Weekly Report – February 27, 2026

Cooperative Institute for Satellite Earth System Studies (CISESS)

NOAA/NESDIS/STAR

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HIGHLIGHTS FOR NESDIS LEADERSHIP

Data and Information

Introducing the First Ocean Carbonate Chemistry Products Hub

This article is based on lightly edited excerpts from a longer article written by Cazzy Medley, published on the Earth System Science Interdisciplinary Center website.

The ocean plays a critical role in stabilizing Earth's climate. As the planet's largest active carbon sink, it absorbs about 25% of global carbon dioxide emissions and roughly 90% of the excess heat generated by those emissions. This critical role helps regulate the planet's climate but comes at a cost. A more acidic ocean reduces carbonate ions, which alongside calcium, is a building block for ocean creatures that form skeletons and shells like coral reefs and oysters. Higher acidity reduces coral larval survival, weakens reef structures, and increases ecosystem vulnerability to storms and bleaching. These creatures function as key marine health indicators, and their decline threatens the entire marine ecosystem. However, the ocean is vast, and the interconnected physical, chemical, and biological processes require scientists like CISESS Scientists Li-Qing Jiang, Alex Kozyr, and Hyelim Yoo to integrate many different types of data to piece together the full picture of how ocean chemistry is changing.

To support researchers navigating this complexity, Jiang led a team of international researchers to publish a comprehensive review of over sixty major ocean carbonate chemistry data products. The catalog brings together a wide range of global datasets, including historical time series, model outputs, and aggregated products spanning multiple time periods, making it one of the most comprehensive compilations of ocean carbonate chemistry data products to date. Jiang's goal is to present all available ocean carbonate chemistry products. He continues to collect datasets through the catalog to widen the library of data. The paper detailing this work, "Synthesis of data products for ocean carbonate chemistry", has been published in *Earth System Science Data.* The full data product catalog is publicly accessible.

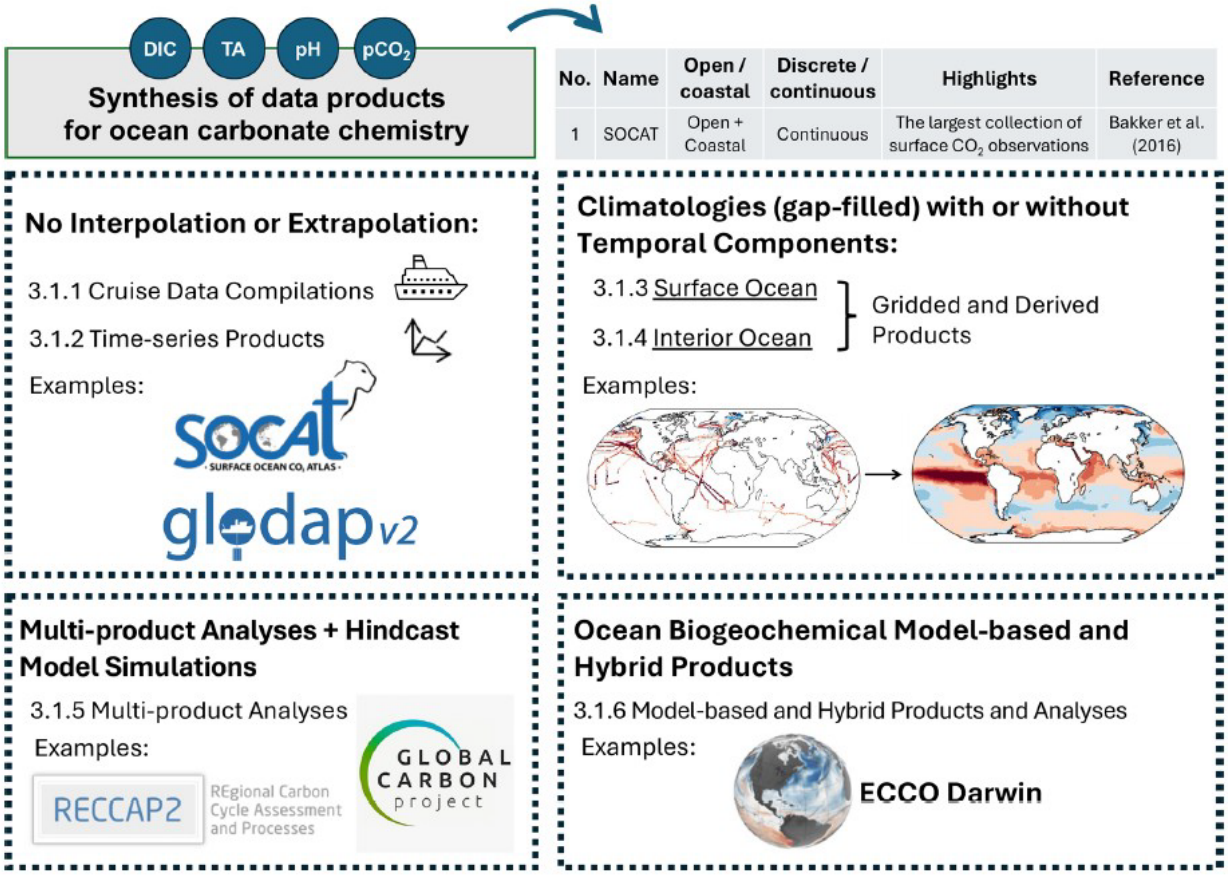
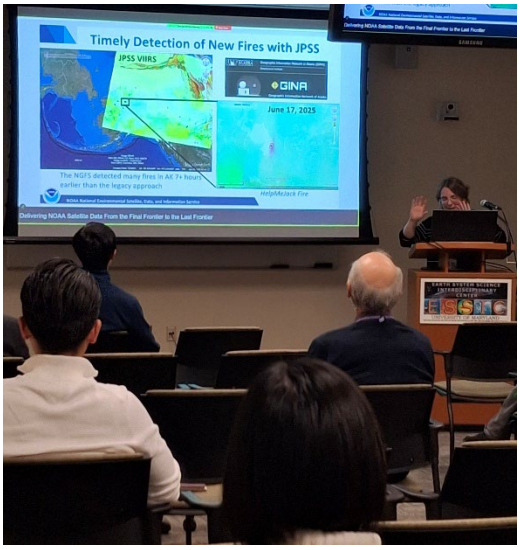


Figure: An overview diagram outlining the paper's structure and flow.

(Li-Qing Jiang, CISESS, liqing.jiang@noaa.gov, Funding: NCEI; Alex Kozyr, CISESS, alex.kozyr@noaa.gov, Funding: NCEI; Hyelim Yoo, CISESS, hyelim.yoo@noaa.gov, Funding: NCEI)

TRAVEL AND MEETING REPORTS

Director of the GINA at the University of Alaska Fairbanks Gives a Talk at the Earth System Science Interdisciplinary Center



In town to meet with Federal Partners and members of CISESS, Dr. Jennifer Delamere, Director of the University of Alaska Fairbanks Geographic Information Network of Alaska (GINA) and Associate Research Professor, left the taiga of Alaska, arriving in the College Park area last weekend. GINA is the latest organization to become a CISESS Consortium Member. She gave an entertaining seminar at the Earth System Science Interdisciplinary Center on February 23 titled "Delivering NOAA Satellite Data from the Final Frontier to the Last Frontier", well attended by twenty people in-person and forty-two people on-line. As the talk abstract states, GINA manages three direct-broadcast antennas in interior Alaska. Her presentation showed how JPSS products derived from direct-broadcast data support critical operations in Alaska: tracking precipitation, detecting, and monitoring wildfires and floods, and analyzing sea ice movement. Looking ahead, a new generation of satellites (AWS, MetOp-SG, GOSAT-GW, JPSS-4/3) will be added to GINA's portfolio. A recording of her talk can be found here: https://www.youtube.com/watch?v=VG9wkLn1AWY

(Jennifer Delamere, CISESS, jsdelamere@alaska.edu, Funding: IIJA & LEO)

MEDIA INTERACTIONS AND REQUESTS

An Insider's Take on Doing Research in the Polar Zones

CISESS Scientist Sinéad Farrell was the subject of an interview in the February 24 edition of *Maryland Today*, the daily news source for the University of Maryland. From what to snack on in the frigid poles to spotting polar bears to the importance of studying Earth's cryosphere, Farrel shared her experience in doing such research, providing nuggets of knowledge about all sorts. Who knew that a chocolate bar did not freeze solid at 5F! Learn from the "cool" conversation here: https://terp.umd.edu/cold-coverage

(Sinéad Farrell, CISESS, sinead.farrell@noaa.gov, Funding: Jason)

PUBLICATIONS

Examining the CRTM with its New Radar Module
Citation: Moradi, Isaac, Satya Kalluri, and Yanqiu Zhu, 2026: Forward modeling of spaceborne radar observations. *Atmos. Meas. Tech.*, **19**, 549–563, https://doi.org/10.5194/amt-19-549-2026.
Summary: In their paper published in *Atmospheric Measurement Techniques*, CISESS Scientist Isaac Moradi and coauthors at NASA and NOAA examine how well the Community Radiative Transfer Model (CRTM) performs for different radar frequencies now that a radar module is included in this RTM. The CRTM is commonly used in the assimilation of satellite observations within numerical weather prediction (NWP) systems. EarthCARE Cloud Profiling Radar (CPR), Global Precipitation Measurement Dual-Frequency Precipitation Radar, and CloudSat CPR observations were used in their analyses, with a focus on the sensitivity of different frequencies to hydrometeor type and the impact of particle size distributions (PSDs) and hydrometeor shape assumptions on simulated radar reflectivities. The authors show that overall, the choice of PSD and particle shape, especially snow particle habits, largely influence simulated reflectivities. They plan to cover more hydrometeor types like hail and graupel in future analyses and to determine observation errors for the assimilation of spaceborne radar observations in NWP models.

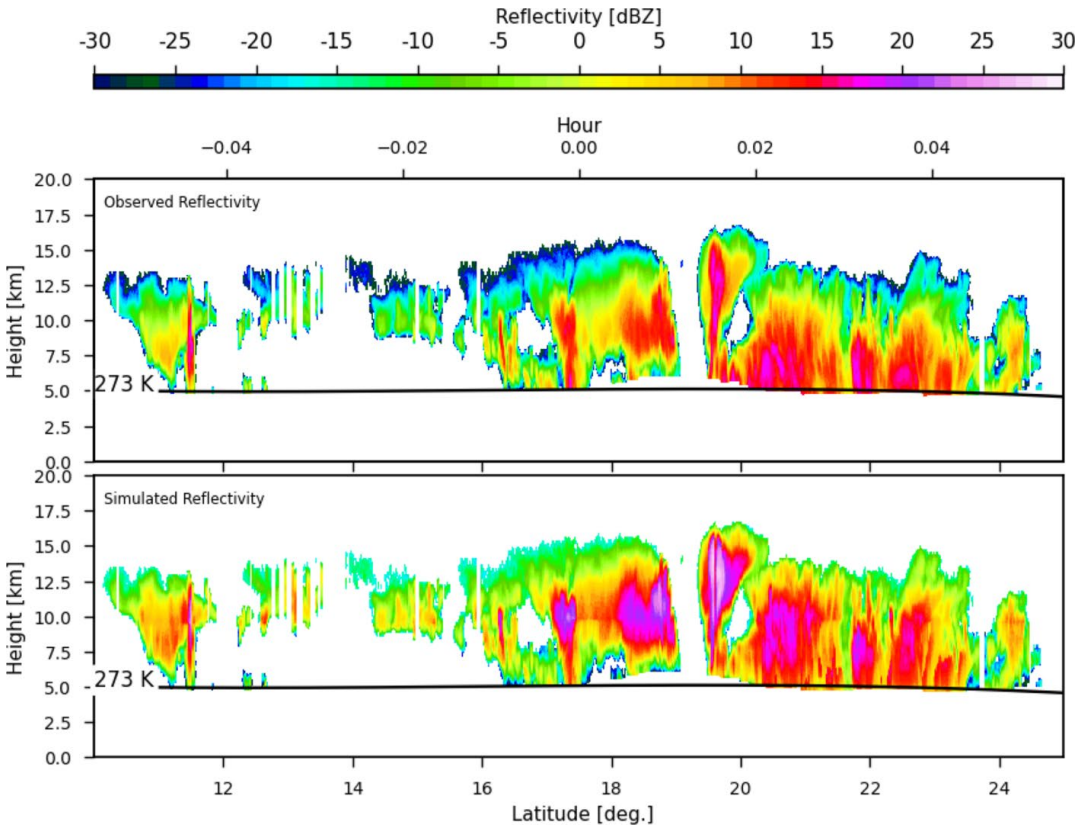


Figure: Observed (top panel) and simulated (bottom panel) CloudSat CPR reflectivities for Hurricane Bill on 19 August 2009 at 17:19 UTC.

(Isaac Moradi, CISESS, imoradi@umd.edu; Funding: LEO)

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