



EUGENE DISASTER WORKSHOP REPORT [WORK PACKAGE 3000]



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German Aerospace Center (DLR)
German Remote Sensing Data Center



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Acronyms

CORINE	EU initiative to process Land Cover databases
CoP	Community of Practice
DLR-DFD	German Aerospace Centre - Remote Sensing Data Centre
DG ECHO	Humanitarian Aid department of the European Commission
DG ENTR	European Commission Department for Enterprise and Industry
DG RTD	European Commission Department for Research
EC	European Commission
ECMWF	European Centre for Medium Range Weather Forecasts
EEA	European Environment Agency
EMI	European Middleware Initiative
EO	Earth Observation
ERS	Emergency Response Service
ESA	European Space Agency
G8	Group of Eight
GCI	GEOSS Common Infrastructure
GEMS	Global Environment Monitoring System Water
GEO	Group on Earth Observations
GEOSEC	GEO Secretariat
GEOSS	Global Earth Observation System of Systems
GMOSAIC	GMES pre-operational Security Service
HLWG	European GEO High Level Working Group
INSPIRE	Infrastructure for Spatial Information in the European Community
JRC	European Commission, DG Joint Research Centre
linkER	EC-initiative to support the implementation of operational GMES services in Emergency response
MIC	Monitoring and Information Centre integrated in the DG ECHO
REA	Research Executive Agency of the European Commission
SAFER	GMES pre-operational Emergency Response Service
SAR	Synthetic Aperture Radar
SBA	Societal Benefit Area
SpaceAid	Framework of Regional Support Offices, National Focal Points and local UN Agencies to ensure access to all types of space-based information
SDIs	Spatial data infrastructures
TYIP	GEOSS 10-Year Implementation Plan
UNOOSA	United Nations Office for Outer Space Affairs
UN-SPIDER	United Nations Platform for Space-based Information for Disaster Management and Emergency Response



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1. Introduction

1.1. Background

The EUGENE project is an FP7-funded support action. Its major goal is to contribute to the establishment of a coordinated and sustained European Earth observing system component as part of the Global Earth Observation System of Systems (GEOSS).

The establishment of a coordinated GEOSS has been initiated by the inter-governmental Group on Earth Observations (GEO). GEO was launched in response to calls for action by the 2002 World Summit on Sustainable Development and by the G8 (Group of Eight) leading industrialised countries. These high-level meetings recognised that international collaboration is essential for exploiting the growing potential of Earth observations to support decision making in an increasingly complex and environmentally stressed world. GEO is a voluntary partnership of governments and international organisations. As of November 2009, GEO's members include 80 governments and the European Commission. In addition, 58 intergovernmental, international, and regional organisations with a mandate in Earth observation or related issues have been recognised as participating organisations.

The development of GEOSS is supposed to qualitatively improve our understanding of the Earth system, enhancing global policy- and decision-making abilities to promote the environment, human health, safety, and welfare. GEOSS is expected to generate societal benefits in the following nine areas, the so-called Societal Benefit Areas (SBA):

- **Disasters:** reducing loss of life and property from natural disasters
- **Human health:** increasing the understanding of environmental factors affecting human health and well-being
- **Energy:** improving the sustainable management of energy resources
- **Climate:** improving the understanding and the prediction of climate variability and change as well as the adaptation to altered environmental conditions
- **Water:** improving sustainable water resource management through better understanding of the water cycle
- **Weather:** improving the information base with respect to meteorological parameters, weather forecasting and warning
- **Ecosystems:** improving the management and protection of terrestrial, coastal and marine ecosystems
- **Agriculture:** supporting sustainable agriculture and combating desertification
- **Biodiversity:** improving the understanding, monitoring and conserving of biodiversity

A GEOSS 10-Year Implementation Plan (TYIP, 2005-2015) was adopted during the Third Earth Observation Summit 2005 in Brussels to develop GEOSS. The Plan defines a vision statement for GEOSS, its purpose and scope, expected benefits, and the nine SBAs. The implementation of GEOSS is realised through a number of dedicated tasks that are defined in the GEO Work Plan. This document (the current version being the 2009-2011 Work Plan) is updated annually.

GEO is governed by a plenary consisting of all member states and participating organisations. It meets at least once a year at the level of senior officials and periodically at the ministerial level. An Executive Committee oversees GEO activities when the plenary is not in session. Additionally, GEO established



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four permanent bodies to guide the implementation of the TYIP. These committees are organised around four transverse areas which cut across, and are relevant to each of the nine SBAs:

- Architecture & Data Committee
- Science & Technology Committee
- User Interface Committee
- Capacity Building Committee

1.2. Scope and objectives of the EUGENE project

The objective of the EUGENE project is to foster collaboration between pan-European organisations in the field of Earth observation and to strengthen the coordination of national and regional programmes and organisations in their work towards GEO by establishing an appropriate coordination process. The ultimate goal is to contribute to the establishment of a coordinated and sustained European component as part of GEOSS.

The EUGENE project aims at further developing a comprehensive European GEO strategy by proposing a structured European approach for selected GEO Societal Benefit Areas (SBAs). This will also encompass intrinsic cross-cutting issues, such as data sharing, with special attention to the relationship between relevant European frameworks and GEOSS.

EUGENE addresses European activities and actors in three selected GEO SBAs, which correspond to European political priorities:

- Climate
- Disasters
- Water

The project work plan is intentionally limited to these three areas as a subset to start with and to allow working at a sufficient level of detail. For each of the three SBAs, a consolidated status-quo report has been documented. These reports provide information on relevant European activities and contributions to GEO. They form the basis for further considerations on a European GEO approach with the goal to establish a coordinated and sustained European Earth observing system component as part of the GEOSS, maximizing both the GEO added value and the European benefit from GEOSS.

1.3. Purpose of this document

The purpose of this document is to report on the proceedings and outcome of the EUGENE Disaster Experts Workshop which was held at the DLR Bureau, Brussels on the 1st June 2010 and is structured according to the following sections:

- Section 1 - this introduction;
- Section 2 - summarises the workshop objectives, expected outcome, agenda and participation;
- Section 3 - outlines the main workshop discussions;
- Section 4 - provides a synthesis of the main strategic points arising from the workshop.

1.4. Applicable documents

- [AD.1]: EUGENE Description of Work, 8th September 2009.
[AD.2]: EUGENE Project Implementation Plan, 20th October 2009.



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1.5. Reference documents

[RD.1]: Status-quo Report Disaster, version 1.0; Doc. No.: EUGENE-WP3000-1.

2. Workshop objectives, agenda and targeted audience

2.1. Objectives

The following workshop goals and expected outcome had previously been identified:

A Disasters SBA status quo study report, which has been drafted beforehand, will be put up for discussion at the workshop. It will be reviewed from an expert perspective. Furthermore, the report will form the basis for strategic considerations on how to achieve a well-coordinated and sustained European GEO component and contributions to GEOSS regarding the Disasters SBA.

Major outcomes of the workshop will be:

- *an updated report on the European status quo relevant to the Disasters SBA,*
- *potential inputs to a coherent European position and visibility at the GEO Ministerial Summit taking place in Beijing in November 2010.*

2.2. Agenda

The workshop agenda is provided in Appendix A.

2.3. Participation

Several Pan-European organisations and programmes, major actors at European Member States level as well as global level organisations under the GEO umbrella were encouraged to take part in the workshop.

The participation list is provided in Appendix B.

3. Summary of workshop presentations and discussions

3.1. Welcome and Introduction to the Objectives of the Workshop

After a round of introduction H. Staudenrausch presented an overview of the EUGENE project and the objectives of the workshop (see also Chapter 1.1, 1.2 and 1.3). He explained the current state of the EUGENE project as follows:

- Draft Status Quo Reports available ("Living documents", to be further reviewed and complemented)
- EUGENE Expert Workshops
 - Climate: 26-27 April, EUMETSAT, Darmstadt
 - Water: 11-12 May, Fed. Institute of Hydrology, Koblenz
 - Disasters: 1 June, DLR Office, Brussels



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- Review of SQ reports, discussion on strategic issues, opportunities for the Beijing Ministerial
- Next Steps:
 - Decide on and produce contributions to GEO Ministerial
 - Work on strategic issues (SBA-specific and cross-cutting)
 - Structure and facilitate further discussions and communication of results

The link between GMES and GEOSS was addressed. In this context three main issues had been identified:

- GMES to be the main European contribution to GEOSS
- GEO data sharing principles being a driver, among others, for GMES data policy
- GEOSS to be an important element of a GMES „international cooperation strategy“

Concerning the strategic considerations H. Staudenrausch mentioned that the European GEO strategy should mainly be implemented by coordinated actions within established European programmes, such as GMES, EMI, INSPIRE, ESA, FP-7 (FP-8), and should be complemented by national contributions. Moreover, the European coordination and political support should be improved to achieve a more effective GEO involvement. Finally, H. Staudenrausch pointed out that the strategic issues will be transferred to the Beijing Ministerial Conference.

3.2. GEO background - current state and future perspective

A. Edwards presented the GEO background (see also Chapter 1.1 and 1.2). He highlighted the GEO data sharing principles and that the main goal of GEO is to create the GEOSS data collection of open resources for everyone to address the GEO Societal Benefit Areas. Subsequently the Disasters Strategic Target was pictured:

Before 2015, GEO aims to: Enable the global coordination of observing and information systems to support all phases of the risk management cycle associated with hazards (mitigation and preparedness, early warning, response, and recovery).

Questions and remarks:

- It was asked with respect to the data sharing principles how the GEO Common Infrastructure (GCI) will look like at the end. A. Edwards remarked that GEO is based on a volunteer approach without time requirements and that numerous details are to be defined still.
- Another question concerned the involvement of the INSPIRE directive into GEO and how it can be achieved that INSPIRE will be used within GEO. A. Edwards explained that the GCI will be an interoperability forum with different registration standards. It was annotated from the auditorium that Europe is involved in GEO with a lot of members and that they should push INSPIRE to become a major part of the GEO infrastructure.

3.3. Current status and achievements of the GEO SBA Disasters

F. Gaetani presented the strategic target, the work plan until 2011, the Communities of Practice (CoP) and the Geohazard Supersites Initiative. Besides the Geohazards CoP, the Integrated Global Water Cycle Observation CoP and the Forest CoP are also involved in GEO work plan tasks of the Disasters SBA.

Questions and remarks:



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- It was remarked, that the multi hazard approach of the SBA Disasters should broaden to humanitarian aid and technical disasters. Some projects in Europe are already focussing on these topics (e.g. IMPACT).
- Concerning the concept of supersites, it was asked what the definition of a supersite is. The supersite concept is based on the "Frascati declaration". Its objective is to stimulate the monitoring of and studies on selected reference sites prone to earthquake, volcano or other hazards by establishing open access to relevant observational datasets. There was a remark from the auditorium that the Supersites Initiative evolved into a mechanism for quick data collection after disasters to a certain extent. The original idea, however, was to chose relevant sites to be systematically monitored.

3.4. International space activities and support to disaster management by the UN-SPIDER programme

J. Szarzynski presented the UN-SPIDER programme and pointed out the mission and mandate: UN-SPIDER is a gateway to space information for disaster management support, serves as a bridge to connect the disaster management and space communities, and facilitates capacity building and institutional strengthening. UN-SPIDER cooperates with several international actors and already collaborates with GEO. The activities are structured in the components

- SpaceAid (Access to Space-based information),
- Webportal (Information and Knowledge Management),
- Technical Advisory Support and
- Capacity Building.

The "Namibia Flood Management Pilot Project" was mentioned as an example for an ongoing activity in the context of Technical Advisory Support.

Questions and remarks:

- J. Szarzynski was asked about the specific role of UN-SPIDER and answered that UN-SPIDER exclusively acts as network, i.e. no products, such as maps, are produced.

3.5. European GMES "Emergency Response Service"

M. Facchini explained in his presentation the overall view on GMES, highlighting the in-situ component led by EEA and the space component led by ESA. He underlined that within the GMES Emergency Response Service (ERS) the rapid-mapping activities have the highest priority. The main challenges are to reinforce the Space infrastructure and data access and to improve the timeliness. The extension of the services to pre- and post-crisis phases is declared as second priority. The ongoing pre-operational phase of the ERS (represented by the project SAFER) will be followed by the GMES Initial Operations phase (2011-2013). M. Facchini also mentioned that GMES as a whole is already registered in GEO.

Questions and remarks:

- It was remarked that on international and also European level the Emergency response activities are not well coordinated (Haiti is mentioned as example). The resulting question would be if SAFER is foreseen to act as coordination body at least for Europe. M. Facchini answered, that this role is not yet defined. There are several possibilities, for instance the GMES Bureau or the EC Monitoring and Information Centre (MIC) could be mandated to fill this role. Further there is a need of supporting the users of the GMES ERS. For Europe the linkER project is established to handle this issue.
- There was an additional remark, that there should be a better coordination between the GMES ERS and the International Charter Space and major Disasters.

- Regarding the extension of the ERS to other phases of the disaster management cycle M. Facchini explained that some cross-cutting approaches are necessary (e.g. joint GMES-EEA projects). First, the requirements and the status-quo of data must be analysed.

3.6. Presentation of the analysis study "European Contributions to the GEO SBA Disasters" (Draft Status Quo Report)

G. Strunz presented the draft results of the study report. He explained the analysis of the user requirements, the analysis of the existing European activities per disaster type and presented the gaps, challenges, opportunities and major strengths discovered. The presentation included the analysis for the disaster types: Landslide, Flood, Earthquake, Volcano, Fire, Tsunami, Extreme Weather and Multi Risk. The presentation closed with the following general conclusions of the analysis:

- General user requirements should be further developed to provide more specific requirements (time, coverage, etc) for each hazard type.
- Improvements are needed with regard to regional and national activities for some hazard types (e.g. landslides) in order to provide efficient pan-European services.
- The links between forecasting services and emergency response services have to be improved.
- The current focus on Emergency Response should be enlarged and supplemented by vulnerability and risk analysis for improved preparedness and mitigation.

Questions and remarks:

- It was remarked that local activities (national level) should be more considered in the report
- Another remark was that the extreme weather component should be better reflected in the report. M. Klöppel (ECMWF) offered to provide information on this topic.
- An open question is still how the Service providers can do vulnerability analysis and how the recovery part should be covered. For this purpose in-situ data are necessary. These data repositories exist mostly on national level.
- It was mentioned that additional reference data are always needed (e.g. land-use data besides CORINE land cover) and that the quality assurance regulations must be considered.
- It was stated that in terms of the different disaster types the input to GEOSS will be very heterogeneous.

3.7. European Contributions to GEO and Strategic considerations

The next three slots, which were foreseen in the agenda (*moderated discussion on European contributions to GEO, moderated discussion on strategic considerations, and Conclusions*), were merged to one moderated plenary discussion. S. Voigt gave a wrap-up of the presented sessions. Subsequently he presented the framework for the discussion with the following topics:

- What will be the intended development of GMES/ERS?
- What will be the intended development of GEO/GEOSS?
- Which mechanism will be implemented on international level (GMES/GEOSS or others) and who will be the coordination body?
- What are the general strengths, gaps, challenges and opportunities of European earth observation for Disaster/Emergencies?
 - Is there a need for promotion of European capacities?

- Should Europe work towards a global leading position in the domain?
- International collaboration to close observational gaps?
- To what extent should GMES ERS like services be organized at global scale?
- How to achieve a sustained operation Disaster/Emergency related earth observation systems in Europe?
- Benefits from a strong European involvement in GEO in the domain of Disasters/Emergencies
 - Incorporation of international data into European systems and programmes
 - Better coordination of international activities?
 - Closing gaps, using synergies?
 - Minimising double work, where possible, however, generating independent assessments where required?
 - Shaping GEO to maximise Europe's benefits from GEO/GEOSS?
 - Could developments in Europe (GMES, data sharing) be facilitated by a strategic involvement in GEO?
 - Could international visibility of European and national achievements increase political support within Europe?
- Effective involvement in GEO and GEOSS in the domain of Disasters/Emergencies
 - Which issues should be addressed by a European GEO strategy?
 - Organisational or structural deficiencies within Europe?
 - Definition of relationship between GMES and GEOSS
 - Is there sufficient political/scientific support? How could it be improved?
 - Utilisation of GEO to facilitate coordination processes within Europe: Are GEO communities (Task Teams, Communities of Practice) suitable vehicles?
 - How could a European GEO strategy be brought into effect?

The results of the following discussion are summarised in the synthesis section.

4. Synthesis of main strategic points

- *Implementation of elements of INSPIRE in GEO*
 There are different international geo-data infrastructure directives. An internationally harmonized geo-data infrastructure is not implemented so far. A possible European contribution to GEO with respect to a harmonized geo-data infrastructure can be the implementation of the INSPIRE initiative. In this context GEO will provide an interoperability forum with different standards for the registration of data. Hence an open question is: How to make sure that INSPIRE will be used in GEO to foster an international harmonization/standardization? This is important for the European partners within GEO, because many European players already implemented the INSPIRE directive in their services. Therefore, the INSPIRE directive should have a large impact on data standards to be defined within the GCI.

- *Expansion of the scope of the GEO SBA Disasters and European visibility*
At this stage there are many European activities, e.g. in FP7 projects, which have a link to GEO, but they are not integrated into the GEO work plan so far. Their integration could enlarge the scope of the GEO SBA Disasters. Also the current focus of GEO is on data acquisition, services are not well represented so far. This situation could possibly change after 2015 which would facilitate the integration of GMES services into GEOSS.
- *Coordination of services at global level*
Past disaster events like the Haiti Earthquake (January, 2010) have shown that a big amount of EO-based disaster information (about 160 products) had been produced by several service providers. The produced portfolio contains much redundant information with different quality. As a result it is difficult for the user to decide which product is the most reliable one and should be used, especially when time is an essential factor. Hence there is a clear need for coordination of the EO-based services for disaster management at the global level. An open question is, if GEO could adopt this coordination role. It must be clearly mentioned that the political dimension in case of disaster management hinders GEO to adopt the role to be the globally mandated body. Furthermore, GEO itself will not act on an operational level.
- *Uncertain future of GEO beyond 2015*
It is to a certain extent unclear what will happen to GEO beyond 2015. This is one reason for some European organisations to be hesitant regarding a strong engagement in GEO.
- *Coordination of the interoperability of users*
Within GEO the user interface committee is managing the CoPs. Some of these CoPs exist for a long time already. So there is an interested user community (however, not through to the end users, rather intermediate and value-adding users). By contrast, GMES has defined end users but there might be deficits regarding intermediate users. Thus, GMES and GEOSS can learn from each other and work together on the mechanism to have a consistent user approach.
- *Transfer of Knowledge*
Due to the big amount of European projects dealing with disaster management Europe could contribute considerable knowledge and experience to GEO.
- *Data sharing*
Europe has experience in coordinating data sharing, but there is no coherent international data policy. This may cause problems, for instance regarding the integration of GMES Sentinel data into GEOSS, because this would have major consequences regarding the data policy. However, GEOSS data sharing principles already have an influence on e.g. Sentinel data policy. Europe has made a commitment to the goals of GEO, and participation in GEO implies the support of the GEO data sharing principles. Data sharing within the GEO framework could also close some observational gaps concerning areas of interest or thematic issues to the benefit of Europe.
- *Service Maturity and Quality*
Due to long-term funded activities, the European EO-based products for disaster management have reached a high standard. For instance European service providers have installed quality assurance and validation processes. On the international level this is still an open issue. Therefore, the sustainability of the high European quality standards must be guaranteed during the process of harmonisation and standardisation within the GEO framework. The focus of GEO until 2015 will be on the data acquisition, but later it is planned to integrate services. Hence Europe can have a precursor role in providing services and can be actively involved in the development of the GEOSS services and the standardisation/harmonisation process. For example in the field of geological hazards, Europe can promote its leading position in SAR technologies.



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APPENDIX A Workshop Agenda

Tuesday, 1 June 2010:

- | | |
|---------------|---|
| 10:00 – 10:20 | Welcome and Introduction to the Objectives of the Workshop
G. Strunz, S. Voigt, H. Mehl, H. Staudenrausch (DLR) |
| 10:20 – 10:40 | GEO background - current state and future perspectives
A. Edwards (European Commission) |
| 10:40 – 11:00 | Current status and achievements of the GEO SBA Disasters
F. Gaetani (GEO Secretariat) |
| 11:00 – 11:20 | International space activities and support to Disaster Management
J. Szarzynski (UN SPIDER) |
| 11:20 – 11:40 | European GMES "Emergency Response Service"
Mauro Facchini (European Commission GMES Bureau) |
| 11:40 – 12:00 | Presentation of the analysis study "European Contributions to the GEO SBA Disasters" (Draft Status Quo Report)
G. Strunz, K. Zosseder (DLR) |
| 13:30 – 16:00 | European Contributions to GEO (moderated discussion)
S. Voigt et al. (DLR), all participants |
| 16:00 – 16:30 | Strategic considerations (moderated discussion):
- European visibility at the GEO Ministerial Summit 2010
- Towards coordinated European contributions to the Disasters SBA
U. Gärtner (DLR), all participants |
| 16:30 – 17:00 | Conclusions |



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APPENDIX B Workshop participants

Organisation	Participant
EC GMES Bureau	Mauro Facchini
EC DG ENTR	Hugo Zunker
EC DG RTD	Denis Peter
EC DG RTD	Alan Edwards
EC DG RTD	Florence Beroud
EC DG RTD	Vojko Bratina
EC DG RTD REA	Stefano Fontana
EC DG RTD REA	Stijn Vermoote
ECMWF	Manfred Klöppel
EEA	Robert Lowson
EEA	Andre Wehrli
GEO Secretariat	Francesco Gaetani
UNOOSA/UN SPIDER	Jörg Szarzynski
Agency for sustainable Development and Eurointegration	Kristian Milenov
National Meterological Administration, Romania	Vasile Craciunescu
Romanian Space Agency	Ion Nedelcu
EUROGEOSURVEY	Luca Demichelli
SAFER Project	David Hello
SAFER Project	Jacque Conway
EUGENE project	Helmut Staudenrausch
EUGENE project	Jens Danzeglocke
EUGENE project	Udo Gärtner
EUGENE project	Günter Strunz
EUGENE project	Stefan Voigt
EUGENE project	Harald Mehl
EUGENE project	Kai Zosseder
EUGENE project	Michael Nyenhuis