

***9th Meeting of the GEO S&T Committee
San-Francisco
16-17 December 2009***

**Point 4: GEO 2009-2011 Work Plan
Role of the GEO S&T Committee in the
implementation of the S&T Content of the Work Plan**

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S&T and Earth Observation/GEOSS

Rational for GEO S&T Committee

Earth Observation is by nature S&T relevant:

- *It involves High-Tech infrastructures (satellites, in-situ observing and monitoring networks etc...);*
- *It requires technology research for the evolution of those High-Tech observing systems;*
- *It is essential for the development of models describing the Earth System.*



- ## GEO Science and Technology Committee
- **STC Vision**
 - build GEOSS through science and technology
 - develop GEOSS to improve understanding of the global integrated Earth system
 - engage S&T community to develop and use GEOSS
 - **STC Activities**
 - GEO Tasks
 - GEO Common Infrastructure
 - GEO Data Sharing Principles
 - **GEOSS S&T Roadmap¹²**

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R&D needed throughout the different GEO 42 overarching tasks

1 A TRANSVERSE GEOSS (*GEOSS Fundamentals*)

ARCHITECTURE
DATA MANAGEMENT
CAPACITY BUILDING
SCIENCE AND TECHNOLOGY
USER ENGAGEMENT

2 THE 9 GEOSS SOCIETAL BENEFIT AREAS (*GEOSS for Society*)

DISASTERS
HEALTH
ENERGY
CLIMATE
WATER
WEATHER
ECOSYSTEMS
AGRICULTURE
BIODIVERSITY



1.1 ARCHITECTURE

AR-09-01: GEOSS Common Infrastructure (GCI)

AR-09-02: Interoperable Systems for GEOSS

AR-06-01: Radio Frequency Protection

CB-06-04: Dissemination and Distribution Networks

1.2 DATA MANAGEMENT

DA-06-01: GEOSS Data Sharing Principles

DA-09-01: Data Management

DA-09-02: Data Integration and Analysis

DA-09-03: Global Data Sets

1.3 CAPACITY BUILDING

CB-09-01: Resource Mobilization

CB-09-02: Building Individual Capacity in Earth Observations

CB-09-03: Building Institutional Capacity to Use Earth Observations

CB-09-04: Capacity Building Needs/Gap Assessment

CB-09-05: Infrastructure Development and Technology Transfer

1.4 SCIENCE AND TECHNOLOGY

ST-09-01: Catalyzing R&D Funding for GEOSS

ST-09-02: Promoting Awareness and Benefits of GEO in the S&T Community

1.5 USER ENGAGEMENT

US-09-01: User Engagement

US-09-02: Socio-Economic Indicators

US-09-03: Cross-cutting Products and Services



2.1 DISASTERS

DI-06-09: Use of Satellites for Risk Management

DI-09-01: Systematic Monitoring to Support Geohazards Risk

DI-09-02: Multi-Risk Management and Regional Applications

DI-09-03: Warning Systems for Disasters

2.2 HEALTH

HE-09-01: Information Systems for Health

HE-09-02: Monitoring and Prediction Systems for Health

HE-09-03: End to End Projects for Health

2.3 ENERGY

EN-07-01: Management of Energy Sources

EN-07-02: Energy Environmental Impact Monitoring

EN-07-03: Energy Policy Planning

2.4 CLIMATE

CL-06-01: A Climate Record for Assessing Variability and Change

CL-09-01: Information for Decision-making & Risk Management

CL-09-02: Sustained Observing Systems

CL-09-03: Global Carbon Observation & Analysis System



2.5 WATER

WA-06-02: Droughts, Floods and Water Resource Management

WA-06-07: Capacity Building for Water Resource Management

WA-08-01: Integrated Products for Water Research

2.6 WEATHER

WE-06-03: TIGGE & Global Interactive Forecast System

WE-09-01: Capacity Building for High-Impact Weather Prediction

2.7 ECOSYSTEMS

EC-09-01: Ecosystem Observation and Monitoring Network (EcoNet)

EC-09-02: Ecosystem Vulnerability to Global Change

2.8 AGRICULTURE

AG-06-02: Data Utilization in Fisheries and Aquaculture

AG-07-03: Global Agricultural Monitoring Risk Management

2.9 BIODIVERSITY

BI-07-01: Biodiversity Observation Network (GEO BON)



New Proposals included in 2009-2011 Work Plan

Health – Monitoring and Prediction Systems :

- Air Quality Observations, Forecasting & Information
- Monitoring Plan for Persistent Organic Pollutants (POPs)
- Global Monitoring Plan for Atmospheric Mercury
- Globally Coordinated Malaria Warning System
- Ecosystems, Biodiversity & Health: Decision-Support Tools and Research



New Proposals included in 2009-2011 Work Plan

Climate – Global Carbon Observation System :

- Forest Carbon Tracking
- Global Monitoring of Greenhouse Gases from Space
- Forest Mapping and Change Monitoring
- Bio-geophysical, Soil & Land Surface Data



New Proposals included in 2009-2011 Work Plan

Water – Resource Management :

- Forecasting & Warning Systems for Droughts and Floods
- Soil Moisture
- Runoff
- Groundwater
- Precipitation
- Water Cycle Data Integration
- Water Discovery and Quality Assessments



New Proposals included in 2009-2011 Work Plan

Ecosystems – Vulnerability to Global Change :

- Vulnerability of **Sea Basins**
- Vulnerability of **Mountain Regions**
- Implication of global change for **Tourism**
- Impact of **Transport Infrastructure Development**
- Global Road and **Human Settlements Mapping**
- Socio-economic and **Demographic Global Data**



Task Number: ST-09-01
Task Title: Catalyzing Research and Development
(R&D) Funding for GEOSS

Encourage national governments and international organizations to address GEOSS Science and Technology needs in their R&D programmes to:

- (i) plan and conduct R&D activities in support of GEOSS implementation;
- (ii) contribute relevant R&D activities (planned or ongoing) to GEOSS; implementation;
- (iii) identify and earmark funding sources for those activities;
- (iv) promote GEOSS throughout the process.

Related activities will include: Develop proposals and guidelines to assist R&D agencies in addressing GEO needs. Engage a dialogue with decision makers and funding agencies. Identify programmes relevant to GEOSS Science and Technology needs and encourage them to collaborate with one another.

Leads (GEO Member or PO, Entity carrying out the work, Contact: e-mail):
EC (RTD)
IIASA (to be confirmed)



Task Number: ST-09-01
Task Title: Catalyzing Research and Development (R&D)
Funding for GEOSS

Motivation/Background : (Why should this Task or sub-task be implemented? What relevance to society? What is the state of the art? 3-5 lines)

Worldwide still only few R&D funding agencies make explicit reference to GEO and GEOSS in their programs.

Limits the engagement of the scientific Community in the construction of GEOSS.

Crucial that the funding agencies dealing with earth observation are becoming more aware of GEO and proactive towards GEOSS.

State of the art: the GEO S&T Committee has produced a document identifying a number of programs relevant to GEOSS and there are already some R&D funding bodies who have flagged activities in their WP (EC etc...).

The task should start from those initial steps.



Outputs *(e.g. products and services which result from the activities of the Task/sub-task; outlined in the form of deliverables with timelines)*

Planned:

- **Identified set of key Science and Technology programmes needed in the context of the development of GEOSS (mid 2009)**
- **Forum/network of funding agencies supporting key Science and Technology programmes (end 2009)**
- **Approach/guidelines/proposal to assist R&D agencies in addressing GEO needs (beginning 2010)**
- **Concerted actions for funding S&T activities relevant to GEO mid 2010 onwards**

Activities *(operations or work processes through which resources are mobilized to produce specific outputs; outlined in the form of milestones including timelines)*

Planned: ...

- **Bring together a group of experts to identify key program and funding agencies**
- **Create informal group of agencies on voluntary basis (through a workshop)**
- **Draft approach/guideline/proposals to be used by R&D funding agencies interested in GEO (to be done together with funding agencies)**



Task Number: ST-09-02
Task Title: Promoting Awareness and Benefits of GEO in the
Science and Technology Community
Area: SCIENCE AND TECHNOLOGY
Relevant Committee: STC
Related Targets: (to be included in 2009)

Sub-task Definition (as given in the 2009-2011 Work Plan):

Engage the research community in GEOSS to achieve breakthroughs in the understanding of the Earth's changing environment and global integrated Earth system.

- (i) Connect disciplines to address the complex issues of the global integrated Earth system;
- (ii) Improve interoperability between global observing systems, modelling systems, and information systems;
- (iii) Facilitate data sharing, data archiving, data dissemination, and reanalysis;
- (iv) Optimize recording of observations, assimilation of data into models, and generation of data products to improve understanding of the global integrated Earth system for prediction of environmental phenomena;
- (v) Enhance value of global observations from individual observing systems through their integration in the societal benefit areas; and
- (vi) Harmonize well-calibrated, high-accuracy, stable, sustained in-situ and satellite observations of the same variable recorded by different sensors and different agencies.

Related activities will include: ...Actively encourage relevant scientists and technical experts to contribute to GEOSS in a truly participatory way. Reach out to the world's diverse scientific and technological communities and make GEOSS more visible and attractive to them. Contact universities and laboratories to involve them in GEOSS activities. Organize a GEO presence at major symposia and other meetings, for example through plenary presentations or side events.

Leads (GEO Member or PO, Entity carrying out the work, Contact: e-mail):

EC (RTD)
COSPAR (to be confirmed)
IIASA (to be confirmed)



Task Number: ST-09-02
Task Title: Promoting Awareness and Benefits of GEO in the Science and Technology Community

Motivation/Background: (Why should this Task or sub-task be Implemented? What relevance to society? What is the state of the art? 3-5 lines)

This task aims at encouraging the wider scientific community to participate as contributors to and benefactors of a sustained GEOSS. Scientific and technological knowledge and research are vital to our understanding of the global integrated Earth System. In this context adequate links have to be established between GEOSS and R&D and the Science Community. It should start as foreseen in this task by increasing the awareness of the Science Community about GEO. All societal benefit area tasks of the 2009-11 WP can benefit from this better engagement of the S&T Community in GEO.

State of the art: A number of workshops, meeting involving the S&T Community have publicized GEO in the international R&D Community (To be developed: EO IEEE meetings, Forest Monitoring Symposium, Asia-Pacific Symposium, and the future IEEE GEOSS Workshop 11 – Ocean Observation Systems and Data Portals) –

This task could be used as a starting point those many workshops



Task Number:

ST-09-02

Task Title:

Promoting Awareness and Benefits of GEO in the
Science and Technology Community

Outputs (e.g. products and services which result from the activities of the Task/sub-task; outlined in the form of deliverables with timelines)

Planned:

- **Assessment of the situation, as far as awareness of the S&T Community about GEO is concerned in the different Societal Benefit Areas bearing in mind GEO needs;**
- **Draw a list of potential events/workshops needed to create synergies between GEO and S&T Community (based on existing ones—starting for instance with the Ocean one in Bremen);**
- **Contribution to the drafting of the GEO S&T Roadmap(action needed until 2015 so that GEOSS can benefit from R&D and that R&D can benefit from GEOSS);**
- **Publicise through website/newsletter synergies between GEOSS an R&D Produced (current status): ...**

Activities (operations or work processes through which resources are mobilized to produce specific outputs; outlined in the form of milestones including timelines)

Planned: ...



Sub-activity 6.4.1 Earth and ocean observation systems and monitoring methods for the environment and sustainable development:

- **Development and integration of observation systems** for environmental and sustainability issues in the framework of GEOSS (to which GMES is complementary)
- **Making systems interoperable** and **optimising the information** for understanding, modelling and predicating environmental phenomena, for assessing, exploring and managing natural resources.
- **European efforts** to be brought in the **global context** as foreseen through GEO



Start of FP7: to cover all SBA's

- *ENV.2007.4.1.1.1 Monitoring of the carbon cycle at global level*
- *ENV.2007.4.1.1.2 Contribution to a global biodiversity observation system*
- *ENV.2007.4.1.3.2 Monitoring the ocean interior, seafloor and subseafloor*
- *ENV.2007.4.1.3.3 Development of a Global Soil Observing System*
- *ENV.2007.4.1.4.1 Georesource information system for Africa*
- *ENV.2007.4.1.4.2 Improving observing systems for water resource management*
- *ENV.2007.4.1.4.3 GEONETCast applications for developing countries*



2nd Year of FP7: emphasise on Initial GEOSS Common Infrastructure

- *Research effort to comply with the requirements under the INSPIRE directive and under the tasks overseen by the GEO Architecture and Data Committee*
- *Science necessary to better assess the impact of energy exploitation on the environment, in coordination with similar requirements under the Energy tasks of the 2007-09 Work Plan of GEO*
- *Necessary research to better monitor and observe oxygen depletion in all the components of the Earth System*
- *Research contributing to capacity building efforts towards the new countries of the EU in the domain of Earth Observation*



Call is opened as of September 3rd, 2008 and covers the following:

1. **Integration of European activities within GEO**
 1. Contribution to observing systems for seismogenic hazards (large scale integrating project)

2. **Cross-cutting research activities relevant to GEO**
 1. Further structuring the European approach to Earth Observation (supporting action)

3. **Emerging Earth Observation activities**
 1. Contribution to observing systems for environment and health monitoring and modelling (large scale integrating project)
 2. Earth observation in support of a sustainable exploitation of mineral resources (small- or medium scale focused research project) SICA

4. **Developing capacity building activities in the domain of Earth Observation**
 1. Action in the domain of EO to support capacity building in GEO; two participants from developing countries are required

More detailed information available on <http://cordis.europa.eu>



Preliminary reflection for the 2010 Work programme

Integration of European activities within GEO

Meteorological hazards Earth Observation systems
Developing GEO S&T related activities

Cross-cutting research activities relevant to GEO

European interest in GEOSS – Benefit estimation
Building and processing observational datasets for reanalyses

Emerging Earth Observation activities

Exploring new GNSS applications (Global Navigation Satellite Systems)
with potential in the domain of Earth Observation and for GEOSS
Global Observation System for Permanent Pollutants

Developing capacity building activities in the domain of Earth Observation

Earth Observation
Network for Hydrological Applications and Run–Off process
Identification and Networking of Earth Observation activities in the Balkan
Area