

**GMES**  
Global Monitoring for  
Environment and Security

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**EDITORIAL**



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Commissioner  
for Research



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Director General of the  
European Space Agency

*It is a pleasure for us to present the first newsletter of the Global Monitoring and for Environment Security (GMES) initiative, co-lead by the European Commission and the European Space Agency.*

*Europe's commitment to promote sustainable development and global governance requires reliable, timely and independent information. The GMES initiative represents, in simple terms, a concerted attempt to produce better policy relevant information. This will require bringing data and information providers together with users, to allow them to better understand each other and to agree on how to make useful information available to the people who need it most. The establishment of GMES is contributing to secure access to such information from a wide range of*

*sources. Thus it becomes a strategic tool in the implementation of a whole range of European policies, from environment, agriculture and transport to development cooperation and external relations.*

*Since the endorsement by our respective Councils in November 2001 of a joint "Initial Period Action Plan", the preparation of the Implementation phase has progressed productively from theoretical concepts to pragmatic steps of how GMES will bring technologies to the service of community policies and potential users across Europe. A central goal is to make full use of Earth-based in-situ monitoring capacities as well as airborne and space-based Earth observation. Air pollution forecasts, which are now a standard feature of news-media, exemplify how high-quality and timely information can be utilised by the man or woman in the street.*

*As a strategic initiative targeting the environmental policies of the Union, the 6<sup>th</sup> Environmental Action Plan will benefit fully from enhanced quality information. The subjects addressed cover: air, water, soils and vegetation, the oceans, management of natural risks. The first to benefit from this more efficient information provision will be the European and national environmental institutions, public services, private industry, academia and ultimately the citizen.*

*As the second main policy domain, GMES addresses the security of European citizens, among others from the point of the European citizen's civil protection. It also includes actions outside our territory, such as humanitarian aid.*

*A key task is to create and maintain a European technical Information capacity – encompassing observation systems and servicing elements - allowing the production and easy access to the information necessary for environment and security policies.*

*GMES will make full use of existing capacities and identify needs for adaptation and complements. On that basis actions will be initiated in the Implementation Period 2004-2008. During this period we see GMES building further institutional and political background, together with the justification for the development of monitoring infrastructure, including earth-observation satellites. The strong interdependence of GMES and Space will also receive attention in the White Paper of the European space policy planned for the end of 2003.*

*The European Commission and the European Space Agency (ESA) are currently working hand-in-hand to get GMES off the ground. Several supporting projects have been put in place under the Initial Period of the Action Plan to provide the basis for 2004-2008 activities (EC Research and Development projects under Framework Programmes 5 and 6, GMES Service Elements within ESA Earth Watch Programme). The highly successful activities of JRC and DG Environment (notably the INSPIRE Initiative on spatial data harmonisation) are central to building on this preparatory work. A set of GMES Forum events and a GMES Steering Committee comprising of EC/ESA member state delegates have been set up to engage both end-user and national stakeholders in the preparation of implementation recommendations for 2004 to 2008.*

*This busy but fruitful period covered under the Initial Action Plan is drawing to an end and a final report, including recommendations on implementation for 2004 to 2008, will be released by the end of this year.*

*A GMES Forum will take place on November 26-28 to allow all interested parties in Europe to comment on this report. We are very happy to invite you to contribute to this discussion.*

  
Philippe Busquin

  
Jean-Jacques Dordain

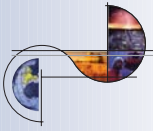
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[www.gmes.info](http://www.gmes.info)





## WHAT IS GMES ?

GMES is a political initiative to secure Europe with an autonomous and operational information production system in support to environment and security policies.

### Informing Sustainable Development policies

**GMES** is an initiative set up jointly by the European Commission and the European Space Agency. It is driven by the need to improve the monitoring of the European and global environment in view of pursuing the sustainable management of our resources and the security of the citizen. The key feature of the **GMES** strategy is to establish by 2008 a European capacity which, through technological, institutional and political support will fully meet those objectives. Hence **GMES** will contribute to the European Strategy for Sustainable Development approved at the Göteborg Summit in June 2001 by the Heads of State and Government of the countries of the European Union<sup>1</sup>. Such commitment to sustainable development, now embedded in all Community policies<sup>2</sup>, requires an enhanced information base backed by a wide range of high quality observations and validated models. In addition, it is now recognized that Europe needs to have independent access to data and information on the global environment and on situations or events which may lead to threats to global security. This will require the capacity to monitor the environment and resources. The European Union needs such independent information to conduct better informed foreign and aid policies and to fulfill commitments made in the context of international conventions. The interplay between human activities and the environment occur at different territorial levels and both global as well as local information is required. The increasing influence of human activities on the Earth System as well as the exposure to natural or technological hazards demand close follow-up and rapid responses. Changing policies, such as those related to security, present new information requirements which must also be met. In this context, **GMES** will pay particular attention to the use and development of appropriate information technologies among which space observations represent a key asset to improve the European capacity to monitor the environment and to play a role in preserving stability and security. The mission and challenge of **GMES** thus is to contribute to the timely provision of such information necessary to enable all society agents, each in their own capacity, to take the decisions and actions which will make sustainable development become a reality.

### Why a new initiative?

A large number of organisations and programmes whose mission is to contribute to the production of information on environment and security are already in place in the countries, but also at the European and Global levels<sup>3</sup>. In addition, the past 20-30 years have witnessed an unprecedented

progress in measurement techniques, observing systems, information technologies. Tools are available to routinely detect dangerous substances in air, water or food at extremely low concentrations; minute changes in land cover, altitude or sea surface temperature can be monitored at any place on the Planet from earth observation satellites; sophisticated analyses of samples drilled at great depth in ice caps or sea sediments inform us on life in extreme environments and on the evolution of the earth ecosystem; communication technologies and infrastructures allow instantaneous transfer and processing of gigantic amounts of data. However, the policy end user is not yet fully served by those advances and more is to be done to match the increasingly specific demands for information and data collection exercises<sup>4</sup>. This is the case for Community policies which require a strong knowledge base in terms of monitoring, assessment, diagnostic and prediction. In many instances adequate information is lacking at national, regional and local levels. Initial activities undertaken in the context of **GMES** confirm that the causes of this mismatch between the policy demand and the technological offer are multiple and interrelated<sup>5</sup>. By and large, the many organisations involved in the production of information tend to work side by side rather than jointly. Programmes tend to be temporary with an ad hoc character, rather than long term oriented. Limited effort is made to foster the generation and use of information compared to the investments made in the acquisition of primary data. There are gaps in observation and data collection systems. Moreover these systems are rarely compatible and data assembled in a routine fashion is not always sufficient or appropriate to produce policy relevant information. Despite progress, our understanding of the functioning of the environment and its relation to human activities is still in its infancy in a series of domains. This limits our capacity to perform the correct observations and to interpret the observed data. The combination of these causes results in a rather low efficiency of the current European capacity to produce policy relevant information, with some notable thematic exceptions, like operational meteorology. The **GMES** initiative will address these issues. Clearly it will not do so by duplicating existing activities, but by offering a frame which will bring about synergies between the activities of the European actors and complement them where gaps exist. The expected benefits are better information for users and a more active economy in Europe in the sectors related to information production.

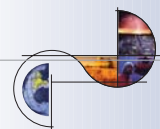
### The GMES Vision 2008

In 2008 the capacity for **GMES** should be an operational system consisting of three main components

- a partnership of the key European actors
- European Shared Information Services
- mechanisms to maintain the dialogue between stakeholders of information production and use.

#### ■ A partnership of the key European actors

A number of public organisms (in particular the European Environment Agency, EC, ESA, EUMETSAT, European Union Satellite Centre) hold compe-



tencies in one or the other areas of the chain of production of information (e.g. data collection, information production, information dissemination). In addition, some non governmental organisations (e.g. Eumetnet, EuroGOOS, Eurogeographics, Eurogeosurvey) focus a large part of their activities on these subjects. Within their domain of specialisation they play a crucial role of co-ordination of the activities of their corresponding national organisations. However co-ordination is insufficient across the domains, both at the national and at the European level. Two examples are often quoted for their potential for improvement: i) between space and in situ observing organisations and programmes; ii) between environmental observations and environmental statistics. In 2008 the key European actors should thus have one common strategy and a clear repartition of tasks between themselves to maintain and develop further a shared European information system for **GMES**.

#### ■ European Shared Information Services

The European capacity comprises facilities corresponding to the various stages of the chain of production and dissemination of information : standardisation of the data observation and data collection; production of information and services; documentation of data and of information; provision of access to these. It consists of large numbers of distributed facilities, co-ordinated in a way that their individual outputs can easily and routinely be assembled into policy relevant information. It also includes space borne and in situ observation facilities, both of which are indispensable and mutually reinforcing.

#### ■ A permanent dialogue between the stakeholders

The information needs of the users evolve over time as do the technological capabilities. The **GMES** system thus must be able to detect such changes at a very early stage and take them into account. A mechanism of dialogue will be established to allow two-way exchanges between all those who play a role in the production and use of information (research centres, industry, governmental and non governmental bodies), and to send feed-back messages to the European partnership and **GMES** management.

### The GMES Action Plan (2002-2008)

An Action Plan in two stages has been agreed and put in place between EC and ESA in consultation with the respective member countries<sup>5</sup>. The Initial Period to be completed at the end of 2003 will document the issues facing the production of information relevant to the European environment and security policies and recommend actions to establish the European capacity for **GMES**. The Implementation Period (2004-2008) will start the establishment of the core structuring elements of the **GMES** capacity and prepare the post-2008 Operational Period.

#### ■ The Initial Period (2002-2003)

A series of Thematic Projects (see insert) have been initiated covering some of the major priority areas of the 6<sup>th</sup> EU Environment Action Programme<sup>7</sup>. By the end of 2003 these projects will deliver information products of interest to EU policies in particular in the field of nature protection, soil degradation, marine resources and air pollution. In addition they will also report the users comments and document fully the quality of the information produced. They will also describe the lessons learnt on the problems met in producing the information (obstacles of institutional or socio-economic nature, or due to data policy, gaps in data and knowledge). A complementary set of projects, launched under the ESA Earth Watch **GMES** Element<sup>8</sup> will evaluate the feasibility of operational services in support to environment or security policies to be provided mainly from data of Earth Observation by satellites. In order to capture the lessons from all these projects and the expertise from their teams, a series of Cross-cutting Assessments have started which will analyse and draw together the results from the projects. Synthesis assessments will be produced which will describe the users needs and the adequacy of the current capacities (institutions, policies and infrastructures) to produce policy relevant information. On this basis, recommendations for actions for the Implementation Period will be identified. These will include funding and legislative aspects.

Member countries are closely associated to the work through the **GMES** Steering Committee and its working groups, as are key European organisms such as the European Environment Agency, Eumetsat and the EU Satellite Centre. A wider range of stakeholders is called upon to provide comments and inputs through national interministerial groups as well as in the context of the **GMES** Forum (see insert).

#### ■ The Implementation Period (2004-2008)

The recommendations stemming from the Initial Period of work will address the obstacles to an efficient production of information for European environment and security policies and suggest ways to improve the situation and to establish by 2008 a European capacity for **GMES**, as requested by the Göteborg Summit. These recommendations will then be evaluated by the European Commission and the ESA Executive and serve as input to prepare proposals to be submitted in the decision making process of the respective institutions. In order to ensure continuity between the two periods of the Action Plan, the EU 6<sup>th</sup> Framework Programme for Research, Technological Development and Demonstration and other ESA relevant programmes will fund **GMES** projects. However given the operational and long term oriented nature of **GMES**, Research funding should begin to be matched by other funding sources already in the Implementation Period of the Action Plan.

<sup>1</sup> COM(2001)264 final/2

<sup>2</sup> Art.6 of the Treaty establishing the European Community

<sup>3</sup> See <http://gmes.info>

<sup>4</sup> See EEA, <http://reports.eea.eu.int/92-9157-202-0/en/page302.html>. "Environment in the European Union at the turn of the century".

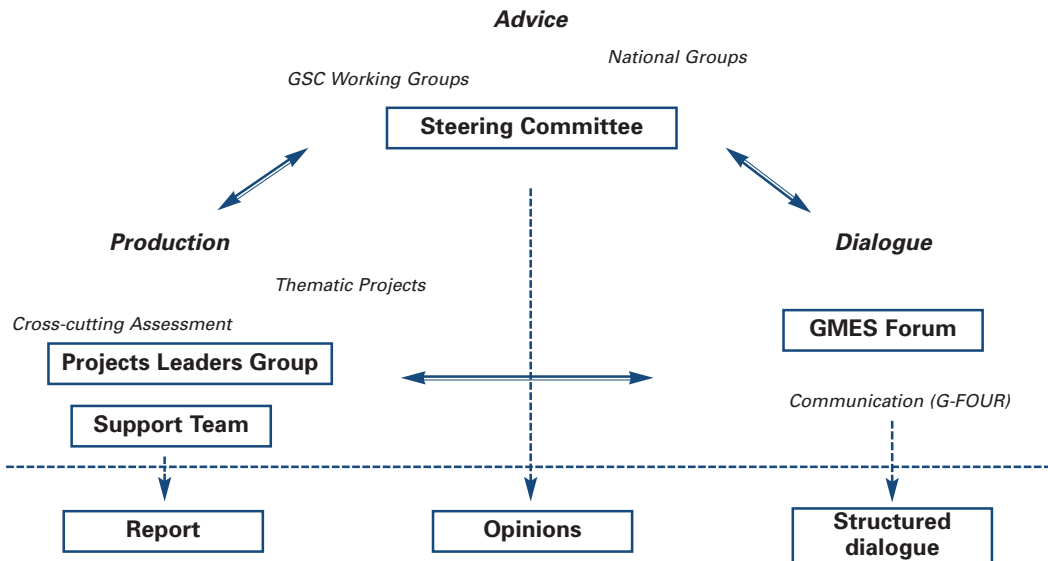
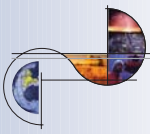
Each chapters concludes with an assessment of availability of information

<sup>5</sup> Proceedings of GMES 1<sup>st</sup> and 2<sup>nd</sup> Forum, see <http://www.gmes.info>, under "Library"

<sup>6</sup> cf. ref. under point i

<sup>7</sup> O.J. L242 of 10/09/2002

<sup>8</sup> see <http://earth.esa.int/gmes/index.html>



A number of groups contribute to the realisation of the Initial period of the GMES Action Plan, performing different functions: production, advice, dialogue.

### From a "technology push" to a "user driven" approach.

The **GMES** initiative finds its origin in an international workshop called in 1998 at Baveno in Italy by the European Commission Joint Research Centre, the European Space Agency, together with the major European Space agencies and organisations. In the "Baveno Manifesto" the participants affirmed the central role that space-based information could play for global environmental monitoring and called for the elaboration of a common agenda for global environmental security monitoring issues. Preparatory work by the JRC and three specialised working groups allowed to identify policy needs<sup>9</sup> as well as the potential contribution from existing and planned earth observation satellites. A major review Conference under EU French presidency at Lille in October 2000<sup>10</sup> was followed by a Council resolution calling for joint EC-ESA action. In 2001, the subsequent EU Presidencies Conferences in Stockholm and Brussels put the emphasis on the information needs rather than on the potential offered by the technology<sup>11</sup>: "The user dimension". This shaped in a decisive manner the **GMES** approach as it is now expressed in the Action Plan (2002-2008) adopted by the EC and the ESA. The main orientations were also summarised in the Council Resolution of November 2001<sup>12</sup>. Both the Commission and Council documents indicate that the European capacity to be developed by 2008 should fulfill three conditions. It should i) be autonomous and operational; ii) guarantee sustainable, long term and coherent monitoring; iii) combine in situ (land, sea and air) and space based monitoring.

## THE WORKING PRINCIPLES OF THE GMES ACTION PLAN

The following principles guide the activities currently conducted under the Initial Period of the Action Plan.

- Activities have been selected and are steered in a way to produce, before the end of 2003, results able to underpin proposals for establishing a European capacity for **GMES**.
- Users are involved in all activities (e.g. **GMES** Steering Committee; Thematic projects; Forum). This is achieved in particular by involving existing groups and committees associated to the monitoring and development of the relevant European policies.
- Complementarity with ongoing or planned

related activity will be ensured and the development of synergies will be sought:

- within the European Commission (e.g. INSPIRE<sup>13</sup>, Joint Research Centre activities),
- between EC and ESA
- with e.g. European Environmental Agency (EEA), EUMETSAT, the EU Satellite Centre.

■ Activities will build upon existing research (e.g. EC 5<sup>th</sup> Framework Programme key action on Global Change, Climate and Biodiversity and Sustainable Marine Ecosystem, the Generic Activity on Earth Observation and ESA Data User Programme, market development and other relevant studies), experience (e.g. Centre for Earth Observation) and networks (e.g. the Environment Information and Observation Network (EIONET) of the European Environment Agency), seeking added value.

■ In order to facilitate the implementation of the above working principles, special emphasis will be put on information exchange and dissemination.

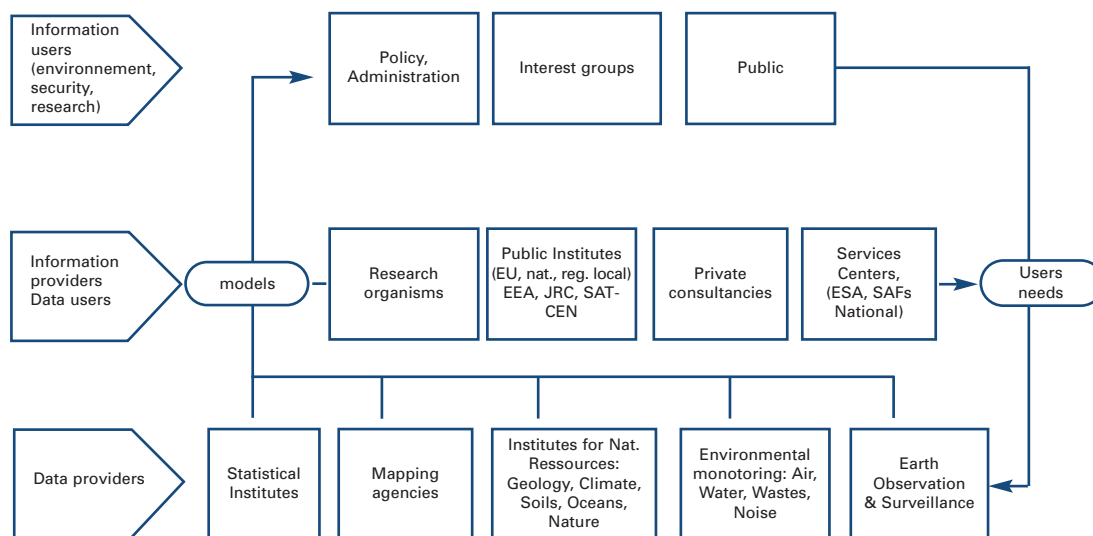
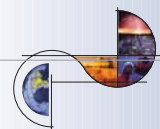
<sup>9</sup> Policy briefs, see <http://jrc.gmes.it>

<sup>10</sup> Council Resolution of 16 Nov. 2000 on a European space strategy, OJ C 371 of 23/12/2000, see [www.gmes.info](http://www.gmes.info), under "Library"

<sup>11</sup> For Stockholm, see [www.gmes.info](http://www.gmes.info), under "Library". For Brussels, no documents were produced.

<sup>12</sup> OJ C 350 of 11/12/2001

<sup>13</sup> The Infrastructure for SPatial InfoRmation in Europe initiative (INSPIRE) aims at making available relevant, harmonised and quality geographic information for the purpose of formulation, implementation, monitoring and evaluation of Community policy-making. See <http://www.ec-gis.org/inspire/>



Key stakeholders in the production of information for European policies on Environment and Security

## GMES FORUM

The GMES Forum is a key element of the GMES Action Plan. Its aim is to build a shared understanding of the issues facing the establishment of a European Capacity for Global Monitoring of Environment and Security and to develop a common approach towards the proposals for the Implementation Period of the Action Plan (2004-2008). The specific objectives of the Forum are:

- to stimulate and structure the dialogue between the many parties involved in the processes of monitoring, information production and use of information (see diagram),
- to disseminate information on **GMES** activities;
- to feed back views on **GMES** interim results to **GMES** Programme managers and Steering Committee.

Three Forum Conferences have already taken place, as well as a specialised **GMES** Ocean Forum<sup>14</sup>. The result is a wide-ranging, well documented review of the obstacles to the production of policy relevant information as well as of key efforts undertaken to improve the situation in the Member States, and at the European or International level.

The last Forum Conference<sup>15</sup> will focus on the results of the activities of the Initial Period of the GMES Action Plan and on the recommendations for action for the Implementation Period.

## NEWS IN BRIEF

### INSPIRE.

Position papers on the main aspects of the Commission's initiative towards an INfrastructure for SPatial InfoRmation in Europe have been adopted by the Expert Group (<http://www.ec-gis.org/inspire>). A Commission's proposal for a community legal instrument is being prepared.

### GCOS.

The second Report on the adequacy of the Global Observing System for Climate is available at <http://www.wmo.ch/web/gcos/gcoshome.html>

### ESA GMES Service Element

Ten proposals were selected in response to the call for tender for the development of operational information services based primarily on Earth Observation data (see <http://earth.esa.int/gmes/index.html>). Progress will be reported in the next GMES newsletter.

### FP6 Call "Space and Aeronautics"

Two Integrated Projects and one Network of Excellence have been selected for negotiation. More information will be reported in next Newsletter.

<sup>14</sup> Brussels, 15-17 July 2002; Athens, 5-6 December 2002; Noordwijk, 14-16 January 2003; Athens, 5-6 June 2003.  
<sup>15</sup> Baveno, Italy 26-28 November 2003.

## GMES PROJECTS AND STUDIES

### ■ List of GMES EC thematic projects:

#### A. Land cover change in Europe :

**BIOPRESS** - Coordinator (from 15 Sept.03): Barry WYATT (bkw@ceh.ac.uk) Natural Environment Research Council Centre for Ecology & Hydrology (UK)

#### B. Environmental stress in Europe:

**LADAMER** - Coordinator: Joachim HILL (hillj@uni-trier.de - Universität Trier (DE);

**OCEANIDES** - Coordinator: Delilah Helen A. AL KHUDHAIRY (delilah.al-khudhairi@jrc.it) - Joint Research Center – JRC (I);

**EUROSION** - Coordinator: Stéphane LOMBARDO (lombardo@euroion.org) - Rijksinstituut voor Kust en Zee (NL)

#### C. Global vegetation monitoring :

**SIBERIA**, Coordinator: Christiane SCHMULLIUS (c.schmullius@geogr.uni-jena.de) Friedrich-Schiller Universität (DE)

#### D. Global ocean monitoring :

**MERSEA** - Coordinator: Johnny A. JOHANNESSEN (johnny.johannessen@nersc.no) - Nansen Environmental and Remote Sensing Center (NO)

**MAMA** , Coordinator: Silvana Vallerga (s.vallerga@imc-it.org) International Marine Center (I) <http://www.ifremer.fr/mama>

**ESONET** - European SeaFloor Observatory Network Prof. Monty Priede, University of Aberdeen, UK (i.g.priede@abdn.ac.uk)

#### E. Global atmosphere monitoring :

**CREATE – DAEDALUS** - Coordinators: Olivier BOUCHER (boucher@loa.univ-lille1.fr) - Centre national de la Recherche Scientifique – Lille (F) - And Stephen G. JENNINGS (gerard.jennings@nuigalway.ie) - National University of Ireland (IRL);

**APMOSPHERE**, Coordinator: David BRIGGS (d.briggs@ic.ac.uk), The Imperial College of Science, technology and Medicine Epidemiology & public Health (UK) - College medical Faculty ;

**METH-MONITEUR** - Coordinator: Euan NISBET (e.nisbet@gl.rhul.ac.uk) - Royal Holloway and Bedford New College (UK) ;

**GATO** - Coordinator: Neil HARRIS (general@ozonesec.ch.cam.ac.uk) European Ozone research Coordinating Unit (UK) <http://www.ozone-sec.ch.cam.ac.uk>

#### F. Support to regional development aid :

**AMESD** - Task manager: Paolo Roggeri EC AIDCO Technical support: Etienne BARTHOLOME - (etienne.bartholome@jrc.it) - Joint Research Centre of the European Commission (I) - <http://ies.jrc.cec.eu.int/Projects/GEIS/>

#### G. Systems for risk management :

**DISMAR** - Coordinator: Stein SANDVEN (stein.sandven@nersc.no) - Nansen Environmental and remote Sensing Centre (NO)

#### H. Systems for crisis management and humanitarian aid :

**RISK\_FORCE** - Coordinator: François MARTIN-DUPONT (Francois.MARTINDUPONT@astrium-space.com) - Astrium SAS (F) ;

**ISIS** - Coordinator: Herbert HANSEN (hhansen@keyobs.com) - Keyobs SA (B) - <http://www.geo4ngo.org>

#### I. Information management tools and contribution to the development of a European spatial data infrastructure :

**EOLES** - Coordinator E. GONTIER (eric.gontier@Spacebel.be) - Spacebel SA (B)

#### J. Earth Observation based Operational Services :

**EUFOREO** - Coordinator: G. Cannizzaro - (Giovanni\_Cannizzaro@telespazio.it) - Telespazio (I) - <http://www.telespazio.it/earsc/EUFOREO>

### ■ ESA GMES Service Element:

Many proposals were made in response to the call for tender for the development of operational information services based primarily on Earth Observation data. They will be reported in detail in the GMES newsletter n°2. <http://earth.esa.int/gmes/index.html>

### ■ List of GMES EC cross-cutting studies:

**BICEPS** - Coordinator: Barry WYATT (bkw@ceh.ac.uk) Natural Environment Research Council Centre for Ecology & Hydrology (UK)

**DPAG** - Coordinator: Raymond HARRIS (r.harris@geog.ucl.ac.uk) - University College London (UK)

**GseS** - Coordinator: Nina COSTA (ncosta@esys.co.uk) - Esys Plc (UK)

**GMES-RUSSIA** - Coordinator: Christiane SCHMULLIUS (c.schmullius@geogr.uni-jena.de) - Friedrich Schiller University Jena (DE)

## COMMUNICATION AND DISSEMINATION OF INFORMATION

A key element in the work of fostering dialogue between the **GMES** users, suppliers and transformers, is the **GMES** Forum. The **GMES** forum acts as a communication platform and aims to keep all interested parties informed about the progress of **GMES**. It also collates any reactions to the results achieved. To maintain an inter-active flow of communication between all the parties involved, the communication and dissemination of information activity of the **GMES** Forum is currently supported by the G-FOUR project. G-FOUR tasks mainly concern the organisation of conferences, maintenance of the **GMES** web site and production of a newsletter.

### PROJECT COORDINATOR

#### FDC

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#### Top Strategies

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in cooperation with the GMES Support Team

Are you a **GMES** user, a supplier, a transformer? Are you interested to express your needs?  
Don't hesitate:

“JOIN THE GMES FORUM!”