

**Sub-task Number:** AR-09-04a

**Sub-task Title:** GEONETCast

**Overarching Task:** Dissemination and Distribution Networks

**Area:** ARCHITECTURE

**Relevant Committee:** ADC

**Related Targets:** CB-09-02g, CB-09-03b, CB-09-03c

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

Establish GEONETCast as a distribution system for GEOSS related data, information and products using communication satellites and low cost, self-contained, stand alone, off-the-shelf reception stations. GEONETCast is particularly useful in distributing operational or project data where a large number of users can benefit and/or where Internet access has low bandwidth or is non-existent. GEONETCast has moved from a demonstration to a fully operational system with near-global coverage and is now evolving to incorporate full access to diverse and cross-cutting data serving all GEOSS Societal Benefit Areas. EUMETCast and GEONETCast America will, within their bandwidth capabilities, redistribute FENGYUNGCast data and products to all interested users in Europe and America. Similarly, FENGYUNGCast will, within its bandwidth capabilities, redistribute EUMETCast and GEONETCast America data and products to all interested users in Asia. This will ensure that data is exchanged among all GEONETCast regional hubs.

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

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**Motivation/Background**

GEONETCast is a dissemination system by which environmental satellite and *in situ* data, products, and services from GEOSS are transmitted to users through communications satellites, using a multicast, access-controlled, broadband capability. The system has near-global coverage with data providers contributing and users receiving broadcasts in Africa, Asia, Australia/New Zealand, Europe, and the Americas.

GEONETCast provides a large array of data to diverse audiences, including scientists and educators, public servants and government agencies, as well as the general public, using low-cost and easy-to-procure technology. Because the communication satellite broadcast reaches areas with little or no internet capacity and because the GEONETCast system is low cost and easy to use, populations and regions formerly under-served by Earth observation data now have access to observations and applications that can have a positive and direct impact on their lives and livelihoods. GEONETCast provides a significant contribution to the data dissemination objectives of GEOSS.

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

**2006-08 Tasks and Current Status:** ...

- (i) Demo of an initial operational capability of GEONETCast by Earth Observation Summit-IV. STATUS: Complete. Operational capability is ongoing and was demonstrated at GEO IV.
- (ii) Further development of GEONETCast for GEO community participation, including in situ, airborne, and space-based observations and products for and user involvement from all nine societal benefit areas. STATUS: Ongoing. GEONETCast regularly augments its service offerings with

new observations and products to users in all three regions (EUMETCast, FengYunCast, and GEONETCast-Americas).

- (iii) Preparation of framework agreements with Data Providers, addressing, for example, cost sharing, data policy, user registration, quality of service, duration. STATUS: Complete: Framework agreements with data providers are available for dissemination in each of the three Global Network Centers (GNCs).
- (iv) Preparation of draft interface specifications for Data Providers. STATUS: Complete – draft interface and service specification documents have been produced and are available for dissemination in each of the three GNCs.
- (v) Engagement of users and data/product providers in regional fora. STATUS: Ongoing: Regional coordination groups and other avenues for feedback and user-data provider interaction are operable in each region. Existing regional institutions (GEOSS-Americas, EUMETCAST-Africa) are leveraged to reach maximum numbers of potential users and data providers.
- (vi) Discussions with Russia regarding its potential involvement as a GEONETCast infrastructure provider. STATUS: Ongoing – Discussions with Russian counterparts continue to indicate an interest in further cooperative work, but practical work on integrating the MITRA or other system is still at the planning stage. Roshydromet contacts indicate that technical and communications problems may soon be mitigated, potentially enabling further talks on an operational level.
- (vii) A GEONETCast Global Design Document was finalized and agreed in July 2007. STATUS: Complete.

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

Planned: 2009-2011 Proposed Activities:

- (i) Develop and strategize the use of a GEONETCast training channel, including securing and/or developing content, negotiating broadcast and usage plans, and utilizing user feedback in improving service.
- (ii) Plan and phase in a GEONETCast Alert Channel capability, including guidance on information and alert characteristics, routing and priority, as well as interoperability.
- (iii) Forge new contacts in academic, policy planning and other communities for the use of the GEONETCast system. Explore multinational academic and policy partnerships taking advantage of the GEONETCast system as an international information dissemination tool.
- (iv) Operationalize data sharing and interoperability among the GNCs. The GEONETCast Network Centre Service Specification document is currently under review by the GNC partners.
- (v) Explore options for expanding GNC coverage into the Pacific, gauge potential user interest and potential avenues for operations of an expansion.
- (vi) Develop the Product Navigator to allow GEONETCast users to find metadata information related to the products being transmitted, including reference to the data sent through GEONETCast into the various EO portals developed within GEO.
- (vii) Organize training course for the setting up and utilization of GEONETCast receiving stations, with a particular focus on developing countries (in coordination with CB-09-02g).

Progress (current status):

- (i) The GEONETCast training channel has been developed and is operational on a number of the GEONETCast broadcasts. Content provision is currently on an as-needed basis to serve discrete training opportunities. A Training Channel White Paper outlining content provision possibilities is under development and will be submitted to GEO. The GEONETCast Training channel and related activities are covered in separate GEO tasks (CB-09-02g).

- (ii) An Alert Channel has been developed for a number of the regional broadcasts, and regular broadcasts of products will be operational by Fall 2009.
- (iii) Data sharing arrangements are standardized across the three GEONETCast Network Centers. The Service Specification document is under review.
- (iv) Initial interest in a Pacific GEONETCast broadcast has been registered from regional partners. Initial discussions are underway on potential partners and supporting organizations to gauge support for system expansion.
- (v) The Product Navigator has established an operating capability, is being broadcast over the GEONETCast product stream, and is available on the internet and via the GEO Portals. Product and metadata input as well as technical evolutions continue.
- (vi) Training opportunities for potential GEONETCast users as well as capacity building activities in the use of Earth Observations are underway.
- (vii) NOAA has established contact with universities in Maryland and Puerto Rico as part of the NOAA CREST Program, which is planning the installation of 2 GEONETCast Americas receive stations to use and develop products.
- (viii) ITC in the Netherlands is partnering with GEONETCast and the DevCoCast project to provide training and capacity building opportunities to potential users in Africa and Latin America. ITC has also helped set up a GEONETCast receiver in Nairobi, Kenya.
- (ix) DevCoCast project has started setting up two new GEONETCast receivers in Argentina and seven in Africa and started preparing the dissemination to Africa and South and Central America of a variety of Earth observation products, including a new CBERS product from INPE.

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

- This task will use human and financial resources already dedicated to the GEONETCast system by the three GNC partners, namely EUMETSAT, CMA, and NOAA.
- Those operating and maintaining a receive station do so at their own expense, which can also be seen as a contribution to the functionality of the overall system.
- Additional contributing organizations, namely COMET, GLOBE, and new university partners, will contribute some staff time to organizing training materials dissemination and organizing cooperative work.
- Resources are allocated to the GEONETCast system on an individual basis in the form of products and data sets by GEONETCast Data Providers. The number and nature of these submissions is constantly changing as providers update their offerings. A full and current listing of data providers and their submissions can be found in the GEONETCast Product Navigator.
- Financial support from the European Commission, through FP7 projects, for the allocation of additional bandwidth and promotion of the use of GEONETCast and expansion into all SBA's.

**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.

The GEONETCast Product Navigator is an XML-based interactive and fully-searchable database of the products offered over the GEONETCast system. The Product Navigator is fully WMO and GEOSS metadata compliant and is submitted for inclusion in the GEOSS Component and Service 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.

The operation of GEONETCast is inherently a capacity-building exercise as the system brings a wide range of Earth observation (EO) and environmental data to new audiences, some of which were previously unable to access or use such information due either to high costs of transmission and receiving equipment or a lack of sufficient internet bandwidth. GEONETCast usage in developing countries and southern hemisphere countries is increasing, thanks to projects such as PUMA, AMESD, GMES Africa, RANET, SERVIR, SERVIR Africa, DevCoCast. Training courses on the installation and use of GEONETCast User Stations are planned and being performed.

A new component of the GEONETCast system, the Training Channel, will provide distance learning components and training materials on the use of EO in practice to the diverse user group within the GEONETCast community. In particular, the GEONETCast Training Channel will focus on (i) training end-users to use products for specific purpose and to disseminate data via GEONETCast; (ii) linking GEONETCast products and Product Navigator (outside portal) with specific training material; (iii) transmitting training materials via GEONETCast to local trainers, and (iv) disseminating training materials on GEOSS-related environmental data.

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)

User engagement is an increasingly important component of GEONETCast in the operation phase. User feedback is regularly solicited to guide the addition or subtraction of products on regional broadcasts. In some regions, users are making a transition to also being data providers, as capabilities and engagement increases. Each Global Network Center is working to increase user engagement in developing and targeting regions in 2009-11 (Africa, Asia, South/Central America and the Pacific).

### **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).

### **China**

The China Meteorological Administration (CMA) maintains FENGYUNCast, their contribution to the global GEONETCast system, which covers Asia and parts of the Pacific.

**EUMETSAT**

The European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) maintains the EUMETCast system, their contribution to the global GEONETCast system, which covers Europe, Africa, and parts of Asia and South America. EUMETSAT maintains a Training Channel and Alert Channel on their broadcasts as well as maintains the GEONETCast Product Navigator, a fully-searchable html-based catalogue of all GEONETCast products, including training and capacity building materials.

**USA**

The National Oceanographic and Atmospheric Administration (NOAA) maintains GEONETCast Americas, their contribution to the global GEONETCast system, which covers North, Central, and South America and the Caribbean. GEONETCast Americas offers a Training Channel and Alert Channel on their broadcasts, and is working with users and providers to match training needs with appropriate programming.

**European Commission**

In close collaboration with EUMETSAT and the other GEONETCast partners, and through coordination of the DevCoCast project, the EC contributes to the enlargement of the portfolio of EO products available on the EUMETCast component of GEONETCast, and to related training, GEONETCast promotion and user engagement activities, in particular focusing on developing countries

**UNOOSA**

Assess use of GEONETCast for activities in the UN Programme on Space Applications and UN-SPIDER.

**Participation** (Table to be filled in 2009):

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