



Link between Arctic dipole anomaly and recent boreal winter cooling over Asian mid-latitudes

Qi Shu, Fangli Qiao, Zhenya Song, and Yajuan Song

First Institute of Oceanography, SOA, Qingdao, China (shuqi@fio.org.cn)

The link between boreal winter cooling over the mid-latitudes of Asia since the late 1980s and the Arctic dipole anomaly (DA) is discussed in this letter. The investigation was based on five datasets comprising the HadCRUT4, NCEP/NCAR Reanalysis, 20CR, ERA Interim and ERA-20C. Results indicate that large-scale boreal winter cooling during 1990–2015 over the Asian mid-latitudes is a part of the decadal oscillations of long-term surface air temperature anomaly. The surface air temperature anomalies over Asian mid-latitudes are correlated significantly with the DA index in boreal winter. Boreal winter cooling over Asian mid-latitudes is linked to DA. When the DA is in its negative phase, anomalously high sea level pressure over northern Eurasia, with a clockwise wind anomaly, causes cold air from the high latitudes to move over the mid-latitudes of Asia, resulting in anomalous cold in that region. Therefore, the recent decreasing trend of the DA index has contributed to recent winter cooling over Asian mid-latitudes.