Keynumbers for the annual reporting of the infrastructure activities (from special terms) - *Nyckeltal för årlig återrapportering av infrastrukturens verksamhet (från särsklida villkor)*

ICOS - Integrated Carbon Observation System - is a new European research infrastructure for quantifying and understanding the greenhouse gas balance of the European continent and of adjacent regions. The infrastructure is built up as a collaboration of nationally operated measurement stations in, at present, 11 European countries. ICOS Sweden is the Swedish contribution to this European effort. An ERIC (European Research Infrastructure Consortium) 'ICOS ERIC' has been established as a legal entity for ICOS data release as well as the coordination and integration of the whole research and measurement infrastructure, ICOS Research Infrastructure (RI), that includes the national networks, the measurement station assemblies and the central facilities.

High-precision, standardized observations of the exchange of greenhouse gases and heat between the Earth's surface and its atmosphere form an essential basis for understanding not only our planet's present climate, but also past and future developments. It has also become clear that these studies must be secured beyond the lifetime of a typical research project. The aim of ICOS is therefore to construct, equip, and operate a network of standardized, long-term, high precision integrated monitoring stations for atmospheric greenhouse gas concentrations and fluxes.

ICOS Sweden will be fully integrated with and play an important role in the pan-European ICOS (ICOS RI). ICOS Sweden will also provide data, and compile information on greenhouse gas exchange of typical northern ecosystems to the research community as well as Swedish stakeholders. ICOS Sweden will furthermore provide test sites for national inventory systems and sites and databases for advanced research.

A description of ICOS RI status and progress can be found at the website http://www.ICOS-ri.eu/. A more detailed annual report from the national infrastructure ICOS Sweden including an extended list of key numbers is available at the website http://www.icos-sweden.se/documents.html.

Following the special terms for ICOS Sweden's annual reporting of keynumbers, this report is devided into two section: (1) physical users, including site visitors and project PIs and (2) data users. In total, 945 phical users and 220 data users can be reported for 2016.

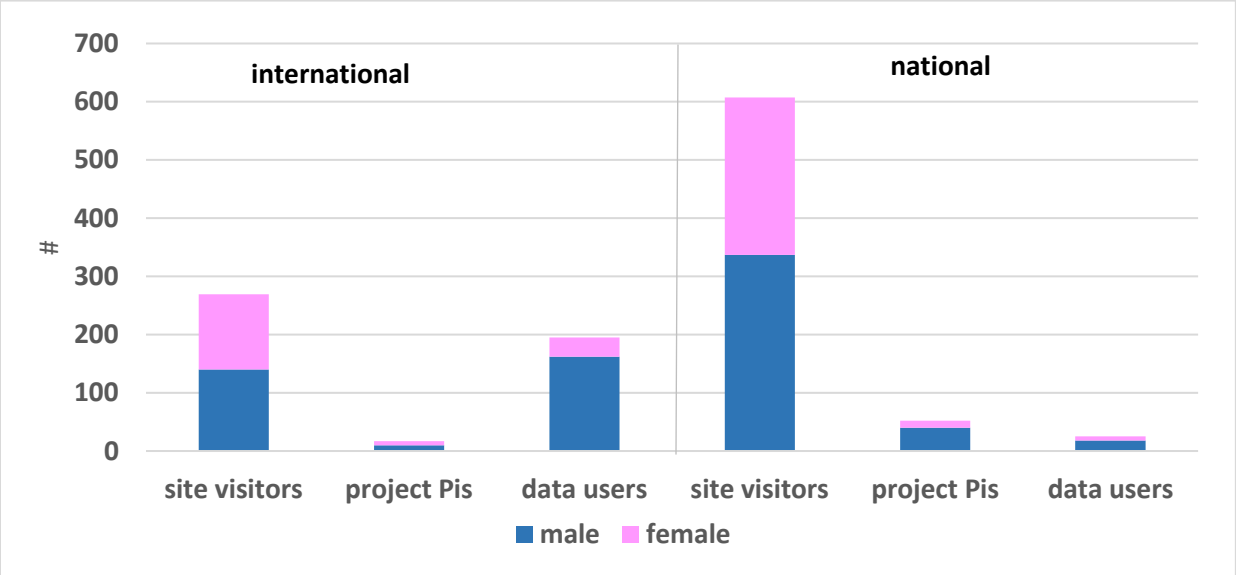

Fig. 1. Total numbers of physical and data users of the ICOS Sweden national infrastructure during 2016.

Table 1. Keynumbers for the annual reporting of the infrastructure activities (from special terms) for 2016.

Keynumbers for the annual reporting of the infrastructure activities (from special terms) - *Nyckeltal för årlig återrapportering av infrastrukturens verksamhet (från särsklida villkor)*	2016
General keynumbers for the entire infrastructure ***Allmänna nyckeltal för hela infrastrukturen.***	
Number of scientific articles and patents infrastructure contributed to (attach list) *Antal vetenskapliga artiklar och patent som infrastrukturen bidragit till (bifoga lista)*	40
1. Keynumbers for physical users - *Nyckeltal för fysiska användare.*	
Number of users per institution, other organizations, companies, public or otherwise. For users outside Sweden also stated country *Antal användare per lärosäte, andra organisationer, företag, allmänhet eller övrigt. För användare utanför Sverige anges även land*	nationell: 676, internationell: 274 Figs. 2 & 3
Number of users per subject areas (defined as the SCB-codes on the three-digit level) *Antal användare per ämnesområden (anges som SCB-koder på tresiffernivå)*	Fig. 4
Number of female, resp. male users *Antal användare som är kvinnor respektive män*	418 / 527
2. Keynumber for data usage via the Carbon Portal ***Nyckeltal för dataanvändning via den svenska portalen***	
Number of users per institution, other organizations, companies, public or otherwise. For users outside Sweden also stated country *Antal användare per lärosäte, andra organisationer, företag, allmänhet eller övrigt. För användare utanför Sverige anges även land*	nationell: 25, internationell: 195 Figs. 5 & 6
Number of users per disciplines (use SCB three-digit codes) *Antal användare per ämnesområden (använd SCB-koder på tresiffernivå)*	Sea
Number of female, resp. male users *Antal användare som är kvinnor respektive män*	40 / 180

1. Keynumbers for physical users - *Nyckeltal för fysiska användare.*

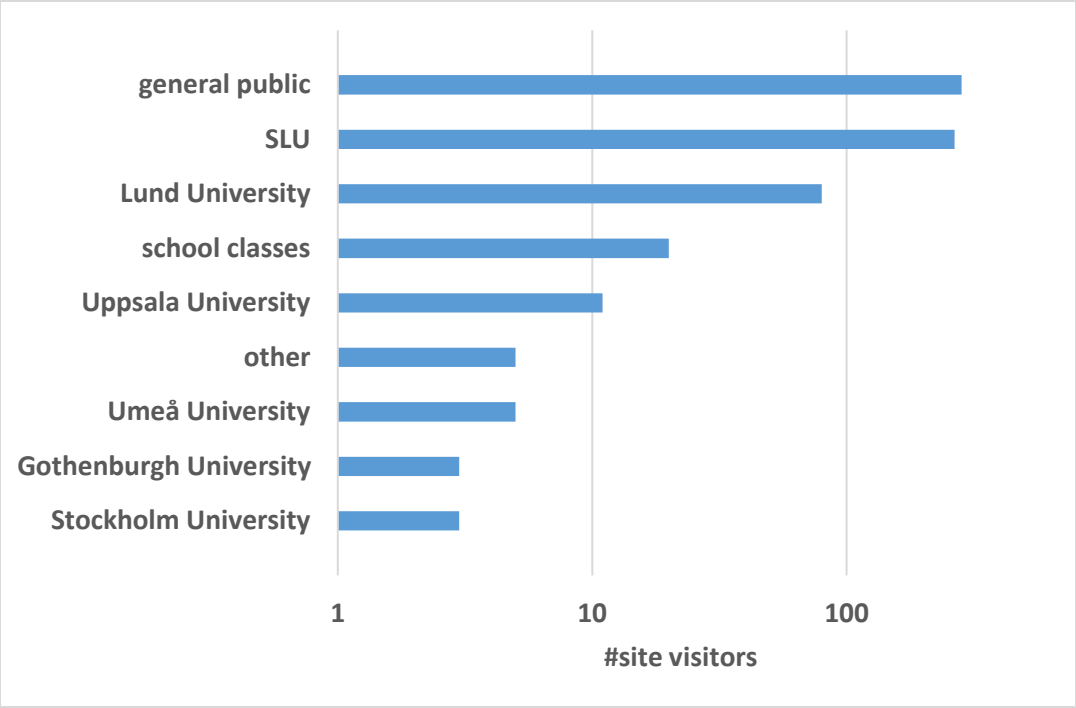

Figure 2. *Number of physical users in 2016 per institution, other organizations, companies, public or otherwise. 'Other' summarizes institutions, organizations or companies with less than 3 visitors.*

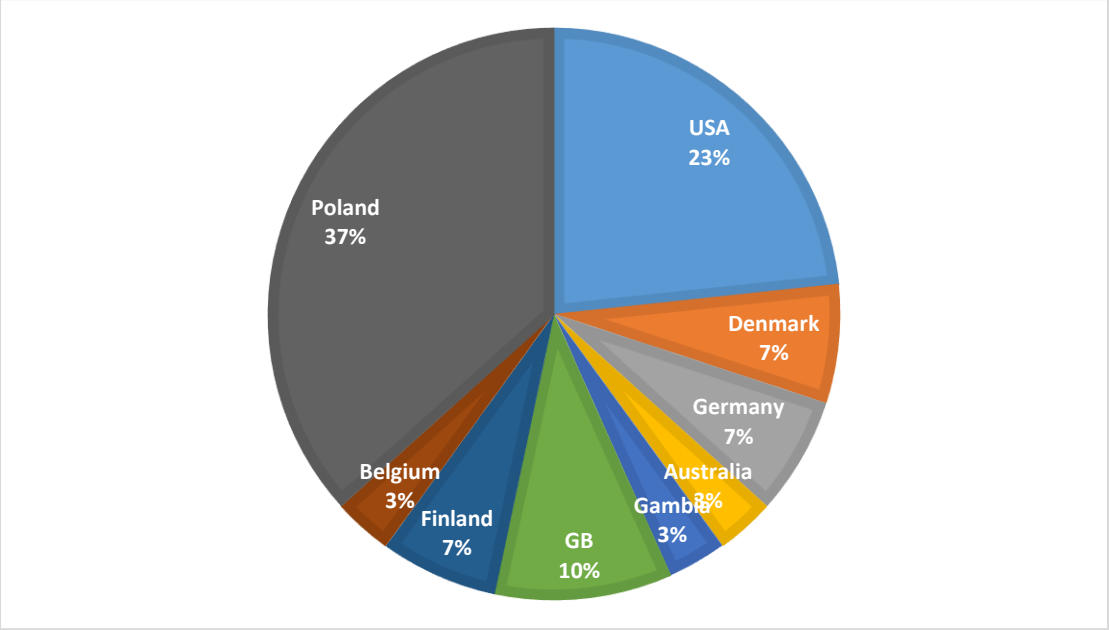

Figure 3. *Number of international physical users of the ICOS Sweden national infrastructure in 2016 per country. For 89% of the international Physical Users, we do not have a closer specification of their origin. The evaluation in Fig. 3 is based on the remaining 11% of international physical users.*

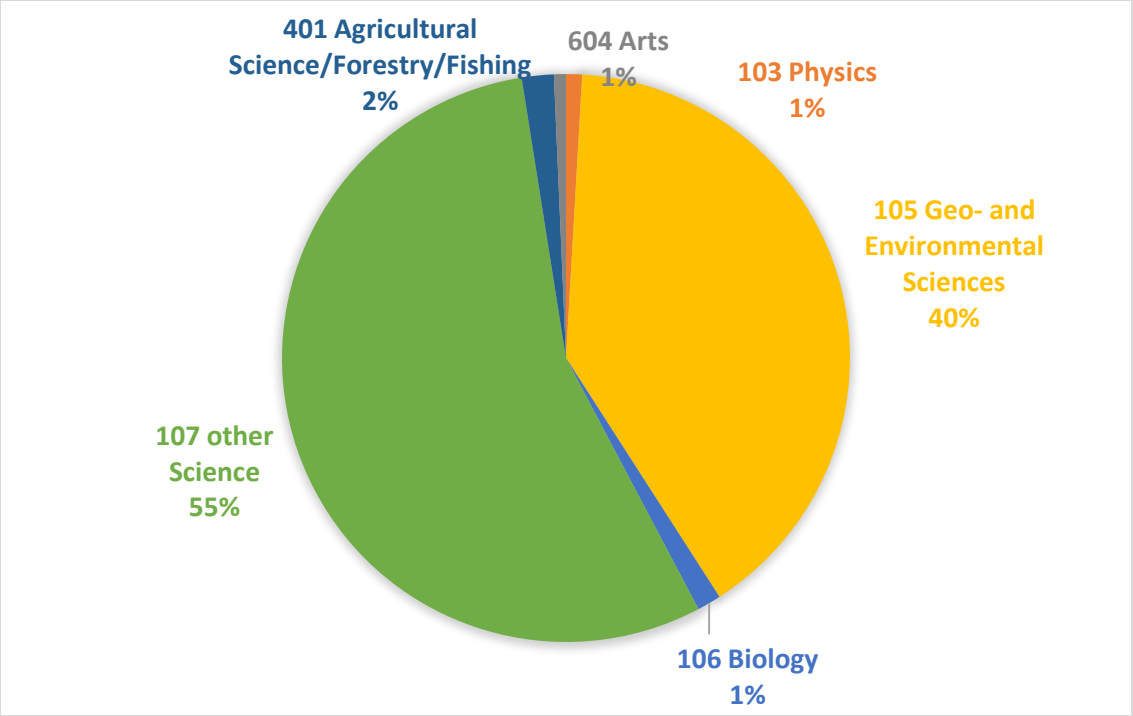

Figure 4. *Number of physical users of the ICOS Sweden national infrastructure in 2016 per subject area (SCB codes).*

2. Keynumber for data usage via the Carbon Portal - *Nyckeltal för dataanvändning via den svenska portalen*

ICOS certified data via the Carbon portal was not yet available during the report period. Furthermore, statistics about gender and background of a potential Data User will not be available through this way.

ICOS data are licensed under a Creative Commons Attribution 4.0 international licence. This license includes that data users are free to

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- No additional restrictions: Users may not apply legal terms or technological measures that legally restrict others from doing anything the licence permits.

Non-ICOS certified data from the ICOS Sweden national network is available directly from the network on two ways: (i) data download from the ICOS Sweden webpage or (ii) by contacting the Coordination Office or the station PIs. These latter data requests, which represent only a small part of potential data users are the basis for the

following statistics on the data users' background. To our knowledge, the subject area of the latter named data users was completely within Geo- and Environmental Sciences (SCB code 105).

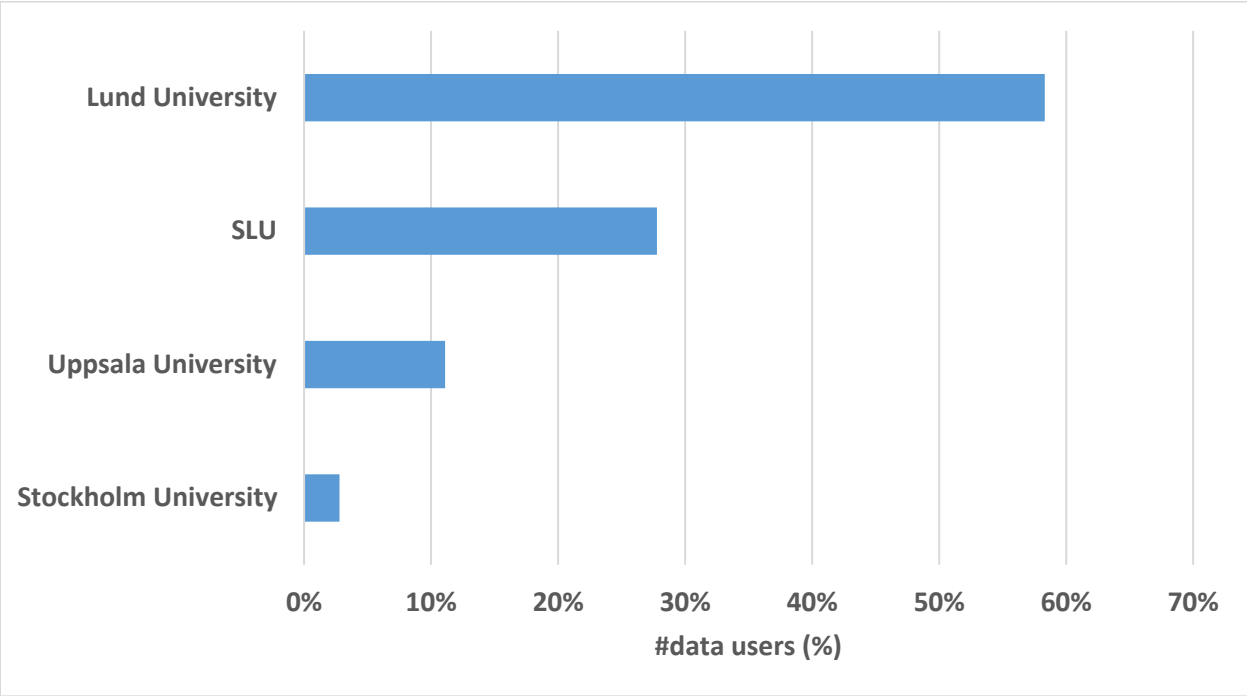

Figure 5. *Percentage of national data users in 2016 per institution, other organizations, companies, public or otherwise.*

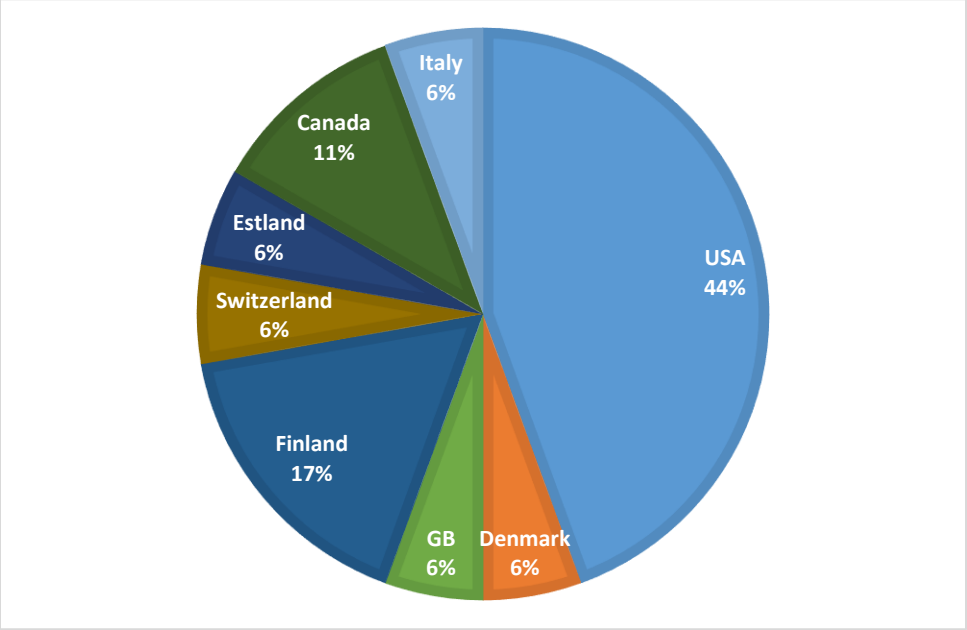

Figure 6. *Percentage of international data users of the ICOS Sweden national infrastructure in 2016 per country.*

Appendix A – List of peer-reviewed scientific publications, the infrastructure contributed to

Amvrosiadi, N., Seibert, J., Grabs, T. & Bishop, K. 2016. Water Storage Dynamics in a till hillslope: The foundation for modeling flows and turnover times. Hydrological Processes, doi:10.1002/hyp.11046, Accepted article okt 2016.

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Deng, J., C. Li, S. Frolking, Y. Zhang, K. Bäckstrand and P. Crill (2014). Assessing effects of permafrost thaw on C fluxes based on multiyear modeling across a permafrost thaw gradient at Stordalen, Sweden. Biogeosci., 11: 4753–4770, doi:10.5194/bg-11-4753-2014

Douglas, P. M. J., D.A.Stolper, K.M. Walter Anthony, C. Paull, S. Dallimore, M. Wik., P.M. Crill, M. Winterdahl, D.A.Smith, A.L. Sessions and J.E.Eiler (2016).Diverse origins of Arctic and Subarctic methane point source emissions identified with multiply-substituted isotopologues. Geochm.Cosmochim. Acta, doi:10.1016/j.gca.2016.05.031.

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Hodgkins, S.B., M.M. Tfaily, C.K. McCalley, T.A. Logan, P.M. Crill, S.R. Saleska, V.I. Rich and J.P. Chanton (2014). Changes in peat chemistry associated with permafrost thaw increase greenhouse gas production. Proc.Nat.Acad.Sci., doi:10.1073/pnas.1314641111.

Jammet, M., Dengel, S., Kettner, E., Parmentier, F.-J. W., Wik, M., Crill, P., and Friborg, T.: Year-round CH4 and CO2 flux dynamics in two contrasting freshwater ecosystems of the subarctic, Biogeosciences Discuss., doi:10.5194/bg-2016-466, in review, 2017

Jammet, M., P. Crill, S. Dengel and T. Friborg (2015). Large methane emissions from a subarctic lake during spring thaw: mechanisms and landscape significance. J. Geophys. Res. Biogeosci., 120,2289-2305 doi: 10.1002/2015JG003137.

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Karlsen, R.H., Seibert, J., Grabs, T., Laudon, H., Blomkvist, P. & Bishop, K. 2016. The assumption of uniform specific discharge: unsafe at any time? Hydrological Processes 30(21):3978–3988, doi:10.1002/hyp.10877.

Kasurinen, V., Alfredsen, K., Ojala, A., Pumpanen, J., Weyhenmeyer, G.A., Futter, M.N., Laudon, H. & Berninger, F. 2016. Modeling nonlinear responses of DOC transport in boreal catchments in Sweden. Water Resources Research 52(7):4970–4989, doi:10.1002/2015WR018343.

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Zhao, J., Peichl, M., Öquist, M. and M.B. Nilsson (2016) Gross primary production controls the subsequent winter CO2 exchange in a boreal peatland Global Change Biology, 22(12):4028-4037. doi:10.1111/gcb.13308.