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Large-scale analysis on long-term changes in the energy-water balance in the Arctic

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The long-term changes in the surface energy-water balance were analyzed at large-scale in the Arctic, using the global datasets of NCEP reanalysis (NNRP) and GPCC precipitation. The Wetness index (WI, Kondo and Xu, 1997) was calculated as the ratio of precipitation (Pr) to potential evaporation (Ep) that is estimated from the energy balance equation at the surface. The trends of WI, Pr and Ep were calculated as linear regression for 1951-2010. In northern Europe, the trend of WI was not significant because the positive trend of Pr is compensated by the positive trend of Ep. In Eastern Siberia, the negative trend of WI was attributed to the positive trend of Ep since the trend of Pr was not significant.

Keywords: surface energy-water balance, long-term changes, Arctic regions, large-scale analysis