



## **Interdecadal Variability of Winter Precipitation in Northwest China and Its Association with the North Atlantic SST Change**

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Winter precipitation in Northwest China experienced an obvious interdecadal increase around 1987. Consistent increase in winter precipitation occurred in Middle Asia. The present study investigates associated changes in atmospheric circulation and sea surface temperature (SST). Analyses show that winter water vapor flux and atmospheric circulation over the North Atlantic Ocean and Eurasia and SST in the North Atlantic Ocean were very different before and after 1987. During 1987-2008, a significant enhancement of tropospheric moisture convergence and ascending motion was observed over Northwest China and Middle Asia. This contributed to the increase of winter precipitation in Northwest China and Middle Asia. The wind difference field before and after 1986/87 features cyclones over Middle Asia and northern Atlantic Ocean and anticyclones over East Asia and southern Europe-northern Africa, signifying an obvious change in the Eurasian (EU) teleconnection pattern over middle latitudes of Eurasia. The results indicate that the Middle Asia and Northwest China were under the influence of enhanced westerlies from the North Atlantic Ocean that strengthened the water vapor transport to Middle Asia and Northwest China after 1987. Moreover, the interdecadal variability in the EU pattern is associated with the SST increase in the North Atlantic Ocean. Thus, the North Atlantic SST change is likely an important reason for the winter precipitation increase in Middle Asia and Northwest China.