Associated ICOS Ecosystem Station Labelling Report

Station: DE-Gri (Grillenburg)

Viterbo (Italy), Antwerp (Belgium), Bordeaux (France), November 6th 2018

Description of the Labelling procedure

Associated stations have a simplified, one step labelling procedure. After a first general evaluation of the station to ensure the compatibility with the ICOS aims and standard, proposed stations must submit data and metadata. There is a list of mandatory variables and related metadata that must be measured and submitted by an Associated station in order to get and maintain their status and it is reported in Table 1. Calculated fluxes and processed data at the final time resolution must be submitted

Table 1. List of variables and metadata that Associated stations must submit

Variable	**Specifications**	**Metadata**
GHG flux	At least one GHG flux + concentration (30 minutes resolution) among CO_2, CH_4 and N_2O measured with eddy covariance. In case of forest storage flux measured using a vertical profile.	Description of the system (sensors and setup), description of the processing applied to calculate the fluxes.
Incoming radiation	At least one between SW_IN and PPFD_IN, representative of the target area	Description of the system (sensors and setup)
Air Temperature	Representative of the target area	Description of the system (sensors and setup)
Relative Humidity	Representative of the target area	Description of the system (sensors and setup)
Precipitation	Representative of the target area	Description of the system (sensors and setup)
Horizontal wind speed/direction	Representative of the target area	Description of the system (sensors and setup)
Maximum LAI	LAI or GAI measured at its maximum in the year. Method not prescribed.	Description of the method used.
Above Ground Biomass	Above ground biomass, for annual vegetation the biomass at the maximum in the year	Description of method used.
Soil texture	Average soil texture at the site	Description of method used.
Management and disturbances	Info on the disturbances occurring at the site and management practices	-----

In addition to the mandatory variables, the Associated stations can and are invited to submit other micrometeorological and ancillary data collected at the site that can help to better interpret and analyze the flux variables.

The station must be active, submit at least one year of data and continue to submit the data at least yearly by end of February of the year after the acquisition.

Labelling report

The station started the labelling on March 6th 2017 and completed the data and metadata submission on October 30th 2018. Here below a summary of the submitted data and metadata is reported.

Station Description

The site Grillenburg (ICOS code DE-Gri) is located in in central Saxony EC at 385m above sea level. Typical plant species are couch grass (*Elymus repens* (L.) Gould), meadow foxtail (*Alopecurus pratensis* L.), yarrow (*Achillea millefolium* L.), common sorrel (*Rumex acetosa* L.) and white clover (*Trifolium repens* L.). The grassland is surrounded by forest (up to 30 m) and the fetch is restricted to 530 m (N), 250 m (W), 470 m (S) and 350 m (E), respectively. However, footprint investigations considering the site represents the specified target land cover type very well. The area is flat in a radius of around 500 m around the EC mast.

The station coordinates are Lat. 50,95004 N, Long. 13,51259 E, the UTC offset is UTC+ 01.

The site is located in the suboceanic/subcontinental climate (Cfb) with the following climate averages:

Average annual temperature: 7.6 C°

Average total annual precipitation: 877 mm

Average annual incoming radiation: 110 W m^{-2}

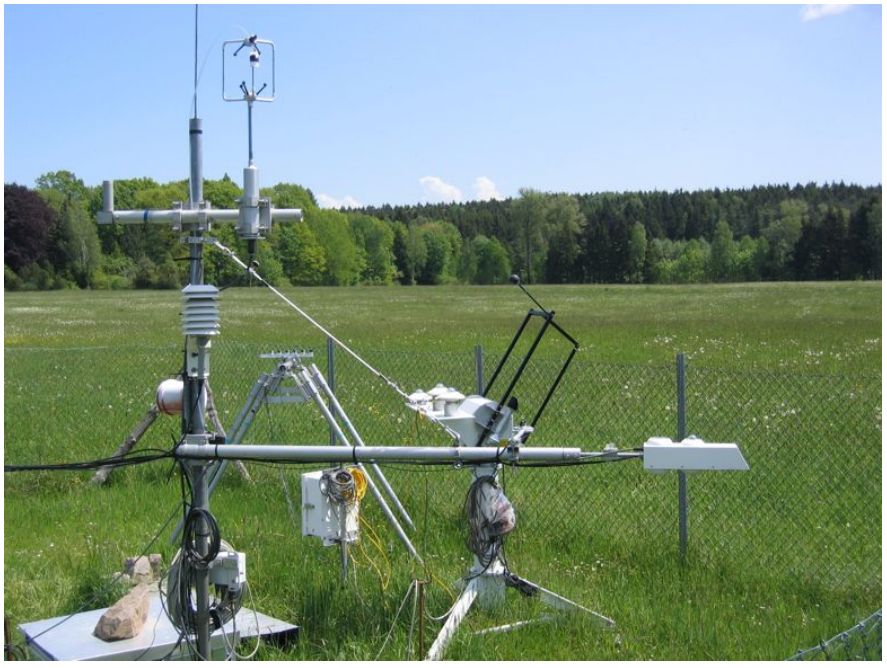


Fig. 1 - DE-Gri instrumentation

Team description

The staff of the site has been defined and communicated in January. It includes in addition to the PI, the CO-PI and the scientific expert. Below the summary table of the Team members is reported.

Tab. 2 - Team members of site

MEMBER_NAME	MEMBER_INSTITUTION	MEMBER_ROLE	MEMBER_MAIN_EXPERT
Christian Bernhofer	TU Dresden	PI	MICROMET
Thomas Grünwald	TU Dresden	MANAGER	MICROMET
Uta Moderow	TU Dresden	SCI-FLX	DATAPROC
Uwe Eichelmann	TU Dresden	DATA	LOGISTIC
Markus Hehn	TU Dresden	TEC	LOGISTIC

Metadata about the sensors

The metadata were sent in October 2018 and for each of the measured variables the sensor has been described, communicant the model, the serial number, its position (height, eastward and northward distances). The Eddy station is characterized by one analyzer LI-COR and one anemometer Gill as reported in the underlying Table 3:

Tab. 3 - The Eddy Covariance system

MODEL	SN	HEIGHT (m)	EASTWARD_DIST (m)	NORTHWARD_DIST (m)
GA_CP-LI-COR LI-7000	IRG4-0596	3	0	0
SA-Gill R3-50	H000364	3	0	-0.25

A set of instruments are located near the tower: precipitation, radiation, air meteorology and soil climate. The metadata for these instruments are under preparation and will be submitted before the GA meeting and the ETC agreed to this delay needed to have cross-checked info.

Ancillary data

To describe the site, the climatic annual averages of temperature, precipitation and radiation (shortwave) have been sent in October 2018 (see the Station Description paragraph). The dates of periodical harvests and annual grazing of cattle or sheep have been reported.

The soil data were sent on October specifying in detail the chemical composition (carbon, nitrogen, and ratios), the pH, the carbon and nitrogen stocks, the data of texture, the soil group according the Soil World Reference Base for Soil Resources.

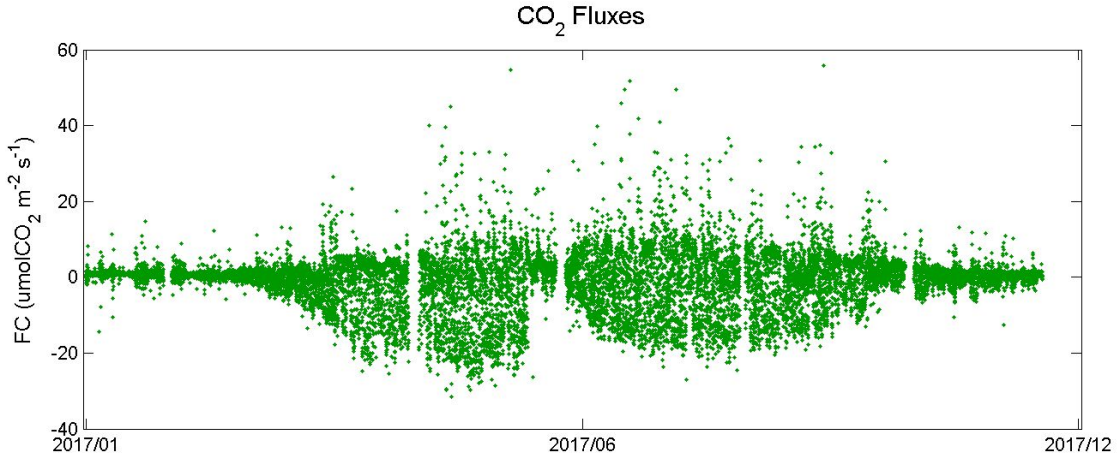
Further and detailed ancillary data have been provided, and in particular:

- **GAI**: 4,83 (maximum value in 2018)
- **Biomass**: total above ground 0,432 KgDM m^{-2} (maximum value in 2018)
- **Canopy height**: 0.85 m (maximum value in 2018)

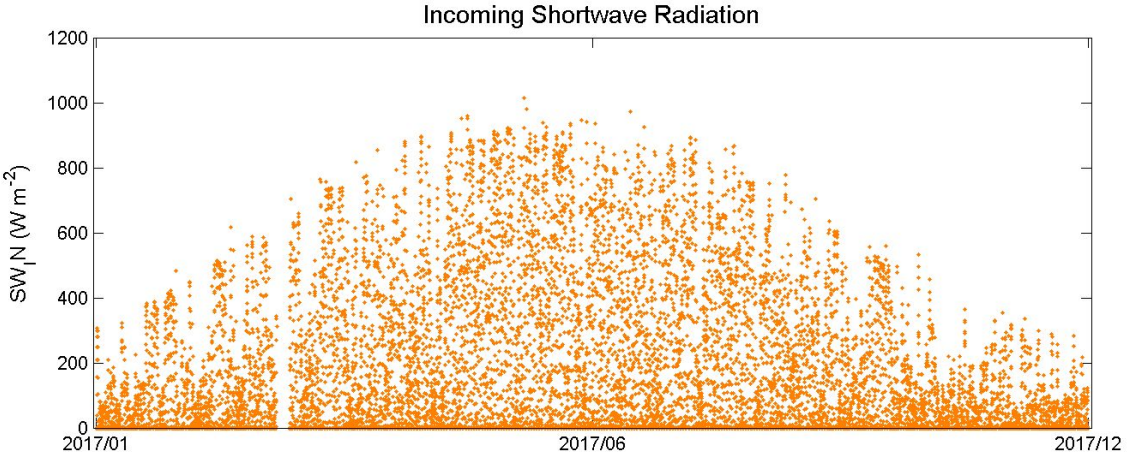
Submitted data

As requested in the labelling procedure, continuous data have been submitted for the period January-December 2017. The file, has been uploaded in July and they include eddy covariance fluxes, meteo measurements and soil measurements. The flux variables (CO_2 flux, sensible heat and Latent heat flux) report also the Steady State and Integral Turbulence Characteristics tests results according to Foken et al. 2004. The uploaded meteo and soil variables are listed in Table 4. In the following figures plots of some of the key variables are presented as example in order to evaluate the data continuity and coverage.

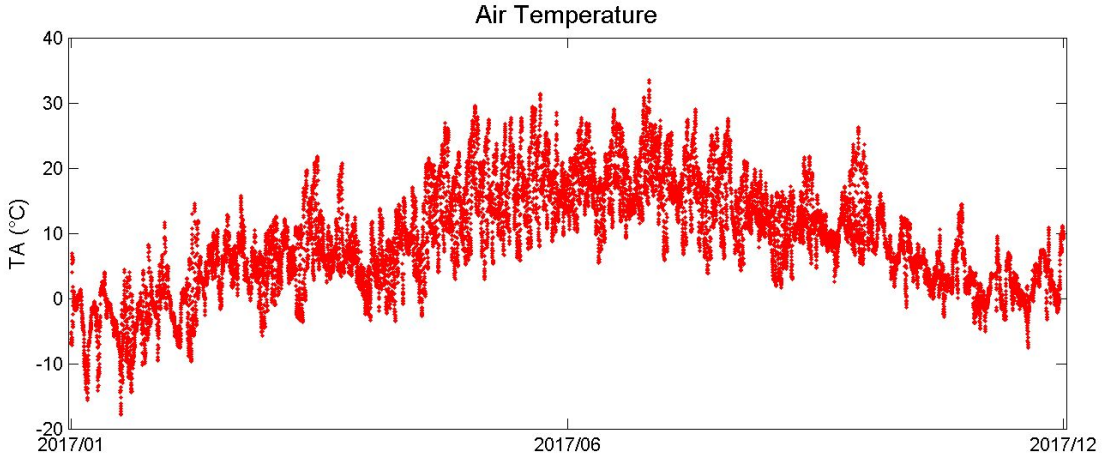
CO_2 fluxes measured with eddy covariance



Incoming shortwave radiation



Air temperature



Relative humidity