

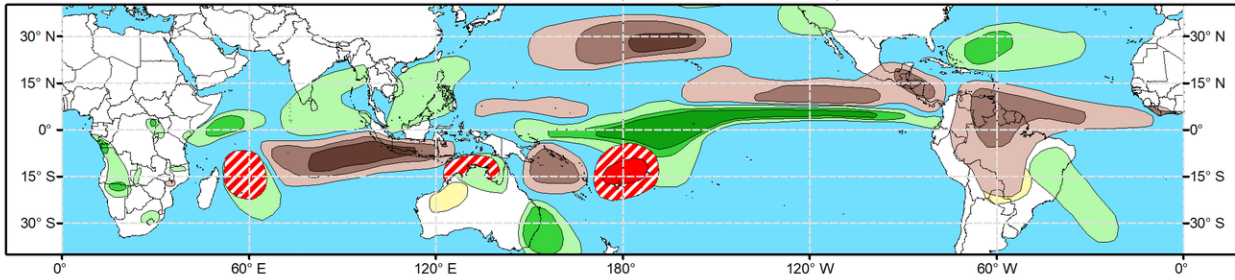


# Global Tropics Hazards Outlook

## Climate Prediction Center

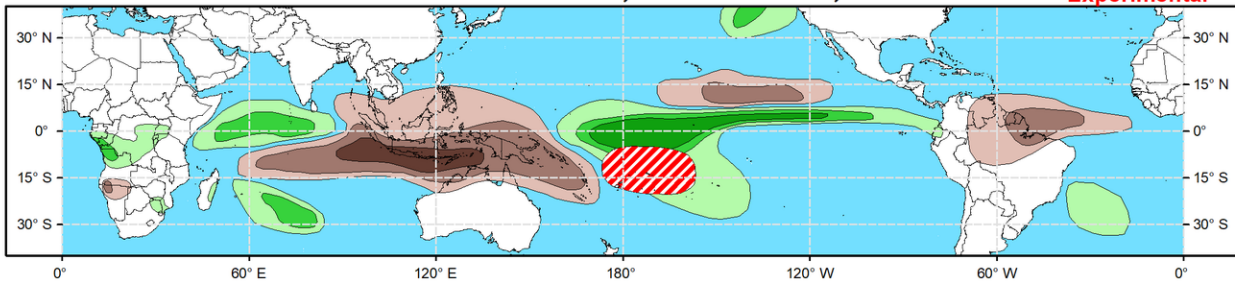


**Week 2 - Valid: Dec 20, 2023 - Dec 26, 2023**



**Week 3 - Valid: Dec 27, 2023 - Jan 02, 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: 12/12/2023**  
**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.**

The Madden-Julian Oscillation (MJO) remains active, having propagated eastward from the Indian Ocean and Maritime Continent since late November. RMM observations currently place the MJO signal in phase 6, and upper-level velocity potential anomaly fields show the MJO has already begun to constructively interfere with the low frequency El Nino base state. Since last week, the GEFS, CFS and ECMWF based RMM forecasts have trended towards favoring a potentially slower and weakened MJO signal over the western Pacific. Any disorganization of the MJO may be short-lived, as this predicted behavior in RMM space appears to be at least in part due to convectively coupled Kelvin wave activity destructively interfering with the suppressed phase of the MJO over the Indian Ocean. The competing tropical variability is supported in the objectively filtered velocity potential anomaly and OLR forecasts, which depict a secondary envelope of anomalous divergence aloft and enhanced convection over the Indian Ocean mainly north of the equator. Such a scenario would explain a loss of signal projected along the RMM2 axis (falling within the RMM unit circle) in the medium range. Beyond this time frame, forecasts depict a more coherent signal emerging with the main convective envelope propagating eastward across the Western Hemisphere through the end of December, and possibly returning to the Indian Ocean by early 2024, though there is good deal of uncertainty in regards to the strength of the MJO at this lead.

With the ongoing constructive interference between the MJO and El Nino, the return of anomalous lower-level westerlies are favored throughout the equatorial Pacific, with the added potential for wind burst activity along and near the Date Line which is likely to reinforce an already strong base state. Farther west, the enhanced trades over the equatorial Indian Ocean associated with the positive Indian Ocean Dipole (+IOD) are favored to relax, but are still expected to remain a prominent fixture in the coming weeks. For the

extratropics, eastward propagating western Pacific and Western Hemisphere MJO events historically favor the development of anomalous mid-level troughing and colder temperatures over the CONUS. However this is at odds with the model guidance for weeks 2 and 3 which instead favors stout mean ridging centered over southern Canada and elevated chances for above-normal temperatures overspreading much of North America.

No Tropical Cyclones (TCs) formed during the past week, though TC Jasper remains active in the South Pacific since forming on 12/4. Currently at Tropical Storm intensity, the Joint Typhoon Warning Center (JTWC) forecasts Jasper to make landfall within the next 24 hours over the Cape York Peninsula of eastern Australia. Based on model guidance, locally heavy amounts of precipitation and periods of high winds are favored over many northern parts of the Queensland State of Australia in the next day or so. The official JTWC forecast shows Jasper dissipating over land, however several deterministic solutions show the remnant low exiting into the Gulf of Carpentaria early in week-1. There is substantial spread in the ensembles, but probabilistic TC tools maintain elevated signals for potential (re)development either in the Gulf of Carpentaria or over the Timor or Arafura Seas. While any formation appears more likely to occur later in week-1, 20% chances are issued over the region for week-2 based on probabilistic tools, warm SSTs (near 30 degrees C), and a decreased shear environment favored next week.

Across the Indian Ocean, 20% chances for TC development are issued to the northeast of Madagascar given the aforementioned Kelvin wave activity and model agreement depicting an area of deepening low pressure later in week-1. Additional TC formation is also possible over the Bay of Bengal, however no corresponding TC shapes are posted due to decreasing support in the probabilistic tools and climatology. These tools also point to TC development in the western Pacific, however the lower-level wind and shear environment appear to become increasingly unfavorable for genesis by the start of week-2, and no shape is issued. In the South Pacific, the TC season is already off to a robust start in the eastern portion of the basin likely due to ENSO. With strongly anomalous lower level westerlies favored through the end of December, 40% chances are posted near the Fiji Islands, with a broad 20% area spanning both hemispheres for week-2. 20% chances are likewise posted for week-3 for approximately the same region in the South Pacific based on support in the extended range guidance and TC composites for Western Hemisphere MJO events during Nov-Jan.

The precipitation outlook for weeks 2 and 3 are based on a historical skill weighted blend of the GEFS, CFSv2, ECMWF, and ECCO ensembles, influences from the ongoing El Nino and +IOD, with added consideration of MJO composites. Forecasts issued over Africa are made in coordination with the International Desk at CPC. In addition to the drier than normal conditions favored over much of South America, above-normal temperatures are expected to persist over parts of Brazil, Bolivia and Paraguay during week-2. Above normal temperatures are also favored for parts of northwestern Australia, where maximum daytime temperatures exceeding 100 and 105 degrees are also possible during week-2. While elevated chances for above normal temperatures are favored for much of the CONUS as previously noted, the unseasonably warm temperatures are not anticipated to be hazardous resulting in no corresponding temperature areas being posted. For hazardous weather conditions in your area during the coming two-week period, please refer to your local NWS office, the Medium Range Hazards Forecast produced by the Weather Prediction Center, and the CPC Week-2 Hazards Outlook.