Weekly Report

CIRA
STAR/NESDIS
National Oceanic and Atmospheric Administration (NOAA)

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Products and Applications

TC PRIMED v1r1 data readiness review: The Tropical Cyclone PRecipitation, Infrared, Microwave, and Environmental Dataset (TC PRIMED) development team, including N. Razin and C. Slocum, completed the National Centers for Environmental Information data readiness review and signed a new submission agreement for the minor release of the dataset (v01r01). TC PRIMED is an artificial intelligence and analysis ready collection of tropical cyclone characteristic metadata, passive microwave and geostationary imagery, and storm environmental context that allows researchers and developers to access a single location for traditionally disparate data sources. The minor release extends TC PRIMED from 1998–2021 to 1987–2022 with the inclusion of historical platforms and new overpasses as well as additional environmental context including cylindrical representation of data and cyclone phase space metrics for distinguishing between tropical and extratropical cyclones. The new version will be publicly available this summer. (POC: C. Slocum, STAR, 970-491-2409, Christopher.Slocum@noaa.gov; N. Razin, CIRA, Naufal.Razin@colostate.edu; Funding: PDRA/ONR/NCAI; Submitted to SOCD)

Synthetic Passive Microwave (SPM) on Slider2: Machine-learning based synthetic passive microwave products for 37-GHz and 89-GHz are now available on SLIDER2 (https://rammb-slider2.cira.colostate.edu/). These products use a consensus of deep convolutional neural networks to predict passive microwave imagery from geostationary full-disk imagery, and they are available every 10 minutes at 2 km for Himawari-9, GOES-16, and GOES-18. Passive microwave near the 37-GHz frequency provides insight into the precipitation structure of systems, and the color composite product helps visualize deep convection (ice scattering) and liquid water (warm rain emissions over oceans), where deep convection appears pink, low-level water clouds and rain (and land) appear cyan, and the sea surface is green. At 89-GHz, large precipitation-sized ice particles in deep convection scatter radiation and produce low brightness temperatures; thus, the 89-GHz polarization corrected temperature (PCT) product highlights regions of deep convection in precipitating systems by overlaying this product over infrared imagery (11.2 µm, grayscale). Examples are shown in the figure below. (POC: K. Haynes, CIRA; katherine.haynes@colostate.edu). Funding: OVERCAST.

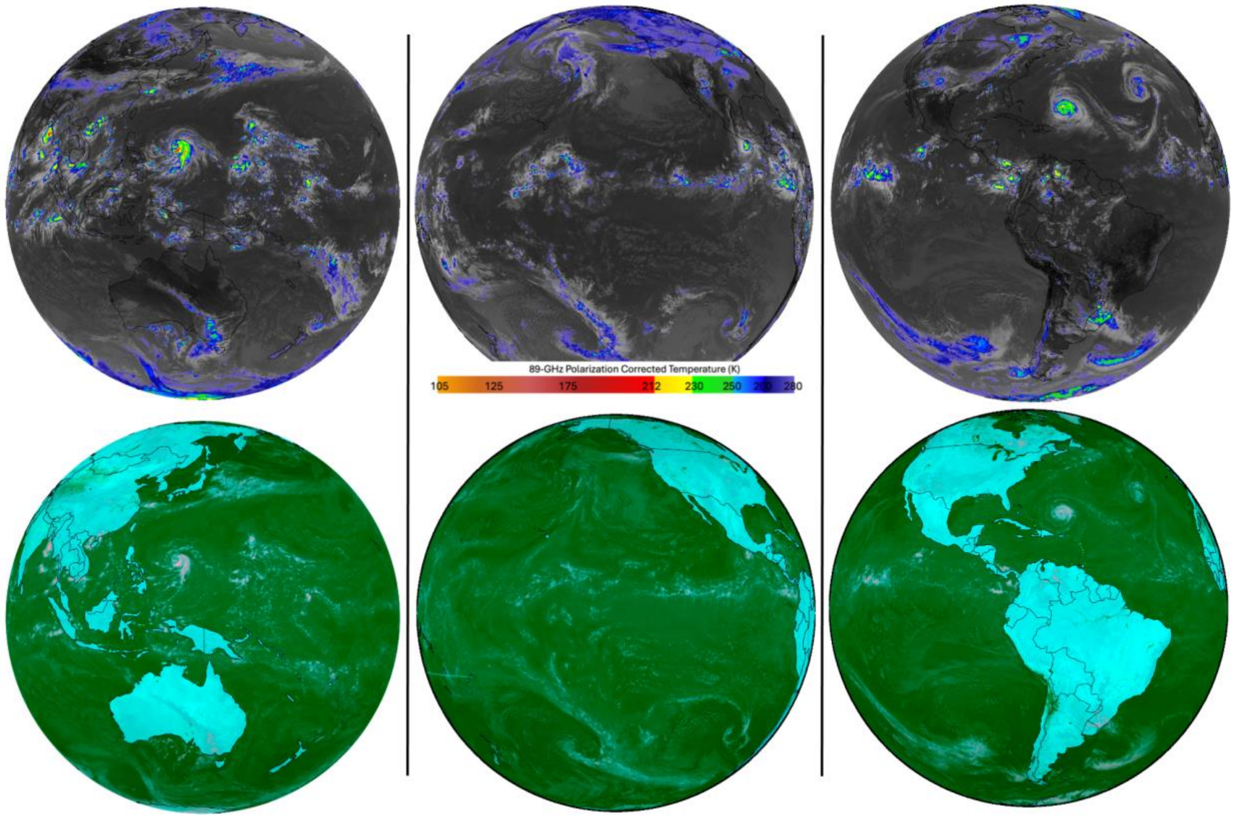


Figure: Sample SPM imagery from Himawari-9 (7 June 2023, Typhoon Guchol), GOES-18 (24 Oct 2023, Hurricane Otis), and GOES-16 (12 Sep 2023, Hurricane Lee). Top row demonstrates the 89-GHz PCT product, and the bottom row shows the 37-GHz color product.

<u>Publications (Citation:</u> <u>followed by a short</u> **<u>Summary:</u>** <u>(Why & so what)</u>**<u>, & detailed summary):</u>**

<u>Awards and Recognition</u>

<u>Travel, Workshops, Conferences, and Meeting Reports</u>

CIRA Executive Board Meeting: CIRA held its annual Executive Board meeting on 7 June 2024. The Board was represented by Jennifer Mahoney (Director NOAA/ESRL and NOAA/GSL), James Donellon (Deputy Assistant Administrator NESDIS), Michael Farrar (Director NCEP), Paul DiGiacomo (Principal Science Advisor NESDIS/StAR), Allen Robinson (Dean CSU/WSCOE), Colleen Webb (Dean CSU Graduate School), Eric Maloney (Professor and Department Head CSU/ATS), and Steve Miller (Director CIRA and Professor CSU/ATS). CIRA employees gave presentations covering different CIRA research areas as well as an administrative and financial overview. (POC: S. Miller, Steven.Miller@colostate.edu; Funding: NOAA and CIRA).

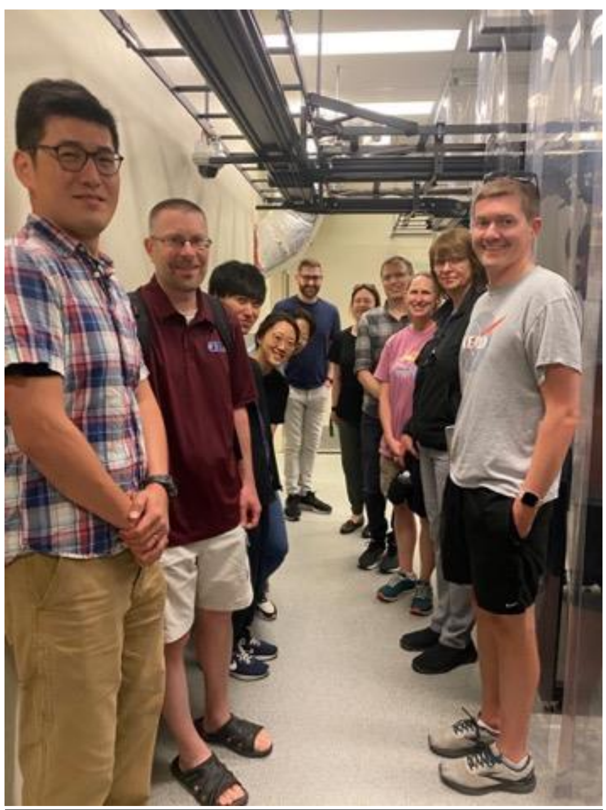
Training and Education activities

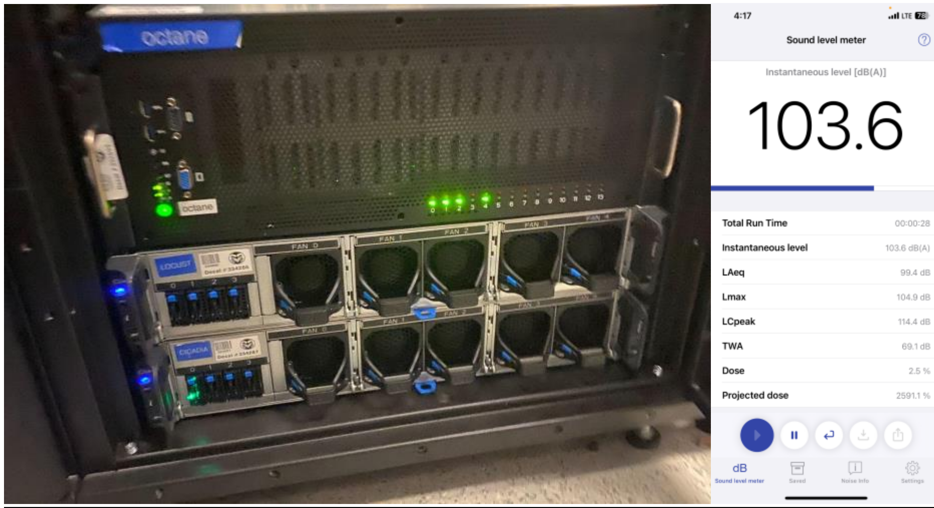
Future Meetings and Events (dates, meeting/event, location, staff involved)

Other

Don Hillger reviewed a manuscript for *The Physics Teacher*, having to do satellite orbit calculations as a teaching tool. (POC: D. Hillger, CIRA, don.hillger@colostate.edu)

Visit to CSU's Scott Data Center: On June 10, 2024, a group of CIRA researchers visited the Scott Data Center on CSU's main campus to observe up close the servers they are using in their daily work, whose functions include processing and storing data used in NOAA-sponsored research. The tour was organized by Natalie Tourville. The group was impressed by the fact that CIRA's servers are occupying an impressive portion of the data center, learned about the cooling system, and got to observe how loud some of the machines are. Particularly loud are CIRA's two new NVIDIA GPU systems (GH200s) for the first 5 minutes when they are booting up - the noise exceeded 100dB! They are aptly called locust and cicada for a reason. Many thanks to Natalie Tourville for organizing the tour. (POC: N. Tourville, YJ Noh, J. Haynes, I. Ebert-Uphoff, CIRA; Natalie.Tourville@colostate.edu, Yoo-Jeong.Noh@colostate.edu, John.Haynes@colostate.edu, iebert@colostate.edu). Funding: CIRA.





A group of CIRA scientists (top) visited the Scott Data Center on CSU's main campus on Mon, June 10 and observed the loud noise of the two GPU systems, locust and cicada (bottom), which tend to exceed 100dB for the first 5 minutes of booting.