



Northward shift of tropical cyclone tracks in the western North Pacific during the early fall

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Tropical cyclone (TC) is the most destructive natural hazard in East Asia due to the associated storm surge, flood, and strong wind. It can lead to significant casualty and property damage in East Asian countries. About 25 to 30 TCs occur per year in the western North Pacific (WNP) basin, among them 5 to 8 TCs result in direct or indirect damages to Korea and Japan.

We analyzed recent changes in the tropical cyclone (TC) track over the western North Pacific (WNP) for the period between June to September for 36 years (1979-2016). The study area (30–45 °N, 120–150 °E) covered the regions that TCs mainly affect on Korea and Japan. In recent years, the northward migrations of TCs over the WNP to the mid-latitudes increased in early fall. The increasing rates of TCs frequency and the Power Dissipation Index (PDI) within the study area were greatest in September because of favorable environmental conditions such as increasing sea surface temperature, decreasing vertical wind shear, shrunken subtropical high, and increasing relative vorticity. We also found that the negative phase of the Pacific Decadal Oscillation in recent years can be associated with the increasing migration of TCs to the mid-latitudes.