

REPORT ON GEONETCAST

In response to CGMS action/recommendation A38.48

GEONETCast consists of a network of three dissemination systems - GEONETCast Americas operated by NOAA, CMACast operated by CMA and EUMETCast operated by EUMETSAT. The three GEONETCast Network Centres (GNC) operated by NOAA, CMA and EUMETSAT are interconnected with data exchange links for the exchange of GEONETCast relevant data. All three GNCs are operationally disseminating their own and the partner's GEONETCast contributions in their respective footprints.

EUMETSAT continues to support the GEO Workplan development and is involved in the GEONETCast related events. Capacity Building and Training is actively supported through participation in various projects and initiatives, and with EUMETSAT's own training activities.

The interaction with users, provision of user stations to East European countries and the development of the EUMETSAT-CMA interface make a significant contribution to widen the user access world-wide.

EUMETSAT and CMA have nearly completed the upgrade of their GNCs into a fully integrated GEONETCast data exchange and dissemination system, which includes a remote data access management interface.

Report on GEONETCast

1 INTRODUCTION

GEONETCast (figure 1) is a low cost, global, environmental information delivery system by which satellite and in situ data, products, and services from the GEO System of Systems (GEOSS) are transmitted to users through communications satellites, using a multicast, access-controlled, broadband capability. The communication satellites for each sector of the globe are provided by one or more partners in GEONETCast. The current coverage is based on contribution from the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), the United States' National Oceanic and Atmospheric Administration (NOAA), and China's China Meteorological Administration (CMA).

The day to day management of each sector is their respective responsibility. The regional components include one or more data collection, management, and dissemination centres that receive, process, prioritise, and schedule the incoming data streams or products. Such centres are called GEONETCast Network Centres (GNCs).

GEONETCast GNC Overview

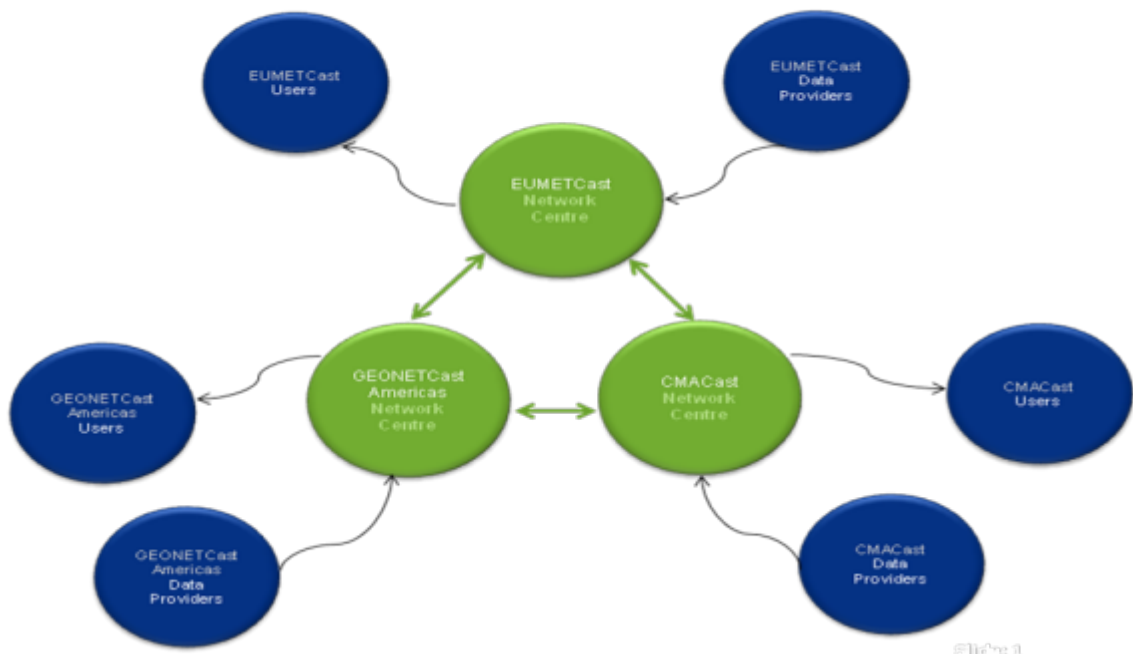


Figure 1: GEONETCast System Overview

The exchange of data between the various centers and the dissemination of this data is the main capability of GEONETCast, which transforms dissemination centres with regional coverage into a networked system with global coverage.

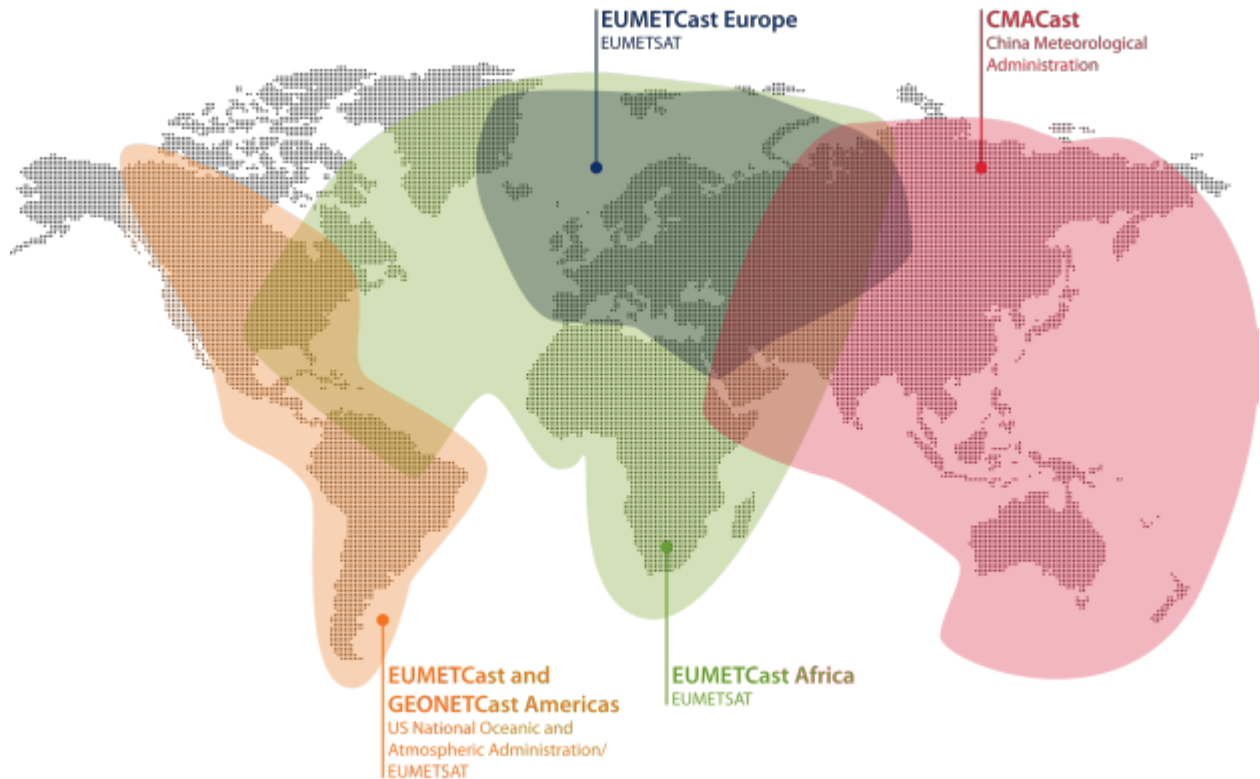


Figure 2: GEONETCast Coverage

The global GEONETCast coverage is presented in Figure 2. Currently the GEONETCast Americas footprint and the EUMETCast Americas coverage are overlapping, however the data content is different.

A regular data exchange with Americas-based data providers, coordinated by NOAA, was established in the second half of 2006. This data exchange has been consolidated into one stream provided by NOAA to EUMETSAT which contains all Americas-based data provider inputs. This data is being disseminated on one or more EUMETCast footprints, depending on the requests of data providers and users.

Data exchange has also been established between EUMETSAT and CMA. This has been implemented operationally in the 2nd quarter of 2008, using the existing RMDCN connectivity between both centres with the Internet as a backup route.

2 GEONETCAST ACTIVITIES

At GEO IV, GEO V, GEO VI & GEO VII in November 2007, 2008, 2009 and 2010 respectively, the exhibition “GEONETCast Global Village” was set up. The components of the exhibition are live GEONETCast reception, and a selection of Data Providers demonstrating their own products. Key objectives of the exhibition were:

GEONETCast and Capacity Building;

GEONETCast and Data Sharing;

GEONETCast and Support of GEOSS Societal Benefit Areas.

The GEO Work Plan 2012 – 2015 was further developed during GEO VII Plenary in Beijing (Nov 2010), GEO ADC & CBC in Sao Paolo (February/March 2011) and GEO ADC and Workplan Symposium in Geneva (May 2011). Version 1 has been submitted for comments, with the aim that the updated version 2 is accepted at GEO VIII Plenary in Istanbul (November 2011). GEONETCast is listed in the Work Plan as a specific sub-task under IN-04 - GEO Communication Networks.

Efforts for widening user access, Training and Capacity Building were achieved through:

EU-funded research projects (DevCoCast, EAMNET, AEGOS).

Several workshops took place in the DevCoCast and EAMNET context in Americas and Africa, between data providers and users. GEONETCast stations were installed in South America and Africa as part of the projects;

EU development funded projects (AMESD and GMES-Africa).

Deployment of AMESD station is completed, training ongoing;

Cooperation with existing training networks (ITC in Africa, Chloro-GIN-Africa, CREST/Puerto Rico);

EUMETSAT & WMO initiative to build capacity in Balkan and East European states (DAWBEE). The station deployment and training is completed;

EUMETSAT & TSMS (Turkish Meteorological Service) initiative to build capacity in five Central Asian countries (SADACA). This planned project is closely related to FP7 SEOCA project;

RANET content is distributed to Users in Africa and Americas. Dedicated user stations will be deployed;

The Training Channel and Alert Channel are operational on EUMETCast. The Training Channel on EUMETCast is being used to support Capacity Building in Africa and the Americas.

The 2nd Meeting of the WMO RAI Dissemination Expert Group was held at EUMETSAT in June 2011. User requirements regarding products, training and station evolution were collected and will result in user requirements on GEONETCast.

GEONETCast related events planned in 2011 are:

3rd EUMETCast Americas User Meeting at UFAL, Maceio, Brazil (end of August)

EUMETSAT Satellite User Conference in Oslo (5-9 September)

DEVCOCast Final Meeting, Belgium, (September 12-13)

Second annual EAMNET project meeting in Belgium (September 14-15)

GEOSS in the Americas in Chile (October 5-7)

Meteorological Technology World Expo in Brussels (18-20 October)

GEO Plenary in Istanbul (16-17 Nov)

Furthermore GEONETCast is coordinated with GEO ADC activities and other communities such as:

Registered as GEOSS Component;

Registered as Data Access GEOSS Service;

Participating in GEO Standards and Interoperability Forum;

Coordinating with WMO IGDDS and WIS.

3 EUMETCAST UPDATES

The overall architecture of the EUMETCast System remains unchanged, supporting the prime EUMETCast Europe and two DVB turnaround services (EUMETCast Africa and EUMETCast Americas). A list of all data services available on EUMETCast is attached in annex A.

A new Alert Channel was implemented as dedicated multicast channel on all EUMETCast footprints and alert products will be migrated to the new channel in Q3-Q4 2011.

In the context of FP7 projects DevCoCast completed the implementation of all planned products and the related initiative EAMNET is ramping up the product flow of ocean products for African coastlines. The products from the AEGOS project were successfully distributed in the 6 months project duration.

As part of the AMESD project, the SADC-Thema regional centre BDMS has started data distribution to African users.

Meteosat NDVI products were included in EUMETCast Americas on request of Brazilian users.

The implementation of other products for Africa from various data providers is ongoing:

NOAA-NCEP Forecast products for Africa;

Landsat products for the Congo Basin;

3.1 Service Registrations

At the end of July 2011, more than 3800 Reception Stations were registered. Of these stations, about 386 are located in Africa, about 70 in South and Central America with the remaining 2800 located in Europe and the Middle East. Subscription for the main data service – the Meteosat Second Generation 15 minutes SEVIRI service – achieved a figure of 2035.

3.2 EUMETCast Services Outlook

For 2012, several changes for the **EUMETCast Europe Service** are planned with the launches of the satellites MSG-3, NPP and Metop-B. The allocated bandwidth will gradually be upgraded to 20.5 Mbps to support new products from NPP, Metop-B and commissioning operations of MSG-3.

With an allocated DVB bandwidth of 3.6 Mbps available for the **EUMETCast Africa Service**, there is some scope for the implementation of additional data services for Africa depending on the data service timeliness requirements. More products for the AMESD and FP7 EAMNET projects will be implemented using spare capacity in 2011 and 2012.

4 EXCHANGE WITH NOAA GNC

The data exchange between NOAA and EUMETSAT is continuing with data being disseminated on EUMETCast and GEONETCast Americas. Several products have

been added to data exchange for dissemination on GEONETCast Americas: MSG Cloud Analysis, ATOVS Sounding products from METOP and NOAA, METOP ASCAT Winds and Soil Moisture products.

The RANET service which was initially started as a temporary trial service was established as a permanent service.

5 EXCHANGE WITH CMA GNC

The interface between the Chinese Meteorological Administration (CMA) and EUMETSAT in the GEONETCast context has now reached a state that presents an integrated GEONETCast data exchange and dissemination system on both sides including user management, product discovery and remote partner station access.

The data exchange agreement has been updated to include FY-2D and FY-3B products from CMA and to include MSG-3, METOP-B and Jason 2/3 products from EUMETSAT as they become available. The new products will be disseminated on each partner's dissemination system and will be available for users in the respective footprint.

Both, CMA and EUMETSAT have implemented dedicated channels for broadcasting their own products on the partner's dissemination system.

The authorisation of CMACast users to receive EUMETSAT data can be managed directly by EUMETSAT using the CMACast user management platform. Likewise, the EUMETCast User Management system allows CMA to administer a dedicated user group for CMA data and products on EUMETCast.

The product and data descriptions will be discoverable in EUMETSAT's DCPC portal interface (EUM EO Portal – www.eumetsat.int) which will be populated by interfacing to CMA's GISC catalogue.

Furthermore CMA and EUMETSAT have set up dedicated CMACast and EUMETCast user stations with remote access for the partner, such that CMA can remotely monitor the reception of CMA data on the EUMETCast partner station and vice versa.

Some outstanding actions – which should be resolved by the end of 2011 – are required to achieve a fully integrated GEONETCast data exchange and dissemination system.

6 THE GEONETCAST PRODUCT NAVIGATOR – KEY INFORMATION ABOUT GEONETCAST DATA SERVICES

The Product Navigator (<http://www.eumetsat.int/products>) is a tool on EUMETSAT's and NOAA's Web Site, designed to put a vast range of essential environmental data at the fingertips of users around the globe, making it easy to search for and list



environmental satellite data and products. Information can be found on data and products generated by EUMETSAT's Geostationary and Low Earth Orbit satellites and the associated Application Ground Segments, as well as data from other environmental satellite operators and processing centres including the contributions with respect to GEONETCast.

The product navigator is included into the bi-lateral data exchange between EUMETSAT-NOAA and EUMETSAT-CMA and is also disseminated routinely via EUMETCast on all footprints to allow offline access by reception stations on this information. The Product Navigator is a registered component of GEOSS.

Each product is presented with a short description and a range of important information, e.g. product coverage, dissemination mechanism, typical file formats, examples of file naming conventions, etc. Additionally, links are provided to more information on the product itself.

7 CONCLUSION

CGMS is invited to take note of the status of GEONETCast activities, the interaction with users, and the evolution of the data streams and GNC interfaces.

Annex A: EUMETCast Data Services

The **EUMETCast Europe** infrastructure (implemented in 2002) is based on Ku-Band, with an up-link station co-located with the Meteosat Second Generation Primary Ground Station in Usingen/Germany, using a transponder onboard the satellite Eurobird-9A at 9°E. The bandwidth allocated to this service is 16.5 Mbps net rate.

EUMETCast Africa, implemented in the second half of 2003, it uses a C-band transponder onboard the satellite Atlantic-Bird 3, with an up-link station located in Fucino/Italy. The bandwidth available for this service is 3.6 Mbps turnaround rate (equivalent to 2.55 Mbps net rate).

EUMETCast Americas, the second DVB turnaround service, was implemented at the beginning of 2006, with an uplink station near Paris, using a C-band transponder onboard the satellite NSS-806. The bandwidth allocated to this service is 2.7 Mbps turnaround rate (equivalent to 1.8 Mbps net rate).

The dissemination of environmental data and products supported by EUMETCast is structured in two categories regarding User access:

Data whose access is open to all registered EUMETCast Users, with the attributes:

- Essential data in the terms of WMO Resolution 40
- Open data policy being applied by the data provider
- No licensing required, provided without charge, with no conditions on use
- For part of this data, however, access may be restricted to certain user groups, or access may be provided only on explicit request

Data whose access is not open to all registered EUMETCast Users, with the attributes:

- Additional data in the terms of WMO Resolution 40,
- A (non open) data policy being applied by the data provider
- Licensing required, licensing fees/charges potentially required
- Data may be denied by the provider.

The respective access control is implemented through the encryption/decryption scheme implemented in EUMETCast. The data sets (data services) belonging to the access categories are listed in the two following sections.

Data Services Not Open to All Registered EUMETCast Users

High and Low Rate SEVIRI (1/4 hourly to 3-hourly dissemination frequency)

MSG Rapid Scanning Data

Indian Ocean Data Coverage - HRI from Met-7 (1/2 hourly to 3-hourly dissemination frequency)

Third Party Products (DWDSAT data, RETIM, Vegetation products from VITO, Aviso)

CMA GEONETCast Products (FY3a/b products)

Data Services Open to All Registered EUMETCast Users

High Rate SEVIRI (6-hourly)

Indian Ocean Data Coverage - HRI Met-7 (6-hourly)

Meteorological Products from the EUMETSAT MPEF

Meteorological Products from EUMETSAT's Satellite Application Facilities (SAFs)

EPS Global Data - METOP Products

EPS Global Data - NOAA Products

EUMETSAT Advanced Retransmission Service (EARS)

Meteorological Data Dissemination (MDD) for WMO RA-I (access restricted to NMSs of WMO RA-I and RA-VI)

Basic Meteorological Data (BMD) for WMO RA-VI (access restricted to NMSs of WMO RA-VI)

DCP Messages and Bulletins (access restricted to DCP Operators)

Foreign Satellite Data (from GOES-East, GOES-West, and MTSAT)

Jason-1/2

Third Party Products (MODIS products)

NOAA GEONETCast Products (RANET, CBERS, SERVIR, USEPA)

CMA GEONETCast Products (FY2e nominal data, FY2e products)

CMA GEONETCast Products (FY2d nominal data, FY2d products)

All data services listed above are provided on EUMETCast Europe. On EUMETCast Africa and EUMETCast Americas, subsets are disseminated.

On EUMETCast Africa:

High Rate SEVIRI

Indian Ocean Data Coverage - HRI Met-7

Foreign Satellite Data (from GOES-East, GOES-West, and MTSAT)

Meteorological Products from the EUMETSAT MPEF

Meteorological Products from EUMETSAT's SAFs (subset)

Meteorological Data Dissemination (MDD) for WMO RA-I

DCP Messages and Bulletins

Vegetation Products (from VITO)

Jason-1/2

NOAA GEONETCast Products (RANET, CBERS, SERVIR, USEPA)

CMA GEONETCast Products (FY2e nominal data, FY2e products)

RETIM Africa

CMA GEONETCast Products (FY2d nominal data, FY2d products)

On EUMETCast Americas

High Rate SEVIRI



Foreign Satellite Data (from GOES-East and GOES-West)

Meteorological Products from the EUMETSAT MPEF (subset)

Meteorological Products from EUMETSAT's SAFs (subset)

Jason-1 OSDR

NOAA GEONETCast Products (CBERS, SERVIR, USEPA)

CMA GEONETCast Products (FY2e nominal data, FY2e products)

CMA GEONETCast Products (FY2d nominal data, FY2d products)