Weekly Report

CIRA
STAR/NESDIS
National Oceanic and Atmospheric Administration (NOAA)

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Products and Applications

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

Awards and Recognition

Media Interactions and Request

Blog Posts and Social Media

Travel, Workshops, Conferences, and Meeting Reports

Last week, Jacob Fooks and Shelby Weder of CIRA's NWS-affiliated social, behavioral, and economic science team participated in a summit on the future needs and design of the Storm Events Database at the NOAA office in Silver Spring, Maryland. The Storm Events Database (SED) is an essential dataset for the social impacts of extreme weather events--including deaths, injuries, and property damage--and is the only dataset of its kind, often serving as the backbone on which other impact datasets are built. The CIRA social, behavioral, and economic science team has worked, and are working, on a number of projects using the SED data, including flood and wildfire mortality analyses. As both hands-on users and advisory scientists they are key stakeholders in the future development and evolution of the SED.

Training and Education activities

GREMLIN at the Satellite Book Club: On September 25, Kyle Hilburn facilitated the Satellite Book Club presentation "GREMLIN in Appalachia: From the Testbed to Operations" presented by Francis Kredensor (Lead Meteorologist) and Jeremy Michael (SOO) from the Charleston, WV (RLX) WFO. GREMLIN (GOES Radar Estimation via Machine Learning to Inform NWP) is an AI-based synthetic radar product derived from GOES-R Series observations of radiances and lightning. This story began with a planned radar outage for maintenance at RLX from May 18 – June 6. The NWS RLX contacted TOWR-S to arrange access to GREMLIN products at their WFO to fill the gap. Meanwhile, Kyle and Francis met each other through the GOES-R and JPSS Proving Ground Demonstration at the 2025 Spring Experiment – Experimental Warning Program (EWP)

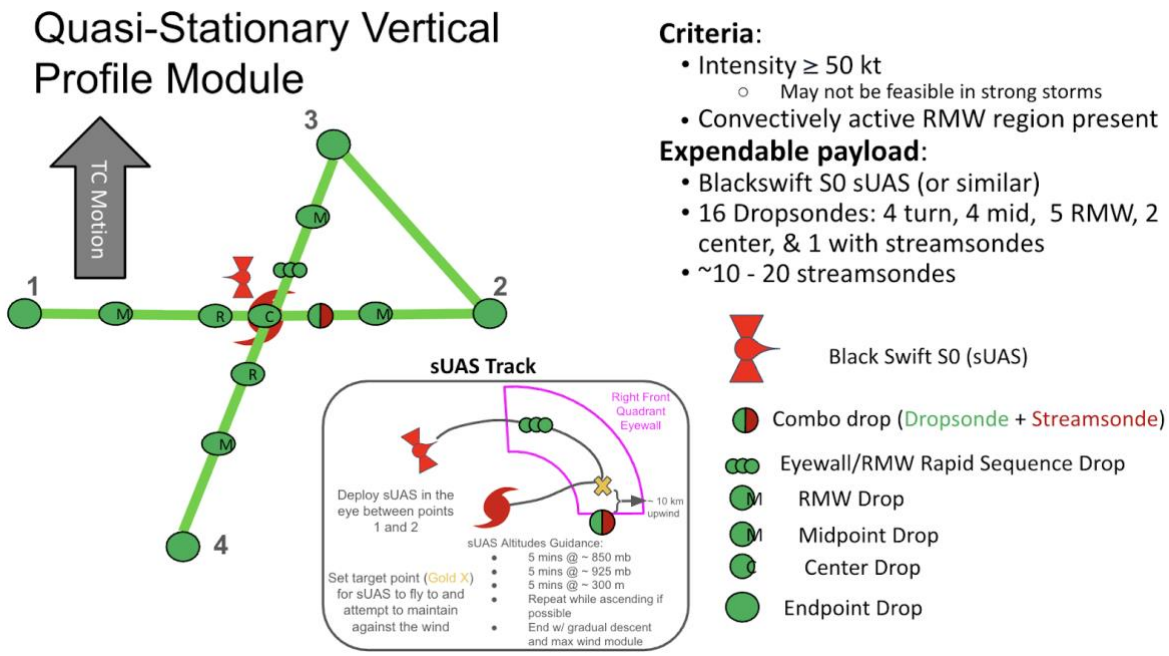
Hazardous Weather Testbed (HWT). This gave Francis the opportunity to learn about GREMLIN through daily evaluation on real weather and through discussions with Kyle, the developer of GREMLIN. Then on May 30 there was a severe weather outbreak over West Virginia with numerous severe wind reports. The SBC presentation talked about use of GREMLIN during this event, which is the *first time that GREMLIN was used operationally during severe weather warning operations*. (POC: Kyle Hilburn, CIRA, Kyle.Hilburn@colostate.edu; Funding: GOES-R).

Figure. *Screenshot from Satellite Book Club #253 describing GREMLIN's first use in warning operations (video link: https://www.youtube.com/watch?v=1aQF0SJPioc).*

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

Other

Novel Observations Collected in Hurricane Gabrielle: Alex DesRosiers, Mark DeMaria, Alan Brammer, James Franklin, Kate Musgrave, and Kate Schwartz are working with the NOAA Emerging Technologies team to develop new observation strategies to leverage small Uncrewed Aircraft Systems (sUAS) and swarms of small radiosondes, called streamsondes, to sample the vertical structure of the tropical cyclone (TC) wind field. Crew aboard the NOAA Hurricane Hunter aircraft executed one of the CIRA team's modules (pictured below), designed by A. DesRosiers, to sample the developing inner-core region of then Tropical Storm Gabrielle in the Atlantic as it began to intensify into a major hurricane.



Schematic detailing the quasi-stationary vertical profile module developed by the CIRA team for TC field observations with emerging technologies

The module design aims to sample the winds at key vertical levels in the atmosphere using the Black Swift S0 sUAS (pictured below) to provide data that can help researchers accurately estimate surface winds from observations at higher levels of the atmosphere. The quasi-vertical sampling of the sUAS, accomplished by flying into the wind, is roughly co-located with in-situ aircraft observations, traditional radiosondes, streamsondes, and airborne radar. Successful execution of the new module in Gabrielle marks an important milestone for the NOAA Emerging Technologies team, demonstrating the ability to target and sample key regions of TCs with the sUAS while flying into the wind. The CIRA and NOAA teams will continue to collaborate on advancing observational capabilities of emerging technologies in the TC environment. (Funding: NOAA STI; POC: A. DesRosiers, Alex.DesRosiers@colostate.edu)

Schematic of the Black Swift S0 sUAS deployed during the NOAA research mission into Gabrielle

Alex DesRosiers reviewed a manuscript for the *Journal of Advances in Modeling Earth Systems*. (POC: A. DesRosiers, Alex.DesRosiers@colostate.edu)