



Associated ICOS Ecosystem Station Labelling Report

Station: FR-EM2 (Estrees-Mons A28)

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 ₂ O 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 PPF _D _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 December 7th 2016 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 station Estrees-Mons A28 (ICOS code FR-EM2) is located in Picardie region, about 200 km north-east of Paris, in an INRA research station which includes 150 ha of experiments on arable crops (both annual food crops and perennial bioenergy crops). The ICOS station is part of the “SOERE ACBB” long-term experiment which includes two eddy covariance towers.

Its coordinates are Lat. 49.8721083 N, Long. 3.02065 E, the UTC offset is UTC+01.

The site is characterized with the following climate averages:

Average annual temperature: 10.8 C°

Average total annual precipitation: 680 mm

Average annual incoming radiation: 125 W m⁻²



Fig. 1 - FR-EM2 instrumentation and tower

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
Joel Leonard	INRA	PI	Á
Bruno Mary	INRA	CO-PI	Á
Frédéric Bornet	INRA	MANAGER	DATAPROC
Eric Grehan	INRA	TEC	MICROMET

Metadata about the sensors

The metadata were sent in August and for each of the measured variables the sensor has been described, communicating the model, the serial number, its position (height, eastward and northward distances). The Eddy station is characterized by one analyzer LI-COR 7200 and one anemometer Gill HS 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-7200	72H-0187	0	0	0
SA-Gill HS-50	H000170	0	0	0

A set of instruments are located near the tower: precipitation, radiation, and air meteorology. Table 4 summarizes the installed sensors and the measured variables.

Tab. 4: The installed sensors and relative codes for the measured meteo and soil variables

MODEL	SN	HEIGHT (m)	EASTWARD_DIST (m)	NORTHWARD_DIST (m)	VARIABLE_H_V_R
RAD-Pyrrad-SW+LW	110707	4.6	2	0	SW_IN_1_1_1
					SW_OUT_1_1_1
					LW_IN_1_1_1
					LW_OUT_1_1_1
RAD-PAR Quantum	1406	4.6	2	0	PPFD_IN_1_1_1
RH-Capac	H4520008	2	0	0	TA_1_1_1

					RH_1_1_1Á
RAIN-WeightGaugeÁ	21200533Á	2Á	50Á	0Á	P_1_1_1Á
PRES-ElectBarÁ	F44550003Á	2Á	0Á	0Á	PA_1_1_1Á
SA-Other	10370016	2	0	0	WD_1_1_1Á
					WS_1_1_1Á

Ancillary data

To describe the site, the climatic annual averages of temperature, precipitation and radiation (shortwave) have been sent on January 2018 (see the Station Description paragraph). Being a cropland the sowing crop seeds and the annual cuts dates have been reported. The management is also typical of a cropland, having been given herbicides and fungicides periodically.

The soil data were submitted in September 2018 specifying in detail the chemical composition (carbon, nitrogen, potassium, phosphorus and ratios), the pH, the carbon, nitrogen, potassium and phosphorus stocks, the data of texture, the non-continuous measurements of SWC, the soil depth and the soil group according the Soil World Reference Base for Soil Resources.

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

LAI: 4.57 referred to the last crop of *Medicago sativa* (mean)

Biomass: 0.5 kgDM m⁻² referred to the last crop of *Medicago sativa* (mean)

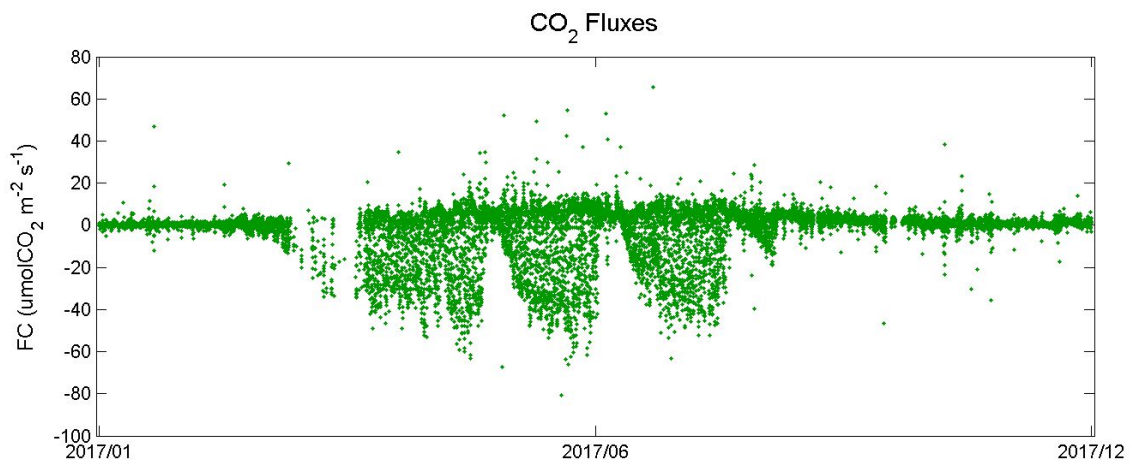
Canopy height: 0.7 m (maximum height in 2017) referred to the last crop of *Medicago sativa*)

Submitted data

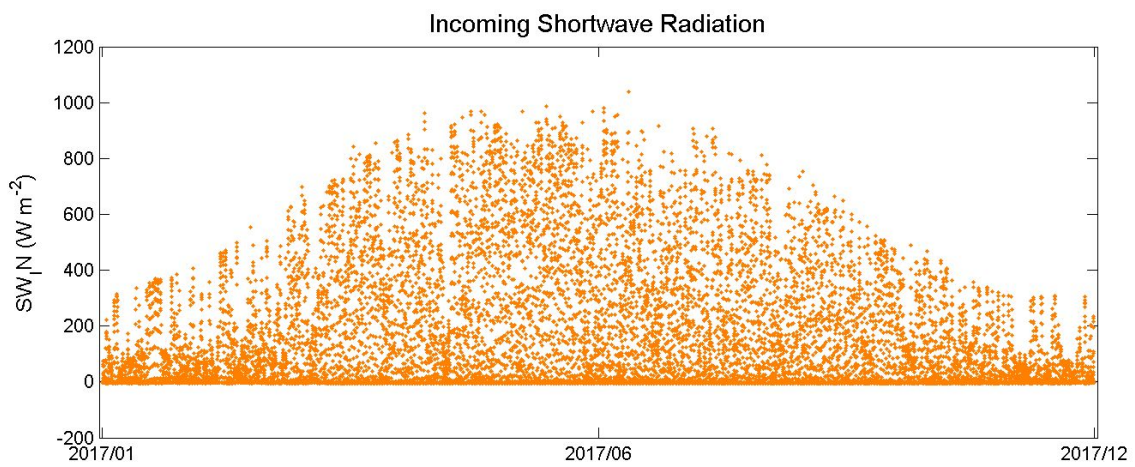
As requested in the labelling procedure, continuous data have been submitted for the period January-December 2017. The file has been uploaded in October and it include eddy covariance fluxes and meteo measurements. The flux variables (CO₂ flux, sensible heat and Latent heat flux) report also the Steady State and Integral Turbulence Characteristics tests results according to Foken et al. 2004. The uploaded meteo 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.

In addition to the measurements, the configuration file of EddyPro software that has been used for data processing has been submitted. This will allow to reconstruct exactly the processing applied (reproducibility) and to simplify in future the use of the site raw data.

CO₂ fluxes measured with eddy covariance



Incoming shortwave radiation



Air temperature

