NOAA SUPPORT FOR THE CGMS VIRTUAL LABORATORY FOCUS GROUP

(Submitted by Anthony Mostek/NOAA/National Weather Service)

Summary and purpose of document

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

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ACTION PROPOSED

(1)   CGMS Members to note the report and make comments, as appropriate;

(2)   CGMS Members to support, as appropriate, the activities of the CGMS VL Focus Group and the next workshop planned for February or March 2005.

DISCUSSION

Background

1.   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 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.
        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.
        d. Second session of the CGMS Virtual Laboratory Focus Group Rescheduled for December 2003

2.   The 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, to coincide with the WMO Satellite training program scheduled for Barbados from December 2-13, 2003. Thus, the second session took place in Barbados during the week immediately following the WMO training event. This report provides information on NOAA's support during the WMO training event.

3.   As instructed by CGMS, the second session of the Focus Group conducted an initial assessment of the VL, report back to CGMS-XXXII on activities and status with regard to the implementation plan on 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". The third session should occur in 2006 and conduct a comprehensive review of the VL.

NOAA SUPPORT ACTIVITIES FOR VIRTUAL LABORATORY TRAINING EVENTS – BARBADOS – DECEMBER 2003

The Regional Training Course on the Use of Environmental Satellite Data in Meteorological Applications for RA III and RA IV was sponsored by the WMO and held in Barbados from December 2-12, 2003. The Regional Meteorological Training Centre (RMTC) in Barbados hosted and organized the workshop. NOAA and Cooperative Institute for Research in the Atmosphere (CIRA) scientists played an active role in the workshop. Prior to the workshop, several NOAA/CIRA staff assisted with the planning and preparation activities. During the workshop, NOAA and CIRA staff provided support, lectures and workshops on the following topics: interpretation of GOES and POES imagery and products, products from meteorological sounders, hyper-spectral imagery, identifying mesoscale weather features in satellite imagery, tropical weather systems, volcanic ash detection and fire detection as well as the use of the VISITview software tool. Many of the labs utilized the "Satellite Imagery and Satellite Products" resources of the VL to locate imagery sources on the Internet. Other labs included preloaded example imagery loops and interactive exercises. The agenda for the workshop is at: http://www.cira.colostate.edu/RAMM/RMTC/Syllabus2003.htm .

At the conclusion of the WMO training workshop, Selvin Burton (Caribbean Institute for Meteorology and Hydrology - Barbados) made the following statement: "VISITview was the highlight of the WMO RMTC workshop on satellite meteorology". The training session on how to

use the VISITview software tool (see http://www.ssec.wisc.edu/visitview/) was followed by a practice session on how to build your own VISITview session. The VISITview builder software and several graphic files were loaded on the studen t workstations prior to the training session. The students and the workshop organizers were very pleased with the opportunity to learn how VISITview works and how to build and run their own lessons.

During the workshop, the second International Satellite Weather Briefing was conducted on December 9, 2003. The organizers of the Barbados workshop wanted to repeat the success of the first international satellite weather briefing done in May 2002 in Melbourne, Australia during Asian Pacific Satellite Applications Training Seminar (APSATS). Participants in the satellite weather briefing included: NESDIS and NOAA cooperative institute staff at Ft. Collins, Colorado and Madison, Wisconsin; an instructor from the RMTC in Costa Rica; instructor from Bureau of Meteorology in Melbourne, Australia (participating from Barbados); plus the students and instructors located in Barbados.

The VISITview server in Madison, WI was used to display loops from the five main geostationary satellites (GOES-PAC, GOES-West, GOES-East, Meteosat-7, Meteosat-5) plus a special sector over the Caribbean. The server was configured so the briefer could share the imagery that included full disc loops of infrared window, water vapour and visible channels. The presenters used several VISITview functions (animations controls, zooming, panning, annotations) to assist with their discussions of the weather features. A Voice-over-Internet package was used to support the live discussions among the participants. A highlight of the briefing was the ability to display selected products from the GOES-East sounder instrument to show that sounder products are available over the Caribbean region.

The software tool that makes these live international weather briefings possible is called VISITview. This shareware software is developed through NOAA's Virtual Institute for Satellite Integration Training (VISIT) program. The VISIT project operates as a "matrix" team with staff from NOAA cooperative institutes (CIMSS, CIRA), NESDIS and the National Weather Service training division. The VISIT project developed the VISITview tool to provide distance training using JAVA plus Internet for real-time connectivity. For voice, the instructors and students use phone conferencing or the Internet (for international activities).

A major action item from the workshop was to form a focus group for the Caribbean and Central American regions (RA III and IV). This focus group is composed of the students plus selected instructors that attended the workshop. The goal of the group was to download the VISITview software, build several lessons, and then schedule some teletraining lessons among the various students and instructors. While preparing their lessons, the first activity among the focus group was to use the VISITview live collaboration Website to conduct a weather satellite briefing as was done during the workshop in December. NOAA is pleased to report that the workshop focus group held three satellite weather briefings in March and April 2004. The plan is for these sessions to continue through 2004 to continue gaining experience in the use of VISITview and to prepare for the next workshop in 2005.

The software tool called VISITview produced by the NOAA VISIT project has made major impact on the international training. The VISIT project is working with the WMO Virtual Laboratory (VL) for Satellite Met Training. The WMO VL uses VISITview to conduct some very long distance training and weather briefings.

In 2000, the WMO formed the VL and established a focus group as part of Co-ordination Group for Meteorological Satellites (GMS). This team recognized the success of VISITview and teletraining within NOAA and the potential to expand this activity to the international community. A major finding of the WMO Virtual Laboratory Focus Group meeting held in December 2003 is that VISITview is a tremendous success in supporting the satellite meteorology training activities. The VL team plans on expanding the role of VISITview in future training events and to continue with live satellite weather briefings. The WMO VL website (http://www.wmo.ch/hinsman/vl.htm) includes links to the VISITview software.

Here is a list some of the WMO training events that used NOAA VISITview training tool:
- Training seminar on the "Use of Environmental Satellite Data in Meteorological Applications" held at the RMTC in Nanjing, China, December 2000.
- 2002 APSATS workshop in Melbourne, Australia in May 2002
- ESAC III Course at EAMCA (African School of Meteorology and Aviation) in Niamey in July 2003
- WMO Satellite Training Workshop held in Barbados December 2003

Of note are the following key firsts that resulted from using VISITview tool for training:
- First live international satellite weather briefing done using 5 different presenters in various locations around world to look at animated images 4 different GOES satellites (APSATS 2002)
- Several very long distance lectures done from CIRA (Ft. Collins, Colorado) to APSATS
- First distance training done in satellite workshop in EAMAC Africa
- Second live international satellite weather briefing done by 6 different presenters using images from four different geostationary satellites (Barbados 2003)
- First long distance training connecting two WMO RMTCs (Barbados and Costa Rica) at December 2003 workshop

NOAA/CIRA continues to support the RMTCs in Costa Rica and Barbados in various ways. Both research and ingest RAMSDIS capabilities, which include software updates, program updates and troubleshooting activities, are provided to the RMTCs. This was particularly important during the past year with the transition from GOES-8 to GOES-12.
In addition to the support of the VL web page, real-time imagery is made available through RAMSDIS Online.

The following web pages provide imagery in jpg format over Central and South America and the Caribbean and can easily be made available through the VISITview format described above:

http://www.cira.colostate.edu/RAMM/rmsdsol/RMTC.html

http://www.cira.colostate.edu/RAMM/rmsdsol/COS.html

Monthly archived GOES satellite imagery is also being provided to both Costa Rica and Barbados. The archives are being used to look at cloud frequency during the rainy and dry seasons and detect local variations from year to year. The archived imagery also provides access to examples for use in satellite focused training efforts.

Additional NOAA support activities are included in other reports to the CGMS. An outline is provided in Appendix B as part of the Virtual Laboratory Implementation Plan.

NOAA will continue to support the WMO Virtual Laboratory activities. This support includes development and support of the VISITview software, the WMO Virtual Laboratory Web server and Web site at CIRA, and support for virtual and physical workshops as scheduled by WMO. NOAA support includes ongoing interaction with the RMTCs in Costa Rica and Barbados and support of the research and ingest RAMSDIS systems located there.

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 excelle nce" 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.

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;
?? To evaluate and ways to improve the VRL;

?? 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.

5 years

?? Conduct comprehensive review