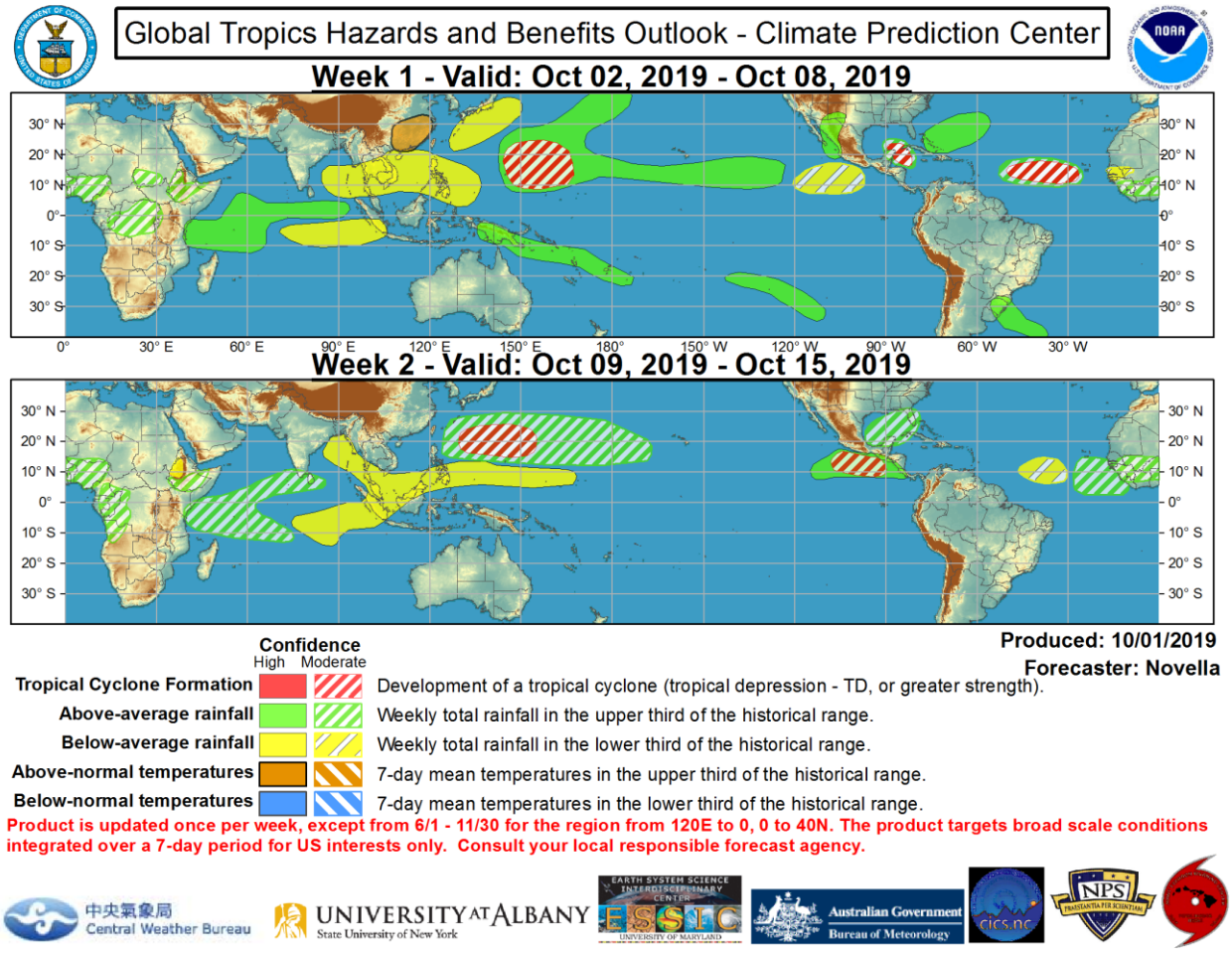

Throughout much of September, the RMM MJO index has indicated a present and eastward propagating MJO signal, but it has continued to weaken over the past several days. Analysis of upper-level velocity potential anomalies suggests the MJO has become stationary in late September, with its enhanced phased centered over the Western Hemisphere, and suppressed convection persisting over the eastern Indian Ocean and the Maritime continent. The stalled position and weakening signal of the MJO is likely associated with the developing positive phase of the Indian Ocean dipole over the Eastern Hemisphere, which is spuriously projecting onto the MJO RMM index with the strongest easterly anomalies observed in the past six months centered over the eastern equatorial Indian Ocean, and lower-level divergence supportive of convective suppression over the Maritime continent.

Dynamical model MJO forecasts are in fair agreement and depict a retrograding and weakening MJO signal. GEFS and ECMWF ensemble means suggest little to no sign of eastward propagation of the MJO signal during Week-1 and most of Week-2, however some ensemble members suggest some re-amplification and eastward propagation in phases 1-2 later during the Week-2 period. At this time, it remains likely that anomalous rainfall forecast will predominately be associated with low frequency

modes of variability throughout the global tropics, as Kelvin and Rossby wave activity is also expected to diminish compared to the last several weeks.

During the last week, two tropical cyclones have formed in the Pacific and one remains ongoing from the previous week in the Atlantic. The development of typhoon Mitag in the western Pacific peaked at category 2 strength and is forecast track to the northeast, weaken over the East China Sea, and make landfall over South Korea as a Tropical Storm during the next several days. In the East Pacific, Tropical Depression Narda formed just offshore of the Guerrero State of Mexico and has briefly strengthened into a Tropical Storm. Narda is forecast to track northwestward into the Gulf of California, and bring above-average rainfall across parts of western Mexico and the southwestern U.S. In the Atlantic, Hurricane Lorenzo (formed on 9/23) continues to track across the central Atlantic and had reached category 5 strength this past weekend. At its peak, Lorenzo was remarkably broad in its spatial structure and broke the record for being the easternmost category 5 storm in the Atlantic basin according to NHC. Lorenzo has since weakened to category 2 strength, and is forecast to continue weakening as it transitions into an extratropical storm while tracking northeast towards the Azores.

Compared to the last several weeks, model guidance suggests a decrease in tropical cyclogenesis during the first half of October. In the Caribbean, a broad area of low pressure extending from the Gulf of Honduras to the southeastern Bahamas is producing cloudiness and disorganized shower activity, however model guidance suggests a low chance of formation during the early portion of Week-1. Over West Africa, an anomalously wet monsoon and easterly wave activity remains ongoing to increase the opportunity for cyclogenesis in the main development region. While both deterministic and ensemble model guidance show increased rainfall associated with westward moving areas of low pressure in the tropical Atlantic, anomalously cold sea surface temperatures in the wake of Hurricane Lorenzo, and an increasing shear environment has lowered confidence for formation during most of Week-1. In the western Pacific, models depict a broad area of low pressure to the east of the Mariana Islands which may result in tropical low developing in the region towards the end of Week-1, and another low forming during the earlier portion Week-2. Latest deterministic guidance shows the potential for rapid deepening of theses lows while tracking westward into the Philippine Sea. In the eastern Pacific, there is a moderate degree of agreement in the models for the development of a tropical disturbance off the Gulf of Tehuantepec during Week-2.

Forecasts for suppressed and enhanced rainfall were made using a consensus of dynamical model forecasts and anticipated tropical cyclone tracks. Over portions of eastern Asia and the Maritime Continent, mean upper-level convergence is expected to suppress precipitation in the region and bring above-average surface temperatures across parts of eastern China. Deterministic guidance suggests daytime maximum temperatures may exceed 35 degrees Celsius in Hunan and Jiangxi regions of the country during the beginning of Week-1. Conversely, parts western equatorial Indian Ocean are

expected to experience enhanced precipitation during Week-1. Over the western and central Pacific, a broad region of mean upper-level divergence is expected to enhance rainfall over the basin. Forecasts over Africa are made in consultation with CPCs international desk, and can represent local-scale conditions in addition to global-scale variability.