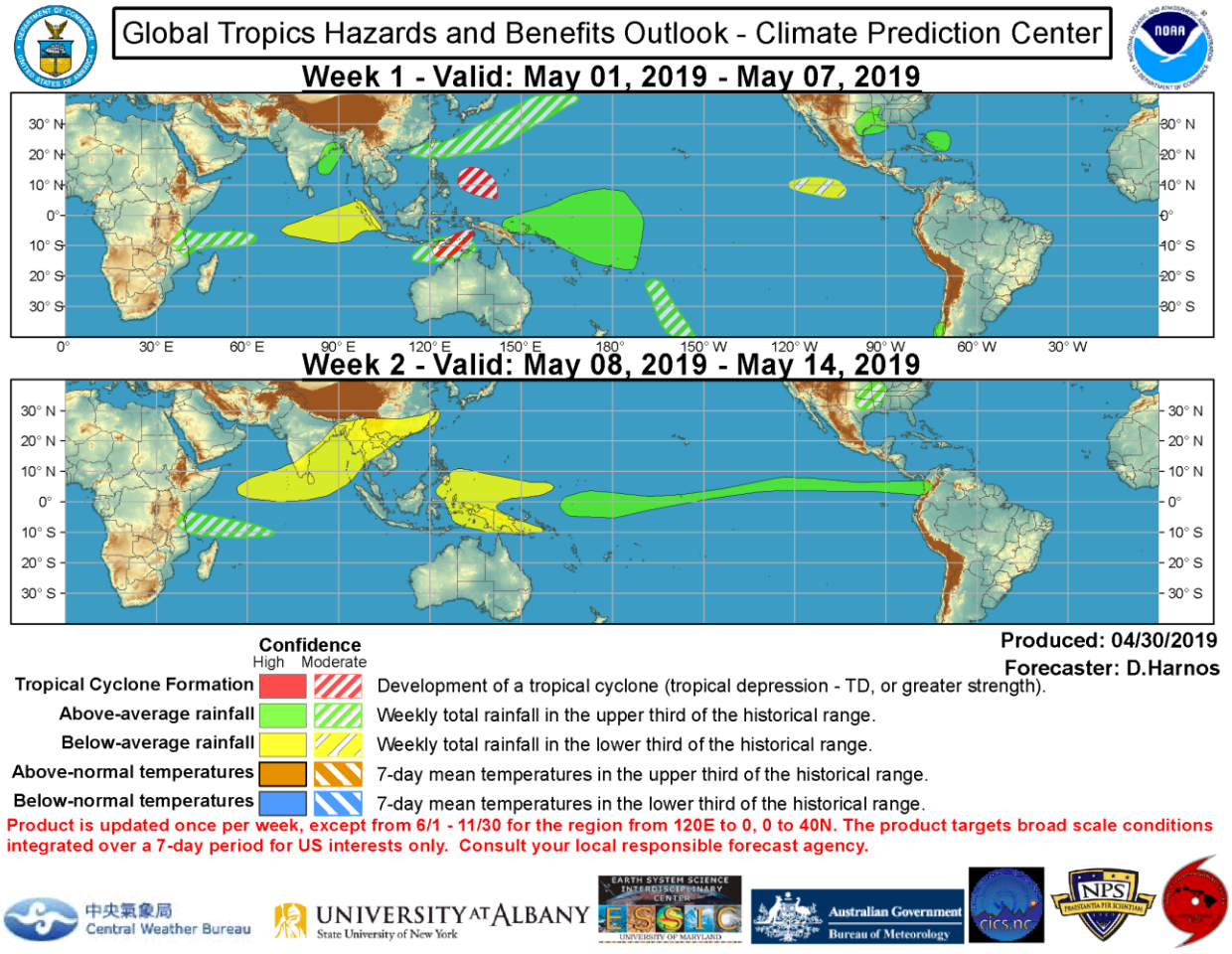

The Madden-Julian Oscillation (MJO) showed increasing signs of organization this past week, supported by a wave-1 appearance in the CPC velocity potential-based index in addition to an increase in amplitude and eastward propagation of the RMM index. The most recent observations place the active MJO over the western Maritime Continent, while the suppressed envelope out ahead of the active phase has helped yield a surge in the trade winds across the West Pacific, effectively masking much of the low-frequency signals tied to the ongoing El Nino. The MJO could have an even more substantial impact on El Nino beyond the forecast period, however, as the anomalous low-level westerlies within the MJO's enhanced phase potentially cross into the West Pacific. Since the shallow thermocline state currently present in the Pacific and copious warm water situated off the equator in the basin, the situation appears ripe for a westerly wind burst to kick off a downwelling oceanic Kelvin wave that reinforces the warm water volume available to maintain El Nino for some time. All told, confidence is high for the MJO to be over the Maritime Continent during Week-1 (RMM Phases 4/5), and reach the West Pacific in Week-2 (Phases 6/7). Constructive interference of the MJO and El Nino is likely during Week-2, with implications for enhancement of the Pacific jet, despite model guidance hinting at extratropical factors such as the Arctic Oscillation largely driving the Week-2 circulation across North America.

Tropical Cyclone (TC) Fani developed over the eastern Indian Ocean on the 27th of April. Fani has slowly intensified while tracking northward into the Bay of Bengal, with an estimated intensity of 95 knots as of 12 UTC on the 30th. The Joint Typhoon Warning Center forecasts Fani to skirt along the eastern coast of India, with potential impacts reaching Kolkata and Bangladesh later this week. Fani is the twin TC to Lorna in the southeastern Indian Ocean, which formed just over a week ago. Also of interest last week was TC Kenneth, which made landfall last Thursday as the strongest landfalling system in the history of Mozambique at 125 knots. Given that the nation is still reeling from Cyclone Idai's impacts roughly a month earlier, an even more extensive humanitarian crisis may be underway. At present, 38 individuals are confirmed to have lost their lives from Kenneth, with the full scope of the storm's impact still slow to be revealed given persistent storminess in the TC's wake.

Over the course of the next week, TC formation continues to be possible tied to anomalous low-level westerlies near the equator within the active MJO envelope and any Kelvin waves that emerge from it. This results in moderate confidence of TC formation stretching from the Timor Sea through areas off the Kimberley Coast of Australia, in addition to the West Pacific between Palau and Guam (around 140W). ECMWF ensembles also hint at the potential for a tropical depression to form near Vanuatu very late in Week-1, but confidence is low at present. Things appear quiet elsewhere, and there are no substantial signals for TC development in Week-2 at present, although the MJO reaching the West Pacific would support a possible uptick in activity from the Philippines through Micronesia. Assuming the MJO reaches the Western Hemisphere by Mid-May, the intraseasonal signal would support the potential for an active start to the East Pacific hurricane season that begins on the 15th of May.

During Week-1, regions of above-normal precipitation are favored with high confidence in association with: the track of TC Fani, for the West Pacific in association with anomalously warm ocean temperatures tied to El Nino, across the Central U.S. driven by anomalous poleward advection of Gulf of Mexico moisture, over the Bahamas in association with a mid-level trough, and across portions of Chile where ongoing drought conditions are likely to be interrupted by a bought of heavy rains linked to ENSO. The only area with high confidence for below-normal precipitation in Week-1 is across the eastern Indian Ocean in the wake of the active phase of the MJO. Moderate confidence for above-normal precipitation also exists during Week-1 across parts of Mozambique and Tanzania extending into the western Indian Ocean (low-frequency state), the Timor Sea through Kimberley Coast (possible TC formation), South China Sea through northwestern Pacific (frontal activity), and South Pacific near 160 W (Rossby wave activity). Consensus among dynamical model guidance also supports moderate confidence for below-normal precipitation across portions of East Africa and the East Pacific.

Anticipated precipitation variability during Week-2 has the highest confidence tied to the ongoing MJO reaching the West Pacific. Typically MJO Phase 6/7 conditions see an extension of enhanced rainfall from roughly 165E through the Americas, which is also indicated by model guidance resulting in high

confidence of this outcome. Additionally, Phase 6/7 MJO events feature suppression of rainfall extending across much of the Indian Ocean through the Maritime Continent, while dynamical models also push the dryness further into East Asia than MJO composites. High confidence for below-normal precipitation exists for both of these regions, with a split across the western Maritime Continent as indicated by dynamical model guidance. The low-frequency state favors moderate confidence for continued anomalous rains from Tanzania through the western Indian Ocean. Across the continental U.S., model guidance supports with moderate confidence a continued wet pattern across much of the Central U.S. as Gulf moisture streams northward over areas with already saturated soils from months of antecedent precipitation.

Forecasts over Africa are made in consultation with the CPC International Desk, and can represent local-scale conditions in addition to global-scale variability.