



WMO/NOAA Train the Trainer Workshop

6-7 April 2013

US National Center for Weather and Climate Prediction (NCWCP)

College Park MD, USA



Summary Report

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The WMO/CGMS Virtual Laboratory and the WMO Space Programme organized, supported by NOAA as hosts, the WMO/NOAA Train the Trainer (TtT) Workshop for WMO RA III/IV members. The 1.5-day workshop preceded the 2013 NOAA Satellite Conference (8-12 April) in the same venue and covered the following topics:

- a) Introduction, operations and capabilities of the GEONETCast (GNC);
- b) Disaster mitigation products and the importance of GNC as a risk-reducing global data access system;
- c) Training Channel and Transfer of training material via GNC, e.g. clips of near-real-time Focus Group recordings and COMET materials;
- d) Supporting systems, EUMETCast, HRIT/EMWIN/LRIT; GEONETCast-Americas, and GOES Data Collection System;
- e) Reviewing regional requirements documentation and the need for better integration of regional dissemination systems;
- f) System demonstrations.

The agenda of the workshop is given in Annex I and the list of participants in Annex II. Presentation material is available at <https://omitron.box.com/s/jrza0qefntcmvtinw8uy>

1. Introduction

Stephan Bojinski introduced motivation for the training event using some results from the WMO 2012 Survey on the Use of Satellite Data which showed evidence for the challenges of users in RA III and IV in accessing and processing satellite data. He gave a brief on WMO activities and priorities with an emphasis on regional satellite data dissemination, requirements definition, user training, and preparation to the new generation of geostationary satellites. He described that regional training in using satellite data was part of a WMO CBS strategy, and that there were persistent challenges in ensuring integrated, simple access to satellite datasets by users. WMO priorities in the 2012-2015 period were on integrating observing systems worldwide through the WMO Integrated Global Observing System (WIGOS), on the Global Framework for Climate Services, on Aviation and Disaster Risk Reduction matters, and on capacity building.

2. GEONETCast

Sally Wannop (EUMETSAT) presented an overview of GEONETCast, jointly with Paul Seymour. GEONETCast is an umbrella term comprising the different components EUMETCast, CMACast and GEONETCast-Americas, which are data dissemination mechanisms based on Digital Video Broadcast (DVB). GEONETCast is a contribution to the GEOSS Common Infrastructure. The Russian MITRA system also provided DVB services, but was not integrated in GEONETCast. JMA is considering developing DVB-S system of their own to support Himawari-8/9 data dissemination for the Pacific region.

Exchange of data interchangeably among all components is an aim but contingent on individual agreements. Uplinks can be provided through various means, e.g. ftp. Arrangements are under way to ensure true interoperability of services in overlap areas of the different DVB-S beams; for example EUMETSAT and CMA are looking into possibilities of managing users in a shared manner in that EUMETSAT would manage the users of EUMETSAT data on CMACast.

GEONETCast (GNC) supports all GEO SBAs and foci of activities are e.g. GFOI, GEOGLAM, and data exchange in support of the International Charter for Major Disasters. It was stressed many

times that the GNC was a suitable, low-cost tool for making datasets available in areas with poor internet connectivity.

Sally showed the technical and cost details of a GNC receiving station, and the number of users of each GNC component.

3. Disaster mitigation products

3.1 Disaster Mitigation products

Matthew Handy (NASA GSFC) presented (for Stuart Fry) on integrated geospatial satellite data analysis in support of flood mapping in Namibia. Annual floods occurring in Namibia were a concern, with existing flood warning models being not very precise. NASA worked with the U.N. to provide an aggregated, integrated, analyzed dataset ("sensor web") based on satellite data (EO-1) and in-situ data (encompassing citizen observations, towers), leading to a greater degree of confidence in flood-related decision making.

He showed the collaboration framework between US academia and Namibian government institutions. EO-1 is being tasked for targeted image acquisition. Experience in the past two years in making map-based flood alerts available has been positive. Dissemination of information is supported by a web-mapping service. Plans are to overlay the maps with TRMM precipitation products.

This was a good example for collaboration between disaster risk reduction authorities, and the Namibian NMS. Plans exist to hand off readymade tools to local authorities, although these would still be reliant on NASA satellite data. Ground-based validation is a mechanism to develop local buy-in and uptake.

3.2 GNC as a risk-reducing global data access system

Paul Seymour (NOAA) introduced the use of GNC in support of disaster risk reduction, e.g. in the case when other telecommunication systems are affected by a disaster (e.g., land slide). This is relevant in invoking the International Charter on Major Disasters which is opening its user base to recognized national disaster response authorities. 29 receiving stations have been installed by NOAA, USAID or GNC-Americas partners. GNC-Americas offers 2 Mbit/s data rate relying on a new Insat-21 telecommunications satellite (expected to operate for another 8-9 years) using multiplexed C-band DVB-S. Product broadcast channels are separate per data provider, and there are no restrictions on product formats. Metadata ("discovery and access broker") available on the GEO Portal is also being transferred.

External providers such as EUMETSAT and INPE are adding mostly environmental information. Current plans involve the instalment of 8 new stations in the Americas this year, at a cost of less than 5K USD per unit.

The discussion, triggered by a remark from Luis Fernandez, revealed that there is a high demand in the Region for simple tools for processing and analyzing the datasets received through GNC (and possibly other means), and for training in the use of these tools. The RA III/IV coordination group on satellite data requirements should have a role in expressing such training needs by the Region, alongside with datasets and products themselves. Some participants expressed the view that the Region should agree on a common tool, facilitating training, exchange of capacity, and further development. This is consistent with the fact that training material is now being uploaded and exchanged on GNC.

4.1 GNC-Americas

Paul Seymour (NOAA) introduced the services available through GNC-Americas.

The team responsible for operating GNC-Americas consisted of: Yana Gevorgyan (NOAA NESDIS), Eric Madsen (NOAA NESDIS), Paul Seymour (NOAA NESDIS) and Rich Coley.

It was pointed out that GNC-A was currently not a tool useful for the operations of a meteorological services. It had single points of failure, no 24/7 support, and no guaranteed latency. Other data services were available (e.g., GVAR, EMWIN, DCS, LRIT) but not necessarily affordable or practical for all users in RA III and RA IV.

To encourage participation by providers within the Region, Paul noted that uploads by partners such as INPE to GNC-A, were administratively much easier to perform than from within NESDIS, since they do not require configuration change management activities.

4.2 EUMETCast

Sally Wannop introduced the evolution of EUMETCast with currently 4000 stations worldwide. Technical evolution of the system implies DVB-S2 service in operation for Jan 2015, with a parallel service running mid-2014 until end 2014. The service is funded by the EUMETSAT Member States, with additional contributions from external content providers. She presented the data/products suite available on EUMETCast; break-even point for a dataset to be included in the service is 7 users; the EUMETSAT product navigator <http://navigator.eumetsat.int> is interoperable with WIS and GEO.

EUMETCast is used as training channel to improve access to training material, especially where internet connectivity is limited; it can be used pre-, post- or during a training event. A pilot service for EUMETCast-Africa is to start in April 2013. Notification to users will be provided on a training calendar.

4.3 GNC as Training Channel

Bernie Connell briefed the group on the use of GNC for supporting the VLab. She had successfully tested GNC for transmitting imagery and readme files (~5MB) for training purposes. Some of the training resources beyond 60 MB in size may not get through at the receiving end, for reasons of limited capacity. She showed the use of VisitView for regional focus group sessions. A user base for training material now needs to be developed and their requirements established. Some discussion on volcanic ash and hazards posed by it ensued, quoting the international volcanic health hazard network.

4.4 DCS

Kay Metcalf informed the group about the GOES Data Collection System, a NRT data collection and relay system for government environmental use. DCS is used heavily by in-situ wildland and fire monitoring users, USGS hydrological stations, the tsunami warning system, and buoys for relaying data (23 000 transmitters in total). Users are all over N&C America as well as the Caribbean and the Pacific. Data are then being disseminated to other data circuits such as GTS, LRIT etc. Tables documenting metadata are sometimes incorrectly coded. Such data could be distributed over GNC-A.

4.4 LRIT/EMWIN

Paul Seymour briefed the group on both the Low Rate Information Transmission (LRIT) and EMWIN, the Environmental Managers Weather Information Network, broadcasts which feature lower bandwidth (128 kbit/s and 19.2 kbit/s respectively). He noted that the planned GOES-R downlink will combine LRIT and EMWIN at 400kbit/s, and details on resolution and repeat cycle of imagery will be made available at the NOAA Satellite Conference (1 full disk image of ABI would take 45 minutes to downlink...); separate GOES east and west schedules will be provided, but

specific regional scanning modes are not currently planned. It may be possible to add some Rapid Scan Images over hurricanes for example, but at the expense of full disk imagery.

The group noted that user preparedness required a significant investment, especially for the new GOES-R Rebroadcast (GRB) service and the GOES-R Proving Ground served as an example.

4.5 GNC installation

Paul Seymour provided information on how to install a GNC receiving station. The biggest difficulty is to correctly point the antenna for receiving the signal, as well as to install the Kencast software. An Installation Guide is available in English and Spanish (contact Paul Seymour), and guidance and assistance are available from both INPE and the Costa Rica Meteorological Service.

6. Review of Regional Requirements Documentation

Luiz Machado, Stephan Bojinski

The main motivation for expressing requirements in the Region was poor access to data, and to bridge the gaps between providers and users. The WMO IGDDS strategy provided an umbrella for the work of the RA III/IV Task Team on Satellite Data Requirements between 2010 and 2012. Results were published in 2012 as a living document. He recalled developments since then, including approval by CBS of the Region-based Procedure.

Luiz summarized key points to be considered by the Team:

- Define the scope of the users in the Region (level 3 vs level 2 vs level 1 data users, and their individual, different needs for visualizing and analyzing data);
- Keep track of the status of data dissemination systems, and plans for next generation of satellites
- Seek arrangements for a sustainable data dissemination system, including the necessary resources
- Discuss working arrangements of the Team, including resourcing the Team
 - Funding of next Team meeting: who can pay?
 - Dates of next Team meeting
 - Composition: Official nominations + Expert invitations
- How to ensure due diligence

Discussions revolved around the following issues:

- What is the range of users represented by the Team?
- Could dissemination occur separately for Region III and IV? - This is considered not practical since there is only one dissemination system providers, and sending products separately means extra effort
- Data formats are evolving and must be useable by users
- Which training opportunities and tools are available and common practice in the Region (e.g., McIDAS-V widely used in RA IV)?
- Who pays for receiving equipment or bandwidth?
- Region wants to take advantage of upcoming products
- Need a "EUMETCast-Americas"?

7.1 GNC Product dissemination

Sally Wannop reported on EUMETSAT user engagement with its Member states, and other users in RA VI (biennial information days) and RA I (Dissemination Expert Group). She described the

brief of RAIDEG, having representation by NMHSs, training centres, and regional user centres. Communication within the Region I is sometimes a challenge

7.2 Disaster Mitigation products

Humberto Barbosa discussed satellite products used for mitigating the impact of disasters (e.g., correlation between NDVI and precipitation indices) by the South America Group of EUMETCast operators (SAGEO). He pointed out the complexity of the climate system and the human imprint on it, and the importance of climate services as a partnership between climate information providers and users. Disaster management involves planning, learning, and mitigation. He quoted the list of ECVs as guidance for disaster management information generation.

SAGEO is uniting more than 50 users of EUMETCast in Brazil (in 19 states) and outside Brazil from meteorology, hydrology and climatology (from academia and operations), with a focus on sharing products, setting up infrastructure, capacity building, and training. A EUMETCast receiving station consists of antenna, coaxial cable, LNBF, receptor unit (PCI, USB), EKV and processing PC. He noted the relevance of different data formats suitable for different users. Nearly 600 staff have been trained over the past 7 years. Annual trainings are held in parallel to meteorological conferences in Brazil or elsewhere in South America, most recently in Havana, Cuba. Training material is available through manuals and online videos.

TerraMA2 is generic, free RS/GIS software that help import and process data on EUMETCast, and can handle almost all data provided on EUMETCast. There are plans to hold a meeting on RGB imagery by NMSs in the Region.

He noted there were only few users of GNC-Americas in Brazil, and EUMETCast is much more broadly used. Switching EUMETCast receiving stations to receive the GNC-Americas signal is possible.

8.1 COMET

Kathy-Ann Caesar presented an overview of training resources available through COMET, which includes the range of upcoming GOES-R products, modules on GEONETCast, and material translated in Spanish and French. The COMET modules and their translation are heavily used for teaching in Latin America. The ESRC provides a portal to search for training modules uploaded from all sources (not just from COMET). Translation of the ESRC portal into French, Spanish and Russian is provided.

8.2 VLab

Kathy-Ann Caesar provided a summary of WMO-CGMS VLab structure and activities. She highlighted some recent VLab successes, such as the Regional Focal Group discussions, event weeks (on Dust, Aviation, Precipitation), and the virtual roundtable on competency standards for aeronautical meteorological personnel.

8.3 GNC as Training Channel (see item 4.3)

9.1, 9.2 GNC Demonstration, EMWIN Demonstration

Paul Seymour showed a GNC-A receiving station comprising a receiving antenna of 2.4m diameter (although it is possible to use a 1.8m diameter dish in some areas of the Americas), satellite receiver and processing PC with Kencast Professional Client on the laptop. Kelly Sponberg explained the use of a robust, low-cost data dissemination and alert system in remote areas

(“Chatty Beetle”), as well as briefed the group on the status of RapidCast which is undergoing procurement at the moment, with 19 receiving stations to be deployed in the Region. Rob Wagner introduced the EMWIN low-cost, low-bandwidth emergency warning system to the group.

Recommendations identified during the Event:

- In Central and South America and the Caribbean, operational users of satellite data from GOES and other systems require a low-cost, operational and sustained data dissemination system building on GNC-A and EUMETCast. Arrangements for cost-sharing, e.g. of bandwidth fees, should be developed with urgency.
- Training on the use of satellite data and associated visualization, processing and analysis tools should be made available, taking into account the different needs and skills of satellite data users. Training should in particular involve preparing users from the Region for GOES-R.
- The proposed standing coordination group for satellite data requirements in RA III and IV should establish user needs for data, products, training, and associated issues (e.g., data formats). The group should ensure linkage to and follow-up by satellite providers at the appropriate level, and represent the needs of a wide variety of users in the Region.

Participants

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Agenda

Time	Agenda item	Presentations	Presenters
Saturday, 6 April 2013			
9:30 to 10:00		Registration	
10:00 to 10:15	1	Introduction	Stephan Bojinski (WMO)
10:15 to 10:45	2	GEONETCast	Paul Seymour (NOAA)/Sally Wannop (EUMETSAT)
10:45 to 11:15		Break	
11:15 to 11:45	3.1	Disaster Mitigation products	Matthew Handy (NASA)
11:45 to 12:15	3.2	GNC as a risk-reducing global data access system	Paul Seymour (NOAA)
12:15 to 1:15		LUNCH	
1:15 to 1:45	4.1	GEONETCast Americas	Paul Seymour (NOAA)
1:45 to 2:15	4.2	EUMETCast	Sally Wannop
2:15 to 2:45	4.3	GNC as Training Channel	Bernie Connell
2:45 to 3:15	4.4	DCS/ EMWIN	Paul Seymour/ Kay Metcalf
3:15 to 3:30		Break	
3:30 to 4:00	4.5	GNC installation	Paul Seymour
4:00 to 4:30	5	Q&A	
END of DAY ONE			
Sunday, 7 April 2013			
9:00 to 9:30	6	Review of Regional Requirements Documentation	Luiz Machado, Stephan Bojinski
9:30 to 10:00	7.1	GNC Product dissemination	Sally Wannop/Paul Seymour (NOAA), Luiz Machado;
10:00 to 10:30		Break	
10:30 to 11:00	7.2	Disaster Mitigation products	Humberto Barbosa
11:00 to 11:15	8.1	COMET	Patrick Dills (Kathy-Ann Caesar)
11.15 to 11:30	8.2	VLab	Kathy-Ann Caesar
11:30 to 12:00	8.3	GNC as Training Channel	Bernie Connell
12:00 to 1:00		Lunch	
1:00 to 1:30	9.1	GNC DEMO	Paul Seymour

			(NOAA), Kelly Sponberg and Rosario Alfaro (USAID), and Sally Wannop (EUMETSAT)
1:30 to 2:00	9.2	EMWIN DEMO	Rob Wagner, Paul Seymour and Kay Metcalf (NOAA)
End of workshop			