Weekly Report – February 06, 2026

Cooperative Institute for Satellite Earth System Studies (CISESS)

NOAA/NESDIS/STAR

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Date of Submission: 06 February 2026

HIGHLIGHTS FOR NESDIS LEADERSHIP

Use-Inspired Science

Publication of the New NOAA Coral Reef Conservation Program Website and Digital Corals Data Portal

On 28 January 2026, the NOAA Coral Reef Conservation Program (CRCP) officially launched its newly re-designed website! In a collaborative effort, CISESS Scientists Rasheeda Alexander and Rebecca Wenker worked with NOAA NESDIS National Centers for Environmental Information (NCEI) and NOS Office of Coastal Management staff to revamp and merge two legacy sites—CRCP and the Coral Reef Information System—into a single, streamlined platform. A key component of the new website is Digital Corals, a data and information portal that houses coral-related data, publications, projects, and more. Benefits of the new site include an updated design and new content for an improved user experience, reduced maintenance overhead, and the delivery of a high-performance, frontend-focused website via the use of modern technologies.

Figure: Homepage of the Digital Corals information portal.

(Rasheeda Alexander, CISESS, ralexa@umd.edu; Funding: NCEI; Rebecca Wenker, CISESS, rwenker1@umd.edu; Funding: NCEI)

Nooksack River Flooding in December 2025

From 8–14 December 2025, a potent atmospheric river stalled over the Pacific Northwest, bringing catastrophic flooding to the Nooksack River basin. The Nooksack River surged to historic levels, causing widespread devastation in Whatcom County that rivaled, and in some specific locations, exceeded the catastrophic floods of November 2021. Freezing levels spiked to above 9,000 feet, causing precipitation to fall as rain across nearly the entire Nooksack watershed rather than snow. This triggered a massive "rain-on-snow" event, where the deluge of warm rain melted the existing mountain snowpack, adding critical volume to the river. The most significant hydrological event occurred at Everson, a critical juncture where the river can leave its channel and flow north. The record height at Everson triggered a massive "Everson Overflow", where floodwaters breached levees and naturally flowed north away from the main river channel. This water inundated the towns of Everson, Nooksack, and Sumas before crossing the international border into Abbotsford, British Columbia. The flooding forced the evacuation of these communities, closed all roads leading in and out of Sumas and Everson, and damaged critical infrastructure. Monitoring the flooding around Everson using optical satellite imagery was severely hindered by persistent cloud cover. Visible Infrared Imaging Radiometer Suite (VIIRS) daily flood products were largely ineffective for much of the event due to weather obstructions. To overcome these visibility limitations, CISESS Scientist Qingyuan Zhang and the NOAA STAR Flood team used Synthetic Aperture Radar (SAR) from two different constellations: Sentinel-1 (S1) and the Radarsat Constellation Mission (RCM). S1 provided coverage on December 14, 17, and 19. However, RCM offered superior temporal resolution with daily products available from December 13 through December 19. This high-frequency radar coverage was crucial for tracking the rapid evolution of the floodwaters during the periods when optical satellites were blind. The most effective flood inundation mapping capability was achieved through a "Blended VIIRS/all SAR" approach. By combining the optical data with the all-weather capabilities of both S1 and RCM radar systems (where available), a comprehensive time series were created. Blended flood inundation map (FIM) products offered the best overall capability for monitoring the disaster (see figure).

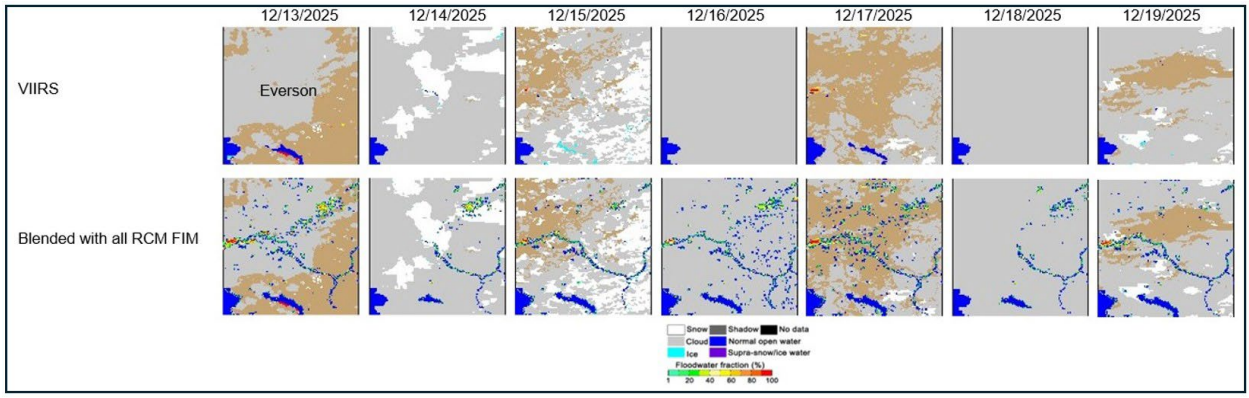


Figure: The NOAA STAR satellite flood inundation monitoring team produces VIIRS FIM products and SAR FIM products. This figure shows the VIIRS daily FIM product (top row) and the blended FIM product (bottom row) along the Nooksack River in the Washington State in December 2025.

(Qingyuan Zhang, CISESS, qyzhang@umd.edu; Funding: IIJA & IRA)

TRAVEL AND MEETING REPORTS

Site Visit to the DCLMA at Howard University

On 23 January 2026, CISESS Scientist Guangyang Fang visited the DC Lightning Mapping Array (DCLMA) station at the Howard University Physics Building in Washington D.C. to troubleshoot a network connectivity disruption and GPS issue. Due to building renovations occurring from 15 December 2025 to 13 February 2026, the Lightning Mapping Array sensor had been moved to a protective shelter. During the visit, the cellular modem firmware was updated, and the internet connectivity was successfully restored. In addition, the GPS unit was found to be malfunctioning, and an inspection indicated that the GPS cable was likely damaged during the relocation. After replacing the GPS with a new unit, the DCLMA at Howard resumed normal operation.

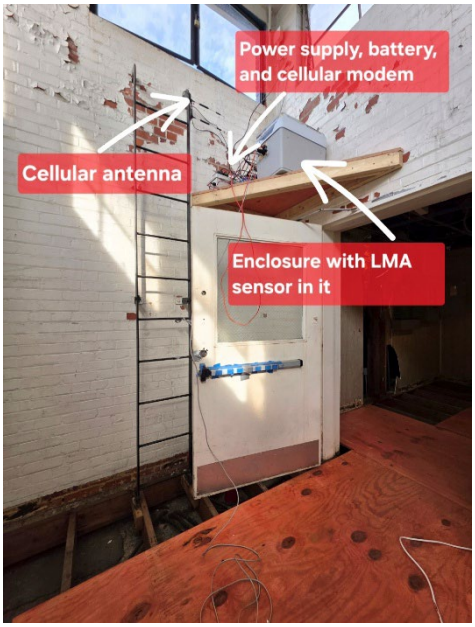
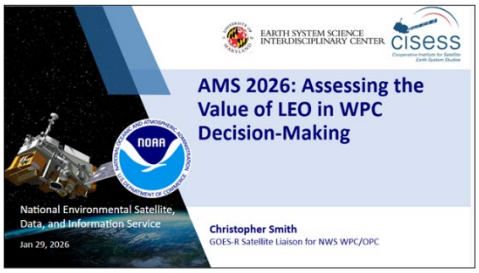


Figure: The temporary elevated mounting platform constructed by Howard University Facility Management to accommodate the indoor components of the DCLMA system during building renovations. The platform provides a stable and protected location for the LMA enclosure, battery, and the power supply until renovation activities are completed, after which the system will be reinstalled at its original location within the room.

(Guangyang Fang, CISESS, gfang@umd.edu; Funding: GEO-XO, GOES-R AWG, GOES-R PGRR & IIJA)

CISESS Scientist Presents at the 106th American Meteorological Society Annual Meeting

CISESS Scientist Christopher Smith, the GOES-R Satellite Liaison to the National Weather Service's Weather Prediction Center (WPC) and Ocean Prediction Center, presented at the 106th American Meteorological Society Annual Meeting in Houston, Texas, on 29 January 2026. Smith's presentation, titled "Assessing the Value of LEO in WPC Decision-Making," described an ongoing study examining how WPC forecasters develop precipitation forecasts and identify critical datasets throughout the forecasting process. The study highlights the role of low-Earth orbit (LEO) satellite data, which not only provides derived satellite products but also serves as a key input for data assimilation in numerical weather prediction models. Findings from this work will help inform NOAA's Near Earth Orbit Network (NEON) Program by identifying where LEO satellite data—and associated weather information—deliver the greatest value for operational forecasting today and into the future. The NEON Series-1 Project will feature the Program's first new instrument, the Sounder for Microwave-Based Applications, which will serve as the backbone for this Program.



(Christopher Smith, CISESS, csmith70@umd.edu; Funding: GOES-R PGRR)

Overall, CISESS had a strong presence at this year's American Meteorological Society Annual Meeting.

In bold: The 23 CISESS Scientists who contributed to presentations and other activities at the 106th American Meteorological Society Annual Meeting

January 26

- NOAA Satellite Snowfall Rate Algorithm and its Applications
  - **Yongzhen Fan (Presenter)**, **Jun Dong**, Huan Meng, **Yulan Hong**, Pingping Xie, Aaron Jacobs, Carl Dierking, Emily B. Berndt, Kristopher D. White, **Ralph Ferraro**
- AI Enhanced Quantitative Precipitation Forecasts from Hybrid High-Resolution Rapid Refresh and LEO and GEO Satellite Data
  - **Yongzhen Fan (Presenter**), Huan Meng, Rick Pernak, Eric S. Maddy, Kevin Garrett
- Long-term Aerosol Variability and Associated Sea Surface Temperature Changes in the Atlantic Ocean: Observed from the Satellite AVHRR-Instruments in the Past 40 Years
  - **Yongsheng Zhang (Presenter)**, **James Frech**, Xuepeng Zhao
- The Microwave Integrated Retrieval System (MiRS): Recent Developments, Improvements, and Applications
  - **Shuyan Liu (Presenter)**, Christopher Grassotti, **Yong-Keun Lee**, **Wei Wang**, **John (Xun) Yang**, **XingMing Liang**, Huan Meng
- Assessing Turbulence Uncertainty in Urban Dispersion modeling Using Rooftop Observations
  - **Fong Ngan (Presenter)**, William Pendergrass, **Bavand Sadeghi**, Mark D. Cohen

- Improve Understanding and Reduce Uncertainties in Urban Atmospheric Transport and Dispersion Modeling
    - **Bavand Sadeghi (Presenter)**, Mark D. Cohen, **Fong Ngan**, Tianfeng Chai
- Use of GNSS RO Commercial Data Processed by STAR during the ROMEX: Identification of the Causes of GNSS RO Biases from High and Low Inclination Angle Missions
    - Shu-Peng Ho (Presenter), **Xi Shao**, Yong Chen, **Xin Jing**
- HYSPLIT-based Emissions Inverse Modeling System (HEIMS): Applications to Wildfires, Volcanic Eruptions, and Nuclear Incidents (Invited Presentation)
    - **Hyun Cheol Kim (Presenter)**, Tianfeng Chai, Charles Fite, **Fong Ngan**, Mark D. Cohen
- Investigation of Plume Rise in Wildfire Smoke Dispersion Simulations
    - Tianfeng Chai (Presenter), **Hyun Cheol Kim**, Charles Fite, **Fong Ngan**, Mark D. Cohen

January 27

- A Fortran-based AI-RTM Inference Algorithm with Jacobian Computation under Clear-sky Conditions
    - **XingMing Liang (Presenter),** Christopher Grassotti, Huan Meng
- Calibration and Validation of MetOp-SG Microwave Sounder using AI/ML and CRTM for Numerical Weather Prediction
    - **Feng Zhang (Presenter)**, Yong Chen, **Xi Shao**, **Tung-Chang Liu**, **Wenhui Wang**
- Repository for AI-Ready Training Datasets to Support Satellite Sensor Calibration and Validation
    - **Yan Bai (Presenter)**, **Feng Zhang**, James Hawkins, **Xi Shao**
- AI/ML Modeling of Sonoran Desert BRDF for LEO-LEO and LEO-GEO Imaging Radiometer Inter-Calibration
    - **Xi Shao (Presenter)**, **Xin Jing**, **Tung-Chang Liu**, **Yan Bai**, **Wenhui Wang**
- Joint Session: Wildfire Observations from Satellite for Pre-fire, During-fire, and Post-fire Applications
    - **Javier Villegas Bravo**, William C. Straka (Cochairs)
- Supporting Post-Fire Risk Assessment with Multi-Sensor Burn Scar Maps
    - Sam Batzli, Danielle Losos, **Javier Villegas Bravo**, Roger Michaelides, William C. Straka (Presenter)
- Wildfire Burned Area Detection and Severity Mapping Using Multiple Satellite Sensors and Machine Learning to Aid in Flash Flood Forecasting
    - **Javier Villegas Bravo (Presenter)**

January 28

- Evaluating Tropical Cyclone Intensity Forecasts from HAFS Using Satellite-Derived Ocean Profile and Heat Content Estimates
    - Lewis James Gramer (Presenter), **Paige Lavin**, Deirdre A. Byrne, David S. Trossman
- The Effects of Ice Habit Models on Passive Microwave Snowfall Retrievals
    - **Yulan Hong (Presenter)**, Huan Meng, **Yongzhen Fan**, **Jun Dong**, Tong Ren, Ping Yang
- Preliminary Microwave Integrated Retrieval System (MiRS) Retrieval Products based on Tomorrow.io TMS Data

  - **Yong-Keun Lee (Presenter), John (Xun) Yang**, Christopher Grassotti, **Shuyan Liu**, **XingMing Liang**, **Wei Wang**, Huan Meng
- Assessing and Denoising Tomorrow.io Radiance Products Toward Improving MiRS 1DVar Retrieval
  - **John (Xun) Yang (Presenter)**, **Yong-Keun Lee**, Christopher Grassotti, **Shuyan Liu**, **XingMing Liang**, **Wei Wang**, Huan Meng
- Extending and Reprocessing the NASA NVAP Water Vapor Dataset
  - John M. Forsythe (Presenter), Thomas H. VonderHaar, Steven J. Fletcher, **Shuyan Liu**
- Implementing VIIRS Global Area Coverage (VGAC): Bridging Climate Data Records with Modern Satellite Capabilities
  - Kenneth R. Knapp (Presenter), Changyong Cao, **Xi Shao**, Douglas Rao, Philip Casey, Viju John

January 29

- AMS SATMOC Virtual Short Course in 2025
  - Jun Wang (Presenter), Megan Christiansen, **Christopher Smith**, **Joseph Patton**, Meng Zhou, **Javier Villegas Bravo**, Jorel Torres, Jordan J. Gerth, John Cintineo, Eric Goldenstern, Sherrie Secunda Morris, Gary B. McWilliams
- Assessing the Value of LEO in WPC Decision-Making
  - **Christopher Smith (Presenter)**, Katherine A. Hawley, Melissa Johnson, Sophia Evelyn Groot, Kim Klockow McClain
- The AWS MWR Implementation on Microwave Integrated Retrieval System (MiRS)
  - **Yong-Keun Lee (Presenter)**, **John (Xun) Yang**, Christopher Grassotti, **Shuyan Liu**, **XingMing Liang**, **Wei Wang**, Huan Meng
- Enhancing MiRS ATMS Precipitation Estimates over the CONUS suing Machine Learning
  - **Shuyan Liu (Presenter)**, Christopher Grassotti, **Wei Wang**, **Yong-Keun Lee**, **John (Xun) Yang**, **XingMing Liang**, Huan Meng

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