



*Monitoring the Environment for Climate Change:
The case of GMES*

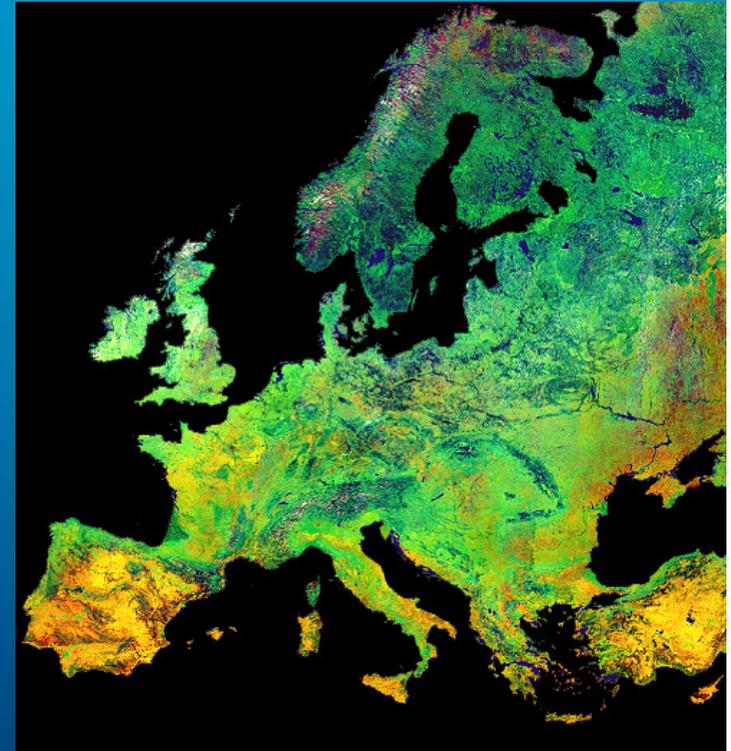
*Presentation at 2008 IISL – ECSL Symposium
Legal Implications of Space Applications for Climate
Change: Principles and Rules*

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GMES aims at developing operational Services,

.....following the example of meteorology.....

...but for other domains such as emergency management, air quality monitoring, land monitoring, ocean & sea ice monitoring etc.



GMES serves the following main policy requirements for Europe:

- *GMES provides independent access to information on environment and security, in support of public and private decision makers' needs*
- *GMES federates the European contributions to GEOSS*
- *GMES provides technological and scientific opportunities*

The GMES Architecture (1)

- *GMES is a EU-led Initiative*
- *GMES is composed of a*
 - *Services Component*
 - *In-Situ Component and a*
 - *Space Component*

The GMES Architecture (2)

- *Services Component*
 - *Produces information services in response to European policy priorities in environment and security*
 - *Relies on data from in-situ and space component*
- *In-situ component*
 - *Mostly of national responsibility, with coordination at European level, e.g. EEA*

The GMES Architecture (3)

- *Space Component: ESA has a two-fold role:*
 - *ESA is the “development agency” for dedicated space infrastructure:*
 - *EO missions developed specifically for GMES (Sentinels)*
 - *ESA coordinates contributions from its Member States, EUMETSAT, private and commercial partners:*
 - *EO missions built for purposes other than GMES but offering part of their capacity to GMES*



GMES dedicated missions: Sentinels

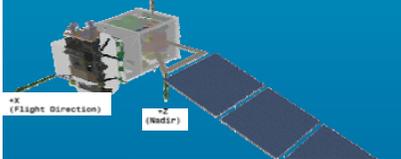


Sentinel 1 – SAR imaging

All weather, day/night applications, interferometry

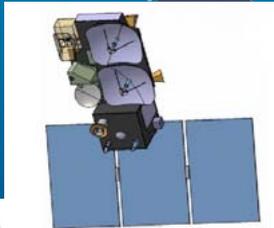
Sentinel 2 – Multispectral imaging

*Land applications: urban, forest, agriculture, etc
Continuity of Landsat, SPOT data*



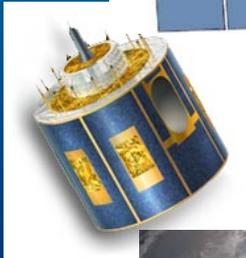
Sentinel 3 – Ocean and global land monitoring

Wide-swath ocean color, vegetation, sea/land surface temperature, altimetry



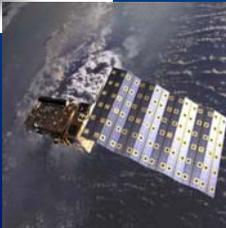
Sentinel 4 – Geostationary atmospheric

Atmospheric composition monitoring, trans-boundary pollution



Sentinel 5 – Low-orbit atmospheric

Atmospheric composition monitoring



2011



2012



2012



2017+



2019+

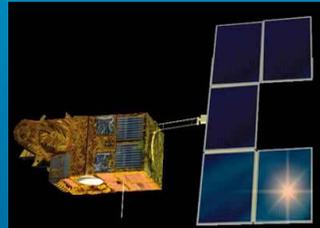


Potential contributions to GMES Space Component

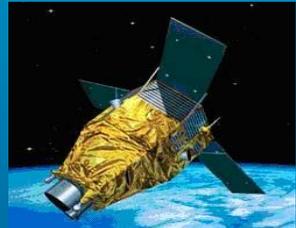
National, Eumetsat and Third Party Missions for GMES (list not exhaustive)



CosmoSkymed



SPOT



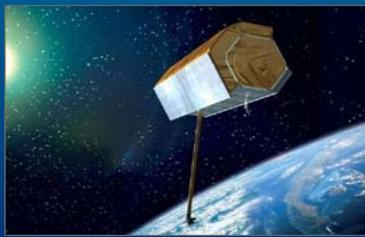
Pleiades



Jason



Radarsat



Terrasar-X



Rapideye



DMCs



METOP



MSG

+ *Seosat, Tandem-X, Enmap, Venus, Altika, etc.*

Cooperation between ESA and EC

- *The EC and ESA are independent International Organisations, which cooperate on the basis of a Framework Agreement entered into force on 28 May 2004*
- *The coordination of cooperative activities is accomplished by regular joint and concomitant meetings of the Council of the EU and of the ESA Council at ministerial level (so-called «Space Council»)*

The cooperation between the EC and ESA on GMES

- *The Space Council issues orientations, which addressed several times GMES (see next slides)*
- *EC ensures the availability and continuity of the GMES Services and contributes to the development, deployment and operations of the space segment; ESA is in charge of the space segment*
- *On 28 February 2008 EC and ESA have concluded an Agreement on the Implementation of the Space Component of GMES*

Key Milestones of GMES (1)

- 2000: Gothenburg EU Summit « establish by 2008 an operational European capacity for GMES »
- 2001 +: Investments by ESA (100 M€) and EC (100 M€) for services
- 2005: Orientations from 2nd and 3rd Space Council confirming GMES as the next flagship of Europe in space, after Galileo, for continued co-operation between ESA and the EC
- November 2005: Commission communication: Global Monitoring for Environment and Security: From Concept to Reality
- December 2005: ESA C-MIN in Berlin: 255 M€ for Phase 1 of the GMES Space Component Programme

Key Milestones of GMES (2)

- *January 2007: Approval of EC FP 7 Space Theme with about 1.2 B€ for GMES*
- *April 2007: Munich Roadmap*
- *May 2007: ESP welcomes the combined effort of ESA and the EU to implement large user-oriented initiatives such as GMES*
- *September 2007: ESA decision on the transition to phase 2 of the GMES Space Component Programme with an investment of 501 M€*
- *February 2008: Conclusion of the EC-ESA Agreement on GMES*
- *November 2008: ESA C-MIN decision on segment 2 of the GMES Space Component Programme*

The ESA /EC Agreement on GMES (1)

- *Legal basis: Art. 5.2 of the EC/ESA Framework Agreement, Art. 53d of EC F.R. (budget implementation by joint management)*
- *Purpose: cooperation between the parties in the development of GMES Space Component Programme & delegation by the EC to ESA of budget implementation tasks in the framework of FP7*
- *The overall indicative EC budget appropriations for the GMES Space Component are 710 M€*

The ESA /EC Agreement on GMES (2)

- *Procurement in accordance with ESA rules with the following adaptations:*
 - . *The EC contribution is not subject to ESA rules on geographical return*
 - . *Procurement actions shall be issued in all States participating in FP7 and in all States participating in the ESA GSC programme*
- *IPR are available to the EC under the same conditions as to ESA*
- *Reporting, Joint Monitoring Mechanism*

Governance Issues (1)

- *The present build-up phase of GMES is characterised by co-ordinated actions between the EC and ESA following the usual governance scheme of both organisations (FP7 Programme Committee, ESA Programme Board for Earth Observation, Space Council)*
- *ESA has established in 2005 the GMES Space Component Programme, which is carried out in co-operation with the EC on the basis of the EC/ESA Agreement on GMES (see slides above)*
- *The Commission has set up in 2006 within DG Enterprise the GMES bureau, which is the focal point for coordination of the Commission's GMES related activities*

Governance Issues (2)

- *With a view to the long-term scenario of GMES the EC and ESA reflect on the most appropriate governance structure/ model*
- *EC funding perspectives for GMES operations: R&D funds or setting-up of a dedicated GMES programme (and a dedicated GMES structure)*
- *A GMES Data Policy will be defined in the near future.*

Data Policy (1)

A GMES Data Policy needs to cover the following elements:

- The access to Space data from existing missions owned by different operators (ESA, EUMETSAT, national and commercial missions)*
- A policy for GMES dedicated Sentinel missions*
- The access for end users and decision makers to information generated by GMES service providers, in line with European directives for geospatial information and data*
- An in-situ data policy in line with national laws*

Data Policy (2)

When defining the Sentinel Data Policy the following principles have to be taken into account:

- Provide fair and open access to all GMES service providers, public or private*
- Support the advancement of scientific exploitation of EO data thus ensuring further development towards new GMES or other applications*
- Restrictions and exceptions (e.g. for reasons of national security, privacy, IPR)*
- INSPIRE Rules, GEOSS Data Sharing Principles*