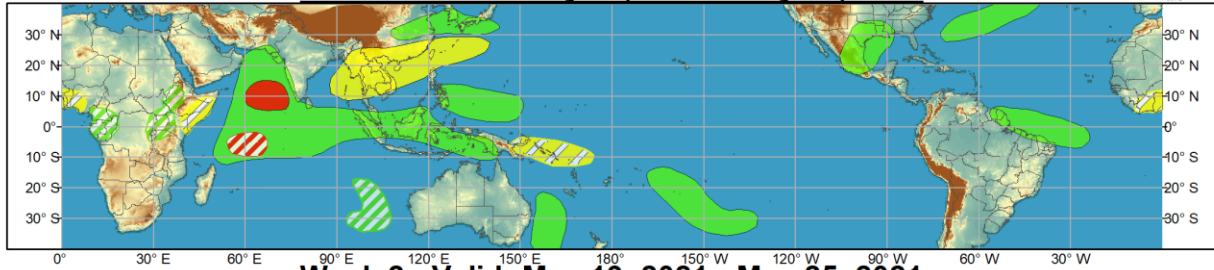




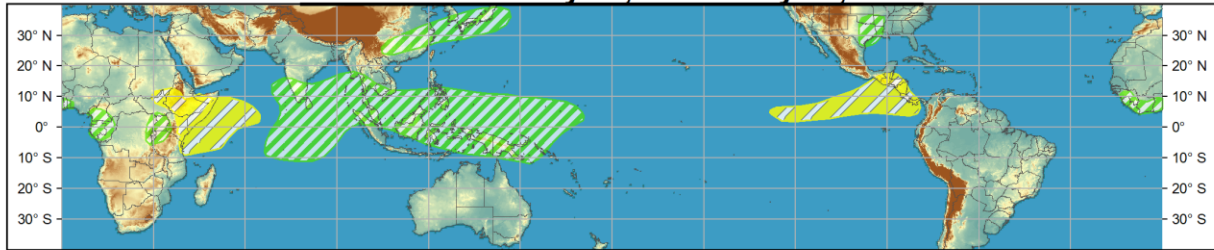
# Global Tropics Hazards and Benefits Outlook - Climate Prediction Center



**Week 1 - Valid: May 12, 2021 - May 18, 2021**



**Week 2 - Valid: May 19, 2021 - May 25, 2021**



Produced: 05/11/2021

Forecaster: Novella

Confidence		
High	Moderate	
<b>Tropical Cyclone Formation</b>		Development of a tropical cyclone (tropical depression - TD, or greater strength).
<b>Above-average rainfall</b>		Weekly total rainfall in the upper third of the historical range.
<b>Below-average rainfall</b>		Weekly total rainfall in the lower third of the historical range.
<b>Above-normal temperatures</b>		7-day mean temperatures in the upper third of the historical range.
<b>Below-normal temperatures</b>		7-day mean temperatures in the lower third of the historical range.

Product is updated once per week, except from 6/1 - 11/30 for the region from 120E to 0, 0 to 40N. The product targets broad scale conditions integrated over a 7-day period for US interests only. Consult your local responsible forecast agency.



Since late February, the Madden-Julian Oscillation (MJO) has remained active and has nearly completed two full global circumnavigations. This is presented well in the upper-level velocity potential anomaly time series, as the enhanced (suppressed) convective envelope has propagated eastward across the Indian Ocean (Western Hemisphere) during the last week. Most recently, two centers of action are revealed in the combined infrared imagery and velocity potential anomaly fields, one focused over Africa and the western Indian Ocean, and the other situated further east across the Maritime Continent and the Western Pacific. The latter is likely tied to a convectively-coupled Kelvin Wave which has begun to separate from the slower-moving MJO signal. This Kelvin wave appears to have been captured in the observed RMM index since early May, where compared to April, there has been an acceleration of the intraseasonal signal (i.e. 3-4 days per phase) over phases 1 through 3, which aligns more with the Kelvin wave band than a canonical MJO in the wavenumber-frequency spectrum. The earlier superposition of these two waves also helps to explain the especially high amplitude in the observed RMM index at the start of May.

There is a general consensus in the RMM forecasts which depict the intraseasonal signal decreasing in amplitude while shifting westward over the Indian Ocean during week-1, followed by strengthening and

eastward propagation of the signal over the Indian Ocean and Maritime Continent during week-2. As noted in our outlook discussion last week, these RMM forecasts need to be taken with caution, particularly during the current transition to ENSO neutral conditions. Specifically, the subtraction of the 120-day mean, which is used as a proxy for removing low frequency variability in the RMM index calculation, can result in artificially “left shifted” values in RMM space during such transition periods. In addition, the westward shifting signal favored by the dynamical models may be indicative of the aforementioned detachment of the Kelvin wave that is forecast to convectively decouple over the Pacific during week-1 while the MJO convective envelope remains to the west over the Indian Ocean. In light of these caveats, there is continued forecast confidence that the MJO will remain active and propagate eastward across the Indian Ocean and into the Maritime Continent, with some uncertainty regarding its strength later in May. The enhanced phase of the MJO and predicted Rossby wave activity are also anticipated to increase tropical cyclone (TC) potential over the eastern Hemisphere during the next two weeks.

Although no TCs formed in eastern Hemisphere during the last week, the Eastern Pacific saw its first TC of the season in Tropical Storm Andres (5/9). The formation of Andres marks the earliest TC formation in the East Pacific basin (barely beating TC Adrian in 2017) and was aided by a band of anomalous lower-level westerlies persisting over the region since late April. The National Hurricane Center (NHC) forecasts Andres to eventually dissipate later today under an unfavorable strong shear and dry air environment. For week-1, high confidence exists for TC development over the Arabian Sea given good agreement among the ECMWF, GEFS ensembles, probabilistic TC tools and the enhanced phase of the MJO. Widespread enhanced precipitation is likely, with heavy amounts possible over coastal areas of India, Pakistan and Oman during week-1. TC formation is also favored to the east of the Seychelles in the southwestern Indian Ocean, though a moderate confidence region is added in the outlook given lesser support from the ECMWF guidance. Farther west, there has been modest support in the dynamical models for TC development over the Philippine Sea during weeks 1 and 2 tied to Rossby wave activity predicted in the region. However, this support has diminished in the latest ensemble guidance and TC tools, and probabilities have become too low to include corresponding hazard areas in the outlook. There are also some signals for TC formation in the Bay of Bengal during week-2, but a TC formation area is also omitted due to inconsistency between the models. Throughout the western Hemisphere, tropical activity looks to be quiet given the influence of the suppressed phase of the MJO and climatology during the next two weeks.

The precipitation outlook during the next two weeks is based on a consensus among the CFS, GEFS, and ECMWF ensemble means, anticipated TC tracks, tropical waves, and MJO precipitation composites. For hazardous weather concerns during the next two weeks across the U.S., please refer to your local NWS Forecast Office, the Weather Prediction Center's Medium Range Hazards Forecast, and CPC's Week-2 Hazards Outlook. Forecasts over Africa are made in consultation with the International Desk at CPC and can represent local-scale conditions in addition to global scale variability.