



State of the Climate Hurricanes & Tropical Storms Annual 2005

National Oceanic and Atmospheric Administration National Climatic Data Center

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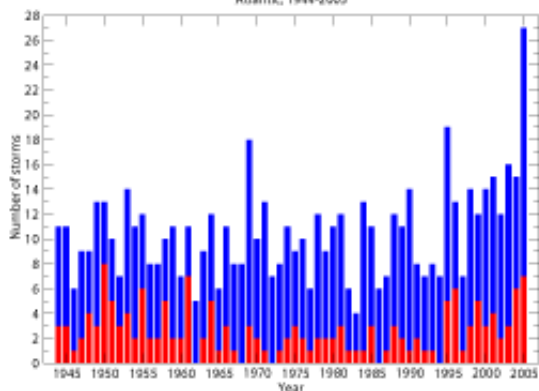
Year: Month:

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Atlantic Basin

There were a record 27 named storms, of which 14 were hurricanes, exceeding the 1969 record of 12 hurricanes, and 7 were major hurricanes. Of the 7 major hurricanes, an unprecedented 3 reached category 5 status, with a 4th reaching the greatest possible windspeed within category 4 of the Saffir-Simpson scale. The season has been remarkable for its early beginning and number of storms as well as the intensity of the hurricanes, including the most intense hurricane on record for the Atlantic. Many records were broken during the season and a list of the most notable are available at the end of this summary.

Annual Number of Named Storms and Major Hurricanes
Atlantic, 1944-2005



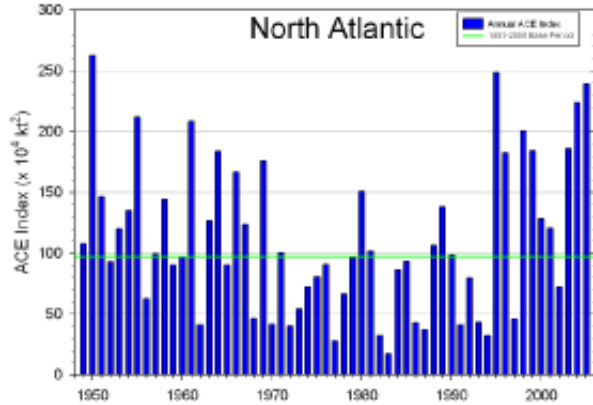
Annual Named Storms and Hurricanes

century is underestimated.

Since reliable records began around the middle of the 20th century (1944) with routine reconnaissance aircraft missions, no season has exceeded 19 named storms until 2005. However, it is known that at least one other season exceeded 20 named storms before 1944 and that was 1933 (21). Prior to the launch of satellites in the 1970s, and particularly before the routine reconnaissance aircraft missions, it was difficult to detect storms that did not affect land or ships, and it is therefore likely that activity in some seasons before the middle of the 20th

Instead of examining only the number of tropical storms and hurricanes as an indicator of activity, [NOAA's Accumulated Cyclone Energy Index](#) takes into account the cumulative strength and duration of each storm. As shown in the figure to the right, 2005 is the third most active season on record behind 1950 and 1995 in terms of the ACE index. Tropical cyclone activity in

the Atlantic basin has been above normal since 1995. This has been largely in response to the active phase of the [multi-decadal signal](#). The average number of named storms since 1995 has been 13, compared to 8.6 during the preceding 25 years during which time the multi-decadal signal was in an inactive phase. An average of 7.7 hurricanes and 3.6 major hurricanes since 1995 compares to 5 hurricanes and 1.5 major hurricanes from 1970-1994.



Atlantic Basin Accumulated Cyclone Energy (ACE) Index



Expected Active Atlantic Multi-decadal Signal

Characteristics of an active multi-decadal signal in the Atlantic include: warmer SSTs in the tropical Atlantic region, an amplified subtropical ridge at upper levels across the central and eastern North Atlantic, reduced vertical wind shear in the deep tropics over the central North Atlantic, and an African Easterly Jet (AEJ) that is favorable for promoting the development and intensification of tropical disturbances moving westward off the coast of

Africa. [Recent studies](#) also indicate that in addition to this multi-decadal oscillation the destructive power of hurricanes has generally increased since the mid-1970s, when the period of the most rapid increase in global ocean and land temperatures began.

2005 Atlantic Ocean Tropical Cyclones

Tropical Cyclone	Maximum Sustained Windspeed (kt)	Landfall Date, Location and Sustained Windspeed	Estimated cost of damage in the US (in US dollars)**
Arlene	60	6/11/05 - Pensacola FL (50 kt)	not available
Brett	35	6/29/05 - Tuxpan, Mexico (35 kt)	not available
Cindy	60	7/5/05 - Grand Isle, LA (60 kt)	not available
Dennis	130	7/8/05 - Cuba (Cat 4); 7/10/05 - Pensacola FL (105 kt)	over \$2 billion total losses, over \$1 billion insured losses
Emily	110	7/14/05 - Grenada (80 kt); 7/18/05 - Cozumel, Mexico (120 kt); 7/20/05 - Boca Madre Mexico (110 kt)	not available
Franklin	60		
Gert	40	7/24/05 - Cabo Rojo, Mexico (40 kt)	not available
Harvey	55		

Irene	85		
Jose	45	8/23/05 - NW of Veracruz, Mexico (45 kt)	not available
Katrina	150	8/25/05 - Hollywood, FL (70 kt); 8/29/05 Buras, LA (110 kt) and Ansley, MS (105 kt)	over \$100 billion total losses, over \$34 billion insured losses
Lee	35		
Maria	100		
Nate	80		
Ophelia	65	Struck North Carolina, but did not make official landfall	not available
Philippe	70		
Rita	150	9/24/05 - Between Sabine Pass TX and Johnson's Bayou LA (105 kt)	over \$10 billion total losses, at least \$4.7 billion insured losses
Stan	70	10/2/05 - Yucatan Peninsula, Mexico (40 kt); 10/4/05 - SE of Veracruz, Mexico (70 kt)	
Tammy	45	10/5/05 - Jacksonville FL (45 kt)	not available
Vince	65		
Wilma	150	10/21/05 - Cozumel, Mexico (120 kt); 10/22/05 - Playa del Carmen, Mexico (115 kt); 10/24/05 - near Everglades City, FL (105 kt)	over \$12 billion total losses, over \$6 billion insured losses
Alpha	45		
Beta	100	10/30/05 - Nicaragua (90 kt)	not available
Gamma	40		
Delta	60		
Epsilon	70		
Zeta	56		

***preliminary estimates and subject to significant revision. Estimates are based on insurance industry estimates (Insurance Industry Institute), with uninsured losses not tallied yet, so using a factor of at least 2 times insured losses for the total. Insured losses do not include flood insurance coverage (FEMA).*

Overview of the 2005 hurricane season:

The 2005 season began early with [Tropical Storm Arlene](#) forming on June 9th from a tropical depression in the southwest Caribbean Sea. [Tropical Storm Bret](#) also formed in June making it only the 13th time since 1851 that 2 tropical storms are known to have formed in June.

A record active July followed, wherein 5 named storms ([Cindy](#), [Dennis](#), [Emily](#), [Franklin](#) and [Gert](#)) formed. The previous record for the number of named storms in July was four. Of the 5 named storms, 2 major hurricanes formed tying a record set in 1916. The seven named storms that had formed up until the end of July represented a record level of activity for the first two months of the season.

A further five named storms formed in August of which two were hurricanes bringing the

seasonal total to 12 named storms and 4 hurricanes - well above the long term average as of August 31st, which is 4.4 storms and 2.1 hurricanes. August also saw the development of [Hurricane Katrina](#), which will likely be one of the most costly and destructive storms in US history. At one stage a category 5 hurricane, Katrina ultimately made landfall in Louisiana and Mississippi at category 3 strength. While loss of life will not approach the magnitude of the Galveston Hurricane of 1900 (6000-12000 deaths), it nonetheless caused more than 1,300 deaths and will likely cost more than 100 billion dollars - by far the highest cost of any hurricane in history.

In September, five hurricanes formed leading to a seasonal total nearly double the June-September average number of named storms. In only one other year (1933) had this many storms (17) formed by the end of September. The 2005 season eventually surpassed 1933 for the number of named tropical cyclones. The second category five hurricane of the season developed in September - [Hurricane Rita](#). Impacting the Florida Keys and eventually the Texas/Louisiana border, it prompted massive evacuations along the Gulf Coast and caused widespread damage in parts of Southwest Louisiana, just weeks after Katrina impacted the state. [Hurricane Ophelia](#) also impacted the US as it raked the North Carolina coast leading to 10-12 inches of rain for coastal areas as well as significant coastal erosion.

October produced some unusual tropical activity and the most intense Atlantic hurricane on record. Six named storms formed during the month leading to an extension of the naming system to include the Greek alphabet. [Hurricane Wilma](#) entered the record books in October as having the lowest central pressure of any Atlantic hurricane at 882 mb, beating Hurricane Gilbert in 1988 with 888 mb. At one stage a category 5 storm, Wilma produced well over 60 inches of rain as it moved across the Yucatan Peninsula, then turned northeastward and eventually made landfall in Florida as a category 3 storm. [Hurricane Vince](#) was unusual in its track and location. Vince became a hurricane in the eastern Atlantic and tracked northeastward, passing northwest of the Madeira Islands. Weakening, it eventually made landfall in Spain as a tropical depression. It is the first known instance of a tropical cyclone making landfall in Spain. [Tammy](#) impacted northeast Florida as a tropical storm and [Tropical Storm Alpha](#) and [Hurricane Beta](#) also formed in October. For the first time since the naming convention was instituted, the Greek alphabet had to be employed as the 22nd named storm of the season developed. Alpha produced heavy rains across portions of Hispaniola, while Beta became a major (category 3) hurricane as it neared the coast of Nicaragua, eventually making landfall at category 2.

In November, 3 further storms formed, [Tropical Storm Gamma](#), [Tropical Storm Delta](#), and [Hurricane Epsilon](#). Gamma formed from the remnants of the 27th tropical depression of the season near the Honduras coast and moved very little before weakening to a tropical depression early on the 20th. Heavy rains associated with Gamma significantly impacted Honduras leading to 12 deaths, flooding and landslides. Tropical Storm Delta formed in the eastern Atlantic and recurved to threaten the Canary Islands and coastal North Africa. The storm weakened to a depression northwest of the Canary Islands, but still caused significant damage, killing 7 people. Hurricane Epsilon formed on the 29th in the central Atlantic just north of 30°N. After moving west-southwestward while strengthening, Epsilon turned to move east-

northeastward at the end of the month and became a hurricane on December 2nd. Continuing to strengthen, despite moving over cooler waters, Epsilon reached a maximum sustained windspeed of 80 mph and hurricane strength winds persisted for 5 days, with a brief intervening period of winds just below hurricane strength. Epsilon was only the 6th December hurricane ever recorded.

The 27th named storm of the season, [Tropical Storm Zeta](#), formed on December 30th and remained in open central North Atlantic waters for its entire existence. Moving generally towards the west, Zeta was sustained for 8 days and achieved maximum windspeeds of 65 mph on January 3rd. Zeta weakened to a Tropical Depression on the 6th and lost tropical characteristics the same day.

2005 Records

- 27 named storms formed during the 2005 season. This is the most named storms in a single season, breaking the old record of 21 named storms set in 1933.
- 14 hurricanes formed during the 2005 season. This is the most hurricanes in a single season, breaking the old record of 12 hurricanes set in 1969.
- Eight major (Category 3 or high on the Saffir-Simpson scale) hurricanes formed during the 2005 season.
- Three Category 5 hurricanes formed during the 2005 season (Katrina, Rita, and Wilma). This is the most Category 5 hurricanes recorded in a single season, breaking the old record of two category 5 hurricanes set in 1960 and 1961.
- Seven named storms made United States landfall during 2005 (Arlene, Cindy, Dennis, Katrina, Rita, Tammy and Wilma). This puts the 2005 season in a tie for second place for landfalling storms behind the 1916 and 2004 seasons where eight named storms made landfall. An eighth storm brushed the coast of North Carolina in 2005, but did not make an official landfall.
- The 2005 season was the most destructive for United States landfalling storms, largely due to Hurricane Katrina. Damage estimates for the 2005 season are over \$100 billion dollars.

July

- Five named storms formed (Cindy, Dennis, Emily, Franklin, and Gert). This is the most on record for the month.
- Two major hurricanes formed (Dennis and Emily). This is the most on record.

August

- Five named storms formed (Harvey, Irene, Jose, Katrina and Lee). Only 1990, 1995 and 2004 have had more than five named storms form during the month of August.

September

- Five hurricanes formed (Maria, Nate, Ophelia, Philippe and Rita). This ties 1955, 1969, 1981, 1998 and 2000 for the most hurricanes to form during the month of September.

October

- Six named storms formed (Stan, Tammy, Vince, Wilma, Alpha and Beta). This ties 1950 for the most named storm formations during the month of October.
- Four hurricanes formed (Stan, Vince, Wilma and Beta). Only 1950 had more hurricanes develop during the month of October.
- Two intense hurricanes formed (Wilma and Beta). This ties 1950, 1961, 1964 and 1995 for the most intense hurricanes to form during the month of October.

November

- no records were set in November, though it was active compared to average

December

- Hurricane Epsilon was only the 6th hurricane to ever exist in the month of December.

Individual Storm Records

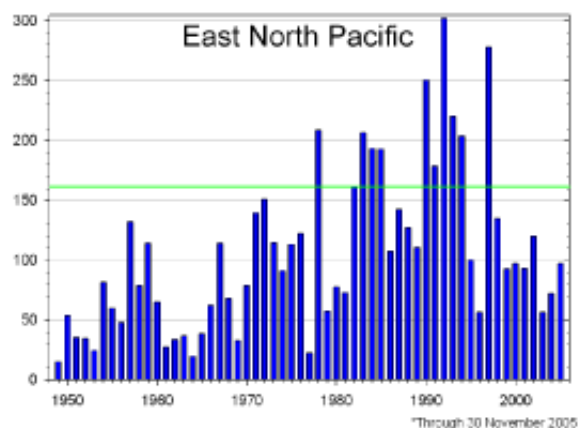
- Dennis became the most intense hurricane on record before August when a central pressure of 930 mb was recorded.
- Emily eclipsed the record previously set by Dennis for lowest pressure recorded for a hurricane before August when its central pressure reached 929 mb.
- Katrina's central pressure dropped to 902mb. At the time, it was the fourth lowest pressure ever measured in the Atlantic basin.
- Katrina's central pressure at landfall was 920 mb. This is the third lowest pressure recorded at landfall behind the Florida Keys storm of 1935 - 892mb and Hurricane Camille of 1969 - 909 mb.
- Katrina became the most destructive storm on record with an estimated \$50 billion dollars in insured damage. This shatters the old record of approximately \$25 billion dollars (normalized to 2005 dollars) in insured damage set by Hurricane Andrew (1992).
- Rita's central pressure dropped to 897 mb. At the time, it was the third lowest pressure ever measured in the Atlantic basin.
- Vince was the furthest north and east that a storm has ever developed in the Atlantic basin.
- Vince was the first tropical cyclone in recorded history to strike the Iberian Peninsula.
- Wilma reached Category 5 intensity. Wilma was the third Category 5 of the season. This is the first time that three Category 5 storms have formed in one year, breaking the record of two Category 5 storms set in 1960 and equaled in 1961.
- Wilma's central pressure dropped to 882mb. It was the lowest pressure ever measured in the Atlantic basin, eclipsing the old record of 888 mb set by Hurricane Gilbert (1988).
- Alpha became the 22nd named storm of the 2005 season. This breaks the old record of 21 named storms set in 1933.
- Beta became the 13th hurricane of the 2005 season. This breaks the old record of 12 hurricanes set in 1969.

NCDC thanks William Gray and Colorado State University for collating many of these records.

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Pacific Basin

The average seasonal activity in the Eastern Pacific Basin is 16 named storms, 9 hurricanes and 4 major hurricanes. In terms of the number of tropical storms, the season was near average in 2005, with 15 named systems, however, there were only 7 hurricanes and only 1 major hurricane (category 3, 4 or 5 on the Saffir Simpson Scale). Hurricane Kenneth - the only major hurricane of the season, reached windspeeds only 2 mph above the minimum windspeed to be designated a category 3 storm (113 kts). When [NOAA's Accumulated Cyclone](#)



[NOAA's ACE Index for 2005.](#)

Energy Index (ACE) is used to calculate activity (see image to the right), the season is well below average, with many of the storms being weak and short-lived relative to average.

Citing This Report

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Questions?

For questions on technical or scientific content of this report, please contact:

Jake Crouch:
Jake.Crouch@noaa.gov

For general climate monitoring questions, please contact:

CMB.Contact@noaa.gov

For climate data orders, please contact the National Climatic Data Center's Climate Services and Monitoring Division:

NCDC.Orders@noaa.gov

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