Federal Ministry
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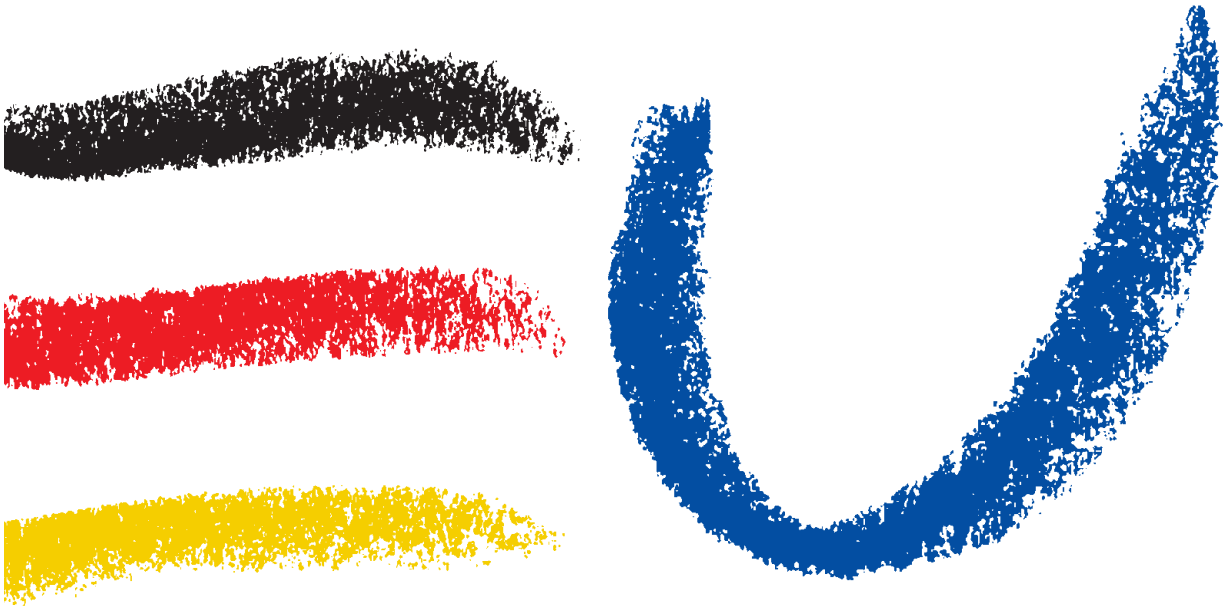

The Way to the European Earth Observation System GMES – The Munich Roadmap

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I. Challenges for the European Earth Observation Services

Human activities have serious impacts on the global environment, threatening human lives and goods. Severe floods, droughts, storms, sea level rise, and land slides are threatening the living conditions, property, and lives of European citizens. Globally, changes in environmental conditions lead to increasing risks for economical, social and political stability, which further affect European security. Reducing the human impact through better management of natural resources and developing strategies to adapt to climate change are among the greatest challenges humankind is confronted with today. Coordinated, comprehensive and sustained global monitoring of the earth system is one of the key factors to respond to this challenge.

GMES is the European solution to respond to the needs of citizens in Europe to access reliable information on the status of their environment. With GMES Europe recognizes its responsibility towards its citizens and the global community at large and pools its Earth Observation activities with the aim to deliver global, regional and local information services for European users on a sustained basis.

GMES addresses in particular the European policy makers' need of better monitoring the earth system for targeted environmental and security management. It ensures Europe's independent access to information on the environment, climate change and security in support of public, but also private, decision makers' needs. By integrating European activities and capacities GMES builds a common foundation of information, which provides for efficient joint political decision-making.

GMES is an important European asset for international co-operation and partnerships and leverages additional benefits through coordination within the frame of the Global Earth Observation System of Systems (GEOSS). Conversely, GMES draws on international cooperation for obtaining additional information coverage most efficiently for European services.

GMES provides technological and scientific opportunities. The growing importance of environmental management is drawing substantial investments from public and private sectors, creating a dynamic market for innovative services. By leading the way into this domain, GMES will be an engine for European innovation and economic growth, therefore delivering an important contribution to the achievement of the Lisbon objectives.

II. The way to European Earth Observation Services - GMES

Building on the orientations adopted by the 3rd Space Council in Brussels (28 November 2005); the decisions taken by the ESA Council at ministerial level in Berlin (5-6 December 2005), and considering the conclusions of the Austrian EU Council Presidency initiative in 2006 ("The Graz Dialogue"), the analysis on the necessary next steps on the way to European Earth Observation Services was pursued further during the German EU Council Presidency. The main objective of this Initiative is to pave the way towards an efficient and sustained GMES.

The consensus that has emerged among the GMES stakeholders and the GMES Advisory Council in particular, is reflected in the annexed "Munich Roadmap": The roadmap summarizes the agreed architecture and proposes principles for the operational

implementation of European Earth Observation Services - GMES including milestones for the way forward.

The German EU Council Presidency, in close cooperation with the European Commission and with ESA, hereby affirms the importance of an operational European Earth Observation capacity as an important tool supporting political decision-making and providing economic opportunities for European innovative enterprises.

Annex

The Munich Roadmap

a) Vision

A sustainable and autonomous Global Monitoring for Environment and Security (GMES) capacity shall provide reliable and timely Earth observation information services enabling effective policy support for the efficient management of environment and security through innovative technology in and for Europe, serving European citizens, delivering considerable socio-economic benefits in various areas and contributing to the fulfilment of international commitments.

b) Architecture

The following overall architecture of European Earth Observation Services - GMES is envisaged:

GMES builds on a network of existing capacities at all levels to serve user needs at EU, national and regional levels efficiently.

The GMES components are

- its services (Core and Downstream)
- its observation infrastructure (space and *in situ*)

Another important element comprises the corresponding data and information management, and dissemination (incl. long-term archiving) scheme in coherence with the INSPIRE directive.

As a user-driven initiative, GMES should be designed in such a way that there is continuous user uptake through constant consultation with users and integration of their changing needs in an iterative process. **Depending on their users and scope GMES distinguishes between Core and Downstream Services:**

Core Services provide standardized multi-purpose information common to a broad range of EU policy-relevant application areas and through which important economies of scale could be derived. They also support European institutional actors in developing, implementing, or monitoring European policies or in their participation in international commitments.

Downstream Services generally serve specific (trans-) national, regional, or local information needs. The corresponding information products may be derived from products of the Core Services or be based on data directly provided through the observation infrastructure.

The categorization of a service can evolve over time and be adapted according to changing policies or specific institutional mandates.

The observation infrastructure collects the data needed for the GMES services and is a prerequisite for their sustainability.

The space component employs both (i) dedicated missions designed to supply data for GMES Services and (ii) European national missions, missions operated by European intergovernmental agencies and non-institutional missions. Commercial providers may also contribute to the data supply for the GMES services. The *in situ* component uses air-, sea- and land-based systems collecting measurements compliant with GMES service requirements, and in particular established capacities; it is operated by European or national institutions. The GMES observation infrastructure is complemented by systems whose data

could be accessible through international mechanisms such as the Global Earth Observation System of Systems GEOSS.

GMES **information management and dissemination** is a significant crosscutting issue for the GMES architecture. Clear and open well defined interfaces have to be established between the GMES components and their governing bodies, and namely with the GMES service users. This approach has to be in compliance with the provisions of the INSPIRE directive.

The GMES architecture shall be fully in line with the **subsidiarity principle**.

c) Governance and funding principles

The GMES governance scheme needs to ensure ownership of the initiative by its users through effective involvement of the European Union and Member States in decision making.

Sustainable, efficient and effective management can only be guaranteed by using dedicated governance structures for each GMES component. They will build on existing structures, involve the relevant users and stakeholders taking into account the **subsidiarity principle** and be tailored to the specific purpose of each GMES component and its architecture:

- **Space Infrastructure**: The space observation infrastructure is based on both dedicated and contributing missions compliant with GMES service requirements with the overall objective of guaranteeing the long-term continuity of GMES compliant observations.
  Dedicated GMES satellite missions are developed by ESA and operated by relevant European level operating institutions, such as EUMETSAT or ESA, depending on the type of mission.
  ESA, being responsible for the implementation of the overall GMES space component, also coordinates the important contribution of space data and other elements made available by Member States, EUMETSAT and other GMES partners.
- ***In situ* infrastructure:** The development, operation, and governance of the GMES *in situ* infrastructure may be contributed by their operating bodies at European, national, and regional levels.
- **Core Services** are supervised and overall managed by dedicated governance schemes on the basis of their specific characteristics building on existing coordination mechanisms. These schemes should ensure implementing, controlling and evolving the services, as well as product archiving and data and information management.
- **Downstream Services** operation and management is entirely driven by their specific users. Links and interfaces with the related Core Service should be ensured. The EU shall support the development of these services where appropriate, and monitor them taking into account the core service evolution.

The GMES governance scheme must provide the management, financial and programmatic instruments necessary to guarantee long-term sustainability of GMES service operations, and to support scientific and technical service evolution; it should be developed in due time and after consultation with Member States and relevant GMES stakeholders. It should enable the supervision of the distributed GMES network, its individual components and their interfaces, the management of the financial instruments and the community funds allocated for operations of GMES, and to manage the contractual relations necessary for operations of GMES: More specifically, the scheme will have to perform integrating and harmonising functions, such as:

- Update existing and implement new GMES services
- monitor and support the evolution of Core and Downstream Services
- monitor and respond to cross-cutting observation infrastructure needs
- Establish data and information access policies including legal issues

- Federate new users and their information needs
- Manage GMES information quality and branding
- Act as interface at international level.

For the 2007 – 2013 period, the GMES funding level has to comply with the ceilings of the EU financial perspective.

d) The way forward

The course for GMES is set: Three Fast-track Services (Emergency Response, Land Monitoring and Marine) are in the implementation process and expected to be ready by 2008. More are to be added in the fields of atmosphere and security. Other activities aiming at the development and coordination of the necessary space and ground infrastructure are underway.

At the same time it is crucial to address immediately the implementation of a **stable long term governance and financing scheme** in order to achieve sustainability for the operation of the services.

Furthermore, it is indispensable to ensure the **transitional management and funding mechanisms** to allow the uninterrupted provision of pilot services to their already established user communities, until GMES becomes fully operational.

For these reasons, the Munich Roadmap:

- Reaffirms the objective for an operational and autonomous capability for GMES providing Earth observation information services for environment and security before the **end of 2008**. In this context,
  - The Commission is invited to launch the operational phase of the three "fast-track" services and to continue the development process of services in the field of atmosphere and security;
  - The Commission, together with Member States and in consultation with relevant GMES stakeholders, is invited to evolve transitional management, supervision and financing arrangements to ensure uninterrupted provision of fast track services, in which ESA coordinates the space component management arrangement;
  - The Commission is invited, after consultation with Member States, ESA and other partners, to make in due time (if possible by the end of 2008) all necessary proposals for sustainable programmatic, management and operational financial schemes covering both the overall GMES architecture as well as its individual components and taking into account the coherence with the INSPIRE directive;
- Recognizes the strategic importance of sustainable GMES in the long-term and its need for a sound overall operational framework. In this context,
  - The Council is invited to decide on the programmatic, management and operational financial schemes for GMES after careful discussion of the Commission's proposals, to be implemented if possible **by 2012**;
  - ESA and its Member States are invited to ensure the implementation of the 1st generation of the dedicated GMES Space Component missions if possible **by 2012** and to adopt a long-term programmatic plan ensuring the continuity of space observations, including aspects of operations.