

The GEOSS Science and Technology Service Suite: Linking S&T Communities and GEOSS

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Abstract

The Global Earth Observation System of Systems (GEOSS) is implemented by the Group on Earth Observations (GEO) with the goal to ensure that decision in nine Societal Benefit Areas (SBAs) of Earth observations (EOs) can be informed by sustained Earth observations. Extracting actionable information from Earth observations often depends on research, and utilization of the societal benefits of EOs requires the involvement of science and research communities. Building a GEOSS responding to the needs of a wide range of users necessitates contributions from many science and technology (S&T) communities. The success of GEOSS depends on a outreach of GEO to the relevant S&T communities, and the outreach concept has a focus on demonstrated services for S&T communities. The GEO Work Plan includes several Tasks focusing on outreach to S&T communities, and most of the GEO Community of Practice have a strong S&T component. Infrastructure serving and linking S&T users communities and GEOSS has been developed and is integrated into a GEOSS S&T Service Suite. The GEOSS S&T Stakeholder Network facilitates input from S&T communities to GEO.

Key words: Earth observations, Observing systems, Societal Benefits, Stakeholder network, Science and Technology Communities

Introduction

The Global Earth Observation System of Systems (GEOSS) developed by the Group on Earth Observations (GEO) aims to provide comprehensible Earth observations (EOs) in support of decision making in a wide range of societal benefit areas. The nine interdependent Societal Benefit Areas (SBAs) addressed by GEO require an interdisciplinary scientific approach, and scientific interpretation of the EOs provided by GEOSS is necessary in order to derive actionable information. A strong engagement of science and technology (S&T) communities in both the development and use of GEOSS is necessary to address the complex issues of the global integrated Earth system; improve interoperability between global observing, modeling, and information systems; facilitate data sharing, archiving, dissemination, and reanalysis; optimize the recording of observations, assimilation of data into models, and generation of data products; enhance the value of observations from individual observing systems through their integration in the SBAs; and harmonize well-calibrated, highly accurate, stable, sustained in-situ and satellite observations of the same variable recorded by different sensors and different agencies.

Many of the Participating Organizations in

GEO have a focus on S&T. Most of the GEO Communities of Practice (CoPs) also have a strong S&T component. Nevertheless, there are still many relevant S&T communities that are not sufficiently linked to GEO and GEOSS.

The S&T Road Map of GEO (GEO STC, 2010) defines a number of outreach activities in order to ensure a broad S&T support for GEOSS and a wide use of GEOSS products by S&T communities. The GEO Work Plan includes several Tasks focusing on the implementation of the S&T Road Map, and on improved linkage between S&T communities and GEOSS (including ST-09-02 in the 2009-2011 Work Plan and ID-03 in the 2012-2015 Work Plan). Infrastructure serving and linking S&T users communities has been developed by these Tasks.

The Outreach Concept

Successful outreach to S&T communities requires demonstration of a benefit for these communities. The S&T outreach concept for the implementation of the GEO S&T Road Map takes this fundamental statement as a starting point and provides services to S&T communities, demonstrates the benefits of GEOSS to S&T communities, and provides a voice for these communities within GEO. The services are integrated into the GEOSS S&T Service Suite (G-STSS). Demonstration of the benefits of GEOSS

for S&T communities is based on the GEOSS S&T Portfolio, which is a component of the G-STSS. The voice of S&T communities is provided by the GEOSS S&T Stakeholder Network.

GEOSS Science and Technology Service Suite

The G-STSS has several outreach components for the demonstration of GEOSS and its value for S&T communities, and for services supporting S&T communities in their linkage to, and use of GEOSS. At the core of the G-STSS, the GEOSS S&T Portfolio includes examples showing GEOSS at work for S&T communities and provides an avenue for S&T groups to feature their contribution to GEOSS. A S&T Meeting Web Portal provides a workspace to coordinate and document GEO and GEOSS participation, side events, and presentations at relevant S&T meetings. A slide library supports outreach both at S&T meetings and enables teachers to include information on EOIs and their societal benefits in their classes. Workshops of the GEOSS S&T Stakeholder Network are organized within the G-STSS and the outcomes of the workshops are accessible through the G-STSS. A web-based tool allows the documentation and promotion of research observational infrastructure that should

be transitioned to a sustained operation. The G-STSS supports data citation through information on the international discourse on data citation, and the provision of guidelines. The assessment of datasets is supported through the development of a GEO Label. Tools for user feedback on all S&T aspects related to GEOSS are under development. A database for continuity indicators is also under development, which will inform the development and maintenance of a GEOSS that supports research related to the Grand Challenges of a future sustainable Earth.

The GEOSS S&T Portfolio

The GEOSS S&T Portfolio features a number of compelling examples showing how GEOSS serves S&T communities in their work. The examples, which have been selected through a rigorous review of proposals submitted to ST-09-02/ID-03 (Plag, 2012), are accessible through a web page (Fig. 1). The goal is to have at least two examples for each SBA. Currently, not all SBAs are represented through examples, and an effort is being made to solicit additional proposals. The Portfolio is open for submission of additional proposals, and guidelines for the submission are available on the Portfolio web page, currently at http://www.geo-tasks.org/gEOSS_portfolio.

GEOSS and S&T	Disasters	Climate	Weather	Water	Health	Agriculture	Biodiversity	Ecosystems	Energy	Cross-Cutting
News	The GEOSS Portfolio for Science and Technology									
April 25, 2012: Four examples of the GEOSS S&T Portfolio were presented at a Splinter Meeting at the EGU Meeting in Vienna, Austria. Read more ...	<p>The GEOSS Portfolio for Science and Technology features examples of GEO activities, projects, and Work Plan Tasks that demonstrate the benefits of GEOSS for science and technology (S&T) communities. GEOSS provides access to many services, data sets and products of value for scientists, researchers and developers. In many cases, new research is enabled and would not be possible without access to the Earth observation products accessible through the GEO portal. This portfolio shows how the products accessible through the GEOSS Common Infrastructure (GCI) works for S&T communities.</p> <p>GEOSS has a reciprocal relationship with the S&T communities. GEOSS needs input from them, and they can benefit from GEOSS. GEOSS depends on input from science and S&T in order to evolve in response to rapidly expanding user needs. GEOSS is a unique source of Earth observation data and related products essential for research in all nine of the Societal Benefit Areas (SBAs) of Earth observations. The technological challenges posed by the implementation of GEOSS stimulates technology development in many technology communities. The GEOSS Portfolio aims to demonstrate this bidirectional relationship between GEOSS and S&T communities.</p> <p>Representative examples for the portfolio have been identified in cooperation with GEO Tasks. Proposals for examples have been reviewed based on a pre-defined review form and a quantitative rating system. The examples selected for inclusion in the portfolio demonstrate a wide range of benefits of GEOSS for science and technology communities, including tools for discovery of data and products, improved accessibility, new data sets and services, and a better link to end users.</p> <p><i>Submissions of proposals for additional examples to complement those currently in the portfolio are being sought. The process of identifying, reviewing and documenting examples for the GEO Portfolio is comprehensively described in the Portfolio Process paper, which was prepared with support by the EGIDA Project. Proposals for new examples will be reviewed by the ID-03 Task team on a continuous basis. Proposals should be prepared using the template. Proposers should consider the review criteria used by the ID-03 team. Successful proposers will be invited to submit as a first contribution a two-page story following the guidelines.</i></p>									
January 26, 2012: The example of the "Global Mercury Observing System" has been integrated into the Portfolio. Read more ...										
December 18, 2011: The "Global Mercury Observing System" has been accepted as a new example in the Healths SBA. The full documentation will be added soon.										
October 26, 2011: New example in the Water SBA added: The new example "Prototype observation system for water resources in South-East Asia" ... See the example ...										
June 13, 2011: The "Prototype observation system for water resources in South-East Asia" has										
	<p>The following examples are currently in the GEOSS Portfolio for Science and Technology:</p> <ul style="list-style-type: none"> • Disaster: no example available yet. • Climate: Capacity building of operational oceanography and climate adaptation. Read more ... Download slideshow as ppt or pdf. • Climate: Year of Tropical Convection (YOTC). Read more ... • Weather: no example available yet. • Water: Pilot Projects for Improved Water Discovery and Quality Assessments. Read more ... Download slideshow as ppt or pdf. • Water: Prototype observation system for water resources in South-East Asia. Read more ... Download the ebrochure as pdf; a slideshow as ppt. • Health: Using Earth Observations to Benefit Health. No introduction available yet. • Health: GMOS — Global Mercury Observation System: Introduction. • Agriculture: The Harmonized World Soil Database (HWSD) as a first step towards a Global Soil Information System. Read more ... Download slideshow as ppt or pdf. • Agriculture: Geo-wiki.org - Crowdsourcing to improve Landcover Validation: Read more ... Download slideshow as ppt. • Biodiversity: Protected Areas Monitoring Pilot. Read more ... Download slideshow as ppt or pdf. • Ecosystems: enviroGRIDS Building Capacity for a Black Sea Catchment Observation and Assessment System supporting Sustainable Development. Read more ... Download slideshow as ppt or pdf. • Energy: no example available yet. • Cross-Cutting: European Observatory Network. Read more ... 									

Fig. 1. The home page of the GEOSS S&T Portfolio, which contains a number of compelling examples that show how GEOSS works for S&T Communities.

GEO GROUP ON EARTH OBSERVATIONS GEOSS at Science&Technology Meetings

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Future S&T Meetings
Past S&T Meetings
Other Meeting Lists

Science and Technology Meetings Future Meetings

STC-Related Meetings:
GEO Committee meetings
STC meetings
ST-09-02 Meetings

SPAM Meeting Announcements:
Fraud Meeting Announcements
Union of International Associations Fraud Monitor

Documents and Tools:
GEO Meeting Portal Document
Submit a Meeting
Submit a GEO Activity

Date	Contacts	Type	Meeting description	Venue, Co-locations, other information	GEO/GEOSS Activities
15-19 December 2014	Web Page	CO	Title: AGU 2014 Fall Meeting Duration: One weeks. Objectives: see 2014 AGU Fall Meeting. Organizers: AGU Participants: All interested scientists.	San Francisco, USA	&nbs;
16-19 September 2014	Announcement	CO	Title: 18th World Congress of CIGR Duration: Four days. Objectives: see announcement. Organizer: CIGR. Participants: All interested scientists.	Beijing, China	-
9 - 13 December 2013	Web Page	CO	Title: AGU 2013 Fall Meeting Duration: One weeks. Objectives: see 2013 AGU Fall Meeting. Organizers: AGU Participants: All interested scientists.	San Francisco, USA	&nbs;
22-26 April 2013	Web Page	CO	Title: 35th International Symposium on Remote Sensing of Environment Duration: Five days. Objectives: see Web Page. Organizer: see Web Page. Participants: All interested scientists.	Beijing, China	-
07 - 12 April 2013	Web Page	CO	Title: General Assembly of the European Geophysical Union Duration: Five days. Objectives: see web page. Organizer/sponsor: EGU Participants: All interested geoscientists.	Vienna, Austria	It is expected that several splinter meetings will be related to GEO/GEOSS.
8 - 12 December 2012	Web Page	CO	Title: First IUGG GRC Conference on Extreme Natural Hazards and Their Impacts Duration: One weeks.	Orange, California, United States	Abstract Deadline: 10 September 2012

Fig. 2: The Version 0.1 of the GEOSS S&T Meeting Page. The page provides functionality for the coordination of GEO and GEOSS-related activities as S&T meetings as well as the documentation of these activities. A fully interactive Version 1.0 is currently under development.

GEO GROUP ON EARTH OBSERVATIONS Bonn 2012 Workshop

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geo-tasks.org
GEO Home
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Relevant Links
MDGs
Belmont Challenges (White paper)
ICSU Grand Challenges
Future Earth - research for global sustainability
GEO Work Plan, Strategic Targets
GEOSS-IPCC Workshop Recommendations (Workshop Presentations)

2nd GEOSS Science and Technology Stakeholder Workshop
GEOSS: Supporting Science for the Millennium Development Goals and Beyond
Bonn, Germany, August 28–31, 2012
universitätbonn

Workshop Scope and Objectives

The eight Millennium Development Goals (MDGs) cover a range of societal issues, all with a target date of 2015:

1. Eradicate extreme poverty and hunger;
2. Achieve universal primary education;
3. Promote gender equality and empower women;
4. Reduce child mortality;
5. Improve maternal health;
6. Combat HIV/AIDS, malaria and other diseases;
7. Ensure environmental sustainability;
8. Develop a global partnership for development.

With this, the "MDGs form a blueprint agreed to by all the world's countries and all the world's leading development institutions. They have galvanized unprecedented efforts to meet the needs of the world's poorest." Although significant progress has been made towards many of the targets for each MDG, in many areas the goals will not be reached and there is an urgent need to lend more support. Science support is needed for many of the targets, and in most cases, Earth observations play a central role in enabling the required research. Moreover, our increasingly global society is facing a number of grand challenges that cannot be met without dedicated science support.

The objective of the workshop is to review the science questions and research topics that need to be addressed in order to support progress towards the MDGs and towards meeting the grand challenges, prior and after the current target date for the MDGs, and to identify Earth observations needed to facilitate the research.

The Group on Earth Observations (GEO) is implementing the Global Earth Observation System of Systems (GEOSS) with the goal to improve access to, and the use of Earth observations for a broad range of stakeholders. Scientists and researchers engaged in environmental research supporting the MDGs and addressing the grand challenges are key stakeholders of GEOSS. Aligning the governing strategy for the implementation of GEOSS to the needs of these stakeholders has a high priority for GEO. The workshop will review the support of GEOSS for research on global sustainability and give guidance on how to improve this support.

Fig. 3: Home page of the 2nd GEOSS S&T Stakeholder Workshop available at http://www.geo-tasks.org/workshops/2012_Bonn.

For each example, the portfolio provides a short story, emphasizing the particular value of the example. For most examples, slide shows are available, and a few examples link to short videos. Once the goal of two examples for each SBA is reached, it is planned to prepare a book and a summary video featuring all examples. The examples are also featured at meetings with outreach components. An example is a Splinter

meeting at the 2012 EGU Assembly in Vienna, where four examples were presented by their authors informing the audience about GEO and GEOSS.

The GEOSS S&T Meeting Portal

GEO has made significant outreach effort to engage a larger segment of the S&T communities

in GEO, both through specific events and participation in major S&T meetings. A number of GEO workshops involving S&T communities have increased awareness of GEO in these communities and beyond. GEO has been present at major science meetings, organized sessions on GEOSS-related topics, convened side events, and facilitated presentations on science applications of GEOSS. To facilitate some level of coordination of these outreach activities, ST-09-02 has developed, and ID-03 is maintaining, an interactive web page for the coordination and documentation of outreach at major S&T meetings (Fig. 2). The web page also provides documentation of past GEO activities at science conferences.

The initial version of this S&T Meeting Portal has limited functionality. A fully interactive version is currently under development. This version will allow the publication of meeting announcements as well as the coordination of GEO and GEOSS-related activities at these meetings. It will be possible to upload presentations and meeting reports, and to publish summary conclusions and recommendation from these activities. Developing this meeting portal into a valuable services for S&T communities is expected to support the dissemination of information on GEO and GEOSS in these communities.

The GEOSS S&T Stakeholder Network

The GEOSS S&T Stakeholder Network provides an umbrella for all S&T user and provider communities. The idea of a Stakeholder Network bringing together relevant S&T communities was developed by the EC-funded EGIDA project. As a first activity, the EGIDA Stakeholder Network organized the 1st Joint Workshop of the EGIDA Stakeholder Network and Advisory Board “*Connecting GEOSS and its Stakeholders in Science and Technology*,” which took place on May 9-11, 2011 in Bonn, Germany (http://www.geo-tasks.org/workshops/2011_Bonn). As an outcome of this workshop, it was decided to extend the EGIDA Stakeholder Network to the GEOSS S&T Stakeholder Network open to all S&T providers and users of GEOSS.

The mission of the GEOSS S&T Stakeholder Network is twofold: to provide a voice for the needs and guidance of S&T communities to GEO, and to promote the use of GEOSS in these stakeholder communities. Following this mission, the 2nd GEOSS Science and Technology Stakeholder Workshop, which will take place on August 28-31, 2012 in Bonn, Germany, is titled “GEOSS: Supporting Science for the Millennium Development Goals and Beyond.” The objective of this workshop is to review to what extent the

Strategic Targets of GEOSS (GEO, 2010) are aligned with the research needs for the Millennium Development Goals (<http://www.un.org/millenniumgoals/bkgd.shtml>) and the challenges for sustainability identified by the International Council of Science (ICSU, 2010) and the Belmont Forum (2011) and to provide guidance to the discussion of the post-2015 development of GEOSS.

Conclusion

The G-STSS aims to link S&T communities (providers and user) to GEOSS through a service-based approach. The underlying concept assumes that successful outreach to S&T communities requires demonstration of a benefit for these communities.

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