

**COLORADO STATE UNIVERSITY FORECAST OF ATLANTIC HURRICANE
ACTIVITY FROM OCTOBER 13 – OCTOBER 26, 2017**

We expect that the next two weeks will be characterized by above-normal hurricane activity.

(as of 13 October 2017)

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In Memory of William M. Gray³

This discussion as well as past forecasts and verifications are available online at <http://tropical.colostate.edu>

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1 Introduction

This is the ninth 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.

Our forecast definition of above-normal, normal, and below-normal ACE periods has been changed to better fit, in our view, the observed historical distributions. Our ACE forecasts are now defined by ranking observed activity in the satellite era (since 1966) and defining above-normal, normal and below-normal two-week periods based on terciles. Since there are 51 years from 1966-2016, each tercile is composed of 17 years. The 17 years with the most active ACE periods from October 13 - 26 are classified as the upper tercile, the 17 years with the least active ACE periods from October 13 - 26 are classified as the lower tercile, while the remaining 17 years are classified as the middle tercile.

Table 1: ACE forecast definition for TC activity for October 13 - 26, 2017

Parameter	Definition
Above-Normal	Upper Tercile (≥ 9 ACE)
Normal	Middle Tercile (1-8 ACE)
Below-Normal	Lower Tercile (0 ACE)

2 Forecast

We believe that the next two weeks will be characterized by activity at above-normal levels (≥ 9 ACE). The primary reason for this above-normal forecast is due to Hurricane Ophelia. Ophelia is likely to generate 5-8 ACE before becoming extra-tropical. The National Hurricane Center has a low potential for a TC developing in the central subtropical Atlantic over the next five days. Some global models are also hinting at potential tropical development in the subtropical central Atlantic next week.

The Madden-Julian Oscillation (MJO) is forecast to be in phases 5-6 over the next two weeks. These phases tend to be associated with increased vertical wind shear in the tropical Atlantic and Caribbean, suppressing hurricane formation.

Figure 1 displays the formation locations of tropical cyclones from October 13 - October 26 for the years from 1966-2015, along with the maximum intensities that these storms reached. Figure 2 displays the October 13 - October 26 forecast period with respect to climatology. This period typically marks the end of the active portion of the Atlantic hurricane season. The primary threat area for major hurricane activity during the late season is in the western Caribbean.

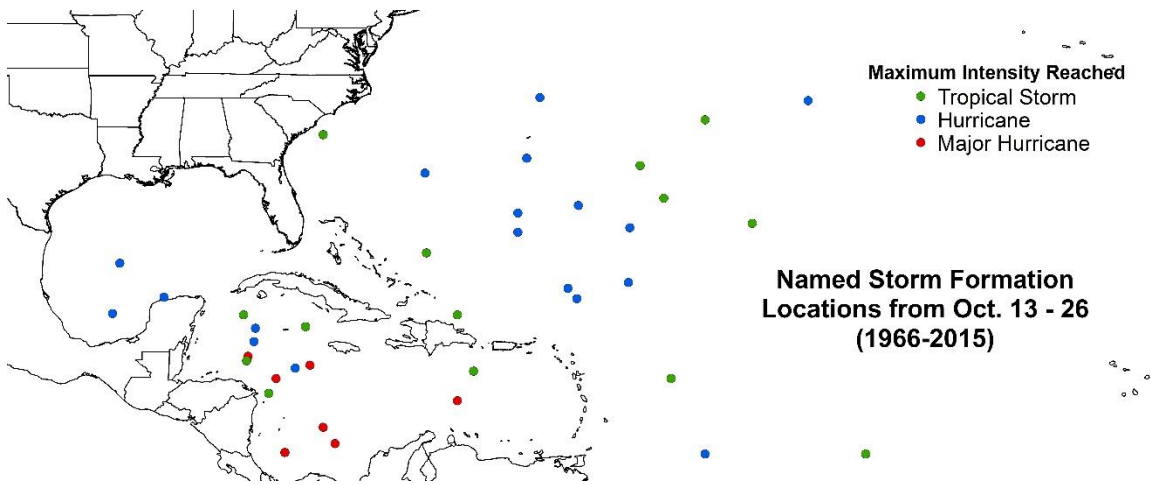


Figure 1: Formation location for all tropical cyclones that formed from October 13-26 in the Atlantic during the period from 1966-2015.

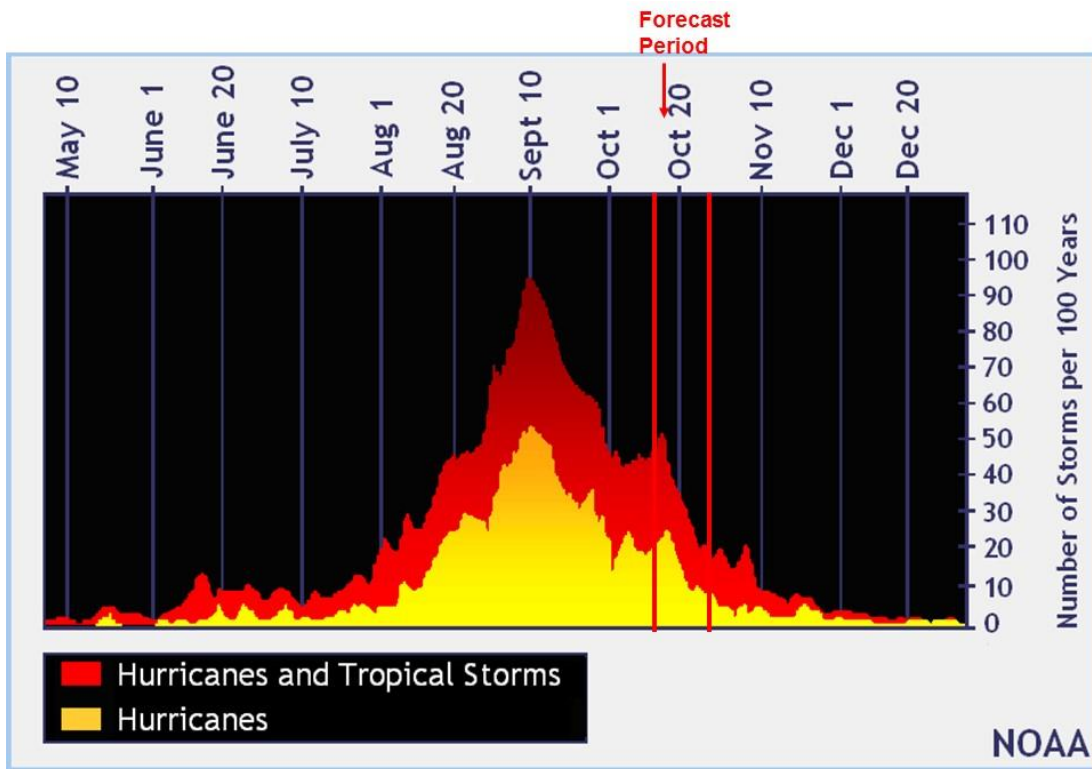


Figure 2: The current forecast period (October 13 – October 26) with respect to climatology. Figure courtesy of NOAA.

We now examine how we believe each of the five factors discussed in the introduction will impact Atlantic TC activity for the period from October 13 – October 26.

1) Current Storm Activity

Hurricane Ophelia is likely to generate 5-8 additional ACE units before becoming extra-tropical as it tracks towards western Europe.

2) National Hurricane Center Tropical Weather Outlook

The National Hurricane Center gives a low probability for TC development in the next five days in the subtropical central Atlantic.

3) Global Model Analysis

Both the GFS and ECMWF hint at potential TC development in the subtropical central Atlantic during the middle of next week.

4) Madden-Julian Oscillation

The ECMWF model forecasts that the MJO index, as classified by the Wheeler-Hendon index, is likely to be in phases 5-6 over the next two weeks (Figure 3). The Climate Forecast System also is predicting similar MJO propagation, and as such, is calling for hurricane-suppressing anomalously strong vertical wind shear across the tropical Atlantic and Caribbean over the next ten days (Figure 4). Table 2 displays normalized TC activity generated when the MJO is in particular phases based on data from 1974-2007.

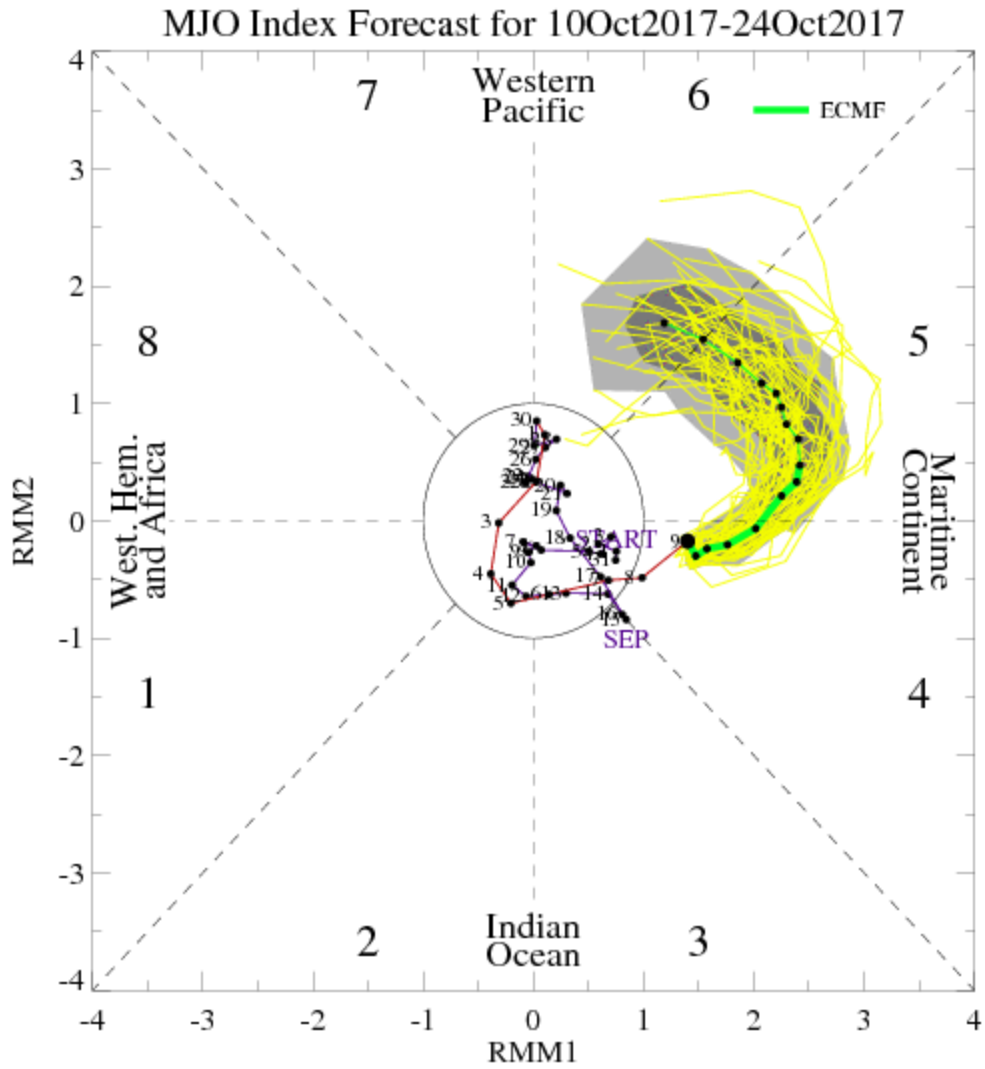


Figure 3: Forecast position of the MJO from October 10, 2017 to October 24, 2017 by the ECMWF model.

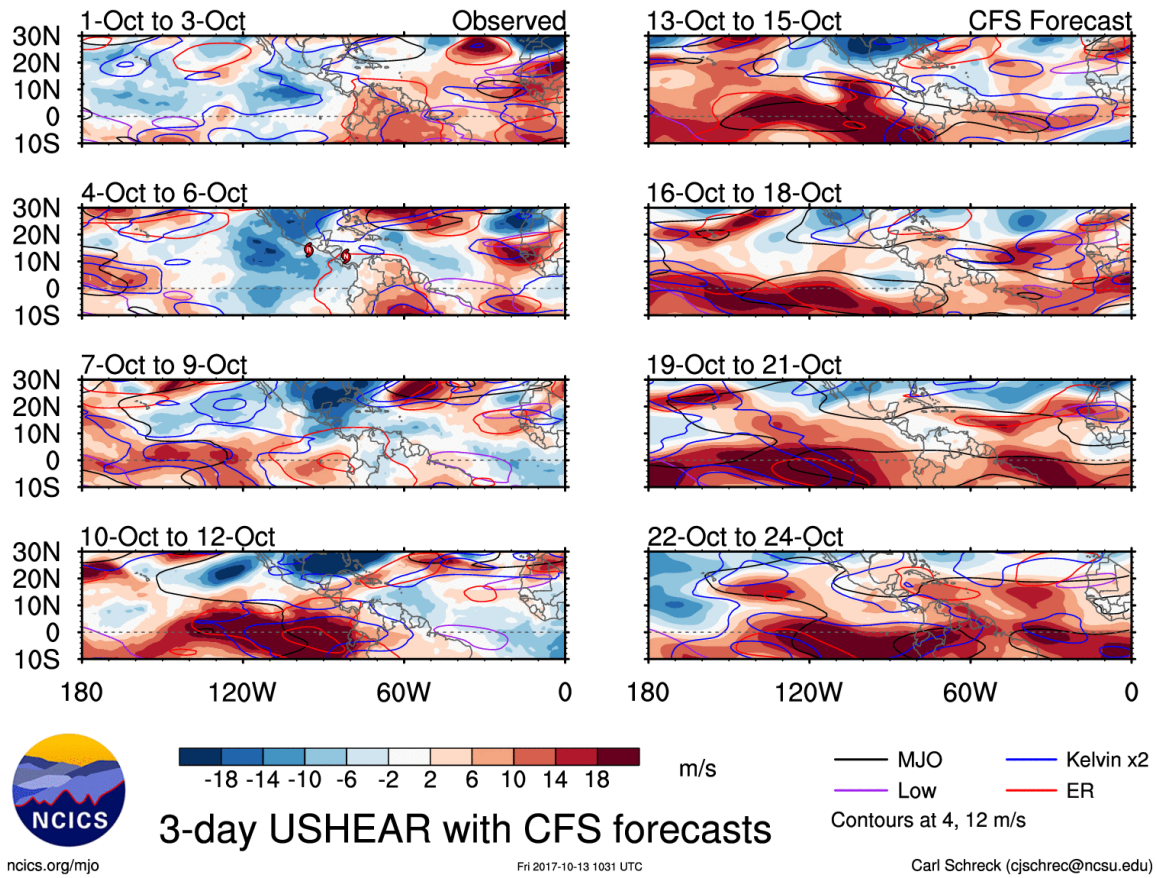


Figure 4: Observed and predicted anomalous 200 minus 850 hPa vertical wind shear from the Climate Forecast System through October 24.

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 Atlantic is currently experiencing one of the most active Atlantic hurricane seasons on record, and we anticipate a continuation of above-normal activity for the next two weeks. The primary reason for the above-normal hurricane activity predicted over the next two weeks is due to Hurricane Ophelia generating considerable ACE before dissipation. Other than that, MJO-associated anomalously strong vertical wind shear should suppress TC formation in the Caribbean, where most strong hurricanes develop at this time of year.

VERIFICATION OF SEPTEMBER 29 – OCTOBER 12, 2017 FORECAST

The two-week forecast of tropical cyclone activity from September 29 – October 12, 2017 correctly verified in the above-normal category. 9 ACE units were required to correctly verify in the above-normal category, and 13 ACE were observed. The ACE that was observed during the two-week period was generated by Lee, Maria, Nate and Ophelia.