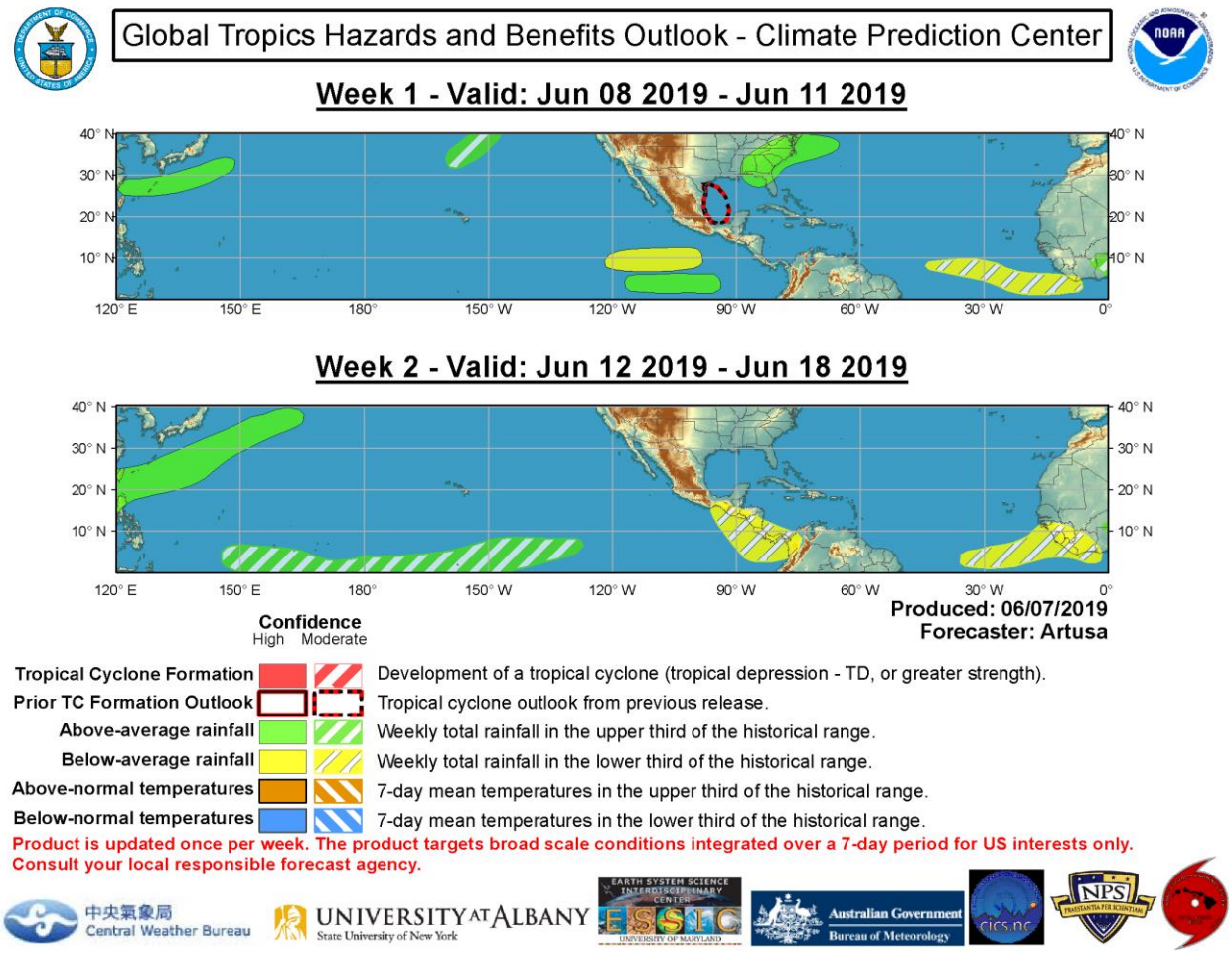

The enhanced phase of the MJO is currently centered over the Indian Ocean and adjacent parts of the Maritime Continent, with the suppressed phase of the MJO located over the Pacific Ocean and Western Hemisphere. CFS forecasts of both the 200-hPa velocity potential field and outgoing longwave radiation field indicate the expected presence of equatorial Rossby waves (ERW) over the Western and Central Pacific during the next two weeks. These westward-moving modes of variability are likely to interfere with the eastward propagation of the MJO signal. Dynamical model phase plots from the GEFS, Canadian, ECMWF, and to some degree the CFS, predict a westward shift in the RMM Index over the eastern Indian Ocean during the next 1-2 weeks.

With the suppressed phase of the MJO dominating most of the Pacific Ocean and Western Hemisphere during the next two weeks, odds for tropical cyclone (TC) development are considered low. One area being monitored is the eastern Pacific during Week-2. The anticipated approach of a Kelvin wave over this region later in Week-2 increases the odds for TC development.

The Week-1 and Week-2 precipitation forecasts are based on a consensus of the latest CFS, ECMWF, and GEFS model runs, influences from El Nino, and anticipated phases of the MJO signal. During Week-1, above average rainfall is forecast just off the southern coast of Japan (high confidence), associated with low pressure systems traveling along the relatively warm Kuroshio current. Above average rainfall is also forecast north of the Hawaiian Islands associated with the approach and passage of a frontal system (moderate confidence), and over the near-equatorial eastern Pacific (high confidence) associated with the proximity of the Inter-Tropical Convergence Zone (ITCZ). A complex frontal system is predicted to bring above average rainfall (with high confidence) to the Southeast U.S., with estimated rainfall totals of 3-7 inches. Below average rainfall (high confidence) is predicted over the eastern tropical Pacific (just north of the expected band of above average rainfall noted earlier), and also over much of the low latitudes of the North Atlantic (moderate confidence).

Week-2 precipitation is forecast with high confidence to be above average in a band from the Northern Philippines and Taiwan northeastward to approximately 40N/165E (well east of Japan). This is associated with low pressure systems that are predicted to move along the western and northwestern flanks of the North Pacific subtropical High. Above average rainfall is also expected across an east-west oriented band that extends from just north of Papua New Guinea to near 10N/130W, passing well south of the Hawaiian Islands (moderate confidence). This is related to a broad area of low pressure expected over this region. Two areas of below average rainfall (with moderate confidence) are anticipated over the vicinity of Central America and the low latitudes of the central and eastern North Atlantic. These areas are due, in part, to the suppressed phase of the MJO, and to sufficient distance from the ITCZ.

---------- The original forecast discussion follows below ----------

The enhanced phase of the MJO is currently centered over the Indian Ocean and parts of the western Maritime continent, with the suppressed phase over the Pacific Ocean and Western Hemisphere. Daily upper-level velocity potential analyses continue to depict a well-defined wave-1 pattern during late May and into early June. Following a period where the MJO signal interfered with westward moving variability and remained stationary in RMM space, the latest mean upper and lower-level zonal wind anomalies clearly depict a robust and rapid eastward propagation of the MJO during the last seven days. For the upcoming Week-1 and Week-2 outlook periods, both the GEFS and ECMWF models are in fair agreement with the evolution of the MJO as it is forecast to continue propagating eastward with some weakening in amplitude during Week-1. The ECMWF ensemble guidance is a bit faster in its eastward propagation during this time. By Week-2, GEFS guidance suggests interference with some westward moving features over the Maritime Continent. However, Kelvin wave activity forecast by some of the models is expected to help sustain the MJO where the enhanced region of convection is forecast to enter the Maritime Continent (phase 5) during Week-2 period.

No Tropical Cyclones formed during the past seven days, however there are two main regions of interest during Week-1. First, a broad area of low pressure over the Bay of Campeche has been observed, with a moderate chance (40%) of cyclone formation during the next few days. Regardless of formation, the northward transport of tropical moisture forecast is likely to trigger locally heavy rainfall over parts of eastern Mexico, Texas, and the lower Mississippi Valley of the U.S. during the next few days. Second, GFS and GEFS models show the development of a closed Low in the Arabian Sea during the early portion of the Week-1 period in association with the enhanced phase of the MJO over the Indian Ocean. Anomalously positive sea surface temperatures (>1.5 degree Celsius) and low deep layer shear over the Arabian Sea also support development. For the Week-2 period, models indicate some potential for TC formation in the Bay of Bengal which is also tied to the active phase of the MJO forecast during this time. As the suppressed phase of the MJO moves into the eastern Pacific and Atlantic Ocean basins, there is an increased chance that Tropical Cyclone activity will be suppressed into mid and possibly late June.

The tropical precipitation outlook during the next two weeks is based on influences from El Nino, model consensus among the CFS, ECMWF, and GEFS models, and MJO phase composites of historically observed rainfall. Persistent Week-1 and Week-2 precipitation anomalies include below-average rainfall over the Indian subcontinent, the tropical eastern Pacific, and Atlantic Ocean basins. Despite the recent enhancement of convection over the Indian Ocean associated with the MJO, the continuation of anomalous lower-level easterlies over the past few weeks have resulted in a delayed onset of the Indian monsoon. Local in-situ reports in India indicate pre-monsoonal temperatures to have exceeded 48 degrees Celsius during the last week, and the anomalous heat is expected to accompany the suppressed convection over the region through the next two weeks. Model guidance does suggest a weakening of the anomalous easterlies and the return to a normal monsoonal flow pattern towards the end of the week-2 period. Over the Western Hemisphere, El Nino continues to elevate the chances of above-average rainfall across the equatorial Pacific, while the MJO favors below-average rainfall across parts of the East Pacific, Central America, and tropical Atlantic. Forecasts over Africa are made in consultation with CPCs international desk, and can represent local-scale conditions in addition to global-scale variability.