COLORADO STATE UNIVERSITY FORECAST OF ATLANTIC HURRICANE ACTIVITY FROM SEPTEMBER 17-30, 2019

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

(as of 17 September 2019)

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In Memory of William M. Gray[4]

This discussion as well as past forecasts and verifications are available online at
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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 17–30 are classified as the upper tercile, the 17 years with the least active ACE periods from September 17–30 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 17–30, 2019.

Parameter	Definition
Above-Normal	Upper Tercile (>22 ACE)
Normal	Middle Tercile (8-22 ACE)
Below-Normal	Lower Tercile (<8 ACE)

2   Forecast

We believe that the next two weeks will be characterized by activity at above-normal levels (>22 ACE). Hurricane Humberto is likely to generate 10-12 ACE before becoming post-tropical. The National Hurricane Center is monitoring two other areas for potential TC development over the next five days. 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 generally be near- to below-normal over the next two weeks which should also favor TC formation and intensification.

The Madden-Julian Oscillation (MJO) is forecast to be conducive for Atlantic TC formation, especially in week two when the convectively-enhanced phase of the MJO moves over Africa.

Figure 1 displays the formation locations of tropical cyclones from September 17–30 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 17–30 forecast period with respect to climatology. The primary threat formation area for major

hurricane formations in mid- to late September is in the tropical Atlantic east of the Lesser Antilles.

Atlantic Named Storm Formations from September 17 - 30 1966-2018

Max Intensity Reached
- Tropical Storm
- Cat. 1-2 Hurricane
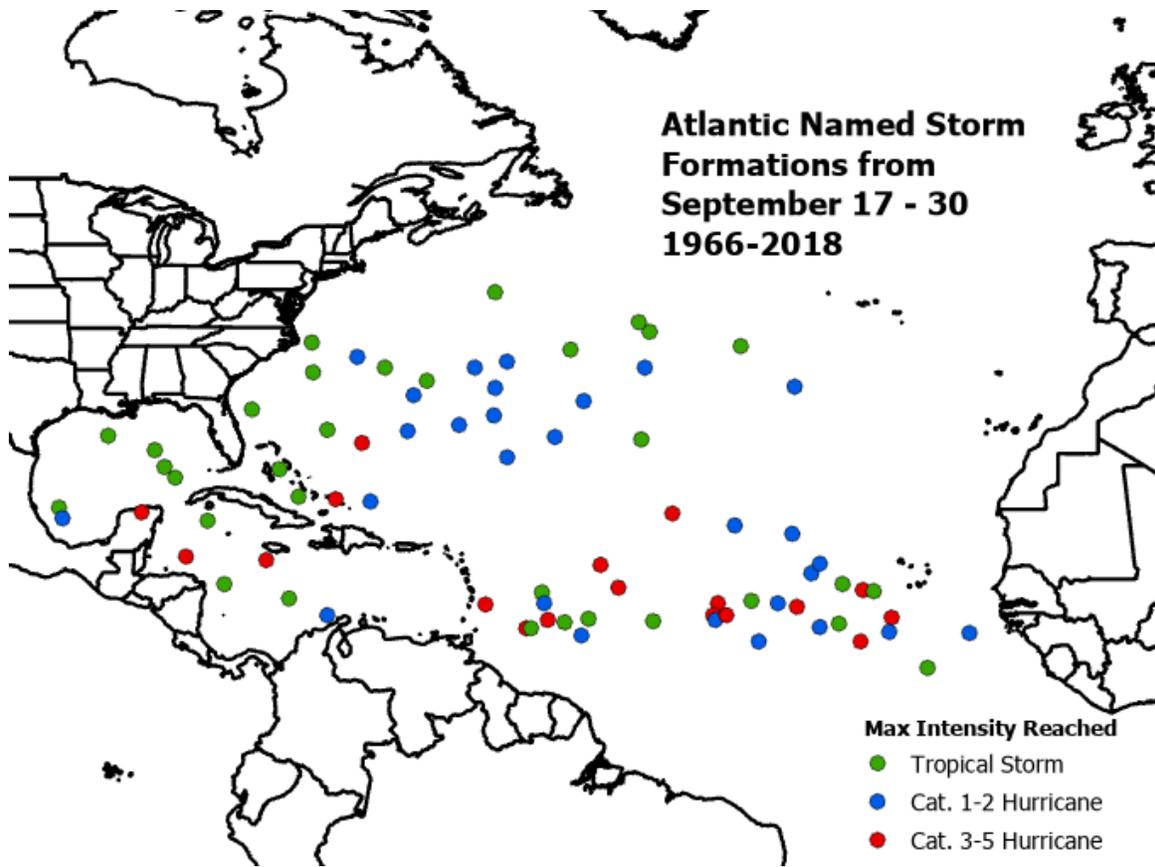- Cat. 3-5 Hurricane

Figure 1: Atlantic named storm formations from September 17–30 during the years from 1966-2018 and the maximum intensity that these named storms reached.
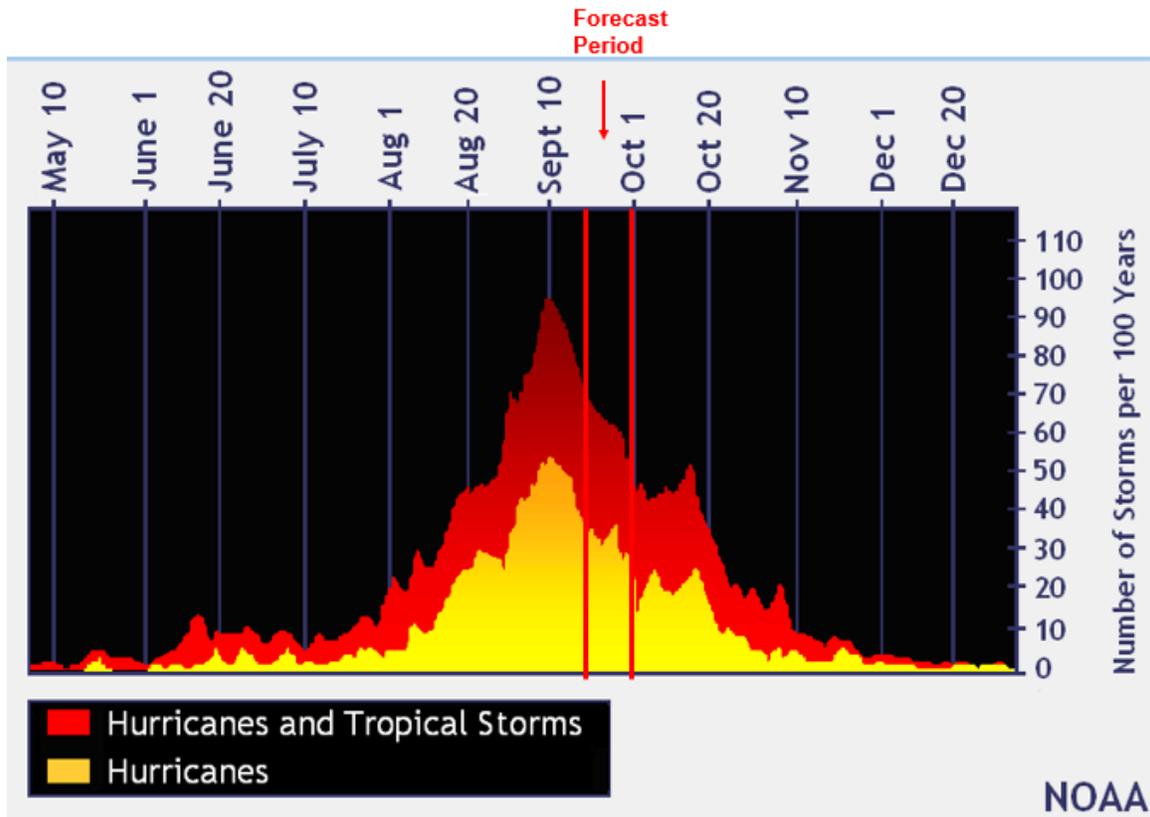
Figure 2: The current forecast period (September 17–30) with respect to climatology. Figure courtesy of NOAA.

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 17–30.

1) Current Storm Activity

Hurricane Humberto is likely to generate 10-12 ACE before becoming post-tropical.

2) National Hurricane Center Tropical Weather Outlook

The latest NHC Tropical Weather Outlook has two potential regions for TC formation. The area in the northern Gulf of Mexico would only generate a very small amount of ACE in the unlikely event that it gets named before moving over land. The current area of interest about 1000 miles east of the Lesser Antilles is likely to become a tropical depression by later this week. The system has the potential to generate moderate levels of ACE as it tracks northwestward.

3) Global Model Analysis

The global models also indicate that there is an additional wave that should move off west Africa in a few days. This storm should have a very conducive environment to track

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through. The ECMWF model is quite aggressive for developing this system into a strong TC as it moves westward across the tropical Atlantic. In general, vertical wind shear is forecast by the Climate Forecast System to be fairly weak across the tropical Atlantic (Figure 3).
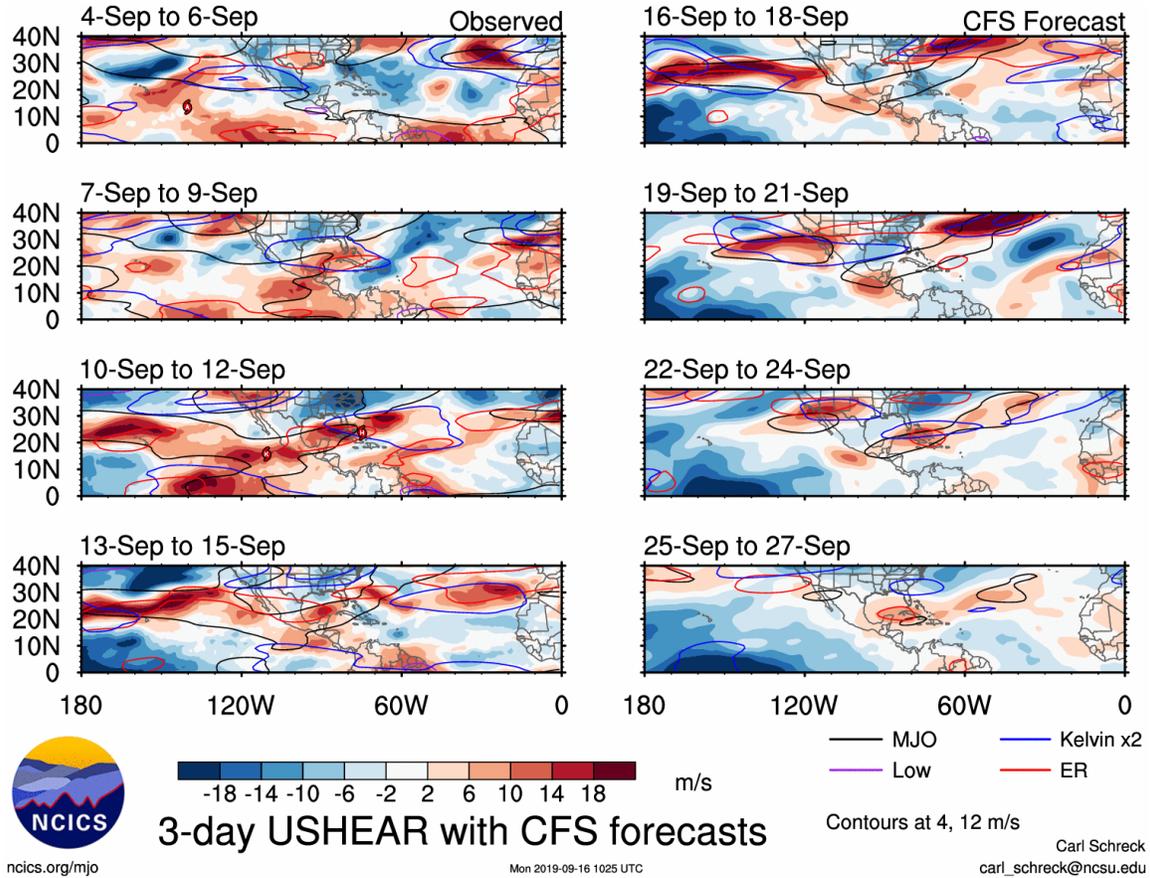

Figure 3: Observed (since September 4) and forecast (by the Climate Forecast System model) vertical wind shear over the next 12 days. Anomalously weak vertical wind shear is forecast over most of the tropical Atlantic.

4) Madden-Julian Oscillation

The Madden-Julian Oscillation (MJO), as measured by the Wheeler-Hendon index, is currently in phase 8. However, as is noted in the recent discussion by the Climate Prediction Center, some of this signal is likely due to other equatorial waves. The global models do indicate that a weak MJO may develop in the next week with enhanced convection favored over Africa. This signal typically is conducive for Atlantic hurricane formation.
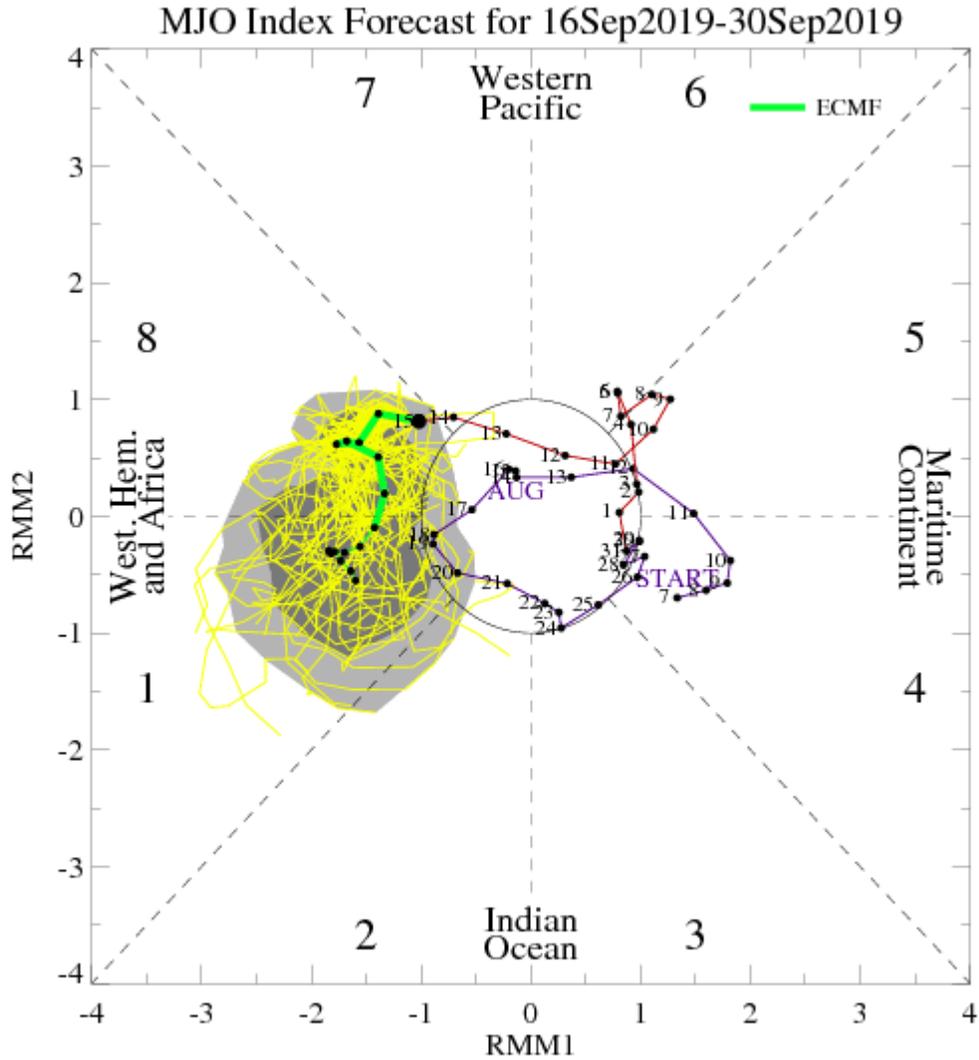
Figure 4: Predicted propagation of the MJO by the ECMWF model.

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 October 1 for the October 1-14 period. A final two-week forecast will be issued on October 15.

VERIFICATION OF SEPTEMBER 3-16, 2019 FORECAST

The two-week forecast of tropical cyclone activity from September 3-16, 2019 verified in the near-average category (e.g., the middle tercile). We predicted upper-tercile activity (>35 ACE), while 26 ACE occurred. Dorian was the primary ACE generator during the two-week period, with Fernand, Gabrielle and Humberto producing lesser ACE.