

Interfacing EUDAT Services to ICOS Research Infrastructure

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ICOS Carbon Portal team

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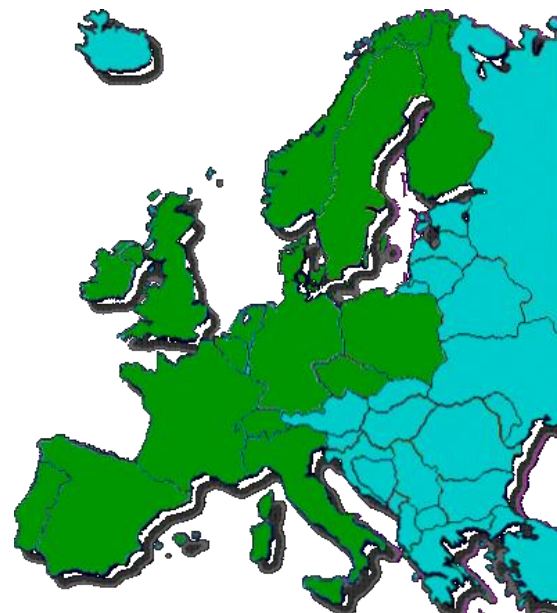




Integrated Carbon Observation System

"A pan-European research infrastructure for quantifying and understanding the greenhouse gas balance of the European continent and adjacent regions"

- 16 European countries
- Soon to become an ERIC (European Research Infrastructure Consortium)
- Construction phase 2014-2015
- Long-term commitment (15+ years!?)



The primary missions of ICOS:

- To collect high-quality observational data relevant to the greenhouse gas budget of Europe
- To make the ICOS data freely available to all interested parties
- To promote the use of the ICOS data for further scientific study

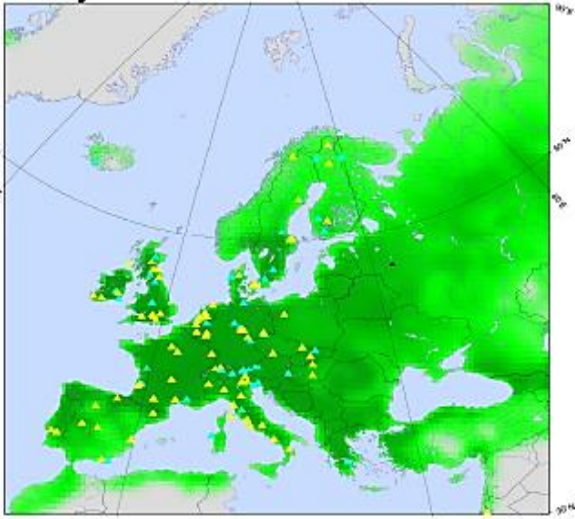
ICOS RI organization

Distributed, highly decentralized structure

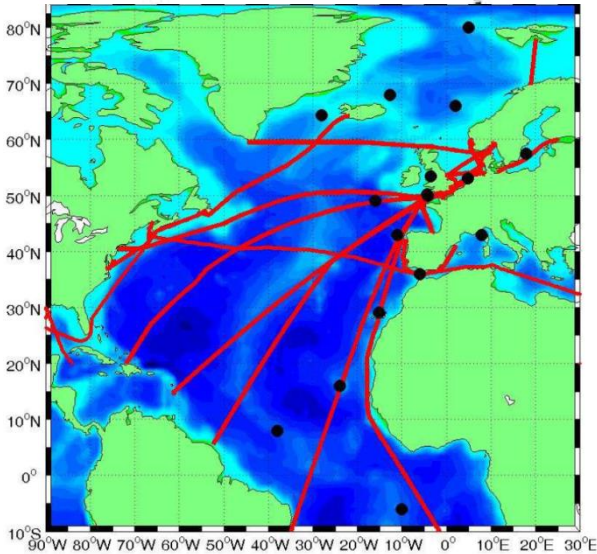
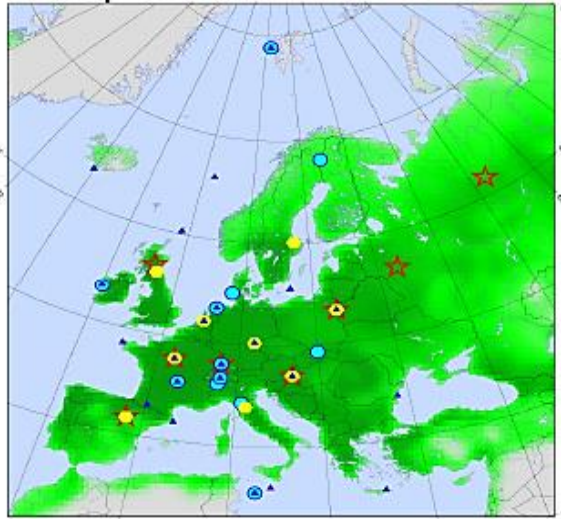
- Head Office in Finland + France
- Carbon Portal in Sweden + Netherlands
- Central Facilities:
 - Atmospheric Thematic Center in France
 - Ecosystem Thematic Center in Italy, Belgium & France
 - Oceanic Thematic Center in Norway and UK
 - Central Analytical Laboratories in Germany
- Measurement station networks in ≈ 15 countries, operated nationally

A vision for the ICOS network

Ecosystem stations



Atmospheric stations



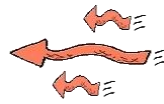
Marine observation routes and stations

Keys to success

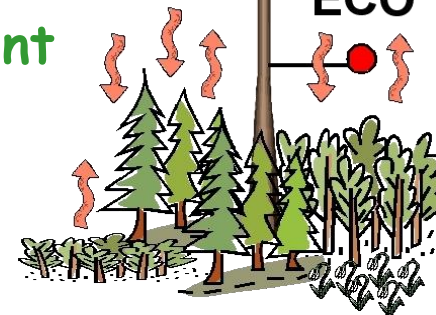
- State-of-the-art instrumentation
- Standardized procedures & data analysis
- Long-term commitment

Aim: to be fully operational in 2016-17

ATM



ECO



ICOS Data Producers

- National Measurement Networks
 - Atmospheric, Ecosystem and Marine observation stations
 - Produce raw time series data, often at “high frequency”
- Thematic Centers
 - One each for Atmospheric, Ecosystem and Marine observation networks
 - QA/QC: Quality Control and Assurance
 - Calculate fluxes of energy and greenhouse gases (GHGs)
 - Produce time series of half-hourly or hourly averages
- GHG research community
 - Apply models that use ICOS observational data
 - Produce elaborate products, such as “flux maps”
 - The Carbon Portal organizes activities (and will also contribute some products)

GHG: Greenhouse Gas (carbon dioxide, methane, nitrous oxide, ...)

ICOS Data Products

- Quality-controlled observational data
 - Greenhouse gas concentrations – CO₂, CH₄, N₂O
 - Other trace gases & isotopes (CO, 14-C, ...)
 - Greenhouse gas and energy fluxes
 - Meteorological parameters
 - Ecosystem variables
- Elaborated (model) products
 - Advanced “visualizations”
 - Flux maps in time & space (inverse modelling)
 - Other model output (ecosystem, vegetation,...)
- Syntheses reports
 - Material for policy makers
 - Regional “GHG statistics”
 - Educational and outreach materials

ICOS Data Users

- **Researchers;**
- International and national Operational Centres assimilating atmospheric composition data;
- Policymakers and stakeholders involved in negotiating carbon reduction policies;
- Carbon trading communities;
- Regional authorities and carbon inventory agencies;
- Private land owners and industrial contributors of greenhouse gas emissions;
- The general public interested in greenhouse gas emissions and global climate change.
- Commercial users
- ...!?

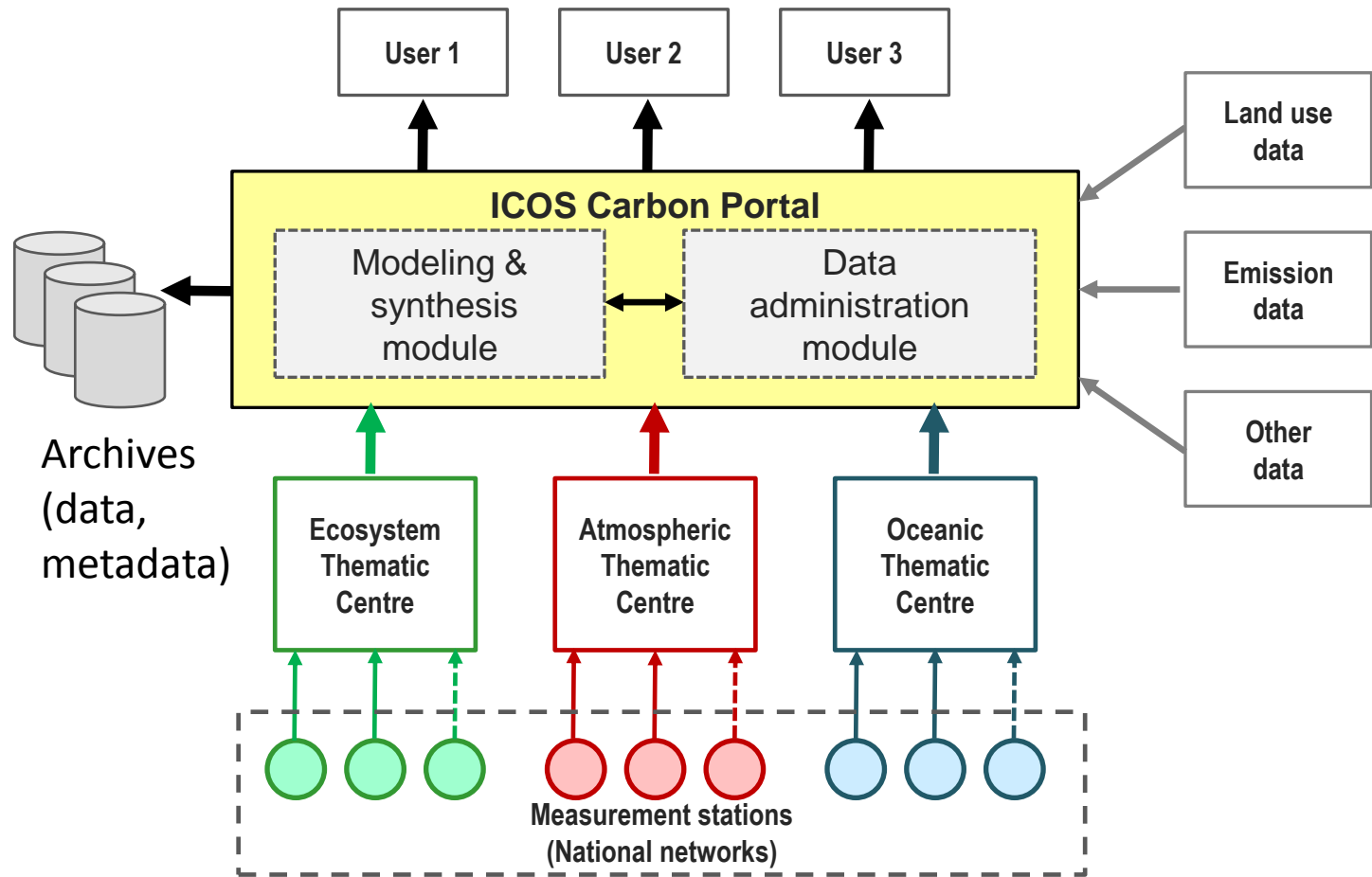
All users should need to do before accessing data is to register and accept the ICOS Data Policy!

The Carbon Portal

- A “one-stop shop” for ICOS data products
- Interface between producers and users
- Provider of services:
 - Discovery
 - Search
 - Visualization
 - Download
 - Data usage tracking
- Coordinator of:
 - Data curation
 - Data set “publication”
 - Long-term storage (“archiving”)
 - Production of value-added elaborated products
- + some more stuff...

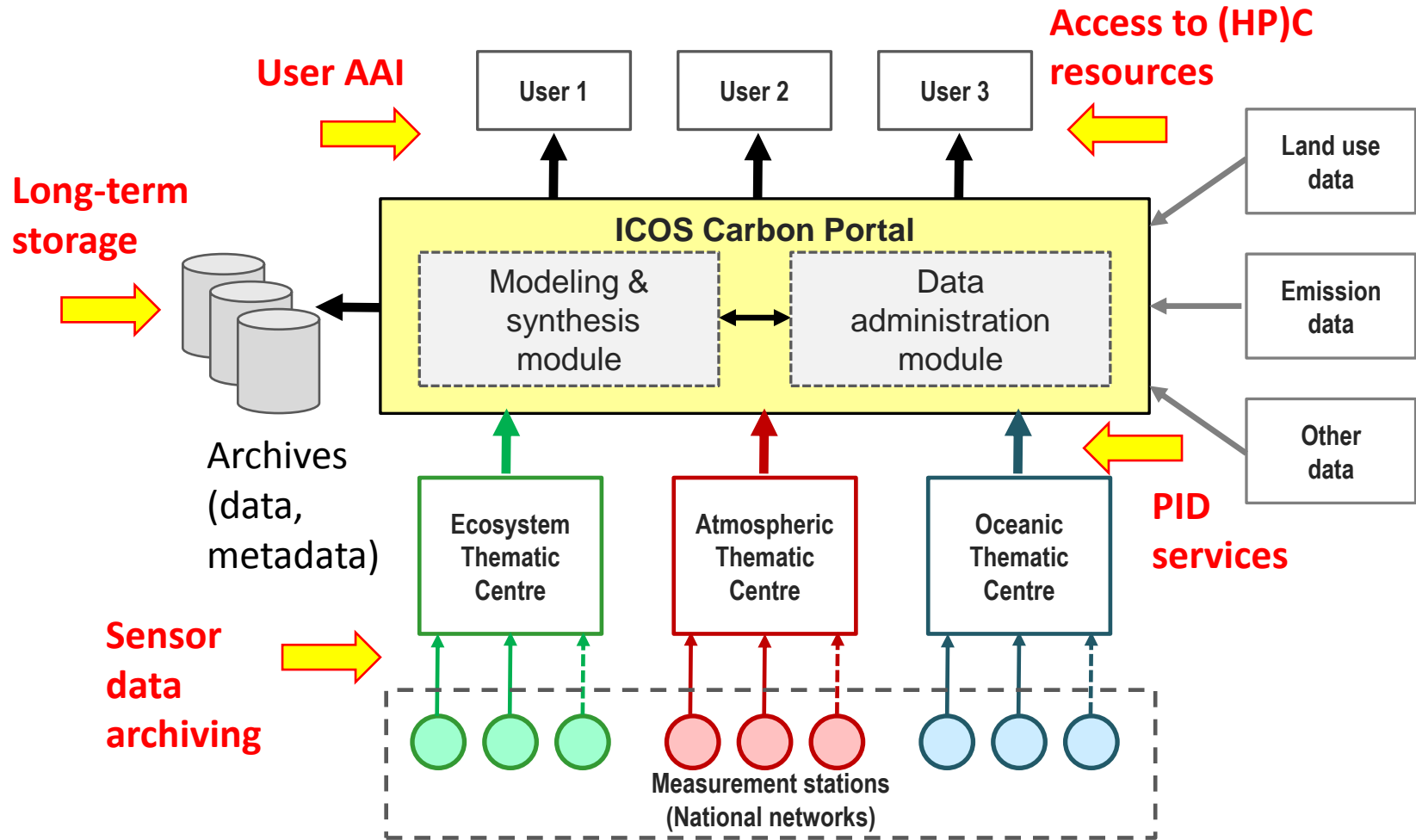
Access to ICOS data

- via the Carbon Portal: a "one-stop shop" for ICOS data



Where could **EUDAT** help?

B2SAFE, B2FIND, & perhaps also B2SHARE, B2STAGE
+ other services (PID, AAI, ...)



Interface points

- “Notary public” repositories for sensor data
- PID services (at all data product levels?)
- User authorization, authentication and identification service (beyond current “federations”)
- Safe, long-term data product storage with fast access (by projects & trusted users)
- Simplify usage of data “at source” for modelers

Why work with EUDAT?

- Stakeholders and funding agencies would like ICOS to make as much as possible use of existing ITC resources
- EUDAT provides attractive services
- ICOS RI is a European endeavor – so it is natural to seek European partnerships – with many different infrastructures
- Common standards and platforms simplify efficient exchange and (re)use of data
- Solutions developed and maintained by professionals are to be preferred - why reinvent the wheel?

Thank you for listening!

More information about ICOS:

<http://icos-infrastructure.eu/>

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