Weekly Report – April 11, 2025

Cooperative Institute for Satellite Earth System Studies (CISESS)

NOAA/NESDIS/STAR

Submitted by: Maureen Cribb
Email: mcribb@umd.edu
Phone: 301-405-9344

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TRAVEL AND MEETING REPORTS

RGBs and Weather: U.S. National Centers

On 1 April 2025, CISESS Scientist and Satellite Liaison to the NWS Weather Prediction Center (WPC) and Ocean Prediction Center (OPC), Christopher Smith, presented at the Red-Green-Blue (RGB) Developers Workshop. Smith presented on RGB satellite composites that are used at NWS WPC and OPC to highlight weather phenomena of interest. Data gaps were also addressed, such as the need to develop an RGB composite that can detect low-level moisture to better predict convective initiation. A goal of the RGB Developers Workshop is to create standardized RGB recipes for the global meteorological community to use for a consistent workflow in using satellite imagery for weather forecasting. RGB recommendations made during the workshop will be made available by the World Meteorological Organization.

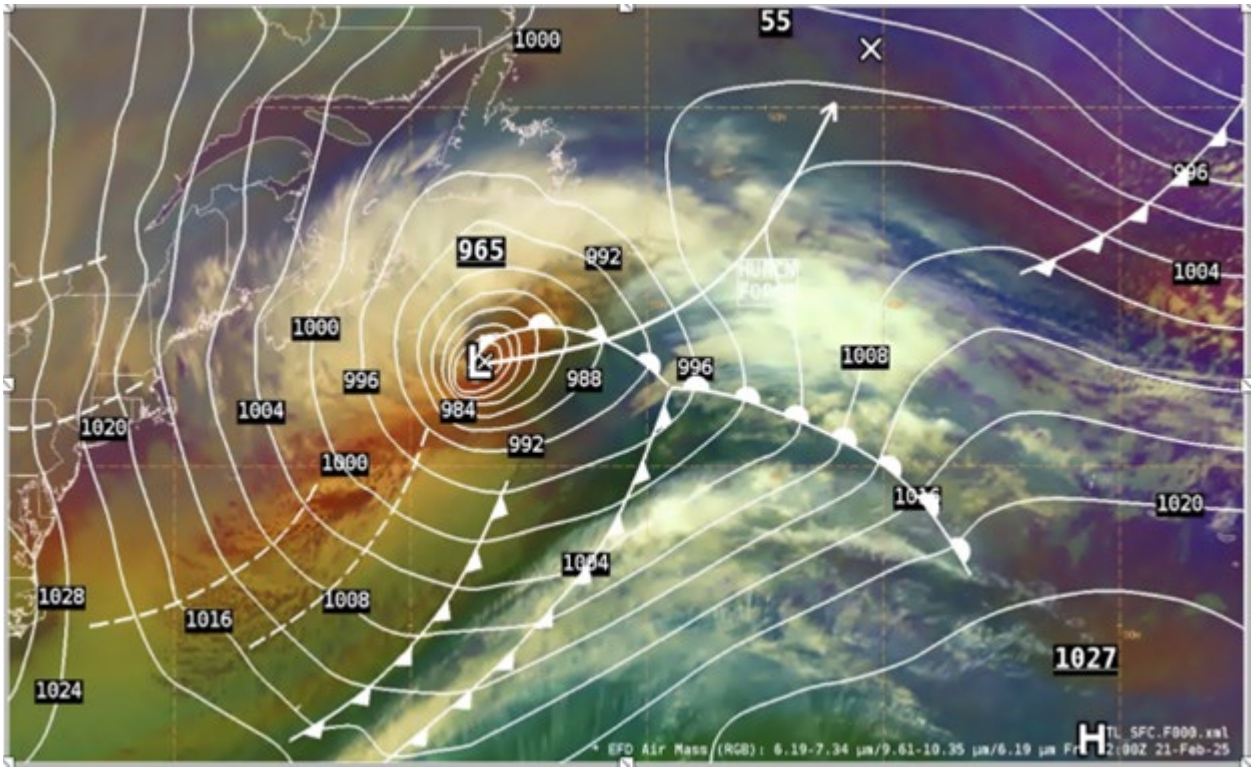

Figure. GOES-East Airmass RGB imagery overlaid with the OPC Surface Analysis valid at 1200 UTC 21 February 2025, highlighting the application of one of OPC's most used RGBs. This image was exported from the Advanced Weather Information Display System.

(Christopher Smith, CISESS, csmith70@umd.edu; Funding: JPSS PGRR)

TRAINING AND EDUCATION

Learning About How to Use Satellite Data to Monitor Coastal Water Characteristics
CISESS Scientist Ron Vogel taught a week-long class for water quality management professionals entitled "Viewing and Analyzing Ocean/Coastal Events and Water Quality Using Satellites". The class aimed to expand the use of oceanographic satellite data for monitoring conditions in coastal areas, such as toxic algal blooms and water clarity that affect human health, the aquaculture industry, tourism, and recreation.

Vogel, teaching with colleagues at NOAA CoastWatch, offered the class in two tiers, so participants could have the flexibility to gain the skills most relevant to incorporate satellite data into their work. Tier I introduced participants to data visualization tools, such as ArcGIS, the NOAA CoastWatch Data Analysis Tool, and NOAA's online Environmental Research Division's Data Access Program data visualization server. In Tier II, participants learned to work more programmatically and analytically with satellite data and worked on a mini research project, drawn from their own work, which they presented at the end of the course.

Tier I was attended by 45 participants, with 20 continuing to Tier II. Participants came from a range of federal and state agencies, including the U.S. Coast Guard, NOAA, the Connecticut Bureau of Aquaculture, the Connecticut Department of Energy and Environmental Protection, and the New York State Department of Environmental Conservation. There were also participants from universities, including the City College of New York, the University of Maryland Center for Environmental Science, and Oregon State University.

A feedback survey highlighted an increase in participants' confidence and likelihood of using satellite data following the course. One class member shared this overall comment: "Going through this course has been an incredibly valuable opportunity! The course gave me a baseline understanding of satellite data and how to access, display, and analyze it. I am excited to incorporate satellite data into my projects!"

As a CISESS Scientist, Vogel works with NOAA colleagues to apply the nation's satellite observations to society's economic, health and safety needs, thereby maximizing the nation's investment in satellite resources.

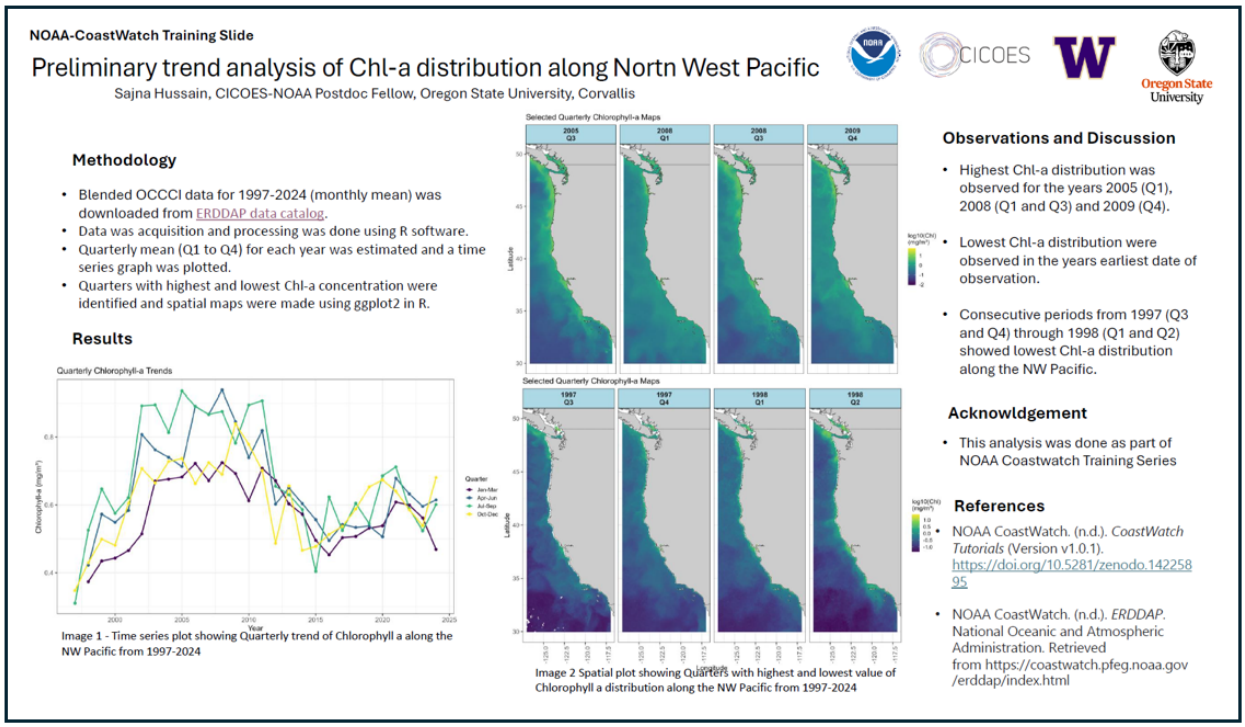

Figure. A participant's Tier II data analysis project to monitor changes in chlorophyll-a (Chl-a) in the Pacific Northwest using temporal trends and spatial distributions.

(Ron Vogel, CISESS, vogelr@umd.edu; Funding: ORS)

PUBLICATIONS

Incorporating Satellite Data into the Assessment of Recovery from Natural Disasters
Citation: Cao, Changyong, **Wenhui Wang**, **Yan Bai**, **Xi Shao**, **Sirish Uprety**, and Hong-Lie Qiu, 2025: Combined use of satellite observations and the RIM for assessing recovery from natural disasters. *Photogramm. Eng. Remote Sens.*, https://doi.org/10.14358/PERS.24-00050R2.
Summary: The Resilience Inference Measurement (RIM) model was developed to quantify resilience to natural disasters like fires and hurricanes for 52 counties along the northern Gulf of America in the United States, using socioeconomic information collected over years or decades. As a complement to the RIM model, CISESS Scientists Changyong Cao, Wenhui Wang, Yan Bai, Xi Shao, and Sirish Uprety and colleague introduce an approach that integrates observations from several satellite platforms so that a recovery assessment can be made with a shorter latency of days, weeks, or months. These observations include NOAA Visible Infrared Imaging Radiometer Suite (VIIRS) observations and VIIRS-observed night light intensity by the Day/Night Band and the urban greenness index from the imagery bands. They demonstrate the usefulness of their approach in interesting analyses of the aftermaths of the Maui Lahaina fire in 2023 and hurricanes along the Gulf. They conclude that satellite assets are a valuable

contribution to the comprehensive assessment of recovery within the framework of the RIM model.

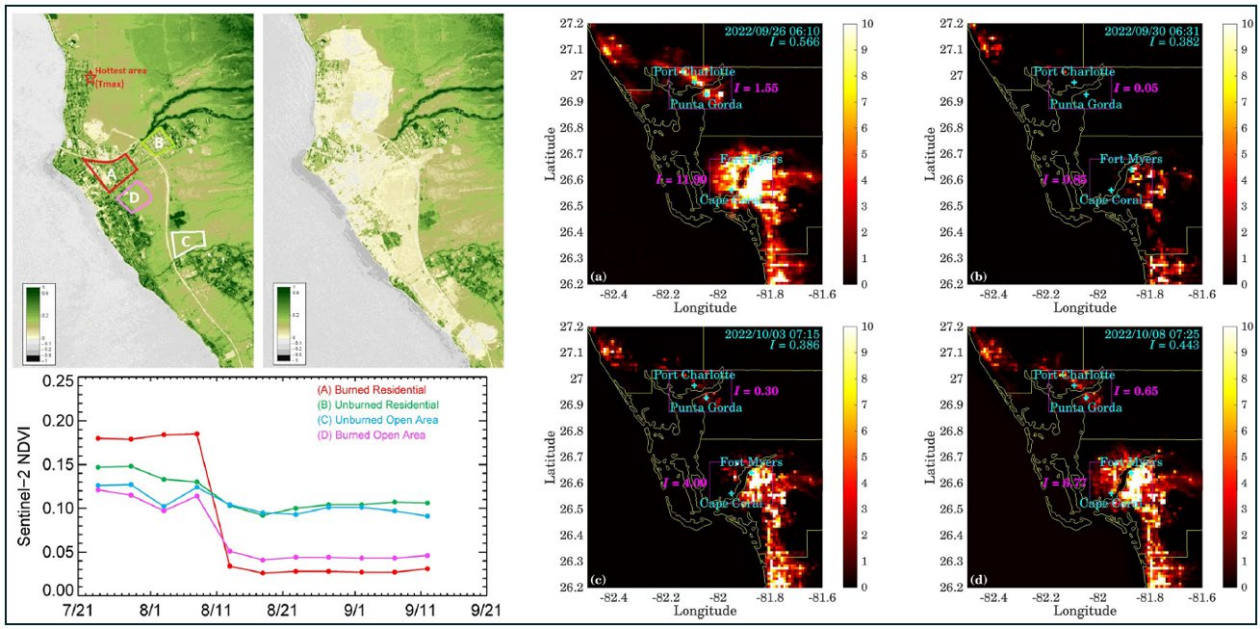

Figure. (Left) Lahaina fire. Top panels show the change in urban greenness before (left) and after (right) the fire. The bottom panel shows the normalized difference vegetation index (NDVI) time series for selected areas from Sentinel-2. (Right) Fort Myers, Florida area before and after Hurricane Ian (2022), showing the spatial extent of power outages from Day/Night Band radiance data. Upper left: before landfall; upper right: after landfall; bottom row: during recovery.

(Wenhui Wang, CISESS, whwang1@umd.edu, Funding: JSTAR; Yan Bai, CISESS, yan.bai@noaa.gov, Funding: JSTAR; Xi Shao, CISESS, xshao@umd.edu, Funding: COSMIC 2, JSTAR, STAR; Sirish Uprety, CISESS, sirish.uprety@noaa.gov, Funding: JSTAR)

(Maureen Cribb, CISESS, mcribb@umd.edu, Funding: CISESS Task I)