



LIFE Project Number

**LIFE12 ENV/FIN/000409**

**4<sup>th</sup> summary report of flux data**

Reporting Date

**31/03/2017**

LIFE+ PROJECT NAME or Acronym

**Climate change indicators and vulnerability of boreal zone  
applying innovative observation and modelling techniques**

Data Project

<b>Project location</b>	Helsinki
<b>Project start date:</b>	02/09/2013
<b>Project end date:</b>	01/09/2017
<b>Total budget:</b>	2755288 €
<b>EC contribution:</b>	1366952 €
<b>(%) of eligible costs</b>	49.61

Data Beneficiary

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## **1 Summary**

The summary report of flux data describes the measurements of CO<sub>2</sub>, CH<sub>4</sub> and H<sub>2</sub>O exchange between atmosphere and different ecosystems. In MONIMET project, this data is utilized for validating and calibrating the models in Actions B4 and B6 and evaluating the phenological parameters of the EO (earth observation) data in Action B2.

The gas exchange data obtained from the two ecosystem models (JSBACH and PRELES) used in Action B4 may be directly compared to the flux observations of different ecosystems. The flux data provides also means to determine detailed phenological and plant physiological data (e.g. growing season stages, their dynamics and interannual variation) which may be used to validate the EO (earth observation) data that is collected in Action B2 and results of webcam exercise in Action B1.

## **2. Data**

### **2.1 Flux data**

The CO<sub>2</sub>, CH<sub>4</sub> and H<sub>2</sub>O exchange between atmosphere and different ecosystems is measured at various stations in Finland using the eddy covariance flux measurement method. The flux data set utilized in MONIMET project is based on the results obtained by the flux measurement programs of Finnish Meteorological Institute and University of Helsinki (Table 1).

In addition to the flux data of the MONIMET sites, additional data sets have been obtained from external measurement sites to cover wider variability in terms of climate, vegetation species and structure. These data has been used for the model calibration in B4.

*Table 1. MONIMET flux measurement stations*

Site	Vegetation type	Latitude/Longitude	Data
Hyytiälä	Scots pine forest	61°50.845'N, 24°17.687'E	1997 -
Sodankylä	Scots pine forest	67°21.712'N, 26°38.270'E	2000 -
Kaamanen	Aapa mire	69°08.441'N, 27°16.230'E	1998 -
Kenttäröva	Spruce forest	67°59.234'N, 24°14.583'E	2003 -
Lompolojänkki	Aapa mire	67°59.832'N, 24°12.551'E	2005 -
Lettosuo	Scots pine on drained peatland	60°38.510'N, 23°57.583'E	2011 -

## 2.2 Meteorological data

All the flux stations provide also supporting meteorological data which is used to run JSBACH and PRELES as point models at the flux measurements sites for the data assimilation and comparison purposes. For regional estimates these models are run in Action B5 with gridded meteorological data obtained from a climate model. The in-situ meteorological data may also be used for evaluating the representativeness of these gridded meteorological data fields at each flux measurement site.

## 2.3 Recent activities

The measurements of CO<sub>2</sub>, CH<sub>4</sub> and H<sub>2</sub>O exchange and supporting meteorological data have continued during the reporting period at all the flux measurement stations (Table 1) without any significant problems.

A new flux data set with gap-filled gas exchange and meteorological data from Lompolojänkki was finalized. A similar data sets for the Hyytiälä, Sodankylä and Kenttäröva sites has earlier been produced and submitted to the modellers for utilization in the JSBACH model (Actions B4 and B5). An extended soil moisture data set for Sodankylä and Kenttäröva has been collected and provided as required for validation of the soil moisture parameters of JSBACH.