

Decadal changes in the atmospheric water cycle and the terrestrial water storage in Northern Eurasia

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We investigated interannual variations in the atmospheric water circulation pattern and the terrestrial water storage change in Northern Eurasia, using long-term atmospheric reanalysis data and the Gravity Recovery and Climate Experiment (GRACE) data. We found interdecadal modulation in the relationships between the interannual variability of summer precipitation and the atmospheric circulation pattern among the three major Siberian river basins (Lena, Yenisei, and Ob). We also revealed a significant increasing (positive) trend of geopotential height in the low-level troposphere since the mid-1980s over Mongolia, resulting in the increasing trend of westerly moisture flux into the Yenisei and Lena river basins. On the contrary, we revealed that summer evapotranspiration has been increasing in tundra region of the eastern Siberian from 2002 to 2015. The increased summer evapotranspiration could be associated with rapid increase of summer air temperatures in the region.

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