

Zonal Displacement of the Western North Pacific Subtropical High from Early to Late Summer

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The zonal shift in the western North Pacific subtropical high (WNPSH) is closely associated with moisture transport in East Asia and is thus an important factor that determines the amount of summer precipitation in the region. Climatologically, the WNPSH retreats eastward from early to late summer. However, there is high variability in the early to late summer shift in the WNPSH from year to year. Thus, the interannual variability in the intraseasonal zonal displacement of WNPSH from early to late summer was examined in this study. The results showed that the El Niño or La Niña years were not predictive of how the WNPSH would shift zonally from early to late summer. Otherwise, the zonal displacements of the WNPSH were more of mid-latitude origin. In the strongly retreating years (SRY), the mid-latitude wave train was much more significant than that in the weakly retreating years (WRY). The mid-latitude wave train was reminiscent of the Silk Road teleconnection pattern (SRP). In the SRY, the centres of the wave trains had opposite signs in early and late summer, which resulted in the opposite features of the WNPSH between early and late summer. The consistency of the three reanalysis datasets confirmed the robustness of our results.

Keywords: Western North Pacific subtropical high, strongly/weakly retreating years, Silk Road pattern, interannual variation, wave activity flux