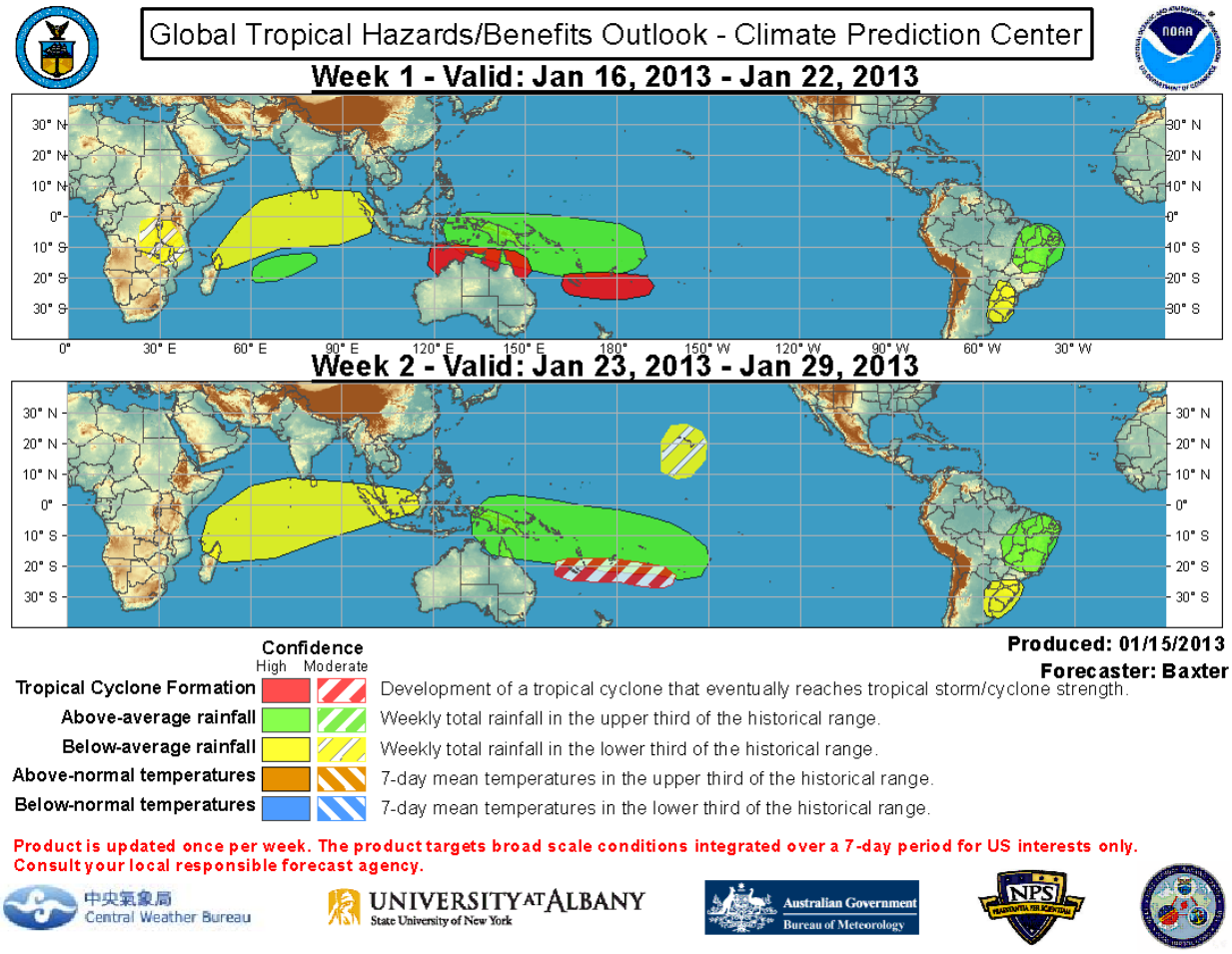

The MJO has remained active over the past week and has propagated into the equatorial Pacific basin. The WH MJO index moved quite rapidly through phases 5 and 6 and is approaching phase 7. Eastward propagation of the overall MJO convective envelope is expected to slow down, however, due to interaction with an equatorial Rossby wave. Additionally, a portion of the rapid phase speed observed during the past week may have been attributable to an atmospheric Kelvin wave embedded within the MJO convective envelope, an influence that is expected to diminish. At the current time, a blend between the statistical contructed analog MJO index forecast and the UK Met Office dynamical model ensemble mean forecast is favored for the next two weeks. Therefore, the MJO is expected to propagate through phase 7 and possibly into phase 8, with the potential for some decrease or weakening in amplitude.

The current Global Tropics Hazards and Benefits Outlook for Week-1 is based largely on a strong MJO signal in phase 7, augmented slightly by CFS and GFS precipitation forecasts. Enhanced probabilities of above-median rainfall are forecast over the eastern Maritime Continent and northern Australia extending toward the Date Line. Below-median precipitation is favored over parts of Africa and much of the Indian Ocean. A small area of enhanced probabilities for above-median precipitation is included in

the South Indian Ocean due to the track of Tropical Cyclone Emang. That storm will also serve to enhance subsidence on the northern flank in concert with the background MJO state. Enhanced odds for above-median rainfall are also anticipated over parts of Brazil. South of this region, below-median precipitation is favored in a classic dipole that results from MJO activity serving to enhance the Hadley circulation later in the period.

There are two areas highlighted for tropical cyclone development in Week-1; the South Pacific near the Date Line and the Australian region. There are tropical disturbances in both regions that are being monitored for developement, and confidence is high that over the next week a Tropical Cyclone will form in each case.

During Week-2, confidence is fairly high that the MJO will continue through phase 7, possibly into phase 8. Therefore, the outlook is based largely on phase-7 and phase-8 MJO composites, adjusted slightly using model guidance. Enhanced odds for above-average convection is indicated across the far eastern Maritime Continent, centered near Papua New Guinea extending eastward well past the Date Line, generally along and south of the Equator. Drier-than-average conditions are favored over much of the equatorial Indian Ocean and western Maritime Continent. The forecast MJO phase and model guidance are generally supportive of an enhanced risk of tropical cyclone formation in South Pacific. The forecast precipitation dipole over South America is continued from Week-1 with high confidence due to an even more favorable MJO phase location and good model agreement.

The current MJO event serves as the best case this season in terms of the canonical impacts on the extratropics. The expected wave pattern resulting from convection centered over the Indian Ocean was realized as ridging developed in the both the North Pacific and eastern North America. As the MJO shifts into the Pacific, it will play a role in extending the East Asian jet eastward. Geostrophically we expect lower heights over the North Pacific and then the canonical downstream wave pattern with lower-than-normal heights over the eastern CONUS. This is bourne out by the latest CFS guidance for weeks three and four. The resulting hydroclimate impacts are an enhanced probability of colder-than-average temperatures over the eastern part of the CONUS and drier-than-average conditions over a large part of the CONUS, except for the eastern seaboard. If the MJO propagates through phases 8 and 1, this can support a renewed southern storm track in early February. Superimposed on the tropical variability is another forcing external to the troposphere, namely, a sudden stratospheric warming, which is ongoing whose impacts could potentially amplify those forced by the MJO over the next few weeks.