNCIL ON ADOPT-A-COMMUNITY

By Brian Miller




Adopt-a-Community Flyer. Design credit Angelica Soria.

On Wednesday, April 19, 2023, Kirk Caceres and Brian Miller briefed the Harlingen City Council on the Adopt-a-Community program and the services we can provide. Kirk and Brian are the focal points for the Adopt-a-Community program in the city of Harlingen. The briefing focused on Decision Support Services. Kirk showed the mayor and commissioners a couple of examples of one-pagers (one-page briefings). The briefing was well received. Commissioner Daniel Lopez said he had seen our one-pagers and found the information on point and valuable. City Manager Gabriel Gonzalez asked to follow up with Kirk about the storm ready aspect of the Adopt-a-Community program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Harlingen Town Hall meeting room. Photo credit Brian Miller

## NWS BROWNSVILLE HOSTS ANNUAL HURRICANE WORKSHOPS

By Amber McGinnis

The National Weather Service Brownsville/Rio Grande Valley annually hosts Hurricane Workshops for local Emergency Managers and Media. These workshops are attended by several members of Emergency management offices across Deep South Texas and the media. These workshops are essential in educating our local partners and allowing us to continue facilitating and growing our relationship with them.

On May 24th we hosted the 13th Annual RGV EM Partners Workshop in Mercedes, TX. The Tropical Team (Co-leads Kirk Caceres and Amber McGinnis and team member Jeremy Katz), along with Meteorologist Mike Buchanan and Warning Coordination Meteorologist Barry Goldsmith, were all in attendance. Topics covered were: ***2022 Season Review: What The Valley Can Learn From Ian***, and ***2023 Season Forecast, and What It Means to You*** (Barry Goldsmith), ***Update on Products/Information and Messaging from the National Hurricane Center and NWS Brownsville/Rio Grande Valley*** (NWS Brownsville), ***Remembering the Deadly 1933 Labor Day Hurricane***, and ***An Update on Wind Resilience Efforts in Historically Underserved and Socially Vulnerable Communities of the RGV*** (Barry Goldsmith), ***FEMA Hurricane Prep*** (Arianne Thomas, Regional Hurricane Program Manager, FEMA Region VI, and Billy Rhodes, Region VI (Texas) Hurricane Planner).

On May 25th, we hosted the 10th Annual Rio Grande Valley Media Partners Workshop at Entravision Communications in McAllen, TX. The workshop lined up with the live press conference announcing the NOAA Atlantic Season Outlook, which was a great way to kick things off the workshop. Much of the same topics from the NWS were presented at this workshop as at the Emergency Manager workshop.

Pictured Above: Eric Salinas, Robin Gwenn Gomez, Jeremy Katz, Barry Goldsmith, Amber McGinnis, Kimberly Salinas and Michael Buchanan at Entravision. Photo Courtesy of Kimberly Salinas.

Both workshops ended with discussions how prepared Deep South Texas is for a potential major Hurricane landfall.

## HOW DO HURRICANES FORM AND GROW?

By Dr. Jeremy Katz

Living along the Gulf Coast comes with the looming threat of hurricanes every summer and fall. Even now as we move into October, hurricanes are still a threat to our area. While we start to see more and more fronts that act as a barrier to our area to keep hurricanes out. There is still the possibility that a hurricane could sneak in at the end of the season and impact our area. It is important to be weather ready in case a hurricane or any significant weather event.

Hurricanes are some of the most costly and deadly natural disasters. While track forecasting for hurricanes has greatly improved, our ability to forecast for their intensity has not improved as much. Research into hurricane intensity is a very active field in meteorology. Hurricane forecasts rely on various numerical weather models to come together that are interpreted by meteorologists to create the track and intensity forecast. However, a big struggle for all of these models is trying to forecast for a hurricane that has yet to form. The genesis of a hurricane is something that is difficult for the models to work with. Let's first go over the conditions that are needed for the initial formation of a hurricane.

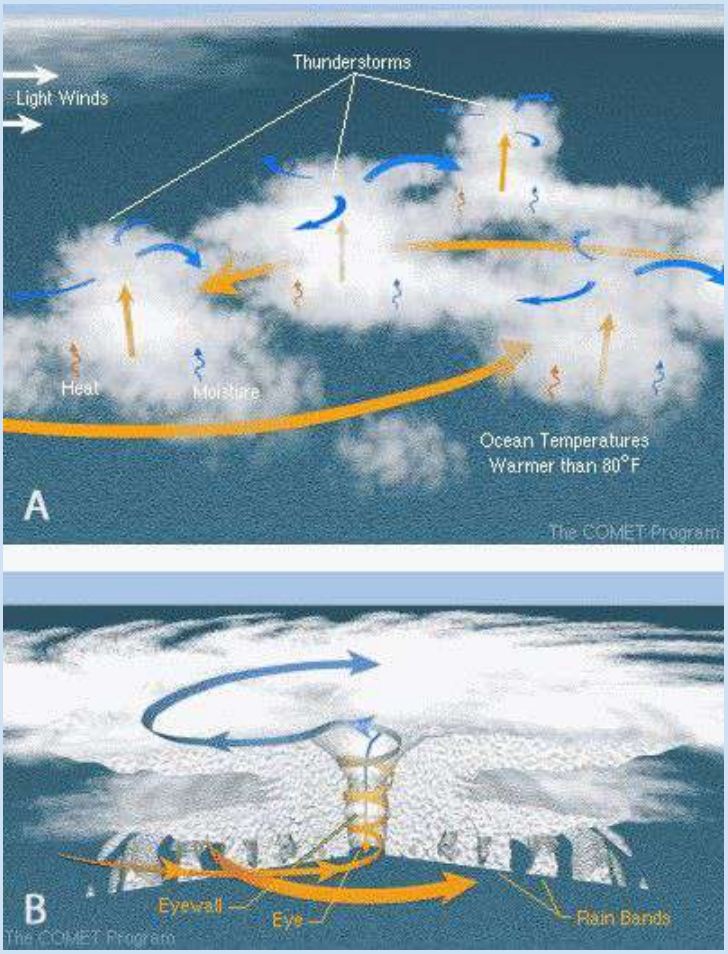
- A pre-existing weather disturbance, such as a tropical wave
- Warm water with temperatures around 80 degrees Fahrenheit
- A moist environment
- Low wind shear
- 5 degrees of latitudinal distance from the Equator
- Conditional instability

These are the ingredients that will start the development of a hurricane. At this stage, they can be either a tropical depression or a tropical storm depending on how quickly and efficiently all of the ingredients came together. Weather prediction models have different biases that forecasters must work through. Some models will see that some of our list of ingredients are present and will try to bake up a storm, while other models will see that list of ingredients and say those ingredients are not enough to bake that storm. Forecasters need to examine the ingredients and draw their own conclusions in these scenarios.

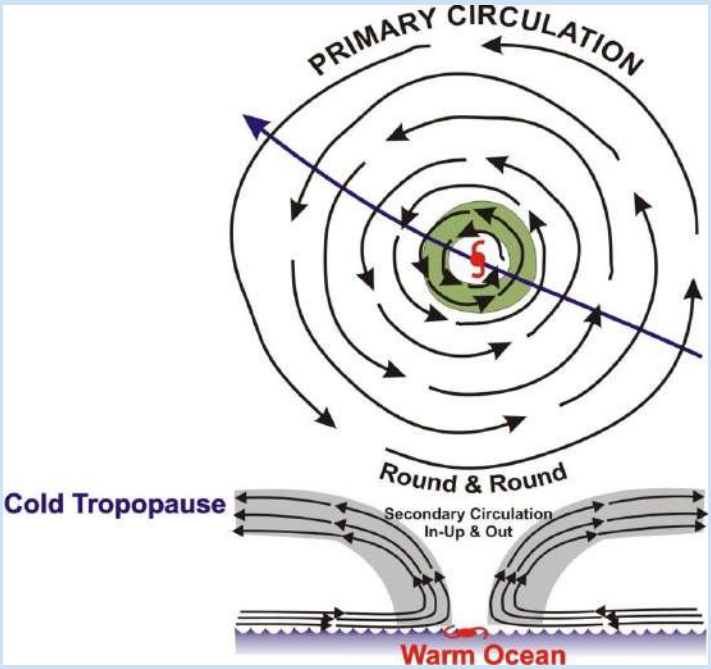
A forecaster cannot always use the same model for every storm. One model

can do poorly with one storm, but can be fantastic for another storm. This is just one of the various struggles of forecasting.

We have gone over how hurricanes form, but that only takes into the tropical depression and tropical storm stages of their life cycle. Hurricanes feed off the warm waters of the ocean. Hurricanes have two circulation systems that operate to take the warm energy and moisture of the oceans and transport horizontally and vertically. First, the primary circulation is the swirling winds that move in a counterclockwise motion to draw in the warm energy and moisture towards the center of the storm. Once the warm energy and moisture arrive at the center, they are transported upward by the secondary circulation, which fosters the growth of the eyewall convection. The interaction between the hurricane and the ocean is critical for understanding the intensification of hurricanes, however, getting the information that is needed to further research is very difficult. Thus, hurricane intensity forecasting has not improved as much as track forecasting.




**Above: The starting point for most hurricanes is a cluster of thunderstorms over the ocean that will then grow and develop into a hurricane. Figure taken from UCAR COMET program**




**Above:The hurricane's primary horizontal circulation and secondary vertical circulation that work together to transport warm energy and moisture from the ocean. Courtesy of Dr. Hugh Willoughby.**

If this was all that was needed for a hurricane to grow in strength, then what prevents every hurricane from becoming powerful major hurricanes? The truth is not all hurricanes reach what is considered to be their maximum potential intensity. This often happens because of wind shear, which tears hurricanes apart, the cooling of the oceans by the hurricanes themselves, eyewall replacement cycles, a process in which a new eyewall will form and replace the old eyewall, and/or the hurricane makes landfall and loses its source of energy and moisture.

**A view of the ocean surface in Hurricane Isabel (2003). Courtesy of Dr. Hugh Willoughby.**

**For more information on Hurricanes and Hurricane Preparedness, please see our Hurricane Guide 2023.**

**English** **Spanish**

## STAFF CHANGES

My name is Ben Ellzey, I am a new meteorologist here at the National Weather Service Brownsville. I graduated last year with a BS in meteorology from Western Kentucky University. I was born down here in Brownsville and grew up in Northern Kentucky.I have been interested in weather and science for as long as I remember. Outside of work, I enjoy golfing, video games, and barbeque. I am excited to be back home in the Great State of Texas and look forward to serving the community.

In May, forecaster Angelica Soria moved to the Springfield, MO Weather Forecast Office (WFO) after two years here at WFO Brownsville. Some of her accomplishments while here at Brownsville include, leading the Satellite program,co-leading the social media program, being an active member of the GFE team, creating story maps, updating our social media and web page graphics. She was active in many outreach events, IDSS activities, and she was working toward becoming deployment ready. Angelica will be greatly missed here in Deep South Texas and the office, but we wish her all the best as she continues to grow within at the National Weather Service and happy that she is closer to friends and family and far away from the tarantulas.

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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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