

CGMS VIRTUAL LABORATORY FOCUS GROUP

(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 indicate activities towards completion of the actions and timetable described in the Implementation Plan in Appendix B.
- (3) CGMS Members to support, as appropriate, the second session of the CGMS VL Focus Group to be held before CGMS XXIX.

Appendices: A. Structure and Goals for the VL Focus Group
B. Implementation plan for the VL

DISCUSSION

Background

1. CGMS-XXIX was informed of the first session of the CGMS Virtual Laboratory Focus Group that was held at the EUMETSAT Headquarters at Darmstadt, Germany, 16-18 May 2001. In response to ACTION 28.14, WMO and the CGMS Secretariat initiated the establishment of a focus group on satellite data utilisation and training within the Virtual Laboratory Framework that reported back to CGMS XXIX on its findings and need for future activities in this area. The first session nominated Mr R. Francis (EUMETSAT) and Mr J. Wilson (BMTC) to serve as the first two co-chairs. CGMS XXIX reviewed and confirmed the Terms of Reference, proposed structure and goals for the CGMS Virtual Laboratory Focus Group. The structure and goals, and implementation plan are included as Appendices A and B, respectively for completeness.

Activity within the VL since CGMS XXIX

2. Within the VL, a number of important milestones that were established by the VL focus group have been addressed and are being met. The status of the various activities are given below:

Action items:

- CIRA to establish a web server for an initial set near real time data and products by the end of November 2001 and report to the VL list-server **Done**
- EUMETSAT to establish a server for an initial site for training resources and materials by the end of July 2001 and report to the VL list-server **Done**
- Prepare an inventory of which training resources and materials are presently available for the core VRL by the end of July 2001 and provide response to J. Wilson **Done**

Each satellite operator should identify which data and products could be linked into the core VRL by the end of July 2001 and provide information to R. Francis

- Selected imagery is available through the CIRA VL web site, the WMO Satellite Activities web page's Imagery link to "Online Satellite Imagery Sites," and EUMETSAT's VL web page
- JMA discussing with BoM the option of GMS near real time imagery being available on the BoM VL Server in SATAID and GIF format

Additional specific actions and timetable:

0 to 1 year

During the next 6 months, all "centres of excellence" to evaluate content, and how and what can be maintained on a server at the "centre":

- Content revision is an ongoing activity.
- Content was reviewed and updated for APSATS 2002.

Train satellite operators and "centres of excellence" on the use of RAMSDIS using VISITview:

- Either RAMSDIS machines or code have been provided to all operators and centres of excellence.

- VISITview has been made available via the VL web site at CIRA to all participants
- Training has been provided by NESDIS for EUMETSAT, Costa Rica, Barbados, BOM, and Nanjing
- EUMETSAT to provide training for Nairobi and Niamey

Increase training event effectiveness through the use of VISITview;

- VISITview effectively used for APSATS 2002

Add the SATAID training resource to the VRL and utilize VISITview on the use of that tool. **Done**

1 to 2 years

Within 1 ½ years, all satellite operators to strive to have a server online and connected to the VL;

- Servers on line at NESDIS (CIRA), EUMETSAT, NSMC and JMA

Each “centre of excellence” will strive to have a server online and connected to the VL;

- Server online at BOM

To establish a voice channel capability within VISITview; **Done and utilized for APSATS 2002**

To evaluate and ways to improve the VRL;

- Ongoing

To evaluate the quality of submitted materials by the “centres of excellence”, completeness (e.g., speaker notes), appropriate deletion dates, compatibility issues, and virus protection.

- Ongoing

5 years

- Conduct comprehensive review

Other achievements

Contact with the ITWG on ITWG recommending training packages on soundings

Developed a taxonomy for classifying satellite meteorology material to assist web based searches

VL development and activities presented to various conferences and workshops: EUMETSAT USERS Conference (Dublin), GOES - R conference, 2 x AMS conferences, ITWG conference, IPWG Conference

APSATS-2002

3. The Asia Pacific Satellite Application Training Seminar (APSATS) workshop was co-sponsored by WMO, Japan Meteorological Agency and the Bureau of Meteorology and held at the BMTC in Melbourne, Australia in May, 2002. The APSATS 2002 workshop continued many of the practices used at the WMO Regional Training Seminar on “*The Use of Environmental Satellite Data in Meteorological Applications*” held at the RMTC in Nanjing, China, in December 2000. The APSATS 2002 workshop consisted of lectures, hands-on case studies and discussions using real time satellite data from around the world. The workshop was attended by forty full time participants, nineteen from the Bureau and twenty one from overseas. In conjunction with the WMOS strategy on education and training, workshop participants are expected to train other staff on return to their workplace.

4. Case studies were undertaken using the SATAID programme, with data also available for use under the RAMSDIS system. VISITview software was linked to the workshop with other "centres of excellence" for some of the real time discussions. Hyperspectral analysis software and data was provided to the students to allowed them to develop, compare and adjust spectral bands in the 0.4 to 2.4 micron region, with principal component software allowing for detailed investigations of information content within various spectral bands. Practice lessons on creating VISITview sessions and other training material were incorporated into the workshop programme. Participants also brought material and created their own training packages using various authoring packages. Lecture, case study and resource material will be written onto CD-ROMs for the participants to take home on completion of the course. Resource material from APSATS 2002 is available on the VRL for use in future training courses.

5. As part of the Research and Development Satellite Operators recent commitment to providing data to the World Weather Watch, NASA sent Dr William Ridgeway to APSATS 2002 and present a series of lectures and workshops on the use of MODIS (Moderate Resolution Imaging Spectroradiometer) instrument data.

5. Each major operational satellite operator supported the workshop by providing experts to speak. Dr James Purdom (formerly of NESDIS) from the Cooperative Institute for Research in the Atmosphere (CIRA) gave a series of lectures and workshops covering the use of hyperspectral and multispectral data and the use of satellite imagery in the monitoring and forecasting of convective and severe weather. Mr Ryoji Kumabe (JMA) presented a series of lectures and workshops covering the use of the SATAID application, the DVORAK technique, automatic identification of cloud types and the status of GMS5 and MTSAT-1R. Presentations on the other main meteorological satellite programs were also made to the workshop by Mr. Richard Francis (EUMETSAT), Ms Irina Trenina (Russian Federation) and Mr Xiaohu Zhang (P. R. China). In addition to the above presenters, Dr. Ray Zehr (CIRA) presented two lectures on the use of satellite data and products in the tropics. The difference with Dr Zehr's sessions was that he was in the US and used two Internet based applications to present his material. The VISITView application used by the US NWS for teletraining was used for the interactive graphics and text component. The voice segment was done using Yahoo messenger service for the second session. This was the first time that a distant lecturer has been used on a WMO or Bureau course. The same technologies were also used for the live global image discussion (also a first) on the Friday of the first week.

7. APSATS 2002 was held in the Bureau's main conference rooms on the fifth floor. Conference Room 1 was setup as a lecture room for forty people (seated at desks) with an additional twenty seats around the walls for casual participants. Two computers and two data projectors were used during the workshop. One of the computers ran McIDAS, a web browser, VISITview and Yahoo messenger for the image discussions. Power outlets were provided at several of the tables to allow participants to use laptop computers on mains power during the talks. Most presentations used Powerpoint. Conference Rooms two and three were opened up and held the twenty computers for the workshop sessions and a space for the visiting lecturers to connect to the internet and prepare / review sessions. One of the Conference Room 1 data projectors was moved into the workshop area when required. The twenty computers and one printer used for the workshop sessions utilized a 100mbs connection to a network hub located in the workshop area. All PCs connected to that hub. Two 60 Gb hard disks (one as a backup) were purchased for this workshop to hold all of the case study data and presentations for latter compilation onto CDs. For APSATS 2002 participants were asked to nominate a case study (times and dates and geographic area) to the organisers prior to the workshop. This data was then extracted from either the Bureau's satellite and NWP archives or JMA's archives and converted to the SATAID format for the hands on sessions during the workshop. Most participants found the case studies to be very useful. Participants took home copies of their case studies and the SATAID application when they left. This data and the available CDs form the basis of their resource material to begin their training tasks. The JMA SATAID application was one of the back bones of this workshop. SATAID is a small application that runs on MS Windows computers allowing users to view and interact with satellite, observational and Numerical Weather Prediction data. It was selected as the main

workshop tool due to its ease of use and as noted elsewhere will be one of the data viewers freely available to all NHMSs for the data coming from the JMA MTSAT-1R satellite in the near future.

8. A website <<http://www.virtuallab.bom.gov.au/apsats2002/index.htm>> utilizing the Bureau's WMO Virtual Laboratory external webserver was created prior to the workshop. Information for participants was posted on this web site prior to the workshop. Presentation and resource material from the workshop are also available from the website. To assist the participants and presenters before, during and after the workshop an APSATS 2002 Learning and Action Guide was created. The Learning and Action Guide has several purposes: it contains workshop information such as the programme, contact details and biographies of the participants and presenters, and information about the workshop facilities; it also contains suggestions on different ways for participants to maximise their learning during and after the workshop; outlines and information about each session, what the session goals are, major references and includes room for participants to add their own notes and things they wish to follow up on for that session; and, the final sections contain templates for them to enter in their overall action plans and the course evaluation sheets.

As noted in the final evaluations many participants thought this was one of the best, if not the best training course they had undertaken.

Recommendations for the second session of the CGMS Virtual Laboratory Focus Group

9. The first session of the CGMS VL Focus Group agreed that the second session of the Focus Group should occur in two years time and conduct an initial assessment of the VL. The third session should occur in five years and conduct a comprehensive review of the VL. This was reconfirmed by CGMS-XXIX. The CGMS requests that the VL Focus Group convene before CGMS-XXXI and report back on activities and status with regard to the implementation plan, especially the following items: the resource library, its role, how it is structured, how it is "peer reviewed," and other pertinent matters; VISITview, its role the Virtual Laboratory construct, etc.; expectations for the RMTCs that are participating in the Virtual Laboratory especially in the area of a review of the questionnaire to help focus their training, and as an input to WMO; coordination of training activities that could lead to a schedule of "classes" for each year; Virtual Laboratory participant roles and responsibilities; archiving of training class presentations as a future training resource; development of a web-based training resource available to WMO and others, how it is managed, and what is the corresponding role of the "centre of excellence".

APPENDIX A

STRUCTURE AND GOALS FOR THE CGMS VIRTUAL LABORATORY FOCUS GROUP

Management structure

Co-chaired by one satellite operator and one representative from the “centres of excellence”. Served by the WMO Satellite Activities Office as the Secretariat. Membership should include:

- representatives of science teams as appropriate;
- remaining satellite operators and “centres of excellence”;
- other interested parties as appropriate.

VL Strategic Goals

- (1) To provide high quality and up-to-date training resources on current and future meteorological and other environmental satellite systems, data, products and applications;
- (2) To enable the “centres of excellence” to facilitate and foster research and the development of socio-economic applications at the local level by the NMHS through the provision of effective training and links to relevant science groups.

VL Immediate Goal

- (1) To implement a baseline VL and to foster its logical growth.

VL Connectivity Goal

- (1) To assure links between the 6 “centres of excellence” (and supporting satellite operators) with a **minimum** data rate of 56 kbs, to support communication (email, voice), the exchange of software and limited image data sets (e.g., case studies and some near real-time data sets);
- (2) “Centres of excellence” to consider means to increase link capacity to a minimum of T-1 within 5 years;
- (3) A preferred method in the short-term would be the direct insertion of data from a ground receiving station into the Virtual Laboratory servers. As an alternative, the Internet can be used to route data and products to the VL servers.

VIRTUAL RESOURCE LIBRARY (VRL) GOALS

- (1) To establish a list of usable training resources (includes image data sets, s/w, tools);
- (2) To implement a structure for the depository of training resources which will allow easy access by the “centres of excellence” trainers;
- (3) To populate this structure with a core set of material from the training resources list;
- (4) To consider a more general access to the resource library by students (forecasters);

- (5) To consider the provision of additional (enhanced) material from the resource library to all 6 “centres of excellence”.

VL UTILIZATION GOALS

- (1) To establish a VL user tracking and feed-back mechanism, from the outset, (for analysis, refinement, reporting to VL management, and to assess overall usefulness);
- (2) To keep abreast of user requirements for the VL (baseline being WMO Pub No. 258). Assume: analysis of user responses focused on education and training to questionnaires within their region and other user feed-back is carried out by “centres of excellence” and results are reported to VL management;
- (3) To train meteorological students to an operational level of expertise as well as to allow daily weather discussions during training events, near real-time data and products are a strong requirement. Near real-time data are needed to train forecasters on the effective use of new satellite reception and processing systems. Depending on the application, the need for near real-time data availability may not be as stringent.

Long-Term Evaluation of the VL

- (1) After five years, conduct a comprehensive review of the VL.

Typical activities to be undertaken to meet the goals

- Consolidate documentation of the range of skills/competencies for operational meteorologists and specialists;
- Examine which online (Web-based learning), Computer Aided Learning. CDs and hard copy learning materials are currently available for use in the Virtual Laboratory. This activity will include contacting groups such as ASMET, COMET, CIRA, EuroMET, BMTC and CIMSS who have complementary projects under way and relevant science groups (such as the EUMETSAT SAFs, the TOVS Working Group, the Winds Working Group and the proposed quantitative precipitation working group);
- Negotiate with the copyright holders of the training material rights to either link to their material and/or to acquire the rights to use their material at the designated centres of satellite training expertise (this includes the centres making the material available to on- and off-site users);
- Working with groups such as ASMET, COMET or EuroMET, design and test possible user interfaces, educational approaches for delivering the material, and examine methods for online tracking of student participation;
- On a trial basis, evaluate the proposed Virtual Laboratory material in conjunction with one of the WMO satellite training workshops for more user feedback;
- Incorporate user feedback into the educational approach and review the content of the Virtual Laboratory;
- Move to a wider implementation of the material;
- Undertake a periodic review of the Virtual Laboratory sites in conjunction with reviews of the skills and competencies of the operational meteorologists and specialists;
- Prepare sample data sets for the various data streams now being provided or planned for in the near future. The data sets would be used within the VL concept;
- Provide for continuous monitoring of user requirements for Education and Training as well as the effectiveness of the Virtual Laboratory

APPENDIX B

IMPLEMENTATION PLAN

Action items:

Prepare an inventory of which training resources and materials are presently available for the core VRL by the end of July 2001 and provide response to J. Wilson (Wilson and all VL participants).

- Done

Each satellite operator should identify which data and products could be linked into the core VRL by the end of July 2001 and provide information to R. Francis (Francis and satellite operators)

- Selected imagery is available through the CIRA VL web site, the WMO Satellite Activities web page 's Imagery link to "Online Satellite Imagery Sites," and EUMETSAT's VL web page

CIRA to establish a web server for an initial set near real time data and products by the end of November 2001 and report to the VL list-server (Purdom).

- Done

EUMETSAT to establish a server for an initial site for training resources and materials by the end of July 2001 and report to the VL list-server (Francis)

- Done

Additional specific actions and timetable:

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- To evaluate the quality of submitted materials by the “centres of excellence”, completeness (e.g., speaker notes), appropriate deletion dates, compatibility issues, and virus protection.
- Ongoing

5 years

- Conduct comprehensive review