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**BRINGING TRAINING TO THE FORECASTERS
USING VISITVIEW–
REVIEW OF PROGRAM SINCE 1999**

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1. INTRODUCTION

This article describes the rapid rise in the use of teletraining by the National Weather Service (NWS) training program since 1999. The teletraining activity is conducted by the Integrated Sensor Training (IST) professional development series (PDS) and the Virtual Institute for Satellite Integration Training (VISIT). The VISIT program is supported by the NWS and the National Environmental Satellite, Data, and Information Service (NESDIS). VISIT is comprised of staff from the Cooperative Institute for Meteorological Satellite Studies (CIMSS), the Cooperative Institute for Research in the Atmosphere (CIRA), and the NWS training division (specifically the Warning Decision Training Branch (WDTB)).

The VISIT and the Integrated Sensor Training programs bring together diverse training activities that have traditionally focused on individual

sensors such as radar, satellite, and other observing systems. Information on the VISIT program can be accessed at www.cira.colostate.edu/ramm/visit/visithome.asp and on the IST PDS program at: meted.ucar.edu/ist.

To support the rapidly changing training needs of the operational forecaster, the IST PDS program has developed a set of instructional components that utilize various tools. An interactive training tool called VISITview (Whittaker 1999) was developed by the VISIT program. VISITview is a platform-independent distance learning and collaboration software that allows multiple users to view and manipulate the same series of pages containing images, animations, graphics and text.

Based on the extensive feedback received from the various NWS offices, the strength of the VISITview teletraining instructional approach is the ability to bring the instructor directly into the office and put them in touch with the students. The direct interaction between instructor and students establishes an active link that is difficult to achieve

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other than with face-to-face instruction. The benefits of this direct interaction and the savings in travel costs are well worth the effort involved with the teletraining approach.

2. VISITVIEW – A FLEXIBLE TELETRAINING TOOL

The VISITview teletraining software (www.ssec.wisc.edu/visitview/) is designed to provide instructors and students with a set of easy to use tools for creating, conducting and taking teletraining sessions. VISITview is Web-based, and can be used in two modes: with the data files located remotely on a central server or with these files residing on a local disk drive. In the latter case (where the files are available locally), only the VISITview commands are sent over the Web.

Because of the potential for network fluctuations or losing connectivity, the training sessions include batch files that make it easy to switch to a backup server machine (typically, one at CIRA and one at CIMSS are used).

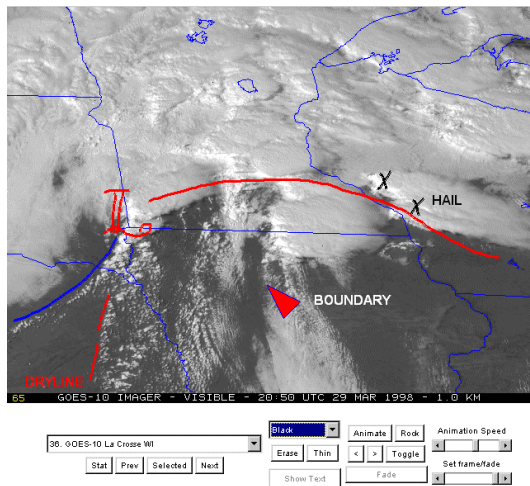


Figure 1 - VISITview panel from GOES Rapid Scan Operations training session showing instructor's annotations on a 640x480 pixel visible satellite image with the control menu displayed at the bottom.

The VISITview teletraining software (see display in Figure 1) provides the following functions:

- A complete set of animation controls
- Image zoom
- Multiple panel displays with animation
- Drawing tool with various color choices
- Erase previous drawing

- Add text
- Change enhancement or colorization of images
- Add/remove overlays
- Chat window
- Quiz questions with feedback
- View status of all session participants
- Recorded audio/video for future playback
- Open Browser with link to selected site
- Image combination with fade between images

A key aspect of VISITview teletraining sessions is that they can be run locally or remotely. The datasets are preloaded to students' workstations in advance of the session. Preloading the files avoids the delays caused by limited bandwidth when loading over the Web. The sessions can be controlled either locally or remotely, so they are suitable for both distance- and on-site learning applications. As can be seen from the list above, the VISITview tool provides instructors with an array of capabilities. Several of the VISITview functions were developed to emulate selected Advanced Weather Information Processing System (AWIPS) functions.

As the VISITview program evolves, additional techniques for distance collaboration are being developed. For example, one VISITview "session" was created and is available on-line at (<http://visit.cira.colostate.edu/vview/vmeast.html>) that uses the Regional and Mesoscale Meteorology Team (RAMMT) Advanced Meteorological Satellite Demonstration and Interpretation System (RAMSDIS) on-line database of real-time data. This approach encourages experimentation with distance collaboration, facilitates discussions of real-time weather events, and supports coordination among various offices. Another new feature is the ability to include recorded audio with the sessions. 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.

Ten to thirty teletraining sessions are given per month. These sessions cover a wide range of topics such as: Detecting Low-level Thunderstorm Outflow Boundaries At Night Using GOES, Detecting Boundaries with AWIPS, The Enhanced-V: A Satellite Severe Storm Signature, Diagnosing Elevated Mesoscale Ascent -The Midland TX Heavy Snow Event, GOES Sounder Data and Products, Mesoscale Analysis of Convective Weather Using GOES RSO Imagery, Lightning Meteorology, Using GOES Rapid Scan

Operations (RSO) in AWIPS, and Tropical Satellite Imagery and Products.

The procedures for signing up and taking a teletraining lesson are listed on the VISIT Web site. More information on all the teletraining sessions (Motta et. al. 2000) is available at: www.cira.colostate/ramm/visit/visithome.asp.

3. TELETRAINING – THE INSTRUCTORS

Instructors for the teletraining sessions are staff from CIRA, CIMSS and WDTB. The staff are both from the NOAA cooperative institutes and NOAA employees (NWS and NESDIS). Thanks to the flexibility of the VISITview teletraining approach, instructors can be located anywhere in the country or in the world. All the instructor needs to conduct a live teletraining session is a PC with a reliable Internet connection and a phone with a headset.

Given the ease of use of the VISITview approach, more instructors have become involved. Several NWS science and operations officers (SOOs) and lead forecasters have led and assisted with teletraining sessions. The SOOs and forecasters are located in offices across the country and in some National Centers. Staff in NWS Regional Headquarters have also developed and presented teletraining sessions. Instructors have participated from other programs such as the Numerical Weather Prediction PDS and at the Cooperative Program for Operational Meteorology, Education and Training (COMET®).

Teletraining sessions by these instructors were developed in coordination with VISIT/IST staff. The sessions cover a broad range of topics:

- An Application of Pattern Recognition to Medium Range Forecasting
- Applying Mesoscale Tools and Techniques to Predict and Detect Severe Thunderstorm Development
- Flash Flood Operations and Awareness Teletraining
- Forecasting Mesoscale Convective Systems
- GOES High-Density Winds
- HPC Medium Range Forecasting
- Precipitation Type Forecasting
- Top Ten Misconceptions about NWP Models
- Using AWIPS to Evaluate Model Initializations
- Using Near-Storm Environment Data in the Warning Decision Making Process

VISITview is being used for the World Meteorological Organization (WMO) Virtual

Laboratory for Training in Satellite Meteorology (Purdom and Mostek, 2001). VISITview sessions have been used for a workshop held in China, at a meeting at EUMETSAT in Germany and demonstrated at the Australian Meteorological Bureau in Melbourne.

As the information on VISIT teletraining continues to spread, the potential for more instructors to use VISITview for teletraining will continue to grow. The need for remote training and briefing tools is greater than ever as funds for travel continue to shrink.

4. TELETRAINING SESSIONS - RESULTS

From April 1999 through September 2001, the training provided by the IST PDS and VISIT program has resulted in the following:

- **373 sessions conducted on 25 topics**
- **More than 1850 offices trained**
- **6086 training certificates issued**

The 1850 offices trained is the total number of offices completing a session, and includes those cases where one office has participated in multiple sessions. 120 of 121 NWS forecast offices have participated! The NWS offices include the 115 locations in the CONUS, San Juan, Puerto Rico, 3 offices in Alaska region and 2 in Pacific region. The NWS National Centers, River Forecast Centers and Central Weather Service Unit offices have also participated along with a few other organizations (Navy, NESDIS and Canada's Atmospheric Environment Service). Beginning in late 2000, the VISIT teletraining program experienced a rapid rise in the number of sessions offered and the number of certificates issued (see Figure 2).

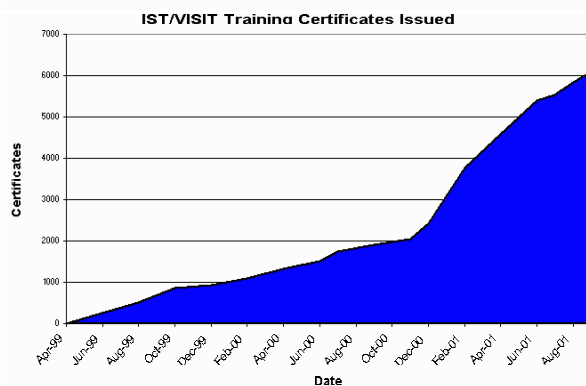


Figure 2 – Cumulative number of IST/VISIT training certificates issued from April 1999 through September 2001.

Evaluations for the teletraining sessions are sent via e-mail to all offices upon completion of the session and are also available on the Web. The large number of evaluations received is the result of an incentive. Upon receipt of the evaluation, training certificates are sent to all students that participated in the session. The linkage of the evaluation to the certificates helps to explain the large number of evaluations received and the large number (over 6000) of certificates. The evaluations provide some useful insights into the teletraining program:

- High quality graphics are a big plus
- Interactions between instructors and students are great
- Animations are very useful
- VISITview sessions are easy to install and use
- Make sure the training materials are at appropriate level of difficulty
- Scheduling is a challenge with 24/7 operations spanning several time zones, but it can be done
- Using phone conference call for audio works well but the audio quality and volume need to be monitored
- Overall, most agree that VISITview is an effective tool and teletraining works

Student feedback also is provided with the open-ended questions. This feedback has helped to improve the teletraining approach, the scheduling, the content and the delivery of the teletraining sessions.

5. SUMMARY

The National Weather Service training program has moved from the traditional classroom setting to an integrated distance learning approach to provide cost-effective training. Some of the training materials require an active component to allow the student to interact directly with an instructor. To meet this need, the IST PDS and VISIT programs have developed VISITview, a new teletraining tool that is flexible, platform independent, and extensible. VISITview allows for the expansion of teletraining functionality needed in today's environment of rapidly evolving technology and reduced travel.

The results of the first 2 1/2 years of teletraining by IST PDS and VISIT programs are:

- **373 sessions conducted on 25 topics**
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6. ACKNOWLEDGEMENTS

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