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Dear Members of the Land Data User Community,

Given the state-of-the-art of the GMES programme, and in particular the issues and projects related to Land Monitoring, which are the focus of this GMES Land Newsletter, it is an excellent time to consider the different views, opinions and expectations of the various stakeholders.

All stakeholders are deeply involved in current discussions taking place on the different approaches to the development of a new minimum European standard for land monitoring. A key question is how to reach a balance between 'top-down' initiatives at the EU level under the GMES umbrella, and 'bottom-up' approaches based on the national land monitoring programmes from the member states, all of which aim to achieve the maximum level of standardisation, harmonisation, timeliness and synergy.

To date analysis of the whole situation has mainly been undertaken at the project level and within the context of user federations. However, what is also needed is a vision of the future and a basis for proceeding into the forthcoming GMES transition period with the introduction of fully operational services.

This newsletter addresses the needs and visions of different GMES stakeholders and provides an insight into the present status of discussion towards a common implementation scheme for GMES.

Contributors to this newsletter have all addressed questions concerning their expectations, current deficits, problems at the projects level or with the GMES programme in general, as well as possible measures to overcome the obstacles identified.

We invite you to take a closer look at the interesting analysis that follows, and to join in the ongoing debate about the land monitoring programmes.

Yours
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CONTENT

GMES Land Services - Status and Outlook

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The GMES Land Services offer a series of advanced land related geo-information services at the regional, European and global scales. These services have been developed within the framework of a number of projects, with the aim to support public institutions of the European Commission (EC) and the Member States (MS) in their management and reporting obligations that arise from the implementation of new environmental EU-directives and international treaties.

In 2007 the Soil Sealing Fast Track Service Precursor became the first operational GMES service, providing information on sealed areas across Europe. A series of additional operational services will follow, covering thematic areas including land use change, water quality and availability, spatial planning, forest management, carbon storage and global food security.

The basis for the majority of these geo-information products is the Land Monitoring Core Service (LMCS), providing generic land use/ land cover/ land cover change information at the European scale.

Its local component, the Urban Atlas, additionally provides detailed high resolution land use information in relation to the planning and management of major European cities, and in support of the Urban Audit (DG Regional Policy). The call for tender for the mapping of the first 300+ European cities was published in May 2008.

Enhancing the CORINE Land Cover Tradition

The LMCS follows the tradition of the CORINE Land Cover (CLC) inventories of 1990, 2000, and 2006 which offered the first cross-border harmonised approach for land cover mapping across Europe on the basis of a standardised nomenclature. However, the LMCS addresses the frequently expressed user need for a higher spatial and temporal resolution for land cover throughout Europe. This is achieved by offering geo-information products with mapping scales down to ~ 1:25,000 with an updating frequency of 3-5 years. This is possible due to advances in satellite sensor techniques, and European service provider consortia ready to produce such information within 1 year of data acquisition, at high levels of accuracy and with reasonable cost.

'Top-down' vs. 'Bottom-up'

Some European countries are already operating their own national land cover mapping programmes, but for years the majority of the MS have taken advantage of the European CORINE land cover / land use initiative as a direct, although less accurate, mapping solution for their national inventories.

GMES land initiatives to develop service visions started initially with the definition of a centrally-defined 'top-down' process to ensure CORINE continuity and additionally to support MS and regions in fulfilling their new reporting and management obligations in a harmonized way more effectively.

At the same time a bi-directional approach is under discussion, with which in addition to the initial 'top-down' mechanism GMES could encourage MS to maintain their present national mapping programmes while adopting the European minimum standard on nomenclatures and data models, and synchronising the mapping activities to ensure a common European outcome. By centrally providing Earth Observation (EO) data and offering incentives like compensation payments this 'bottom-up' approach could be an interesting alternative to the 'top-down' mechanism. In particular it helps to maintain existing national capacities, enables a higher mapping accuracy and reduces handicaps emerging from still unsolved national vs. European data policy issues.

Despite these clear advantages the 'bottom-up' approach nonetheless runs the risk of producing a fragmented picture of European land cover reflecting varying seasons and phenological stages. This will happen if MS are unable to realise their mapping activities within a certain timescale and in a harmonised way.

Opportunities

In order to encourage the transformation of the GMES Land Services into an operational monitoring programme for the regions, the EC offers financial support through the Life+ and Interreg IV programmes. With co-funding rates of up to 85 % these programmes provide a great opportunity for regional authorities to test the applicability of these new services and integrate them into their daily workflows.

Threats

Key customers, including European Public Authorities, MS and the regions, have not yet agreed to a sustainable funding scheme for GMES Services. This is despite the fact that the need for GMES Land Services is evident, that preliminary services have been validated and approved by many user organisations all over Europe, and that the European service provider's capability to deliver them has been successfully demonstrated. Research and development budgets such as that from FP7 are inadequate for the provision of an operational service. However, it is acknowledged that the establishment of limited funding sources under the Preparatory Actions will support the operation of mature services components until 2013. From this date onwards, the future funding scheme for the services is still under discussion.

To-date, the unsettled issue of operational budget lines together with the unresolved questions on governance remain the most critical bottlenecks on the way to the sustainable implementation of the European GMES Land Services.

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Involvement in GMES activities (past / present)

Following the appearance of the Baveno Manifesto heralding GMES in 1998 I was the national delegate for Germany at the preparatory meetings of the EC. Once seconded to the EC in 2004 I started with a user analysis from the EC and ESA sponsored precursor projects. When the Fast-Track Services were agreed upon in 2005 I began preparing a user workshop for the Land Core Service. The internal preparation involved EC services for environment, agriculture, regional planning, transport, statistics, mapping, and security.

The workshop itself was attended by ~100 users from 22 countries and a number of relevant European organisations. It was divided into a “continental” i.e. pan-European and a “local” part, while the global context was provided by an introductory statement. Common requirements focussed on more precise and up-to-date land-cover information for the whole of Europe at different scales (see Annex 2, LMCS Strategic Implementation Plan). Subsequently a “Global Component” was included.

The EC committed to build efficient Implementation Groups (IG) to supervise realisation of these requirements (COM(2005)565). The LMCS-IG was constituted according to criteria that specified that members should be key stakeholders in their respective thematic and geographic fields, who can commit resources and represent and provide links with large user communities at all levels. They are not invited as national representatives but have, if not affiliated to an EU institution, a European profile (see the contribution by D. Grünreich for further details).

We have been guiding respective FP6 and FP7 projects in compliance with the goals defined at the workshop, but were also successful in acquiring first operational budgets from user DGs for the two European components (continental and local). The most recent highlight is a call on behalf of DG Regio for an “Urban Atlas”, mapping European cities uniformly and simultaneously for purposes of territorial development and urban planning. Presently I am working with my colleagues on questions of the appropriate architecture and governance to run the Land Service operationally, including possible enlargements, as well as how to secure an inflow of widely usable data from space and in-situ sources.

Opinion about GMES state of the art - what are your expectations?

As the pressure on our planet grows, the monitoring, assessment and pro-active modelling of changes and human impacts becomes increasingly vital. Europe is addressing this through a number of policies, but also the citizen must find answers to questions such as:

- How productive is our land consumption - do we still have enough natural space?
- How attractive is our living environment - for people and/or investment?
- How secure are our resources in crops, fish stock, water, energy?
- How likely are natural or human disasters and are we prepared?
- What are the impacts of political decisions - for agriculture, infrastructures, spatial planning? What alternative scenarios are there?

Generally, we have to be prepared for the big challenges ahead, and to adapt to dwindling resources. GMES provides one of the major European contributions to meet these challenges. However, to be successful it must pay equal attention to both, general knowledge gain and single practical solutions already good for direct application. Thus, together with the other major European initiatives INSPIRE and SEIS (Shared Environmental Information System), GMES has to improve political decision making and reporting by being accessed through the long expected European geo-spatial one-stop-shop.

Opinion on the current deficits, gaps, problems from your point of view?

If I try to see the LMCS through the glasses of a user, say someone working in a regional environmental or spatial planning office, the biggest deficit is that they cannot yet get GMES information services for the entire surface of Europe, continuously updated, and delivered via data channels with which they are familiar. So far this information is only available for test areas supported by research and development money. There is no operational GMES product that can be compared with traditional means and decided in favour in case of a quality or cost advantage. Major barriers exist in the realisation of this vision:

- There is no guaranteed sustainable flow of input data, neither from space nor from in-situ sources, and the prospects for the latter are even more gloomy. For the LMCS we would need EU-wide access to topographic maps of medium scales and harmonised digital elevation models of several accuracy levels; all current projects work with ad-hoc solutions on a country by country base;
- Rights of use, in particular re-use of the constituent data for GMES services are unclear;
- We have no established workflow for the production of the LMCS; so far services are produced on a case-by-case basis designed according to available operational budgets. In the case of the Continental Component the optimisation of the workflow - centralised vs. decentralised parts; decentralisation by MS or geographic zones - will depend on an agreement with the MS on the nomenclature;
- As GMES will for the first time deliver European geo-information content in a larger extent - irrespective its centralised or decentralised origin - we need inter-service agreements concerning who will host the corresponding parts of the architecture. Talks are, however, underway using EC-internal GI coordination platforms.

Opinion on the measures to overcome the current obstacles?

The present US dominance in geospatial business and technology has its origin in a very liberal policy for the release of public geo-information from the 1980's. This included Landsat data and extends today to the very high resolution satellite data for the US territory. If GMES wants to follow this success story and stimulate as much as possible downstream activities, which in turn will compensate public expenditure by tax income, there must be first of all public operational budgets to sustain a continued inflow of satellite and other data with wide rights of use. But also our obligations as Europeans to share burdens in the international response to global change require greater investment in the observation

sector. We are preparing the grounds for appropriate budgets to be established both inside and outside the EC by bodies in charge of European space policy, as well as those in charge of geospatial information infrastructures.

In parallel we aim to convince user DG's and MS to contribute funds to sustain a core service production that fully meets user needs. Many past public geo-spatial products have suffered from being outdated, expensive to manufacture and incompatible across borders. In the radius of LMCS it is already evident that some MS are preparing for innovative mapping solutions involving space and European elements.

Take the Moselle catchment as an example. Here combined European budgets, both RTD and operational origin (INTERREG together with the participating countries FR, DE, LU and BE) have created a river documentation database which is unique in the world. The database permits the assessment of the impacts of any new construct within water reach on potential floods, damage of potential floods at any location as well as the modelling of the exact flooding course longer in advance. Moreover, the system on water pollution reporting, covering both ground and surface waters, has been perfected with the support of the GSE Land project. I presented this to an international conference in the European Parliament in 2007 as a European model case for much larger rivers (Tisza in Europe, Mekong in Asia, Paraná in South America). This example shows, furthermore, that the power of the European regions, especially the cross-border ones, should not be neglected in the development of GMES.

Another example is the Urban Atlas. The Urban Atlas was defined by the DG-REGIO as representative user and budget provider. Rapid agreement was reached on some 20 land use/ land cover classes to be measured and validated with 85% accuracy for a ¼ ha minimum mapping unit. Feasibility was proven in a short test exercise involving all potential stakeholders. The Urban Atlas may not be perfect in its first edition, but it is available for local users to provide feedback and their suggestions for improvements in the 2nd edition due after three years. Starting with a simple product and collecting feedback from practical use is sometimes better than aiming for perfection in theory.

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Dietmar Grünreich - Land Implementation Group

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Involvement in GMES activities (past / present)

As the President of the German Federal Agency for Cartography and Geodesy (BKG) I was a temporary president of Eurogeographics, the Association of the National Mapping and Cadastre Agencies (NMCA) in Europe which has been working towards interoperable European reference data sets since 1996. As the German expert for reference data I have been involved in the preparation of the INSPIRE Directive that entered into force last year. In addition I had accumulated a lot of experience from setting up the National Spatial Data Infrastructure in a federal country like Germany, harmonising the topographic reference data of the 16 Federal States and integrating them into the National Geodatabase, which right now is going to be enriched using remotely sensed EO data.

This experience was considered by the EC as an ideal profile to be instrumental in the GMES Land Fast-Track Service, which for the first time undertakes the creation of European spatial information on a large scale based on both 'bottom-up' contributions from MS and 'top-down' services from the European level. The EC invited me to chair the first user workshop in October 2005 where the LMCS was defined in such a way as to equally serve European policy interests and the purposes of the MS. The workshop assembled some 100 potential users from 22 European countries and all disciplines, as well as a number of pertinent European associations, offering access to a fully representative range (geographically as well as thematically) of European users opinion. The structure of the workshop restricted us to a "continental component" (pan European coverage) and a "local component".

The EC has subsequently agreed to establish IGs in support of the work of the GMES Bureau, with the task to supervise and validate the implementation of the "fast track" services by 2008, and to report on progress to the GMES management structure. I was again invited to chair the IG for the LMCS. The group is composed of 7 experts from European services (agriculture, regional development, statistics mapping, and environment) and agencies, as well as experts representing the European NMCAs and the European Environment Information and Observation Network (Eionet). We have so far held 12 meetings since early 2006 and produced reports concerning service description, space data needs, in-situ data needs, LMCS strategic implementation, LMCS architecture and governance (in progress). In parallel, an ad-hoc expert group is preparing a concept for the "global component" of the LMCS. Furthermore, we provided advice on service development via both research and development and operational

projects (e.g. in the Steering Board of the "GMES Land Fast-Track Service Precursor"). I reported to the GMES Advisory Council (GAC) and had also some meetings with the chairpersons of the other IGs to align our activities.

Opinion about GMES state of the art - what are your expectations?

A lot of effort has been made to advance the development of the GMES observation infra-structures and services, both as an important component of the European Spatial Data Infra-structure (ESDI) and as the European response to Global Change. The ultimate goal is a one-stop-shop for geospatial decision and policy support in Europe. As regards the LMCS we will soon complete the CORINE Land Cover 2006 as the continental component, coordinated by the European Environment Agency (EEA). We will also see the implementation of the local component in due time, but it will still take some more time to implement the global component.

My expectation about GMES is that it may, on a sustained basis, offer European added value in the form of:

- Joint capacity building by both EC and MS to implement and monitor policies coherently;
- Cross-border compatible European geo-information products;
- Robustness and sustainability of the Core services reducing downstream investment and interfacing efforts to data sources (Global components);
- Economy of scale;
- Increased competitiveness of EU service industry in the growing world market for geographic content;
- Consistent information integration from local to global and the inclusion of large-view data sources that MS cannot afford.

With such efforts we want to support the implementation of European policies and also business, like resources management including increased renewable energy use, far-sighted infra-structure investment and sustainable cities, etc.

Opinion on the current deficits, gaps, problems from your point of view?

In my opinion the LMCS IG has done a good job, and the FTS implementation is going to reach operational maturity as regards the continental component meeting the needs of the EC services and the agencies. Let me take this opportunity to express my thanks to all IG members for their continued motivation and work. Let me also thank the EEA and the ETC-LUSI with Eionet in particular for organising tests and user feedback.

What is missing now is a more concerted political support for a number of issues:

- An operational budget line from 2008 onwards, as 2008 was earmarked for operational release of the Fast-Track Services;
- Better coordination of partly overlapping European initiatives, in particular GMES and INSPIRE as main pillars of the ESDI, and SEIS;
- Balanced development of both the EO techniques and effective data processing methods;
- A programmatic approach for a harmonised data access policy;
- An agreed work sharing with a corresponding governance structure between MS and EU - the problem is actually most pronounced in the Continental Component of the LMCS.

Opinion on the measures to overcome the current obstacles?

For pragmatic reasons decisions being made both for the development of observation infrastructures and the core services, as well as the production of geo-information in the period until 2013, need to

be implemented immediately in order to be able to fulfil reporting obligations of the EEA etc. However, I think it is necessary to focus on the coordinated development of an integrated ESDI made up of INSPIRE compliant geodata from the NSDIs and EO data, and services that provide interoperable geodata and geo-information. All are needed to solve various challenges in the different application areas at both EU and MS levels. In order to achieve such an effective and cost-efficient solution for Europe it is advisable to differentiate conceptually between the ESDI i.e. the geodata, services and portals on one hand, and applications using the ESDI on the other hand. This means after 2013, MS as potential important users, will not only be interested in GMES downstream services, but also services using the integrated ESDI. Beyond Europe, however the only way forward seems to be to use maps derived from space-borne EO data.

The LMCS-IG and I are highly committed to continue to underpin this process with our expertise and to offer maximum support to the development of a ready-to-use GMES Land Service.

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Chris Steenmans - European Environment Agency

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Involvement in GMES activities (past / present)

10 years ago, I remember that I gave a presentation at the Baveno event, where the seeds of GMES were planted. Since then, I have been responsible at EEA for managing operational land cover services i.e. CORINE Land Cover updates and GMES Precursor Services. My contribution to GMES has often been related to the user oriented components like the GMES fora, advisory and steering groups of the 5th and 6th EC Research Framework Programme funded projects, as well as the ESA GSE projects. In this I have represented the user needs of the EEA and the Eionet. Since 2005, significant investments are made at EEA to put the GMES LMCS on the right track through participation in the LMCS-IG and the implementation of an LMCS precursor operational service together with 38 participating countries. Recent contributions to GMES include the definition of the architecture and governance of LMCS as well as streamlining dataflows for the in-situ data component across the different GMES core services.

Opinion about GMES state of the art - what are your expectations?

2008 is a key milestone in the implementation of GMES. The road towards a fully programmatic approach for GMES should now become reality. It seems that the political willingness is there, so we are now looking forward to see the proposed implementing actions published in the new Communication from the EC, which is expected before the end of this year. It should not only give clarity about the future governance and architecture, but also the future directions for data policy and the financing of an operational programme.

From the EEA side, we envisage taking a leading role in ensuring that the needs of today's and tomorrow's environmental user communities will be fully considered in this new operational programme. We expect as well to continue playing a leading role in the supervision of some GMES core services, including the LMCS. One of the main challenges will be to organise the complex number of in-situ data flows, which are needed for the implementation of the core services.

Opinion on the current deficits, gaps, problems from your point of view?

It might sound a bit odd after the many years of preparatory work, but it seems that there is still a lot of work to be done "to get the user on board". Especially when looking at the many European and national environmental reporting obligations, there are only limited indications that national authorities responsible for reporting are ready to make use of the GMES services.

Looking specifically to the Land Monitoring Services, there are several reasons that can explain this shortcoming. There is not, as yet, the optimal satellite infrastructure available that guarantees "value for money"; data policy with regard to input as well as output of the GMES services remains unclear; parts of the service chain, such as the validation of change detection methods, still need further research and development. To name just a few.

Another major issue relates to the need to find better convergence between the needs at national and European levels. The GMES LMCS should provide the "incentives" to move towards a better synchronisation between the national and European monitoring programmes.

Opinion on the measures to overcome the current obstacles?

To ensure our role in coordinating the LMCS user community as well as streamlining related in-situ data flows and services, we include a prominent role for GMES activities in the new EEA strategy 2009-2013, which will be approved by our Management Board by the end of 2008. And needless to say, we will of course continue our close collaboration with the GMES Bureau, which hopefully will continue its excellent work in 2009 and beyond, until a formal governance structure is in place.

For the further development of the GMES Land Monitoring Services, we count a lot on the new FP7 funded geoland2 project. We should refine and regularly update the detailed technical specifications of the different core service elements, in consultation with our network of national partners within Eionet, DG Environment and other EC services. This will permit the better alignment of the national, European and global user needs of LMCS. In that context, a clear communication strategy will be crucial to get buy-in of the operational services at all levels.

Finally, we should not forget to keep a close eye on the fast evolving technology around us related to environmental monitoring. Sensor web technology based on in-situ infrastructure is growing very fast, and will offer in the near future not only complementary but also competitive services. We also might take a clearer strategic position in Europe towards the use of Google Earth, Microsoft Virtual Earth and other image or map based services within LMCS. These kind of freely available information services are now-adays well received and used by the public and decision makers. We should reflect carefully on the integration of this new technology in our information services and to what extend this might influence the quality, sustainability and the business models of LMCS.

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Herbert Haubold - Austrian Federal Environment Agency

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Involvement in GMES activities (past / present)

Coordinator of the FP6-funded GMES Network of Users (GNU), Member of the Austrian Delegation to GAC, formerly Austrian Delegate to the GMES Steering Committee, supports the Austrian co-chair of the In-Situ Observation Working Group (ISOWG), represents the Federal Environment Agency in the Austrian Interministerial Group on Space, member of the GEO User Interface Committee; participated in writing the GSE Forest Monitoring and PROMOTE and geoland proposals, at first represented the Austrian Federal Environment Agency in these projects.

Opinion about GMES state of the art - what are your expectations?

GMES has brought about some impressive results. For instance, some organisations have purchased products by GSE Land, which shows they appreciate these products. Indicator data obtained through GSE Forest Monitoring were already used for reporting. Noteworthy outcomes within other fields covered by GMES are e.g., the PROMOTE air quality forecast, or the MarCoast oil spill monitoring. Nevertheless, GMES does not yet have much influence on the work practices of the average users. Therefore, measures are needed to broaden the effect of GMES.

The LMCS focuses on different satellite based European level data products. It is still a challenge for GMES to arouse an interest for these products among organisations operating on subsidiary levels. An exception is CORINE Land Cover (CLC), which is already well established since years, and was recently included into the portfolio of the LMCS. This product is well received among the MS because it is the first coherent land related data set for Europe. Among other applications, it provides a standard for national and regional land monitoring activities. The LMCS integrates in-situ (measured in contact with the medium) data primarily to obtain the ground truth for satellite data. Therefore, it has little to offer regarding several important environmental monitoring issues including biodiversity. However, current developments of downstream (see below) related services as to surface water, spatial planning and soil are promising. One should consider that monitoring the land surface is far more complex than monitoring the atmosphere or the oceans, but it is crucial, because most environmental topics relate to this heterogeneous medium. Currently, a series of GMES land related workshops encourages and facilitates discussions among users and between users and service providers. In this way, the different communities can develop visions as to the CS Land articulate their expectations.

Opinion on the current deficits, gaps, problems from your point of view?

The GMES Action Plan 2004-2008 called for the "... response to data needs of public authorities...". The document "European Space Policy - Prelimi-

nary Elements (2005)" said "... identifying and bringing together user needs ..." and "... aggregating the political will in support of these ..." The Baveno Manifesto (1998) stated GMES actions will occur "at the Union level and in Member countries". Such statements brought about high expectations on the users' part. Any dynamic process changes with time, but it is nevertheless essential to assure it does not deviate from its initial fundamental promises to avoid disappointment.

Initially, GMES projects were sensibly required to start with a policy analysis and to place emphasis on the reporting obligations of their users, who mostly work on MS or regional levels. Later, the GMES programme was split in the core and downstream sectors. The EC takes care of the core sector, this likely includes securing sustainable funding. Accordingly, industrial data providers do whatever they can to become involved in this core sector. While the LMCS fulfils data requirements of the European level, the specific needs of organisations within the MS will be addressed by a yet to be defined downstream sector which, in its operational state, will be "non-GMES". The MS are expected to start their own initiatives to set up this sector. To take advantage of this model, the MS will have to establish an over-arching European coordination.

Although GMES was initially presented as a monitoring programme that considers space derived and in-situ data equally important and integrates them, it has a clear space focus. This integration would, however, be a prerequisite to improve the usefulness of the GMES services and to enable for them to be linked and combined with the data owned and applied by the users. This need is now widely recognised, although, after ten years of GMES, product development is far advanced and more difficult to be influenced than it would have been in the early phases of the programme. Therefore, the recent creation of the ISOWG and the future in-situ related EEA-led coordination action (ISOC) are urgently needed steps.

GMES is presented in the form of success stories. These are truly impressive and show the potential of the programme. However, this strategy leaves out most of the broad range of GMES experiences. Current GMES funding mechanisms bring about projects which involve only a relatively small number of users who do not always represent the wider communities within and outside their organisations. Among the various people who do environmental monitoring as their daily work, GMES related experiences range from a lively interest to not even knowing GMES exists, and from enthusiasm to disapproval. As long as this wide spectrum is ignored, and only the success-part is considered, GMES will take advantage only of a small part of its potential.

Official GMES documents claim the process to be user-driven, but the reality looks different. GMES was set up by the space sector, and organisations concerned with environmental monitoring are not as strongly presented in the process and do not influence it to the degree that would be needed to "drive" it. There was and is a range of mechanisms for users to become involved and to articulate their views, such as large workshops related to the CS topics, or the CS IGs, but up to now, users in the MS do not find their views truly represented by these mechanisms. The GMES related calls for proposals are part of space programme lines, and they laid out an approach in which all projects are planned and led by service providers. A user-driven programme with its funds being decided about by advocates of the supply side is a contradiction.

Opinion on the measures to overcome the current obstacles?

- A new GMES governance should reflect the subsidiary nature of environmental reporting;
- The Core Services' responsibility should encompass to enable the downstream sector to effectively serve the MS;

- Existing user networks should be systematically involved to achieve broadly supported solutions;
- In-situ data should be considered equally important in GMES, as space data;
- This should encompass a re-opening of the anticipated Core Services' portfolios;
- More realistic cost-benefit analyses of future GMES services should be enabled;
- GMES funds should be decided about by those who will be addressed by the future services, as is the case with other European programmes;
- GMES project calls should require the projects to be led or at least steered by users.

The mentioned deficits relate to GMES governance and can only be addressed on programme level. For GMES to provide the "broadly supported solutions" (quote from "Orientations from the second Space Council", 2005), the MS and their regions should be enabled to shape the GMES process so it fits their needs. The previous GMES governance working group that operated during the Austrian Council Presidency, unfortunately failed, and a new more systematic approach is needed. With such a future subsidiarity-based GMES governance, the CS would be responsible to support the down-stream services in the MS, by providing basic data and boundary conditions (images, climate key aspects, coastlines, etc.) and, secondly, ensuring data compatibility by working out consistent standards with the broader user communities.

In addition to presenting success stories, GMES needs a broader communication approach by taking advantage of already existing networks encompassing pertinent user communities, and by providing systematic trainings and information. The individual users involved in GMES projects would operate as intermediaries between the projects and the main-stream users, who will later apply the new data products in their daily work. Future specifications of the services should be made more transparent and discussed within these networks during product development, so users at all times have better insight into what can be expected, and an overselling of future services is avoided. Simultaneously, future costs of service utilisation should be made transparent already during product development, to enable a realistic cost-benefit analysis.

The ISOWG and the ISOC should not only enable in-situ data streams identified by the CS IGs, but review and also re-open the currently anticipated CS and DS portfolios. Especially regarding land, the service portfolios should go beyond their current focus on products achievable using primarily satellite data. The scope of GMES could be widened by a range of data products that would be useful in an integrated environmental monitoring system.

All GMES funds should be decided about by those who will in the future use the outcomes of the funded activities. This could be accomplished by national GMES offices situated at the environment ministries, in collaboration with international reviewers and supervised by DG Environment, much the same as funds of certain other programmes are distributed, e.g. Twinning, EuropeAid, Structural Funds, Life+. Only if the contracting body truly represents the majority of the users and their needs, GMES can become user-driven instead of supply-driven. GMES project funding mechanisms should be altered from the current provider focus to a user focus, to enable that these projects will be led and managed, or, if no suitable user organisation can be located, steered by user organisations that have been identified as the future users (or customers) of the data products and services. Already today, Life+ and Structural Funds would allow for users to become active regarding GMES related issues. Unfortunately, this opportunity is not yet being utilised.

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Conclusions by the Editor

The introduction to this newsletter highlighted the ongoing and lively debate between various stakeholders in the world of land monitoring. As a contribution to this debate this newsletter aims to provide useful insights into the differing stakeholder perspectives concerning the development of a new European standard for land monitoring. The prime question identified is how we can reach the right balance between GMES driven 'top-down' initiatives at the EU level, and 'bottom-up' MS approaches based on national land monitoring programmes. In this process of stakeholder debate we are constructing the necessary vision of the future and the basis for successful transition to fully operational services.

What has been achieved:

- The need for GMES Land Services is evident;
- Preliminary services have been validated and approved by user organisations in Europe;
- The European service provider's capability to deliver them has been demonstrated;
- LMCS addresses the EC's need for a higher spatial and temporal resolution for land cover throughout Europe;
- The Soil Sealing Fast Track Service Precursor has became the first operational GMES service, providing information on sealed areas across Europe;
- A series of additional operational services will follow, covering thematic areas including land use change, water quality and availability, spatial planning, forest management, carbon storage and global food security.

What remains to be done:

User defined product development remains the mantra for GMES. But this goal can only be attained on the basis of a common vision, expressed in a common language, in order to deliver a common understanding. This common understanding will enable all stakeholders collectively to define a new European standard for land monitoring and secure its successful implementation via an operational service.

Summarising the challenges ahead the following key issues need to be addressed:

- GMES aims to offer support to MS and regions in their reporting and management obligations according to the demands of Europe's environmental Directives. However, there seem to be obvious deficits in the communication process among the stakeholders. For instance, the pending decision on binding specification of the LMCS by the end users, makes it very difficult to define how much it will finally cost, or to answer the question who would be best suited to produce it i.e. 'top-down' or 'bottom-up';
- GMES services have been set-up from the beginning to provide end-to-end solutions to customers. These are not "simple" maps or data, but statistics, indicators, model results, trends etc. The differentiation between core and downstream services originates only from the different funding mechanisms behind them. While the core services should be funded 'top-down' by the EC, due to the subsidiary principle, the downstream services will have to be paid 'bottom-up' by the final customer. Such an offer would support the MS by providing recent imagery and basic geo-information for free. However, it allows downstream adaptations

according to local user needs. Considerations to reduce GMES to only the core services could lead to the strange situation that geo-information might be created without a concrete demand and/or without the budgets to use it appropriately;

- The unsettled issue of operational budget lines together with the unresolved questions on governance, remain an other very critical bottle-necks on the way to the sustainable implementation of the European GMES Land Services. Research and development budgets such as those from FP7 are inadequate for the provision of an operational service. Here, besides decisions for the next EC household period, gap filling activities are also urgently needed to avoid disappointing again the many GMES users that can benefit today from mature GMES services.

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