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Prepared by EUMETSAT
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REPORT ON EUMETCAST INCLUDING GEONETCAST

This paper presents the actual status of the EUMETCast system architecture, data services supported, and registration figures, with an outlook into the near term evolution of the EUMETCast Europe, Africa and Americas Services. Additionally, the actual status and intended development of GEONETCast are described, underlining the role of EUMETCast in this system.

Report on EUMETCast including GEONETCast

1 INTRODUCTION

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. In the evolving GEONETCast system, EUMETCast constitutes the first operational building block

2 SYSTEM ARCHITECTURE

The overall architecture of the EUMETCast System remained unchanged in 2006 and 2007, supporting the prime EUMETCast Europe and two Turn-around Services (EUMETCast Africa and EUMETCast Americas).

The system architecture is depicted in Figure 1, showing also the actual data sources and data providers.

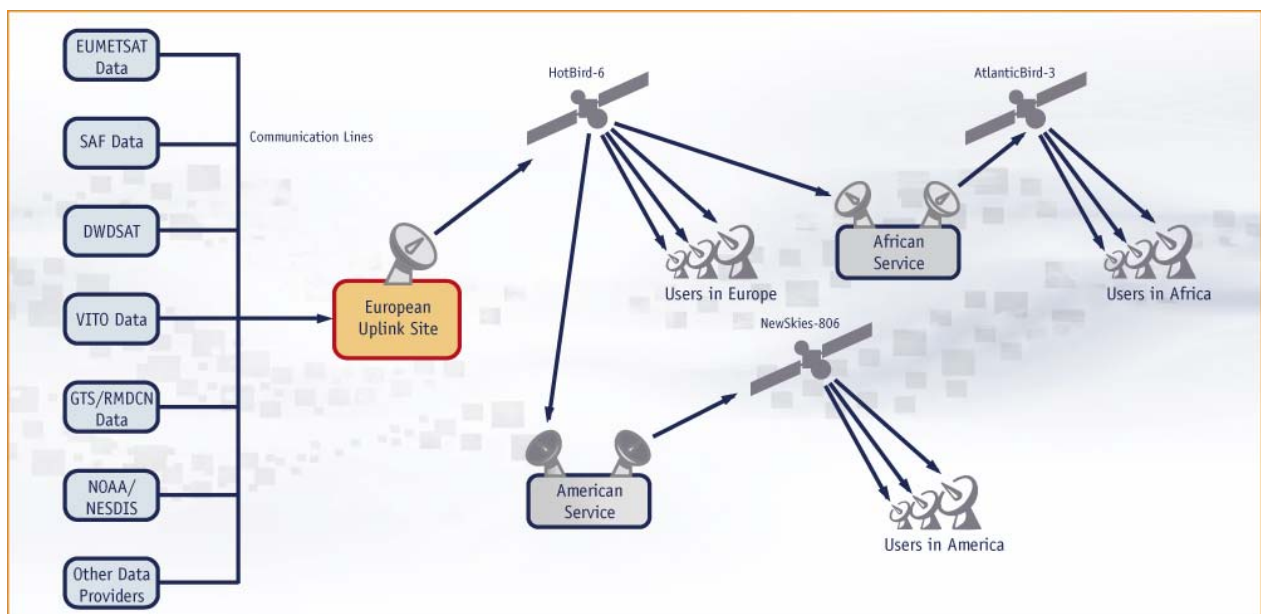


Figure 1: EUMETCast System Architecture

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 HotBird-6. Resulting from several upgrades for support of additional services, the total bandwidth of the EUMETCast Europe Service will amount to 14 Mbps (megabits per second) at the end of 2007.

EUMETCast Africa, implemented in the second half of 2003, is using 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 turn-around service, was implemented beginning of 2006, with an uplink station near Paris, using a C-band transponder onboard the satellite NSS-806. This service is conceived as a trial, currently limited until end of 2008. The bandwidth allocated to this service remained unchanged at 2 Mbps.

The geographic coverage (footprint) of the Ku-Band Europe Service, the C-Band Africa Service, and the C-Band Americas Service is shown in Figure 2.

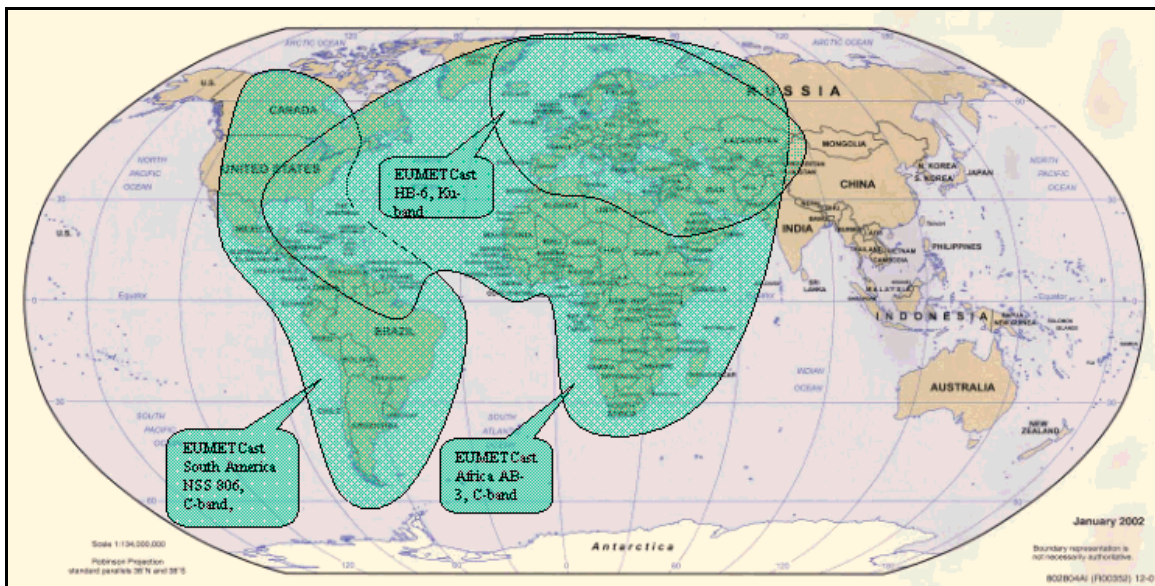


Figure 2: Geographic Coverage of all EUMETCast Services

3 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.

3.1 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, ...)

3.2 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

4 THE PRODUCT NAVIGATOR – KEY INFORMATION ABOUT EUMETCAST DATA SERVICES

The Navigator is a tool on EUMETSAT's Web Site, designed to put a vast range of essential environmental data at the fingertips of users around the globe, making it thus 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. Whilst the Navigator is also containing information about products provided by EUMETSAT's U-MARF, about web based services and data distributed via direct dissemination, the focus is on data and products disseminated through EUMETCast and GEONETCast.

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.

Version 1.0 of the Product Navigator has been released beginning of August on EUMETSAT's Web Pages (see: <http://www.eumetsat.int/products>)

5 DATA SERVICES ON EUMETCAST SERVICES

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

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

6 SERVICE REGISTRATIONS

The number of registered EUMETCast Reception Stations continues to increase with about 50 new registrations per month. End of July 2007, more than 2300 Reception Stations were registered - which is equivalent to the number of Encryption Key Units distributed. Subscription for the main data service – the Meteosat Second Generation 15 minutes SEVIRI service – achieved a figure of 1800.

7 EUMETCAST SERVICES OUTLOOK

For 2008, no major changes for the **EUMETCast Europe Service** are expected. The allocated bandwidth of 14 Mbps is well supporting 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** from beginning of 2008, there will be some scope for the implementation of additional data services for Africa.

The **EUMETCast Americas Service**, established as a trial in 2006, should formally terminate end of 2008. Considering the capabilities (limitations) of the evolving GEONETCast Americas Service (being established in 2007 by NOAA), there is scope for the continuation of this service beyond 2008. This issue is treated in the autumn 2007 meetings of the EUMETSAT Delegate Bodies.

8 GEONETCAST UPDATE

GEONETCast 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 (Chinese

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, prioritize, and schedule the incoming data streams or products.

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.

The actual architecture of GEONETCast and the respective data flows are depicted in Figure 3.

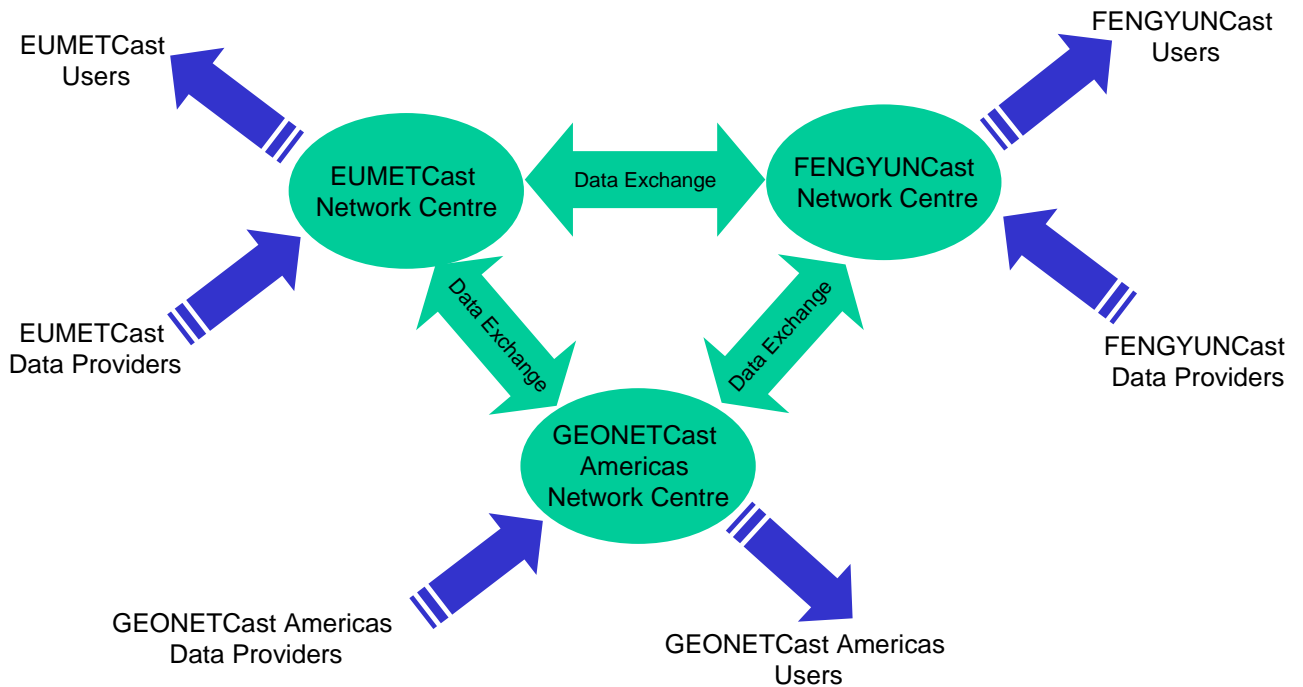


Figure 3: GEONETCast Architecture and Data Flows

Notional Global GEONETCast Coverage

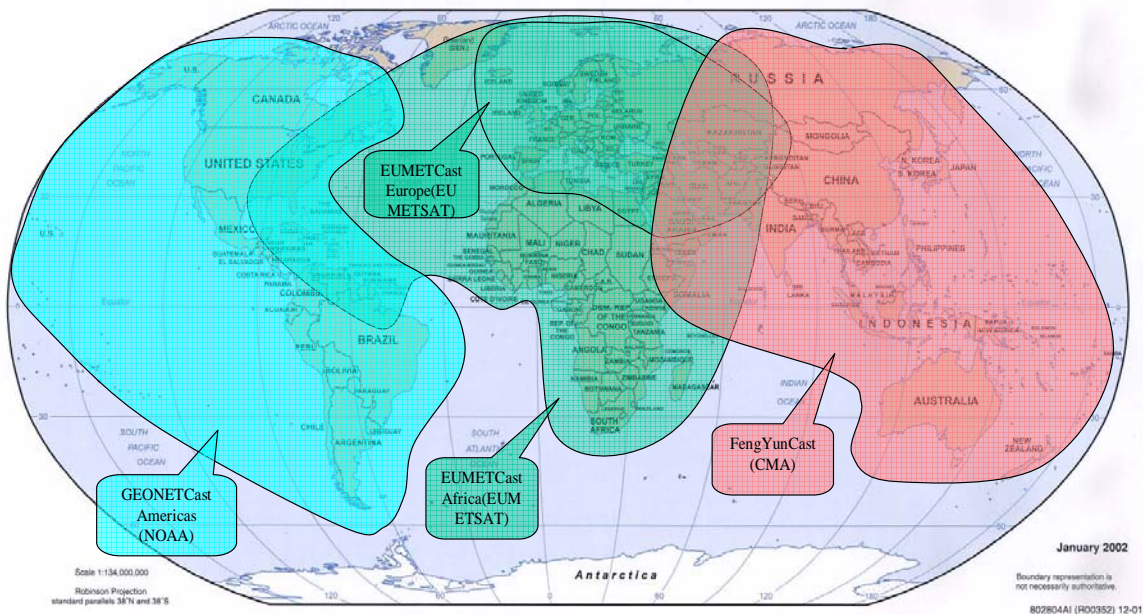


Figure 4: Global GEONETCast Coverage

The global GEONETCast coverage is presented in Figure 4, containing the GEONETCast Americas component, which is planned to be available by end of 2008. Comparing the latter with the EUMETCast Americas coverage shown in Figure 1, currently an overlap of these two systems is foreseen.

A regular data exchange with NOAA has been established in the second half of 2006. Data provided by NOAA/NESDIS, NASA and the US Environmental Protection Agency is transferred via internet directly onto the EUMETCast up-link platform, and distributed by the EUMETCast Americas Service for reception in the Americas. EUMETSAT is providing via EUMETCast Americas the Met-9 SEVIRI image data, GOES-E and GOES-W images, MPEF products, JASON-1 data and products from the Land SAF.

Data exchange with CMA has been implemented operationally in the 3rd quarter of 2007, using the existing RMDCN between both centres. From CMA, the full image from FY-2C is provided (with an hourly frequency), together with a set of meteorological products. EUMETSAT is sending 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. In both Network Centres (at CMA and EUMETSAT), the dissemination of these products will be implemented in the very near future, on FENGYUNCast and EUMETCast, respectively. The operational implementation of this data exchange including the products involved was presented at the GEO Asia Pacific Workshop in Beijing on 10-12 October 2007.

At the GEO IV & Ministerial Summit in November 2007 in Capetown, South Africa, the exhibition “GEONETCast Global Village” will be supplied. Key components of the exhibition are GEONETCast reception (involving EUMETCast Europe and EUMETCast Africa), and a selection of Data Providers demonstrating their own products. Key objectives of the exhibition are:

- 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

9 CONCLUSION

CGMS is invited to take note of the current status and the near term evolution of the EUMETCast Services, its contributions to GEONETCast, and the overall status of the GEONETCast system.