

Weekly Report – March 8, 2024
Cooperative Institute for Satellite Earth System Studies (CISESS)
NOAA/NESDIS/STAR

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HIGHLIGHTS FOR NESDIS LEADERSHIP

Data and Information

NESDIS SFR Product Actively Monitored the Heavy Snowstorm in California Last Week

A powerful, multiday winter storm slammed Northern California, Nevada and Southern Oregon over the last weekend, March 1-4, 2024. The winter storm dropped as much as 10.5 feet of snow with hurricane-force winds of up to 200 mph. CISESS Scientists Yongzhen Fan and Jun Dong and NOAA Scientist Huan Meng watched as the NOAA/NESDIS Snowfall Rate (SFR) product actively monitor the winter storm and provide timely snowfall rate estimations to NWS weather forecast offices (WFOs). The NESDIS SFR product is retrieved from Passive Microwave (PMW) sensors aboard a constellation of polar-orbiting satellites including SNPP, NOAA-20, NOAA-21, NOAA-19, Metop-B, Metop-C, and GPM. The top two panels in the figure below show a comparison of the SFR product retrieved from NOAA-21 (left) and the NOAA National Operational Hydrologic Remote Sensing Center (NOHRSC) hourly snow precipitation analyses (right) during the storm. The comparison between the two products shows that the satellite retrievals generally agree well with the NOHRSC snow analysis. The underestimation in the Sierra Nevada is likely due to orographic snow representation issues that are the focus of current research. The bottom panels present the 72-hour accumulated snow water equivalent (SWE) from the SFR products (left) and the accumulated snow depth from NOAA Snow Data Assimilation System (SNODAS) (right). The two products agree very well both in the accumulated snowfall amount and the snowfall areas within CONUS. In addition, SFR is a global product compared to the limited coverage of SNODAS.

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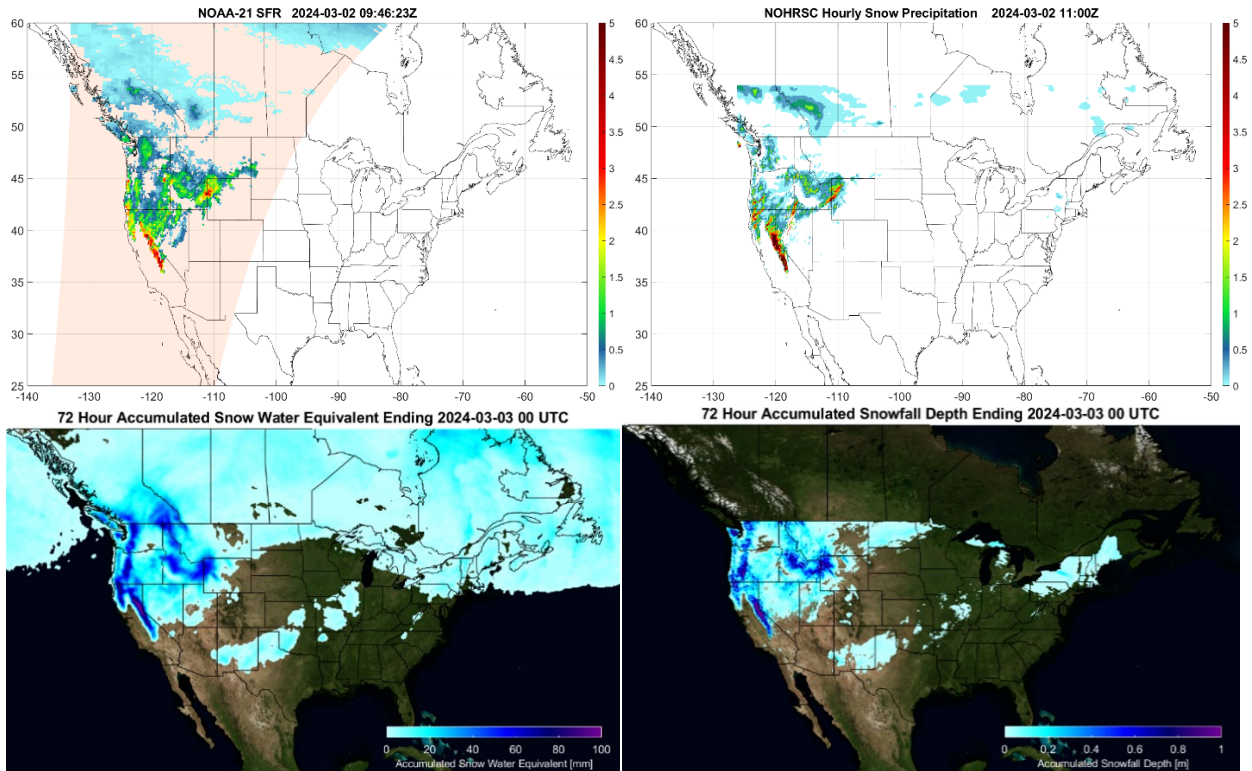


Figure. Comparison of the NESDIS SFR product retrieved from NOAA-21 (top left) and NOAA NOHRSC hourly snowfall precipitation (top right), and comparison of the 72-hour accumulated SWE from NESDIS SFR products (bottom left) and accumulated snowfall depth from NOAA SNODAS (bottom right). (Yongzhen Fan, CISESS, yfan1236@umd.edu, Funding: JPSS STAR, JPSS PGRR)

TRAVEL AND MEETING REPORTS

NOAA NCWCP and UMD hold Second Annual Mini-Conference:

The National Weather and Climate Prediction Center (NCWCP) and UMD's Earth System Science Interdisciplinary Center (ESSIC) held a three-day mini-conference from February 27 to 29, a hybrid event held both at the ESSIC Large Conference Room and on line. The conference brought together ESSIC, CISESS and NOAA scientists to share their presentations and posters from the recent AGU and AMS conferences. CISESS Scientist Peter Beierle was the conference organizer for UMD. The CISESS speakers at the conference were:

- **Christopher Smith** (NWS), Enterprise Proving Ground at NCWCP (see figure below);
- **Bavand Sadeghi** (ARL), Enhancing Volcanic Emission Forecasting through Data Fusion and Trajectory Analysis: A Case Study of 2022 Hunga Tonga Eruption;

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- **Miguel Cahuich** (ARL), Synthetic Data Experiments of a Measurement-Modeling Greenhouse Gas Emissions Estimation System for the Washington, DC and Baltimore, MD Metropolitan Area;
- **Jicheng Liu** (STAR), Inter-Sensor Calibration of Microwave Brightness Temperature Between AMSR-E and AMSR2;
- **Isaac Moradi** (STAR & EMC), Assimilation of All-Sky Microwave and Radar Observations in the NWO Model;
- **Yongzhen Fan** (STAR), Machine Learning Enhanced Snowfall Retrievals from Passive Microwave Sensors;
- **William Miller** (STAR), Investigating Spire GNSS RO Bending Angle Assimilation Impacts on HWRP Forecasts of Four 2022 Atlantic Hurricanes;
- **James Beauchamp** (NCEI), Extending NOAA/MHS Hydrological Bundle Climate Data Record (CDR) by Incorporating ATMS Observations; and
- **Malarvizhi Arulraj** (STAR), Vertical Structure of the Precipitation Systems: A Satellite Passive Microwave Sensor Perspective.

Posters were presented by CISESS Scientists:

- **Ron Vogel**, (CWOW), Satellite Chlorophyll for Chesapeake Bay Fisheries Management;
- **Yuling Liu**, (STAR), Towards Routine Radiance-Based Validation of VIIRS LST Using GDAS Profiles;
- **Lei Ji**, (STAR), Assessment of BRDF Effects in Surface Reflectance between GOES-16 and GOES-18;
- **Veljko Petkovic** (STAR), Exploring Common Information Content of Satellite Level-1 Products: Precipitation Retrieval Applications;
- **Xi Shao** (STAR), A Method for Predicting Radio Occultation Opportunities and Applications in RO Sensor Inter-calibration and Mission Planning & Evaluation of VIIRS Thermal Emissive Bands Long-Term Stability and Inter-Sensor Consistency with Radiative Transfer Modeling; and
- **Xin Jing**, (STAR), Assessing Retrieved Temperature Profile Quality and Consistency in Spire and COSMIC-2 Radio Occultation via Comparisons with NOAA-20 ATMS and Radiosonde Measurements.

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Figure: CISESS Scientist **Christopher Smith** presenting his research as the Enterprise Proving Ground Satellite Liaison for the NWS Weather Prediction Center (WPC) and Ocean Prediction Center (OPC) to maximize satellite capabilities for weather forecasts.

The full agenda is available [here](#). (Peter Beierle, CISESS, peter.beierle@noaa.gov, Funding: JSTAR)