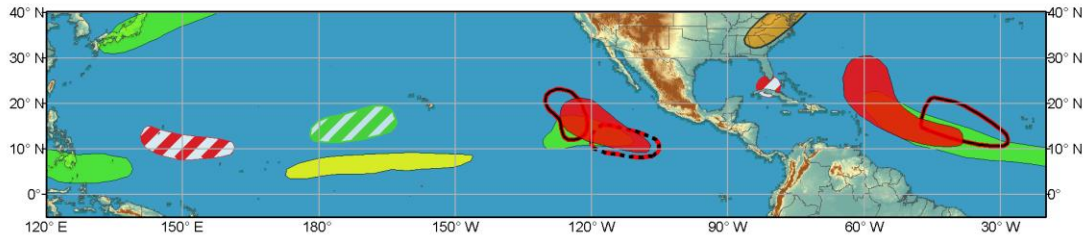




Global Tropics Hazards and Benefits Outlook - Climate Prediction Center



Week 1 - Valid: Sep 10 2016 - Sep 13 2016



Week 2 - Valid: Sep 14 2016 - Sep 20 2016



Confidence
High Moderate

Produced: 09/09/2016
Forecaster: D. Harnos

- Tropical Cyclone Formation** Development of a tropical cyclone (tropical depression - TD, or greater strength).
- Prior TC Formation Outlook** Tropical cyclone outlook from previous release.
- Above-average rainfall** Weekly total rainfall in the upper third of the historical range.
- Below-average rainfall** Weekly total rainfall in the lower third of the historical range.
- Above-normal temperatures** 7-day mean temperatures in the upper third of the historical range.
- Below-normal temperatures** 7-day mean temperatures in the lower third of the historical range.

Product is updated once per week. The product targets broad scale conditions integrated over a 7-day period for US interests only. Consult your local responsible forecast agency.



Since Tuesday, weakness of the MJO continues to be apparent in both the Wheeler-Hendon and CPC velocity potential indices. Some enhancement in the Wheeler-Hendon framework was apparent towards Phase 2, however, the velocity potential index shows a negligible signal globally over the most recent five day period. Dynamical model guidance consistently supports continued weakness of the intraseasonal signal over the next two weeks, with a handful of bias-corrected GFS and ECMWF ensemble members showing an emerging MJO signal across the far eastern Indian Ocean or Maritime Continent during week-2. While ensemble spread is reasonably large, the majority of members cluster within the unit circle and support the continued weakness of the MJO that was anticipated during the original Tuesday forecast. As such, much of the original forecast appears to be on track and limited intraseasonal impacts continue to be anticipated during the coming two weeks.

On September 9, the Joint Typhoon Warning Center (JTWC) began issuing advisories for Tropical Depression 16, which formed near 14N/142E. This system is forecast to track west-northwest towards Taiwan through the remainder of Week-1 before anticipated recurvature, with gradual intensification into a typhoon expected over the next few days. JTWC is also monitoring a disturbance near 11N/161E for possible tropical cyclogenesis as of Friday, September 9. This system is forecast to drift westward

towards Guam during the forecast period, with a moderate probability of tropical cyclogenesis now forecast in Week-1 along the anticipated track of this disturbance in the West Pacific. In the East Pacific, Hurricane Newton crossed the Gulf of California earlier in the week, reaching Arizona and New Mexico as a Tropical Depression and bringing some areas up to 5 inches of rainfall. The National Hurricane Center (NHC) continues to monitor a region of low pressure near 10N/110W in the East Pacific for possible development, giving it a 60% chance of forming a tropical cyclone in the next 48 hours and an 80% chance through the next 5 days. The previous region west of this that was highlighted for potential tropical cyclogenesis in the original outlook is no longer being monitored for possible development. In the Atlantic, an easterly wave near 12N/41W as of 2 PM EDT on September 9, is given a 80% chance of becoming a tropical depression in the next 5 days by the NHC, with the forecast track shifting southward and westward relative to Tuesday's forecast, with recurvature anticipated as the system approaches 60W. Two other disturbances are present in the Atlantic, the first presently just north of the Leeward Islands, and the second between Cuba and South Florida. NHC gives the former a 10% chance of developing during the next 5 days due to expectations of substantial vertical wind shear acting to limit potential development, while the latter has seen dramatic improvement in its circulation over the course of this morning resulting in the NHC providing a 40% chance for this system to become a Tropical Depression in the next 48 hours. A moderate confidence shape for tropical cyclogenesis has been added to the updated map associated with this system.

Adjustments were made to the Week-1 precipitation forecast to account for the antecedent tracks of Hurricane Newton in the East Pacific and Tropical Storm Malou (as per the Japanese Meteorological Agency) across Japan. Other minor adjustments were made to regions expecting anomalously dry or wet conditions in line with expected forecast track adjustments of potential tropical disturbances in the previous paragraph or for updated dynamical model support. Warm conditions continue to be forecast along the eastern CONUS this weekend before the expected passage of a cold front. During week-2, slight adjustments were made to the moderate risk of tropical cyclogenesis area in the Atlantic in line with the latest GEFS and CFS tropical cyclone guidance. The CFS has also trended drier across the west Pacific, resulting in a moderate confidence area of below-normal precipitation being introduced east of the Philippines.

----- Original forecast discussion from September 6, 2016 follows. -----

The MJO remained weak over the previous week, with the RMM-based index remaining very near the origin while the velocity potential-based index supported broad, weak ascent over the Western Hemisphere and corresponding subsidence over the Indian Ocean and Maritime Continent. Outgoing longwave radiation (OLR) remains relatively out of phase with the velocity potential field, highlighted by enhanced convection across the Indian subcontinent last week associated with a return in monsoonal flow across the Arabian Sea in addition to suppressed convection across the East Pacific outside of TC

activity. The Maritime Continent has seen an abundance of Rossby wave activity over the past month, with forecasts of another event forecast to initiate soon and propagate westward through mid-September. Dynamical model RMM guidance continues to be impacted by the influence of the active monsoon trough across the West Pacific during the past month, with the dry signal equatorward of this feature now impacting the RMM index. Dynamical model guidance splits into two camps with the MJO's progression over the next two weeks: the first supporting continued weakness in the MJO, and the second suggesting an emerging MJO event over Africa or the Indian Ocean. The second group may be impacted by the drying signal over the Maritime Continent south of the monsoon trough being aliased into the RMM-index via increased positive OLR anomalies and 850-hPa easterly anomalies along the equator. Given the recently observed out of phase OLR and velocity potential MJO indices, uncertainty regarding the West Pacific monsoon trough's influence on the RMM index, and the diversity of model solutions, continued weakness in the MJO is anticipated during the forecast period. If an intraseasonal signal were to re-emerge across the Indian Ocean this would support enhanced probabilities for tropical cyclogenesis across the East Pacific and Atlantic during the forecast period.

During the past week, Typhoon Namtheun developed east of Taiwan on August 31 and tracked northward before making landfall at the island of Kyushu in Japan. The Japanese Meteorological Agency initiated Tropical Storm Malou on the morning this forecast was made near 29N/128E, however the Joint Typhoon Warning Center maintains only a high probability of development in the next 24-h for this system. In the Central Pacific, Hawaii saw limited impacts from Hurricanes Madeline and Lester, which passed the islands to the south and north, respectively. Further east, the East Pacific saw development of Hurricane Newton on September 4 which also took a northward track and made landfall on September 6 just west of Cabo San Lucas. Newton is expected to cross the Gulf of California and make it into the lower-48 states at the beginning of the forecast period. In the Atlantic, Hurricane Hermine made landfall near St. Marks, Florida on September 2nd, ending Florida's stretch of not experiencing a landfalling hurricane since 2005. Hermine then progressed up southeastern U.S. coastline, before becoming relatively stationary south of New England in recent days.

The Week-1 forecast period coincides with the climatological peak in Atlantic hurricane activity. Presently, the National Hurricane Center (NHC) is monitoring a pair of disturbances in the Atlantic. The first is currently south of Hispaniola and is given a near 0% chance of undergoing tropical cyclogenesis in the next 5 days by NHC as it is expected to approach the Yucatan. Further east, a wave now departing the African coastline is given a 70% chance of development over the next 5 days by the NHC. This results in a high confidence area for tropical cyclogenesis during Week-1 being forecast between roughly 10-20N/27-47W where anomalously warm SSTs and minimal wind shear are anticipated along the forecast track. In the East Pacific, the NHC is monitoring two areas for potential development over the next 5 days: the first between 12-22N near 125W which is given a 50% chance of development over the next 5 days, and the second between 7-15N and 105-117W which is given a 60% chance of development over the next 5 days. The former is given a high probability of development in the GTH outlook, with the

latter a moderate chance of formation. SSTs remain warm across the basin, with the system further west under lesser wind shear at present, while the second system is expected to track westward into this more favorable environment. In the West Pacific, the Joint Typhoon Warning Center gives a high chance of development during the next 24 hours to a disturbance presently near 26N/126E with the system forecast to track towards Japan during Week-1. The Japanese Meteorological Agency declared this system to be Tropical Storm Malou just prior to this forecast being issued. A moderate probability of tropical cyclogenesis was forecast for this system during week-1 initially, but dropped prior to forecast issuance given the actions of the Japanese Meteorological Agency in naming this system and the Joint Typhoon Warning Center expecting development prior to the forecast period starting. During Week-2, moderate risks of tropical cyclogenesis exist west of the Week-1 high risk in the Atlantic should that disturbance experience slower development than anticipated, and between 7-17N/95-120W in the East Pacific where dynamical model guidance suggests favorable conditions during Week-2.

During Week-1, high likelihood areas of above-average rainfall are forecast along the West Pacific monsoon trough and associated track of the possible tropical cyclone, across portions of Mexico and the southwestern U.S. associated with Hurricane Newton, between 10-25N near 125W associated with possible tropical cyclogenesis in the East Pacific, in the tropical Atlantic with the easterly wave departing the African coast, and in the vicinity of the Philippines where Rossby wave activity is anticipated. A high chance of below-normal rainfall is forecast near 5N between approximately 170W-150E associated with a low frequency climate signal. Remaining rainfall-related shapes during Week-1 generally are due to consistent forecasts between the CFS and ECMWF dynamical guidance. A high risk of above-normal temperatures extends along the east coast of the United States associated with mid-latitude ridging. Mid-latitude influences also bring a high risk of below-normal temperatures to portions of central South America.

For Week-2, a high probability of enhanced rainfall is given for eastern portions of Japan and adjacent waters in line with expectations of the monsoon trough persisting across this area. Low-frequency dry conditions across the Central Pacific result in a continuation of the high confidence below-normal rainfall shape from Week-1 for this region. Moderate confidence for above-normal rainfall shapes accompany the possible tropical cyclogenesis areas in the East Pacific and Atlantic during Week-2. Given uncertainty regarding any substantial MJO-related signal during the forecast period, remaining Week-2 rainfall related shapes focused around the Maritime Continent are associated with consistent dynamical model guidance and potential equatorial Rossby wave influences. Mid-latitude frontal activity is expected to possibly bring a period of below-normal temperatures to southwestern portions of Australia during Week-2, resulting in a moderate risk of the associated hazard applied for this area.

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