



South Texas Weather Journal



NWS Corpus Christi, TX

Winter 2013 Edition

Special points of interest:

- Did you know that this year ranks as the sixth-least-active Atlantic hurricane season since 1950?
- Has the Drought Improved?
- Find out more about the Nueces River flood.
- Learn more about what is expected for the upcoming Fire Weather Season.

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Winter Weather Safety Tips

John Metz — Warning Coordination Meteorologist

The winter season is upon us and with it you can expect cold temperatures, the potential for frozen precipitation, and the occasional severe storm. The season got off to a quick start this year with the arrival of the first arctic air mass in November. High temperatures in Corpus Christi were limited to 50 degrees F or below for a total of 4 days, and this ranks as the longest cold spell for the month of November dating back to 1929. Cold weather typically lasts through February before the spring warm up begins.



When freezing temperatures are expected you'll want to dress appropriately. Wear layers of loose, lightweight clothing, including hat, scarf, and gloves or mittens to stay warm. To avoid damaging the water pipes on your home, allow the water to drip from one indoor faucet. Be sure to cover any sensitive outdoor plants, and bring your pets indoors.

Be careful with space heaters during cold spells as they account for 80% of home heating fire deaths. Remember to keep space heaters at least 3 feet away from kids that may be playing and any flammable objects. Be sure to use proper fuel specified by the manufacturer, and remember to turn space heaters off when leaving the room. Finally, ensure that your smoke alarms are functioning properly by testing them monthly!



Winter storms are rare in south Texas, but when they do occur, be prepared for ice, snow, blowing snow, and dangerous wind chills. How common is winter weather in south Texas? In total, about 30% of winters had measurable snow or ice and about 30% of those events were significant with greater than 1/4" of ice and/or more than 1" of snow.

Winter Driving Tips:

- Check weather and road conditions before traveling:
- www.weather.gov/crp
- www.drivetexas.org
- Wait for conditions to improve.
- Take it slow!
- Wear your seat belt.
- Go easy on the brakes
- Turn into a slide



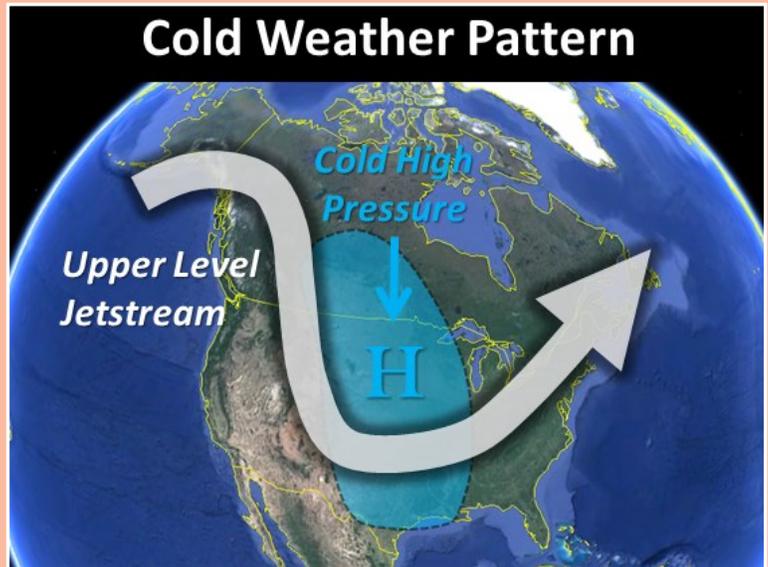


Severe thunderstorms occasionally occur during the winter, given our close proximity to the warm tropical waters of the Gulf of Mexico and frequent frontal passages. When a tornado or severe storm is approaching, get low and stay low! Seek shelter in a small interior room of your home or business. Evacuate mobile homes and take shelter in a nearby

What causes cold weather in South Texas?

When high pressure in the upper atmosphere surges northward into Alaska, the jet stream often buckles, resulting in the very cold air across the northern territories, surging southward through the plains and into Texas. This has been a common pattern during the 2013 winter thus far. However forecasting these Jetstream patterns is very difficult beyond 7-14 days.

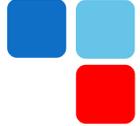
Historic cold snaps and ice storms have occurred during similar weather patterns. During the 1985 winter, very cold high pressure surged into south Texas resulting in 9 days in January with low temperatures in the 20s and 30s. One of the greatest ice storms in Corpus Christi history occurred during this event. The Corpus Christi Caller Times reported up to 1" of ice accumulated along the Nueces Bay Causeway. There were 2 fatalities and 27 injuries due to traffic accidents. The ice storm closed roads, bridges



and school for several days.



For a complete history of ice storms in South Texas check our website at: <http://www.srh.noaa.gov/crp/?n=icestorms>



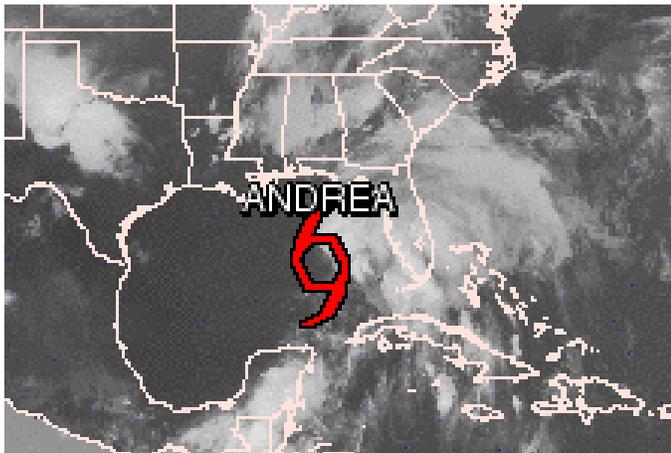
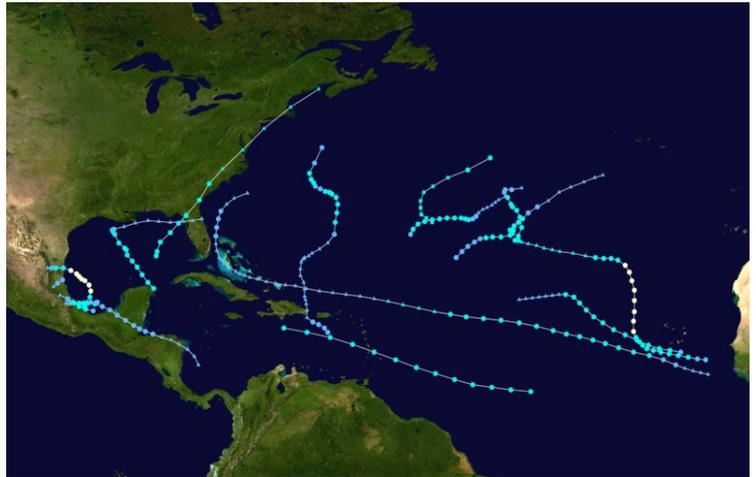
A LOOK BACK

A Relatively Quiet Atlantic Hurricane Season

John Metz—Warning Coordination Meteorologist

The 2013 Atlantic hurricane season officially ended November 30th, and had the fewest number of hurricanes since 1982, thanks in large part to persistent, unfavorable atmospheric conditions over the Gulf of Mexico, Caribbean Sea, and tropical Atlantic Ocean. This year ranks as the sixth-least-active Atlantic hurricane season since 1950, in terms of the collective strength and duration of named storms and hurricanes.

Thirteen named storms formed in the Atlantic basin this year. Two became hurricanes (Ingrid and Humberto), but neither became major hurricanes. (See Table 1) Although the number of named storms was above the average of 12, the numbers of hurricanes and major hurricanes were well below their averages of six and three, respectively. Major hurricanes are categories 3 and above.



Tropical storm Andrea, the first of the season, was the only named storm to make landfall in the United States this year. Andrea brought tornadoes, heavy rain, and minor flooding to portions of Florida, eastern Georgia and eastern South Carolina, causing one fatality.

The closest threat to Texas came during the peak of the season when Hurricane Ingrid formed in the Bay of Campeche on Sept 12. Ingrid initially moved north, but took a sharp left turn, making landfall along the central Mexico coastline. Ingrid produced large swells that impacted Texas beaches caused some minor tidal overflow.

The 2013 hurricane season was only the third below-normal season in the last 19 years, since 1995, when the current high-activity era for Atlantic hurricanes began.

Unlike the U.S. which was largely spared this year, Mexico was battered by eight storms, including three from the Atlantic basin and five from the eastern North Pacific. Of these eight landfalling systems, five struck as tropical storms and three as hurricanes.



This also marks the 8th consecutive year without a major hurricane strike in the United States. The last major hurricane was Wilma which struck south Florida in October of 2005. Although many would consider Hurricane Ike a major hurricane, because of its low pressure and massive storm surge, technically it was ranked a category 2. Hurricane categories are only derived from the storms maximum sustained wind speed.



NOAA and the U.S. Air Force Reserve flew 45 hurricane hunter aircraft reconnaissance missions over the Atlantic basin this season, totaling 435 hours--the fewest number of flight hours since at least 1966.

NOAA will issue its 2014 Atlantic Hurricane Outlook in late May, prior to the start of the season on June 1.

Name	Peak Category	Dates	Peak Wind (mph)	Minimum Pressure (mb)	Damage (USD/millions)	ACE
Tropical Storm Andrea		June 5-7	65	992	0.04	1.83
Tropical Storm Barry		June 17-20	45	1003	minimal	0.56
Tropical Storm Chantal		July 7-10	65	1003	10	2.09
Tropical Storm Dorian		July 23-August 3	60	1002	none	2.62
Tropical Storm Erin		August 15-18	45	1006	none	1.1
Tropical Storm Fernand		August 25-26	60	1001	millions	0.7
Tropical Storm Gabrielle		September 4-13	65	1003	none	1.92
Hurricane Humberto	1	September 8-19	85	980	minimal	8.76
Hurricane Ingrid	1	September 12-17	85	983	1500	4.77
Tropical Storm Jerry		September 29-October 3	50	1005	none	1.54
Tropical Storm karen		October 3-6	65	999	none	2.41
Tropical Storm Lorenzo		October 21-24	50	1000	none	1.62
Tropical Storm Melissa		November 18-22	65	980	none	3.53
Totals					>\$1.5 Billion	33

Table 1: Preliminary 2013 Hurricane Season Statistics

Nueces River Flooding

Mike Buchanan — Science and Operations Officer

Between the morning of October 13, 2013, and the morning of October 14, 2013, a large area of 6 to 8 inches of rain with isolated measured amounts as high as 13.88 inches (Crystal City) fell in the upper portions of the Nueces River watershed. In fact, rainfall amounts in northern Dimmit and southern Zavala counties exceeded 10 inches in many areas. The intense rainfall was triggered by an upper level disturbance interacting with an outflow boundary and deep tropical moisture from both the Gulf of Mexico and Pacific Ocean. The result of this very heavy rainfall produced some of the most significant river crests along the Nueces River in recorded history. On October 17, the Nueces River at Asherton recorded a crest of 29.70 feet which was the 5th highest crest of all-time. On October 17, the Nueces River at Cotulla recorded a crest of 22.81 feet which was the 4th highest crest of all-time. During the evening of October 17, the Nueces River near Tilden recorded a crest of 23.50 feet which was the 3rd highest crest of all-time. On October 21, the Nueces River at Three Rivers recorded a crest of 38.95 feet which was the 10th highest crest of all-time.

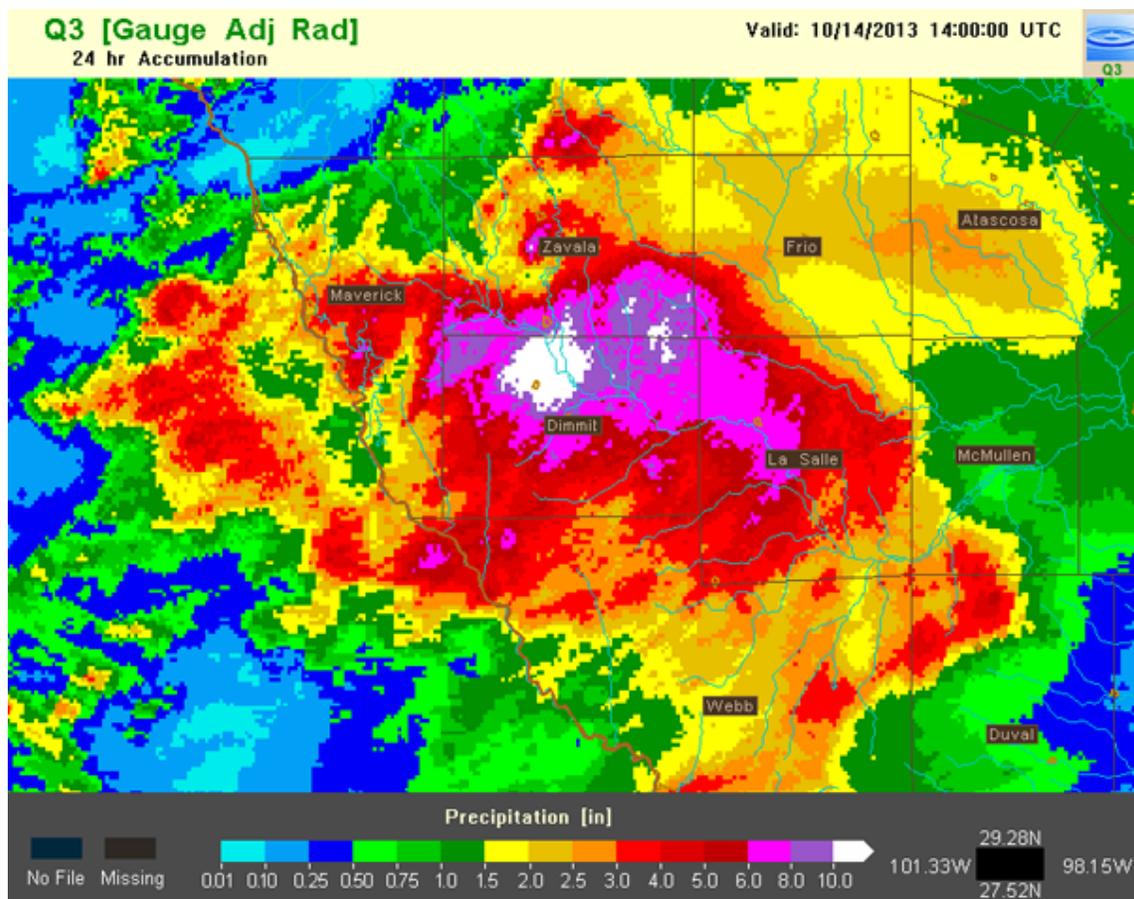


Figure 1. 24-hour rainfall amounts ending 10/14/13 at 900 AM CDT.

As a result of the immense volume of water flowing down the Nueces River, Lake Corpus Christi completely filled to 100% capacity by November 1, 2013. Before the flood wave arrived, Lake Corpus Christi was at 25% capacity due to a long-term drought which has plagued South Texas for several years.

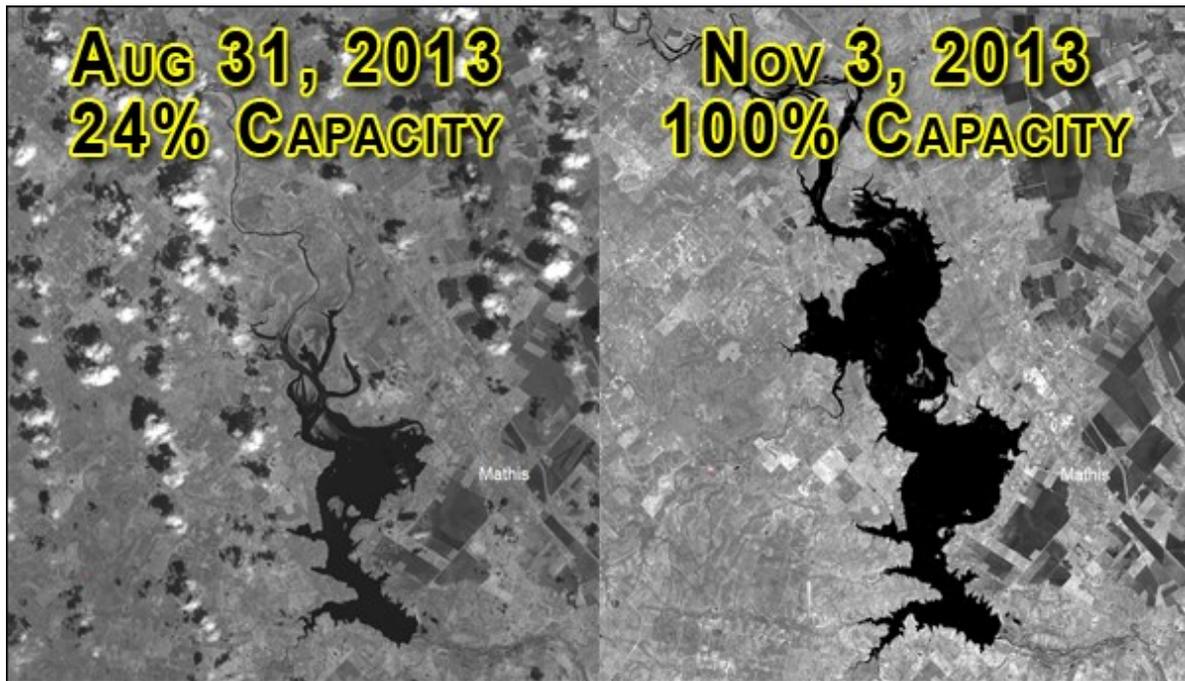


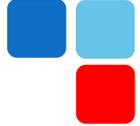
Figure 2. Before and After Photos of Lake Corpus Christi.

Widespread lowland flooding several miles from the main Nueces River channel was experienced between Asherton and the headwaters of Lake Corpus Christi. Many homes, roads, farm and oil field equipment, and cattle were either flooded and/or cut off due to the major river flooding. Residential areas at Buckeye Knoll, Jones River Bend, Kellner Camp, Shady Oak Grove, River Oak Acres, Swimming Hole RV

Park, and River Creek Acres were most affected by the swollen river. For more information on this historic river flooding, please go to <http://www.srh.noaa.gov/crp/?n=nuecesfloodOct2013>.



Figure 3. Aerial Photo (courtesy: Jason Runyen from the NWS and the Texas DPS) taken on 10/22/13 of rural McMullen County.



LOOKING AHEAD

Drought Conditions Improve Greatly Over Texas Since Spring 2013. What will 2014 Bring? Greg Wilk — Lead Forecaster

Since the middle of spring 2013, drought conditions have gradually improved, not only over South Texas, but in nearly all of the state of Texas. As Figure 1 indicates, much of the southern half of South Texas was either in extreme or exceptional drought, while the Northern Coastal Bend, Brush Country and Victoria Crossroads region being in moderate to severe drought. By the end of November, only the coastal counties of the Coastal Bend and a small portion of the Victoria Crossroads area were in drought (moderate), with the remainder of South Texas abnormally dry or drought-free (for the latest Drought Monitor product, go to: <http://www.srh.noaa.gov/crp/?n=drought>).

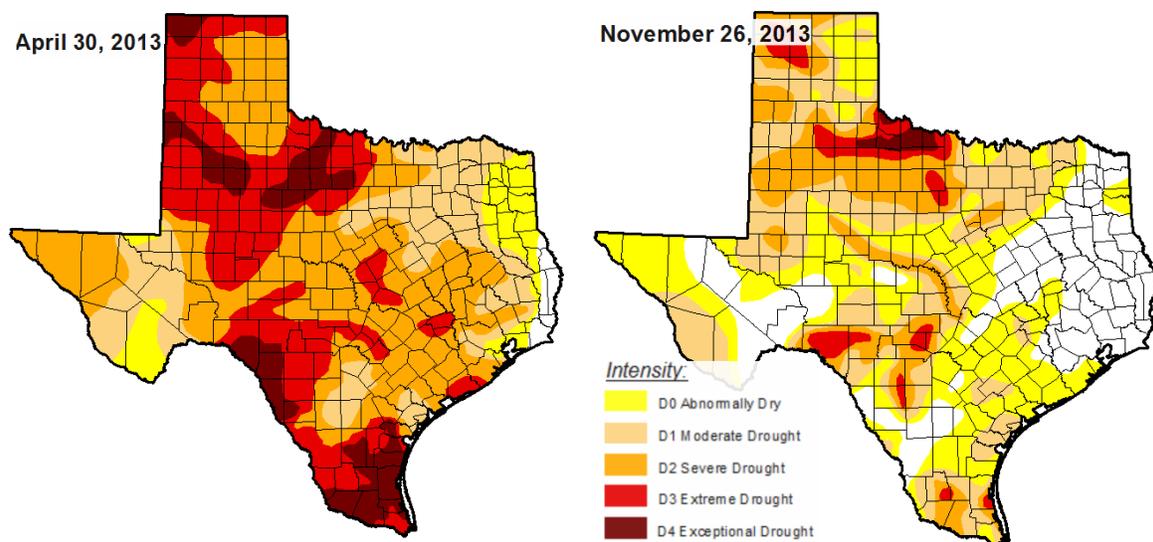


Figure 1: Drought conditions over Texas valid on April 30 (left) and November 26 (right). Note the improvement in drought conditions not only over South Texas, but over nearly all of Texas.

So, given the fact that South Texas did not have an organized tropical system move into the area in 2013, why did drought conditions improve over the last several months? First, although tropical storms and hurricanes stayed away from Texas, a couple systems were close enough to either bring remnant moisture to the area (e.g. Hurricane Ingrid), resulting in plentiful rainfall. Also, storms which formed over the mountains of Mexico during the spring and summer moved across the Rio Grande, at times producing widespread heavy rainfall and flooding (e.g. mid June heavy rainfall event). Finally, slow-moving cold fronts or semi-stationary cool thunderstorm boundaries combined with plentiful gulf moisture and surface forcing, producing heavy rainfall at times (heavy rainfall event on October 13 over the Rio Grande Plains and Brush Country). This latter event produced enough excessive rainfall over the Nueces River Basin to fill Lake Corpus Christi (which was around 25 percent capacity prior to the event)! Finally, ENSO (El-Nino/Southern Oscillation) neutral conditions have



continued over the equatorial Pacific Ocean for well over a year, which usually means more normal rainfall for South Texas. All of these factors diminished and, in some locations, eliminated drought conditions across the area.

So, what does 2014 hold? Will drought conditions return (and worsen) over South Texas, or will we continue to gradually eliminate the drought entirely over the area? The three month climate outlook for the period December 2013 through February 2014 call for equal chances for above/below/near normal rainfall (with above normal temperatures most likely). Later seasonal outlooks for 2014 continue with equal chances for above/below/near normal rainfall. The Climate Prediction Center (CPC) expects ENSO-neutral conditions to continue through at least the spring of 2014, with ENSO-neutral conditions possibly continuing into the summer of 2014. In fact, probabilistic ENSO outlooks favor neutral conditions through most of the summer, with an increasing potential for an El-Nino to develop (see Figure 2). As the graph below shows, in the forecast for the June-July-August time frame, there is about a 52 percent probability for ENSO- neutral conditions to continue, about a 36 percent chance for El-Nino conditions, and only about a 12 percent chance for La Nina to develop. What all this means is that, with La Nina unlikely, rainfall chances over the next several months should be closer to normal (on average). That does not mean that some areas will not have below (or above) normal rainfall for the next several months. It means that, when averaging rainfall over the next several months, South Texas will have a reasonable chance to have near normal rainfall during the first half of 2014. Stay tuned!

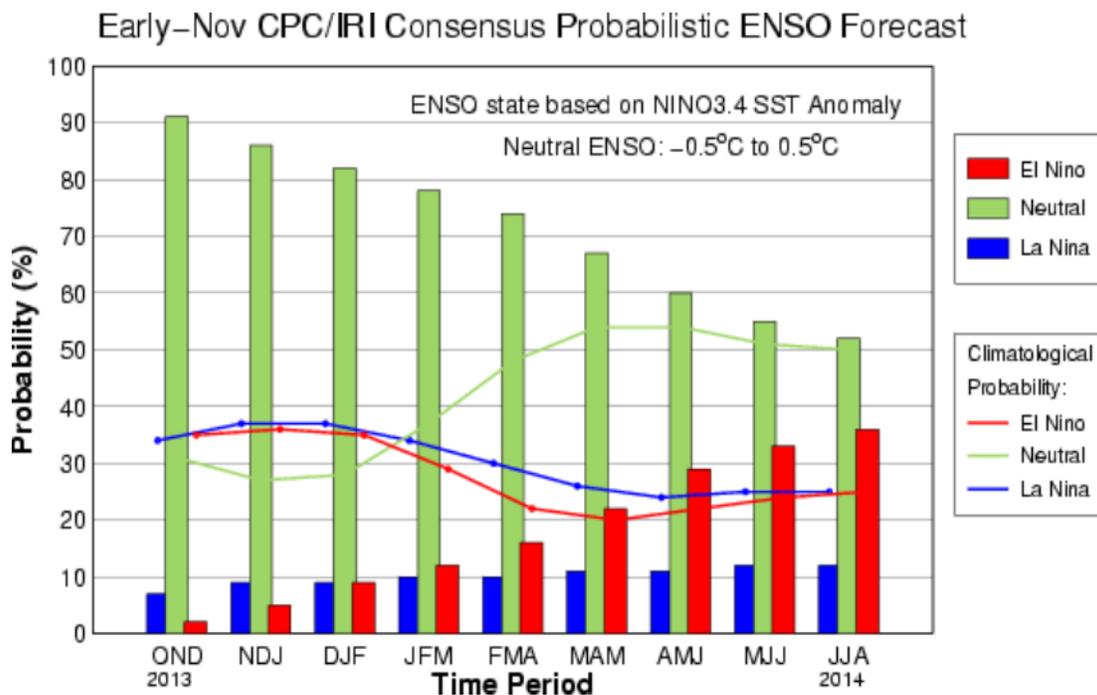
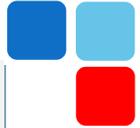


Figure 2: Cumulative probabilities for El Niño, La Niña and ENSO Neutral conditions to develop for each three month period through June-July-August 2014. Note that the probability for La-Niña conditions to develop is very low, while El-Niño probabilities increase during each three month period.



Will South Texas Experience an Active Winter and Spring Fire Season?

Jason Runyen — Lead Forecaster

Drought conditions have gradually improved across South Texas since the spring of 2013. So does this mean South Texas will see a reduction in the upcoming fire season?

Not necessarily. The current drought status alone is not the primary factor of the fire season. Brad Smith of the Texas A&M Forest Service Predictive Services Branch explains, “The drought, where it still exists, is not the primary driver of a fire season. We will see impacts from the past three years of drought, mainly tree and shrub mortality. The dead fuel loading, both on the surface and standing, can add to the fuel loading when it dries.”

In addition, grass production is up compared to the past two seasons, due in large part from the above normal rainfall received in some areas from July through September. This moisture boosted grass production during the growing season, increasing fine fuel loading in the areas that received the better rainfall.

So with dead fuel loading and increased fine fuel loading should South Texas expect an active fire season? Again, not necessarily. The key factor will be longer term weather patterns. Brad Smith explains, “The key to an active fire season will be extended drying. So far the trend has been cool and moist with frequent fronts bringing moisture to most of the state. If we do not see extended drying then we may see



Figure 1. Firefighters battle a 500 acre wildfire on North Padre Island on December 14, 2013. Picture courtesy of Katherine Pierce.

a more normal winter fire season where we see short term drying followed by a frontal passage, which can produce initial attack activity.”

So what is the seasonal precipitation forecast? Winter and spring precipitation in South Texas can be heavily influence by the El Niño Southern Oscillation (ENSO), a naturally occurring oscillation in sea surface temperature patterns across the equatorial Pacific. The El Niño phase of ENSO typically brings wet and cool patterns during the winter and spring season across South Texas. The La Niña phase can bring warm and dry patterns, similar to what occurred in 2011.



We are currently in a neutral phase of ENSO, which is forecast to persist through the spring. During this phase seasonal precipitation forecasters rely on other naturally occurring patterns and oscillations, which unfortunately are shorter in duration than ENSO phases and shorter in lead time. Thus, the current seasonal forecasts from January through May call for equal chances for above or below normal precipitation.

Increased dead and fine fuel loading is in place across areas of South Texas. But for an active winter and spring fire season to be likely across the region we will need several dry frontal passages that will lead to extending drying. Keep an eye out for these weather conditions, which at this time are hard to predict on a seasonal time frame.

As always, residents of South Texas are urged to exercise care with respect to all outdoor activities that could inadvertently cause wildfires. Avoid the use of welding or grinding equipment near weeds, grass and dry brush. Avoid parking in or driving through tall, dry grass that could be ignited. Do not toss cigarette butts on the ground. And be extremely careful with fireworks this New Year's Holiday.



Figure 2. A 500 acre wildfire on North Padre Island on December 14, 2013 was caused by a truck driving through tall, dry grass. Picture courtesy of Katherine Pierce.

A Look at New Upper Air Equipment

Lara Keys—Meteorologist Intern

Upon first looking at the Vaisala RS92-NGP someone might exclaim, “What is *that*?” This odd looking device is actually a **radiosonde**, which is used to collect meteorological data to aid in the forecasting of weather. These radiosondes are attached to weather balloons and launched twice a day, all across the country, to collect **pressure, temperature, and humidity** data, as well as derived **wind speed and direction** throughout the depth of the atmosphere. This data is used to assess current conditions in the atmosphere and is input into weather forecast models.

The National Weather Service has been taking upper air observations with radiosondes for several decades, but along with advancing technology, the equipment we use has advanced. The NWS has begun implementing the use of this new radiosonde earlier in the year. So, what’s so different about this new radiosonde? These radiosondes are lighter, use a dry cell battery (the old one had to be soaked in water to activate), and have more sensitive instruments on them, to give more accurate readings of the atmosphere. They are also shaped differently than their predecessors, with the instruments exposed on the outside of the radiosonde, instead of being housed inside of it.

If you happen to find a radiosonde that has fallen after a balloon has popped, and the balloon it is attached to is no longer inflated with hydrogen, it is safe to approach and handle the instrument. Attached to the radiosonde is a bag with mailing instructions. If you find a radiosonde, please follow these instructions to return the radiosonde, as they can be reconditioned and used again in the field.



Figure 1. Lockheed Martin Sippican Mark IIA old radiosonde used at NWS Corpus Christi

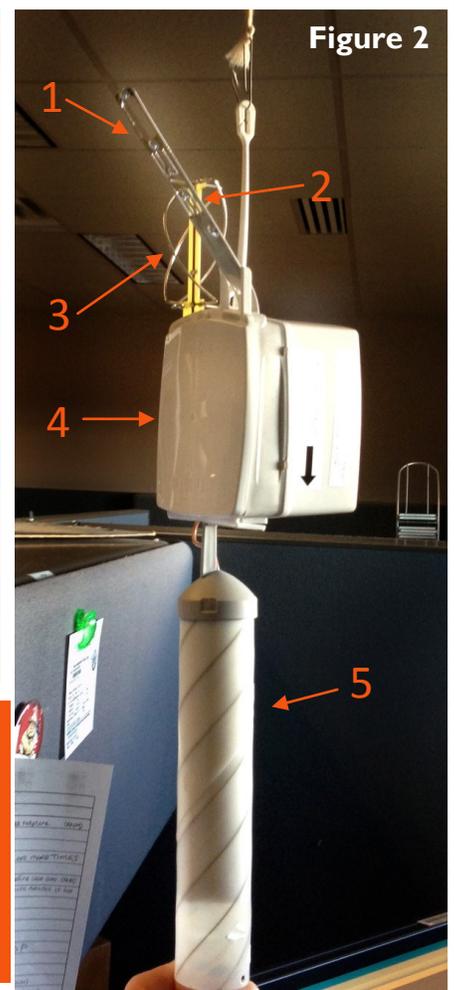


Figure 2. Vaisala RS92-NGP new radiosonde; 1 = Temperature sensor; 2 = Humidity sensor; 3 = GPS antenna; 4 = Radiosonde body with internal pressure sensor; 5 = Antenna with mailing bag inside



EVENTS, OUTREACH, & MORE

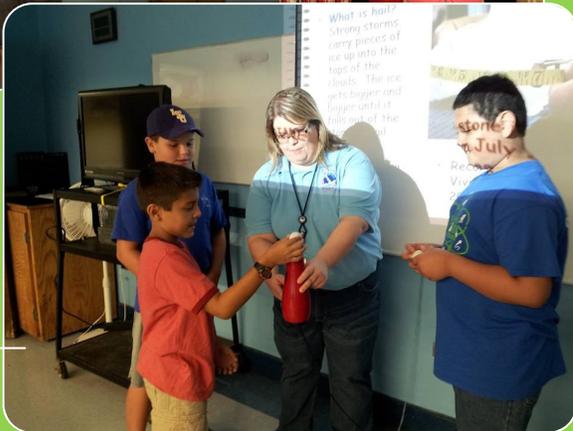
SKYWARN Recognition Day

On December 7th, 2013 the National weather Service celebrated the SKYWARN Recognition Day. SKYWARN Recognition Day was developed in 1999 by the National Weather Service and the American Radio Relay League. It celebrates the contributions that volunteer SKYWARN radio operators make to the National Weather Service. During the day, SKYWARN operators visit NWS offices and contact other radio operators across the world. Here are a few pictures of the events that occurred at NWS Corpus Christi's SKYWARN Recognition Day. Thank you at all of our volunteers!



2013 Sea Camp

During summer 2013 the National Weather Service in Corpus Christi participated in the 2013 Sea Camp from Texas State Aquarium. The NWS staff had the opportunity to provide interactive presentations to the kids participating at the camp. Needless to say, it was a great experience for our staff members and a great way to share our knowledge and excitement for weather phenomena with the little ones.



The Staff at the NWS in Corpus Christi Wishes you a Merry Christmas and a Happy New Year!

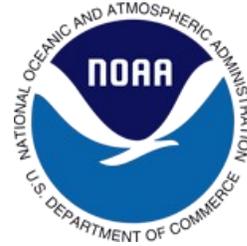
National Weather Service WFO Corpus Christi, TX

426 Pinson Drive

Corpus Christi, TX 78406

Phone: 361-289-0959

Fax: 361-289-7823



www.weather.gov/corpuschristi



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