

ICOS

• • •
National
Network
Finland

ICOS Suomi

GEO Suomi

23.5.2018

Elisa Halmeenmäki

Structure



HELSINGIN YLIOPISTO



ILMATIETEEN LAITOS



ITÄ-SUOMEN
YLIOPISTO



Liikenne- ja
viestintäministeriö



Opetus- ja
kulttuuri-
ministeriö

- Steering group: prof. Markku Kulmala (HY), res. prof. Hannele Korhonen (IL), prof. Kari Lehtinen (UEF), chair: prof. Timo Vesala (HY), *Head of ICOS-FI*, and secretary: E. Halmeenmäki, *ICOS-FI coordinator*
- Station PIs (Principal Investigators)
- Technical staff, data managers



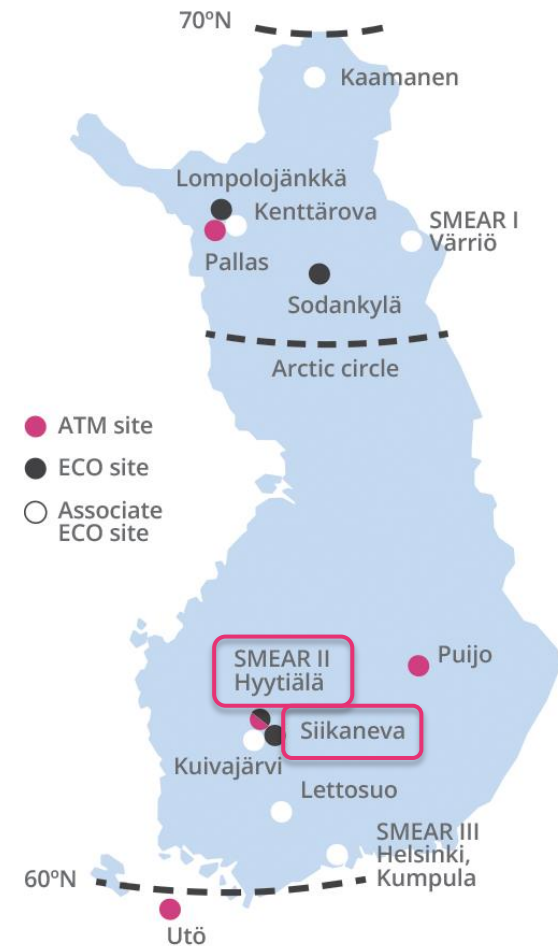
History

- ICOS Finland (ICOS-FI) was formed in 2008, when the EU-funded Preparatory Phase Project (PPP) started.
- The idea of ICOS had been already present in previous projects, such as EUROFLUX (ended 1998) and CARBOEUROPE.
- During PPP, it was agreed that the statutory seat (main part of the Head Office) will be located in Helsinki.
- In 2010, the first funding period from the Academy of Finland started, and it covered both the building of the national station network (ICOS-FI) and the establishment of the Head Office (ICOS ERIC).
- In May 2012, 'The Memorandum of Understanding' between the Finnish partners (UH, FMI and UEF) was signed, establishing officially the national cooperation within ICOS-FI.



Measurement stations

- In total 14 stations
- 4 atmospheric stations (ATM)
 - Sub-arctic hill, urban area, pine forest, marine environment
- 10 ecosystem stations (ECO)
 - 4 forest, 4 peatland sites, 1 lake, and 1 urban site
- 6 stations operated by UH, 7 by FMI, 1 by UEF/FMI
- 2 stations labelled ICOS stations (in 2017)





Measurements

- ECO stations:
 - turbulent fluxes of GHGs, latent (evapotranspiration) and sensible heat fluxes by *flux towers*, and auxiliary meteorological, ecophysiological and soil parameters
- ATM stations:
 - precise concentrations of GHGs above the atmospheric surface layer by *tall towers*, or on the sea shore



Links to other infrastructures



- Institute for Atmospheric and Earth System Research Infrastructure (INAR RI)
 - Coordinates the environmental infrastructures (in the ESFRI roadmap) in Finland: ICOS, ACTRIS, eLTER, AnaEE
- SMEAR (Stations for Measuring Ecosystem-Atmosphere Relations) station network
 - The SMEAR stations provide co-location for several ESFRIs including ICOS-FI, ACTRIS, eLTER and AnaEE
 - 4 stations of the ICOS-FI stations
- Pallas-Sodankylä supersite (FMI)
 - Global Atmosphere Watch (GAW)
 - 4 ICOS-FI stations

Significance & impact

- Quality controlled, long-term, high-precision, open data
 - The process descriptions of carbon and nitrogen cycles are improved, which increases the prediction capability and reliability of climate and Earth system models.
 - Regional GHG flux patterns, tipping-points and vulnerabilities can be assessed.
- ICOS data is extensively used by researchers (articles are regularly published in top journals such as Nature, Science, PNAS).
- About 20% of the ICOS data end-users are estimated to be decision makers, stakeholders, teachers and persons from media.
- ICOS brings together top level scientists studying GHGs and biogeochemical cycles.
- ICOS provides a platform for facilitating education and training.
- ICOS/ICOS-FI stresses the importance of the close collaboration between atmospheric physicists and forest and environmental scientists.
- ICOS-FI has a world-wide reputation for its excellent sites supporting high-level research visits.

Examples of impact

- The expertise of ICOS-FI/UH has been utilized in establishing a flux tower on a West-Siberian peatland site being the only flux tower in the core of the West-Siberian plateau
 - Alekseychik *et al.*, 2017
 - in collaboration with prof. Elena Lapshina, Yugra State University, Khanty-Mansiysk, Russia
- Similarly, a flux tower is under establishment to Kenya for observations over a maize field
 - linked to the national project SMARTLAND “Environmental sensing of ecosystem services for developing climate smart landscape framework to improve food security in East Africa”, prof. Petri Pellikka, UH
- A standard for eddy covariance (EC) measurements has been submitted to the World Meteorological Organisation (WMO).
- ECO station protocols of together more than 1000 pages are currently in the final stage of the publication process.

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Kiitos!
Thank you!