



A comparative approach to assess variation in surface energy fluxes in northern high-latitude ecosystems

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The partitioning of energy at the surface is a crucial process which exerts a major control on climatic and hydrologic regimes in northern high-latitude ecosystems. High-latitude ecosystems are also known to be very sensitive to climate change. With concern made to the potential effects of climate warming, knowledge of the terrestrial surface energy balance of arctic and subarctic environments is therefore important but there is a lack of direct measurements and observations.

In this study we assess the variability of arctic and subarctic terrestrial ecosystems in surface energy partitioning and moisture exchange. We use micrometeorological data provided by the INTERACT-network (International Network for Terrestrial Research and Monitoring in the Arctic). The study areas cover measurements from high-arctic (Zackenbergl, Northeast Greenland and Adventdalen, Svalbard), low-arctic (Kobbefjord, West Greenland) and sub-arctic (Stordalen, Sweden) heath and fen tundra ecosystems. The study period covers the years 2012-2014.

The aim of the study is to: (1) Determine and quantify the controlling factors of the surface energy balance of these arctic and subarctic terrestrial ecosystems; (2) Examine the effects of differences in regional climate, vegetation, topography and substrate on the surface energy budget and evapotranspiration regime; (3) Assess possible changes in land-atmosphere interactions caused by climate change; (4) Discuss the energy balance closure problem.