EARLY APRIL FORECAST OF ATLANTIC BASIN SEASONAL HURRICANE ACTIVITY FOR 1996

(A year of expected somewhat above average hurricane activity)

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(This forecast is based on ongoing research by the authors, together with meteorological information through March 1996)

[This forecast with figures and tables is available on the World Wide Web at this URL:
http://tropical.atmos.colostate.edu/forecasts/index.html] - also

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DEFINITIONS

Atlantic basin - The area including the entire Atlantic Ocean, the Caribbean Sea, and the Gulf of Mexico.

Hurricane - (H) A tropical cyclone with sustained low level winds of 74 miles per hour (33 ms^{-1} or 64 knots) or greater.

Hurricane Day - (HD) Four 6-hour periods during which a tropical cyclone is observed or estimated to have hurricane intensity winds.

Tropical Cyclone - (TC) A large-scale circular flow occurring within the tropics and subtropics which has its strongest winds at low levels including hurricanes, tropical storms, and other weaker rotating vortices.

Tropical Storm - (TS) A tropical cyclone with maximum sustained winds between 39 (18 ms^{-1} or 34 knots) and 73 (32 ms^{-1} or 63 knots) miles per hour.

Named Storm - (NS) A hurricane or a tropical storm.

Named Storm Day - (NSD) Four 6-hour periods during which a tropical cyclone is observed or estimated to have attained tropical storm or hurricane intensity winds.

Hurricane Destruction Potential - (HDP) A measure of a hurricane's potential for wind and storm surge destruction defined as the sum of the square of a hurricane's maximum wind speed (in 10^4 knots^2)for each 6-hour period of its existence.

Intense Hurricane - (IH) A hurricane reaching at some point in its lifetime a sustained low level wind of at least 111 mph (96 kt or 50 ms^{-1}). This constitutes a category 3 or higher on the Saffir/Simpson scale (a "major" hurricane).

Intense Hurricane Day - (IHD) Four 6-hour periods during which a hurricane has intensity of Saffir/Simpson category 3 or higher.

Maximum Potential Destruction = (MPD) The seasonal sum of the square of the maximum wind in knots of each named storm in units of 10^3. MPD is different than HDP because MPD does not involve the time over which hurricane force winds exist.

Millibar - (mb) A measure of atmospheric pressure which is often used as a vertical height designator. Average surface values are about 1000 mb; the 200 mb level is about 12 kilometers and the 50 mb is about 20 kilometers altitude. Monthly averages of surface values in the tropics show maximum summertime variations of about $\pm$ 2 mb which are associated with variations in seasonal hurricane activity.

El Niño - (EN) A 12-18 month period during which anomalously warm sea surface temperatures occur in the eastern half of the equatorial Pacific. Moderate or strong El Niño events occur irregularly, about once every 5-6 years or so on average.

Delta PT - A parameter which measures the anomalous west to east surface pressure (ΔP) and surface temperature (ΔT) gradient across West Africa.

SOI - Southern Oscillation Index - A normalized measure of the surface pressure difference between Tahiti and Darwin.

QBO - Quasi-Biennial Oscillation - A stratospheric (16 to 35 km altitude) oscillation of equatorial east-west winds which vary with a period of about 26 to 30 months or roughly 2 years; typically blowing for 12-16 months from the east, then reverse and blowing 12-16 months from the west, then back to easterly again.

Saffir/Simpson (S-S) Category - A measurement scale ranging from 1 to 5 of hurricane wind and ocean surge intensity. One is a weak hurricane whereas 5 is the most intense hurricane.

SLPA - Sea Level Pressure Anomaly - A deviation of Caribbean and Gulf of Mexico sea level pressure from observed long term average conditions.

SST(s) - Sea Surface Temperature(s).

ZWA - Zonal Wind Anomaly - A measure of upper level ($\sim$ 200 mb) west to east wind strength. Positive anomaly values mean winds are stronger from the west or weaker from the east than normal.

1 knot = 1.15 miles per hour = .515 meters per second.

ABSTRACT

This paper presents the authors' forecast of Atlantic tropical cyclone activity expected to occur during 1996. This forecast is based on a couple of new forecast schemes recently developed by the authors. One scheme is based on meteorological information through November 1995, and the other, a newer scheme is based on somewhat different meteorological data through March 1996. Both forecast schemes predict nine individual seasonal tropical cyclone parameters. Each chooses the best six (those resulting in the most skillful prediction) of ten forecast parameters as predictors. These ever evolving forecast schemes use the following as possible predictors: forward extrapolations of the stratospheric Quasi-Biennial Oscillation (QBO) of equatorial zonal winds, two measures of West African rainfall, North Atlantic sea surface temperature conditions, and the October through November and March Atlantic subtropical ridge strength. In addition, other forecast parameters from the North Atlantic, the Pacific Ocean and from the Asia-Australia regions as well as an extended range forecast of summertime El Niño conditions, and an extended range forecast of Western Sahel monsoonal rainfall are used to make additional qualitative assessments. We combine the results of both of these forecasts along with qualitative information not explicitly contained in either scheme to produce the final forecast values.

This early April forecast anticipates a greater amount of 1996 hurricane activity than indicated by our late November forecast. Global circulation patterns as well as conditions in and around the Atlantic Ocean have created favorable conditions for hurricane activity this summer. It appears as though decadal variations of Atlantic deep water production are returning to conditions similar to those of the 1950s and 1960s. The consensus also points toward cool or neutral El Niño conditions this summer. These factors along with the results from our forecast schemes result in this April update.

Information obtained through March 1996 indicates that 1996 Atlantic hurricane activity is likely to be somewhat greater than the average season with 7 hurricanes (average 5.7), 11 named storms (average 9.3), 55 named storm days (average 46), 25 hurricane days (average 23), 2 intense (category 3-4-5) hurricanes (average 2.1), 5 intense hurricane days (average is 4.5) and a hurricane destruction potential (HDP) of 75 (average 71). Collectively, net tropical cyclone activity is expected to be 105 percent of the long term average. The 1996 season should be much less active active than the 1995 season, but more active than the average of the last decade or so.

1. Introduction

Surprisingly strong long range predictive signals exist for Atlantic basin seasonal tropical cyclone activity. Our recent research indicates that a sizeable portion of the season-to-season variability of nine indices of Atlantic tropical cyclone activity can be skillfully hindcast by as early as late November of the prior year with updates in early April, early June and early August. Information is developed from 46 years of past data (1950-1995). We study this historical data to develop the best possible hindcast forecasts from a variety of global wind, temperature, surface pressure, and rainfall features. Figures 1 and 2 show the variety of predictors that we use to make these forecasts.

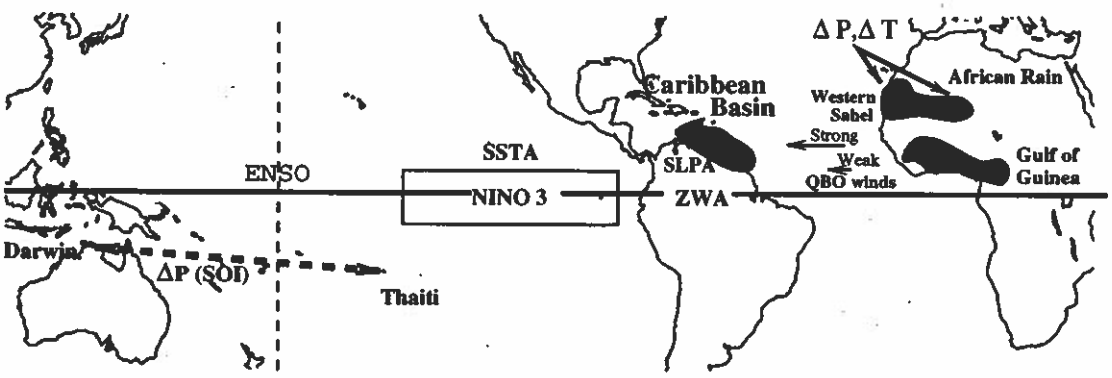

Figure 1: Meteorological parameters used in our various late November, early April, early June and early August forecasts.

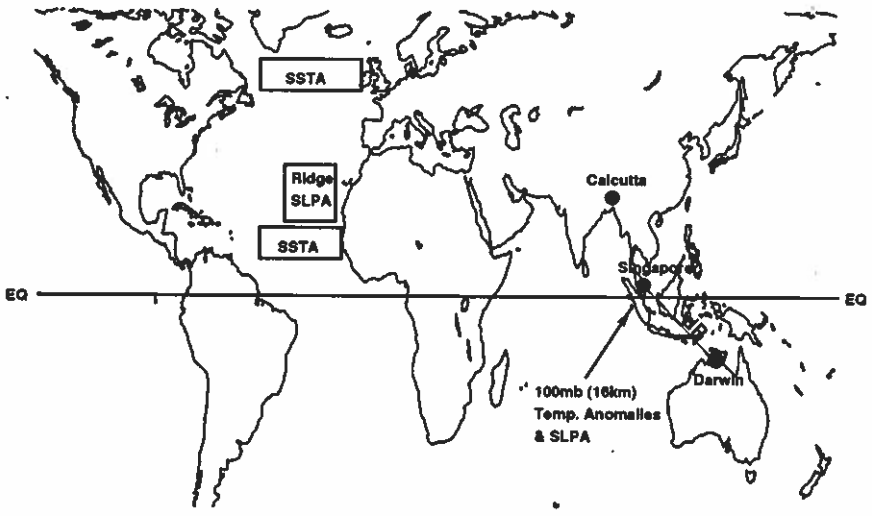

Figure 2: Most recent predictors which have been added to our forecast pool.

These seasonal hurricane forecasts are based on the premise that the atmosphere will behave in the coming years as it has in the past years. In other words, we assume that those global environmental conditions which have preceded active or inactive hurricane seasons of the past will be related to similar alterations of future storm activity. The global atmosphere operates as a single entity. Each separate and independent observation aids in our physical interpretation of the complete atmosphere-ocean-land system and how it likely will influence coming seasonal activity. We are actively researching this area in order to physically understand how these global precursor signals can be best combined in order to create the most skillful forecasts.

2. Descriptions of 1 December and 1 April Forecasts

We have a pool of 10 predictors for the 1 December forecast and a pool of 9 predictors for the 1 April forecast. We choose the six best predictors for each of the nine forecast variables (NS, NSD, H, HD, IH, IHD, HDP, NTC, and MPD). These potential predictors are shown in Table 1.

Table 1: Parameters used for 1 December and 1 April predictions.

for 1 December Prediction
1 = QBO 50 mb 9 month extrapolation
2 = QBO 30 mb 9 month extrapolation
3 = Absolute Shear of 30 to 50 mb extrapolated shear
4 = African rain - Sahel (Aug-Sept of previous year)
5 = African rain - Guinea (Aug-Nov of previous year)
6 = Singapore 100 mb TA (Jul-Nov)
7 = Calcutta SLPA (Sept-Nov)
8 = Northeast Atlantic pressure ridge for Nov
9 = Singapore minus Darwin SLPA (Jul-Nov)
10 = Balboa 50 mb QBO (Jun-Aug)

for 1 April Prediction
1 = QBO 30 mb 6 month extrapolation of zonal wind
2 = QBO 50-30 mb Absolute shear of zonal wind
3 = QBO 50 mb Balboa (Jun-Aug)
4 = Atlantic Ridge (Oct-Nov)
5 = Atlantic Ridge (March)
6 = African rain - Sahel (Aug-Sept of previous year)
7 = African rain - Guinea (Aug-Nov of previous year)
8 = North Atlantic SSTA for 12N to 20N, 50W to 18W (Jan-Mar)
9 = North Atlantic SSTA for 50N to 60N, 20W to 60W (Jan-Dec)

Our predictions are developed from the 46-year period of 1950-1995. Our hindcast skill for the best six predictors varies from about 48 to 65 percent of the variance. In application to independent data, we expect a degradation of skill by 10 to 25 percent depending upon the initial skill of a particular hindcast.

About half of the predictors contained in our early April forecast are similar to the forecast parameters in our early December forecast and about half are different.

These new predictors contain more current information on the state of the atmosphere. So far we have been unable to obtain significant improvement of our 1 April forecast over that of our improved 1 December forecast. We expect to obtain the best prediction by making a qualitative assessment of both of these forecasts. This early April assessment makes use of both our 30 November 1995 forecast and of our early April statistical forecast, along with other circulation related factors not explicitly contained in the statistical forecasts.

3. Early April Atlantic Basin Hurricane Forecast for 1996

We have recently developed a new updated Atlantic Basin seasonal hurricane forecast for issuance in early April. This updated early April forecast includes meteorological data through March – four more months of information than our 30 November 1995 forecast contains.

Column two of Table 2 shows our 30 November 1995 forecast of 1996 hurricane activity and our statistical forecast of late November (column one). We have since found that we had an error in one of the input parameters to our statistical scheme. Our corrected 30 November 1995 statistical prediction is given in the right column. The revised statistical prediction indicated a higher amount of hurricane activity than was originally anticipated. We had expected a slightly below average hurricane season in December. More recent and improved analysis of global conditions through November 1995 along with global circulation features changes since November indicate that our 30 November 1995 forecast for 1996 was too low. We now expect a more active hurricane season to occur in 1996. This is based on a data correction to our 30 November forecast and the projection of our newly developed early April forecast scheme.

Table 2: 1996 Atlantic basin hurricane statistical and average forecast of made on 30 November 1995 and revised 30 November 1995 based on improved data.

Forecast Parameter	Original Statistical Forecast	Actual 30 Nov. 95 Forecast	Corrected 30 Nov 95 Statistical Forecast
Named Storms (NS)	8.3	8	10.1
Named Storm Days (NSD)	39.5	40	52.5
Hurricanes (H)	5.4	5	6.7
Hurricane Days (HD)	21.2	20	29.0
Intense Hurricanes (IH)	2.1	2	2.7
Intense Hurricane Days (IHD)	6.2	5	7.7
Hurricane Destruction Potential (HDP)	42	50	58.9
Net Tropical Cyclone Activity (NTC)	85.2	85	100.8
Maximum Potential Destruction (MPD)	59.3	55	73.2

Table 3 lists our corrected 30 November 1996 forecast and our newly developed early April forecast. The last column on the right gives our adjusted 5 April 1996 hurricane forecast which is a compromise between our corrected 30 November 1995 forecast, our new early April quantitative forecasts and other qualitative information relating to global circulation statistics which are not explicit part of either

forecast. This information includes Atlantic Ocean surface pressure and sea surface temperature anomalies, and Pacific and Asian regional meteorological data such as the current state of the El Niño, Singapore 100 mb temperature anomalies, and other related information.

Table 3: Updated statistical and adjusted Atlantic basin hurricane forecasts for 1996.

Forecast Parameter	1950-90 Average	Corrected 30 Nov 95 Statistical Forecast	Early April Statistical Forecast	Adjusted 5 April Forecast
Named Storms (NS)	9.3	10.1	12.8	11
Named Storm Days (NSD)	46.6	52.5	62.7	55
Hurricanes (H)	5.8	6.7	9.2	7
Hurricane Days (HD)	23.9	29.0	19.7	25
Intense Hurricanes (IH)	2.3	2.7	2.4	2
Intense Hurricane Days (IHD)	4.7	7.7	4.6	5
Hurricane Destruction Potential (HDP)	71.2	58.9	95.6	75
Net Tropical Cyclone Activity (NTC)	100	100.8	118.2	105
Maximum Potential Destruction (MPD)	66.0	73.2	77.7	75

We anticipate that 1996 will have somewhat above average hurricane activity in comparison with the activity over the last 45 years but will be distinctly more active than the recent hurricane seasons of 1991-1994 or that of the 1970-1990 average hurricane season.

This increase in expected hurricane activity was prompted by the following factors included in our forecast schemes.

1. The Atlantic subtropical ridge has been much weaker than normal both last fall and during this spring. This reduces ocean upwelling along Western Africa, and South America resulting in warmer tropical waters and low sea level pressure this summer.

2. SST conditions in the tropical Atlantic are much warmer than normal.

3. The African Gulf of Guinea rainfall was slightly greater than normal. This indicates that West Africa likely will not experience drought conditions this summer.

Only the QBO factors remain unfavorable in our forecast schemes – resulting in slightly suppressed intense hurricane activity in 1996.

Qualitative features not explicitly in our forecast which will likely act to make 1996 a slightly above average hurricane season, despite easterly QBO wind conditions expected to occur this summer, are:

1. Cool equatorial East Pacific sea surface temperature conditions for August through October are expected this year.

2. Drought conditions are not expected in the Western Sahel region.

3. Lower Caribbean pressure anomalies and weaker than normal Atlantic trade wind conditions are expected this summer.

4. Higher surface layer salinity conditions in the far North Atlantic, indicating a possible speed-up of the Atlantic Ocean thermohaline circulation. Middle latitude Atlantic wind patterns during the winter of 1996 have been more typical of blocking conditions. which were more prevalent in the 1950s and 1960s.

5. Lower than normal Singapore 100 mb temperature anomalies during March 1996

Many of the factors listed above, whether explicit or not, point toward dramatic changes in the Atlantic Ocean-atmosphere circulation. These may signal the end of the long running conditions that have led to the reduced intense hurricane activity for the last 25 years or so (see section 6). Though for now nothing is certain.

4. Atlantic Basin Hurricane Activity in Years Following Extremely Active Seasons

Our forecast philosophy dictates that we consider the climatology of past events. There have been ten previous hurricane seasons (1887, 1893, 1906, 1916, 1926, 1933, 1950, 1955, 1961, 1969) with activity comparable to 1995. In attempting to assess how active the 1996 may be, it is instructive to note the level of activity during hurricane seasons following these other ten unusually active hurricane seasons. The years following unusually active seasons tend to experience somewhat below average hurricane activity. Table 4 provides a comparison of seasonal averages during the ten most active hurricane seasons (top line) versus average activity in the subsequent ten seasons (1888, 1894, 1907, 1917, 1927, 1934, 1951, 1956, 1962 and 1970) following unusually active years. Also listed is the ratio of activity during the active years to that in the subsequent years. Some striking features are to be noted include the following:

1. Years following unusually active hurricane seasons tend to be suppressed in hurricane activity, particularly for intense hurricane activity.

2. Tropical cyclone activity during unusually active seasons is typically 2 to 4 times higher during the subsequent seasons, depending on the specific index of activity considered. The seasonal number of intense hurricane days, is nearly 6.5 times greater during active seasons than in following years. The net tropical cyclone activity (or NTC) is three times greater.

3. Only two of the ten "subsequent" seasons (1934 and 1951) had above average hurricane activity and only two others had a total of more than five hurricanes in the subsequent season.

Table 4: Average seasonal totals of named storms (NS), named storm days (NSD), Hurricanes (H), Hurricane Days (HD), Intense Hurricanes (IH), Intense Hurricane Days (IHD), Hurricane Destruction Potential (HDP), and Net Tropical Cyclone (NTC) activity during the ten previous most active hurricane seasons during the last 125 years (top line) versus the same average seasonal totals during the ten subsequent seasons (line 2). The ratio of active year to subsequent year activity is on the third line.

	NS	NSD	H	HD	IH	IHD	HDP	NTC
Ave. of Ten Most Active Seasons	13.9	95	9.5	52	4.7	14.2	166	251
Ave. of Ten Years Following Ten Most Active Seasons	7.3	38	4.2	17	1.2	2.2	49	83
Ratio Active Yr/Following Yr	1.9	2.5	2.3	3.0	3.9	6.4	3.4	3.0

This type of analyses suggests that the 1996 hurricane season will likely be a great deal less active than has been the 1995 season. However, our analysis through early April 1996 indicates that there are certain atmospheric conditions present this year that will likely make the 1996 hurricane season more active than the average year following a very active season. It is likely that the 1934 and 1951 hurricane seasons (above average activity following a heavy year) will be the best analogs for this upcoming year.

5. Comments on Our 1995 Forecasts

All of our 1995 hurricane forecasts were for an above average season. Our forecast of named storm days, hurricane days, and intense or major hurricane days, although calling for an above average season of all parameters, did not fully specify how unusually active this season would become however.

Despite our underprediction of the unusually high amounts of 1995 tropical cyclone activity, we were quite correct in anticipating a great upswing in 1995 activity from the very inactive 1991-94 seasons. We also correctly forecast the 1995 dissipation of the El Niño as early as November 1994. This was contrary to most El Niño forecasts made at this time.

Despite the very active 1995 hurricane season, the US was spared from major damage except for hurricane Opal. U.S. residents were very lucky to have a stationary upper-level trough over the US East Coast which recurved most of the hurricanes away from the east coast. The people of the Northeast Caribbean were not as fortunate. Even though 1996 is not expected to be as active as 1995, the same favorable trough feature which recurved cyclones in 1995 may not be present this summer. The potential of U.S. hurricane landfall could be just as large or larger than 1995 even though overall Atlantic basin activity is expected to be less.

The 1995 Hurricane Season and Global Warming. Some individuals will interpret the great upswing in 1995 hurricane activity as being related in some way to

increased man-made greenhouse gases like carbon dioxide (CO_2). Such individuals are sometimes driven more by a political than a scientific agenda or do not fully understand the physics of tropical cyclones. There is no reasonable way that such an interpretation can be made. Anthropogenic greenhouse gas warming, even if a physically valid hypothesis, is a very slow and gradual process that, at best would only be expected to bring about small changes in global circulation over periods of 50 to 100 years. This would not result in the abrupt and dramatic one year upturn in hurricane activity as occurred between 1994 and 1995. And, even if man induced greenhouse increases were to be interpreted as causing global mean temperature increase over the last 25 years, there is no way to relate such a small global temperature increases to more intense Atlantic basin hurricane activity during this same period. Atlantic intense (or category 3-4-5) hurricane activity has shown a substantial decrease to only about 40 percent of the amount of intense hurricane activity which occurred 25-50 years ago. In reality intense hurricane activity in the Atlantic basin has shown a significant decrease while the globe has undergone a small mean temperature increase.

6. Likely Increase of Landfalling Major Hurricanes in Coming Decades

There has been a great lull in the incidence of intense category 3-4-5 hurricanes striking the US East Coast, Florida and Caribbean basin (except for 1995) during the last 25 years. We see this trend as a natural consequence of the slowdown in the Atlantic Ocean (thermohaline) Conveyor Belt circulation which appears to be responsible for a long list of concurrent global circulation and rainfall pattern changes during the last quarter century. This includes the Sahel drought, increased El Nino activity, Pacific and Atlantic middle latitude zonal wind increases among numerous other changes.

Both historical and geological (proxy) records indicate that this lull in major hurricane activity will not continue for very long. A return of increased major landfalling hurricane activity should be expected within the next decade or so. When this happens, the upshot of large coastal development during the last 25-30 years will very likely include hurricane destruction as never before experienced. More research on the causes and the likely timing of this change-over to increased intense hurricane activity is desperately needed. Increased intense hurricane activity striking US coastal areas is a more assured threat to the US than that of earthquakes, greenhouse gas warming and other environmental problems which are receiving comparatively much greater attention.

Changes in the North Atlantic. We may be seeing the early stages of the beginning speed-up of the Atlantic thermohaline (Conveyor Belt) circulation from its three decades long slow down. There have been reports of a large decrease in ice flow through the Fram Strait (the North Atlantic passage between Greenland and Spitzbergen). This decreased ice flow reduces the introduction of fresh water and, thereby, increases surface salinity values in the North Atlantic. Recent observations report surface water salinity increases in the deep water formation areas of the North Atlantic during the last couple of years. Rising salinity increases water density. Chilling of high salinity surface water then creates very dense water which is able to sink to great depth, thereby causing equatorial flow of deep dense water and engendering a northward flow of warm near surface replacement water; hence

- the Atlantic Ocean conveyor. A strong conveyor increases North Atlantic water temperatures.

Recent deep water observations in the North Atlantic reveal that fairly stagnant water has been present for a decade or more. The surface salinity increases that are now being measured in the North Atlantic will likely result in a speed-up of the Atlantic Ocean thermohaline circulation in the next few years. If this does occur, then we anticipate a general increase in West African Sahel rainfall, a decrease in Atlantic summertime upper tropospheric westerly winds and, regarding the issue at hand, a likely multi-decadal long increase of Atlantic basin intense hurricane activity. These new regional North Atlantic measurements may thereby be an ominous sign of future increases in US and Caribbean basin landfalling hurricane activity. Atlantic area observations of the last few months tend to support the view that a basic change in the Atlantic circulation may be imminent. Regardless, the over quarter century lull which we have enjoyed cannot be expected to continue indefinitely into the future.

7. Coming Updated Forecasts

Later 1996 updated forecasts will be issued on

- a) Thursday 6 June 1996 just after the official start of the hurricane season and on
- b) Wednesday 7 August 1996 just before the start of the most active part of the hurricane season.

These later forecasts utilize data closer in time to the hurricane season and should be somewhat more accurate than our late November and early April forecasts.

8. Cautionary Note

It is important that the reader appreciate that these seasonal forecasts are based on statistical schemes which will fail in some years. These forecasts also do not specifically predict where within the Atlantic basin storms will strike. Even if 1996 should prove to be a somewhat above average hurricane season, there are no assurances that many hurricanes will strike along the US or Caribbean Basin coastline and do much damage.

9. Acknowledgements

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APPENDIX: Verification of All Past Seasonal Forecasts

The first author has now issued seasonal hurricane forecasts for the last 12 years. In most of the prior forecasts, predictions have been superior to climatology, which was previously the only way to estimate future hurricane activity (see Table 6). The seven late May and early June seasonal forecasts for 1985, 1986, 1987, 1988, 1991, 1992 and 1994 were more accurate than climatology. The forecasts for 1984 and 1990 were only marginally successful and the two seasonal forecasts for 1989 and 1993 were failures. The 1989 forecast was a failure because of processes associated with the excessive amounts of rainfall which fell in the Western Sahel that year. Prior to 1990, our seasonal forecast did not include African rainfall as a predictor. We have corrected this important omission and forecasts since 1990 have incorporated Western Sahel rainfall estimates and we have developed a new Sahel rainfall prediction scheme. The failure of the 1993 seasonal forecast is attributed to our failure to anticipate the resurgence of El Niño conditions. In particular, the first author failed to anticipate the re-emergence of stronger El Niño conditions after the middle of August 1993. It is very unusual to have an El Niño last so long as the recent 1991-94 event. This failure motivated us to develop a new extended range ENSO prediction scheme, which is used as a quantitative first guess as to upcoming El Niño conditions.

Table 5: Verification of the authors' previous seasonal predictions of Atlantic tropical cyclone activity for 1984-1995.

1984	Prediction of 24 May and 30 July Update		Observed
No. of Hurricanes	7		5
No. of Named Storms	10		12
No. of Hurricane Days	30		18
No. of Named Storm Days	45		51
1985	**Prediction of 28 May**	**Updated Prediction of 27 July**	**Observed**
No. of Hurricanes	8	7	7
No. of Named Storms	11	10	11
No. of Hurricane Days	35	30	21
No. of Named Storm Days	55	50	51
1986	**Prediction of 29 May**	**Updated Prediction of 28 July**	**Observed**
No. of Hurricanes	4	4	4
No. of Named Storms	8	7	6
No. of Hurricane Days	15	10	11
No. of Named Storm Days	35	25	23
1987	**Prediction of 26 May**	**Updated Prediction of 28 July**	**Observed**
No. of Hurricanes	5	4	3
No. of Named Storms	8	7	7
No. of Hurricane Days	20	15	5
No. of Named Storm Days	40	35	37
1988	**Prediction of 26 May and 28 July Update**		**Observed**
No. of Hurricanes	7		5
No. of Named Storms	11		12
No. of Hurricane Days	30		21
No. of Named Storm Days	50		47
Hurr. Destruction Potential(HDP)	75		81
1989	**Prediction of 26 May**	**Updated Prediction of 27 July**	**Observed**
No. of Hurricanes	4	4	7
No. of Named Storms	7	9	11
No. of Hurricane Days	15	15	32
No. of Named Storm Days	30	35	66
Hurr. Destruction Potential(HDP)	40	40	108
1990	**Prediction of 5 June**	**Updated Prediction of 3 August**	**Observed**
No. of Hurricanes	7	6	8
No. of Named Storms	11	11	14
No. of Hurricane Days	30	25	27
No. of Named Storm Days	55	50	66
Hurr. Destruction Potential(HDP)	90	75	57
Major Hurricanes (Cat. 3-4-5)	3	2	1
Major Hurr. Days	Not Fcst.	5	1.00

1991	Prediction of 5 June	Updated Prediction of 2 August	Observed
No. of Hurricanes	4	3	4
No. of Named Storms	8	7	8
No. of Hurricane Days	15	10	8
No. of Named Storm Days	35	30	22
Hurr. Destruction Potential(HDP)	40	25	22
Major Hurricanes (Cat. 3-4-5)	1	0	2
Major Hurr. Days	2	0	1.25

1992	Prediction of 26 Nov 1991	Updated Prediction of 5 June	Updated Prediction of 5 August	Observed
No. of Hurricanes	4	4	4	4
No. of Named Storms	8	8	8	6
No. of Hurricane Days	15	15	15	16
No. of Named Storm Days	35	35	35	39
Hurr. Destruction Potential(HDP)	35	35	35	51
Major Hurricanes (Cat. 3-4-5)	1	1	1	1
Major Hurr. Days	2	2	2	3.25

1993	Prediction of 24 Nov 1992	Updated Prediction of 4 June	Updated Prediction of 5 August	Observed
No. of Hurricanes	6	7	6	4
No. of Named Storms	11	11	10	8
No. of Hurricane Days	25	25	25	10
No. of Named Storm Days	55	55	50	30
Hurr. Destruction Potential(HDP)	75	65	55	23
Major Hurricanes (Cat. 3-4-5)	3	2	2	1
Major Hurr. Days	7	3	2	0.75

1994	Prediction of 19 Nov 1993	Updated Prediction of 5 June	Updated Prediction of 4 August	Observed
No. of Hurricanes	6	5	4	3
No. of Named Storms	10	9	7	7
No. of Hurricane Days	25	15	12	7
No. of Named Storm Days	60	35	30	28
Hurr. Destruction Potential(HDP)	85	40	35	15
Major Hurricanes (Cat. 3-4-5)	2	1	1	0
Major Hurr. Days	7	1	1	0
Net Trop. Cyclone Activity	110	70	55	36

1995	Prediction of 30 Nov 1994	14 April Qualit. Adjust.	Updated Prediction of 7 June	Updated Prediction 4 August	Obs.
No. of Hurricanes	8	6	8	9	11
No. of Named Storms	12	10	12	16	19
No. of Hurricane Days	35	25	35	30	62
No. of Named Storm Days	65	50	65	65	121
Hurr. Destruction Potential(HDP)	100	75	110	90	173
Major Hurricanes (Cat. 3-4-5)	3	2	3	3	5
Major Hurr. Days	8	5	6	5	11.5
Net Trop. Cyclone Activity	140	100	140	130	229