



South Texas Weather Journal

NWS Corpus Christi, TX

Spring 2011 Edition

Historic Ice Storm

Mike Gittinger - Lead Forecaster

Mike Buchanan - Science & Operations Officer

A large dome of [Arctic air](#) plunged southward across South Texas on Tuesday morning, February 1st behind a very strong cold front. Temperatures plummeted from the 60s and 70s early Tuesday morning into the upper 20s to lower 30s by Tuesday evening. Frigid temperatures and prolonged hard freezes persisted through the week as [Arctic high pressure](#) continued to push further south across South Texas. Widespread record low temperatures occurred between Feb 2nd and Feb 5th when most areas averaged between the middle 20s to middle 30s. This was the coldest 3-day stretch in over 20 years across South Texas. Although impressive, this cold spell ranks well below those of 1899, 1951, 1983 and 1989. Specifically, the 3-day period ending on February 4th ranks only as the 24th coldest for Corpus Christi and the 36th coldest for Victoria, while the 3-day period ending on February 3rd was the 26th coldest for the Laredo area. To add insult to injury, the very cold air-mass set the stage for one of the most significant ice storms to affect the Coastal Bend and adjacent coastal plains in recent history as moisture began to increase across the region.



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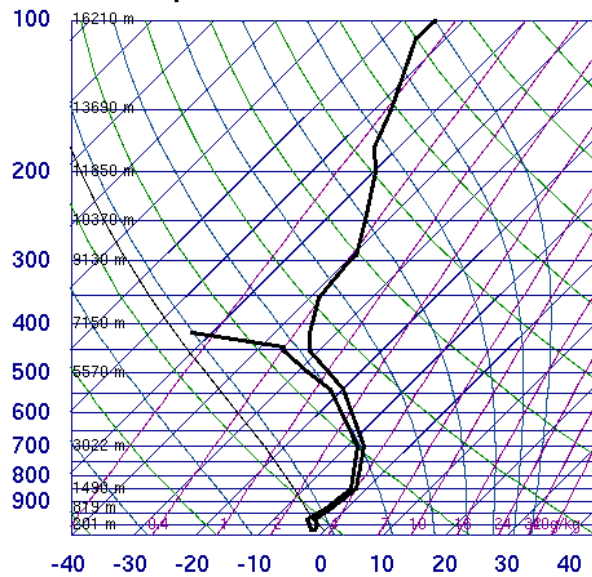
A [strong upper level disturbance](#) approached South Texas on Thursday February 3rd. This disturbance along with increasing Gulf moisture above the cold arctic air produced widespread light freezing rain and freezing drizzle by early Thursday evening.

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Although the temperature throughout the cloud layer was several degrees below freezing, water typically does not freeze in the atmosphere until temperatures reach -10 deg C (or 14 deg F). This is because water resists initial crystallization while in droplet form. In order for the precipitation to change into snow during this event, the cloud temperatures needed to fall a few more degrees. In addition, if the moist layer had reached higher up into the atmosphere, then the top of the cloud would have reached the colder temperatures required for ice crystals. This ice would have then fed down, crystallizing the cloud from the top down, as it did during in the Christmas 2004 snow event. Since neither of these two things happened, the precipitation mostly remained in a supercooled liquid form which froze nearly instantly on contact at the surface where temperatures were well below freezing.

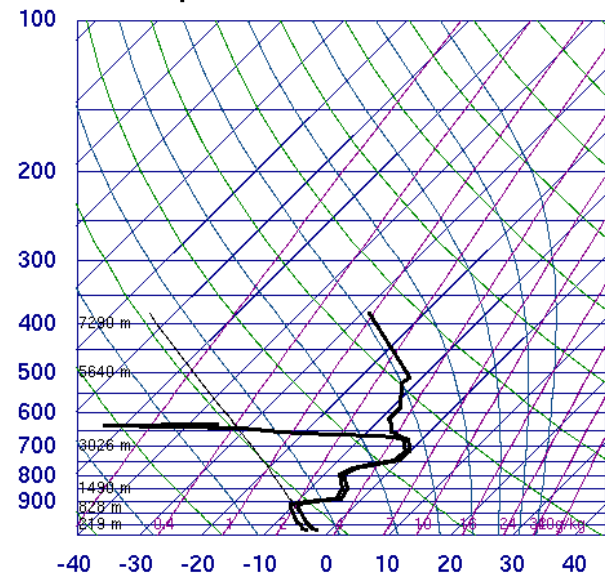
72251 CRP Corpus Christi Intl



12Z 25 Dec 2004

University of Wyoming

72251 CRP Corpus Christi Intl



12Z 04 Feb 2011

University of Wyoming

Sounding from Christmas Day 2004 snow (left) compared to sounding from February 2011 ice storm (right).

As the freezing rain and drizzle fell in the evening, trees, roads, grassy surfaces, vehicles and rooftops quickly became ice-covered. Freezing drizzle and light freezing rain then continued through all of Thursday night before ending Friday morning. A few sleet pellets and snowflakes did occur at times during this event across the Brush Country and northern Coastal Bend. This occurred mainly toward the end of the event as cloud temperatures cooled closer to the -10 deg C mark as the upper level storm system passed by. No significant sleet or snow accumulation was observed. Ice accumulations on the other hand were significant across much of South Texas. Generally 1/4 to 3/8 inch of ice accumulations occurred across the Coastal Bend and eastern Brush Country with up to 1/10 inch of ice accumulation across the remainder of South Texas.

This amount of ice produced very dangerous driving conditions. As a result, state and local officials closed many of the main roads, highways and bridges across South Texas. Numerous accidents along with multiple injuries were reported. Corpus Christi Fire Department units responded to over 75 incidents in a three hour period. The normal 24 hour period is 100 incidents. Corpus Christi Police Department units responded to 81 major accidents. The ice gradually melted during the late morning and afternoon hours on Friday as the temperatures warmed above freezing and sunshine returned. Falling ice from bridges and high-tension wires posed a threat into the afternoon hours on Friday and was the final impact associated with this unusual South Texas ice storm.



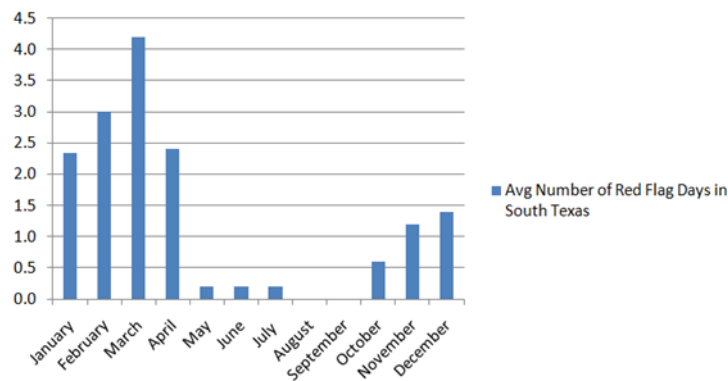
FIRE WEATHER

Active Texas Fire Season to Continue Through the Spring

Jason Runyen - Lead Forecaster

This year's fire season across South Texas has been steady. Fire seasons in South Texas typically peak from February into March, months which often produce dry cold fronts with gusty winds and at a time when fuels are dormant. As of March 15th over 53,000 acres have been burned in South and Deep South Texas in 2011 because of wildfires, and nearly 560,000 acres in all of Texas. Despite recent green up beginning along the Coastal Bend, residents across all of South Texas are urged to exercise caution with any outdoor activities that can inadvertently cause wildfires. Drought conditions are forecasted to expand across all of South Texas through the Spring months, and late March and April often brings dry and gusty winds, conditions favorable for wildfire growth. In fact, the months of March and April have seen large and destructive wildfires in recent years across South Texas, including the Lagarto Wildfire in April 2009 that destroyed over 30 homes. The NWS issues Red Flag Warnings for days in which weather conditions, when combined with fuel dryness, support a high fire danger threat. Residents should remain extra vigilant during days in which Red Flag Warnings are in effect.

Avg Number of Red Flag Days in South Texas



(Left) Average number of Red Flag Days (High Fire Danger) days per month across South Texas.

(Right) Burn scar from the Lagarto Wildfire in 2009. Over 30 homes were destroyed.





A LOOK BACK

A Review of the 2010-2011 Cool Season

Matt Grantham - Meteorologist Intern

Cool Season Statistics - Corpus Christi, TX

	November 2010	December 2010	January 2011	February 2011	Nov 2010-Feb 2011 Total	Nov-Feb Average (1950-2011)
Mean Temp Departure	-0.2°	+1.7°	-0.6°	-1.4°	-0.5°	N/A
Observed Rainfall	1.00	0.62	4.01	0.13	5.76	6.64
Rainfall Departure	-0.73	-0.97	+2.41	-1.59	-0.88	N/A
Freezes	1	2	0	9	12	5.4
Lows 40°F or less	5	10	8	12	35	23.5
Coldest Temp	31°	29°	33°	25°	25°	N/A

The most recent fall and winter of 2010-2011 reminded South Texas meteorologists that we still don't know as much about the weather as we would like. What happened to the warmer and drier than normal winter that was expected? La Nina, a phase of cooler than normal sea surface temperatures in the equatorial Pacific, is typically a major driving force for relatively warm and dry conditions across South Texas during the fall and winter. Through December, South Texas looked to be on track for such a winter, but Mother Nature had other ideas.

With only 1.62 inches of rainfall for Corpus Christi in November and December combined, drought conditions were developing across South Texas. Thankfully January brought relief in the form of several storm systems that produced just over 4 inches of rainfall. Much of the rain fell on January 9th as a significant and severe squall line plowed through the Coastal Bend. A wind gust of 69 mph was measured at Corpus Christi along with almost 1 inch of rain. Temperatures for January were slightly below normal, and rainfall was over 2 inches above normal for the month.

Coming off the heels of a wet and cool January, some rather unusual weather occurred as February arrived with a bang. A strong Arctic airmass overspread much of the U.S. and sent South Texas into a deep freeze late on February 1st. A low of 25 was observed at Corpus Christi on the 2nd as the air-mass continued to settle in place. The extremely cold weather lasted for several days with temperatures failing to reach above freezing on February 3rd at Corpus Christi as a rare ice storm affected the region. Yet another cold blast affected the area a week later and produced more freezing temperatures. For Corpus Christi through the first 12 days of the month, 9 days had freezing temperatures which set a record for February, and first 13 days of the month averaged 13.8 degrees below normal. After the record setting cold spell, La Nina type conditions finally arrived as a tremendous warming trend ensued with a reading of 89 on the 24th. The average monthly temperature finished only 1.4 degrees below normal, and precipitation was well below normal. These warm and dry conditions persisted into March as La Nina took a firm grip on the weather pattern. Overall during the period from November through February, temperatures averaged 0.5 degrees below normal, and rainfall was around 1 inch below normal.

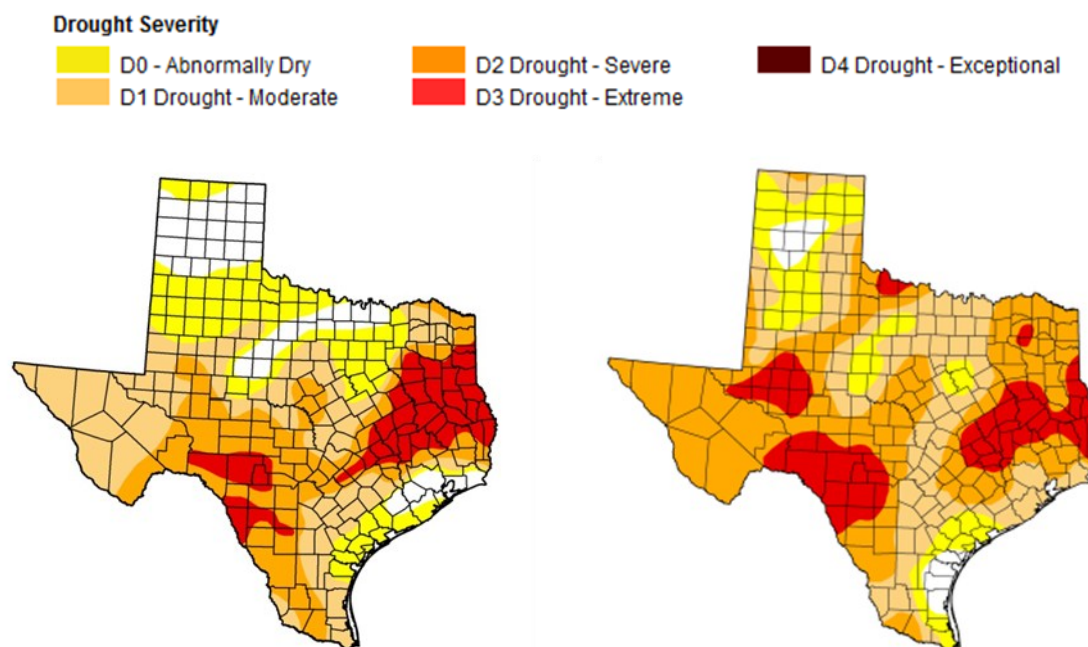


LOOKING AHEAD

Drought Conditions Expected Over All of South Texas by the Middle of Spring: How Long Will It Last?

Greg Wilk - Lead Forecaster

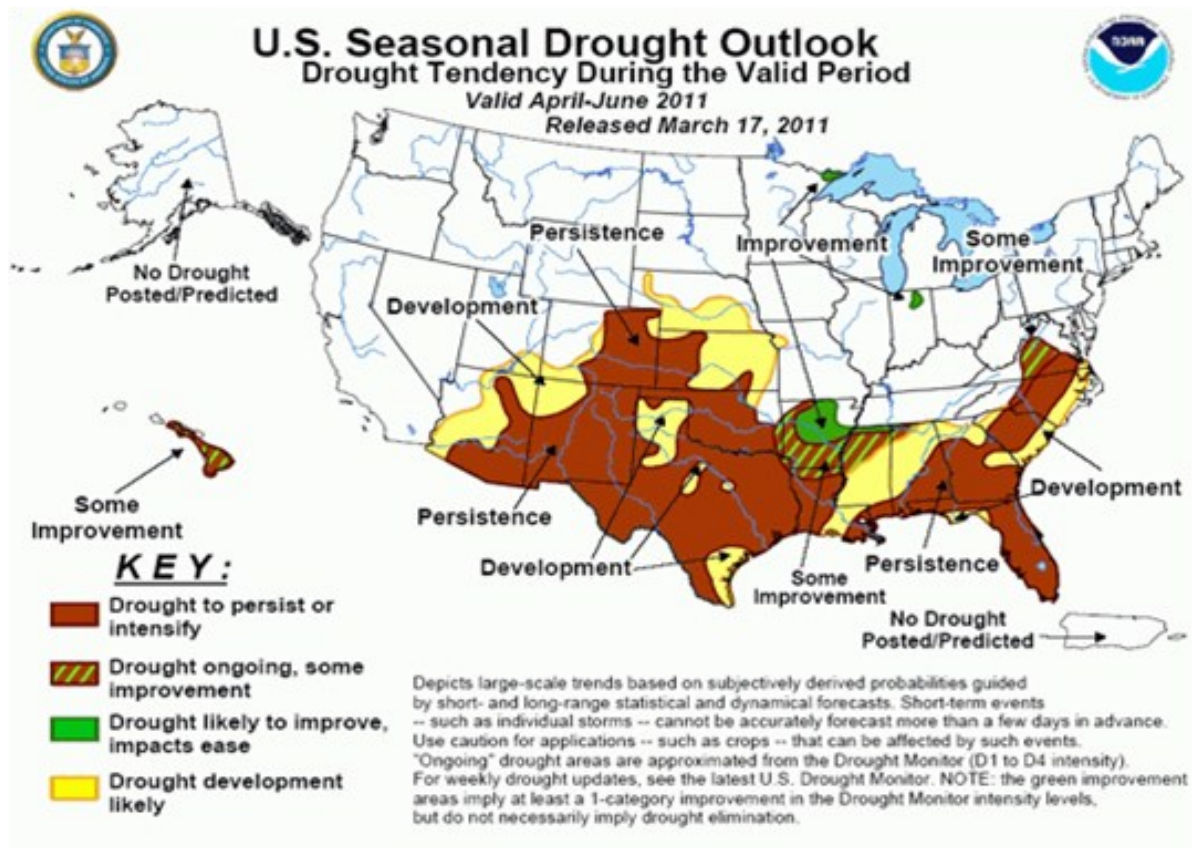
After about a year of abnormally wet weather, dry conditions returned to South Texas by the late summer of 2010. By October 26, drought conditions developed over western portions of South Texas, encompassing the western Brush Country and Rio Grande Plains, including the cities of Cotulla and Laredo. The drought began to spread east into western portions of the Coastal Bend, including northern portions of Bee and Goliad Counties (the city of Corpus Christi was not included in the drought). Initially, the drought peaked in early January 2011 (see Figure below). However, due to above normal rainfall in January, conditions slightly improved over South Texas. However, dry weather returned to the region in February, and drought conditions once again are currently spreading east. Unfortunately, the ongoing drought is expected to continue to spread east and encompass all of South Texas by the end of May 2011 (see figure on Page 6).



Drought conditions on January 4, 2011 (left) and on March 15, 2011 (right).

Why has it been so dry over South Texas? The primary reason for the ongoing drought is La Nina conditions. La Nina is a phase of cooler than normal water temperatures in over the equatorial Pacific Ocean. From a climate standpoint for South Texas, this normally means above normal temperatures and below normal rainfall during the winter and spring. The current La Nina, which began in the summer of 2010, peaked in January 2011 and is now starting to slowly weaken. At this time, La Nina conditions are expected to persist through April, with an equal chance for either La Nina or neutral conditions for the May through June period. Therefore, it is most likely that below normal rainfall will occur over South Texas for the next few months (which is why drought conditions are expected to develop, persist, or intensify over the region).

(Continued on Page 6)



(Above) Current U.S. Seasonal Drought Outlook

So, how long will the drought last, and how bad will the drought be? The answer to that is not straight-forward, and may depend on what happens with the ongoing, weakening La Nina. If La Nina ends, and water temperatures become more neutral by May or June, then precipitation may become more frequent, with monthly rainfall amounts near (if not above) normal. Drought duration may depend on the upcoming tropical storm season. A near average or above average season, or if frequent tropical waves visit the area, more normal or above normal rainfall will occur, which will help alleviate the drought. South Texas does not necessarily have to be directly impacted by a tropical storm or hurricane for a drought to end.

You can keep abreast of the current drought status over South Texas (or over any part of the country) by visiting our South Texas Drought page. Just go to our homepage and click on the thumbnail/icon "Drought Info" located near the bottom right of the page, or just go to:

<http://www.srh.noaa.gov/crp/?n=drought>

Here, you be able to view the latest Drought Information Statement (containing pertinent drought information for the Corpus Christi Hydrologic Service Area), the latest Drought Monitor and Drought Outlook products, as well as several drought-related links. By left-clicking directly on the Drought Monitor product, you can get a closer look at the current drought conditions over the state of Texas. Whenever drought conditions end, begin, or persist over our area, we will keep you informed concerning how a drought will impact you with our Drought Information Statements.



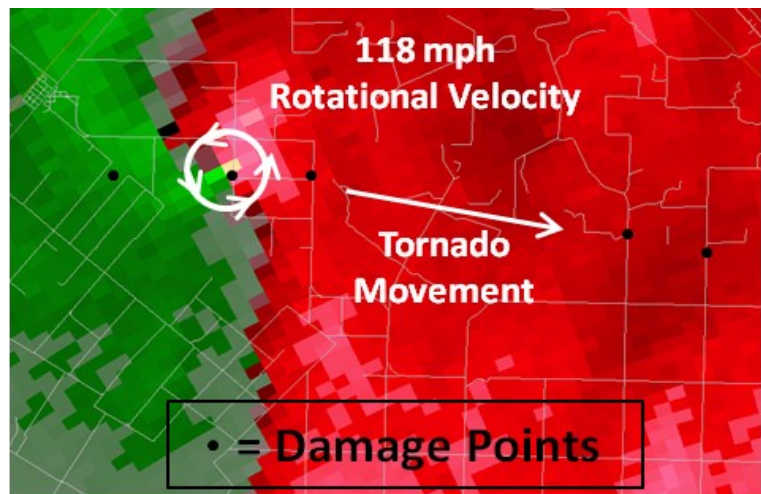
NEW TECHNOLOGY

Storm Survey Technology

Matt Grantham - Meteorologist Intern

The development of new technology has enhanced our ability to track severe weather in real-time, but what about after the storm? Here at the Corpus Christi Forecast Office, new technology was infused into our storm assessment efforts beginning in the spring of 2010. By incorporating GR2Analyst, archived radar data, GPS tracking, and street-level mapping, our storm surveys have become much more efficient and effective.

GR2Analyst is a unique program that allows users to view super-resolution radar data from NWS radars all across the country. Data can be ingested in real-time or downloaded from an archive at the National Climatic Data Center. With the implementation of GR2Analyst in the storm assessment process, NWS meteorologists are now able to view archived radar data while traveling to areas of potential damage. GR2Analyst also allows users to utilize a GPS device along with street level mapping. By combining archived radar data with live GPS tracking and street level mapping, GR2Analyst becomes a very powerful tool.



(Above) Radar velocity image with street level mapping used on June 2, 2010 storm survey.

There were several cases in past last year when storm survey teams from NWS Corpus Christi benefited from using this newly incorporated technology. With the ability to navigate with GPS tracking overlain on street-level maps and radar data, teams were able to drive directly to damage locations and conduct more thorough and efficient surveys. The survey teams were also able to find the start and end points of tornado paths more easily and accurately. Locating tornado paths and other damage is crucial for warning verification and improving warning lead time. Without GR2Analyst, it is entirely possible that some of the tornado paths and other wind damage may have gone undocumented.



(Above) Crop sprinkler destroyed at one of the damage points in the above radar image.



(Above) Bee County Line sign snapped at one of the damage points in the above radar image.



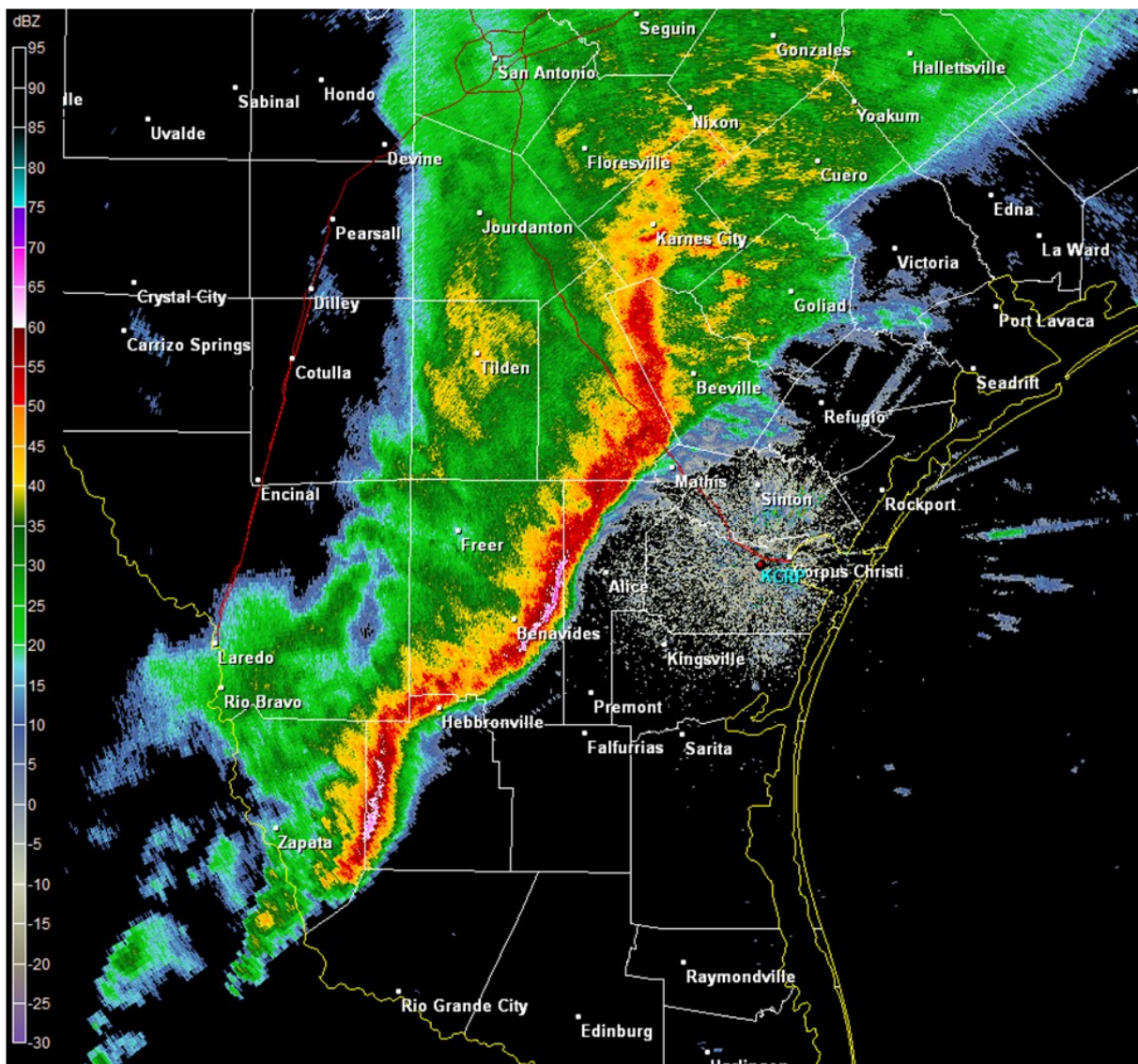
SEVERE WEATHER

Historic January Tornado in South Texas: January 9th, 2011 Squall Line

Mike Buchanan - Science & Operations Officer

In the early morning hours (mostly between 200 and 600 AM CST) on January 9th, 2011, a severe squall line of thunderstorms developed and pushed rapidly eastward across South Texas and the adjacent coastal waters. Straight-line wind gusts between 50 and 80 mph were quite common along and just behind this squall line. Besides the straight-line winds, a tornado also developed along the leading edge of the squall line. The tornado was rated an EF-1 based on the observed wind damage. Wind gusts between 86 and 110 mph equate to an EF-1 classification. This marked the first time in recorded history that a tornado was observed in the month of January in South Texas.

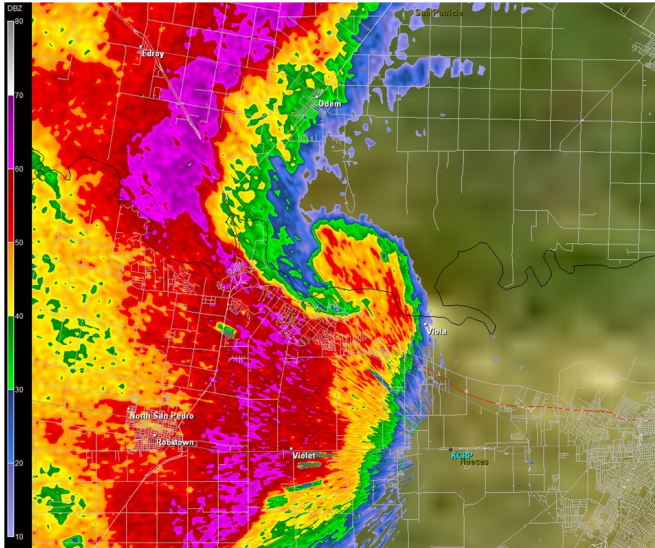
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(Left) The reflectivity from the KCRP Doppler Radar at 310 AM CST on January 9th, 2011. The squall line was just west of Alice at this time and eventually produced a 67 mph wind gust at the Alice International Airport several minutes later.



The tornado developed around 4 miles southeast of the Alice International Airport. The tornado then tracked northeast for around 21 miles. It travelled through the western portion of Robstown and then into the Calallen area before dissipating. The tornado was at its strongest between Robstown and Calallen. Winds estimated around 100 mph occurred within this portion of the tornado track. Numerous trees, power lines, telephone poles, roofs and signs were damaged or destroyed in the path of this tornado. Damage to the Robstown High School and a semi truck being overturned in the Calallen area were two examples of the strength of this tornado.



(Left) The “mesovortex” signature which was responsible for the EF-1 tornado which tracked from near Alice to Calallen.

Widespread wind damage occurred to many trees, homes and other structures between Victoria and Banquete due to the strong straight-line winds. Even some boats moored in the surrounding bays were damaged. Although quarter size hail was reported in San Patricio and Nueces counties, the more interesting fact was the depth of hail. Many areas in Corpus Christi had sufficient hail to coat the grass white. Some areas experienced so many hailstones, that they did not completely melt away until more than 12 hours later!

(Right) This mobile home in Portland was completely destroyed by the strong straight-line winds.



The squall line was spawned by a strong upper level disturbance approaching from West Texas and northern Mexico. At the surface, a strong area of low pressure developed over northern Mexico and tracked rapidly across South Texas. The surface low and associated warm front helped to draw in warm, moist and unstable air from the Gulf of Mexico. However, the most important aspect of this event was the significant change in both wind speeds and direction with height (“wind shear”). Strong wind shear produced by this developing low pressure system was a key factor in both the rapid intensification of the squall line and the development of the tornado.



STAFF SPOTLIGHT

New Science & Operations Officer - Mike Buchanan



Michael Buchanan is the new Science & Operations Officer (SOO) at the National Weather Service (NWS) office in Corpus Christi, Texas. Mike has been with the NWS for more than 19 years. He started as a Meteorologist Intern back in February of 1992 at the NWS office in League City, TX. In 1994, he was promoted to a Journeyman Forecaster position at the NWS office in Morristown, TN. Then in 1998, he was promoted to a Senior Forecaster position with the NWS office in Corpus Christi. In November of 2010, Mike was promoted to the SOO position.

Mike grew up in history-rich Quincy, Massachusetts where he lived for nearly 23 years. His fascination with weather began at an early age. Nor'easters, hurricanes and severe weather fueled his passion for the weather. His older brother Jimmy also helped propel his desire to understand the weather. The Blizzard of 1978, Hurricane Gloria in 1985, Hurricane Bob in 1989 and the "Perfect Storm" in October 1991 were four of the more significant New England weather events in which he experienced.

He graduated with highest honors from Rutgers University in 1991 with a B.S. degree in Meteorology. Mike has been married for almost 3 years now and has two step-kids. He enjoys saltwater fishing and camping at Big Shell with his wife. He also enjoys attending rock concerts, riding his brand new truck, enjoying a nice movie, traveling across the country, learning new technologies and playing basketball, volleyball and bowling.

New Journeyman Forecaster - Rob Hart



Rob Hart became our newest Journeyman Forecaster when he joined the staff in January of this year. He comes to us from Brownsville, TX where he started his career with the National Weather Service in 2008. Prior to working for the NWS, Rob was a broadcast meteorologist in Lubbock, TX and Meridian, MS. He also worked behind the scenes in news production at WCBI-TV in Columbus, MS as well as WEHT-TV in Evansville, IN, and was an on-air personality for WBNL-Radio in Indiana. Rob graduated Cum Laude from Mississippi State University where he studied meteorology and communications. Outside of work, Rob enjoys traveling to new places, spending time with friends and family, and is big into photography.

- Photo taken by Jim/Darlene Campbell



New Lead Forecaster - Jason Runyen



In January 2011, Jason Runyen was promoted to Lead Forecaster at the NWS Weather Forecast Office (WFO) in Corpus Christi, TX. Prior to this, Jason had served at WFO Corpus Christi since 2003 as a Journeyman Forecaster. Jason serves as the Fire Weather & Decision Support Program Leader for our office and has been heavily involved with local, state, and national partners in both of these areas. He was dispatched to the Texas Forest Service Emergency Operations Center (EOC) during the 2008 & 2011 Fire Seasons and to the Victoria County EOC during Hurricane Ike. Jason also assists with leading the SKYWARN program for training severe weather spotters across South Texas, assists with compiling local Storm Data information, is active in public outreach, and assists in developing simulation training for WFO Corpus Christi. Jason has received several NWS Southern Region Director's Awards and most recently a NWS Regional Cline Award for his efforts during the historic 2008-2009 drought and fire season.

Prior to arriving in Corpus Christi, Jason served at WFO Lubbock, TX from 2002 to 2003. Jason also worked in the private sector as a corporate aviation meteorologist for Baseops International in Houston. Jason graduated from Texas A&M in College Station in 1998 with a degree in Meteorology. In his spare time Jason enjoys attending Texas A&M Football games and is also President of a bowling league in Corpus Christi. Jason also enjoys camping, especially at Garner State Park.

www.weather.gov/corpuschristi

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