Storm Signals

Houston/Galveston National Weather Service Office

Volume 59

The Summer of 2001 - A Climate Story

By Daniel Huckaby

In our memory, the specter of Tropical Storm Allison will certainly overshadow the rather ordinary summer that followed. Though the past few summers were considerably warmer, this summer's temperatures across Southeast Texas were again above normal. In a nutshell, the summer of 2001 was a long dry period, moderated and diluted by two weeks of deluge around Labor Day. As Allison ends, our story begins.

After the torrential rains of Tropical Storm Allison subsided in late spring, a dry spell engulfed much of Southeast Texas. During the first two months of the summer season, many locations received only half of their average rainfall. The following rainfall statistics begin on the summer solstice.

Rainfall Data - June 21 to August 25

		Actual	Average	% of Normal
IAH	Intercontinental Airport	4.02	8.06	49.9
GLS	Galveston	7.12	9.04	78.8
CLL	Bryan/College Station	2.75	5.47	50.3

By mid-August, burn bans were in effect for many counties in Central Texas, including Brazos County and other areas to the north of Houston. The Palmer Drought Serverity Indices for August 25 put the entire state of Texas in at least the "mild drought" category, with many areas in *severe* or *extreme* drought.

However, famine quickly turned to feast. The summer drought abated in a matter of days as two weeks of consistent rains brought another round of flooding to parts of Southeast Texas. In only 12 days (August 26 to September 6), many locations received two or even three times the rainfall of the previous two months. Although during a period of longer duration, some areas exceeded the rainfall totals from Tropical Storm Allison - even in parts of the Houston metro area, which saw tremendous rains during the June floods. Areas to the south and east of the city were drenched with 10 to 20 inches during the 12-day stretch in late August and early September.

As the autumnal equinox passed, only Far West Texas remained in drought. The Palmer Drought Severity Indices for September 22 put all of Southeast Texas in the "moderately wet" category, categorically as far above average moisture as the region was below just a month earlier.

Rainfall Statistics for August 26- September 6

Location		Amount
IAH	Intercontinental Airport	9.10
HOU	Hobby Airport	14.91
SGR	Sugar Land (Hull Field)	10.10
LVJ	Pearland (Clover Field)	13.62
GLS	Galveston	13.09
HGX	League City (NWS)	15.58
LBX	Angleton/Lake Jackson	9.00
PSX	Palacios	9.94
CLL	Bryan/College Station	8.12
UTS	Huntsville	6.46
CXO	Conroe	3.40
DWH	Tomball (Hooks Airport)	7.50

In this Issue:

Summer Solstice Temperatures			
Houston	High	Low	Avg
2001	92.4	72.7	82.5
2000	96.6	72.1	84.3
1999	94.7	72.9	83.8
1998	95.3	74.0	84.7
Avg	91.9	71.5	81.7
Galveston	High	Low	Avg
2001	88.7	78.5	83.6
2000	90.5	78.5	84.5
1999	89.4	77.5	83.4
1998	89.1	79.5	84.5
Avg	86.9	78.4	82.7
College Station	High	Low	Avg
2001	95.5	73.9	84.7
2000	99.3	71.7	85.5
1999	95.5	72.1	83.8
1998	96.7	74.7	85.7
Avg	93.0	72.4	82.7

While the bulk of the summer season was dry, summer temperatures along the coastal plain were only slightly above normal. However, areas to the north of Houston, which were particularly dry, saw summer temperatures considerably above normal. This is the fourth consecutive summer during which temperatures have been at least somewhat above normal. Although, for most locations across the region, Summer 2001 was not as hot as the previous few summers.

The information to the left is data for the summer season, June 21 to September 21, inclusive. Included below are the average high, the average low, and the mean of the two (avg) for the three-month period. The data for "avg" are from the 30-year normals for 1961-1990. The new normals (1971-2000), which will encompass much of the recent data here, will be available within the next few months.

The last four summers (1998-2001) have been warmer and drier than normal, but hot dry summers are far from unusual in the Lone Star State. Normals and averages give an indication of mean weather conditions, but heavy rain events and extended dry periods are part of the typical variance of Texas climate. We learn to expect the high variability of our weather. After all, these extremes are part of what make Southeast Texas climate so interesting.

2001 Hurricane Season

From the National Hurricane Center's Monthly Tropical Weather Summaries

Through September 2001, the Atlantic Hurricane Season has seen eight tropical cyclones. Four of these systems became hurricanes, but none of the four struck the continental United States. The Gulf of Mexico has seen three tropical storms - Allison, Barry and Gabrielle (Gabrielle later became a hurricane in the Atlantic) - and only one tropical storm, Chantal, has visited the Caribbean Sea. Two of the four hurricanes - Erin and Felix - became major hurricanes while moving across the Atlantic Ocean.

The season so far is best known for Tropical Storm Allison, which was the only tropical cyclone to form in the Atlantic basin during **June**. Allison developed from a tropical wave that had moved into the eastern North Pacific Ocean on the 2nd. The disturbance stalled over the Gulf of Tehuantepec before moving to the northeast and weakening over the Yucatan peninsula. By the 4th, the disturbance moved north-northwestward over the western Gulf of Mexico where thunderstorm activity increased, and the system became a depression when a small low-level circulation formed on the morning of the 5th. The depression strengthened quickly, becoming Tropical Storm Allison and reaching a peak intensity of 60 m.p.h. early in the afternoon. Allison weakened slightly before it moved inland with 50 m.p.h. winds late in the afternoon over Southeast Texas. After moving inland, Allison rapidly weakened before stalling over Eastern Texas on the 7th. The remnant circulation drifted south and emerged over the northwestern Gulf of Mexico on the 9th where the system reorganized as a subtropical cyclone before moving inland again over Louisiana on the 11th. The subtropical low tracked east-northeastward before stalling over eastern North Carolina on the 14th. The low was nearly stationary for almost three days before finally moving northeastward off the mid-Atlantic coast on the 17th. The subtropical low merged with a cold front and dissipated on the 19th southeast of Nova Scotia.

Allison produced extremely heavy rainfall from eastern Texas across the Gulf states and along the mid-Atlantic coast, resulting in the most extensive flooding ever associated with a tropical storm. Preliminary damage estimates are greater than $6 billion, and there were at least 32 direct deaths. Much of the $6 billion damage was inflicted in the Houston metropolitan area, where more than 30 inches of rain were reported at several locations and at least 24 fatalities occurred. The preliminary death toll by states is as follows: Texas 24, Florida 8, Louisiana 1, and Mississippi 1.

The only tropical cyclone to form during the month of **July** was short-lived Tropical Depression Two which formed in the central tropical Atlantic about 1250 miles east of the Windward Islands on the 11th. The depression moved west-northwestward and almost immediately encountered hostile vertical wind shear which caused the system to weaken to a tropical wave on the 12th while located about 700 miles east of the Windward Islands.

Tropical cyclone activity was a bit below normal in **August**. An average August has three named storms, of which two become hurricanes. There were three tropical storms during August - Barry, Chantal and Dean - but no hurricanes. This is the first August to have no hurricanes since 1997. This is also the first season since 1988 to have no hurricanes observed prior to September.

Barry formed from a tropical wave over the eastern Gulf of Mexico on August 2nd. Initially moving west-northwest, the storm slowed to an erratic drift on the 3rd that continued into the 4th. Unfavorable upper level winds caused Barry to weaken to a depression early on the 4th, with the cyclone regaining tropical storm strength later that day. Barry moved north and intensified on the 5th, making landfall at just under hurricane strength in the Florida panhandle between Panama City and Destin early on the 6th. The cyclone turned northwest and weakened to a depression over southwestern Alabama, then weakened further to a low over northern Mississippi. The remnants of Barry were last seen over southeastern Missouri on the 8th. Winds and rains associated with Barry caused minor damage in the Florida panhandle.

Chantal originated from a tropical wave, first becoming a depression on August 14th about 1500 miles east of the southern Windward islands. The depression moved westward so rapidly that it was unable to maintain a closed surface circulation and degenerated into an open wave on the 16th. It moved through the Lesser Antilles as a wave but did produce winds of tropical storm force at Martinique. The wave slowed down in the eastern Caribbean, and when a circulation redeveloped on the 17th the system became a tropical storm. Chantal moved westward through the Caribbean, briefly reaching an intensity of 70 m.p.h. on the 19th when it was south of Jamaica. Chantal weakened late on the 19th, but began to strengthen again as it approached Belize and the Yucatan Peninsula. Chantal made landfall near the Belize-Mexico border late on the 20th with winds of 70 m.p.h.. Chantal weakened to a depression and then dissipated over southeastern Mexico on the 22nd. There were no casualties associated with Chantal while it was a tropical cyclone, although two deaths were reported in Trinidad from lightning associated with the passage of the tropical wave through the Lesser Antilles. Damage in Belize is estimated at $10 to $15 million. There were no reports of significant damage in Mexico.

Dean formed from a tropical wave over the Virgin Islands on the 22nd, and a hurricane hunter plane indicated that its winds were near hurricane force later that day. However, the system soon encountered an unfavorable environment and it weakened to a tropical wave just north of Puerto Rico the next day. Dean's remnants moved mostly northward for the next several days, and interacted with a large nontropical trough off the U.S. East coast. On the 26th, thunderstorm activity began to organize near the remnant low pressure indicating that is was again acquiring tropical characteristics. Dean reattained tropical storm status late on the 26th while located about 400 miles north-northeast of Bermuda. After strengthening to just below hurricane force, Dean continued northeastward and became extratropical the following day. Winds to tropical storm force were reported in the U.S. Virgin Islands, and there was damage due to flooding in Puerto Rico.

September was a fairly active month for tropical cyclones. Four named storms formed, and all of them became hurricanes. However, none of these systems reached hurricane strength over the deep tropics south of 23 N latitude. In addition, there was one tropical depression.

2001 Hurricane Summary Table

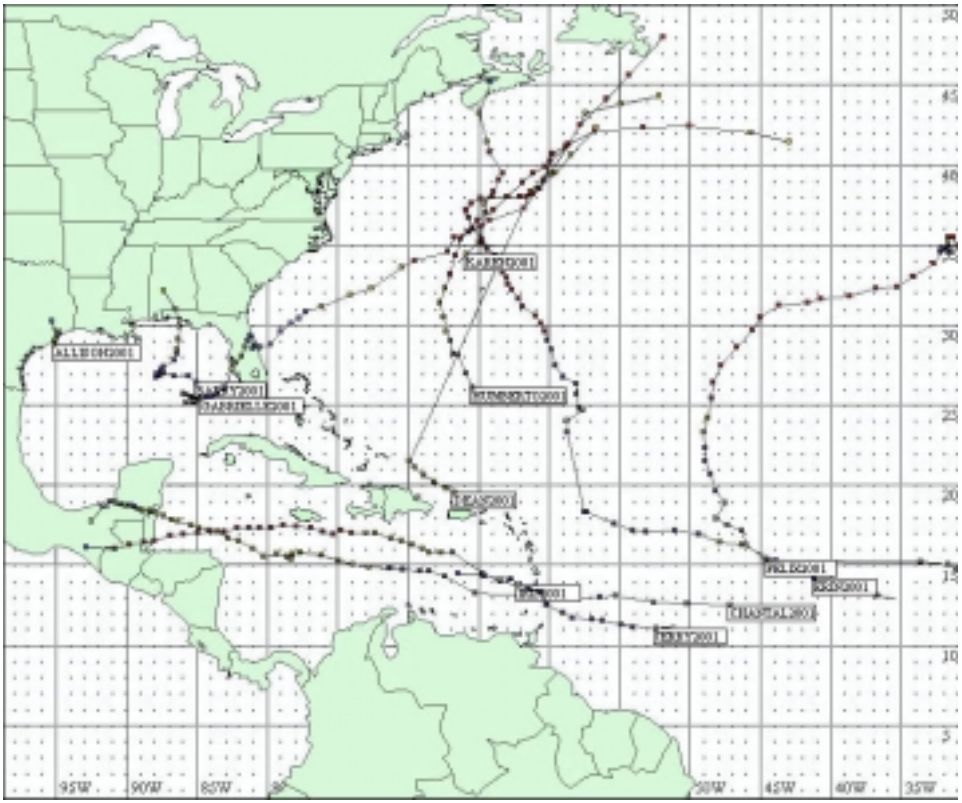
Name	Dates	Wind (mph)	Deaths	U.S. Damage
T.S. Allison	5-19 June	60	32*	Est 6 Billion
T.D. Two	11-12 July	30	0	0
T.S. Barry	2 - 6 Aug	70	0	30
T.S. Chantal	14 - 22 Aug	70	0	0
T.S. Dean	22 - 28 Aug	70	0	2
H. Erin	1-14 Sep	120	0	0
H. Gabrielle	11-18 Sep	80	2	Pending
T.D. Nine	19-20 Sep	35	0	0
H. Humberto	21-27 Sep	105	0	0

*There were an additional 11 fatalities indirectly associated with Allison.

Erin formed on the 1st over the eastern tropical Atlantic from a strong tropical wave that moved off the west coast of Africa on August 30th. The system soon became a tropical storm about 670 miles west-southwest of the Cape Verde Islands. Over the next few days, Erin moved west-northwestward. It strengthened to 60 m.p.h. on the 3rd, but soon succumbed to westerly shear. The weakening cyclone moved to about 280 miles east-northeast of the northern Leeward Islands on the 5th where it dissipated. However, a new center developed the following day about 475 miles north-northeast of the northern Leeward Islands within the same area of disturbed weather that was associated with Erin. The reborn tropical cyclone strengthened into a tropical storm about 635 miles southeast of Bermuda. Moving north-northwest, Erin became a hurricane on the 8th. The system passed about 100 miles east of Bermuda on the 9th. A little later that same day, it strengthened to its peak intensity of 120 m.p.h. - the first major hurricane of the season. Erin accelerated northeastward and passed very near Cape Race, Newfoundland on the 14th. It became extratropical shortly thereafter.

Felix developed on the 6th about 400 miles southwest of the Cape Verde Islands and moved westward for the next two days. Late on the 8th, the depression encountered strong upper-level vertical wind shear and weakened back to a tropical wave. While continuing on a westward track, the vertical shear relaxed enough to allow deep convection and a new center to redevelop early on the 10th about 1000 miles east of the Lesser Antilles. The depression tracked steadily west-northwestward over the open tropical Atlantic and slowly strengthened into tropical storm Felix on the 11th. During the next couple of days, Tropical Storm Felix turned to the northwest and then north. Late on the 12th, it intensified into the second hurricane of the season about 1500 miles southwest of the Azores Islands. While recurving to the northeast late on the 13th, Felix strengthened into the second major hurricane of the season about 1400 miles southwest of the Azores. A peak intensity of 115 m.p.h. was maintained until early on the 14th, after which slow weakening occurred. Felix gradually turned eastward on the 15th and continued this motion until it weakened back to a tropical storm on the 17th when it stalled about 350 miles southwest of the Azores. Increasing upper-level shear and cold upwelling caused Felix to weaken as it drifted slowly southward. It weakened to a depression early on the 18th and dissipated later that day about 400 miles southwest of the Azores Islands.

Gabrielle formed over the southeastern Gulf of Mexico on the 11th. After looping slowly for a few days, it moved inland across the west coast of Central Florida on the 14th as a 80 m.p.h. tropical storm. Over 10 inches of rain caused major river flooding in west-central Florida and there was coastal storm surge flooding along the Central Florida west coast of up to 5 feet above normal. Strong winds across Central Florida caused damage to roofs, mobile homes and trees. Gabrielle then moved northeastward over the western North Atlantic Ocean and strengthened to an 70 m.p.h. hurricane on the 18th while located about 250 miles north of Bermuda. It became an extratropical storm on the 19th and caused up to 6 inches of rain on the Avalon Peninsula of Newfoundland. Two drowning deaths are attributed to Gabrielle.



2001 Atlantic Basin Tropical Cyclones (thru 09/30/01)

Tropical Depression Nine formed over the southwestern Caribbean Sea on the 19th. It moved inland over northeastern Nicaragua almost immediately and dissipated over land early the next day. The tropical wave associated with the depression continued westward into the eastern Pacific and contributed to the development of Hurricane Juliette.

Humberto formed on the 21st about 470 miles north-northeast of San Juan, Puerto Rico. It moved northwestward for about a day and strengthened into a tropical storm on the 22nd. Humberto gradually turned toward the north, and while passing about 160 miles west of Bermuda, it strengthened into a hurricane. The hurricane's winds soon increased to near 100 m.p.h.. Humberto turned toward the northeast and weakened but still maintained hurricane strength for a couple of days. Then, remarkably, the cyclone re-intensified over the North Atlantic and its winds reached a peak near 105 m.p.h. on the 26th while Humberto was centered about 200 miles south-southeast of Sable Island, Nova Scotia. The hurricane turned eastward and weakened to a tropical storm the following day. It lost tropical characteristics on the 27th and the remnant circulation was eventually absorbed by a large extratropical low pressure system over the far North Atlantic.

SKYWARN

What is Skywarn? Skywarn is a program sponsored by your National Weather Service Office in conjunction with your local Emergency Management Organizations. It is a group of trained volunteers that watch the skies during severe weather and relay reports back to the local Emergency Management Official, the local law enforcement agency, and/or the National Weather Service. These volunteers provide valuable information to their local community and to the National Weather Service which helps improve the warning program, thus possibly saving lives and property in the community.

The Skywarn program helps individuals identify the varying types of thunderstorms and what type of severe weather to expect from each type of thunderstorm. But of more importance, you will learn what valuable information should be passed on to the National Weather Service and/or your Emergency Management Office and also what method to use to get that information relayed. You will learn about the NWS operations and how we disseminate information to your community.

The Houston/Galveston National Weather Service will be conducting Skywarn classes during the months of January, February, and March 2002. Training sessions last 2-3 hours and can be scheduled during the day, in the evening or even on Saturday.

If your group or community is interested in sponsoring a Skywarn Program in early 2002, please make your reservations now. Call Gene Hafele at 281-337-5074 x223.

Houston AMS

The Houston Local Chapter of the American Meteorological Society is looking forward to an exciting year for our members. Our chapter is dedicated to the development and dissemination of the knowledge of meteorology as well as the space and earth sciences. Each year we try to appeal to our broad member community with wide ranging topics from weather impacts on sailboat racing such as the America's Cup, how weather shaped important historical events, discussions on lightning safety and global warming, to weather photography taken from the Space Shuttle. There are also several activities that have become annual events for our chapter such as judging the Houston Regional Science Fair and traveling to Texas A&M to present a career fair to the members of the TAMSCAMS local chapter. Last year we held a 1900 Galveston Storm commemoration dinner which was also a successful fund raiser for our chapter, allowing us to provide more generous prizes to our science fair winners and their schools. We hope to add some fun into this year with a fundraiser bowling tournament on Groundhog Day. We are also investigating adopting a school where we can develop a longer lasting relationship with the students.

We had a great start to the 2001-2002 year with our September meeting. The topic was none other than Tropical Storm Allison. The Houston/Galveston NWS office was very helpful in arranging the meeting in conjunction with the Texas Gulf Coast Emergency Management Association. We held an informative panel discussion including Dave Schwertz, the HGX NWS service hydrologist, Frank Gutierrez, the operations manager of the Harris County Office of Emergency Management, Randy Burow, the health and safety group leader for Shell Deer Park, Mike Iscovitz, meteorologist for FOX 26 and David Tillman, meteorologist for ABC's KTRK-TV (who were both on camera on June 8th and 9th). Our October speaker was Dr. Marc Levitan from the LSU Hurricane Center. He discussed some innovative ideas to address the problems associated with a direct hurricane strike on New Orleans, which has the potential of being one of the nation's major catastrophes. In November, the local National Public Radio station, KUHF, will host a lunch meeting at their studio. Several of our members do the weather broadcast for KUHF.

Check out our web page at **www.houstonams.org** whether you are interested in joining our chapter or just want to see what events we have planned. Whether you are working in the field of meteorology or you are just a weather buff, everyone is welcome!

Doris Rotzoll
President 2001-2002

Is Your Community Or County Storm Ready?

By Gene Hafele

Many laws and regulations help local emergency managers deal with hazardous material spills, search and rescue operations, and medical crises but there are few guidelines dealing with hazardous weather operations.

Recognizing this need, the National Weather Service designed StormReady to help cities, counties, and towns implement procedures to reduce the potential for disastrous, weather-related consequences. Ninety percent of all presidentially declared disasters are weather related. Through the StormReady program, NOAA's National Weather Service gives communities the skills and education needed to survive severe weather - before and during the event. StormReady helps community leaders and emergency managers strengthen their local hazardous weather operations.

StormReady Does Not Mean Storm Proof!
StormReady communities are better prepared to save lives from the onslaught of severe weather through better planning, education and awareness. Communities have fewer fatalities and property damage if they plan before dangerous weather arrives. No community is storm proof, but StormReady can help communities save lives.

How Can My Community Become StormReady?
The entire community - from the mayor and the emergency managers, to business leaders and civic groups - can take the lead on becoming StormReady. The Houston/Galveston National Weather Service forecast office will work with communities to complete an application and review process. To be recognized as StormReady, a community must:

- Establish a 24-hour warning point and emergency operations center
- Have more than one way to receive severe weather warnings and forecasts and to alert the public
- Create a system that monitors local weather conditions
- Promote the importance of public readiness through community seminars
- Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.

How Can I Learn More About StormReady?
For more information about StormReady, visit the StormReady Web site at: http://www.nws.noaa.gov/stormready/

or contact Gene Hafele, Warning Coordination Meteorologist
Phone: 281-337-5074 x223 Email: gene.hafele@noaa.gov.

StormReady

NOAA WEATHER RADIO WILL SOON GET A NEW VOICE

By Brian Kyle

NOAA Weather Radio, the nation's automated radio weather warning system, will soon have a new voice. The National Weather Service evaluated five voices and reviewed 19,000 internet survey comments from the public in the effort to find the new voices. These voices, one male and one female, are more understandable and human-sounding than the current voice.

NOAA has awarded Siemens Information and Communication Network of Boca Raton, Fla., a $633,615 contract for the voice improvement. The National Weather Service will begin implementation of the new voice's text-to-speech software program early in 2002, following successful testing and integration within the NOAA Weather Radio system.

NOAA Weather Radio

The National Weather Service first used a computer synthesized voice technology as part of a console replacement system in 1997. Automating NOAA Weather Radio enabled the National Weather Service to send out multiple independent warnings over multiple transmitters simultaneously, allowing speedier delivery of severe weather warnings and more lead-time for the public.

Advances in artificial speech technology now make it possible for us to provide a service that is more understandable to the public. Siemens will team with SpeechWorks International of Boston, to provide software that combines phonetic sounds with natural language modeling.

NOAA Weather Radio, sometimes referred to as the voice of the National Weather Service, is a portable device that enables the public to receive continuous weather broadcasts and hazard alerts directly from local weather forecast offices. Transmitting from a network of 583 stations nationwide, the NOAA Weather Radio can be heard by more than 85 percent of the U.S. population.

To listen to the new voices compared to the current voice, visit the web at:

http://205.156.54.206/nwr/newvoice.htm

New Wind Chill Index

By Paul Lewis

The National Weather Service and the Meteorological Services of Canada will begin using a new wind chill temperature index this upcoming 2001-2002 winter season. The reason for the change is to improve upon the current wind chill index. The new formula takes into account the latest advances in the sciences of meteorology and engineering, in technology, and in computer modeling. It also provides a more accurate, understandable, and useful tool for calculating the dangers arising from the combination of winter winds and freezing temperatures.

The wind chill is an index that measures what the outside temperature feels like to people. It is based on the rate of heat loss from exposed skin caused by the combined effects of wind and cold. As the wind increases, heat is carried away from the body at an accelerated rate. This in turn drives down the skin temperature and eventually the internal body temperature.

Very cold wind chill index temperatures can lead to frostbite or hypothermia. Frostbite occurs when body tissue freezes and tissue damage occurs. Hypothermia occurs when the body temperature falls below ninety-five degrees Fahrenheit. Medical attention is needed immediately for frostbite or hypothermia.

The New Wind Chill Temperature Index Chart

The biggest difference between the old and new wind chill temperature indices is that the new indices will not be as cold as the old ones. The old wind chill index was based on experiments conducted between 1938 and 1945 in the Antarctic by Paul Siple and Charles Passel—they compared the length of time cylinders of water took to freeze during different combinations of wind and temperature. The new wind chill index is based on a human face model and uses the wind speed measured at an average height of five feet. It also incorporates modern heat transfer theory, lowers the calm wind speed from four to three miles an hour, uses a consistent standard for skin tissue resistance, and assumes no impact from the sun. Adjustments for the impact of the sun and a variety of sky conditions will be added to the new wind chill index calculation model in 2002.

New Wind Chill Chart
Wind (mph)

Temperature (F)	Calm	5	10	15	20	25	30	35	40	45	50	55	60
40	36	34	32	30	29	28	28	27	26	26	25	25	
35	31	27	25	24	23	22	21	20	19	19	18	17	
30	25	21	19	17	16	15	14	13	12	12	11	10	
25	19	15	13	11	9	8	7	6	5	4	4	3	
20	13	9	6	4	3	1	0	-1	-2	-3	-3	-4	
15	7	3	0	-2	-4	-5	-7	-8	-9	-10	-11	-11	
10	1	-4	-7	-9	-11	-12	-14	-15	-16	-17	-18	-19	
5	-5	-10	-13	-15	-17	-19	-21	-22	-23	-24	-25	-26	
0	-11	-16	-19	-22	-24	-26	-27	-29	-30	-31	-32	-33	
-5	-16	-22	-26	-29	-31	-33	-34	-36	-37	-38	-39	-40	
-10	-22	-28	-32	-35	-37	-39	-41	-43	-44	-45	-46	-48	
-15	-28	-35	-39	-42	-44	-46	-48	-50	-51	-52	-54	-55	
-20	-34	-41	-45	-48	-51	-53	-55	-57	-58	-60	-61	-62	
-25	-40	-47	-51	-55	-58	-60	-62	-64	-65	-67	-68	-69	
-30	-46	-53	-58	-61	-64	-67	-69	-71	-71	-74	-75	-76	
-35	-52	-59	-64	-68	-71	-73	-76	-78	-79	-81	-82	-84	
-40	-57	-66	-71	-75	-78	-80	-82	-84	-86	-88	-89	-91	
-45	-63	-72	-77	-81	-84	-87	-89	-91	-93	-95	-97	-98	

The new wind chill index chart highlights areas in blue that indicate frostbite is possible in fifteen minutes or less. The new wind chill formula is as follows:

Wind Chill (°F) = 35.74 + 0.6215T - 35.75(V0.16) + 0.4275T(V0.16)
Where V = the wind speed value in mph and T = the temperature in °F

Additional information can also be found at: **http://www.nws.noaa.gov/om/windchill**

WINTER SAFETY RULES

Although rare in southeast Texas, winter weather does occasionally occur. January is the month when snow, sleet, or freezing rain is mostly likely to be observed; yet, winter weather conditions can occur at anytime during the winter and early spring months. Also, people traveling into other parts of the country will likely encounter winter weather harsher than what occurs along the upper Texas Gulf coast.

The leading cause of death during winter storms is transportation accidents. Hypothermia and frost bite are other dangers from very cold winter temperatures. The Houston/Galveston National Weather Service Office would like to review some important safety information to help you and your family to prepare for winter weather.

- **Limit travel during periods of winter weather. Bridges, overpasses, and elevated roadways are especially vulnerable to ice and snow conditions given the lack of ground insulation under these structures.**
- **Before the onset of winter precipitation, check your supplies and, if necessary, stock up on groceries, gasoline, and other necessities.**
- **Have flash lights and extra batteries on-hand in case of possible power outages.**
- **Wear layers of protective clothing if you are venturing outside—wind makes the air feel much colder.**
- **Be alert to the signs of hypothermia. These include uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness, and apparent exhaustion.**
- **If hypothermia signs occur, seek immediate medical attention. If medical attention is not available, slowly warm the person's body core first by getting them into dry clothing and wrapping them in a warm blanket covering the head and neck. Giving warm broth and warm food is better than giving beverages or food that is hot. Alcohol should not taken.**
- **Be alert to the signs of frostbite. The most susceptible parts of the body are the extremities such as fingers, toes, ear lobes, or the tip of the nose. If frostbite occurs, seek immediate medical attention. If it is not available, the affected areas should be warmed slowly.**

Concerning travel, make sure your vehicle is prepared for the onset of winter weather. Have a mechanic check the coolant system and fluid levels, the electrical system and lights, and the heater and defroster. Also, ensure good winter tires are installed. Keep a windshield scraper and small broom available for ice and snow removal. During periods of winter weather it is a good idea to maintain at least a half tank of gas. If you must travel, allow extra time to reach your destination and leave plenty of space between you and other vehicles. Ice- or snow-covered roadways are especially treacherous and stopping distances are greatly increased.

In the event of a winter storm, it is a good idea to carry a winter storm survival kit in your vehicle. Suggested items for the kit for southeast Texas residents include:

- **Flashlights with extra batteries**
- **A first aid kit with a pocket knife**
- **Necessary medications**
- **Blankets and an extra set of winter clothes and rain gear**
- **Matches and a candle for heat**
- **A brightly colored cloth to use as a flag**
- **A supply of food and water**
- **A shovel and a small bag of sand for generating traction under wheels**
- **Small tools and booster cables.**

Remember, even though harsh winter weather is rare in southeast Texas, it still occasionally occurs. It is very important to stay informed about the possibility of winter weather in your area. This can be done by tuning into NOAA weather radio, commercial radio, or your local television station. If you would like more winter weather information, you can contact the Houston/Galveston National Weather Service Office.

Houston EMWIN Wins the Walter J. Bennett Public Service Award from the National Weather Association

By Gene Hafele

On October 17 at the annual meeting of the National Weather Association (NWA), the Houston EMWIN (Emergency Managers Weather Information Network) team was awarded the Walter J. Bennett Public Service Award. This award is presented to an individual or organization directly assisting the meteorological community in providing weather-related information to the public. Individuals and organizations in the meteorological profession are ineligible for this award.

The Houston EMWIN team consists of three employees of the Harris County Appraisal District who have combined their expertise and efforts to establish the nation's premier EMWIN VHF rebroadcast site. The team is led by Jim Robinson who is the Chief Appraiser of the Harris County Appraisal District (HCAD). Mike Fliefel, Director of Systems Operations at HCAD and Robert Timmons, Supervisor of GIS mapping at HCAD, provide the technical and operational support for the Houston EMWIN system.

Currently, the Houston EMWIN team downloads the EMWIN data stream via satellite and rebroadcast the data stream on 150.435 MHZ at 1200 baud and 163.325 MHZ at 9600 baud from antennas located atop the Exxon USA building in downtown Houston. Exxon USA provides the space atop their building for only $1.00 per year. In addition to the rebroadcast on VHF, Houston EMWIN has established a home page for weather in Southeast Texas (emwin.hcad.org) that is fed by data received from the EMWIN data stream. Houston EMWIN also provides email notification of weather warnings and watches issued by the Houston/Galveston WFO to any Emergency Management Office that requests this service. This email is again fed by data provided from the EMWIN data stream.

In order to make all of the above services work smoothly and efficiently, the Houston EMWIN team uses four personal computers to run the system. Mike Fliefel has been responsible for setting up the computer network and maintaining the system to keep it on line. The four computers are networked together and each plays an integral part in making the Houston EMWIN system work. Computer one runs the lightning software developed by Boltek and displays the lightning data on a locally developed mapping system. Computer two serves as a scheduler and retrieves products from other sources and inserts the products into the EMWIN rebroadcast data stream at predetermined times. The third computer is the web server that runs the byte-blaster software, distributes the email to emergency management and also provides products to the EMWIN Houston homepage. The fourth computer is the broadcast server which actually provides the products that are sent on the Houston EMWIN rebroadcast. Robert Timmons provides operational support and graphical support to the system by making sure the system stays online and provides continuous data to the local area.

In addition to providing all of the above features for the Houston area, the Houston EMWIN team has also made many contributions to the national EMWIN program. In November 1998, the Houston EMWIN team hosted the first National EMWIN conference. Over 100 participants from across the country attended this conference where ideas and accomplishments were shared among the EMWIN users, broadcasters and vendors. They provided the space for the conference free of charge and refreshments were provided by local industry. Jim Robinson has actively participated in several conferences during the two last years promoting the EMWIN system. These conferences included the Texas Emergency Management Conference in 1999 and 2000, the National AMS Conference held in Dallas in January 1999 and most recently at the second EMWIN National Conference held in Fort Collins, Colorado. Jim also hosts an EMWIN Broadcasters list that is an email discussion of technical issues other broadcasters from across the country are having. During the first five months of 2000, Houston EMWIN was the test site for using the new 9600 baud transmission using NWS owned frequencies. These tests have proven to be successful and now the new frequencies will be available throughout the country.

On the local level, Houston EMWIN continues to promote the use of the Houston EMWIN rebroadcast not only for the emergency management community but also for the school districts in the region. Houston EMWIN has hosted several training sessions (again

free of charge) to train users of the system how to use the software to make it work for them.

EMWIN is an initiative of the National Weather Service on the national level to provide weather information to the emergency management community in a timely and cost effective method. The Houston EMWIN team has helped not only the Houston area but many other areas of the country by creating and sharing the premiere EMWIN rebroadcast in the nation. Many of the hours these three individuals provide to support the EMWIN system is volunteer time and they receive no compensation for their time and effort. If the EMWIN system is successful in the years ahead, I believe we can give much of the credit of its success to the Houston EMWIN team of Jim Robinson, Mike Fliefel and Robert Timmons.

From left to right:
Bill Read, Jim Robinson, Mike Fliefel and Robert Timmons

Staff Spotlight...Debbie Helvy

Name: **Debbie Helvy**
Office: **NWSO Houston/Galveston**
Position: **Hydro-Meteorological Technician (HMT)**

NWS BACKGROUND
1980-1986..... Meteorological Technician, NWSO Longview, TX
1986-1994..... Meteorological Technician, NWSO Galveston, TX
1994 to present..... HydroMeteorological Technician, NWSO Houston/Galveston, TX

HIGHLIGHTS/DUTIES/OTHER TIDBITS

- **Primary duties include monitoring NOAA Weather Radio, assisting with public phone calls and quality controlling climate data. Other daily duties include helping the meteorologists with the public, aviation and marine forecasts.**
- **Also worked as Radar Technician (in Galveston) and on radar and upper air balloons (in Longview)**
- **Favorite movie: "Titanic"**
- **Latest New Hobby: water gardening**

What were your most memorable weather events?
Having the eye of Typhoon Kim cross the island while in the Philippines (!977) and when 1 inch of snow fell on Galveston Island (1991).

Beach or Mountain?	**Both**
Sunrise or Sunset?	**Sunset**
Cats or Dogs?	**Cats**
Dine in or Eat out?	**Eat out**
Cookies or Ice Cream?	**Ice cream (preferably handcranked!)**

Storm Signals Questionnaire

We are attempting to improve the quality of "Storm Signals" and make it available to more of our users. In addition, we are trying to cut the cost of producing and mailing the publication to our readers. It is our desire to convert the majority of the distribution from mailing it to allowing you to download the publication from the internet. We would notify you via email that the latest publication is available and you would then go and download the latest issue. (You can now download our special issue on Tropical Storm Allison at www.srh.noaa.gov/hgx/stormsignals) At the same time, we would like to improve the content of the publication to have information that you find useful. If you would take time to answer the following questionnaire and return it to the Houston/Galveston National Weather Service Office, we would appreciate it.

IF WE DO NOT HEAR FROM YOU EITHER THROUGH THIS LETTER OR THROUGH YOUR EMAIL REPLY, YOU WILL BE DROPPED FROM OUR MAILING LIST.

1. Would you be willing to download "Storm Signals" from the Houston/Galveston National Weather Service homepage?

   _____Check here if you want to receive "Storm Signals" from the internet
   _____Check here if you still want to receive "Storm Signals" by regular mail

Your information...

Name _____

Street Address _____

City, State, Zip _____

Email Address _____

2. What features of "Storm Signals" do you enjoy?

3. What suggestions for improvement do you have for "Storm Signals" publication?
   (Different kinds of articles? Too long? Too short?)

Please return this questionnaire to:

Houston/Galveston NWS
1620 Gill Road
Dickinson, TX 77539

or email it to SR-HGX.NWS@noaa.gov.