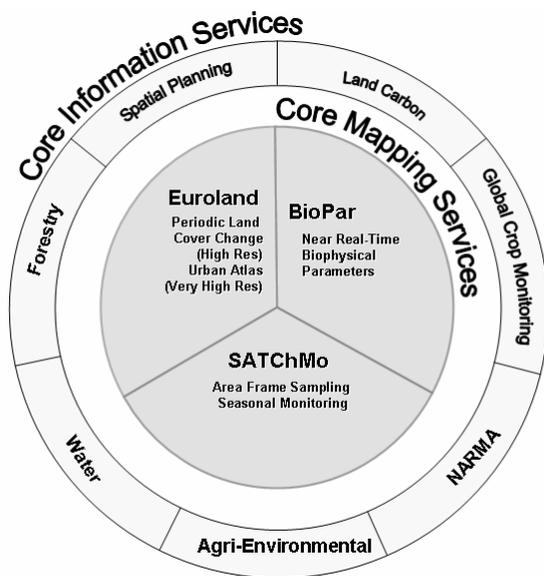# geoland2

Towards an Operational GMES Land Monitoring Core Service

geoland2 intends to constitute a major step forward in the implementation of the GMES Land Monitoring Core Service (LMCS). The three components (Local, Continental and Global) of the LMCS are addressed.

The goal of geoland2 is (i) to prepare, validate and demonstrate pre-operational service chains and products that will underpin the LMCS, and (ii) to propose and demonstrate a concrete functional organisation of the LMCS.

The geoland2 deliverables are: (i) the organisation of a production network, (ii) the building of operational processing lines, (iii), the demonstration of services and products, (iv), the support on continuity and increase of the land user platform.

geoland2 efforts will rely on the assets of previous or ongoing projects funded under FP6 (geoland, Boss4GMES), by ESA (GSE projects "Land", "Forest Monitoring", "GMFS", "SAGE", "Urban Services") and EEA's "CLC/FTS 2006" project. The key word for geoland was "consolidate", the focus of the GSEs was "demonstrate services", and now the focus for geoland2 is "build: design, integrate, and test operational processing lines, demonstrate large scale products, build robust provider-user relationships.

The architecture of geoland2 is made of two different layers, the Core Mapping Services (CMS) and the Core Information Services (CIS). The CMS produce 'basic' land cover, land cover change, and land state products which are of broad generic use and can be directly used for deriving more elaborated products. The CMS products cover a wide variety of thematic content, spatial scales from local to global, and update frequency, from 1 day to several years. The CIS are a set of thematic elements that start from CMS products and other data sources to produce 'elaborated' information products addressing specific European policies. They are in direct contact with institutional end-users in charge of European policies and Member State policies which have a generic pan-European character. They serve to estimate the added value of the CMS in comparison to existing approaches and to carry out a utility assessment of selected end-to-end service demonstrations.

The 3 Core Mapping Service tasks are:

- Land Cover & Land use (EUROLAND): At local scale, EUROLAND produces VHR Urban Atlas inventory and change, with 22 classes at 0.25 ha MMU, according to the new Urban Atlas specification approved by DG REGIO in November 2007, on several tens of European cities. At continental scale, it produces over Europe and demonstration sites HR Land Cover inventory and change with 21 classes plus 4 Forest classes and Forest Density at 1-5 ha MMU.

- Biogeophysical Parameters (BioPar): BioPar produces in near real time and off-line a series of biogeophysical parameters describing the continental vegetation state, the radiation budget at the surface and the water cycle. The biogeophysical parameters are derived mostly with MR and LR data, at a global or continental scale; the time frequency of product update is on the order of 1 - 30 days.
- Seasonal & Annual Change Monitoring (SATChMo): SATChMo operates at continental scale over Europe and Su-Saharan Africa. It delivers: (i) a VHR/HR Area Frame Sampling over permanent samples representative for all European and African environmental / ecological conditions for annual statistics of land cover & land cover change; (ii) a complete MR continental coverage of seasonal and annual vegetation parameters to produce land cover change and agricultural land use. The time frequency of the product update is on the order of 3 - 12 months.

7 Core Information Services addressing important sectoral policies and showing examples of GMES end-to-end services are being set up with the following missions:

- Spatial Planning: Describe, explain and forecast urban land use change in Europe.
- Water: Integrate EO derived LC/LU data in water quality models that can contribute to water management in Europe in a flexible, sustainable and cost-efficient way.
- Agri-Environment: Evaluate the utility of the CMS for the supply of EO-based indicators assessing in Europe the impact of agriculture on the environment and the effectiveness of agri-environmental measures.
- Forest: Address specific user requirements from the European Environment Agency (EEA), DG, JRC and DG AGRI for improved forest class and biodiversity indicator information required for the LMCS and policy reporting requirements at a Pan European level.
- Land Carbon: Understand and assess the impact of weather and climate variability on terrestrial biospheric carbon fluxes, in the context of international conventions.
- Natural Resource Monitoring in Africa (NARMA): Develop an environmental monitoring capacity over African countries for the needs of the EC services and for regional and continental EC partners in African countries.
- Global CROP Monitoring (GCM): Provide objective, real-time crop assessment and yield forecasts in support to EC Policies in the field Agriculture (Common Agriculture Policy) and Food Security.

The duration of the project is 4 years. The CMS and CIS development obey to two different logics:

- The CMS are activities of the type "System Design and Pre-Operational Demonstration". They build processing lines and production architecture. They conduct R&D activities to design the production lines and to implement new elements for service evolution. They set up, test and demonstrate a prototype / demonstrator. They follow a review cycle appropriate for industrial service implementation.
- The CIS are activities of the type "Service Consolidation / Evolution". They conduct R&D activities to define and test new products & services, and provide a utility assessment of these. The goal is a demonstration of concept rather than the construction of operational lines; the Review cycle is therefore of a different nature than for the CMS.

geoland2 gathers 50 partners from about 20 European countries. The requested EC grant is 22 M€, which corresponds to a total budget of approximately 32 M€. The largest part of the budget allocation goes to the construction of the CMS.

The team is organized in Tasks, lead by a Task Manager. Each CMS and CIS constitutes a Task (with in addition a Task devoted to the implementation of a geoland2 portal for data discovery, view and access functions building upon findings from BOSS4GMES). The Task Managers have full responsibility of organisation of their team and work schedule in the general project framework and development logic set-up.