COLORADO STATE UNIVERSITY FORECAST OF ATLANTIC HURRICANE ACTIVITY FROM OCTOBER 15–28, 2025

We believe that the most likely category for Atlantic hurricane activity in the next two weeks is above-normal (50%), with near-normal (40%) and below-normal (10%) being less likely.

(as of 15 October 2025)

By Philip J. Klotzbach[1], Michael M. Bell[2], and Levi G. Silvers[3]

With Special Assistance from Carl J. Schreck III[4]

In Memory of William M. Gray[5]

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, and 4) the current and projected state of the Madden-Julian oscillation (MJO).

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 19 years with the most ACE from October 15–28 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 October 15–28, 2025.

Parameter	Definition	Probability in Each Category
Above-Normal	Upper Tercile (>7 ACE)	50%
Normal	Middle Tercile (1–7 ACE)	40%
Below-Normal	Lower Tercile (<1 ACE)	10%

2   Forecast

We slightly favor above-normal activity for the next two weeks (>7 ACE). Tropical Storm Lorenzo is forecast to dissipate within the next day or so, generating very little ACE before doing so. While the National Hurricane Center is currently not monitoring any areas for TC formation in the next week, there is a relatively strong signal in most of the global models for a potential hurricane developing in the Caribbean late next week. The Madden-Julian Oscillation (MJO) is currently in TC favorable phases for the Atlantic but will likely be moving into less favorable Atlantic TC conditions by the end of October.

Figure 1 displays the formation locations of TCs from October 15–28 for the years from 1966–2024, along with the maximum intensities that these storms reached. Figure 2 displays the October 15–28 forecast period with respect to climatology. The primary threat area for major hurricane formations during mid- to late October is in the western Caribbean.
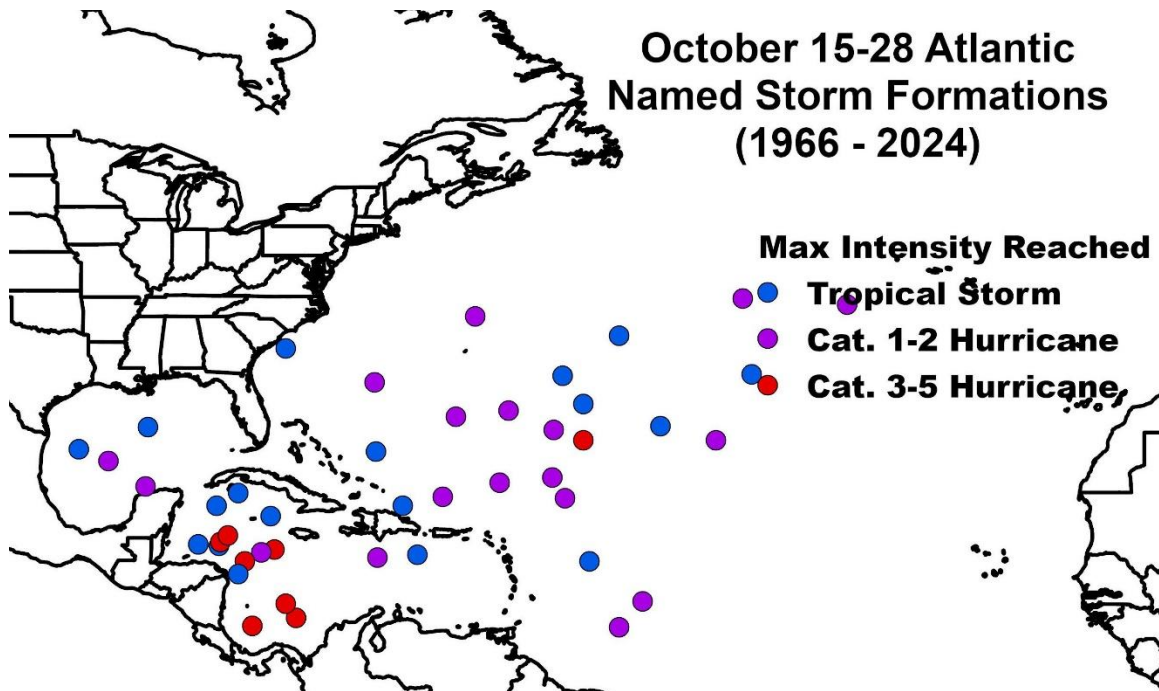
Figure 1: Atlantic named storm formations from October 15–28 from 1966–2024 and the maximum intensity that these named storms reached.
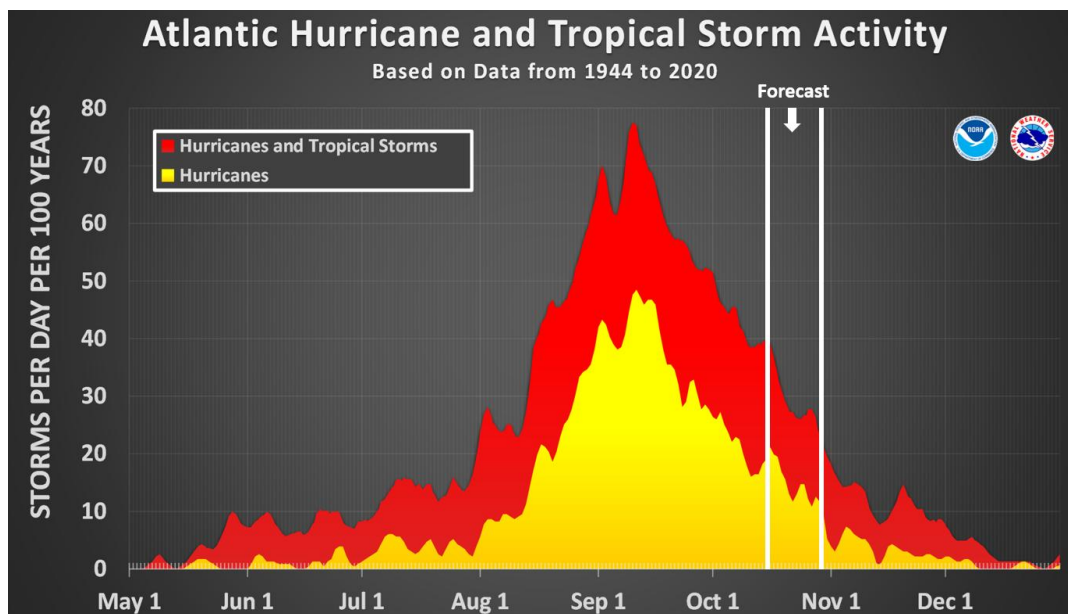

Figure 2: The current forecast period (October 15–28) with respect to climatology, delimited with white lines. Figure courtesy of NOAA.

We now examine how we believe each of the four factors discussed in the introduction will impact Atlantic TC activity for the period from October 15–28.

1) Current Storm Activity

Tropical Storm Lorenzo is forecast to dissipate within the next day or so, generating little additional ACE before dissipation.

2) National Hurricane Center Tropical Weather Outlook

The National Hurricane Center is currently not monitoring any areas for potential TC development (Figure 3).
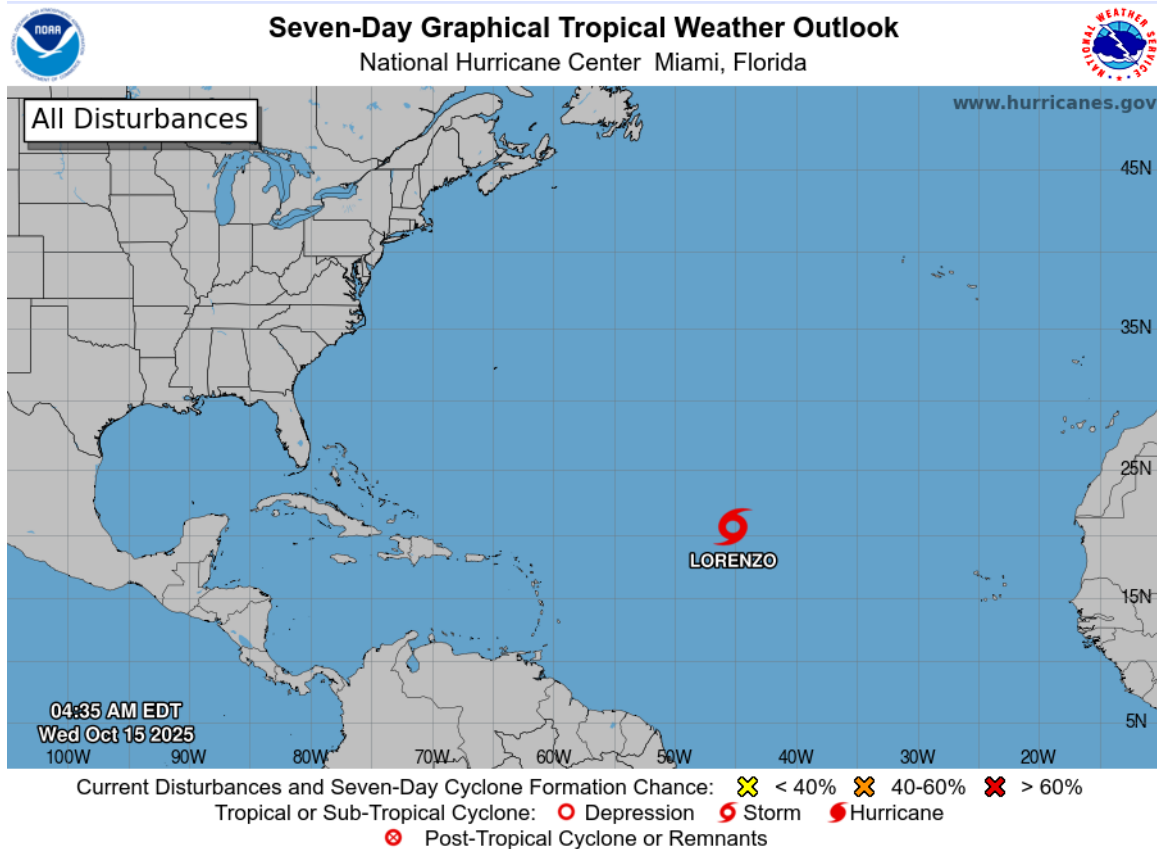

Figure 3: Current National Hurricane Center Atlantic Tropical Weather Outlook.

3) Global Model Analysis

The ECMWF EPS ensemble (Figure 4), ECMWF AI ensemble (Figure 5) and the GEFS ensemble (Figure 6) are highlighting potential TC development in the Caribbean late next week. While TC formation that far in advance is certainly not guaranteed, the other big question is even if a TC does form in the Caribbean, where does it form, and how does it track? A more southward and westward formation in the Caribbean may limit a TC's time for intensification, consequently reducing the ACE that it would generate.
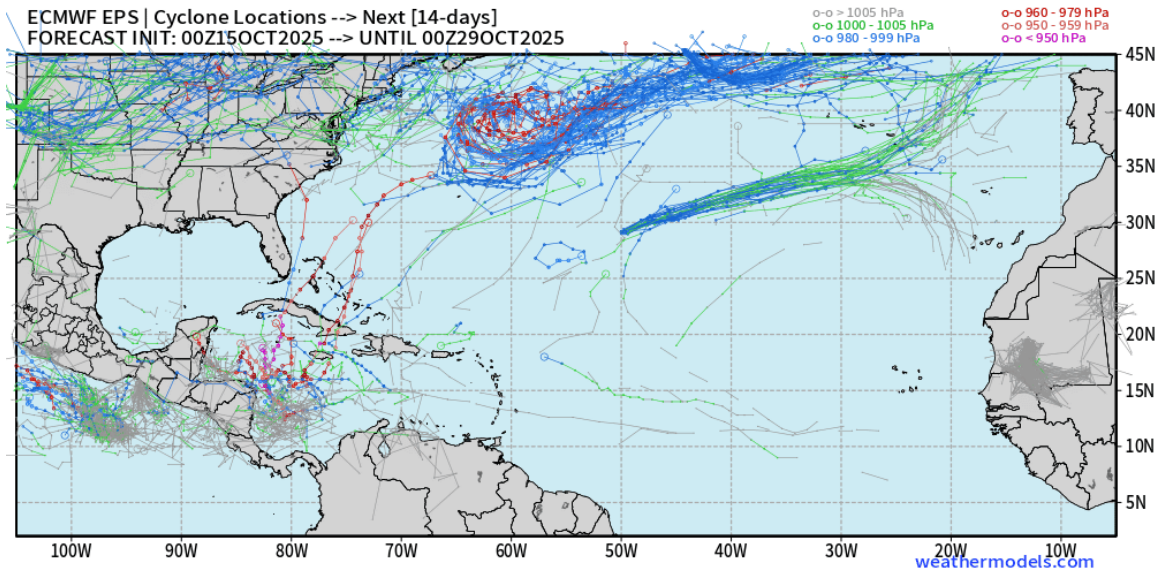
Figure 4: Cyclone locations from the ECMWF EPS ensemble for the next 14 days. Figure courtesy of weathermodels.com
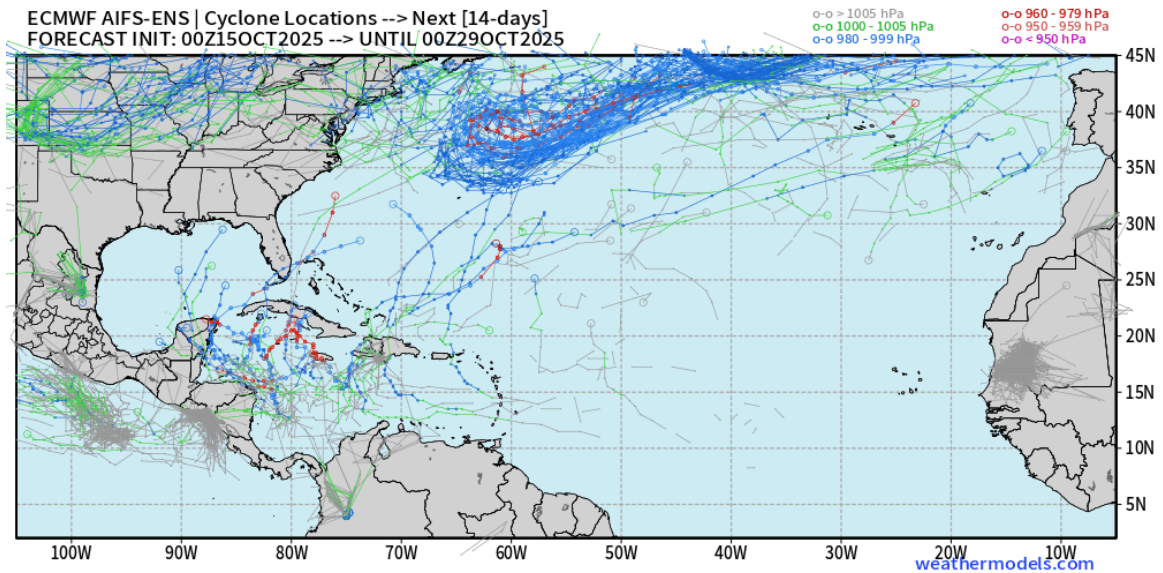

Figure 5: Cyclone locations from the ECMWF AI ensemble. Figure courtesy of weathermodels.com.
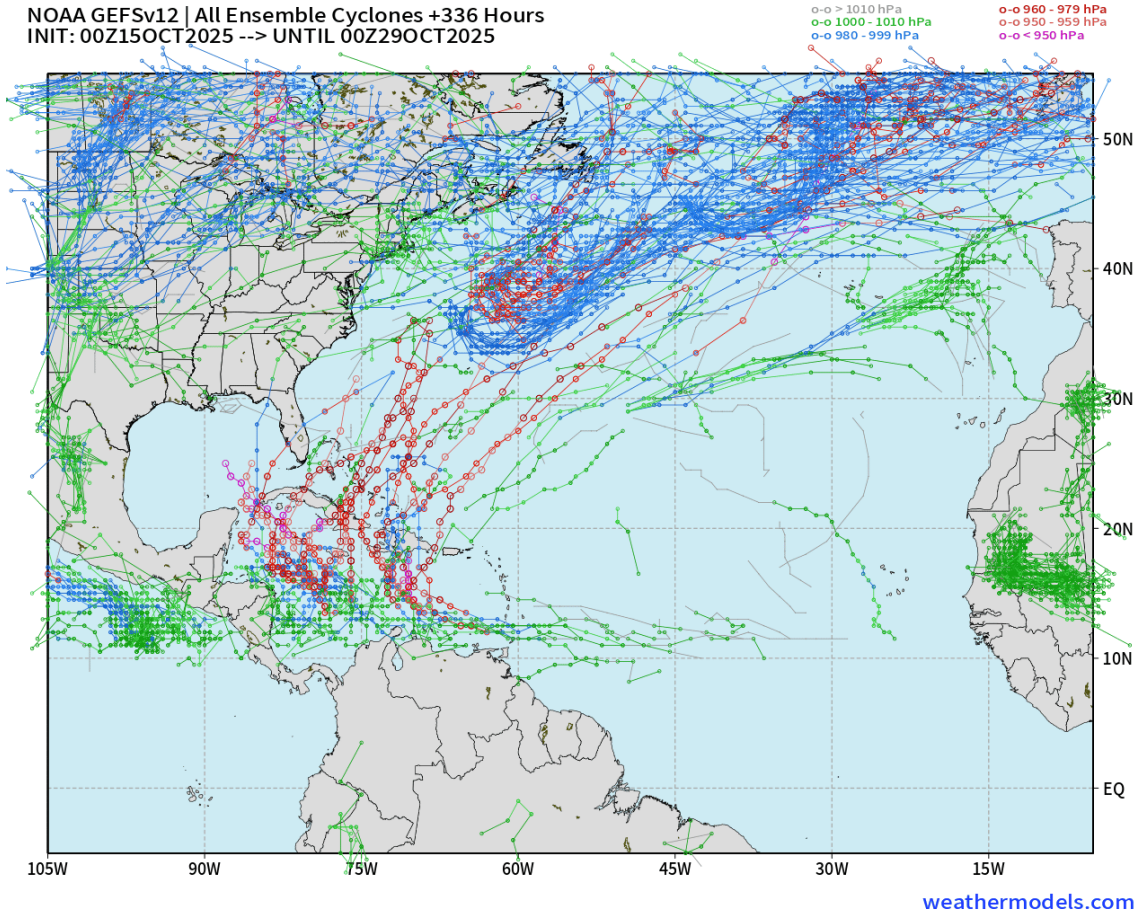
Figure 6: Cyclone locations from the GEFS ensemble for the next 14 days. Figure courtesy of weathermodels.com

4) Madden-Julian Oscillation

The MJO as measured by the Wheeler-Hendon index, is currently located over the Indian Ocean (Figure 7). While the MJO has generally been fairly incoherent over the past few weeks, the ECMWF ensemble (as well as other ensembles) are bullish on a more coherent MJO propagating eastward through phases 1–4 over the next two weeks. While phases 1–3 are typically favorable for Atlantic TC formation, phase 4 becomes less conducive. Consequently, we do expect a reduction in TC activity across the Atlantic following the potential Caribbean threat. This is due to climatology becoming much less favorable, as well as subseasonal conditions driven by the MJO also being less conducive.

Overall, ECMWF is forecasting relatively favorable vertical wind shear across the western Atlantic over the next two weeks, while vertical wind shear is forecast to become much stronger across the eastern Atlantic, likely putting an end to tropical TC formations east of the Caribbean (Figure 9).
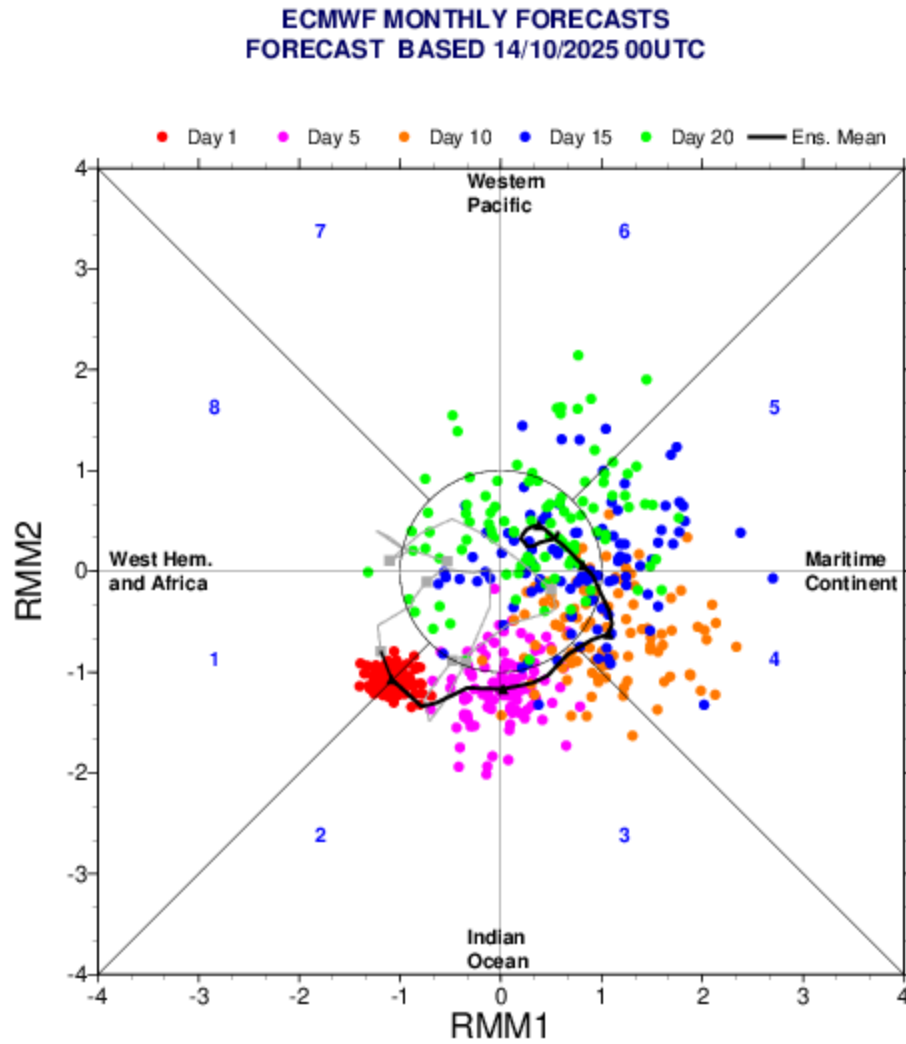
Figure 8: Predicted propagation of the MJO by the ECMWF Ensemble Prediction System. Figure courtesy of ECMWF.
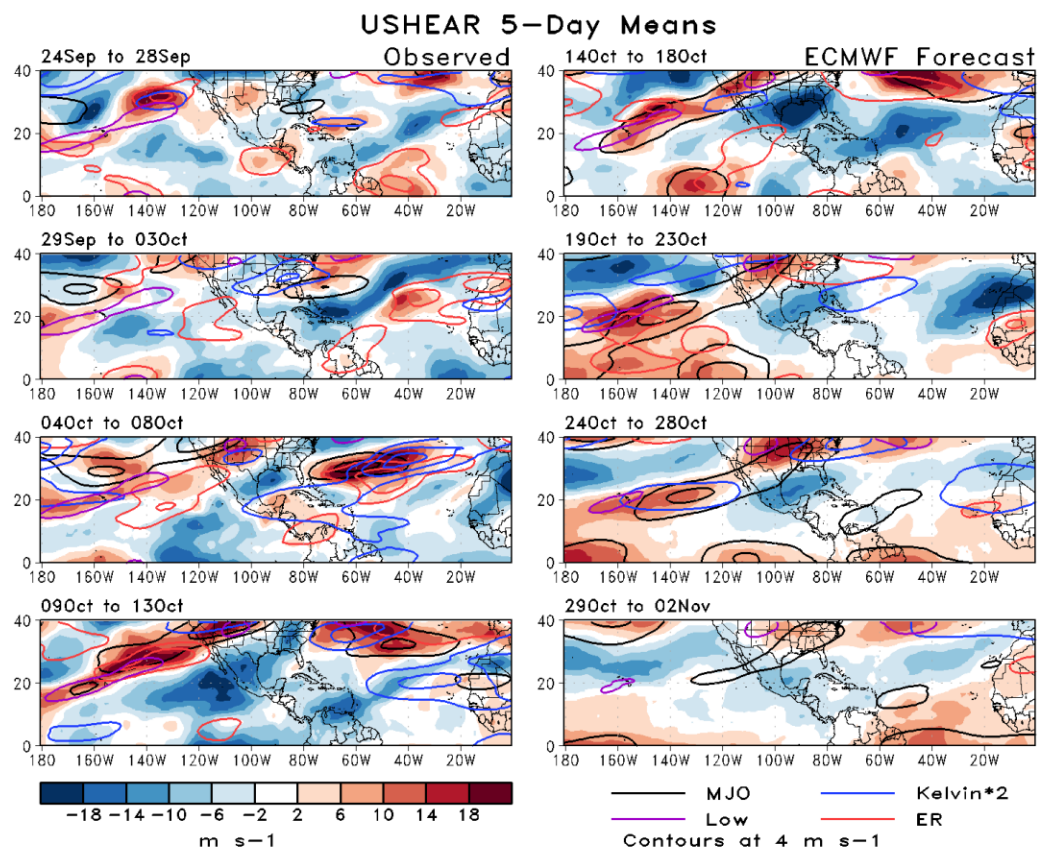
Figure 9: Observed and predicted 200 minus 850 hPa zonal winds by the ECMWF ensemble for the next 20 days. Figure courtesy of Nick Novella (NOAA/CPC).

VERIFICATION OF OCTOBER 1 – OCTOBER 14 FORECAST

12 ACE were generated during the two-week period. Imelda and Jerry both generated 4 ACE, while Humberto, Karen and Lorenzo combined to produce the other 4 ACE. We had assigned a 59% probability of above-normal activity, with a 40% chance of normal activity and a nominal 1% chance of below-normal activity during the two-week period.

Table 3 displays the percentage chance that we gave for each category being reached and observed ACE.

Table 3: ACE forecast for tropical cyclone activity for October 1–14, the probability assigned for each category being reached and observed ACE.

ACE Category	Definition	Probability in each Category	Observed ACE
Above Normal	Upper Tercile (>10 ACE)	59%	12
Normal	Middle Tercile (3–10 ACE)	40%	
Below Normal	Lower Tercile (<3 ACE)	1%	