

EGU2020-4297

<https://doi.org/10.5194/egusphere-egu2020-4297>

EGU General Assembly 2020

© Author(s) 2020. This work is distributed under the Creative Commons Attribution 4.0 License.



Comparisons of different definitions of the western Pacific pattern and associated winter climate anomalies in Eurasia and North America

Hasi Aru

Institute of Atmospheric physics, Chinese academy of sciences, Center of Monsoon system and research , China
(aruhasi@mail.iap.ac.cn)

The western Pacific pattern (WP) is one of the most prominent teleconnection patterns over the Northern Hemisphere (NH) in boreal winter. There exist several methods employed to identify the WP in the literature. This study compares eight WPs defined by different methods. Correlation coefficients among the eight WP indices (WPIs) show considerable spreads, though most of them are statistically significant. The meridional dipole structure of WP can be captured by all of the WPIs, but it shows large spreads in the locations of the centers. Several WPIs produce a significant correlation with the winter Arctic Oscillation, with marked signals of atmospheric anomalies over the Arctic region. Connections of the WPs with the simultaneous winter El Niño-Southern Oscillation (ENSO) depend largely upon their definitions. Impacts of the WPs on the surface air temperature over many parts of Eurasia and North America are also sensitive to their definitions. Differences in the surface air temperature anomalies are closely related to differences in the spatial structure of the WPs. Finally, we define a new WP index as differences in the area-average 500-hPa geopotential height anomalies between subtropics and mid-latitude of northwestern Pacific. This newly defined WP index has a close relation with the above eight WPIs, the tropical Pacific sea surface temperature and surface air temperature anomalies over Eurasia and North America.