2023 Shareholders Report

National Weather Service
Austin/San Antonio

TABLE OF CONTENTS

A Message from Meteorologist in Charge Pat Vesper

Hi, my name is Pat Vesper. I am the new Meteorologist in Charge at the Austin/San Antonio Weather Forecast Office. I wanted to take this opportunity to introduce myself and tell you how excited I am to be here!

I joined the NWS back in February of 1991 as an intern at NWS Brownsville. After almost 3 years in Deep South Texas, I promoted to become a journeyman forecaster at the NWS Lubbock where I worked until late 1998. I then headed to Springfield, Mo. as a lead forecaster, where I had the opportunity to work weather in the Ozarks and learn about the impacts associated with low water crossings – something central Texas residents are quite familiar with as well. Finally, in late 1999, I moved back to West Texas, this time to Midland, where I held three positions. I was a lead forecaster for one year; then the Warning Coordination Meteorologist (like Paul Yura) for 12 years, and then lastly, I served as the Meteorologist in Charge of the Midland office for the past decade. Over the past 23 years in Midland, I rarely applied for other jobs. My wife and I raised our two boys and we liked West Texas. However, when the opportunity to serve as the MIC at the Austin/San Antonio presented itself, it was a very easy decision for me.

So why was it such an easy decision? Honestly, I have felt a special connection to the Austin/San Antonio office for nearly all of my 32-year career. NWS San Antonio was the first office that I visited for a familiarization trip while working in Brownsville. Back then, Al Dreumont was the area manager and a young Joe Arellano, the person I would eventually replace here, was a talented lead forecaster. I met so many people who spent decades contributing to this office and our Southern Region Headquarters.

On May 27, 1997, I was working in the operations area at NWS Lubbock when tragic news of the Jarrell tornado came across the airwaves. Similarly, the Wimberley Flood of 2015 and the catastrophic flooding in Central Texas in 2013 and 2018 were major weather events that left a sinking and helpless feeling in our hearts. It reminded us how important our mission is at the NWS. The protection of life and property is the primary part of that mission. It means identifying underserved communities and being ready to provide critical information to the public and our partners so they can make informed decisions to protect themselves, their families, and our communities. When I had the opportunity to apply to become the next MIC at the Austin/San Antonio office, it was a very easy decision because I wanted to take the knowledge I've acquired over my 32-year career and make a difference in one of the most populated and active weather areas in the country. Plus, I get to work with an incredible group of people. My colleagues at the Austin/San Antonio office are some of the very best in the NWS. They bring a special level of expertise to the job. They understand our partners and their needs. Their effort to meet our mission is laser-focused. It is really an honor to work with this talented group.

Finally, let me close be saying that I look forward to meeting all of you. One of the things I most enjoy about this job is working with our partners to help save lives. Anytime you're in the area, come over to the office and say hi in person. Again, it's great to be here and I look forward to serving you!

Integrated Warning Teams Aim to Improve Hazardous Weather Messaging

By: Jason Runyen, Lead Meteorologist

An Integrated Warning Team (IWT) brings emergency management, broadcast and print media, transportation, school, military, public information, and National Weather Service (NWS) officials together with the goal of finding the best ways to communicate a consistent warning message during a hazardous event.

Post-event studies of high-impact weather events have shown that coordinated actions of an IWT play an important role in achieving a favorable public response. Bringing NWS, emergency managers, and broadcast media together with other partners in the same room to discuss best practices and challenges not only lays the foundation for improved relationships between members of the IWT, but helps us to all understand how the public we serve responds to our services.

An IWT workshop was held on December 7th, 2022 at the San Antonio and Bexar County Emergency Operations Center. Over 60 IWT members were in attendance from around the Alamo Area representing many of the IWT groups listed above. The workshop focused on messaging challenges and best practices during winter events as well as information sharing. Topics also included messaging to vulnerable populations, with subject matter experts present to discuss how best to serve these populations. IWT members not only discussed ways probabilistic snow and ice forecasts can be used, but also the challenges associated with messaging these forecasts to the public. The workshop was interactive with large group discussions and smaller break out group discussions. Much has been learned about winter weather messaging during recent years, including during and after the historic 2021 winter storm which impacted Texas, and this workshop served as a great collaborative exchange of information among the Alamo Area IWT members.

San Antonio/Alamo Area IWT members in breakout groups discussing winter weather messaging at a December 2022 workshop

Austin/Capital Area IWT members discussing severe weather messaging at a March 2023 workshop

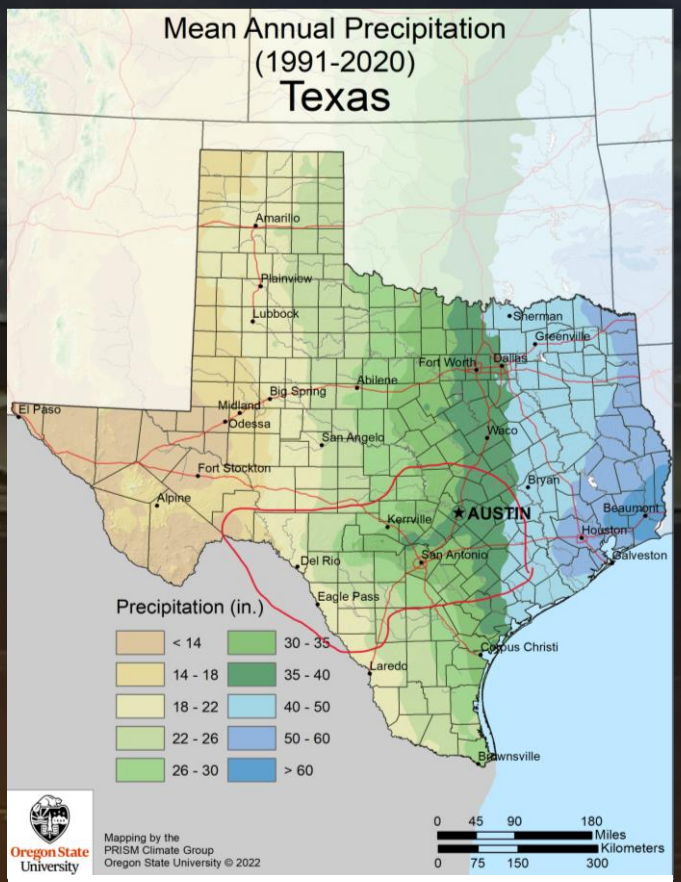
Another IWT workshop was held on March 29th, 2023 at the Austin Combined Transportation and Emergency Communications Center. Again, over 60 IWT members were in attendance from around the Capital Area representing many of the IWT groups listed above. This workshop was split into two parts. The first focused on what went well and improvements that could be made on messaging leading up to and during the January 30-February 2nd 2023 ice storm across the Hill Country and Austin metro area, which left over 200,000 customers without power. The second part focused on the latest social science studies and best practices concerning how to best message severe weather risk to the public as well as how to better collaborate and share information among the IWT during severe weather and flooding.

Additional IWT workshops will be held moving into 2024 throughout the South-Central Texas region with the goal of continued improvement and consistency of hazardous weather messaging.

10 Weather and Climate Myths

By: Keith White, Meteorologist

1) Generally speaking, there is no "rain bubble/dome" or artificial barrier around your town preventing storms from impacting you. We are still coming out of an off/on three year drought, so rain was hard to come by, but there is also some inherent randomness to storms in some environments. You may miss out one day when the next town over gets drenched, and vice versa during the next rain event. It all typically averages out over time. However, there is a large variability in average annual rainfall across our area, from <20" along the Rio Grande to >40" east of US-77 as shown in the image at right.

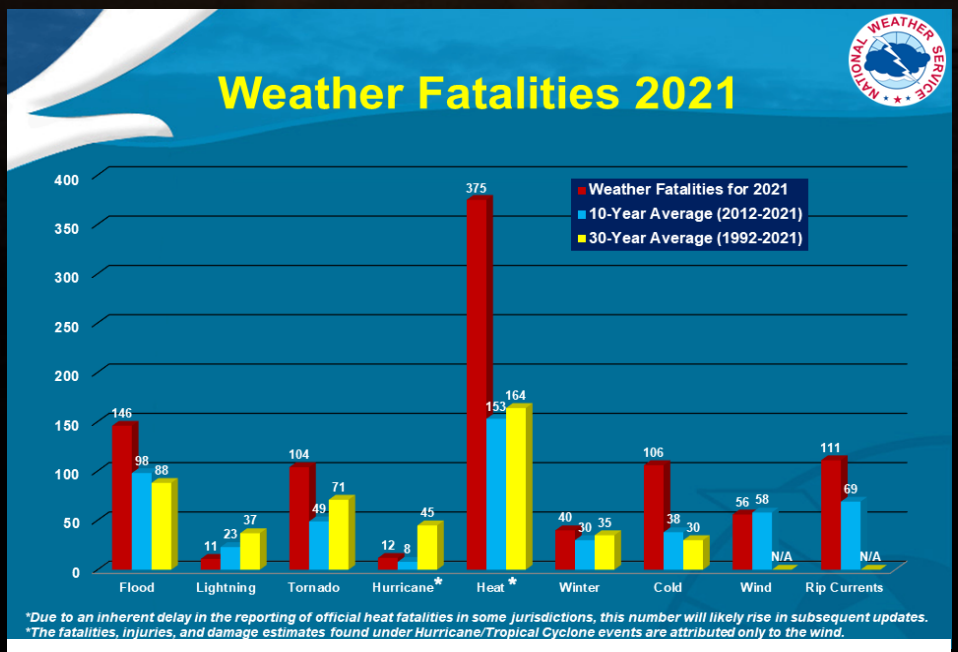


Mean Annual Precipitation for Texas using 1991-2020 normals. Image courtesy PRISM Climate Group at Oregon State University. South central Texas is circled in red.

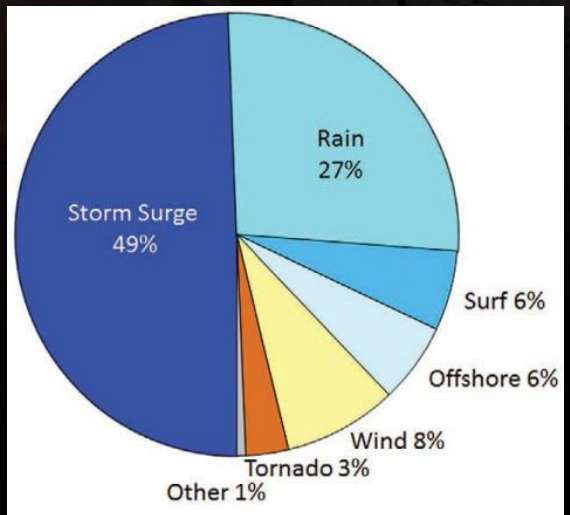
2) "Heat Lightning" is just regular lightning. The term is often used to describe lightning so far away that flashes can be seen but thunder cannot be heard. But it's still just the same old lightning processes. Also, the pedant in me feels the need to point out that there's no E in lightning.

3) Not all thunderstorm damage is from tornadoes. We frequently get requests asking us to investigate tornado damage after thunderstorms that rolled through that were not capable of producing a tornado. 60-80+ mph straight line winds can do significant damage to property. See the Science Corner coming up in the next article for more details on this.

4) Tornadoes aren't the deadliest type of weather. Extreme temperatures and flash flooding have historically been more deadly (below). In fact, even from hurricanes the vast majority of fatalities are due to flooding from freshwater rainfall and storm surge (right; more details on page 10).

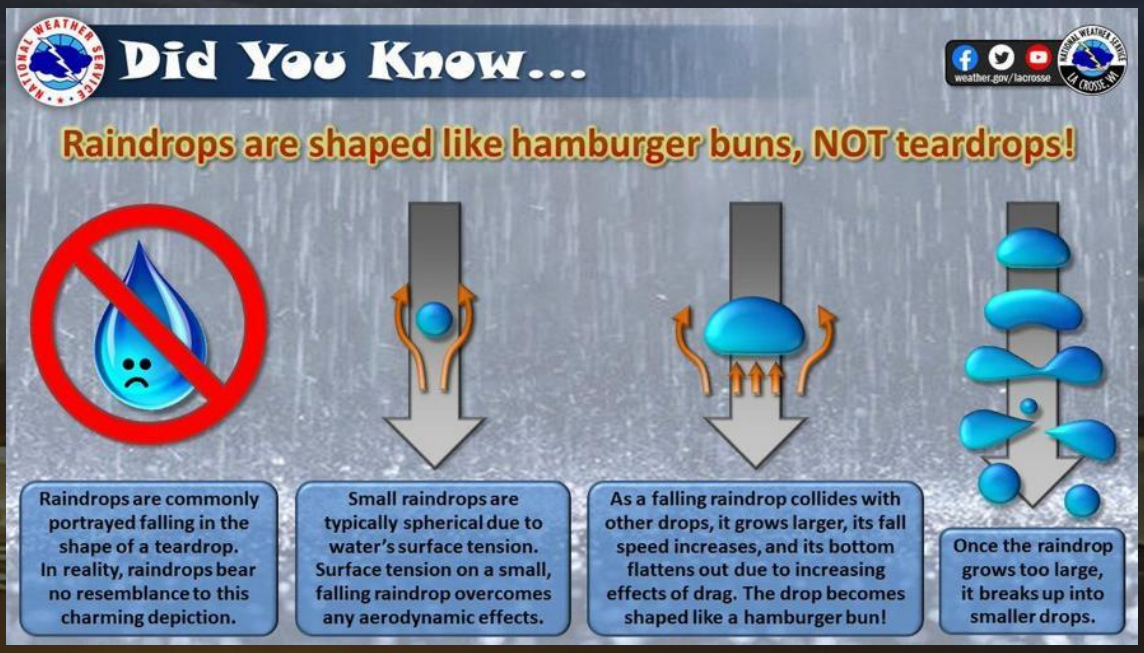


US Weather Fatalities in 2021 as well as 10 & 30 year averages



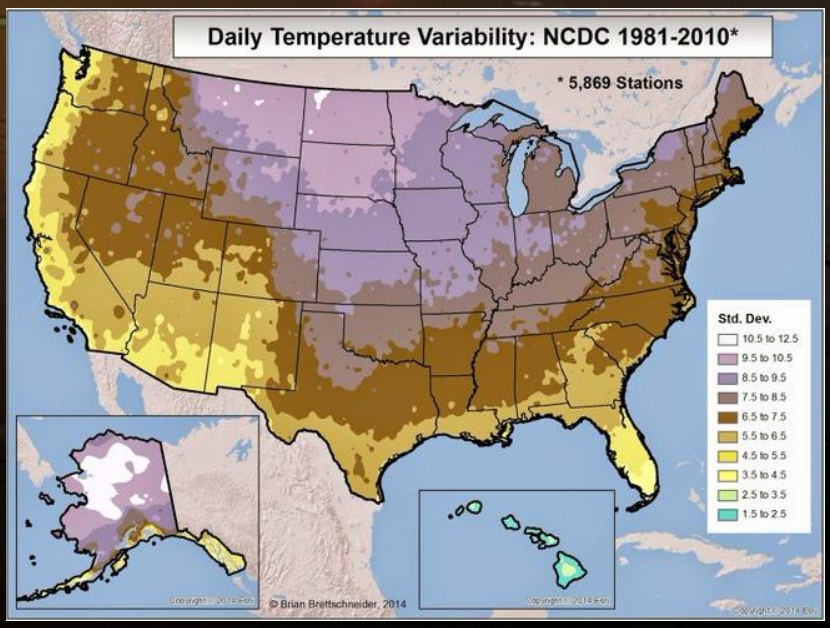
Cause of death in the United States directly attributable to Atlantic tropical cyclones, 1963–2012. Rappaport 2014.

5) Raindrops are not shaped like the traditional teardrop we picture. Small raindrops are generally spherical, and as they grow air resistance tends to flatten them out.



6) Highway overpasses are not safe shelter from storms. Stopping to avoid hail damage puts you and other drivers at risk by blocking roadways. Do not do it! In addition, they're not a safe shelter from tornadoes due to tunneling effects. A presentation on this topic by our sister office in Norman, OK is available here.

7) "Only in ____...." People everywhere along and east of the Rockies use this phrase when the weather changes significantly in a short period of time. Unless you live on the west coast or in FL, chances are your area experiences highly variable weather (right).



8) Cloud Seeding is not a viable drought mitigation strategy on a large scale. The process requires that the atmosphere already be conducive to precipitation production, so rain can't just be created out of thin air.

9) Despite the common trope, the climate science community was not advertising a coming global cooling in the 1970s. This misconception was largely driven by the media. You can read more here.

10) "We can't possibly know what the Earth's climate looked like before the official temperature records began in the 1800s." Through proxy data from things like tree rings & ice cores, paleoclimatologists know A LOT about the Earth's past climate over hundreds of thousands of years. Additional paleoclimatology resources are available here, here, and here.

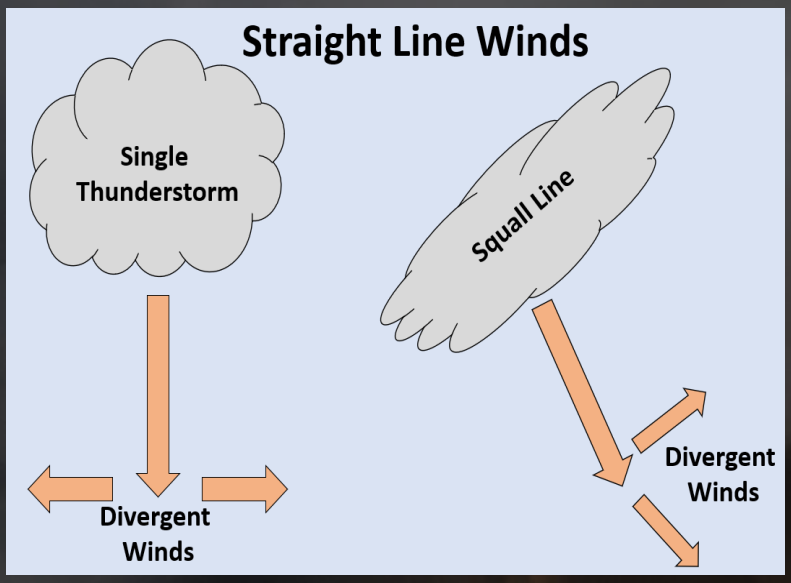
This article was based on a Twitter thread I compiled in the summer of 2022. If you enjoyed this list and/or learned something from it, please consider sharing!

Science Corner: Differences between Tornado and Straight Line Wind Damage

By: Nick Hampshire, Lead Meteorologist

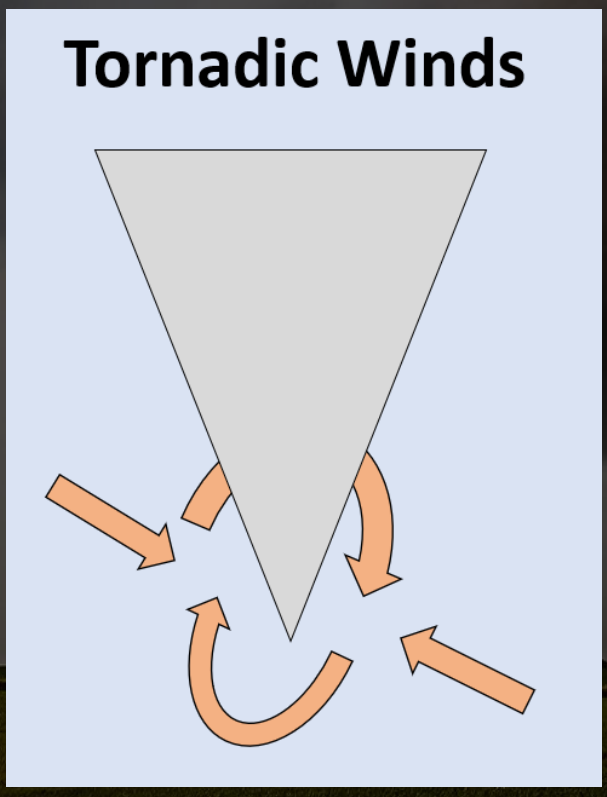
Part of the National Weather Service's responsibility is maintaining historical weather information across the country. This is most commonly associated with high temperature, low temperature, and precipitation data at area airports to keep track of climatological trends and the weather of a given day/month/year. However, the National Weather Service also maintains post-storm reports after severe weather events to maintain a database of historical hail, damaging winds, and tornado reports. But have you ever wondered how the National Weather Service can tell the difference between damage caused by straight-line winds and winds associated with a tornado? It begins with extensive training our meteorologists take to learn how to tell the difference between the two when looking at storm damage on post-storm surveys.

Straight line winds occur underneath the downdraft of a thunderstorm when a mass of air descends from the middle and upper levels of the storm. This mass typically accelerates as it approaches the surface of the Earth. Imagine dumping a cup of water out and letting the water fall to the ground. When the water hits the ground it will spread out in all directions from that center point. This is what happens with a downburst that occurs from a single thunderstorm as shown in the images below.



Another instance of straight line winds comes from a squall line of thunderstorms as it moves across an area. These lines of thunderstorms typically move at a fast speed. The general mechanisms are the same as the single cell storms, but as the air hits the ground the momentum from its forward speed causes the winds to mainly spread out in the direction that the line is moving. The damage from these winds will still be in a divergent pattern as the same physics are involved; the air will spread out from the center point of contact with the surface. Meteorologists will look at the damage patterns for these signs of either unidirectional damage or divergent damage moving away from a centerline when on storm surveys. Another image depicting straight line wind damage is on the next page.

In contrast to straight line wind damage, tornado damage is convergent in nature. Tornadoes occur underneath the updraft of the thunderstorm and by definition are violent columns of rotating air extending from thunderstorm clouds to the ground. Picture the tornado as a vacuum hose that reaches down to the surface. Instead of air descending downward and outward like a downburst or straight line winds, air is pulled up from all directions into the thunderstorm by the tornado (see the idealized image at bottom left). Because of this, air at the surface points inward toward the center of the tornado. This makes the damage patterns distinguishable from that of the divergent straight line winds. From there, meteorologists will look at the kinds of things that were damaged and to what extent they were damaged, and compare that with expected wind speeds that are known to cause similar damage to the item being examined. But that's a topic for another installment of the Science Corner!



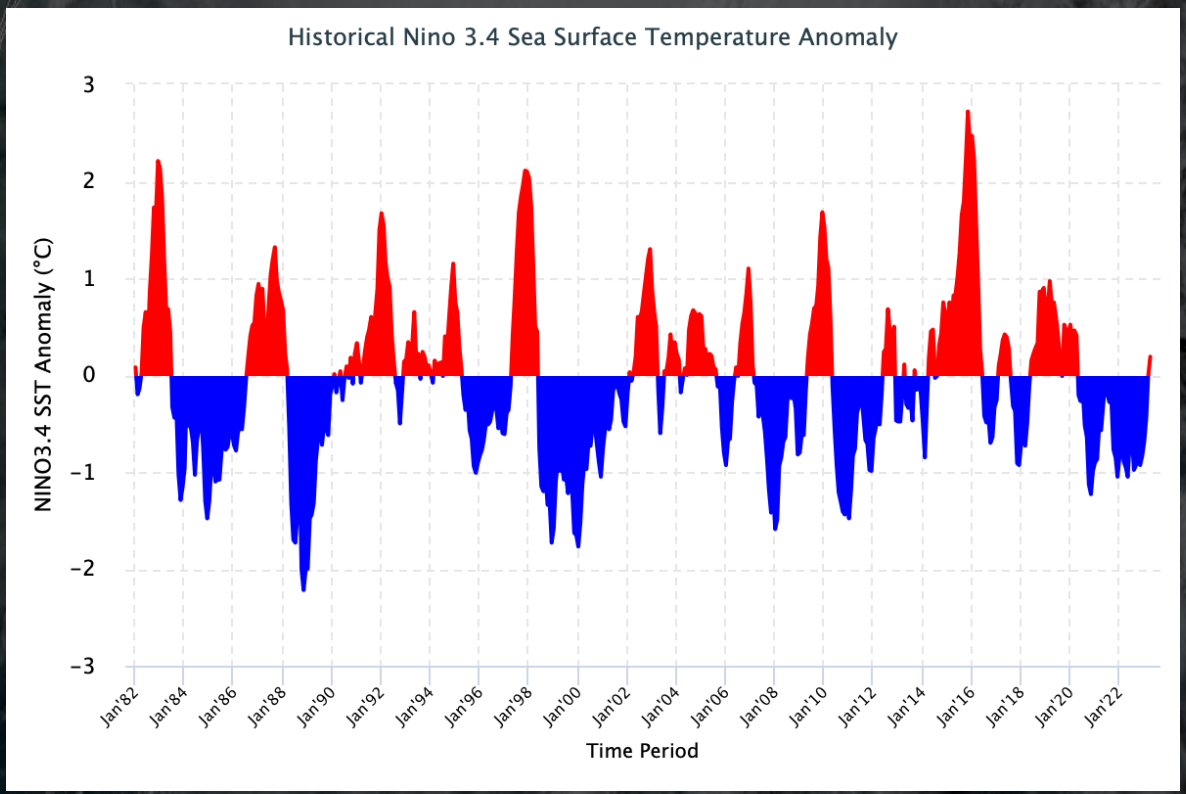
El Niño Southern Oscillation's Impact on the Atlantic Basin Hurricane Season and Texas Hurricane Frequency

By: Jason Runyen, Lead Meteorologist

Background Image: GOES satellite imagery of Major Hurricane Laura approaching the southwest coast of Louisiana on Aug 26, 2020

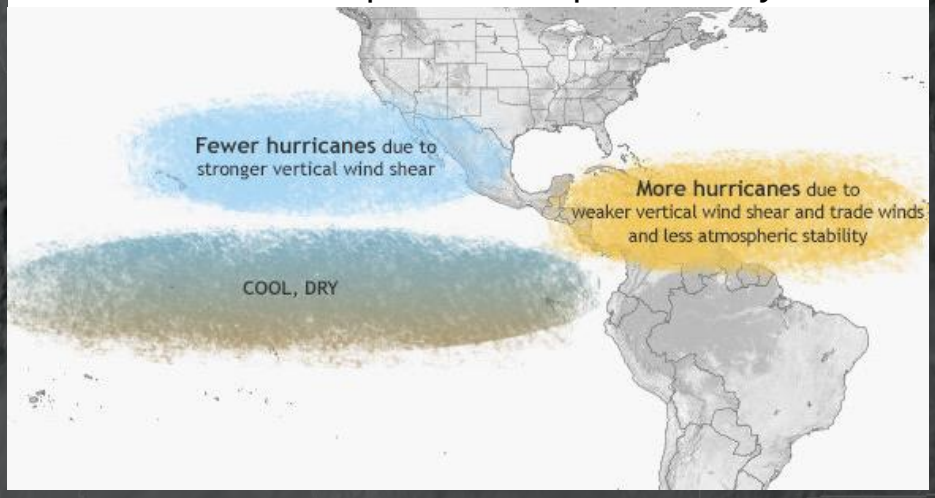
There are many contributing factors that can play a role in how active a hurricane season will be. Long term factors such as the Atlantic Multi-decadal Oscillation, medium range factors such as the El Niño Southern Oscillation (ENSO), and smaller scale factors like the Madden-Julian Oscillation, West African monsoon season, and Saharan Air Layer can all have positive or negative contributing factors towards an active hurricane season depending on the phase or state of each.

Here we briefly look at ENSO and the role it plays on hurricane activity. ENSO is a recurring climate pattern involving changes in the temperature of waters in the central and eastern tropical Pacific Ocean. Over periods ranging from about three to seven years, the surface waters across a large swath of the tropical Pacific Ocean warm or cool by anywhere from 1°C to 3°C, compared to normal. This oscillating warming and cooling pattern, referred to as the ENSO cycle, directly affects rainfall distribution in the tropics and hurricane seasons in both the Pacific and Atlantic basins, and can have a strong influence on weather across the United States and other parts of the world. El Niño (warm) and La Niña (cool) are the extreme phases of the ENSO cycle; between these two phases is a third phase called ENSO-neutral.

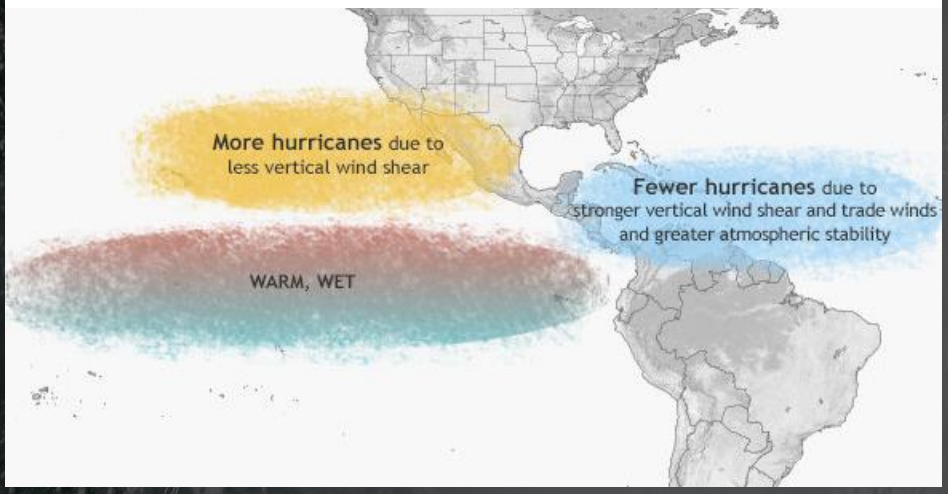


During the La Niña phase there are typically more hurricanes than average in the Atlantic basin due to less vertical wind shear present in this region and less hurricanes than average in the Pacific basin due to stronger vertical wind shear present in that region. The exact opposite can often play out in the El Niño phase, with the Atlantic basin experiencing fewer than average number of hurricanes.

La Niña's Impacts on Tropical Activity



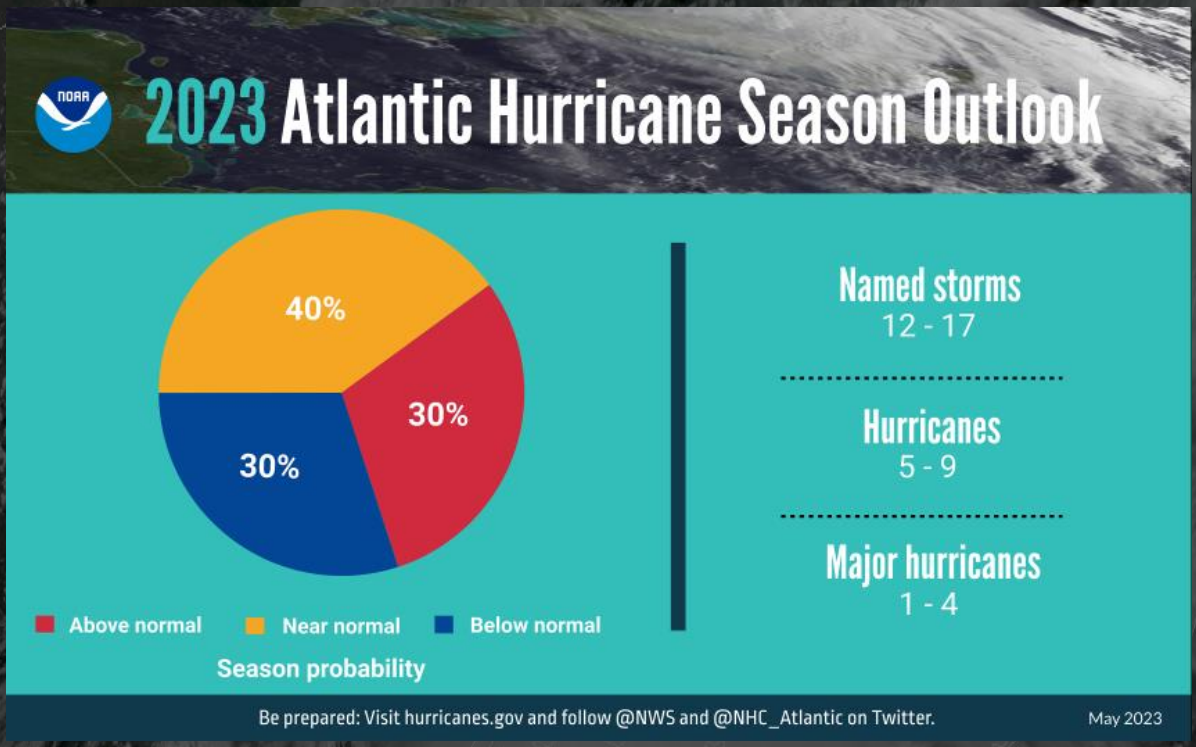
El Niño's Impacts on Tropical Activity



During the 2020-2022 hurricane seasons the ENSO phase was in La Niña. Due in part to La Niña, as well as several other positive contributing factors mentioned above, these seasons experienced above normal activity in the Atlantic basin, with a record 30 named storms in 2020, the third-most active Atlantic season in 2021 with 21 named storms, and 14 named storms in 2022. For comparison, the 1991-2020 annual average is 14 named storms in the Atlantic Basin.

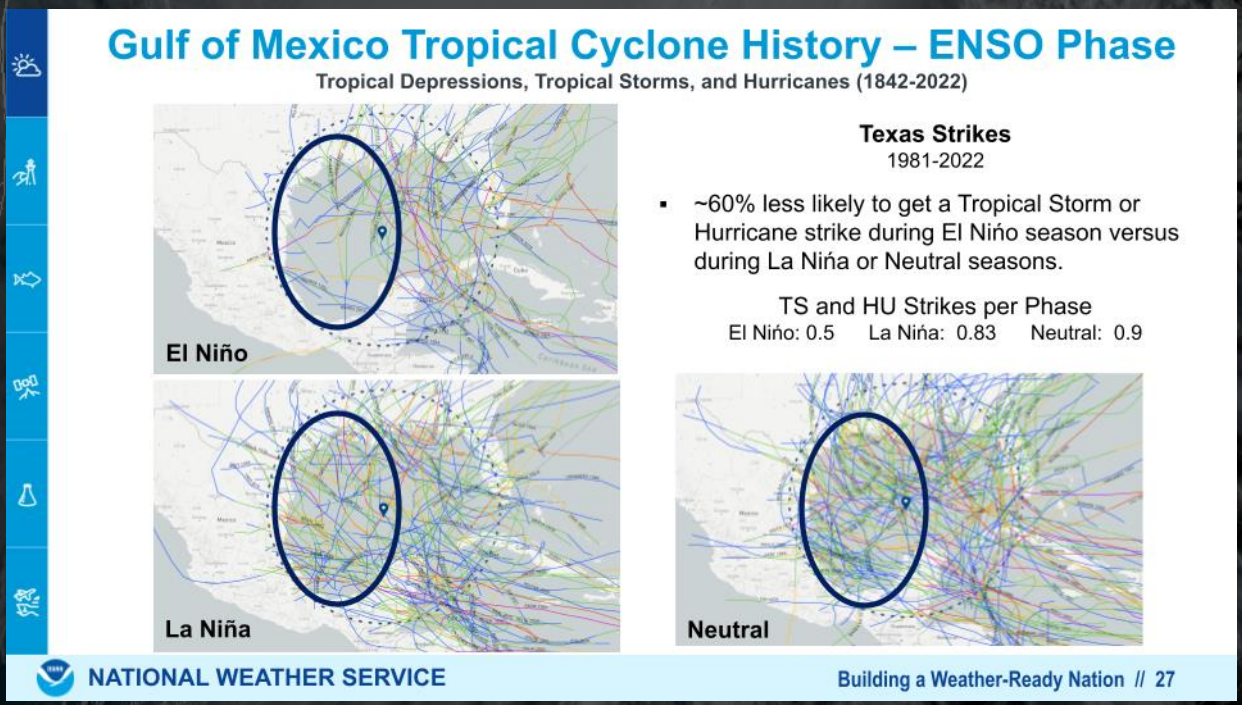
So what about 2023? Since late last year ENSO conditions have shifted quickly from La Niña to El Niño. Odds are tilted heavily in model guidance for a continued warming in the central and eastern equatorial Pacific Ocean into a moderate or potentially strong El Niño phase this Fall. Should this occur, and dependent on other contributing factors, the 2023 Atlantic hurricane season could end up tilted towards an average to below average season.

NOAA forecasters with the Climate Prediction Center, a division of the National Weather Service, predict near-normal hurricane activity in the Atlantic this year. NOAA's outlook for the 2023 Atlantic hurricane season, which goes from June 1 to November 30, predicts a 40% chance of a near-normal season, a 30% chance of an above-normal season and a 30% chance of a below-normal season.



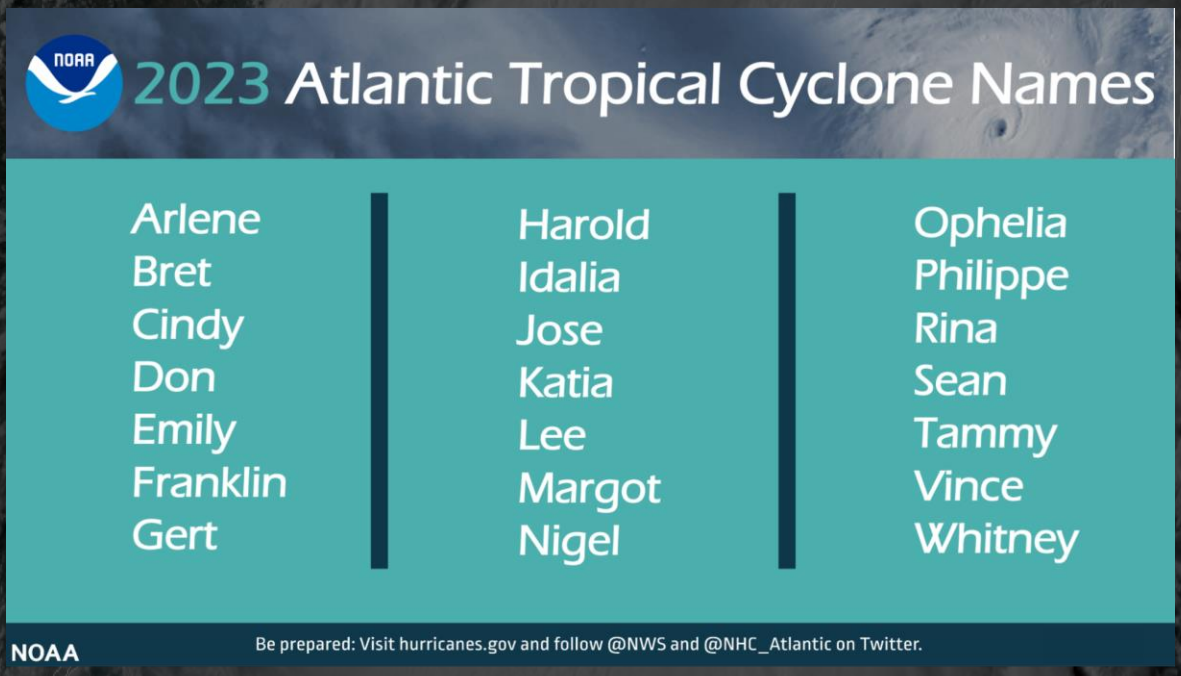
The upcoming Atlantic hurricane season is expected to be less active than recent years, due to competing factors—some that suppress storm development and some that fuel it—driving this year's overall forecast for a near-normal season.

El Nino's potential influence on storm development could be offset by favorable conditions local to the tropical Atlantic Basin. Those conditions include the potential for an above-normal west African monsoon, which produces African easterly waves and seeds some of the stronger and longer-lived Atlantic storms, and warmer-than-normal sea surface temperatures in the tropical Atlantic Ocean and Caribbean Sea, creating more energy to fuel storm development.



What about Texas? The western Gulf of Mexico often sees reduced tropical activity during the El Niño phase, which we are forecast to move into. In fact, since 1981 Texas is around 60% less likely to get a tropical storm or hurricane strike during the El Niño phases versus during a La Niña or Neutral season (see image at the bottom of the previous page). However, as we talk about every season it's important not to focus too much on seasonal outlooks as it only takes one bad storm to impact a community forever.

Curious about the names for this hurricane season? Here they are!



Planning Beyond the Category of a Storm - Inland Flooding

By: Jason Runyen, Lead Meteorologist

All too often we hear people say: "It's only a category one hurricane" or "It's only a tropical storm". There continues to be an over-reliance on a numerical category when preparing for threats from a tropical cyclone. To combat this, in 2010 the name Saffir-Simpson Scale was changed to Saffir-Simpson Hurricane **Wind** Scale. The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based only on a hurricane's maximum sustained wind speed. **This scale does not take into account other potentially deadly hazards such as storm surge, rainfall flooding, and tornadoes.**

In fact, as discussed in the 4th Weather and Climate Myth earlier in this newsletter, over 80% of direct fatalities from tropical cyclones are water related, not wind! These water related fatalities come from storm surge, flooding rain, and surf. Inland flooding from heavy rainfall is the leading cause of fatalities from tropical cyclones in South-Central Texas. Tragically, most of these flooding fatalities occurred with people in vehicles and were preventable.

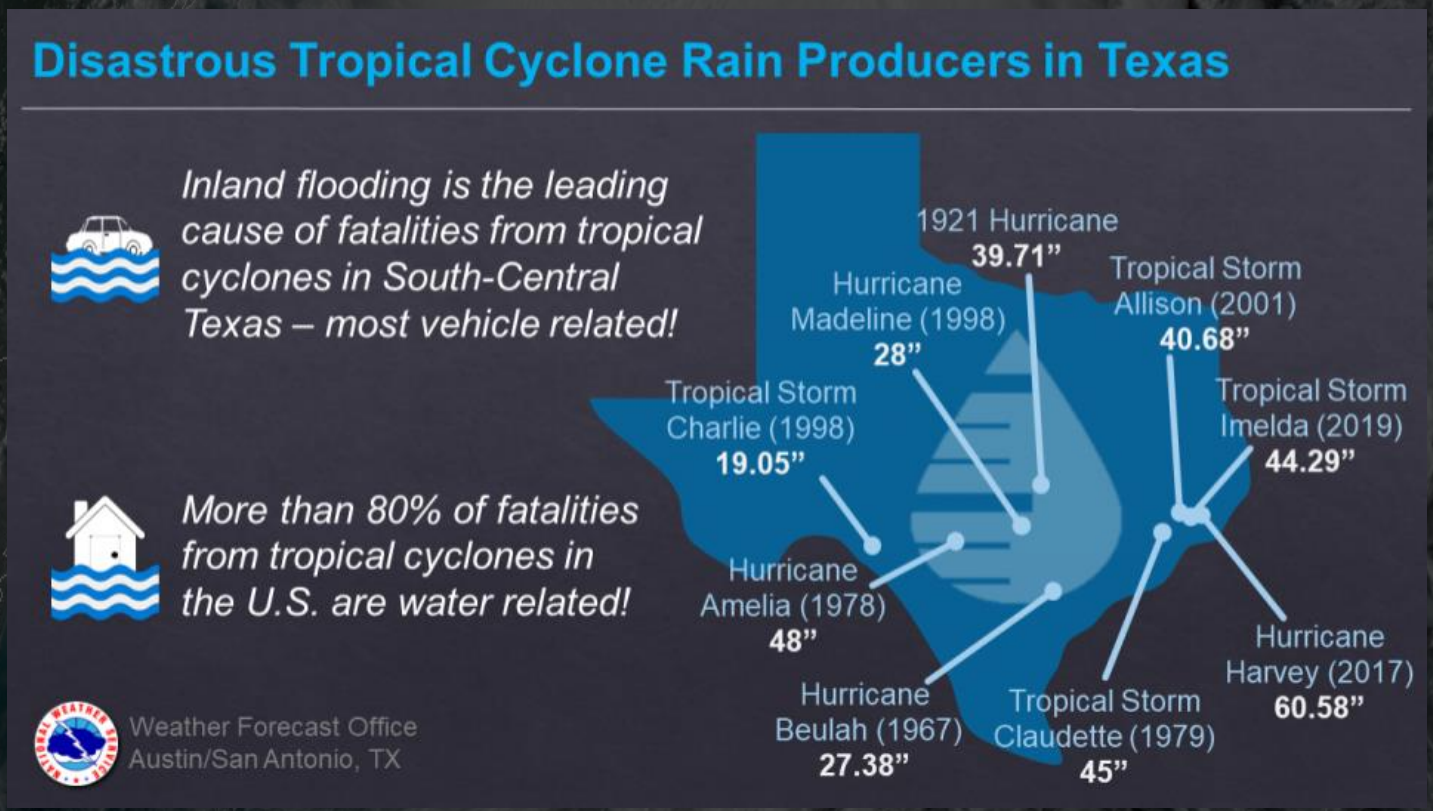
26 Aug 2020 23:01Z NOAA/NESDIS/STAR GOES-East ABI GEOCOLOR

The category of a storm does not indicate risk and impacts from flooding rain and tornadoes, historically the two biggest threats inland across South-Central Texas. Our region has experienced some of its biggest floods from “weaker” storms. Some examples of catastrophic flooding from systems that weren’t hurricanes include:

- 48 inches of rain in Bandera County from the remnants of Tropical Storm Amelia in 1978. 33 flooding fatalities occurred in this region.
- 43 inches of rain in just 24 hours in Alvin from Tropical Storm Claudette in 1979.
- Over 30 inches of rain in parts of Houston from Tropical Storm Allison in 2001. 41 flooding fatalities occurred.
- Over 19 inches of rain in Del Rio, most of it in just 4 hours, from the remnants of Tropical Storm Charlie in 1998. 13 flooding fatalities occurred.

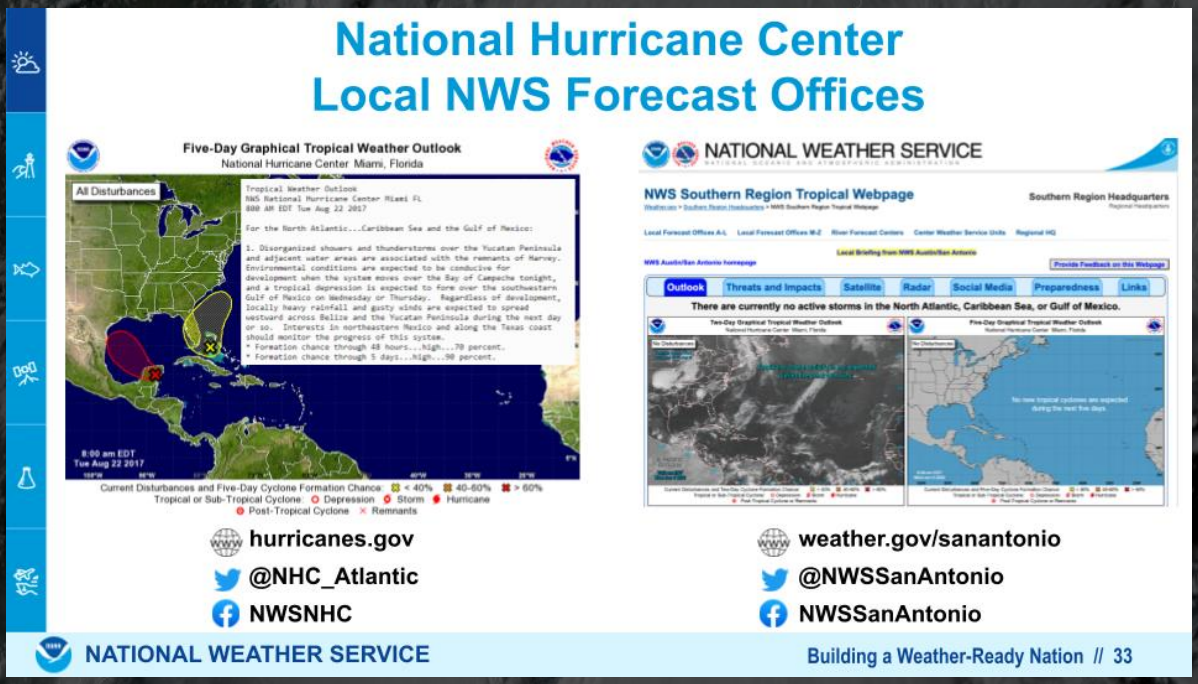
Historic inland floods across this region that have come from hurricanes include:

- Nearly 40 inches of rain in Thrall, TX from the 1921 Hurricane resulting in a staggering 215 flooding fatalities. This hurricane also produced devastating flooding in San Antonio spurring the construction of Olmos Dam and the San Antonio River Walk.
- 28 inches of rain near New Braunfels, TX, assisted by Pacific Hurricane Madeline in 1998. 31 flooding fatalities occurred in this region.
- Over 27 inches of rain in Pettus, TX from Hurricane Beulah in 1967. This produced record flooding on the Nueces and San Antonio River systems.
- A U.S. tropical cyclone record 60.58” of rainfall in Nederland, TX from Hurricane Harvey in 2017. Harvey resulted in 65 flooding fatalities and $125 billion in damage.



This year marks the 45 year anniversary of Tropical Storm Amelia, the 25 year anniversary of Tropical Storm Charlie and the 25 year anniversary of the 1998 flood and Hurricane Madeline. We will have more on these events later in the year.

Remember to think beyond the category of a storm when preparing for all threats from a tropical cyclone. Follow trusted sources, such as the National Hurricane Center and our local NWS Weather Forecast Office, for accurate information on expected hazards from a tropical system.



For more information on hurricane preparedness please visit noaa.gov/hurricane-prep

NWS Austin-San Antonio Welcomes Newest Lead Meteorologist Emily Heller

My name is Emily Heller and I am a new Lead Forecaster at the Austin/San Antonio Forecast office. I grew up in Florida and decided I wanted to be a meteorologist after a few years of hurricanes impacted my hometown of Jacksonville. I went to The Florida State University for my undergraduate degree in Meteorology and stayed for post graduate work where I had the opportunity to volunteer with the National Weather Service in Tallahassee, Florida. I started my official weather service career in Topeka, Kansas in 2014 where I stayed for roughly 4 years. I made a move westward in 2018 to join the NWS office in Sacramento, California, and stayed another 4 years in that location. Finally, in November of 2022, I moved to the New Braunfels area as a Lead Forecaster. Moving across the US has allowed me to learn and forecast for a myriad of weather situations I never had the opportunity to experience growing up in Florida. I'm very happy to now be in Texas and working for the Austin/San Antonio office.

NWS Austin-San Antonio Welcomes Meteorologist Brandon Gale

While I began my NWS career in Bismarck, ND, I was primarily raised in Texas (Houston area) and attended Texas A&M University for my undergraduate degree in Meteorology (Gig Em!). I graduated in May 2020 and began at the NWS office in Bismarck the following August. While I had the opportunity to take some beautiful road trips across the Northern Plains, see more snowfall, and experience the northern lights while in North Dakota, I was very eager to return to Texas and thankfully I was able to in just under two years. I started at the Austin-San Antonio office in July 2022 and have been enjoying it ever since! While I was in Bismarck, both to help pass the time and broaden my knowledge base, I completed an online Masters Degree in Emergency Management through Millersville University in Pennsylvania. This degree has and will continue to be of use throughout my career since we work very closely with local, state, and sometimes federal emergency managers as NWS Meteorologists.

While I am interested in all things weather related, my two biggest passions are in severe weather and aviation. I love to work the radar/warning desk during severe weather events and I'm the Aviation Focal Point for our office. As the Aviation Focal Point, my two biggest responsibilities are to build good relationships with our local aviation partners and commercial airline meteorologists, as well as ensure our office is providing the best forecasts and services possible to these entities. My passions for meteorology and aviation have seemingly always been neck and neck, and I've considered other career paths such as a Commercial Pilot and an Air Traffic Controller in the past. I also enjoy doing as much outreach as possible with our local community, whether that be giving school talks or deploying to events to help support our emergency managers in person, getting to interact with you all is one of the best parts of the job.

Outside of work, I enjoy watching and playing sports, working out, hiking, traveling, and hanging out with friends. The Hill Country has provided some beautiful trails for hiking and I'm looking forward to tubing on the nearby rivers a bit more this summer. I am a big fan of the Houston Rockets, the Chicago Cubs, and of course my Aggies (even though they make it hard at times). I also love food, especially Mexican food/Tex-Mex, so I've definitely been enjoying all the Austin-San Antonio corridor has to offer in that regard.

National Weather Service
Austin/San Antonio

2090 Airport Rd
New Braunfels, TX, 78130
(830) 629-0130

weather.gov/ewx

Find us on social media! (images are links)



Newsletter Editor:
Keith White

Proofreaders:
Andrew Quigley
Brandon Gale
Samuel Hernandez
Evelyn Barkley