Weekly Report – October 30, 2026

Cooperative Institute for Satellite Earth System Studies (CISESS)

NOAA/NESDIS/STAR

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

Date of Submission: 30 October 2026

TRAVEL AND MEETING REPORTS

Tree Troubles Continue

On 26 October 2026, CISESS Scientist Guangyang Fang reinstalled the repaired Lightning Mapping Array (LMA) sensor at the University of Maryland (UMD) Uncrewed Aircraft Systems (UAS) site and verified normal operation, restoring the station following the connectivity issue investigated during the previous visit. Fang also coordinated with the airport personnel regarding ongoing tree removal near the station. The airport plans to clear the surrounding wooded area gradually and will notify Fang once the trees immediately around the sensor have been removed.



Figure: UMD UAS LMA station following reinstallation of the repaired sensor. The antenna and solar panels remain surrounded by trees, with additional clearing planned by the airport to improve site conditions. Photo credit: Guangyang Fang

(Guangyang Fang, CISESS, gfang@umd.edu; Funding: GEO-XO & Seed Grant)

SOCIAL MEDIA AND BLOG POSTS

Iceland Battered and the Mid-Atlantic Coast Flooded

CISESS Scientist Christopher Smith, the GOES-R Satellite Liaison to the National Weather Service's (NWS) Weather Prediction Center (WPC) and Ocean and Tsunami Center (OTC), reports on two high-impact October Atlantic storms in his latest blog posts.

Iceland felt the brunt of an unusually deep low-pressure system over the North Atlantic in mid-October, formed out of the remnants of Hurricane Isaias. A bomb cyclone developed from this system on 14 October, with the minimal central pressure plummeting a striking 51 mb in 24 hours. A Sentinel-3B altimeter pass at ~1200 UTC measured wave heights approaching 45 feet, with high winds lashing Iceland's coastal regions.



Figure: Meteosat Third Generation / Flexible Combined Imager Air Mass RGB imagery at 1030 UTC 14 October 2026.

Fueled by warm waters and located near the Gulf Stream, a low-pressure system winding its way along the East Coast on 21 October rapidly morphed into something more tropical, prompting the NWS National Hurricane Center to name this system Subtropical Storm Josephine. With winds stronger than 50 knots, causing much coastal flooding in the Mid-Atlantic states, Josephine finally pushed off the East Coast in the early hours of 23 October.

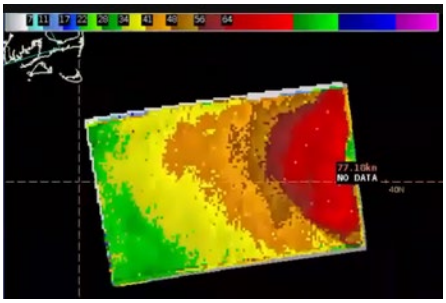


Figure: RADARSAT Constellation Mission-3 Synthetic Aperture Radar output at ~2234 UTC 22 October 2026, southeast of Nantucket. Wind speeds greater than 55 knots are shown in red.

(Also published on the Satellite Liaison Blog, along with other blog posts of interest by other contributors.)

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

PUBLICATIONS

Advancing Satellite Cloud Detection with a Deep Neural Network
Citation: Liu, Qian and **Banghua Yan**, 2026: Cloud detection of OMPS nadir mapper radiance data using deep learning techniques. *IEEE Trans. Geosci. Remote Sens.*, **64**, https://doi.org/10.1109/TGRS.2026.3719137.
Summary: Cloud contamination is a problem when trying to do accurate satellite-based retrievals of surface and lower atmospheric properties as well as aerosols and trace gases in the atmosphere, especially if the satellite observations have large fields of view. Satellite-based ultraviolet instruments, such as the ozone mapping and profiler suite (OMPS), are especially susceptible to cloud contamination because of their relatively coarse spatial resolution. CISESS Scientists Qian Liu and Banghua Yan tackle this cloud contamination problem in their paper published in the journal *IEEE Geoscience and Remote Sensing*, introducing a novel deep neural network (DNN)-based sub-pixel cloud detection model specifically for the NOAA-21 OMPS nadir mapper (OMPS-NM). The learning target for the DNN model is the cloud fraction derived from the NOAA-21 Visible Infrared Imaging Radiometer Suite (VIIRS) cloud mask product. The subpixel detection model is evaluated against the VIIRS cloud mask, which is considered to be the "truth". Cloud classification results are also compared with those derived from NOAA's

operational OMPS-NM total column ozone product. Liu and Yan report that the overall global classification accuracy ranges from 87% to 90%, with the model performing marginally better over oceans. Globally, the model achieves a precision of 95%, meaning that 95% of the pixels classified as cloudy are cloudy. Recall and F1-score metrics suggest that the new model can minimize both false positives and false negatives across different surface types. Overall, the proposed DNN model is more computationally efficient than traditional radiative-transfer-model-based approaches. Another significant benefit of the proposed DNN model is that it can be adapted to similar sensor pairs as NOAA-21 OMPS-NM and VIIRS. The authors outline plans for future research, including adding more predictor variables, expanding the training dataset to include tricky cases like thin clouds and high-reflectance scenes, and developing a dedicated high-latitude cloud detection model.

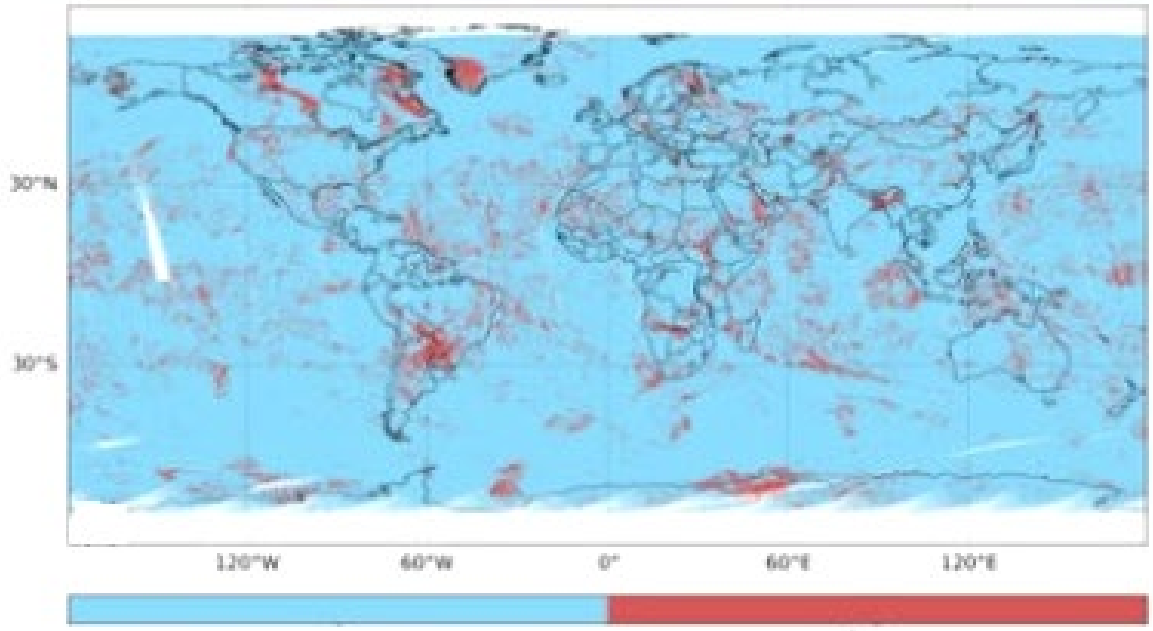


Figure: Pixel-level differences between the VIIRS-derived cloud mask and the DNN-based classification for the case study of 22 September 2024. Blue pixels indicate agreement between the two, and red pixels show where they disagree. The DNN model successfully identifies most OMPS-NM cloudy FOVs.

(Qian Liu, CISESS, qian.liu@missouri.edu, Funding: JSTAR; Banghua Yan, CISESS, banghua.yan@noaa.gov, Funding: JSTAR)

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