



Cost-effective methods for reducing nitrogen load at a catchment scale

Katri Rankinen (1), Pekka Kinnunen (2), Jussi Huotari (3), and Kirsti Granlund (1)

(1) Finnish Environment Institute, Natural Environment Center, Helsinki, Finland (katri.rankinen@ymparisto.fi), (2) Natural Resources Institute Finland, (3) University of Helsinki

Croplands and forests of the boreal region supply a wide range of ecosystem services. The properties and processes of these ecosystems regulate water flow and climate, and retain nutrients and store carbon. The functioning of the ecosystem processes depends on ambient temperatures and precipitation patterns, which are likely to continue changing in the boreal zone. MONIMET (LIFE12 ENV/FI/000409, 9/2013 – 9/2017) is an EU Life funded project about Climate Change Indicators and Vulnerability of Boreal Zone Applying Innovative Observation and Modeling Techniques. In this project, we calculated future changes of carbon storage in soil, and nutrient loading from soil to surface waters and drinking water supplies. We calculated the carbon storage of forests and croplands using the dynamic YASSO litter and soil carbon model. The simulated carbon budget estimates were upscaled to the river basin by combining them with gridded data of land cover. We simulated nutrient loading from two boreal catchments to the receiving waters using the dynamic, catchment scale model INCA. We calculated land use specific loading values for these two well monitored catchments that belong to the LTER (The Long Term Ecological Research) monitoring network, and upscaled these results to the larger river basin based on grid-scaled data of land cover. We used population projections as proxies for the societal demand for the services of climate regulation and water purification, and assessed thereby the vulnerability of society to climate-induced changes in these services. In this poster we present the technical frame of combining models and data.