# Storm Signals

Houston/Galveston National Weather Service Office

Volume 75 Spring/Summer 2007

## 2007 Houston/Galveston Hurricane Workshop

You are invited to attend the 2007 Houston/Galveston Hurricane Workshop on Saturday, June 9th from 10 a.m. to 4 p.m. at the George R. Brown Convention Center. The workshop will provide vital information to families on how to be prepared for the eventual impact of a major hurricane in the southeast Texas region.

CenterPoint Energy will be the presenting sponsor for the third consecutive year. CenterPoint Energy brings a wealth of experience and knowledge to the workshop in preparing and recovering from a major hurricane and the restoration of power to your home. The City of Houston will once again provide the George R. Brown Convention Center at no cost to the National Weather Service to present this very important program.

If you would like additional information concerning the Hurricane Workshop, please feel free to contact Gene Hafele at 281-337-5074 x 223 or gene.hafele@noaa.gov.

In this Issue

# The Naming of Tropical Cyclones



...from JETSTREAM, the National Weather Service Online School for Weather, and the National Hurricane Center/Tropical Prediction Center

For several hundred years, many hurricanes in the West Indies were named after the particular saint's day on which the hurricane occurred. Ivan R. Tannehill describes in his book "Hurricanes" the major tropical storms of recorded history and mentions many hurricanes named after saints. For example, there was "Hurricane Santa Ana" which struck Puerto Rico with exceptional violence on July 26, 1825, and "San Felipe" (the first) and "San Felipe" (the second) which hit Puerto Rico on September 13 in both 1876 and 1928.

The first known meteorologist to assign names to tropical cyclones was Clement Wragge, an Australian meteorologist. Before the end of the 19th century, he began by using letters of the Greek alphabet, then from Greek and Roman mythology and progressed to the use of feminine names. In the United States, an early example of the use of a woman's name for a storm was in the novel "Storm" by George R. Stewart, published by Random House in 1941. During World War II, this practice became widespread in weather map discussions among forecasters, especially Air Force and Navy meteorologists who plotted the movements of storms over the wide expanses of the Pacific Ocean.

In 1953, the United States abandoned a confusing a two-year old plan to name storms by a phonetic alphabet (Able, Baker, Charlie, etc.). That year, this Nation's weather services began using female names for storms. The practice of naming hurricanes solely after women came to an end in 1978 when men's and women's names were included in the Eastern North Pacific storm lists. In 1979, male and female names were included in lists for the Atlantic, Caribbean and Gulf of Mexico.

**Why Tropical Cyclones Are Named**

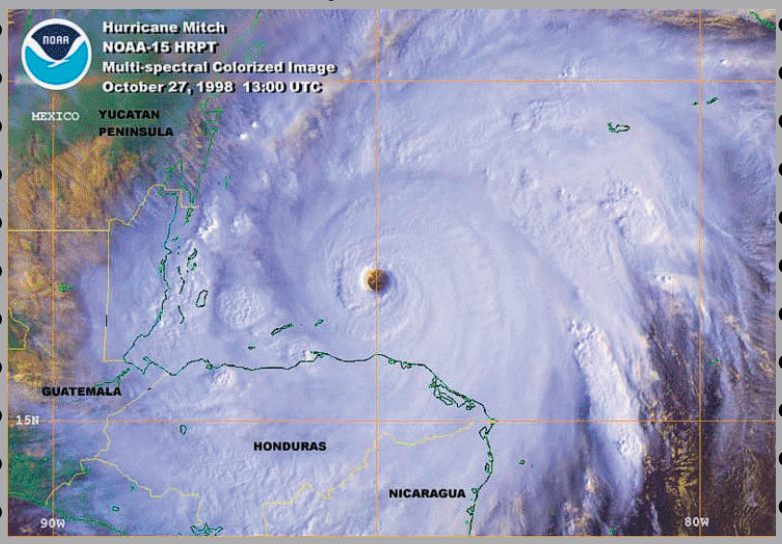
Experience shows that the use of short, distinctive given names in written as well as spoken communications is quicker and less subject to error than the older more cumbersome latitude-longitude identification methods. These advantages are especially important in exchanging detailed storm information between hundreds of widely scattered stations, airports, coastal bases, and ships at sea.

The use of easily remembered names greatly reduces confusion when two or more tropical storms occur at the same time. For example, one hurricane can be moving slowly westward in the Gulf of Mexico, while at exactly the same time another hurricane can be moving rapidly northward along the Atlantic coast. In the past, confusion and false rumors have arisen when storm advisories broadcast from one radio station were mistaken for warnings concerning an entirely different storm located hundreds of miles away.

The name lists have an international flavor because hurricanes affect other nations and are tracked by the public and weather services of countries other than the United States. Names for these lists are agreed upon by the nations involved during international meetings of the World Meteorological Organization (WMO).

The only time that there is a change in the list is if a storm is so deadly or costly that the future use of its name on a different storm would be inappropriate for reasons of sensitivity. If that occurs, then at an annual meeting by the WMO committee (called primarily to discuss many other issues) the offending name is stricken from the list and another name is selected to replace it.

## Did you know?




Hurricane Mitch (October 1998) will be remembered as the most deadly hurricane to strike the Western Hemisphere in the last two centuries! Not since the Great Hurricane of 1780, which killed approximately 22,000 people in the eastern Caribbean, was there a more deadly hurricane. Mitch struck Central America with such viciousness that it was nearly a week before the magnitude of the disaster began to reach the outside world.

The death toll reported is 11,000 with thousands of others missing. Though the final death toll will never be known, it is quite likely that Mitch directly killed more people than any Atlantic hurricane in over 200 years. More than three million people were either homeless or severely affected.

## Atlantic Names

The National Hurricane Center is responsible for the Atlantic basin west of 30°W. If a disturbance intensifies into a tropical storm, the Center will give the storm a name from one of the six lists below. A separate set is used each year beginning with the first name in the set. After the sets have all been used, they will be used again. The 2007 set, for example, will be used again to name storms in the year 2013.

The letters Q, U, X, Y, and Z are not included because of the scarcity of names beginning with those letters. If over 21 named tropical cyclones occur in a year, the Greek alphabet will be used following the "W" name. In addition, any land-falling tropical storm or hurricane having a major economic impact has its name retired.

| 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Andrea | Arthur | Ana | Alex | Arlene | Alberto |
| Barry | Bertha | Bill | Bonnie | Bret | Beryl |
| Chantal | Cristobal | Claudette | Colin | Cindy | Chris |
| Dean | Dolly | Danny | Danielle | Don | Debby |
| Erin | Edouard | Erika | Earl | Emily | Ernesto |
| Felix | Fay | Fred | Fiona | Franklin | Florence |
| Gabrielle | Gustav | Grace | Gaston | Gert | Gordon |
| Humberto | Hanna | Henri | Hermine | Harvey | Helene |
| Ingrid | Ike | Ida | Igor | Irene | Isaac |
| Jerry | Josephine | Joaquin | Julia | Jose | Joyce |
| Karen | Kyle | Kate | Karl | Katia | Kirk |
| Lorenzo | Laura | Larry | Lisa | Lee | Leslie |
| Melissa | Marco | Mindy | Matthew | Maria | Michael |
| Noel | Nana | Nicholas | Nicole | Nate | Nadine |
| Olga | Omar | Odette | Otto | Ophelia | Oscar |
| Pablo | Paloma | Peter | Paula | Philippe | Patty |
| Rebekah | Rene | Rose | Richard | Rina | Rafael |
| Sebastien | Sally | Sam | Shary | Sean | Sandy |
| Tanya | Teddy | Teresa | Tomas | Tammy | Tony |
| Van | Vicky | Victor | Virginie | Vince | Valerie |
| Wendy | Wilfred | Wanda | Walter | Whitney | William |

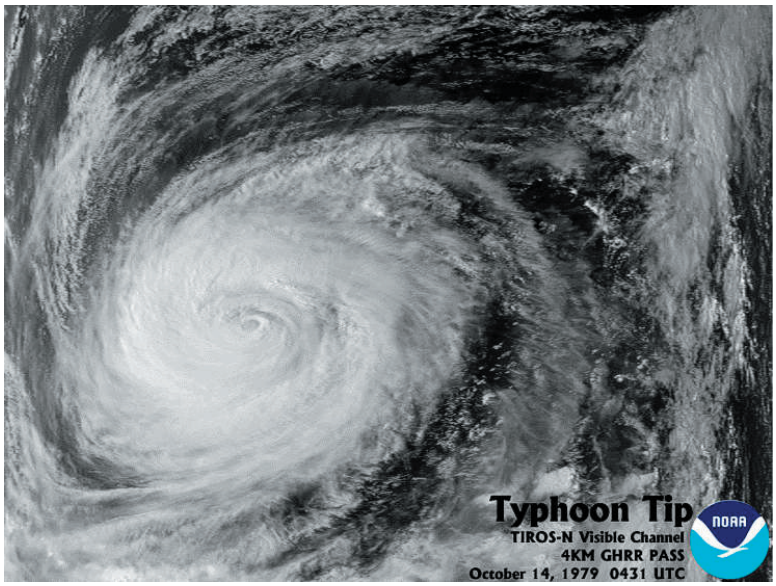
**List of Retired Atlantic Names by Year (1954-2006)**

| | | | | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Carol | Connie | | Audrey | | |
| | | | | Hazel | Diane | | | | |
| | | | | | Ione | | | | |
| | | | | | Janet | | | | |
| **1960** | **1961** | **1962** | **1963** | **1964** | **1965** | **1966** | **1967** | **1968** | **1969** |
| Donna | Carla | | Flora | Cleo | Betsy | Inez | Beulah | Edna | Camille |
| | Hattie | | | Dora | | | | | |
| | | | | Hilda | | | | | |
| **1970** | **1971** | **1972** | **1973** | **1974** | **1975** | **1976** | **1977** | **1978** | **1979** |
| Celia | | Agnes | | Carmen | Eloise | | Anita | | David |
| | | | | Fifi | | | | | Frederic |
| **1980** | **1981** | **1982** | **1983** | **1984** | **1985** | **1986** | **1987** | **1988** | **1989** |
| Allen | | | Alicia | | Elena | | | Gilbert | Hugo |
| | | | | | Gloria | | | Joan | |
| **1990** | **1991** | **1992** | **1993** | **1994** | **1995** | **1996** | **1997** | **1998** | **1999** |
| Diana | Bob | Andrew | | | Luis | Cesar | | Georges | Floyd |
| Klaus | | | | | Marilyn | Fran | | Mitch | Lenny |
| | | | | | Opal | Hortense | | | |
| | | | | | Roxanne | | | | |
| **2000** | **2001** | **2002** | **2003** | **2004** | **2005** | **2006** | | | |
| Keith | Allison | Isidore | Fabian | Charley | Dennis | | | | |
| | Iris | Lili | Isabel | Frances | Katrina | | | | |
| | Michelle | | Juan | Ivan | Rita | | | | |
| | | | | Jeanne | Stan | | | | |
| | | | | | Wilma | | | | |

# Hurricane Talks

The Houston/Galveston National Weather Service Office continues to offer our very informative and very popular hurricane presentations to schools, businesses and organizations. These talks include details on the dangers of tropical storms and hurricanes, the history of activity along the Upper Texas coast and ways to protect your life and property during a tropical threat. Brochures on hurricanes can also be made available to all attendees.

If you are interested in having a meteorologist come to you and talk about hurricanes, please contact Gene Hafele (gene.hafele@noaa.gov) or Joshua Lichter (joshua.lichter@noaa.gov) at (281)337-5074. The more you know about tropical storms and hurricanes, the better you will be prepared to survive when the next one strikes.




**Did you know...**

Super Typhoon Tip ranks number 1 as the most intense tropical cyclone on record. Tip was located in the northwest Pacific Ocean, which on October 12, 1979 had winds gusting as high as 190 mph (306 km/h) and a central pressure of 870 mb (25.69"Hg). The size of the circulation around Typhoon Tip was approximately 1350 miles (2174 km) across. If placed over the continental U.S., it would almost cover the western half of the country.

# New Climate Products Now Available

**By Charles Roeseler**

A new climate product developed at the Climate Prediction Center (CPC) is now available on the Houston/Galveston National Weather Service home page (www.srh.noaa.gov/hgx). This new product is called the Local 3 Month Temperature Outlook (L3MTO). This product provides probabilities of whether temperatures will be above, near or below normal. Before describing the L3MTO in detail, it is necessary to provide some background on the evolution of this product. The CPC issues a three month temperature outlook on the third Thursday of the month. This temperature outlook features a national map with a series of letters such as "A" and "B" for above or below normal temperature values and a set of numbers indicating what the probabilities of whether the temperatures will in fact be above or below normal. The letters "EC" indicates that there is an equal chance of above or below normal temperatures. The national map is a broad brush approach and does not provide the scale necessary to make this product as useful as it could be. CPC decided to downscale this information to the local level, thus creating the L3MTO. Downscaling is the transformation from large scale climate variations to small scale variations with increased spatial resolution. CPC then created mega climate divisions aggregating NCDC (National Climatic Data Center) climate divisions. Mega climate divisions share some similarity with the NCDC climate division with a few exceptions. The mega climate divisions are roughly the same size across the country (NCDC divisions can be quite small or quite large) and these climate divisions cross state lines (NCDC divisions honor political boundaries). Temperature data from 1959 to present were used with the downscale relationship between the mega climate divisions and the station of interest, targeting the 30 year normals (currently 1971-2000). Stations of interest include primary climate sites such as Houston Intercontinental Airport or Scholes Field in Galveston, ASOS sites such as Huntsville, and co-op sites such as Columbus and Cleveland. The data from these stations are then normalized. Some of the adjustments include making all the observations midnight to midnight, a spatial quality control check, adjustments for station moves and estimates for missing data.

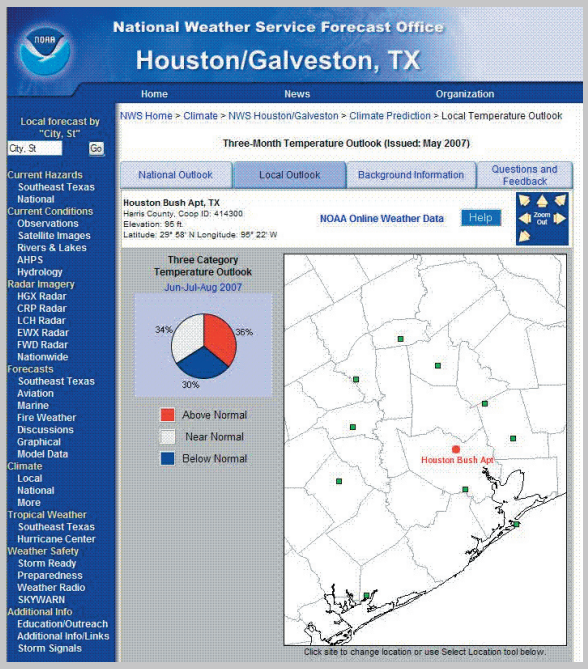



**Figure 1**

The Local 3 Month Temperature Outlook was created to provide the user with site specific temperature information. By downscaling, the hope was to add value to the current CPC long range temperature forecasts. As stated earlier in the article, the L3MTO is located on the Houston/Galveston homepage (climate tab) at www.weather.gov/climate/climate_prediction.php?wfo=hgx (see Figure 1). Once on this page, you will notice a section titled Climate Prediction and Variability. Just beneath this headline is a smaller headline titled Climate Prediction and a graphic product titled Local 3 Month Outlook.

Select the Local 3 Month Outlook or just click on the image and a new page will load. This shows a map of southeast Texas with a selection of observation sites. Move the mouse or cursor over any of the boxes on the map to reveal the observation site. For this example, we have selected Houston Hobby Airport. Let's look at the long range temperature forecast for the summer months defined as June, July and August 2007 (JJA). Just select the pie chart for the three month period in question. A large pie chart will open with three categories representing above, near or below normal. The climate normals were broken down into thirds and a range of temperatures was established based on the 30 year climatalogical record. This graphic suggests there is a 38.0% chance for the average temperature during this 3-month period to be higher than 83.4°. There is also a 34.0% chance for the average temperature during this 3-month period to be between 82.5° and 83.4° and lastly there is a 28.0% chance for the average temperature during this 3-month period to be lower than 82.5°.

There are other products available such as a probability of exceedance, probability of non-exceedance and a temperature range graphic (see Figure 2). There is a drop down menu beneath the enlarged Three Category Temperature Outlook pie chart titled Select Product. Just select the item of interest and then select Go. Each site-specific outlook is provided in graphical, tabular, and text formats for thirteen forecast leads, from 0.5 months to 12.5 months. The sites available for Southeast Texas include: Houston Intercontinental Airport, Houston Hobby Airport, Brenham, Cleveland, College Station, Columbus, Galveston, Huntsville, Liberty, Madisonville and Palacios.

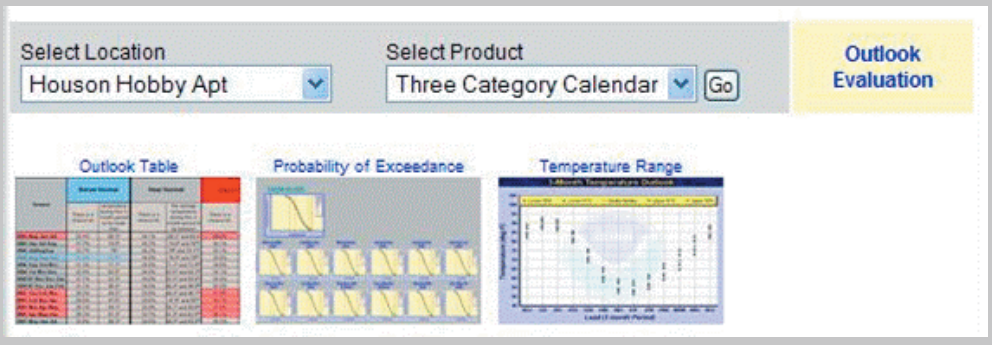



**Figure 2**

## New Climate Products Now Available continued

By selecting the PoE for JJA, a range of temperatures can be determined through probabilities. The greater the probability, the larger the temperature range. Inversely, the smaller the probability corresponds to a smaller temperature range. In this example, for a 99% confidence level, the temperature range will be 80.1 to 85.7 degrees (see Figure 3).

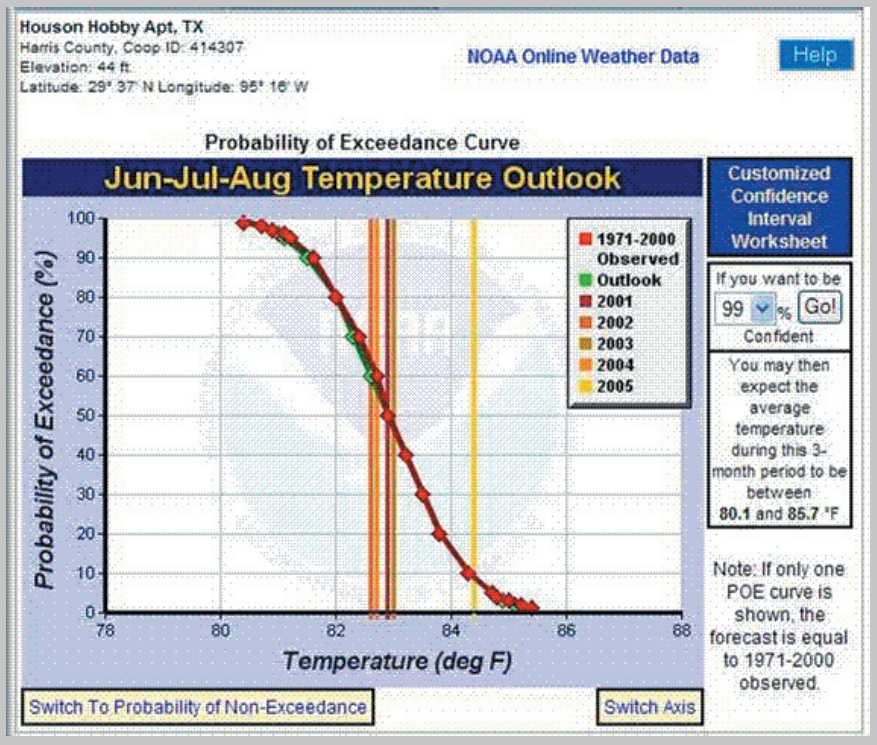



**Figure 3**

If we switch the confidence level to 50%, the temperature range will shrink to 82.3 to 83.7 degrees (see Figure 4).

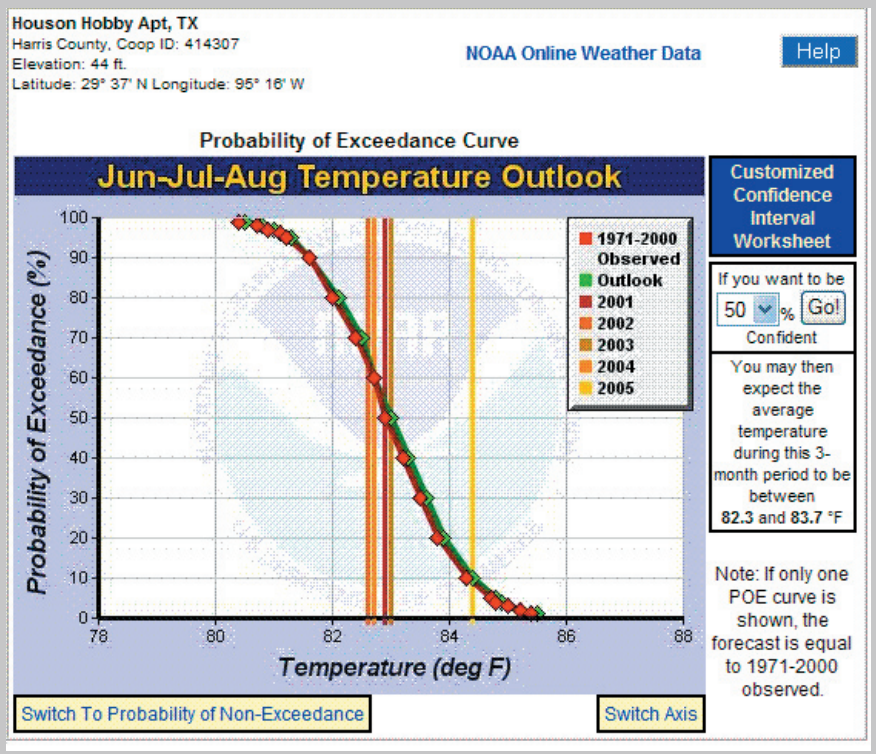



**Figure 4**

So at this point, probabilities favor a warmer than normal summer. However, there is still a chance for temperatures to average below normal – a 28% chance to be exact.

Please direct additional questions and further inquiries to Charles.Roeseler@noaa.gov and place L3MTO in the subject headline.

# 2006 - A Year In Review

**By Charles Roeseler**

2006 was one of the warmest years in recorded history. The average temperature for 2006 in Galveston was 72.6 degrees and is the warmest ever recorded. The previous warmest year was 72.3 and last occurred in 2005. Eight of Galveston's ten warmest years have occurred since 1994. Houston and College Station also had one of their warmest years on record. Houston tied for its eighth warmest year and College Station tied for its sixth warmest year on record. Below is a list of the ten warmest years on record for the three primary climate sites across Southeast Texas:

| Houston | College Station | Galveston |
|---|---|---|
| 71.7 - 1933 | 70.9 - 1933 | 72.6 - 2006 |
| 71.5 - 1927 | 70.7 - 1911 | 72.3 - 2005 |
| 71.3 - 1954 | 70.4 - 1927 | 72.3 - 1999 |
| 71.2 - 1956 | 70.4 - 1921 | 72.3 - 1994 |
| 71.1 - 1921 | 70.3 - 1996 | 72.3 - 1933 |
| 71.1 - 1950 | 70.2 - 2006 | 72.1 - 1927 |
| 70.9 - 1965 | 70.2 - 1934 | 71.9 - 1995 |
| 70.8 - 1911 | 70.0 - 1918 | 71.9 - 1998 |
| 70.8 - 2006 | 70.0 - 1916 | 71.7 - 2004 |
| 70.8 - 1957 | 69.8 - 2005 | 71.7 - 2000 |

January, March and April were rather warm compared to 30 year normals with these months averaging five to seven degrees warmer than normal. The average temperature during the summer months (June, July and August) were near to slightly below normal which bucks a recent trend of unseasonably warm summers.

Rainfall for the year was well above normal. Rainfall averaged about 10 to 15 inches higher than normal. Both Anahuac and Liberty had annual rainfall totals in excess of 70 inches. Liberty received 87.50 inches of rain during the year. This is the second greatest annual rainfall total in recorded history. The greatest annual rainfall total occurred back in 1991 with 88.14 inches of rain. Anahuac received 77.36 inches of rain during 2006. This is the sixth greatest rainfall total in recorded history. The greatest annual rainfall total occurred back in 1946 with 98.08 inches of rain. Hobby Airport also received an overabundance of rainfall with a rainfall total of 62.17 inches. This was the 13th wettest year since 1946. There were several significant rain events during 2006. The first heavy rain event occurred on June 18th and 19th. A relatively small area of very heavy rain developed over eastern Harris, southwestern Liberty and northern Galveston counties. Rainfall totals over this area were in excess of ten inches in some spots. 16.00 inches of rain fell at the Port of Houston and 10.58 inches of rain fell at Hobby Airport. A second and more widespread heavy rain event occurred on October 16th and 17th with 10 to 15 inches of rain falling across a large part of southeast Texas. Conroe received 12.71 inches of rain on the 16th and Hobby Airport received 11.17 inches of rain. Other heavy rainfall totals on October 16th include 9.53 inches at Lake Jackson, 10.04 inches at Pearland and 10.20 inches at Anahuac. Both Hobby Airport and Liberty exceeded ten inches of rain on two different calendar days. Neither site is immune from heavy rain yet this is the first time that these sites achieved this dubious fate in one year. Liberty received 14.59 inches of rain on June 19th and 11.30 inches of rain on October 17th. Hobby Airport received 11.17 inches of rain on October 16th and 10.58 inches of rain on June 19th. Another four to six inches of rain fell on October 27th, mainly over the eastern half of the region. Below is a brief narrative for each month, followed by temperature and rainfall data for area ASOS sites and then a table showing rainfall data for area co-op sites.

### January

Temperatures were well above normal during the month. In particular, daytime high temperatures were considerably warmer than normal. Rainfall was less than normal especially toward the coast. On the 16th, strong winds in the wake of a cold front toppled a scaffolding in Deer Park injuring two men. Thunderstorms on the 21st produced nickel to golf ball sized hail in Matagorda and Trinity counties.

### February

Temperatures were warmer than normal toward the coast and cooler than normal inland. Rainfall was heavier inland and considerably lighter toward the coast. Thunderstorms with high winds toppled a few trees in Houston county on the 1st and a weak tornado produced minor damage in Harris county on the 10th.

**March**

March was similar to February with temperatures warmer than normal and rainfall near normal inland and below normal along the coast. A few thunderstorms produced penny sized hail in Harris county on the 20th and 29th.

**April**

Temperatures in April were near to slightly above the 30 year normal. Rainfall was another 1 to 2 inches below normal. Thunderstorms on the 20th produced wind damage in Brazos, Austin, Montgomery and Harris counties. Golf ball sized hail was reported in Galveston and Chambers counties. On the 29th , strong winds and isolated tornadoes produced damage in Brazos, Grimes and Washington counties. More significant damage to homes occurred near Segno with over 50 homes suffering damage from a tornado. Four persons were injured in Coldspring as a tornado raced through the area during the early morning.

**May**

Temperatures were about 1 to 2 degrees warmer than normal during the month. Rainfall varied greatly during the month with several locations exceeding 10 inches of rain for the month. Other locations received less than 3 inches for the month. Severe weather erupted on the 4th, 6th 10th and 14th with numerous thunderstorms producing large hail.

**June**

Temperatures in June were near normal. Rainfall was considerably higher than normal along the coast with rainfall totals below normal well inland. A significant flood event occurred over parts of Harris county on the 19th. Over 3300 homes in Harris county flooded due to heavy rain. Water rescues became necessary to free trapped motorists near I-45 and 610 South. 10 to 15 inches of rain fell over parts of Harris, Liberty, Brazoria, Chambers and Galveston counties early on the 19th.

**July**

Temperatures were near to slightly below normal during July. Rainfall was again heavier than normal especially toward the coast. Despite the frequency of thunderstorms, hazardous weather was restricted to damage inflicted by lightning. Even though rainfall was well above normal, flooding was minimal with only minor flooding reported.

**August**

Temperatures were about 1 to 2 degrees warmer than normal during the month. Rainfall dropped off quickly from July with most climate sites about an inch below normal. Rainfall was closer to normal near the coast. Thunderstorms produced damaging winds in Brazos and Burleson counties on the 6th and in Madison, Walker and Trinity counties on the 17th. Flooding was reported in Galveston near The Strand on the 19th.

**September**

Temperatures were again near normal. Rainfall totals were slightly below normal inland and near to slightly above normal near the coast. Strong winds on the 22nd prompted a wind advisory. A fatality occurred when the strong winds toppled a large tree near Conroe.

**October**

Temperatures were around 2 degrees warmer than normal. A tornado watch was in effect on the 10th and a tornado was reported near Brenham. Other thunderstorms produced roof and fence damage near DW Hooks airport. Strong winds produced additional damage southwest of Angleton on the 12th and penny sized hail near Jamaica Beach. Isolated tornadoes and wind damage also occurred on the 16th especially near the coast. Strong onshore winds helped to increase tide levels and minor coastal flooding affected areas along Highway 146, near 61st Street in Galveston and along the Bolivar peninsula near Gilchrist.

The primary severe weather hazard was flooding caused by excessive rain. Rainfall during the month exceeded 10 inches in most locations. Conroe received rainfall over 22 inches during the month and Hobby Airport received in excess of 19 inches. Many rivers and bayous went out of banks. Heavy rain fell on the 16th, 18th, 26th and 27th. Many roads became impassable due to high water. The flooding claimed two lives in southeast Harris county.

**November**

Temperatures during the month were between 1 and 2 degrees warmer than normal. Rainfall varied throughout the area but a cluster of storms on the 6th did produce flooding across parts of Walker, San Jacinto, Montgomery and Liberty counties. Fire Weather conditions became critical mid-month as rainfall decreased and winds began to increase. A Red Flag Warning was issued on the 15th. Many climate sites across Southeast Texas received less than an inch of rain.

**December**

Temperatures were about 1 to 2 degrees warmer than normal. Rainfall again varied across the area but overall was near normal. On the 21st, strong thunderstorm winds tore a roof off a barn and produced penny sized hail near Weimer. Nickel sized hail was reported near Katy in Harris county. Other hazards through the month include several wind and dense fog advisories.

## 2006 - A Year In Review continued

Here are a few tables listing the temperature and rainfall data for ASOS sites across Southeast Texas:

**Average High Temperature**

| Site | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAH | 70.2 | 66.6 | 75.2 | 83.8 | 86.6 | 91.2 | 91.2 | 94.1 | 89.8 | 82.8 | 74.6 | 65.2 | 81.0 |
| GLS | 67.7 | 65.4 | 73.6 | 80.0 | 84.1 | 88.3 | 88.3 | 90.2 | 87.2 | 82.1 | 72.6 | 64.2 | 78.6 |
| CLL | 69.8 | 64.0 | 74.5 | 83.4 | 87.0 | 92.7 | 92.7 | 96.6 | 90.4 | 81.2 | 72.8 | 63.6 | 80.7 |
| HOU | 70.8 | 67.3 | 75.0 | 82.6 | 86.1 | 90.3 | 89.5 | 92.4 | 88.7 | 83.0 | 74.3 | 65.5 | 80.5 |
| CXO | 69.8 | 65.3 | 75.4 | 84.0 | 86.7 | 91.4 | 91.6 | 95.6 | 89.8 | 81.6 | 73.0 | 63.7 | 80.7 |
| UTS | 68.8 | 63.9 | 73.9 | 83.4 | 86.7 | 91.7 | 92.5 | 96.1 | 89.7 | 80.6 | 71.8 | 62.5 | 80.1 |
| PSX | 70.6 | 69.2 | 71.0 | 82.6 | 86.0 | 89.4 | 88.7 | 91.2 | 88.3 | 84.0 | 76.7 | 67.3 | 80.9 |
| SGR | 70.3 | 66.6 | 75.4 | 84.0 | 86.9 | 91.2 | 90.1 | 93.3 | 89.3 | 82.6 | 73.8 | 64.7 | 80.7 |
| DWH | 70.6 | 67.3 | 76.7 | 84.7 | 87.0 | 91.7 | 91.5 | 94.4 | 89.1 | 81.9 | 73.8 | 64.5 | 81.1 |
| LBX | 71.1 | 68.3 | 75.9 | 82.0 | 85.8 | 90.2 | 89.3 | 92.0 | 88.9 | 83.4 | 74.9 | 65.5 | 80.6 |
| LVJ | 70.0 | 67.3 | 75.3 | 82.5 | 86.5 | 92.2 | 90.5 | 93.6 | 89.6 | 83.3 | 74.8 | 65.8 | 80.9 |
| HGX | 69.6 | 66.2 | 74.3 | 81.0 | 84.5 | 88.6 | 88.0 | 90.8 | 86.8 | 81.6 | 72.7 | 63.6 | 79.0 |

**Average Low Temperature**

| Site | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAH | 47.6 | 44.4 | 55.9 | 63.5 | 66.8 | 71.5 | 75.3 | 75.7 | 69.0 | 62.0 | 50.7 | 46.2 | 60.7 |
| GLS | 53.5 | 51.0 | 61.0 | 69.0 | 73.0 | 77.0 | 79.0 | 80.5 | 75.7 | 70.0 | 58.2 | 51.5 | 66.6 |
| CLL | 44.7 | 42.2 | 55.2 | 62.7 | 66.5 | 70.8 | 74.8 | 75.5 | 68.6 | 59.9 | 50.0 | 44.2 | 59.6 |
| HOU | 49.8 | 46.9 | 57.5 | 64.5 | 67.7 | 72.6 | 75.3 | 76.6 | 70.6 | 64.7 | 53.3 | 48.0 | 62.3 |
| CXO | 41.2 | 39.5 | 52.1 | 60.2 | 63.0 | 66.8 | 72.4 | 71.5 | 64.1 | 57.8 | 47.2 | 43.1 | 56.2 |
| UTS | 45.3 | 41.9 | 54.4 | 61.9 | 65.8 | 69.5 | 74.5 | 74.8 | 66.8 | 59.0 | 49.0 | 43.7 | 58.9 |
| PSX | 49.8 | 48.2 | 59.0 | 67.9 | 71.5 | 74.8 | 77.4 | 78.7 | 72.2 | 66.4 | 55.6 | 49.9 | 64.3 |
| SGR | 45.5 | 44.2 | 55.9 | 62.7 | 65.8 | 69.7 | 74.0 | 74.4 | 67.9 | 62.2 | 50.8 | 45.8 | 59.9 |
| DWH | 46.0 | 43.1 | 55.7 | 63.5 | 66.4 | 70.7 | 75.1 | 75.1 | 67.4 | 61.0 | 50.3 | 45.2 | 60.0 |
| LBX | 45.7 | 45.2 | 55.0 | 63.1 | 65.9 | 68.9 | 74.0 | 74.1 | 68.2 | 64.0 | 51.1 | 47.4 | 60.2 |
| LVJ | 48.1 | 47.4 | 57.5 | 64.6 | 68.2 | 72.1 | 76.1 | 77.1 | 70.9 | 65.0 | 53.2 | 48.4 | 62.4 |
| HGX | 47.3 | 45.5 | 56.5 | 63.4 | 66.4 | 70.0 | 73.5 | 74.5 | 69.2 | 63.5 | 52.1 | 46.1 | 60.7 |

**Average Daily Temperature**

| Site | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAH | 58.9 | 55.5 | 65.6 | 73.6 | 76.7 | 81.3 | 83.3 | 84.9 | 79.4 | 72.4 | 62.6 | 55.7 | 70.8 |
| Dep | +7.1 | +0.1 | +3.3 | +5.1 | +0.9 | 0.0 | -0.3 | +1.6 | +0.5 | +2.0 | +1.7 | +2.0 | |
| GLS | 60.6 | 58.2 | 67.3 | 74.5 | 78.5 | 82.6 | 83.6 | 85.4 | 81.4 | 76.1 | 65.4 | 57.8 | 72.6 |
| Dep | +4.8 | +0.2 | +3.2 | +4.5 | +1.6 | +0.4 | -0.7 | +1.0 | +0.3 | +2.0 | 0.0 | -0.3 | |
| CLL | 57.3 | 53.1 | 64.9 | 73.1 | 76.7 | 81.8 | 83.7 | 86.0 | 79.5 | 70.5 | 61.4 | 53.9 | 70.2 |
| Dep | +7.1 | -1.4 | +3.3 | +5.2 | +1.4 | +0.2 | -0.9 | +1.3 | -0.2 | 0.0 | +1.4 | +1.7 | |
| HOU | 60.3 | 57.1 | 66.2 | 73.6 | 76.9 | 81.4 | 82.4 | 84.5 | 79.6 | 73.9 | 63.8 | 56.8 | 71.4 |
| Dep | +6.0 | -0.6 | +2.0 | +3.6 | -0.1 | -0.9 | -2.1 | +0.1 | -0.9 | +1.7 | +0.8 | +0.7 | |
| CXO | 55.5 | 52.4 | 63.7 | 72.1 | 74.8 | 79.1 | 82.0 | 83.6 | 77.0 | 69.7 | 60.1 | 53.4 | 68.6 |
| UTS | 57.0 | 52.9 | 64.2 | 72.6 | 76.3 | 80.6 | 83.5 | 85.4 | 78.2 | 69.8 | 60.4 | 53.1 | 69.5 |
| PSX | 59.9 | 58.9 | 68.1 | 75.2 | 78.8 | 82.1 | 83.0 | 85.0 | 80.2 | 75.2 | 66.2 | 58.6 | 72.6 |
| SGR | 57.9 | 55.4 | 65.6 | 73.4 | 76.3 | 80.4 | 82.0 | 83.9 | 78.6 | 72.4 | 62.3 | 55.2 | 70.3 |
| DWH | 58.3 | 55.2 | 66.2 | 74.1 | 76.7 | 81.2 | 83.3 | 84.8 | 78.3 | 71.5 | 62.0 | 54.9 | 70.5 |
| LBX | 58.4 | 56.7 | 65.5 | 72.6 | 75.9 | 79.6 | 81.7 | 83.1 | 78.6 | 73.7 | 63.0 | 56.5 | 70.4 |
| LVJ | 59.1 | 57.3 | 66.4 | 73.6 | 77.4 | 82.2 | 83.3 | 85.3 | 80.3 | 74.1 | 64.0 | 57.1 | 71.7 |
| HGX | 58.5 | 55.9 | 65.4 | 72.2 | 75.4 | 79.3 | 80.8 | 82.6 | 78.0 | 72.6 | 62.4 | 54.9 | 69.8 |

**Average Rainfall**

| Site | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IAH | 2.50 | 1.46 | 2.36 | 2.93 | 8.78 | 7.84 | 7.85 | 3.40 | 3.22 | 14.53 | 0.92 | 2.07 | 57.86 |
| GLS | 0.57 | 0.67 | 1.35 | 1.34 | 3.24 | 5.37 | 9.39 | 5.24 | 6.41 | 11.62 | 0.47 | 2.68 | 48.35 |
| CLL | 2.63 | 3.70 | 4.80 | 2.45 | 2.65 | 3.36 | 5.86 | 2.47 | 2.69 | 12.88 | 0.62 | 4.57 | 48.68 |
| HOU | 1.92 | 1.62 | 1.48 | 2.23 | 6.02 | 11.03 | 7.76 | 2.92 | 3.08 | 19.26 | 0.87 | 3.95 | 62.14 |
| CXO | 3.36 | 3.21 | 2.83 | 2.85 | 4.95 | 3.54 | 4.30 | 0.71 | 2.03 | 22.01 | 3.27 | 2.07 | 55.13 |
| UTS | 3.50 | 3.29 | 2.29 | 2.75 | 4.56 | 3.02 | 3.80 | 3.26 | 4.20 | 10.06 | 3.88 | 3.99 | 48.60 |
| PSX | 1.38 | 0.64 | 0.84 | 2.32 | 4.61 | 8.10 | 14.28 | 2.78 | 6.07 | 10.24 | 1.16 | 4.10 | 56.52 |
| SGR | 2.64 | 1.68 | 1.26 | 2.35 | 2.56 | 2.66 | 9.14 | 4.02 | 2.77 | 10.01 | 0.96 | 1.97 | 42.02 |
| DWH | 2.33 | 2.39 | 1.94 | 3.06 | 9.12 | 6.69 | 8.00 | 3.49 | 2.87 | 15.10 | 1.31 | 2.59 | 58.89 |
| LBX | 2.48 | 1.06 | 4.24 | 1.00 | 3.41 | 3.57 | 9.04 | 3.02 | 3.91 | 14.79 | 0.87 | 5.36 | 52.75 |
| LVJ | 2.11 | 1.84 | 1.12 | 1.50 | 6.59 | 3.77 | 12.88 | 4.66 | 2.20 | 16.73 | 0.81 | 5.13 | 59.34 |
| HGX | 1.92 | 1.68 | 1.24 | 2.34 | 10.15 | 5.91 | 10.06 | 4.71 | 9.20 | 11.78 | 0.79 | 3.08 | 62.86 |

## 2006 - A Year In Review continued

The following table will show the monthly and annual rainfall for the volunteer co-opeative network across Southeast Texas:

| STATION | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alvin | 2.23 | 2.40 | 1.09 | 3.43 | 4.15 | 4.28 | 7.76 | 3.60 | 3.59 | 9.64 | 1.52 | 7.68 | 51.37 |
| Anahuac | 1.82 | 1.61 | 1.90 | 4.23 | 10.00 | 9.26 | 15.94 | 2.35 | 7.30 | 17.64 | 0.43 | 4.88 | 77.36 |
| Angleton | 2.29 | 1.77 | 3.32 | 0.91 | 3.27 | 5.28 | 8.38 | 6.32 | 4.16 | 18.58 | 1.00 | 7.82 | 63.10 |
| Bay City | 1.63 | 1.41 | 2.77 | 1.17 | 3.88 | 7.28 | 9.11 | 1.11 | 5.60 | 6.53 | 0.62 | 2.86 | 43.97 |
| Baytown | 3.03 | 2.23 | 1.73 | 2.39 | 7.36 | 6.44 | 12.24 | 4.79 | 2.54 | 16.82 | 0.44 | 7.20 | 67.21 |
| Bellville | 0.85 | 2.28 | 3.42 | 1.48 | 2.44 | 5.54 | 4.79 | 1.57 | 2.70 | 6.64 | 0.79 | 4.27 | 36.77 |
| Brenham | 1.69 | 2.82 | 4.05 | 2.24 | 2.08 | 4.52 | 1.77 | 0.94 | 5.31 | 7.19 | 0.27 | 5.16 | 38.04 |
| Caldwell | 3.42 | 2.67 | 2.81 | 1.94 | 3.12 | 4.40 | 3.20 | 1.95 | 1.31 | 11.68 | 0.60 | 4.53 | 41.63 |
| Cleveland | 2.29 | 3.68 | 1.77 | 4.19 | 1.96 | 3.89 | 6.95 | 3.05 | 3.02 | 18.46 | 2.32 | 4.17 | 55.75 |
| Clodine | 2.88 | 1.70 | 1.24 | 2.66 | 1.90 | 5.83 | 11.39 | 2.82 | 5.36 | 10.61 | 0.66 | 2.64 | 49.69 |
| Columbus | 1.86 | 2.31 | 2.47 | 1.16 | 2.23 | 2.81 | 6.57 | 0.24 | 2.82 | 6.20 | 1.35 | 3.41 | 33.43 |
| Conroe | 3.33 | 4.30 | 3.08 | 2.63 | 3.57 | 4.65 | 4.83 | 1.48 | 1.90 | 22.57 | 3.91 | 2.62 | 58.87 |
| Corrigan | 4.52 | 4.94 | 3.58 | 2.09 | 2.25 | 4.69 | 4.15 | 1.12 | 2.59 | 11.54 | 1.30 | 3.87 | 46.64 |
| Crockett | 5.19 | 4.74 | 3.53 | 3.19 | 1.49 | 3.48 | 3.15 | 1.58 | 3.54 | 14.02 | 2.09 | 4.24 | 50.24 |
| Cypress | | | | | 3.79 | 6.53 | 12.29 | 2.99 | 2.71 | 15.58 | 1.06 | 3.02 | 47.97 |
| Dacus | 3.76 | 2.99 | 2.61 | 1.99 | 2.25 | 4.20 | 8.63 | 1.53 | 6.44 | 10.82 | 3.35 | 3.11 | 51.68 |
| Danevang | 1.72 | 1.22 | 1.68 | 1.25 | 2.67 | 5.72 | 11.73 | 2.12 | 5.69 | 6.74 | 0.89 | 4.31 | 45.74 |
| Edna | 1.21 | 1.92 | 2.43 | 1.33 | 7.78 | 4.51 | 5.10 | 0.56 | | 8.76 | 0.80 | 2.99 | 37.39 |
| El Campo | 1.12 | 0.66 | 2.05 | | 2.88 | 4.46 | 5.37 | 2.49 | 2.90 | 6.01 | 0.32 | 0.97 | 29.23 |
| Freeport | 1.61 | 1.42 | 2.56 | 1.77 | 3.55 | 7.90 | 9.02 | 3.45 | 6.09 | 10.29 | 0.72 | 1.88 | 50.26 |
| Houston Barker | 2.89 | 2.04 | 1.83 | 3.07 | 2.53 | 6.21 | 13.48 | 1.99 | 3.96 | 9.57 | 0.64 | 2.67 | 50.88 |
| Houston Deer Park | 2.42 | 1.92 | 1.32 | 0.33 | | 5.60 | 10.50 | 0.45 | | 12.71 | 0.14 | 7.89 | 43.28 |
| Houston Heights | 3.56 | 1.73 | 1.92 | 3.40 | 7.41 | 8.34 | 8.99 | 3.56 | 4.50 | 13.44 | 0.91 | 3.54 | 61.30 |
| Houston N. Houston | 2.43 | 1.75 | 2.56 | 2.24 | 9.33 | 8.99 | 10.47 | 4.17 | 3.18 | 11.00 | 0.93 | 2.46 | 59.51 |
| Houston - Port | 2.06 | 1.70 | 0.81 | 3.62 | 3.47 | 20.38 | 8.25 | 3.36 | 4.88 | 7.50 | 0.09 | 5.31 | 61.43 |
| Houston - NWSO | 1.92 | 1.68 | 1.24 | 2.34 | 10.15 | 5.91 | 10.06 | 4.71 | 9.20 | 11.78 | 0.79 | 3.08 | 62.86 |
| Houston - Westbury | 3.38 | 1.33 | 2.16 | 2.55 | 2.21 | 3.66 | 7.53 | 2.83 | 1.46 | 12.96 | 1.03 | 3.65 | 44.75 |
| Huntsville | 4.46 | 3.73 | 3.25 | 2.07 | 3.54 | 3.06 | 3.50 | 3.53 | 5.62 | 11.99 | 3.23 | 4.39 | 52.37 |
| Jamaica Beach | 0.92 | 1.13 | 2.31 | 1.44 | 3.82 | 5.34 | 11.46 | 2.94 | 7.66 | 14.89 | 1.24 | 3.13 | 56.28 |
| Katy | 2.33 | 2.17 | 1.69 | 2.10 | 1.27 | 4.36 | 7.83 | 2.90 | 4.02 | 8.83 | 0.53 | 4.03 | 42.06 |
| Liberty | 4.57 | 1.94 | 1.13 | 7.68 | 7.70 | 16.17 | 13.68 | 3.47 | 3.65 | 21.27 | 0.25 | 5.99 | 87.50 |
| Livingston | 4.35 | 3.02 | 2.98 | 3.37 | 3.12 | 2.53 | 4.27 | 2.33 | 4.21 | 20.27 | 2.18 | | 52.63 |
| Madisonville | 3.62 | 3.51 | 3.67 | 3.08 | 2.58 | 2.70 | 1.62 | 2.68 | 2.67 | 12.89 | 1.32 | 5.54 | 45.88 |
| Matagorda | 1.53 | 0.63 | 1.13 | 2.64 | 3.54 | 16.45 | 13.47 | 1.50 | 6.23 | 7.97 | 0.02 | 4.39 | 59.50 |
| Midway | 4.38 | 4.45 | 3.95 | 1.87 | 3.29 | 3.20 | 0.12 | 0.13 | 3.16 | 10.11 | 2.93 | 3.64 | 41.23 |
| Montgomery | 0.37 | 4.07 | 3.02 | 2.47 | 5.26 | 4.26 | 4.47 | 1.11 | 2.13 | 10.50 | 4.55 | 2.14 | 44.35 |
| New Caney | 2.32 | 2.62 | 2.69 | 3.14 | 4.44 | 7.20 | 7.56 | 2.11 | 3.89 | 18.48 | 1.24 | 3.23 | 58.92 |
| Pierce | 0.83 | 1.29 | 1.61 | | 3.39 | 3.46 | 6.79 | 2.16 | 3.92 | 6.77 | 0.53 | 2.87 | 33.62 |
| Richards | 2.05 | 2.31 | 2.71 | 1.45 | 5.10 | 4.10 | 5.20 | 4.00 | 7.20 | 8.02 | 1.48 | 4.76 | 48.38 |
| Richmond | 2.42 | 1.01 | 1.25 | 2.09 | 2.06 | 2.91 | 13.68 | 4.56 | 1.87 | 13.68 | 1.32 | 2.77 | 49.62 |
| Somerville Dam | 3.02 | 2.72 | 3.29 | 3.54 | 2.48 | 5.61 | 4.43 | 2.00 | 3.90 | 7.64 | 0.61 | 3.94 | 43.18 |
| Sugar Land | 3.31 | 1.48 | 1.04 | 3.43 | 1.72 | 2.96 | 9.50 | 2.96 | 3.12 | 14.82 | 1.22 | 1.38 | 46.94 |
| Thompsons | 2.74 | 1.58 | 5.05 | 1.87 | 2.89 | 7.04 | 9.31 | 3.40 | 11.49 | 14.30 | 3.46 | 2.79 | 65.92 |
| Tomball | 2.84 | 2.33 | 2.04 | 2.23 | 5.62 | 4.78 | | 2.33 | 2.56 | 19.96 | 2.22 | 3.51 | 50.42 |
| Washington | 1.70 | 2.25 | 2.78 | 4.02 | 1.48 | 5.37 | 3.16 | 1.40 | 4.07 | 6.71 | 1.12 | 2.95 | 37.01 |
| West Columbia | 1.66 | 1.63 | 3.81 | 2.10 | 2.52 | 6.95 | 7.27 | 2.73 | 5.57 | 9.40 | 0.95 | 3.76 | 48.35 |
| Wharton | 1.59 | 1.47 | 3.98 | 1.74 | 4.80 | 4.02 | 8.14 | 3.61 | 3.70 | 7.56 | 1.08 | 4.03 | 45.72 |

# Heat Waves

**Know What These Terms Mean...**

* Heat wave: Prolonged period of excessive heat and humidity. The National Weather Service steps up its procedures to alert the public during these periods of excessive heat and humidity.
* Heat index: A number in degrees Fahrenheit (F) that tells how hot it really feels when relative humidity is added to the actual air temperature. Exposure to full sunshine can increase the heat index by 15 degrees F.
* Heat cramps: Heat cramps are muscular pains and spasms due to heavy exertion. Although heat cramps are the least severe, they are an early signal that the body is having trouble with the heat.
* Heat exhaustion: Heat exhaustion typically occurs when people exercise heavily or work in a hot, humid place where body fluids are lost through heavy sweating. Blood flow to the skin increases, causing blood flow to decrease to the vital organs. This results in a form of mild shock. If not treated, the victim may suffer heat stroke.
* Heat stroke: Heat stroke is life-threatening. The victim's temperature control system, which produces sweating to cool the body, stops working. The body temperature can rise so high that brain damage and death may result if the body is not cooled quickly.
* Sunstroke: Another term for heat stroke.

**If a Heat Wave Is Predicted or Happening...**

* Slow down. Avoid strenuous activity. If you must do strenuous activity, do it during the coolest part of the day, which is usually in the morning between 4:00 a.m. and 7:00 a.m.
* Stay indoors as much as possible. If air conditioning is not available, stay on the lowest floor, out of the sunshine. Try to go to a public building with air conditioning each day for several hours. Remember, electric fans do not cool the air, but they do help sweat evaporate, which cools your body.
* Wear lightweight, light-colored clothing. Light colors will reflect away some of the sun's energy.
* Drink plenty of water regularly and often. Your body needs water to keep cool.
* Drink plenty of fluids even if you do not feel thirsty.
* Water is the safest liquid to drink during heat emergencies. Avoid drinks with alcohol or caffeine in them. They can make you feel good briefly, but make the heat's effects on your body worse. This is especially true about beer, which dehydrates the body.
* Eat small meals and eat more often. Avoid foods that are high in protein, which increase metabolic heat.
* Avoid using salt tablets unless directed to do so by a physician.

**Signals of Heat Emergencies...**

* Heat exhaustion: Cool, moist, pale, or flushed skin; heavy sweating; headache; nausea or vomiting; dizziness; and exhaustion. Body temperature will be near normal.
* Heat stroke: Hot, red skin; changes in consciousness; rapid, weak pulse; and rapid, shallow breathing. Body temperature can be very high-- as high as 105 degrees F. If the person was sweating from heavy work or exercise, skin may be wet; otherwise, it will feel dry.

**Treatment of Heat Emergencies...**

* Heat cramps: Get the person to a cooler place and have him or her rest in a comfortable position. Lightly stretch the affected muscle and replenish fluids. Give a half glass of cool water every 15 minutes. Do not give liquids with alcohol or caffeine in them, as they can make conditions worse.
* Heat exhaustion: Get the person out of the heat and into a cooler place. Remove or loosen tight clothing and apply cool, wet cloths, such as towels or sheets. If the person is conscious, give cool water to drink. Make sure the person drinks slowly. Give a half glass of cool water every 15 minutes. Do not give liquids that contain alcohol or caffeine. Let the victim rest in a comfortable position, and watch carefully for changes in his or her condition.
* Heat stroke: Heat stroke is a life-threatening situation. Help is needed fast. Call 9-1-1 or your local emergency number. Move the person to a cooler place. Quickly cool the body. Immerse victim in a cool bath, or wrap wet sheets around the body and fan it. Watch for signals of breathing problems. Keep the person lying down and continue to cool the body any way you can. If the victim refuses water or is vomiting or there are changes in the level of consciousness, do not give anything to eat or drink.

# Heat Index °F (°C)

## Relative Humidity (%)

| Temperature | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **110 (47)** | 136 (58) | | | | | | | | | | | | |
| **108 (43)** | 130 (54) | 137 (58) | | | | | | | | | | | |
| **106 (41)** | 124 (51) | 130 (54) | 137 (58) | | | | | | | | | | |
| **104 (40)** | 119 (48) | 124 (51) | 131 (55) | 137 (58) | | | | | | | | | |
| **102 (39)** | 114 (46) | 119 (48) | 124 (51) | 130 (54) | 137 (58) | | | | | | | | |
| **100 (38)** | 109 (43) | 114 (46) | 118 (48) | 124 (51) | 129 (54) | 136 (58) | | | | | | | |
| **98 (37)** | 105 (41) | 109 (43) | 113 (45) | 117 (47) | 123 (51) | 128 (53) | 134 (57) | | | | | | |
| **96 (36)** | 101 (38) | 104 (40) | 108 (42) | 112 (44) | 116 (47) | 121 (49) | 126 (52) | 132 (56) | | | | | |
| **94 (34)** | 97 (36) | 100 (38) | 103 (39) | 106 (41) | 110 (43) | 114 (46) | 119 (48) | 124 (51) | 129 (54) | 135 (57) | | | |
| **92 (33)** | 94 (34) | 96 (36) | 99 (37) | 101 (38) | 105 (41) | 108 (42) | 112 (44) | 116 (47) | 121 (49) | 126 (52) | 131 (55) | | |
| **90 (32)** | 91 (33) | 93 (34) | 95 (35) | 97 (36) | 100 (38) | 103 (39) | 106 (41) | 109 (43) | 113 (45) | 117 (47) | 122 (50) | 127 (53) | 132 (56) |
| **88 (31)** | 88 (31) | 89 (32) | 91 (33) | 93 (34) | 95 (35) | 98 (37) | 100 (38) | 103 (39) | 106 (41) | 110 (43) | 113 (45) | 117 (47) | 121 (49) |
| **86 (30)** | 85 (29) | 87 (31) | 88 (31) | 89 (32) | 91 (33) | 93 (34) | 95 (35) | 97 (36) | 100 (38) | 102 (39) | 105 (41) | 108 (42) | 112 (44) |
| **84 (29)** | 83 (28) | 84 (29) | 85 (29) | 86 (30) | 88 (31) | 89 (32) | 90 (32) | 92 (33) | 94 (34) | 96 (36) | 98 (37) | 100 (38) | 103 (39) |
| **82 (28)** | 81 (27) | 82 (28) | 83 (28) | 84 (29) | 84 (29) | 85 (29) | 86 (30) | 88 (31) | 89 (32) | 90 (32) | 91 (33) | 93 (34) | 95 (35) |
| **80 (27)** | 80 (27) | 80 (27) | 81 (27) | 81 (27) | 82 (28) | 82 (28) | 83 (28) | 84 (29) | 84 (29) | 85 (29) | 86 (30) | 86 (30) | 87 (31) |

| Category | Heat Index | Possible heat disorders for people in high risk groups |
|---|---|---|
| Extreme Danger | 130°F or higher (54°C or higher) | Heat stroke or sunstroke likely. |
| Danger | 105 - 129°F (41 - 54°C) | Sunstroke, muscle cramps, and/or heat exhaustion likely. Heatstroke possible with prolonged exposure and/or physical activity. |
| Extreme Caution | 90 - 105°F (32 - 41°C) | Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity. |
| Caution | 80 - 90°F (27 - 32°C) | Fatigue possible with prolonged exposure and/or physical activity. |

### Precautions To Take Against Excessive Heat

Increase your intake of non-alcoholic, non-carbonated, caffeine free beverages such as water and juice.
Wear clothing that is light in color and loose fitting.
Avoid the outdoors during extreme heat. Stay out of the sun.
Stay in an air-conditioned environment if possible. Shopping malls offer relief if your home is not air-conditioned.
Check on the elderly. They are especially susceptible to heat related illness.
Eliminate strenuous activity such as running, biking and lawn care work when it heats up.

### Heat Related Illnesses And Their Symptoms

**SUNBURN** - Redness and pain in the skin. In severe cases there is also swelling, blisters, fever, and headaches.
**HEAT CRAMPS** - Heavy sweating and painful spasms usually in the leg or abdomen muscles.
**HEAT EXHAUSTION** - The person becomes weak and is sweating heavily. The skin is cold, pale and clammy. Fainting and vomiting accompanies heat exhaustion.
**HEATSTROKE/SUNSTROKE** - High body temperature (106 degrees or higher) along with hot dry skin and a rapid and strong pulse. Unconsciousness is possible.


## ***Before*** the Hurricane Season

- Determine safe evacuation routes inland.
- Learn location of official shelters.
- Make emergency plans for pets.
- Check emergency equipment, such as flashlights, generators and battery-powered NOAA Weather Radio All Hazards and cell phones.
- Buy food that will keep and store drinking water.
- Buy plywood or other material to protect your home.
- Clear loose and clogged rain gutters and downspouts.
- Trim trees and shrubbery.
- Decide where to move your boat in an emergency.
- Review your insurance policy.

## ***During*** the Storm

### When in a Watch area...

- Listen frequently to radio, TV or NOAA Weather Radio All Hazards for bulletins of a storm's progress.
- Fuel and service your vehicles.
- Inspect and secure mobile home tie-downs.
- Board up windows in case the storm moves quickly and you have to evacuate.
- Stock up on batteries, food that will keep, first aid supplies, drinking water and medications.
- Store lawn furniture and other loose, light-weight objects, such as garbage cans and garden tools.
- Have cash on hand in case power goes out and ATMs don't work.

### Plan to evacuate if you...

- Live in a mobile or manufactured home. They are unsafe in high winds no matter how well fastened to the ground.
- Live on the coastline, an offshore island or near a river or flood plain. In addition to wind, flooding from storm surge waves is a major killer.
- Live in a high-rise. Hurricane winds can knock out electricity to elevators, break windows and more.

### When in a Warning area...

- Closely monitor radio, TV or NOAA Weather Radio All Hazards for official bulletins.

### TERMS TO KNOW

**Hurricane Watch:** Hurricane conditions are *possible* in the specified area of the watch, usually within 36 hours.

**Hurricane Warning:** Hurricane conditions are *expected* in the specified area of the warning, usually within 24 hours.

**Tropical Storm Watches and Warnings:** Take these alerts seriously. Although Tropical Storms have lower wind speeds than hurricanes, they often bring life-threatening flooding and dangerous winds. Take precautions!

- Close storm shutters.
- Follow instructions issued by local officials. **Leave immediately if ordered!**
- If evacuating, leave as soon as possible. Stay with friends or relatives, at a low-rise inland motel or at a designated public shelter outside the flood zone.
- DO NOT stay in a mobile or manufactured home.
- Notify neighbors and a family member outside of the warned area of your evacuation plans.
- Take pets with you if possible, but remember, most public shelters do not allow pets other than those used by the handicapped. Identify pet-friendly motels along your evacuation route.

### If Staying in a Home...

- Turn refrigerator to maximum cold and keep closed.
- Turn off utilities if told to do so by authorities.
- Turn off propane tanks.
- Unplug small appliances.
- Fill bathtub and large containers with water in case tap water is unavailable. Use water in bathtubs for cleaning and flushing only. Do NOT drink it.

### If Winds Become Strong...

- Stay away from windows and doors, even if they are covered. Take refuge in a small interior room, closet or hallway.

# Weather Safety: Hurricanes

- Close all interior doors. Secure and brace external doors.
- If you are in a two story house, go to an interior 1st floor room.
- If you are in a multi-story building and away from water, go to the 1st or 2nd floor and stay in the halls or other interior rooms away from windows.
- Lie on the floor under a table or other sturdy object.

## Be Alert For...

- Tornadoes: They are often spawned by hurricanes.
- The calm "eye" of the storm. It may seem like the storm is over but after the eye passes, the winds will change direction and quickly return to hurricane force.
- Storm surge flooding. These high waves can be more deadly than hurricane winds. Leave the coast and stay away from low lying areas, creeks, streams and other inland waterways.

## *After* the Storm

- Keep listening to radio, TV or NOAA Weather Radio.
- Wait until an area is declared safe before entering.
- Watch for closed roads. If you come upon a barricade or a flooded road, **Turn Around Don't Drown!™**
- Avoid weakened bridges and washed out roads.
- Stay on firm ground. Moving water only 6 inches deep can sweep you off your feet. Standing water may be electrically charged from power lines.

NOAA — National Oceanic and Atmospheric Administration — U.S. Department of Commerce

U.S. Department of Homeland Security — FEMA

American Red Cross

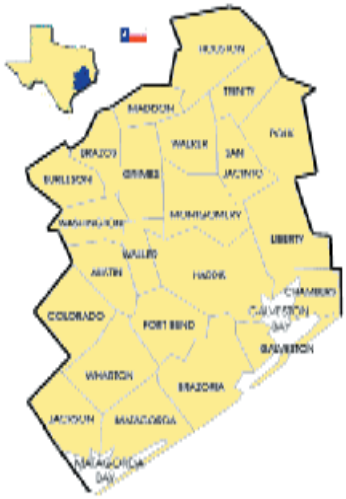
## What to Bring to the Shelter

- First aid kit
- Medicine, prescriptions
- Baby food and diapers
- Games, books, music players with headphones
- Toiletries
- Battery-powered radio and cell phone
- Flashlights
- Extra batteries
- A blanket or sleeping bag for each person
- Identification
- Copies of key papers such as insurance policies
- Cash, credit card

***REMINDER: If you are told to leave, do so immediately!***

- Once home, check gas, water and electrical lines and appliances for damage.
- Use a flashlight to inspect for damage. Never use candles and other open flames indoors.
- Do not drink or prepare food with tap water until officials say it is safe.
- If using a generator, avoid electrocution by following manufacturers instructions and standard electric code.

NWS hurricane links, forecasts, assessments:
**http://www.weather.gov/os/hurricane**
NOAA Weather Radio All Hazards:
**http://www.weather.gov/nwr**
National Hurricane Center:
**http://www.nhc.noaa.gov**
Central Pacific Hurricane Center:
**http://weather.gov/cphc**
NOAA Hurricane Website
**http://hurricanes.noaa.gov/**
American Red Cross:
**http://www.redcross.org**
Federal Emergency Management Agency:
**http://www.fema.gov**

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