Weekly Report

SCSB/CISESS
Cooperative Research Program Division (CoRP)
STAR/NESDIS
National Oceanic and Atmospheric Administration (NOAA)

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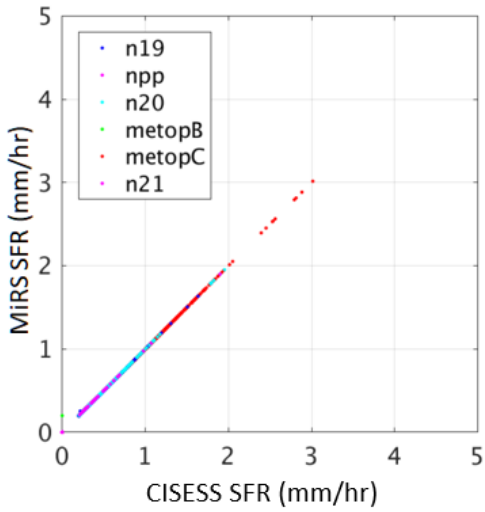
Products and Applications

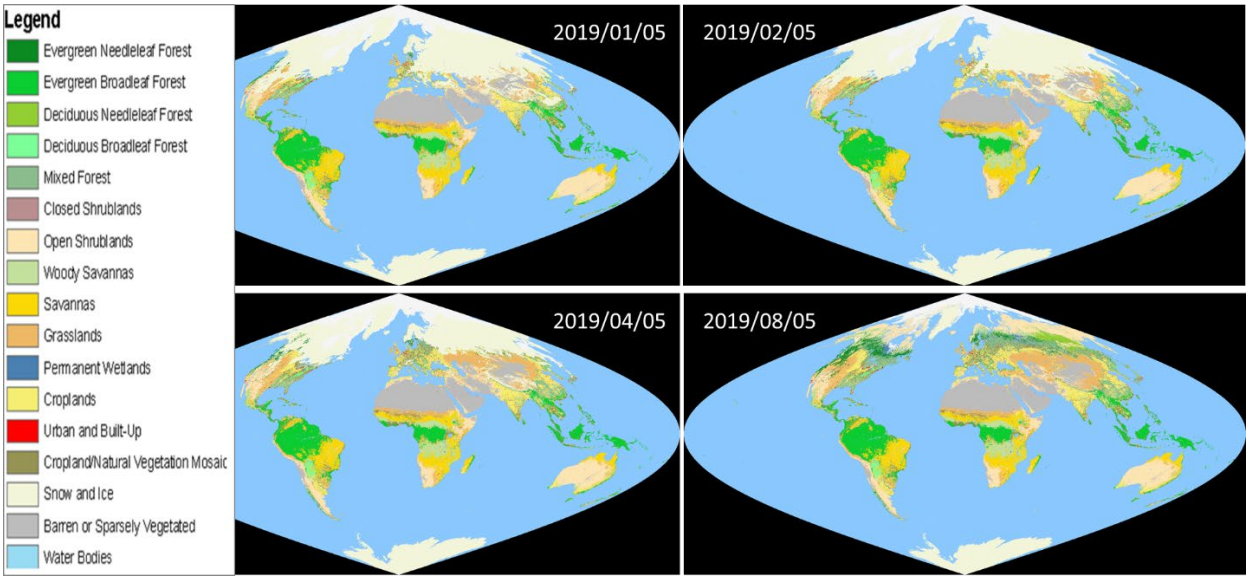
Updated SFR Delivered to MiRS: An updated enterprise snowfall rate (SFR) package was delivered to the MiRS team for integration into MiRS DAP v11.6. The DAP is scheduled to be delivered to NDE in July. The major changes to the current SFR processing are (i) updated bias correction for all satellites (NOAA-20, S-NPP, NOAA-19, Metop-B, and Metop-C), and (ii) the addition of preliminary JPSS-2 capability. The SFR product is operationally generated from MiRS on the script level. As a check for correct implementation in MiRS, the figure below compares the SFR output from MiRS and CISESS (the development end). The result shows a high degree of agreement between the two systems for all satellites and thus validates the integration.



(H. Meng, J. Dong, Y. Fan, C. Kongoli, R. Ferraro, huan.meng@noaa.gov, Funding: JSTAR & JSTAR PSDI)

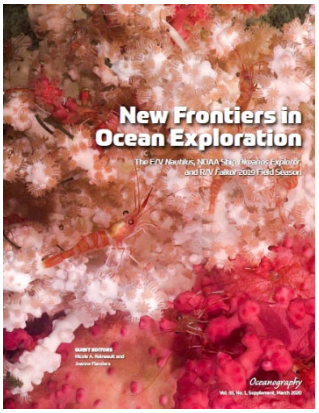
Annual VIIRS Surface Type and Daily Snow Cover: Research Prof. Chengquan Huang from the UMD Department of Geographical Sciences works on a CISESS task providing scientific support for the STAR JPSS Surface Type products. His major focus is on development of the NPP/JPSS

VIIRS Environmental Data Records (EDRs) for Surface Type (ST). This requires creating the Annual Global Gridded Surface Type (AST) ancillary data product (ADP) which must be generated annually and regridded to the VIIRS swath. The AST map cannot capture intra-annual changes in surface cover conditions, many of which can have substantial short-term impact on weather/climate processes. Huang and his team started to explore the feasibility of developing a product suite that could capture some of these intra-annual changes. Given resource constraints, they focused on leveraging products being generated by other programs or agencies. They concluded that the 1 km product generated by the Interactive Multisensor Snow and Ice Mapping System (IMS) could be used together with the AST to produce a product suite.



Their first experimental product, shown above, is daily surface type maps for selected dates in 2019 to capture large intra-annual changes in snow cover. These maps are part of a prototype daily Surface Type product suite designed to capture daily snow cover conditions. This new product suite begins the Research to Operations process under their new CISESS task that begins on August 1. (*Chengquan Huang, cghuang@umd.edu , Funding: JSTAR*)

Publications



New Frontiers in Ocean Data Sharing: Anna Lienesch, who works with NCEI, is a coauthor of a chapter on open data sharing in a new *Oceanography* supplement on the NOAA Ship Okeanos Explorer, and R/V Falkor 2019 Field Season. Lienesch leads a CISESS task with the NOAA Office of Ocean Exploration and Research (OER), to develop and operate the Cruise Information Management Services (CIMS). This a collection of structured data systems and evolving services that generates rich metadata, ensures data security, and provides free public access to OER data collections. This project includes two public

access data portals: the OER Digital Atlas and the OER Video Data Portal. The chapter discusses how OER and NCEI are implementing the "FAIR Guiding Principles," which are gaining acceptance in the scientific data community as a way to describe the best data management practices to support open data sharing. FAIR practices strive to produce data that are Findable, Accessible, Interoperable, and Reusable.
Mesick, Sharon, Susan Gottfried, Barry Eakins, Caitlin Ruby, **Anna Lienesch**, Clint Edrington, Jesse Varner, and Megan Cromwell, 2020: Playing FAIR: Enabling Ocean Exploration Through Open Data Sharing, in Raineault, N.A., and J. Flanders, eds. 2020. New Frontiers in Ocean Exploration: The E/V Nautilus, NOAA Ship Okeanos Explorer, and R/V Falkor 2019 Field Season. *Oceanography* **33**, supplement, 122 pp., https://doi.org/10.5670/oceanog.2020.supplement.01, pp. 74 -77. *(Anna Lienesch, anna.s.lienesch@noaa.gov, Funding: NCEI/OER)*

Workshops, Conferences, and Meetings

Critical Design Review for EUMETSAT Polar System – Second Generation (EPS-SG): The first of the three ESP-SG satellite couples is set for the launch in 2024. To ensure a smooth integration of the new satellite products, on July 14th STAR has held a CDR meeting. Ralph Ferraro and Veljko Petkovic are leading Microwave Imager (MWI) algorithm team tasked to deliver the NOAA Unique Product (NUP) product retrieval suite to STAR operations. This is the first time a microwave imager will be an instrument on a EUMETSAT satellite. During the Critical Design Review meeting, each team presented a plan on the reusability of NOAA's enterprise algorithms to develop EPS-SG NUP products. All proposed MWI product elements have successfully passed the review and the MWI team and the team will proceed with the development and support of ten MWI-specific products: Imagery, Total Precipitable Water, Cloud Liquid Water, Precipitation Rate and Type, Sea Surface Winds, Snow cover/depth, SWE, Sea Ice, and Snowfall Rate. During the Critical Design Review meeting, a long-term MWI proxy data set was set as the next priority for the team. This soon-to-be-generated data set will serve for development and testing of pre-launch retrievals. It will ensure all operational requirements will be met once the EPS-SG satellite B becomes operational. The figure below (left panel)

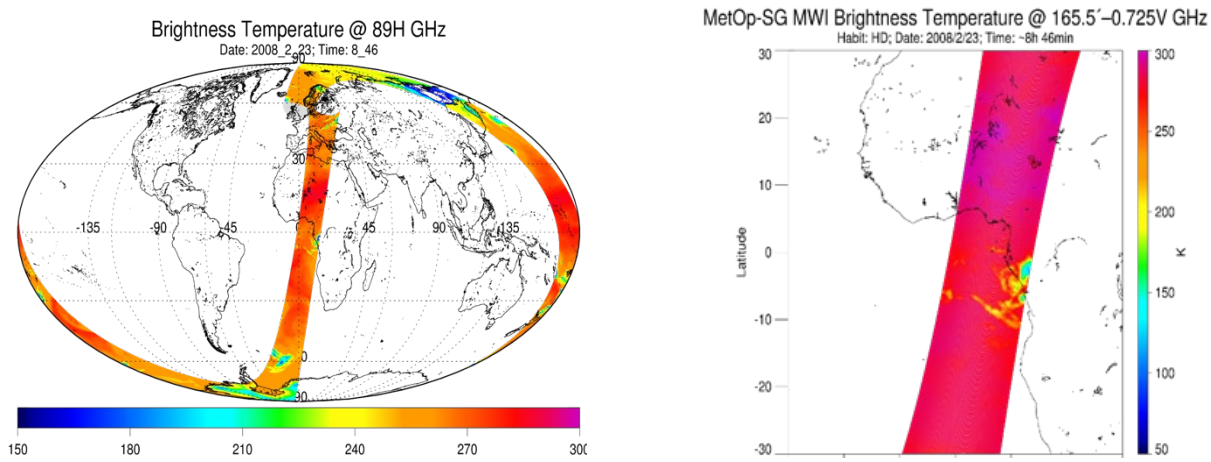


Figure: EPS-SG MWI proxy data brightness temperature example. 89 GHz horizontal (left) and 165 GHz vertical (right).

depicts one third of currently available level 1 MWI proxy data.
(*POC: Ralph Ferraro ralph.r.ferraro@noaa.gov , Veljko Petkovic, veljko.petkovic@noaa.gov , Funding: EPS-SG)*

Precipitation Processes Through the Eyes of Artificial Intelligence: CISESS scientist Veljko Petkovic is a primary convener for the AGU Fall Meeting 2020 session on Machine Learning applications on precipitation processes. This session will highlight contributions on precipitation-related AI/ML studies seeking physical implications, model interpretations, visualizations, remote sensing applications and uncertainty analyses that can identify novel elements in understanding of precipitation processes. It calls for studies that can link the information content of observational/modeled datasets to the physical causes and/or materializations of storm properties. These include, but are not limited to, studies on radiative-, hydrometeor-, cloud-, and hydrological-responses to precipitation processes. Abstracts are due July 29. See https://agu.confex.com/agu/fm20/prelim.cgi/Session/102606 **.**

(*POC: Veljko Petkovic, veljko@umd.edu , Funding: HPCC & EPS-SG)*

Training and Education

A virtual meteorology class: Daile Zhang gave a virtual meteorology class for the 6th Grade students from the Stafford County Public Schools on July 16th, 2020 during their summer camp. The students were interested in exploring a career path to meteorology and atmospheric science. Daile showed the students what, in general, meteorologists do, the job options that meteorologists have, and the projects that she has been working on. She also talked about her own experience of how she became a meteorologist and gave the students advice on how to choose a science career path. After the class, she sent the students a lightning booklet that she developed in 2017, which answers many questions that people often asked about lightning. *(Daile Zhang, dlzhang@umd.edu, Funding: GOES-R AWG & GOES-R PGRR)*