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HIGHLIGHTS FOR NESDIS LEADERSHIP

Partnerships

CISESS Scientist Erin Jones visits ECMWF to Test a New Cloud Detection Method
CISESS Scientist Erin Jones is just wrapping up Technology Maturation Program (TMP) 5 project, which investigated whether a hypothetical hyperspectral infrared (IR) sensor with only midwave (MW) and shortwave (SW) bands could be assimilated in NOAA's global system. These bands are not currently used for NOAA data assimilation but are becoming more important with the increase in low-cost Small Satellites. ECMWF has been investigating whether SW channels can be used for hyperspectral infrared (IR) cloud detection for clear-sky data assimilation. ECMWF invited Erin Jones (CISESS at NOAA/STAR) and Bryan Karpowicz (UMBC at NASA GMAO) over to Reading, England for a six-week project to tune their Cloud and Aerosol Detection Software (CADS) to use the JPSS Cross-Track Infrared Sounder (CrIS) SW channels for cloud detection in their Integrated Forecasting System (IFS, the ECMWF model) experiments. Though experiments are ongoing, initial results indicate that a SW-based approach to cloud detection has promise. If no degradation is seen in experiment forecasts, this could indicate that it is possible to bring back S-NPP CrIS in data assimilation at NOAA, and it could open the door to actively using potential future MW/SW-only Small Satellites in the NOAA Global Data Assimilation System (GDAS).
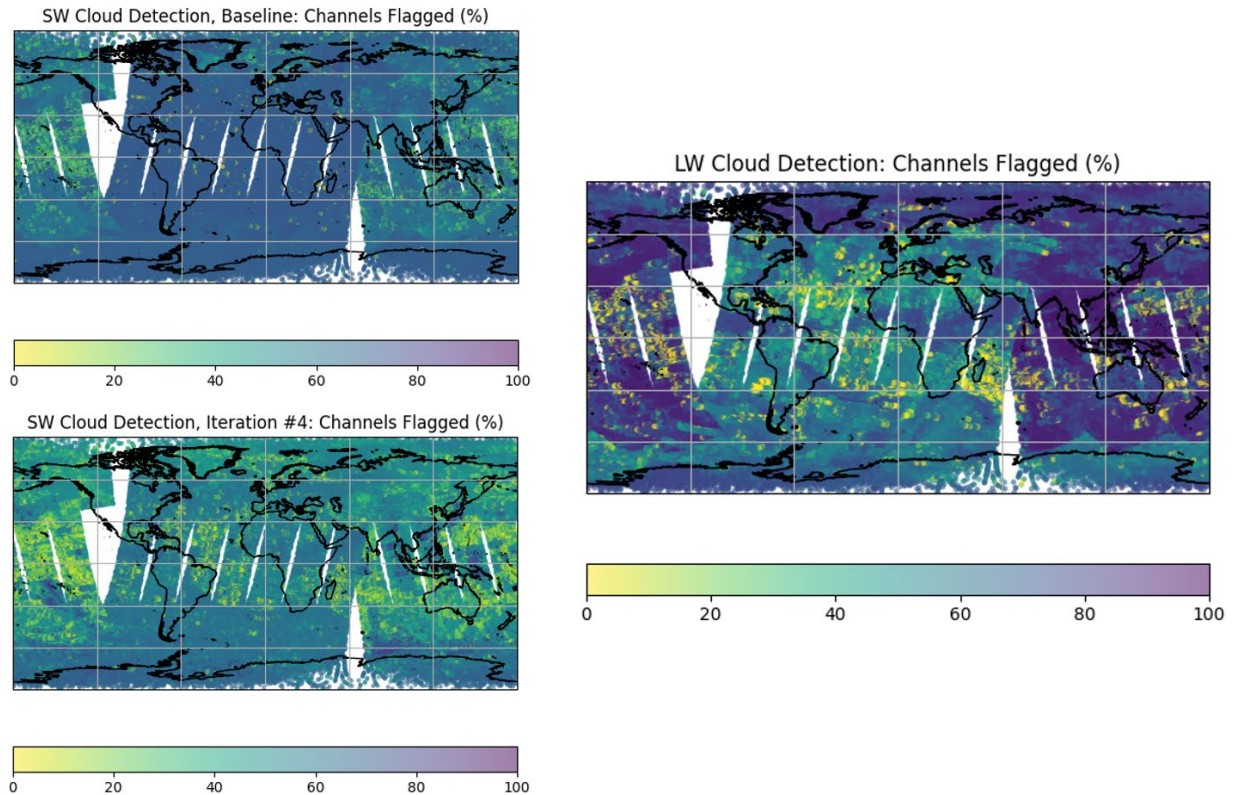
Figure: *Total percentage of ingested CrIS channels flagged for cloud in CrIS SW-based cloud detection (left) and LW-based cloud detection (right). Top left is the baseline, unoptimized cloud detection, which shows that virtually no clear-points (i.e. no channels flagged for cloud) are detected during the night-time. Bottom left shows a later iteration of SW-based cloud detection, where more clear points are being identified, and more homogeneity exists in daytime vs night-time cloud detection.*

(Erin Jones, CISESS, erin.jones@noaa.gov , Funding: SAE (formerly OSAAP) & DRSA)

TRAVEL AND MEETING REPORTS

CISESS Scientists Wenhui Wang and Xi Shao Presented at JACIE 2024 Workshop
The Joint Agency Commercial Imagery Evaluation (JACIE) Workshop was held March 11–14 at USGS Headquarters in Reston, VA. The annual workshop features presentations on improving Earth Observations. CISESS Scientists Wenhui Wang and Xi Shao gave a presentation on "Inter-Comparison of VIIRS Solar Reflective Bands with NASA JPL EMIT Observations." The Earth Surface Mineral Dust Source Investigation (EMIT), launched in

July 2022, is a hyperspectral instrument designed for mapping the mineral composition of arid dust source regions with 60-meter spatial resolution at nadir. The inter-comparison of VIIRS with EMIT hyperspectral observations provided valuable information for assessing the VIIRS on-orbit calibration accuracy. A figure from their talk is shown below.
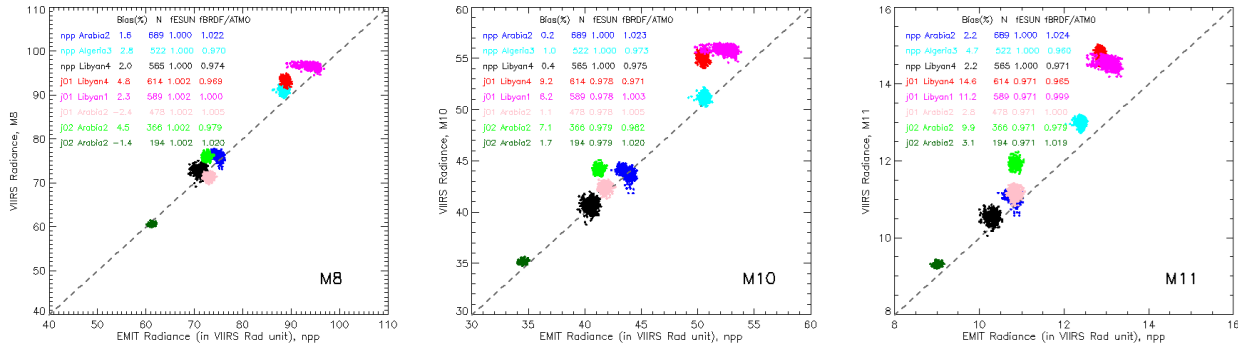
Figure *Scatterplots of S-NPP, NOAA-20, and NOAA-21 VIIRS versus EMIT co-located radiances over well-established desert cal/val sites. The effects of solar/view geometries, surface bidirectional reflectance distribution function (BRDF), and solar irradiance model differences were corrected.*

(Wenhui Wang & Xi Shao, CISESS, wenhui.wang@noaa.gov & xshao@umd.edu ; Funding: JSTAR)

CISESS Scientist Daile Zhang Gave a Guest Lecture and Had a Site Visit to UNCW
CISESS scientist Daile Zhang gave a guest lecture on lightning for an undergraduate course on Natural Disasters at the University of North Carolina at Wilmington (UNCW) on March 13, 2024. She also had a site visit to the Center for Marine Science to check on the Raspberry Pi camera and replace cables, part of the Lightning Network she developed under a CISESS Seed Grant and maintains with on-site student interns, like David Wells at UNCW.

Figure: Left: Dave Wells working on the Raspberry Pi cables; Right: Raspberry Pi camera set up at the Center for Marine Science dock.

(Daile Zhang, CISESS, dlzhang@umd.edu ; Funding: GOES-R AWG, GOES-R PGRR, and GEOXO)