

COLORADO STATE UNIVERSITY FORECAST OF ATLANTIC HURRICANE ACTIVITY FROM SEPTEMBER 3–16, 2025

We believe that the most likely category for Atlantic hurricane activity in the next two weeks is near-normal (65%), with above-normal (20%) and below-normal (15%) being much less likely.

(as of 3 September 2025)

By Philip J. Klotzbach¹, Michael M. Bell², and Levi G. Silvers³

With Special Assistance from Carl J. Schreck III⁴

In Memory of William M. Gray⁵

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

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

¹ Senior Research Scientist

² Professor

³ Research Scientist

⁴ Research Scholar at NC State University

⁵ Professor Emeritus

1 Introduction

This is the 17th year that we have issued shorter-term forecasts of tropical cyclone (TC) 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 1966–2024 and defining above-normal, normal and below-normal two-week periods based on terciles. Since there are 59 years from 1966–2024, we include the 20 years with the most ACE from September 3–16 as the upper tercile, the 19 years with the least ACE as the bottom tercile, while the remaining 20 years are counted as the middle tercile.

Table 1: ACE forecast definition and probabilistic forecast for TC activity for September 3–16, 2025.

Parameter	Definition	Probability in Each Category
Above-Normal	Upper Tercile (>36 ACE)	20%
Normal	Middle Tercile (9–36 ACE)	65%
Below-Normal	Lower Tercile (<9 ACE)	15%

2 Forecast

While the Atlantic hurricane season has been relatively quiet over the past ~10 days, we anticipate the season picking up over the next couple of weeks. The National Hurricane Center is monitoring one area with a high potential for TC formation in the next week. Based on global model forecasts, this area could generate moderate to large levels of ACE if it were to form. Global model ensembles are pretty aggressive with additional tropical cyclone development in days 8–14, with potential formations in the eastern Atlantic as well as in the western Caribbean/southern Gulf. Large-scale environmental vertical wind shear conditions are forecast to become more conducive over the two week period, as the MJO moves across the Western Hemisphere and potentially over Africa during the two-week period. Historically, MJO events over Africa are associated with above-average Atlantic hurricane activity.

Figure 1 displays the formation locations of tropical cyclones from September 3–16 for the years from 1966–2024, along with the maximum intensities that these storms reached. Figure 2 displays the September 3–16 forecast period with respect to climatology. This period marks the climatological peak of the Atlantic hurricane season. The primary threat formation area for major hurricanes in early- to mid-September is in the eastern and central tropical Atlantic.

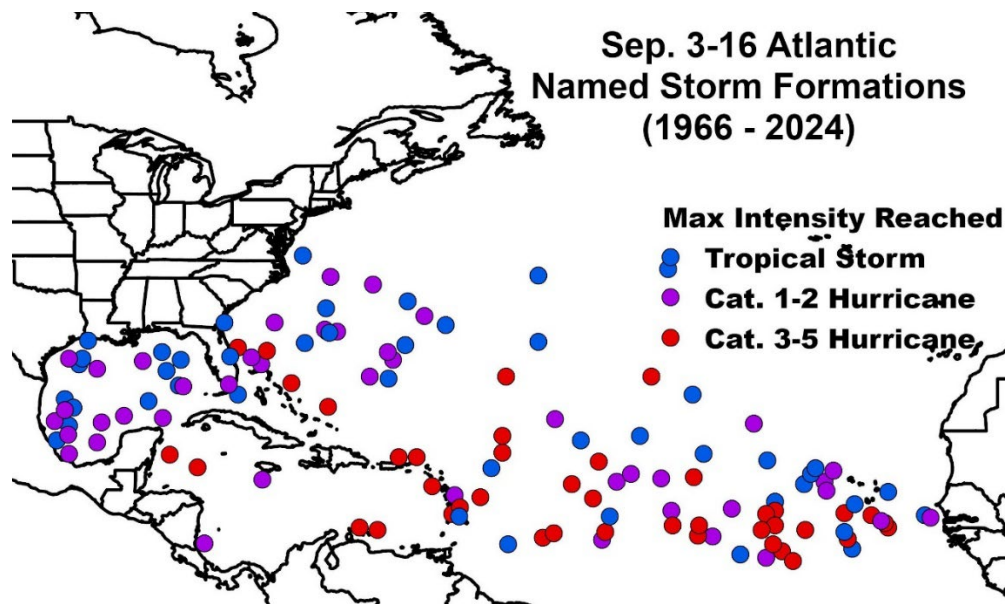


Figure 1: Atlantic named storm formations from September 3–16 from 1966–2024 and the maximum intensity that these named storms reached.

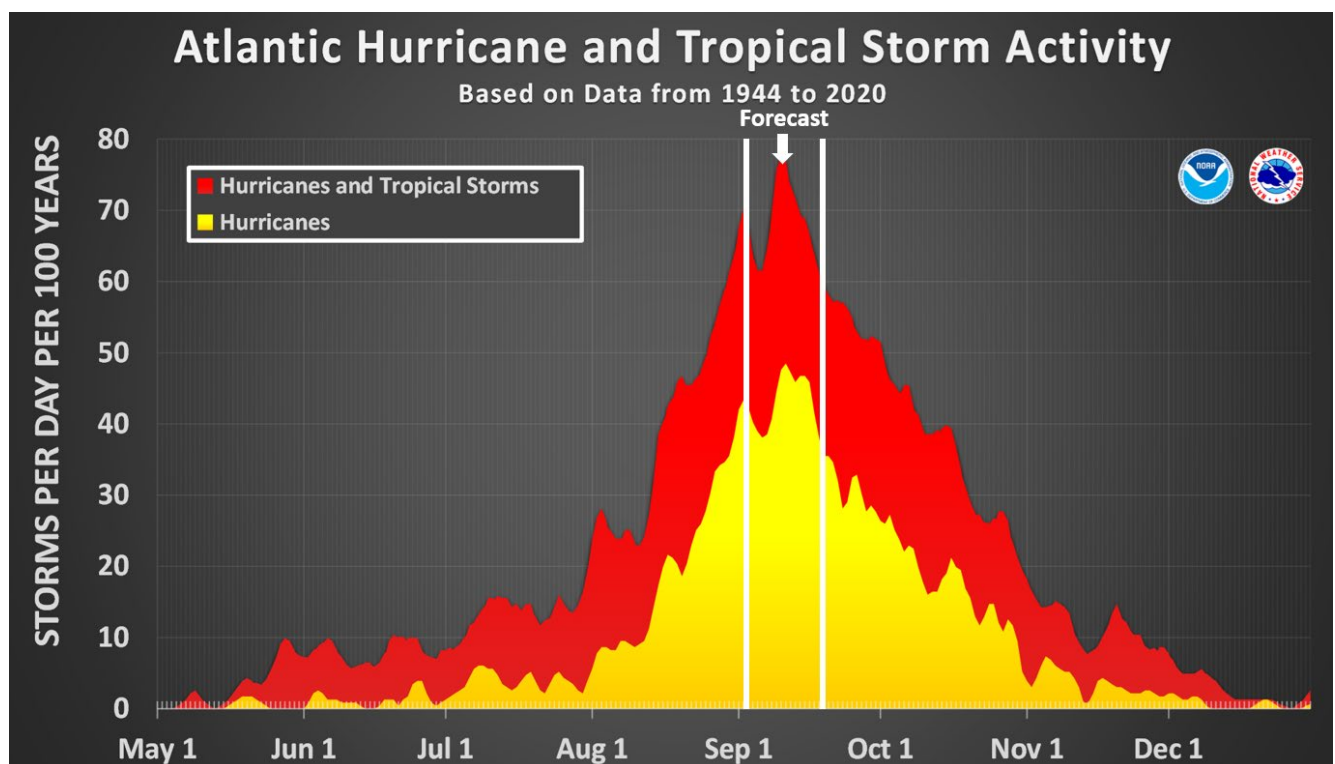


Figure 2: The current forecast period (September 3–16) with respect to climatology, delimited with white lines. Figure courtesy of NOAA.

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

There are currently no active tropical cyclones in the Atlantic.

2) National Hurricane Center Tropical Weather Outlook

The latest NHC Tropical Weather Outlook is monitoring one area for potential TC formation (Figure 3). This system, associated with an African easterly wave, could potentially be a moderate to large ACE generator (~10–20 ACE), if it were to form. However, vertical wind shear is relatively high, and there is copious dry air near the system which could inhibit its development, especially in the short term.

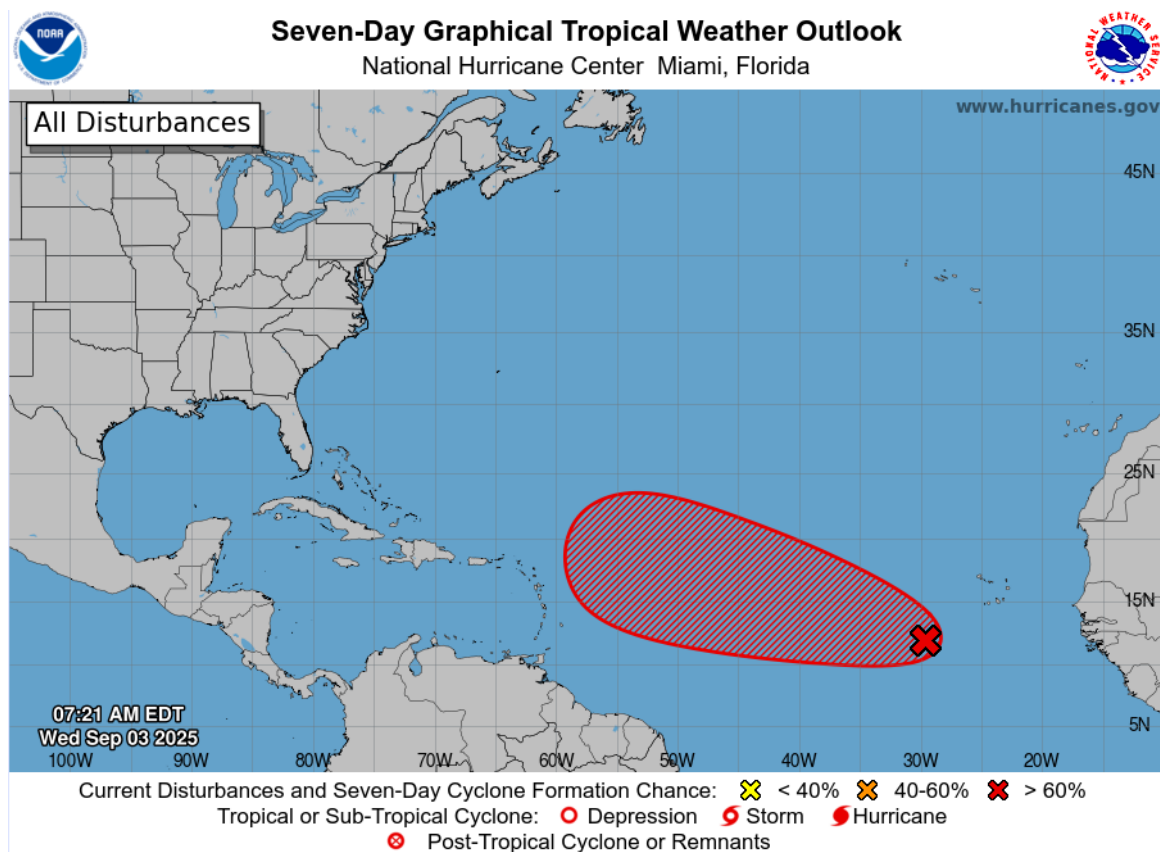


Figure 3: Current National Hurricane Center Atlantic Tropical Weather Outlook.

3) Global Model Analysis

The ECMWF EPS ensemble (Figure 4), the ECMWF AI ensemble (Figure 5), and the GEFS ensemble (Figure 6) are all highlighting significant potential for tropical cyclone formation from the area that the National Hurricane Center is currently monitoring in the

eastern tropical Atlantic. Following that system, there is model support for additional tropical cyclone formations as we approach the middle of September. Given the generally tropical cyclone-favorable wind shear patterns forecast for the middle of September, this increase in tropical cyclone activity forecast by the models seems reasonable. We anticipate the Atlantic to be quite active towards the middle of September.

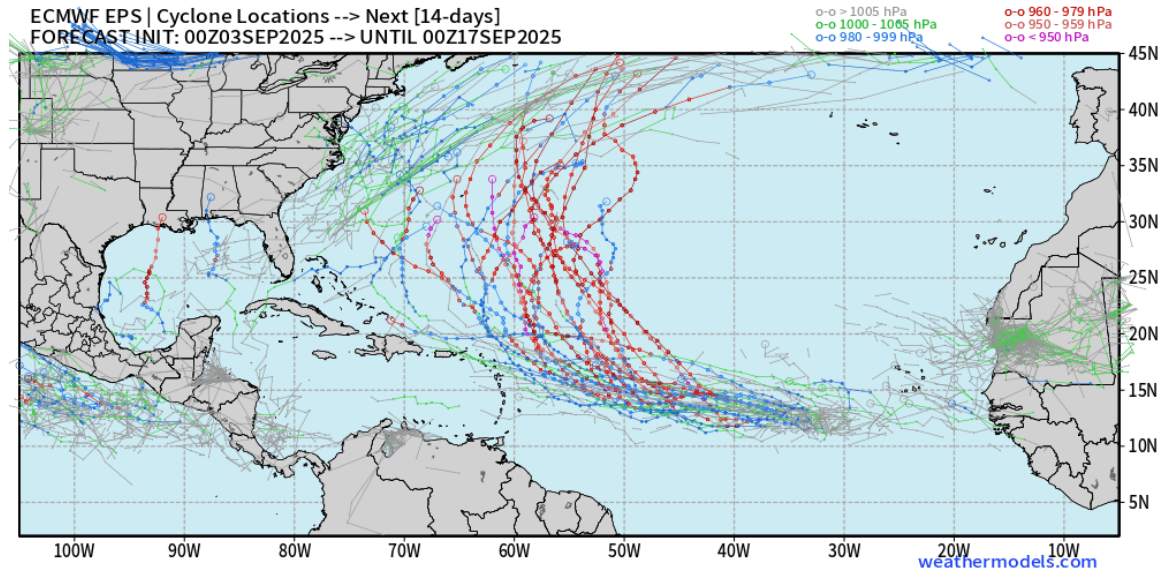


Figure 4: Cyclone locations from the ECMWF EPS ensemble for the next 14 days. Figure courtesy of weathermodels.com.

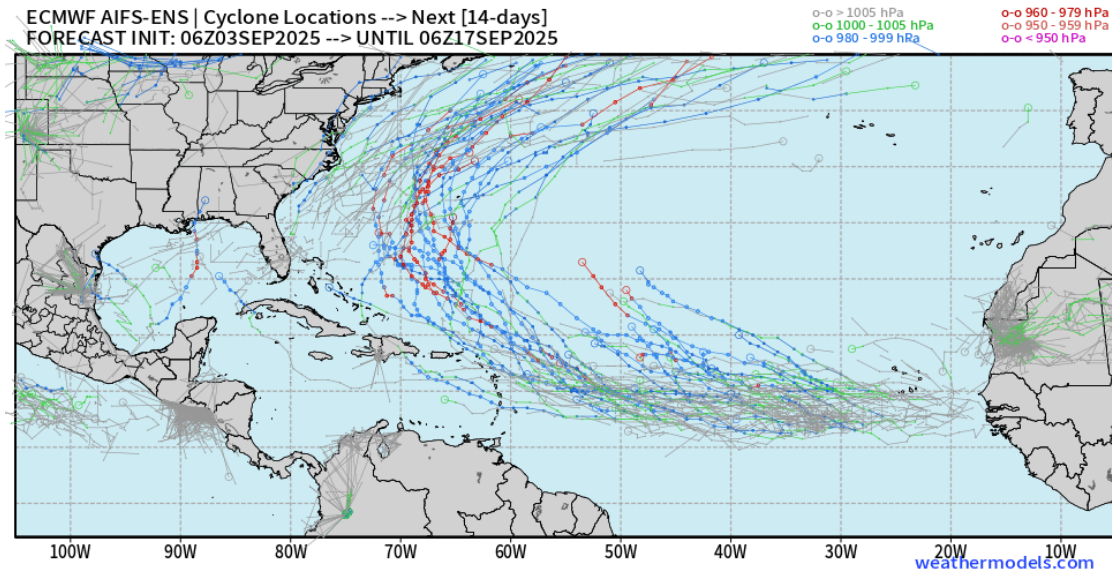


Figure 5: Cyclone locations from the ECMWF AI ensemble for the next 14 days. Figure courtesy of weathermodels.com.

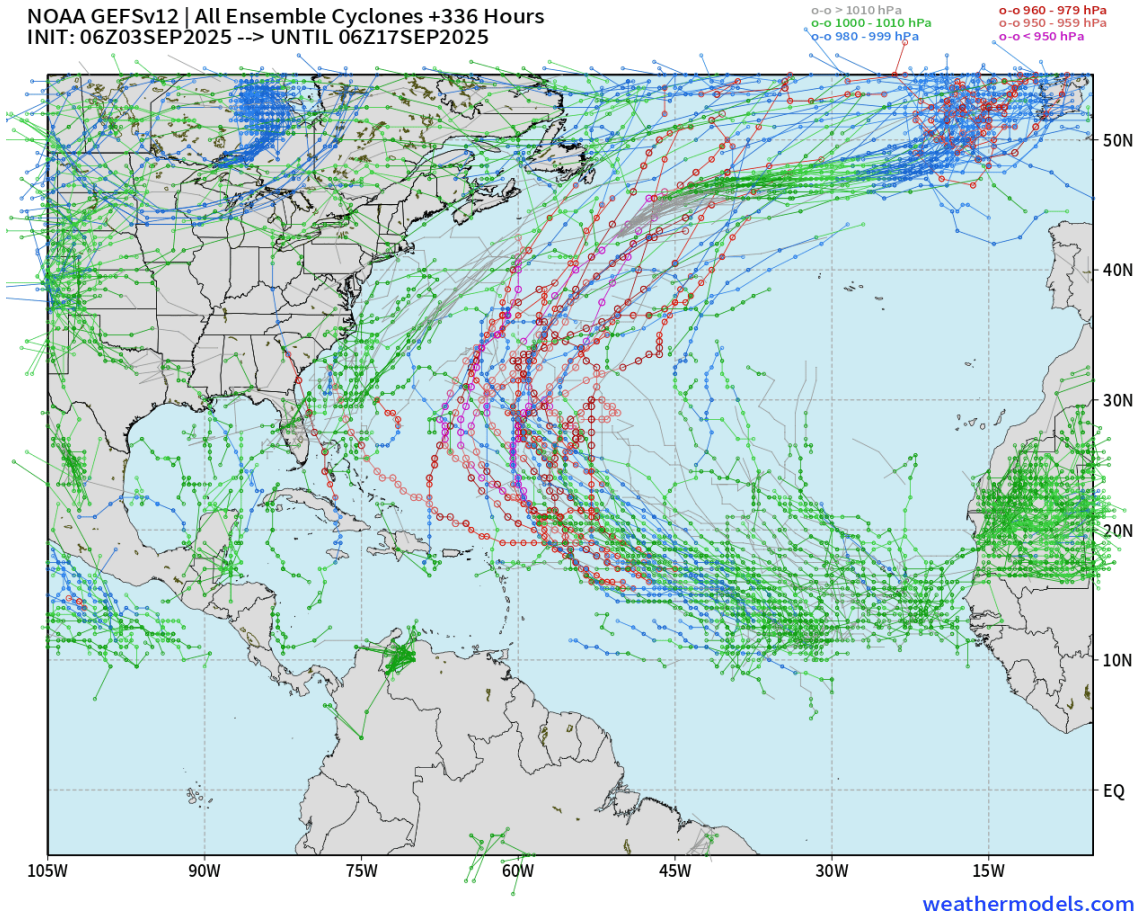


Figure 6: Cyclone locations from the GEFS ensemble for the next 14 days. Figure courtesy of weathermodels.com

4) Madden-Julian Oscillation

The MJO, as measured by the Wheeler-Hendon index, is currently enhancing convection over the tropical Pacific. The MJO is forecast to propagate eastward towards the Western Hemisphere and then Africa over the next two weeks (Figure 7). When the MJO is enhancing convection across Africa, Atlantic TC activity tends to be above average. Vertical wind shear anomalies are forecast to become more conducive as the two-week forecast period progresses (Figure 8).

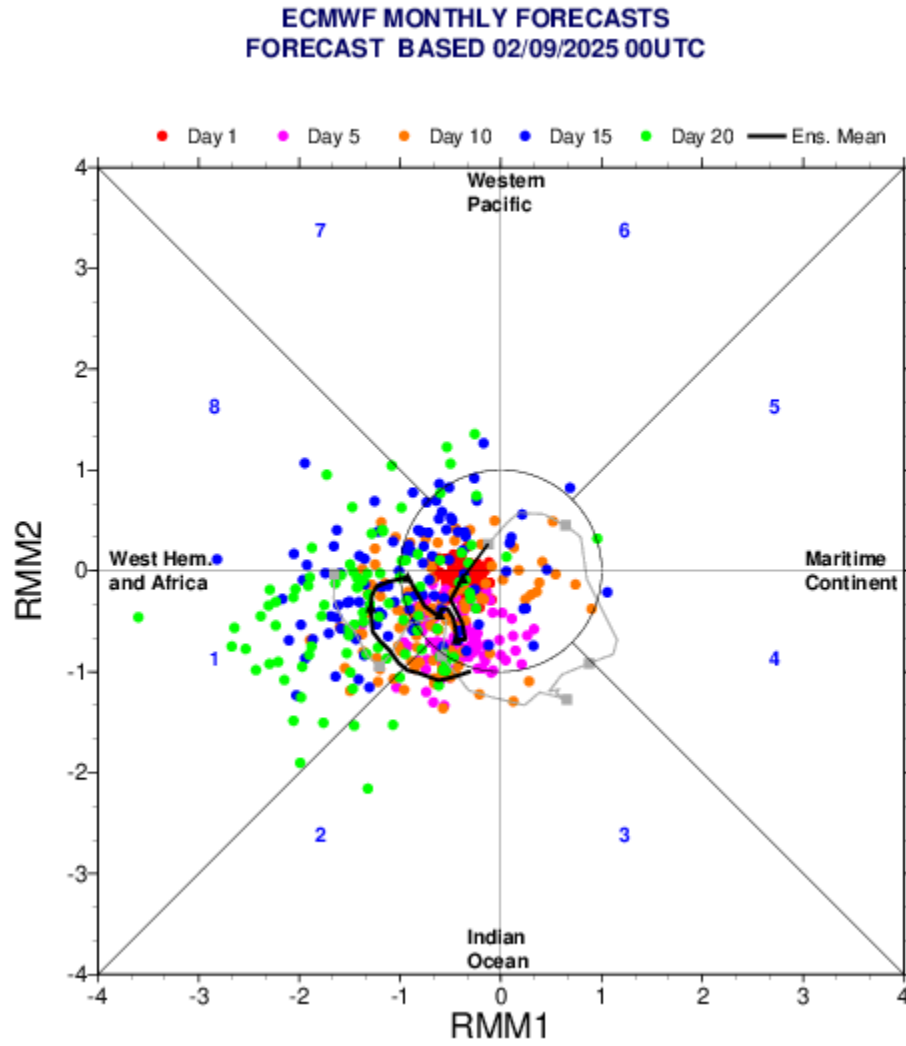


Figure 7: Predicted propagation of the MJO by the ECMWF ensemble. Figure courtesy of ECMWF.

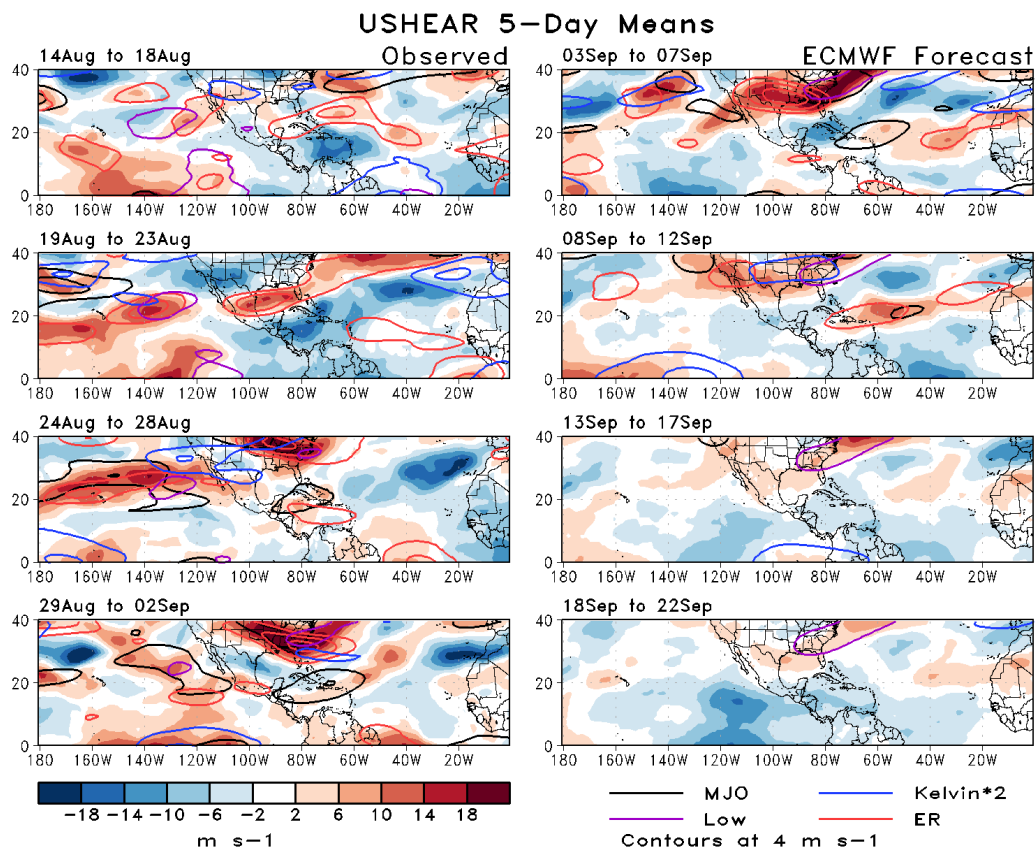


Figure 8: Observed and predicted zonal wind shear anomalies by the ECMWF ensemble for the twenty days. Vertical wind shear anomalies are forecast to decrease across the Atlantic Main Development Region over the next couple of weeks. Figure courtesy of Nick Novella (NOAA/CPC).

5) Seasonal Forecast

The most recent seasonal forecast calls for an above-average season. We still believe that this forecast will verify, despite a recent quiet period. The Atlantic hurricane season looks to pick up markedly towards end of this two-week period, with continued conducive Atlantic tropical cyclone conditions during the second half of September.

3 Upcoming Forecasts

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

VERIFICATION OF AUGUST 20 – SEPTEMBER 2 FORECAST

The two-week ACE forecast verified in the normal category – the category that we strongly favored for the two-week period. Erin generated 9 ACE from August 20 through the end of its lifetime, while Fernand produced the remaining 3 ACE. Table 3 displays the percentage chance that we gave for each category being reached and observed ACE.

Table 3: ACE forecast for TC activity for August 20–September 2, the probability assigned for each category being reached and observed ACE.

ACE Category	Definition	Probability in each Category	Observed ACE
Above Normal	Upper Tercile (>22 ACE)	10%	12
Normal	Middle Tercile (6–22 ACE)	85%	
Below Normal	Lower Tercile (<6 ACE)	5%	