

**COLORADO STATE UNIVERSITY FORECAST OF ATLANTIC HURRICANE
ACTIVITY FROM SEPTEMBER 3-16, 2019**

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

(as of 3 September 2019)

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In Memory of William M. Gray⁴

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 is 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 September 3–16 are classified as the upper tercile, the 17 years with the least active ACE periods from September 3–16 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 September 3–16, 2019.

Parameter	Definition
Above-Normal	Upper Tercile (>35 ACE)
Normal	Middle Tercile (11–35 ACE)
Below-Normal	Lower Tercile (<11 ACE)

2 Forecast

We believe that the next two weeks will be characterized by activity at above-normal levels (>35 ACE). Hurricane Dorian is currently a category two hurricane and is likely to generate 10-15 ACE before dissipation. Tropical Depression 7 is currently situated in the southern Gulf of Mexico but would only generate minimal ACE if it gets named before making landfall in Mexico. The National Hurricane Center is monitoring three other areas for potential TC development over the next five days as well. In addition to these areas, the global models also indicate that another wave moving off of Africa has the potential for development into a tropical cyclone next week. Vertical wind shear is forecast to be much lower than average across the tropical Atlantic as we near the peak of the Atlantic hurricane season too, which should provide conditions very conducive for hurricane formation and intensification.

The Madden-Julian Oscillation (MJO) is forecast to be of relatively weak magnitude over the next two weeks.

Figure 1 displays the formation locations of tropical cyclones from September 3–16 for the years from 1966–2018 (e.g., the satellite era), along with the maximum

intensities that these storms reached. Figure 2 displays the September 3–16 forecast period with respect to climatology. The primary threat formation area for major hurricane formations in early- to mid-September is in the tropical Atlantic east of the Lesser Antilles.

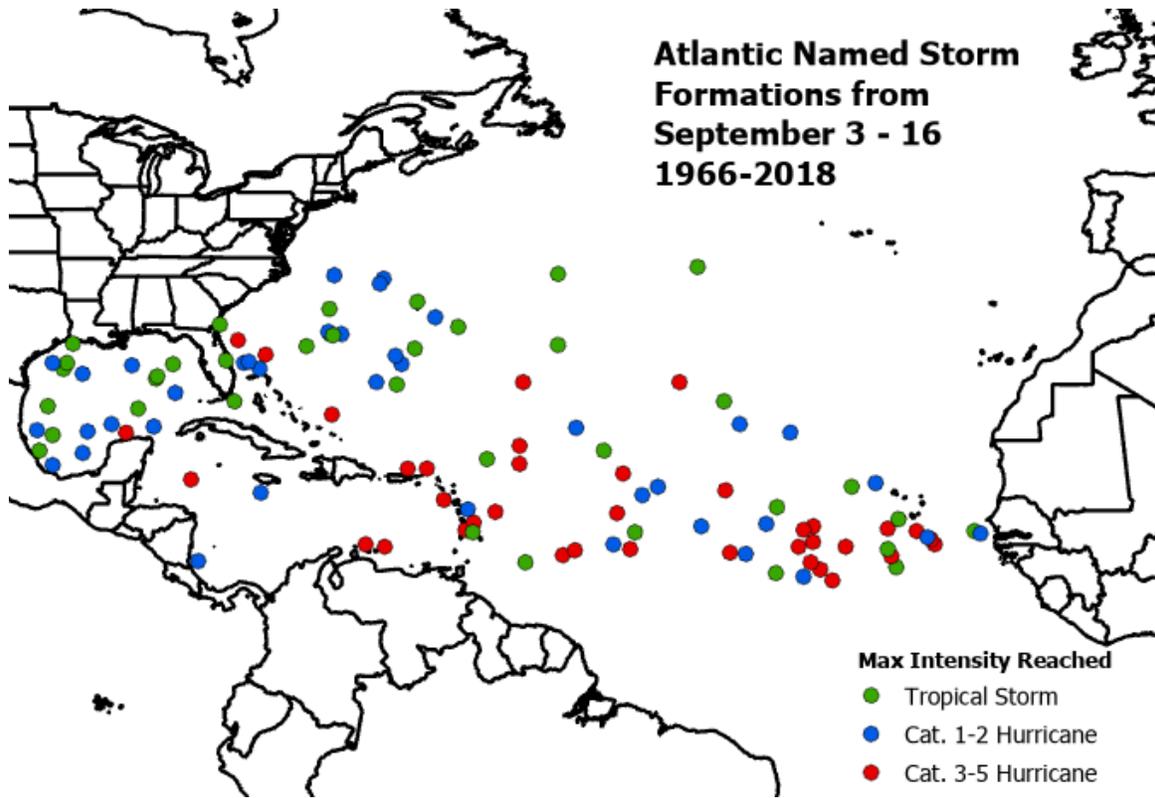


Figure 1: Atlantic named storm formations from September 3–16 during the years from 1966-2018 and the maximum intensity that these named storms reached.

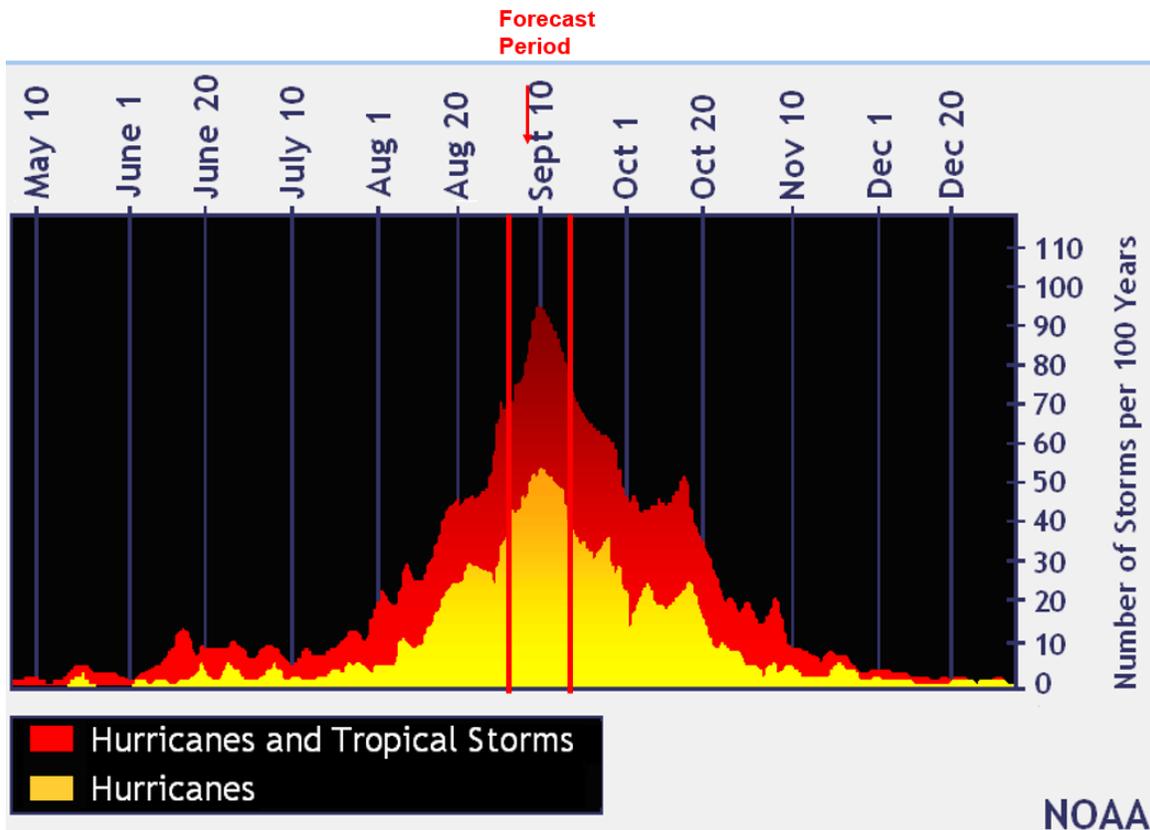


Figure 2: The current forecast period (September 3–16) with respect to climatology. Figure courtesy of NOAA.

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 3–16.

1) Current Storm Activity

Hurricane Dorian is likely to generate 10-15 ACE before becoming post-tropical. Tropical Depression 7 should produce little ACE before making landfall in Mexico.

2) National Hurricane Center Tropical Weather Outlook

The latest NHC Tropical Weather Outlook has three additional regions for TC formation. The area in the central Atlantic that is given a medium chance of development should only produce minimal ACE before dissipating. The area in the eastern tropical Atlantic with a high chance of development has the potential to produce moderate levels of ACE, but the storm looks to track northwestward, taking it towards cooler SSTs and higher shear relatively quickly. However, the area that NHC is monitoring that is currently over West Africa has the potential to take a more southerly track, likely giving it a higher chance of generating substantial ACE.

3) Global Model Analysis

The global models also indicate that there is an additional wave that should move off west Africa early next week. This storm should also have a very conducive environment to track through, as global models are forecasting well below-normal levels of vertical wind shear, especially as we get into mid-September (Figure 3).

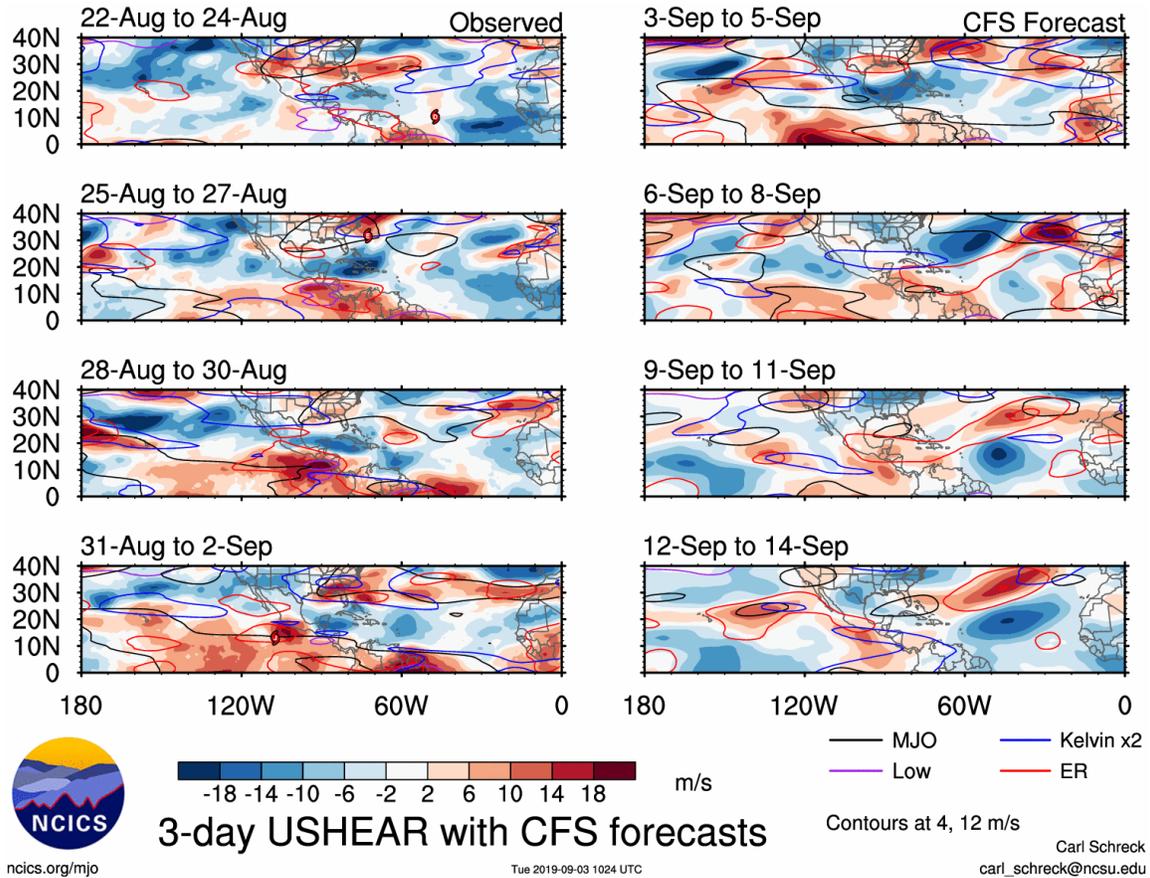


Figure 3: Observed (since August 22) and forecast (by the Climate Forecast System model) vertical wind shear over the next 12 days. Anomalously weak vertical wind shear is forecast over the tropical Atlantic.

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 generally forecast to remain weak during the next two weeks, likely limiting its impacts on Atlantic hurricane activity (Figure 4).

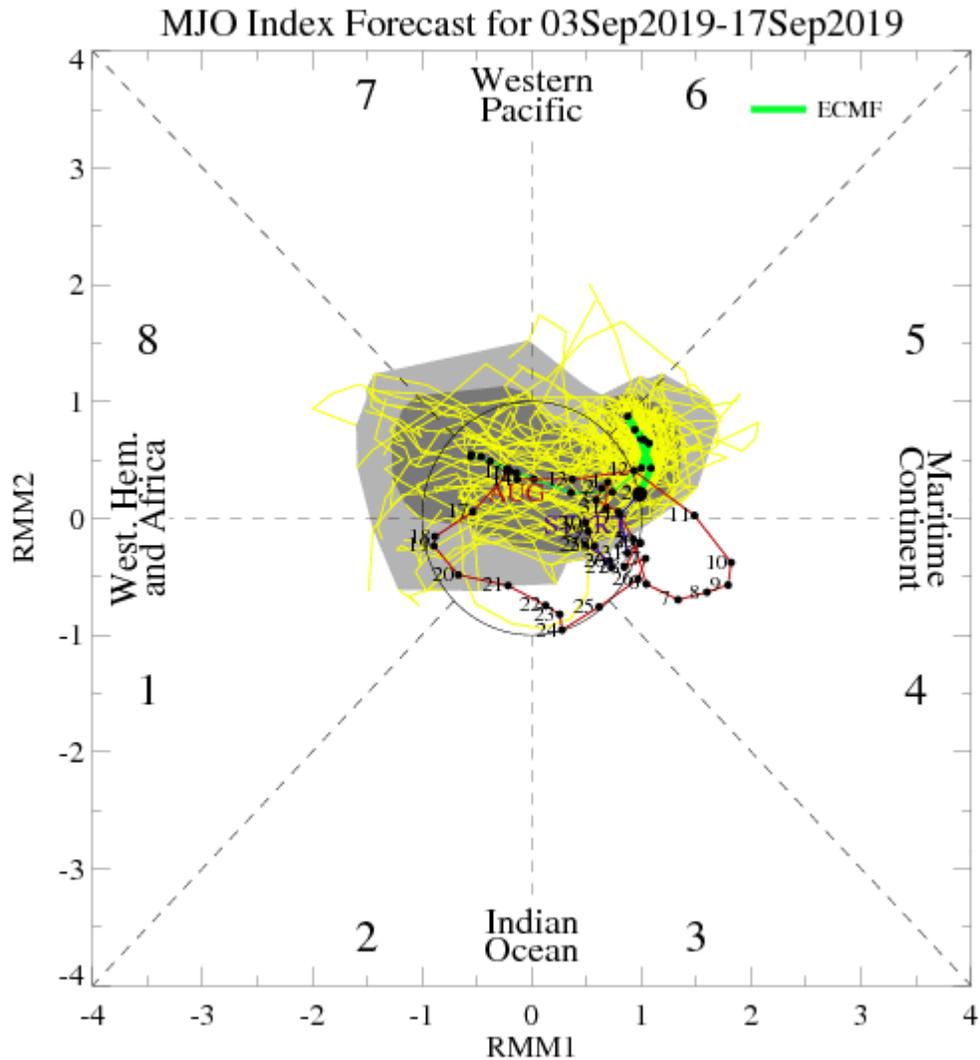


Figure 4: Predicted propagation of the MJO by the ECMWF model.

5) Seasonal Forecast

The most recent seasonal forecast calls for a near-average season. We believe that the next two weeks will have above-average activity, however.

3 Upcoming Forecasts

The next two-week forecast will be issued on September 17 for the September 17– September 30 period. Additional two-week forecasts will be issued on October 1 and October 15.

VERIFICATION OF AUGUST 19–SEPTEMBER 1, 2019 FORECAST

The two-week forecast of tropical cyclone activity from August 19–September 1, 2019 did not verify well. We predicted below-average activity (<6 ACE), and above-average activity occurred (24 ACE). Dorian generated virtually all of the ACE that occurred during the two-week period. The system's development and subsequent intensification was not well-anticipated by the global models. Erin was extremely short-lived and weak and produced only 0.5 ACE.