

## Capacity Building Task CB-06-04

Task Number	Title
CB-06-04	GEONETCast, an operational service delivering data and products based on the use of communication satellites
Area	
Capacity Building	
Relevant Committee	
ADC	

### Description of the Work to be Performed

GEONETCast is a dissemination system by which environmental satellite and in situ data, products, and services from GEOSS will be transmitted to users through a global network of communications satellites, using a multicast, access-controlled, broadband capability. The communication satellite costs for each sector of the globe would be funded by one or more partners in GEONETCast, and the day to day management of each sector would be under their responsibility. Commercial communication satellite providers would broadcast using a standard protocol interface, such as used for Direct to Home Television or Direct TV transmission. Different data streams or products would be available on separate channels. The user would decide when to pull a data set onto his terminal and which data are to be managed and saved locally.

- NOAA, EUMETSAT and WMO refined initial technical details relating to late spring demo of GEONETCast (as built upon EUMETCast). NOAA identified and regularly provides data sets from several societal benefit areas, which are added to EUMETCast data stream. Coordination still needed with WMO's IGDDS, a prospective system contributing to GEOSS (See WE 06 04).
- Refine concept, including an assessment of current data transfer and dissemination systems, a discussion of options, and a recommended way forward, building on identified user requirements.
- Identify other GEONETCast providers to develop a global dissemination capability and all associated technical tasks.
- Work with the GEO User Interface and Capacity Building Committees and others to identify additional data, products, services, and reception requirements to meet the needs of all nine societal benefit areas under GEO.
- Develop full master schedule through GEO-III timeframe.
- Report status and proposed way forward to GEO's Architecture and Data Committee, Executive Committee, and Plenary.

### Output & Deliverables

- (i) Demo of GEONETCast by late spring 2006.
- (ii) Development of GEONETCast initiative for GEO community participation, including data products for and user involvement from all nine societal benefit areas.

A GEONETCast Implementation Group is composed of the task co-leads.

### Calendar (incl. milestones)

(1) Demo in late spring 2006: Demonstrations held at

- European Commission workshop, Brussels, Belgium, May 3, 2006
- GEO Capacity Building Best Practices Workshop, Sao Jose dos Campos, Brazil, May 29, 2006
- NOAA Management, Suitland, Maryland, USA, July 10, 2006
- GEONETCast Participants Meeting, Seattle, Washington, USA, July 19, 2006
- GEO Architecture and Data Committee, Seattle, Washington, USA, July 20, 2006
- IGARSS GEOSS Workshop, Denver, Colorado, USA, July 30, 2006

Prospective demonstrations to:

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- U. S. Group on Earth Observations, Washington, D.C., USA, Autumn 2006
- GEO Plenary Meeting, Bonn, Germany, November 28-29, 2006

(2): Start on third quarter 2006 and submission for endorsement at GEO-III in November 2006

- Third Quarter Report is the task sheet update for September 2006.

### Financial Contributions (from GEO Operations Budget)

none

### Actual Project Costs

*NOTE: This is intended to report on the actual, consolidated cost of the task. It should contain and estimate of the contributions made to date to this task such as manpower, materials, travel costs, etc.*

### Current Status

#### 15 Sep 2006:

The greatest initial challenges in implementing this task have been to work towards global coverage, engage users to identify needs, expand data and products being transmitted beyond meteorology, and demonstrate an initial technical capability.

- NOAA, EUMETSAT and WMO (Co-leads comprising the Implementation Group) refined initial technical details relating to late spring demo of GEONETCast (as built upon EUMETCast). NOAA identified and regularly provides data sets from several societal benefit areas, which are added to EUMETCast data stream. Coordination with WMO's IGDDS, a contributing system to GEOSS (See WE 06 04), has begun.
- As a result of dialogue with prospective users, data providers, and other interested parties, the Implementation Group refined the concept, including a recommended way forward and continuing to build on user requirements.
- The Implementation Group worked to identify other GEONETCast providers to develop a global dissemination capability and all associated technical tasks. On 30-31 August 2006, discussions were held with China regarding its FengYunCast, which has been offered to cover most of Asia, Australia/ New Zealand, and the Western Pacific. Russia is testing the MITRA satellite data dissemination system, which is a prospective future contribution.
- Members of the Implementation Group participated in a May 2006 Capacity Building Committee Workshop to demonstrate GEONETCast and begin to identify additional data, products, services, and reception requirements to meet the needs of all nine societal benefit areas under GEO. Members of the Implementation Group also engaged the User Interface Committee in September 2006 to begin a dialogue on requirements.
- The Implementation Group developed a schedule of demonstrations and other milestones through GEO-III timeframe.
- The GEONETCast task reported its status and proposed way forward to GEO's Architecture and Data Committee and hopes to demonstrate an initial capability at Plenary-III.

#### Demonstrations

GEONETCast was successfully demonstrated at the following venues:

- a. GEONETCast Workshop, hosted by the European Commission, Directorate General-Research, in Brussels, Belgium, 3 May 2006
- b. GEO Capacity Building Best Practices Workshop, hosted by the Brazilian Space Agency in Sao Jose dos Campos, Brazil, 29 May 2006
- c. Meteorological Satellite Data Users Course, Brazil, July 2006
- d. First GEONETCast Participants Meeting, Seattle, USA, 19 July 2006
- e. GEO Architecture and Data Committee Meeting, Seattle, USA, 20-21 July 2006

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- f. GEOSS Workshop, IEEE Int'l Geoscience and Remote Sensing Symposium, Denver, USA, 30 July 2006

Each demo focused on providing information on GEONETCast status and plans, answering questions, soliciting the needs of users, and attempting to identify potential data providers to contribute to GEONETCast. Each demonstration was split into two parts for two categories of prospective GEONETCast participants: data users and data providers. Data user demo: Demonstrated the automatic real-time reception of NOAA's demonstration products from Suitland, Maryland, USA, and EUMETSAT SEVIRI data and products from Darmstadt, Germany at the local receive station at the workshop site.

Data provider demo: Demonstrated the real-time manual transmission of a sample graphical product (which could be any product from a registered public or private sector participant) from the workshop site to EUMETSAT headquarters in Darmstadt, to the uplink station in Usingen, Germany (both via the Internet), up to the Hotbird-6 commercial satellite covering Europe (for the EC demo), and the downlink reception at the local receive station computer...all occurring within one minute. The sample product was transmitted to all EUMETCast receive stations in Europe, Africa, and the Americas. For the Brazilian demo, an additional hop was required, i.e., uplink to the Ku Hotbird satellite, downlinked and turned around in Paris for uplink again to the New Skies 806 C-band satellite whose footprint covers Brazil...still occurring within one minute. For the Seattle and Denver demonstrations, yet another communication satellite link was required to hop the data to the demonstration site. At the Seattle demo, the National Aeronautics and Space Administration provided sample data from a thumb drive to illustrate the ease with which data providers can upload products for broadcast. Similarly, at the IGARSS demonstration in Denver Colorado, the US Environmental Protection Agency provided real-time air quality products from a thumb drive that were inserted into the real-time GEONETCast broadcast during the demonstration and received back at the workshop in less than a minute via satellite downlink on the roof of the building.

Most questions during the course of the workshops focused on the following clarifications:

- EUMETCast and the developing GEONETCast are data dissemination services and do not currently include data collection, quality control, archival, or retransmission. They assure that data files that flow into the "pipe" also flow out on the other end without loss.
- They enable near real-time data flow, so if you miss a real-time transmission, you need to get the data/product from the data provider. Most GEONETCast receive units are envisioned to be running 24x7.
- Archived data is better received from the data provider via the Internet or other existing infrastructures.
- Use of terrestrial-based dissemination networks (e.g., Internet), development of a clearinghouse and inventory, and questions regarding formats and interoperability are all questions regarding the overall GEOSS architecture – of which GEONETCast is one element – under the remit of the GEO Architecture Committee. GEONETCast is neither the whole GEOSS architecture nor a data processing system. The intent of GEONETCast is to be invisible and seamless to the user.
- There is a perceived need for better specification of expected types of users.

### User Involvement

Development of GEONETCast initiative for GEO community participation, including data products for and user involvement from all nine societal benefit areas.

On July 19, the GEONETCast co-leads (EUMETSAT, United States/NOAA, and WMO) held the first official GEONETCast participants meeting, the purpose of which was to:

- Ensure that there is a consensus understanding of the initiative;
- Identify those partners that might be able to provide other components, both infrastructure as well as data or products, contributing to a global dissemination capability;
- Work with those participating as users to identify additional data, products, services, and reception requirements to meet the needs of all nine societal benefit areas under GEO;
- Discuss the future framework of the 2007-2009 GEO Work Plan and any desired GEONETCast input;

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- Discuss development of a GEONETCast Implementation Plan; and
- Demonstrate an initial GEONETCast capability.

The July 19 date was chosen to take advantage of the GEO Architecture and Data Committee (ADC) meeting on July 20-21, as the GEO ADC has oversight responsibility for the GEONETCast task.

### Moving toward global coverage

NOAA, EUMETSAT, WMO, and GEO Secretariat held successful discussions with the China Meteorological Administration on August 30-31, regarding the prospective Chinese contribution to GEONETCast. China plans to move its FengYunCast data dissemination system from Ku- to C-band late in 2006 or early 2007 at which time their broadcast will cover as far west as Pakistan and as far east as New Zealand. With the assistance of the Chinese National Space Administration, they put receiving stations in seven countries, Bangladesh, Indonesia, Iran, Mongolia, Pakistan, Peru and Thailand this year and provided training workshops in CMA. While the data currently being distributed on FengYunCast are primarily satellite meteorological data, China expressed its intention to provide a data collection and transmission hub for East Asia for all types of data (in situ, airborne, satellite) as well as for all societal benefit areas of GEO. With its contribution China has joined the technical GEONETCast Implementation Team. Actions are being taken to include Chinese data/products in future GEONETCast demos, as well as to include GEONETCast data/products in FengYunCast.

### **9 Jun 06:**

#### **Demo of GEONETCast by late spring 2006.**

GEONETCast was successfully demonstrated at two venues: a GEONETCast Workshop hosted by the European Commission, Directorate General-Research, in Brussels, Belgium, May 3, 2006, and the GEO Capacity Building Best Practices Workshop hosted by the Brazilian Space Agency, in Sao Jose dos Campos, Brazil, May 29, 2006. Approximately 30 participated in the EC workshop, the objective of which was to solicit participation of EC-funded scientists in GEONETCast. The Capacity Building workshop drew approximately 50-60 people. Each demo focused on providing information on GEONETCast status and plans, answering questions, and attempting to identify potential data providers to contribute to GEONETCast. Each demonstration was split into two parts for two categories of prospective GEONETCast participants: data users and data providers.

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- Data provider demo: Demonstrated the real-time manual transmission of a sample NOAA graphical product (which could be any product from a registered public or private sector participant) from the workshop site to EUMETSAT headquarters in Darmstadt, to the uplink station in Usingen, Germany (both via the Internet), up to the Hotbird-6 commercial satellite covering Europe (for the EC demo), and the downlink reception at the local receive station computer...all occurring within one minute. The sample product was transmitted to all EUMETSAT receive stations in Europe, Africa, and the Americas. For the Brazilian demo, an additional hop was required, i.e., uplink to the Ku Hotbird satellite, downlinked and turned around in Paris for uplink again to the New Skies 806 C-band satellite whose footprint covers Brazil...still occurring within one minute.

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There is a perceived need for better specification of expected types of users.

### **Development of GEONETCast initiative for GEO community participation, including data products for and user involvement from all nine societal benefit areas.**

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#### **Coordination with other tasks of committees**

#### **GEO Member Potential Contributions Reported to date**

##### **Germany**

Mr Hoffmann is involved through his WMO/CBS activities, too. Dr Schröder is member of the WMO-CBS CT-MTDCF (coordination team for the migration to table driven code forms) and has been nominated as German Member of the GEO-Architecture & Data Committee.

##### **South Africa**

1. Ground segment station - serve as a reception and distribution return path to identified customers in AFRICA during pilot phase;
2. Engage a local D-T-H design team in developing the required application (software) and related hardware;
3. Avail ICT specialists to the GEO design team.

##### **United Kingdom**

UK could be most helpful in a minor role providing user experience of the EUMETCast system in operation.

#### **Relevant EC Projects**