



Hydrological functioning and ecological response across northern catchments within the North-Watch program

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The impact of climate change on hydrological functioning is of great concern and has profound implications on aquatic ecosystems, water resources and society. The higher mid-latitudes of the northern hemisphere are particularly sensitive to the impact of climate change as slight differences in temperature determine whether precipitation falls as rain or snow and the extent to which winter snow packs accumulate and melt. Changes in the intensity and seasonal distribution of precipitation is attributed to increasing temperatures where altered flow regimes, severity of droughts and the frequency and magnitude of floods are on the increase causing immense stress to ecosystems and the flora and fauna within them.

North-Watch (Northern Watershed Ecosystem Response to Climate Change) (<http://www.abdn.ac.uk/northwatch/>) is a cross-regional inter-catchment comparison program which intends to examine long-term data from experimental catchments within the climate sensitive northern temperate region to assess the integrated physical, chemical and ecological response of northern watershed ecosystems to climate change. The study catchments, spanning different hydro-climatic zones, include northern temperate, sensitive boreal and sub-arctic environments within the northern regions of the USA, Canada, Scotland and Sweden. These study catchments are amongst the most intensively studied long-term research catchments in northern regions, where there has been considerable research on the hydrological and geochemical functioning of these catchments. Here, we aim to present preliminary findings on the hydrological functioning and ecological response of the North-Watch catchments. In particular, relationships between various hydro-climatic factors on vegetation patterns and species richness of aquatic communities are considered in order to better understand the implications of environmental and climatic variability on biodiversity. A major goal of the project is to identify key issues and ecological responses, such that direct investigations and regional protocols can be developed in the future.