COLORADO STATE UNIVERSITY FORECAST OF ATLANTIC HURRICANE ACTIVITY FROM AUGUST 16 – AUGUST 29, 2013

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

(as of 16 August 2013)

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This forecast as well as past forecasts and verifications are available online at
http://hurricane.atmos.colostate.edu/Forecasts

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1   Introduction

This is the fifth year that we have issued shorter-term forecasts of tropical cyclone 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 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 (greater than 130 percent of climatology). The average ACE accrued during the period from 1950-2010 from August 16-August 29 was 15 units, and consequently, our forecast for the next two weeks is for greater than 18 ACE units to be generated.

The above-average forecast is due to several factors. Tropical Storm Erin will likely generate several ACE units as it tracks across the tropical Atlantic. An area of disturbed weather currently passing over the Yucatan Peninsula has a moderate chance of developing into a tropical cyclone in the next 48 hours according to the National Hurricane Center, although any ACE generated by this system would likely be small. Several global models develop another TC in the next few days off of the coast of Africa, and this system has the potential to generate large ACE values if it were to track across the tropical Atlantic.

The Madden-Julian Oscillation is forecast to amplify into Phase 1 over the next two weeks, which is also typically favorable for Atlantic TC formation.

Figure 1 displays the tracks that tropical cyclones have taken during the period from August 16 - August 29 for the years from 1950-2008. Figure 2 displays the August

16 – August 29 forecast period with respect to climatology. The August 16 – August 29 period is just prior to the most active portion of the climatological hurricane season.
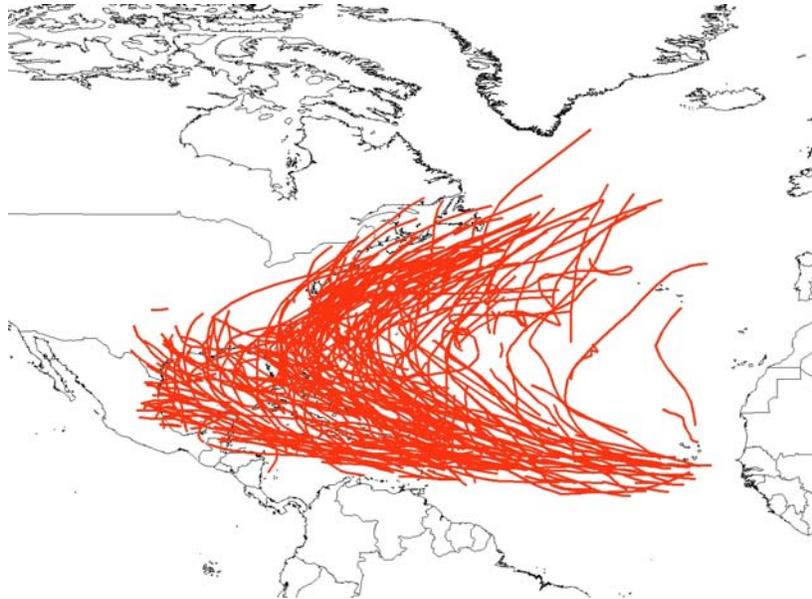

Figure 1: Tracks that named tropical cyclones have taken over the period from August 16 – August 29 for the years from 1950-2008.
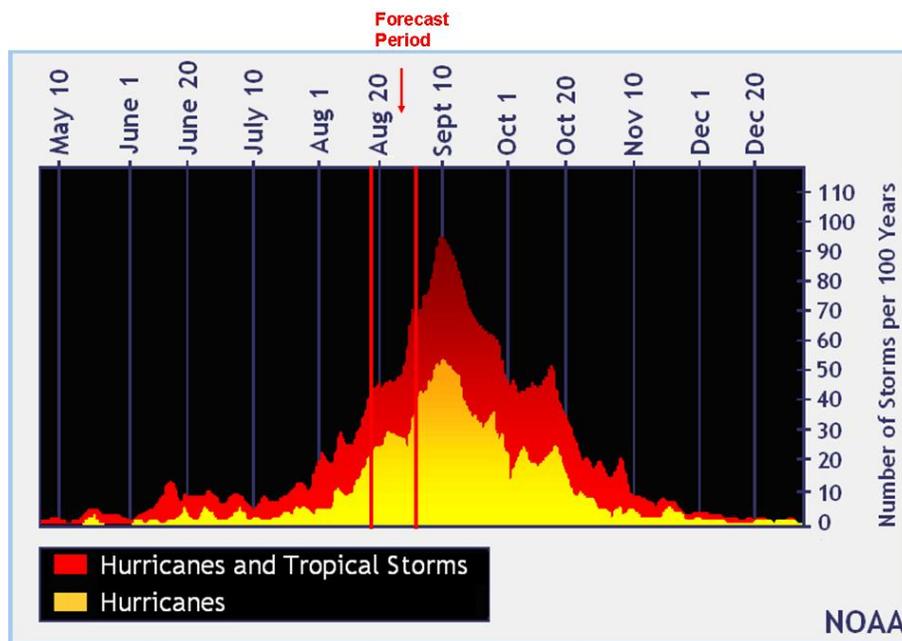

Figure 2: The current forecast period (August 16 – August 29) with respect to climatology. Figure courtesy of NOAA.

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 16 – August 29.

1) Current Storm Activity

Tropical Storm Erin is currently tracking westward across the eastern tropical Atlantic. Erin is likely to generate several ACE units before potentially weakening due to its encountering of a drier and more stable air mass.

2) National Hurricane Center Tropical Weather Outlook

The latest NHC Tropical Weather Outlook foresees a 50% chance for a tropical cyclone developing in the next 48 hours from an area of disturbed weather currently moving across the Yucatan Peninsula. If the area did develop, it would likely generate only small values of ACE before making landfall.

3) Global Model Analysis

Several global models indicate that development of a TC in the eastern Atlantic is possible in the 5-7-day timeframe. If this TC were to develop, it would have the potential to have a long track across the tropical Atlantic and in the process, generate significant levels of ACE.

4) Madden-Julian Oscillation

The Madden-Julian Oscillation is currently of a relatively weak magnitude and has been for the past several weeks (as indicated by the line being near the center of the circle) (Figure 3). The Global Forecast System (GFS), the European Centre for Medium-Range Weather Forecasts (ECMWF) model and the United Kingdom Met (UK Met) Office models all indicate that the MJO should amplify into Phase 1 in the next few days (Figure 4). Phase 1 of the MJO typically enhances TC activity in the Atlantic basin Table 2 displays the levels of TC activity observed over the Atlantic basin Main Development Region (MDR) given various MJO phases over the period from 1974-2007. Note the generally high levels of TC activity experienced in the Atlantic when the MJO is located in Phases 1.
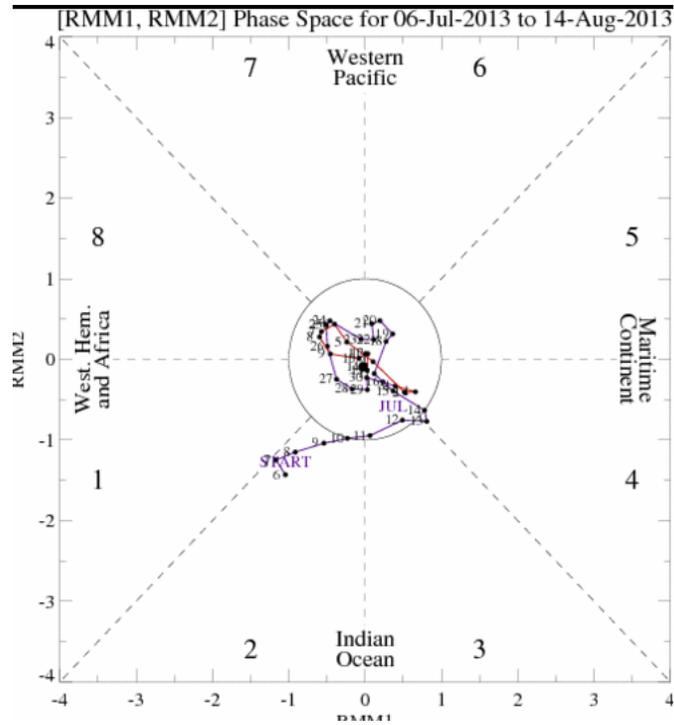
Figure 3: Estimated position of the MJO from July 6, 2013 through August 14, 2013. In general, the MJO index over the past few weeks has been near the center of the circle, indicative of weak MJO activity.
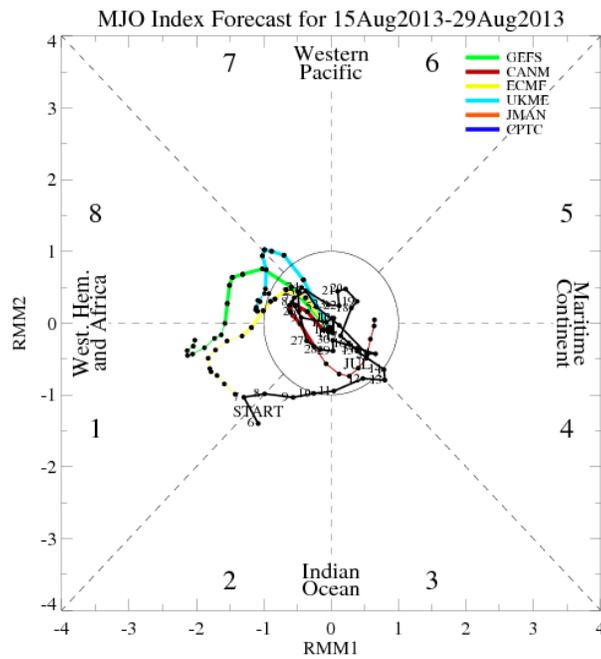

Figure 4: Model forecast for the MJO from August 15 through August 29.

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 utilize the seasonal forecast as a baseline for our two-week forecasts. Given the seasonal forecast as well as model output and the predicted phase of the MJO, we believe that the most likely scenario is above-average TC activity for the next two weeks.

3   Upcoming Forecasts

The next two-week forecast will be issued on August 30 for the August 30 – September 12 period. Additional two-week forecasts will be issued on September 13, September 27 and October 11.

VERIFICATION OF AUGUST 2 – AUGUST 15, 2013 FORECAST

The two-week forecast of tropical cyclone activity from August 2 – August 15 verified well. Activity at below-average levels was predicted (<=4 ACE units), while observed activity was at below-average levels (0.2 ACE units). The only TC that contributed to ACE during the two weeks was Tropical Storm Erin, which formed on August 15.