C I C S - M D
Cooperative Institute for Climate and Satellites

BACKGROUND

The Cooperative Institute for Climate and Satellites (CICS) is a multi-institution partnership led by the University of Maryland at College Park (UMCP) and engaged in collaborative research with several Centers and Laboratories of the National Oceanic and Atmospheric Administration (NOAA). CICS comprises two main research centers, one at the University of Maryland (CICS-MD) and the other in Asheville, NC which is administered by North Carolina State University (CICS-NC). The CICS Consortium includes another 15 institutions as partners, including academic, non-governmental, and private research enterprises. Phil Arkin is the Executive Director of CICS with Hugo Berbery as the CICS-MD Director. CICS-NC is in the able hands of its Director, Otis Brown.

VISION

CICS performs collaborative research aimed at enhancing NOAA's ability to use satellite observations and Earth System Models to advance the national climate mission, including monitoring, understanding, predicting and communicating information on climate variability and change.

MISSION

CICS conducts research, education and outreach programs in collaboration with NOAA to:

- Develop innovative applications of national and international satellite observations and advance transfer of such applications to enhance NOAA operational activities;
- Investigate satellite observations and design information products and applications to detect, monitor and understand the impact of climate variability and change on coastal and oceanic ecosystems;
- Identify and satisfy the satellite climate needs of users of NOAA climate information products, including atmospheric and oceanic reanalysis efforts;
- Improve climate forecasts on scales from regional to global through the use of satellite derived information products, particularly through participation in the NOAA/NWS/NCEP Climate Test Bed;
- Develop and advance regional ecosystem models, particularly aimed at the Mid-Atlantic region, to predict the impact of climate variability and change on such ecosystems; and
- Establish and deliver effective and innovative strategies for articulating, communicating and evaluating research results and reliable climate change information to targeted public audiences.

DIRECTOR'S MESSAGE

After one year as CICS-MD Associate Director, on July 1st I will take over as CICS-MD Director. During my first year at the Institute I had the opportunity to meet a dedicated group of scientists and supportive administrative staff. I feel privileged to be a part of this Institute. Words are not enough to express my gratitude to Phil Arkin, the outgoing Director. Phil's deep knowledge of the operation of a Cooperative Institute has helped me understand many of the key aspects needed for a smooth operation. Phil will continue to oversee the whole functioning of CICS as Executive Director.

CICS-MD has been growing steadily and we have developed new partnerships with NOAA groups to increase our contributions to NOAA's Mission. While we consolidate our current activities, we feel that we can continue to grow doing research in the three main research areas of the institute (see back page for their description), while promoting our Outreach and Capacity Building initiatives. By reaching out to undergraduate and graduate students we will be able to train and make young scientists aware of NOAA's priorities.

The building that will house the NOAA Center for Weather and Climate Prediction is finished and ready to receive its tenants, among them, the Center for Satellite Applications and Research (STAR), the National Centers for Environmental Prediction (NCEP), and the Air Resources Laboratory (ARL). We welcome our partners and neighbors at the University of Maryland Research Park. Their relocation at such a close distance will undoubtedly enhance the prospects for strengthening our collaborations.

I look forward to the opportunities and challenges of leading CICS-MD in this new environment. With my best regards,

Hugo Berbery

E. Hugo Berbery,
CICS-MD Director as of July 1, 2012

Phil Arkin,
CICS Executive Director

NOAA SPONSORS

- Center for Satellite Applications and Research (STAR)/National Environmental Satellite, Data and Information Service (NESDIS)
- Climate Prediction Center/National Centers for Environmental Prediction/National Weather Service
- National Climatic Data Center/NESDIS
- National Oceanographic Data Center/NESDIS
- Air Resources Laboratory/Office of Oceanic and Atmospheric Administration

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RESEARCH THEMES

Theme 1: Climate and Satellite Research and Applications incorporates the development of new observing systems, or new climate observables from current systems.

Theme 2: Climate and Satellite Observations and Monitoring focuses on: (a) development and improvement of climate observables from current systems, and (b) development of all continental and global fields of climate parameters that can be used for climate analysis and climate model initialization.

Theme 3: Climate Research and Modeling is the research component that brings together (a) climate observables, modeling and validation in a comprehensive integrated whole, and (b) observational products with model development efforts to enable research into the improvement of forecasts of climate system variability on space scales ranging from regional to global, and time scales from a week or two to centuries.

CICS Support of the CHUVA Field Campaign in Brazil

Scott Rudlosky (STAR/SCSB) and Visiting Scientist Rachel Albrecht (CICS) traveled to São Paulo, Brazil during October 2011 to help install a Lightning Mapping Array (LMA) in support of the CHUVA field campaign. CHUVA is a Brazilian-led field component of the Global Precipitation Measurement (GPM) mission that will investigate distinct precipitation regimes in Brazil using a series of regional IOPs. The GOES-R Program is leveraging the observing assets associated with the CHUVA São Luiz do Paraitinga IOP by supplying a portable LMA network that will be used to generate proxy data for the future Geostationary Lightning Mapper (GLM). Rudlosky and Albrecht are currently helping to insure that the GOES-R program fully leverages the wealth of observing assets deployed for the CHUVA campaign.

(http://essic.umd.edu/joom2/index.php/news/featured-at-essic/955-rudlosky-lightning).
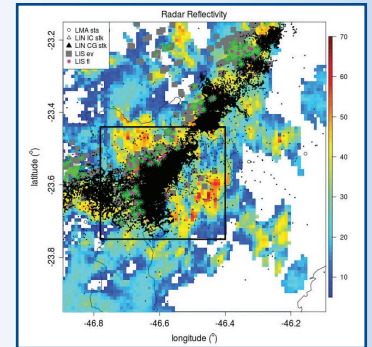
Coral Reef Temperature Anomaly Database:

There is broad scientific consensus that global-scale stressors are partially responsible for the decline of coral reefs (eg., Aronson et al., Science, v302, 2003; Harvell et al., Science, v285, 1999). One likely candidate is an increase in SST in much of the tropics. Yet the total number of reefs that have experienced an increase in the frequency or magnitude of thermal stress is still unknown, and the spatial and temporal patterns of coral reef temperatures and how these relate to broader climate change have only begun to be investigated. To address these gaps in understanding, the National Oceanographic Data Center in partnership with UNC developed a unique Coral Reef Temperature Anomaly Database (CoRTAD) in 2008. The CoRTAD has been enhanced by Gregg Foti of CICS and now uses Pathfinder Version 5.2 SSTs to quantify thermal stress patterns on the world's coral reefs between November 1981 and December 2010.

*Figure shows harmonic mean SST from 11/1981 through 12/2012. Units are °C * 100.*
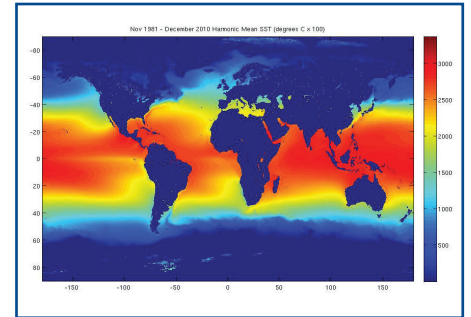
GOES-R Proving Ground Activities

The Geostationary Operational Environmental Satellite R-Series (GOES-R) Proving Ground is a collaborative effort between the GOES-R Program Office and NOAA Cooperative Institutes, Weather Forecast Offices, NCEP National Centers, and Testbeds. The Proving Ground is a project in which simulated GOES-R products can be tested and evaluated before the GOES-R series of satellites are launched. Simulated GOES-R products are generated using combinations of currently available GOES data, along with higher resolution data provided by instruments on polar-orbiting satellites such as the Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Aqua and Terra satellites as well as model synthetic satellite data.

The Proving Ground just finished evaluating the Red Green Blue (RGB) Airmass imagery. This product provides additional value as a compliment to current satellite imagery by identifying features such as stratospheric intrusions, potential vorticity anomalies, and baroclinc zones. CICS scientist, Michael Folmer has developed training specific to aid Ocean Prediction Center (OPC) forecasters in identifying systems that undergo explosive cyclogenesis in the North Atlantic. The Hydrometeorological Prediction Center (HPC) forecasters have been introduced to this product to assist in identifying potential vorticity anomalies that could instigate heavy precipitation events. The Precipitation desk at NESDIS Satellite Analysis Branch has been evaluating how well the imagery can identify areas of potential heavy precipitation. Forecasters are very engaged in the Proving Ground activities and look forward to evaluating and using future GOES-R products in operations.

The Spinning Enhanced Visible Infra-Red Imager (SEVIRI) RGB Airmass image above shows a hurricane-force extratropical cyclone in the North Atlantic that OPC was issuing advisories and forecasts for on February 3, 2012. The wind barbs are from the Advanced Scatterometer (ASCAT) instrument which shows a 65 knot wind barb highlighted by the yellow circle.