Project acronym: CAST

Project title: Coupling the cycles in the Arctic, from Soils to Thaw hydrosystems

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Discipline: Earth Sciences & Environment: Other - Environment

Station(s): Abisko Scientific Research Station (Sweden)

We make the hypothesis that the warming of Arctic regions will change the interactions between the cycles of C and other elements, because of vegetation cover shift and permafrost thawing that releases dissolved organic and inorganic material. The on-site missions will allow to sample main vegetation species, soils/peat, soil solution and surface waters, to measure the greenhouse gas emission (CO_2, CH_4, N_2O) and to quantify the microbial community. Abisko station gives access to various ecosystems, with the tree line close to the station, and organic-rich soil horizons lying on various metamorphic lithologies. At first, the comparison between Khanymey and Abisko regions should have allowed integrating the soil to hydrosystem continuum with various stoichiometric status. We will make this comparison with intra-region comparison between different ecosystems arount Abisko. Thanks to collected samples, we will quantify carbon and inorganic elements in main vegetation species, soils, soil solutions and surface waters. Then the fluxes of carbon and inorganic elements from soils to hydrosystems, and hydrosystems to the atmosphere will be assessed. The composition of microbial community will be determined in the hydrosystems and soils. This will allow improving the knowledge about how ongoing warming will modify stoichiometry in fluxes from soil to hydrosystems and the consequence for microbial activity and GHG emissions in the Arctic.