The results analyzed by using JTWC and reanalysis data show that interannual variations of the activities (including genuses and tracks) of tropical cyclones and typhoons (TCs in short) over the Northwest Pacific (NWP) are very obvious and closely associated with the thermal states of the tropical western Pacific (TWP). When the TWP is in a warm state, then the monsoon trough and convergent region of zonal wind field shifts westward and northward over the NWP. In this case, the region of the transition from the MRG wave to the TD type disturbance also shifts westward and northward, which leads to the westward and northward shift of TCs genuses and tracks over the NWP. Therefore, more TCs can influence China. Oppositely, when the TWP is in a cold state, then the monsoon trough and the convergent region of zonal wind field shifts eastward and southward over the NWP. In this case, the region of the transition from the MRG wave to the TD type disturbance also shifts eastward and southward, which leads to the eastward and southward shift of TCs genuses and tracks, i.e., TCs tracks are easy to turn northeastward near 130°E. Therefore, less TCs influence China, but more TCs can affect Japan and South Korea. Moreover, the mechanism of the effect of the monsoon trough on the TCs activities mentioned above is further discussed from dynamical theory and is simply simulated with shallow-water wave equations.