



## **The Skogaryd Research Catchment - an infrastructure to integrate terrestrial and aquatic greenhouse gas fluxes**

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The Skogaryd Research Catchment (SRC; 58°23'N, 12°09'E, hemiboreal) is part of the Swedish Infrastructure for Ecosystem Science (SITES, [www.fieldsites.se](http://www.fieldsites.se)). SITES is a national coordinated infrastructure for terrestrial and limnological field research, consisting of nine research stations covering the different landscapes and climatic regions in Sweden. The SITES initiative is a long-term effort founded by the Swedish Research Council and the station owners. Researchers regardless of affiliation are welcome use the stations including the infrastructure in their research and perform experiments (after approval) or outsource tasks which are managed by the stations. Data collected in both background monitoring programs and previous and ongoing projects at the stations are also intended to support past, present and future research.

Ecological, biogeochemical, and environmental research often focus on a specific ecosystem or have strict habitat boundaries. However, the growing awareness of systems interactions, feedbacks and large scale consequences calls for approaches that integrate across ecosystems and habitats to consider whole catchments, landscapes and regions. Thus there is an urgent need for long-term field sites that support integrative and cross-habitat-boundary research. Our aim at SRC is to develop methodologies to quantify GHG balances at the landscape scale in forested regions that include land-atmosphere, land-water, and water-atmosphere exchange of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O. Another aim is to promote investigations to elucidate the undelaying regulation of the biogeochemical processes.

The SRC harbor several main habitats including mires, forests at different growth stages, lakes, and streams. The fluxes of greenhouse gases (GHG) are measured to a large extent according to ICOS protocol for the Eddy Covariance (EC) methodology for CO<sub>2</sub>, H<sub>2</sub>O, and CH<sub>4</sub>, as well as axillary data for habitats where such protocols exist. For aquatic habitats lacking such protocols, efforts have been made to adopt the best possible measurement practices covering all types of flux pathways. The GHG fluxes have so far been monitored using 5-6 EC systems and a large number of flux chambers, and various primary production and respiration measurements covering a wide range of habitats. In addition, an ambitious monitoring program for hydrology, water chemistry, and soil and sediment characteristics has been adopted for SRC. Altogether the measurement designs were made to allow for Net Ecosystem Carbon Balance (NECB) determinations over multiple years. Given this setup with extensive previous data collection and development of advanced research infrastructure SRC has a great potential to contribute to present and future studies of whole landscape GHG exchange in the hemiboreal biome. This presentation will further describe this potential and highlight some results from the ongoing research at SRC.