

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

We welcome you to the 14th issue of the GMES Land User Newsletter.

This newsletter edition provides you with the state-of-the-art of geoland2 Core Mapping Services, an overview of the last NRC land cover meeting, a summary of the geoland2-EAGLE-MS.MONINA joint meeting, and a summary of the user assessment of the High Resolution Layers developed in geoland2.

To conclude the newsletter, we provide an introduction to three new FP7 projects promoting the GMES land component (HELM, MS. MONINA and EUFODOS), plus a listing of the most relevant upcoming events.

***Yours  
Andreas Littkopf***

## Content:

- ⇒ geoland2 Project Review Meeting
- ⇒ EIONET NRC Land Cover Workshop
- ⇒ Joint Meeting of geoland2, MS.MONINA and EAGLE
- ⇒ Summary of the High Resolution Layer User Assessment
- ⇒ New Project: HELM - Harmonised European Land Monitoring
- ⇒ MS. MONINA - Multi-scale Service for Monitoring NATURA 2000 Habitats of EC Interest
- ⇒ EUFODOS - Improved Information on Forests
- ⇒ Upcoming Events

## geoland2 Project Review Meeting

On December 2nd and 3rd 2011, the second annual geoland2 review meeting took place at the Research Executive Agency (REA) in Brussels. The geoland2 Executive Board was invited to **report on the current status of geoland2** over the past year. Presentations were made to the project officer and the review panel about the **main developments and achievements for each task**, building on the recommendations provided by the technical review report. As geoland2 has an overall duration of four years, this review meeting may be regarded as a mid-term review. Recommendations provided by the meeting will provide the basis for reshaping future geoland2 activities.

At the meeting the Core Mapping and Core Information Services were demonstrated, showing significant development of product based on user defined need. The dissemination of data through the project data portal has improved data availability and usability.

**Author:**

Elisabeth Schmeer; Astrium GEO-Information Services; Email: [elisabeth.schmeer@astrium.eads.net](mailto:elisabeth.schmeer@astrium.eads.net)

## EIONET NRC Land Cover Workshop

geoland2 Task Managers and the EIONET NRC Land Cover Group met again in Copenhagen in November 2010 in the context of a GMES in situ coordination (GISC) land service workshop organised by the GISC group of the EEA.

Discussions were held concerning GIO, GMES High Resolution Layers (HRL), in-situ data coordination, links to global activities, data acquisition procedures, CORINE next steps, etc. Minutes from NRC Land Cover - EAGLE workshops can be downloaded on the EIONET website: <http://sia.eionet.europa.eu/EAGLE>.

For the GMES Land Community, the most important outcomes and discussions are highlighted below.

- 2 examples of the 5 High Resolution Layers (Imperviousness, Forest, Grasslands [1], Wetlands, Small Water Bodies) located in 2 different regions are available for download [2]. Feedback on the test cases presented including priorities for selection of High Resolution Layers is vital, consequently an online questionnaire will be provided to be analysed by the geoland2 - User Platform.
  - The first verification of High Resolution Layers demonstrated the robustness of the approach. But:
    - Further clarification of user requirements for definition of thresholds e.g. forest - shrubs and especially for the 'Grassland' layer is needed;
    - There are still inconsistencies between the 'Water' and Wetlands' layers;
    - Compared to JRC forest map, GIO forest layer offers additional information (crown density) and a flexible rather than fixed classification;
    - For the 'Imperviousness' layer, a threshold of 30% instead of 80% is recommended to be used in built-up areas (ETC/LUSI validation report);
    - A strong request for 0.5 ha mapping for FAO, UN-ECE forest reporting obligations to be taken into account in the service design. However, a Minimum Mapping Unit of 1 ha is recommended by geoland2 to avoid inconsistencies in the products;
    - Further investigation and clarification regarding the appropriate handling of semantic and geometric accuracy as well as validation.
  - For reduction of costs of the CLC update and mapping, an 'expected change layer' has been requested as an intermediate product of HR classification. An appropriate method has to be proposed taking into account change detection vs. signal / noise ratio.
- GMES can support Member States (MS) with monitoring obligations (e.g. Directives on Air Quality, Habitats, Marine Strategy, Water, Floods etc.) and also in reviewing the effectiveness of policies, compliance and assessments of their impacts. However, it has

been acknowledged by DG ENV that GMES products are not used sufficiently, recognising the need for intermediate actors like EEA or JRC in order to interpret the data in the policy context. But:

- Role of the MS in relation to the production of the High Resolution Layers should be clarified, and a possible mixed scheme will be proposed;
  - Investigation of potential for High Resolution Layers to be derived from national datasets will be undertaken, and MS will inform GMES Bureau of the outcomes;
  - Need to synchronise activities with MS, including national land cover production timelines, in-situ exercises and national procurement of satellite data. Duplication of costs must be avoided and MS should be allowed to use available datasets to produce harmonised national products.
- In addition, a short presentation and discussion on the GMES User Forum (UF) took place. The UF is legally based on Art 17 of the GIO Regulation (EU) 911/2010, and it will advise the EC in defining and validating user requirements. It will be composed of representatives of MS public sector users, appointed by the MS.
    - It is necessary to have an adequate user representation to make services fit-for-purpose, and to facilitate better synergy between national monitoring activities.

Finally, discussion of geoland2 High Resolution Layer developments, including the outcomes of the evaluation performed with the EIONET NRC Land Cover representatives took place in Frankfurt, on 9 and 10th March, 2011.

## Author:

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

---

[1] An update of the Grassland layer will be provided in 2011.

[2] <http://www.geoland2.eu/portal/service/ShowServiceCategoryDirectory.do>

## Joint Meeting of geoland2, MS.MONINA and EAGLE

The aim of the meeting was “to **provide a full overview of the High Resolution Layers (HRL)** developed within geoland2, cooperation with MS. MONINA project, and Member States (MS) opinion and roles.” The EAGLE group presented their expectations towards better understanding of the latest progress on the HRL, and in particular with regard to the changes in the Grassland HRL, change detection techniques, validation, and user update initiatives. Finally, FP7 MS.MONINA coordinator presented the aims of the project, and their interest to secure mutual understanding and synergies.



A general **presentation on the state-of-the-art of GIO** was provided by a representative of EEA. Questions arising concerned the promotion of better understanding of GIO including overlaps in HRL and CLC production, the need for an appropriate Earth Observation (EO) data acquisition window, clarification of the contributions of the MS, as well as the validation procedures, and the role of the GMES in-situ coordination project.

Subsequently, the **Land Monitoring Core Service (LMCS) continental and local components were presented** by the geoland2 team as a continuation of the Copenhagen NRC Land Cover meeting in November 2010, and the Bonn meeting in November 2009 between geoland2 and EAGLE.

Useful comments in the discussion included:

- EAGLE (EIONET members), once more, expressed great interest in the HR density layer approach (primary layers) as part of the European LMCS. The future European LC data model will promote the integration of this information (i.e. populating CLC polygons or 1 km grid cells);
- Demand for full-pixel detailed thematic HRL information without application of any Minimum Mapping Unit (MMU). The geoland2 team evaluated this approach as a downstream mapping service, in view of additional mapping effort, EO data requirements, etc, rather than a core monitoring service as per the HRLs;
- geoland2 stated that good communication between EEA - EC - ESA is essential for the success of EO projects as well as GIO initiative (i.e. to promote the appropriate EO data acquisition windows)

Specific comments on different geoland2 components were provided with the exception of the Imperviousness layer which had been previously reviewed by EEA and MS.

- **HR Forest Layer:** Users see this as one stage of development following the HR Imperviousness layer. Main comments were linked to 1) the need to adjust the MMU to 0.5ha; 2) the production of the crown cover density layer from 10-100% (instead 0-100%), due to cost, effort, accuracy and lack of reporting requirement for a density range of 0-10%; and 3) the need to show the first quantitative validation results for this HRL.
- **HR Wetland Layer:** Four ideas were emphasised by many users. 1) HRL Wetland is not seen as a quantitative (density) layer rather the first EU wetland inventory; 2) a good example showing the Decentralised - Centralised GIO approach using EU and MS wetland data if available; 3) need to use semi-automatic processing chains instead of visual interpretation; and 4) need for a clear definition of wetlands, as one step forward from the RAMSAR definition.
- **HR Water Layer and Biophysical Parameters:** The new concept on Biophysical parameters derived from spectral information, was appreciated by the MS as information to complement the HRL production in GIO. However, key questions concerning the validation procedure, the type of sensor and number of EO scenes per year required are still being discussed.
- **HR Grassland Layer:** The new approach presented based on the development of biophysical parameters was welcomed, as it overcomes previous methodological limitations. New steps will be undertaken in 2011 to consolidate the service specifications.
- **LMCS Continental Change Detection:** This information was one of the most requested datasets by MS at previous meetings. A list of different methods was presented and a new report is available in ETC/SIA webpage for all the stakeholders.
- **geoland2 SATChMo - AFS:** The goal is to develop a methodology to produce probability layers in order to help local monitoring activities. The local component was seen as the perfect complement to the EU LCMS not only for validation purposes but also for hot-spot monitoring.

- **Validation of GMES HR layers:** A new and long-awaited approach for validating the HRL primary products (density layers) was presented. This demonstrated the relevance of clear, user-based and mature service specifications to provide a good quantitative (with error estimations) validation approach. Likewise, further investigation and information raises several key issues: 1) need to develop an overall quantitative accuracy at each level (EU and/or national); 2) need to develop a methodology harmonised at EU Level and accepted by MS (as with the CORINE Land Cover exercise); and 3) need to determine how GIO will assess the validation procedures.

At the end of the meeting, two presentations were given on the INSPIRE Thematic Working Groups (TWG) on Land Cover and Land Use. Both TWGs are working in close cooperation, focusing on the development of the next EU LC data model and land use dataset integration. More information is expected after the summer break.

A complete package of information about this workshop (agenda, presentations and minutes) is available on the ETC/SIA website:

[http://sia.eionet.europa.eu/EAGLE/EAGLE\\_5rdMeeting\\_g2\\_MONINA\\_FFM/index.html](http://sia.eionet.europa.eu/EAGLE/EAGLE_5rdMeeting_g2_MONINA_FFM/index.html).

#### **Author:**

*Núria Blanes; UAB - ETC/SIA; Email: [Nuria.blanes@uab.cat](mailto:Nuria.blanes@uab.cat)*

*Alejandro Simon; UMA – ETC/SIA; Email: [alejandro.simon@uma.es](mailto:alejandro.simon@uma.es)*

## **Summary of the High-Resolution Layer User Assessment**

At the end of 2010 the geoland2 user platform developed a **questionnaire to evaluate the High Resolution Layers (HRL) being developed by the Core Mapping Service (CMS) EUROLAND**. A summary of the entire report was presented at the last geoland2 EAGLE meeting and published on the EIONET website "EUROLAND-User Assessment Summary based on On-Line survey" (final document will be available by mid 2011). ([http://sia.eionet.europa.eu/EAGLE/EAGLE\\_5rdMeeting\\_g2\\_MONINA\\_FFM/index.html](http://sia.eionet.europa.eu/EAGLE/EAGLE_5rdMeeting_g2_MONINA_FFM/index.html))

Different groups and institutions were invited to participate in the on-line survey:

- The EIONET NRCs (Land Cover; Land Use; and Agriculture and Forestry; and those suggested by the initial NRC contacts); and
- The National Forest Inventories (NFIs)

More than 200 people and 30 countries received an invitation to participate in the questionnaire. **32 institutions or people provided complete responses** for one or several High Resolution Layers (HRL).

**Final and complete report** of the assessment performed by the respondents will be **available by mid 2011**, and will include summaries of all results, as well as detailed answers and computation methods used, plus further documentation provided by NRC representatives.

Several respondents commented that the evaluation was rather general and generic due to the fact that test sites were not available in their countries, and that, responses could have been more detailed if new test sites could be produced. Currently there are 2 test sites for which all 5 HRL layers have been produced: 1) EU-05 Alpine transect Munich-Innsbruck-Verona (30,926 sqkm), and 2) EU-07 Greek areas of Thessaloniki (10,173 sqkm).

The Forest HRL team also has test sites in Finland, Sweden, Germany, Austria, Bulgaria/Greece, and from 2011 new test sites in each of the 27 EU Member States (MS) (where possible including border areas between 2 or more different states), and the rest of HRL will be produced at 2 or 3 more test sites.

Provided that new data is available, the geoland2 User Platform will invite potential users to evaluate the usefulness, compatibility, etc. of the products developed. A comparison of the results obtained in previous evaluations could serve to determine if products have improved.

## METHODOLOGY OF THE ANALYSIS

The analysis has focused on 4 main items per HRL:

- **Analysis of the respondents' typology:** This analysis categorises users responding to the questionnaire into 4 groups (1) private companies, (2) public bodies, (3) universities or research institutions and (4) other types of institutions.
- **Overall analysis:** The objective is to quantify the answers received. The categories include: A) Fulfilment of users requirements, B) Usefulness of the HRL, and C) Harmonisation / Compatibility of the products developed. [see Figure 1 below]
- **Detailed analysis of the expected benefits:** The objective is to provide a more detailed analysis of benefits that the respondents can foresee for each HRL.
- **Main comments, especially related to initiatives and benefits:** Comments to be considered in the next developments.

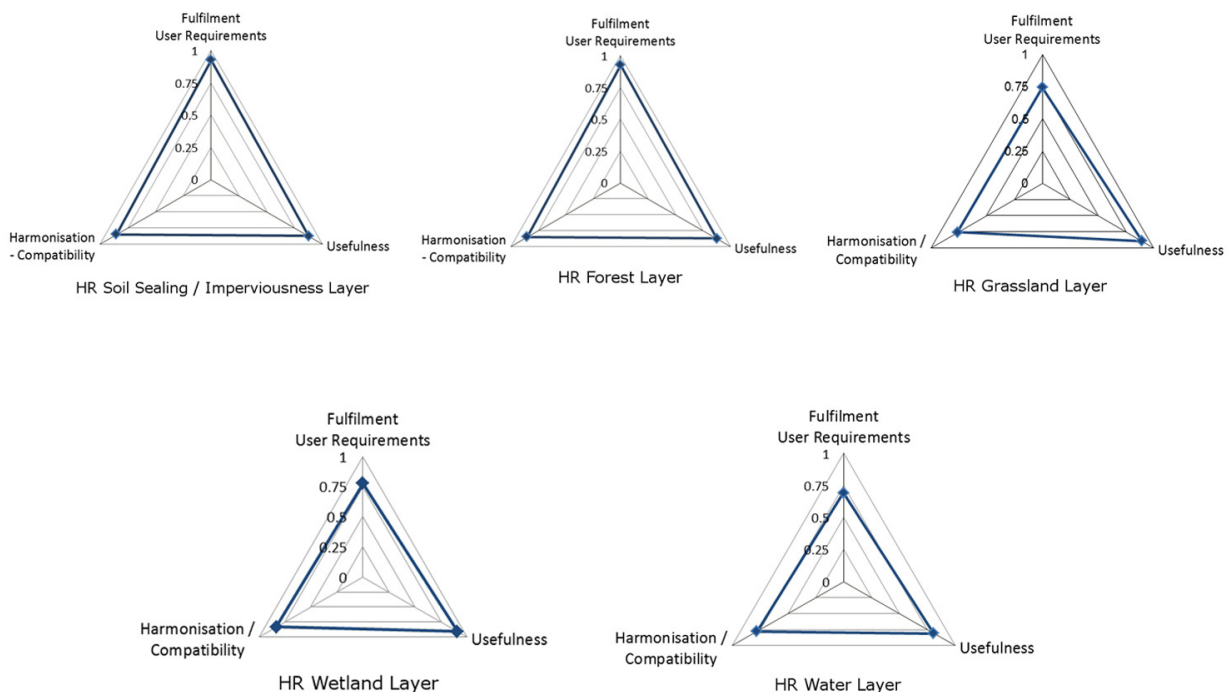


Figure 1 Overall Analysis of the HR Layers

These outcomes have been presented at a joint meeting between EUROLAND Task Managers and EIONET NRC Land Cover representatives, most of them respondents to the questionnaire. Several improvements proposed at the meeting are highlighted below:

- Demonstrate the value of the products, especially for end users. Therefore, it is important to extend the number of test sites, to cover more countries and more area. This would lead to better acceptance of the products;
- Support the integration of the current and future HRLs in the national systems of the users, providing them with a delivery plan in advance;
- Communications clarifying the specific use of the HRL at MS level and the expectations for the next 10 - 20 years regarding the LMCS will build mutual understanding;
- MS together with Service Providers should develop show cases, demonstrating the usefulness of the developments and products;
- GIO should provide test beds for preparing operational services.

## Authors:

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

Alejandro Simon; UMA - ETC/SIA; Email: [alejandro.simon@uma.es](mailto:alejandro.simon@uma.es)

Tim Green; EFI; Email: [tim.green@efi.int](mailto:tim.green@efi.int)

## HELM - Harmonised European Land Monitoring



### European authorities develop a strategy to coordinate their data on land cover and land use

Information about land cover and land cover change is vital for a wide range of purposes including spatial planning, nature conservation and the protection of river basins. Data is collected via land monitoring, with experts monitoring the quality of land and its current use, and land use change, over extended periods of time. The aim of the HELM (Harmonised European Land Monitoring) network, which commenced activities in January 2011, is to **develop a harmonised, efficient**

**European system for land monitoring**, which is also **designed to support EU reporting obligations**. The HELM network consists of local authorities from all over Europe, which collect, update and evaluate data on national land use and land consumption.

HELM aims to ensure **continuous knowledge transfer between national, regional and European authorities**, in order to enhance the quality of European land monitoring and to encourage better use of available resources. Coordinated data collection and harmonised data interpretation enable alignment of national systems and provide the **basis for a permanent integration and combination of data** across all levels of administration.

## Focus on land development

Geodata are based on surveys, aerial images, satellite images and other sources. They are continuously updated and made available as thematic maps. They provide information about land use, land use change and the state of the environment and therefore provide the basis for an environmentally sound, resource-efficient and sustainable use of the Earth's surface.

Online in late April 2011:

<http://www.FP7HELM.eu>

<http://www.twitter.com/FP7HELM>

### Author:

*Dr. Herbert Haubold; Umweltbundesamt Österreich - Environment Agency Austria; Email: [herbert.haubold@umweltbundesamt.at](mailto:herbert.haubold@umweltbundesamt.at)*

## MS.MONINA - Multi-scale Service for Monitoring NATURA 2000 Habitats of EC Interest



### Research project on European biodiversity monitoring successfully launched

In the spirit of the International Year of Biodiversity 2010, an **international team of researchers, small and medium enterprises and users** has recently launched a GMES (Global Monitoring for Environment and Security) **project exploring biodiversity** as a 'new emerging area' of European and global attention.

The project called MS.MONINA offers **remote sensing based monitoring services for observing and managing the state of NATURA 2000 sites and other precious habitats** outside the existing network of protected areas to reduce the loss of biodiversity.

At the kick-off meeting in Salzburg, last December, a first step was taken towards **defining and implementing new concepts and methods combining Earth Observation (EO) data and in-situ data** with the aim to support public authorities in implementing policies and measures.

The University of Salzburg with Z\_GIS as its geospatial center of competence is proud to lead this project with **partners from 9 European countries**. The MS.MONINA service portfolio will specifically address reporting and monitoring needs on three levels: EU level, Member State (MS) level and the local site management. While European nature conservation will substantially benefit from this initiative, the tools and services developed will also have a global impact.

The project will support the GMES endeavor of supporting EU actors on various levels and, by demonstrating the power of EO-based methods for monitoring sensitive ecological sites, also contributes to the GEO societal benefit area of biodiversity.

### Authors:

*Stefan Lang; University of Salzburg, Z\_GIS Centre for Geoinformatics; Email: [Stefan.Lang@sbg.ac.at](mailto:Stefan.Lang@sbg.ac.at)*

*Lena Pernkopf; University of Salzburg, Z\_GIS Centre for Geoinformatics; Email:*

*[Lena.Pernkopf@sbg.ac.at](mailto:Lena.Pernkopf@sbg.ac.at)*

## EUFODOS - Improved Information on Forests



Forests play a key role in the European economy and environment. This role incorporates ecological as well as economic functions, which can be affected by the occurrence of insect infestations, storms or windfall events. Local or regional authorities thus require detailed information on the degradation status of their forests to be able to take appropriate countermeasures against forest damage and to ensure sustainable forest management.

The EUFODOS project will use state-of-the-art satellite and laser scanning technology to **provide forest authorities with cost-effective, timely and comprehensive information on forest structure and damage**. EUFODOS is carried out within the GMES programme and is scheduled to run from **January 2011 to the end of 2013**.

### The main goals

The European Earth Observation Programme GMES provides data useful in tackling a range of issues including climate change and citizens' security. The purpose of GMES is to deliver information, which corresponds to user needs. The Forest Downstream Services (FDS) to be developed by **EUFODOS focuses on the assessment of forest damage and the measurement of functional parameters for commercial and protected forests**. For example, protected forests have an important function to maintain the safety of settlements and infrastructure in alpine areas. The monitoring services, urgently required by regional European forest authorities, will be developed to an operational level by a consortium of research organisations and commercial service providers from Austria, Germany, Finland, Italy, Bulgaria and Poland.

Although the main focus in EUFODOS is on regional services, it is also proposed to offer the results to higher authorities in order to **support their reporting obligations in relation to national and international forest policies**, e.g. the Ministerial Conference on the Protection of Forests in Europe (MCPFE) and Pan-European Indicators on Sustainable Forest Management, UNECE/FAO Forest Resource Assessment, ICP Forests and ICP Integrated Monitoring or the Alpine Convention.

In EUFODOS it is mandatory to use existing capacities, for example, from projects like geoland, GSE-FM, SAFER, FUTMON or JRC activities like EFDAC or EFFIS. Also EFDAC or NFI data will be considered as potential data sources.

### The benefits

The use of space- and air-borne sensor platforms allows data to be acquired at **short time intervals and in a cost effective way**. For instance, a first assessment of windfall damage could be derived from satellite data faster and with lower costs than by multiple helicopter flights or field trips. The Forest Downstream Services will therefore provide **fast and reliable information for effective damage assessment and sustainable forest management at a regional scale**.

The data can be utilised by users in a wide range of applications:

- **Effective damage assessment and countermeasures:** identification of damaged areas - due to storm, fire or insect infestations - in order to enable proper countermeasures, compensation payments and reforestation planning;
- **Sustainable management of protection forests:** targeted management of protected forests in order to maintain and enhance their protective function against natural hazards;

- **Sustainable management of commercial forests:** wood procurement planning and strategic investment planning for commercial forests;
- **Reporting:** revision of forest maps and inventories, compilation of regular reports and annual statistics (e.g. changes in forested area), establishment of forest damage information systems.

EUFODOS involves an **extensive user community** well connected to other related GMES User Groups. These relations will facilitate the roll-out of the services and create strong socio-economic benefits.

**Author:**

Mathias Schardt, JOANNEUM RESEARCH, Email: [mathias.schardt@joanneum.at](mailto:mathias.schardt@joanneum.at)

## Upcoming Events

### **Lets embrace space - FP7 space conference 2011**

12. - 13. May 2011, Budapest, Hungary

The conference will take place at the Marriott Hotel in Budapest, and will address all topics in the FP7 Space Work Programme.

Website:

[http://ec.europa.eu/enterprise/newsroom/cf/itemlongdetail.cfm?item\\_id=4845&tpa\\_id=1004&lang=en](http://ec.europa.eu/enterprise/newsroom/cf/itemlongdetail.cfm?item_id=4845&tpa_id=1004&lang=en)

### **31th EARSeL Symposium 2011**

30. - 3. June 2011, Prague, Czech Republic

The meeting will be accompanied by:

- 4th Workshop on Land Use & Land Cover: Funded by geoland2; Website: <http://www.earsel.org/SIG/LULC/workshops.php>
- 1st Workshop on Forestry; Website: <http://www.earsel.org/SIG/Forestry/call.php>
- 3rd Workshop on Education and Training; Website: <http://www.earsel.org/SIG/ET/3rd-workshop/index.php>
- 5th Workshop on Remote Sensing of the Coastal Zone; Website: <http://www.earsel.org/SIG/CZ/5th-workshop/index.php>

### **geoland Forum\_7**

Mid-September 2011, Warsaw, Poland

The meeting will focus on the future of the LMCS and the GMES Initial Operations (GIO). The date and further details will be announced shortly.

## Newsletter sponsored by the European Commission



GSE Land

geoland:2

BOSS4GMES  
Building Operational Geospatial Services

GMES User Plattform European Topic Centre for Spatial Information and Analysis (ETC/SIA)	GMES Land (GSE Land / geoland) Communications represented by	Project funded by	Newsletter Editor
<p>Andreas Littkopf Alejandro Simon Universidad de Málaga Edificio Habitec. PTA C/ Marie Curie, nº 22, 29590, Campanillas, Málaga, Spain T +34 952020548 andreas.littkopf@uma.es alejandro.simon@uma.es</p> <p>Nuria Blanes Universitat Autònoma de Barcelona Edifici C - Torre C5S, 4º Planta 08193 Bellaterra, Barcelona, Spain T+34 935813867 Nuria.blanes@uab.cat</p>	<p>Astrium GEO-Information Services - Infoterra GmbH Judith Metschies 88039 Immenstaad, Germany T +49 (0)7545 8 4267 F +49 (0)7545 8 1337 judith.metschies@astrium.eads .net <a href="http://www.infoterra.de">http://www.infoterra.de</a></p>	<p>REA - Research Executive Agency Virginia Puzzolo Place Rogier, 16 1049 Brussels, Belgium T +32 (02) 29 90115 F +32 (02) 29 79646 virginia.puzzolo@ec.europa.eu</p>	<p>David Ludlow UWE Bristol, BS16 1QY, UK T +44 (0) 117 328 3223 F + 44 (0) 117 328 3579 david.ludlow@uwe.ac.uk <a href="http://www.uwe.ac.uk">http://www.uwe.ac.uk</a></p>