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Nordic Bioeconomic Pathways - catchment scale water quality impacts of various scenarios and projections

Joy Bhattacharjee¹, Hannu Marttila¹, Artti Juutinen², Anne Tolvanen², Arto Haara³, Jouni Karhu², and Björn Klöve¹

¹University of Oulu, Water, Energy and Environmental Engineering Research Unit, Oulu, Finland

²Natural Resources Institute Finland (LUKE), Oulu, Finland

³Natural Resources Institute Finland (LUKE), Joensuu, Finland (arto.haara@luke.fi)

The development, the alternative pathways for use of bioresources, can lead to plausible stressors in the future on forestry dominated catchments. It is needed to analyse the impact of regional future projections on different land system management (LSM) attributes. The catchment scale projections are downscaled from Nordic Bioeconomic Pathways (NBPs), the subsets of Shared Socioeconomic Pathways (SSPs). As a case study, the Simojoki catchment (3160 km²) in northern Finland has been considered where drained peatlands and forests dominate (53%) in the catchment. We integrated stakeholder-driven input, Finnish forest inventory model pathways (MELA) and hydrological catchment model (SWAT) to explore the future consequences of forest management practices for different NBP scenarios. We calibrated and validated water quality parameters in SWAT for the Simojoki catchment. Then, based on the output of MELA model of LSM attributes including stand management, catchment management strategy and fertilizer use, we used NBP scenario projections in SWAT model. We also included stakeholders' evaluations of biomass removal at the time of harvesting at the Simojoki catchment. Additionally, climate imposing emission scenarios have been integrated into SWAT model to analyse longer perception of climate change (CC). The final outcomes of the proposed scenarios (NBP and/or CC) will portray the probable impacts on each LSM attribute in the Simojoki catchment, to adapt to the future forest management consequences.