



Ecosystem and atmospheric measurements in ICOS-Finland

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The global mean temperature has increased and will continue to increase in the 21st century due to the increased concentrations of greenhouse gases such as carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) in the atmosphere (IPCC, 2007). Understanding about the driving forces of climate change requires full quantification of the greenhouse gas (GHG) emissions and sinks by long term and high precision observations in the atmosphere as well as on the land and ocean surfaces. There are major research challenges such as 1) what is the regional distribution of GHG fluxes, 2) how does environmental factors and human intervention impact the exchange of GHG, and 3) how will the sources and sinks of GHGs change in future.

Integrated Carbon Observation System (ICOS) has received funding by the EU to develop a strategic plan for constructing a European research infrastructure to provide the long-term atmospheric and flux observations required to understand the present state and predict the future behaviour of the global carbon cycle and GHG emissions as well as to monitor and assess the effectiveness of carbon sequestration in GHG emission reduction activities. The legal seat and the Head Office of the forthcoming ICOS organisation, European Research Infrastructure Consortium (ERIC), will be located in Finland, with secondary node in France. Finland has a role as a Nordic Hub and mobile laboratory operator of the Atmospheric Thematic Centre (ATC), which is led by France. The backbones of the ICOS research infrastructure are the national measurement networks for atmospheric, ecosystem and oceanic measurements.

The ICOS-Finland is established by three national partners: University of Helsinki, Finnish Meteorological Institute, and University of Eastern Finland, and it will operate 14 ICOS measurement stations: four Level 1 atmospheric measurement sites; two Level 1 ecosystem measurement sites; one Level 2 ecosystem measurement site; and seven associate ecosystem measurement sites. The Finnish sites represent the boreal and sub-arctic Eurasian environments with both east-west and south-north transitions in eco-climatic features. The poster will present the ICOS-Finland research, construction and measurement activities during the past year.