

Sub-task Number: AR-09-02c

Sub-task Title: Sensor Web Enablement for In-Situ Observing Network Facilitation

Overarching Task: Interoperable Systems for GEOSS

Area: ARCHITECTURE

Relevant Committee: ADC

Related Targets: (to be included in 2009)

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

Foster the development of space-borne, air-borne, sea-based and ground-based sensing networks (advances in communication technology and ground-based in-situ technologies have made it feasible to consider webs of sensors on all types of platforms with rapid access to observations; this technology is referred to as Sensor Webs and Sensor Networks). Develop scenarios or use cases that demonstrate the value of Sensor Webs to the GEOSS societal benefit areas e.g. Disasters, Health, Biodiversity, Ecosystems and Water. Evaluate the applicable standards, and coordinate with AR-09-01.

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

South Africa (Meraka), Point of contact: Anwar Vahed, avahed@meraka.org.za

South Africa (CSIR), Ingo Simonis, ingo.simonis@igsi.eu

Motivation/Background

GEOSS has to master the challenge of integrating heterogeneous systems across institutional and political boundaries. Timely delivery of earth observation data is a key aspect in identifying potential natural and human threats, such as tornados, tsunamis, wild fires, or algae blooms. Data from in-situ or remote sensing devices forms the basis for analyzing gradual processes, such as increasing drought, water shortages, or rising sea levels. The Sensor Web presents a paradigm in which the Internet is evolving into an active sensing macro instrument. Based on internationally adopted standards, the Sensor Web accomplishes the necessary requirements to ensure interoperability among its various components. Sensor Web software components and services work interactively in arbitrary application domains.

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:

- Sensor Web Training Material. First draft August 2009
- Report on Sensor Web technologies and best practices, June 2009
- Sensor terms registry, draft May 2009, final release October 2009

Produced (current status):

- Provide support and create awareness for the sensor web and related technologies. E.g. Create an awareness in other supporting organisation of GEO, such as CEOS, IGOS, GOOS, etc.. A Sensor Web working group was established in CEOS WGGIS (Working Group on Information Systems and Services of the Committee on Earth Observing Satellites).
- Conduction of Sensor Web workshops in 2007 (South Africa) and 2008 (Switzerland). The workshop for 2009 is scheduled for May 21-22, to be held in Japan.

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

Planned:

- Development of Sensor Web education and training material. First draft scheduled August 2009
- Conduction of the annual Sensor Web workshop (May 21-22, Tsukuba, Japan)
- Education and training workshops with focus on Sensor Web technologies and open source implementations. First workshop scheduled April 2009 in Mozambique.
- Development of a registry of technical terms used within the Sensor Web. First draft scheduled for May 2009, final release to be scheduled October 2009
- Development of a Sensor Web catalogue that allows retrieval about sensors in close to real-time
- Development of an integration strategy of Sensor Web components into GEOSS task AR-09-01. First draft to be scheduled July 2009
- A geospatial information infrastructure connecting heterogeneous in situ sensors and remote sensors are linked, shall be defined. This includes the definition and design of the Sensor Web Communication- and Information layers.

Progress (current status): ...

- Sensor Web Workshop organization in progress, May 21-22
- Development of Sensor technical terms registry in progress

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

South Africa: CSIR South Africa has provided manpower for task lead, technical contributions, and organization of the Sensor Web Workshop.

European Commission: SANY has provided manpower and technical demonstrations to the project and is co-organizer of the Sensor Web workshop 2009. SANY is an Integrated Project (contract number 0033564) co-funded by the Information Society and Media DG of the European Commission within the RTD activities of the Thematic Priority Information Society Technologies”.

Japan: The Center for Spatial Information Science, University of Tokyo, and the National Agriculture and Food Research Organization Japan, support this task with technical expertise and as co-organizers of the Sensor Web workshop 2009.

Architecture and Data Component

1) Please briefly describe any task-related Earth observation resources (data set, system, website/portal) and any related Web Service interfaces that are contributed to GEOSS. State whether these items are or will be registered with the GEOSS Component and Service Registry for access via the GEO Web Portals, and whether any associated standards or other interoperability arrangements will be registered in the Standards and Interoperability Registry.

2) Please also describe what data and information your activity/system needs that you would request to be accessible through the GEOSS Common Infrastructure.

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.*

One of the goals of this task is to deploy Sensor Web components and services. Given that Sensor Web technologies have reached a level of maturity that qualifies them for deployment, training activities have to be started. Task AR09-02c develops Sensor Web components and training material and helps with finding appropriate training opportunities. A first workshop is planned to be held in Mozambique in April 2009, a second workshop will be conducted at the IST-Africa conference 2009 in Kampala, Uganda.

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

User Engagement Component

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

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)*

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).

Autralia

CSIRO: We intend to make our South Esk Sensor Web available as a GEOSS interoperability test-bed. Our main contribution, however, will be development of a standard way for encoding water information in a Sensor Web. We also intend participating in efforts to develop a Sensor Instance Registry for GEOSS.

USA

NOAA: Business and technical point of contact for NOAA IOOS Data Integration Framework contribution to the GEOSS Architecture Implementation Pilot.

CEOS

CSIR: Flood Sensor Web Emergency Response Prototype: Identify scenarios and implement a prototype flood sensor web emergency response prototype for evaluation and eventual use by the IFRC and GEOSS.

EC

EU-project HYPOX (WPI): Build oxygen monitoring capacities in shelf and open seas, and land locked water bodies in compliance with GEOSS standards (interoperability, data and metadata standardization, archiving, and sharing)

EEA

Linking EEA and GEOSS activities.

Participation (Table to be filled in 2009):

Type	Member or PO	Representing	Contact Name	EmailAddress
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