CryoLand

GMES Service Snow and Land Ice

BRIEFING NOTE FOR POLICY MAKERS

No. 1

AT A GLANCE

Title: CryoLand - GMES Service Snow and Land Ice

Grant Agreement No. 262927

Call: FP7-SPACE-2010-1 Activity 9.1
Theme: SPA.2010.1.1-01 Stimulating Development of Downstream GMES Services

INSTRUMENT: Collaborative Project FP7
TOTAL COSTS: € 2.828.859
EC CONTRIBUTION: € 2.201.182
PERIOD: 1 Feb. 2011 – 31 Jan. 2015
DURATION: 48 Months

CONSORTIUM: 10 Partners from 6 European Countries

PROJECT COORDINATOR:
ENVEO Environmental Earth Observation IT GmbH
Innsbruck, Austria

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THE CHALLENGE

Climate change has a strong impact on land ice and snow cover based environments. Rising temperatures will lead to retreat of snow and ice, jeopardizing the supply of fresh water for human consumption, agriculture, and hydropower generation. In addition, changing snow and ice will affect ecosystems and biospheric diversity. Accurate and timely observations of snow and ice are necessary to prepare for these challenges. In order to support the management of snow and ice resources, CryoLand develops new services for monitoring snow cover, glacier ice and lake/river ice.

OBJECTIVES

The primary objective of CryoLand is to develop, implement and validate a standardized and sustainable service on snow, glacier and lake/river ice monitoring as a Downstream Service within GMES in a value added chain. CryoLand will exploit the GMES Sentinels and other Earth Observation satellites. The project prepares the basis for a future cryospheric component of the GMES Land Monitoring Service.

The project will

- develop and validate a pan-European satellite-based snow and land ice service delivering highly needed products to the user community,
- prepare the tools for offering snow and ice services world-wide,
- develop tools to utilize data from the GMES Sentinel Satellite Series for snow and ice application,
- perform full verification and real time demonstration of the services,
- conform to INSPIRE/GEOSS standards,
- make products available via state-of-the-art online services,
- issue guidelines for stakeholders and for service deployment operations.

Policy Brief No. 2 is planned for November 2012.

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CryoLand Products and Services

The geospatial products on seasonal snow, glaciers, and lake/river ice are derived from Earth observation satellite data, optionally including information from field stations. Advanced information technology will be applied to process and distribute snow and land ice products, which are tailored to the customer needs, in near real time.

SNOW SERVICE: The baseline products include snow cover area, snow wetness, snow temperature, snow water equivalent and statistical snow data for basins.

GLACIER SERVICE: The baseline products include glacier area and outlines, maps of snow/ice area, ice motion maps, and glacier lakes.

LAKE AND RIVER ICE SERVICE: The baseline products include lake and river ice extent, temporal changes of ice extent, snow cover on lake ice.

Expected Impact of CryoLand to the European Economy and Policies

The CryoLand service on accurate and timely observations of snow, and land ice by means of satellites is very relevant to supporting environmental and resource management activities in Europe:

- Water resources management (Irrigation, water quality, water supply
- Hydropower energy production, energy trading
- Natural hazards mitigation (snow and glacier related floods, avalanches)
- Transportation (roads, rivers, lakes) and construction activities
- Insurance and re-insurance companies
- Climate monitoring and modelling
- Numerical weather prediction
- Carbon accounting and biodiversity
- Living conditions of northern indigenous people
- Ecosystem, Agricultural management
- Tourism

Relevance of CryoLand to EU Strategies and Directives

DG ENV and EEA: Water Information System for Europe (WISE). Water supply from snow and ice is crucial for river basin management, groundwater recharge, and water quality in many parts of Europe.

DG ENER: European Strategic Energy Technology Plan - SET. Climate protection requests to make the most efficient use possible of the available energy sources. Hydropower is by far the dominating renewable source for electricity. Improved information on snow and glacier runoff is needed for increasing the efficiency of hydropower production.

DG ECHO and EEA: The Community Civil Protection Action Programme. Significant improvements for hazard forecasting can be expected from the CryoLand Service: Snow cover information is essential for forecasting avalanches and snow-melt related floods. Up-to date glacier information is important for predicting and mitigating floods in high alpine regions. Glacier dammed lakes may cause sudden floods, and the increased glacier runoff in warm summers tends to amplify floods caused by rainfall in Alpine basins. Snowmelt floods in Nordic rivers may be aggravated by ice jams.

EEA: Support of Environmental Policy in Europe. Snow cover is relevant for Water quality and water availability. and has an important function in surface/atmosphere exchange processes, thus being very relevant to air pollution control.

DG AGRI: Rural Development Policy. Snow melt water is essential for agriculture in many parts of Europe

DG CLIMA: European Climate Change Programme (ECCP). Adapting to Climate Change: Snow and land ice are sensitive indicators for climate change.

DG ENTR – European Space Policy - GMES: CryoLand is aimed at developing a service based on EO data, which is of high socio-economic relevance to the European citizens. This is a key objective of GMES.

PROJECT PARTNERS

ENVEO IT GmbH (Project Coordinator), Innsbruck, AT	Norwegian Computing Center, Oslo, NO
EOX IT Services GmbH, Vienna, AT	Northern Research Institute AS, Tromsø, NO
Finnish Environmental Institute, Helsinki, FI	National Meteorological Administration, Bucharest, RO
Finnish Meteorological Institute, Sodankylä, FI	Gamma Remote Sensing AG, Gümligen, CH
Kongsberg Satellite Services AS, Tromsø, NO	Swedish Meteorological and Hydrological Institute, SE

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