Geophysical Research Abstracts
Vol. 21, EGU2019-6650-2, 2019
EGU General Assembly 2019

Seasonality and El Niño Diversity in the Relationship between ENSO and Western North Pacific Tropical Cyclone Activity

Yumi Choi (1), Kyung-Ja Ha (2), and Fei-Fei Jin (3)

(1) Korea Institute of Ocean Science and Technology (KIOST), Busan, South Korea (yumi_choi@kiost.ac.kr), (2) Pusan National University, Busan, South Korea (kjha@pusan.ac.kr), (3) University of Hawai'i at Mānoa, Honolulu, Hawaii, USA (jff@hawaii.edu)

Impacts of seasonality and El Niño pattern diversity on seasonal tropical cyclone (TC) activity over the western North Pacific (WNP) were investigated by using the 1979–2016 RSMC best track dataset. To explore roles of seasonality in the relationship between El Niño-Southern Oscillation (ENSO) and TC genesis, we examined genesis potential index (GPI) anomalies associated with the canonical ENSO variability (Niño3.4) in summer (June–August) and fall (September–November). The influences of ENSO on large-scale conditions for TC genesis in summer (fall) exhibit a distinct meridional (zonal) asymmetry which results from changes in thermodynamic and dynamic factors over the northern (western) and southeastern parts of the WNP, respectively. The typhoon-season average of GPI anomalies shows a northwest-suppression and southeast-enhancement pattern. The difference between summer and fall reveals a southwest-suppression and northeast-enhancement pattern which is ascribed to both seasonal changes in ENSO south of 20°N and background state over the northeastern part of the WNP, respectively. The changes in the WNP TC genesis and track associated with El Niño pattern diversity were distinguished between summer and fall. The distinct seasonal change in the upper-level suppression for the eastern Pacific-type El Niño leads to a meridionally asymmetric typhoon-season difference of GPI anomalies. For the central Pacific-type El Niño, regardless of season, prevailing favorable conditions for TC genesis over the southeastern part of the WNP intensify the influence of seasonal change in background state on the typhoon-season difference of GPI anomalies in situ, thus revealing a zonally asymmetric difference. The differences revealed in TC genesis distribution and tracks in summer and fall under two-types of El Niño will lead to different TC impacts over East Asia (EA). We believe that considering of seasonality and El Niño pattern diversity can improve seasonal forecast of the El Niño-induced TC activity and its impacts over EA.