CGMS INTERNATIONAL SATELLITE DATA UTILIZATION AND TRAINING FOCUS GROUP

FIRST SESSION

EUMETSAT HEADQUARTERS

DARMSTADT, GERMANY

16-18 MAY 2001

FINAL REPORT

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

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

The first session of the CGMS International Satellite Data Utilization and Training Focus Group to discuss coordination and oversight requirements for the Virtual Laboratory for Education and Training in Satellite Matters (VL) was held at the EUMETSAT Headquarters at Darmstadt, Germany, 16-18 May 2001. The meeting was opened at 09h00. Presentations were made by EUMETSAT, WMO, NOAA/NESDIS, NSMC/CMA, JMA and the "centres of excellence" at the RMTCs in Barbados, Costa Rica, Niger, Kenya, China and the BMTC in Australia. 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. ELECTION OF CHAIRMAN *(agenda item 2)*

The Task Force elected Dr James Purdom as Chairman. The Chairman outlined his expectations for the future, and noted that the first session would be a seminal meeting. He informed the meeting that within his experience as Chairman of the CBS Open Programme Area Group for Integrated Observing Systems, the satellite systems were the single most reliable observing systems within the WWW Global Observing System (GOS). One result from an effective VL would be better utilization of the data, products and services from the stable satellite observing component of the GOS. Thus, it was incumbent upon the session to seek the establishment of realistic goals that would produce concrete results. By defining appropriate Terms of Reference, a sound structure for the VL and a coherent implementation plan, the session would help ensure that the VL contribute greatly towards maximizing the benefits from satellites.

3. REVIEW ACTIONS TOWARDS ESTABLISHMENT OF AN INTERNATIONAL SATELLITE DATA UTILIZATION AND TRAINING FOCUS GROUP *(agenda item 3)*

3.1 The first session noted that in July 2000 the CBS OPAG IOS Expert Team on Satellite Systems Utilization and Products (ET-SSUP) had suggested the formation of an "International Satellite Data Utilization and Training Focus Group" to help foster the VL and to realize the challenges set forth by the WMO Executive Council Panel on Education and Training.

3.2 The first session recalled that the twelfth session of the Commission for Basic Systems in November 2000 had acknowledged the valuable contribution made thus far by the VL and the future potential for education and training.

3.3 The session also recalled that CGMS, at its twenty-eighth session in October 2000, had agreed to the formation of a Focus Group and endorsed a proposed structure for the "International Satellite Data Utilization and Training Focus Group". The first session also acknowledged the CGMS request to report back to CGMS-XXIX, to be held in October 2001, on findings and recommendations as well as the need for future Focus Group activities in this area.

4. REVIEW DRAFT TERMS OF REFERENCE FOR AN INTERNATIONAL SATELLITE DATA UTILIZATION AND TRAINING FOCUS GROUP *(agenda item 4)*

4.1 The first session reviewed the proposed structure for the "International Satellite Data Utilization and Training Focus Group" as proposed at CGMS-XXVIII. It also noted that

CGMS-XXVIII had requested the Focus Group to review and make proposals for changes to the draft Terms of Reference as appropriate for consideration at CGMS-XXIX.

4.2 The first session drafted a proposed structure and goals for the CGMS Virtual Laboratory Focus Group, as contained in Annex III, for presentation to CGMS-XXIX.

5. REVIEW LESSONS LEARNED FROM VIRTUAL LABORATORY TRAINING EVENTS *(agenda item 5)*

5.1 The first session reviewed lessons learned from previous training events conducted under the Strategy for Education and Training in Satellite Meteorology and in particular those conducted under the Virtual Laboratory for Education and Training in Satellite Meteorology. The first session was briefed on activities at the RMTCs in Costa Rica, Barbados, Nairobi, Niamey (EAMAC) and Nanjing. The first session also reviewed the results of the recent Nanjing training event held in December 2000.

5.2 With regard to the Nanjing training event, the first session noted that it had followed the guidelines for the WMO Strategy for Education and Training in Satellite Matters. The Nanjing training event was considered a “first” in several respects: it was the first training event held in Nanjing as a “specialized centre of excellence” under the Strategy for Education and Training in Satellite Meteorology and it was the first event held that embraced the recently approved concept of the Virtual Laboratory for Education and Training in Satellite Meteorology. It focused on "training the trainers". The Nanjing RMTC provided a network of over twenty computers with on-line Internet capabilities to allow each participant to view the presentations. Almost all lectures were made either through Microsoft Powerpoint presentations or stand-alone versions of the Regional Mesoscale Satellite Image and Display System (RAMSDIS). All materials presented electronically were mastered onto two CD ROMs and given to each participant at the end of the training seminar, thus enabling them to return to their country and further train other members of their NMHS. In addition to the two CD ROMs for class lectures, JMA and EUMETSAT provided three more CD ROMs - JMA for the SATAID programme and EUMETSAT for the ASMET modules and the CGMS Directory of Applications. At the end of each day, there was a map discussion covering the weather situation within the field of view of data received by NIM. In summary, the first session agreed that the Nanjing event was exceptional and set a standard for future training events.

5.3 The first session noted that the activities at the RMTC and the recent training event in Nanjing highlighted several key factors to be considered in furthering the VL. The important factors included:

- distribution of all training materials, preferably in advance of the training event, on the VRL or CD ROM as appropriate,
- the need for input from the participants in advance of the training event as to their data access, data reception systems, level of experience with satellite data and primary forecasting requirements,
- linking together the “six centres of excellence” into a network,
- provision and availability of satellite data by each satellite operator into the RAMSDIS format,
- each "centre of excellence" should have internet telephonic capability to allow full exploitation of the VISITview software,
- participants should be provided in advance of the training event with information concerning RAMSDIS “Online” software,
- the need to attract students,
- better exposure of digital satellite imagery interpretation and McIdas basics,
- use of mailing list,
- the use of looped imagery for comments on every day situations,

- achieving a local satellite climatology,
- better communication between RAMSDIS users through VISITview and other software for voice communication,
- promotion of the use of any existing computer aided learning, multimedia or web-based platforms of instruction, including videos,
- the urgency to improve internet in every country,
- the benefits from refresher workshops,
- RAMSDIS Online imagery was now an integral part of satellite training,
- research in satellite meteorology, and
- distribution at the end of a training event of any additional training materials on CD ROMs.

6. DEVELOP RECOMMENDATONS AND IMPLEMENTATION PLAN FOR CGMS AND FOR THE SECOND SESSION OF THE INTERNATIONAL SATELLITE DATA UTILIZATION AND TRAINING FOCUS GROUP *(agenda item 6)*

6.1 The first session recalled the request from CGMS-XXVIII to develop recommendations as well as an implementation plan for the VL. With regard to the implementation plan, the first session discussed the following items: the resource library, its role, how it should be structured, how it should be "peer reviewed," and other pertinent matters; VISITview, how it should work, how it should fit into the Virtual Laboratory construct, etc.; expectations for the RMTCs that were 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 should be managed, and what would be the corresponding role of the “centre of excellence”.

6.2 The first session recalled that the VL was a global network of specialized training centres created to meet user needs for increased skills, knowledge in using satellite data. With regard to the Virtual Resource Library (VRL), it should be the core of the VL and reflect the 3 cornerstones of the WMO Strategy to Improve Satellite System Utilization by providing access to training and educational material, software and expertise on how to the utilize data, and case study and near real time data. The VRL should contain a suite of standard software packages and applications for use on those packages. Used in combination with the case study data, it should provide bench marking capabilities for adapting algorithms and software. The VRL should have strong links to specialized science groups such as the ITWG and the Wind Workshop Group and provide access to case study data in a variety of standard formats. The data should be linked to training sessions or could be used independently (e.g., for application development and testing). The VL resources will have two components: a core of baseline information to be exchanged (mirrored as appropriate) to all “centres of excellence”, and a repository of data and specialized information for local use. Local use distribution will be decided by the data provider. Local use distribution could range from complete distribution to all “centres of excellence” to restricted distribution to only the local “centre of excellence”.

6.3 The first session then discussed in-depth several components of a VL including goals, data flow and formats, management and the Virtual Resource Library (VRL).

6.4 With regard to VL management, the first session felt it important that the management group review progress, assimilate inputs/feedback and assign actions. As appropriate, the management team should address relevant training programmes, e.g. within PUMA, EUMETNET and Project Mitch, and synergy and consistency with the VL goals. There should be regular and extensive use of teleconferencing (initially 3-monthly). The first session agreed that two co-chairs, one from a “centre of excellence” and one from a satellite operator, should be given responsibility for day-to-day management. The two co-chairs would report to the VL Focus Group which would

provide overall guidance for the VL. The first session nominated Mr R. Francis (EUMETSAT) and Mr J. Wilson (BMTC) to serve as the first two co-chairs.

6.5 The first session noted the importance of initiating training events based around the VL concept (as was done in Nanjing 2000 and planned for APSATS 2002). Such events would naturally bring together VL participants and the latest materials, and should be used to regularly inject impetus into further VL development.

6.6 The first session agreed to a proposed implementation plan for the VL with corresponding action items and timetable as shown in Annex IV.

6.7 The first session also reconfirmed the validity of the structure for the VL as proposed in Lannion Meeting. A schematic representation of the relationships between the various components of the Virtual Laboratory is shown in Figure 1.

6.8 The first session reviewed the Virtual Institute for Satellite Integration Training (VISIT) capabilities. It noted that teletraining was one component of distance learning utilized by the USA National Weather Service (NWS) to provide cost-effective training to operational hydrometeorological forecasters located in offices across all 50 states. The NWS and NESDIS worked together to establish and fund the VISIT Programme. VISIT is comprised of staff from the Cooperative Institute for Meteorological Satellite Studies (CIMSS) and the Cooperative Institute for Research in the Atmosphere (CIRA). The VISIT Programme brings together diverse training activities that had traditionally focused on individual sensors such as radar, satellite, and other observing systems. Information on the VISIT Programme is available at <http://www.cira.colostate.edu/ramm/visit/visithome.asp>.

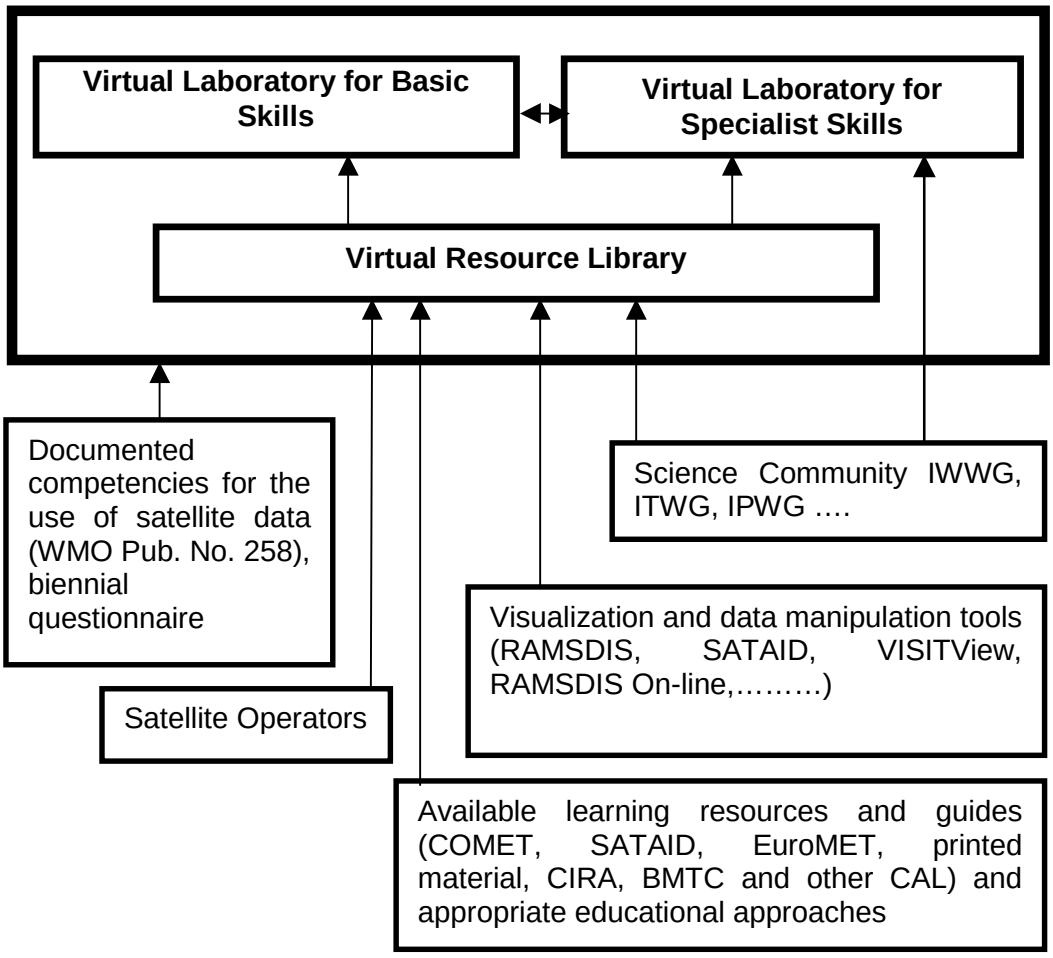

Figure 1: Schematic of the Virtual Laboratory

6.9 To support the evolving training needs of the operational hydrometeorological forecaster, the VISIT Programme had developed instructional components that utilized various training approaches. Training sessions and modules were developed using both remote web-based and remote-or-local teletraining approaches. In order to get instructors connected directly with the forecasters in the field, interactive teletraining called VISITview was developed by the VISIT team.

6.10 VISITview <http://www.ssec.wisc.edu/visitview/> is a platform-independent distance learning and collaboration software programme. It allows multiple users located in different offices across a wide geographic region to view the same series of images containing graphics and text. VISITview provides a large number of features, including annotation, colour enhancements, zooming, animations, multi-panel displays, image fading, quiz questions, etc. To avoid problems with limited Internet bandwidth, files used for the real-time presentations are acquired by the offices in advance. The files for each training session contain all the information needed for the training. This allows each training office the opportunity to view the session in advance and to use the session to conduct on-station training. Standard voice phones are used during the session. However, for those remote offices with limited phone access, alternative voice options using Internet phone software can be used.

6.11 VISITview sessions are prepared using imagery and text products derived from various hydro-meteorological materials in either GIF or JPEG format. To assemble the training session, a programme called the VISITview lesson builder is provided. A training session on using the lesson builder program was available at <http://www.ssec.wisc.edu/visitview/>. The interactive lesson builder is created to assist instructors in organizing materials for teletraining lessons. Each page of a lesson consists of one or more frames of imagery or other products. Multiple frames were employed to show animations, portals, or overlays. The Lesson Builder gives instructors a tool to create a lesson and then automatically create the zip archive file that is distributed to the offices.

6.12 The VISITview Programme evolved as additional techniques for distance learning were included. For example, a VISITview "session" was available on-line at CIRA that used the RAMSDIS on-line database of real-time data <http://visit.cira.colostate.edu/vview/vmeast.html>. This approach encouraged experimentation with distance collaboration, facilitates discussions of real-time weather events, and supported coordination among various offices and centres. Also, the incorporation of a recorded speech option allows the lessons to be "played back" in virtual real time right along with the voice and annotations of the instructor.

6.13 The first session felt that the VISITview approach to teletraining was very flexible and could be used in various settings. Training lessons using VISITview had been performed at WMO sponsored workshops held at the Regional Meteorological Training Centers in Nanjing, China and San Jose, Costa Rica. VISITview training sessions had also been run at the BMTC, Melbourne, Australia as well as demonstrated during the first session.

7. DEVELOP ACTION PLAN FOR APSATS-2002 *(agenda item 7)*

7.1 The first session noted that Asia Pacific Satellite Application Training Seminar (APSATS) workshop would be co-sponsored by WMO, Japan Meteorological Agency and the Bureau of Meteorology and held at the BMTC in Melbourne, Australia. The China Meteorological Agency and the Korean Meteorological Agency have also offered guest presenters. The next workshop, APSATS 2002, is currently scheduled for early 2002.

7.2 The APSATS 2002 workshop will continue many of the practices used at the recent WMO Regional Training Seminar on *"The Use of Environmental Satellite Data in Meteorological Applications"* held at the RMTC in Nanjing, China, in December 2000. The APSATS 2002 workshop will consist of lectures, hands-on case studies and discussions using real time satellite data from around the world. Dr Roger Weldon (NOAA/NESDISS) will be the main invited speaker.

7.3 Case studies are currently being devised using the SATAID programme, with data also available for use under the RAMSDIS system. It is proposed to use the VISITview software to link the actual workshop with other “centres of excellence” for some of the real time discussions. Practice lessons on creating VISITview sessions and other training material will be incorporated into the workshop programme. Participants will be encouraged to bring material to create their own training packages using authoring packages such as VISITview, PowerPoint or simple Web editors.

7.4 Resource material from APSATS 2002 is expected to be available on the VRL after the training event.

7.5 Lecture, case study and resource material will be written onto CD-ROMs for the participants to take home on completion of the course.

8. ANY OTHER BUSINESS

8.1 The first session agreed that the second session of the Focus Group should occur in two years time and conduct an initial assessment of the VL. The third session should occur in five years and conduct a comprehensive review of the VL.

8.2 The first session suggested that henceforth the CGMS International Satellite Data Utilization and Training Focus Group be called the CGMS Virtual Laboratory Focus Group.

9. CLOSURE OF THE MEETING

9.1 The meeting closed at 15h00 on Friday 18 May 2001.

ANNEX I

AGENDA

1. OPENING OF THE MEETING

2. ELECTION OF CHAIRMAN

3. REVIEW ACTIONS TOWARDS ESTABLISHMENT OF AN INTERNATIONAL SATELLITE DATA UTILIZATION AND TRAINING FOCUS GROUP

4. REVIEW DRAFT TERMS OF REFERENCE FOR AN INTERNATIONAL SATELLITE DATA UTILIZATION AND TRAINING FOCUS GROUP

5. REVIEW LESSONS LEARNED FROM VIRTUAL LABORATORY TRAINING EVENTS

6. DEVELOP RECOMMENDATIONS AND AN IMPLEMENTATION PLAN FOR CGMS AND FOR THE SECOND SESSION OF THE INTERNATIONAL SATELLITE DATA UTILIZATION AND TRAINING FOCUS GROUP

7. DEVELOP ACTION PLAN FOR APSATS - 2002

8. ANY OTHER BUSINESS

9. CLOSURE OF THE MEETING

ANNEX II

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ANNEX III

PROPOSED 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

ANNEX IV

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).

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)

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).

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)

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”;
- Train satellite operators and “centres of excellence” on the use of RAMSDIS using VISITview;
- Increase training event effectiveness through the use of VISITview;
- 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;
- Each “centre of excellence” will strive to have a server online and connected to the VL;
- 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