

Document reference: ATC-FI-LA-RP-001-1.0

ICOS ATMOSPHERIC STATION LABELLING STEP1

FOR THE SITE

SMEAR II-ICOS HYYTIÄLÄ,
FINLAND

ICOS ATC, March 5, 2016

ICOS ATC 2016

Contact Information:

ICOS ATC

Laboratoire des Sciences du Climat et de l'Environnement (LSCE)

CEA – Orme des Merisiers

91191 Gif sur Yvette, France

Email: leonard.rivier@lsce.ipsl.fr

1. Submitted information

The following information has been submitted by Janne Levula on the ICOS station labelling interface of the ICOS Carbon Portal website (<https://meta.icos-cp.eu/labeling/>).

Identification

- Station full name : *SMEAR II - ICOS Hyytiälä*
- Station short name : *ATM-HYY*
- List of the names of the main personnel involved in ICOS station operation:
Janne Levula, Timo Vesala, Pasi Kolari, Petri Keronen ,Pasi Aalto, Heikki Laakso, Olli Peltola, Tuukka Petäjä
- Institution name responsible for the station :
Division of Atmospheric Sciences, Department of Physics, University of Helsinki
- Postal address :
*Department of Physics
P.O. Box 64
FI-00014 University of Helsinki*
- Web site : <http://www.physics.helsinki.fi/tutkimus/atm/english/>
- Requested Station class labelling : 1

Station Localisation

- Latitude [WGS84, decimal degrees] : 61.84741
- Longitude [WGS84, decimal degrees] : 24.29477
- Station altitude above sea level [m] : 181
- Inlet height(s) above ground (slash separated) [m] : 127
- Describe accessibility (relevant for mobile lab for ex) :
Easy access by a car, van or truck. Distance to the main road is 1.5 km and there is a road with high bearing capacity up to the tower.

Station Geographical Description

- Description of surrounding (e.g. vegetation, structures impeding air flow in a 100 km radius) :
The station locates in clean remote environment inside the upland boreal forest with lakes and small wetlands within a few kilometers from the site. The station location is in a rolling ground with the altitudes ranging mainly between 140 and 180 m a.s.l. in the surrounding area. The monitoring station, where all ICOS related measurements are operated, is on the top of a small hill. The surrounding vegetation consists mainly

of Scots pine and Norway spruce with undergrowth. The top of the tree canopy is at the height of about 19 m.

- Nearby anthropogenic activity (population density, closest cities, roads... in a 100 km radius) :
The nearest populated village, Korkeakoski, with approx. 1000 inhabitants, is 6 km to the south-east. The nearest town, Orivesi, with some 9000 inhabitants, is 18 km to the south. The closest, bigger city, Tampere, with 220 000 inhabitants, is 45 km to the south-west and is located upstream of the prevailing wind. There is sawmill industry in Korkeakoski (6.5 km to the south-east) which process about 0.8 Mm³ round wood annually. The site is occasionally affected by long-range transported pollution from Europe / Russia / wildfires.

Construction/Equipment

- Planned date starting construction/equipment (for existing station leave blank) :
- Planned date ending construction/equipment (for existing station leave blank) :
- Planned date starting ICOS measurements : 2012-03-01
- Available telecommunication means and its reliability : *Reliable 500 Mb/s fiber connection*
- Existing infrastructure (tall tower, collocated station, ...) :
127m high tower for atmospheric and flux measurements, one 18 m tower for irradiation and flux measurements, another for tree physiology measurements and 35 m walk-up tower for aerosol measurements, several air conditioned buildings for the housing of analyzers
- Is the station already belonging to an environmental measuring network? If so, please list the names of the networks : *ACTRIS 2, ANAEE, EXPEER, INAR*

Submitted documents

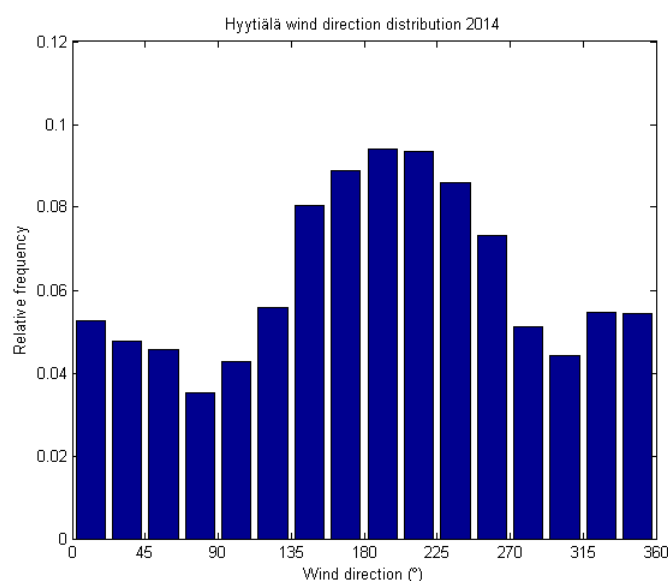


Figure 1: wind direction distribution at Hyytiälä station



Figure 2: tall tower at Hyytiälä station

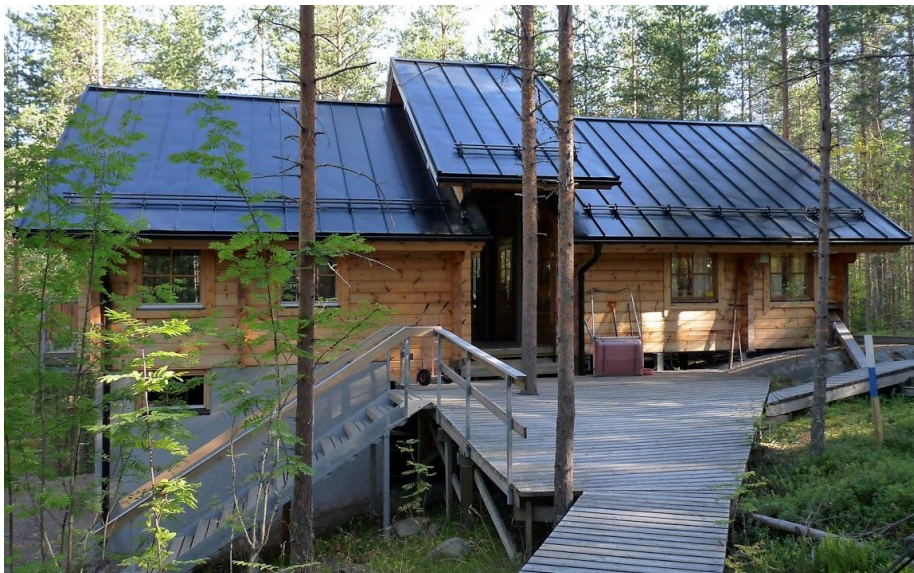


Figure 3: station building at the bottom of tall tower

2. Site assessment

The following assessment of the Hyttiälä site is based on the submitted information (cf. chapter 1) and the latest ICOS Atmospheric Station Specifications (version 1.1, October 2015).

Location :

Considering the altitude (181m above sea level) and geographical information (figures 4-6), the Hyttiälä station should be considered as a continental station.

Regarding the topography of station surroundings, located in a relatively flat area (between 140 and 180 m a.s.l.) the station avoid complex terrain which are difficult to represent for modelling.

The station is enough far from strong anthropogenic source. The closest significant urban area (Tampere) is about 45km. In the closer vicinity of the station, only small rural clusters are encountered. However as the main urban area (Helsinki, Tampere, Turku) are located in the south as the prevailing wind, the station may be impacted by this regional anthropogenic sources.

The Hyttiälä is currently the first atmospheric station applying for the ICOS label in Finland. No recommendation can be stated regarding the Hyttiälä location in term of network design.

In conclusion, the location of the Hyttiälä station fulfils with the ICOS requirements and recommendations.

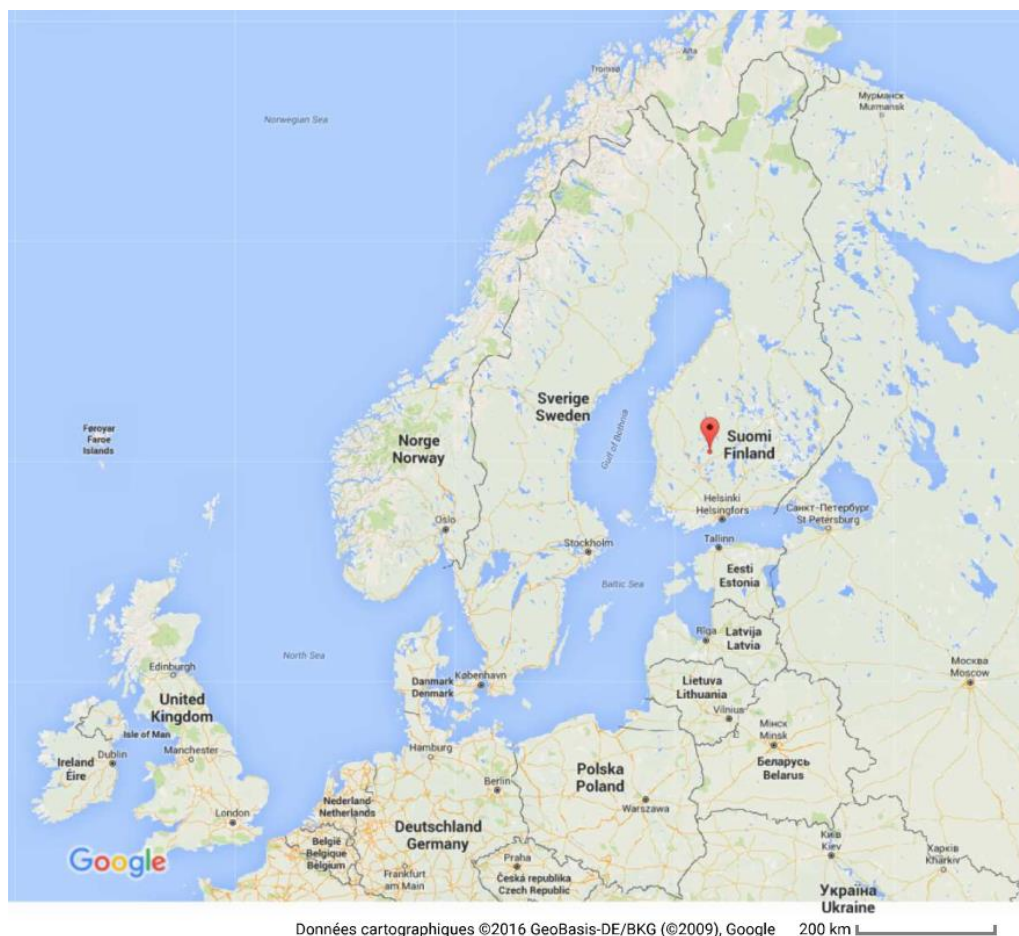


Figure 4: Global view of the station location

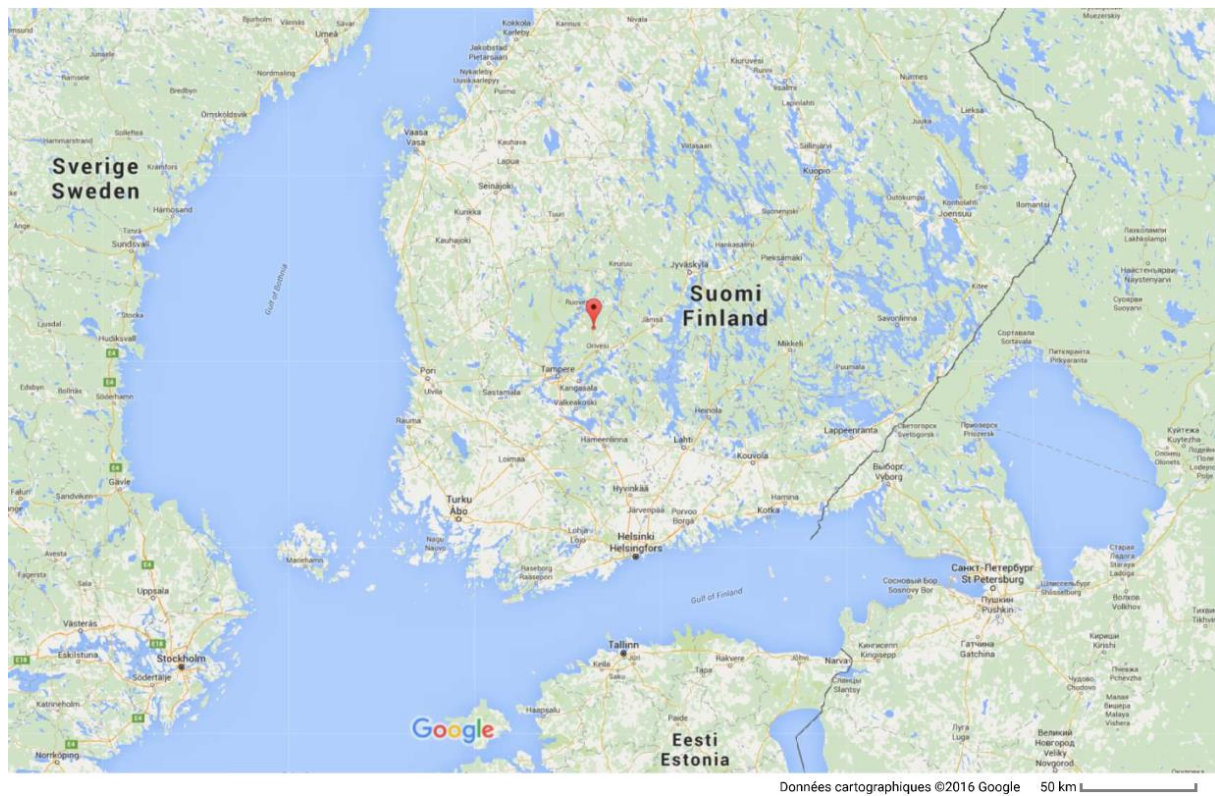


Figure 5: Regional view of the station location

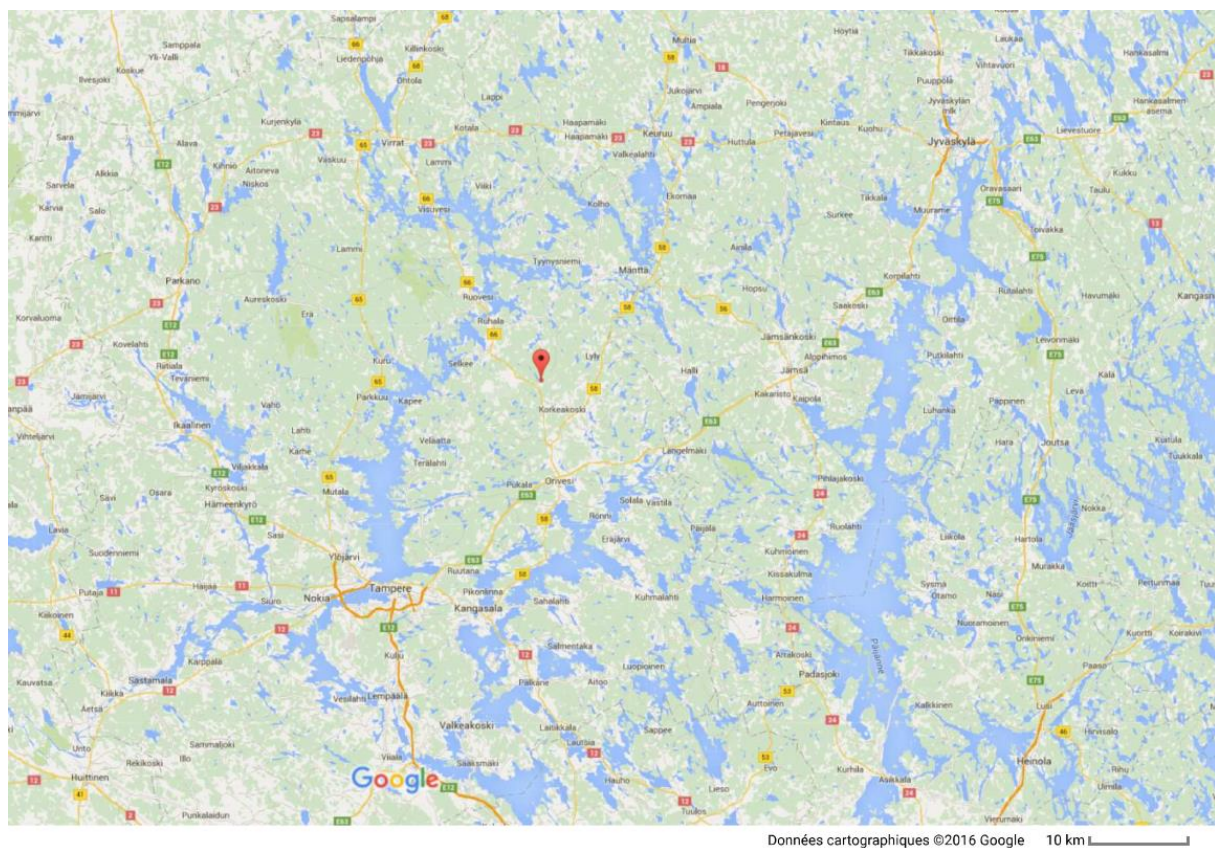


Figure 6: Local view of the station location

Station infrastructure

As the Hyytiälä station is considered as a continental station (cf. location above), ICOS requires a tall tower with a minimum of 100m height.

The actual infrastructure with the 127m height already fulfils the ICOS requirement.

Station history and reference

The research station Hyytiälä is a reference station for atmospheric aerosol sciences and ecosystem sciences in Europe since many years. The station is already involved in several international networks (*ACTRIS 2*, *ANAEE*, *EXPEER*, *INAR*, ...) and is labeled by WMO as a regional station of the Global Atmosphere Watch program for aerosol measurement.

The station has already been audited by the ICOS ATC Mobile Lab in 2014 (report ATC-MOL-AU-RP-001-1.1) during the “Mobile Lab preparatory phase”. The conclusion of the audit is globally satisfactory in term of infrastructure, organization and staff.

The short name *ATM-HYY* is not ICOS compliant. Indeed it must be a trigram. Also note that Hyytiälä site is already declared under WMO and ICOS (part of the extended demonstration network) as SMR. Changing the station short name may cause confusion.

3. ATC recommendation

The Hyytiälä site location fulfils the ICOS requirements and recommendations specified in the latest ICOS Atmospheric Station Specifications document (version 1.1, October 2015). Thanks to the quality of the infrastructure and the staff we are confident that the Hyytiälä station will be able to provide the high quality measurements required for a class-1 ICOS atmospheric station.

Consequently the ATC recommends that the Hyytiälä site be proposed to proceed to the step2 of the ICOS station labelling process, provided that the station short name is clarified. The actual measurements from Hyytiälä will be then assessed by ATC in order to become one of the continental stations of ICOS atmospheric network.

4. References

ICOS Atmospheric Station Specifications, version 1.1 edited by O. Laurent (2015)

https://icos-atc.lsce.ipsl.fr/?q=doc_public