

CGMS VIRTUAL LABORATORY FOCUS GROUP

SECOND SESSION

CARIBBEAN INSTITUTE FOR METEOROLOGY AND HYDROLOGY (CIMH)

BRIDGETOWN, BARBADOS

15-16 DECEMBER 2003

FINAL REPORT

Group photo removed from here to reduce document size

1. OPENING OF THE MEETING (*agenda item 1*)

1.1 Opening of the meeting (*agenda item 1.1*)

The second session of the CGMS Virtual Laboratory Focus Group (VL FG) to discuss coordination and oversight requirements for the Virtual Laboratory for Education and Training in Satellite Matters (VL) was hosted by the Caribbean Institute for Meteorology and Hydrology (CIMH) and held at the Barbados Pavilion in Bridgetown, Barbados, 15-16 December 2003. The meeting was opened at 08h45. Mr Frank Farnum from CIMH, Chief Hydrologist, made opening remarks on behalf of Dr Colin Depradine, Director CIMH. He noted the importance CIMH placed on training and its reliance on satellite data and products. He was especially proud that CIMH was one of the six "centres of excellence" and recognized the value of a focus group to manage and coordinate the VL. The list of participants is attached as Annex II.

1.2 Adoption of the Agenda (*agenda item 1.2*)

The agenda for the meeting was adopted as amended and is reproduced in Annex I.

1.3 Working arrangements for the meeting (*Agenda item 1.3*)

The working arrangements for the meeting were agreed upon.

2. REPORT OF THE CO-CHAIRMEN (*agenda item 2*)

2.1 Under this agenda item, the Co-Chairmen informed the VL FG on their activities carried out since its last session (Darmstadt, Germany, 16-18 May 2001). They also described to the VL FG the expected outcome for the session in the light of the requests from CGMS-XXX and CGMS-XXXI.

2.2 The Co-Chairmen reported on the wide range of activities undertaken by all VL members during the past 2½ years. Much progress had been made on the technical side of the VL with servers established at each of the satellite operators and at three of the "centres of excellence". Three very successful training events had been held under the auspices of the VL. VISITView had been used to provide access to remote lecturers in the two training events held since the formation of the VL FG and, JMA had increased the capacity of SATAID to utilize geostationary data from EUMETSAT and GOES. The initial Virtual Resource Library (VRL) at EUMETSAT had been populated with links to more than 200 titles and a simple search engine. CIRA had taken a different, but complementary approach by adding links to information and training material alongside near real-time data on its website.

2.3 There had been slower progress on the collaboration side between the centres than the Co-Chairmen would have expected. Nevertheless, they were encouraged by the cooperation and collaboration that had occurred. The "centre of excellence" in Niamey had linked up with the BMTC in Australia for a lecture and weather briefing for a course at Niamey in July 2003 whilst Barbados linked up with Costa Rica for a lecture and image discussion at the Barbados training event held in December 2003. The Co-Chairmen were of the opinion that the next three years would be a good test of the potential of the VL as it moved from the formation into delivery stage. Finally, Mr Francis, one of the Co Chairmen, indicated that due to his change in employers he must complete his term as Co Chairman at the end of VL-2.

3. REVIEW ACTIONS SINCE VL-1 (*agenda item 3*)

3.1 Under this agenda item, the session reviewed relevant activities since VL-1 including VL-1 Action Items, as well as the newly established WMO Space Programme and relevant discussions at CGMS-XXX and CGMS-XXXI.

3.2 The session noted that the four action items from the VL-1 Implementation Plan had been completed while some "additional specific action items" for the 0 to 1 year and 1 to 2 year timeframes had only been partially completed. In particular, only the BMTC "centre of excellence" had evaluated the content, and what could be maintained on its server in the 0 to 1 year timeframe and only the BMTC, Niamey and Nanjing "centres of excellence" had placed a server online and connected to the VL. VRL improvement in general was still pending in the 1 to 2 year timeframe since VL-1.

3.3 The second session was informed of the Rapporteur's report to CGMS-XXXI concerning the status and progress of the VL. His report pointed out that a number of important activities and milestones that were established by the VL FG were being addressed and met. All "centres of excellence" were connected to Internet, some with more bandwidth than others; all centres were using the VL, mainly for lecturer information rather than class room, this was at least partially due to poor line speed in some cases; servers were in place at all operators and by some "centres of excellence"; and, the VL was available for WMO Members with a rich variety of resources. CGMS was informed that the WMO Congress at its fourteenth session (Cg-XVI) had noted the positive impact of the VL and that it had made a tremendous impact throughout WMO Regions through its six "centres of excellence".

3.4 CGMS-XXXI was also informed that the second VL FG meeting had been postponed due to schedule and funding constraints and would occur immediately after the WMO satellite training event scheduled for Barbados from 2 to 13 December 2003. The second session noted that the VL FG should conduct an initial assessment of the VL, report back to CGMS-XXXII on activities and status with regard to the implementation plan, especially for the following items:

- 1) the resource library, its role, how it is structured, how it is "peer reviewed," and other pertinent matters;
- 2) VISITView, its role within the Virtual Laboratory construct, etc.;
- 3) 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;
- 4) coordination of training activities that could lead to a schedule of "classes" for each year;
- 5) Virtual Laboratory participant roles and responsibilities;
- 6) archiving of training class presentations as a future training resource;
- 7) development of a web-based training resource available to WMO, 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 2005, five years since the formation of the FG, and conduct a comprehensive review of the VL.

3.5 The second session was informed that the Fourteenth WMO Congress (Cg-XIV), held in May 2003, had agreed to establish a new WMO Space Programme as a major cross-cutting Programme. The second session recalled that fifty fourth session of the WMO Executive Council had agreed to expand the space-based component of the GOS to include appropriate R&D environmental satellite missions. The second session was pleased to note that the new WMO Space Programme included as one of its major elements "additional and continuing emphasis on education and training". Finally, the second session noted that the WMO Space Programme Office was developing an associated Implementation Plan that would be reviewed by the fourth session of the WMO Consultative Meetings on High-level Policy on Satellite Matters scheduled to be held in Geneva, 26-27 January 2004. The Implementation Plan would contain appropriate description of the resources required to provide for the "additional and continuing emphasis on education and training".

4. REVIEW LESSONS LEARNED FROM VIRTUAL LABORATORY TRAINING EVENTS *(agenda item 4)*

4.1 Under this agenda item, the session reviewed lessons learned at Nanjing 2000, APSATS-2002, EAMAC 2003 and Barbados 2003.

APSATS 2002

4.2 The second session was informed that the VL was at the core of the very successful APSATS 2002 event training. The organisers of APSATS 2002 used the VL framework to engage face-to-face presenters, VISITView presentations, and, resources in the form of CD and paper materials. VL tools such as SATAID, RAMSDIS online and VISITView were extensively used. NASA supported the workshop by making available the services of Dr Bill Ridgway to present several sessions on the application and use of MODIS data. Participants took home SATAID based case study material relevant to their region that had been worked on during the workshop. More than 20 CDs of resource material were generated for and during the workshop.

4.3 Based on the experiences learned at APSATS 2002, the following were strongly recommended:

- create a Learning and Action Guide for each course to assist in course planning for local organisers (setting course and session objectives), presenters (focussing session presentations and noting key learning points and references), and participants noting down the key points as they see them and forming action plans for what to do on return to their own countries;
- create a email list for follow up discussion between the group and, with the benefit of hindsight, some consolidation of course material using VISITView;
- collect presentation material early to make the process of providing the resource material to the participants a lot more effective (highlighted in the outcomes from the Nanjing workshop in 2000); and
- where possible, utilize case studies the participants have nominated to get more engagement with the course presentations and workshops; and, use both written and oral feedback as part of the evaluation process at the end of the course with further follow up evaluation sometime later.

Nanjing 2000 Training Event

4.4 The second session noted the importance of proper baseline facilities for the training event held in Nanjing in December 2000. The baseline facilities were prepared in advance by the Nanjing Institute of Meteorology (NIM) under the support of the China Meteorological Administration (CMA). A special purpose lab with 20 P-III 600 microcomputers with 256M memory, 10G hard disk, 1.44M floppy and 24×CD-ROM was set up for the training seminar. All computers were linked to the Internet with a bandwidth of 100Mbps. Each participant could use a computer and have access to satellite data at the designated web sites. Communications and linking with other satellite centres and RMTCs were quick. RMTC Nanjing was of the opinion that it was most important to be aware of participants' level of experience with satellite data beforehand.

Barbados 2003

4.5 The session was informed of lessons learned during the recent Regional Training Event for RA III and IV held in Barbados, 2-12 December 2003. CIMH stressed the need for advance preparation. Sufficient lead-time to identify the participants in advance was a necessary prerequisite in order to tailor the lecture content. Additionally, advanced knowledge of the participant's level of experience would be very helpful. Language was also a challenge to be overcome especially with those whose mother tongue was not that being used for the course. One

positive experience was the presentations made by the participants and this should be continued. VISITView also had a very positive impact and its potential was realized and should be further exploited.

EAMAC

4.6 EAMAC informed the second session of a dedicated distance training session during the EUMETSAT Satellite Data Applications Courses (ESAC-IIIF) co-organized by EUMETSAT and ASECNA at the EAMAC Training Centre over the period 12-25 July 2003. The dedicated distance training session had made use of a live connection to Mr Jeff Wilson, from the Bureau of Meteorology (BoM) in Melbourne. The concept of distance training was a new and important element of this particular course.

4.7 The distance training session contained the following elements:

- introduction to collaboration and the training on-line;
- presentation on the Bureau of Meteorology and its training activities;
- components of distance training;
- the VISITView Project: history, goal and perspectives;
- explanation of the client/server concept of VISITview;
- VISITView terminology: lesson, page, framework, client/server, etc.

4.8 The main purpose of the distance training session was to demonstrate to course participants and lecturers at EAMAC the potential for using tools such as VISITView to provide both distance learning opportunities and real time collaboration between geographically remote training centres. Whilst tools such as VISITView have been available for some time, it was only the recent improvement of Internet bandwidth at the EAMAC centre that made the demonstration realistically possible.

5. REVIEW INITIAL ASSESSMENT OF THE VL (*agenda item 5*)

5.1 Under this agenda item, the session reviewed an initial assessment of the VL that was requested by CGMS-XXX and CGMS-XXXI and developed under Agenda Item 4.

5.2 The Co-Chairmen were of the opinion that the VL had achieved much in the first 30 months of its existence and were proud to have been Co-Chairmen during this period. In order to maintain the same rate of achievement in the next three years, there would be a need for sustained or even accelerated:

- commitment (commitment to put effort and resources into the VL);
- cooperation (by asking each other for help and sharing material); and
- collaboration (agreeing to work on joint projects or priorities)

between all parties within the VL, particularly the “centres of excellence”. Many of the achievements in the initial 30 month period had been concerned with the technical challenges of placing servers online, sharing data and applications etc. For the next 3-year period, the challenge will be to utilize the physical infrastructure to deliver training remotely and improve the effectiveness of face-to-face training events. Technical challenges in the next 3-year period will include improvement of VRL content and increase Internet bandwidth to centres such as Nairobi, Barbados and Costa Rica.

5.3 The second session, in response to the request from CGMS-XXXI, reviewed an initial assessment of the VL presented by the Co Chairmen and updated it to represent the view of the VL FG as contained in Annex IV.

6. DEVELOP RECOMMENDATIONS TO INCREASE EFFECTIVENESS OF THE VL *(agenda item 6)*

6.1 Under this agenda item, the session developed recommendations to increase the effectiveness of the VL and in particular for the Virtual Resource Library. Each “centre of excellence” provided recommendations to increase the VL effectiveness. The session also evaluated inputs from the satellite operators and special interest groups (ITWG, IPWG and IWW). The session also discussed the VL web interface. Additionally, the session was informed of relevant recommendations from the fourth session of the OPAG IOS Expert Team on Satellite System Utilization and Products held in Geneva, 29 April–3 May 2002.

Bureau of Meteorology Training Centre (BMTC)

6.2 BMTC provided input to improve the effectiveness of the VL as summarised in the following points:

- Commitment (to be visibly committed to being a VL “centre of excellence”);
- Cooperation (to be more active in engaging the other “centres” and satellite operators); and
- Collaboration (to demonstrate that the VL’s potential by working on some agreed upon, high priority joint projects).

6.3 BMTC proposed two high-priority areas where the VL members could demonstrate their commitment, cooperation and collaboration:

- improved VL confidence in using satellite imagery and data at the meso-scale; and
- increased knowledge and use of near-IR data to assist services in areas such as aviation, fire and severe weather forecasting.

6.4 BMTC further suggested that for “improved confidence in using satellite imagery and data” a list of meso-scale features (and their attendant processes and interrelationships) be circulated amongst members, and agreement be made to collect examples of these features in each region using VISITView lessons by the end of March 2004. After March 2004, VL FG members could meet via VISITView with audio service to discuss the examples (clarification and quality control) and then post the lessons on the VRL. The VL FG would then continue to do this at 3 monthly intervals to build up a library of material (on a global basis) and the confidence at each centre to use the data at the meso-scale level. At the end of 12 months each “centre of excellence” could then advertise a series of VISITView sessions to their neighbouring NHMSs on the use of satellite data in the meso-scale.

6.5 BMTC suggested “increased knowledge and use of near-IR data” be approached in a similar fashion where the CIRA 3.9 micron tutorial would be utilized while concentrating on the application of 3.9 micron data for particular areas, such as aviation, fire, severe weather, etc. By the end of March 2005, each “centre of excellence” would be able to offer a series of tailored lessons for the NHMSs within its region.

RMTC Costa Rica

6.6 The second session was informed of suggestions from the RMTC Costa Rica to increase VL effectiveness as follows:

- The resources in the VL was attractive to teachers, students and other users. Each resource in the VL should strive to make the job of the trainer more effective. e.g. images, products, data, information, links. The number of books in the library should be increased;

- Use the VL in training whenever possible, as done in APSATS 2002, Barbados 2003, in the classroom at the RMTTC, etc;
- For training material that were accessible only by request, a short description should be prepared that would encourage potential users to access the resource;
- Presentations and notes for WMO satellite training seminars should be in the VRL for immediate consultation;
- Multilingual material should be made available;
- A collection of case studies should be prepared;
- Focus on people in an early stage of education;
- The search engine was very important.

EUMETSAT

6.7 EUMETSAT informed the second session of its current Training Programme, activities since VL-1 and ongoing projects and activities.

6.8 With regard to improving VL effectiveness, EUMETSAT made the following suggestions:

- EUMETSAT should mirror the software of the prototype VRL currently hosted on its server to the EAMAC and IMTR servers as soon as feasible. IMTR and EAMAC should consider themselves as owners of this facility, maintain it and update the software as required, including protection against threats of viruses and misuse;
- IMTR and EAMAC senior management should be fully committed to further develop and promote the concept of the VL at their institutes;
- A “What’s New” bulletin should be developed centrally to keep the “centres of excellence” and other trainers and organizations aware of new developments and new training material;
- To be eligible for the role of “centres of excellence”, a minimum set of requirements should be agreed. These would give management of these centres guidelines for further development of the infrastructure. For example, current access to the Internet at IMTR was inadequate to support VL activity. IMTR should set a goal of achieving a minimum speed of 1 Mb/s as soon as possible;
- Further training in the use of tools such as VISITView, SATAID, RAMSDIS, EumetCAL, etc., should be arranged locally on a regular basis;
- Actively promote the concept and use of the VL at conferences, seminars and courses;
- Investigate the feasibility of disseminating training material by operational meteorological dissemination services such as EUMETCast. This would match the requirement set at VL-1 to directly insert data acquired at a ground receiving station into the VL servers;
- Encourage the use of “distance-learning” techniques at training events held at “centres of excellence”. These presentations should serve two objectives:
 - To demonstrate the potential of distance learning,
 - To increase knowledge of satellite meteorology,
- As soon as feasible, organise a “remote conference” meeting with the “centres of excellence” to build up experience in these techniques; Goal:2005
- Too few CAL development groups were currently trained. A Working Panel should address this need.
- Investigate the feasibility of making near real-time data available to the VL from sources such as archives, the Internet and via direct broadcast.

IMTR

6.9 IMTR informed the second session of its activities since VL-1 including the current status. With regard to improve effectiveness and efficiency of the IMTR's education and training programmes, it suggested this could be achieved through the utilization of the e-learning approach and that the Institute should have good Internet connectivity although at the moment the bandwidth was 64 kbps. In this regard, the second session was informed that IMTR, under the auspices of Kenya Meteorological Department (KMD), had installed a VSAT with a proposed bandwidth of 512 Kb/s or more depending on the requirements. It should be commissioned by mid-December, 2003. Although there exists some restrictive policies concerning the connection of a VSAT to the backbone, IMTR was optimistic that the government of Kenya would exempt KMD and provide the authorization immediately after the commissioning.

6.10 Through the current Meteorological Transition in Africa Project (MTAP) initiative, IMTR was in the process of establishing a "Meteosat Second Generation (MSG) Laboratory" fully installed with 12-networked PCs, a web server, and satellite receiving equipment early next year. IMTR would, therefore, have capabilities to receive near real-time data (satellite and conventional data) for training purposes. The Laboratory would be connected to the Global Telecommunications System (GTS) Regional Telecommunication Hub (RTH) through the LAN. These facilities should enhance the learning environment and VL activities. Additionally, IMTR has plans to create a new computer laboratory specifically for VL activities.

JMA

6.11 JMA informed the second session of its activities since VL-1 including its co-sponsorship of APSATS 2002 and SATAID. JMA suggested the following to increase the efficiency and effectiveness of the VL:

- Easy access to proper materials on the VRL. There were already many materials on VRL. However, it was sometimes difficult to find the proper material. The inventory, key words, and the VRL at EUMETSAT represented a possible methodology for a more sophisticated system to reach the resource that a user required.
- Distribution of near real-time data. Most of the SATAID users have queried how they could use SATAID with the satellites available in their area. Access to near real-time data was a high priority. The imagery server project undertaken by ABoM and JMA was an example of an attempt to meet such a requirement.
- JMA could consider a more systematic and sustainable manner to maintain the VRL and development of SATAID.

RMTC BARBADOS

6.12 The second session was informed of suggestions from the RMTC Barbados and noted that all points were contained in the recommendations by the other "centres of excellence".

SSUP-4

6.13 The second session considered the results of the fourth session of the CBS OPAG IOS Expert Team on Satellite Systems Utilization and Products (SSUP-4) relevant to the VL FG, including: the status of the Virtual Laboratory for Education and Training in Satellite Meteorology and strategic goals for 2002-2003 to improve the utilization of satellite systems. Additionally, ET SSUP-4 proposed conclusions and recommendations resulting from the analysis of the questionnaire on the availability and use of satellite data and products for 2001 that relate specifically to education and training.

6.14 With regard to the conclusions and recommendations resulting from the analysis of the questionnaire SSUP-4 had recalled the role of the Strategy to Improve Satellite System Utilization

as a primary means to assist WMO Members towards full exploitation of satellite systems. A rolling review process would be initiated by the issuance of a biennial questionnaire. An analysis of the questionnaire would provide one input to the guidelines for the Strategy to Improve Satellite System Utilization. The Strategy was based on three cornerstones: data access, data use and education and training. The questionnaire would be analyzed with regard to each cornerstone in monitoring the benefits, as well as identifying problem areas and solutions that would enable increased utilization of the satellite system.

6.15 SSUP-4 agreed that the strategy for 2002–2003 should be based on the results of the analysis of the questionnaire for 2001 and include outcomes of discussions during the present session. In particular, the SSUP-4 had agreed that the specific strategic goals for 2002-2003 should include:

Education and training

- A feedback mechanism should be developed between the “centres of excellence” including their cosponsoring satellite operator and the Members they serve to provide information on training activities during the evaluation period;
- Future versions of the questionnaire should also be distributed electronically to WMO Members as well as made available on the WMO Satellite Activities web pages;
- “Centres of excellence” should participate in the analysis phase as well as the subsequent feedback mechanism. They should actively engage WMO Members they serve within their region during the analysis phase to strive for a 100% response to the questionnaire;
- “Centres of excellence” and their corresponding sponsoring satellite operators will participate in responding to the questionnaire as well as providing information to WMO Members within their regions that may assist in responding to the questionnaire;
- “Centres of excellence” will use the questionnaire during all relevant training events;
- “Centres of excellence” will contact participants from prior training events to seek input for the questionnaire;
- “Centres of excellence” and the WMO Secretariat will establish list-servers for the exchange of related information;
- The VL Focus Group consider preparing a periodic newsletter that will be distributed electronically via appropriate list-servers.

Analysis of the questionnaire on the availability and use of satellite data and products

- Conclusions regarding education and training:

6.16 ET SSUP-4 noted that this was the first iteration of the questionnaire that included a section on education and training. It was obvious that the regional responses were incomplete and inconsistent and thus no firm conclusions could be made at that time. Through increased familiarity with this section during the next cycle of the questionnaire, it is expected the responses will provide a stable basis for recommendations concerning education and training. However, the following preliminary remarks were appropriate:

- The most typical training area was for satellite image interpretation (about 50% of the total staff were trained in this area), followed by the fundamentals of remote sensing;
- In general, activities towards training were satisfactory. Nevertheless, more training is desired or better training may be needed when viewed in the context of the reported lack of knowledge in use of satellite data and products;
- Members were aware of the importance of training in satellite meteorology and planned to train more personnel in the future: the reported number of staff members to

be trained in the future was approximately 1,695 (compared to the reported number of 1,229 trained staff);

- In general, the level of training activities was not an area of concern.

NOAA/NESDIS

6.17 The second session was informed of the recommendations of NOAA/NESDIS on ways to increase the effectiveness of the VL. Dr Purdom reviewed selected activities of VL. He pointed out that while it was opportune to discuss recommendations for improving the effectiveness of the VL, it should be noted that the VL has only been formally instituted for slightly over two years. After a thorough assessment from the FG meeting and a look at lessons learned, the VL FG would be able to better focus in on needed improvements. He then reviewed the selected successes of the VL. Training tools, data, products, algorithms, tutorials and satellite imagery were freely available to all users. For example, JMA had made SATAID available and NESDIS and NOAA have made available RAMSDIS and VISITView. Three major WMO training events have been conducted, Nanjing 2000, APSATS 2002 and Barbados 2003. This success has been accomplished because of hard work within the VL and support from WMO and CGMS.

6.18 Dr Purdom's and Mr Mostek's paper addressed the need to institutionalize certain functions within the lab. For example development of common VL web entry pages, learning guides for the various subjects that were taught within the lab. Certain standard activities with respect to training events should be adopted and become routine. They were well spelled out and discussed in the lessons learned from APSATS. There must be routine coordination between the "centres of excellence" and sponsor's centres. Improve Internet connectivity and exercise the VL tools. With the OPAG IOS SSUP Expert Team, determine satellite data uses and training needs within the various WMO regions. The role of research satellite operators as CGMS sponsors of the VL was also discussed.

6.19 The second session reviewed the set of presentations describing ways and means to increase the effectiveness of the VL and agreed to the principles and possible measures to evaluate VL effectiveness as contained in Annex V. Additionally, the VL FG identified expectations, as contained in Annex VII, for "centres of excellence", satellite operators and WMO/CGMS.

6.20 The second session also discussed a potential development that would place all training materials, tools and presentations delivered during a training event onto a VL Training Workstation. It was envisioned that in the future such VL Training Workstations could be configured for use as a primary tool during the training event and return with the participant to his/her country for further education and training activities. An example of a VL Training Workstation is contained in Annex VIII.

7. REVIEW TERMS OF REFERENCE FOR THE VL FOCUS GROUP (agenda item 7)

7.1 Under this agenda item, the session reviewed the current Terms of Reference in light of new activities that should be included. The second session agreed that the present Terms of Reference adequately covered the present and planned VL activities and thus suggested that no changes were required. The present Terms of Reference are contained in Annex III.

8. DEVELOP ACTION PLAN FOR 2003 THROUGH 2006 (agenda item 8)

8.1 Under this agenda item, the session developed an action plan for approval by CGMS taking into consideration the WMO Space Programme Long-Term Strategy. As part of the action plan, the session considered promotional activities that could expand the usage of the Virtual Laboratory within the wider WMO Members' user base.

8.2 As a three year goal, the second session agreed to convene a major high-profile VL global training event in the two to three year timeframe. Such a VL global training event would address all the points raised by the VL FG in its discussion on ways to increase the effectiveness of the VL described in Agenda Item 6. A description of the global high-profile VL training event is contained in Annex VI including several related action items. The session also agreed in order to convene the high profile VL global training event that several important areas need to be further elaborated on as contained in Annex VI.

9. ELECTION OF CO-CHAIRMEN (*agenda item 9*)

9.1 The session re-elected Mr Jeff Wilson and elected Dr James Purdom as VL FG Co Chairmen. The second session thanked the outgoing Co-Chairman, Mr Richard Francis, for his outstanding contributions to the VL, as well as serving as one of the first two VL FG Co chairmen. The session also noted with appreciation Mr Wilson's dedication and zeal within VL activities.

10. ANY OTHER BUSINESS

10.1. The second session agreed that the third session of the VL Focus Group should occur in three years time and conduct a comprehensive review of the VL as originally outlined as the first session of the VL Focus Group.

10.2. The second session was also briefed on a recent WMO initiative to establish a Global Education and Science Network (GESN). WMO noted that it had proposed to CGMS-XXXI the establishment of an exciting, worldwide, hands-on education and science programme, through involved scientist-school partnerships globally. The Global Education and Science Network (GESN) would engage senior personnel that include highly committed scientists and educators with substantial experience in the effective leadership of large national and international programmes. CGMS-XXXI was requested to support the GESN plan including:

- Support a full time GESN coordinator at WMO;
- Support part time GESN support people at each RMTc;
- Connect RMTcs with secondary schools in participating countries;
- Translate training manuals, publish, and distribute as necessary;
- Participate as observer in long distance training demonstrations at selected schools using the Virtual Laboratory;
- Organize annual workshop with RMTc leaders and secondary school representatives engaged on GESN team;
- Maintain global school data web site (this has already been established but should become part of WMO web site);
- Organize an international classroom in Geneva for one week (50 students from selected schools will give papers and share experiences and receive awards from WMO).

10.3. To further this activity, CGMS-XXXI had agreed to establish an ad hoc focus group to study this proposal and report back to CGMS XXXII. Since the GESN relies on the Virtual Lab, it was felt that it would be beneficial for a member of the GESN focus group to attend the Virtual Laboratory Focus Group meeting in Barbados in December 2003 to solicit support from the "centres of excellence". The Senior Scientific Officer for the WMO Space Programme, Dr Donald Hinsman, is a member of the focus group. The second session noted that the WMO Secretariat remained committed to the GESN concept and would work through WMO structures such as its Executive Council, Commission for Basic Systems, EC Panel on Education and Training and WMO Consultative Meetings on High-level Policy on Satellite Matters.

10.4. The second session welcomed the invitation by the representative from EAMAC, one of the "centres of excellence" to consider meeting in Niamey, Niger for its next session. EAMAC explained that it would be appropriate for consideration due to the important satellite meteorology

programmes underway in Africa including the Meteorological Transition in Africa Project (MTAP).

10.5. The second session also requested that its Report be delivered formally to the heads of the “centres of excellence” and the headquarters of ASECNA by the CGMS Secretariat. Furthermore, the session agreed to provide the CGMS Secretariat with names and addresses for the mailing as shown in Annex IX.

11. CLOSURE OF THE MEETING

The meeting closed at 15h15 on Tuesday, 16 December 2003.

ANNEX I

AGENDA

1. ORGANIZATION OF THE SESSION
 - 1.1 Opening of the session
 - 1.2 Adoption of the agenda
 - 1.3 Working arrangements
 2. REPORT OF THE CO-CHAIRMEN
 3. REVIEW ACTIONS SINCE VL-1
 4. REVIEW LESSONS LEARNED FROM VIRTUAL LABORATORY TRAINING EVENTS
 5. REVIEW INITIAL ASSESSMENT OF THE VL
 6. DEVELOP RECOMMENDATIONS TO INCREASE EFFECTIVENESS OF THE VL
 7. REVIEW TERMS OF REFERENCE FOR THE VL FOCUS GROUP
 8. DEVELOP ACTION PLAN FOR 2003 THROUGH 2006
 9. ELECTION OF CO-CHAIRMEN
 10. ANY OTHER BUSINESS
 11. CLOSURE OF THE MEETING
-

ANNEX II

LIST OF PARTICIPANTS

Mr Selvin BURTON
Caribbean Institute for Meteorology and
Hydrology
Husbands
St. James
Barbados
Tel: +1 246 425 1362 /5
Fax: +1 246 424 4733
sdburt@inaccs.com.bb
sburton@cimh.edu.bb

Dr Vilma CASTRO
Universidad de Costa Rica
Departamento de Fisica, Oceanica y
Planetaria
Ciudad Universitaria Rodrigo Facio
2060 San José
Costa Rica
Tel: +506 207 5394/5142
Fax: +506 207 5619
vcastro@ariel.efis.ucr.ac.cr

Mr Richard FRANCIS
Satellite Research & Development Scientist
Met Office
FitzRoy Road
Exeter
Devon EX1 3PB
United Kingdom
Tel : +44 1392 884828
richard.francis@metoffice.com

Dr Donald HINSMAN
Senior Scientific Officer
Satellite Activities
WMO
7 bis Avenue de la Paix
Case postale 2300
1211 Geneva 2
Switzerland
Tel: +41 22 730 8285
Fax: +41 22 730 8021
dhinsman@wmo.int

Mr James KONGOTI
Senior Meteorologist
IMTR
Kenya Meteorological Department
Dagoretti Corner, Ngong Road
P.O. Box 30259
NAIROBI
Kenya
Tel: +254 20 567 880
Fax: +254 20 577 373/568444
Mobile : +254 733 9606 13
gerald.kongoti@lion.meteo.go.ke

Mr Ryoji KUMABE
Senior Scientific Officer
JMA
System Engineering Division, Meteorological
Satellite Center
3-235 Nakakiyoto
Kiyoshe-shi
Tokyo 204-0012
Japan
Tel: +81 424 93 4981
Fax: +81 424 92 2433
ryoji@msc.kishou.go.jp

Mr Tony MOSTEK
Satellite Training & VISIT Leader
NWS/NOAA
Office of Climate, Water, and Weather
Services
PO Box 3000
Boulder, CO 80307
USA
Tel: +1 303 497 8490
Fax: +1 303 497 8491
mostek@comet.ucar.edu

Dr James PURDOM
Chair of OPAG IOS
Cooperative Institute for Research in the
Atmosphere
Foothills Campus
Fort Collins, Colorado 80523-8241
USA
Tel: (970) 491 8510
Fax: (970) 491 8241
Email: purdom@cira.colostate.edu

Mr Henk VERSCHUUR
Senior Training Officer
EUMETSAT
Am Kavalleriesand 31
D-64295 Darmstadt
Germany
Tel: +49 6151 807 608
Tel: +49 6151 807 304
verschuur@eumetsat.de

Mr Jeff WILSON
Australia Bureau of Meteorology
P.O. Box 1289 K
VIC 3001 Melbourne
Australia
Tel: +61 3 9669 4470
Fax: +61 3 9669 4366
j.wilson@bom.gov.au

Dr Adamou Garba
African School of Meteorology and Civil
Aviation (EAMAC)
PO Box 746
Niamey, Niger
Tel: (227) 93 54 33
Fax: (227) 72 22 36
Email: garba@eamac.ne

Dr. M'Piè DIARRA
Direction Generale ASECNA
32-38 Jean Jaurès
B.P. 3144
Dakar
Senegal
Tel: +221 869 5711
Fax: +221 823 4654
Mobile: +221 546 2346
DIARRAMpi@asecna.org

Observer

Dr Evangelina Oriol-Pibernat
METOP and MSG Mission Manager
ESA/ESRIN
Via Galileo Galilei 32
I-00044 FRASCATI
Italy
Tel: (39) 06 941 80408
Fax: (39) 06 941 80402
Email: eoriol@esa.int

ANNEX III
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

- 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, BMTTC 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

ANNEX IV

Initial Assessment of the Virtual Laboratory for Education and Training in Satellite Meteorology

The resource library, its role, how it is structured, how it is “peer reviewed”, and other pertinent matters;

The initial goals were met. Its role was to provide access to training and educational material, software and expertise on how to utilize data, and case studies and near real-time data. It served as an entry point or portal for a user searching for information or resource material for satellite education and training. It was globally distributed with servers located at all operational satellite operators and some of the “centres of excellence”. However, there was no structured peer review. In its current state each contributor peer reviews its own site.

VISITView, its role within the Virtual Laboratory construct, etc;

VISITView was a powerful communications and collaboration tool and its use within the Virtual Lab was expected to continue to grow. The importance of the VISITView tool can't be over-emphasized. VISITView provided the ability to incorporate remote lecturers and experts into face-to-face training events (allowing more effective use of funds) and hence to enable distance education sessions. One of the Co-Chairs had recently been involved in a training event that had used VISITView to provide follow-up training to the course participants and to encourage them to consolidate and use the course material. It was recommended that future satellite training events also incorporate follow-up sessions using VISITView to reinforce the training that occurs during the face-to-face sessions.

Other tools within the VRL included analysis tools such as SATAID, RAMSDIS and Envi Freelook. These analysis tools along with VISITView were probably one of the strongest parts of the VL at this stage. Whilst tool developments were being funded outside of the VL framework, the developers were very aware of the interest and use of their tools within the VL and had been extremely co-operative in incorporating suggestions and requests into the tool development. Use of common tools within the satellite operators, “centres of excellence” and neighbouring NHMSs has allowed more sharing of resources and expertise.

Expectations for the RMTCs that are participating in the Virtual Laboratory specially in the area of a review of the questionnaire to help focus their training, and as an input to WMO;

Focus Group members agreed that the “centres of excellence” should see the responses to the Questionnaire for their regions. The “centres of excellence” should themselves also provide a response to the Questionnaire to WMO Space Programme Office. The “centres of excellence” have agreed to encourage WMO Members to respond to the Questionnaire through whatever mechanisms are appropriate. WMO Space Programme Office should advise “centres of excellence” of responses to the Questionnaire using the VL list server.

Coordination of training activities that could lead to a schedule of “classes” each year;

As already mentioned in the agenda item 5 discussions the Focus Group identified the need to enhance coordination and collaboration between “centres of excellence”. As an outcome of the Barbados training event, a task group of the participants, satellite operator and two “centres of excellence” has been formed to initiate and coordinate a series of ongoing contacts. “centres of excellence” have used VISITView and other VL resources to provide training activities as part of the WMO Satellite training events and other training activities.

Virtual Laboratory participant roles and responsibilities;

The broad roles and responsibilities of the VL participants were clearly outlined at the first Focus Group meeting and were being met on a best effort basis. The learning that had occurred during the first two years of the VL Focus Group had helped define exciting new pathways forward as well

as further elaborating activities that a VL participant should undertake. As the goals for the next period are agreed the association of activities with their responsible VL participant shall be embodied in the plan.

Archiving of training class presentations as a future training resource;

Training resources and material from the Nanjing and Melbourne training events have been made available to VL members and were available via the VRL. Training resources from the Barbados event should be added when they become available. In general terms, and in the interest of enhancing communications between participants, training class presentations will be distributed and also made available via the VRL as soon as practical.

Development of a web-based training resource available to WMO, how it is managed, and what is the corresponding role of the Centre of Excellence

The VISITView tool for generating web based training material was available online, as were a large number of VISITView lessons. Most “centres of excellence” have utilized VISITView within their training activities. It was reported that VISITView is freely available to any WMO Member and should be used by the Barbados task group. There were still challenges to be met including VISITView sessions on how to utilize the various components of the VL.

ANNEX V

Principles for the VL

Guide for running VL training events

The VL Focus group agreed to the following principles for the planning and running of VL training workshops:

- Planning should begin a year prior to the event;
- All the course information must be included in a Learning and Action guide that conforms with the VL template:
 - o This acts to focus the participants and lecturers on the purpose of the training activity and its relationship to the course objectives and other learning activities;
- Courses should include a wide range of learning activities. Those activities are designed to engage participants taking into account their culture, language and skill level:
 - o Typical activities will include traditional face to face content lectures and their accompanying consolidation workshops, online lectures, talks in non formal sessions, group discussions, poster presentations, participant presentations on how they utilise satellite data and products, real time imagery discussion and one on one sessions with lecturers. The course must cover the three facets of learning: skills, knowledge and attitude;
- Must provide resource material for participants to take back to their home institution to assist them in providing training at their NMHS;
- Should form a task group composed of the training participants, the appropriate satellite operator and the “centres of excellence” to become a self help team;
- Should conduct a six month assessment after the training workshop and if necessary provide follow-up online training covering relevant workshop material;
- Should report back to the other “centres of excellence” on lessons learnt from running this training event to aid in the running of future training events.

Possible measures to evaluate VL effectiveness

- How many students have been trained as participants of training events;
 - o How many distance hours / lessons;
- From the six month assessment following the training workshop evaluate the impact of the learning on the ability of the students to better utilise satellite data and products;
- How many NHMS staff have been formally trained by the participants following their participation in a VL training event;
- What impact have the NHMS advised us of as a result of their staff attending VL training events;
- Tracking changes in utilization of sat data and products by WMO Members using the Questionnaire.

ANNEX VI

Three year VL Goal

A global high-profile VL training event

A major high level goal – a global high profile VL training event, 2-3 year timeframe with interim events testing the overall concept and its components. All “centres of excellence” and their regional NMHSs, satellite operators, focussed science groups and a globally distributed set of lecturers linked into a common training event. “Roll around the globe with the trainers” to link two or three of the “centres of excellence” at any one time.

Benefits:

- “Centres of excellence” would all achieve a comparable skill level;
- Leverages E&T events, not just a WMO event, and extra-budgetary resources to maximize the impact;
- The same set of expert lecturers that make presentations to an event at one “centre of excellence” could make the same presentations to all “centres of excellence”;
- This would add the linking of NMHSs with their regional “centre of excellence” into the global event. Training would reach into the NMHSs at the same time as the global event;
- Preparing for the event and the event itself would exercise the VL addressing all proposed ways to increase VL effectiveness as discussed at the second session of the VL FG.

Action item:

Appoint a focal point (Mr Wilson as VL FG Co Chair) to coordinate the global high profile VL training event and it was anticipated that the focal point would convene an *ad hoc* working group to assist.

Action item:

Focal point to identify financial resources required to implement the event.

Action item:

CGMS VL Rapporteur to inform and seek agreement from CGMS-XXXII of the event and associated need for financial resources.

Action item:

WMO Space Programme Office to inform the 2004 Consultative Meeting of the event and associated need for financial resources.

Important areas requiring further elaboration by the focal point.

- VRL
 - o Case studies and lectures able to be downloaded, as well as found via the search engine;
 - o Sat operators to provide online access to digital data for the standard VL tools (SATAID, RAMSDIS);
 - o Improve search capabilities on the VRL;
 - o Standardise meta data to allow more effective searching;
 - o Provide a brief description of the material on the VRL that is available only on request;
 - o Peer review mechanism.

- Institute routine coordination between “centres of excellence” and sat ops (at least 3 monthly) – Co – Chairs;
- Collaborate on series of training related projects (3 monthly for those who can);
- Common VL interface on the web pages (Mr Wilson to email to group);
- “What’s new and FAQ” to be added to the VL websites;
- Sat Operators to install the RAMSDIS-Online type system and tailor to meet their needs and those of the “centres of excellence” (CIRA to provide code);
- Have EUMETSAT investigate and report back on the feasibility of using EUMETCast to disseminate training material (by end of 2004)

ANNEX VII

Expectations for “centres of excellence”, satellite operators, and WMO/CGMS

Expectations from the “centres of excellence”

Whilst recognizing that each “centre of excellence” has different administrative and financial structures, relationships with the sponsoring satellite operator and links with neighbouring NHMSs, the VL FG recommended the following:

- Nominate a focal point and an alternate within the CoE as the primary contact for all VL business:
 - o Preferably this person should have some authority to make decisions regarding the use of the VL within the CoE;
- Run international training events that conform with the VL guides for organising and running training events;
- Maintain an up to date list of priority training needs for that region:
 - o Links to SSUP ET coordination;
- Develop and maintain proficiency in providing online training using tools such as VISITView;
- Maintain regular contact with the other members of the VL Focus Group:
 - o Co-chair responsibility to coordinate sessions;
- Provide the Co-Chairs (or designated people) a brief annual report at the end of August each year, relevant to the VL, outlining the training activities for the past 12 months, anticipated training activities for the next twelve months, priority training needs for the region for the next 12 months and their ability to meet the training needs, and other information they feel is relevant to the VL:
 - o Co-chairs responsibilities to report to constituent bodies after receipt of information.

Expectations from the Satellite Operators

- Nominate a focal point and alternate for VL business:
 - o Preferably this person should have some authority to make decisions about VL matters within the satellite operator and some delegation to assist the CoEs on a case by case basis;
 - Make near real time data, products and/or selected case study data available for education and training purposes to CoE’s in the correct data formats for use with the agreed VL tool sets;
 - Maintain regular contact with the CoE(s) that the satellite operator is sponsoring, focusing in particular, but not solely on communications and data access issues. As appropriate, provide an alerting role for the CoE(s) on new training resources and material generated within or for the satellite operator;
 - Maintain regular contact with the other VL satellite operators on data access and format issues and other matters as appropriate;
 - Provide the Co-Chairs (or designated people) a brief annual report at the end of August each year, relevant to the VL, outlining the activities that the satellite operator has undertaken in the past 12 months for their sponsored CoE(s) and the VL in general, and plans relevant to the CoE and the VL for the next 12 months;
 - Assist the CoE(s) to overcome resource constraints on VL related matters through advice, championing with other funding bodies and direct assistance as appropriate.
-

Expectations from WMO and CGMS

- Provide long term guidance and advice, and where appropriate, direction regarding global and regional priorities;
- Represent the VL partners at appropriate policy and resource for a;
- Assist with resource issues.

ANNEX VIII

An example of a VL Training Workstation

Virtual Laboratory Training Workstation

The workstation should have the following hardware

- Sound card
- DVD/CD reader and writer
- Network card
- Modem
- Appropriate memory and hard disk capacity
- Microphone and headset
- USB memory stick

Non VL Applications

- Anti virus software
- Firewall
- Browser
- Powerpoint or openoffice
- Web editor
- Software to handle audio hook ups (i.e., yahoo messenger, msn messenger, netmeeting ...)
- Picture editing software (Paintshop pro or similar)
- CD/DVD burner software
- ftp programme

VL Applications

- RAMSDIS
- SATAID
- VISITView
- AniS (for web animations and control - ssec)
- QUIZIMAGE (online questions and discovery tool for images- ssec)
- The new multispectral tool from CIMSS (non matlab version)
- Envi freelook (any chance of getting a non idl version of AHABS)
- New EUMETSAT CAL tools

Virtual Resource Library "titles"

- The CIRA 3.9 and GOES tutorials
- The new EUMETSAT MSG interpretation guide
- Training Course lecture and resource material
 - PPT
 - Pictures and movies
 - Learning guide
 - Written document
- Learning Guide template and course learning guide
- Current set of "essential" satellite related URLs
 - Links to products
 - Algorithms
 - Tutorials
- Syllabus for selected events

Digital data

- Selection of canned mcidas data and workshop notes for that data
 - GOES
 - MSG

- MT-SAT
- FY-X
- AVHRR
- MODIS
- Selection of canned sataid data and workshop notes for its use
- Selection of VISITView lessons

Digital Manuals

- RAMSDIS users manual
- SATAID users manual
- VISITView user guide
- AniS user guide
- Quizimage user guide
- User manual for EUMETSAT CAL tools

ANNEX IX

Monsieur Ousmane Issoufou OUBANDAWAKI
Directeur General de l'ASECNA
32-38 Jean Jaurès
B.P. 3144
Dakar
SENEGAL

Monsieur J.P. Makosso
Directeur de l'EAMAC
BP 746
Niamey
NIGER

Dr Joseph R. Mukabana
Director of Kenyan Meteorological Services
PO Box 30259
00100-GPO
Nairobi
KENYA

Mr Richard Masika
Principal, IMTR-Nairobi
PO Box 30259
00100-GPO
Nairobi
KENYA