

**Dear Member of the Land Data User Community,**

We welcome you to the 13th issue of the GMES Newsletter.

This edition of the newsletter provides a list of acronyms that will help you to better understand the GMES Land framework, the current status of the continental Land cover mapping activities - Euroland, as well as the GMES Land user workshops for three high resolution layers (Grassland, Wetland and Forest). Furthermore, in order to improve subsequent editions of the newsletter, we ask for your contribution to a short questionnaire.

Finally, before Christmas, a new EIONET NRC Land Cover meeting will take place. As always, we will keep you informed about the outcomes of this and other meetings.

***Yours***

***Andreas Littkopf***

## **Content:**

- ⇒ Continental Land Monitoring Core Service – Specification of 5 High-Resolution Layers
- ⇒ Needs and Requirements for the Future Grasslands and Wetlands High Resolution Layer
- ⇒ 1st GMES Forest Expert Exchange
- ⇒ GMES: Global Monitoring for Environment and Security – Acronyms and Abbreviations
- ⇒ Help us to improve the GMES Land User NL

## **Continental Land Monitoring Core Service - Specification of 5 High-Resolution Layers**

The Continental Land Monitoring Core Service addresses high spatial resolution, wall-to-wall land cover information, and land cover change. It comprises at present:

- High resolution image data (such as Image2000, Image2006 and Image2009);
- Common layers (e.g. calibrated indices, texture features, etc.);
- Set of five high resolution (HR) layers with information on quantitative thematic land cover and changes in the land cover. The five layers are: impervious areas, forests (forest area, crown cover density, types), grasslands, wetlands, and small water bodies (for details see Table 1 below);
- Continuity of CORINE Land Cover updates.

	<b>HR Layer Imperviousness</b>	<b>HR Layer Water</b>	<b>HR Layer Grassland</b>	<b>HR Layer Wetland</b>	<b>HR Layer Forest</b>
<b>Information Content</b>	Built-up areas including continuous degree of imperviousness ranging from 0-100%	Small inland water bodies such as lakes, water reservoirs, river, streams	Grassland areas with a continuous degree of intensity	Wetland areas according to RAMSAR definition	Forest Types, Forest Crown Cover Density [10-100%], Forest Area (customisable), Forest Area Change
<b>Type</b>	Raster				
<b>Spatial Resolution</b>	Pixel level, validated to 1 ha				
<b>Update Frequency</b>	3 - 5 years				
<b>Specific Benefits</b>	Input to State of Environment Report: Land-take trend in Europe (vs. FTS Sealing 2006) Input to various reporting and management obligations (WFD, STS, UTS, ESDP, national sustainability strategies)	Input to various reporting and management obligations (WFD, Flood Directive, Climate Change, Aarhus Convention, CAP)	Input to Habitats Directive CAP (cross-compliance aspects: agri/forest conversion, environmentally friendly farming, maintenance of grasslands) Global Warming impact monitoring (desertification in the South, spread of humid grassland in the North)	Provision of first pan-European dataset on wetlands (available on demonstration sites)	<u>International:</u> Environment for Europe Ministerial Conference (EfE); Ministerial Conference on the Protection of Forests in Europe (MCPFE). <u>EU level:</u> EEA State of Environment Report, SEBI2010 indicators, support to the EU Forest Action Plan implementation. <u>National level:</u> support to national forest inventory and monitoring. Forest Crown Cover Density product allows customised scaling of Forest Area information between national and international level.

Table 1: 5 HR Layers Specification Overview

The expected benefits at the European level are that the operational HR layers will allow the creation of pan-European environmental indicators. In addition, they can contribute to a better understanding of land cover changes and ecological and environmental trends to mitigate the impacts of global warming and environmental degradation. At the Member State level they can

support national mapping and monitoring activities, for instance by providing additional quantitative land cover information to upgrade or further attribute existing national land databases.

While the service specification of the two layers "Imperviousness" and "Forest" are already consolidated, the other remaining layers (grasslands, wetlands, water) are still under discussion between European and Member State experts and users. In order to support this discussion process, geoland2 has started to produce first examples for all 5 HR layers (see Figure 1 below). The examples have been created in a central European / Alpine transect (from Germany, via Austria to Italy) and in a Mediterranean region (Northern Greece).

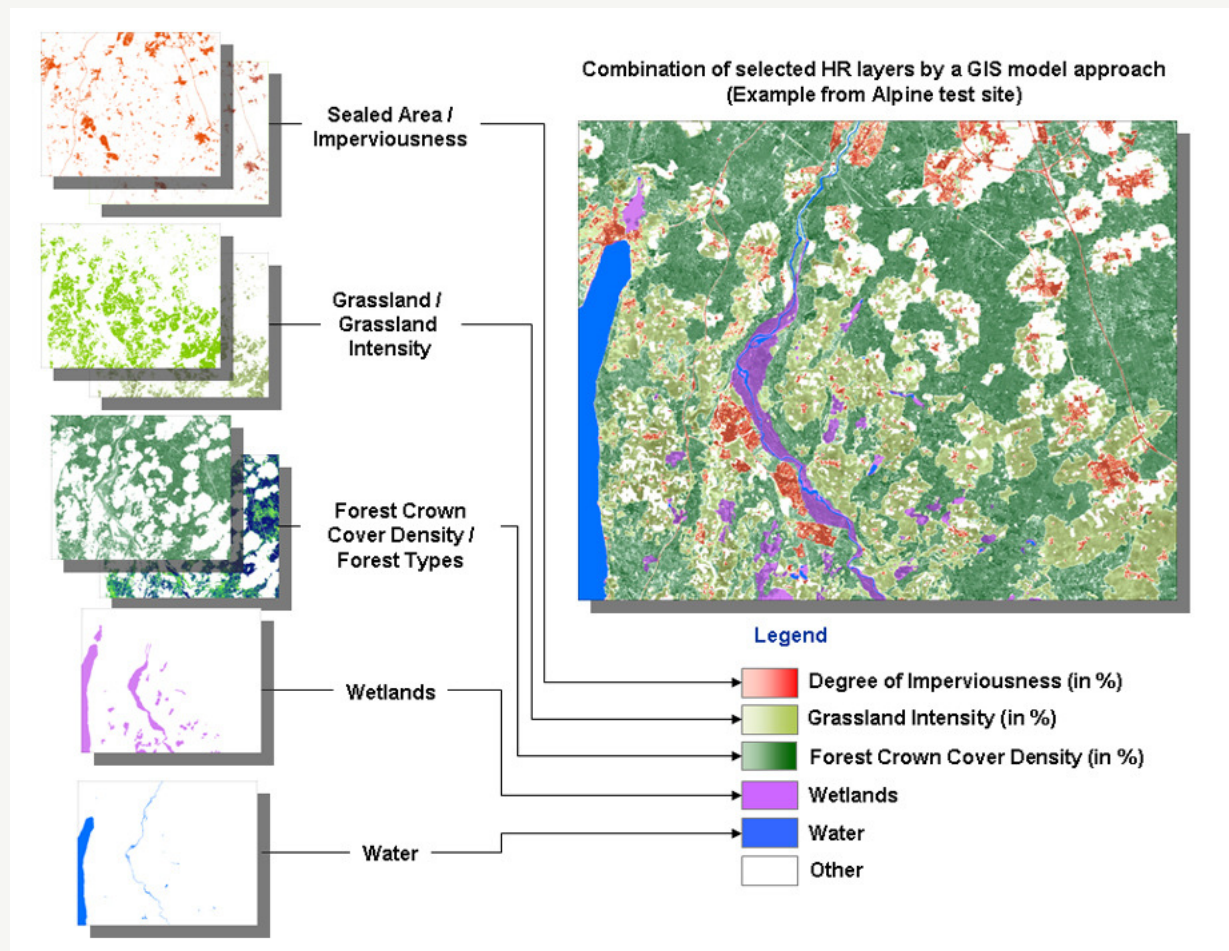


Figure 1: Example for the 5 HR layers - Alpine test site:

Left: individual layers in full resolution, right: demonstration of all layers combined based on a GIS model approach. As several layers are partially overlapping (e.g. wetlands and forest) the borderlines between the layers may vary according to user needs.

geoland2 has produced a DVD with these full resolution test products, together with documents providing the detailed service specification and meta data. These examples will provide Member State specialists and other interested users, to investigate the content of the layers in more detail. The DVD has already been sent to selected experts but can be provided to any interested user upon request (please send an Email to ETC-LUSI Alejandro Simon Colina; Email: [alejandrosimon@uab.cat](mailto:alejandrosimon@uab.cat)). All data and documents will be accessible from the geoland2 Expert Portal on: <http://www.geoland2.eu/portal/service/ShowServiceCategoryDirectory.do>.

All services and products have been based on an extensive user consultation process, however geoland2 would very much appreciate additional feedback on the service specifications by final users to allow further improvement of the layer content and implementation of the processing chains (please send your comments to Elisabeth Schmeer; Email: [elisabeth.schmeer@infoterra-global.com](mailto:elisabeth.schmeer@infoterra-global.com)).

## Authors:

Steffen Kuntz, Infoterra GmbH; Email: [steffen.kuntz@infoterra-global.com](mailto:steffen.kuntz@infoterra-global.com)

Elisabeth Schmeer, Infoterra GmbH; Email: [elisabeth.schmeer@infoterra-global.com](mailto:elisabeth.schmeer@infoterra-global.com)

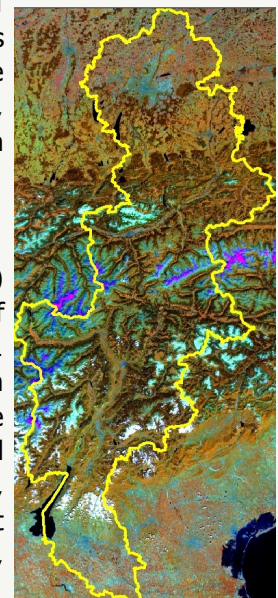
## Needs and Requirements for the Future Grasslands and Wetlands High Resolution Layer

### Introduction

A dedicated session on the needs of the Grasslands and Wetlands users was held in July, jointly organised by ETC-LUSI and the EUROLAND team (geoland2). The objective of the meeting was to actively involve users in discussions of user requirements and the service specifications for both high-resolution (HR) layers. The European Commission views the participation of users as a crucial step in ensuring the stability and future development of the products. The EUROLAND team shared the service specifications of the product with the aim of building a fruitful discussion around new ideas, needs, and potentials whilst retaining a focus on the remainder of the EUROLAND HR layers. The meeting was divided into three parts, a) General overview of the HR layers, b) description and discussion on grasslands, c) description and discussion on wetlands.

### General Overview

The day began with a session on the Land Monitoring Core Service (LMCS) concept underpinning the five HR layers. To facilitate an understanding of EUROLAND activities results from the test site "Alpine transect" (Figure 1 right: Alpine Transect (yellow), overlain on a AWIFS satellite scene from July 2006, covering an area from Munich via Innsbruck to Verona) were demonstrated to the users. The Alpine transect is the first region where all 5 HR layers have been produced. Further demonstrations will follow, starting with a Mediterranean region (Greece) and other transboundary test sites across Europe. This approach, requested by the EU and national users, will assist in the approval and validation of the products from the user side.



### HR Grassland Layer Meeting

The session began with the presentation of the HR layer on behalf of the grassland team. The current reporting obligations at EU and national levels (including WFD, European Soil thematic Strategy, Natura2000 etc.) create new requirements such as improvements in spatial resolution, differentiation of mixed classes, and delivery of more continuous information. These requirements cannot easily be met by the Corine Land Cover (CLC), the unique land cover database in Europe (CLC classification available on:

[http://etc-lusi.eionet.europa.eu/CLC2006/CLC\\_Legeng.pdf](http://etc-lusi.eionet.europa.eu/CLC2006/CLC_Legeng.pdf)), which serves as the European key reference and which is produced by expert knowledge provided by Member States.

Defining Grasslands from an Earth Observation (EO) technical perspective is not an easy task. The HR Grassland layer makes reference to CLC and has identified agreements and deviations from this de-facto standard. This comparison is described in the Table 1 below, which was presented and discussed at the meeting. However, certain modifications of this definition are expected in the future based on the experience from further test sites.

<b>HR Grassland Layer</b>	
Grassland in urban areas (public parks, green areas in industrial sites)	Contained in: CLC classes 111 to 142
Pastures, grassland used for grazing or hay production	CLC classes 231, but also contained in 211 to 244
Cultivated or semi-natural grassland within forest and grass covered surfaces within transitional woodland	CLC classes 311-313, 324
Natural grasslands	CLC class 321
Clearly recognisable grassland contained in moors, heathland, sparsely vegetated areas etc., wetland classes	CLC classes 322, 33x, 41x
Green fodder (field clover, alfafa/lucerne) may be included where these areas have a higher multi-temporal greenness than crops	
Grassy areas with few or low bushes	
Alpine meadows with low fraction of bare rock or gravel	
Alpine dwarf shrubs (especially rhododendron)	

<b>Not Covered by HR Grassland Layer</b>
Bushy areas with small patches of grassland
Wetland areas with low vegetation
Brown or dry grassland (eg due to drought or very low cut of former high standing grass) may be omitted where this is not balanced by sufficient multi-temporal images

*Table 1: Types of Vegetation included in the HR Grassland layer*

Relevant technical solutions were tested and applied by the team to be discussed with the users. The team highlighted not only the successful identification of grasslands in humid climate conditions, but also the difficulties in obtaining grassland information only from EO data. Consequently, additional multi-seasonal data and in-situ data (i.e. national data or data from the IACS EU system) would be very useful in improving the class separation. Additionally, it is expected that new test site areas in other geographical regions (i.e. semi-arid areas in parts of the Mediterranean sea basin) will require further adaptations of the processing chain. The possibility of developing indicators for the intensity of grassland use and of deriving a change layer were indicated.

Fruitful discussion followed these presentations between the service providers and users. Requests from users are summarised as follows:

- New complementary test sites to the Alpine transect. The Mediterranean zone should be the first priority for exploration of semi-arid conditions;

- The service specification document has to provide a clear distinction of the type of land cover and vegetation included as grasslands. Basic requirements for obtaining a proper assessment and thematic validation by the users;
- Not only a binary mask layer (yes/no) of grasslands is required. There is also a requirement to create an intensity indicator layer as a secondary product. This would offer added value to the grassland layer at EU and Member State levels;
- A change detection layer will be required in the future. It will help to monitor land cover in Europe and the most "fragile" grassland areas;
- Increase the promotion of EUROLAND.

In conclusion, the grassland team demonstrated its resolve to improve its work in respect of user requirements. Some of the actions identified will be completed before the end of 2010, including a Mediterranean transect, improved service specification, an intensity indicator and promotion, while others will be addressed in 2011, including the change detection layer.

More information on the meeting and the grasslands specification is available from the workshop minutes on:

[http://etc-lusionet.europa.eu/GMES-Geoland2/Meetings\\_with\\_users\\_in\\_g2/MIIN-g2-EL-User\\_Grasslands\\_I1.00\\_20100902\\_DLR/](http://etc-lusionet.europa.eu/GMES-Geoland2/Meetings_with_users_in_g2/MIIN-g2-EL-User_Grasslands_I1.00_20100902_DLR/).

## HR Wetland Layer Meeting

On July 22nd, the Wetland HR layer was introduced for the first time to the users. The team explained the characteristics and specifications of the HR layer in a well structured presentation with the aim of obtaining maximum feedback from the users.

The final objective of the HR wetlands layer is to create a database including as many wetlands as possible identified through different approaches and databases in order to create a European-wide wetland inventory. The primary product is a mask (yes/no) layer, while secondary products provide information on basic land cover (based on the other four layers), as well as a pressure indicator regarding the proximity of artificial areas. The layer will assist the future policy reporting activities including RAMSAR, the Habitat and Water Framework Directives.

Defining wetlands is a really complicated task. International experts and organisations do not give a unique definition for wetlands and it really depends on the scale (local, national, European or global) and the purpose of the definition. However, in general terms, at European and global organisation RAMSAR is considered as the key and most relevant wetland definition. According to RAMSAR: "Wetlands are areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres. They may incorporate riparian and coastal zones adjacent to the wetlands, and islands for bodies of marine water deeper than six metres at low tide lying within the wetlands" (RAMSAR, 1971).

In addition to existing datasets, seasonal EO data is a critical requirement, as the first exercise over the Alpine transect has shown. 76% of the total wetlands identified (1,209) were extracted exclusively from EO data, as they were not present in other datasets (see Table 2 below).

Imagery	
IMAGE2006: main data source for delineation	GoogleEarth
Landsat images (Global Land Survey 2005 and 2000) AWiFS images (multitemporal)	GoogleEarth and VirtualEarth
AWiFS images (multitemporal)	

<b>Ancillary Data</b>
RAMSAR database Water layer (any source) National wetland databases Topographic maps (when available) Corine Land Cover EUNIS database MEDWET database Birds International. List of important bird areas (online database) NATURA2000 Network Others Water layer (any source) Topographic maps (when available) EUNIS database Birds International. List of important bird areas (online database) Others

Table 2: EO Imagery and Databases used for HR Wetland layer

Beyond the difficulties of a wetland definition, mapping activities from EO imagery is extremely complicated due to, among other issues, the seasonal nature of the wetlands. Stakeholders require apart from wetland location, information about the water regime and water level fluctuation (see Table 3 below).

<b>Primary Product</b>	
<b>Data source code (D_Source)</b>	<b>Water regime (W_regime)</b>
A. Imagery (not in ancillary data, visible in imagery)	A. NonTidal - Saturated
B. Ancillary (in ancillary data, not visible in imagery)	B. NonTidal - Permanent
C. Imagery + ancillary (in ancillary data, and visible in imagery),	C. NonTidal - Highly fluctuant (seasonal)
	D. NonTidal - Intermittently flooded
	E. NonTidal - Unknown
	F. SaltWater Tidal
	G. FreshWater Tidal

<b>Secondary Product</b>
Percentage of other HR layers as an assessment stage
Pressure on wetland (from artificial surface). A future arable land layer will also be used for pressure assessment.

Table 3: Overview of Information included in the HR Wetland

Ending the wetlands presentation, the team presented a list of open issues for further discussion with the users. Following more than 2 hours of productive discussion, a list of actions responding to both service providers and user suggestions was provided (see Table 4 below).

<b>Open Issues</b>	<b>Results and Suggestions</b>
Which is the <b>best definition of wetland</b> ?	An understandable and concise <b>Service Specification description</b> is required. Clear distinction of primary (mask) and secondary products (pressure indicator and others). MedWet organisation offers the wrap-up <b>classification of the wetlands according to RAMSAR and CLC</b> developed in the GlobWetland I project (ESA).

Open Issues	Results and Suggestions
How important are <b>accurate wetland boundaries</b> ?	Users did <b>not have a unique opinion</b> . It is understood that clear boundary definition requires field work and/or very high-resolution (VHR) imagery.
What are the real possibilities to access existing <b>in-situ national datasets</b> ? Would be the action useful for the HR Wetland layer? (many countries, many dates)	<b>InSitu data</b> is required to validate and develop the product. Member States representatives <b>offered access to national databases</b> . Access to the <b>IACS DB</b> would be very useful.
Definition with the users of the optimal dates for data acquisition depending on the European bio-regions	In the Mediterranean, spring and autumn are the best times to detect wetlands. No clear answer from Nordic and central European users.
What has to be mapped first? Water HR layer or Wetland HR layer?	Clear agreement. <b>Water must be mapped first</b> .
Wetlands must fully cover water bodies?	No agreement. Not all water bodies are wetlands but all wetlands have a humid part. According to RAMSAR definition, any water body can be considered as a wetland.
And have artificial wetlands to be mapped?	Common agreement that for 1ha MMU, the <b>best approach is to map them</b> (i.e very relevant in semi-arid regions).
Are pressure indicators as well as water level fluctuation important information?	<b>Analysis of the Water Fluctuation and Wetlands Change Layer</b> . EL teams agree but as an objective for the future and as secondary product.
Other issues discussed	<b>New test sites are required</b> (e.g. in the Mediterranean area). The need to include Mediterranean transects as soon as possible to evaluate the behaviour of the product in different biogeographical areas. <b>Promote cooperation among users and networks of users</b> . EUROLAND - MedWet - EAGLE - EIONET NR

Table 4: Conclusions from the Wetlands Meeting

Finally, the wetlands team confirmed their positive response to the meeting and the helpful feedback provided by users. The work on the Wetland HR layer is continuing in 2010 to implement the new ideas and will go on during 2011 on more test sites according to the final service specifications.

More information on the meeting and wetland specification is available from the workshop minutes on: [http://etc-lusi.eionet.europa.eu/GMES-Geoland2/Meetings with users in g2/MIN-g2-EL-User Wetlands I1.00 20100902 DLR/](http://etc-lusi.eionet.europa.eu/GMES-Geoland2/Meetings%20with%20users%20in%20g2/MIN-g2-EL-User%20Wetlands%20I1.00%2020100902%20DLR/).

### Contact Details:

HR Grassland Layer: Manfred Keil, German Aerospace Center (DLR), Earth Observation Center;  
Email: manfred.Keil@dlr.de

HR Wetland Layer: César Santos, INDRA; Email: csantos@indra.es

User Activities: Alejandro Simon, ETC-LUSI / UAB; Email: alejandro.simon@uab.cat

## 1st GMES Forest Expert Exchange

The FP7 Land Core Project geoland2 aims to develop and demonstrate 5 High-Resolution (HR) thematic land cover layers for future GMES Land Monitoring Core Services. The envisaged HR Layers include: Imperviousness, Forest, Grassland, Wetlands, Small Water Bodies. Once approved, these layers will be rolled out for operational pan-European implementation. These developments follow the latest GMES and stakeholder discussions on the land domain.



A dedicated workshop was organised on Monday, September 6th, 2010 in Lugo, Spain to present and discuss the latest status of the development of the HR Forest Layer, to improve the understanding of user requirements, and to consolidate the technical specifications. Additional aims were to review the enhanced geoland2 HR Layer test site approach addressing all EU-27 countries, to discuss a strategy for improving interactions with users in all EU27 Member States, and to prepare and consolidate an input for the forthcoming NRC meeting in Copenhagen on November 15th-16th, 2010.

The workshop brought experts together from the FP7/geoland2 Forest task, from EIONET National Reference Centres (NRC), as well as national forest experts and stakeholders. The workshop was co-chaired by the GMES Land User Platform represented by the European Topic Centre on Land Use and Spatial Information (ETC-LUSI) and the European Forest Institute (EFI), with support from the geoland2 Forest team as represented by GAF and Metria. Delegates from various user organisations from across Europe (UK, Ireland, Spain, Denmark, Sweden, Austria, and Italy) actively contributed to the discussions.

Selected examples of the first results of the HR Forest Layer in its current design from the boreal, temperate, alpine and Mediterranean eco-regions were presented as well as the latest results from an integrated production of all 5 HR Layers in the Alpine Transect site. Also an improved test site approach was presented. Now all EU27 countries are planned to receive partial coverage from test site mapping.

The users attending the workshop confirmed strong interest in the Forest Crown Cover Density product as a flexible tool for scaling between national and international forest definitions, and the Forest Types product was also considered useful. The users requested that the general product specifications should fully evolve towards the FAO forest definition in terms of Minimum Mapping Unit. It was agreed that future pan-European monitoring approaches need to be developed as a combination of top-down and bottom-up approaches, making best possible use of existing land cover and in-situ data sets at national level, and that Member States need to be included as partners. The improved EUROLAND Forest demo site concept addressing sites in all EU27 states was unanimously welcomed, as it will help the project to get improved understanding of existing data, and provide potential synergies with Member State activities. It was also considered a suitable approach to increase Member State awareness and commitment. Additionally it was stressed that user engagement should be aided by appropriate funding.

Workshop Agenda, introductory presentations and detailed meeting minutes are available on: <http://etc-lusi.eionet.europa.eu/activities/announcements/ann1287563209>.

### **Authors:**

Jo Van Brusselen, European Forest Institute (EFI); Email: [jo.vanbrusselen@efi.int](mailto:jo.vanbrusselen@efi.int)  
Markus Probeck, GAF AG; Email: [markus.probeck@gaf.de](mailto:markus.probeck@gaf.de)

## GMES: Global Monitoring for Environment and Security – Acronyms and Abbreviations

### **CLC - CORINE, Coordination of Information on the environment, Land Cover**

This European Land Cover database for 1990, 2000, 2006 uses Earth Observation data to create information on land cover at scale 1:100,000 and is implemented as part of the European LMCS.

For further information please visit the EEA website ([http://www.eea.europa.eu/publications/technical\\_report\\_2007\\_17](http://www.eea.europa.eu/publications/technical_report_2007_17)) and ETC-LUSI website (<http://etc-lusi.eionet.europa.eu/CLC2006>).

### **DG - Directorate General**

The Commission is divided into departments known as Directorates-General (DGs or the services), each headed by a Director General, and various other services. Each covers a specific policy area or service such as Environment or Regional Policy. DGs prepare proposals for their Commissioners, which can then be put forward for voting in the college of Commissioners.

For further information please visit the European Commission website. ([http://ec.europa.eu/about/ds\\_en.htm](http://ec.europa.eu/about/ds_en.htm)).

### **EAGLE - EIONET Action Group on Land Monitoring in Europe**

A small group of NRCs with a focus on land cover supporting the future specification of the European Land Monitoring Programme including technologies, product development, object oriented models, etc.

For further information please visit the EIONET website (<http://etc-lusi.eionet.europa.eu/EAGL%20-%20Eionet%20Group%20LC>).

### **EARSeL - European Association of Remote Sensing Laboratories**

EARSeL is a scientific network of European remote sensing institutes, coming from both academia and the commercial/industrial sector. EARSeL is unique in that it represents the interests of these institutes rather than individuals. About 250 laboratories are addressed by EARSeL.

Further information please visit the EARSeL website. (<http://www.earsel.org/?target=earsel/earsel>).

### **EIONET - European Environment Information and Observation Network**

EIONET is a partnership network of experts including representatives of the EEA, its member and cooperating countries. The main agencies include:

- ETCs: European Topic Centres. A consortium of organisations from EEA member countries with expertise in a specific environmental area contracted by the EEA to support the EEA work programme;
- NFPs: National Focal Points. A group of experts in national environmental organisations nominated and funded by the country and authorised to be the main contact point for the

EEA. The NFP coordinates the national network in order to support the implementation of the EEA work programme;

- NRCs: National Reference Centres. They are nationally funded experts or groups of experts in organisations which are regular collectors or suppliers of environmental data at the national level and/or possess relevant knowledge of specific environmental issues, monitoring or modelling.

For further information visit the EIONET website (<http://www.eionet.europa.eu/about>).

## **g2 - Operational Monitoring Services for our Changing Environment**

Linked to the GMES LMCS the aim is to prepare, validate and demonstrate pre-operational service chains and products that will underpin the LMCS (i.e. continental products to complement CLC, 5 High Resolution Layers etc) and create the opportunity for dialogue with the stakeholder communities.

geoland2 consists of two layers: The Core Mapping Services (EUROLAND, SATChMo, BioPar) provide land cover, land use and land cover change information, as well as a range of bio-physical parameters as an input to more elaborated services. The Core Information Services (Spatial Planning, Agri-Environmental Monitoring, Water Monitoring, Forest monitoring, Land Carbon, Natural Resource Monitoring in Africa (NARMA), Global Crop Monitoring) offer specific information to support European Environmental Policies and international treaties on Climate Change, food security and the sustainable development of Africa.

For further information please visit the geoland2 website (<http://www.gmes-geoland.info/>).

## **GIO - GMES Initial Operations**

GIO aims to establish a legal basis for the GMES programme (2011 - 2013) in respect of emergency response, land monitoring, user uptake, data access and in-situ collection as well as the space component. The Commission proposal (COM (2009) 223 final) for a regulation on the GMES Programme is expected to be adopted by the end of 2010.

For further information, download the first reading of the proposal for GIO (<http://www.land.eu/upload/st10980.en10.pdf>).

## **GMES - Global Monitoring for Environment and Security**

A European initiative established in 1998 and financed by the European Commission (FP6, FP7), European Space Agency (ESA projects) as well as public and private contributions (Co-financing in EU projects).

GMES aims to develop and implement services to support the monitoring of the environment and security based on both EO and in situ data. The implementation of GMES commenced in 2008 with three Fast-Track Services: Land, Marine and Emergency Response, supported by two additional pilot services: Atmosphere and Security.

For further information please visit the GMES website (<http://www.gmes.info/>).

## **GNU - GMES Network of Users**

GNU is the only GMES project lead by the users. It is an independent platform built by the end users of the environmental products of the GMES programme. The aim of GNU is threefold:

- To defragment the environmental GMES user communities and enable independent and unfiltered use statements;
- To link data-related and human aspects of the socio-technological system GMES and provide a mouthpiece for the needs of GMES users;
- To add and distinguish the evaluations of the GMES products made by the end users participant in the existing GMES projects.

Further information please visit the GNU website (<http://www.gmes-network-of-users.eu/>).

## **GSE - GMES Service Elements**

GSE - GMES Service Element was the first ESA programme fully dedicated to GMES. It focuses upon the delivery of policy-relevant services to end-users, primarily (but not exclusively) from Earth Observation (EO) sources. GSE is a key element of GMES, since it enables end-users to become involved in 'closing the loop' between the operational results obtained from the present generation of EO satellites and the definition of future systems.

For further information please visit the ESA website ([http://www.esa.int/esaLP/SEMSVM0DU8E\\_LPgmes\\_0.html](http://www.esa.int/esaLP/SEMSVM0DU8E_LPgmes_0.html)).

## **LMCS - The GMES Land Monitoring Core Service**

EEA defines the Land Monitoring Core Service (LMCS) as follows:

1. Orthorectified satellite images
2. Land use / land cover ground survey
3. Reference mapping
4. Land cover and land cover change mapping at global, continental and local level
  - Local component: focus on land cover / land use mapping of sensitive or specific geographic or rapidly changing areas; VHR images ( $\leq 2.5$  m); periodic updating; e.g. "Urban Atlas" type,
  - Continental component: focus on land cover / land use mapping information all over Europe based on high spatial resolution (HR) images (20-30 m) and a temporal update of 3-5 years to annual, plus more elaborated information products to address a wide range of European policies and Directives.
  - Global component: focus on production of biophysical parameters at global scales and more elaborated information products to support the EU international development co-operation policies and the implementation and monitoring of international conventions; based on low (LR) or medium (MR) spatial resolution images (1 km-250 m) with a high time resolution from near real time monitoring systems to 5 yearly products (e.g. GLOBCOVER).
5. Quality control and quality assurance
6. Product dissemination
7. Data archiving

For further information please visit the GMES website (<http://www.gmes.info/pages-principales/library/implementation-groups/land-monitoring-core-service-lmcs/>) and ETC-LUSI website (<http://etc-lusi.eionet.europa.eu/Land%20Monitoring%20Core%20Service/>).

## **LUCAS - Land Use/ Cover Area Frame Survey**

The Land use/ cover area frame statistical survey, abbreviated as LUCAS, is a European field survey programme funded and executed by Eurostat. Its objective is to set up area frame surveys for the provision of coherent and harmonised statistics on land use and land cover in the European Union. In addition, it is to provide information on agriculture, the environment, landscapes and sustainable development, ground evidence for calibration of satellite images and a register of points for specific surveys (such as soil, biodiversity etc.) and for the core European in-situ data collection network.

For further information please visit the Eurostat website. ([http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/LUCAS — a multi-purpose land use survey](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/LUCAS_-_a_multi-purpose_land_use_survey)).

## **MS - Member States**

A MS of the European Union is a state that is party to treaties of the European Union (EU) and has thus taken on the privileges and obligations of EU membership. Unlike membership of an international organisation, being an EU member state places a country under binding laws in exchange for representation in the EU's legislative and judicial institutions. On the other hand, unlike being a member of a federation (such as a U.S. state) EU states maintain a great deal of autonomy, including maintaining their national military and foreign policy (where they have not agreed to European action in that area).

For further information please visit the European Union website ([http://europa.eu/about-eu/member-countries/index\\_en.htm](http://europa.eu/about-eu/member-countries/index_en.htm)).

## **SDI - Spatial Data Infrastructure**

"An SDI is a coordinated series of agreements on technology standards, institutional arrangements, and policies that enable the discovery and use of geospatial information by users and for purposes other than those it was created for." Kuhn, 2005

Further Information please visit the GSDI website (<http://www.gsdi.org/>).

## **SEIS - Shared Environmental Information System**

SEIS is a collaborative initiative between the European Commission, EEA and member countries of the EEA. It aims to interconnect existing databases to make the data accessible to everyone, specifically:

- Improve the quality and quantity of information required for European policy;
- Connect the information systems and provide online services;
- Facilitate environmental reporting facilitating information flow between all levels (national, European and global);
- Promote web-based applications.

For further information please visit the EEA website (<http://www.eea.europa.eu/about-us/what/shared-environmental-information-system>).

## Sentinel - GMES Sentinel

ESA's new five satellite missions addressed for the operational needs of the joint European Commission - ESA GMES programme. Each Sentinel mission is based on a constellation of two satellites to fulfil, revisit and coverage requirements to provide robust datasets for GMES Services.

For further information please visit the ESA website ([http://www.esa.int/esaLP/SEM097EH1TF\\_LPgmes\\_0.html](http://www.esa.int/esaLP/SEM097EH1TF_LPgmes_0.html)).

### Authors:

Alejandro Simon, ETC-LUSI / UAB; Email: [alejandro.simon@uab.cat](mailto:alejandro.simon@uab.cat)

Núria Blanes, ETC-LUSI / UAB; Email: [Nuria.Blanes@uab.cat](mailto:Nuria.Blanes@uab.cat)

Steffen Kuntz, Infoterra GmbH; Email: [steffen.kuntz@infoterra-global.com](mailto:steffen.kuntz@infoterra-global.com)

David Ludlow, UWE; Email: [David.Ludlow@uwe.ac.uk](mailto:David.Ludlow@uwe.ac.uk)

## Help us to improve the GMES Land User NL

With the GMES Land User Newsletter we are aiming to provide the Land User Community with the latest news, reports and information about what is going on in the Land domain. In order to tailor the content and format of the newsletter to your needs, we would kindly ask you to help us by completing a little online questionnaire. Tell us what you like about the newsletter, what content you would like to see covered more or what ideas for improvements you have. Completing the questionnaire will only take a few minutes. Thank You very much for your support.

**Simply complete our Online Questionnaire here:**

<http://www.gmes-geoland.info/project-documentation/questionnaire>

**Your feedback will help us to provide you with the News you need!**

Newsletter sponsored by the European Commission



GSE Land

geoland:2

BOSS4GMES

GMES Land User Federation Activities	GMES Land (GSE Land / geoland) Communications represented by	Project funded by	Newsletter Editor
European Topic Centre on Land Use and Spatial Information Andreas Littkopf ETC/LUSI Manager Universitat Autònoma de Barcelona Edifici C - Torre C5 Senars 4a planta 08193 Bellaterra (Barcelona), Spain T +34 93 581 3519 F +34 93 581 3545 <a href="mailto:andreas.littkopf@uab.es">andreas.littkopf@uab.es</a>	Infoterra GmbH Judith Metschies 88039 Immenstaad, Germany T +49 (0)7545 8 4267 F +49 (0)7545 8 1337 <a href="mailto:judith.metschies@infoterra-global.com">judith.metschies@infoterra-global.com</a> <a href="http://www.infoterra.de">http://www.infoterra.de</a>	REA - Research Executive Agency Virginia Puzzolo Place Rogier, 16 1049 Brussels, Belgium T +32 (02) 29 90115 F +32 (02) 29 79646 <a href="mailto:virginia.puzzolo@ec.europa.eu">virginia.puzzolo@ec.europa.eu</a>	David Ludlow UWE Bristol, BS16 1QY, UK T +44 (0) 117 328 3223 F +44 (0) 117 328 3579 <a href="mailto:david.ludlow@uwe.ac.uk">david.ludlow@uwe.ac.uk</a> <a href="http://www.uwe.ac.uk">http://www.uwe.ac.uk</a>