

Tseng, W.-L., C.-C. Hong, M.-Y. Lee, H.-H. Hsu and C.-C. Chang, 2020: Compound effect of local and remote sea surface temperature on the unusual 2018 western North Pacific summer monsoon. *J. Meteor. Soc. Japan*, **98**, 1369-1385.

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Plain Language Summary: In July and August (JA) 2018, the monsoon trough in the western North Pacific (WNP) was unusually strong, the anticyclonic ridge was anomalously northward-shifted, and enhanced and northward-shifted tropical cyclone activity was observed. This study proposed that the local effect of both the tropical and extratropical WNP SST anomaly as the major driver and the remote effect of the North Atlantic SST anomaly as a minor contributor jointly induced the anomalous circulation and climate extremes in the WNP during JA 2018.

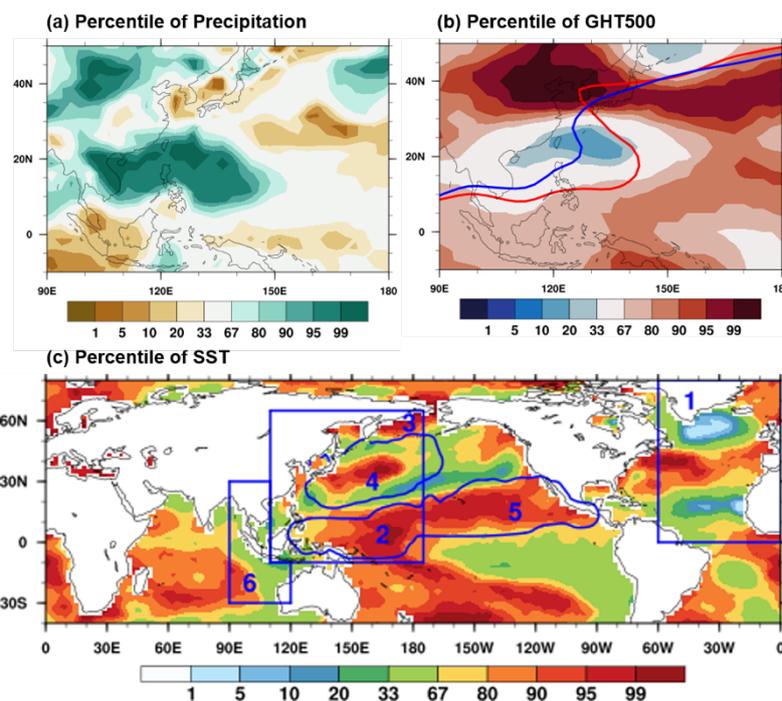


Figure 1. Anomalous precipitation, GHT500 and SST in JA 2018. (a) Percentiles of precipitation in JA 2018 relative to that in the 1951–2018 period. (b) Percentiles of 500-hPa geopotential height in JA 2018 relative to that in the 1948–2018 period. Blue and red curves in (b) indicate the 1490-m contour of 850-hPa geopotential height for the climatological average and 2018, respectively. (c) Percentiles of SSTs in JA 2018 relative to those in the 1948–2018 period. The blue box/outline marks the region in which SST anomaly was prescribed as a forcing in the numerical experiments listed in Table 1.

- The joint influences of the SST anomalies in both the tropical and extratropical WNP was the major factor that strengthened the WNP summer monsoon and the northward shift of the Pacific subtropical high.
- The North Atlantic (NA) SST anomaly also enhanced the monsoon trough in the presence of WNP SST anomaly.
- The individual SST anomaly in the NA, Indian Ocean, the extratropical WNP, and the subtropical eastern North Pacific could not force the enhanced monsoon trough.