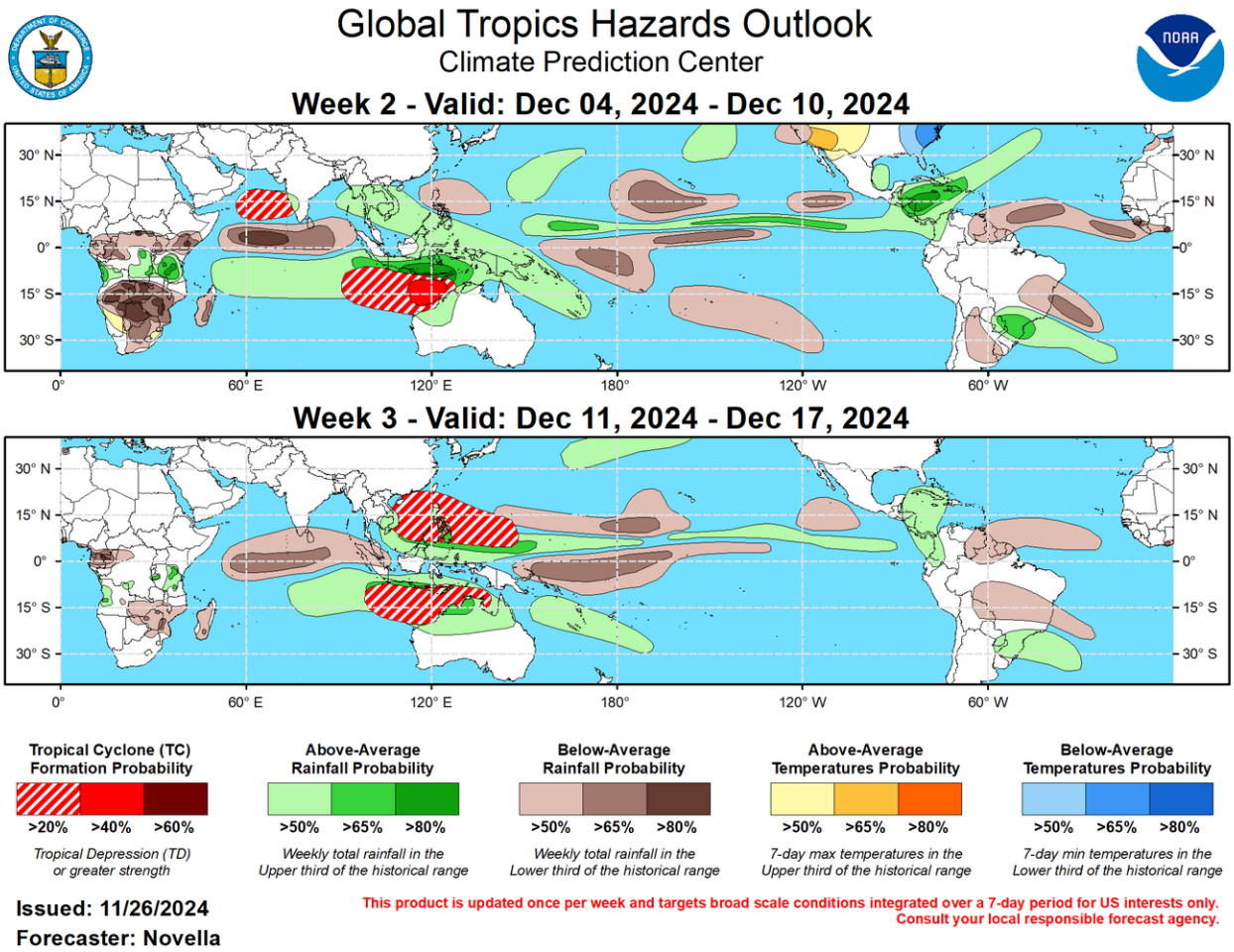

ï»¿Since becoming briefly disorganized over the Western Hemisphere earlier this month, both RMM and upper-level velocity potential anomaly observations show the MJO regaining amplitude with the enhanced phase propagating eastward over the Indian Ocean during the past week. Notably, the strengthening of the suppressed MJO envelope over the Pacific not only led to a break in Tropical Cyclone (TC) activity in the western Pacific basin, but also contributed to a broadening of anomalous lower-level easterlies along the equator (approximately from 120E to 120W), where an enhanced trade regime may help to enliven a La Nina base state later this year and into 2025.

Looking ahead, there is good agreement in the dynamical models favoring continued eastward propagation of the MJO into and across the Maritime Continent, but there are some discrepancies in the guidance in regards to the evolution and coherence of subseasonal activity as the enhanced phase nears the Western Pacific later in December. Upper-level velocity potential anomaly forecasts depict the pattern becoming more disorganized by early December, with a low frequency response taking shape over the Maritime Continent. Similarly, lower-level zonal wind forecasts feature more persistent anomalies, suggestive of the Maritime Continent Barrier effect. However, a more progressive westerly phase of the MJO favored aloft in the models may advect less diffluent background flow, and help maintain the passage of the MJO into the Western Pacific. This realization is supported in the RMM forecasts with more ensemble members in recent runs crossing the Western Pacific, with the GEFS depicting several robust members in RMM space. The thinking is that this is likely significant, as the GEFS has been prone to stalling the MJO over the Maritime Continent based on a recent verification study. Although the amplitude of the MJO remains somewhat a question over time, the continuation of subseasonal activity expected over the Maritime Continent and into Western Pacific brings

increased chances for TC development over the eastern Indian Ocean and parts of the Western Pacific during the next several weeks. It is also worth noting that while extratropical responses typically associated with Indian Ocean MJO events predominately favor warmer than normal temperatures for much of the central and eastern CONUS during boreal autumn, there are previous instances where a faster Rossby wave response from enhanced Indian Ocean convection shifting into the Maritime Continent resulted in more amplified ridging over the western U.S. and forced a downstream trough to induce anomalously colder temperatures over the eastern U.S, which is consistent with the model guidance over North America heading into early December.

No TCs formed during the past week. For week-1, models continue to agree on a Westerly Wind Burst (WWB) event in the equatorial Indian Ocean (near 90E) where twin TCs (99B and 96S) are favored to form on both sides of the equator according to the Joint Typhoon Warning Center (JTWC). For 99B that is likely to form within the next day or so, models show the disturbance slowly tracking northeastward towards eastern India, though some deterministic and ensemble solutions from the ECWMF favor the low crossing India and possibly redeveloping over the Arabian Sea by the start of week-2. While the GEFS keeps the mean low over the Bay of Bengal, 20% chances for TC formation are posted to the west of India to capture this potential. Tied to the active MJO, strongly anomalous lower-level westerlies are favored to protrude eastward into the Maritime Continent, supporting TC development over the Bay of Bengal, South China Sea and the southeastern Indian Ocean. Although probabilistic tools maintain genesis signals north of the equator, the shearing environment may be too unfavorable, and there are lesser signs for low development to support any corresponding TC shapes in the week-2 outlook. However, based on continued good support in the guidance south of the equator, 40% chances are issued for week-2 to the north of western Australia, with a broad area of 20% chances extending westward to approximately 95E. For week-3, an eastward propagating MJO from phase 5 into phase 6 historically supports TC development in western Pacific, north of Australia, with odds increasing into the South Pacific based on MJO composites for Nov-Jan. Despite a quieter climatology for TC activity in the western Pacific during December, extended range probabilistic tools show increased chances for development across the South China and Philippine Seas, as well as to the north of Australia where 20% chances are issued. Genesis signals are evident in the probabilistic tools over the South Pacific during week-3, however these signals appear too modest and varied in space to support a corresponding TC shape at this time.

The precipitation outlook for weeks 2 and 3 is based on anticipated TC tracks, a developing La Nina base state, composites of Maritime Continent and Western Pacific MJO events, and informed by a historical skill weighted blend of GEFS, CFS, ECMWF, and Canadian precipitation guidance. For temperatures, uncalibrated and calibrated tools show increased chances for above-normal temperatures tied to early monsoon dryness over much of southern Africa. The aforementioned ridge/trough pattern favored over North America is expected to bring increased chances for above (below) normal temperature of much of the western (eastern) CONUS during week-2. For hazardous weather concerns in your area in the coming weeks, please refer to your local NWS office, the Medium Range Hazards Forecast from the Weather Prediction Center (WPC), and the CPC Week-2 Hazards Outlook. Forecasts made over Africa are made in coordination with the International Desk at CPC.