

1.10 DEVELOPMENT OF SATELLITE METEOROLOGY TEACHING MATERIALS FOR GRADES 7-12

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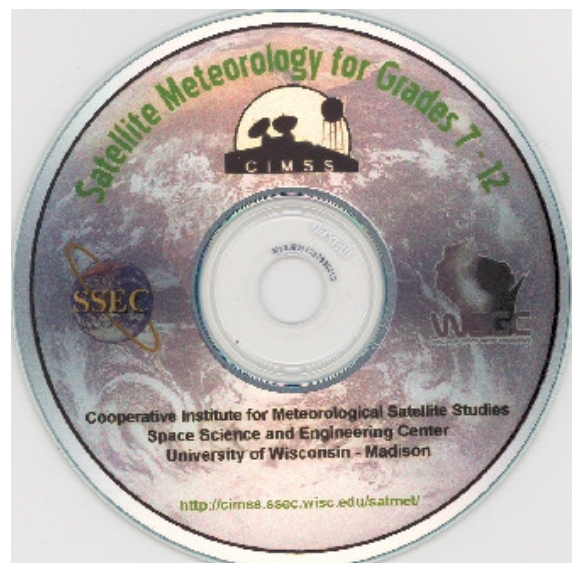
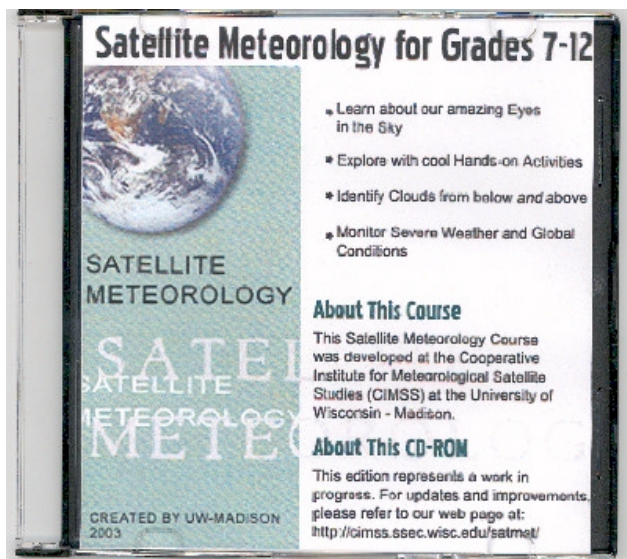
Satellite Meteorology provides scientists and educators with exciting tools for investigation, inquiry, analysis and stewardship. In 2002-2003, the Cooperative Institute for Meteorological Satellite Studies (CIMSS) used a Wisconsin Space Grant Consortium (WSGC) grant to re-cast a UW-Madison web-based undergraduate course in Satellite Meteorology to include materials more appropriate for middle and high school teachers and students.

CIMSS Director, Dr. Steven Ackerman and CIMSS Executive Director, Tom Achtor, gathered a small group of qualified individuals together to tackle this goal. The initial meeting consisted of Leanne Avila, CIMSS editor and web page designer, Jason Brunner, a CIMSS graduate student, and Margaret Mooney, Outreach Specialist and former NWS employee at the UW-Madison Space Science and Engineering Center (SSEC). We started off by distributing an electronic questionnaire to over one hundred science teachers in Wisconsin. With a 10% response rate some core messages were loud & clear:

- Stand-alone lessons are preferred
- The more hands-on activities the better
- Links to science standards are appreciated but **course quality** is more important

For our second meeting we invited a Madison high school teacher to join the team. Then we started writing and designing. Resources at CIMSS and SSEC were abundant. Additional resources used to augment the course content include numerous NASA (National Aeronautics and Space Administration) and NOAA (National Oceanic and Atmospheric Administration) web sites. The material was further enhanced using CIMSS Director Steven Ackerman's Meteorology text titled "Understanding the Atmosphere" (Ackerman & Knox, 2002) and CIMSS teaching applets.

Three parts comprise the course. The on-line portion is updated most frequently and is always available for reference, (<http://cimss.ssec.wisc.edu/satmet/index.html>) but the CD-ROM is considerably more convenient for educational purposes:



A teacher's guide with links to Wisconsin State Science Standards is available on all educators edition of the CD-ROM. Applicable National Science Standards are also being identified.

Memorial High School students tested the material as early as December, 2002 while the initial modules were being developed. Beta versions were later distributed at the AMS convention in February 2003. The first formal 1-hour workshop was presented at the Wisconsin

Society of Science Teacher Convention in March, 2003. This short presentation highlighted the extensive hands-on activities of the course with CD-ROMS distributed to all the teachers in attendance.

Participants were very enthusiastic about the style and content of the course material. They offered several suggestions, most of which have been incorporated. They were delighted with the *virtual shift* aspect of the cloud module where a ground-based picture of a certain

cloud type is immediately followed by visible and infrared images of the same cloud. The capability to simultaneously acquire satellite images and ground based photos of the same scene is uniquely possible at CIMSS.

Another one-hour workshop was presented at the Satellites & Education Conference XVI in March of 2003. Positive feedback from these presentations inspired a two-day Satellite Meteorology workshop for middle and high school teachers offered in July 2003. Sixteen teachers from four different states visited CIMSS to learn about satellite meteorology and our educational tools.

This workshop was a big success. Along with lectures on operational and research use of satellite images, the teachers worked through each module of our course and provided valuable feedback and recommendations for improvement. Nine teachers rated the experience as "excellent;" the rest choose the next best option of "very good."

The participants offered over 50 suggestions during the two-day workshop; most of these were incorporated into the course during the fall of 2003. The workshop will be offered on an annual basis with an option for continuing education college credit.

Our team has developed a growing network of science teachers around Wisconsin by conducting workshops and distance learning courses in earth and space science. We have engaged middle and high school teachers in curriculum review that has specific, documented evaluation objectives to acquire the needed feedback in preparation for distribution to schools. We found many opportunities within Wisconsin (and some out-of-state) to distribute the 1st generation of the curriculum as widely as possible. We have made several improvements based on educator's feedback. Our plan is to continue to build upon our initial successes, with the ultimate goal of national and international distribution through the investigators association with NOAA, NASA and the World Meteorological Organization.