COLORADO STATE UNIVERSITY FORECAST OF ATLANTIC HURRICANE ACTIVITY FROM AUGUST 4 - 17, 2017

We expect that the next two weeks will be characterized by above-average amounts (>130%) of activity relative to climatology.

(as of 4 August 2017)

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In Memory of William M. Gray[3]

This discussion as well as past forecasts and verifications are available online at
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1   Introduction

This is the ninth year that we have issued shorter-term forecasts of tropical cyclone (TC) activity starting in early August. These two-week forecasts are based on a combination of observational and modeling tools. The primary tools that are used for this forecast are as follows: 1) current storm activity, 2) National Hurricane Center (NHC) Tropical Weather Outlooks, 3) forecast output from global models, 4) the current and projected state of the Madden-Julian Oscillation (MJO) and 5) the current seasonal forecast.

The metric that we are trying to predict with these two-week forecasts is the Accumulated Cyclone Energy (ACE) index, which is defined to be all of the named storm's maximum wind speeds (in 10^4 knots^2) for each 6-hour period of its existence over the two-week period. These forecasts are too short in length to show significant skill for individual event parameters such as named storms and hurricanes. We issue forecasts for ACE using three categories as defined in Table 1.

Table 1: ACE forecast definition.

Parameter	Definition
Above-Average	Greater than 130% of Average ACE
Average	70% - 130% of Average ACE
Below-Average	Less than 70% of Average ACE

2   Forecast

We believe that the next two weeks will be characterized by activity at above-average levels (>130 percent of climatology). The average ACE accrued during the period from 1981-2010 from August 4 – August 17 was 8 units, and consequently, our forecast for the next two weeks is for 11 or more ACE units to be generated.

The above-average forecast is due to a combination of factors. The National Hurricane Center currently has two areas that they are monitoring for potential tropical cyclone development over the next five days. The area in the eastern tropical Atlantic that currently has a high probability of development according to the National Hurricane Center has the potential to be a long-lived tropical cyclone, potentially generating considerable ACE in the process. The medium potential area in the Caribbean also has the potential to generate several ACE units should it develop as predicted by some of the global models.

The MJO is currently of a relatively weak magnitude, and is forecast to remain weak over the next two weeks. Consequently, the MJO is unlikely to play a major role in dictating levels of hurricane activity experienced over the next two weeks.

Figure 1 displays the tracks that tropical cyclones have taken during the period from August 4 - 17 for the years from 1950-2008. Figure 2 displays the August 4 – 17 period with respect to climatology. The August 4 – 17 period is prior to the most active portion of the hurricane season.
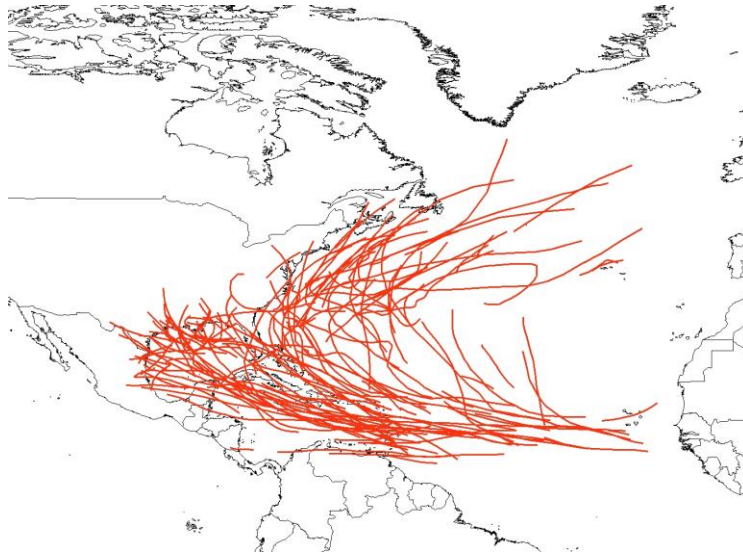

Figure 1: Tracks that named tropical cyclones have taken over the period from August 4 – 17 for the years from 1950-2008.
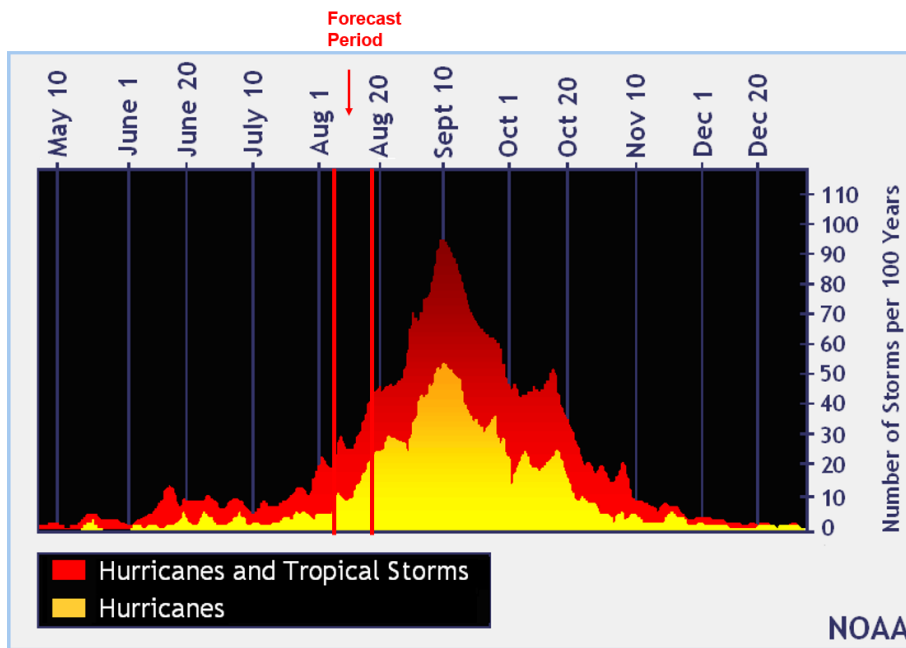

Figure 2: The current forecast period (August 4 - 17) with respect to climatology. Figure courtesy of NOAA.

We now examine how we believe each of the five factors discussed in the introduction will impact Atlantic TC activity for the period from August 4 – 17.

1) Current Storm Activity

There are currently no active TCs in the Atlantic.

2) National Hurricane Center Tropical Weather Outlook

The latest NHC Tropical Weather Outlook has one high potential area for TC development in the next five days and one medium potential area for TC development in the next five days.

3) Global Model Analysis

Several of the global models develop both of the areas that the National Hurricane Center is currently monitoring. The system in the eastern Atlantic has the potential to generate considerable levels of ACE should it develop as indicated by some of the models.

4) Madden-Julian Oscillation

The Madden-Julian Oscillation (MJO), as measured by the Wheeler-Hendon index is currently of relatively weak magnitude. The MJO is forecast to remain weak over the next two weeks (Figure 3). Consequently, we do not expect the MJO to play a significant role in Atlantic hurricane activity over the next two weeks. For reference, Atlantic hurricane activity stratified by MJO phase is displayed in Table 2.
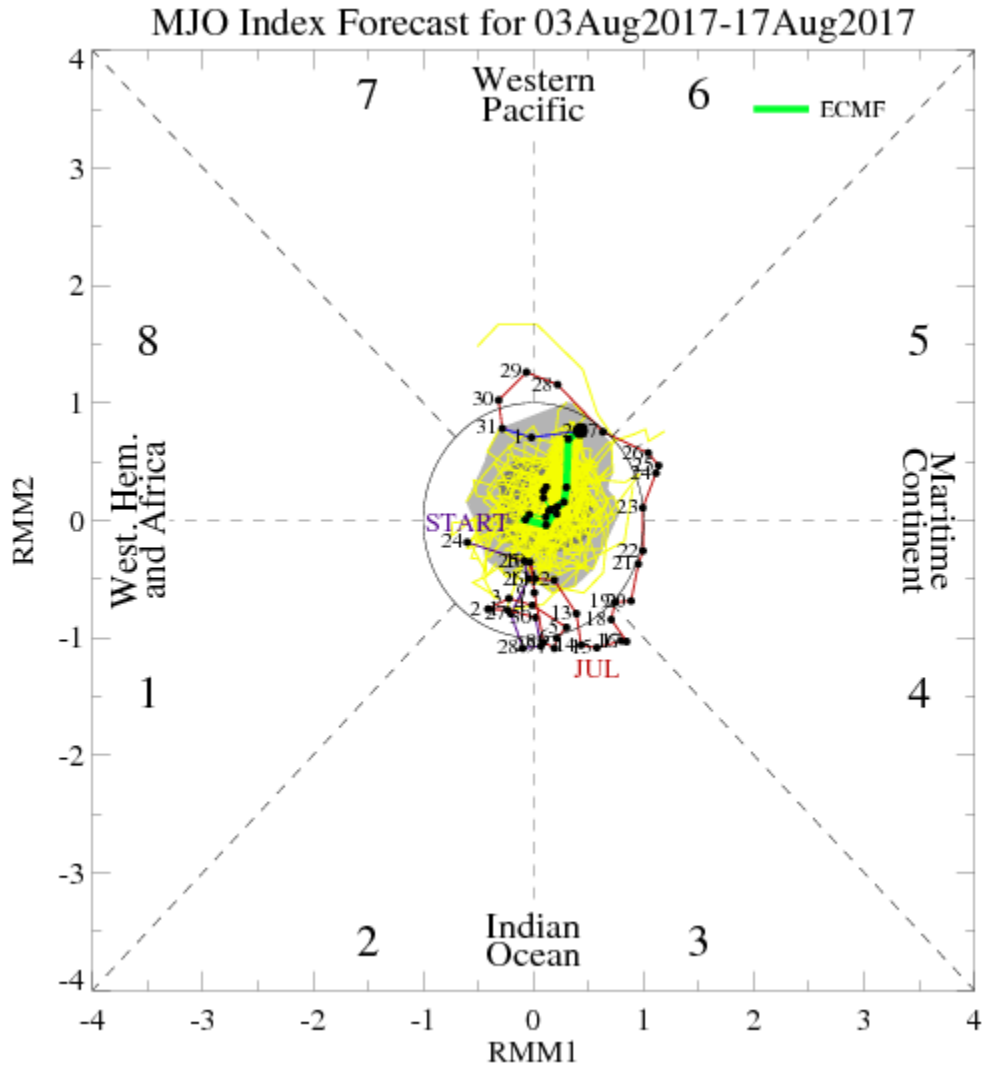
Figure 3: Predicted propagation of the MJO by the ECMWF model.

Table 2: Normalized values of named storms (NS), named storm days (NSD), hurricanes (H), hurricane days (HD), major hurricanes (MH), major hurricane days (MHD) and Accumulated Cyclone Energy (ACE) generated by all tropical cyclones forming in each phase of the MJO over the period from 1974-2007. Normalized values are calculated by dividing storm activity by the number of days spent in each phase and then multiplying by 100. This basically provides the level of TC activity that would be expected for 100 days given a particular MJO phase.

MJO Phase	NS	NSD	H	HD	MH	MHD	ACE
Phase 1	6.4	35.9	3.7	17.9	1.8	5.3	76.2
Phase 2	7.5	43.0	5.0	18.4	2.1	4.6	76.7
Phase 3	6.3	30.8	3.0	14.7	1.4	2.8	56.0
Phase 4	5.1	25.5	3.5	12.3	1.0	2.8	49.4
Phase 5	5.1	22.6	2.9	9.5	1.2	2.1	40.0
Phase 6	5.3	24.4	3.2	7.8	0.8	1.1	35.7
Phase 7	3.6	18.1	1.8	7.2	1.1	2.0	33.2
Phase 8	6.2	27.0	3.3	10.4	0.9	2.6	46.8
Phase 1-2	7.0	39.4	4.3	18.1	1.9	4.9	76.5
Phase 6-7	4.5	21.5	2.5	7.5	1.0	1.5	34.6
Phase 1-2 / Phase 6-7	1.6	1.8	1.7	2.4	2.0	3.2	2.2

5) Seasonal Forecast

The most recent seasonal forecast calls for an above-average season. We believe that activity over the next two weeks will be in keeping with the seasonal prediction for above-average activity.

3   Upcoming Forecasts

The next two-week forecast will be issued on August 18 for the August 18 – August 31 period. Additional two-week forecasts will be issued on September 1, September 15, September 29 and October 13.