

Weekly Report – July 24, 2026
Cooperative Institute for Satellite Earth System Studies (CISESS)
NOAA/NESDIS/STAR

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HIGHLIGHTS FOR NESDIS LEADERSHIP

Partnerships

CISESS XR Collaboration with UMD/AGNR Professor Christopher Ellis

On July 20, 2026, Dr. Guangyang Fang hosted Professor Christopher Ellis from the University of Maryland's College of Agriculture and Natural Resources (AGNR) for a tour of the CISESS Proving Ground and Training Center. Dr. Fang introduced the center's extended reality (XR) research and demonstrated several applications, including *Terrality* and the *Virtual Proving Ground and Training Center*. Professor Ellis experienced the VR applications firsthand and discussed their potential for geoscience education, training, and public outreach. Professor Ellis also presented his VR-based *Sea Level Rise Explorer: Point Lookout State Park* application and described his research on hydrologic and sea-level-rise modeling and three-dimensional flooding visualization. CISESS student interns Ian Way, Anh Pham, and Abdur-Rahman Shakir joined the discussion and shared their ongoing XR development work. The group discussed immersive technologies, 3D scanning and photogrammetry, and opportunities to integrate environmental data and models into interactive XR applications. The visit identified promising opportunities for future collaboration involving environmental modeling and NOAA data visualization for research, education, and community resilience.



Figure: Professor Christopher Ellis from UMD's College of Agriculture and Natural Resources explores the Virtual Proving Ground and Training Center application using a Meta Quest headset. (Photo credit: Guangyang Fang)

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

SOCIAL MEDIA AND BLOG POSTS

Texas Hill Country Flash Flooding

[The Texas Hill Country faced multiple Flash Flood Emergencies](#) after repeating rounds of heavy rainfall struck the state during the week of July 13. Even while [GOES-East was briefly out of service due to an anomaly last week](#), GOES-West Full Disk Band 13 Infrared imagery successfully captured the training thunderstorms. This was reported by CISESS Scientist Christopher Smith, the GOES-R Satellite Liaison to the National Weather Service's (NWS) Weather Prediction Center (WPC) and Ocean Prediction Center. The NWS WPC issued three consecutive days of High Risk Excessive Rainfall Outlooks to highlight the threat for severe, widespread flash flooding. Five-day estimated rainfall totals topped 20 inches in Uvalde County, TX.

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

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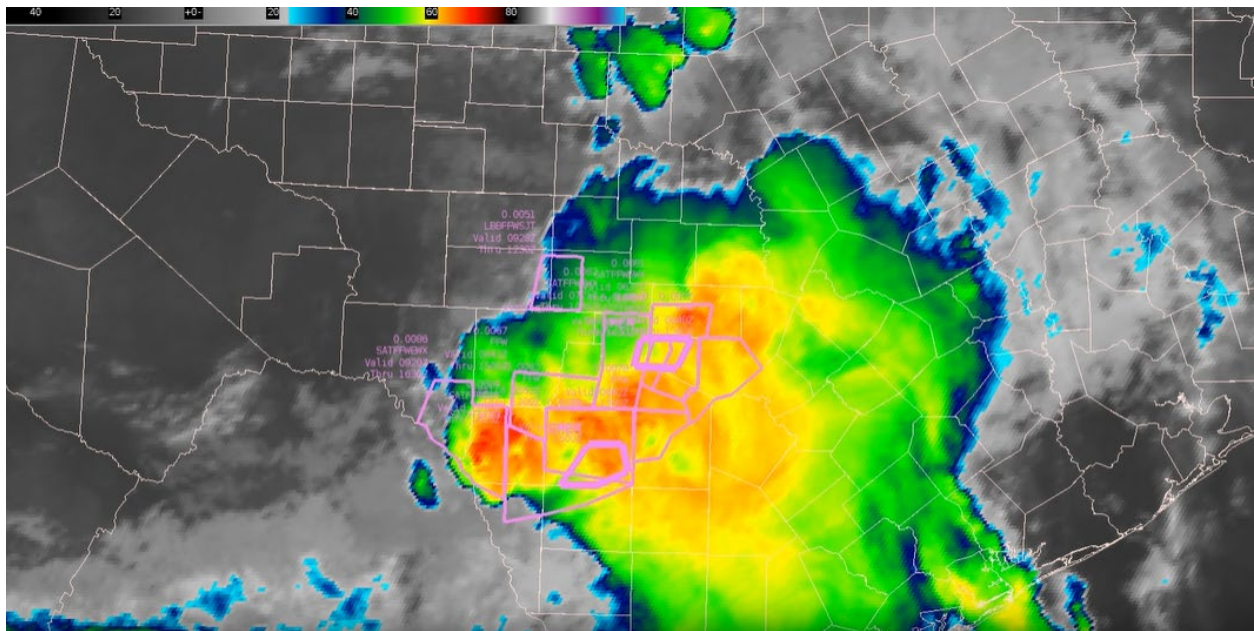


Figure: GOES-West Full-Disk IR imagery overlaid with Flash Flood Warnings (pink) and Flash Flood Emergencies (bold). This animation was exported from Advanced Weather Information Display System (AWIPS), and display files can be shared upon request.

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

PUBLICATIONS

Assessing Design and Deployment Strategies for Future Microwave-Sounding Missions

Citation: Ma, Zaizhong, Niels Bormann, Katie Lean, David Duncan, Ernesto Hugo Berbery, and Satya Kalluri, 2026: Ensemble of Data Assimilations (EDA) impact studies in support of NOAA's Next-Generation Microwave Sounding Missions. *Mon. Wea. Rev.*, **154**, 687–702, <https://doi.org/10.1175/MWR-D-25-0255.1>.

Summary: CISESS Scientist Dr. Zaizhong Ma and co-authors, including CISESS Deputy Director Dr. Hugo Berbery, recently published a study on the expected forecast impact of future microwave sounding instruments planned under NOAA's Near Earth Orbit Network (NEON) program using the Ensemble of Data Assimilations (EDA) within the European Centre for Medium-Range Weather Forecasts (ECMWF) Integrated Forecasting System. The work was carried out in close collaboration with colleagues from the ECMWF Microwave Team. In this study, two observing system concepts are assessed. The first examines the benefit of deploying an Advanced Technology Microwave Sounder (ATMS)-like instrument in the early morning (1730 LTAN) orbit to complement existing mid-morning and afternoon satellites. The second evaluates the more advanced Sounder for Microwave-Based Applications (SMBA), which includes additional channels near 118 and 229 GHz, in both 1330 LTAN and 1730 LTAN orbital configurations. The results show that an ATMS-like instrument in the early morning orbit

significantly reduces short-range forecast uncertainty, with an impact comparable to that of legacy POES satellites. The additional 118- and 229-GHz channels on SMBA provide modest but measurable improvements in forecasts of geopotential height and wind fields beyond those achieved with the conventional 50- and 183-GHz channels alone. However, these new channels complement rather than replace the essential 50-GHz temperature sounding band. The greatest forecast benefit is achieved with a two-orbit SMBA constellation. Across all experiments, forecast impact is found to be highly sensitive to instrument noise, highlighting the importance of low-noise sensor design. Comparisons between real and simulated ATMS observations further demonstrate consistent impact estimates, increasing confidence in the simulation-based assessment.

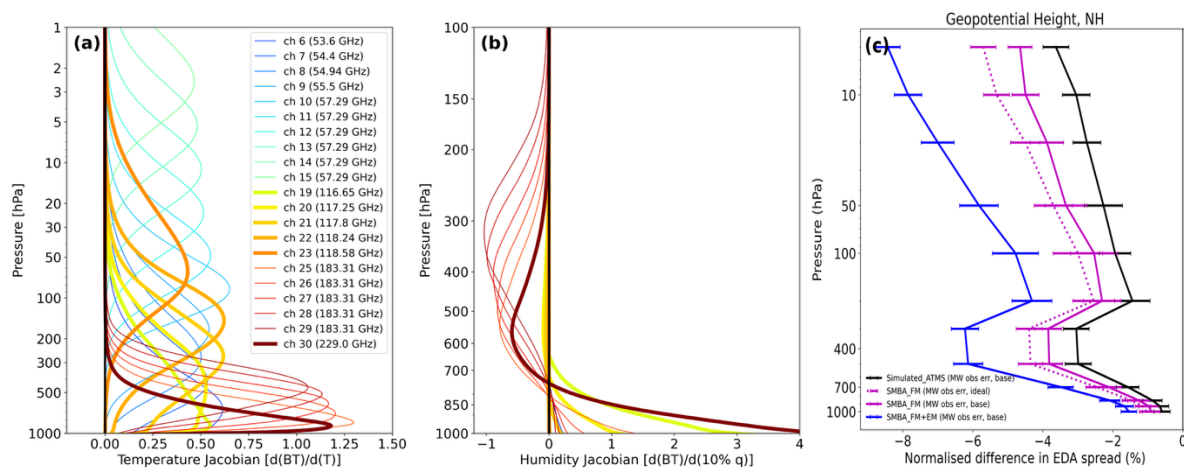


Figure: Temperature (a) and humidity (b) Jacobians for SMBA in clear-sky conditions, with new 118 GHz and 229 GHz channels. (c) Vertical profiles of EDA spread reduction for geopotential height in northern hemisphere (latitude > 20°N). The baseline observing system, which used as proxy for a future observing system without NOAA MW sounders, includes all non-MW observations used operationally at ECMWF in 2021, excluding passive MW data from China. Data are for the period 8-30 June 2021 and error bars indicate an estimate of 95% confidence.

(Zaizhong Ma, CISESS, zmaumd@umd.edu, Funding: LEO)