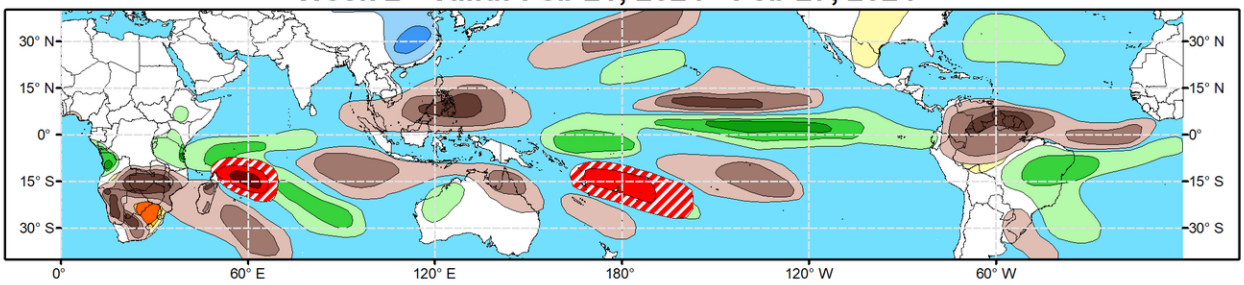
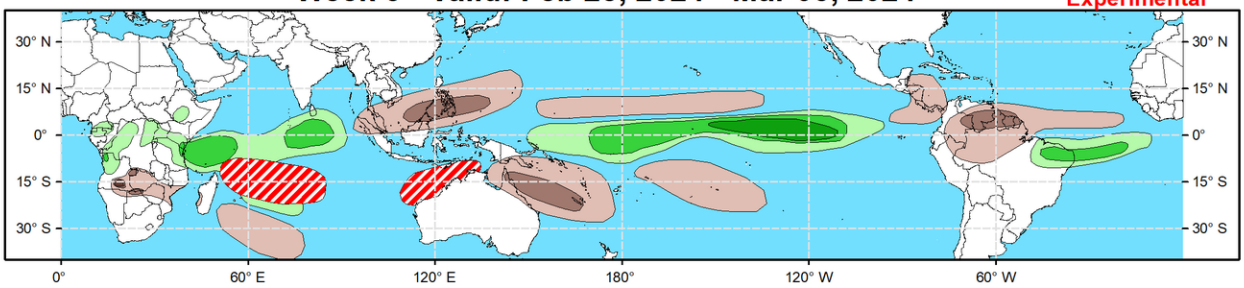
Global Tropics Hazards Outlook

Climate Prediction Center

Week 2 - Valid: Feb 21, 2024 - Feb 27, 2024



Week 3 - Valid: Feb 28, 2024 - Mar 05, 2024 ** Experimental **



Tropical Cyclone (TC) Formation Probability
>20% >40% >60%
Tropical Depression (TD) or greater strength

Above-Average Rainfall Probability
>50% >65% >80%
Weekly total rainfall in the Upper third of the historical range

Below-Average Rainfall Probability
>50% >65% >80%
Weekly total rainfall in the Lower third of the historical range

Above-Average Temperatures Probability
>50% >65% >80%
7-day max temperatures in the Upper third of the historical range

Below-Average Temperatures Probability
>50% >65% >80%
7-day min temperatures in the Lower third of the historical range

Issued: 02/13/2024
Forecaster: Novella

This product is updated once per week and targets broad scale conditions integrated over a 7-day period for US interests only.
Consult your local responsible forecast agency.

Since earlier this month, RMM observations show a westward retreat of the MJO signal over the western Pacific, followed by the resumption of a more canonical eastward propagation where it has recently entered the Western Hemisphere (phase 8). The observed behavior appears to be tied to a fairly strong Rossby wave activity in the global tropics which led to a breakdown of the wave-1 spatial pattern in the upper-level velocity potential anomaly fields during the past week. Looking ahead, RMM forecasts have been consistent in favoring a weakened and incoherent MJO through late February, as models remain nearly unanimous with the signal falling within the unit circle in the next two weeks. However, analysis of several MJO variable forecasts reveal a more coherent MJO perspective, and the thinking is that the disorganizing MJO favored in the RMM forecasts may be more of an undesired effect of RMM methodology. A comparison of RMM indices with and without the 120-day running mean shows a sharp left-to-right shift of values in phase space, where the positive Indian Ocean Dipole (+IOD) event that peaked this past fall appears to be exerting a dominating influence in the mean. Because this low frequency response is no longer evident in the tropical circulation (namely, in the absence of enhanced lower-level easterlies over the Indian Ocean), the RMM forecasts may be overcorrecting themselves to the right along the RMM 1 axis, where the eastward propagating signals favored in the Western Hemisphere (phases 8 and 1) are actually higher in amplitude than what is being depicted.

As a result, this would suggest stronger MJO activity in the outlook, which is supported by upper-level velocity potential anomaly forecasts favoring more of a wave-1 pattern during the next several weeks. Though, it should be noted that even with this RMM biasing, there remains some uncertainty with the evolution of the MJO given a tendency in the model solutions for faster propagation speeds. This is still contributing to high ensemble spread, placing the

enhanced envelope at different phases at the longer leads, which is also featured in the upper-level velocity potential forecasts between the ECMWF and GEFS. Regardless of these differences with timing, the large-scale environment is expected to be favorable for tropical cyclogenesis over the southern Indian Ocean, with increasingly less favorable conditions for additional Tropical Cyclone (TC) formation over the South Pacific heading into early March.

During the past week, two TCs developed in the South Pacific associated with a very strong band of anomalous lower-level westerlies ongoing to the south of the equator. TC Osai formed on 2/7 a few hundred miles northwest of American Samoa. This system tracked southeastward and peaked at Tropical Storm intensity before encountering a more hostile environment and quickly dissipating to the north of the Cook Islands on 2/8. Around the same time, TC Twelve formed further west in the Coral Sea and tracked to the east while peaking at Tropical Storm strength. TC Twelve weakened to a Tropical Depression and dissipated to the west of the Fiji Islands on 2/11, however ensemble solutions maintain an area of depression near the Date Line, where reformation or a newly formed area of tropical low pressure is possible in the region during week-1.

The Joint Typhoon Warning Center (JTWC) is currently monitoring an area (90S) in the southern Indian Ocean for potential development this week. In the wake of this disturbance, there is good model support for additional TC development to the east of Madagascar, and probabilistic tools indicate higher chances of formation near 15S/60E compared to previous runs. Based on continued ensemble support and trend, 60% chances are issued in the region for week-2. In the South Pacific, both equatorial Rossby and Kelvin wave activity are favored in the basin, prompting 40% chances for additional TC development for week-2. Higher chances were considered, however the aforementioned anomalous lower-level westerlies in the South Pacific are predicted to rapidly ease and possibly flip to easterly during week-2, thereby limiting TC genesis potential. 20% chances for development were also considered to the north of Australia based on continued elevated signals from ECMWF probabilistic tool, however this part of the tropics appears more unfavorable with the suppressed phase of the MJO in the region.

For week-3, probabilistic TC genesis tools show increased chances for additional TC development across the southern Indian Ocean, consistent with the enhanced phase of the MJO moving into the basin. However, lower-level wind anomaly forecasts are fairly muted and 20% chances are posted in the outlook. 20% chances are also issued to the north of Australia based on increased signals in the probabilistic tools. Although probabilistic tools feature some modest signals in the South Pacific, no shapes are posted in the basin due to the suppressed phase of the MJO moving into the basin to inhibit development.

The precipitation outlook for weeks 2 and 3 is based on anticipated TC activity, a blend of El Nino and MJO composites, and a skill weighted consensus of GEFS, CFSv2, Canadian, and ECMWF ensemble mean solutions. Accompanying the suppressed precipitation favored across parts of the tropical Americas, anomalously warm maximum daytime temperatures remain favored to further dry out soils across parts of northern South America. Across southern Africa, there are elevated chances for widespread anomalously above-normal temperatures with several areas from the Zambezi River Basin to the Maize Triangle region of South Africa expected to experience daytime temperatures exceeding the 90th climatological percentile and 95 degrees F. Unseasonably warm wintertime temperatures are also forecast across many parts of the Great Plains and Mississippi Valley of the U.S. Conversely, there are elevated chances for below normal minimum temperatures throughout eastern Asia during week-2.

For hazardous weather conditions in your area during the next two weeks, please refer to your local NWS office, the Medium Range Hazards Forecast issued by the

Weather Prediction Center, and the CPC Week-2 Hazards Outlook. Forecasts made over Africa are made in coordination with the International Desk at CPC.