P1.54 INTERNATIONAL FOCUS GROUP– VIRTUALLY THERE WITH VISITVIEW

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1. INTRODUCTION

A dramatic explosion of satellite and communication technology over the last 15-20 years has resulted in an abundance of information available to utilize for all sorts of weather and hazard related forecasts, and so has the need to train users on how to better utilize the information. The World Meteorological Organization (WMO) has encouraged satellite operators to take the lead in providing training to other countries in their hemisphere by collaborating with their Regional Meteorological Training Centers of Excellence (CoE). The National Oceanic and Atmospheric Administration (NOAA) has done this in the Western Hemisphere in conjunction with its Cooperative Institutes by collaborating initially with the existing CoE in Costa Rica and Barbados and recently with the newly formed CoE in Brazil and Argentina.

The progression of training activities focused on satellite meteorology has gone from classroom based instruction to virtual instruction and initiation of a focus group. The target group initially included forecasters, but has expanded to include researchers, students and persons outside the field of meteorology. The teletraining and real-time collaboration tool used in the instruction and focus group is called VISITview.

Within this paper, we present the framework for a focus group that has developed among a large number of participants from Central and South America and the Caribbean. The focus group is imbedded within a larger training structure and portions of these activities will be described here as appropriate. Some of the keys to a successful program include: motivation on the part of the trainers and participants; cooperation and collaboration, input from experts as well as users, and building long-term capacity.

2. BACKGROUND

The WMO recognized the explosion of satellite products and information early on and in 1996 its executive council recommended that "each satellite operator … cooperate with at least one of the specialized satellite applications training centres ("centres of excellence") strategically located around the globe with regard to the satellite programme, facilities and expertise required" (Purdom, 1997). Under this recommendation, NOAA, along with the Cooperative Institute for Research in the Atmosphere (CIRA) and the Cooperative Institute for Meteorological Satellite Studies (CIMSS) partnered with the CoE in Costa Rica and Barbados.

The CoE in Costa Rica is closely associated with the Universidad de Costa Rica, and the CoE in Barbados is closely associated with the Caribbean Institute of Meteorology and Hydrology. The project was designed around the concept of the virtual laboratory, which focused on using Personal Computers (PCs), case data sets, and Internet connections to demonstrate the invaluable use of digital satellite imagery. Back in 1997, this was indeed a challenge because Barbados had no Internet and Costa Rica had limited Internet capabilities. Fortunately, capabilities have increased dramatically over the past 10 years. The project started with PCs, sent data through ground mail and additionally for Costa Rica sent imagery overnight through the Internet.

The group organized and participated in WMO sponsored two-week satellite training workshops, the first of which occurred in Barbados in October 1998 and the second in Costa Rica in December 1999. Hurricane Mitch occurred near the end of October 1998 creating a natural disaster in Central America. Since the group already had a presence in Central America, it was able to direct training and recovery efforts for the meteorological services in Central America. In a few words, we were readily able to build capacity starting with a centralized CoE and expanding to include the National Weather Services in the surrounding countries.

The idea for the satellite weather briefings, was born at the (WMO) Satellite Training Workshop held in Barbados in December 2003. At that time, a WMO Virtual Laboratory Focus Group was formed with support from NOAA, CIRA, CIMSS, the Virtual Institute for Satellite Integration Training (VISIT), and the CoE in Costa Rica and Barbados. During the first year, the focus group was composed of participants and workshop instructors; the sessions were conducted in English and occurred on a monthly basis. After the WMO Workshop held in Costa Rica in March 2005 the

focus group expanded tremendously and evolved to include monthly bi-lingual and Spanish only sessions.

It is pertinent to note that besides the overwhelming interest from participants in the focus group generated at the March 2005 workshop, the group leadership expanded to include the NOAA's International Desk at the Hydrometeorological Prediction Center (HPC). The mission of the HPC International Desk is to provide visiting scientists with meteorological training with an emphasis on the operational use and application of numerical model products. They brought with them an extensive history of positive interaction with countries in Central and South America and the Caribbean and hence a strong following of participants. As a side note, the International Desk formed in response to assistance offered to South American countries after suffering a severe drought during the 1988-1989 La Niña episode.

3. SOFTWARE "RECYCLING"

The VISITview tool utilized for the weather briefings and the training activities was developed for the United States (US) National Weather Service (NWS) under the well established VISIT program (http://rammb.cira.colostate.edu/visit/visithome.asp). The primary mission of VISIT (Mostek et al. 2004) is to accelerate the transfer of research results based on atmospheric remote sensing data into NWS operations using distance education techniques. It was created in response to training requirements outpacing available travel funds as well as increased internet bandwidth and reliability. VISITview is a teletraining and real-time collaboration tool which provides a "slideshow" format that allows image animations, zooming, and chalkboard capabilities, and connects one or more instructors to many students via the internet (http://www.ssec.wisc.edu/visitview/) VISITview has and continues to function extremely well and provide excellent training for the NWS. It is being "recycled" and expanded for use by the international community.

It is worthwhile noting that VISITview is being used in two similar but different capacities for the training and the focus group sessions. VISITview was designed to be a complete lecture that is downloaded onto a remote computer. During a session, students and teachers are connected to a single server. The controls in the lecture are transmitted through the server to individual participants and allow the teacher to advance pages, point out features of interest, and draw on the imagery. This approach uses minimal bandwidth during the session. For the VISITview real-time online sessions, the imagery resides on the server and is downloaded when requested for viewing. Being able to draw on the imagery or point out features is also available. This approach requires a larger bandwidth during the session.

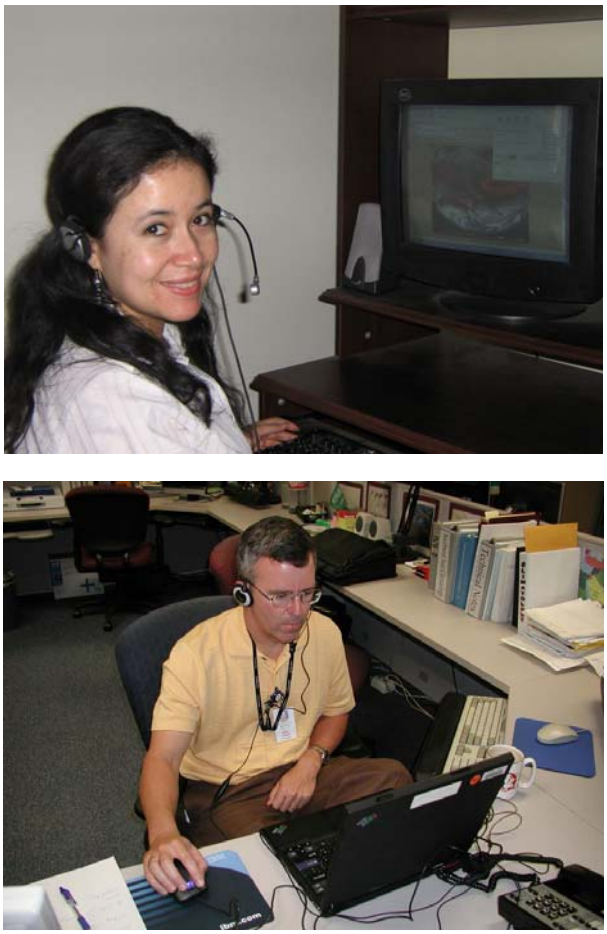

Figure 1. Gloria Marin from Colombia (top) and Mike Davison (bottom) from the International Desk at HPC participating in a monthly weather briefing of the focus group.

4. Cooperation

In order to have success at running the monthly focus group sessions, the workload is distributed among the many partners so that it is "doable" by all involved. For a typical monthly session, one person is responsible for scheduling and moderating the session and making sure the announcement and summary gets sent out to all participants. A VISITview server at CIRA (link) provides the framework and real-time geostationary and polar orbiting imagery and products for viewing. Imagery are created automatically from a RAMSDIS (Molenar et al. 2000) system.

Initially, only "standard" geostationary satellite images (visible, short and long wave infrared, and water vapor) were made available on the site. This has evolved to including specialized polar orbiting products such as total precipitable water from the Advanced Microwave Sounder Unit, rain rate and wind speed from the Special Sensor Microwave/Imager, sea surface

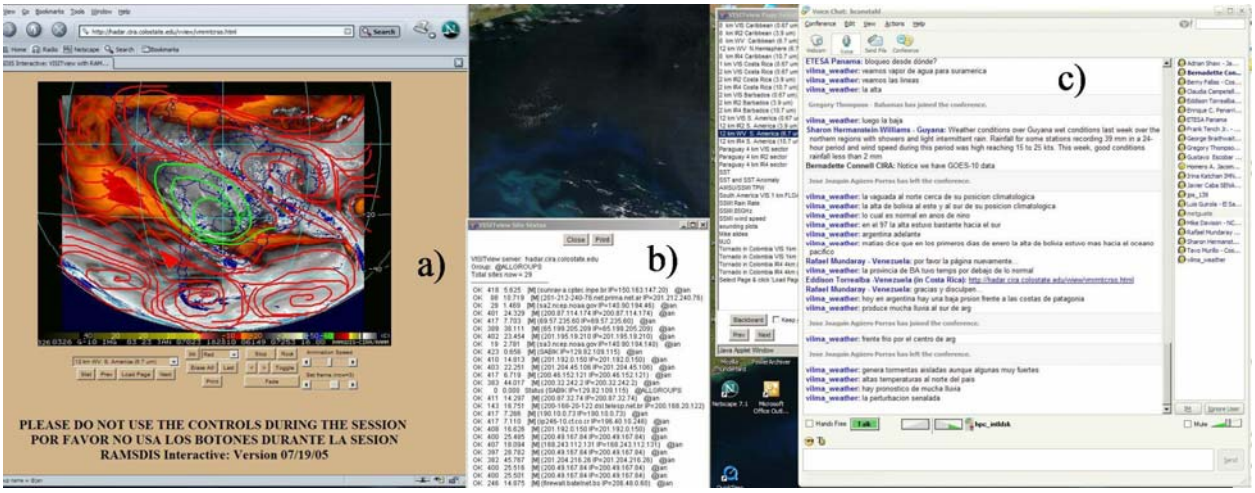

Figure 1. Computer screen grab of a monthly weather briefing session showing a) the VISITview window depicting water vapor imagery with contours drawn on during the session, b) the VISITview status window, and c) the Yahoo messenger conference window with chat display on the left and participant list on the right.

temperature and anomalies derived from Advanced Very High Resolution Radiometer, and potential vorticity anomalies for Madden-Julian Oscillation analysis. Each month, special interest topics, products, or imagery of significant events can be added to the standard suite of images and products to customize the session.

The Yahoo Conference feature is used to provide voice-over-Internet. A session is initiated by a person from either CIRA or the CoE in Costa Rica. All participating persons need to be sent an invitation to join a session. The CoE helps out tremendously by inviting participants and providing assistance during the session. HPC provides invaluable guidance (in both English and Spanish).

Text messaging is used during the conference as a backup to voice communications. Following each session, the CoE in Costa Rica prepares a summary of the session. During the northern hemisphere summer, we average 25-30 connections per session. During the northern hemisphere winter, we average 18-25 connections per sessions. We have had participants join in from many countries: Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Cayman Islands, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guyana, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Vincent, Trinidad and Tobago, and Venezuela

The sessions have proven to be a very powerful training tool. The use of real time weather data/imagery, as well as reference to "canned data", allow us to keep the sessions interesting and the participants engaged. People learn how to use new and existing satellite products in real time situations. They also get to discuss the evolving weather patterns and local impacts, for a better feeling to the long term effects and forecasts. Having pauses for translations between English and Spanish have also proven beneficial – it gives people time to digest what has been said and formulate new questions.

5. CHALLENGES

The weather briefings have been highly successful, but they have also had their share of challenges – particularly in connecting so many people from many different countries with varying Internet bandwidth capabilities. In terms of bandwidth, there are two issues to deal with: viewing the images and hearing voice. To help with download capabilities for the images, loops are (generally) limited to 4 images with the largest ones at 160KB and with many images less than 90KB. VISITview comes with a component to check the status of participants connected to the server. For a group of 24 participants, 75% are able to load the standard 4 image loop within 30 seconds. Generally 99% of participants view imagery within 1 minute. The software utilizes the Java 2 Runtime Environment. One of the more common problems of not being able to view the imagery results when the participant does not have the Java 2 Platform running on his system.

For voice, the conference feature under Yahoo Messenger has been used. For the most part, it has been fairly reliable. Over the past three years, only one session has been canceled due to unexplained difficulties with connecting to the Yahoo server. We have found that we are less likely to have problems with groups that have fewer than 20 participants. With groups of more than 20 participants, those with less bandwidth will experience dropped connections. As with any computer or software connecting to the Internet – Yahoo security vulnerabilities are being exposed on a regular basis. A certain amount of time

needs to be dedicated to making sure everyone is using the same version of Yahoo Messenger to reduce compatibility issues between participants and to prevent malicious interruptions.

It is interesting to note that we have had a small number of participants with high motivation to participate but with insufficient bandwidth available in their office. They have creatively participated from near-by Internet cafes.

6. GROWTH, TRAINING EVENTS, OTHER BENEFITS

With a well established focus group, taking training from classroom instruction to virtual instruction has gone rather smoothly. As part of a global effort led by WMO, a virtual High Profile Training Event (HPTE) took place in October 2006. The HPTE provided four core online lectures which were designed to give an overview of 4 important topics: how WMO operates within the realm of satellites to help us all, basic characteristics of environmental satellites and applications, examples of creating satellite products, and applications of satellite products for analysis of severe convection. The lectures were created in PowerPoint format, reviewed by VL members, and then converted to VISITview format. The HPTE also offered 2 weather briefings with a format similar to the monthly weather briefings. A web page (http://rammb.cira.colostate.edu/training/wmovl/) in both English and Spanish was created and provided a summary of the event, calendar and registration, and student guides.

Around the same time as the planning of the HPTE, new CoE were recognized in Brazil and Argentina in 2006. Their participation in the HPTE as well as hosting of numerous combined classroom and virtual instruction sessions has also increased the visibility of the focus group.

During this past year, a list group was set up in Yahoo to promote communication among the participants and to provide better organization on our end. To date we have 140 members on the list. The list came in very handy in December 2007 to keep GOES-10 and GOES-12 users informed of the progress of events when GOES-12 had an outage and GOES-10 was commanded to fill in for imagery over the continental US.

Meteorologists from the Americas join into monthly international focus group discussions and receive training on an operational environment. During the weather discussions, participants from all around the Americas and the Caribbean look at present weather situations they have to analyze while performing their duties. During the very active 2005 hurricane season, the international weather discussions took place on a daily basis during emergency situations, summoned by members of the Focus Group. With this new form of international collaboration, meteorologists are no longer isolated in their countries. They analyze real time situations while using new products, web pages, and on-line training material. The variety of cases in the real world becomes challenging, not overwhelming. Stress is reduced, self confidence is enhanced and, hopefully, weather services provided to the public are being improved.

With the growth of the main focus group, there is a need for smaller localized groups too. Within Costa Rica, the meteorological service conducts regular weekly sessions with other agencies that oversee agriculture issues and hydroelectric power production. In the eastern Caribbean during this past tropical season, Barbados engaged personal from small island meteorological services to share weekly discussions about the weather, satellite imagery and model output.

The focus group continues to offer benefits on various scales to us and our international partners. Check out our activities at: http://rammb.cira.colostate.edu/training/rmtc/

5. ACKNOWLEDGEMENTS

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6. REFERENCES

Molenar, D.A., K.J. Schrab, and J.F.W. Purdom, 2000: RAMSDIS contributions to NOAA satellite data utilization. *Bull. Amer. Meteor. Soc.*, 81:5, 1019-1029.

Mostek, A., J.F. Weaver, D.E. Bikos, D.T Lindsey, B.A. Zajac, S. Bachmeier, T. Whittaker, B. Motta, B. Grant, J. LaDue, and J. Ferree, 2004: VISIT: Bringing Training to Weather Service Forecasters Using a New Distance -Learning Tool. *Bull. Amer. Meteor. Soc.*, 85, 823-829.

Purdom, J. F. W., 1997: Satellite meteorology applications: A demonstration project for satellite meteorology applications focused on regional meteorological training centers in Costa Rica and Barbados. *World Meteor. Org. Bull.,* 46 (3), 230-237.