The Group on Earth Observation (GEO) Perspective in the Field of Natural Hazards

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Florence BEROUD – Project Officer
Management of Natural Resources – RTD.I.4
Environment Directorate
Research Directorate General
EUROPEAN COMMISSION
Presentation overview

• The Group on Earth Observation
• The EC participation to GEO and the GEOSS
• Disasters / Natural Hazards tasks in the GEOSS
• Conclusion
Launched in response to a call for action by the 2002 World Summit on Sustainable Development for coordinated observations relating to the state of the Earth.

In June 2003 the G8 Summit (Group of Eight) leading industrialized countries affirmed the importance of Earth observation as a priority activity.

GEO was established by the 3rd EO Ministerial Summit in 2005.

GEO is a voluntary partnership of governments and international organizations.

As of end September 2009 GEO’s Members include 80 Governments and the European Commission and 56 Participating Organisations.

GEO provides a framework within which these partners can develop new projects and coordinate their strategies and investments.
The Group on Earth Observations (GEO) is coordinating efforts to build a Global Earth Observation System of Systems, or GEOSS.

GEO is constructing GEOSS on the basis of a 10-Year Implementation Plan for the period 2005 to 2015.

GEO Work Plan, currently 2009-2011, implementing the GEOSS 10-year Implementation Plan

“The vision for GEOSS is to realize a future wherein decisions and actions for the benefit of humankind are informed by coordinated, comprehensive and sustained Earth observations and information.”

GEOSS Implementation Requires: Interoperability of Systems
GEOSS Common Infrastructure Operational View

Represents a COLOSSAL investment by GEO Members & PO in EO systems.

Delivers major societal benefits to USERS, such as policy makers & citizens.

Provides improved interoperability.

Delivers trusted data & information.

Is “Open”, in accordance with DSP.

Enables GEOSS resources to be readily discovered and accessed.

Represents a COLOSSAL investment by GEO Members & PO in EO systems.
9 Societal Benefit Areas

- Reducing losses from disasters
- Environmental effects on human health
- Terrestrial, coastal and marine ecosystems
- Climate change
- Management of energy resources
- Weather
- Water resource management
- Sustainable agriculture and desertification
- Biodiversity
Contribution of FP7 ENV projects to the GEOSS

THE 9 GEOSS SOCIETAL BENEFIT AREAS
(GEOSS for Society)

Disaster
Energy
Health
Climate
Water
Ecosystem
Agriculture
Biodiversity
Weather

ImpactMin (09)
EO-MINERS (09)
EO2HEAVEN (09) Call 10
COCOS (07) EuroSITES (07) ACOBAR (07)
CEOP-AEGIS (07)
EnviroGRIDS (08)
HYPOX (08)
EBONE (07)
The GEOSS Disasters SBA

- Wild fires
- Volcanoes, Volcanic ash and aerosols
- Earthquakes
- Coastal hazards and Tsunamis
- Landslides and subsidence
- Tropical cyclones
- Extreme weather
- Floods
- Sea and lake ice
- Pollution events

Geohazards

Elsewhere: disease, drought, algal blooms and invasive species
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).

This will be achieved through:

- More timely dissemination of information from globally-coordinated systems for monitoring, predicting, risk assessment, early warning, mitigating, and responding to hazards at local, national, regional, and global levels;
- Development of multi-hazard and/or end-to-end approaches, as appropriate to meet the needs for disaster risk reduction, preparedness and response in relevant hazard environments;
- Supporting the implementation of the priorities for action identified in the Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters (HFA).
## GEO Workplan 2009-2011 - Disasters Tasks

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With reference to a multi-hazard approach, define and facilitate implementation of a satellite constellation for risk management.

The Task will also include specific activities concerning assessment of user requirements (Report completed), Constellation requirements definition and performance assessment, with the full involvement of Users.

Extension of International Charter for Major Disasters and Space, possible strengthening of Charter mechanisms and options for widening its scope; and Charter metadata catalogue.

Task lead by Canada (CSA), China (CARSA, NSMC), CEOS (Committee on Earth Observation satellites) and UNOOSA, and supported by the Geohazards Community of Practice.
The Charter provides a unified system for acquiring Space data and delivering it to those affected by natural or man-made disasters.
As of today, the number of Authorized Users and cooperating bodies that can benefit from the Charter is limited; in particular, 47 GEO Member countries do not have Authorized User status.

In response to GEO request for access for all GEO Members to Charter, the Charter Board unanimously endorsed the principle of « universal access » for all GEO member states.

GEO Secretariat has assessed existing disaster management mechanisms and defined a mechanism for providing Charter access to all GEO Members. The GEO proposal was discussed at the Charter Board Meeting in April 2009. The Board agreed with the proposed approach.

Next steps:
- Consultation with African countries;
- Implementation of Charter access mechanism for Asia-Pacific Region through Sentinel Asia.
Proposed approach: Regional Approach.

- The Regional Center will activate the Charter on behalf of the Countries in the region.
- Regional Center could offer Project management and Value Adding (PM & VA).

Extending Charter on Space and Major Disasters Access

1. Disaster
2. Request
3. Regional Center: Country Requests Filtering - Project Management - Value Adding
4. Country Request
5. Charter
6. Data
7. Country Request
8. Value Added Product
DI-09-01
Monitoring for Geohazards Risk Assessment

a) Vulnerability Mapping and Risk Assessment
Focus on the Geohazards Supersites Initiative:
- retrieval, integration and systematic access to the remote sensing and in-situ data of a number of regional areas exposed to major geological threats
- initial focus on enhancing access to SAR data;
- development, testing and application of seismic vulnerability model applied to selected Supersite areas.

Task co-leads: China (CENC), France (BRGM), Italy (EUCENTRE, ISPRA, ESA, UNOSAT and WMO, and supported by the Geohazards Community of Practice

b) Seismografic Networks Improvement and Coordination
- Facilitate the sharing of data and event products among GEO members; (120 seismic networks contribute a free summary of world seismicity, 24 data centres and nw contribute bulletin information available within days of an event)
- Facilitate collaboration and cooperation and research work to increase the capability of global earthquake and tsunami monitoring networks;
- Expand and coordinate efforts to provide access, to real-time and archived seismological data and products and develop a portal

Task co-leads: China (CENC), EC (EMSO), USA (USGS), FDSN and ISC, and supported by the Geohazards Community of Practice
Geohazards Supersites Initiative

An open and seamless data access to a wide range of key observations (spaceborne, airborne, ground-based), from raw data to processed information over a number of Volcanoes and Seismogenic Areas.

Mt. Etna, Vesuvius/Campi Phlegreii, Hawaii, Istanbul, Tokyo, Vancouver/Seattle and Los Angeles. Messina (Phase 2)
DI-09-02
Multi-Risk Management and Regional Applications

a) Multi-hazard Approach Definition and Progressive Implementation
- Promote the definition and implementation of an integrated and comprehensive approach to systematically address all risks and disasters phases, including risk assessment and mapping (guidelines and good practices in Early Warning Systems -EWS).
- Support ISDR in the Implementation of the Hyogo Framework for action
- promote the definition and implementation of a Disasters Community of Practice (CoP)
  Task Co-leads: France (BRGM) and WMO, and supported by the Geohazards Community of Practice

b) Regional end-to-end disaster management applications
- Define framework and Implement regional cross-cutting end-to-end projects
  Task led by France (BRGM), and supported by the Geohazards and Water Cycle Community of Practice
Flood Pilot Project for the Caribbean & Namibia

NASA, CSA, CEOS, UNOOSA, ESA, ASI, World bank, Servir, Cathalac, CDERA, DLR, NOAA, & others
• **Namibia:** Flood forecasts and flood extent products were developed (NASA) for the 2008/2009 flood events in Mozambique and Namibia. Specific areas were targeted for satellite-data acquisition from a wide range of sensors including EO-1, RADARSAT-2, Envisat and Formosat-2.

• **In the Caribbean:** an ambitious workplan was developed in close consultation with the user community to identify user requirements. The project aims to monitor the entire Caribbean region on a regular basis using the flood-prediction software developed by NASA.

In particular, five National Partners were selected for Phase 1: Barbados, British Virgin Islands, Grenada, Jamaica and Saint-Lucia.
a) **Tsunami early warning system** of systems
Support the establishment and continuation of a multi-hazard fully operational global tsunami and mitigation system of systems

Task led by IOC and UNOSAT, and supported by the Geohazards and Coastal Zone Communities of Practice

b) **Implementation of a fire warning system** at global level
Develop a globally-coordinated warning system for fire, including improved prediction capabilities, analysis tools, and response through sensors, information products and risk assessment models.

This sub-task is led by Canada (CFS), Portugal (INOV) and GTOS (GOFC-GOLD), and supported by the Geohazards and Forest Communities of Practice
GEO provides a framework within which the partners can develop new projects and coordinate their strategies and investments.

By making it possible to integrate different types of disaster-related data and information from diverse sources, GEOSS aims to strengthen analysis and decision making for disaster response and risk reduction.

GEOSS is also helping to reduce risk over the long term by providing a better understanding of the relationship between natural disasters and climate change. Climate forecasts must become an integral part of sustainable development planning and of strategies for adaptation and risk management.

The GEO Secretariat Expert responsible for Disasters is Veronica Grasso

E-mail: VGrasso@geosec.org