

Weekly Report

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

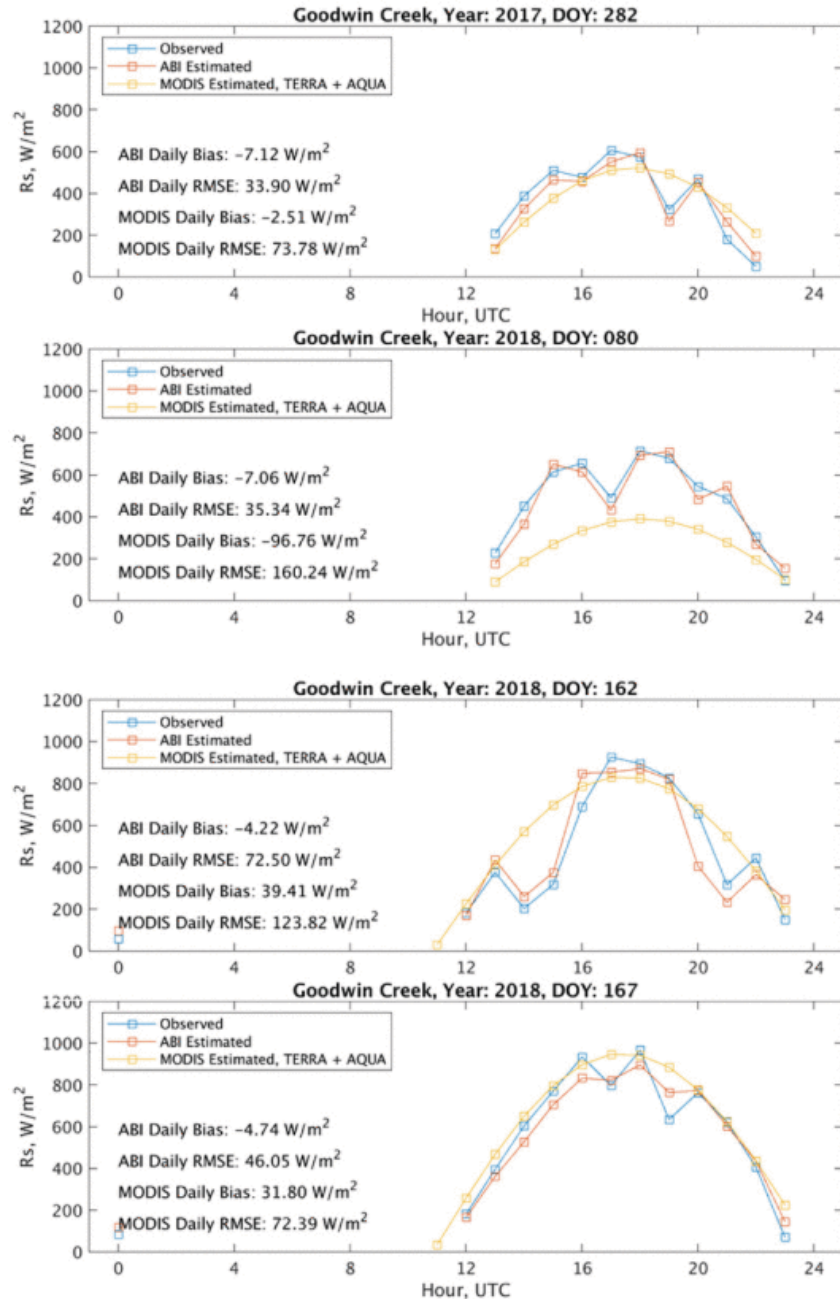
Submitted by: Huan Meng/John Knaff
Prepared by: Debra Baker
Date of Submission: 2/25/2022

Publications

Four Satellite Articles on CISESS Tasks: The latest issue of *IEEE Transactions on Geoscience and Remote Sensing* has articles on four different CISESS Tasks:

- **Wang, Wenhui**; Changyong Cao, Slawomir Blonski, Yalong Gu, **Bin Zhang** and **Sirish Uprety**, 2022: An improved method for VIIRS radiance limit verification and saturation rollover flagging. *IEEE Trans. Geosci. Remote Sens.*, **60**, 1-11, Art no. 5403011, <https://dx.doi.org/10.1109/TGRS.2021.3097896>. CISESS Scientist Wenhui Wang leads a task on the JPSS Visible/Infrared Imager Radiometer Suite (VIIRS) calibration and validation of the Day-Night Band (DNB), reflective solar band (RSB) and thermal emissive band (TEB). In this article, she describes an improved radiance limit verification and saturation rollover flagging method for pixel-level errors in Sensor Data Records.
- Vahedizade, Sajad; Ardeshir Ebtehaj, **Yalei You**, Sarah E. Ringerud and F. Joseph Turk, 2022: Passive Microwave Signatures and Retrieval of High-Latitude Snowfall Over Open Oceans and Sea Ice: Insights From Coincidences of GPM and CloudSat Satellites. *IEEE Trans. Geosci. Remote Sens.*, **60**, 1-13, Art no. 4300913, <https://dx.doi.org/10.1109/TGRS.2021.3071709>. CISESS Scientist Yalei You leads a task on developing and assessing the NOAA Alaska Regional Snowfall Rate Product. His new article introduces a new snowfall retrieval algorithm over open ocean (sea ice) with a true positive rate of 92% (85%) and a RSME of 0.24 (0.15) mmh⁻¹.
- Tremblay, Denis A.; Favio Iturbide-Sanchez, Yong Chen, Lori Borg, Joe Predina, Xin Jin, David C. Tobin, **Larrabee Strow**, Daniel L. Mooney, Dave Johnson, Lawrence Suwinski, and Henry E. Revercomb, 2022: Radiometric noise assessment of the Cross-Track Infrared Sounder on the NOAA-20 satellite. *IEEE Trans. Geosci. Remote Sens.*, **60**, 1-15, Art no. 5506615, <https://doi.org/10.1109/TGRS.2021.3083137>. CISESS Consortium Scientist Larabee Strow (UMBC) leads a task on calibration and validation of JPSS the Cross-Track Infrared Sounder (CrIS Cal/Val) and the NOAA Unique Combined Atmospheric Processing System (NUCAPS). His new article is on two new methods to estimate the CrIS noise equivalent radiance differential.


- CISESS Scientist Dongdong Wang (UMD GEOG) leads a task on the S-NPP and JPSS land surface albedo algorithm. His team's new article is on Surface incident shortwave radiation (ISR), an important component of the surface radiation budget. The team refined the optimization method developed for polar-orbiting satellite data and applied it to estimate ISR from the new generation geostationary Himawari Advanced Himawari Imager (AHI) and GOES-R Advanced Baseline Imager (ABI). Their study also demonstrated that AHI and ABI observations have realized much better estimations for hourly and diurnal ISR than previous polar-orbiting satellite data because of their higher frequency of sampling on the atmospheric conditions (see the figures below).




Zhang , Yi; Shunlin Liang, Tao He, **Dongdong Wang**, Yunyue Yu, and Han Ma, 2022: Estimation of land surface incident shortwave radiation from geostationary Advanced Himawari Imager and Advanced Baseline Imager observations using an optimization method. *IEEE Trans. Geosci. Remote Sens.*, **60**, 1-11, Art no. 5600611, <https://doi.org/10.1109/TGRS.2020.3038829>.


Workshops, Conferences, and Meetings

ProbSevere LightningCast Product Testbed at OPC: CISSS Scientist Javier Villegas Bravo, the GOES-R Satellite Liaison to the National Weather Service (NWS), conducted a testbed at the Ocean Prediction center to evaluate the ProbSevere LightningCast (LC) product. The goal is to expand OPC's 6hr offshore convective text product to a graphical product with full CONUS/PACUS coverage and 5 min resolution. The product was developed at CIMSS by John Cintineo, Michael Pavolonis and Justin Sieglaff. The talk was presented at the TOWR-S Satellite Book Club series and the recording can be viewed here: SBC Session 85 - ProbSevere LightningCast Testbed at the Ocean Prediction Center – YouTube: <https://www.youtube.com/watch?v=tL3XdQKsQA&authuser=0> . Below is a summary slide and the product can be viewed here: https://cimss.ssec.wisc.edu/severe_conv/pltg.html .







NOAA Ocean Prediction Center
ProbSevere LightningCast (LC) Testbed
Javier A. Villegas Bravo
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Faculty Assistant at UND CISSS
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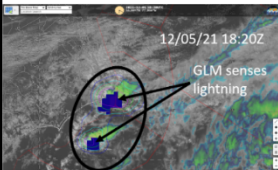
- Expand beyond current offshore zone convective text product
- Testbed to verify LC as a graphical convective product for direct use by mariners
- LC is a machine learning alg. to predict lightning out to 1hr as seen by GOES GLM from the GOES ABI imagery
- LC shows skill in monitoring areas of cumulus and cooling cloud tops that may result in lightning
- Suggest to devs to train model over marine convection for OPC mission
- Want to test product for Weather Prediction Center and National Hurricane Center Tropical Analysis Forecast Branch



12/05/21 16:30Z
LC detects areas of interest

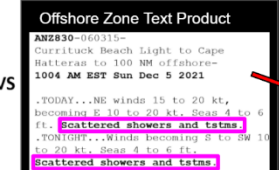


12/05/21 17:30Z
LC increases probabilities




12/05/21 18:20Z
GLM senses lightning


VS



Offshore Zone Text Product
ANZ830-060315-
Currituck Beach Light to Cape Hatteras to 100 NM offshore-
1004 AM EST Sun Dec 5 2021
..TODAY...NE winds 15 to 20 kt, becoming S to 10 to 20 kt... Seas 4 to 6 ft.
Scattered showers and tsns
..TONIGHT...Winds becoming S to SW 10 to 20 kt. Seas 4 to 6 ft.
Scattered showers and tsns



Cintineo, J. L., M. J. Pavolonis, and J. M. Sieglaff, 2022: ProbSevere LightningCast: A deep-learning model for satellite-based lightning nowcasting. Wea. Forecasting, submitted
https://cimss.ssec.wisc.edu/severe_conv/pltg.html



(POC: Javier Villegas Bravo, javier.a.villegasbravo@noaa.gov , Funding: GOES-R PGRR)