Weekly Report

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

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Publications

Paper published on Satellite Hail Detection: R. Ferraro is a co-author on a recently published paper using satellite observations to detect and map regions of hail. The paper, led by S. Laviola of the National Research Council of Italy, builds off of collaborative work performed during his 1 year visit at SCSB/CISESS five years ago. In this study, the previous hail detection model is adapted to work with all passive microwave sensors that are part of the GPM constellation. This include both conical and cross-track scanning sensors (including ATMS). By taking advantage of all of the constellation, a better representation of the diurnal cycle of hail is gained, which can yield a more accurate hailfall climatology.

Laviola, S., G. Monte, V. Levizzani and **R. Ferraro,** 2020: A new method for hail detection from the GPM constellation: a prospect for a global hailstorm climatology. *Remote Sens*., **12,** 3553, doi:10.3390/rs12213553.

(POC: Ralph Ferraro, Ralph.R.Ferraro@noaa.gov, Funding: PDRA)

Potential Predictability of Meteorological Variables for MJO: CISESS scientist, Dr. Jieshun Zhu, collaborating with NOAA scientists, Drs. Arun Kumar and Wanqiu Wang of NWS/NCEP/Climate Prediction Center, analyzed potential predictability in meteorological variables associated with skillful prediction of Madden-Julian Oscillation (MJO) during boreal winter. The analysis is motivated by the fact that dynamical prediction systems are now capable of predicting MJO up to 30 days or beyond, measured in terms of anomaly correlation for Real-time Multivariate MJO (RMM) indices. Translating recent gains in MJO prediction skill and relating them back to potential for predicting meteorological variables, such as precipitation and surface temperature, is not straightforward because of the complexity of the models that compute and evaluate RMM indices. This paper identified potential predictability in outgoing longwave radiation (OLR) and 850- and 200-hPa zonal wind. It also analyzed two-meter temperature (T2m) and precipitation (see the figure below), which could be attributed with skillful prediction of the MJO.

The analysis is based on the observational data alone and assess the upper limit of MJO associated predictability that could be achieved. Compared to predictability studies based on model forecasts or reforecasts, this observational approach provides a much more objective measure of predictability that is independent of model biases (and their influence on skill).

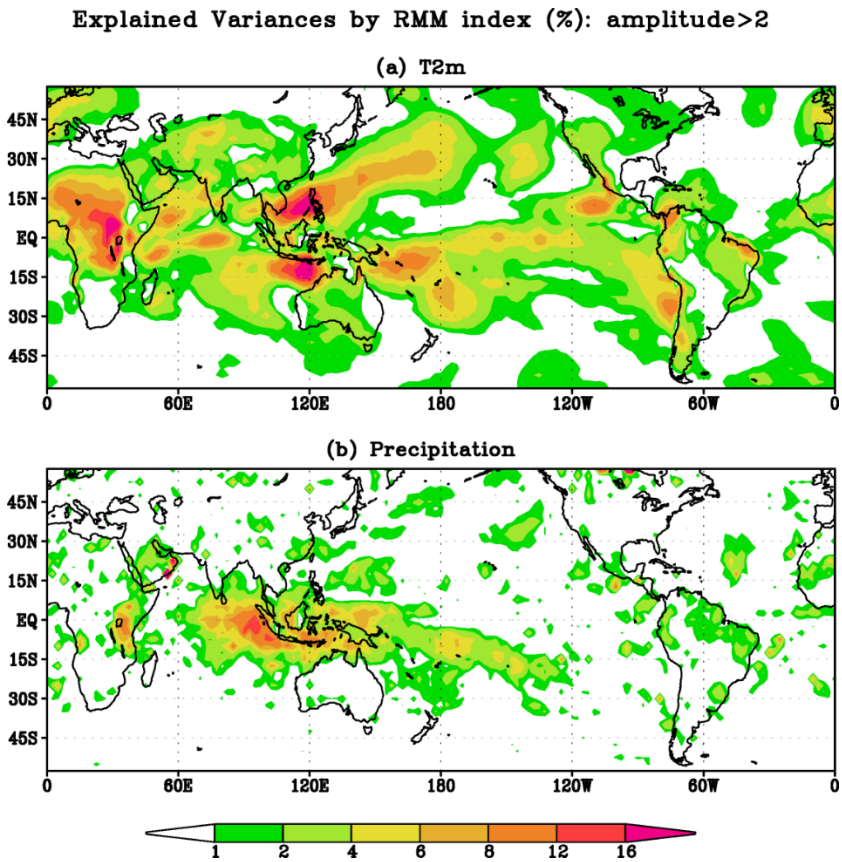


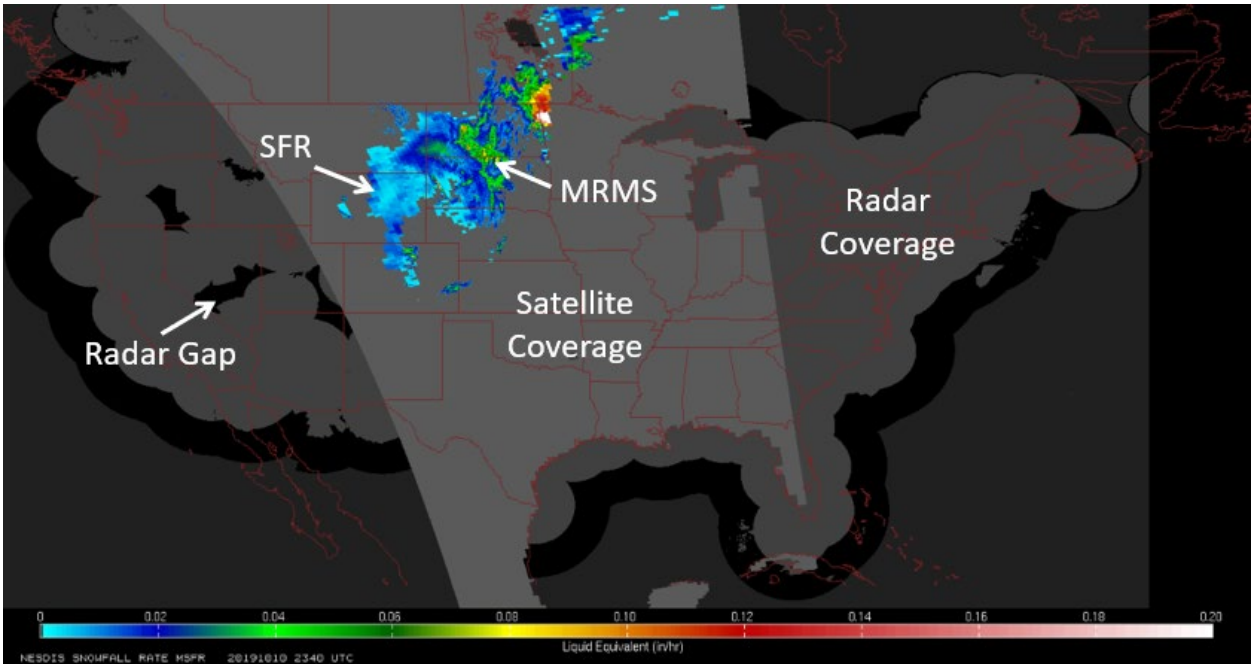
Figure: Variances explained by the RMM indices for (a) T2m during the boreal winter (November-April), 1988-2017, and (b) Precipitation during the boreal winter (November-April), 1998-2017. The explained variances (unit: %) are computed as the ratio of variance of RMM-reconstructed fields versus that of the original fields for days with MJO amplitude larger than 2.

Kumar, Arun; **Jieshun Zhu** and Wanqiu Wang, 2020: Assessing predictive potential associated with the MJO during the boreal winter. *Mon. Wea. Rev.*, in press, https://doi.org/10.1175/MWR-D-20-0128.1.

(POC: Jieshun Zhu, jieshun.zhu@noaa.gov, Funding: CPC)

Workshops, Conferences, and Meetings

TOWR-S Seminar about mSFR: On November 5, H. Meng gave a TOWR-S seminar about the radar-satellite blended product, mSFR, on November 5. This is an experimental product merging the NSSL Multi-Radar Multi-Sensor (MRMS) instantaneous precipitation product and the operational satellite snowfall rate (SFR). It takes advantage of both the broad coverage of polar-orbiting satellites, and the frequent radar observations to provide a spatiotemporally enhanced snowfall rate product that can aid weather forecasting. The seminar was well-received with about 80 attendees. There were several questions about the mSFR product and how to access it in operation. Brian Motta, the NWS/Office of the Chief Learning Officer, followed up after the seminar about updating the mSFR and SFR Quick Guides that were originally developed by NASA SPoRT. The SFR team will collaborate with SPoRT on the task.



An image showing the MRMS radar product and the satellite SFR product blended snowfall rate product (mSFR) on Oct 10, 2019 23:40 UTC.

(POC: Huan Meng, Huan.Meng@noaa.gov, Funding: JPSS)