

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 Education and 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 15-16 December, 2003 in Barbados.

Appendices:

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

DISCUSSION

Background

1. **CGMS-XXVIII**

- (a) CGMS-XXVIII was informed of WMO discussions concerning a Virtual Laboratory (VL) for Education and Training in Satellite Meteorology. WMO noted the importance of the coordination and overseeing needed for the VL and thus suggested that CGMS, in partnership with WMO, form an "International Satellite Data Utilisation and Training Focus Group";
- (b) CGMS-XXVII placed ACTION 28.14 on WMO and the CGMS Secretariat to initiate 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.

2. **CGMS-XXIX**

- (a) 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;
- (b) The Virtual Laboratory for Education and Training in Satellite Meteorology was formally adopted by CGMS XXIX, with continued reporting through the Virtual Lab Focus Group.

3. **CGMS-XXX**

- (a) CGMS-XXX noted that a number of important activities and milestones that were established by the VL Focus Group were being addressed and met;
- (b) CGMS-XXX was pleased to be informed of the successful application of the Virtual Laboratory for Education and Training in Satellite Meteorology for the Asia Pacific Satellite Application Training Seminar (APSATS) workshop that was co-sponsored by WMO, Japan Meteorological Agency and the Bureau of Meteorology in 2002;
- (c) 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.

4. **WMO Cg-XVI**

WMO Cg-XVI noted positive impact of the Virtual Laboratory for Education and Training in Satellite Meteorology in document 3.1.6 paragraph 3.1.6.9, a portion which follows: "...In particular, it [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". The "centres of excellence" were now co-sponsored by the satellite operators and thus provided a worldwide nucleus of RMTCs in Niger and Kenya for RA I, in China for RA II, in Costa Rica and Barbados for RA IV and in Australia for RA V. Noteworthy was a recent training event that included lectures on new R&D instruments. 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 Laboratory 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. ..."

5. **Second session of the CGMS Virtual Laboratory Focus Group Rescheduled for December 2003**

5. CGMS-XXX had requested that the VL Focus Group convene before CGMS-XXXI and report back on activities and status with regard to the implementation plan. Schedule and funding constraints required the VL Focus Group meeting to be postponed until December 2003, which coincides with the WMO satellite training event scheduled for Barbados from December 2-13, 2003. Thus, the second session will take place in Barbados during the week immediately following the WMO training event. As instructed by CGMS, the second session of the Focus Group will conduct an initial assessment of the VL, report back to CGMS-XXXII 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 within 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". The third meeting of the VL Focus Group should occur in five years and conduct a comprehensive review of the VL.

6. Activity within the VL since CGMS XXX

- All centres of excellence have completed a survey covering how they were using the VL and importantly, details on connection speeds. The survey showed all centres were using the VL but some a lot more than others due to lack of bandwidth. This was a major problem for Nanjing, Nairobi and Niamey with it taking considerable time to load even the simplest pages. Barbados and Costa Rica were experiencing some problems but not as acute as the African centres. All centres were using the VL, mainly for lecturer information rather than class room, this was at least partially due to poor line speed;
- The VL is directly accessible through the main WMO's Satellite Activities Home Page under the heading "CGMS Virtual Laboratory for Education and Training in Satellite Matters";
- All satellite operators have a server online and connected to the VL
 - VL servers are online and connected to the NESDIS (CIRA), EUMETSAT, NSMC and JMA;
- Selected "centres of excellence" have a server online and connected to the VL;
 - VL servers online at BOM (Australia) and EAMAC (Niamey)
- Resource libraries are available online for the VL at NESDIS (CIRA), EUMETSAT, JMA, NSMC and WMO
- VISITview has been made available via the VL web site at CIRA to all participants
 - Courses on MSG were organized at the centres of excellence at EAMAC in Niamey, with help of EUMETSAT, and the RMTc in Nairobi. During that period, VISITView was successfully used with participation between those centres of excellence and the centre of excellence at AuBOM.
- EUMETSAT's new five year training programme has integrated the Virtual Laboratory into its planning and implementation.

- In addition the following exists within the VL:

The resources listed below are available from various VL servers:

Satellite Imagery	Satellite Products	Tutorials
Training Tools	Software	Digital Satellite Imagery
Live Training Events	Online Courses and Quiz's	Search

Centres of Excellence resource sites and sponsors' resource libraries are available from:

Centers of Excellence at five WMO Regional Meteorological Training Centers at San Jose, Costa Rica , Bridgetown, Barbados , Niamey, Niger , Nairobi, Kenya, and Nanjing, China and Australian Bureau of Meteorology Training Center (ABOMTC)
Resource libraries at NESDIS (CIRA), EUMETSAT, JMA, NSMC and WMO

Supporting Science Groups have links into the VL, and each science group has agreed to support the needs of the VL

International TOVS Working Group (ITWG)
International Winds Working Group (IWWG)
International Precipitation Working Group (IPWG)

The Virtual Lab continues to receive strong support from its Sponsors:

USA (NESDIS)	Europe (EUMETSAT)	China (NSMC)	Japan (JMA)
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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:

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 centers 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 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