EEA Briefing

May 2012

GMES land monitoring service

Summary: The objective of the GMES *land monitoring service* is to provide land cover information to users in the field of environmental and other terrestrial applications. Initial operations of the service (*GIO land*) focus on four components, three of which are coordinated by EEA -- the pan-European and local components, and the in-situ component. Initial activities around the pan-European component include providing: a land cover change product between 2006 and 2012, and a land cover product for 2012; and five pan-European high-resolution layers on land cover characteristics -- artificial surfaces, forest areas, agricultural areas (grasslands), wetlands, and small water bodies. Eionet countries have the opportunity to participate in GIO land pan-European activities.

What is 'GIO land'?

If our environment and natural heritage are to be properly managed, one of the key tools needed by decision-makers is comprehensive and timely information on land cover and land cover change. Corine Land Cover (CLC) datasets have provided a time series of land cover and land use information over the European continent since 1990. These allow for monitoring changes to the earth's surface that result from the interaction of both natural processes and human activities.

The objective of the GMES[1] *land monitoring service* is to provide land cover information to users in the field of environmental and other terrestrial applications. Information priorities and their relevance to users are defined and validated by the European Commission (EC) and the GMES Committee, with the advice of the GMES User Forum.

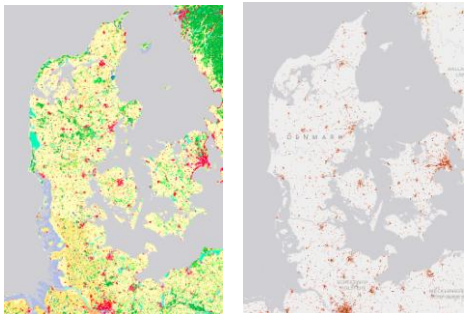

Figure1: For Denmark, images of Corine Land Cover (CLC) data (left) and soil sealing (right).

GMES initial operations (2011-2013) of the land monitoring service (or *'GIO land'*) focus on the priority for multi-purpose information common to a large community of users (i.e. land cover/land cover change at various scales and periodicity; biophysical variables for dynamic land monitoring; and improved access to reference data). Four components have been identified: (i) pan-European land cover, land cover change and land cover characteristics; (ii) a 'global' component producing biophysical variables at global scale; (iii) a 'local' component providing very high resolution information on specific areas of interest; and (iv) access to a reference data building on INSPIRE[2] architecture and useful for several GMES services.

The agreement and project

On 25 May 2011, a Delegation Agreement was signed between the EU and EEA. The agreement tasks EEA with the technical coordination of the pan-European and local components of the GIO land monitoring services. Its execution entered into force on 25 May 2011 and will be completed 31 December 2014.

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[1] *Global Monitoring for Environment and Security (GMES)* is an EU-wide flagship programme that aims to support policymakers, business and citizens with improved environmental information. GMES integrates satellite and in-situ data with modelling to provide user-focused information *services*.

[2] Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE).

The GMES Land monitoring service will be implemented using two implementation schemes: (i) centralised implementation, with procurement via framework and service contracts to service providers; and (ii) decentralised implementation, using grant agreements to participating countries.

Satellite imagery (ortho-rectified) needed for the production of the pan-European and local components have been made available from December 2011 onwards, through the GMES data warehouse operated by the European Space Agency (ESA). It is scheduled that one-third of the total coverage of the EEA's 39 countries will be available from 2011 acquisitions, while two-thirds will be acquired in 2012.

The Pan-European component

GIO land will begin with the first component -- pan-European land cover -- which encompasses: (i) the production of five additional pan-European high resolution layers (HRL) with specific land cover characteristics; (ii) the continuity of CLC with a new exercise for the reference year 2012; and (iii) support to the harmonisation efforts of countries in order to improve synergies between pan-European and national land cover activities and in support to the implementation of INSPIRE Annex II & III geospatial data specifications.

Regarding (i), the production of the five pan-European high-resolution layers HRLs is the objective of the first call for tender for framework contracts. One layer relates to each of the main land cover types -- artificial surfaces, forest areas, agricultural areas (grasslands), wetlands, and small water bodies -- for the reference year 2012. These can then be used, for example, as attributes for different kind of map objects, such as NUTS[3], CLC polygons, regular grids or designated areas. The publication of the call for tender was made in August 2011. The first specific agreements began in January 2012. Service providers are working on streamlining activities that will ensure a homogeneous coverage throughout the EEA's 39 countries.

For (ii), the reference year for the next update of the CLC datasets is 2012 (following CLC projects completed in 1990, 2000 and 2006). This update will provide a land cover change product between the reference years 2006 and 2012, and a land cover product for the reference year 2012.

For (iii), one element of harmonisation consists of the organisation of training workshops to ensure that both participating countries and service providers will perform verification and enhancement activities for the production of the HRLs along the same lines. Other activities will follow related to the conversion of national datasets for integration and use in the European context.

The local component

GIO land activities for the local component encompass support to the EC for the definition of the thematic content of the local component, and the implementation of that component. The main objective of this action will be to provide more detailed information complementary to the pan-European component on specific areas of interest (e.g. urban areas, biodiversity). It will primarily be based on very high resolution images collected between 2011/13 in combination with other available datasets (high resolution and medium resolution images) over the pan-European area.

A first local component will focus on biodiversity and ecosystem policy. It is proposed to develop a tailored land cover classification where detailed information is missing across Europe for riparian areas. The first suggestions were presented at and welcomed by both the GMES User Forum and the GMES committee, and will be defined in detail by EEA in 2013.

A second local component will build on the initial GMES local component (i.e. a follow-up exercise on the Urban Atlas). The first version of the Urban Atlas was made on the basis of

[3] Nomenclature of territorial units for statistics

2006 satellite imagery. An update exercise is under preparation, to be based on 2012 imagery. The results of the first Urban Atlas are available under the Data & maps section of the EEA website:

http://www.eea.europa.eu/data-and-maps/data/urban-atlas
http://www.eea.europa.eu/data-and-maps/figures/urban-atlas

Access to in-situ data

All of the GMES services need access to in-situ data in order to ensure an efficient and effective use of the GMES space data. The EEA has been tasked with the coordination of the GMES in-situ component through the GISC project. In support of the GMES Bureau, the project explores how a future management (governance, architecture) of the in-situ component during an operational phase might best be achieved.

More information can be found on the GISC website: http://gisc.ew.eea.europa.eu/about-gisc.

Cooperation with participating countries

Eionet countries have the opportunity to participate in GIO land pan-European activities. For the production of the HRLs, cooperation is foreseen in the verification, enhancement and dissemination phases. Furthermore, CLC products will be produced by the EEA member and participating countries. Embedding the CLC products in the GMES land monitoring services is a major step forward for a systematically repeated and sustainable provision of land cover information over Europe. All grant agreements should be signed in 2012.

More about GMES: http://www.gmes.info/
More about INSPIRE: European Commission/INSPIRE

EEA Contacts:
Project coordination: Hans Dufourmont (+45 2494 1115; hans.dufourmont@eea.europa.eu)
Contract and grant management: Ana Maria Ribeiro de Sousa (+45 3343 5945; ana.sousa@eea.europa.eu)
Resource management: Ilona Schiøler (+45 2494 1064; ilona.schioler@eea.europa.eu)
Quality control and assurance: György Büttner (+45 3343 5904; gyorgy.buttner@eea.europa.eu)