



LIFE MONIMET - Climate change indicators and vulnerability of boreal zone applying innovative observation and modeling techniques

LIFE12 ENV/FI/000409



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Contact details:

Project Manager: Ali NADIR ARSLAN

Fax: 358919294604

Email: ali.nadir.arslan@fmi.fi

Project description:

Background

The magnitude of climate change is considered to be dependent on the atmospheric load of the two most important greenhouse gases, carbon dioxide (CO₂) and methane (CH₄). The terrestrial biosphere plays an important role in the global carbon balance, and boreal forests and peatlands are an important part of the global carbon cycle. The future development of carbon and water balances and their relationship to climate change in boreal zones are currently poorly known. Such knowledge gaps are particularly acute at regional level, and obtaining accurate figures of country-based carbon balances and their future development is a challenge. Climate change indicators are simple ways of presenting difficult information to the public. In order to map the climate change indicators related to boreal ecosystems, versatile observational and modelling tools must be used.

Objectives

The LIFE MONIMET project aims to fill knowledge gaps and better understand the future development of carbon and water balances and their relationship to climate change in boreal zones. It will also fill knowledge gaps concerning indications of a region's vulnerability by implementing an innovative approach to in-situ monitoring and mapping of climate change indicators that have an influence on the mitigation potential and vulnerability estimates of boreal forests

and peatlands. The approach is based on a combination of different information sources describing phenology, CO₂ and CH₄ exchange, land cover, snow evolution and albedo. The information sources include in-situ observations and Earth Observation (EO) (satellite) data, as well as ancillary data supporting vulnerability assessments. Dedicated high resolution regional models will be applied to describe climate and land surface fluxes of carbon and water by different ecosystems.

Actions carried out to achieve these objectives shall involve:

- Collecting information, data and expertise that is currently spread over several institutes, in order to build a comprehensive platform for analysing climate change effects on seasonal dynamics of various phenomena;
- Establishing links and adding value to existing monitoring mechanisms such as ICOS and EO systems (GMES) and making use of data acquired in previous LIFE-funded - and other - projects related to ecosystem monitoring;
- Creating a new webcam monitoring system in order to facilitate EO systems by providing time-series of field observations for calibration and validation, as well as to improve the assessment of forest ecosystem services;
- Synthesising modelling and observation approaches to identify climate indicators; and
- Linking the climate change indicators and their effects in order to create vulnerability maps of boreal zones in connection to climate change scenarios.

Expected results: The expected results of the LIFE MONIMET project are:

- A harmonised webcam network for monitoring the seasonal cycle in boreal ecosystem carbon exchange;
- A demonstration of the mapping of climate indicators in boreal forest zones; and
- A demonstration of the vulnerability assessment for Finnish municipalities to climate change effects.

Results

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Environmental issues addressed:

Themes

Risk management - Risk assessment and monitoring
Climate change Adaptation - Natural resources and ecosystems

Keywords

modelling, monitoring system, indicator, greenhouse gas, sensitive area

Natura 2000 sites

Not applicable

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Beneficiaries:

Coordinator	Ilmatieteen laitos
Type of organisation	Research institution
Description	The Finnish Meteorological Institute (FMI) is part of the national government's Ministry of Transport and Communications. The FMI's mandate includes information provision relating to atmospheric conditions as well as airborne hazards.
Partners	Metsäntutkimuslaitos, Finland Finnish Environment Institute (SYKE), Finland Helsingin yliopisto, Finland

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Administrative data:

Project reference	LIFE12 ENV/FI/000409
Duration	02-SEP-2013 to 01-SEP -2017
Total budget	2,755,288.00 €
EU contribution	1,366,952.00 €
Project location	Uusimaa(Finland Suomi) Varsinais-Suomi(Finland Suomi) Satakunta(Finland Suomi) Häme(Finland Suomi) Pirkanmaa(Finland Suomi) Päijät-Häme(Finland Suomi) Kymenlaakso(Finland Suomi) Etelä-Karjala(Finland Suomi) Etelä-Savo(Finland Suomi) Pohjois-Savo(Finland Suomi) Pohjois-Karjala(Finland Suomi) Kainuu(Finland Suomi) Keski-Suomi(Finland Suomi) Etelä-Pohjanmaa(Finland Suomi) Vaasan rannikkoseutu(Finland Suomi) Keski-Pohjanmaa(Finland Suomi) Pohjois-Pohjanmaa(Finland Suomi) Lappi(Finland Suomi) Ahvenanmaa/Åland(Finland Suomi) Baltic Sea Suomi (SF)(Finland Suomi)

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