CGMS

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REPORT ON GEONETCAST

In response to CGMS action/recommendation

GEONETCast, which consists of a network of three dissemination systems - GEONETCast Americas operated by NOAA, FENGYUNCast operated by CMA and EUMETCast operated by EUMETSAT, has reached a nearly global coverage. 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 disseminating their GEONETCast contributions in their respective footprints operationally. The next step is to include these data exchange contributions of the other GNCs into the respective regional dissemination. EUMETSAT is already disseminating these contributions from NOAA and CMA on all EUMETCast footprints covering Europe, Middle East, Africa and South and Central America.

This paper presents in more detail the actual status of the GEONETCast system as regards the respective participating dissemination systems, data exchange and data services supported, with an outlook into the near term evolution. Additional focus is given to the actual status and intended evolution of the EUMETCast services, as a significant contributor to GEONETCast, by presenting the data services provided by EUMETCast dissemination and an overview of the GEONETCast Product Navigator which provides one-stop-shop access to GEONETCast data collection discovery.

Report on GEONETCast

1 INRODUCTION

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 Meterological 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).

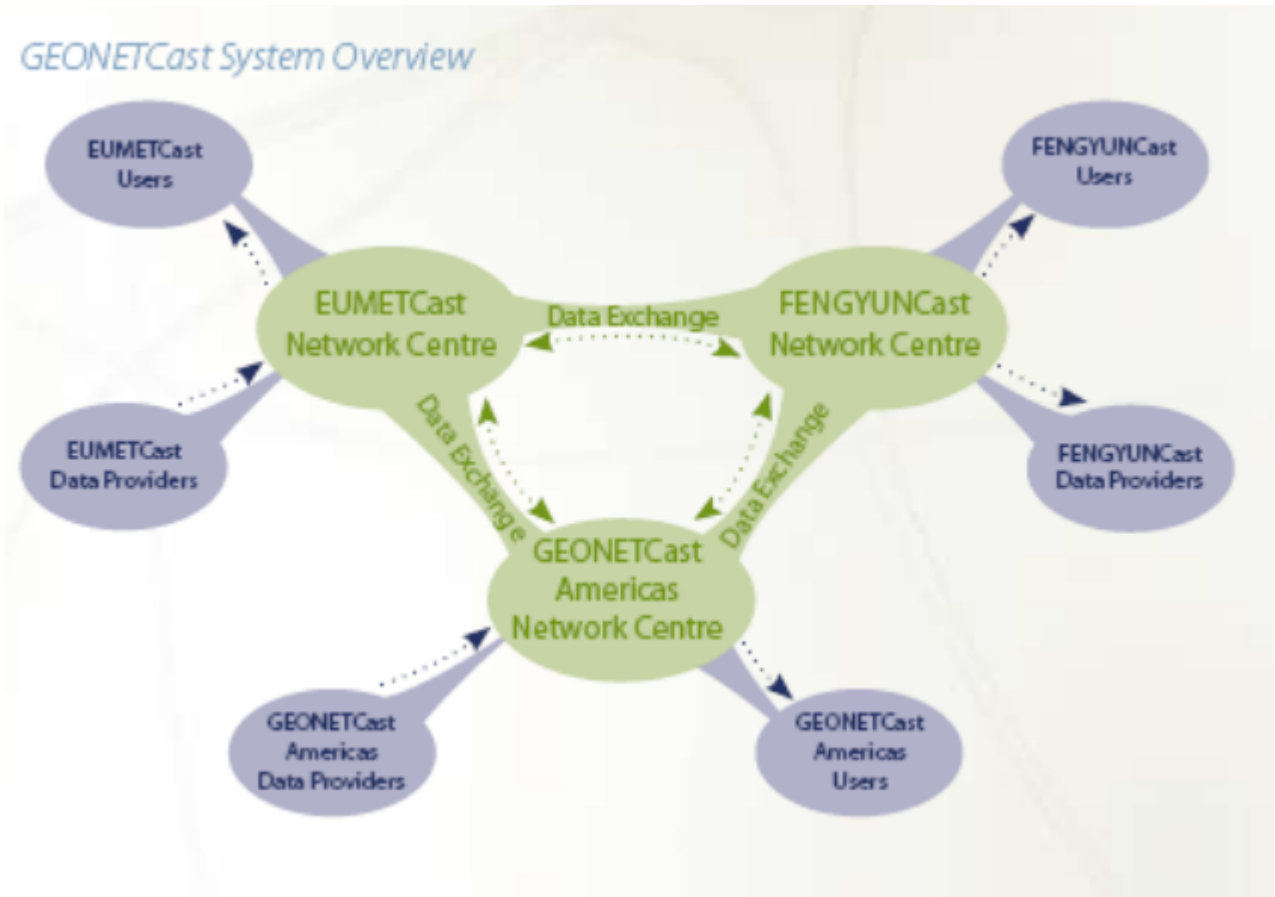

Figure 1: GEONETCast System Overview

2 GEONETCAST UPDATE

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 system with global coverage.

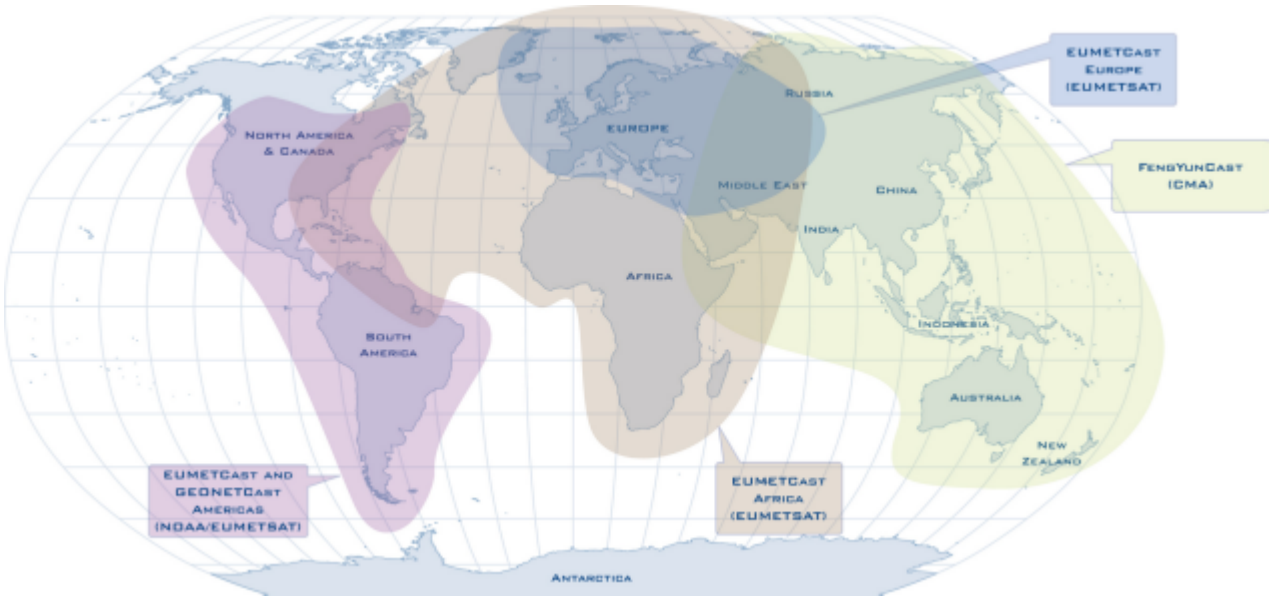

Figure 2: GEONETCast Coverage

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

A regular data exchange with Americas based data providers, coordinated by NOAA, was established in the second half of 2006. Data provided by NOAA/NESDIS, NASA SERVIR and the US Environmental Protection Agency is transferred via internet directly to the EUMETCast up-link platform, and distributed by the EUMETCast Americas Service for reception in the Americas. This data exchange is in process of being consolidated into one stream provided by NOAA to EUMETSAT which will contain all Americas data provider inputs. This data is being disseminated on all EUMETCast footprints. EUMETSAT is providing via EUMETCast Americas the Met-9 SEVIRI image data, GOES-E and GOES-W images, MPEF products, JASON-1 and 2 data, products from the Land SAF and products from the DevCoCast project.

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. From CMA, the full image from FY-2C is provided (with an hourly frequency), together with a set of meteorological products. EUMETSAT transfers to CMA image data from Met-

9 and Met-7, GOES-E and GOES-W images, MPEF products derived from Met-9 and Met-7 images, and a subset of Metop Global Data Products. EUMETSAT is disseminating CMAs data contribution on all footprints since the end of 2008 via EUMETCast. CMA is expected to start dissemination of EUMETSATs contributions by the end of 2010 via FENGYUNCast.

At the GEO IV & GEO V in November 2007 and 2008 respectively, the exhibition "GEONETCast Global Village" was set up. The components of the exhibition are live GEONETCast reception (involving EUMETCast Europe and EUMETCast Africa), and a selection of Data Providers demonstrating their own products. Key objectives of the exhibition were:

the global coverage and accessibility of GEONETCast;
the wide variety of environmental data and products available to users of GEONETCast;
the operational use of GEONETCast;
the contribution of GEONETCast to the operational application of Earth observation information.

Presentations planned in 2009 are:

IGARSS (South Africa)
OceanObs (Italy)
AMESD User Forum (Ghana)
GEO-VI Plenary (USA)

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;
Working with providers such as SERVIR, USEPA, RANET, JCOMM/GOOS, ECMWF, INPE, AMESD, CBERS;
A number of EU projects in the approval process include use of GEONETCast – DevCoCast, AIDA, AEGOS.

3 EUMETCAST

Started in 2002, EUMETCast has gone through a rapid growth as EUMETSAT's Broadcast System for Environmental Data, with continuous increase of dissemination bandwidth and addition of data services.

The overall architecture of the EUMETCast System remains unchanged, supporting the prime EUMETCast Europe and two DVB turnaround services (EUMETCast Africa and EUMETCast Americas).

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.

This service started in January 2009. Up till then, the service was provided by HotBird-6 at 13°E. Resulting from several upgrades for support of additional services, the total bandwidth of the EUMETCast Europe Service now amounts to 14.5 Mbps (megabits per second).

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 – after an increase in October 2007 – is 3 Mbps, to be upgraded to 3.3 Mbps in January 2008.

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 remained unchanged at 2 Mbps.

3.1 EUMETCast Data Services

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.

3.2 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, Vegetation products from VITO, …)

3.3 Data Services Open to All Registered EUMETCast Users

High and Low 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 OSDR
Third Party Products (MODIS products)
NOAA GEONETCast Products (RANET, CBERS, SEVIR, USEPA)
CMA GEONETCast Products (FY2c nominal data, FY2c products)

All data services listed in Sections 3.1 and 3.2 are provided on EUMETCast Europe. On EUMETCast Africa and EUMETCast Americas, subsets are disseminated.

On EUMETCast Africa:

High and Low 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 OSDR
NOAA GEONETCast Products (RANET, CBERS, SEVIR, USEPA)
CMA GEONETCast Products (FY2c nominal data, FY2c products)

On EUMETCast Americas

High and Low 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 (RANET, CBERS, SEVIR, USEPA)
CMA GEONETCast Products (FY2c nominal data, FY2c products)

3.4 Service Registrations

The number of registered EUMETCast Reception Stations continues to increase with about 20 new registrations per month. At the end of July 2009, more than 2700 Reception Stations were registered. Of these stations, about 150 are located in Africa, just over 50 in South and Central America with the remaining 2500 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 1950.

3.5 EUMETCast Services Outlook

For 2009, no major changes for the **EUMETCast Europe Service** are expected. The allocated bandwidth of 14.5 Mbps supports the baselined data services, and will provide room for the implementation of dissemination of some additional data and products.

With an allocated bandwidth of 3.3 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.

The **EUMETCast Americas Service**, established as a trial in 2006 has been extended with agreement by the EUMETSAT Delegate Bodies until 2010.

4 GEONETCAST AMERICAS

The GEONETCast Americas system, operated by NOAA, passed final acceptance early spring 2008 and is considered fully operational. Currently the system, which covers all Americas, is disseminating data from a number of Americas based data providers.

5 FENGYUNCAST

The FENGYUNCast system, operated by CMA, is fully operational since 2007 and covers the entire Asia-Pacific region. By end of 2008 it is expected that CMA will start to disseminate the GEONETCast data exchanged between EUMETSAT and CMA – which is:

METEOSAT 7 (VIS, WV,IR) (hourly data)
METEOSAT 7 (VIS, WV,IR) (half-hourly data)
METEOSAT 7 Met Products
METEOSAT 9 (VIS, HRV,WV,IR) HRIT (hourly data)
METEOSAT 9 Met Products (all data): CLM, GII, AMV, CLA, CLAI, CTH, TH, TOZ
Other Satellite Data (GOES 11 and 12)
METOP level 1 products:
AMSA, ASCAT, GRAS (thinned), HIRS, MHS, IASI Level 1c (thinned)
JASON-1 OSDR and JASON-2 OGDR.

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

The 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.

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 current overall status and the near term evolution of GEONETCast, and the evolution of the EUMETCast Services with regards to GEONETCast.