

FORECAST OF ATLANTIC HURRICANE ACTIVITY FOR OCTOBER- NOVEMBER 2007 AND SEASONAL UPDATE THROUGH SEPTEMBER

We experienced about average hurricane activity in September. We expect October-November to be active due to the growing strength of the current La Niña event.

(as of 2 October 2007)

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with special assistance from William Thorson³

This forecast as well as past forecasts and verifications are available via the World Wide Web at <http://hurricane.atmos.colostate.edu/Forecasts>

Emily Wilmsen, Colorado State University Media Representative, (970-491-6432) is available to answer various questions about this forecast

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ATLANTIC BASIN SEASONAL HURRICANE FORECAST FOR 2007

Full Season Tropical Cyclone Parameters and 1950-2000 Climatology (in parentheses)	Full Season Adjusted 3 Aug. 2007 Forecast	Full Season Adjusted 4 Sep. 2007 Forecast	Observed Activity Through September	Updated Oct.-Nov. Forecast	Full Season Adjusted 2 Oct. 2007 Forecast
Named Storms (NS) (9.6)	15	15	13	4	17
Named Storm Days (NSD) (49.1)	75	71.75	28.25	24.75	53
Hurricanes (H) (5.9)	8	7	4	2	7*
Hurricane Days (HD) (24.5)	35	35.50	10	10	20
Intense Hurricanes (IH) (2.3)	4	4	2	1	3
Intense Hurricane Days (IHD) (5.0)	10	12.25	5.75	2.25	8
Accumulated Cyclone Energy (ACE) (96.2)	150	148	62	38	100
Net Tropical Cyclone Activity (NTC) (100%)	160	162	84	43	127

*Per our discussion with forecasters at the National Hurricane Center, Karen will likely be upgraded to a hurricane in the post-season best track analysis.

EARLIER 2007 FORECASTS

Forecast Parameter and 1950-2000 Climatology (in parentheses)	Issue Date 8 December 2006	Issue Date 3 April 2007	Issue Date 31 May 2007
Named Storms (NS) (9.6)	14	17	17
Named Storm Days (NSD) (49.1)	70	85	85
Hurricanes (H) (5.9)	7	9	9
Hurricane Days (HD) (24.5)	35	40	40
Intense Hurricanes (IH) (2.3)	3	5	5
Intense Hurricane Days (IHD) (5.0)	8	11	11
Accumulated Cyclone Energy (ACE) (96.2)	130	170	170
Net Tropical Cyclone Activity (NTC) (100%)	140	185	185

ABSTRACT

Information obtained through 30 September 2007 shows that we have so far experienced a slightly above-average Atlantic basin hurricane season. August had somewhat above-average activity (about 130% of average) while September had about average activity (about 92% of average). 84 percent of the average full season Net Tropical Cyclone (NTC) activity has occurred so far this year. In an average year, approximately 78 percent of the seasonal average NTC of 100 occurs by the end of September.

Our October-November forecast calls for 4 named storms, 2 hurricanes, 1 major hurricane and NTC activity of 43 which is well above the October-November average value of 22. Our well above-average prediction for October-November activity is largely due to the emergence of a now moderate La Niña event during the last two months.

Notice of Author Changes

By William Gray

The order of the authorship of these forecasts was reversed in 2006 from Gray and Klotzbach to Klotzbach and Gray. After 22 years (since 1984) of making these forecasts, it is appropriate that I step back and have Phil Klotzbach assume the primary responsibility for our project's seasonal, monthly and landfall probability forecasts. Phil has been a member of my research project for the last seven years and was second author on these forecasts from 2001-2005. I have greatly profited and enjoyed our close personal and working relationships.

Phil is now devoting more time to the improvement of these forecasts than I am. I am now giving more of my efforts to the global warming issue and in synthesizing my projects' many years of hurricane and typhoon studies.

Phil Klotzbach is an outstanding young scientist with a superb academic record. I have been amazed at how far he has come in his knowledge of hurricane prediction since joining my project in 2000. I foresee an outstanding future for him in the hurricane field. I expect he will make many new forecast innovations and skill improvements in the coming years. He was recently awarded his Ph.D. degree.

VERIFICATION OF SEPTEMBER MONTHLY FORECAST

CSU forecast and verification of September-only hurricane activity issued on 4 September.

Tropical Cyclone Parameters and 1950-2000 September Average (in parentheses)	September 2007 Forecast	September 2007 Verification
Named Storms (NS) (3.4)	5	8
Named Storm Days (NSD) (21.7)	35	16.25
Hurricanes (H) (2.4)	4	3
Hurricane Days (HD) (12.3)	20	3.50
Intense Hurricanes (IH) (1.3)	2	1
Intense Hurricane Days (IHD) (3.0)	6.5	2
Accumulated Cyclone Energy (ACE) (47.6)	75	26
Net Tropical Cyclone Activity (NTC) (48.0)	80	44

Our September 2007 forecast did not verify particularly well. The month witnessed the formation of eight named storms, tying a record for most named storm formations during the month. However, most of these tropical cyclones were quite short-lived and not particularly intense. Sea surface temperature and vertical wind shear values were near their long-period averages, while sea level pressure values remained somewhat below average. A more in-depth discussion of our September-only forecast is in section 4.

1 Introduction

Our Colorado State University research project has shown that a sizable portion of the year-to-year variability of Atlantic tropical cyclone (TC) activity can be hindcast with skill significantly exceeding climatology. These forecasts are based on a statistical methodology derived from 55 years of past global reanalysis data and a separate study of prior analog years which have had similar global atmospheric and oceanic precursor circulation features. Qualitative adjustments are added to accommodate additional processes which may not be explicitly represented by our statistical analyses. We believe that seasonal forecasts must be based on methods showing significant hindcast skill in application to long periods of prior seasonal and monthly data.

2 2007 Atlantic Basin Activity through September

As of the end of September, the 2007 hurricane season has had 84 percent of the NTC activity of the average hurricane season. June-July 2007 had approximately average activity while August had above average (approximately 130%) TC activity compared with the typical August. September activity was about average (when evaluated by the NTC metric) with 8 named storms, 3 hurricanes and 1 major hurricane forming during the month. As of 1 October, a total of 13 named storms, 4 hurricanes and 2 major (Cat. 3-4-5) hurricanes have developed this season. Through September, the climatological (1950-2000) average number of named storms, hurricanes and major hurricanes is 7.5, 4.5, and 2.1, respectively. Through September 2007, the Atlantic basin has thus witnessed 173, 89, and 95 percent of average named storm, hurricane, and major hurricane activity, respectively. Table 1 shows observed Atlantic basin tropical cyclone activity by storm, and Figure 1 displays Atlantic basin tracks for the 2007 season.

Table 1: Observed 2007 Atlantic basin tropical cyclone activity through September.

Highest Category	Name	Dates	Peak Sustained Winds (kts)/lowest SLP (mb)	NSD	HD	IHD	NTC
TS	Andrea	May 9-11	40 kt/1002 mb	1.00			2.1
TS	Barry	June 1-2	45 kt/997 mb	0.75			2.0
TS	Chantal	July 31-Aug. 1	45 kt/994 mb	0.75			2.0
IH-5	Dean	Aug. 14-23	145 kt/918 mb	8.50	6.50	3.75	31.6
TS	Erin	Aug. 15-16	35 kt/1003 mb	1.00			2.1
IH-5	Felix	Sep. 1-5	145 kt/929 mb	4.00	3.00	2.00	21.9
TS	Gabrielle	Sep. 8-10	45 kt/1004 mb	2.25			2.5
H-1	Humberto	Sep. 12-13	75 kt/986 mb	1.00	0.25		5.1
TS	Ingrid	Sep. 14-15	40 kt/1002 mb	1.50			2.2
TS	Jerry	Sep. 23-24	35 kt/1004 mb	1.00			2.1
TS	Karen	Sep. 25-29	60 kt/990 mb	4.25			3.2
H-1	Lorenzo	Sep. 27-28	70 kt/990 mb	0.75	0.25		5.0
TS	Melissa	Sep. 29-30	40 kt/1003 mb	1.25			2.2
Totals	13			28.25	10.00	5.75	83.9



Figure 1: 2007 Atlantic basin hurricane tracks through September. Figure courtesy of Unisys Weather (<http://weather.unisys.com>).

3 Predictions of Individual Monthly Atlantic TC Activity

A new aspect of our climate research is the development of TC activity predictions for individual months. There are often monthly periods within active and inactive Atlantic basin hurricane seasons which do not conform to the overall season. For example, 1961 was an active hurricane season (NTC of 222), but there was no TC activity during August; 1995 had 19 named storms, but only one named storm developed during a 30-day period during the peak of the hurricane season between 29 August and 27 September. By contrast, the inactive season of 1941 had only six named storms (average 9.3), but four of them developed during September. During the inactive 1968 hurricane season, three of the eight named storms that formed that year did so during June (June average is 0.5).

We have conducted new research to see how well various sub-season or individual monthly trends of TC activity can be forecast. This effort has recently been documented in papers by Blake and Gray (2004) for August and Klotzbach and Gray

(2003) for September. We have shown moderate skill with our final qualitative adjustments to our monthly forecasts; however, our statistical forecasts have not shown skill in real-time forecasting. We believe this is due to the schemes being considerably over-fit to the data. Because of this, we are currently in the process of redesigning our monthly statistical forecasts. Therefore, our monthly forecasts for this year are based on a combination of some new research material that we are gathering along with qualitative reasoning.

3.1 Independent October-November Forecast

Typically, the end of the Atlantic basin hurricane season is governed by rising values of vertical wind shear. We expect La Niña conditions through this fall. La Niña conditions tend to reduce levels of vertical wind shear in the tropical Atlantic, and therefore, the end of the Atlantic basin hurricane will likely be extended this year. We are forecasting a very active October-November compared with climatology (Table 2). We have kept our October-November forecast nearly the same as was predicted in early August and in early September.

Table 2: Prediction of October-November 2007 hurricane activity. October-November climatology is shown in parentheses.

Parameter	Forecast
NS (2.2)	4
NSD (11.5)	24.75
H (1.4)	2
HD (5.2)	10
IH (0.4)	1
IHD (0.9)	2.25
ACE (16.7)	38
NTC (22.0)	43

Table 3 displays a summary of this year's hurricane activity through September and our projection for the rest of the season. We expect October-November activity to be well above average.

Table 3: Summary of hurricane activity through September 2007 and projected hurricane activity for the remainder of the year.

Tropical Cyclone Parameters and 1950-2000 Full Season Climatology (in parentheses)	Observed TC Activity Through September	Updated October-November Forecast	Updated Full Season Forecast
Named Storms (NS) (9.6)	13	4	17
Named Storm Days (NSD) (49.1)	28.25	24.75	53
Hurricanes (H) (5.9)	4	2	7*
Hurricane Days (HD) (24.5)	10	10	20
Intense Hurricanes (IH) (2.3)	2	1	3
Intense Hurricane Days (IHD) (5.0)	5.75	2.25	8
Accumulated Cyclone Energy (96.2)	62	38	100
Net Tropical Cyclone Activity (NTC) (100%)	84	43	127

*Per our discussion with forecasters at the National Hurricane Center, Karen will likely be upgraded to a hurricane in the post-season best track analysis.

4 Discussion

4.1 Early Season (June-August) Discussion

June-July 2007 had about average activity with two named storms forming during the two-month period (Barry and Chantal). The long-period average from 1950-2000 is approximately 1.5 named storm formations and 0.6 hurricane formations. We did not see any activity in the deep tropics during June and July 2007.

August 2007 had a slightly below average number of named storm and hurricane formations. However, the one hurricane that did form (Dean) reached Category 5 status and lasted for 3.75 days as a major hurricane. This is the most days that a single major hurricane has accrued during the month of August since 2004 (Frances). When investigating an aggregate measure such as ACE or NTC, August 2007 had slightly above-average activity.

From a large-scale perspective, atmospheric and oceanic conditions provided a mixed bag for the tropical Atlantic. Sea level pressures were quite low implying increased instability and weaker-than-normal trades. Vertical wind shear values across the tropical Atlantic were slightly above average in August. Low-level trade winds were weaker than normal, while upper-level westerlies were stronger than normal. Low- and mid-level moisture values were near their long-period averages during August. Tropical Atlantic sea surface temperature values were near their average values.

4.2 September Discussion

September had about average activity when evaluated by the NTC metric. September witnessed the formation of eight named storms, tying the record set in 2002

for most September named storm formations. However, most of these storms were quite short-lived, with only 75% of an average September's named storm days observed during the month, despite the large quantity of storms that formed during the month. Only 3.5 hurricane days occurred in September 2007, which is the lowest number of hurricane days observed in September since 1994.

Climate features in September were mixed for tropical cyclone development in the Atlantic. Sea surface temperatures and vertical wind shears were near their long period averages, while sea level pressures were slightly below normal.

5 Forthcoming 2007 Verification and Initial Forecast of 2008 Hurricane Activity

A 2007 seasonal forecast verification and detailed discussion of all aspects of this year's hurricane activity will be issued on **Tuesday 27 November 2007**. Our first seasonal hurricane forecast for the 2008 hurricane season will be issued in early December 2007. All of these forecasts will be made available on the web at: <http://hurricane.atmos.colostate.edu/Forecasts>.