The ICOS ecosystem thematic center

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The ICOS Ecosystem Thematic Centre

In brief

The ICOS Ecosystem Thematic Centre (ETC) is a central facility responsible for the ecosystem network of stations.

The ETC coordinates the development of the network in accordance with the E-MSA, provide support, ensure the quality and compliance with ICOS standards and process centrally the raw data submitted Near Real Time by the ICOS Ecosystem Network.

ETC Organization

The ETC is organized in three different countries. CMCC and University of Tuscia in Italy, University of Antwerp in Belgium and INRA in France.

Coordinated by the institutions in Italy that are also responsible for the continuous data processing, the ETC has also a number of activities in the ancillary and biological data collection and processing (Univ. Antwerp) and the analysis of vegetation and soil samples collected at the stations (INRA).

The institutions involved have a continuous exchange and coordination of activities and are organized in four units.

ETC Executive Committee Unit

- Communication and interaction with the ICOS ecosystem stations and other Central Facilities
- Organization of the anual assessments of ETC operations
- Planning of the medium and long term activities

Data Unit

- Near real time data/metadata collection
- Automatic data QAQC and processing
- Data sharing, distribution and archiving
- Development of tools for data exploration and validation
- Alert service in case of data problems or incosistencies

Test Unit

- Evaluation of new sensors and prototypes
- New methods developments
- Interactions with instrument manufacturers and research centers
- Evaluation of the ICOS station performances
- Training sessions for site managers and technicians
- Roving system management for sites validation and parallel measurements

Network Unit

- Assistence to the ICOS ecosystem stations
- Evaluation of the ICOS station performances
- Training sessions for site managers and technicians
- Soil and vegetation sample analysis and storage
- Organisation of the Workgroups for protocol development

Example of ETC activities

The station labelling activity. Ensuring the high quality requested.

During the labelling activity the ETC together with the station team ensure the best possible station setup, compliant with the ICOS protocols, and test the data in particular regarding the percentage of data removed and the footprint contribution from the Target Area and the possible different ecosystems included.
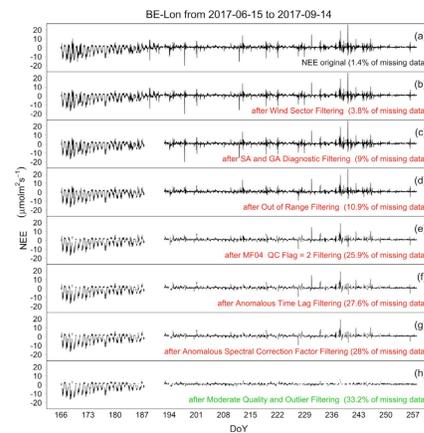

Example of quality filtering

A new objective and reproducible quality filtering scheme has been developed and is applied to a period of data (3 months) in order to evaluate the percentage of data discarded that must be less than 40%

Example of footprint test

The measurements are expected to come mainly from the Target Area (minimum 70% of the good data) and if different land cover types are present they bust be represented in the fluxes (day and night at least 20% of the measurements)
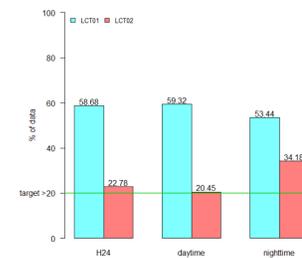
Vegetation chemical analysis.

Samples of vegetation are collected and pre-treated at the stations and then analysed for chemical composition in the INRA ETC laboratories. Also soil samples collected following a stratified random design prepared by the ETC are analysed and archived in the INRA ETC labs.

Foliar Analyses for station BE-Lon, 2017-06-21
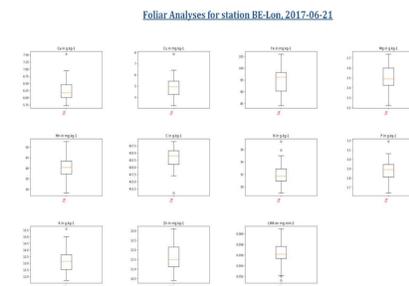
Example of chemical analysis results

The main elements are measured from 30 samples collected at the stations.

Ecosystem characterization and ancillary measurements

The ICOS stations are characterized and monitored also for the ancillary biological parameters such species composition, biomass and Green Area Index. The processing and calculation are performed by the ETC on the basis of field measurements done at the stations following the ICOS Instructions.
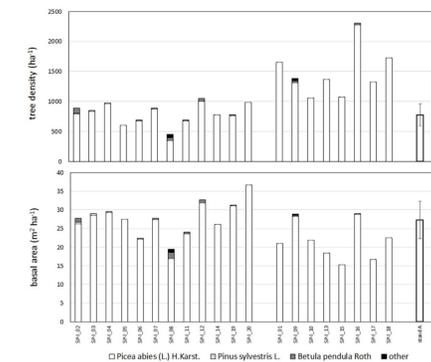
Example of ancillary data analysis

Tree density, diameters, basal area, heights, healthy status and species are measured in the target area following the same stratified random sampling design used for the soil and every year in continuous measurement plots. GAI is calculated using hemispherical pictures or ceptometer, all processed centrally in Antwerp.

Documents and participation

The ICOS Ecosystem methods have been defined by Working Groups and explained in protocols and instructions.

The Working Groups are open to all the interested people and it is possible to register in the ETC website at: **www.icos-etc.eu**

Protocols for the ICOS measurements have been used to prepare ICOS Instructions Documents, a set of practical and clear documents to explain how to setup, maintain, collect and submit data to the ETC and the Carbon Portal. All the ICOS Instructions are publically available and with a DOI.

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