COLORADO STATE UNIVERSITY FORECAST OF ATLANTIC HURRICANE ACTIVITY FROM AUGUST 5 - 18, 2020

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

(as of 5 August 2020)

By Philip J. Klotzbach[1], Michael M. Bell[2], and Jhordanne Jones[3]

In Memory of William M. Gray[4]

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] Research Scientist
[2] Associate Professor
[3] Graduate Research Assistant
[4] Professor Emeritus

1 Introduction

This is the 12th 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 1966-2019 and defining above-normal, normal and below-normal two-week periods based on terciles. Since there are 54 years from 1966-2019, each tercile is composed of 18 years. The 18 years with the most active ACE periods from August 5 – 18 are classified as the upper tercile, the 18 years with the least active ACE periods from August 5 – 18 are classified as the lower tercile, while the remaining 18 years are classified as the middle tercile.

Table 1: ACE forecast definition for TC activity for August 5 – 18, 2020.

Parameter	Definition
Above-Normal	Upper Tercile (>6 ACE)
Normal	Middle Tercile (2–6 ACE)
Below-Normal	Lower Tercile (0–1 ACE)

2 Forecast

We believe that the next two weeks will be characterized by activity at normal levels (2–6 ACE). The National Hurricane Center has one area in the western Atlantic with a low chance of development in the next five days, but there is very little support from global models for significant development of this system. There are some hints at potential TC development in the central tropical Atlantic in the 7-10-day timeframe. While the seasonal forecast just released called for an extremely active season, the next two weeks look to be somewhat suppressed relative to the extreme activity predicted due to sub-seasonal variability described in the remainder of this forecast.

The Madden-Julian Oscillation (MJO) is currently located in phase 4 over the Maritime Continent. However, the MJO is forecast to rapidly propagate into phase 8, likely due to a strong convectively-coupled Kelvin wave that should suppress convection over the tropical Atlantic in the next week.

Figure 1 displays the formation locations of tropical cyclones from August 5–18 for the years from 1966–2019 (e.g., the satellite era), along with the maximum intensities that these storms reached. Figure 2 displays the August 5–18 forecast period with respect to climatology. This period typically marks the beginning of the ramp-up for Atlantic

tropical cyclone activity. The primary threat formation area for major hurricanes in early- to mid-August is in the tropical Atlantic east of the Lesser Antilles.

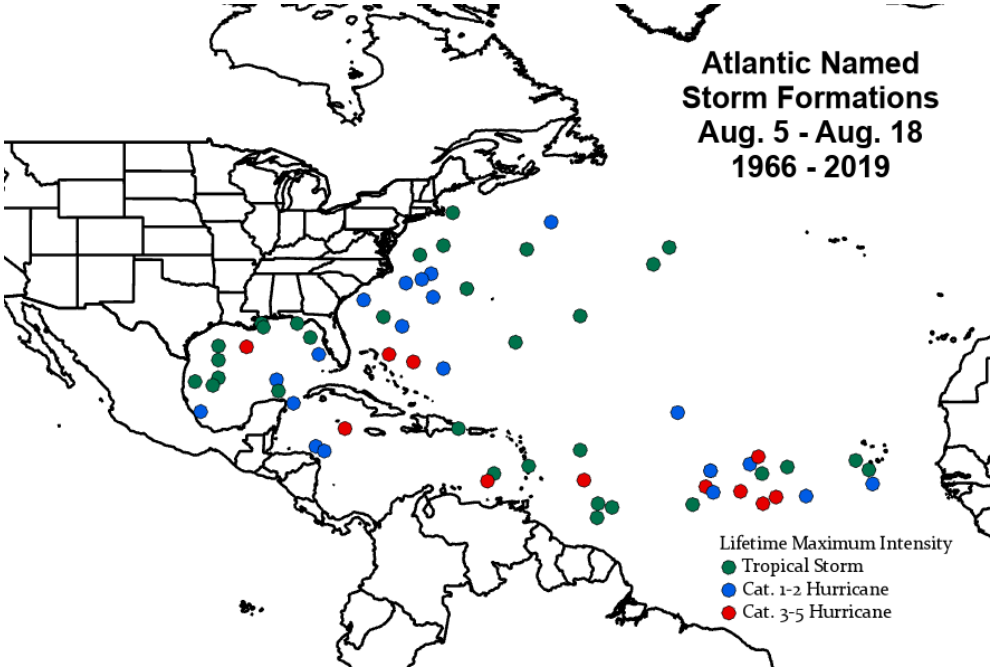

Figure 1: Atlantic named storm formations from August 5 – 18 during the years from 1966-2019 and the maximum intensity that these named storms reached.

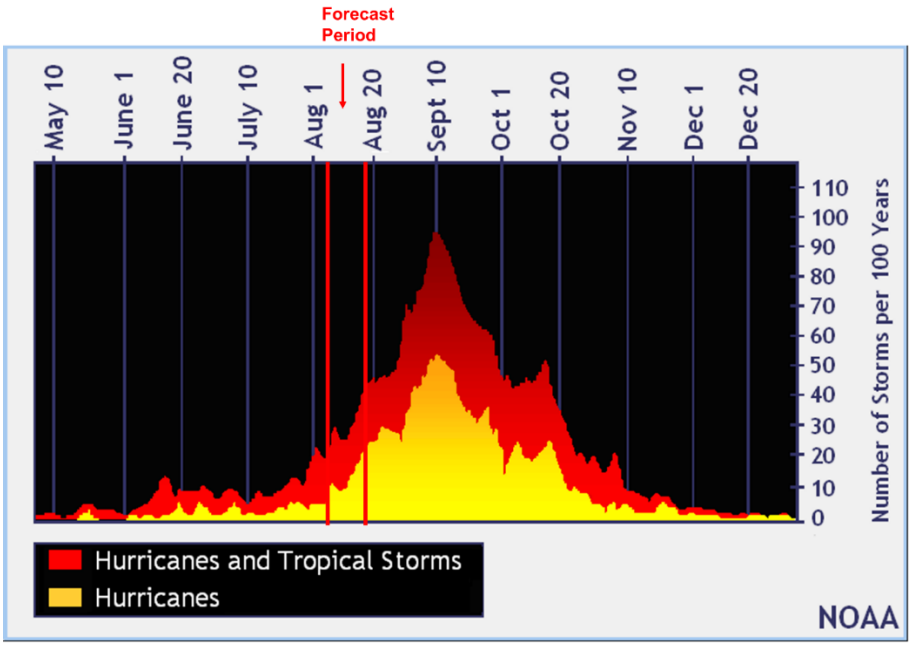

Figure 2: The current forecast period (August 5–18) with respect to climatology. Figure courtesy of NOAA.

We now examine how we believe each of the five factors discussed in the introduction will impact Atlantic TC activity for the period from August 5–18.

1) Current Storm Activity

There are currently no active TCs in the Atlantic.

2) National Hurricane Center Tropical Weather Outlook

The latest NHC Tropical Weather Outlook has one area with a low chance of tropical cyclone formation in the western Atlantic, but the odds of this area developing appear very low.

3) Global Model Analysis

While the global models forecast very little TC activity in the next few days, there are indications of potential TC development in the central tropical Atlantic in week two by the ECMWF ensemble (Figure 3).

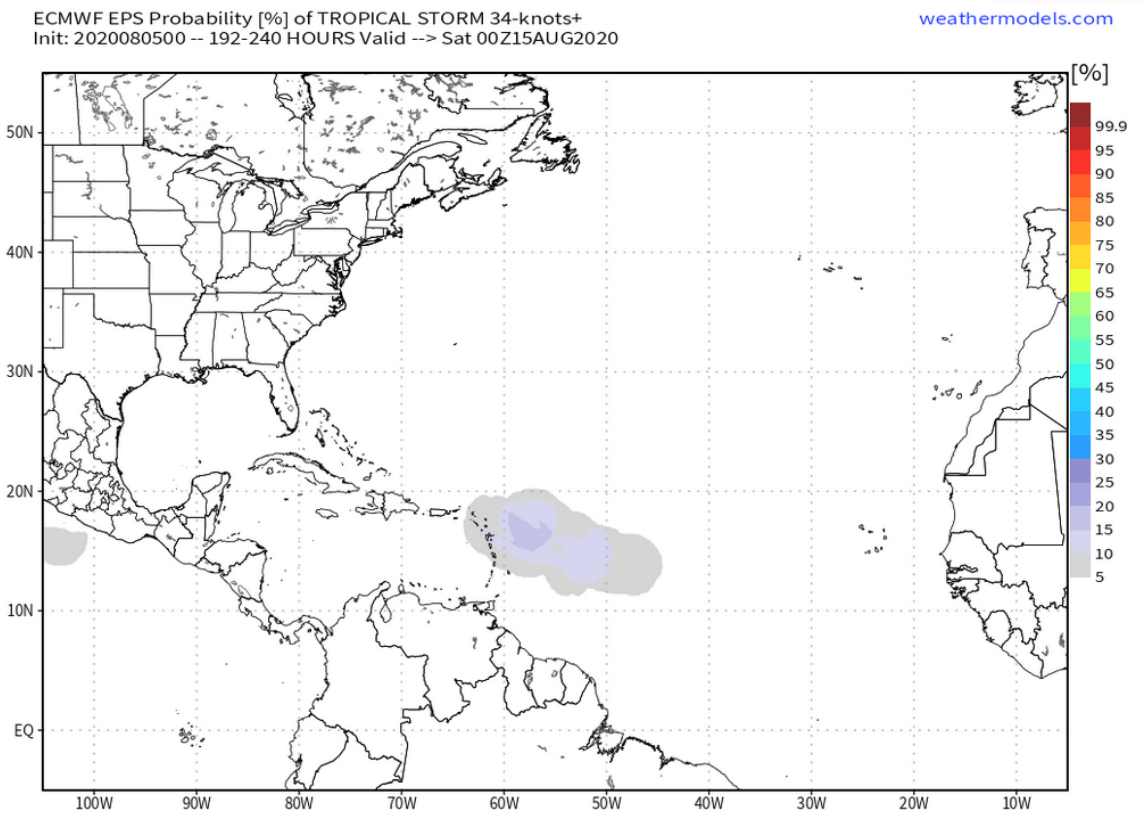

Figure 3: Probability of a tropical storm in the 8-10-day period based on the latest forecast from the ECMWF EPS ensemble. Figure courtesy of weathermodels.com.

4) Madden-Julian Oscillation

The Madden-Julian Oscillation (MJO), as measured by the Wheeler-Hendon index, is currently in phase 4 over the Maritime Continent. The MJO is forecast to quickly propagate into the Western Hemisphere over the next two weeks (Figure 4). Table 2 summarizes the typical MJO impacts on Atlantic TC activity. The reason for the fast MJO progression is likely due to a convectively-coupled Kelvin wave imprinting on the MJO signal (Figure 5). Positive upper-level velocity potential anomalies are associated with suppressed convection and reduced chances for Atlantic TC formation. This suppressed convective signal should result in a quiet upcoming week in the Atlantic for TCs, but there is a chance for a more hurricane-favorable large-scale convective signal in week two.

The Climate Forecast System (CFS) model is predicting above-normal vertical shear over the next two weeks (Figure 6). If this forecast were to verify, it would tend to reduce Atlantic hurricane activity. However, we note that the CFS also predicts extremely weak vertical wind shear beginning around August 20, at about the time the Atlantic hurricane season climatologically becomes much more active.

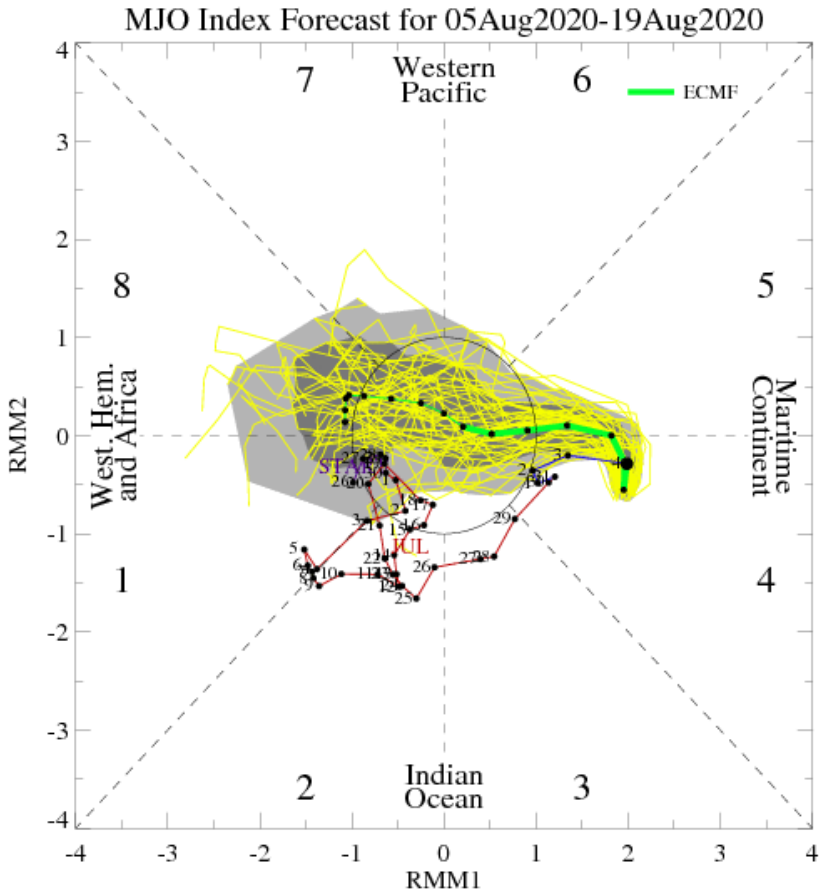

Figure 4: Predicted propagation of the MJO by the ECMWF model. Figure courtesy of NOAA.

Table 2: Normalized values of named storms (NS), named storm days (NSD), hurricanes (H), hurricane days (HD), major hurricanes (MH), major hurricane days (MHD) and Accumulated Cyclone Energy (ACE) generated by all tropical cyclones forming in each phase of the MJO over the period from 1974-2007. Normalized values are calculated by dividing storm activity by the number of days spent in each phase and then multiplying by 100. This basically provides the level of TC activity that would be expected for 100 days given a particular MJO phase.

MJO Phase	NS	NSD	H	HD	MH	MHD	ACE
Phase 1	6.4	35.9	3.7	17.9	1.8	5.3	76.2
Phase 2	7.5	43.0	5.0	18.4	2.1	4.6	76.7
Phase 3	6.3	30.8	3.0	14.7	1.4	2.8	56.0
Phase 4	5.1	25.5	3.5	12.3	1.0	2.8	49.4
Phase 5	5.1	22.6	2.9	9.5	1.2	2.1	40.0
Phase 6	5.3	24.4	3.2	7.8	0.8	1.1	35.7
Phase 7	3.6	18.1	1.8	7.2	1.1	2.0	33.2
Phase 8	6.2	27.0	3.3	10.4	0.9	2.6	46.8
Phase 1-2	7.0	39.4	4.3	18.1	1.9	4.9	76.5
Phase 6-7	4.5	21.5	2.5	7.5	1.0	1.5	34.6
Phase 1-2 / Phase 6-7	1.6	1.8	1.7	2.4	2.0	3.2	2.2

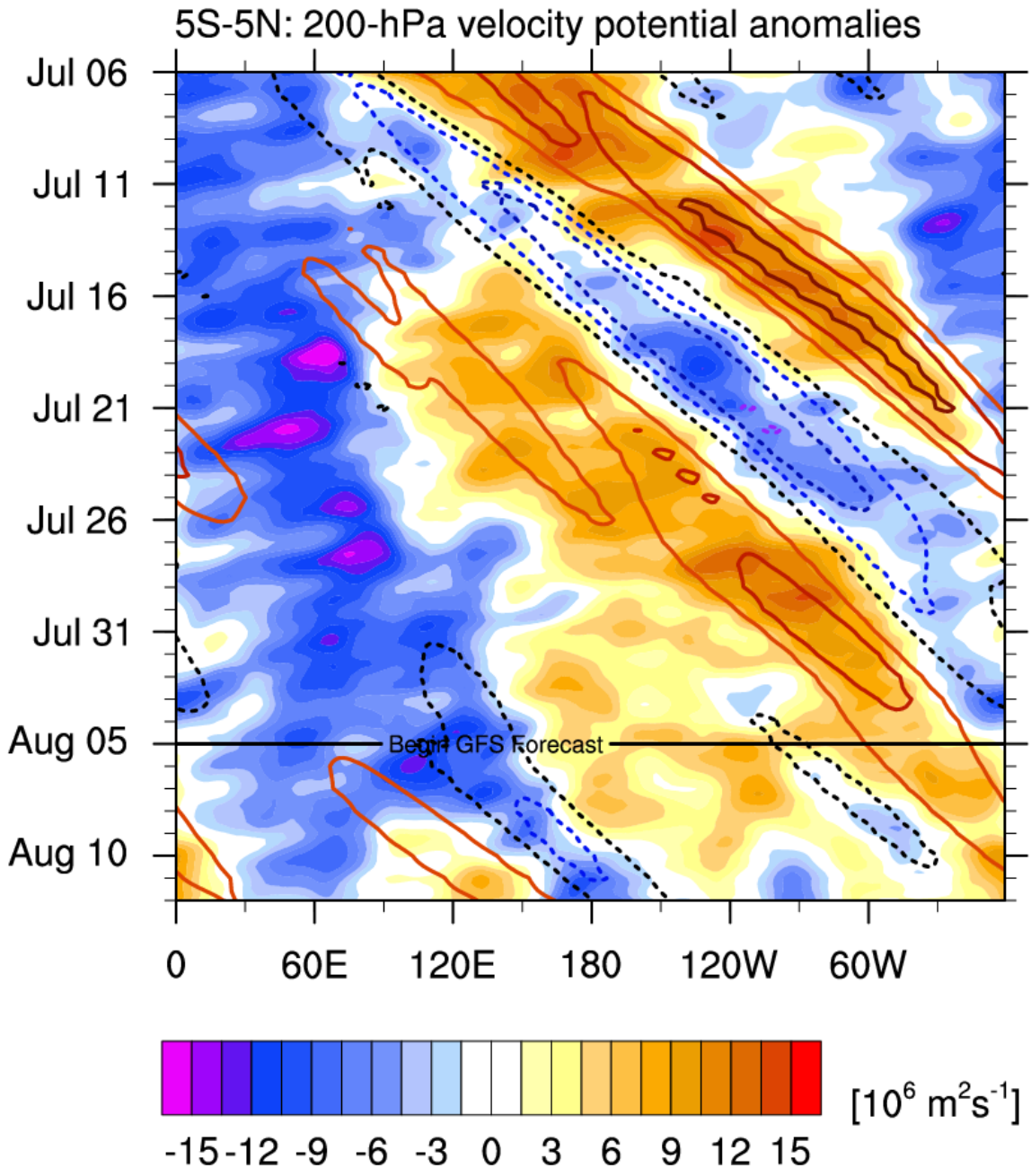

Figure 5: Observed and GFS forecast convectively-coupled Kelvin wave filtered 200 hPa velocity potential anomalies. Positive velocity potential anomalies indicate suppressed vertical motion. Figure courtesy of Mike Ventrice (http://mikeventrice.weebly.com/cckwmjo.html)

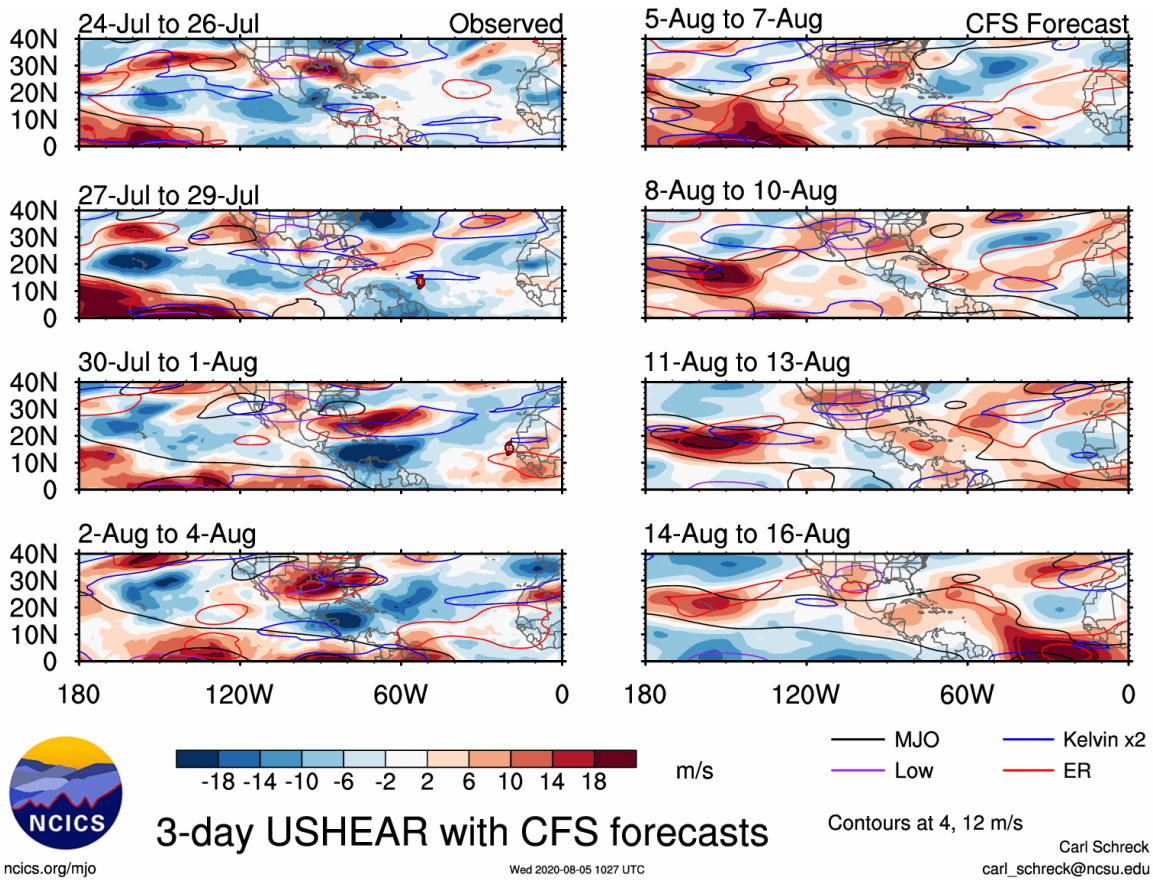

Figure 6: Observed and predicted anomalous 200 minus 850 hPa vertical wind shear from the Climate Forecast System through August 16. Figure courtesy of Carl Schreck.

5) Seasonal Forecast

The most recent seasonal forecast calls for an extremely active season. The next two weeks look relatively benign, but there are hints that TC activity may pick up quite significantly given the more favorable forecast shear environment later in August.

3 Upcoming Forecasts

The next two-week forecast will be issued on August 19 for the August 19 – September 1 period. Additional two-week forecasts will be issued on September 2, September 16, September 30, and October 14.