

**COLORADO STATE UNIVERSITY FORECAST OF ATLANTIC HURRICANE  
ACTIVITY FROM OCTOBER 15–28, 2019**

We expect that the next two weeks will be characterized by near average amounts of hurricane activity.

(as of 15 October 2019)

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In Memory of William M. Gray<sup>4</sup>

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 11th 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 Accumulated Cyclone Energy (ACE) periods are defined by ranking observed activity in the satellite era from 1966-2016 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 15–28 are classified as the upper tercile, the 17 years with the least active ACE periods from October 15–28 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 15–28, 2019

Parameter	Definition
Above-Normal	Upper Tercile ( $\geq 7$ ACE)
Normal	Middle Tercile (1–6 ACE)
Below-Normal	Lower Tercile ( $< 1$ ACE)

# 2 Forecast

We believe that the next two weeks will be characterized by activity at near-normal levels (1–6 ACE). Tropical Depression 15 may develop into a tropical storm later today, but even if that occurs, it would generate very little ACE before encountering much colder sea surface temperatures (SSTs) and higher vertical wind shear. The National Hurricane Center has two areas with a low potential of development in the next five days, but both of these areas are in relatively marginal environments that should prevent significant intensification. None of the global models indicate other significant development in the next 10 days. Vertical wind shear is forecast to be near- to somewhat above-average across most of the tropical Atlantic and Caribbean, which should suppress significant tropical cyclone development. We note that all that is needed to reach the normal ACE in the next two weeks is one weak named storm, since only 1 ACE is required to reach this category.

The Madden-Julian Oscillation (MJO) is forecast to propagate through phases 1-2 in the next two weeks. However, as has been noted in the past couple of NOAA weekly discussions, the MJO signal is likely somewhat contaminated by a positive Indian Ocean

Dipole (IOD) event. The forecast large-scale environment does not look particularly conducive for an active two-week period.

Figure 1 displays the formation locations of tropical cyclones from October 15–28 for the years from 1966–2018 (e.g., the satellite era), along with the maximum intensities that these storms reached. Figure 2 displays the October 15–28 forecast period with respect to climatology. All systems becoming major hurricanes during the satellite era have formed in the western Caribbean.

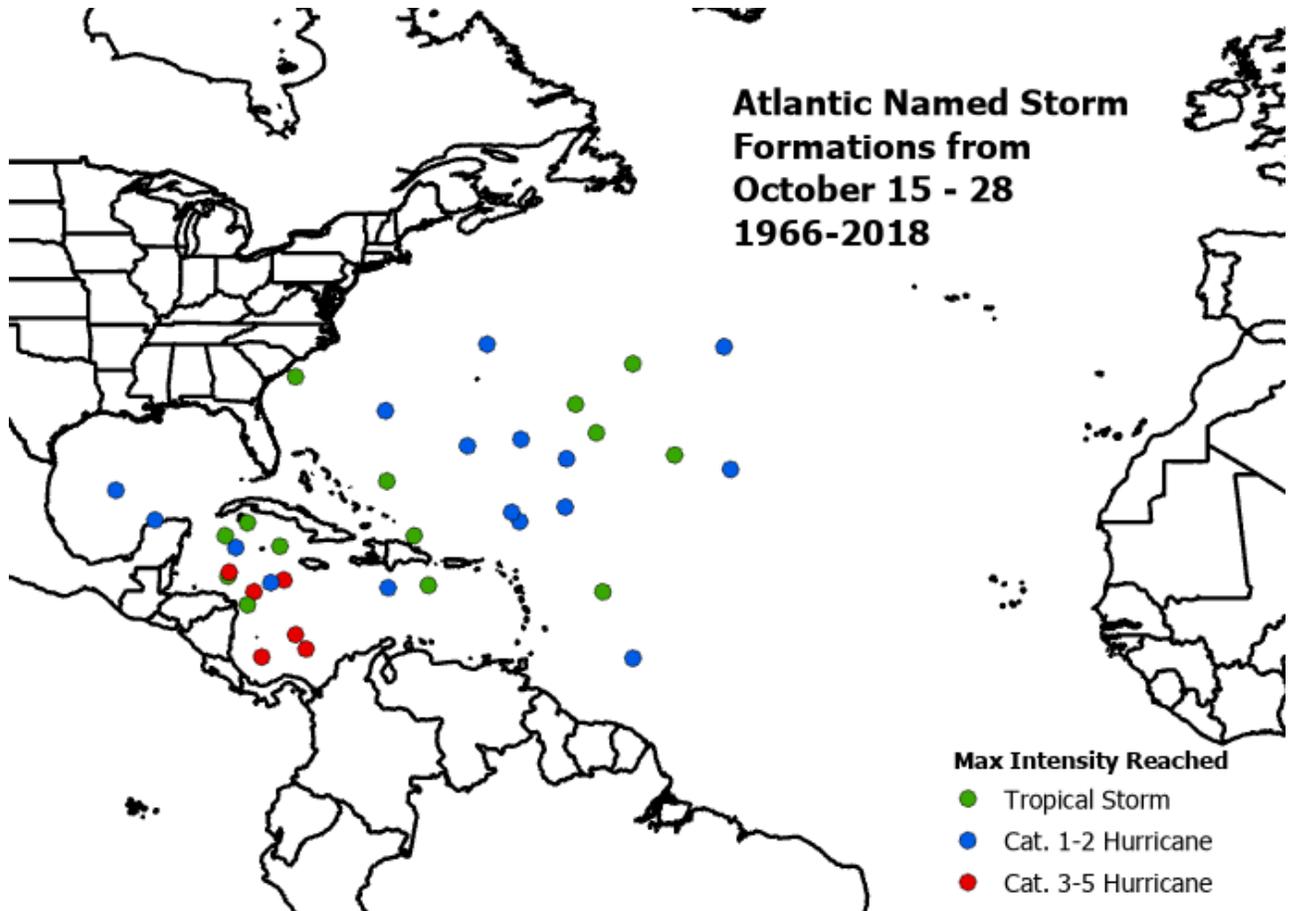


Figure 1: Atlantic named storm formations from October 15–28 during the years from 1966-2018 and the maximum intensity that these named storms reached.

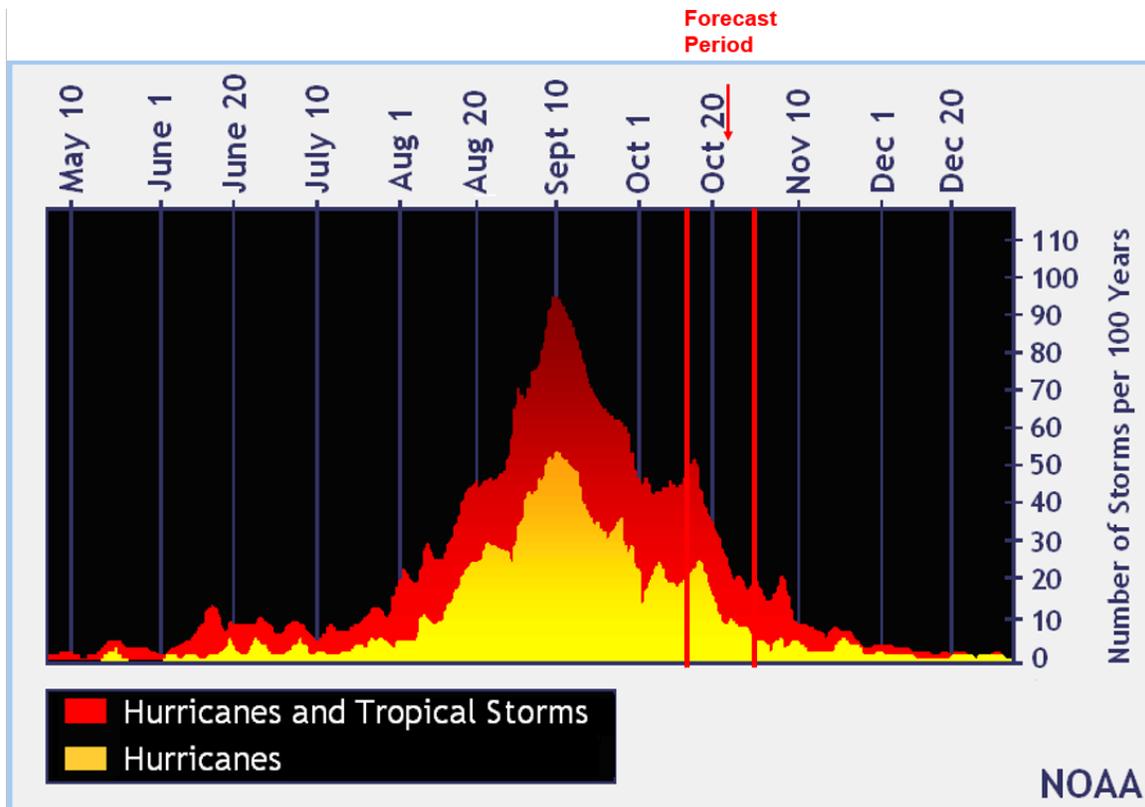


Figure 2: The current forecast period (October 15–28) with respect to climatology. Figure courtesy of NOAA.

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 15–28.

### 1) Current Storm Activity

Tropical Depression 15 may become a named storm later today, but if it does, it would likely generate very little ACE before encountering much stronger shear and cooler SSTs tomorrow.

### 2) National Hurricane Center Tropical Weather Outlook

The latest NHC Tropical Weather Outlook has two areas with a low probability of TC formation in the next five days. The area approaching the Lesser Antilles is likely to be sheared apart shortly, while the area currently located over the western Caribbean has a better chance of development in the western Gulf of Mexico. However, upper-level winds do not particularly conducive for significant development of this system either.

### 3) Global Model Analysis

None of the reliable global models indicate any other significant TC development in the next week.

#### 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 potentially track through phases 1-2 in the next two weeks (Figure 3), which is typically associated with more active periods for Atlantic hurricane activity. However, as has been noted in the past couple of NOAA weekly discussions, the MJO signal is likely somewhat contaminated by a positive Indian Ocean Dipole (IOD) event. The forecast large-scale environment does not look particularly conducive for an active two-week period (Figure 4), with near-to above-normal vertical wind shear predicted across most of the tropical Atlantic and portions of the Caribbean over the next 12 days. While below-average vertical wind shear is predicted for the Gulf of Mexico, vertical wind shear is typically quite strong there this time of year, so even anomalously weak vertical wind shear is relatively strong.

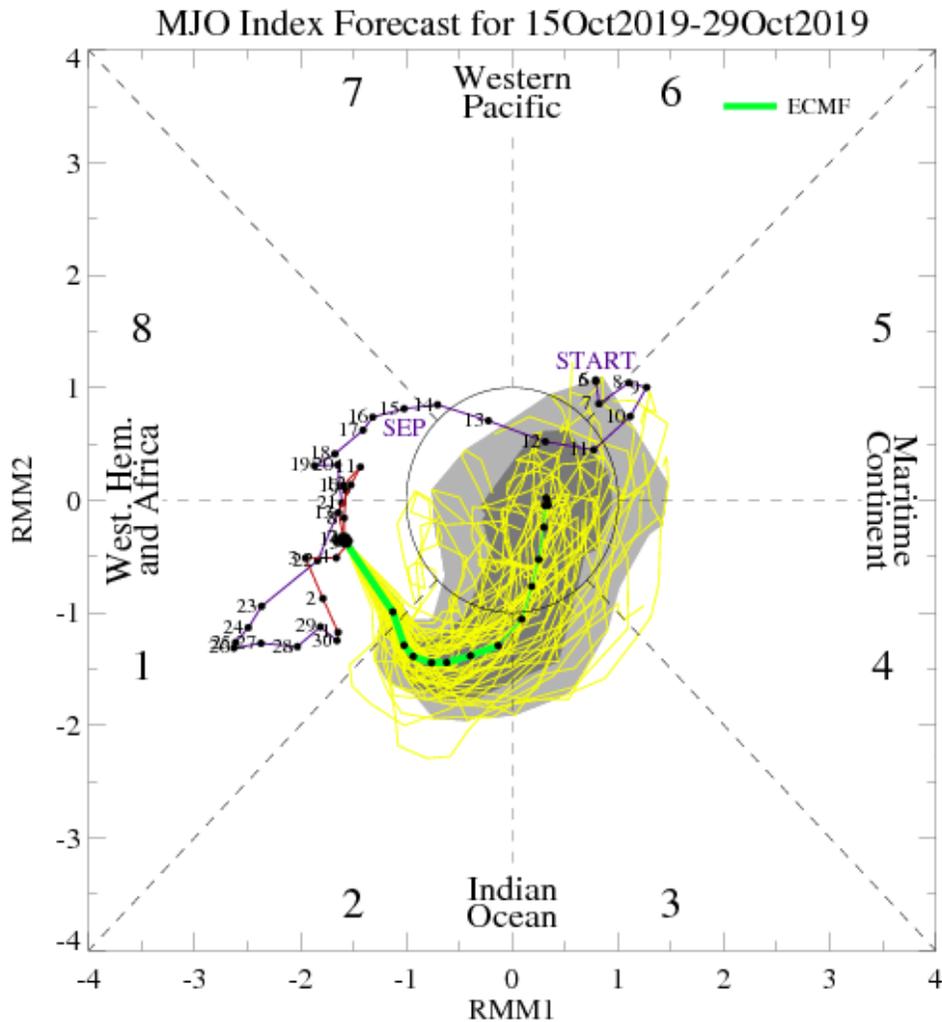


Figure 3: Predicted propagation of the MJO by the ECMWF model.

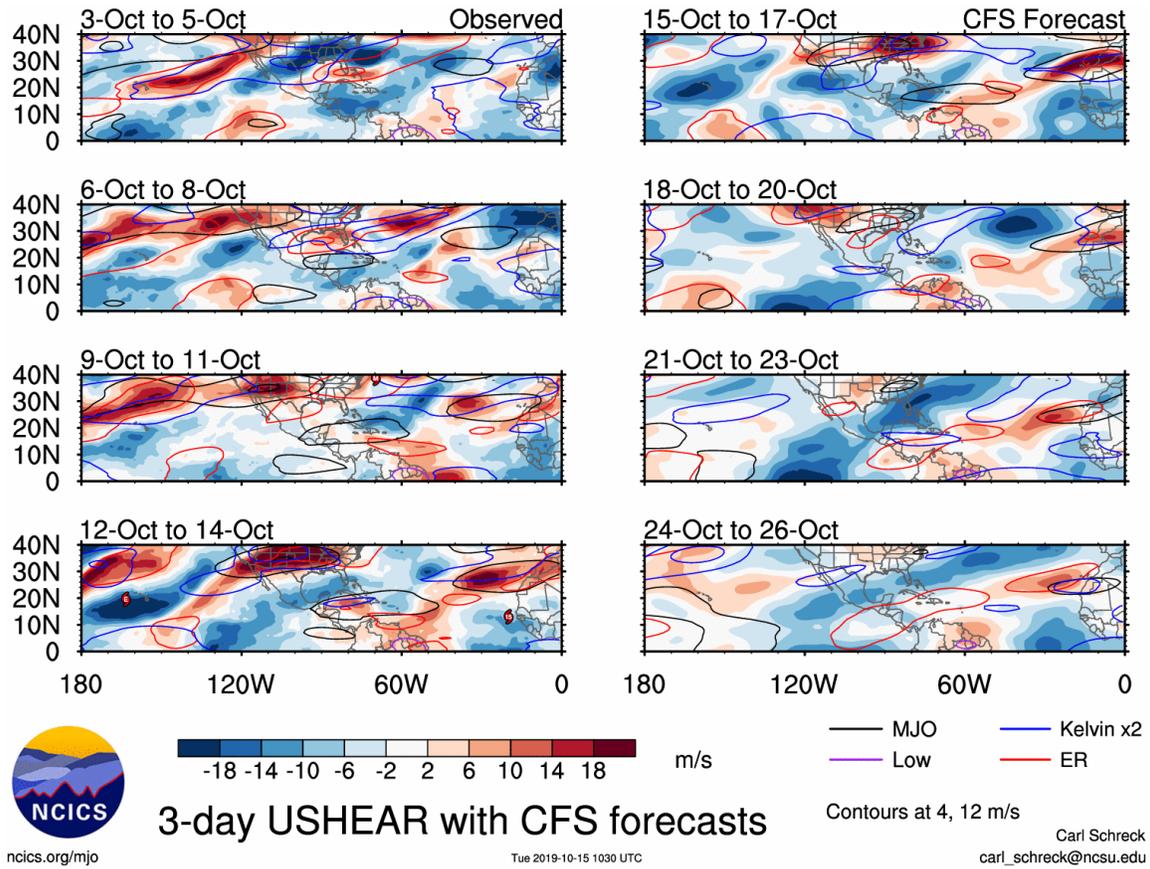


Figure 4: Observed and predicted anomalous 200 minus 850 hPa vertical wind shear from the Climate Forecast System through October 26. Figure courtesy of Carl Schreck.

### 5) Seasonal Forecast

The most recent seasonal forecast calls for a near-average season. We believe that the next two weeks will be in keeping with this seasonal forecast.

## **VERIFICATION OF OCTOBER 1–14, 2019 FORECAST**

The two-week forecast of tropical cyclone activity from October 1–14, 2019 just missed verifying in the correct category. We predicted above-normal ACE ( $>7$  ACE), while 6.6 ACE were observed. Hurricane Lorenzo and Tropical Storm Melissa were responsible for the ACE generated during the period.