



Storm Signals

Houston/Galveston National Weather Service Office



Volume 64 Spring 2003

2002 Southeast Texas Weather - A Year In Review

By Charles Roeseler

Weatherwise, 2002 was an interesting year. The first half of the year was drier and warmer than normal. The second half of the year was warmer and wetter than normal. For the year, rainfall totals tallied above normal with temperatures averaging near to slightly above normal. A brief monthly summary of unique and significant weather will be provided followed by a complete listing of 2002 temperature and rainfall data for several observation sites across southeast Texas. Rainfall data for supplemental (co-op) sites will also be provided.

January - The month started out colder than normal but a mid to late month warm spell left January warmer than normal. Conditions were drier than normal with a bulk of the rainfall occurring in the first week of the month. The only significant weather was on the 1st when some sleet and very light snow fell over the region. Dense sea fog affected coastal sections toward the end of the month.

February - The month was much cooler than normal primarily due to unusually dry air. Overnight lows were rather chilly all month with several low temperature records established toward the end of the month. Rainfall was well below normal for the month. The only significant weather occurred on the 19th and 21st when thunderstorms produced some wind damage in Galveston county and dime sized hail in Madison and Harris counties.

March - The month was again cooler and drier than normal. A significant severe weather event occurred on March 30th. Dime to quarter sized hail fell over much of the region. Baseball sized hail fell in Wharton county near El Campo. Several tornadoes were spawned as thunderstorms roared through the region during the late afternoon and early evening hours. One tornado touched down near Wharton and a second tornado produced damage in La Porte.

April - Rainfall was near or just slightly drier than normal but temperatures averaged above normal. In fact, 90 percent of the monthly rainfall occurred in a 24 hour period on April 6th and 7th. In addition to the locally heavy rain which fell on the 7th, strong thunderstorm winds produced damage from Weimer to San Luis Pass.

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May - The month was again warmer and drier than normal. Rainfall approached normal levels near the coast. Daytime temperatures were near normal, but overnight low temperatures averaged 2 to 3 degrees above normal. Significant weather was at a minimum with a few hail producing thunderstorms at the end of the month.

June - Weather patterns underwent a gradual shift at the end of May and this trend continued into June. A break in the sub-tropical ridge of high pressure allowed deeper tropical moisture to surge into Texas throughout the month of June. Temperatures and rainfall totals returned to climatologically normal levels. There were two episodes of severe weather. The first event occurred on the 16th and these storms produced gusty winds which toppled trees

2002 Southeast Texas Weather - A Year In Review continued

over the northern half of southeast Texas, generally north of a Brenham to Sweeny line. A second round of storms produced wind damage on the 29th.

July - Temperatures varied quite a bit across the region but the overall trend indicated that temperatures were slightly below normal for the month. Rainfall was well above normal averaging 2 to 4 inches above normal. There was only one significant thunderstorm event and this occurred on the 8th. Minor structural damage was reported west of a Crockett to Brenham line.

August - Temperatures were generally near to slightly above normal. Rainfall was again well above normal. The heavy rain which fell during August was not due to any organized tropical systems. There were several severe weather episodes that occurred during the month. A cluster of storms ripped through the area on the 3rd. These storms produced widespread wind damage to homes and knocked down trees and power lines. Heavy rain returned to the area on August 15th. Galveston received over 6 inches of rain between midnight and 5 am. By the time the day had ended, Galveston had received 11.46 inches of rain. This was a new 24 hour rainfall record for the day and for the month. In fact, it was the 4th wettest 24 hour period in city history. By the time August came to a close...Galveston's monthly rainfall total of 14.67 inches was the third wettest August in recorded history. More thunderstorms erupted toward the end of the month with isolated reports of wind damage and hail.

September - There was quite a contrast across the county warning area during the month of September. Areas away from the coast endured warmer than normal temperatures and rainfall that was well below normal. Coastal counties received very heavy rain and below normal temperatures.

The disparity between regions can be summed up in one word - Fay. Tropical Storm Fay developed over the western gulf on September 5th and moved inland near Palacios on the 7th. This system was rather compact and its effects were limited to areas near the coast. Fay spawned several tornadoes in Brazoria, Matagorda, Fort Bend and Wharton counties. 3 people in Fort Bend county were injured when a mobile home was damaged by one of these tornadoes.

October - Abundant rainfall continued into October. All reporting stations recorded above normal rainfall for the month. Rain was prevalent from around the 15th through the 28th. Heavy rain fell over parts of the region on the 24th and significant flooding affected northern Brazoria, northern Galveston and southeastern Harris counties. Another round of thunderstorms developed on the 28th. Heavy rain produced flooding along the U.S. 59 corridor from Wharton to Houston. Intercontinental airport received in excess of 8 inches of rain on the 28th. In addition to the heavy rain, isolated tornadoes affected parts of Harris and Liberty counties. October 2002 will be remembered as one of the wettest months in recorded history.

Hurricane Lili flirted with the upper Texas coast as this strong Category 4 storm pushed into the northwest gulf. A hurricane watch was posted for parts of the upper Texas coast, but the only affect from Lili was unseasonably warm temperatures for the area.

November - This month started out the way the previous one ended - wet! Heavy rain continued to fall over most of the area during the first week. Conditions dried out and the rest of the month was relatively dry. Temperatures were 2 to 3 degrees cooler than normal. Other than the heavy rain to start the month, there was no other significant weather.

December - Another rainy month affected the region. There were several episodes of severe weather. The first episode occurred on the 12th. Locally heavy rain, strong winds and small hail pummeled the area. Another round of strong to severe thunderstorms affected the area on December 30th. Isolated tornadoes affected areas along Galveston Bay from Texas City to La Porte.

The most significant severe weather episode of the month and probably the year occurred on December 23rd. Over 80 severe weather warnings were issued on this day. Large hail, up to 2 inches in diameter, damaging winds in excess of 70 mph and tornadoes raked the area from pre-dawn to midnight. This weather event will long be remembered for it's ferocity and long duration. Every county in southeast Texas reported either wind damage, tornado or hail.

2002 Southeast Texas Weather - A Year In Review continued

Houston Intercontinental Airport - 2002 Data						
Month	Average High	Average Low	Average Daily	Departure	Rain	Departure
January	66.0	43.1	54.6	+2.8	1.24	-2.44
February	63.0	38.4	50.7	-4.7	0.89	-2.09
March	71.8	50.7	61.3	-1.0	2.36	-1.00
April	81.8	65.2	73.5	+5.0	3.79	+0.19
May	85.4	68.6	77.0	+1.2	1.79	-3.36
June	90.1	73.2	81.7	+0.4	4.54	-0.81
July	93.1	75.8	84.5	+0.9	7.10	+3.92
August	92.7	75.0	83.9	+0.6	5.47	+1.64
September	88.1	71.2	79.7	+0.8	8.02	+3.69
October	78.3	64.8	71.6	+1.2	14.65	+10.15
November	68.8	48.8	58.8	-2.1	4.20	+0.01
December	63.9	45.2	54.5	+0.8	5.65	+1.96
Totals	78.6	60.0	69.3	+0.5	59.71	+11.87

Galveston Scholes Field - 2002 Data						
Month	Average High	Average Low	Average Daily	Departure	Rain	Departure
January	63.1	49.7	56.4	+0.6	2.20	-1.88
February	61.1	47.5	54.3	-3.7	0.71	-1.90
March	68.8	55.6	62.2	-1.9	1.85	-0.91
April	77.3	68.5	72.9	+2.9	2.36	-0.20
May	82.2	72.1	77.1	+0.2	3.63	-0.07
June	86.3	76.3	81.3	-0.9	5.31	+1.27
July	88.8	79.4	84.1	-0.2	3.73	+0.28
August	90.1	79.5	84.8	+0.4	14.67	+10.45
September	86.1	75.5	80.8	-0.3	11.38	+5.62
October	79.5	69.7	74.6	+0.5	11.81	+8.32
November	69.8	56.6	63.2	-2.2	2.93	-0.71
December	63.5	50.9	57.2	-0.9	3.64	+0.11
Totals	76.4	65.1	70.8	-0.5	64.22	+20.38

College Station Easterwood Field - 2002 Data						
Month	Average High	Average Low	Average Daily	Departure	Rain	Departure
January	64.5	40.1	52.3	+2.1	1.60	-1.72
February	62.1	35.8	48.9	-5.6	1.63	-0.75
March	71.1	47.5	59.3	-2.3	0.85	-1.99
April	81.7	63.9	72.8	+4.9	1.43	-1.77
May	87.7	65.2	76.4	+1.1	0.89	-4.16
June	92.8	71.0	81.9	+0.3	3.04	-0.75
July	92.3	73.3	82.8	-1.8	5.66	+3.74
August	94.5	73.3	83.9	-0.8	3.62	+0.99
September	90.4	69.1	79.8	+0.1	0.77	-3.14
October	76.8	61.9	69.4	-1.1	9.79	+5.57
November	67.4	46.1	56.8	-3.2	6.00	+2.82
December	62.6	43.0	52.8	+0.6	7.58	+4.35
Totals	78.7	57.5	68.1	-0.5	42.86	+3.19

COOP Stations - Monthly Rainfall Data

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Alvin	3.15	0.45	2.86	2.56	2.65	0.18	4.69	17.00	9.02	14.04	3.97	11.28	71.85
Angleton	2.73	0.57	1.84	4.30	2.15	3.58	4.13	19.10	15.31	14.54	4.28	11.52	84.05
Bay City	1.93	0.81	0.87	3.35	1.70	8.00	3.77	5.90	14.80	9.25	4.95	6.68	62.01
Baytown	1.51	2.65	3.42	5.37	4.11	4.99	12.35	9.53	13.20	13.00	3.94	9.26	83.33
Bellville	1.10	0.87	1.26	2.61	0.43	3.89	3.22	7.61	3.85	11.42	5.08	6.99	48.33
Brenham	1.28	1.29	0.93	3.78	1.00	5.28	6.62	2.85	3.48	17.05	8.01	11.21	62.78
Caldwell	1.30	2.14	1.45	1.15	2.80	3.30	5.53	2.86	0.91	9.64	7.56	7.76	46.40
Cleveland	1.72	2.13	2.48	3.09	1.36	8.71	7.30	2.63	8.22	15.07	6.31	6.70	65.72
Columbus	1.93	1.13	1.10	3.94	1.17	4.73	6.36	1.99	4.09	9.39	6.10	7.31	49.24
Conroe	1.98	1.28	2.16	2.90	2.45	6.62	2.25	2.92	4.53	14.77	6.93	4.75	53.54
Corrigan	2.38	2.15	4.79	2.58	3.59	2.15	4.69	3.64	3.32	10.20	7.13	7.59	54.21
Danevang	1.08	1.19	0.61	2.22	2.96	6.31	4.60	2.34	7.44	8.12	6.85	3.38	47.10
Edna	0.72	0.67	0.78	4.37	0.73	4.85	9.43	2.22	5.12	8.89	5.30	4.44	47.52
Freeport	2.38	0.26	0.88	2.26	4.02	3.09	2.86	8.48	20.03	14.28	4.52	7.62	70.68
Houston - Barker	1.12	1.39	1.56	3.39	1.18	4.75	6.41	6.29	6.03	11.50	5.75	4.40	53.77
Houston -Heights	1.39	1.19	3.13	5.65	3.26	2.86	5.31	8.14	6.77	11.03	5.00	5.34	59.07
Houston -North Houston	1.13	1.51	2.28	3.72	1.56	2.73	3.99	6.30	3.63	15.57	4.79	5.43	59.07
Houston - Westbury	1.52	1.10	2.69	4.10	1.46	4.69	7.68	10.25	4.83	10.50	3.09	5.10	57.01
Huntsville	1.91	1.95	2.92	2.30	1.97	6.35	7.23	1.03	2.88	11.81	7.81	6.36	54.52
Jamaica Beach	2.80	0.45	1.69	3.16	3.64	8.90	5.71	12.07	18.23	12.84	3.74	7.02	80.25
League City -NWS Office	3.17	0.40	4.46	3.46	8.57	5.68	6.06	10.28	8.50	15.66	4.02	12.60	82.86
Madisonville	1.75	2.04	1.80	2.90	1.55	6.61	3.74	1.70	2.16	10.23	8.49	10.09	53.06
Montgomery	2.01	1.71	1.41	3.72	1.41	4.02	4.28	3.04	2.40	12.52	7.11	6.14	49.77
New Caney	1.49	1.66	3.36	4.15	3.10	5.31	2.34	4.36	8.88	16.66	4.15	5.35	60.81
Richards	1.45	1.75	1.53	2.67	1.07	4.79	4.85	3.08	14.24	12.00	7.60	6.33	61.36
Richmond	1.63	1.87	1.35	5.33	1.40	5.99	5.71	7.09	5.22	18.59	9.17	5.69	69.04
Sealy	2.12	0.81	1.25	3.90	0.70	4.94	5.55	4.42	3.93	9.12	5.42	6.61	48.77
Lake Somerville	0.81	1.63	1.04	1.58	1.16	2.30	4.01	3.56	1.57	9.30	6.13	7.16	40.25

2003

*Houston/Galveston Hurricane Workshop
"Alicia: Our Last Major Hurricane"
Wednesday, May 28, 8am - 12pm*

The annual Houston/Galveston Hurricane Workshop will take place on Wednesday May 28 from 8am until 12pm. The workshop will be at the Pasadena Convention Center located on Fairmont Parkway near the intersection with Red Bluff in Pasadena. This year's theme will focus on the 20th anniversary of Hurricane Alicia, the last major hurricane to make landfall along the upper Texas coast.

This year's Hurricane Workshop is actually going to partner with the Texas Gulf Coast Emergency Management Annual Conference. Training sessions on hurricane preparedness will take place on Tuesday and Wednesday afternoon.

Hurricane Alicia made landfall on August 18, 1983 as a category 3 hurricane. Alicia produced a tidal surge near 12 feet along the western shore of Galveston Bay. Despite this surge, Alicia was known for the damaging winds that extended as far inland as Huntsville, Texas. We plan to look at some of the things we have learned about hurricane winds during the past 20 years. We also plan on studying what changes have taken place in downtown Houston where the wind did a tremendous amount of damage to the high rise buildings.

The workshop is again being sponsored by the East Harris County Manufacturers Association (EHCMA) and the City of Pasadena. There will be numerous vendors on hand displaying information on how to be prepared for the upcoming hurricane season. The workshop will once again be free and is open to the public.



AMBER ALERT

The original Amber Plan was developed by the Association of Radio Managers in the Dallas/Worth area after the 1996 abduction and murder of nine-year-old Amber Hagerman. Radio and television managers, in cooperation with local law enforcement agencies, agreed to distribute timely information to radio and tv listeners concerning child abductions. A similar plan was adopted in the Houston area in 2000 and a statewide system was put into place in 2002. National Weather Service Offices across Texas participate in the statewide Amber Alert notification system. The local National Weather Service office currently issues a Civil Emergency Message that is sent to media outlets across the state via the weather wire. In addition, the local National Weather Service also broadcasts the Amber Alert via the weather radio using both the tone alert and SAME alert that allows entry into the Emergency Alert System (EAS). During 2003 a new EAS code CAE (Child Abduction Emergency) will be introduced for use with Amber Alerts. The National Weather Service feels with the use of the weather radio we can help save the lives of children that are abducted.

December 23rd and 30th Severe Weather Events

By Josh Lichter

The last eight days of 2002 brought two rounds of severe weather to portions of Southeast Texas. Severe Thunderstorm, Tornado and Special Marine Warnings were issued for the first event on December 23rd that lasted nearly eighteen hours (see Figure 1). The second event on December 30th only lasted around six hours, but that was long enough for the issuance of the same type of warnings that we saw on the 23rd. No fatalities were observed with these events.

Several days before the 23rd, computer weather models were coming together to indicate a very good chance of severe storms. An upper level low pressure system was expected to move out of the southwestern U.S. and off to the east and the northeast across Texas. Abundant low level moisture was in place across Southeast Texas, and the models indicated very strong shear, or turning and strengthening of the winds with height, to be in place for much of the day. On the 23rd the Storm Prediction Center placed Southeast Texas under a high risk for severe thunderstorms on their Day One Convective Outlook issued around midnight on the 22nd.

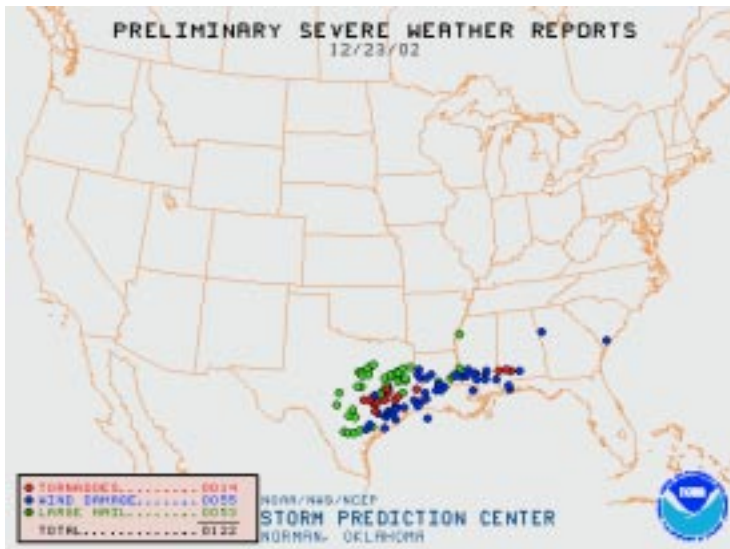


Figure 1

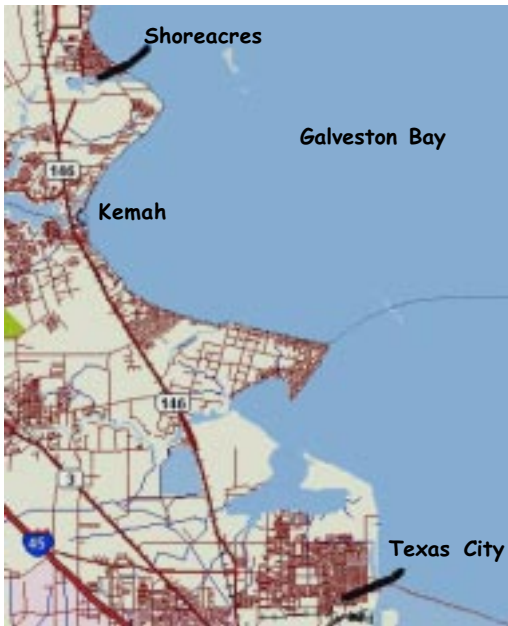
On the 23rd the Storm Prediction Center placed Southeast Texas under a high risk for severe thunderstorms on their Day One Convective Outlook issued around midnight on the 22nd. Showers and thunderstorms began to form across the Hill Country before dawn, and our first severe thunderstorm warning was issued just past 6:00 AM for Austin and Colorado counties as storms began to rapidly develop and intensify near and along the western portions of a warm front across our area. Over the next eighteen hours as the warm front moved to the north, nearly fifty severe weather events occurred across Southeast Texas, including tornadoes in Colorado, Burleson, Washington, Brazos, Grimes, Madison, Montgomery, and San Jacinto counties. Large hail (up to 1.75 inches) was observed mainly north and west of the Houston area. Locations from the Houston area to the beaches felt the brunt of this event in the evening when a squall line rapidly moved eastward across Harris County and toward the coast and produced 60 to 80 mph winds (see Figure 2). All severe weather came to an end by midnight.



Figure 2 - Squall line moving through Harris County. Base reflectivity at 9:35pm, December 23rd, 2002.

A similar (but shorter and less active) event evolved on the 30th. The next upper level low pressure system approached from the west during the day, and severe storms developed shortly before 6:00 PM. Hail was observed with some of the storms, but the most significant damage came from straight line winds and tornadoes. Montgomery, Wharton, Harris

December 23rd and 30th Severe Weather Events continued

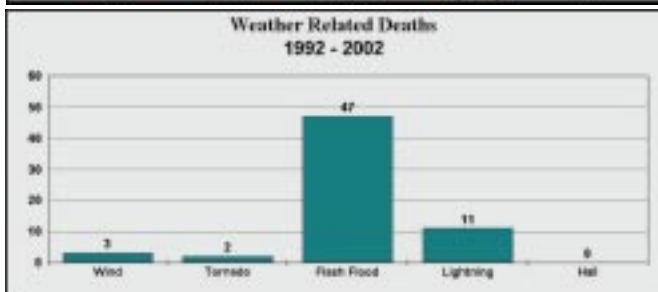
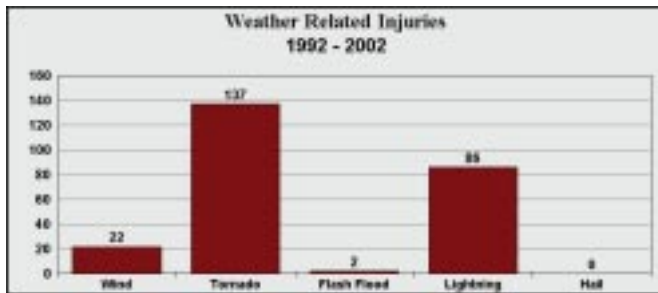


and Galveston counties experienced the most severe storms. Tornadoes were confined to Harris and Galveston counties. At approximately 9:20 PM, a tornado touched down in Texas City near the intersection of State Highway 348 and Loop 197. The storm moved east northeast eventually crossing the Texas City dike. Several businesses were damaged at the initial touchdown. Numerous power poles were knocked down on the Texas City dike. The tornado was on the ground for a little over one mile before moving over Galveston Bay as a waterspout. Most of the damage was F0 with a little F1 damage at the initial touchdown point. At approximately 9:25 PM, a second tornado briefly touched down in Shoreacres near the Houston Yacht Club. This tornado was only on the ground for about a half mile before it moved over Galveston Bay as a waterspout. Most damage was confined to trees except at the Houston Yacht Club. Several boats at the club were overturned in the parking lot and a large section of a metal roof was destroyed and tossed onto boats further downwind. The damage from this short lived tornado was F0. Figure 3 is a trackmap of these two tornadoes.

Ham radio reports, Skywarn trained storm spotters, emergency management and law enforcement personnel played a significant role in helping the Houston/Galveston National Weather Service office during these events. We would like to thank all of those involved.

Figure 3 - Texas City and Shoreacres tornado tracks. December 30, 2002

Interesting Southeast Texas Weather Facts:



Southeast Texas Severe Weather Awareness Week March 2-8, 2003

By Robert C. Van Hoven

Governor Rick Perry has proclaimed the week of March 2-8 as Severe Weather Awareness Week for the state of Texas.

During Severe Weather Awareness Week, the National Weather Service in coordination with the Texas Division of Emergency Management and the Insurance Information Institute will highlight various aspects of severe weather through press releases and Public Information Statements. Newspapers, broadcast media, safety organizations and other local government officials are encouraged to work with their communities to disseminate severe weather awareness information in order to prepare them for the upcoming severe weather season.



During each day of Severe Weather Awareness Week, special releases will be made by the National Weather Service to further emphasize important information about severe weather and the National Weather Service's job in warning the public.

Date	Release
Sunday, March 2 AM	Introduction to Severe Weather Awareness Week
Sunday, March 2 PM	Texas Severe Weather Climatology
Monday, March 3 AM	Texas Deadliest Tornadoes
Monday, March 3 PM	Tornado Safety in Schools
Tuesday, March 4 AM	Lightning Facts and the 30/30 Rule
Tuesday, March 4 PM	Straight Line Winds
Wednesday, March 5 AM	Flash Flood Safety in Vehicles
Wednesday, March 5 PM	Amateur Radio and Storm Spotters
Thursday, March 6 AM	NOAA Weather Radio Saves Lives
Thursday, March 6 PM	Safety Plan for home or Business
Friday, March 7 AM	Safety after the Storm
Friday, March 7 PM	Severe Weather Quiz

2003 National Severe Weather Workshop February 27 through March 1, 2003 Norman, OK

The third annual National Severe Weather Workshop will feature the nation's premier severe weather experts discussing their latest research and forecasting techniques. Speakers will include forecasters and researchers from the NOAA Weather Partners in Norman: Storm Prediction Center, National Severe Storms Laboratory, Warning Decision Training Branch, Radar Operations Center and National Weather Service Norman Forecast Office.

Designed for emergency managers, storm spotters and other weather enthusiasts, the workshop offers a unique opportunity to learn about the National Weather Service's outlook, watch and warning process, severe weather preparedness and safety, StormReady, EMWIN, severe storm risks, lightning effects, wind damage effects and new ways to get radar data. Spotter training will be offered in conjunction with the workshop.



More information on this workshop can be found at: www.nssl.noaa.gov/nsww2003/



2003 Houston International Boat and Travel Show

By Brian Kyle

The 2003 Houston International Boat Show was held at the Reliant Center from January 3rd through January 12th. Similar to the past several years, NWS Houston/Galveston set up a booth among the other vendors of boats, marine products and services. Though numbers are not yet currently available, if this years attendance is similar to past years, over 125,000

people likely attended the 10 day event. This was a great opportunity for the Houston/Galveston staff to meet with the marine community as they passed by the NWS booth.

This year the office had an internet connection at the booth which allowed folks to see what weather data is available on our website. The onsite internet connection, along with magnets, pens and pencils given away with the office web page address written on them was an excellent way to show people where to obtain the latest weather information. Many positive comments were received about the local forecasts and products. We really enjoyed meeting those that stopped by!

Skywarn 2003

Severe weather can and does occur every month of the year. However, the majority of the severe weather episodes in southeast Texas occur in the springtime months of March, April and May. October and November is the other peak time period for severe weather. One of the ways your community or county can be better prepared for the upcoming severe weather season is to host a Skywarn training session for your community.

What is Skywarn?

Skywarn is a program sponsored by your local National Weather Service Office to train individuals in your community to be storm spotters. When there is a threat of severe weather these trained spotters will watch the skies and report important weather information to their local Emergency Manager, law enforcement official or you local National Weather Service. This information can be used to warn local citizens and schools of possible severe weather. This information will also be used by the National Weather Service to enhance the warning program.

Who can be a Storm Spotter?

Anyone who has an interest in helping out their community can be a spotter. People that make good spotters are law enforcement employees, volunteer firemen, amateur radio operators and interested citizens. Good communication is a key. It is important you can relay your reports as quickly as possible back to the local authorities.

How do you become a trained spotter?

Skywarn training classes take place throughout southeast Texas from late winter into early spring with most classes during the months of February and March. The training class lasts between two and three hours and is usually given during the evening or on Saturdays. Each participant at the end of the training will receive a certificate, a Skywarn sticker for your vehicle and additional reading material to further enhance your understanding of severe weather. Instructions on what information to report and how to report your information will be given during the training. If you are interested in helping the National Weather Service by becoming a Skywarn spotter, plan on attending a training session. You can check our web site on times and location of upcoming Skywarn training sessions.

If you are an emergency manager, sheriff, or other public official, and you are interested in scheduling a training class, please contact the Houston/Galveston National Weather Service Office at 281-337-5074. Please check our website www.srh.noaa.gov/hgx/severe/skywarn/schedule03.htm for more information on training classes to be held in your area. Information will be posted and updated during the training season.

Did you know.....

What are degree days?

To calculate heating and cooling degree days, add the high and low temperature and divide by 2. If 65 is lower than the average temperature, subtract 65 from the average and you have the number of cooling degree days. If the average temperature is lower than 65, subtract the average from 65 and you have the number of heating degree days.



The number 65 is used as the base number because most buildings and homes would be most comfortable and energy efficient at or around 65 degrees.



Operations at the Storm Prediction Center

By Mike Rehbein

The Storm Prediction Center (SPC) is a national center that is responsible for forecasting severe thunderstorms and other hazardous weather phenomena for the 48 contiguous United States. The SPC is located on the north campus of the University of Oklahoma in the National Severe Storms Laboratory building. In the next few years, the SPC will consolidate with several other Federal and state agencies to create the National Weather Center on OU's main campus.

By definition, a severe thunderstorm produces wind gusts in excess of 58 mph (50 knots), hailstones 0.75 inch or larger and/or tornadoes. Other hazardous weather events for which the SPC issues forecasts are fire weather and winter weather (including heavy snow, freezing rain, and blizzard conditions just to mention a few things). There are several different products the SPC uses to convey this information. These products include severe weather outlooks, severe thunderstorm and tornado watches, watch status messages, mesoscale discussions, and fire weather outlooks.

Perhaps the most visible products issued by the SPC are the severe thunderstorm and tornado watches. When severe weather is forecast, forecasters at the SPC will issue a watch indicating to the public that severe thunderstorms or tornadoes are possible in and near the watch area. Watches generally

cover about 25,000 square miles and usually last between 4 and 6 hours. For fast-moving systems or longer duration events, some watches will be larger and longer than these averages. After the watch is issued, status messages are produced hourly. The status reports are guidance to the local National Weather Service offices about where the threat for severe weather has diminished. It also conveys information about whether a watch continues, is replaced, or is canceled early. Additionally, a mesoscale discussion is issued at least once and sometimes twice during the life of the watch. This product provides information about what is happening within a watch area, what is causing the particular event, and what will likely happen over the next



Figure 1 - Mesoscale Convective Discussion Example

Operations at the Storm Prediction Center continued

couple of hours. This product can also alert other Weather Service offices that severe weather may be approaching their area. See Figure 1 for an example of what a mesoscale discussion area looks like and Figure 2 for an example of what a watch area looks like.

Another popular product issued by the SPC is the convective outlook. There are three different time periods covered by the outlooks. They are the Day 1, Day 2, and Day 3 products. The initial day one forecast is issued at midnight central standard time (1:00 a.m. CDT) and becomes valid at 6:00 a.m. (7:00 a.m. CDT) and covers the following 24 hours. It is updated at least four more times on a regularly scheduled basis and other times as needed. In the past year or two, the SPC has been issuing separate probabilistic forecasts for hail, wind, and tornadoes. The higher the probability, the higher the categorical (i.e. Slight, Moderate, High) forecast will be. The initial day 2 forecast is produced at 2:30 a.m. central time and becomes valid approximately 27 hours later. This forecast is updated during the early afternoon prior to the day it is valid. This forecast includes probabilistic forecasts for all types of severe weather combined. The day 3 forecast is issued around 4:00 a.m. and is valid approximately 51 hours later. This forecast only includes the severe threat in a generalized area and categorical forecasts are not produced. An example of a convective outlook for a recent severe weather outbreak (Dec. 23, 2002) is shown in Figure 3.

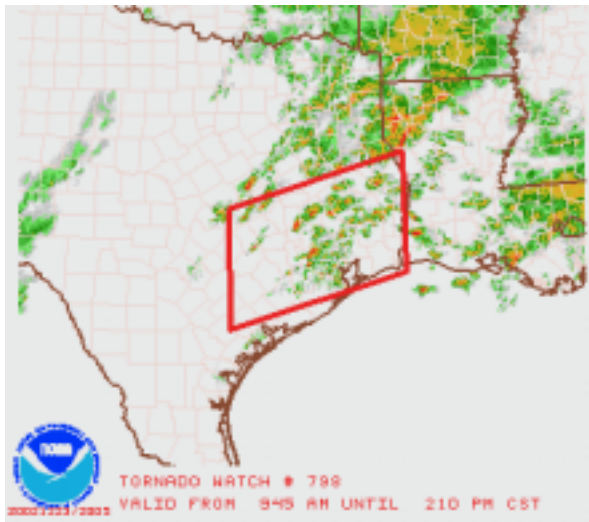


Figure 2

The fire weather program was begun a few years ago to be a national guidance product to the local offices in the production of their fire weather forecasts. It is not intended to represent all the local effects that are known to the local office, but rather to advise about the overall weather conditions that may lead to a significant fire. At the present time, this forecast is produced only once daily at 4:00 a.m. central time.



Figure 3

Operations at the Storm Prediction Center continued

The winter weather program is the final area forecast by the SPC. A forecaster will issue a mesoscale discussion to indicate an area where winter weather will begin, increase in intensity, or end. The local offices still maintain the expertise on the local topography, but the SPC helps to identify smaller scale features that may lead to significant winter weather.

All of these forecasts are generated by analyzing a large amount of observational and forecast model data. Supercomputers located in Washington, D.C. help to process this data so the forecasters can perform their tasks.

This is only a brief discussion of how the Storm Prediction Center works with other National Weather Services across the country to help protect life and property. The center is staffed 24 hours per day, 365 days a year. At least four meteorologists are on duty at any given time each with specific duties to help produce the forecasts. If you would like to learn more about the daily operations of the SPC, their website is www.spc.noaa.gov.

HGX Aviation Workshop

by Robert Van Hoven

The Houston/Galveston Weather Forecast Office (HGX) sponsored an aviation workshop on November 13, 2002. Participants included representatives from the FAA Regional Traffic Air Management Unit (TMU), the Conroe Automated Flight Service Station (AFSS), Center Weather Service Unit (CWSU) located at Houston's Intercontinental Airport (IAH), NASA/NWS Space Meteorology Group (SMG), and the local flying club at Clover Field.



CWSU meteorologists Matthew Bishop and Leslie Petersen discussed their interaction with air traffic control personnel. SMG meteorologist Tim Garner provided a presentation on forecasting landing conditions for the space shuttle.

Customer insight came from several sources. TMU manager David Frame relayed the disruptive impacts of adverse weather on inbound and outbound traffic from IAH. AFSS Conroe flight briefing specialists Ashley Waters and Bob Thompson praised the Area Forecast Discussion products. They said it helped them understand the reasoning behind the TAFs. General aviation pilots Carter Tull and Jeff Richichi said that they get their aviation weather information from the internet prior to having a verbal briefing from the flight service station.

Overall, the HGX aviation workshop provided an excellent opportunity to interact with users of NWS aviation products. For those interested, the next aviation workshop will be held probably during November of this year. Contact point will be Robert Van Hoven 281-337-5074 ext.318
e-mail: robert.vanhoven@noaa.gov.

THE SPRING STORM SEASON



Often in Southeast Texas, the most active season for severe weather is the collection of the spring months of March, April, and May.

With warm, moist air returning from the Gulf of Mexico and active frontal systems from the north and west, the Upper Texas Coast and Southeast Texas often experience numerous showers and thunderstorms.

There are mainly two big weather phenomena during the spring—thunderstorms and tornadoes. Tornadoes are associated with thunderstorms, but not every thunderstorm is capable of producing a tornado. However, thunderstorms can still produce significant damage without the presence of tornadoes. By definition, a thunderstorm produces lightning which is the number two weather related killer in the United States. The number one killer is flash floods which are also associated with thunderstorms. Despite the popularity or notoriety of hurricanes and tornadoes, the two main weather related killers can occur on a frequent basis. There are ways to help reduce the chances of suffering injury or damage during thunderstorms.

The best defense for spring thunderstorms is preparation. Try to keep updated to forecasts that might suggest severe weather. There are several signs that suggest a thunderstorm approaching. Thunder is often the best warning signal. Temperature changes and breezy winds also offer a clue to approaching weather. If you can hear thunder or feel cool breezes, you are close enough to the thunderstorm to be affected. If at all possible, take shelter in a sturdy building away from windows. Use phones only in case of an emergency. If a shelter is not available, find a hard top automobile and keep the windows up. A common myth about automobiles is that the rubber tires insulate the car. This is false as lightning can still strike the vehicle. But the vehicle will provide significantly more protection than the open ground. Stay away from towers, hills, and tall trees as objects protruding into the air are the ones most likely to be struck. The only time to move to higher ground is if flood waters have been seen or reported in your area. If at the lake or on the coast, get off and away from water. If caught in the open ground, find a low spot in the terrain away from trees and fences. Squat low to the ground and lean on the balls of your feet. As lightning strikes the ground, it often spreads in several directions and can strike any object in the vicinity. By eliminating the area of ground that you are in contact with, you minimize your chance of being struck. If at all possible, stay informed by listening to advisories from commercial radio and television or to the National Weather Service's weather radio. With proper information and preparation, you can reduce the damage of severe thunderstorms to you, your family, and your property.

Tornadoes offer different problems, but many safety rules from thunderstorms apply. The best defense is again preparation. Practice tornado drills so that all members of the family or employees of businesses know the appropriate locations of tornado shelters. Don't panic. Move to an interior room away from windows. If at all possible cover yourself with blankets, pillows, or other soft objects. If driving, find a suitable low spot on the ground as quick as possible and abandon your vehicle. Do not try to outrun a tornado. If you reside in a mobile home, leave and find appropriate shelter as mobile homes offer little, if any, protection from tornadoes. Stay informed with the changing weather conditions.

The Spring Storm Season *continued*

By following these basic rules, one can minimize the risk, and thus the damage, posed by the variety of spring severe weather over Southeast Texas.

DEFINITIONS:

Tornado Watch - Conditions are favorable for the development of tornadoes (tornadoes are possible in the area).

Severe Thunderstorm Watch - Conditions are favorable for the development of severe thunderstorms (severe thunderstorms are possible in the area).

Tornado Warning - Tornadoes are imminent or are occurring in the area.

Severe Thunderstorm Warning - Severe thunderstorms are imminent or are occurring in the area.

—STAFF SPOTLIGHT— LANCE WOOD

Name: Lance Wood

Position: Senior Forecaster

Favorite Color: earth tones

PERSONAL INFO

Status: 1 wife, 2.5 kids

Hometown: Houston, TX (but really born in Austin, TX)



NWS BACKGROUND

1994-1995 Meteorological Intern, NWSO El Paso, TX
1995-1998 Journeyman Forecaster, NWSO Lake Charles, LA
1998-2000 Senior Forecaster, NWSFO Houston/Galveston, TX
2002- present Senior Forecaster, NWSFO Houston/Galveston, TX

HIGHLIGHTS/DUTIES/OTHER TIDBITS

- Primary duty: shift supervisor for forecasts and warnings for southeast Texas. Other duties include forecasting and issuing severe weather warnings, public, aviation and marine forecasts.
- Graduated from Texas A&M University
- Favorite TV show: "Seinfeld"
- Brief hiatus from NWS was spent at Duke Energy.
- Significant studies presented and published include: "Using the Tropical Z-R Relation to Improve Precipitation Estimates During a Heavy Rainfall Event in Southeast Texas", "VIL Density and Associated Hail Size Along the Northwest Gulf Coast" (written with C. Roeseler)
- Focal Point duties: NWS Directives and WES (Warning Event Simulator)
- 2003 BLAST Participant
- Lettered in basketball at Sharpstown High School
- Favorite movie: "Shawshank Redemption"

Favorite type of weather to forecast? Severe weather

Most memorable weather event(s)? Hurricane Alicia in 1983 and the ice storm of January 1997 while in Lake Charles.

Favorite sandwich? Ham and swiss cheese (usually on white bread)

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1620 Gill Road
Dickinson, TX 77539



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Bill Read - Meteorologist In Charge
Gene Hafele - Warning Coordination Meteorologist
Josh Lichter / Kim Mikesell - Editors

Phone: 281-337-5074
Fax: 281-337-3798
www.srh.noaa.gov/hgx