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Report on end-user/stakeholder consultation workshop

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Action
Action 1 – *Project Management and Monitoring*

LIFE+ PROJECT NAME or Acronym
SNOWCARBO

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1 Introduction

This report summarizes the end-users/stakeholder consultation workshop which was held on December, 14, 2011 at the Finnish Meteorological Institute in Helsinki, Finland.

2 Stakeholders

In SnowCarbo project, the carbon balance maps will be provided for national and international organizations and policy makers responsible for 1) climate change investigations 2) inventory of greenhouse gases and 3) international agreements, their implementation and reporting in Finland. The primary stakeholders of the project in Finland include:

- Ministry of Transport and Communications (governing body of FMI): CO₂ net balance information highly relevant for future traffic regulations

- Ministry of Environment (governing body of SYKE): project results highly relevant for the implementation of national environmental policy

- Statistics Finland, which is responsible for greenhouse gas reporting

Under the Ministry of Agriculture and Forestry: CO₂ net balance of forest holdings highly relevant for the national forestry policy, future regulations, and the development of environmentally sustainable forestry industry.

- Finnish Forest Research Institute (METLA), which is responsible for methods for calculation of GHG balances of forests

- Agrifood Research Finland (MTT) which is responsible for methods for calculation of GHG balances of agricultural land

For the European Commission the project results are important concerning Green Paper follow up (adaption policy development) and European Climate Change Programme II (ECCP), also refer to section 'EU added value of the project' above. The products of this activity will also support a number of international environmental monitoring activities, such as Arctic Monitoring and Assessment Programme (AMAP) and Sustained Arctic Observing Networks (SAON) initiative of the Arctic Council, and Global Atmosphere Watch (GAW) programme of the World Meteorological Organization (WMO).

The spatial and temporal changes in snow cover have widespread direct and indirect impacts on ecosystems and human activities, e.g. flooding, water resources management, agriculture, transportation, hydropower production, reindeer husbandry, game management, biological diversity, insurance, tourism and recreational use of nature. Thus, national and international organizations and companies related to these issues are secondary stakeholders of the project. Additionally, secondary stakeholders include organizations that support the snow monitoring systems used in the project:

- The snow and phenology monitoring services of FMI and SYKE applied in the project are part of European Space Agency's (ESA) GMES (Global Monitoring of Environment and Security) Services (projects Polar View and Land). It is agreed between ESA and EC that the continuation of these after the year 2008 can be partially supported by Life+ projects that directly apply the GMES data.

- Environment Canada provides their snow melt monitoring data (based on space-borne microwave scatterometers) covering northern Eurasia and America.

3 Agenda

Morning session

09:10-12:30

- 09:10 Topical issues in climate change politics (Ministry of Environment)
- 09:30 ICOS – greenhouse gas monitoring network (Timo Vesala, University of Helsinki)
- 10:00 The terrestrial carbon cycle (Gerhard Krinner, LSCE)

Coffee Break

- 11:15 The greenhouse gas reporting obligations set by United Nations (Tuija Lapveteläinen, Statistics Finland)
- 11:45 SnowCarbo – Project (Jouni Pulliainen, FMI)

Lunch break

Afternoon session

13:30-16:30

- 13:30 SnowCarbo- REMO-JSBACH modelling (Tiina Markkanen, Tea Thum, FMI)
- 14:30 Satellite data products to support climate modelling –Land Cover (Pekka Härmä, SYKE)

Coffee Break and Posters

- 15:15 Satellite data products to support climate modelling-Phenology & Snow Cover (Kristin Bötcher, SYKE)
- 15:45 Satellite data products to support climate modelling-Northern Hemispheric Snow Cover (Kari Luojus, FMI)
- 16:15 Dissemination (Mwaba Kangwa, FMI)

SnowCarbo cocktail

17:30-19:00

4 Highlights and summary of the workshop

The SnowCarbo Stakeholder meeting was successful. The presentations can be found in SnowCarbo webpage: <http://snowcarbo.fmi.fi>

The registered participants were 45 but there were also unregistered participants so there were about 55. The meeting was successful in terms of informing people about the SnowCarbo project and results so far produced and networking. In discussion session following questions asked to audience related the stakeholder's needs in terms of SnowCarbo project results and products:

Q1: How do you see the relevance of SnowCarbo project products in terms of

- (a) policy making

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- (b) educational
- (c) forest management

Q2: What is the potential use of CO₂ Atlases?

Q3: What kind of CO₂ information needed and what format?

Q4: How would be results best disseminated

Some conclusions:

The modeling framework can be utilized in several different ways:

- To support in fulfilling national and international greenhouse gas reporting obligations
 - Emissions in different sectors (forestry, agriculture)
 - The components of natural greenhouse gas exchange (sinks and sources of vegetation and soil)
- To produce estimates for the effects of spatial variability carbon dioxide sinks and sources in regional scale that can be used as an information source
- To use the results in national and international climate change adaptation and mitigation programs and related decision making
 - E.g. In the implementation of emission the trade system of European Union
- Model can also be used to simulate future scenarios for atmospheric carbon balance related to climate change

The areal coverage of the models is currently consisting of Nordic countries, excluding Iceland, and Baltic countries. As the final outcome of the project, there will be an atlas of annual carbon balance for years 2001-2010. Additionally the different components of the carbon cycle can be described (e.g. the monthly gross primary production, in figure 1). Due to large uncertainties in carbon dioxide estimates the results should also be used by comparing to estimates using other methods (e.g. annual balances, table 1).

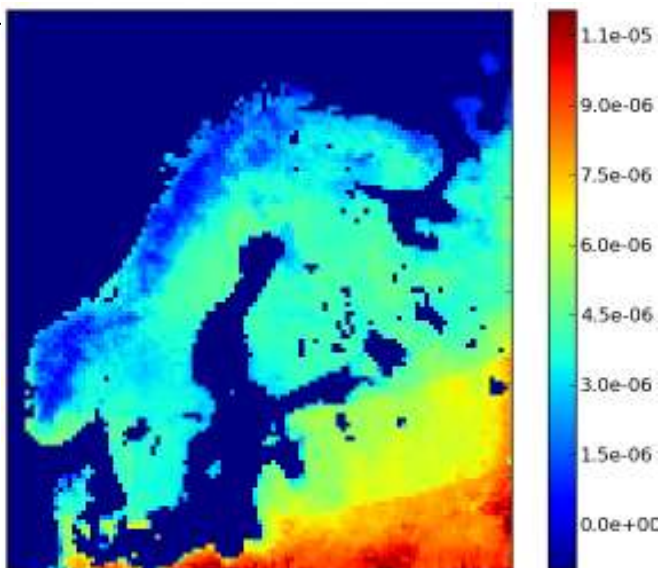


Figure 1. Example of estimates produced by the model. In the above figure the gross primary production (GPP). Here the figure presents a monthly mean for July 2002 in [mol/m²/s], which is broadly speaking the carbon sequestered by vegetation. Similar maps can be produced for annual carbon balance.

Table 1. Sample from the Finnish national greenhouse gas inventory, reported for UNFCCC (United Nations convention on climate Change).

Tg CO ₂ eq.	2005	2006	2007	2008	2009
Forest land ¹	-34.6	-38.3	-29.4	-34.9	-47.2
Biomass, mineral soils	-19.7	-23.1	-15.7	-21.9	-33.1
Biomass, organic soils	-16.7	-17.0	-15.6	-14.8	-16.1
DOM+SOM, mineral soils	-6.9	-7.1	-6.7	-6.4	-6.6
DOM+SOM, organic soils	8.7	8.9	8.6	8.3	8.5
Cropland ²	5.21	5.42	5.68	5.96	6.23
Biomass	-0.003	-0.002	-0.003	-0.003	-0.002
DOM+SOM, mineral soils	-0.49	-0.37	-0.20	-0.02	0.17
DOM+SOM, organic soils	5.70	5.79	5.88	5.98	6.06
Grassland	0.40	0.42	0.46	0.51	0.50
DOM+SOM, mineral soils	-0.41	-0.40	-0.34	-0.30	-0.31
DOM+SOM, organic soils	0.81	0.81	0.81	0.81	0.81
Wetlands	1.35	1.34	1.35	1.36	1.30
DOM+SOM, organic soils ³	1.35	1.34	1.35	1.36	1.30
N fertilisation	0.011	0.018	0.017	0.035	0.025
Disturbance associated with land-use conv. to cropland	0.008	0.008	0.009	0.009	0.010
Liming	0.265	0.298	0.249	0.290	0.312
Biomass burning	0.006	0.017	0.007	0.010	0.006
Harvested wood products	-0.3	-0.5	-1.7	-0.3	-1.7
Total CO₂ eq.	-27.7	-31.2	-23.3	-27.0	-40.6

¹ Excludes emissions from N fertilisation and biomass burning

² Excludes emissions from disturbance associated with land-use conversion to cropland and liming

³ Includes emissions from peat extraction areas and emissions from drainage of wetlands

The modeling framework, implemented in SnowCarbo- project, can be used to produce information to support national and international climate policy making and monitoring. The central international conventions and programs in European level, which can utilize the results, are:

- **Decision [280/2004/EC](#) of the European Parliament and of the Council of 11 February 2004 concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol.**
 - ▶ UNFCCC (United Nations Framework Convention on Climate Change) obligates the members of the convention to compile, update and publish their national greenhouse gas inventories (including carbon dioxide) on regular bases.
- **DG CLIMA - European Climate Change Program (ECCP) – Climate change program of the European Union, concerning all actors in the European Union (public sector, private sector and non governmental organizations)**
 - ▶ The accounting of greenhouse gas emissions in all sectors of society (e.g. forestry and agriculture) and building mechanisms for restricting emissions.
- **DG ENV – (ECCP) Action on Climate Change Post 2012 (Before the establishment of DG CLIMA in 2010) aims at preventing severe effects of climate change by limiting the global warming associated with human activity to under 2°C, when compared to the mean temperature of the pre-industrial era (1850-1899).**
 - ▶ Imposing emission limits, regulation of emission trade and monitoring of emissions need comprehensive emission accounting and reporting

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- **Other central programs of the European Commission:**
 - *DG ENER – Emission trade related to energy production; Research and development aiming at reduction of carbon dioxide emissions*
 - *DG MOVE – Program for reduction of emissions from land and sea traffic*

This workshop help us to know better how we should continue the project and what information, to whom and what form should be delivered. It has also been discussed on dissemination of final results of SnowCarbo project. There were many good suggestions. One of them we agreed to disseminate our result via <http://ilmasto-opas.fi> which is another Life+ project. Another suggestion to disseminate the results of SnowCarbo project is using the Finnish meteorological institute's Arctic Research Centre Erdas Apollo system. Erdas Apollo system is an enterprise geospatial platform that offers high performance Open Geospatial Consortium (OGC) web services quickly and securely disseminates the geoinformation products.