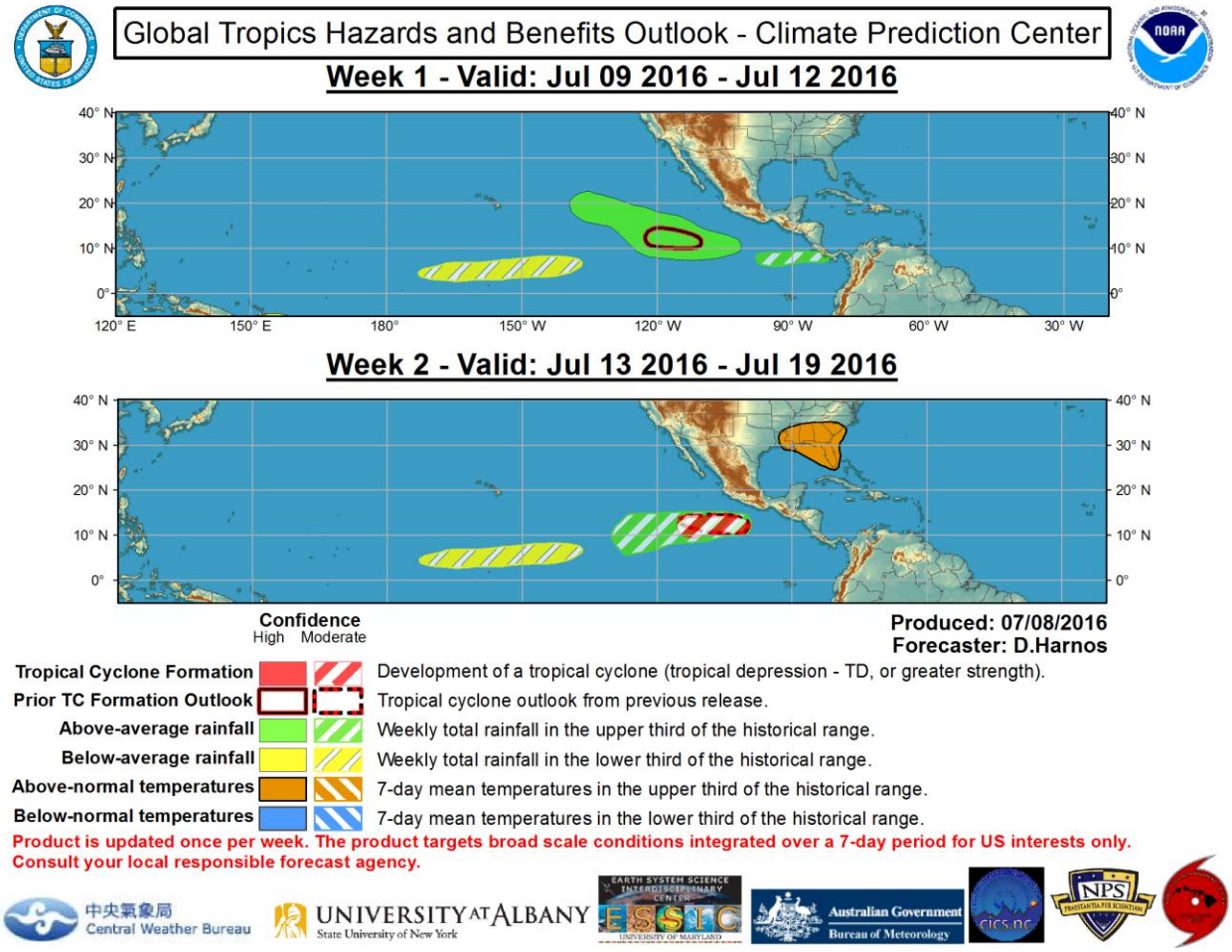

The MJO continues to show weakness in the Wheeler-Hendon index, with RMM values near 0. Meanwhile, 200-hPa velocity potential anomalies continue to support a robust MJO signal across the East Pacific that would indicate a MJO event in Phase 7. These perspectives remain in line with the previous forecast thinking, in that the Wheeler-Hendon index is failing to characterize the MJO properly but a MJO-related signal does in fact exist across the East Pacific. This discrepancy does not appear to be tied to multiple modes of tropical variability that are interfering with the RMM signal as non-MJO variability is not obvious in Hovmoller analyses. Some of the weakness in the Wheeler-Hendon index could be tied to assumptions regarding a quasi-steady background atmospheric state that may be inappropriate given the decay of the antecedent El Nino event over the past 120 days, which would bias the RMM indices towards Phases 3 and 4 (i.e. limiting potential amplitudes of an event in Phases 7 or 8). Regardless, the observed precipitation anomalies through the early part of this week and the forecast period align well with expectations of a Phase 7 or 8 MJO event and the original forecast is largely on track.

The East Pacific tropical cyclogenesis shape for week-1 has been removed, as a tropical depression formed on July 6th near 12N and 109W and has since become Tropical Storm Celia. The National

Hurricane Center does indicate a new region of potential tropical cyclone formation roughly between 10-15N and 100-115W (similar to the area targeted in week-2 earlier this week), however they currently give this region a 30% chance of formation over the next 5 days. GEFS and CFS formation guidance continue to indicate week-2 tropical cyclogenesis potential for this region, while general troughing is apparent for this region in both ECMWF and CanSIPS guidance. Thus, no shape is shown on the map but the moderate confidence shape for tropical cyclone formation is maintained during week-2.

The week-1 high confidence of above-median rainfall shape along and north of Taiwan has been removed, as Typhoon Nepartak has shifted west of the area. The week-1 moderate confidence of above-median rainfall shape across the Philippines has been removed, as the CFS guidance has trended drier for the remaining portion of week-1 and the suppressed phase of the MJO appears to be shifting to this area in both OLR and 200-hPa velocity potential perspectives. Slight adjustments were made in location for the week-2 above-median rainfall shape in the East Pacific associated with the potential subsequent tropical cyclone, in line with GEFS and CFS tracking any potential disturbance slightly further south. The week-1 moderate confidence below-median precipitation shape to the northeast of the Date Line is now anticipated to stretch into week-2. A strong subtropical ridge is also favored to influence the southeastern CONUS during week-2, resulting in a high confidence of above-normal temperatures being added to the forecast map for this area.

---------- The previous discussion released on July 5 follows. ----------

MJO signatures became muddled last week as the convective envelope attempted to traverse the Maritime Continent. OLR fields and low-level wind fields suggest the decay of the antecedent MJO event, apparent in the RMM index which returned to within the unit circle over the past week. 200-hPa velocity potential signatures reveal a different perspective however, with a robust region of upper-level divergence spanning eastward from the Date Line across the equatorial Pacific. Also apparent in 200-hPa velocity potential is a Kelvin Wave currently near 90W that likely aided in the development of Tropical Storm Agatha (since dissipated) and Hurricane Blas (ongoing) in the East Pacific over the past week. Elsewhere, Typhoon Nepartak developed into the first West Pacific tropical cyclone (TC) of the season on the third of July near the Caroline Islands. Nepartak developed in the vicinity of the decaying OLR signature of the MJO, and edge of the MJO-related velocity potential anomalies. Dynamical model forecasts suggest a continued weakness of the MJO over the next two weeks before potential re-emergence over the Western Indian Ocean late in week-2. Caution should be exercised with such a forecast, however, as a similar pattern was forecast with the MJO event of May that decayed in the OLR and low-level wind fields, but showed continued eastward propagation through the present in 200-hPa velocity potential. It is also noted that some of the weak MJO forecasts from the dynamical models may be due to differences in ensemble member phase speeds, that when averaged can appear to be a weak MJO event. Given the forecasts of a weak MJO, uncertainty regarding the MJO's development, and

typically limited coupling to the mid-latitudes this time of year any teleconnections from the MJO are anticipated to be tropical cyclone-related. Enhanced TC activity is possible across the East Pacific in week-1 and week-2 associated with forecast negative velocity potential anomalies associated with the MJO providing large-scale vertical ascent.

The precipitation outlook during week-1 is based on CFS and ECMWF model guidance, potential MJO influences in Phase 7, and observed climate variability including an atmospheric Kelvin wave currently near 90E and low-frequency suppression of convection west of the Date Line. A high confidence region of tropical cyclogenesis during week-1 is forecast near 10N between 110-125W that would be complimented by the MJO if it were in Phase 7. The National Hurricane Center presently gives this region an 80% chance of TC development over the next 5 days. High confidence in above-median precipitation exists surrounding this shape and to its west given the favorable MJO state, expected TC development, and Hurricane Blas lying within the area at the start of the forecast period. Elsewhere, high confidence also exists for above-median precipitation to the east and north of Taiwan along the anticipated recurving track of Typhoon Nepartak. A final region of high-confidence above-median precipitation lies southeast of the Date Line over the Central Pacific, where persistent anomalously warm SSTs have driven observed values above 30 degrees Celsius. Lower confidence regions of above-median precipitation are indicated by CFS and ECMWF guidance for portions of the far East Pacific, the vicinity of the Philippines, Central India, and the Southern Indian Ocean. A high confidence region of below-median precipitation is forecast for the vicnity of the Solomon Islands where low-frequency variability has been supressing convection in recent weeks. Moderate confidence regions of below-median precipitation suggested by dynamical guidance exist across the Western Ghats of India, northeast of the Date Line, and western Indian Ocean. Moderate confidence regions of above normal temperatures in week-1 are forecast across portions of Eastern Pakistan and Northwestern India and across central South America based on dynamical guidance.

During week-2, upper-level MJO signatures continue to be forecast over the East Pacific, while low-level fields suggest no MJO presence. As in week-1, the MJO presence in Phase 7 or 8 would support potential TC development in the East Pacific, resulting in a moderate risk region shown for week-2 between 10-15N and 100-115W. GEFS and CFS guidance also suggest potential possible tropical cyclogenesis for this region. A moderate confidence above-median precipitation shape extends around the aforementioned TC shape. Elsewhere, moderate confidence of above-median precipitation is expected southeast of the Date Line in the same region as week-1 associated with anomalously warm SSTs. Dynamical model guidance suggests moderate confidence of below-median precipitation across the Western Ghats again in week-2, with above-median precipitation for portions of the South Indian Ocean. Above normal temperatures with moderate confidence are forecast by dynamic models across much of Southeast Asia in week-2.

Forecasts over Africa are made in consultation with CPCs international desk, and can represent local-scale conditions in addition to global-scale variability.