高緯度陸上の広域地表面熱水収支の長期変動特性～気候湿潤度による解析～

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Long-term variations of the large-scale energy-water balance on land at high latitudes - Analysis using a wetness index -

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Long-term variations of the large-scale energy-water balance on land were examined using a wetness index (*WI*) calculated as a ratio of precipitation to potential evaporation (Kondo and Xu, 1997; Xu et al., 2005). Potential evaporation (*Ep*) was calculated from the energy balance equation at the surface, using the latest ECMWF global atmospheric reanalysis data (ERA interim) from 1979 to 2010; and the global precipitation analysis product of GPCC was used for precipitation (*Pr*).

The trends during the period were analyzed in each terrestrial region (after Sheffield and Wood, 2007). An attempt to quantify the contribution of the factors to those trends was made. There are increasing trends in *Ep* and *Pr* for most of the regions in northern high latitudes. In particular, the increasing trend in *Ep* and *Pr* for eastern Siberia is significant (i.e., larger than RMSE), and the both offset each other to show no trend in *WI*. On the other hand, the increasing trend in *Ep* and the decreasing trend in *Pr* seemed to bring about the decreasing trend in *WI*, though each trend was similar to its RMSE respectively.

The increasing trends in *Ep* were also shown in many regions in the northern mid-latitudes (six regions out of eight). There were decreasing trend in *WI* for monsoon Asia and Central Asia, where there were almost no trend in *Pr*.

Wet and dry conditions on land have been discussed mostly on the basis of precipitation, but it is shown that the contribution of *Ep* is significant in some regions (e.g., monsoon Asia) or the changes in *Ep* offset the changes in *Pr* in other regions (e.g., eastern Siberia, western Siberia, northern Europe).

Acknowledgements

This study is partly supported by the GRENE project for Arctic Climate Change..

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