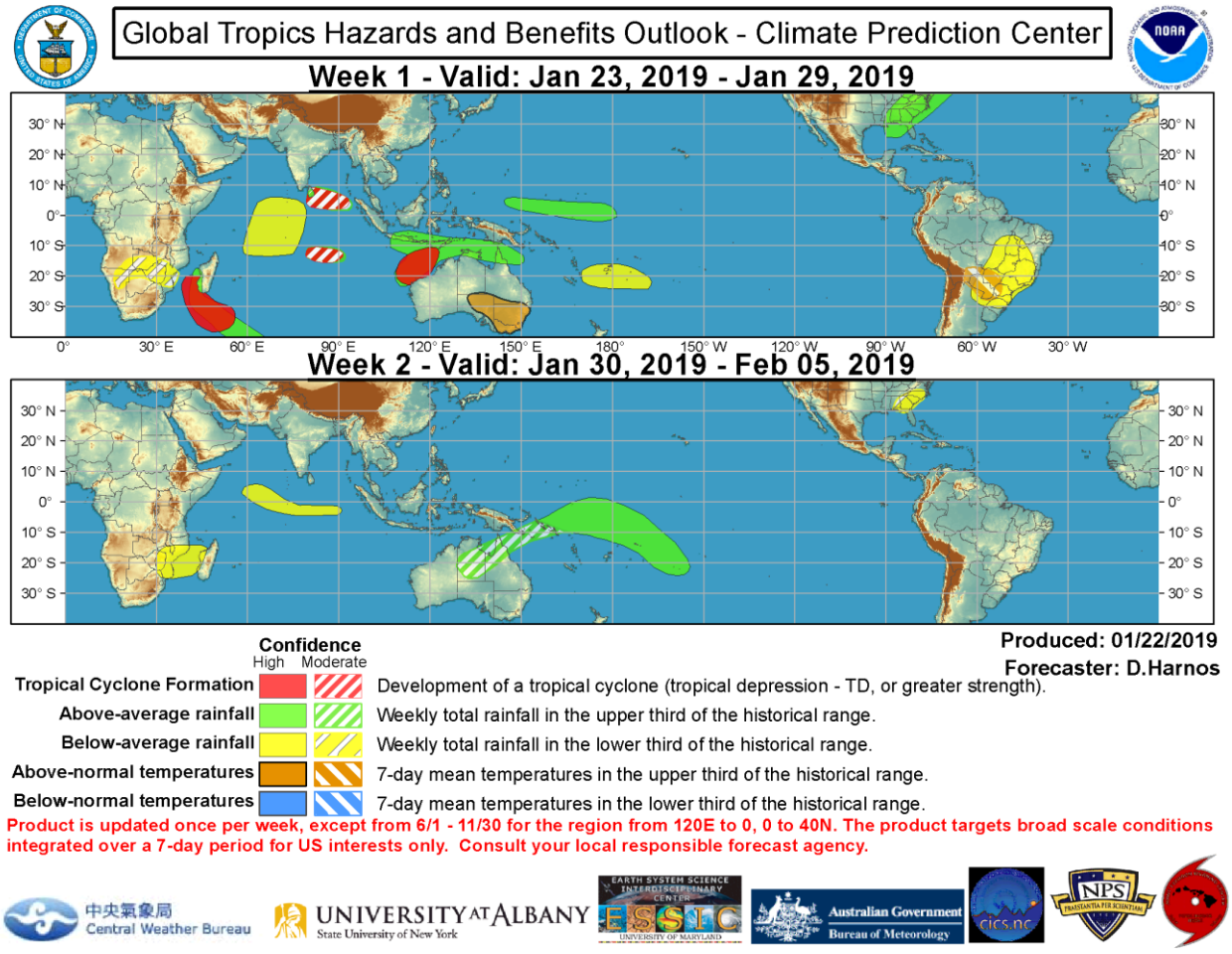

Over the previous week, the Madden-Julian Oscillation (MJO) sped eastward from Africa to the western Maritime Continent. The RMM index depicted weakening of the MJO during this timeframe, likely tied to the anomalous convection associated with the low frequency state west of the Antimeridian helping to bias the index towards Phases 6/7. Elsewhere, cyclonic wavebreaking from the Northern Hemisphere helped drive anomalous westerlies over the equatorial East Pacific, yielding a competing center of action that projected onto the intraseasonal timescale and appeared MJO-like. Model guidance is clustered closely together regarding the eastward progression of the enhanced phase of the MJO envelope during the next two weeks into the West Pacific. Late in Week-2 guidance supports the slowing and weakening of this signal, potentially tied to equatorial Rossby wave activity over the West Pacific. The MJO is anticipated to shift from the eastern Maritime Continent into the West Pacific during Week-1 (Phases 5/6), while stalling over the West Pacific in Week-2 (Phases 6/7) with the signal possibly dropping within the unit circle late in that week. The CFS model, and to some extent the ECMWF model, is an outlier among guidance as it is the most robust on decaying the feature currently shifting across the Maritime Continent, while instead amplifying the aforementioned 200-hPa westerly packet over the East Pacific that is forced from the extratropics. These solutions support this as the primary eastward moving intraseasonal signal on the MJO's timescale as it crosses the Indian Ocean by late in Week-2 (Phases 2/3).

The only tropical cyclone (TC) to develop during the past week was Tropical Storm Desmond in the Mozambique Channel. Desmond formed on the 20th of January and brought flooding due to over a month's worth of rainfall in a single day for portions of Mozambique (277 mm in Beira, with 251 mm typically observed in January). The Joint Typhoon Warning Center (JTWC) is presently monitoring another disturbance in the Mozambique Channel, presently near 17S/46E as of 22 January, with a medium chancel of becoming a tropical cyclone prior to the forecast period. High confidence exists for the system to become a TC before next Wednesday, with a track curving to the south and east around Madagascar appearing likely. Elsewhere, JTWC gives a low chance for a system near 11S/127E to become a TC prior to the forecast period. High confidence exists for this system to undergo tropical cyclogenesis over the next week as it tracks off the Northwest coast of Australia. The last regions of interest during Week-1 are for moderate confidence of twin TC potential in the Bay of Bengal and South Indian Ocean tied to Rossby wave development with the passage of the enhanced phase of the MJO. Between these two disturbances, it appears the Southern Hemisphere system has the better chance of becoming a TC. By Week-2 TC signals have largely waned globally among dynamical guidance, with the best chances for a system developing likely to be for the Coral Sea or Gulf of Carpentaria in association with the MJO passage, although with insufficient confidence to go on the forecast map.

During Week-1, the MJO being in Phases 5/6 is generally favored. This supports high confidence for above-normal (below-normal) precipitation to the south of the Maritime Continent and West Pacific between 150E-180 (Western Indian Ocean, South Pacific, and eastern South America). High confidence for above-normal rainfall during Week-1 is also tied to the possible TC tracks near Madagascar and the Kimberley Coast, with moderate confidence for above-normal rainfall linked to the reduced confidence of TC formation for the twin disturbances in the Bay of Bengal and southern Indian Ocean. The remaining precipitation shape during Week-1 is high confidence for above-normal precipitation over the Eastern U.S. tied to frontal activity. High confidence for above-normal temperatures exists across portions of southeastern Australia in Week-1, in line with the latest heat wave forecasts from the Australian Bureau of Meteorology. Moderate confidence for above-normal temperatures exists across portions of Paraguay, Bolivia, Brazil, and Argentina during Week-1 where the GEFS shows daily high temperatures near or above 40 degrees C with weekly maximum temperature anomalies of +12 degrees C or more.

The Week-2 outlook is substantially less confident, lending to the potential for destructive interference between the MJO and low frequency states in the Pacific. Highest confidence in Week-2 is for portions of the equatorial Indian Ocean and Mozambique Channel to dry out, in association with the suppressed phase of the MJO. The MJO pushing into the Pacific yields high confidence for above-normal rains across parts of the South Pacific, with moderate confidence for these rains to extend across the Coral Sea, Gulf of Carpentaria, and parts of Australia. Moderate confidence for below-normal rains in Week-2 exists for

portions of the southeastern U.S., consistent with both dynamical model guidance and historical expecctations from Phase 6/7 MJO events.

Forecasts over Africa and South America are made both in consultation with the CPC international and therefore can represent local-scale conditions in addition to global-scale variability.