J2.4 SATELLITE EDUCATION AND TRAINING RESOURCES FOR THE FORECAST COMMUNITY: ADVANCES IN METEOROLOGICAL SATELLITE DATA AND APPLICATIONS

Patrick N. Dills* and Sherwood Wang

UCAR/COMET®, Boulder, Colorado USA

1. INTRODUCTION

The Cooperative Program for Operational Meteorology, Education and Training (COMET®) receives funding from NOAA NESDIS (National Environmental Satellite, Data and Information Service) and the NPOESS (National Polar-orbiting Operational Environmental Satellite System) Integrated Program Office (IPO) to specifically support education and training efforts in the area of satellite meteorology. Distance-learning technologies applied by COMET include CD-ROM based modules, Web-based training modules and Web casts, teletraining developed in conjunction with the NOAA/NWS VISIT (Virtual Institute for Satellite Integration Training) program, and courses that employ a "blended" distance-learning approach. Access to these resources is freely available via COMET's MetEd Web site (meted.ucar.edu).

2. SATELLITE EDUCATION AND TRAINING INITIATIVES

For COMET's partnership with NESDIS, the focus is on the integration of geostationary and polar-orbiting remote sensing data into operational applications and forecast processes by including examples and training in all COMET learning materials. COMET also provides updates and revisions to previously released satellite meteorology modules when sensor modifications or new capabilities come online.

The full exploitation of improved information from advanced research and operational global observing systems is contingent on strong education and training processes. For the NPOESS IPO, the COMET Program's focus is on highlighting and demonstrating the future capabilities and applications of the NPOESS system for operational forecasters and other user communities. COMET works closely with these user communities to stimulate greater utilization of both the training materials and current polar-orbiting satellite data observations and products.

* *Corresponding author address:* Patrick N. Dills, UCAR/COMET, 3450 Mitchell Lane, FL3, Boulder, CO 80301; e-mail: dills@ucar.edu.

To meet these goals, in addition to the Web-modules, teletraining sessions, Webcasts, and workshops, COMET maintains a Web-based information resource portal, the NPOESS Userport (meted.ucar.edu/npoess). The Userport Website provides links to polar-orbiting satellite multimedia learning resources and real-time data for forecasters, scientists, and the general public interested in learning more about the spacecraft, data processing, products, and applications.

3. DISTANCE LEARNING: MODULES AND WEBCASTS

COMET modules and Web casts combine the fundamental science behind meteorological phenomena and their observation with operationally relevant techniques to help forecasters in their operational duties. As the following example in Figures 1 to 4 from the Microwave Analysis of Tropical Cyclones module shows, relevant scientific background information on microwave radiative transfer in precipitating convective clouds is used to help explain the appearance of key cloud and storm structures in microwave imagery of tropical cyclones.

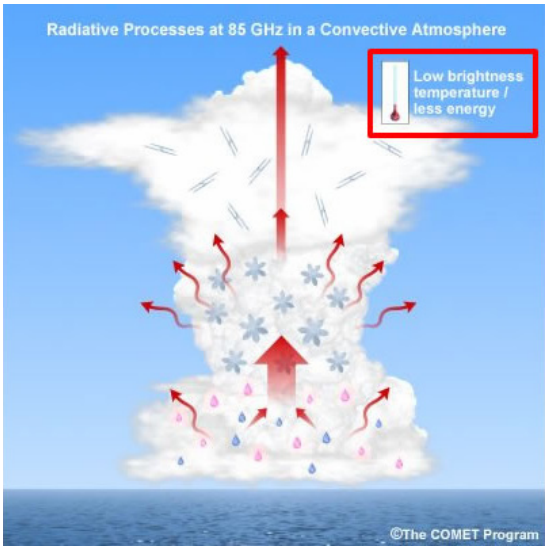

FIG. 1. Background Information: Radiative transfer processes at 85 GHz in deep convective clouds.

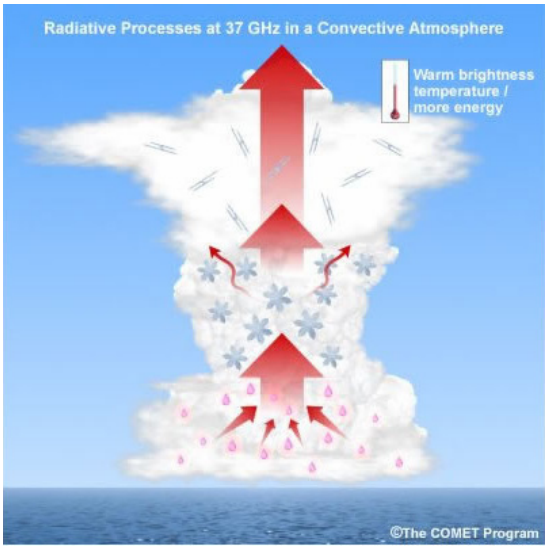

FIG. 2. Background Information: Radiative transfer processes at 37 GHz in deep convective clouds.

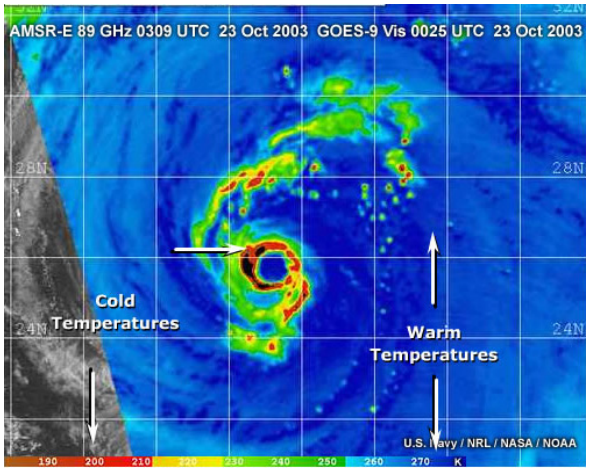

FIG. 3. Operational Information: AMSR-E 89 GHz channel image of Hurricane Parma taken 0309 UTC on 23 October 2003.

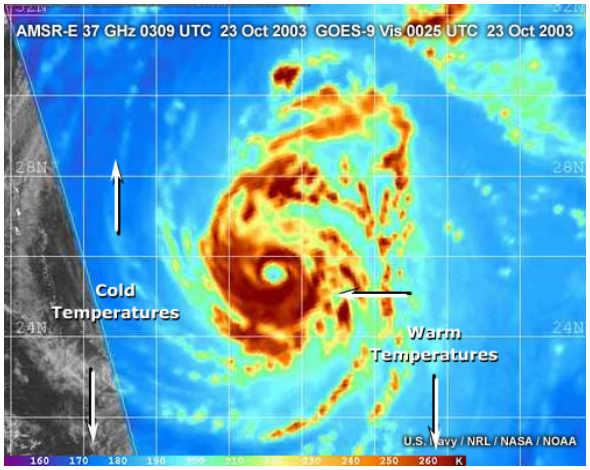

FIG. 4. Operational Information: AMSR-E 37 GHz channel image of Hurricane Parma taken 0309 UTC on 23 October 2003.

Another integral part of COMET's satellite training effort is the infusion of satellite data into the production process of all development teams. Each team looks for opportunities to highlight the application of operationally available satellite observations across diverse topics and communities of interest such as mesoscale meteorology, hydrology, northern latitude meteorology, marine meteorology, boundary layer meteorology, climate, fire weather, aviation weather, numerical weather prediction, and space weather.

Figures 5 and 6 highlight the ability of multispectral image compositing techniques to improve the detection of blowing snow and dust respectively. The composite shown in Figure 5 was produced from imagery taken by the NASA EOS Terra satellite's MODIS sensor and appears in the Blowing Snow: Baker Lake, Nunavut, Canada 04-10 February 2003 module.

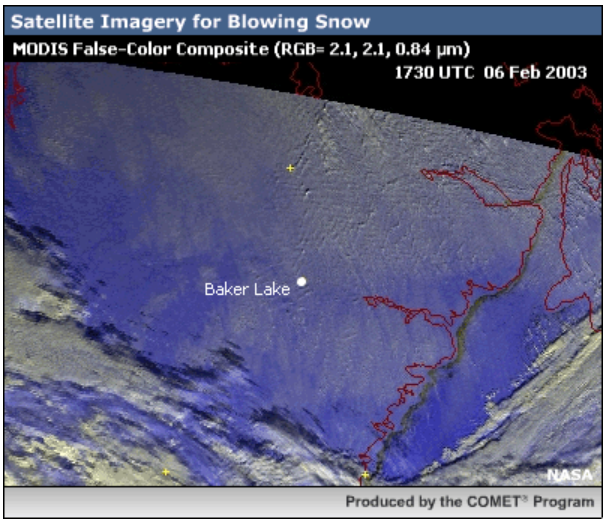

FIG. 5. Terra MODIS visible-shortwave infrared composite image of blowing snow over eastern Nunavut Province, Canada at 1730 UTC on 06 February 2003.

The two images shown in Figure 6 were also taken by the MODIS sensor and appear in the Dust Enhancement Techniques module. Notice how the composite product shown in the lower panel is able to distinguish areas of blowing dust from desert terrain that may otherwise be easily mistaken for blowing dust.

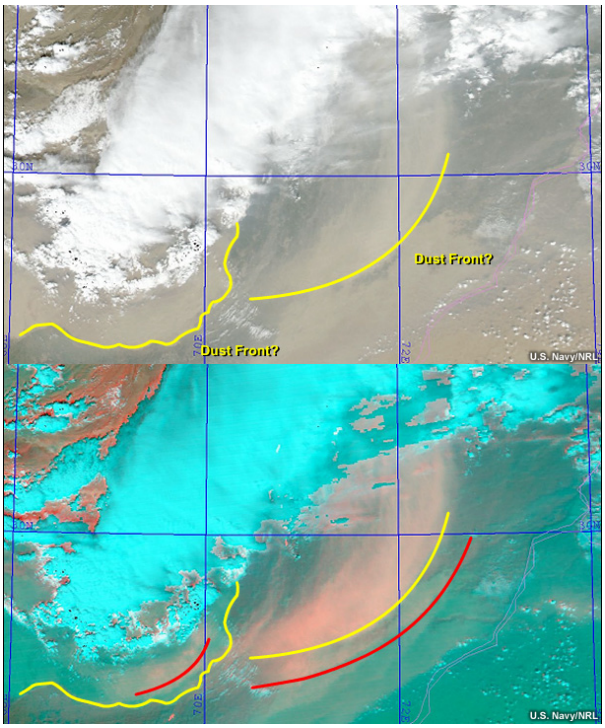

FIG. 6. Upper image is a MODIS true-color composite image taken over central Pakistan at 0850 UTC on 21 October 2002. Lower image is a false-color enhanced composite image for the same time constructed specifically for dust detection.

4. CONFERENCE PRESENTATION

The conference presentation will review COMET's ongoing satellite training efforts with an emphasis on newer satellite data and applications, as well as the preparations for the NPOESS system. Recent training modules and Webcasts will be highlighted, and attendees will be able to see the Userport Web site.

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