Weekly Report – April 25, 2025

Cooperative Institute for Satellite Earth System Studies (CISESS)

NOAA/NESDIS/STAR

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Date of Submission: 25 April 2025

HIGHLIGHTS FOR NESDIS LEADERSHIP

People

CISESS Scientists Jiang and Zhang Recognized by the NCEI

Certificates of Appreciation were handed out to CISESS Scientists Liqing Jiang and Yongsheng Zhang "for going above and beyond to support the mission of NCEI during the Hurricane Helene recovery time period". Both scientists "sprang into action in the immediate aftermath of Hurricane Helene to minimize impacts to NCEI's digital archives", ending with "your dedication serves as an inspiration to all." Congratulations to Liqing and Yongsheng!

(Liqing Jiang, CISESS, liqing.jiang@noaa.gov, Funding: NCEI; Yongsheng Zhang, CISESS, yongsheng.zhang@noaa.gov, Funding: NCEI)

CISESS Seed Project: Wildfires and Human Health

Wildfire events generate an enormous amount of smoke, ejecting a combination of gases and particulate matter into the atmosphere that can travel long distances. Wildfire smoke poses a number of risks, from visibility concerns for aviation to human health impacts. At-risk members of the population, such as the elderly, infants, and young children, are more vulnerable during smoke events. One of this year's CISESS Seed Projects, led by CISESS Scientist Evan Ellicott, is focused on developing a wildfire smoke early-warning system using Earth observations,

modelled data, and ground measurements to enable the timely deployment of clinical support resources to high-risk areas in Maryland. Smoke from the Summer 2023 Canadian wildfires created serious air quality issues across the eastern United States, suggesting the need for this kind of tool. The web dashboard will offer real-time situational awareness of fire and smoke activity in North America and will allow users to subscribe to receive notifications via text or email when a smoke event is imminent.

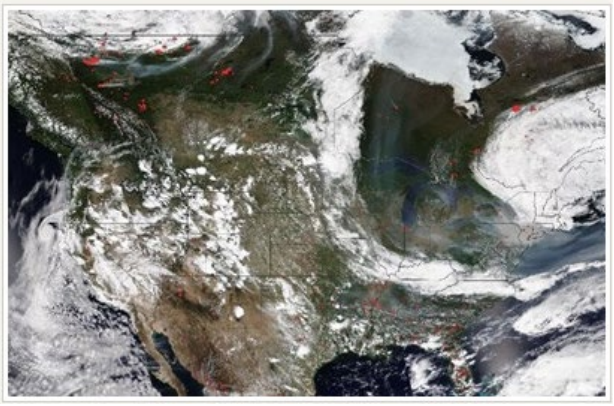

Figure: Long-range transport of Canadian wildfire smoke to the central and eastern United States: active fire points and smoke plume observed from NOAA-20 VIIRS on 7 June 2023. © NOAA Satellites

(Evan Ellicott, CISESS, ellicott@umd.edu, Funding: DRSA)

SOCIAL MEDIA AND BLOG POSTS

Winds Sweep Across Eastern Canada

It was “blowin’ a gale” yet again in the Canadian province of Newfoundland (and Labrador) at the beginning of this week. Fondly called “The Rock” for good reason, a late-season strong frontal system swept across the northeast U.S. and headed out to sea, battering the island with high winds along the way. This was the most recent storm described by Chris Smith, CISESS Satellite Liaison to the National Weather Service Weather and Ocean Prediction Centers, in one of his latest blog posts. Overpasses by different satellites carrying scatterometers and synthetic aperture radars measured sustained winds between 55 and 72 mph, whipping up the sea surface to wave heights of more than 21 feet. Swaths of sea spray even developed into cloud streets over Nova Scotia. More imagery from different satellite platforms, useful to weather forecasters, are featured in the post.

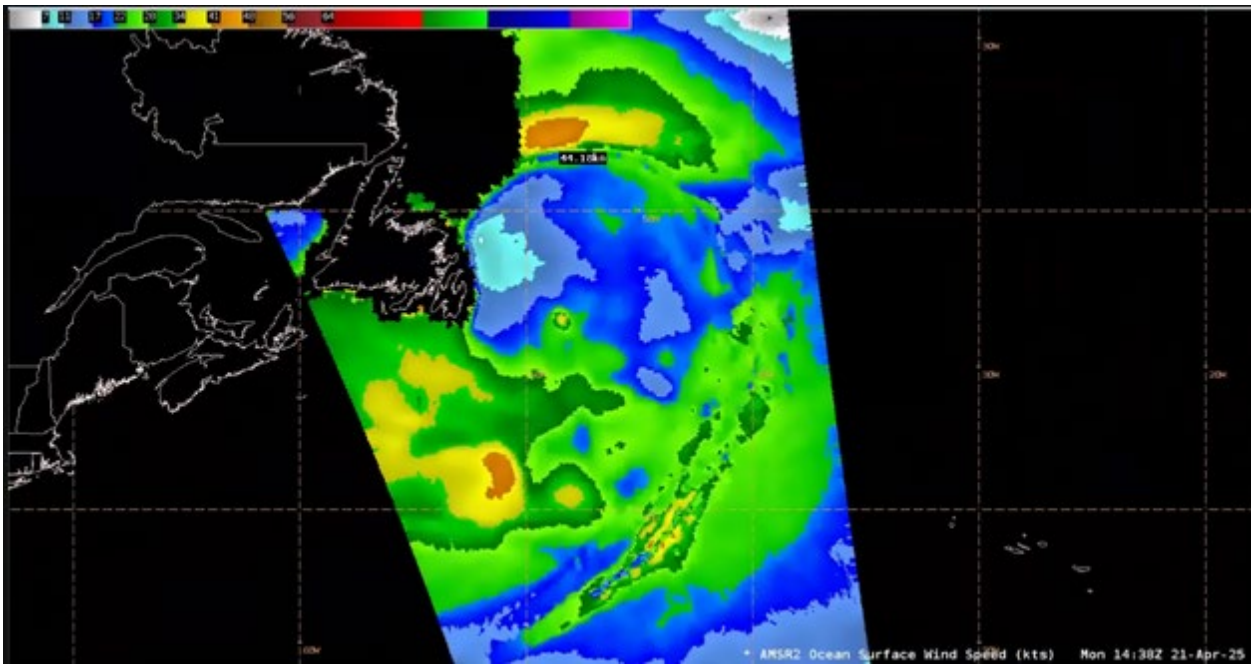

Figure: Global Change Observation Mission – Water Advanced Microwave Scanning Radiometer 2 ocean surface wind speeds (in knots) at ~1438 UTC 21 April 2025.

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

PUBLICATIONS

Oyster Aquaculture in the Chesapeake Bay
Citation: Bricker, Suzanne, Varis Ransibrahmanakul, Katherine Okada, Eric Davenport, Renee Karrh, **Ronald L. Vogel**, Travis Briggs, and Michelle C. Tomlinson, 2025: Evaluating satellite data products and state monitoring data as substitutes for on-farm data for oyster aquaculture modeling. *J. Shellfish Res.*, 44(1), 105-123, https://doi.org/10.2983/035.044.0110.
Summary: Many waterbodies in the U.S. and elsewhere experience eutrophication primarily caused by nutrient pollution arising from human-related activities like nitrogen and phosphorus discharges. Chesapeake Bay is one such waterbody that is highly polluted this way. Over the past couple of decades, researchers have investigated bivalve shellfish aquaculture as a way of improving water quality, given that shellfish, such as oysters, filter out these kinds of chemicals from the water. Models exist that can predict oyster harvest and the amount of nutrients that can be removed from the water, using chlorophyll-*a* concentration and other water quality parameters as input. However, at least a year's worth of such input data is needed for simulations, and in-situ monitoring of water quality at oyster farms can be costly, estimated at ~$7,700 per sampling station per year. In a paper published in the *Journal of Shellfish Research*, CISESS Scientist Ron Vogel and colleagues assess whether satellite data products and water

quality data collected routinely by the Maryland Department of Natural Resources (MDDNR) can replace on-site measurements taken at oyster farms as input to an oyster harvest model. Two oyster-farm study sites in the Maryland part of the Chesapeake Bay were chosen: Chester River and North Tangier Sound. Vogel reports that there were no significant differences in on-farm and MDDNR chlorophyll-*a* concentrations nor between on-farm and satellite chlorophyll-*a* concentrations at either of the oyster-farm study sites. These results suggest that both MDDNR and satellite chlorophyll-*a* data can be substituted for on-farm project specific data, saving time and money.

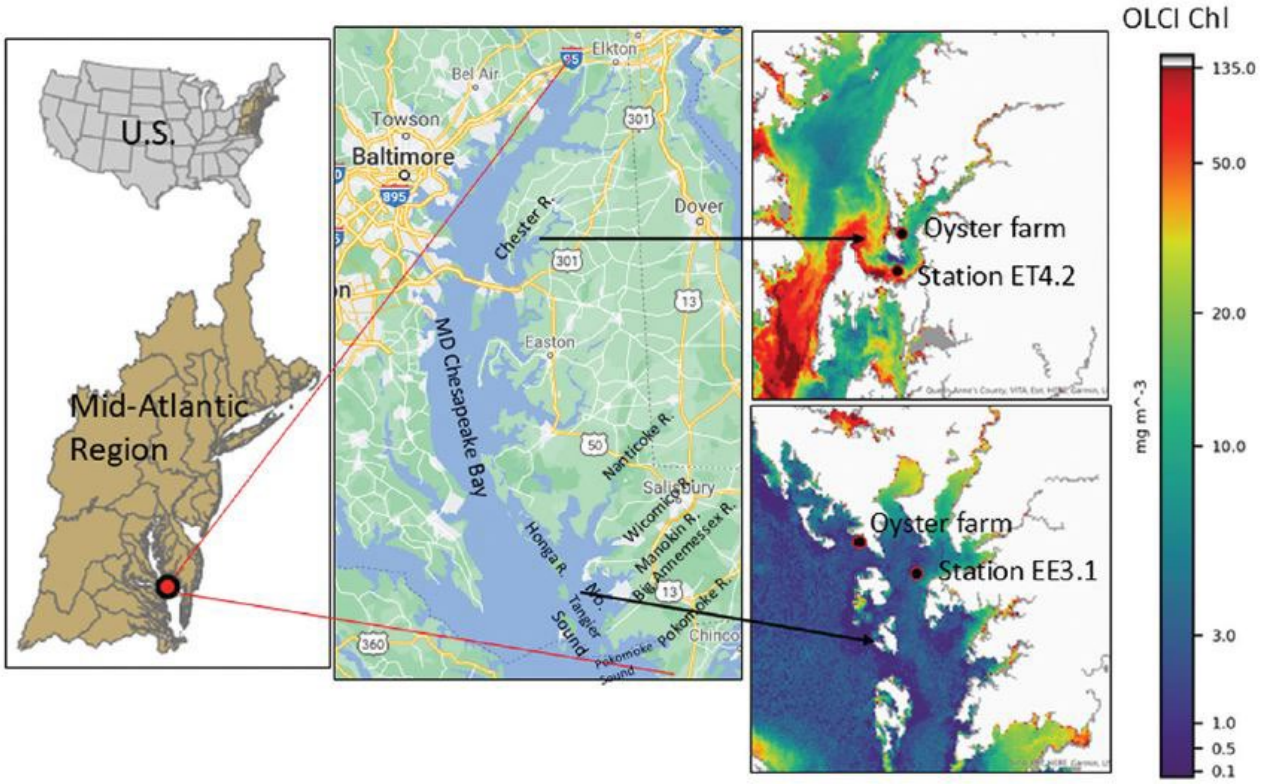

Figure: Locations of the oyster-farm study sites and Maryland Department of Natural Resources stations ~8 km away from the study sites. Chlorophyll concentration imagery from the Ocean Land Colour Instrument are shown on the right.

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

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