

An integrating nexus of land and water management for a sustainable Nordic bioeconomy (BIOWATER)



BIOWATER will provide solutions for land, environmental and water resources management in the face of potential and competing demands for biomass, land and water resources related to the green shift. Potential impacts of land use change and climate change on water, elemental cycles and ecosystem services will be assessed. Assessment of the opportunities and limitations for a green bioeconomy in the Nordic countries will be based on the scenario outcomes and ecosystem service accounting exercises, together with detected long-term changes in elemental budgets. The center will interact with policy makers and stakeholders on the opportunities and limitations of the green, bio-economic shift for the rural North.

During the recent years, Biowater has developed socio-economic pathways which take into account climate change by using shared socioeconomic pathways (SSP) in Nordic context. These five Nordic Bioeconomy Pathways (NBPs) are based on relationships between climate change adaptation and mitigation. NBPs were analysed in expert workshops held in Norway, Sweden, Denmark and Finland. Finnish workshop took place in Oulu mid April 2019 together with official river basin co-operation group of North-Ostrobothnia. Effects of Land use and climate change on biogeochemical budgets of C, N and P are being analysed together by using a Nordic dataset from ~60 research catchments. In general, loading of organic carbon has increased and brownification is obvious and visible in watercourses. Despite of huge efforts related to water protection, also nitrogen fluxes are still increasing, particularly from peat-dominated river basins in North-Ostrobothnian area. Biowater brownification experiments related to river biota have taken place at Paltamo experimental station starting from summer 2018.

Biowater case study catchment is river Simojoki, where effects of peatland drainage are visible in water quality. Manuscript related to land use is currently under preparation.

Ecosystem service valuation is realized at same catchment by using choice experiment approach by interviewing local citizens in June 2019. Similar interviews are done at all Nordic countries.

Renewable energy is one of the key issues in future bioeconomy. Hydropower is green energy, but harmful effects on rivers are obvious. Biowater researchers published a study where change in short term regulation visible related to increasing use of wind and solar energy.

Biowater consortium will organize summer school for PhD-students and annual meeting at Rokua, Finland, in the beginning of October 2019. Main issues are focused on factors affecting biogeochemical processes and fluxes, together with preparing of manuscripts. Special issue in Ambio concentrating on effects of bioeconomy on waters will be prepared.

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More information: <https://biowater.info/>