

CGMS VIRTUAL LABORATORY FOR TRAINING IN SATELLITE METEOROLOGY

(Submitted by WMO)

Summary and purpose of document

To inform CGMS Members on the status of activities within the CGMS Virtual Laboratory for Training in Satellite Meteorology

ACTION PROPOSED

- (1) CGMS Members to note the report and make comments, as appropriate
- (2) CGMS Members to endorse the addition of new Virtual Laboratory Centres of Excellence in Argentina and Brazil;
- (3) CGMS to continue support of the VL and its structure and goals, and requests a full report on VL implementation (from the VL Management Group Meeting in 2007) be presented to CGMS-XXXV.

- Appendices:**
- A. Summary of VISITview satellite weather briefings of the WMO VL Focus Group of the Americas – 22-23 August 2006
 - B. Portion of WMO Space Programme's web site announcement of the High Profile Training Event (HPTE)
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DISCUSSION

1. Background

CGMS-XXVIII

1. CGMS-XXVIII was informed of WMO discussions concerning a Virtual Laboratory (VL) for Training in Satellite Meteorology. WMO suggested that CGMS, in partnership with WMO, form an "International Satellite Data Utilization and Training Focus Group".

2. CGMS places ACTION 28.14 on WMO and the CGMS Secretariat initiate the establishment of a focus group on satellite data utilization and training within the Virtual Laboratory Framework that reported back to CGMS-XXIX on its findings and need for future activities in this area.

CGMS-XXIX

3. CGMS-XXIX reviewed and confirmed the Terms of Reference, proposed structure and goals for the CGMS Virtual Laboratory Focus Group.

4. The Virtual Laboratory for Satellite Data Utilization was formally adopted by CGMS-XIX, with continued reporting through the Virtual Laboratory Group.

CGMS-XXX

5. CGMS-XXX was pleased to be informed of the successful application of the Virtual Laboratory for Satellite Data Utilization for the Asia Pacific Satellite Application Training Seminar (APSATS) workshop that was co-sponsored by WMO, Japan Meteorological Agency and the Bureau of Meteorology.

6. CGMS-XXX requested that the VL focus group convene before CGMS-XXXI and report back on activities and status with regard to the implementation plan.

WMO Cg-XVI

7. WMO Cg-XVI expressed its pleasure with the now established Virtual Laboratory for Education and Training in Satellite Meteorology. The Virtual Library had already made a tremendous impact throughout WMO Regions through its six "centres of excellence". Congress was pleased to see the integration of the new R&D constellation into education and training activities. It also noted that the WMO Space Programme Long-term Strategy and associated Implementation Plan provided for increased utilization of the Virtual Library to the benefit of WMO Members especially for fuller exploitation of R&D data, products and services as well as those from new and existing operational meteorological satellite systems.

CGMS-XXXI

8. CGMS-XXXI was informed on progress within the VL since CGMS-XXX. Important milestones were being met: all centres were utilizing the VL; servers were in place at all sponsor centres and some centres of excellence; resource libraries were available on-line; and training tools such as VISITView and SATAID were available.

CGMS-XXXII

9. CGMS Members endorsed and supported the specific recommendations of the second VL Focus Group Meeting, paying particular attention to recommendations within sections that addressed Servers; Tools; Virtual Resource Library; Connectivity; Future Training Event Guidelines; Electronic Workbook; Major Training Event; and endorsed the plans for a Third Session of the VL Focus Group to be held in 2007.

10. CGMS confirmed and noted the importance of the roles of the VL partners as put forth in the report to CGMS-XXXI.

11. CGMS enthusiastically supported the VL Goal of staging a Global High-Profile VL Training Event that would link all centres of excellence;

12. CGMS was enthusiastic about the establishment of new Caribbean Focus Group to perpetuate and build a new and stronger dialogue amongst trainers and forecasters in the region, and requested information concerning its progress at CGMS-XXXIII.

CGMS XXXIII

13. Growth of VL: CGMS endorsed the growth of the VL through the formation of additional space operator sponsors and new centres of excellence, confirming a new centre of excellence in Oman sponsored by EUMETSAT and India;

14. Electronic notebooks: CGMS was pleased to learn of the success of the Costa Rica training event that was held in February 2005, and the successful trial of electronic notebooks at that event. In invoking this paradigm shift in training. The electronic notebooks which were then provided to the VL trainees for their use during the training course and for their subsequent use in training, technology transfer and communication within the newly formed Costa Rica Training VL focus group upon their return to their native countries. Following the Costa Rica training event, electronic notebooks were provided to the RMTTC's at Barbados, Niamey and Nairobi, and the sponsoring agency NSMC. Copies of the electronic notebook contents were also provided to other VL participants: EUMETSAT, the WMO Space Programme and the Australia Bureau of Meteorology Training Centre (BMTTC).

15. CGMS Members were pleased to learn of the status of activities within the Virtual Laboratory with respect to Implementation Planning for a High Profile Training Event to occur in October 2006. CGMS Members strongly endorsed and supported the specific recommendations for the High Profile Training Event, in particular the requests for assistance in the development and translation of the core lectures, and implementation of the foundation VISITview server software as detailed in the report.

Note: - CGMS Action Item Action 33.07: CGMS Members are requested to support the arrangements for their high profile training event as described in the document WMO-WP-17.

Deadline: CGMS-34.

16. HPTE: CGMS was informed of the success of the Regional Focus Groups and looked forward to the development of similar Regional Focus Groups at all COEs prior to the High Profile Training Event;

17. CGMS changed in name of the Virtual Laboratory Focus Group to the Virtual Laboratory Management Group.

2. Activity within the VL since CGMS-XXXIII

Growth of the Virtual Laboratory

18. The new Centre of Excellence in Muscat (Oman), co-hosted by the Remote Sensing and GIS Centre of Sultan Qaboos University and the Directorate General for Civil Aviation and Meteorology (DGCAM) of Oman and co-sponsored by EUMETSAT and the NMS of India, was formally inaugurated on 11 February 2006.

19. The WMO Space Programme received a proposal from the Permanent Representative of Argentina to establish a CoE in Buenos Aires for training in satellite meteorology in Spanish. ET-SUP-2 reviewed the Buenos Aires application and noted that all necessary conditions to become a

Centre of Excellence. NOAA/NESDIS agreed to co-sponsor this CoE and the proposal was supported by RA III.

20. The WMO Space Programme received a proposal from the Permanent Representative of Brazil to establish a CoE at the Centre for Weather Forecast and Climate Studies of Brazil (CPTEC). The Centre will have special interaction with the Weather Services of Brazil and Portugal to improve the use of satellite data and products in South America and African Portuguese speaking countries. ET-SUP-2 reviewed the CPTEC application and noted that all necessary conditions to become a Centre of Excellence. NOAA/NESDIS agreed to co-sponsor this CoE.

WMO VL Focus Group of the Americas

21. Since the Barbados training event in 2003 and the Costa Rica training event in 2005 the Caribbean Focus Group has met on a monthly basis in a virtual laboratory environment using VISITView. The popularity of that activity grew to the point where the focus group has expanded to cover both RA III and RA IV and has been renamed the Virtual Laboratory Focus Group of the Americas.

22. The focus group meets at least monthly with sessions on two different days, with the first day in both Spanish and English and the second day in Spanish only. The sessions generally last between one and two hours.

23. During the two days, 20 or more countries normally participate in the focus group sessions with most of the countries having multiple participants.

24. As an example of utilization: copy of email from the August 22/23, 2006, focus group session is attached as appendix A.

High Profile Training Event (HPTE)

25. The HPTE was held during 16-27 October 2006, in conjunction with the Asia Pacific Satellite Applications Training Seminar (APSATS 2006) in Melbourne, and the Regional Training Seminar in Nanjing. A portion of the announcement for the HPTE from the WMO Space Programme Home Page is shown in Appendix B.

26. Four core lectures (see Appendix B) were developed in PowerPoint and converted to VISITView format (in English) and were reviewed by each of the partners, prior to distribution to the registered participants in each Region. The Central and South American groups, in conjunction with NOAA/NESDIS, translated the lectures into Spanish and Portuguese. China translated all 4 core lectures into Chinese.

27. Electronic notebooks were donated for the event with CMA donating 10 laptops to Nanjing training event and the Australian Bureau of Meteorology donating 10 laptops to the APSATS training event.

28. In early August 2006, the Virtual Laboratory Management Group (VLMG) responded to twelve key questions about their preparation for the HPTE training event, responses were received from NOAA/NESDIS, Costa Rica, EUMETSAT, Oman, Australia, Brazil and Japan. The responses show below: **(more current information will be reported to CGMS).**

- The number of people registered for the HPTE is estimated to be between 120 and 150 at the current moment (Central and South America ~ 50, Africa and Middle East ~ 50 and the Pacific ~ 20); A limited amount of customisation of the lectures to incorporate local examples has occurred;
- Translation of the core lectures into Spanish, Portuguese and Chinese has begun;
- No non-English sessions have yet been created in VISITview;

- VISITview servers are available at Wisconsin, Fort Collins, the UK Met Office and Melbourne;
- Regional focus groups are active in Central and South America and are in the process of being established in the Middle East, Africa and the Pacific, with the Middle East group being the most advanced;
- Key lecturers have been identified for most regions;
- EUMETSAT have identified the need for strong coordination of times and activities in the lead up to the HPTE to ensure maximum impact;
- Publicity: A wide range of publicity for HPTE has occurred, from: formal letters from the WMO Secretary General to each WMO Member, along with DVDs from the Cooperative Institute for Research in the Atmosphere (CIRA) of the Virtual Resource Library; to presentations at conferences and workshops (including Regional Association meetings); to announcements on websites; and, one on one contact between VLMG members and NMHS staff;
- Plans on how the core lectures will be distributed to participants in each region. Groups are being finalised and will most likely use post and ftp;
- Face to face training events will be held in China, the Pacific, Oman and Africa (Niamey and Pretoria) during HPTE.

29. In relation to HPTE evaluation the ET-SUP noted the VLMG intention to use the actual outcomes of the objectives defined in the HPTE Project Development Plan as the initial measures of success.

3. Training Events within the VL since CGMS-XXXII

Centre of Excellence in Muscat Oman

30. The CoE was inaugurated on 11 February, 2006. The first official CoE training event followed the CoE inauguration (12-22 February 2006). It was attended by 25 participants from 7 Arab countries and 7 lecturers. Training focused on the application of MSG data in the Middle East. The strength of distant learning with VISITview was demonstrated with a lecture originating from EUMETSAT headquarters.

Centre of Excellence at the Australia Bureau of Meteorology

31. The Asia Pacific Satellite Applications Training Seminar (APSATS 2006) that focused on Use of Environmental Satellite Data in Meteorological Applications for RA V was held during 16-27 October 2006, in conjunction with the HPTE and the Regional Training Course in Nanjing. The 3rd IPWG workshop was held in parallel with the APSATS 2006, with one day being a joint session with special lectures provided to APSATS participants by experts in the use of satellite data for precipitation estimation. It is anticipated that at least some of the participants in the APSATS training course will also be able to take VL notebooks back to their Member countries

Centre of Excellence in Nanjing, China

32. A Regional Training Course on the Use of Environmental Satellite Data in Meteorological Applications for RA II was held in Nanjing during 16-27 October 2006, in conjunction with the HPTE and the Asia Pacific Satellite Applications Training Seminar (APSATS 2006). It is anticipated that at least some of the participants in the Nanjing training course will also be able to take VL notebooks back to their Member countries. A demonstration of the Chinese ADM system FENYUANCAST was part of this workshop.

**SUMMARY OF VISITVIEW SATELLITE WEATHER BRIEFINGS OF THE WMO VL FOCUS
GROUP OF THE AMERICAS – 22-23 AUGUST 2006**

Our next sessions are tentatively scheduled for Monday, September 25 at 19 UTC and Tuesday, September 26 at 16 UTC.

Special Note: Our Focus Group will participate in the worldwide WMO/OMM High Profile Training Event (HPTE) by holding two bilingual weather briefings: one on October 17 at 14 UTC and one the week of October 23. After the weather briefings, there will be a lecture in Spanish (using VISITview) on the use of satellite data for monitoring convection. Vilma and I will be at WMO Headquarters in Geneva next week September 4-8 to finalize plans for HPTE. I will provide more information when I return after September 11.

As usual for our group, one session took place on August 22 at 19 UTC and a second the next day, on August 23 at 16 UTC. The first session was in English and Spanish (2 h), the 2nd in Spanish only (1:10 h). During the 2nd session many participants had sound problems though quality improved at the end of the session. It is suspected that the problem was related to a change in the Yahoo version used by several of the participants. Thanks to the written notes by Gloria Marin, participants with sound problems were still able to follow the discussion. The developments of a possible El Niño/La Niña and the Caribbean/Atlantic hurricane season have become routine subjects of discussion.

Participants either one of the sessions:

Antigua Barbuda	George Braithwaite
Antilles (Neth.)	David Barkmeyer
Argentina	Ricardo Valenti and Met. Weather Service forecasters y Matías Bertolotti with the group at Universidad de Buenos Aires
Barbados	Selvin y Horace Burton
Bolivia	Enrique Peñarrieta and Milton Javier Caba
Brazil	Gustavo Escobar and Leonardo Peres, CPTEC
Colombia	Ruth Mayorga (IDEAM), Gloria Marín (Serv. Púb. de Medellín)
Chile	Juan Quintana
Costa Rica	Berny Fallas (with the group at UCR), Evelyn Quirós (with the group at IMN), J. Rojas
El Salvador	Lorena Soriano, Luis García, Walter Vanegas, Danilo Ramírez (CEPA)
U.S.A.	Tony Mostek (NOAA-NWS), Mike Davison (NOAA/NCEP/international Desk), Sheldon Kusselsson (NOAA/NESDIS), Bernadette Connell (CIRA)
Guatemala	Claudio Castañón (INSIVUMEH), Jorge Sánchez (Cengicaña)
Guyana	Sharon Hermanstein
Honduras	Luis Rocco, Joaquín Gómez, Francisco Argeñal and Met. Weather Service forecasters
Jamaica	Adrian Shaw
Panamá	Blanca Solís, Met. Weather Service forecasters
Paraguay	Oscar Rosales
Perú	Jorge Chira, Clara Oria and Met. Weather Service forecasters
República Dom.	Caridad Pérez, Juana Sille and Met. Weather Service forecasters
Venezuela	CENAPH, Argenis Ramírez, Eddison Torrealba, Claudio Castañón, José Pereira

Congratulations for their first participation in a VISITView satellite weather briefing of the WMO VL Focus Group to Claudio Castañón, Leonardo F. Peres, Jorge Sánchez Danilo Ramírez, and Samuel Ortega.

In both sessions we used satellite imagery in the 4 usual channels (visible, reflectivity/3.9 micron, water vapor/6.7 micron and thermal IR/11 micron), and various products: SST and anomalies, total precipitable water, volcanic ash, MJO, data of a hail event in Argentina including hail photographs and radar imagery.

Every participant commented on the meteorological situation over and near their countries. In general, there was a very dynamic exchange of comments, questions and observations in both sessions.

In the tropics, there was a very complex pattern with many lows and a trough under 20° N, perturbations in the Trade winds, one east of the Caribbean, another affecting Hispaniola and another west of the Caribbean. Imagery showed the presence of Saharan dust over eastern Caribbean. Selvin Burton commented on surges and squall lines that were near Barbados. In El Salvador, they asked about the forecast of a system south of Panama which, according to the GFS, was going to affect them in 128 hours. Mike commented that he has observed that the long range GFS forecast is not usually very good after 72 hours.

In the southern hemisphere, the following were observed and discussed: a blocking pattern and divided flow around a cut-off flow over the Pacific Ocean, off the coast of Chile, a strong subtropical jet south of Peru, and a strong polar trough over the Atlantic Ocean, south of Brazil, which produced significant frost over Argentina, and extreme low temperatures and humidity on its path (15% humidity reported in Sao Paulo). Mike commented that the system over Argentina had the characteristics of a spring transition pattern. He was surprised by its intensity, usual for October but not for July, as well as by the definition of the Bolivian High. Both situations lead the group to consider that a transition to an El Niño was underway, which has started to show up over the Pacific Ocean. Mike added that the cut off low would probably affect the weather over Peru and Chile with an increase in precipitation, but not above 40 mm. Participants from Bolivia, Chile, Argentina, Paraguay and Brazil got involved in an intense discussion on the weather over the region with Mike.

SST anomalies: The FNMOC product showed positive anomalies over the ocean around the Antarctic Peninsula related, according to Mike, with the high pressure system over Argentina and the blocking system. Positive anomalies could also be seen over the north Atlantic, off the Canadian coast, and along the coast of Peru, confirming the possibility of the onset of an El Niño event.

Madden-Julian oscillation: this product can be found at <http://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/mjo.shtml> and an experimental forecast at <http://www.cdc.noaa.gov/MJO/index.html>.

The MJO has to do with anomalies at 200 hPa. Green lines are associated with upper level divergence and enhanced convection. Brown lines are associated with upper level convergence. The scale of the MJO is smaller than the planetary scale, it is analogous to the middle latitude Rossby Waves, but located in the tropics. During El Niño years, there are less MJO perturbations than during La Niña years. By looking at the MJO of the previous days, Mike showed a divergent pattern over the Pacific Ocean moving east during the 2nd half of August. This pattern is expected to be over the American continent and then over the Atlantic Ocean in the next 2 or 3 weeks, producing an increase in tropical cyclone activity. By the middle or end of September, a convergent phase will follow, producing a decrease in tropical cyclone activity.

Tropical cyclones: Tropical storm Ileana is over the Pacific Ocean, off the coast of Mexico. There is a tropical depression over the Atlantic Ocean, close to Africa. During an El Niño pattern, tropical cyclone activity decreases across the Tropical Atlantic. As a matter of fact, Caridad commented on this year's low activity. Berny presented some figures: only 4 systems this year have reached the category of tropical storm. On 2004 by this time of the year, there were only 5, and still it was an

above average season (but not as high as 2005). Mike and Berny commented that the presence of a divergent pattern in the MJO and the high water temperatures can be associated with the recent generation of 5 typhoons over the West Pacific Ocean, Ioke in the Central Pacific and Hector and Ileana in the East Pacific. Berny attracted the attention of the participants to a wave north of Guyana, which according to some models, especially NOGAPS, will grow into a tropical cyclone when it reaches north of Colombia. Mike expressed his doubts about this forecast due to high shear wind conditions. A couple of days later it became Ernesto, but did not develop in the region indicated by the NOGAPS forecast.

Volcanic ash: By using the ash/fog product and the visible channel, Bernadette showed how to detect the ash of Volcan Tungurahua's eruption, which sent ash 12 km up into the atmosphere.

Total Precipitable water: Sheldon showed the usual high humidity belt around the tropics and the long tropical intrusion of high values extending from the Equator towards the south-east, down to the tip of South America. Mike points out at the minimum over Barbados, which seems to be related with the Saharan dust. If you have questions, send email to Connell@cira.colostate.edu, bernyfallas@yahoo.com or mostek@ucar.edu.

Remember, you can use VISITview anytime and load any of the satellite loops by going to the CIRA collaboration weather briefing satellite site:

<http://hadar.cira.colostate.edu/vview/vmrmtcrso.html>

Congratulations to everyone and keep up the good work!
Muchas Gracias to Berny Fallas for the first draft of this report!

Muchas Gracias/Thanks/Merci ... Tony

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PORTION OF WMO SPACE PROGRAMME's WEB SITE ANNOUNCEMENT OF HPTE

Welcome

The High-Profile Training Event (HPTE) is a series of interactive online lectures covering 4 topics in Satellite Meteorology that will be broadcast to WMO Members in each Region during the second half of October 2006. To participate in this training event you will need to have access to a computer (equipped with a microphone and headset or speakers) connected to the internet and able to download at least at 56 kbs. A series of trial lectures will be held prior to the main lectures to enable you to become familiar with how to collaborate online.

Lecture A WMO Space Program, Satellite Capabilities and the WMO Virtual Laboratory

Lecture B Spectral Bands and their uses.

Lecture C From Digital Data to Products

Lecture D Detection and Monitoring of Severe Convection

For more information please visit:

<http://www.virtuallab.bom.gov.au/HPTE/index.htm>

For those persons registering in Brazil please visit:

<http://pindara.cptec.inpe.br/visitview/HPTE/index.shtml>

For more information on the events in the Americas visit:

<http://rammb.cira.colostate.edu/training/wmov/>

This training session uses a technology call VisitView. To learn more click here:

<http://www.ssec.wisc.edu/visit/vex.html>

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