

Sub-task Number: AR-09-04b

Sub-task Title: GEONET

Overarching Task: Dissemination and Distribution Networks

Area: ARCHITECTURE

Relevant Committee: ADC

Related Targets:

Sub-task Definition

Establish GEONET as a global communication network of interconnected networks by which GEOSS related information, data and products can be circulated and distributed in response to users and providers needs. GEONET is based on the sharing of national, regional and global telecommunications networks and will serve all GEOSS Societal Benefit Areas. GEONET comprises User Access, Data Exchange and Dissemination services. GEONET will be based on communication network typologies, satellite and terrestrial (fixed and mobile networks), considered most suitable to meet the service requirements, providing access points for users and data providers at identified locations. Within the task, an inventory of the available networks for access, exchange and dissemination as candidates for GEONET will be performed, the draft architecture of GEONET will be defined and a demonstrator based on the available networks will be set-up as a first step towards a full operational system.

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

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Motivation/Background

GEONET is a system by which information, data and products related to environmental satellite and *in situ* systems from GEOSS will be circulated in response to requirements of information users and data providers. GEONET Services comprise of:

- User Access Services
- Data Exchange Services
- Dissemination Services

User Access Services typically respond to user needs for on-line information and data retrieval, e.g. from product archives. Data Exchange Services typically serve requirements for large volume data transfers, e.g. for repatriating data from other world-regions or for feeding data into regional processing facilities. Dissemination Services focus on the provision of data shared by a wide user community, e.g. through broadcasting.

GEONET will be based on terrestrial as well as satellite communication networks (fixed and mobile networks) as required and as considered most suitable for the user and data provider and the desired service. GEONET will thus be a network-of-networks within GEOSS. Those networks will co-exist and be interconnected and will provide connecting points for users and data providers at identified locations. The use of GEONET and its constituting networks should be governed by an operations concept and costing model.

In addressing developing country needs where internet access is limited, the penetration of mobile phones has been on a tremendous rise and can provide an important capability for GEOSS products. Providing access to GEOSS through mobile phone networks would allow expansion of the user base. The capability to link GEOSS to push applications over mobile phone networks could serve, for example, dissemination of emergency warnings to a distributed population in response to events such as tropical storms, tsunamis, or other such events. The specific utilisation of mobile networks for the provision of access to GEOSS products will be analysed in the task.

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

Planned:

- (1) Inventory of available networks for access, exchange and dissemination as candidate for GEONET. This might include a 'GEONET information day' including presentations by networking and other organisations.
- (2) Collection and definition of basic requirements from GEOSS users and data providers, definition of service requirements, use cases and sizing scenarios for GEONET
- (3) Definition of GEONET draft architecture, including contributing networks and identification of possible interconnection locations per world region between networks and connection points for users and data providers
- (4) Definition of a draft GEONET operations concept including the possible sharing of responsibilities between operating entities, and the management of the interconnection.
- (5) Definition of sharing principles and simple GEONET costing model distinguishing existing fixed operations cost of each participating network and the specific additional cost resulting from the additional use of a network in support to GEOSS.
- (6) As network part of the network of networks, assessment of the degree to which mobile phone technology can support the GEO communication, outreach objectives and outputs through services such as SMS, mobile e-mail, and mobile web services. Definition of a capability that supports tailored information distribution in developing countries, particularly for applications in rural and urban regions with limited access to the wired internet. Definition of a framework for a network for authenticated access to GEOSS data and information through mobile phone technology.
- (7) Liaise with Architecture and Data Committee and User Interface Committee for feed-back on the GEONET operations concept and its usage in the different Societal Benefit Areas.
- (8) Set-up a GEONET Demonstrator for demonstration purposes based on the interoperation of existing networks.
- (9) Progressive evolution of the Demonstrator to build the integrated networking services for GEOSS.

The activities planned in this task will require the establishment of a technical cooperation with GEONetcast.

Progress (current status):

Start of the activities was planned for the 2nd quarter of 2009. A preliminary inventory of available networks for access, exchange and dissemination as candidate for GEONET is currently being started.

Resources (indication of resources – e.g. financial, human – contributed by GEO Members or Participating Organizations to produce outputs)

The inventory of existing networks will be directly supported by ESA including an inventory of the existing ESA networks, HiSEEN (High Speed ESA Earth Observation Network) and DDS (Data Dissemination System), and taking into account ESA initiatives in the ESA Telecommunications Programme. The inventory can benefit from ESA's cooperation with the EC Info Society on the European Internet, GEANT.

An ESA study, reviewed and complemented with the expertise of the tasks participants, will support the overall design of the GEONET architecture and concept (activities 1, 2, 3, 4 and 5 defined above).

The analysis of mobile network utilization within GEOSS (activity 6 as defined above) will be based upon the expertise of IEEE Communication Society and coordinated with the other members of the task team.

The GEONET Demonstrator will be based on existing networks used in operational or under implementation EO mission ground segments.

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:

1. Report on GEONET inventory and user requirements. Q1 2010.
2. Report on GEONET draft architecture specifications, operations concept and sharing principles. Q3 2010.
3. Report on analysis of mobile network utilization within GEOSS. TBD.
4. Definition and demonstration of GEONET prototype. Q3 2010.

Produced (*current status*): ...

Capacity Building Component

(*capacity building is defined to include the development of capacity related to: (i) Infrastructure and technology transfer (Hardware, Software and other technology required to develop, access and use EO); (ii) Individuals (education and training of individuals to be aware of, access, use and develop EO) and (iii) Institutions – building policies, programs & organizational structures to enhance the value of EO data and products*).

1) In accordance with the above definition does this Task have a capacity-building component? If so, please provide a short description of this component including a description of end users.

GEONET will be a global communication network of interconnected networks by which GEOSS related information, data and products can be circulated and distributed in response to users and providers needs. As such this task perfectly fits in the definitions above because:

- i) it aims at developing an infrastructure to favour distribution, access and use of EO data and products.
- ii) it can favour access to training material, sample data, etc...

2) Have any additional CB needs for this Task been identified? Please provide a short description.

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User Engagement Component

(*please briefly describe to what extent end users are engaged in this Task and influence the nature of the outputs produced*)

Users will be involved in the collection of a set of basic requirements to be used in the definition of the architecture and operations concept of GEONET. Liaison with the User Interface Committee for feed-back on the GEONET operations concept and its usage in the different Societal Benefit Areas.

Science and Technology (S&T) Component

1) Please briefly describe the elements of scientific research or technological development contained in this Task

2) In relation to the S&T component(s) of this task, please describe gaps, priorities, continuity needs, barriers, scientific expertise and additional resource needs (this information will be used for developing a gaps and needs assessment in Task ST-09-01)

To be completed

Members and POs' Contributions to Outputs and Activities above:

(*Input is optional. This section gives the chance to Members and POs to provide more details (3-5 lines) on their individual activities, making a clear connection with the outputs and activities outlined above*).

ESA

ESA will directly support the inventory of existing networks, including its existing terrestrial and satellite networks HiSEEN and DDS, and taking into account ESA initiatives in the ESA Telecommunications Programme. The inventory can benefit from ESA's cooperation with the EC Info Society on the European

Internet, GEANT. ESA will also carry out a study, reviewed and complemented with the expertise of the tasks participants, to consolidate the inventory activity and to support the overall design of the GEONET architecture and operations concept. ESA will support the demonstration activity through its existing EO networks (HiSEEN and DDS).

Japan

JAXA: To contribute the GOSAT ground network collaboration with ESA.

IEEE

In addressing developing country needs where internet access is limited, the penetration of mobile phones has been on a tremendous rise and can provide an important capability for GEOSS products. For example, second generation (2G) with limited data capabilities and 2.5 G solutions like GPRS and EDGE with adequate data capabilities are being offered in many developing countries. Handheld mobile device capabilities are increasing impressively as well. There are many areas of the world where the primary means of access to the Internet is through mobile phone networks. Providing access to GEOSS through mobile phone networks would allow expanding the user base and providing increased value to GEOSS down to the local level. Furthermore, linking GEOSS to push applications over mobile phone networks can serve to disseminate emergency warnings to a distributed population in response to events such as tropical storms, tsunamis, or other such events.

IEEE will perform the analysis of mobile network utilization for GEO (i.e. assessment of the degree to which mobile phone technology can support the GEO communication, outreach objectives and services, definition of a capability that supports tailored information distribution in developing countries, definition of a framework for a network for authenticated access to GEOSS data and information through mobile phone technology, coordination with other task participants).

Participation

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