Weekly Report

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

Submitted by: Ralph Ferraro
Prepared by: Debra Baker
Date of Submission: 7/3/2020

Products and Applications

Snowfall Rate Product–Case for COMET Training: A satellite and radar blended snowfall rate (mSFR) product has been generated at CISESS at near real-time. The satellite product is the NESDIS operational SFR produced from a suite of satellites and the radar counterpart is the Multi-Radar Multi-Sensor (MRMS) instantaneous precipitation product developed by NOAA NSSL. The SPoRT program retrieves mSFR from CISESS and disseminates to some WFOs that have access to SPoRT distributions. At the request of Patrick Dills, a scientist from the COMET program at UCAR, a set of mSFR images was generated for a training module he was developing. The images were from a snowstorm that swiped through the country on April 16-17, 2020. The figure below demonstrates how the satellite product can fill in the gaps in radar coverage. An mSFR animation of the storm is at:
http://cics.umd.edu/~jdong/temp/msfr/case_20200416/animation.gif

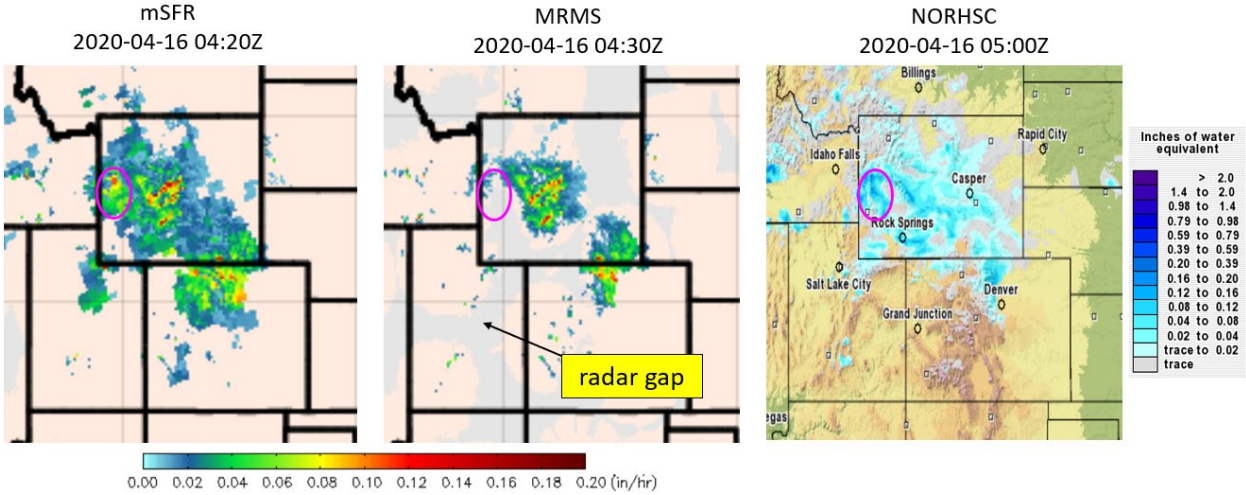
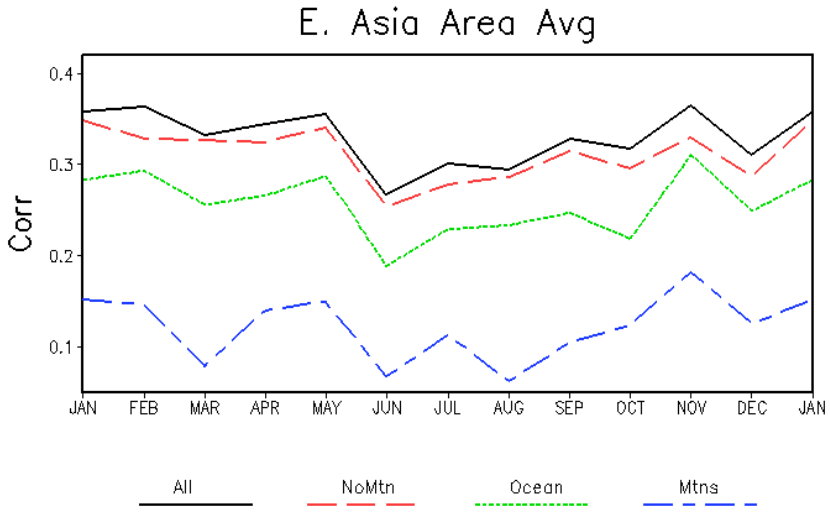


***Figure 1**: Snowfall rate images from a snowstorm on April 16, 2020: mSFR at 04:20Z (left), MRMS at 04:30Z (center), and National Operational Hydrologic Remote Sensing Center (NOHRSC) modeled hourly snowfall precipitation data at 05:00Z (right). The light grey color in the MRMS image indicates radar gap. The satellite SFR product can fill in these gaps when there*

are satellite overpasses. For instance, the moderate snowfall in the area circled in magenta color is missing in MRMS but is captured in both mSFR and NOHRSC.

(*POC: H. Meng and J. Dong, huan.meng@noaa.gov and jundong@umd.edu, Funding:* STAR JPSS*)*

Statistical-Ensemble Forecasting of East Asian Monthly Precipitation: T. Smith and his colleagues performed testing of monthly average precipitation predictability over East Asia. Testing used cross-validation super ensemble statistical forecasting of monthly average precipitation using predictors from the previous month. Tests evaluate the importance of different predictors on precipitation over the land region 20°N-50°N, 104°E-150°E. Predictors from the previous month include both SST and precipitation in the North Indian and Northwest Pacific Oceans, land temperature and precipitation over the predictand region, and land temperatures over the Himalayan Mountains. Oceans influence following precipitation due to their influence on moisture content and atmospheric temperature and persistence over the predictand region can influence prediction. The Himalayan temperatures can influence conditions by their ability to force long atmospheric waves that influence downstream precipitation. Results show that the Himalayan temperatures have a modest impact on predictability all year. Although modest, the systematic improvements from Himalayan temperatures show that they give independent skill and therefore mountain predictors should be used for prediction.



Spatial averages of cross-validation correlation skill of monthly precipitation forecast for East Asia. Results are shown for ensembles using all predictors (All), using all except for the LST over the Himalayan Mountains (NoMtn), using only ocean-area predictors (Ocean), and using only the Himalayan Mountain LST (Mtns). The month listed is the predictor month, and forecasts are validated for the following month.

(*T. Smith, tom.smith@noaa.gov, Funding: PDRA)*

Workshops, Conferences, and Meetings

International Lightning Safety & Protection Meeting: CISESS Scientist Daile Zhang helped organize and attended the first International Lightning Safety & Protection Meeting, which was held on June 24th and 25th, 2020 over zoom. This was the first time that over 30 organizations from 12 countries get together sharing their work and discussing potential future collaboration on lightning safety awareness education and protection, especially for developing countries in Africa and south Asia. Daile also helped create a YouTube channel for the International Lightning Safety & Protection Council and uploaded the meeting videos at https://www.youtube.com/channel/UCjh9VO4xeJHe80rEAZJPyqQ?view_as=subscriber .

(*POC: Daile Zhang, dlzhang@umd.edu, Funding: GOES-R PGRR)*

Land Model Advances: CISESS Scientist Jifu Yin is one of the conveners for an AGU Fall Meeting 2020 session on Advancing Land Surface Models for Hydrological and Environmental Applications. This session will highlight the latest developments in LSMs and their applications in hydrology and other disciplines. We encourage contributions in: (1) Model developments and improvements for hydrological and multi-disciplinary applications; (2) Innovative approaches for model optimization and calibration through various techniques including data assimilation and machine learning; (3) Applications of LSMs for environmental monitoring (4) Insights on LSMs performance based on model inter-comparisons and evaluation using in situ and remote sensing data. Abstracts are due July 29. See https://agu.confex.com/agu/fm20/prelim.cgi/Session/101550.

(*POC: Jifu Yin, jifu.yin@noaa.gov, Funding: CPO MAPP)*