Weekly Report

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

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Products and Applications

CIRA's Satellite-based Cloud Layers & 3D Cloud Data Development: On 30 June 2022, Dr. Yoo-Jeong Noh (CIRA) gave a Satellite Book Club (SBC) presentation titled "*Progress and Improvements for Satellite-based Cloud Layers & 3D Cloud Data*". The talk focused on the most recent CIRA Cloud Team developments and improvements to CIRA's cloud vertical cross-section product along flight paths, which is being developed by the CIRA Cloud Team in support of the NOAA JPSS Aviation Initiative. This experimental product aims to provide a comprehensive collection of data from multiple sources into one package and extend the benefit of satellite cloud data into the vertical dimension for aviation users and forecasters. The product is made available through a web-based interface. Most recently, a user-interactive option for custom cross-sections over user-selectable routes using 3D gridded satellite cloud data was introduced at https://aviation.cira.colostate.edu/define-custom-cross-section . Many of the improvements to the product are the result of user interactions (aviation forecasters and pilots) with the development team. (*POC: Yoo-Jeong Noh, yjnoh@colostate.edu, Funding: JPSS and GOES-R*)

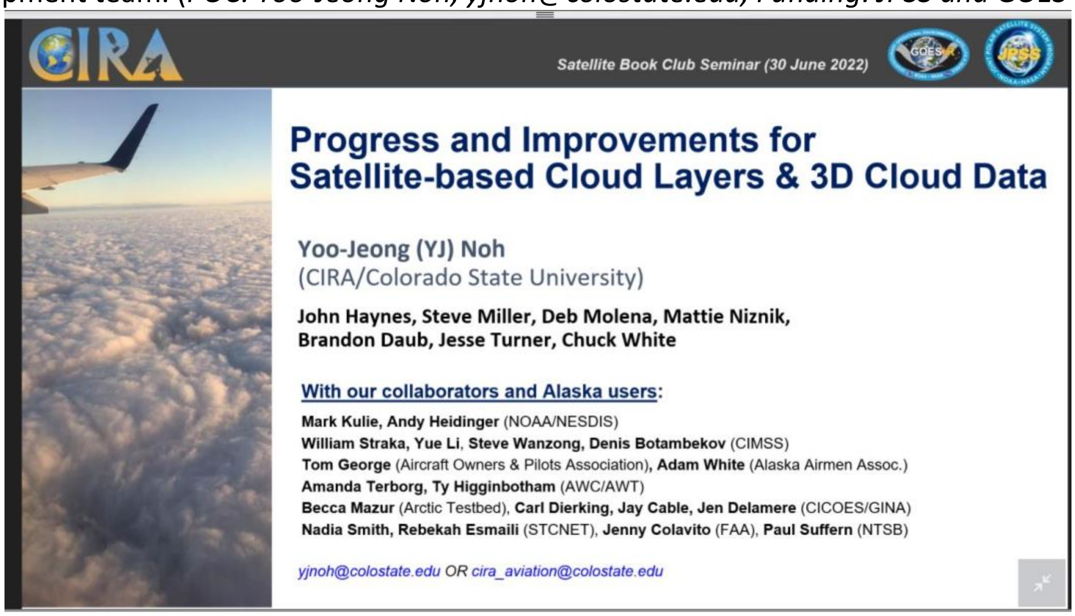


Figure: Title slide of Dr. Yoo-Jeong Noh's SBC presentation on 30 June 2022.

Awards and Recognition

Publications (Citation: followed by a short **Summary:** (Why & so what)**, & detailed summary):**

Media Interactions and Requests

Blog Posts and Social Media

Travel, Workshops, Conferences, and Meeting Reports

Conference presentation: Akansha Singh Bansal presented her paper entitled "**A Moment in the Sun: Solar Nowcasting from Multispectral Satellite Data using Self-Supervised Learning**" at the *Thirteenth ACM International Conference on Future Energy Systems (ACM e-Energy)* on June 29, 2022. Conference program: link. Accepted conference paper: link. *(POC: Akansha Singh Bansal, CIRA, Akanshasingh.Bansal@colostate.edu, Funding: NSF.)*

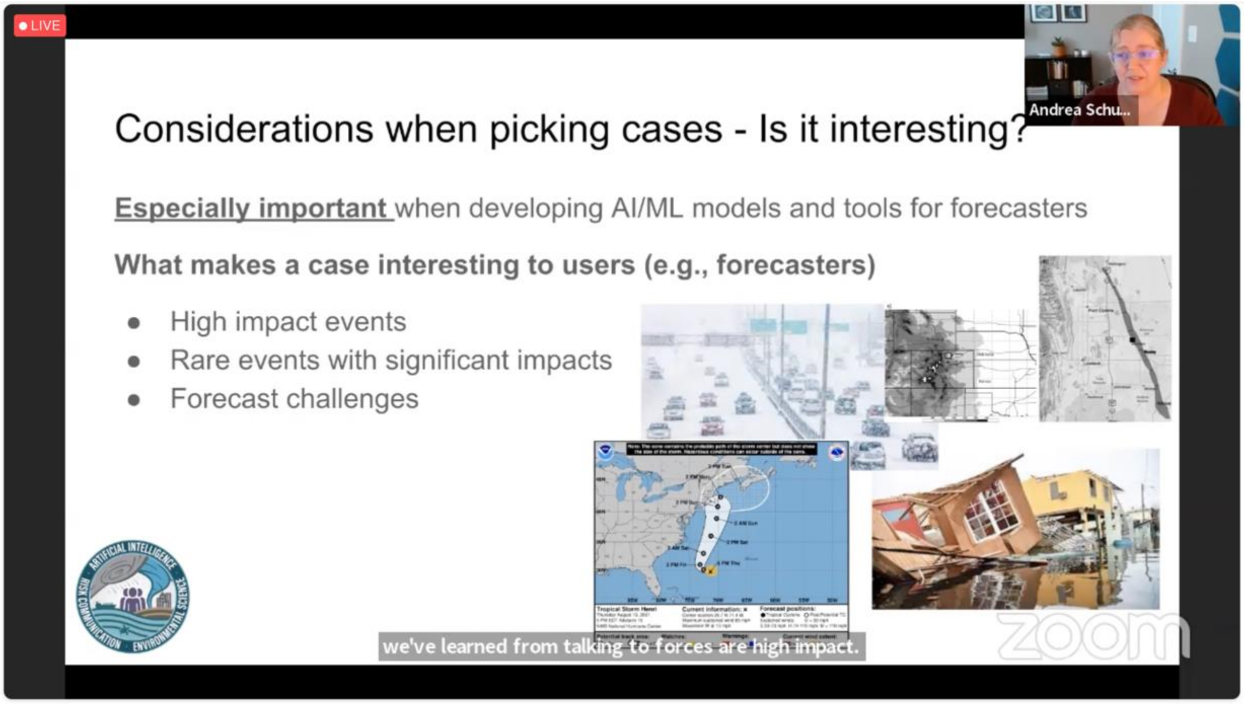
TAI4ES - Summer school on Trustworthy Artificial Intelligence (AI) for Environmental Science. Virtual, June 27-30, 2022. Daily lectures (3h) in mornings, trust-a-thon in afternoons.

- Website: https://www2.cisl.ucar.edu/events/tai4es-2022-summer-school
- Organized by AI2ES and hosted by NCAR.
- In collaboration with NOAA Center for AI (NCAI), LEAP, and Radiant Earth Foundation,
- Google Cloud donated Cloud credits.
- Attendance: Final numbers yet to be analyzed, but at least 500 different people attended at least one session of the summer school lectures.

Several CIRA researchers were heavily involved in the Summer School. CIRA contributions included:

- **Overall organization:** Ebert-Uphoff was the lead for all lectures on Day 2 (Explainable AI) and Day 4 (Uncertainty Quantifications) of the summer school. Akansha Singh Bansal was the lead tester of all code developed for the summer school, including lectures and trust-a-thon.
- **Delivering lectures:**
    - Imme Ebert-Uphoff (CIRA) and Antonios Mamalakis (CSU-ATS) presented on Day 2 on explainable AI for weather applications.
    - Andrea Schumacher (CIRA) presented on Day 3 on the importance of case studies and tips for using them effectively for AI in weather applications.
    - Marie McGraw, Ryan Lagerquist, and Imme Ebert-Uphoff presented (all CIRA) on Day 4 on Uncertainty Quantification for weather applications. Katherine Haynes contributed to slide preparation on Day 4.
- **Providing Notebooks for lectures (sample code for participants):**
    - Katherine Haynes, Ryan Lagerquist and Marie McGraw (all CIRA), prepared notebooks for participants to support the lectures.

- **Organizing trust-a-thon:**
    - Jason Stock (CSU-CS), Marie McGraw (CIRA), Akansha Singh Bansal (CIRA), Imme Ebert-Uphoff (CIRA) and Kate Musgrave (CIRA) contributed to preparing and running the trust-a-thon for the tropical cyclone/weather dataset.



Andrea Schumacher (CIRA) presenting on Day 3 of the TAI4ES summer school on the importance of case studies and tips for using them effectively for AI in weather applications

(POC: Imme Ebert-Uphoff, Marie McGraw, Ryan Lagerquist, Akansha Singh Bansal, Andrea Schumacher, Katherine Haynes, Kate Musgrave, CIRA, iebert@colostate.edu, Funding: NSF and CIRA strategic funds for societal impact)

Training and Education activities

JPSS Teletraining for NWS Users: On 22 June 2022, J. Torres led a JPSS/GOES Fire Monitoring tele-training session; NWS Alaska Region Headquarters attended the session. On 27 June 2022, J. Torres led a Near-Constant Contrast (NCC) teletraining session; NWS San Juan, Puerto Rico attended the session.

(POC: Jorel Torres, CIRA, Jorel.Torres@colostate.edu, Funding: JPSS)

Future Meetings and Events (dates, meeting/event, location, staff involved)

Operations Proving Ground (OPG) Heat Tool evaluation: July 5th - Sept 22nd, 2022 (Connor Nelson, CIRA OPG)

The OPG, in collaboration with Analyze, Forecast & Support (AFSP Public Weather Program, will conduct a virtual experiment throughout the summer of 2022 that seeks to understand the learning gaps, strengths, and weaknesses of three heat tools currently used for Watch, Warning, and Advisory decision making and Impact-Based Decision Support Services (IDSS): Heat Index, Wet Bulb Globe Temperature, and the Western Region Heat Risk prototype. This evaluation will also inform future training needs for each of these tools. Participants will examine these tools in the western region and complete surveys identifying their understanding and usage of the tools, highlighting discrepancies in the tools. Connor Nelson's role in this evaluation is to provide additional technical support to OPG Development Techniques Meteorologist (Ryan Walsh) for documenting participant responses and participation in overall evaluation planning and project planning. *(POC: Amanda Terborg, CIRA, 816-584-7241, amanda.terborg@noaa.gov, Funding: GOES-R)*

OPG Tornado Tag evaluation: July 12-13 and 19-20, 2022 (Connor Nelson, CIRA OPG)

In partnership with the Storm Prediction Center (SPC), the OPG will host a virtual evaluation of a probabilistic tornado intensity estimation tool/method for warning operations. This tool offers a probabilistic assessment of tornado intensity based upon radar indicated rotational velocity, environmental conditions, and population density. The Tornado Intensity Estimation tool has been proven effective in both research and real time applications at the SPC. However, the OPG and SPC would like to better understand how operational forecasters from local offices may utilize this tool/method in real time decision making. In addition, this evaluation will investigate options for conveying probabilistic information based upon recommendations from social science initiatives. Connor Nelson's role in this evaluation is to participate in overall evaluation documentation, planning, logistics (including participant document preparation), statistical analysis of user inputs and survey feedback. *(POC: Amanda Terborg, CIRA, 816-584-7241, amanda.terborg@noaa.gov, Funding: GOES-R)*

Other