



# Storm Signals

Houston/Galveston National Weather Service Office

Volume 82 Spring 2010



**2010 HURRICANE WORKSHOP**  
**READY OR NOT**

**HOUSTON / GALVESTON NATIONAL WEATHER SERVICE**  
**2010 HURRICANE WORKSHOP**  
Saturday, June 19, 10 a.m. – 3 p.m.  
George R. Brown Convention Center  
Open to the Public

The 2010 Houston/Galveston Hurricane Workshop, the largest free public event of its kind, will take place on June 19<sup>th</sup> from 10 AM until 3 PM at the George R. Brown Convention Center. The theme of the 2010 workshop will be “Ready or Not.”

Focused on providing families with the information they need as hurricane season begins, the event has grown each year and will likely draw more than 1,200 attendees in 2010. During the workshop, Bill Read, the Director of the National Hurricane Center, will give an update on recent improvements in hurricane forecasting and what the 2010 Hurricane Season might have in store for Texas. Also, local Emergency Management experts will be on hand to explain the latest plans for hurricane preparedness along the upper Texas coast.

The event will also feature an interactive format suitable for the entire family, including the Kids Zone Activity Center, guest appearances by the Energizer Bunny and Louie the Lightning Bug, free giveaways, a “Hurricane tracker” scavenger hunt and an electric safety demonstration presented by CenterPoint Energy. Kids will be able to learn about tropical cyclones and how to prepare for an approaching hurricane through a fun, educational experience that teaches them to respect, but not fear, these strong storms.

There will also be at least thirty vendors on hand displaying items related to hurricane preparedness. Many items will also be given away on a first-come, first-served basis, such as hurricane tracking charts, tip sheets, a comprehensive booklet on hurricanes from the National Weather Service, as well as other vendor-provided items.

The 2010 Hurricane Workshop is once again being sponsored by CenterPoint Energy, the City of Houston and the National Weather Service. Harris County Office of Emergency Management, Interfaith Ministries, and the Weather Museum are also active participants in making this a successful educational event. The workshop is free and open to the public.




Please visit the 2010 Hurricane Workshop website for updates on the event program and registration information at...

[hurricaneworkshop.com](http://hurricaneworkshop.com)



# Hurricane Preparedness Week is May 23-29, 2010

National Hurricane Preparedness Week  
May 23-29, 2010

HISTORY	HURRICANE HAZARDS		FORECAST	PREPARE	ACT	
						
<b>S</b>	<b>M</b>	<b>T</b>	<b>W</b>	<b>Th</b>	<b>F</b>	<b>S</b>
MAY 23	MAY 24	MAY 25	MAY 26	MAY 27	MAY 28	MAY 29
Hurricane Basics Hurricane History	Storm Surge Marine Safety	High Winds Tornadoes	Inland Flooding	Forecast Process	Disaster Prevention	National Day of Family Preparedness

[www.hurricanes.gov/prepare](http://www.hurricanes.gov/prepare)



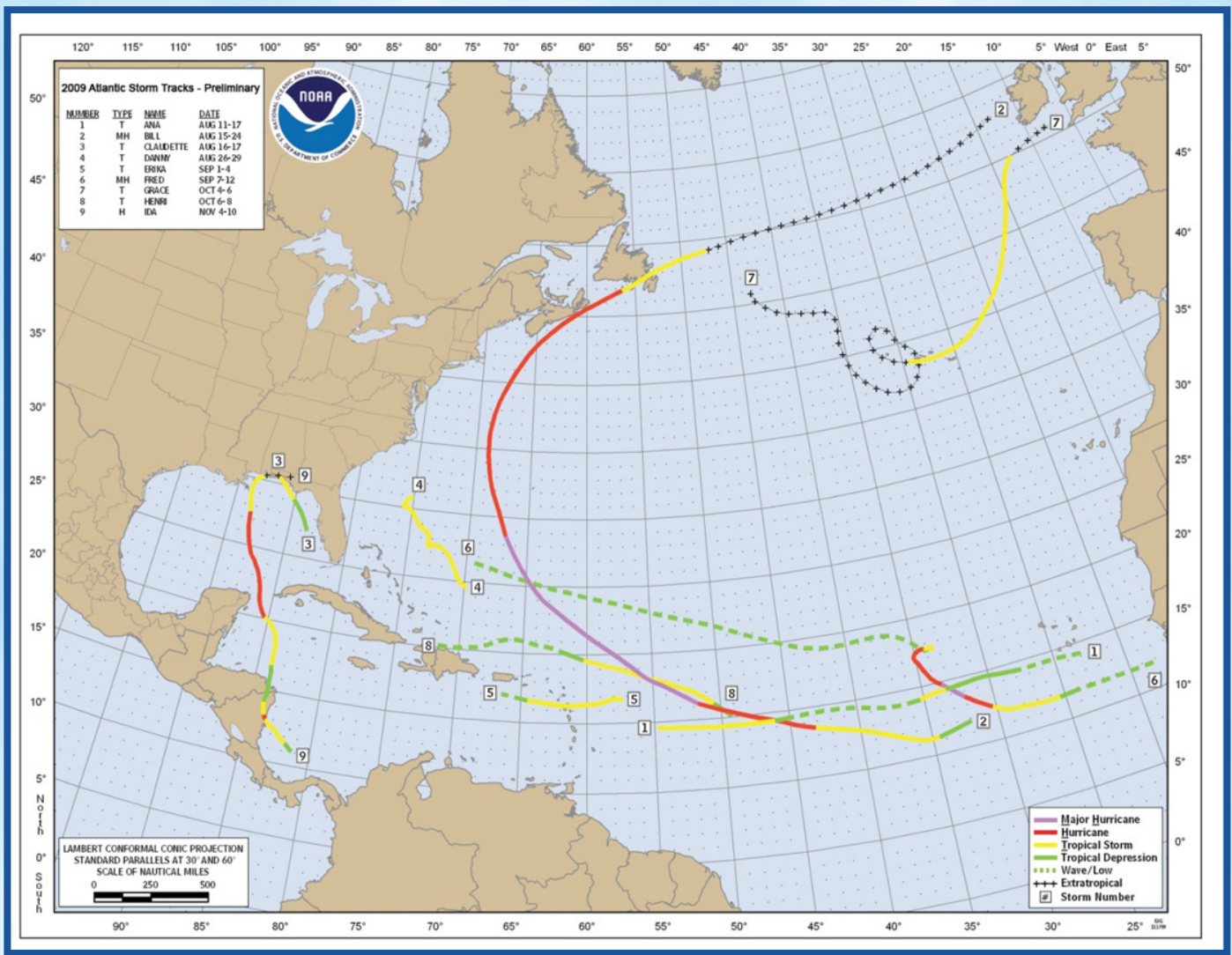
**FEMA**

History teaches that a lack of hurricane awareness and preparation are common threads among all major hurricane disasters. By knowing your vulnerability and what actions you should take, you can reduce the effects of a hurricane disaster. Hurricane Preparedness Week during 2010 will be held May 23rd through May 29th.

The goal of the Hurricane Preparedness Web site ([www.hurricanes.gov/prepare](http://www.hurricanes.gov/prepare)) is to inform the public about the hurricane hazards and provide knowledge which can be used to take action. This information can be used to save lives at work, home, while on the road, or on the water. Look carefully at the safety actions associated with each type of hurricane hazard (storm surge, high winds, tornadoes and flooding) and prepare your family disaster plan accordingly. The 2010 Hurricane Season starts on June 1<sup>st</sup>.

# The 2009 Atlantic Hurricane Season and Looking Ahead to 2010

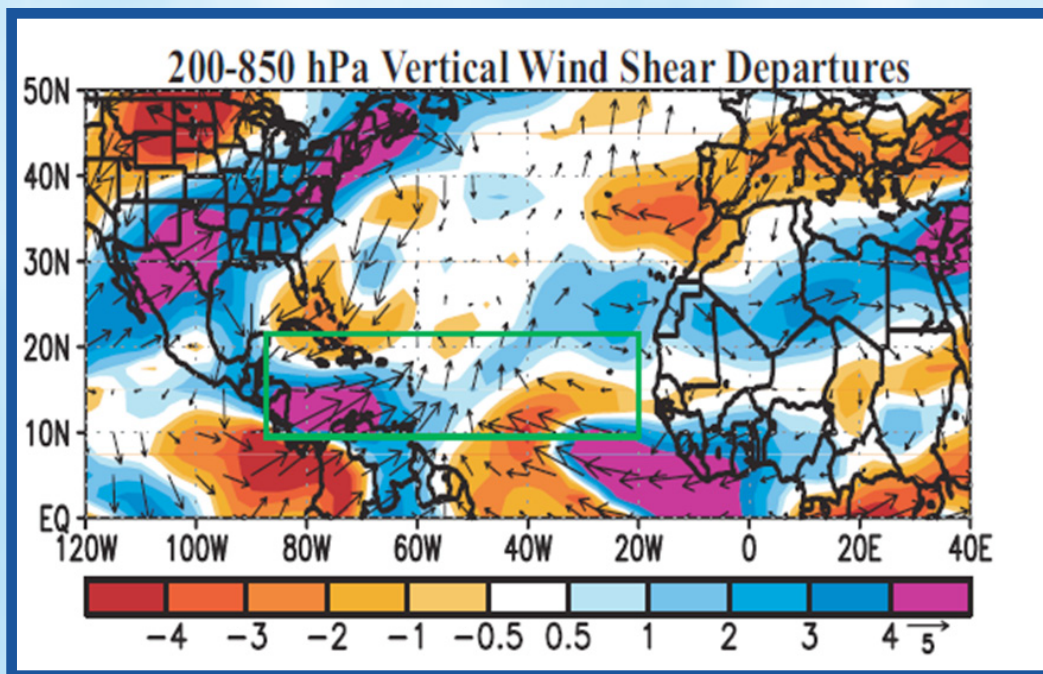
After experiencing six consecutive tropical cyclone landfalls in 2008 (Dolly through Ike), the United States received a break from Mother Nature during the 2009 season, as only one tropical storm made landfall (Claudette – Florida Panhandle). In fact, the 2009 season was the least active season since the 1997 season. The ACE (Accumulated Cyclone Energy) index totaled only 60% of the median, and the below normal season produced only 9 named storms, 3 hurricanes, and 2 major hurricanes (Figure 1). Not only was the season inactive, but it got off to a very slow start. Tropical storm Ana, the season's first named storm, formed on August 12<sup>th</sup>, which is the latest start to a season since August 1983 (Alicia). The primary reason the seasonal activity was below normal, especially when compared to recent history, was due to the development of a strong El Niño during the summer and fall of 2009.



**Figure 1** - Tracks of Atlantic named storms during 2009. Shading corresponds to strength of maximum sustained surface wind speeds, with green indicating tropical depression intensity (< 39 mph), yellow indicating tropical storm (TS) intensity (39-73 mph), red indicating hurricane (H, cat. 1-2) intensity, and magenta indicating major hurricane (MH, cat. 3-5) intensity.

## El Niño (2009-2010)

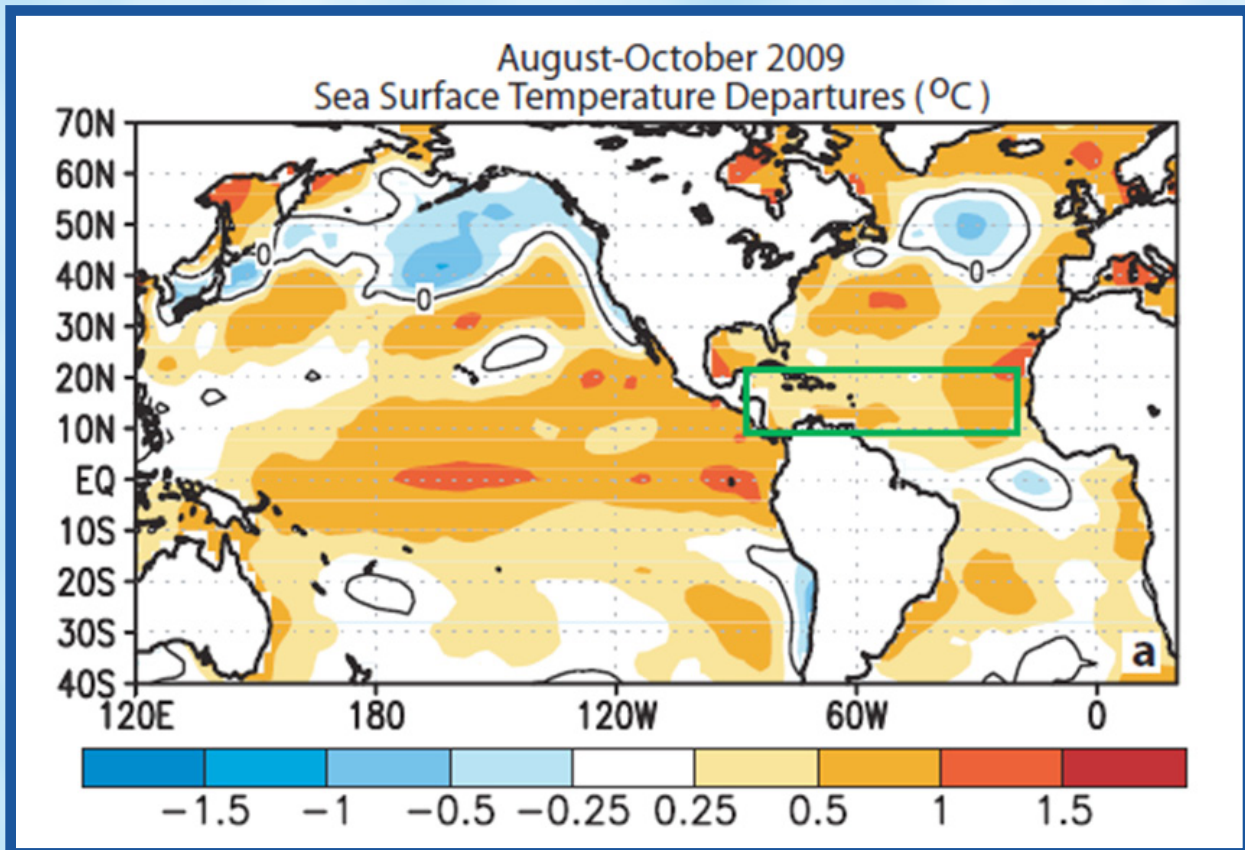
During the spring of 2009, water temperatures across the equatorial Pacific began to warm with climate models advertising different magnitudes of continued warming. By late spring 2009, it became apparent that a significant warm event (El Niño) was likely; therefore, an El Niño Watch was issued by the Climate Prediction Center in early June 2009, with an El Niño Advisory issued in early July. Although El Niño is an oceanic event, the atmosphere and ocean are coupled (El Niño Southern Oscillation - ENSO); therefore, the warmer water temperatures over the Pacific coincide with increased winds aloft over the main development region (MDR) of the Tropical Atlantic. These stronger winds increase wind shear values which inhibit tropical cyclone development. During the climatologically most active portion of the Atlantic basin season (August-October) most of the MDR experienced deep layer, above normal wind shear (Figure 2). It is the magnitude and persistence of this wind shear that resulted in fewer storms, and also shorter lived and weaker storms, as compared to most seasons since our overall longer term, active period began in 1995. In fact, the effect of this wind shear was significant enough to overcome the *favorable for development* warmer than normal sea surface temperatures that were present across most of the Tropical Atlantic (Figure 3).



**Figure 2** - Aug-Oct 2009: Departures from normal of 200-850 hPa vertical wind shear magnitude (m s<sup>-1</sup>) and vectors. Green box denotes the MDR. Vector scale is to right of color bar. Departures are with respect to the 1971-2000 period monthly means.

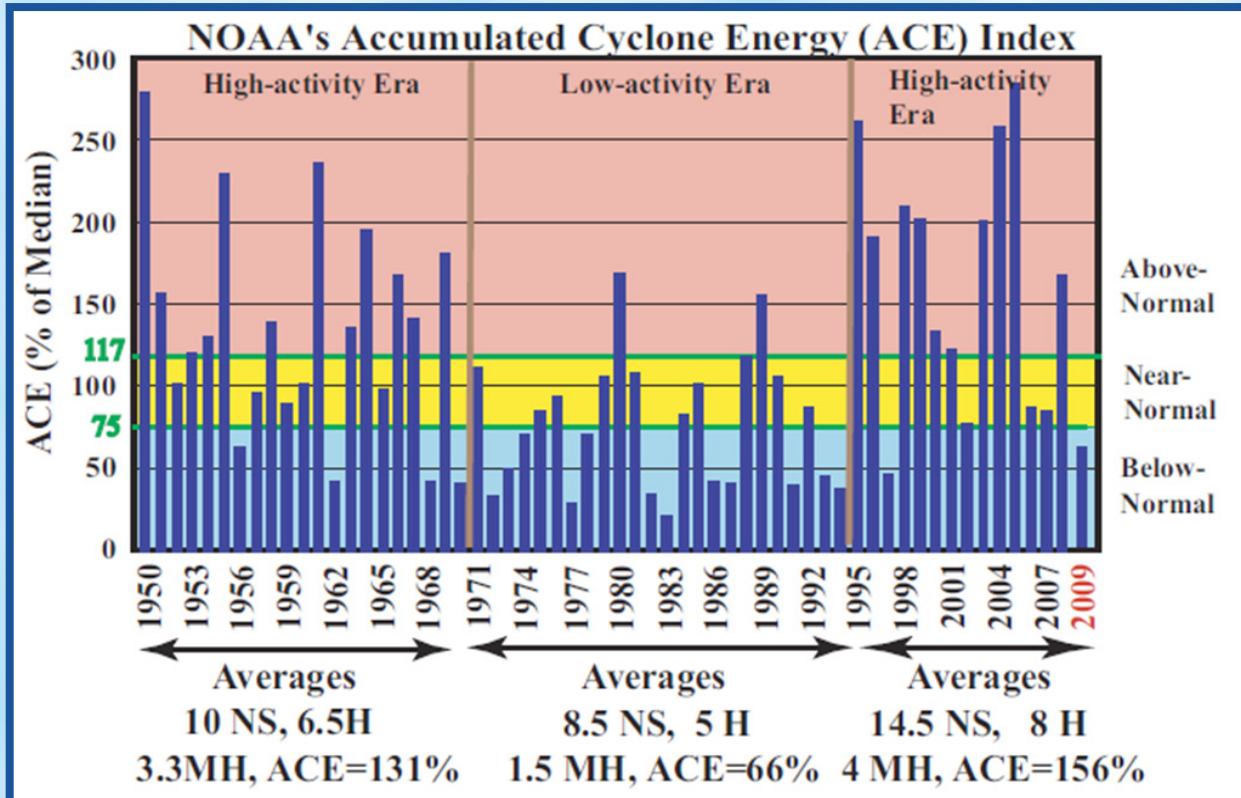
## Seasonal Forecasts and Looking Ahead to 2010

NOAA's (National Oceanic and Atmospheric Administration) seasonal activity forecast is issued annually in late May and updated in August. The lead scientist for NOAA is Dr. Bell from the Climate Prediction Center. He also has a team of researchers which include members of the National Hurricane Center and the Hurricane Research Division. Although NOAA began issuing seasonal forecasts in 1999, ranges of named storms and hurricanes, and probabilities did not appear in the outlook until 2001. In addition to these ranges, NOAA now uses the ACE index to categorize North Atlantic hurricane seasons as being above normal, near normal, or below normal. This index refers to the collective intensity and duration of Atlantic named storms and hurricanes occurring during a given season. Therefore, it is a measure of total seasonal activity and it is computed as the sum of the squares of the maximum sustained surface wind speed (knots) measured every six hours for all named systems while they are at least tropical storm strength.



**Figure 3** - Sea surface temperature (SST) departures (°C) during Aug-Oct 2009. Main Development Region (MDR), denoted by green box. Departures are with respect to the 1971-2000 period monthly means.

The fundamental variable that NOAA's forecast has been predicated on since its inception, is the continuation of the positive phase of the Multi-decadal Signal. In the current warm (positive) phase, which began in 1995, this pattern has favored above normal Atlantic basin seasons. In fact, all of the Atlantic basin hurricane seasons since 1995 have been above normal, with the exception of four moderate to strong El Niño influenced years (1997, 2002, 2006, and 2009). See Figure 4 for historical seasonal ACE indices. This contrasts sharply with the 1971-1994 period of generally below-normal activity when the Multi-decadal Signal was in a cool (negative) phase (Goldenberg et al., Science, 2001). Over the North and Tropical Atlantic, the key aspects of the positive phase of the Multi-decadal Signal which are likely to persist include 1) warmer SSTs, lower surface air pressure, and increased moisture across the tropical Atlantic, 2) an amplified ridge at upper levels across the central and eastern subtropical North Atlantic, 3) reduced vertical wind shear in the deep tropics over the central North Atlantic, and 4) weaker easterly winds in the middle and lower atmosphere, resulting in a configuration of the African easterly jet that favors hurricane development from tropical waves moving westward from the African coast. This signal will be the main factor guiding seasonal outlooks for the near future as it does not switch phases on the time scales of years, but rather decades. The second factor, which can change on the time scale of months, is the state of ENSO. As noted above, the only seasons (since 1995) that have experienced below normal activity coincided with moderate to strong El Niño events (warm phase of ENSO). When the ENSO state was one of Neutral or La Nina conditions, near and during the peak of the hurricane season, an above normal season has resulted.



**Figure 4** - NOAA's Accumulated Cyclone Energy (ACE) index expressed as percent of the 1950-2000 median value ( $87.5 \times 10^4$  kt<sup>2</sup>). ACE is a wind energy index that measures the combined strength and duration of the named storms. ACE is calculated by summing the squares of the 6-hourly maximum sustained wind speed (measured in knots) for all periods while the named storm has at least tropical storm strength. Pink, yellow, and blue shadings correspond to NOAA's classifications for above-, near- and below-normal seasons, respectively.

Observations from the equatorial Pacific indicate that El Niño is weakening (spring 2010). Therefore, the rate at which the El Niño weakens during the first half of the 2010 hurricane season will be a very important factor concerning tropical cyclone activity across the Atlantic basin. Global climate models indicate that a transition to at least Neutral conditions is likely during the summer of 2010, with a chance that La Nina conditions could develop by the late summer or fall months of 2010. Either condition would support an active season, especially during the peak months of the season (August-October). It should be noted that regardless of the degree of activity expected, it is imperative that all potentially impacted residents prepare as if they could be impacted by a hurricane every year. Even though the 1983 and 1992 hurricane seasons experienced significantly below normal activity, both of these seasons saw landfalling hurricanes along the Gulf coast (Alicia 1983 and Andrew 1992).

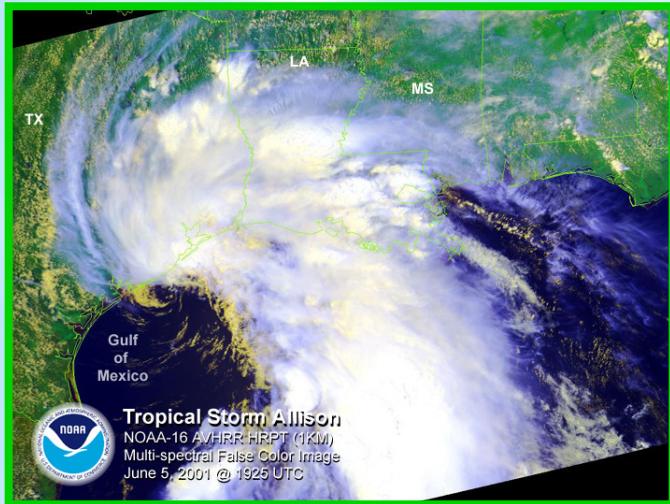
References:

Bell, G., et al., 2009: The 2009 North Atlantic Hurricane Season: A Climate Perspective. [www.cpc.noaa.gov/products/expert\\_assessment/hurrsummary\\_2009.pdf](http://www.cpc.noaa.gov/products/expert_assessment/hurrsummary_2009.pdf)

Goldenberg, S. B., C. W. Landsea, A. M. Mestas-Nuñez, and W. M. Gray, 2001: The recent increase in Atlantic hurricane activity: Causes and implications. *Science*, 293, 474-479.

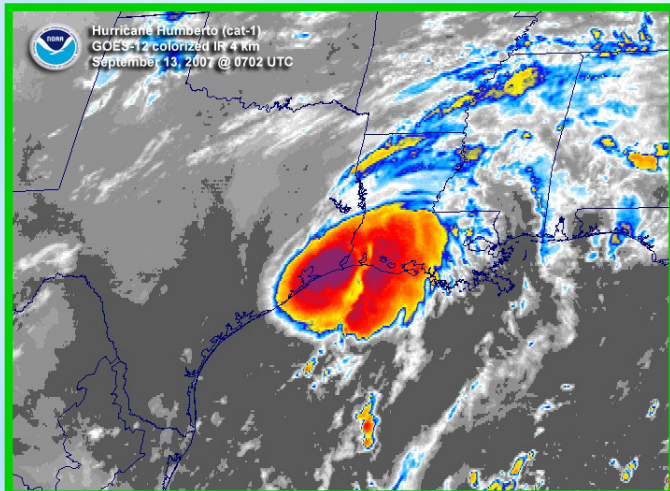
# Schedule Your 2010 Hurricane Talk now!

If you are not able to make it to one of our area's Hurricane Town Meetings ([www.srh.noaa.gov/hgx/?n=tropical\\_meetings10](http://www.srh.noaa.gov/hgx/?n=tropical_meetings10)), your 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.

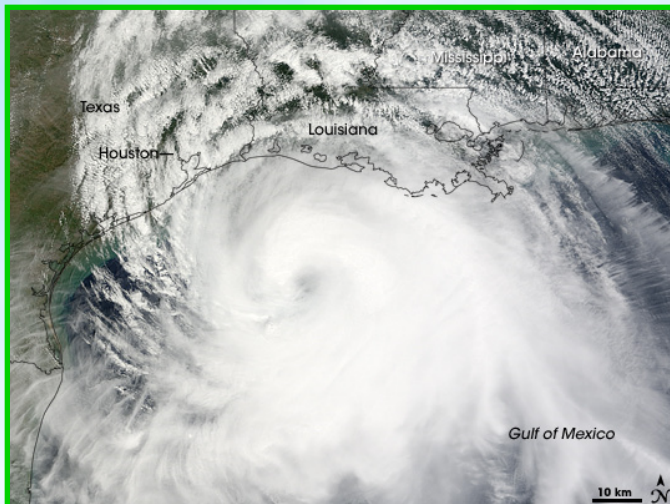


If you are interested in having a meteorologist come to you and talk about hurricanes, please contact Dan Reilly ([dan.reilly@noaa.gov](mailto:dan.reilly@noaa.gov)) or Joshua Lichter ([joshua.lichter@noaa.gov](mailto:joshua.lichter@noaa.gov)) at (281)337-5074. The more you know about tropical storms and hurricanes, the better you will be prepared to survive when the next one strikes. This could be the year we see our next Tropical Storm Allison, Hurricane Humberto or Hurricane Ike.

**Tropical Storm Allison  
(June 2001)**



**Hurricane Humberto  
(September 2007)**



**Hurricane Ike  
(September 2008)**

## 2010 Names

- Alex
- Bonnie
- Colin
- Danielle
- Earl
- Fiona
- Gaston
- Hermine
- Igor
- Julia
- Karl
- Lisa
- Matthew
- Nicole
- Otto
- Paula
- Richard
- Shary
- Tomas
- Virginie
- Walter



**Storm Signals is a publication of the  
Houston/Galveston  
National Weather Service Office**

**Gene Hafele - Meteorologist In Charge  
Dan Reilly - Warning Coordination Meteorologist  
Josh Lichter / Kim Armstrong - Editors**

**Phone: 281-337-5074  
Fax: 281-337-3798  
[www.srh.noaa.gov/hgx](http://www.srh.noaa.gov/hgx)**

