

Weekly Report – July 17, 2026
Cooperative Institute for Satellite Earth System Studies (CISESS)
NOAA/NESDIS/STAR

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HIGHLIGHTS FOR NESDIS LEADERSHIP

Data and Information

SOUP: A Recipe for Managing Data from the Abyss to Archive

NOAA Ocean Exploration follows an "Explorer Model" that integrates ocean science and resource management through a community-driven approach to explore and characterize data-scarce regions of the deep ocean. Exploration sampling plays a critical role in these efforts by collecting biological, geological, and water samples that provide the data needed to assess genetic diversity, morphology, ecological connectivity, taxonomy, and seafloor composition within areas of interest. NOAA's National Centers for Environmental Information (NCEI) plays a key role in this process by managing and preserving the data on these precious samples throughout their lifecycle, from collection and processing to facilitation of long-term archiving and public access.

The Sampling Operations User Portal (SOUP) is the new sampling data management system that NCEI and NOAA Ocean Exploration will use during [NOAA Ship Okeanos Explorer](#) expeditions. SOUP is a cloud-based application with a robust back-end database designed to store, manage, and maintain information about physical samples collected from the deep sea. Biological, geological, and water samples are collected during Remotely Operated Vehicle (ROV) dives and Conductivity, Temperature, and Depth rosette deployments. Each sample has associated environmental metadata, which can include the latitude and longitude, depth, temperature, and in-situ imagery recorded at the time of collection. As Sample Data Manager and a primary user of this tool, CISESS Scientist Anna Lienesch was involved in the tool's design, feature enhancement, and testing.

SOUP has taken onboard data processing to new depths with its streamlined user interface and integration into ship-based data recording software. With the simple click of a button within SOUP, a user can ingest sampling metadata, print museum quality labels, generate summary exports and reports, and so much more. Through automation processes and network-based pipelines, SOUP simplifies the sampling workflow, allowing for easier and faster data backup, remote access, and fewer errors. During the 2026 ROV shakedown, [EX2603](#), SOUP was installed on the updated NOAA Ocean Exploration network, integrated into the workflow of the systems from which it pulls data, and tested to ensure all issues were addressed before the field season officially begins on NOAA Ship *Okeanos Explorer*. Looking ahead, SOUP may undergo further

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development to be utilized for other projects, replacing outdated workflows and streamlining processes.

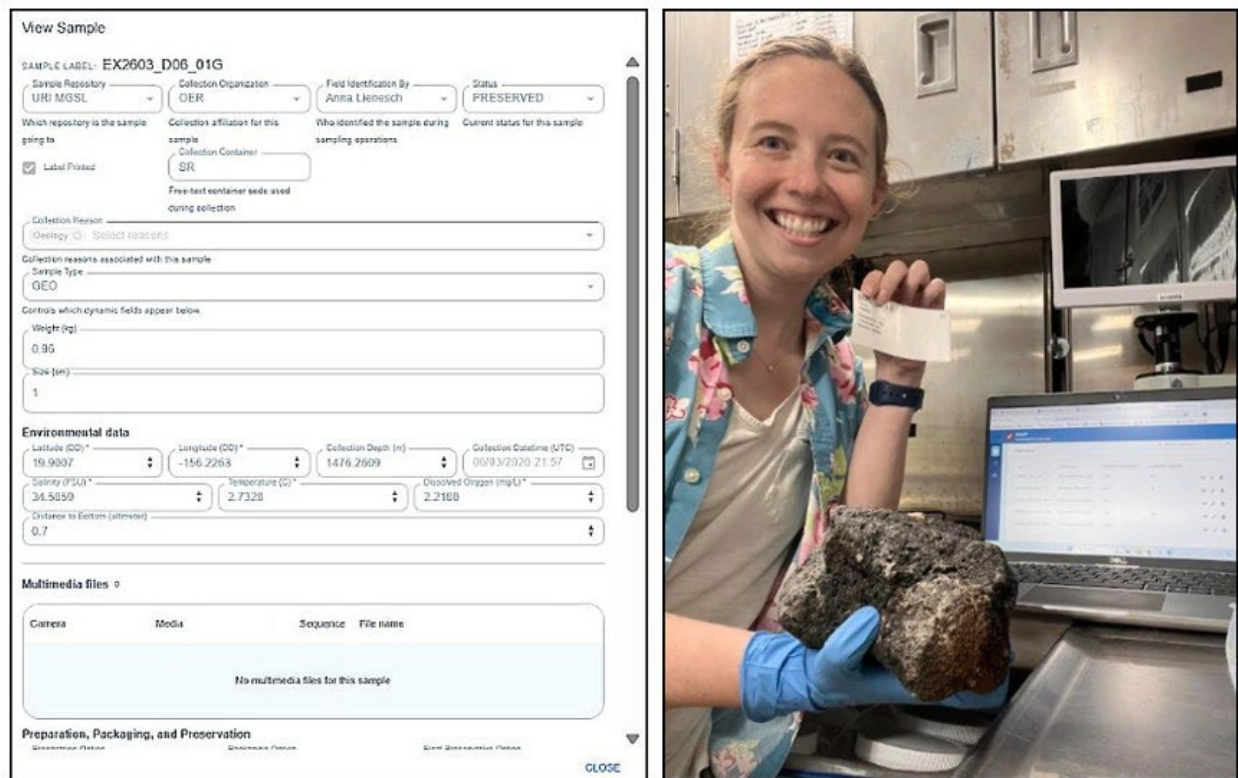


Figure: (left) The sampling information displayed in the SOUP application for a sample collected during the ROV Shakedown. (right) Lienesch on the ROV Shakedown in June with the first official sample in hand, the SOUP application displayed on the laptop, and the first label printed using the new SOUP application.

(Anna Lienesch, CISESS, anna.s.lienesch@noaa.gov; Funding: NCEI)

Use-Inspired Science

Extraordinary Efforts by CISESS Scientists to Leverage ARL's Unique Monitoring Capabilities

University of Maryland scientists Benaya Berhane, Randall Bowers, and Phillip Stratton (CISESS/AOSC) have been going above and beyond to enhance NOAA's ability to conduct rapid-response monitoring for environmental emergencies during recent events. According to the NOAA Air Resources Laboratory (ARL) Atmospheric Sciences and Modeling Division Director Howard Diamond, "All three have demonstrated exceptional resilience, dedication, and selfless determination in advancing ARL's mobile atmospheric monitoring capabilities, specifically through the major technical overhaul of the [NOAA Air Resources Car \(ARC\)](#) and taking advantage of unique opportunities." In support of the President's Executive Order 14234—

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Establishing the White House Task Force on the FIFA World Cup 2026, they contributed to the [SOCCER-AQ 2026](#) field campaign that took place at three World Cup venues in PA, NY, and MA. Additionally, in collaboration with Xinrong Ren and other researchers at ARL, they took advantage of the massive fireworks event in Washington D.C. on 4 July 2026 to advance ARL's data holdings by using the ARC to sample emissions. It was a unique opportunity to sample a collective explosion with nearly 900,000 projectiles emissions, which was likely the largest on record anywhere, that will propel HYSPLIT modeling capabilities. The team made excellent planning projections of where the fireworks emissions plume would be, and they masterfully handled logistical challenges to position the ARC in an optimal location. While many observed the 'rockets' red glare', these dedicated scientists examined the 'bombs bursting in air' and sampled 'through the night' and returned to ARL in College Park at 2:00 am on the morning of Sunday, 5 July. Their illuminating results will continue advancing ARL's mission long after the smoke clears.



Figure: NOAA Air Resources Car, an SUV outfitted with a range of air-monitoring sensors, used as a mobile lab throughout the region. Photo Credit: [Maryland Today, April 03, 2023](#).

(Russell Dickerson, CISESS/AOSC, rrd@umd.edu, Funding: ARL; Phillip Stratton, CISESS, pstratto@umd.edu, Funding: ARL)

TRAVEL AND MEETING REPORTS

MiRS Team Presence on the International Scene

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Members of the Microwave Integrated Retrieval System (MiRS) team have had a busy July, presenting at international meetings. The 12th International Precipitation Working Group Workshop organized by the Institute of Meteorology and Water Management National Research Institute in Krakow, Poland took place during 7–10 July 2026. CISESS Scientist Shuyan Liu gave an in-person talk titled “*AI-Enhanced Satellite Precipitation Retrieval in MiRS: From Research to Operations*”, where she reported that the baseline MiRS reproduces the overall precipitation climatology but has systematic regional biases, particularly an overestimation across the central U.S. The UNet enhancement Liu described in the talk improves the climatological accuracy of the MiRS rain rate retrieval without compromising its overall precipitation patterns.

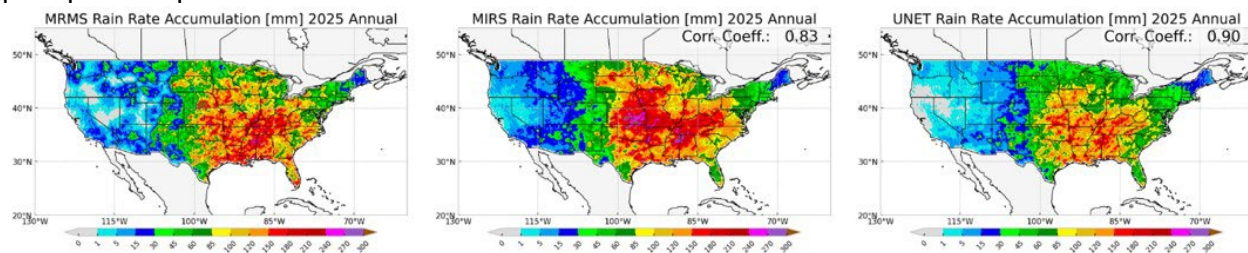


Figure: Annual accumulated rain rate (mm) for 2025 from the Multi-Radar Multi-Sensor (MRMS) reference, the baseline MiRS, and the UNet-enhanced MiRS retrieval.

During that same week and continuing on the AI theme, CISESS Scientist Xingming Liang attended the Forty-Third International Conference on Machine Learning in Seoul, South Korea, presenting a poster titled “*MiRS-AI: A Data-Driven Framework for Accurate and Efficient Atmospheric Profile Retrieval from Microwave Observations*”. Liang showed that temperature and water vapor retrievals from the UNet-Transformer model are an improvement over baseline MiRS retrievals of the same across most vertical layers. These improvements underscore the importance of leveraging spatial context, highlighting that incorporating neighboring information is critical for accurate retrievals in dynamically complex environments.

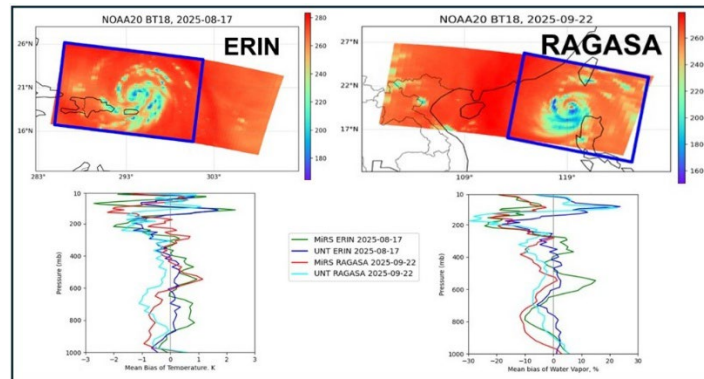


Figure: (top) Regions of interest (ROIs): areas surrounding Tropical Cyclones Erin and Ragasa. (bottom) Vertical profiles of mean biases of temperature and water vapor from selected points within the ROIs. UNT: UNet-Transformer model

(Shuyan Liu, CISESS, liusy@umd.edu, Funding: JSTAR; Xingming Liang, CISESS, lldl514@umd.edu, Funding: IJJA)

MEDIA INTERACTIONS AND REQUESTS

CISESS Scientist Interviewed About Thunderstorms in DC

On 13 July 2026, CISESS Scientist [William Miller was interviewed](#) on Washington D.C.'s Fox 5 news network, answering questions about summertime thunderstorm activity in the Washington D.C. metropolitan area and how it differs from other parts of the country. Miller notes that over the past few decades, thunderstorms over the mid-Atlantic have become more frequent and intense.



Figure: Screenshot of William Miller (on the left) being interviewed on Fox 5.

(William Miller, CISESS, wmiller1@umd.edu; Funding: COSMIC2)

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