



Project acronym: NitroFresh

Project title: Nitrogen sources for Arctic freshwaters

Project leader: Ada Pastor, Aarhus University, Denmark

Discipline: Earth Sciences & Environment: Water sciences/Hydrology

Station(s): Toolik Field Station (USA), Western Arctic Research Centre (WARC) (Canada), CNR Arctic Station “Dirigibile Italia” (Svalbard/Italy)

Nitrogen is a key nutrient and its availability defines structure and function of ecosystems. Extremely low nitrogen availability is one of the reasons of the limited productivity across Arctic ecosystems. The lateral transport of nitrogen from terrestrial to aquatic ecosystems is still not well defined, although major changes are expected with the change of climate. The main aim of Nitrofresh is to assess the nitrogen sources for streams across different regions with continuous permafrost in High Arctic. In particular, we have three objectives: (1) to quantify and characterize nitrogen pools along the riparian-stream continuum, (2) to determine the amount of available nitrogen for biological assimilation, and (3) to evaluate the main drivers of nitrogen pools and processes (i.e. vegetation, lithology, soil type and geomorphology). With these purposes, we have selected three stations for this INTERACT project (TOOLIK, WARC, and DIR-ITA), which encompasses a gradient of environmental variables. At each station, we will select five sampling sites. Triplicate samples will be obtained along the compartments of the riparian-stream continuum (stream water, stream sediment, riparian soil and upland soil). The sampling protocol will be conducted following a detailed guide with simplified methods. The samples will be store frozen and shipped for further laboratory analyses to Aarhus University. This coordinated sampling effort will provide novel information on the biogeochemical riparian-stream linkages, thus advancing our understanding on the role of nitrogen supporting key freshwater ecosystems functions in High Arctic.