

**COLORADO STATE UNIVERSITY FORECAST OF ATLANTIC HURRICANE
ACTIVITY FROM AUGUST 30 – SEPTEMBER 12, 2013**

We expect that the next two weeks will be characterized by average amounts (70-130 percent) of activity relative to climatology.

(as of 30 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. We have decided to discontinue our individual monthly forecasts. 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 knots²) 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 average levels (70-130 percent of climatology). The average ACE accrued during the period from 1950-2010 from August 30-September 12 was 28 units, and consequently, our forecast for the next two weeks is for 20-37 ACE units to be generated.

The average forecast is due to several factors. Two areas are currently being watched for development in the next few days by the National Hurricane Center. The area currently moving off of the west African coast is given a moderate chance at development in the next 48 hours. The second area that bears watching is located in the central tropical Atlantic, but is only given a low chance of development over the next 48 hours. The Global Forecast System (GFS) is hinting at additional eastern Atlantic TC development in the one-to-two week timeframe.

The Madden-Julian Oscillation is forecast to remain at a relatively strong magnitude in Phases 1 and 2 for the next two weeks. These phases are typically associated with active periods for Atlantic basin tropical cyclone activity.

Figure 1 displays the tracks that tropical cyclones have taken during the period from August 30 - September 12 for the years from 1950-2008. Figure 2 displays the

August 30 – September 12 forecast period with respect to climatology. The August 30 - September 12 period is typically considered to be part of the most active part of the Atlantic hurricane season.

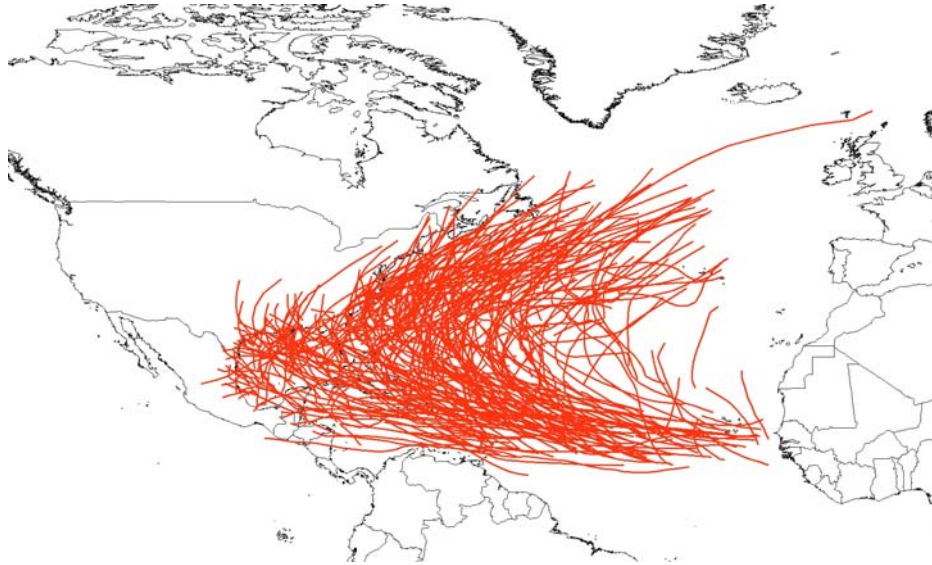


Figure 1: Tracks that named tropical cyclones have taken over the period from August 30 – September 12 for the years from 1950-2008.

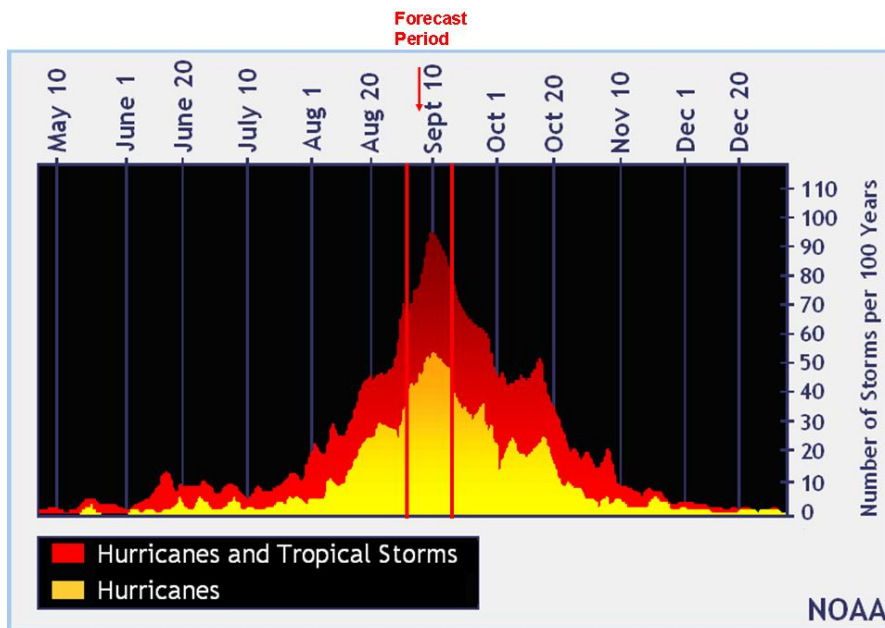


Figure 2: The current forecast period (August 30 – September 12) with respect to climatology. Figure courtesy of NOAA.

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 30 – September 12.

1) Current Storm Activity

No tropical cyclones are currently active in the Atlantic basin.

2) National Hurricane Center Tropical Weather Outlook

The latest NHC Tropical Weather Outlook gives an area in the eastern Atlantic a medium chance of development in the next 48 hours, while they give an area in the central Atlantic a low chance of development.

3) Global Model Analysis

Each system is developed by different global models, with the Canadian (CMC) and Navy (NAVGEM) models developing the central Atlantic system. The eastern Atlantic system is developed by the GFS and European Center for Medium Range Weather Forecast (ECMWF) models.

4) Madden-Julian Oscillation

The Madden-Julian Oscillation has been amplifying over the past few days and is currently located in Phase 1 (Figure 3). A prediction ensemble from various global dynamical models indicates that the MJO should remain at a fairly strong amplitude in Phases 1 and 2 for the next two weeks (Figure 4). Table 2 displays the levels of TC activity observed over the Atlantic basin given various MJO phases over the period from 1974-2007. Phases 1 and 2 are typically the two most active phases for Atlantic TC development.

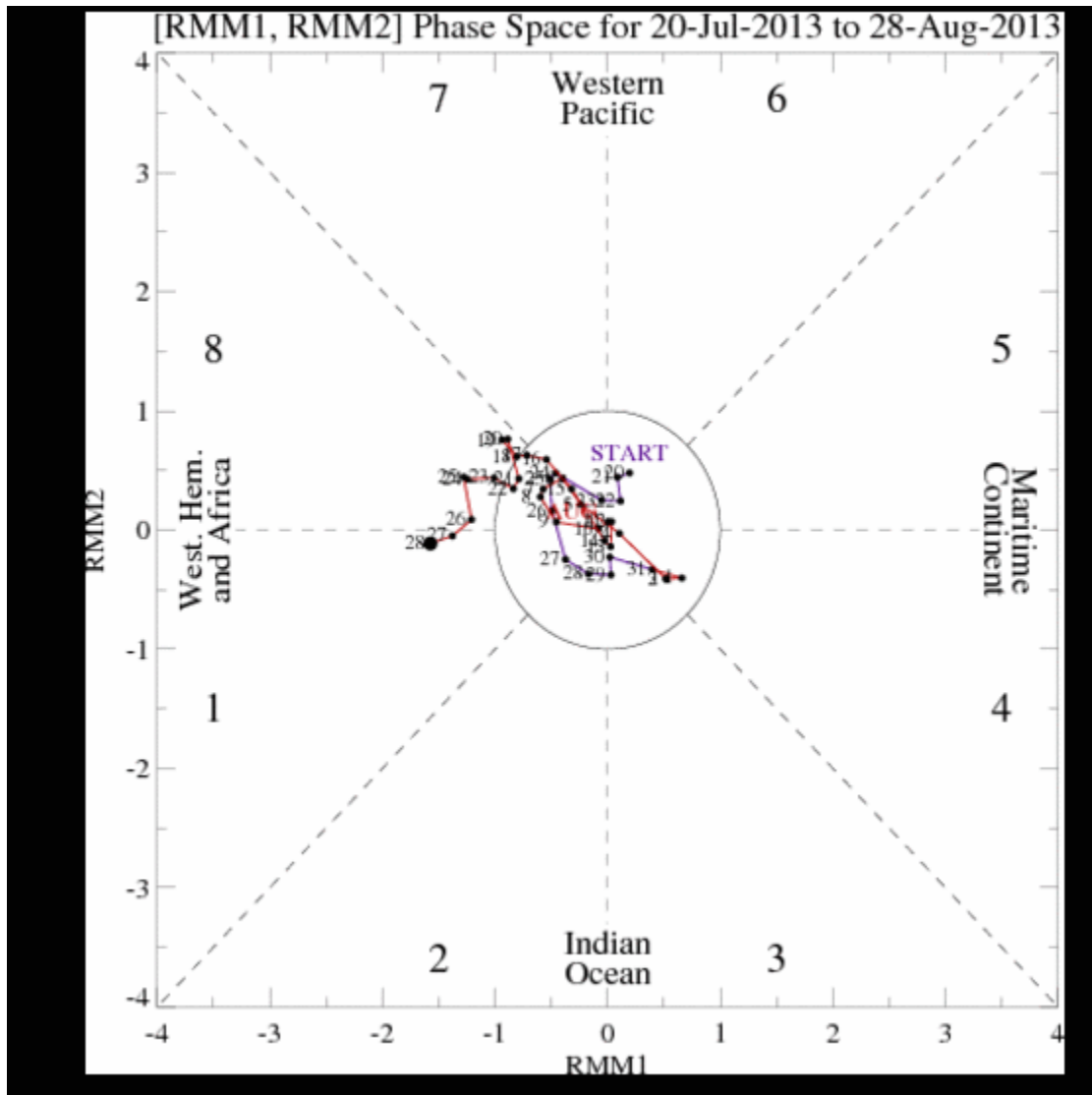


Figure 3: Estimated position of the MJO from July 20, 2013 through August 28, 2013.

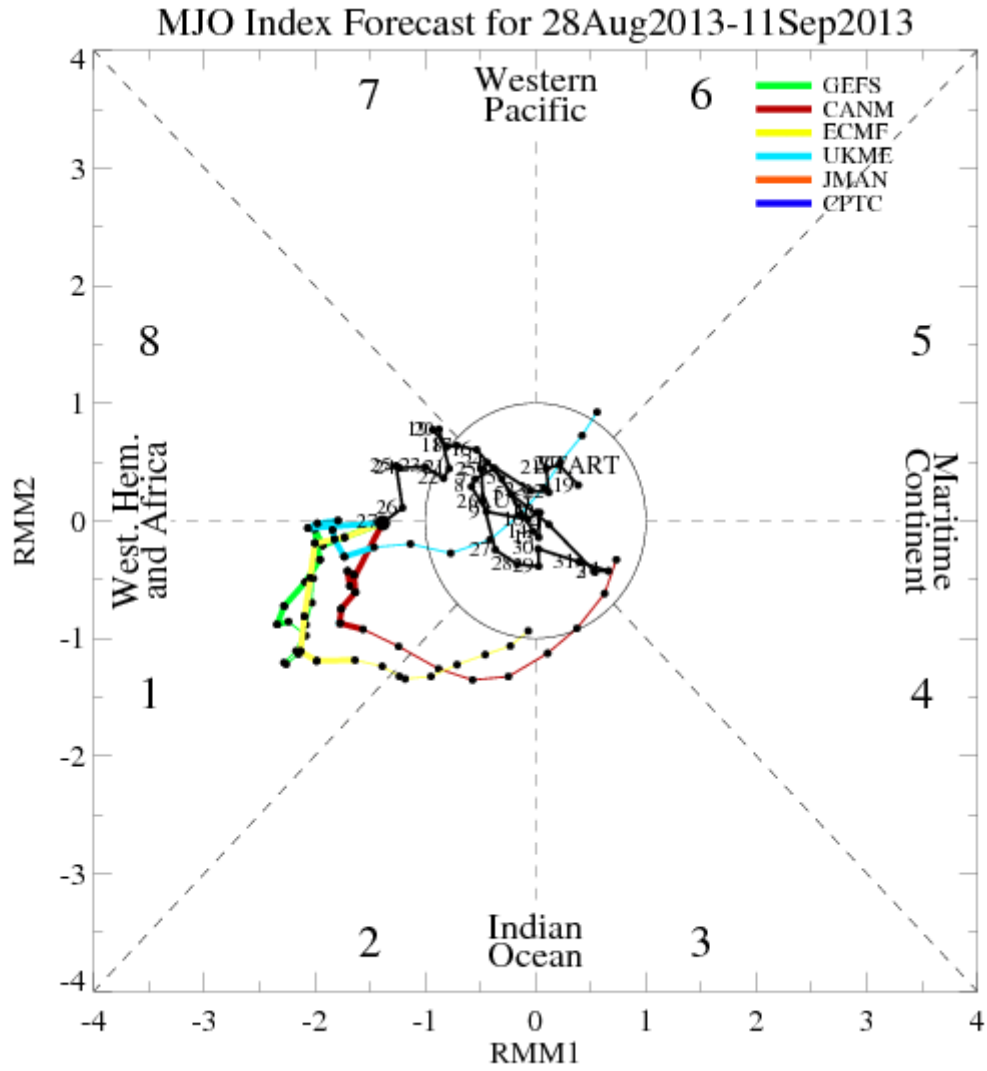


Figure 4: Model forecasts of the MJO from August 28 - September 11.

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 called for an active season. However, given the dearth of activity up to this point, we are hesitant to call for as much as activity during the next two weeks as we would otherwise given the favorable MJO conditions that are being predicted.

3 Upcoming Forecasts

The next two-week forecast will be issued on September 13 for the September 13 - September 26 period. Additional two-week forecasts will be issued on September 27 and October 11.

VERIFICATION OF AUGUST 16 – AUGUST 29, 2013 FORECAST

The two-week forecast of tropical cyclone activity from August 16 – August 29 did not verify well. Activity at above-average levels was predicted (≥ 19 ACE units), while observed activity was at well below-average levels (2 ACE units). Two systems contributed to ACE during the August 17 – August 30 period. Tropical Storm Erin and Fernand contributed small amounts of ACE.

The primary reason why the forecast during the two weeks was a bust was due to the fact that the MJO took a much longer time to amplify into hurricane-conducive conditions than was predicted by the global models in the middle part of August (Figure 3 and 5). In addition, vertical shear has been much stronger over most of the tropical Atlantic than expected with the seasonal forecast issued in early August. Anomalously dry air at mid-levels in the atmosphere has also tended to be present for the past few weeks.

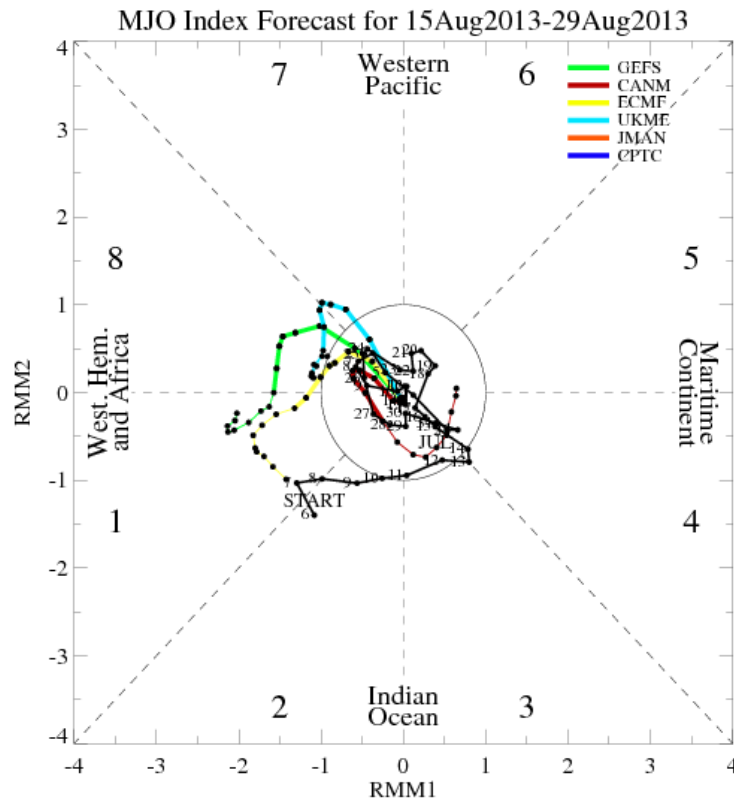


Figure 5: Predicted MJO propagation from August 15 - August 29. The MJO was predicted to propagate into TC-conducive MJO Phase 1 conditions by around August 20. This amplification and propagation took about ten days longer than forecast by the models.