Weekly Report – August 01, 2025

Cooperative Institute for Satellite Earth System Studies (CISESS)

NOAA/NESDIS/STAR

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TRAVEL AND MEETING REPORTS

Having an Awesome Time at AWE USA 2025

From 10–12 June 2025, CISESS Scientist Guangyang Fang, along with his students Damian Figueroa and Samuel Wiggins, participated in the Augmented World Expo (AWE USA 2025) in Long Beach, CA, the world's largest spatial-computing event. Their goal was to explore the cutting-edge innovations in virtual reality (VR) and mixed reality and to identify opportunities that align with their immersive geoscience education project.

With more than 5,000 attendees, 250+ exhibitors, and 450 speakers, AWE USA 2025 highlighted the latest innovations in spatial computing across sectors such as education, enterprise, healthcare, and gaming. A major theme of the conference was the convergence of Artificial Intelligence (AI) and Extended Reality (XR), lightweight wearable devices, and enterprise applications. The CISESS team engaged in sessions on spatial computing and AI, met with industry leaders, and explored a wide range of exhibits demonstrating state-of-the-art immersive technologies. These included advanced augmented-reality glasses powered by Snapdragon chips, such as "Spectacles"—the same kind used by Damian and Samuel to win awards at the ImmerseGT hackathon back in April this year—and a full-body locomotion treadmill designed to enhance immersion and mitigate motion sickness.

Damian served as a media volunteer for Intercollegiate XR (ICXR), supporting press representatives with interview logistics and communications, while Samuel contributed as a general volunteer of AWE, helping guide attendees and assisting with event coordination. Their hands-on involvement offered valuable exposure to emerging XR technologies and industry practices. Insights gained at the conference are now being integrated into their immersive education modules designed for platforms like Meta Quest and Apple Vision Pro.

Figure. (From left to right) Damian Figueroa, Guangyang Fang, and Samuel Wiggins at the AWE USA Conference in Long Beach, CA. Photo credit: Ashley Neall/University of North Carolina–Chapel Hill

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

SOCIAL MEDIA AND BLOG POSTS

A Satellite Perspective of the 4 July 2025 Texas Flash Flood Catastrophe
Co-authored with Bill Line (NESDIS/STAR), CISESS Satellite Liaison to the NWS Weather Prediction Center and Ocean Prediction Center, Christopher Smith, presents a satellite perspective of the devastating south-central Texan flooding event of 4 July 2025. All satellite information collected early on 3 July pointed to an increase in the probability of flash flooding. An extremely moist air mass over the region, in which slow-moving thunderstorms with cloud-top temperatures as cold as -88C developed and where lightning was plentiful, established itself. The newly developed machine-learning product called the GOES Radar Estimation via Machine-Learning to Inform NWP mirrored well what the satellites were observing. Other articles on the current and future capabilities of GOES-R and JPSS programs can be found at the Satellite Liaison blog site.

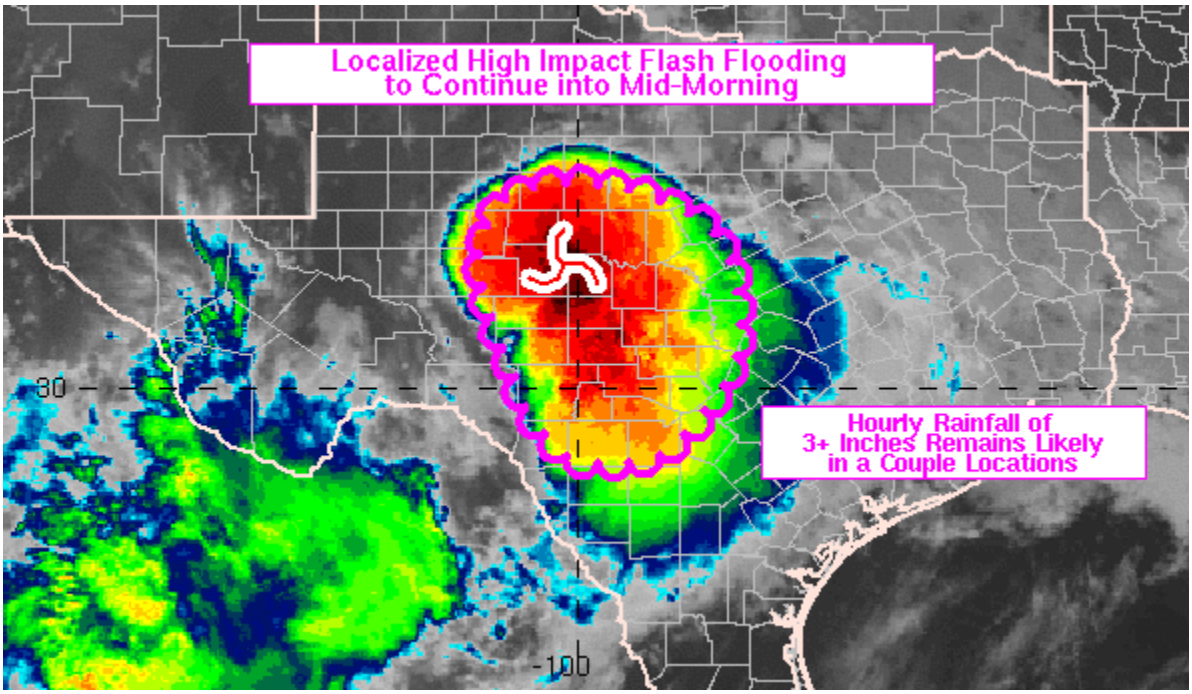

Figure. The Weather Prediction Center Mesoscale Precipitation Discussion issued at 1027 UTC (0526 local time) on 4 July 2025, overlaid on GOES-East Band 13 IR imagery showing cloud-top temperatures (the deeper the red color, the colder the cloud top). The "three-legged" symbol shows the location of the vorticity center for a mesoscale convective vortex.

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

PUBLICATIONS

GSICS Publishes its Spring 2025 Newsletter

The Global Space-based Inter-Calibration System's Spring 2025 Newsletter, edited by CISESS Scientist Manik Bali, is available for perusal. Articles cover topics from national and international groups focused on various aspects of satellite calibration/validation, among others, such as the European Organisation for the Exploitation of Meteorological Satellites' introduction to a new model for lunar calibration called Lunar Extended Spectral Simulation Reflectance. News tidbits and other announcements of interest are also provided. (https://doi.org/10.25923/47zn-kw46)

(Manik Bali, CISESS, manik.bali@noaa.gov, Funding: JPSS PGRR)

Quantifying Surface Water Acidification in the Arctic
Citation: Caero, Thomas, Hongjie Wang, and **Annika Jersild**, 2025: Pacific-Arctic Ocean acidification: decadal trends and drivers. *Global Biogeochem. Cy.*, **39**, e2024GB008249, https://doi.org/10.1029/2024GB008249.
Summary: The Earth's oceans absorb much of the carbon dioxide entering the atmosphere, making the oceans' waters more acidic. The Pacific-Arctic Region (PAR), defined in the study as the west Arctic Ocean and its marginal seas, the western Canadian Archipelago, the Bering Sea, the Gulf of Alaska, and the subarctic Pacific Ocean, is particularly vulnerable to acidification due to its unique chemical properties. Using existing datasets and statistical methods, CISESS Scientist Annika Jersild and colleagues examine surface ocean acidification trends in the PAR for the period 1993–2021, with the goal of expanding the understanding of long-term acidification trends in that remote part of the world. They report that in the southern part of the PAR, which is ice-free and an open-ocean environment, acidification occurred at a similar rate to the global mean, primarily due to the uptake of anthropogenic carbon. However, the northern part of the PAR acidified two to four times faster than the global average due to rising levels of atmospheric carbon dioxide and the influx of freshwater, mainly from melting sea ice. Overall, their results highlight the importance of sustained monitoring in the climate-sensitive PAR.

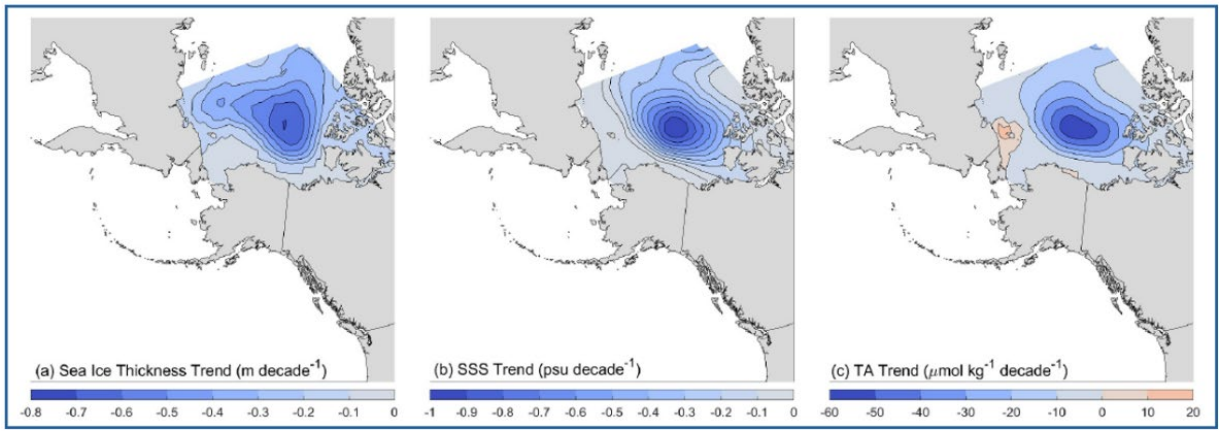

Figure. Decadal trends in (a) sea ice thickness, (b) sea surface salinity (SSS), and (c) total alkalinity (TA) for the northern Pacific-Arctic Region from 1993 to 2021. Locations with the highest rates of sea ice decline correspond to locations with strong negative SSS and TA trends.

(Annika Jersild, CISESS, ajersild@umd.edu, Funding: GOMO)

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