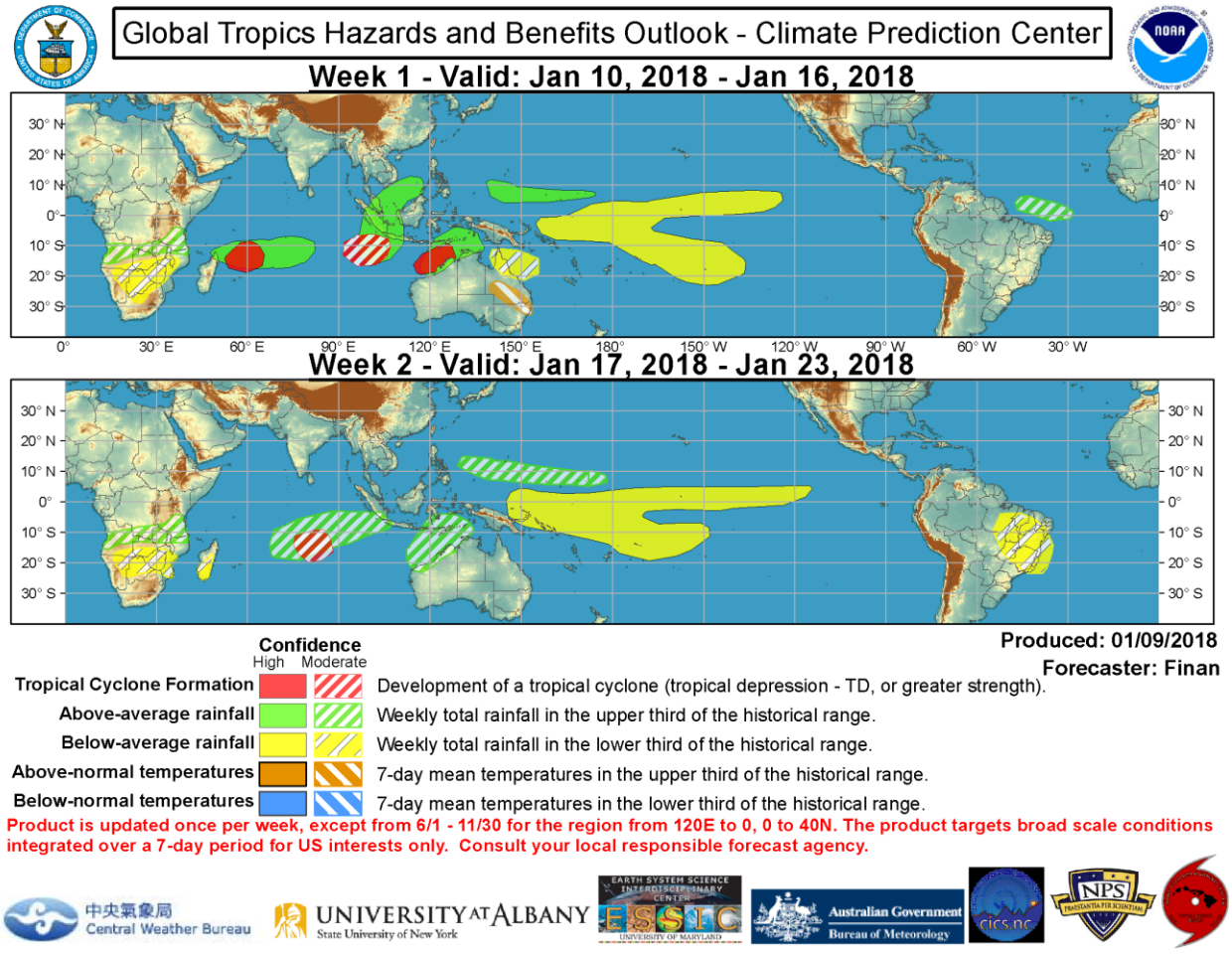

Large-scale modes of climate variability are likely to continue to dominate in the tropics with the active Madden-Julian Oscillation (MJO) signal and continuing La Nina base state. The MJO is currently in Phase 2, placing the enhanced convective envelope over the Indian Ocean and the corresponding suppressed convection over the western Pacific. For Week-1, the MJO signal is forecast to move into Phase 3, maintaining the current amplitude. Both the GEFS and European models support the continued active signal and eastward propagation. The Week-2 timeframe has some uncertainty in the timing of this continued eastward propagation. The European model shows a quicker timeline with the signal moving through Phase 4 and reaching Phase 5 by the end of Week-2 with a rapid decrease in amplitude. The GEFS solution remains in Phase 4 through Week-2 and maintains the current amplitude. Both solutions still support the general pattern of enhanced convection over the Maritime Continent, with the suppressed envelope constructively interfering with the base state over the central Pacific during the next two weeks.

The South Indian basin has had an active start to the year, with 3 tropical cyclones in the beginning of January. Tropical cyclone Ava made landfall on the western Madagascar coast, and then moved south back over water. Tropical cyclone Irving remains active in the southwestern Indian Ocean, east of

Madagascar. JTWC also issued a tropical cyclone formation alert for the Kimberley coast as of 9 January. The basin is likely to remain active over the next few weeks as the MJO signal continues eastward propagation and the enhanced convective envelope moves out of the region. For Week-1, several areas of interest are highlighted for possible TC formation. An area of high confidence for TC formation is shown off the eastern coast of Madagascar, an area of is currently active. Similarly, the Kimberley coast of Australia remains a high risk area of TC formation throughout the week. There is also an area of moderate confidence off the coast of Java for Week-1. For Week-2, the western side of the South Indian basin is likely to quiet down as the MJO signal moves over the Maritime Continent. A moderate confidence region for TC formation is anticipated in the central South Indian basin, as the enhanced convection propagates eastward. There also remains a possibility for TC formation off the Kimberley coast, though confidence is low at this time.

For Week-1, areas of above and below-average rainfall are mostly tied to the MJO signal, La Nina or TC activity. The MJO signal is forecast to move into a Phase 3, bringing the enhanced convective envelope over the Maritime Continent with the suppressed convective moving further toward the Date Line. East of 150E longitude, below-average rains are expected with the MJO signal reinforced by La Nina. Below-average rainfall is also expected for the Coral Sea with moderate confidence, most likely as part of the retreating suppressed convective region. Above-normal temperatures are also expected for parts of Queensland and New South Wales, which has been experiencing an extreme heat wave recently and is likely to continue over the next few days. Dynamical model guidance shows that there could be a break in the temperatures toward the end of Week-1. Areas of high confidence for above-average rains over the Maritime Continent are supported by both dynamical model guidance as well as the MJO tropical composites for Phase 3. In the western South Indian Ocean, high confidence for above-average rainfall is due to ongoing TC activity that is likely to continue into Week-1. An area of above-average rainfall is forecast in the central Atlantic Ocean, a pattern seen in both dynamical model guidance and statistical tools tied to Rossby wave activity.

Much of the forecast for Week-2 is attributable to typical MJO patterns, reinforced by dynamical model guidance. The area of below-average rainfall over the western and central Pacific remains into Week-2 with high confidence. The MJO signal is expected to transition from Phase 3 into Phase 4, pushing the suppressed envelope further over the Pacific Ocean. This suppressed convection is likely to be continually reinforced by typical La Nina patterns in Week-2. There is moderate confidence in areas of above-average rains over the Maritime continent, as the MJO tropical composites and dynamical model guidance support patterns of enhanced precipitation off the coast of Java into the central Indian Ocean, as well as off the Kimberley coast. The above-average rainfall region in the Philippine Sea expands in Week-2, typical of a Phase 4 MJO. Dynamical and statistical tools indicate below-average rains are likely in Brazil.