

NESDIS Education and Outreach

**Center for Satellite Applications and Research (STAR)
Ken Pryor**

- **NESDIS outreach activity is geared toward education, training, and technology transfer:**
 - **Virtual Institute for Satellite Integration Training (VISIT)**
 - **Web-based tutorials**
 - **Student internships/mentorships**
 - **Presentation at primary and secondary schools, participation in science fairs, etc.**

Virtual Institute for Satellite Integration Training (VISIT)

- VISIT accelerates the transfer of research results based on atmospheric remote sensing data into weather service operations.
- This transfer is accomplished through the education of operational forecasters on the latest techniques to integrate remote sensing data, especially from satellite and radar.
- The education approach is based primarily on the use of distance education techniques (WEB-based, teletraining, computer-based modules).
- VISIT has provided over 15,000 person-hours of training since 1999. STAR continues to provide new training sessions in VISIT.

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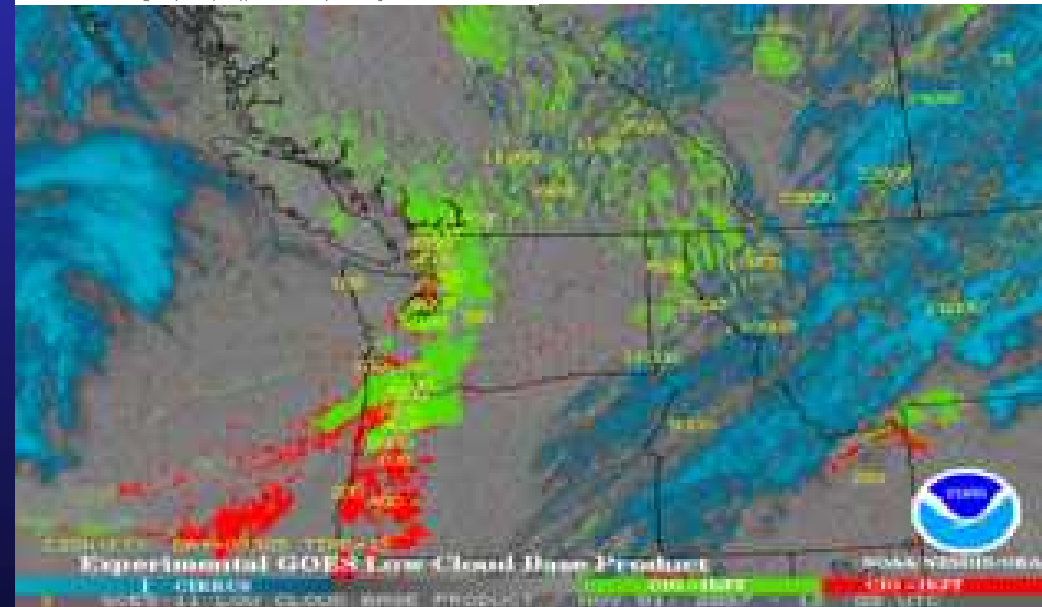
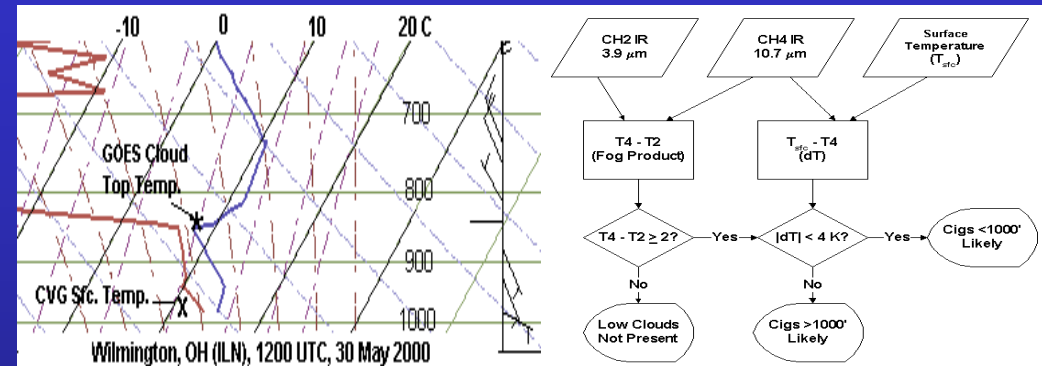
VISIT- STAR Contributors

- Mark DeMaria
 - An Overview of Tropical Cyclone Track Guidance Models used by NHC
 - Subtropical Cyclone Analysis with Satellite Data
- Ken Pryor
 - GOES Low Cloud Base Product
 - Forecasting Convective Downburst Potential Using GOES Sounder Derived Products
- Dan Lindsey
 - The GOES 3.9 mm Channel - Dan Lindsey
- Roger Weldon-
 - Cyclogenesis: Analysis utilizing Geostationary Satellite Imagery
- Robert Kuligowski
 - The Satellite Rainfall Hydro-Estimator

The GOES Low Cloud Base Product

Course Outline

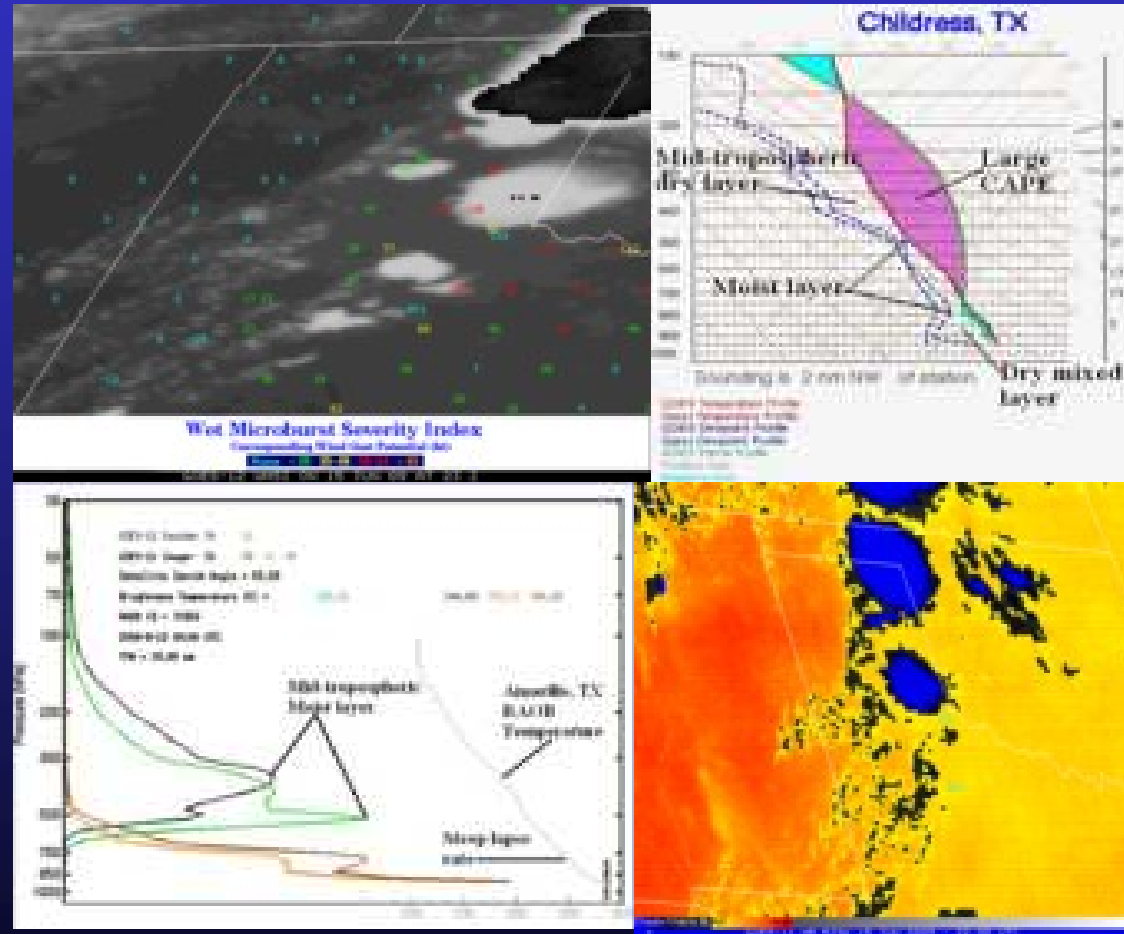
- Environmental conditions
- Detection of low clouds
- Determination of low ceilings
- Case studies/prediction exercises
- Summary



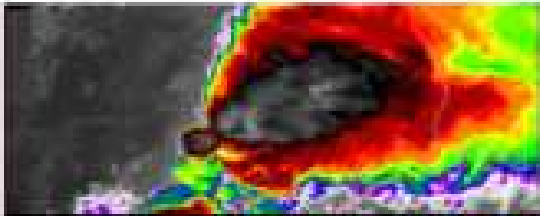
Forecasting Convective Downburst Potential Using GOES Sounder Derived Products

Course Outline

- Introduction to Convective Downbursts
- Description of the GOES Microburst Products
- Case Studies/Microburst Prediction Exercises
- Use of the GOES Microburst Products with Other Satellite Data



Web Tutorials



Basics of Remote Sensing from Satellite

In this tutorial, we will be describing the basics of how to interpret the satellite imagery that is available on the internet from many sources. We start out in chapter 1 by describing the basic partitioning of solar radiation into energy in the atmosphere, such as absorption and reflection. From there, we will go into the concept of emissivity and how that helps in the interpretation of satellite imagery. In chapter 2, we go into detail on why satellite have continuously improved in specific regions in the electromagnetic spectrum, so that various aspects of the Earth's atmosphere can be detected. Chapter 3 concludes the tutorial by introducing the concept of calibration and discussing the various types of calibrations that improve the viewing quality of a satellite image.

Table of Contents

1. Partitioning of radiation.
2. Emissivity.
3. Satellite imagery and the atmosphere.
4. Calibration issues.
5. Summary.
6. Bibliography.

This tutorial was developed by Jim Lader in 1994-95 and Ken Pryor in 2001-03.
For information, contact:
Ken Pryor
NOAA/STAR Operational Products Development Branch
Room 312, 581 SA, Silver Spring
Camp Springs, MD 20746
Phone: (301)763-8334

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<http://www.star.nesdis.noaa.gov/smcd/opdb/tutorial/intro.html>

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STAR Student Mentorship

- Since 2006, STAR has hosted seven mentorship students from Thomas Jefferson High School for Science and Technology, Alexandria, Virginia
- Mentorship program includes completion of an in-depth research project on a topic selected by both the mentor and the student:
 - Completion of a scholarly paper
 - Completion of a seminar presentation
 - Completion of a poster presentation
- Mentorship program entails directed/guided research by a STAR scientist to assist the student in completion of a senior research requirement. High quality research contributes to both the STAR mission and educational objectives of TJHSST.

STAR Student Bibliography

- Matson, E.M., 2006: The Effect of the 12-micrometer Band: Comparing GOES-11 and GOES-12 Data Using the 3-Channel Volcanic Ash Algorithm. arXiv:physics/0608254v1 [physics.aop-ph]
- Mason, D., 2007: Investigation of Convective Downburst Hazards to Marine Transportation. arXiv:physics/0701230v1 [physics.aop-ph]
- Nagirimadugu, A., 2007: An Initial Assessment of a Clear Air Turbulence Forecasting Product. arXiv:0708.3362v1 [physics.aop-ph]

The NOAA Environmental Visualization Lab

Mission: To enhance the understanding of the Earth and NOAA by providing scientific data visualizations to the media, educators, and the public.

Goal 1: Promote the visibility of NOAA science.

Goal 2: Create a diverse portfolio of data visualizations spanning topics that complement the breadth of NOAA's scientific activities.

Goal 3: Develop products in partnership with external media and educational groups to ensure the effective use of NOAA products and science.

Implementing the Strategy

- Vis Lab website with daily images, videos, posters, etc.
- Resources for all NOAA Lines



- Average ~100 products released to media per year
- Regular clients include CNN, BBC, Discovery, ABC, Nat Geographic



- SOS Network
- Provided resources to over 15 museums since FY06



- YouTube Channel with over 225 subscribers—2nd highest in NOAA



The new NOAA Vis Lab website

Streaming video

Daily images

High definition downloads

Extensive exportable database

NOAA NATIONAL ENVIRONMENTAL SATELLITE DATA AND INFORMATION SERVICE

NOAA ENVIRONMENTAL VISUALIZATION LABORATORY

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EL NIÑO RETURNS
CLIMATE CYCLE WILL AFFECT U.S. WEATHER PATTERNS

TOP ANIMATIONS

HURANS IMPACT THE OCEAN
EL NIÑO RETURNS IN JULY 2009
OCEAN ACIDIFICATION IMPACTS ...
AFRICAN DROUGHTS
THE DEAD ZONE
MORE ANIMATIONS...

RECENT IMAGES

Daily Imagery July 22, 2009
Shower and thunderstorm activity east of the Southeastern Coast of the United States.

Full Solar Eclipse over China from MTSAT
This image was taken from the Japan Meteorological Agency's MTSAT-1R geostationary environmental satellite on July 22, 2009. The image shows the longest solar eclipse of the century darkening south China.

Daily Imagery July 21, 2009
Thunderstorm activity has increased in several areas of the Atlantic with high concentrations in the northern Bahamas and in association with a tropical wave in the Caribbean near Puerto Rico. Upper level winds remain unfavorable for tropical storm development. This image combines water vapor and visible (more...)

Daily Imagery July 20, 2009
A low pressure system producing showers and storms over parts of the Eastern Seaboard.

DAILY SATELLITE IMAGE

LAT/LON: 45N 01W ON 12 MAR 13:45Z

SEARCH
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Center for Satellite Applications and Research (STAR)
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NOAA's source for
television and multi-
media content



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Visualization activities across NOAA with the Lab



- Daily satellite images
- Support of NOAA's media requests
- Development of visualization productions that highlight satellite science
- Support of the Smithsonian Ocean Hall



- Developing enhanced capability to process, visualize, and store high resolution data
- New visualization techniques and more diverse topics to enhance public understanding of Earth sciences.
- Collaborating and expanding the Lab throughout the NOAA Line Offices



- Daily images/animations for NOAA and Climate Watch
- Visualization of 3-D observation and model data
- Interactive exploration of data visualizations online
- SSMC Science on a Sphere development

Challenges

- To increase awareness of NESDIS/STAR research activity:
 - Provide student access to research and education resources, new/experimental satellite products
- Need to implement more informal means of communication:
 - Weblogs (Blogs)
 - Social Networking sites (i.e. Facebook, Twitter)
 - User friendly access to NESDIS/STAR products, research, and education resources