



# Flood Alley Flash

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FALL 2009

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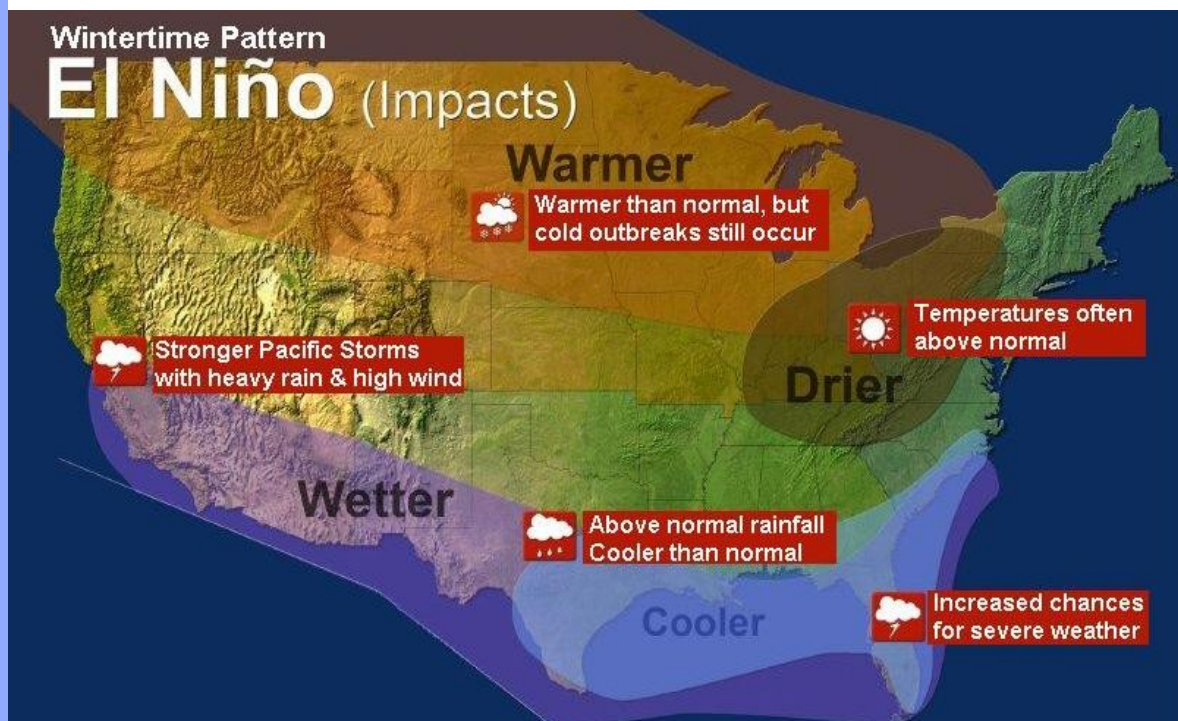
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## El Niño Has Arrived, But What Does It Mean For South Central Texas?



Map depicting expected winter impacts across the United States during El Niño.

Devastating floods, droughts, anomalous temperatures, rising sea surface temperatures: these are all impacts of a natural atmospheric cycle called El Niño. However, El Niño affects various parts of the world in different ways. For example, the southern United States normally receives above average rainfall amounts with cooler temperatures while Southeast Asia becomes very dry and warm.

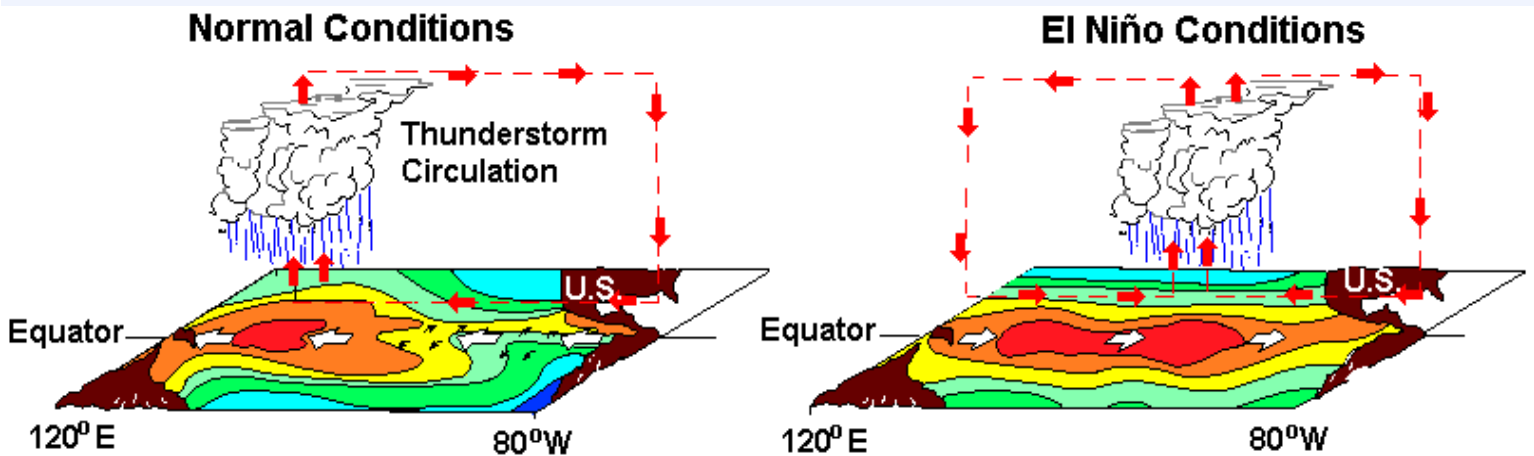
What exactly is El Niño and how does it affect so many parts of the world? This question is still being researched by scientists today. Once every three to eight years, the sea surface temperature in the Tropical Pacific begins to warm above its normal value. When this begins, the delicate balance

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# *El Niño, Continued from Page 1*

BY: AMANDA FANNING

between the ocean and the atmosphere is altered and causes weather patterns to change. This observation is what is known as El Niño. El Niño, meaning “the boy” in Spanish, refers to the Christ Child since this phenomenon normally occurs near South America around Christmas. Buoys in the Pacific Ocean monitor the activity around this area, and once these aforementioned changes begin to occur, the Climate Prediction Center assesses whether or not El Niño is imminent. Since the amount of warming in these waters varies from each El Niño, the strength of these events is never the same. Thus, it is hard to forecast the magnitude of the global impacts.



*Pattern in the Pacific Ocean during Normal Conditions (left), and El Niño Conditions (right). Sea surface temperatures are depicted with greens and blues indicating cooler temperatures, and oranges and reds indicating warmer temperatures.*

Although the last strong El Niño was in the autumn and winter of 1997-1998, South Central Texas did not feel the effects of this event as much as some other places around the country. The last devastating flood during an El Niño in Texas was during the 1991-1992 period, and it was known as the Christmas Flood of 1991. New record rainfall totals for the month of December were set at Austin and San Antonio in 1991. This rainfall caused some of the worst flooding in Texas history. Lake Travis nearly topped the dam, causing 400 homes to be flooded. In the end, this incident was responsible for 10 deaths and \$43 million in property damage. This particular El Niño caused a series of flood events throughout the year even after this major occurrence.

During the 2009-2010 winter season, the Climate Prediction Center expects a weak to moderate El Niño to develop. On average, during an El Niño phase, autumn and winters in South Central Texas bring cooler temperatures and rainfall amounts which average 30% to 40% above normal. Despite past events showing similar patterns, not all of these events are identical. Some events will produce an abundance of rainfall, while others only produce slightly above normal amounts. Since there is a better chance for above normal rainfall this winter, at least some improvement of this devastating drought is expected. If you want to learn more about El Niño and the possible influence it will have on South Texas' winter, please visit the [El Niño](#) website provided by the Pacific Marine Environmental Laboratory, the NWS Austin/San Antonio website for [Climate Resources](#), or the [Climate Prediction Center](#).

# Summer 2009 Was The Hottest And One Of The Driest Summers On Record

BY: ROBERT BLAHA

The consistent strength of the sub-tropical ridge over South Central Texas during the summer months of 2009 helped to make it the warmest summer of record at Austin, Del Rio and San Antonio. The abnormally hot conditions were persistent from day to day, making the average temperature the warmest for any June through August period. A record number of days reached 100 degrees at both San Antonio (59 days) and at Austin Bergstrom (55 days). Austin Mabry was just one day short of the record of 69 100-degree days. At Del Rio, the 65 days which reached 100 degrees this summer was close to the record of 72. Although all-time extreme monthly

highs were not reached, several daily record highs were tied or broken.

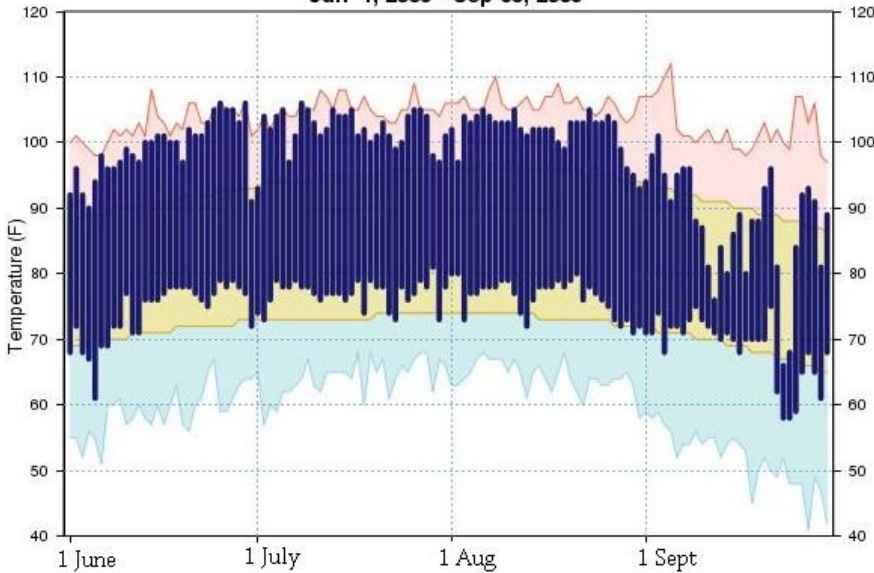
Although Del Rio had the hottest day of the summer (107 degrees) on May 6<sup>th</sup>, the hottest days at most other locations came from late June through August. The hottest temperature at San Antonio was 104, and was reached five different days from late June through August. Austin Mabry's hottest temperature of 106 was reached three days between late June and July.

July 2009 ended up being the warmest July--and overall month--on record at Austin Mabry and San Antonio, and the 3<sup>rd</sup> warmest July at Del Rio. August 2009 was the warmest August at Austin Mabry. This August tied with 2006 for the warmest August at San Antonio; and was the 2<sup>nd</sup> warmest August at Del Rio.

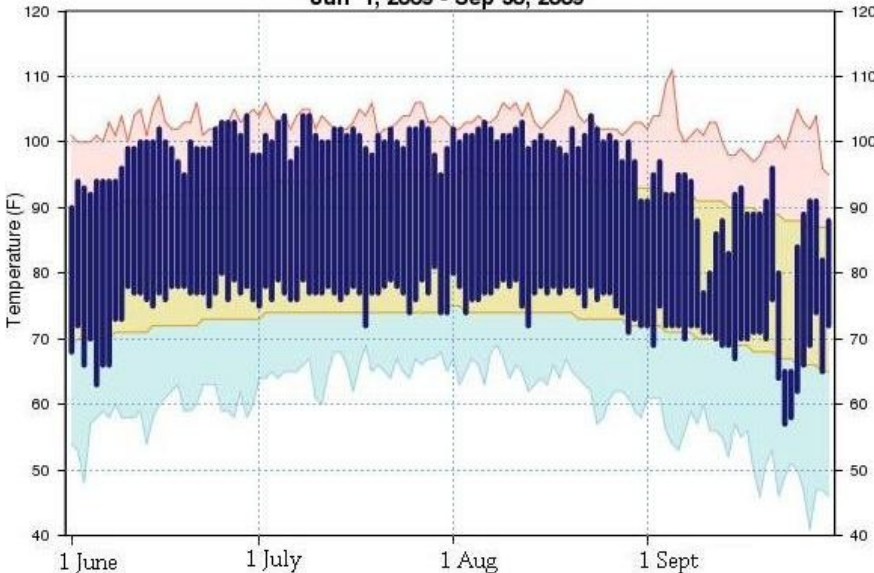
Stronger than usual cool fronts came in September, and cooled off the average monthly temperatures by about 10 degrees.

September started off warm for the first few days, then turned much cooler and wetter. A warming trend followed during the middle of the month, as hot afternoon highs in the 90s prevailed through the 21<sup>st</sup>. The first official day of Autumn, September 22<sup>nd</sup>, brought much different conditions. High temperatures across the region were in the 60s to near 70. Some sites

Temperature Summary for Austin Area  
Jun 1, 2009 - Sep 30, 2009



Temperature Summary for San Antonio Area  
Jun 1, 2009 - Sep 30, 2009



Temperature profiles from June 1-September 30, 2009. Observed high and low temperatures are connected by the dark blue bar. Area between normal high and low represented by the tan shading. Red line connects daily record high temperatures. Light blue line connects daily low record temperatures.

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even set new records for cool maximum temperatures!

From June to August, the summer of 2009 was one of the drier June to August periods on record. There were a few brief weather events with showers and thunderstorms throughout the summer, but rainfall was scant and provided no relief to the ongoing drought conditions. In fact, the period from September 2007 through August 2009 ended up being the driest consecutive 24-month period at San Antonio, and the third driest at Austin Mabry. Shown below is a chart of the top 3 driest consecutive 24-month periods at San Antonio and Austin Mabry.

### San Antonio (1885-2009)

1. September 2007-August 2009; 24.83 inches
2. August 1954-July 1956; 30.23 inches
3. October 1908-September 1910; 30.41 inches

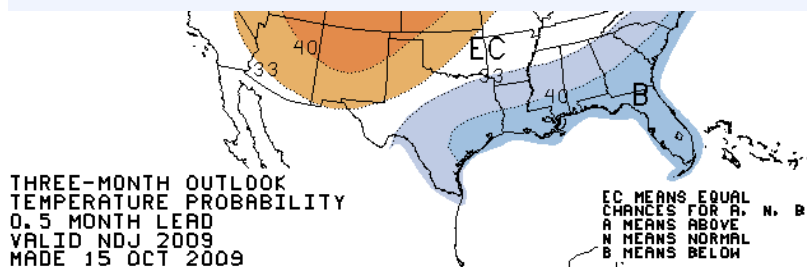
### Austin Mabry (1856-2009)

1. October 1916-September 1918; 33.87 inches
2. January 1954-December 1955; 33.96 inches
3. September 2007-August 2009; 35.23 inches

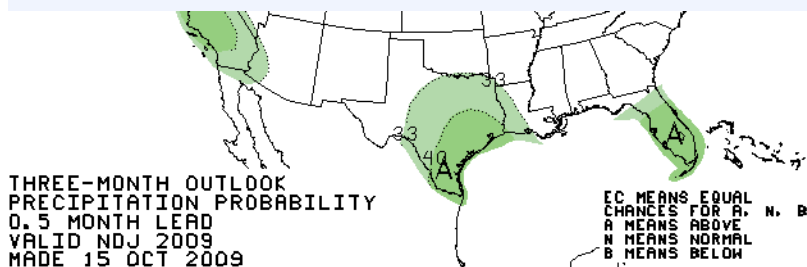
In early September, the weather patterns changed to bring more widespread showers to the region. In sharp contrast to the record dry periods, September 2009 ended up being wetter than normal at most sites across the region! The rain which fell during the month of September accounted for over a third of the region's year-to-date total.

Want even more information? We have a wealth of climate information such as observed weather, El Niño resources, normals and extremes, and much more. To get started, please visit our [Climate website](#).

## Climate Outlook



*Three-month temperature outlook for November through January.*



*Three-month precipitation outlook for November through January.*

The Climate Prediction Center (CPC) issues seasonal outlook maps of the probability of departures from normal temperature and precipitation, each of which covers a period of 3 adjacent calendar months. These three-month outlooks are updated by [CPC](#) on the third Thursday of each month. The CPC also issues technical discussions of the long-range outlook; skill levels for each season's outlook; normals; and probability that a temperature or precipitation quantity will be exceeded for the given season.

The latest climate outlook from the CPC indicates higher chances for below normal temperatures through January. The precipitation outlook shows greater chances for above normal rainfall for the same time frame. Click on either picture for a U.S.-scale view, or visit the [CPC website](#).

# Co-op Corral

BY: STEVE SMART

Welcome back! Since our last newsletter, we have had the honor of presenting or delivering length of service (LOS) awards to the following cooperative observers:

## Individual Awards

- March 1, 2009 - Adolfo Rodriguez of Poteet - 30 Years
- April 1, 2009 - Shirley A. New of Speaks - 20 Years
- June 1, 2009 - James Overstreet of Derby -10 Years
- July 1, 2009 - Jerry Simon of Jeddo - 15 Years

## Institution Awards

- March 1, 2009 - City of Pearsall (Conrad Banda)- 50 Years

Additionally, we are proud to announce that Stuart J. Haby of Vanderpool was selected this summer to receive the coveted and prestigious Thomas Jefferson Award. This is the highest meritorious award the NWS can present to a cooperative observer. Only five or six observers from over 11,000 observers nationwide are selected for this prestigious award each year. Mr. Haby will be presented with his award at a luncheon event in Kerrville, Texas during the latter part of October. Look for pictures in the next issue of the Flood Alley Flash! From the NWS, many thanks are given to these and all our great cooperative observers for the time, work and effort they give to support the rainfall, climate and spotter networks.



*From left: Conrad Banda; Jose G. "Pepe" Trevino, Pearsall City Manager; and Loretta H Carter, Pearsall Mayor Pro-Tem receive the 50-year Length of Service Award from NWS Austin/San Antonio MIC Joe Arellano. Photo by Joe Baskin, HMT, NWS Austin/San Antonio.*

## Mark Your Calendar!



### Upcoming Safety Awareness:

November 10, 2009 - Texas Winter Weather Awareness Day

February 21-27, 2010 - Severe Weather Awareness Week



### SKYWARN:

#### February:

- 20th (8am-4pm) - Austin, Pickle Auditorium

For additional information and a current list of training dates, please visit our [SKYWARN website](#).

# Test Your Weather Knowledge!

BY: DAVID SCHUMACHER



1. True or False: The relative humidity has to be 100% when it is raining?
2. At what temperature do Fahrenheit and Celsius temperatures equal each other?  
a. 100° b. 35° c. -40° d. -273° e. Celsius and Fahrenheit are never equal.
3. True or False: Water as little as 12 inches deep can float and move a car.

4. The name "National Weather Service" has been in use since 1965 when the agency was reorganized and became part of the Department of Commerce. What was the name of this agency prior to 1965?

5. What is the highest angle possible for the sun to reach in the sky for the Austin/San Antonio area (approximately 30 degrees north Latitude)?  
a. 83.5 degrees b. 90 degrees c. 60 degrees d. 87.5 degrees

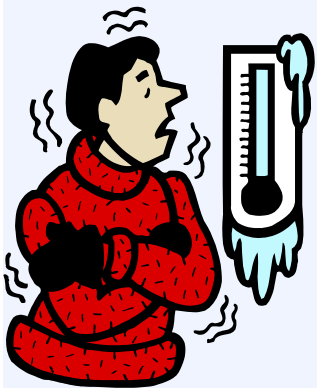
6. What are the all-time coldest temperatures (in Fahrenheit) on record for Austin (Camp Mabry), San Antonio, and Del Rio, respectively? Which of these was set most recently?  
a. -6°, 0°, 4° b. -10°, -8°, -5° c. -4°, -2°, -6° d. -2°, 0°, 10°



*Semi-trailer trucks being floated. Note that the water comes up only to the wheel wells!*

1. Answer: The humidity needs to be 100 percent *in the cloud* where the raindrops are forming. However, once the raindrop falls out of the cloud, the humidity can vary widely as the raindrop falls through the air toward the ground. Therefore both True and False can be right! The answer depends on "where" in the atmosphere the humidity has to be 100 percent.

2. Answer: -40°. The formulas to convert the temperature are: Celsius = (Temperature Fahrenheit - 32) x 5/9, and Fahrenheit = (Temperature Celsius x 9/5) + 32. So: Celsius = (-40°F-32) x 5/9 = -40° and, Fahrenheit = (-40°C x 9/5)+ 32 = -40°!



3. Answer: True, but if the water is moving fast, it can be less than 12 inches. Also, large tires on a truck can act like pontoons and float the truck. For each foot of rising water, a vehicle weighs **1500 pounds** less!

4. Answer: The Weather Bureau

5. Answer: a. 83.5 degrees. This would occur at noon on the Summer Solstice (first day of summer, June 20 or 21, depending upon the year). First subtract the latitude from 90, i.e.  $90 - 30 = 60$  degrees. On the first day of summer when the earth's axis is tilted 23.5 degrees TOWARD the sun, the noon sun angle is that number, plus 23.5. So, for our area, it's  $60 + 23.5 = 83.5$  degrees.

6. Answer: d., and Del Rio's record of 10 degrees was set most recently, on December 23, 1989.

# *A Constitution for Personal Flood Safety*

BY: JON ZEITLER, SCIENCE AND OPERATIONS OFFICER

Continuing from the Spring 2009 issue of the *Flood Alley Flash*, we will address how to create a “Constitution” for personal safety in advance of flooding events.

Floods occur across the entire United States, in all seasons, and range in duration from flash floods lasting minutes or hours, to large river floods lasting for weeks. Why then are many flood victims still “surprised” when flooding occurs? A few simple questions about flood threat can be asked of residents in any area, but the answers are shocking and uncomfortable to consider. For example, Houston is known as the Bayou City and bayous are essentially standing water. So, why are residents surprised when flooding occurs? Here in the Texas Hill Country, there are numerous low water crossings (which can only be crossed when the water level is low). Yet people are surprised and die precisely at these locations when their vehicles are swept away while trying to cross when the water level is high.



*Flood sign on Texas Highway 46, just west of New Braunfels*



*Flood gauge on Farm-to-Market Road 482, just south of New Braunfels*

Sometimes, even good intentions for safety can lead us astray. Consider the two pictures above. The picture on the left depicts a typical scene in our area, in this case, from Texas Highway 46 just west of New Braunfels. It’s not an optical illusion, the road actually goes uphill. Some questions to consider after looking at the sign: When is the roadway subject to flooding? How much rain will it take? Where is the road subject to flooding? The next mile? The next 25 miles? Now consider the flood gauge in picture on the right. If the water were at the two foot marker, would the water depth be two feet across the entire area near the gauge? If the road were washed out by the flood, would the water depth still be two feet? Would you be able to tell if the road were washed out if you approached at 30 mph? Would you be able to tell at night?

In summary, the examples above embody the constitutional principle of establishing justice. Specifically, that justice is achieved by realizing each of us is responsible for our own flood safety. Emergency managers, the National Weather Service, and first responders will attempt to provide planning, warning, and rescue. However, it is impossible to foresee or respond to every potential situation. The signs above also illustrate that even when potentially dangerous areas are identified, it’s still up to each driver to recognize the risk and not proceed when water covers the road. Responsibility for taking appropriate action rests with our own actions, and the next installments in this series will provide the details for a simple, low-cost, flood safety program.

*Continued in the next issue of Flood Alley Flash!*

# *We Wish the Best to Cristy Mitchell!*

BY: JOE ARELLANO, METEOROLOGIST-IN-CHARGE

On October 31, 2009, Cristy Mitchell, General Forecaster NWS Austin/San Antonio, will retire after 34 years of Federal government service. On behalf of the entire staff of the NWS Austin/San Antonio, congratulations and best wishes for a long and enjoyable retirement.

Cristy's career with the NWS started in 1975 in Rockville, MD as a Mathematician before converting to a Meteorologist Intern and transferring to the San Antonio Weather Service Forecast Office (WSFO) in 1976. After reaching the level of Graduate Met-Intern in 1978, she was promoted to a meteorologist position at the Center Weather Service Unit (CWSU) in Leesburg, VA. In October 1980, Cristy transferred to the Aviation Weather Branch at the National Meteorological Center (NMC) Forecast Division in Rockville, MD. In 1985, she was promoted to the NMC Monitoring and Aviation Branch. She then returned to the Weather Service Forecast Office (WSFO) in San Antonio as a General Forecaster in 1986. After the modernization of the San Antonio office and subsequent move to New Braunfels, she has been a steadfast General Forecaster at the Weather Forecast Office (WFO) Austin/San Antonio since February 1994.

Cristy's career with the NWS spanned some of the most exciting and demanding periods in the history of the Agency. She provided outstanding and dedicated weather forecasts and warning services to the citizens of South Central Texas for the past 23 years. She also played a vital role in making the modernization of the NWS forecast office in New Braunfels a reality.

We will miss Cristy, and her many friends and co-workers want to thank Cristy for her 34 years of dedication and service. May the coming years be the best!



*Photo of Cristy Mitchell trying to stay warm. The picture was taken shortly after the NWS office in New Braunfels opened in 1994, and the air conditioning system was running cold.*



# Are You Cuckoo for CoCoRaHS?

BY: MARIANNE SUTTON



CoCoRaHS stands for **C**ommunity **C**ollaborative **R**ain, **H**ail & **S**now network. It is a grassroots network of volunteer weather observers who measure rain, hail, and snow. Volunteers input their 24-hour rainfall total each day on the CoCoRaHS website. These reports are plotted on a map, and are then used by a variety of individuals and groups, such as farmers, teachers, engineers, and of course, your National Weather Service. An archive is also kept on the CoCoRaHS website, so you can access past rainfall information.

Our region currently has over 950 CoCoRaHS observers, but we still need more! Other than the cost of the rain gauge, it is free to join. The information collected is very important to us, especially during heavy rain events. Anyone can become a CoCoRaHS observer--all it requires is a desire to observe and report weather observations. Anyone of any age can become a CoCoRaHS observer--all it requires is a desire to observe and report weather observations. For more information, please visit our [CoCoRaHS website](#), "because every drop counts!"

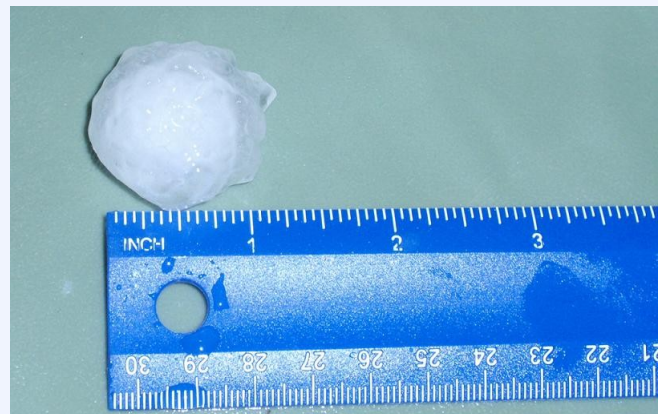


## New Severe Hail Criteria Coming in 2010!

BY: PAUL YURA, WARNINGS COORDINATION METEOROLOGIST

When you hear a Severe Thunderstorm Warning on NOAA Weather Radio, or you see the warning scroll across the bottom of the television screen, do you fully understand what the National Weather Service is saying? The Meteorologists are warning you that  $\frac{3}{4}$  inch hail or larger may occur in the warned area. If you compare this to coin sizes, this means that penny size hail or larger may fall from the storm. Many times it means that hail has already been reported across the area. You can report hail and other weather hazards through our webpage at [www.srh.noaa.gov/ewx](http://www.srh.noaa.gov/ewx).

For the past several decades, the National Weather Service has used this  $\frac{3}{4}$  inch diameter criterion. However, recent research has found that it takes larger hail to cause damage to roofs and automobiles. For this reason, the criteria for severe hail will be increased to 1 inch diameter starting January 5, 2010. This change will go into effect for the entire country. One inch diameter hail is approximately equal to the size of a quarter.



As a result of this change, we will likely see a decrease in the number of Severe Thunderstorm Warnings issued by the National Weather Service. Severe Thunderstorm Warnings can also be issued if meteorologists detect or anticipate winds of 58 mph or greater over the warned area. That is roughly the speed at which 2 to 3 inch diameter limbs start to break off trees. Although lightning can be very destructive by starting fires and causing power outages, frequent lightning is not a criterion for issuing a warning. Nonetheless, it's a good idea to seek shelter whenever threatening weather approaches!

## 2009 Hurricane Season - Is it Over Before it Began?

BY: BOB FOGARTY

The Atlantic Basin's Hurricane Season got off to a late start this year. During the average hurricane season, the first tropical storm is named by July 10<sup>th</sup> and the first hurricane develops by August 14<sup>th</sup>. This year, the first tropical storm was named Ana on August 15<sup>th</sup>, and the first storm to reach hurricane strength wasn't until August 17<sup>th</sup> (Bill). While this was a late beginning, it was not the latest on record. According to the National Hurricane Center, the records for the latest date for the season's first tropical storm and hurricane are:

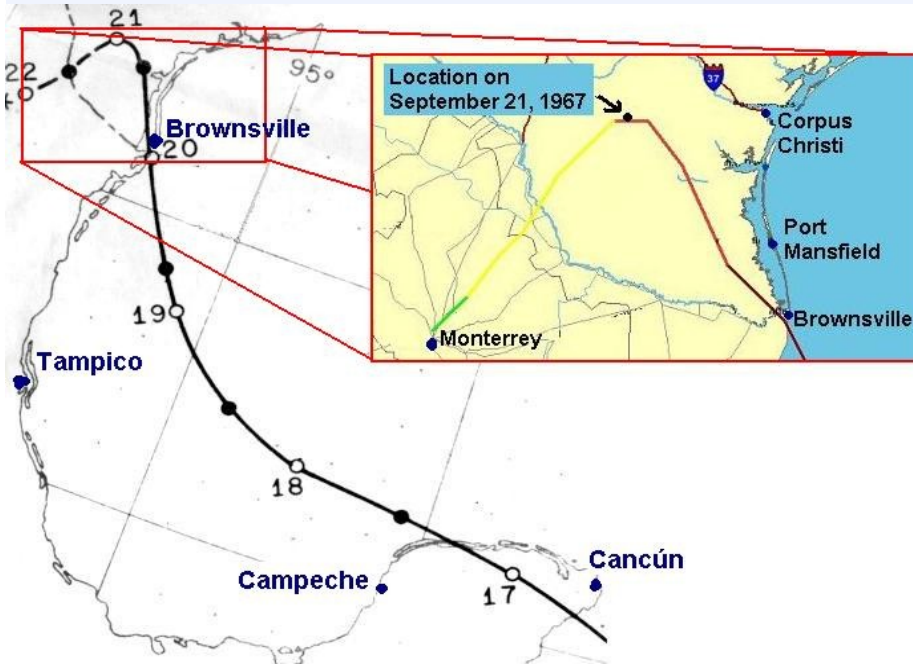
### Since records began in 1851:

Tropical Storm - September 15, 1914  
Hurricane - October 8, 1905

### Since 1966 (with satellite monitoring):

Tropical Storm - August 30, 1967 (Arlene)  
Hurricane - September 11, 2002 (Gustav)

So, while this year was late, we still had more than two weeks to break the record for a tropical storm and almost four weeks for a hurricane. Given the late start to the season, does this tell us anything about the severity of what's to come? Based on data from 1944 to 2002, in an average year,



Track of Hurricane Beulah, September 1967. Inset displays path of Beulah after landfall near Brownsville, Texas on September 20<sup>th</sup> through dissipation near Monterrey, Mexico on September 22<sup>nd</sup>.

there are about 10 named storms. Of the four seasons listed above, only 2002 had at least an average number of named storms, with 12. In 1967, there were eight named storms; 1905 had 5 storms of at least tropical storm strength (storms were not named at that time) and the 1914 tropical storm was the only one that year. That means in our tiny sample of four years, three of the four were below normal. So far, 2009 has been running behind "schedule". In an average year, there will have been eight named storms by September 30--four of which will have become hurricanes with two of those becoming major hurricanes (category 3 or greater

on the Saffir-Simpson Scale). Through September 30, we've had only six named storms. Two of these storms became hurricanes, both of which reached major hurricane strength.

From a Texas perspective, what has happened during those late starting years? In 1904 and 1915 no tropical cyclones hit the Texas coast. In August 2002, a tropical depression which had been Tropical Storm Bertha moved across Padre Island near Baffin Bay. In September of that year, Tropical Storm Fay

*Continued on Page 11*

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crossed the coast near Matagorda. September 1967 saw Hurricane Beulah bring devastation to South Texas. Beulah made landfall as a major hurricane just south of Brownsville. The storm then moved northwest toward Freer in Duval County, and then back southwestward to Zapata. According to the National Hurricane Center, the storm caused widespread flooding with “every river south of San Antonio flooded.” The storm also produced a record 115 tornadoes, and nearly 60 lives were lost in Texas and Northern Mexico.

**W**hat might be ahead for the rest of the season? The 2009 season is past its peak, and popular opinion seems to be that Texas is safe from a tropical cyclone for the rest of this year. Popular opinion, however, may not be correct. There have been 28 tropical cyclones (all strengths) that have hit Texas in September and six in October. The latest date that a hurricane has made land fall in Texas is October 16, the date of which an unnamed hurricane came ashore in 1912. Hurricane Jerry made landfall on the same date in 1989. The latest land falling tropical storm to hit Texas was an unnamed storm on October 17, 1938. So, while the peak of the season is over, new records could still be set before the official end of Hurricane Season on November 30th!

*Interested in a Guest Speaker or Tour?*



**T**he National Weather Service Forecast Office in New Braunfels Texas offers guest speakers and office tours to adults and school children. We are a small office, so planning a visit requires coordination. We are more than happy to provide any length of presentation on a wide variety of weather topics, free of charge, to schools, civic organizations, etc. However, we do ask that requests for a guest speaker be made at least a month in advance. For additional tour and guest speaker requirements and information, please visit our [Tour Information](#) website.

If you have any questions or comments, please let us know! Our mailing address is: NWS Austin/San Antonio, 2090 Airport Rd., New Braunfels, TX 78130. Or, contact Paul Yura at (830) 629-0130, ext. 223 or, you may send an email to [Paul.Yura@noaa.gov](mailto:Paul.Yura@noaa.gov).