

Earth Science and Climate Change

The interannual relationship between North American (NA) winter temperature and large-scale atmospheric circulation anomalies and its decadal variation are analyzed. NA temperature anomalies are dominated by two leading maximum covariance analysis (MCA) modes of NA surface temperature and Northern Hemisphere 500-hPa geopotential anomalies. A new teleconnection index, termed the Asian-Bering-North American (ABNA) pattern is constructed from the normalized geopotential field after linearly removing the contribution of the Pacific-North American (PNA) pattern. The ABNA pattern is sustained by synoptic eddy forcing. The first MCA mode of NA surface temperature is highly correlated with the PNA and ABNA teleconnections and the second mode with the North Atlantic Oscillation.

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