ICOS Ecosystem Thematic Centre

ICOS Ecosystem Instructions

ASSOCIATED STATIONS

Version: **20161114**

INSTRUCTIONS FOR

ASSOCIATED STATIONS

characteristics, labelling process and rules

Version	Release date	Summary of changes

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CONTENTS

SUMMARY

The network of ecosystem sites in ICOS is enlarged to a set of Associated stations where the requirements in terms of variables collected and standards to follow are different from the Class 1 and Class 2 ICOS stations. Nevertheless there are requirements in order to get the ICOS Associated station label and a simplified labelling procedure to follow. This procedure is requested for opening the possibility for the Associated stations to receive services from the ETC.

This document describes the requirements and labelling process that an ICOS Associated station has to follow. It is structured in six different sections with the aim to facilitate the use and application:

- Associated station requirements: this section describes what is requested from an Associated station to get and maintain the label.
- Labelling process: in this section the labelling process applied to the Associated stations is described, including the list of material needed.
- ETC services: this section describes the services that the ETC offers to the Associated stations.

ASSOCIATED STATION REQUIREMENTS

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. Differently from Class 1 and Class 2 stations, already calculated fluxes and processed data at the final time resolution must be submitted (unless ICOS protocols are applied – see ETC services section). The requested variables and metadata are reported in table 1.

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 PROCESS

The Associated stations are subject to a simplified single step labelling process where the general site characteristics are evaluated in order to better understand the station context and possible critical aspects. The labelling process requires the submission of the following material through the Carbon Portal interface (https://meta.icos-cp.eu/labeling/):

1. Coordinates of the tower, WGS84, Latitude-Longitude, 5 decimal degrees (XX.xxxxx, YY.xxxxx). Format: decimal numbers, negative for South and West. No letters. Online on the CP interface.

2. Basic station information (Ecosystem Type, management, recent disturbances, site description, history of previous measurements and available data, past land use changes if any), including the information about the estimated duration of the station commitment to remain ICOS Associated Station (minimum 1 year). Format: free text, one page maximum. File name XX-###_Description.ext (Word, PDF and ASCII accepted) where XX-### is the official site code.

3. Instruments and setup short description where for the requested variables is reported the intended (or actual if already in place) general method and/or sensors position and setup. It should be a short document or a table in order to give an overall idea because the exact information will be communicated after the labelling. Format: free text. File name XX-###_Setup.ext (Word, PDF and ASCII accepted) where XX-### is the official site code.

4. Vegetation map of the 1x1 km (accepted and suggested 3x3 km) around the tower with information about the vegetation height, dynamic and type. It is not needed a detailed map at this stage but a general contextualization of the site (see examples in the Annex 1). Format: all images formats are allowed (jpg, png and giff best for the small size but also the other formats are accepted). Map file name XX-###_VEGMAP.ext where XX-### is the site code and ext the extension. See examples in the appendix. Legend and info file name (free text): XX-###_VEGMAPinfo.ext (Word, PDF and ASCII accepted).

The ETC will perform an evaluation of the proposed site based on expert knowledge and discuss with the PI directly about possible issues and improvements before writing an evaluation that is directly sent to the DG. After the GA approval, the station is officially labelled as “Associated ICOS Site” and will have to submit data according to the requirements in order to keep the label.

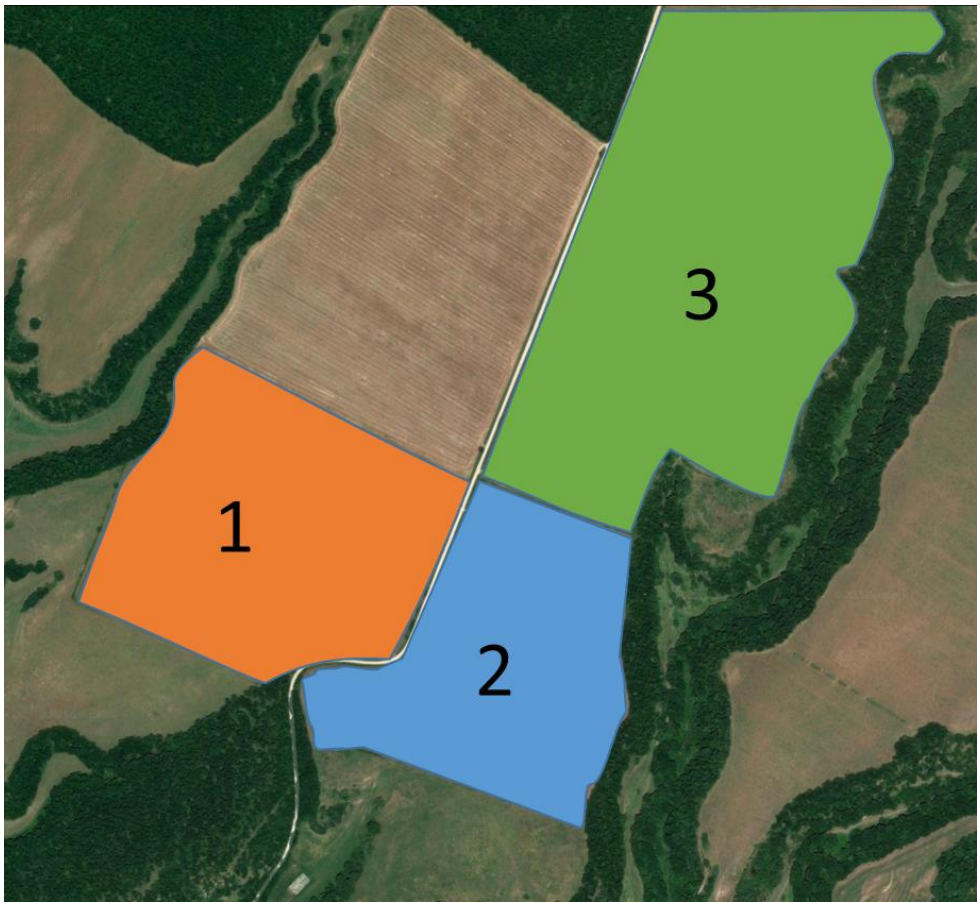
ETC SERVICES

Associated stations may benefit from a number of ETC services:

- Participation to the training initiatives (in the limit of the available seats)
- Support from ETC for the protocols application.
- If ICOS protocols are applied, certification that the methods/procedures for the specific variables follow ICOS standards.
- Processing of the raw data produced in compliance with ICOS protocols (subject to resources availability and effective number of Associated sites).
- ICOS standard post-processing and QAQC of the calculated halfhourly data submitted, as defined in the processing protocol.
- On request, possible access to the foliar analysis service at reduced price (same costs applied for Class 1 and Class 2 sites) for one sample per year if the foliar sample collection follows the ICOS protocol. Payment of the analysis will be arranged directly with the ETC.
- Assistance to have the raw data stored long term in the ICOS system

ANNEX 1 – EXAMPLE OF VEGETATION MAPS

Option 1



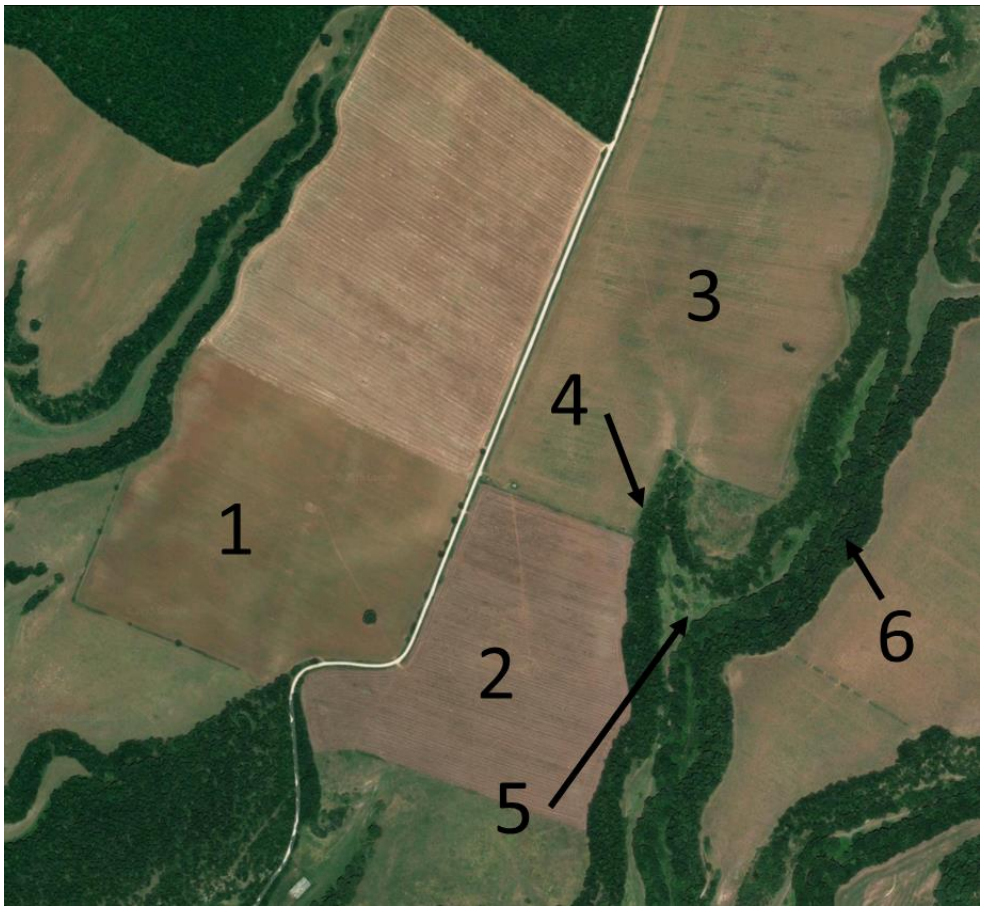
Identification on the image of the different vegetation type (including different crop types, management types etc., all the info needed to characterize the site). Report the vegetation high (min-max) for each homogeneous type.

Example of the legend content (image above), file name FI-Hyy_VEGMAPinfo.txt:

- Sunflower, no rotation, height between 0 and 2.5 meters
- Sunflower, rotation with wheat every year, height between 0-2.5m (sunflower), 0-0.7m (wheat)
- Grassland grazed periodically, veg. Height 0-0.1 meters. It has been sunflower for 10 years until 2013

Example map file name: FI-Hyy_VEGMAP.png

Option 2



If the image allow easy identification of the different plots/vegetation type (e.g. because it is already a classification map), a simplified report can be also used (map and legend).

Example of the legend content (image above), file name FI-Hyy_VEGMAPinfo.txt:

1. Sunflower, no rotation, height between 0 and 2.5 meters
2. Sunflower, rotation with wheat every year, height between 0-2.5m (sunflower), 0-0.7m (wheat)
3. Grassland grazed periodically, veg. Height 0-0.1 meters. It has been sunflower for 10 years until 2013
4. Line of trees, deciduous (*Populus*), height 10-16 m
5. Small water stream, with water only in winter
6. Trees deciduous (*Quercus*), height 15-25 m

Example map file name: FI-Hyy_VEGMAP.gif