Flood Alley Flash

VOLUME 2, ISSUE 1 SPRING, 2009

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Early Spring Storms Pummel South Central Texas

Photo courtesy of WOAI

Take a look at the picture above. Is this a picture from this past winter? The answer is no, this picture was taken on March 26, 2009 near Charlotte, Texas, which is about 40 miles south of San Antonio in Atascosa County. A large severe thunderstorm developed southwest of San Antonio and moved east while producing wind damage and copious amounts of hail -- enough to make South Central Texas look like a winter wonderland! Hail the size of golf balls fell near Uvalde, while farther east, nickel and quarter size hail created drifts a foot deep in many locations. Strong winds of 50 to 60 mph produced damage near the towns of Charlotte and Christine.

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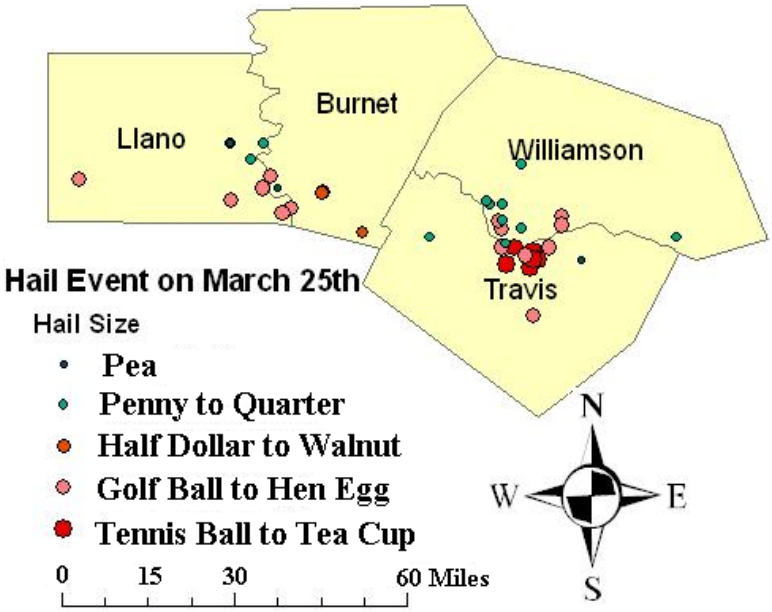
Early Spring Storms Pummel South Central Texas, Continued from page 1

BY: PAUL YURA, WARNING COORDINATION METEOROLOGIST



The end of March was very active for South Central Texas. On March 25th, just the day before the blanket of hail in Charlotte, the Austin area was hit by a very costly hail storm. An estimated 160 million dollars of damage to homes and cars became the new record for the costliest hail storm in Austin. The damage was caused by a long track supercell which moved east from near Llano, through Marble Falls, and then continued through extreme northern Travis county and southern Williamson County. The storm finally weakened as it moved into eastern Williamson County. The largest hail (2 to 3.5 inches) fell along the Travis and Williamson County line near Anderson Mill, Jollyville, and over to Pflugerville.

Above Left: Hail from Austin Great Hill Co-op Station which fell from 5:45 pm-5:55 pm. Photo courtesy Troy Kimmel.
Above Right: Hail which fell across the north side of Austin on March 25th. Photo courtesy Jonathan Steets

While reviewing the records of the costliest hail storms in Austin, a strange coincidence was discovered. It turns out that March 25th of 2009 is not the first time that Austin has endured a costly severe storm on March 25th. It turns out that the top three Austin hailstorms have **all** occurred on March 25th! The top three costliest hailstorms for Austin are:

- March 25, 2009 ($160 million in damage)
- March 25, 1993 ($125 million)
- March 25, 2005 ($100 million).

Above: 3.5-inch hail from Austin, March 25th, 2009. Photo courtesy of KVUE.

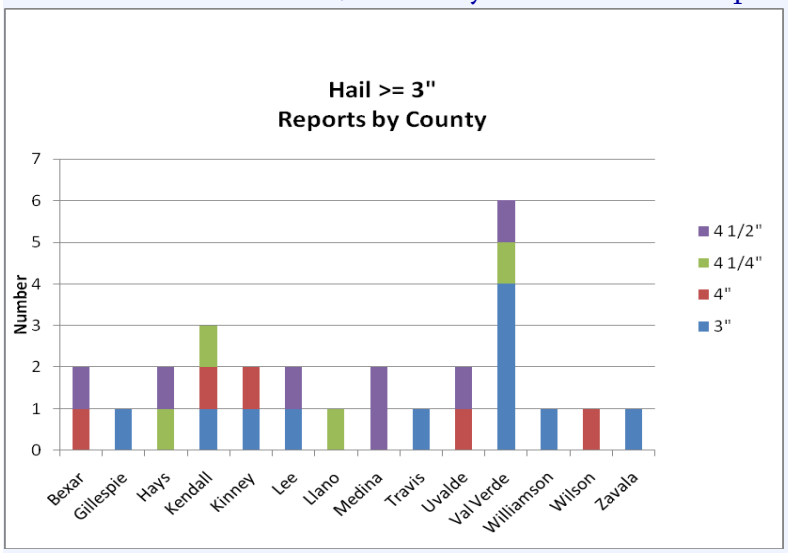
"Pennies" from Heaven

BY: BOB FOGARTY

The National Weather Service is responsible for issuing severe weather warnings to protect the lives and property of Americans. In South Central Texas, that duty is carried out by the men and women of the Weather Forecast Office in New Braunfels. Using the latest radar and satellite technology, we warn the public of impending life threatening and damaging weather events. One such event is a severe thunderstorm, which is defined as producing hail of at least 3/4" in diameter.

Marbles come in many sizes!

While we can use the radar to look into storms and estimate the size of hail they may be producing, what we can't do is see that hail with our own eyes and verify its size. That's where you come in. We need you to be our eyes in the field to confirm what size hail is actually falling. This helps us in two ways. First, it helps us "calibrate" the radar on any particular day. We can learn for that day that the radar echo we are seeing is producing a certain size hail. Second, your report can lead to additional warnings, or even the cancellation of warnings in and near your location. These reports are vital to our severe weather operations. One of the challenges for observers is how to estimate the size of a hailstone. The best way, of course, is not to estimate it, but measure it with a ruler. This way we know for sure how big the hail is. What if you don't have a ruler handy? For hail smaller than a ping pong ball, we want you to compare it to a coin. There is the temptation to call smaller hail marble size. Unfortunately, marbles don't come in standard sizes! Coins on the other hand, are always the same size. A penny is ¾" in diameter and a quarter is 1". So, if you can't measure the hail, please compare it to a coin.



Reports of hail greater than or equal to 3" seem independent of population

Now, let's look at a little history of hail reporting in South Central Texas. Not surprisingly, the most reports come from the counties with the largest populations: Bexar, Travis, Williamson, and Val Verde. Reports of very large hail (3 in. or greater) seem to be independent of a county's population.

Large hail is a fact of life in South Central Texas. The National Weather Service issues warnings for hail to protect lives and property. Reports from the public are critical for us to be able to issue the most accurate warnings possible. We get the largest number of reports from our most populated counties and really need help with some of our more sparsely populated areas. We know that a lot of folks live in sparsely populated areas across South Central Texas, and would appreciate you letting us know whenever you get hail, since we might not get the report otherwise. Just remember, no "marble-sized" hail reports!

March 2009 Marks the 10th Anniversary of Fire Weather Services to South Central Texas

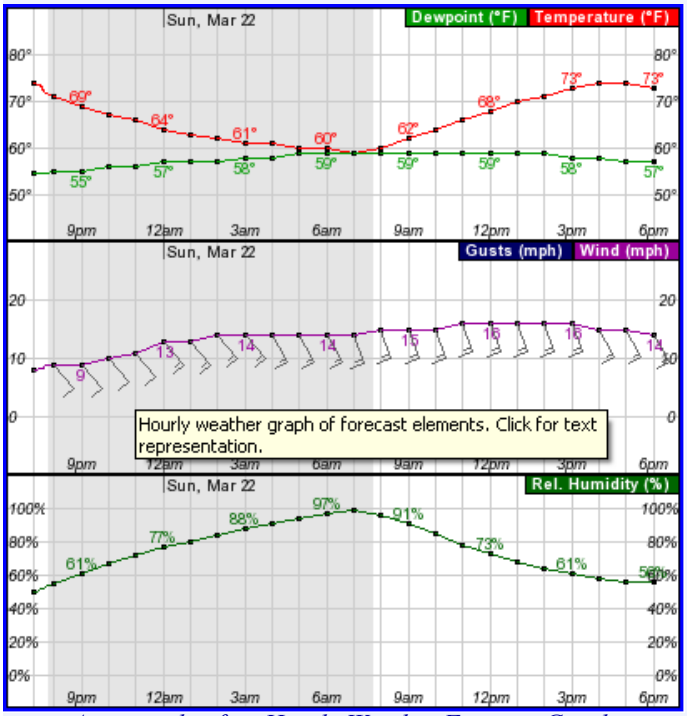
By: Monte Oaks, Fire Weather Focal Point

For the past 15 years, the climate of South Central Texas has been highlighted by several years of drought and active fire weather seasons, illustrating the value of fire weather forecasts and support from the NWS. Recently, exceptional drought conditions played a role in the spawning of the most destructive wildfire seen in South Central Texas in over a decade. On February 28th, the Wilderness Ridge fire near Bastrop destroyed 26 homes, 20 businesses, and another 44 outbuildings while consuming nearly 1,500 acres.

Aerial view of some damage from the Wilderness Ridge fire near Bastrop. Photo courtesy of the Texas Forest Service.

Developments in technology over the past couple decades have resulted in rapidly expanding capabilities for providing fire weather forecasts and support. In 1999, a collection of fire weather products was established for all NWS forecast offices to produce in the interest of protecting life and property from weather influenced fires.

The Red Flag Program was developed to alert government agencies, the media and the general public about critical fire weather conditions--weather conditions which promote especially dangerous wildfires. A forecaster expecting windy and dry conditions or thunderstorms producing little to no rain will issue a Fire Weather Watch or a Red Flag Warning, depending on how far in advance the alert is being provided. The critical fire weather conditions are relayed to emergency response agencies so that resources are optimized for the fire threat. With a high level of situational awareness for the critical fire weather event on February 28, the Texas Forest Service reported that fire crews were able to save over 400 threatened homes from the Wilderness Ridge fire.



An example of an Hourly Weather Forecast Graph.

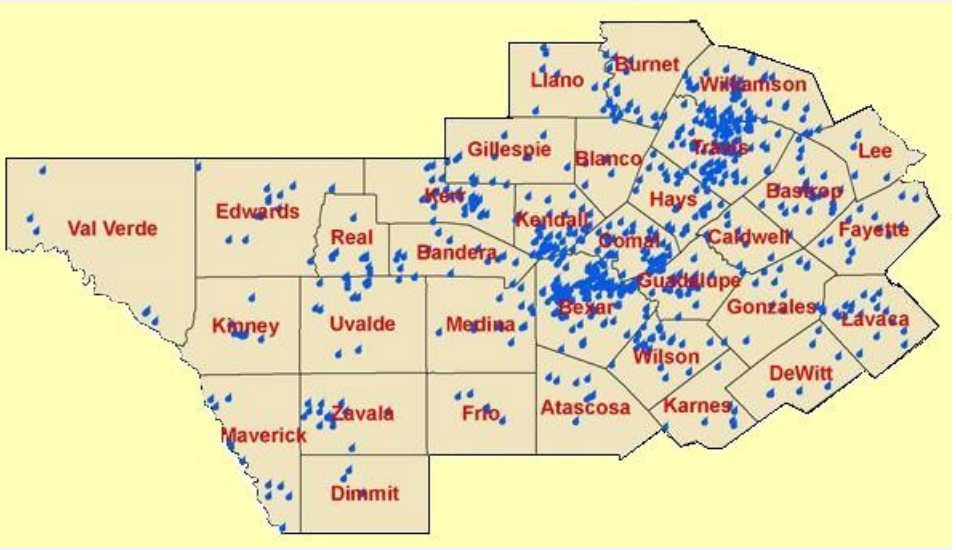
In addition to providing weather support for critical fire weather conditions, the NWS offers a variety of fire weather forecast products that allows the general public to prepare for various outdoor burning activities. While burn bans are decided upon by local authorities, the NWS can help establish which days are best to burn, or if the forecast calls for conditions that exceed local restriction thresholds. The Fire Weather Planning Forecast provides a conventional text based forecast for those who need a printed overview. However, customers with internet access can take advantage of our graphical forecast and point forecast features, including a Hourly Weather Forecast Graph, which shows a graphical time series of several fire weather parameters.

Cuckoo for CoCoRaHS!

BY: MARIANNE SUTTON

CoCoRaHS stands for Community Collaborative Rain, Hail & Snow network. It is a grassroots network of volunteer weather observers who measure rain, hail, and snow. This information is then collected through the CoCoRaHS website. These reports are plotted on a map on the CoCoRaHS website, and are used by a variety of individuals and groups, such as farmers, teachers, engineers, and of course, the National Weather Service.

Every March, CoCoRaHS coordinates a "March Madness" drive to recruit new members. From March 1-31, 2009, 637 new observers signed up nation-wide. Of those, Texas had the highest state total, with 86. Half of those were from South Central Texas and the Hill Country!



Map of current CoCoRaHS observers across South Central Texas and the Hill Country

While our region has over 830 CoCoRaHS observers, we still need more. Other than the cost of the rain gauge, it costs nothing to join, and the information you provide is a big help, since "rain doesn't fall the same on all"! Anyone can become a CoCoRaHS observer-all it requires is a desire to observe and report weather observations. For more information, please visit the **CoCoRaHS website**, "because every drop counts!"

Mark Your Calendar!

Upcoming Safety Awareness:

April 27-May 1, 2009 - **National Air Quality Awareness Week**
May 24-30, 2009 - **Hurricane Preparedness Week**
June 21-27, 2009 - **Lightning Safety Week**

SKYWARN:

April : 14 - Del Rio
16 - Jourdanton
20 - Johnson City
22 - Hondo
30 - Seguin

May : 7- Canyon Lake
7 - Leakey
11 - Kenedy
14 - Cuero
26 - Halletsville

June : 2 - Taylor

Visit our **SKYWARN website** for further information, as well as updates!

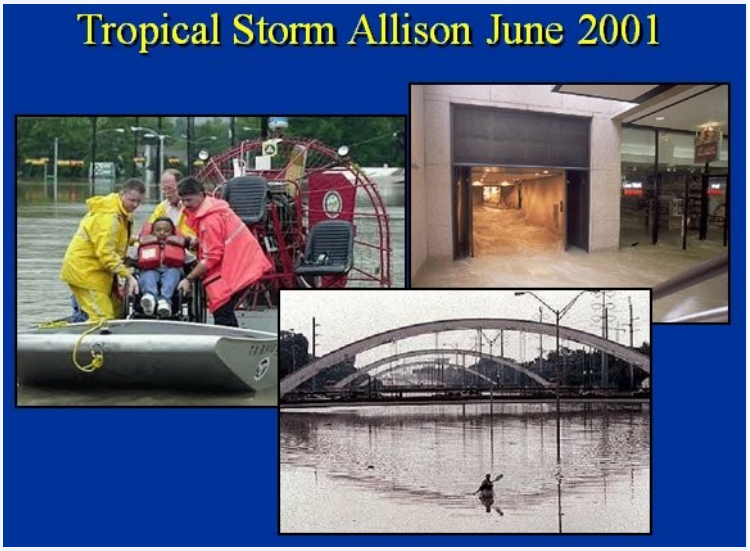
A Constitution for Personal Flood Safety
Part One

BY: JON ZEITLER, SCIENCE AND OPERATIONS OFFICER

Floods are a fact of life here in Texas. With this in mind, it is a good idea for all of us to have a plan of action before flooding threatens. Over the next few issues of *Flood Alley Flash,* we will address how to create a "Constitution" for personal safety in advance of flooding events.

2007 marked the 220th anniversary of the United States Constitution, and a record year of flood deaths (64) in Texas. Previous and subsequent floods have caused significant damage and deaths in many parts of the United States. Despite decades of flood safety awareness programs, these efforts have not been fully effective in preventing loss of life and mitigating the disastrous financial and emotional impact of flooding.

A prime example is Tropical Storm Allison, which struck Houston from June 9-10, 2001. Twenty-two people lost their lives, nearly 50,000 homes were flooded, and over $5 billion in damage occurred. Despite accurate forecasts, extensive pre-event flood awareness efforts, and continuous media coverage during the event, many were still surprised by the intensity of rainfall and consequent flooding. Some of the outcomes from T.S. Allison (e.g., driving through floodwaters) were also common in prior events. Other outcomes were new, generally resulting from an increasingly urban, unprepared population that expected to receive instant, detailed flood information. From all of the outcomes, two primary themes emerged. First, there was a general lack of planning by individuals and businesses. Second, a communication gap existed between official warnings and announcements and what the public actually expected. Subsequent floods across the U.S. have reinforced these themes.



Photos copyrighted and courtesy of the City of Houston Department of Emergency Management

Therefore, a new flash flood action paradigm is necessary, based on two principles: 1) flash floods have occurred before and will occur again; 2) protection of lives and property is most effective before an event takes place. The first may seem obvious, but many individuals do not fully accept their risk from floods, or they have moved to a coastal or flash runoff area and are unaware of the threat. The second principle is based on the fact that even a flash flood warning issued an hour in advance still leaves precious little time for those affected to take action.

A new approach developed by our office is based on the five main principles in the preamble of the U.S. Constitution: 1. establish justice; 2. ensure domestic tranquility; 3. provide for the common defense; 4. promote the general welfare; 5. secure the blessings of liberty. This program offers a solution for personal flood safety, an easily remembered mnemonic, and a call for a higher level of commitment — as one would pledge to defend the U.S. Constitution. We'll look at each of the principles in subsequent issues of the Flood Alley Flash, with the final result being a comprehensive, low cost program that will allow you to eliminate or greatly reduce the risk to your life, property, and emotional impacts from floods.

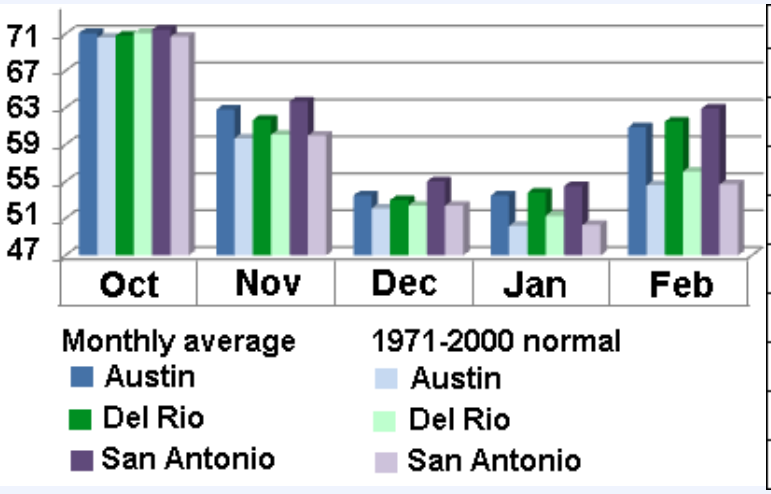
Continued in the next issue of Flood Alley Flash!

Climate Review: Winter 2008-2009

By: Robert Blaha

The polar jet stream ended up further north than usual this fall and winter. This helped keep rain and very cold air away from South Central Texas. The fast pace of cold fronts not only intensified the change from warm to cold, but also more frequently than usual. The persistent dryness also shortened the duration of cooler temperatures, quickly bringing the return of warmer temperatures. The warmer daytime highs offset the cool overnight lows, resulting in average temperatures being warm, even during the cooler periods. These ingredients made the Fall of 2008 to Winter of 2008-2009 one of the warmer Fall-Winters of record.

September 2008 to February 2009 was a tie for the 7th warmest September to February at San Antonio, with 1922-1923 and 2005-2006; the 13th warmest at Del Rio; and the 8th warmest September to February at Austin. The 3 Month Winter period from December 2008 to February 2009 was the 7th warmest at San Antonio; the 9th warmest at Austin Mabry; and tied for the 12th warmest December to February at Del Rio with 1910-1911 and 1971-1972.



	Oct	Nov	Dec	Jan	Feb
Austin					
Avg	71.1	62.8	53.5	53.5	60.9
Normal	70.6	59.7	52.1	50.2	54.6
Del Rio					
Avg	70.8	61.7	53	53.8	61.5
Normal	71.1	60.1	52.4	51.3	56.1
San Antonio					
Avg	71.5	63.7	55	54.5	62.9
Normal	70.7	60	52.4	50.3	54.7

The most extreme changes in daily temperatures occurred in early December, late February, and in March, just before Spring officially began. On December 9th, it warmed into the 80s ahead of a cold front, which brought a mix of wintery precipitation to the region that evening. Temperatures fell by as much 45 to 50 degrees later that night behind cold front. Daytime highs on the 10th were 25 to 35 degrees colder than the 9th. Temperatures fell rapidly during the day of January 27th, with another cold front, that brought another winter precipitation event to the area the night of the 27th to morning of the 28th. One month later, another rapid change from warm to cold occurred on February 27th to the 28th. Highs on the 28th were between 20 and 30 degrees cooler than highs near 90 to the mid 90s on the 27th.

Big temperature changes from warm to cold also came very late in the season. After unseasonably warm conditions March 9th, and 10th, temperatures fell 25 to 30 degrees from the morning through the afternoon on March 11th. Additional reinforcements of cold air swept across South Central Texas March 12th and 13th, under cloudy skies with rain. The coldest daily highs of record for March 13th came in 2009, with highs of 42 at Austin Mabry, 42 at Austin Bergstrom, 46 at San Antonio, and 51 at Del Rio.

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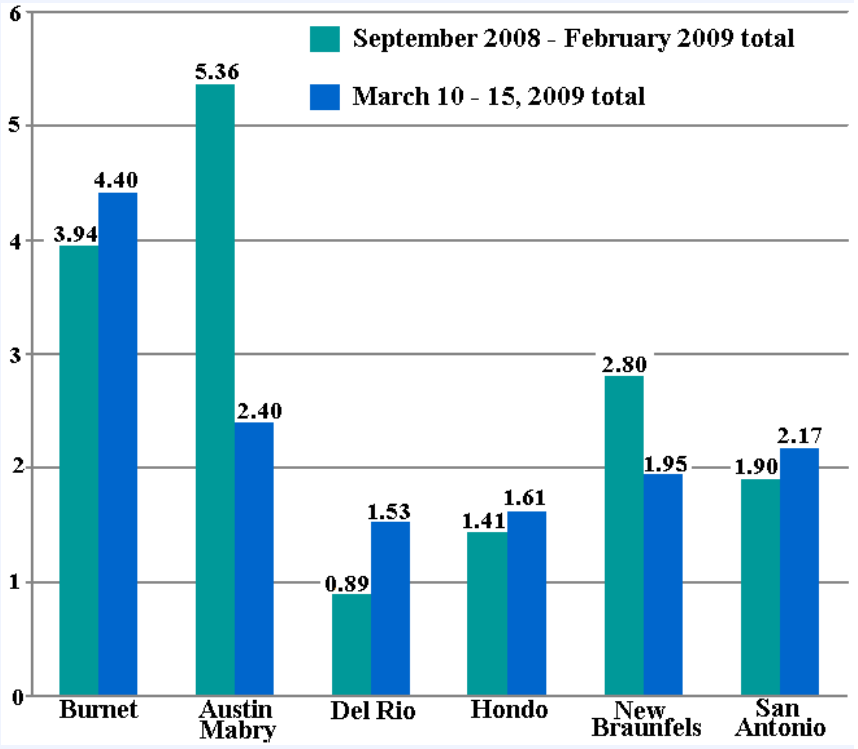
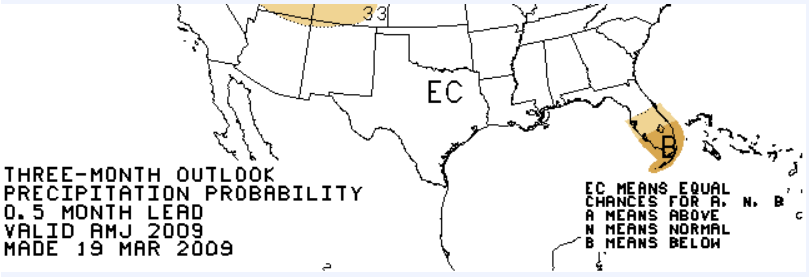
Although the period from September through February was mostly bone dry, beneficial rains fell on March 10th to the morning of March 15th as a cold front stalled across the region. Some places received more rain from this event than in the total 6 month period from September 2008 to February 2009!



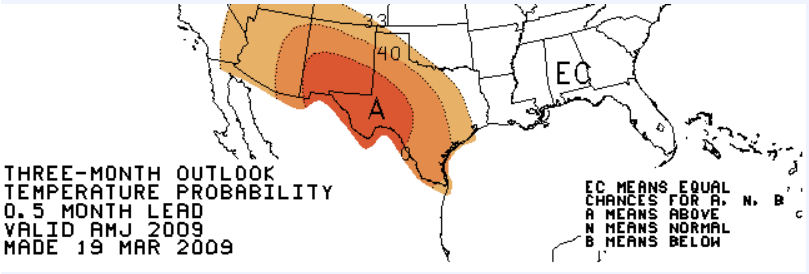
The March 10th-15th rainfall also set a few new daily rainfall records. Del Rio tied the record daily rainfall of 1.45 inches on March 11th. This record was previously observed exactly 100 years ago on March 11, 1909. On March 12th, new records were set for Austin Bergstrom and San Antonio, with 1.85 inches and 1.72 inches, respectively.

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 precipitation outlook for April through June



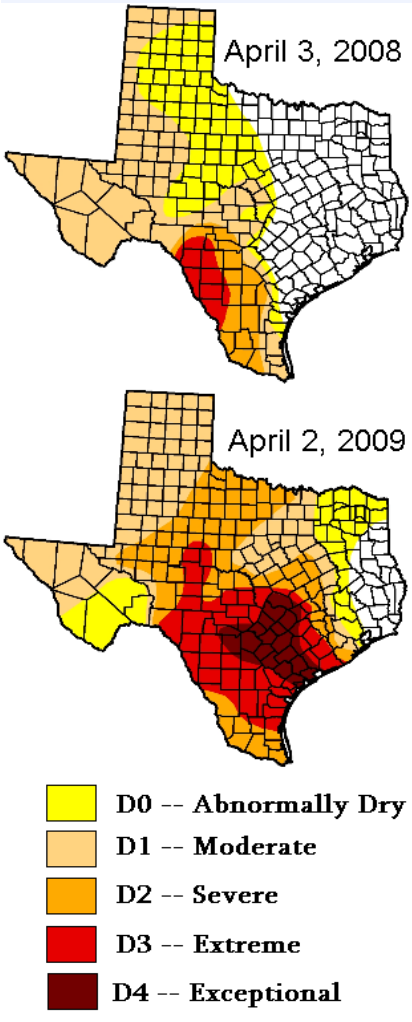
Three-month temperature outlook for April through June

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 above normal temperatures through June. The precipitation outlook shows equal chances for above, below, and near-normal rainfall for the same time frame. Click on either picture for a U.S. scale view, or visit the **CPC website**.

Ongoing Drought is Worst in Decades

BY: MARIANNE SUTTON



There's a familiar saying that the climate in Texas can be summarized as periods of drought interrupted by floods. Even though 2007 started off as a wet year, drier conditions settled in by the end of summer. Below normal rainfall has been recorded across South Central Texas since September, 2007. There have been a few days of higher than normal daily rainfall over the last 19 months, but these have been too few to overcome the ongoing drought.

Each week, the National Drought Mitigation Center, works with its partners (including the National Weather Service, the Climate Prediction Center, and the USDA, among others) to produce a pictorial representation of the drought intensity across the United States. Drought intensity is divided into 5 categories, ranging from D0, "abnormally dry", to D4, "exceptional". In addition to lack of rainfall, many other factors are considered when determining an area's drought intensity. Some of these are the underlying soil moisture, crop moisture, as well as seasonal variations in expected rainfall. Shown to the left is a comparison of drought intensity over the last year. The picture on the top was the drought intensity from April 3, 2008. The picture on the bottom was issued April 2, 2009. (Maps courtesy of the National Drought Mitigation Center)

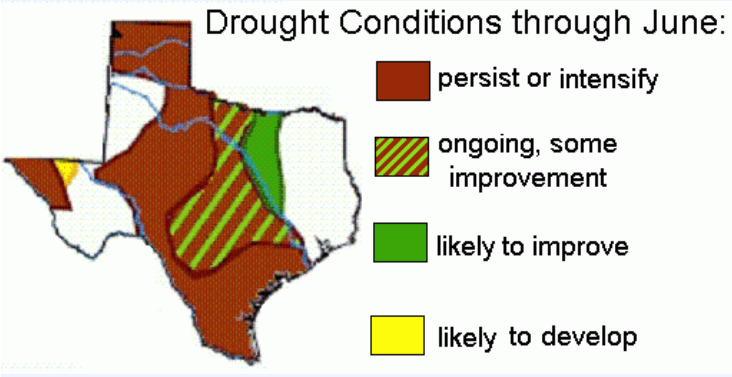
How dry has it been? The 18-month period from September 2007 to February 2009 was the third driest 18-month September to February on record at Austin Camp Mabry. Concurrently, it was the all-time driest 18-month September to February period at San Antonio. Records began at Austin Camp Mabry in 1856, and at San Antonio in 1885. As expected, several rivers are below normal for this time of year. Additionally, many lakes and reservoirs are also below normal levels. The level at Canyon Lake continues to fall slowly, and has currently reached a historically low level of 897.07 feet. This record will be continually superseded until significant rainfall occurs. The previous record low level was 899.70 feet in December, 1984.

Driest 18-month September to February periods:

San Antonio:
1. 17.32 inches, Sept. 2007- Feb. 2009
2. 20.13 inches, Sept. 1916- Feb. 1918
3. 20.75 inches, Sept. 1955 - Feb. 1957

Austin Camp Mabry:
1. 22.93 inches, Sept. 1955 - Feb. 1957
2. 24.53 inches, Sept. 1916 - Feb. 1918
3. 25.21 inches, Sept. 2007 - Feb. 2009

Del Rio:
1. 8.22 inches, Sept. 1955 - Feb. 1957
2. 10.55 inches, Sept. 1916 - Feb. 1918
3. 12.69 inches, Sept. 1951 - Feb. 1953
...
...
38. 23.00 inches, Sept. 2007 - Feb. 2009



Some hope is in sight, though. While several rain events will be needed to overcome the current drought disaster, the Climate Prediction Center has indicated that some improvement is expected through June. Click on the map to the left for the national-scale map issued by the Climate Prediction Center. For additional drought information, visit our office's drought information webpage.

Co-op Corral

By: Joe Arellano, Meteorologist-In-Charge

Welcome back! Since our last issue, we have had the honor of presenting Length-of-Service Awards to more of our co-operative observers.

- **January 8 - Leona B. Roitsch of La Grange - 30 Yrs**
- **January 29 - Frederick L. Kite of La Pryor - 20 Yrs**
- **February 18 - Steve Flocke of Wimberley - 10 Yrs**
- **February 25 - Joan M Smith of Watson - 25 Yrs**

Mrs. Charlene Fischer, Cooperative Weather Observer of Fischer, Texas, accepts the 70-Year Ruby Stufft Length of Service Award from MIC Joe Arellano, WFO Austin/San Antonio, TX, inside the Fischer Store. (Photo by Mark Lenz, Senior Service Hydrologist)

Additionally, on February 23, we presented the Fischer family, of Fischer, Texas a Ruby Stufft Length of Service award. This honor recognizes 70 years of co-op observer service. Mrs. Charlene Fischer is a 5th generation Fischer whose family has achieved an amazing unbroken rainfall observation record dating back to 1890. Charlene's uncle, Willie Fischer, began taking the official rainfall observations for the National Weather Service on June 1, 1939 and her father, Eddie Fischer, took over on December 1, 1952. Charlene became the official cooperative observer on January 1, 1977. The Fischer Store which Charlene reopened and runs along with Fischer Hall are rich in history. The Fischer Hall was featured in Willie Nelson's film "Honeysuckle Rose".

Office Awards

The Austin/San Antonio NWS office recently presented a 25-year Length of Service award to our Administrative Support Assistant (ASA), Norma Jones. Norma joined the NWS in 1984 as a secretary at the San Antonio office. The office closed in 1994 when it was consolidated with the new office built in New Braunfels. Norma has been at this office since then, and in 1997 earned a promotion to Administrative Support Assistant. She was the first person in the Southern Region to receive the promotion to ASA for NWS Modernization. Congratulations on your 25-year Length of Service award, Norma! Pictured on the left is Norma being presented her award by Meteorologist-In-Charge Joe Arellano. (Photo taken by Steve Smart, Observing Program Leader.)

Raindrops Ain't Fallin' On My Head

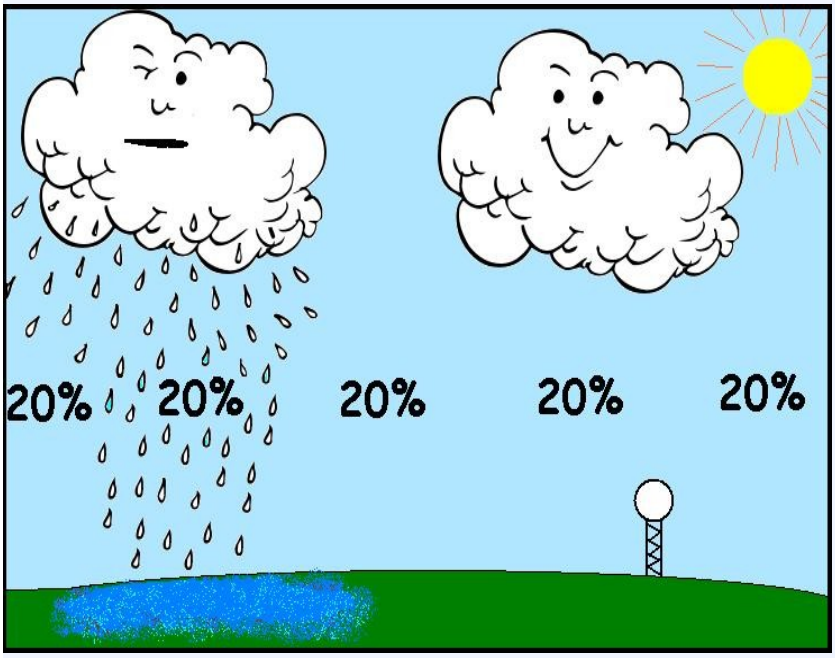
BY: DAVID SCHUMACHER

One of the most common complaints meteorologists hear is: "The forecast said only a 20 percent chance of rain today, but it ***poured*** at my house!" What does the 20 percent actually mean and how is it derived?

The National Weather Service began using Probability of Precipitation (PoP) in the 1970s as a way of conveying the chance (probability) of precipitation in the forecast. Forecasts issued by the NWS include a "PoP" statement, which is often expressed as the "chance of (rain, snow, showers, etc.)" or "chance of precipitation".

Example of a National Weather Service forecast:

Tuesday: Partly cloudy with a 30 percent chance of showers . High near 75. South winds 10 mph.



What does this "30 percent" mean? Will it rain 30 percent of the day? Will it rain over 30 percent of the area? How much will it rain? First of all, PoPs do ***not*** specify the amount of rain expected to fall (see "*Weather Words*" on the next page for more information). The PoP only describes the chance of precipitation occurring at ***any*** point you select in the area during a 12-hour period. These 12-hour periods are usually expressed as: Today, Tonight, Sunday, Sunday night, etc. So, how does a forecaster arrive at this value?

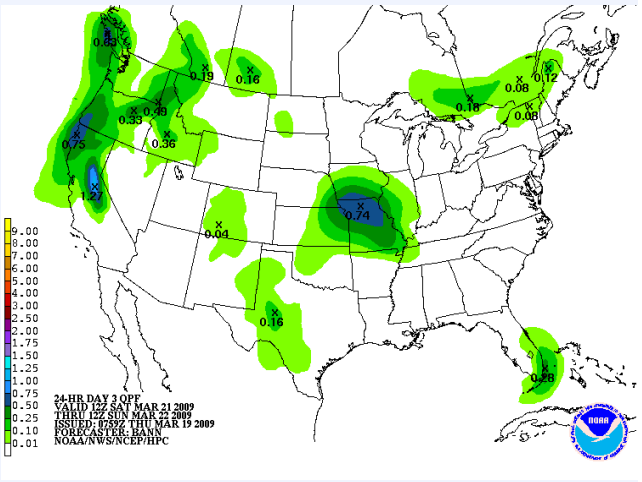
Mathematically, PoP is defined as follows: PoP = C x A where "C" = the confidence that precipitation will occur ***somewhere*** in the forecast area, and "A" = the percent of the area that will receive measureable precipitation, ***if it occurs at all.*** So, in the case of the forecast above, if the forecaster has 100% confidence that precipitation will occur, then he/she is expressing how much of the area will receive measurable rain. (PoP = "C" x "A" or "1" times ".3" which equals .3 or 30%.) ***But***, most of the time, the forecaster is expressing a more complicated combination of confidence and areal coverage. If the forecaster is only 50% sure that precipitation will occur, and expects that, ***if it does occur,*** measurable rain will fall over about 60 percent of the area, the PoP is still 30%. (PoP = .5 x .6 which equals .3 or 30%.) In either event, the correct way to interpret the 30 percent forecast is: there is a 30 percent chance that rain will occur at any given point in the area, or you ought to receive measurable rain 3 out of 10 times when 30 percent is in the forecast.

In order to get a better idea as to how much confidence a forecaster has with a rain event, it is a good idea to read the Area Forecast Discussion (AFD) available from the web page of the office issuing the forecast. The AFD often provides insight as to the "how and why" of the forecast and could help you make a better planning decision. In summary, the use of Probability of Precipitation in the forecast has been around a long time and is likely to continue for the foreseeable future.

Weather Words

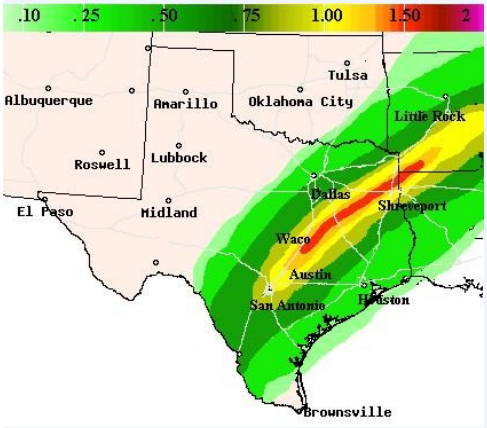
BY: MARIANNE SUTTON

Quantitative Precipitation Forecast (QPF): This term used to represent the total amount of liquid precipitation, in inches, expected during a certain time period at any point in the forecast area.



An example of a national-scale HPC QPF map

QPF is meant to be used in conjunction with a precipitation (PoP) forecast. While PoPs tell you the chance of rain, QPF is the expected average amount of rain across an area over a period of time. Many branches of the NWS create rainfall amount forecasts. The **Hydrometeorological Prediction Center** (HPC), the River Forecast Centers, and local NWS forecast offices each create precipitation forecasts if rainfall amounts of at least 0.01 inch are expected. The HPC currently produces precipitation amount forecasts for up to five days in the future. It creates several national-scale maps to visually portray the forecast, and also issues a text discussion to further explain the forecast. Each local forecast office also issues a local-scale QPF. These forecasts only extend through the following 3 days, since they provide finer detail. The QPFs produced from the local forecast offices can be viewed as a national, regional, or local-scale mosaics via the **NWS's website**, by clicking on the "Graphical Forecasts" tab.



An example of a regional-scale mosaic of QPFs produced by local offices.

Interested in a Guest Speaker or Tour?

The National Weather Service Forecast Office in New Braunfels Texas offers guest speakers and office tours to adults and school children. Our office here in New Braunfels is a small facility, so tour groups of more than 15 people are discouraged and cannot be handled without significant coordination. In the cases of large groups, we suggest contacting our office to arrange for a speaker to come to your location or meeting place. We can provide any length of presentation talking about a wide variety of weather topics including severe weather, **Skywarn**, tornadoes, hurricanes, flooding, weather preparedness, and careers in meteorology. We provide this service free of charge and would love the opportunity to be a guest speaker at club meetings, schools, civic organizations, etc. We do ask that you call and request a guest speaker at least a month in advance so scheduling can be arranged. For further information, please see our **website regarding tours**, or contact Paul Yura, Warning Coordination Meteorologist at (830) 629-0130, ext. 223, or, send an email to **Paul.Yura@noaa.gov**.

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.