ICOS Ecosystem Station Labelling Report

Station: BE-Lon (Lonzee)

Viterbo (Italy), Antwerp (Belgium), Bordeaux (France), October 25th 2017

Description of the Labelling procedure

The Step2 procedure has the aims to organize the building the station in accordance with the ICOS Instructions, to establish the link with the ETC, and to validate all the data formats and submission. Furthermore, it involves also defining the additional steps needed after the labelling to complete the station construction according to the station Class. During the Step2 a number of steps are required and organized by the ETC in collaboration with the PI.

Preparation and start of the Step2

The station started the Step1 of the labelling on May 11th 2016 and got the official approval on August 28th 2016. The Step2 started officially on November 29th 2016 with a specific WebEx between the ETC members and the station team members where the overall procedure was discussed and explained.

Team description

The station PI has to describe the station team and provide the basic information about the proposed station using the BADM system. The submission is done using a specific ICOS interface.

Sampling scheme implementation

The sampling scheme is the distribution of points in the ecosystem where a number of measurements must be done. It is composed by two different type of sampling locations: the Sparse Measurement Plots (SP) that are defined by the ETC following a stratified random distribution on the basis of information provided by the PI and the Continuous Measurement Plots (CP) where continuous measurements are performed.

Measurements implementation

The measurement of a set of variables must be implemented in the Step2 labelling phase. The compliance of each proposed sensor and method is checked by the ETC and discussed with the PI in order to find the optimal solution. In case for specific reasons it is not possible to follow the ICOS agreed protocols and Instructions an alternative solution, equally valid, is defined and discussed also with the MSA if needed.

Once the sensors and methods are agreed the station Team has to implement the measurements using calibrated sensors, submit the metadata to the ETC and start to submit data Near Real Time for the continuous measurement. Also vegetation samples must be collected and shipped to the ETC chemical laboratory in France. The list of variables to be implemented during Step2 is reported in Table 1. Adaptation of the table to specific ecosystem conditions are possible and always discussed with the PI and the MSA.

In addition to the variables reported in Table 1 there is an additional set of measurements that are requested and that must be implemented after the labelling in the following 1-2 years. For all these variables (in particular for the soil sampling) an expected date and specific method to be used is discussed and agreed before the end of the Step2 process.

Table 1 – Variables requested for Step2

Group	Variable
EC fluxes CO2-LE-H	Turbulent fluxes Storage fluxes
Radiations	SW incoming LW incoming SW outgoing LW outgoing PPFD incoming PPFD outgoing
Meteorological above ground	Air temperature Relative humidity Air pressure Total precipitation Snow depth Backup meteo station
Soil climate	Soil temperature profiles Soil water content profiles Soil heat flux density Water table depth
Site characteristics	History of disturbances History of management Site description and characterization
Biometric measurement	Green Area Index Aboveground Biomass
Foliar sampling	Sample of leaves Leaf Mass to Area Ratio
Additional variables for Class1 stations	
Radiation	SW/PPFD diffuse
Meteorological	Precipitation (snow)
Biometric measurement	Litterfall

<u>Data evaluation</u>

Stations entering Step2 have been already analyzed during Step1 of the labelling but the optimal configuration and the possible presence of issues can be checked only looking to the first data measured. For this reason a number of tests will be performed on the data collected during the Step2 (NRT submissions, that can be integrated if needed by existing data) and the results discussed with the PI in order to find the best solution to ensure the maximum quality that is expected by ICOS stations. Four tests are performed:

Test 1 - Percentage of data removed

During the fluxes calculation the raw data are checked by a number of and some of them will lead to data exclusion and gaps. It is be calculated the number of half hours removed by these QAQC filters and the target value is to have less than 40% of data removed. If the test fails, an in depth analysis of the reasons is performed in order to find solutions and alternatives.

Test 2 – Footprint and Target Area

The Target Area is the area that we aim to monitor with the ICOS station. The test will analyze using a footprint model (Klijun et al. 2015) the estimated contribution area for each half hour and check how many records have a contribution coming mainly from the target area. The target is to have at least 70% of measurements that are coming mainly (70% of the contribution) from the Target Area. If the test fails, a discussion with the PI is started in order to find solutions and alternatives, in particular changing the measurement height or wind sectors to exclude.

Test 3 – Data Representativeness in the Target Area

The aim is to identify areas that are characterized by different species composition or different management (and consequently biomass and density) and analyze, using the same footprint model (Kljun et al. 2015), the amount of records coming from the different ecosystems, checking their representativeness in terms of day-night conditions and in the period analyzed. The target is to get, for the main ecosystem types, at least 20% of the data during night and during day and also distributed along the period analysed. If not reached, a discussion with the PI is started in order to find solutions and alternatives, in particular changing the measurement height or wind sectors to exclude.

Test 4 – CP Representativeness in the Target Area

The CPs must be as much as possible representative of the Target Area and this will be checked on the basis of the results of the site characterization, in particular in relation to species composition, biomass and management. The target is to have the percentage of the two main species and their biomass in the CP not more that 20% different respect to the measurements done in the SP plots. In case the CPs proposed do not represent a condition present in the Target Area they are relocated or one or more additional CPs can be added.

Station Description

The station with ICOS code BE-Lon is called Lonzée and located in the Vallonia part of Belgium, in the Province of Namur, Hesbaye region. It is a cropland of 11.8 ha with coordinates in WGS84 system: Latitude 50.55159°N, Longitude 4.74613°E. The quote above sea level is 167 m. The offset respect to the Coordinated Universal Time (UTC) is +01. The cropland has a 4-year rotation between sugar beet (Beta vulgaris L.), winter wheat (Triticum aestivum L.), potato (Solanum tuberosum L.), and winter wheat (Triticum aestivum L.). In Figure 1 a representation of the crop after the tillage and of the instrumentation present is shown.

Figure 1 - the BE-Lon tower

Team description

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

Table 2 - Description of team members roles at BE-Lon

MEMBER_NAME	MEMBER_INSTITUTION	MEMBER_ROLE	MEMBER_MAIN_EXPERT
Bernard Heinesch	Gembloux Agro-Bio Tech, Univ. of Liège	PI	DATAPROC
Bernard Bodson	Gembloux Agro-Bio Tech, Univ. of Liège	CO-PI	BIOMASS
Bernard Longdoz	Gembloux Agro-Bio Tech, Univ. of Liège	CO-PI	SOIL
Anne De Ligne	Gembloux Agro-Bio Tech, Univ. of Liège	MANAGER	DATAPROC

Tanguy Manise	Gembloux Agro-Bio Tech, Univ. of Liège	SCI-ANC	BIOMASS
Henri Chopin	Gembloux Agro-Bio Tech, Univ. of Liège	DATA	MICROMET
Thibaut Thyrion	Université catholique de Louvain	TEC-ANC	BIOMASS
Aurélie Bachy	Gembloux Agro-Bio Tech, Univ. of Liège	AFFILIATED	
Benjamin Bergmans	Institut Scientifique de Service Public	AFFILIATED	
Benjamin Dumont	Gembloux Agro-Bio Tech, Univ. of Liège	AFFILIATED	PLANT
Christian Roisin	Centre Wallon de Rech. Agronomiques	AFFILIATED	LOGISTIC
Fabian Lenartz	Institut Scientifique de Service Public	AFFILIATED	
Margaux Lognoul	Gembloux Agro-Bio Tech, Univ. of Liège	AFFILIATED	DATAPROC

Spatial sampling design

For the spatial sampling scheme design the BE-Lon Team proposed, in addition to the Target Area (TA), a set of small areas to be excluded from sampling (EA). No continuous measurement points (CP) have been reported. Figure 2 shows the spatial extent and position of such features, in relation to the actual site area. The total TA surface was 17.93 Ha and the total EA surface was 511 m2.

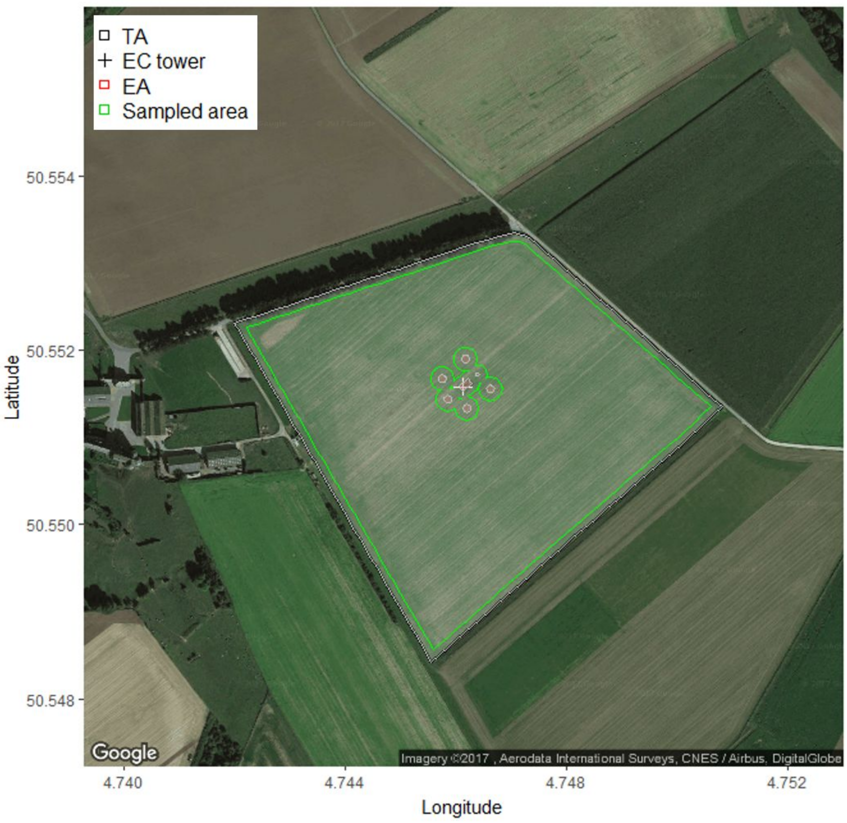


Figure 2: Map of proposed spatial features for BE-Lon.

The whole area excluded from the placement of sparse measurements plots (SP-I) comes from the sum of the EA as uploaded by the PI and a 10 m buffer around the TA border so as to ensure SP-I centers to be at least 10 m far from any borders. After the effective area (SA in Figure 3) have been partitioned into 10 geographically compact, randomly generated sub-areas of equal size, 20 SP-I locations were randomly extracted (2 within each sub-area).

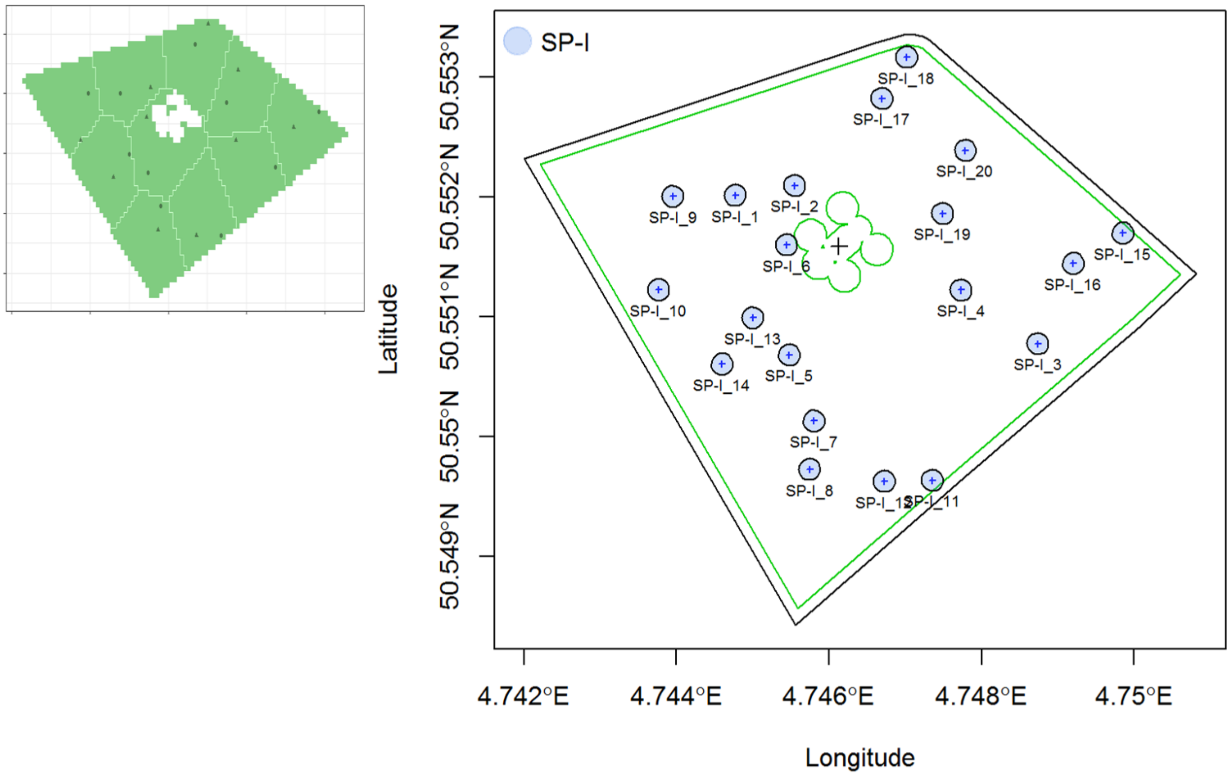


Figure 3: Location of proposed sampled sampling points. The box at the top-left corner shows the stratification of the TA into 10 sub-areas of equal size and the respective SP-I sampled locations.

The actual location of the sampling points that the Station Team performed in the field, perfectly matched with the proposed design (max SP-I offset of 15 cm and average SP-I offset of 7.1 cm). Such points coordinates are currently definitive and used for specific vegetation and soil samplings. 2 CP have been reported subsequently, their number and position is compliant with ICOS and have been accepted.

Station implementation

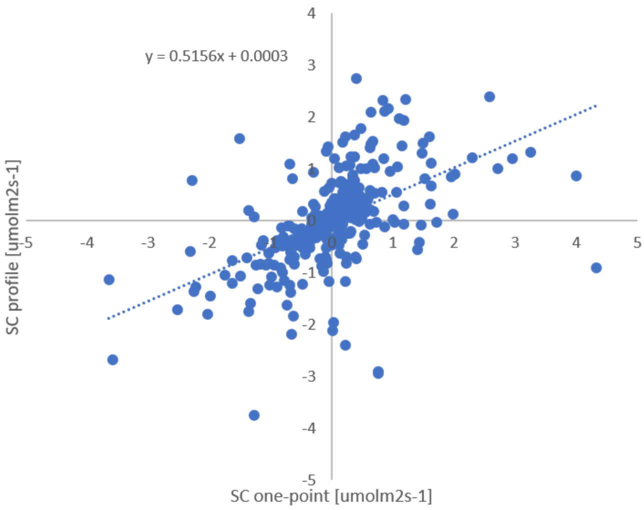
Eddy covariance:

BE-Lon station has been performing eddy covariance (EC) measurements with ICOS-compliant instrumentation since 2016. The sensors (ultrasonic anemometer Gill HS and infrared gas analyser LICOR LI-7200, Tab. 3) for turbulent measurements of CO2 flux, sensible (H) and latent heat (LE) have been calibrated in March 2017, then less than 2 years ago according to ICOS Instruction. On the position of EC system the ETC found that the suggested location was not optimal due to the presence of big control boxes for the instrumentation in the vicinity and also to a big area with no vegetation surrounding the tower and likely included in the footprint. The station PI made a commitment to change the position of the EC tower in a more favourable position for EC measurements within the end of the year, optimising the orientation of the sonic and manually performing inside the fence hosting the instrumentation the same operations as outside, as to avoid as much as possible any discontinuity. The ETC agreed with the PI that the best orientation of the sonic is 145 ° from North. We also agreed in maintaining a measuring height of 2.1 m when the vegetation is between 0 m (bare soil) and 60 cm, and to rise it to 2.4 m above 60 cm of canopy height.

Table 3 - Description of sensors for turbulent measures. Eastward and Northward distances are relative to a reference point, in this case the eddy covariance tower

Model	Serial Number	Measurement height (m)	Eastward Distance (m)	Northward Distance (m)
LI-COR LI-7200	72H-0399	2.06	0.70	-0.67
Gill HS-50	H000222	2.10	0.86	-0.80

For what it concerns the storage measurement, given the specific EC measurement height at the site (2.06 m), the Station Team proposed that storage flux measurements could not be necessary at their site. ETC asked to perform a 3 week test to effectively evaluate the importance of storage at the site, following the respective instruction document. The experiment have been set-up after a fruitful interaction between ETC and the station PI.



The test was achieved in July 2017 and last about 2 weeks. 3 profile levels were installed at 0.1, 0.8 and 2.4 m on a dedicated mast close to the EC tripod. Two storage fluxes were calculated, the one resulting from profile integration and the one resulting from one-point (the topmost at 2.4 m). Results showed that in 1.8% of data there was a difference of at least 10% with the storage flux higher than 2 µmolCO2 m2 s-1 and in 0.4% of data there was a difference of at least 10% with the storage flux higher than 5 µmolCO2 m2 s-1. According to it, and to further discussion with the Team, ETC agreed and decided that the profile system is not needed at BE-Lon.

Radiations:

For short- and long-wave radiation measurements the Team proposed the use of Kipp&Zonen CNR4 four component radiometer. It is composed by pyranometer and pyrgeometer pairs, one sensor facing upward, the other facing downward, it is ICOS compliant and will be used in combination with CNF4 Ventilation and heating unit. The sensor is installed and will be calibrated before October 2017. For photosynthetically active radiation measurements the Team proposed the SKP215 (Skye Instruments) quantum sensor. This sensor is ICOS compliant and has been installed at the site.

Table 4 - Description of sensors used for radiation measurements at BE-Lon

MODEL	SN	HEIGHT	EASTWARD_DIST	NORTHWARD_DIST	VARIABLE_H_V_R
Kipp&Zonen CNR4	131489	2.70	18.22	15.14	SW_IN_1_1_1
					SW_OUT_1_1_1
					LW_IN_1_1_1
					LW_OUT_1_1_1
SKP215, Skye	43197	2.88	9.65	1.95	PPFD_IN_1_1_1
SKP215, Skye	43314	2.65	9.65	1.95	PPFD_OUT_1_1_1

Precipitation:

For total precipitation the Team proposed and installed the weighing gauge TRwS415 (MPS system sro) in conjunction with a Tretiakov type wind shield. Although this wind shield typology is not recommended in ICOS (in case of relatively heavy snow, that structure may cause the snow to accumulate and possibly obstruct the pluviometer inlet), ETC decided to accept it for BE-Lon because of the rare chance that important snowfall occur at the site. The Station Team agreed to perform periodical checks and possibly manually remove any obstruction.

Table 5 - Description of sensors used for precipitation measurements at BE-Lon

MODEL	SN	HEIGHT	EASTWARD_DIST	NORTHWARD_DIST	VARIABLE_H_V_R
MPS System TRwS415	1362	1.10	4.88	0.10	P_1_1_1
Campbell Scientific SR50A	5271	2.06	6.60	6.63	D_SNOW_1_1_1

Air temperature, relative humidity and air pressure:

The proposed sensor for air temperature (TA) and relative humidity (RH) was ICOS-compliant, but a forced ventilated shield for it don't exist. For that reason the PI agreed in buying a new sensor that is going to be installed in the next weeks. The sensor proposed for air pressure measurements (PA) was compliant, but an exception was agreed concerning the routine calibration: the first 2 calibrations will be made at the factory and repeated at a not-certified lab: if there is conformity, the lab can be used for the future calibrations.

Table 6 - Description of sensors used for air meteo measurements at BE-Lon

MODEL	SN	HEIGHT	EASTWARD_DIST	NORTHWARD_DIST	VARIABLE_H_V_R
Vaisala PTB110/CS106	L1740902	0.9	5.25	4.9	PA_1_1_1
Delta-T Devices Ltd RHT2nl	1405	2.10	-0.82	0.59	RH_1_1_1
					TA_1_1_1

Backup meteorological station:

The proposed sensors of short-wave incoming radiation (SW_IN) and air temperature and humidity (TA, RH) for the backup sensors were not ICOS compliant for different reasons: the pyranometer for its non linearity, directional error, temperature dependence of sensitivity; the thermo-hygrometer had not a forced ventilated shield. For the backup station the ETC accepted the request of exception made by the PI, and the proposed sensors were then accepted. The precipitation sensor has not yet been installed as it was at the factory for calibration, and just came back. The PI committed to installing it as soon as possible.

Table 7 - Description of sensors used in the backup meteo station at BE-Lon

MODEL	SN	HEIGHT	EASTWARD_DIST	NORTHWARD_DIST	VARIABLE_H_V_R
Delta-T Devices Ltd RHT2nl	Lon_TA_1_1_1_2004	2.80	8.90	2.70	RH_1_1_2
					TA_1_1_2
Kipp&Zonen CNR1	51048	2.80	9.65	1.00	SW_IN_1_1_2

Soil temperature, soil water content, soil heat flux and water table depth

The station team and the ETC have discussed and agreed on a set-up for the soil plots as shown schematically in Figure 4. The selected sensor models and measurement depths are fully compliant with the ICOS requirements for Class 2 stations in croplands. The ETC has asked the station team to perform a soil-specific calibration of the Enviroscan profile probes, employed to measured soil water content (SWC). The station team has agreed and this calibration will be carried out this winter.

As requested for Class 2 stations in croplands, the station team installs one permanent soil plot near the EC tower and two soil plots in the crop field. Furthermore, two additional heat flux plates are installed in the crop field, each with one accompanying SWC sensor and two accompanying soil temperature (TS) sensors. It is agreed between the ETC and the station team that the full setup as shown in Figure 4 will be followed from the first upcoming field installation of the soil plots on, i.e. after the sowing or planting of the main crop in 2018.

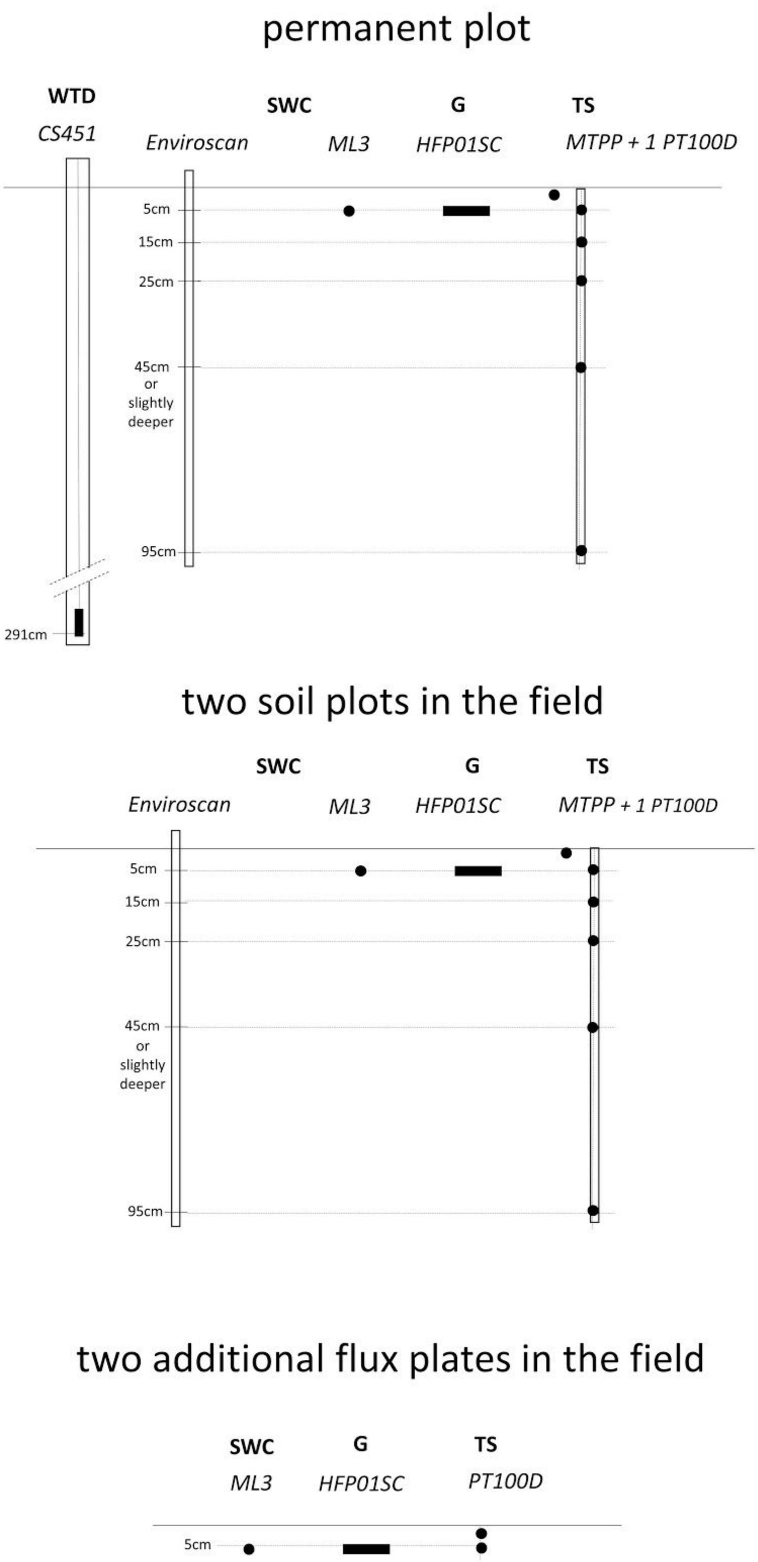


Figure 4: Schematic overview of the set-up of the soil plots and the additional heat flux plates. The sensor models are given in italics. WTD = water table depth; SWC = volumetric soil water content, G = soil heat flux density, and TS = soil temperature.

Table 8 - Description of sensors used for soil meteo measurements at BE-Lon

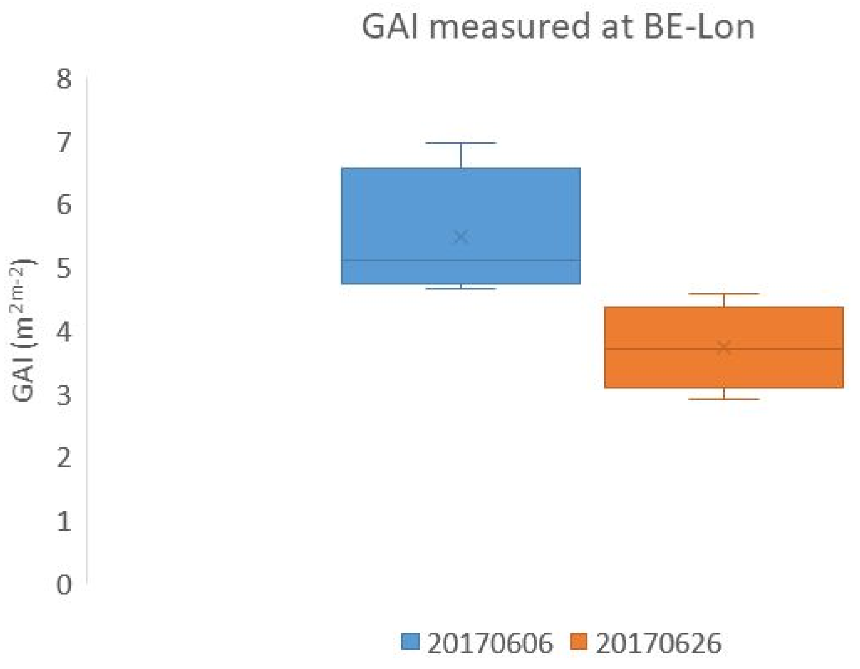
MODEL	SN	HEIGHT	EASTWARD_DIST	NORTHWARD_DIST	VARIABLE_H_V_R
Baumer ED752	Lon_WTD_1_1_1_2014	-2.91	-1.80	0.80	WTD_1_1_1
Hukseflux HFP01SC	3582	-0.05	1.90	4.20	G_1_1_1
Sentek Sensor Technologies EnviroSCAN Probe	01872E6611000070 (sdi1)_1	-0.05	0.60	1.95	SWC_1_1_2
Sentek Sensor Technologies EnviroSCAN Probe	01872E6611000070 (sdi1)_2	-0.15	0.60	1.95	SWC_1_2_2
Sentek Sensor Technologies EnviroSCAN Probe	01872E6611000070 (sdi1)_3	-0.25	0.60	1.95	SWC_1_3_2
Sentek Sensor Technologies EnviroSCAN Probe	01872E6611000070 (sdi1)_4	-0.45	0.60	1.95	SWC_1_4_2
Campbell Scientific PT107	Lon_TS_1_1_1_2014	-0.01	2.20	4.20	TS_1_1_1

Spatial heterogeneity characterization

The spatial characterisation for cropland ecosystems is not performed in the strict sense as for the other ecosystem types due to the lack of a permanent vegetation cover. Instead a large scale sampling at all SP-I plots is performed at the end of each growing season to estimate the spatial variability of the aboveground biomass and yield.

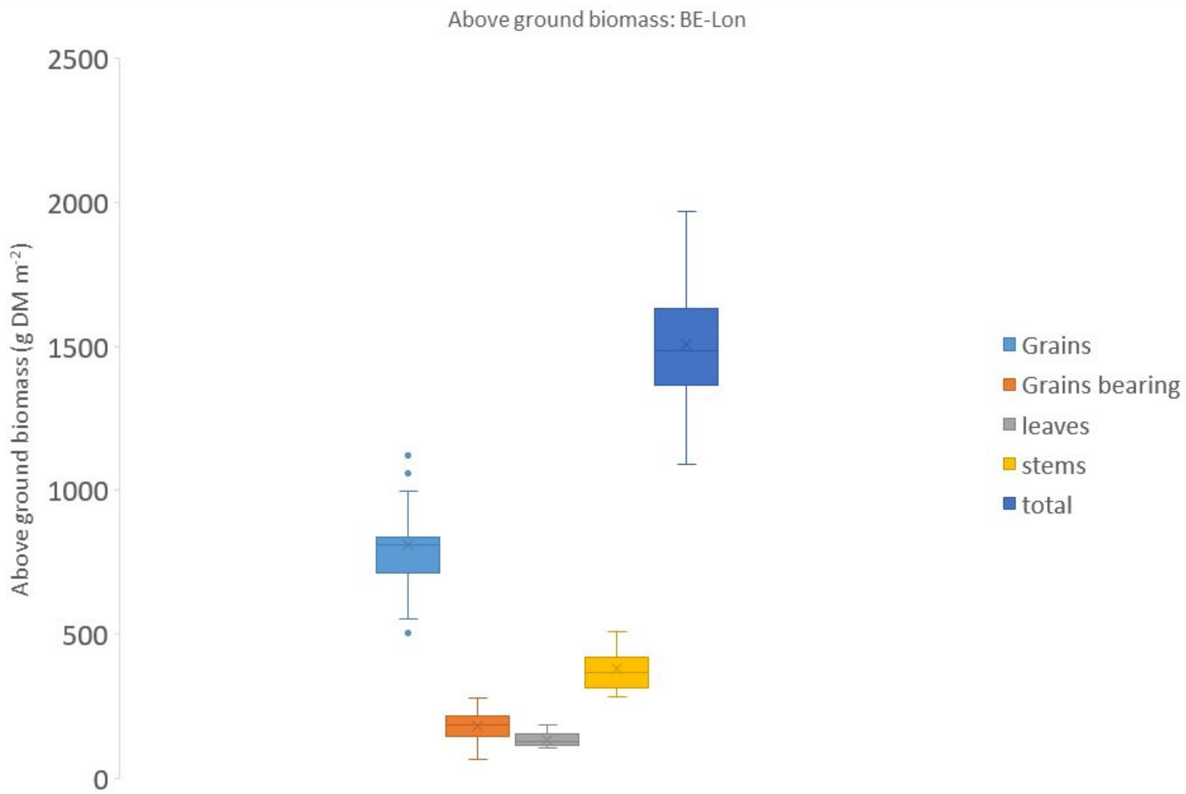
Green Area Index

The Green Area Index was measured with the CP at two dates (June 6th and June 26th) just after the seasonal peak. It was measured using destructive sampling method. The reduction in the values between the two measurements dates is due to the start of the senescence of the vegetation.



Above Ground Biomass

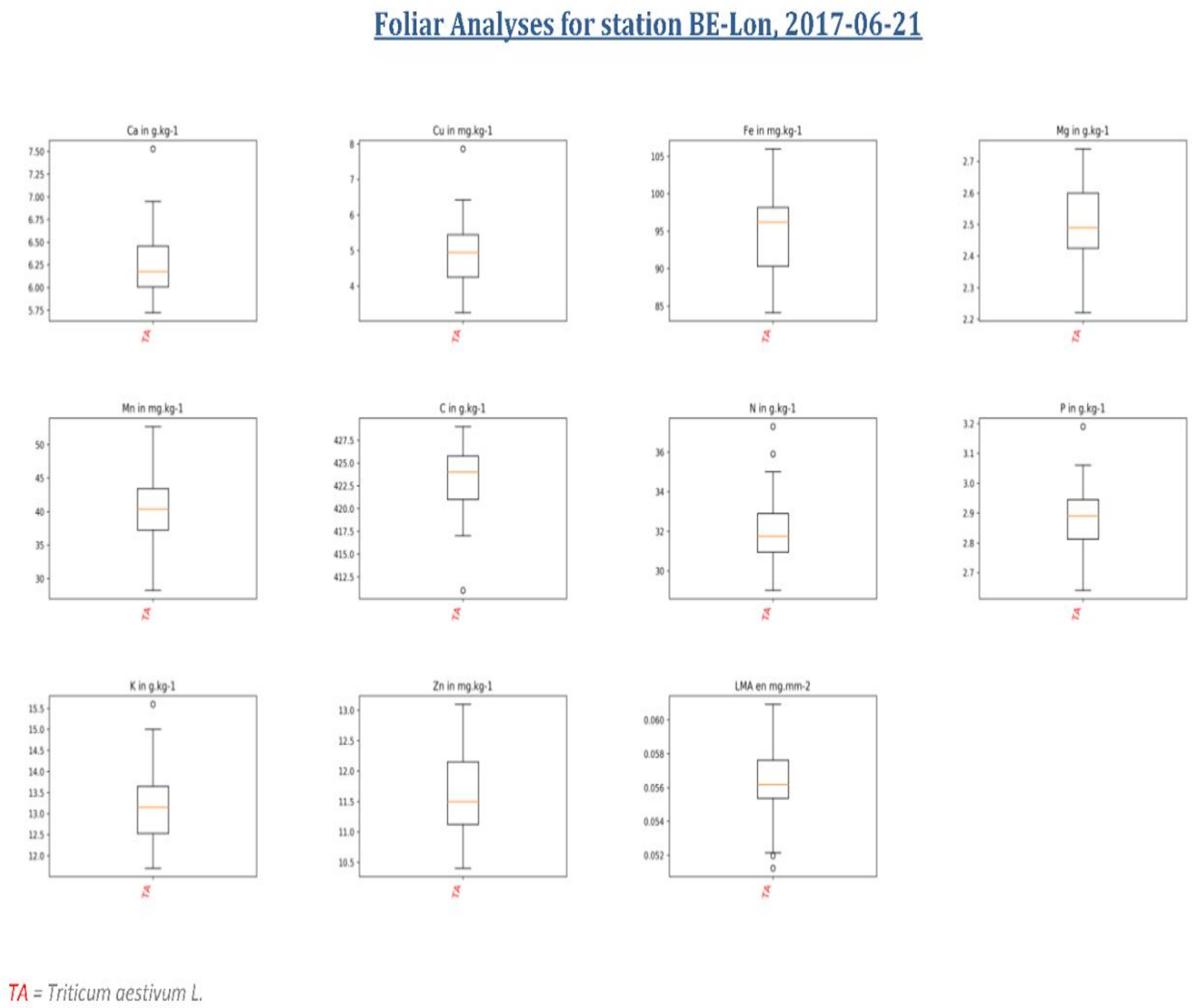
The aboveground biomass was estimated destructively on 17 july 2017 at all 20 SP-I locations just before the vegetation was harvested. The harvested biomass was split correctly in the different fractions (grains, grain bearings, stems and leaves).



Vegetation sampling and analysis

The foliar samples for the determination of the leaf mass-to-area ratio and the nutrient analysis were collected by June 13th and the related instructions for area and dry mass determinations as well as for leaf packaging were applied correctly. The quality control for these data consists in systematic comparison with (i) previous analysis results, irrelevant for the present labelling, and (ii) literature data and databasis such as TRY. At this stage the procedure is not achieved entirely since the reference metadata of those were not yet entirely retrieved. The quality control procedure will be continued therefore and achieved within weeks.

However the results obtained in terms of average values and precision (shown below) are consistent with the current literature data and considered acceptable.



Boxplots of nutrient mass per g dry mass of leaves of *Triticum aestivum* at the Lonzée site (BE-Lon) and leaf mass-to-area ratio (LMA). Each plot gives the distribution and median value of n=30 values. Leaves samples were collected by June 13th 2017 using a sampling scheme compliant with the ICOS instructions.

Data check and test

Data quality analysis (Test 1)

On the basis of the current state of scientific knowledge, the quality control (QC) procedure aims to verify that at least 60% of half-hourly values in a given temporal window (e.g. 3 months) are of the highest quality possible. This means that the total percentage of missing and removed data after the QC filtering do not exceed the 40% threshold value.

The QC procedure involves a sequential filtering of half-hourly flux data flagged by severe and moderate quality (Vitale et al, *in prep*). A severe flag is assigned (i) when flux originates from wind sectors to exclude; (ii) in case of instrument malfunction as provided by sonic anemometer (SA) and gas analyser (GA) diagnostics; (iii) when flux is out of its physical range; (iv) when stationary and integral turbulence conditions are not satisfied following the quality flag policy by Mauder and Foken (2004, qc flag 2) based on the combination of the quality assessment tests by Foken and Wichura (1996); (v) when the maximum covariance between vertical wind speed and CO_2 concentrations occurs at implausible time lag respect to the eddy covariance system setup; (vi) in case of anomalous values of the spectral correction factor.

A moderate flag is assigned (i) when stationary and integral turbulence conditions are only partly satisfied (i.e. flag 1 of quality policy by Mauder and Foken, 2004), and (ii) in case of failure of one of statistical tests proposed by Vickers and Mahrt (1997) to detect any instrument malfunction. Flux data flagged with severe quality are directly discarded, whereas those with moderate quality are removed only if they are also identified as outlier.

Concerning Be-Lon site, the testing period involves raw data sampled in 2017 from June 15th to September 15th. Of 4416 expected half-hourly files for NEE fluxes, 66.8% were retained after the QC filtering procedure as illustrated in Figure 5. In particular, 1.4% of raw files were missed, 26.6% of calculated fluxes were discarded because flagged by severe quality, while an additional 5.2% of them were discarded because identified as outliers and flagged by moderate quality. Being the percentage of missing data equal to 33.2% and below the 40% threshold value, we conclude that BE-Lon site reaches the minimum requisite expected for the Step 2 of the labelling.

References

Foken T and Wichura B (1996) Tools for the quality assessment of surface-based flux measurements, Agric For Meterol, 78, 83-105
Mauder M and Foken T (2004) Documentation and instruction manual of the eddy covariance software package TK2, Univ Bayreuth, Abt Mikrometeorol, 26-42.
Vickers D and Mahrt L (1997) Quality control and flux sampling problems for tower and aircraft data, J Atmosph Ocean Techn, 14(3), 512-526

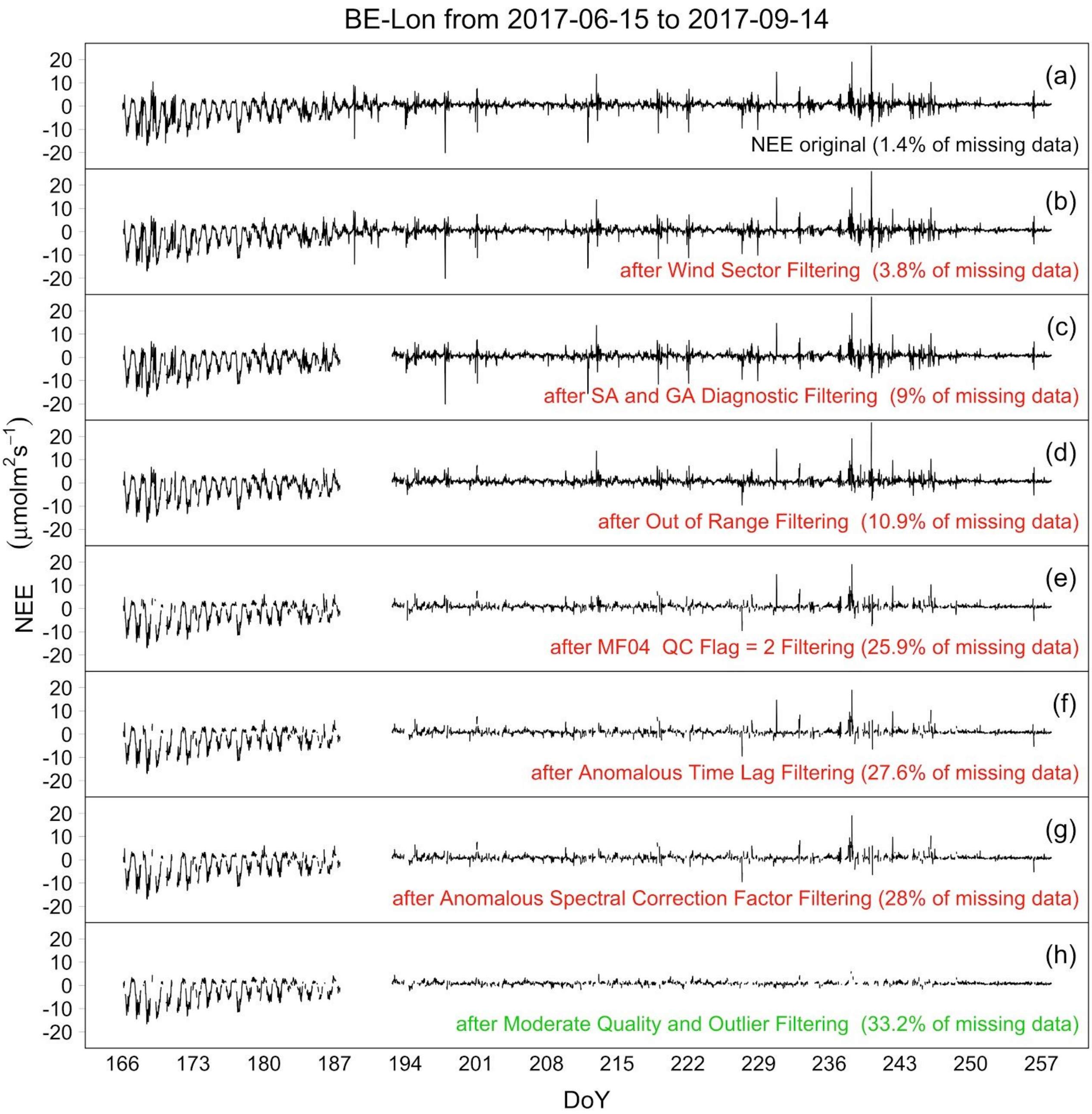


Figure 5: Sequential filtering of Net Ecosystem Exchange (NEE) sampled at BE-Lon from 2017/06/15 to 2017/09/14 according to the QC filtering procedure. The original half-hourly flux time series is exhibited in the top panel. Panels b-g display the severe quality flag filtering due to: wind sectors to exclude; diagnostics provided by sonic anemometer (SA) and gas analyser (GA); out of physical range check; Mauder and Foken (2004, MF04) quality policy (flag=2); anomalous time lag of the cross-correlation function estimated between vertical wind speed and CO_2 concentrations; anomalous spectral correction factor check. Bottom panel displays the retained high-quality NEE time series after the additional filtering due to moderate quality flags (mainly related to Mauder and Foken (2004) quality policy (flag=1) and Vickers and Mahrt (1997) statistical tests) combined with the outlier detection procedure.

Footprint analysis (Test 2)

The test aimed to evaluate if half-hourly flux values are effectively representative of the target area, was performed on 3 months of data, after QA/QC filtering procedure (previous Section). The model of Klijun et al. (2015) has been used to obtain the 2-dimensional flux footprint for each half-hour which, having been georeferenced, was compared to the TA spatial extent. Results showed that basically the 100 % of the whole data have a cumulated contribution of at least 70 % from the Target Area, and this holds also for daytime and nighttime conditions.

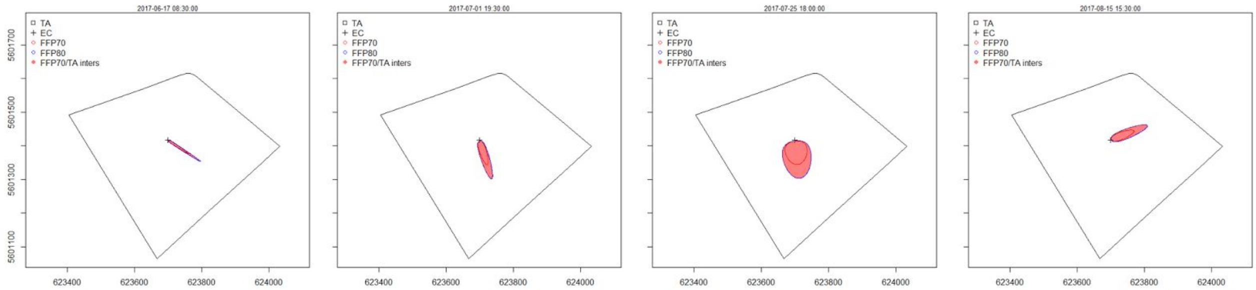


Figure 6: exemplary representation of 70% and 80% footprint contribution at BE-Lon during 4 representative half-hours.

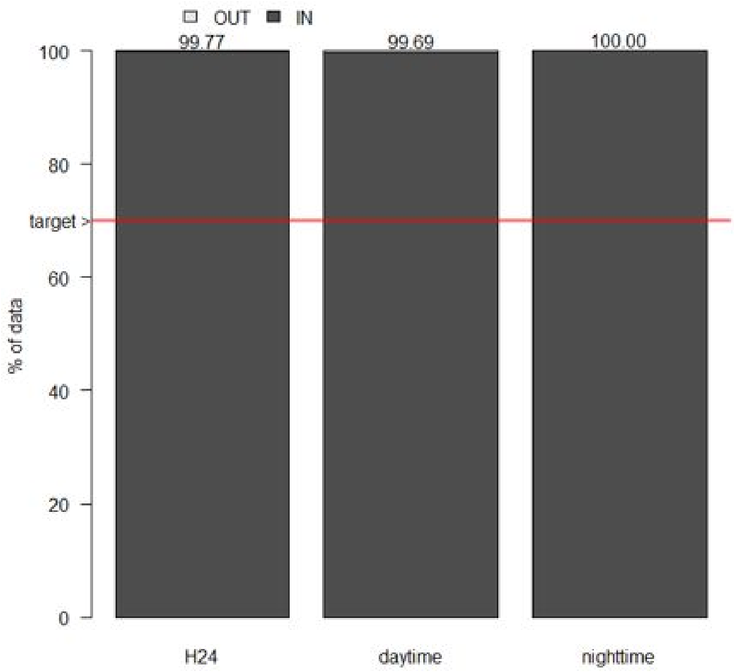


Figure 7: test results showing the percentage of half-hours with a footprint cumulated contribution of 70% from the target area. The target value is that the 70% of data must hold this condition.

Data representativeness analysis (Test 3)

Considering the intrinsic homogeneity of the site (the whole target area is fully covered by the same crop) this test was not performed for Be-Lon. Having passed Test 2 it can be implicitly assumed that the whole half-hourly flux records are representative of the target ecosystem.

Ancillary plot representativeness (Test 4)

This test does not apply to croplands because the vegetation cover changes with every crop type that is cultivated.

Near Real Time data transmission

The station is submitting to the ETC ASCII files in NRT transmission for EC and BM data since September 26th 07.30 am. The number of expected EC files until October 22nd is 1281. The total number of file received is 1278, i.e. 99.77%. The files are being created using a CR6 logger from Campbell Scientific in non-compliant binary format, and then converted to ASCII with a dedicated routine, which is not accepted in ICOS. Also the timestamp in the files is not ICOS compliant, and some of the mandatory variables are missing. The PI committed to modifying its acquisition strategy and file format as soon as possible. The ETC accepted this exceptional situation due to the fact that the strategy for a correct acquisition with Campbell loggers has not been defined yet, that the comprehension of the importance of the synchronisation between the time-series of interest is still ongoing, and that the missing variables are depending from LICOR sensor. Before getting the files in the actual shape the ETC collaborated with the station team to solve all the inconsistencies possible. The ETC provided assistance to the station team for the filling of the BADM info.

Plan for remaining variables

Soil sampling

The BE-Lon soil sampling for the determination of the organic carbon and nitrogen soil stocks (0 - 1m) should not encounter methodological or technical difficulties. The sampling is planned in fall-winter 2017-2018. The coring technique should be applied easily in this site.

Data and metadata

The format of the actual files (BM and EC) needs to be adequate to ICOS standard. In particular regarding the number of rows produced. Some metadata are still missing in the BADM system, even if most of them have been inserted.

<u>Backup station and soil sensors</u>

The precipitation sensor at the backup station and the soil sensors will be installed in the next weeks, after harvesting.

Labelling summary and proposal

On the basis of the activities performed and data submitted and after the evaluation of the station characteristics, the quality of the data and setup, the compliance of the sensors and installations and the team capacity to follow the ICOS requirements for ICOS Ecosystem Stations we recommend that the station Lonzee (BE-Lon) is labelled as ICOS Class2 Ecosystem station.

Dario Papale, ETC Director

October 25th 2017