



Weather Research Center



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Press Release

For Immediate Release

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What a Season! 2005 Atlantic Hurricane Season Outlook Verified

Houston – After a long, record-breaking hurricane season, the end is finally within reach! Weather Research Center's 2005 Atlantic Hurricane Season Outlook validated this year as the official season comes to an end on November 30.

"There have only been six Atlantic Hurricane Seasons when there were more than 15 named cyclones [1887, 1933, 1936, 1969, 1995, 2003]" according to Certified Consulting Meteorologist – Jill F. Hasling of Weather Research Center. So far this year we have had 26 named tropical cyclones in the Atlantic [Arlene through Epsilon. Since 1871, there have been 41 years with more than 10 named tropical cyclones per year. The 1933 Hurricane season held the previous record with 21 named storms. Since 1871, there have only been six years with more than 15 tropical storms or hurricanes; 21 cyclones in 1933, 19 cyclones in 1995, 18 cyclones in 1969, 17 cyclones in 1887, 16 cyclones in 1936 and 2003. This very active year could continue into December.

This is the first Atlantic Hurricane Season since 1871 where there have been four named storms before July 6th. Prior to this year the last time there were four storms before July 6th was 1959 when there was Tropical Storm Arlene – May 28 - June 2 Louisiana; Tropical Storm Beulah – June 15 - 21 Mexico; Hurricane Unnamed – June 17-21 Atlantic; and Hurricane Cindy – July 5 - 12 South Carolina.

2005 will go down as a record breaking Atlantic Hurricane season not only for a record number of storms and hurricanes, but for breaking many other records. A record was broken as early as July when there were five named storms. The record for July prior to 2005 was four named storms while the last time there were two major hurricanes in July was 1916. Hurricane Dennis and Emily were both Category 4 storms at some point during their lifetime. There were nine hurricanes prior to September 30, 2005. The last time there were nine or more hurricanes before September 30th was in 1893 when

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there were 10 hurricanes. There were six named storms in October, which tied the record set in 1950. By the end of October 31st there were 13 hurricanes recorded in the 2005 hurricane season with seven of these becoming major hurricanes. There were two tropical storms in November – Tropical Storms Gamma and Delta.

According to WRC's Orbital Cyclone Strike Index [OCSI], there was an 81% chance that the Gulf of Mexico Oil leases would experience a tropical storm or hurricane this year. This forecast verified with Tropical Storm Arlene in June, Tropical Storm Cindy in July, Hurricane Dennis in July, Hurricane Emily in July, Hurricane Katrina in August, and Hurricane Rita in September. For comparison, there were two years in this phase of the OCSI which had at least five storms move over the oil leases: 1932 when a strong hurricane made landfall along the northern Texas Coast, and 1985 when Hurricane Juan and Hurricane Kate moved over the Gulf oil leases. These cyclones caused many hours of down time for the offshore industry.

For the 2005 hurricane season, the sections of the United States coastline with the highest probability of a land falling tropical storm or hurricane were the Texas Coast and the west coast of Florida which both had a 70% chance of experiencing a tropical system. The section of coast from Georgia to North Carolina had the second highest risk with a 60% chance of experiencing a land-falling tropical storm or hurricane (as can be seen in the Table below the forecast verified this year.)

Below is the forecast for the 2005 Hurricane Season. The table not only gives the OCSI percent risk of land falling storms along the North American Coast but also gives the percent risk based on climatology [the average number of landfalls per year for a particular section using the entire record 1871 to 1995].

2005 OCSI FORECAST FOR THE ATLANTIC

COAST	OCSI	CLIMATOLOGY	
Mexico	40%	40%	Bret, Emily, Gert, Jose, Stan
Texas	70%	51%	Emily, Rita
Louisiana to Alabama	50%	59%	Arlene, Cindy, Dennis, Katrina, Rita
West Florida	70%	71%	Arlene, Dennis, Tammy, Wilma
East Florida	30%	41%	Katrina, Tammy
Georgia to N. Carolina	60%	56%	Ophelia
East Coast of US	20%	36%	
Gulf Oil Blocks	81%	88%	Arlene, Cindy, Dennis, Emily, Katrina, Rita

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In order to compare WRC's Annual Hurricane Outlook to other seasonal forecasts, WRC meteorologists issue secondary predictors as shown in the table below.

Secondary 2005 Predictors from the OCSI [through November 28, 2005]:

Number of Storms :	10	25
Number of Hurricanes:	5	13
Number of Hurricane Days:	21	46
US Landfalls:	4	9
Cat 3 or Higher Storms:	50%	Dennis, Emily, Katrina, Maria, Rita, Wilma, Beta

WRC meteorologists Jill F. Hasling and the late Dr. John C. Freeman developed and have used the OCSI since 1985 to make an annual outlook for the section of the US coast that has the highest risk of storm landfall. The years used for this year's seasonal forecast were 1876, 1887, 1898, 1910, 1922, 1932, 1942, 1953, 1963, 1973, 1985 and 1995. Some significant tropical events in those years were:

- 1910 Category 3 hurricane made landfall over the southwest Florida Coast in October.
- 1932 Category 4 hurricane made landfall south of Galveston, Texas in August.
- 1942 Category 3 hurricane made landfall in Central Texas in August.
- 1985 Hurricane Gloria, a Category 3 storm, made landfall along the East Coast of the US.
- 1995 Hurricane Opal became a Category 5 storm in the eastern Gulf of Mexico but weakened to a Category 3 storm before making landfall on the west coast of Florida.

The OCSI also indicated a long season with three out of the 11 years in this Phase of the OCSI having storms as early as May, and two years out of the 11 years having storms in December. This verified with the 2005 Atlantic Hurricane Season starting on June 8th with the development of Tropical Storm Arlene and continuing at least through November 28th with Tropical Storm Delta moving east-northeast toward Africa. The OCSI is giving a 20% chance of a December Storm.

Four out of the 11 years had five or more storms make landfall somewhere on the United States coast. There were nine US landfalls this year. Florida experienced five of them with Tropical Storm Arlene, Hurricane Dennis, Hurricane Katrina, Tropical Storm Tammy, and Hurricane Wilma.

Five out of the 11 years had hurricanes that were category 3 or higher on the Saffir/Simpson Damage Potential Scale.

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Hurricane Katrina could very well have been a Category 5 hurricane as it made landfall with a minimum central pressure of 915 mbs along the southeast Louisiana coast and the Mississippi coast. This makes Katrina the 21st known Category 4 or higher hurricane to make US landfall. If Katrina eventually becomes classified as a Category 5 then it would be the fourth known Category 5 storm to make US landfall. Below is a list of the Category 4 and Category 5 hurricanes that have made US landfall ranked by pressure.

Hurricane	Year	Category (at landfall)	Landfall Minimum Pressure (mb)	Minimum Pressure (in)
Unnamed (FL Keys)	1935	5	892	26.35
Camille (MS, SE LA, VA)	1969	5	909	26.84
Katrina [SE LA MS]	2005	4	915	27.02
Andrew (SE FL, SE LA)	1992	5	922	27.23
TX (Indianola)	1886	4	925	27.31
Unnamed (FL Keys, S TX)	1919	4	927	27.37
Unnamed (Lake Okeechobee FL)	1928	4	929	27.43
Donna (FL, Eastern U.S.)	1960	4	930	27.46
Unnamed (New Orleans LA)	1915	4	931	27.49
Carla (N & Cent. TX)	1961	4	931	27.49
LA (Last Island)	1856	4	934	27.58
Hugo (SC)	1989	4	934	27.58
Unnamed (Miami FL, MS, AL, Pensacola FL)	1926	4	935	27.61
Unnamed (Galveston TX)	1900	4	936	27.64
Unnamed GA/FL (Brunswick, GA)	1898	4	938	27.70
Hazel (SC, NC)	1954	4	938	27.70
Unnamed (SE FL, SE LA, MS)	1947	4	940	27.76
Unnamed (N TX)	1932	4	941	27.79
Charley (Eastern U.S.)	2004	4	941	27.79
Audrey (SW LA, N TX)	1957	4	945	27.91
Unnamed (Galveston TX)	1915	4	945	27.91

Thirteen of these hurricanes made landfall in the Gulf of Mexico with 11 of them making landfall from the Mississippi Coast to the Texas Coast. The 1919 Category 4 hurricane made landfall in the Florida Keys, then moved across the Gulf, and finally made landfall again along the South/Central Texas Coast. The other two storms that made landfall on the southwest coast of Florida were the 1935 Labor Day Category 5 hurricane, which made landfall across the tip of Florida then tracked north of Tampa, and Hurricane Charley which was a Category 4 hurricane in 2004 that made landfall along the Southwest Florida Coast near Fort Myers, Florida.

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The last time that a Category 4 or higher hurricane made landfall along the central or western Gulf Coast was Hurricane Camille in 1969, which moved into the Mississippi coast as a Category 5 hurricane.

If you look at the statistics since 1950, there have only been two Category 5 hurricanes, Camille in 1969 and Andrew in 1992. There have been seven Category 4 hurricanes since 1950.

Hazel	in 1954 along the East Coast of the United States
Audrey	in 1957 at the Texas/Louisiana border
Donna	in 1960 along the southwest coast of Florida
Carla	in 1961 in Central Texas
Hugo	in 1989 along the South Carolina Coast
Charley	in 2004 along the west coast of Florida
Katrina	in 2005 along the Louisiana/Mississippi border

The 2006 Atlantic Hurricane Season will be more difficult to forecast than most since this will be the beginning of a new cycle. A new cycle in the OCSI starts when the sun spot minimum is observed and this is expected to occur in 2006 which means the OCSI is reset to Phase 1 which includes the years: 1878, 1889, 1901, 1913, 1923, 1933, 1944, 1954, 1964, 1976, 1986, and 1996.

2006 OCSI FORECAST FOR THE ATLANTIC

COAST	OCSI	CLIMATOLOGY
Mexico	40%	40%
Texas	40%	51%
Louisiana to Alabama	60%	59%
West Florida	70%	71%
East Florida	40%	41%
Georgia to N. Carolina	90%	56%
East Coast of US	60%	36%
Gulf Oil Blocks	90%	88%

In order to compare WRC's Annual Hurricane Outlook to other seasonal forecasts, WRC meteorologists issue secondary predictors as shown in the table below.

Secondary 2006 Predictors from the OCSI:

Number of Storms :	11
Number of Hurricanes:	5
Number of Hurricane Days:	24
US Landfalls:	4
Cat 3 or Higher Storms:	50%

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The years in this phase of the OCSI had as few as four storms for the season to as many as 21 for the season. There is a 50% chance that there will be more than 11 named storms. The distribution by month indicates 2006 will be a very long season with early as well as late storms.

During the 20-year period from 1985 to 2004, there have only been three years, 1987, 1992, and 1999 when a storm or hurricane did not make landfall in the section of the United States coastline that had the highest risk. In all three of these years cyclones made landfall in the section of the coast with the second highest risk. This gives the OCSI an 85% accuracy rate.

The OCSI model is based on the premise that there are orbital influences that are reflected in the global circulation pattern on the sun and subsequently the global circulation pattern of the earth. The sun's orbit influences the sun spot cycle. Using this solar cycle to make an index, hurricane climatology has been summarized into an index called the OCSI. This index has been used since 1985 to make annual hurricane season forecasts of which section of North America has the highest risk of experiencing a tropical storm or hurricane. In addition to its ongoing research, the Center also provides storm and hurricane information via the Internet through Storm Navigator®. This service helps people navigate weather information on the Internet in addition to providing detailed storm updates and related information. All of the Center's projections including past predictions can be found on the Internet, <http://www.wxresearch.com/outlook>.

Weather Research Center is a non-profit educational research center, which provides research into tropical cyclones as well as real-time weather forecasts. Ms. Jill F. Hasling is a Fellow and Certified Consulting Meteorologist from the American Meteorological Society as well as a member of the National Council of Industrial Meteorologists.