

**COLORADO STATE UNIVERSITY FORECAST OF ATLANTIC HURRICANE
ACTIVITY FROM SEPTEMBER 28 – OCTOBER 11, 2011**

We expect that the next two weeks will be characterized by below-average amounts (less than 70 percent) of hurricane activity relative to climatology. These new two-week forecasts have replaced the monthly forecasts that we have been issuing in recent years.

(as of 28 September 2011)

By Philip J. Klotzbach¹ and William M. Gray²

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

Department of Atmospheric Science
Colorado State University
Fort Collins, CO 80523
Email: amie@atmos.colostate.edu

¹ Research Scientist

² Professor Emeritus of Atmospheric Science

1 Introduction

This is the third year that we have issued shorter-term forecasts of tropical cyclone (TC) 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 below-average levels (less than 70 percent of climatology). The average ACE accrued during the period from 1950-2010 from September 28-October 11 was 12 units, and consequently, our forecast for the next two weeks is for less than 9 ACE units to be generated.

The below-average forecast is due to several factors. Tropical Storm Philippe is likely to weaken over the next several days, generating little ACE in the process. The remnants of Ophelia are likely to redevelop, with the potential for some intensification; however, ACE generation will probably be limited for this system as well. No other areas are being monitored for development by the National Hurricane Center. Neither the GFS nor the ECMWF develop any other TCs for the next seven days.

The MJO has been intensifying over the past few days, and most global models predict continued intensification with some eastward propagation over the next several days. The MJO is likely to be in phases that are typically not favorable for Atlantic TC formation (Phases 5-7) for the next ten days. The Climate Prediction Center's latest update indicates agreement with this particular assessment.

Figure 1 displays the tracks that tropical cyclones have taken during the period from September 28 – October 11 for the years from 1950-2008. Figure 2 displays the September 28 – October 11 forecast period with respect to climatology. The September 28 – October 11 period typically witnesses a shift of activity from the Main Development Region more towards the Caribbean.

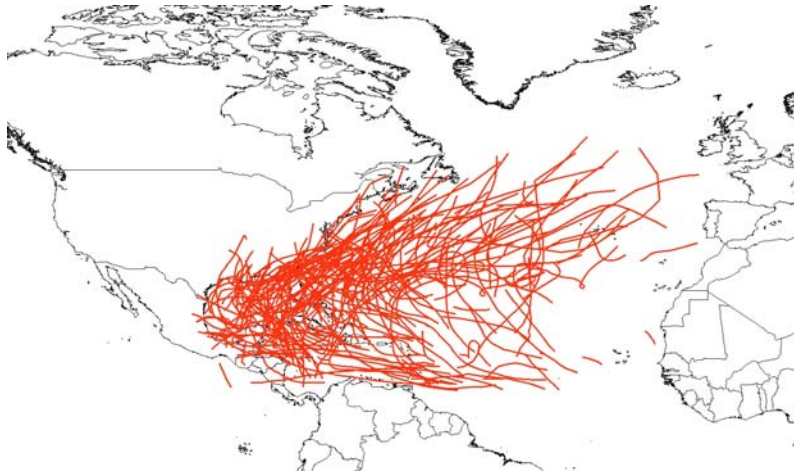


Figure 1: Tracks that named tropical cyclones have taken over the period from September 28 – October 11 for the years from 1950-2008.

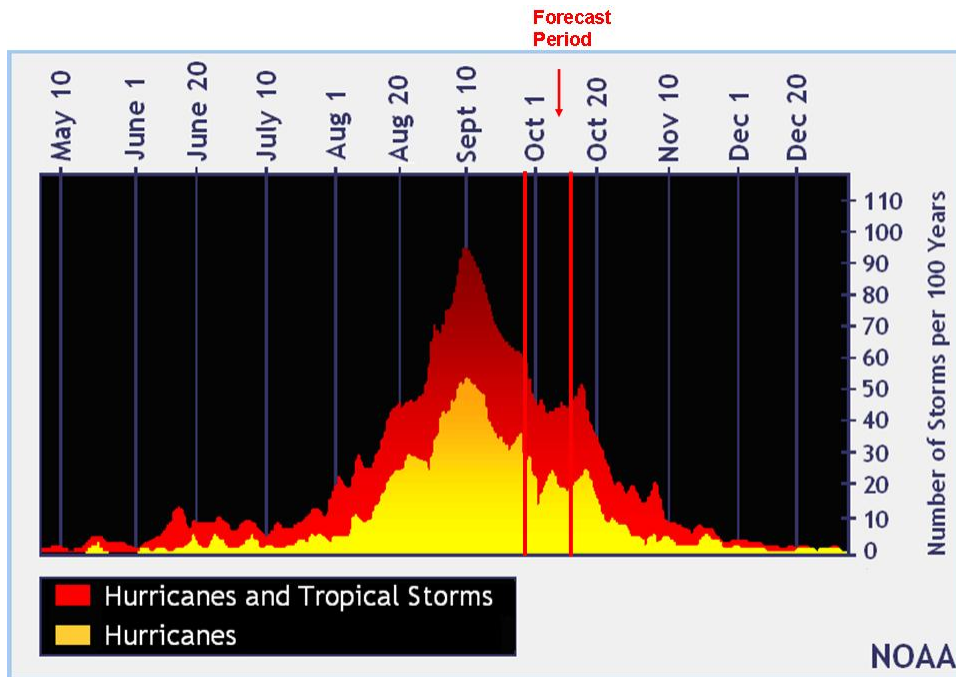


Figure 2: The current forecast period (September 28 – October 11) with respect to climatology. Figure courtesy of NOAA.

We now examine how we believe each of the five factors discussed in the introduction will impact Atlantic TC activity for the period from September 28 – October 11.

1) Current Storm Activity

Tropical Storm Philippe is predicted to weaken while tracking northwestward over the next several days. ACE generation from this system is likely to be minimal.

2) National Hurricane Center Tropical Weather Outlook

The National Hurricane Center believes that the remnants of Ophelia are likely to regenerate in the next 48 hours. The models are relatively enthusiastic with the intensification likelihood for Ophelia. However, the system is predicted to track northward and dissipate 4-5 days from now. Consequently, ACE generation from Ophelia is probably going to be small.

3) Global Model Analysis

Neither the GFS nor the ECMWF develop any other systems (besides Ophelia) over the next seven days.

4) Madden-Julian Oscillation

The Madden-Julian Oscillation has recently been intensifying (Figure 3). The Climate Prediction Center's outlook for the next two weeks is that the MJO will likely continue to intensify and propagate eastward. The ensemble Global Forecast System (GFS) (Figure 4) and European Centre for Medium-Range Weather Forecasts (ECMWF) (Figure 5) both predict some intensification and eastward propagation of the MJO. The MJO will likely be in Phases 5-7 for the next ten days, which are typically associated with reduced TC activity in the Atlantic. Phase 8 of the MJO is associated with enhanced activity in the Caribbean basin, so there is the potential for formation in the western Caribbean towards the end of the two-week forecast period. Table 2 displays the levels of TC activity observed over the Atlantic basin given various MJO phases over the period from 1974-2007.

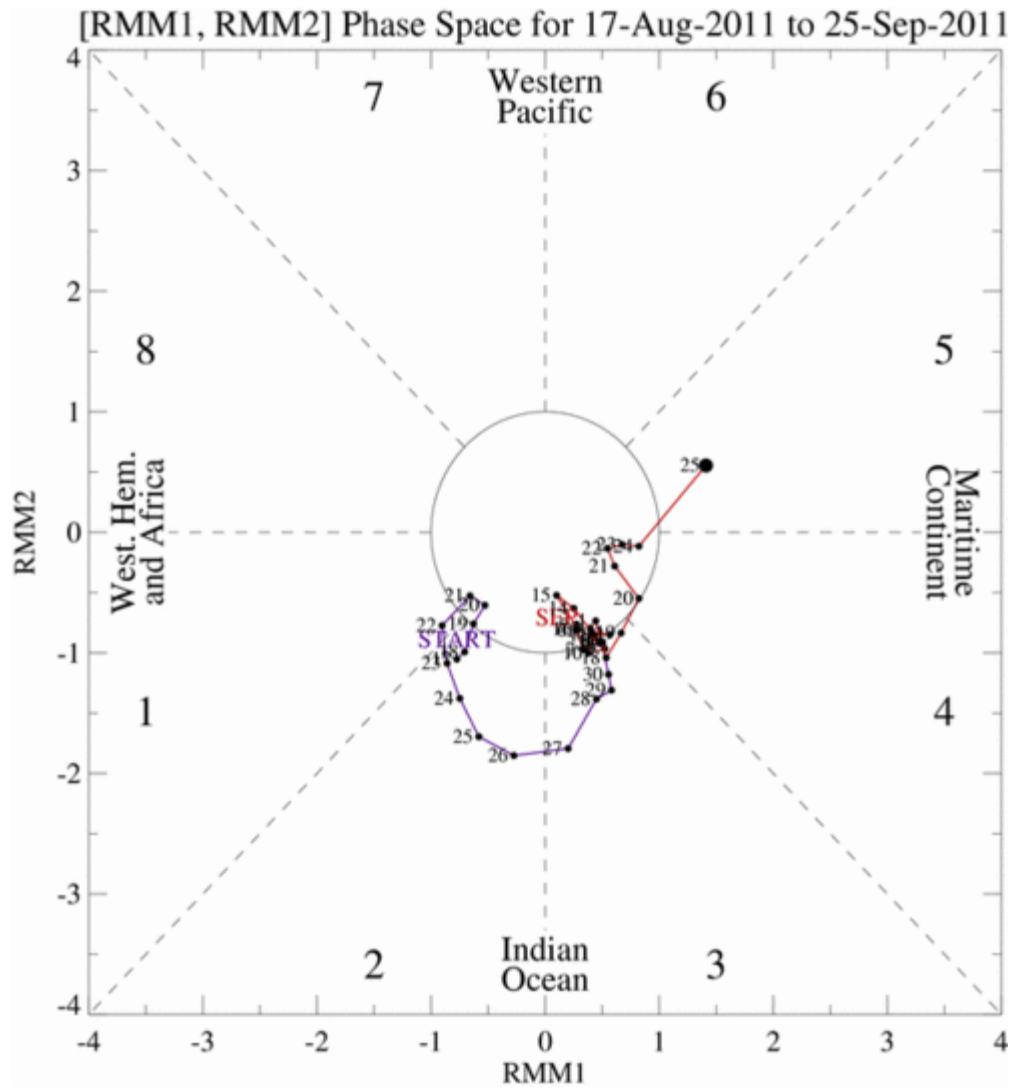


Figure 3: Estimated position of the MJO from August 17, 2011 through September 25, 2011.

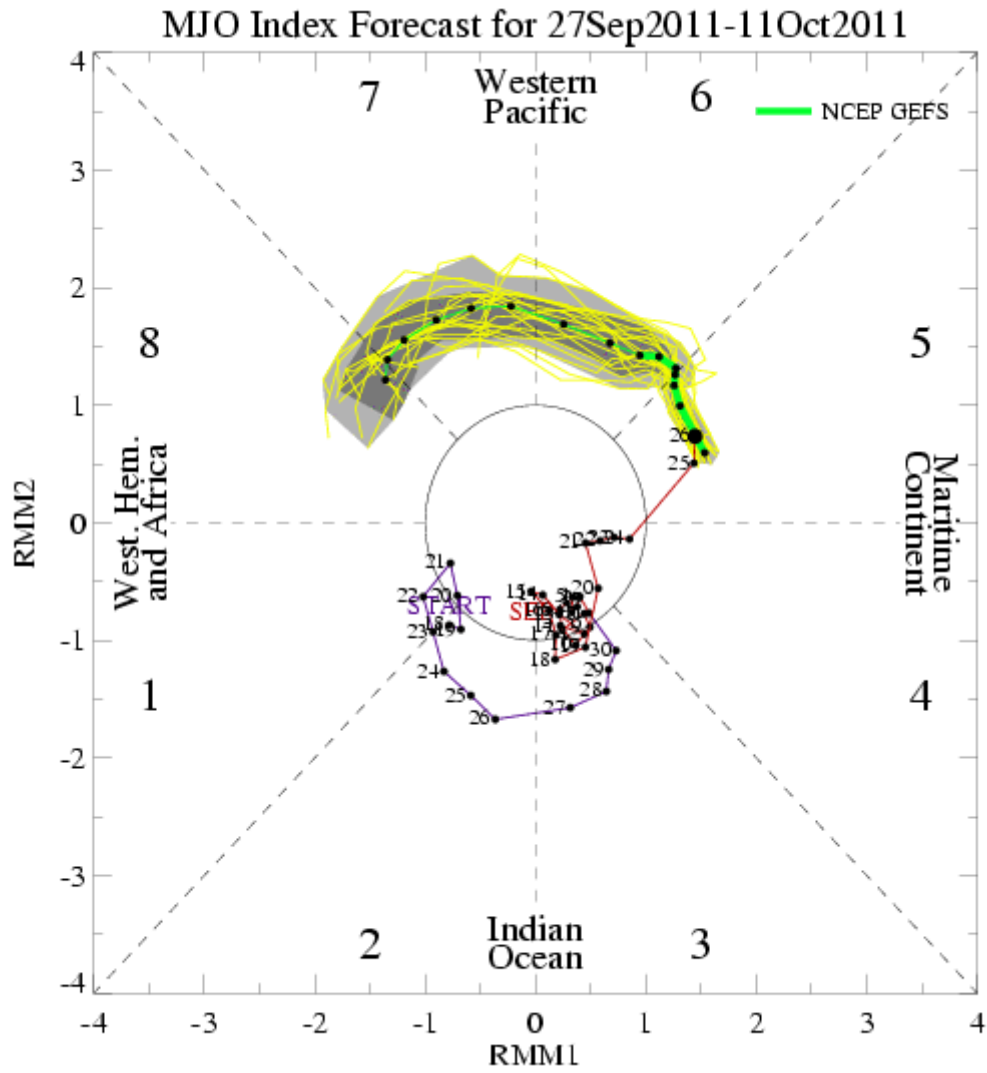


Figure 4: GFS model forecast for the MJO from September 27 – October 11.

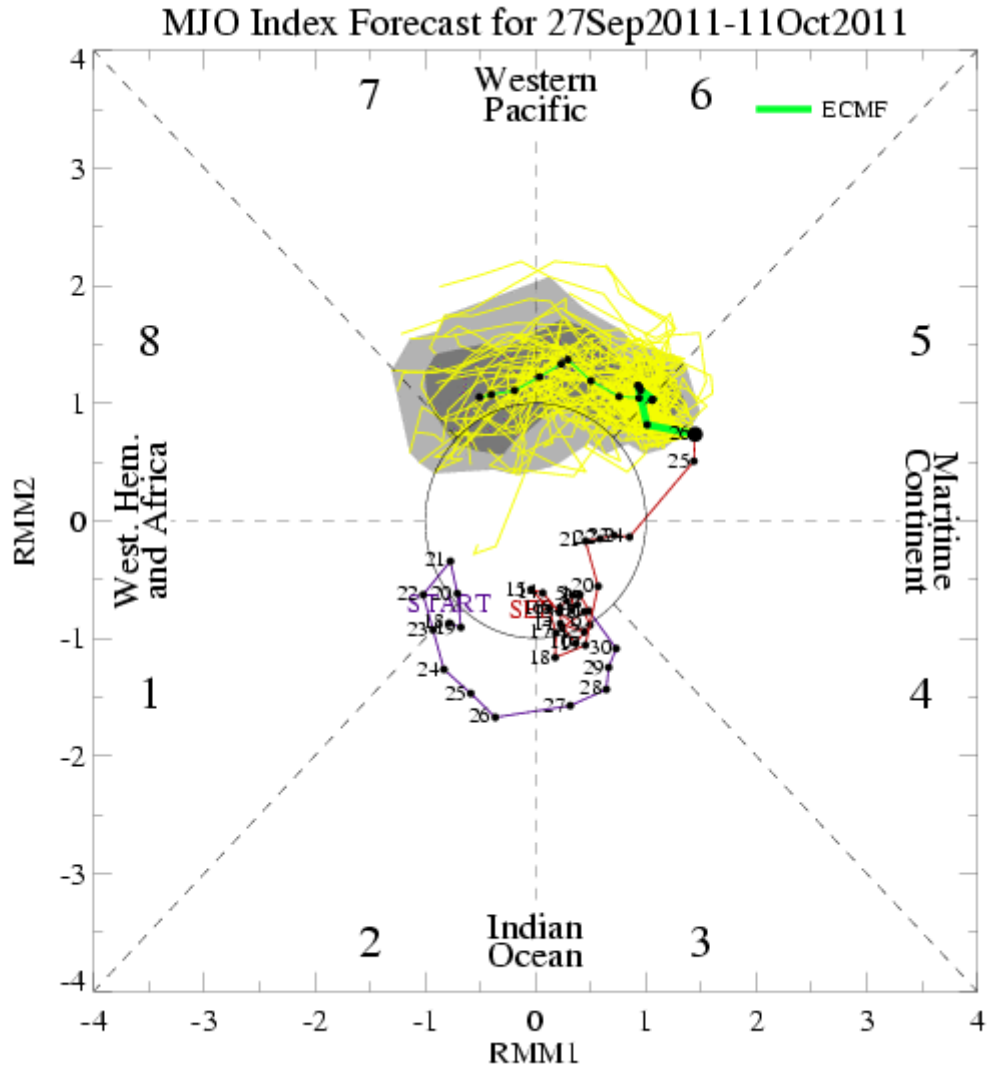


Figure 5: ECMWF model forecast for the MJO from September 27 through October 11.

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 calls for a well above-average season. We utilize the seasonal forecast as a baseline for our two-week forecasts. At this point, it appears likely that our seasonal forecast was an over-forecast, and consequently, we are putting more stock in currently-observed conditions.

3 Upcoming Forecasts

The final two-week forecast will be issued on October 12 for the period from October 12 – October 25. All two-week forecasts will be verified in greater detail with our seasonal forecast verification in late November.

VERIFICATION OF SEPTEMBER 14 – SEPTEMBER 27, 2011 FORECAST

The two-week forecast of tropical cyclone activity from September 14- September 27 verified well. Activity at below-average levels (<70% of normal) was predicted (<=15 ACE units), and observed activity was at below-average levels (11 ACE units). Hurricane Maria and Tropical Storms Ophelia and Philippe contributed to the ACE generated during this two-week period.