

# Weekly Report

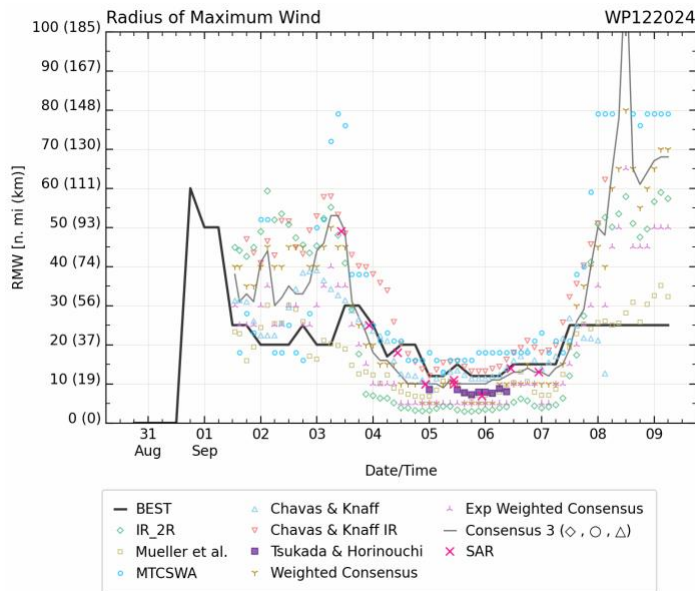
CIRA  
STAR/NESDIS  
National Oceanic and Atmospheric Administration (NOAA)

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Prepared by: CIRA and STAR contributors

## Products and Applications

**Radius of Maximum Wind (RMW) product:** The radius of maximum wind (RMW) of a tropical cyclone (TC) is a crucial parameter for various applications. In Tsukada & Horinouchi (2023), we trained the linear regression using the IR-measured eye size with the SAR-derived RMW estimates. The mean absolute error (MAE) was  $\sim 2$  km when the TC had a clear eye. This estimation has been automated for real-time use and is displayed on the TC-realtime page with updated graphics (below). JTWC is adopting this product from us and is expected to integrate it into their real-time and post-storm analyses.

(POC: Taiga Tsukada, taiga.tsukada@colostate.edu; John Knaff, john.knaff@noaa.gov; Steven Miller, steven.miller@colostate.edu; Funding: ONR)



**RMW Figure:** An example of RMW estimates displayed on the TC-realtime page for [Typhoon Yagi](#) (2024; WP122024). The purple square represents the 3-hourly RMW estimates from our method.

*The magenta cross marker indicates the SAR-derived RMW (considered as ground truth). The black line represents the operational working best track analysis made by JTWC without our fixes.*

**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**

**Virtual Participation at the National Weather Association Annual Meeting:** Sheldon Kusselson participated virtually at the 49th Annual 2024 National Weather Association Meeting from September 15-18. He presented his showcase poster titled, "Evaluation and Applications of Water Vapor Analysis Tools Derived from Blended Satellite Products". He also presented a 5 minute video on the showcase poster that explained and showed applications for CIRA's Advected Layer Precipitable Water (soon to be an operational NOAA/NESDIS satellite product), Advected Total Precipitable Water (slated to replace NOAA/NESDIS Operational Blended Total Precipitable Water in 2025) and experimental Layer Vapor Transport and Advected Layer Precipitable Water Percentile Ranking satellite products that can be viewed at <https://vimeo.com/1008118520/b4db18288d?ts=0&share=copy>. (POC: Sheldon Kusselson, CIRA, [sheldon.kusselson@colostate.edu](mailto:sheldon.kusselson@colostate.edu), Funding: JPSS)




these products on CIRA-SLIDER and soon on AWIPS-Cloud. (POC: Tom Juliano, CSU/ATS, [Tom.Juliano@colostate.edu](mailto:Tom.Juliano@colostate.edu) and Jason Apke, CIRA, [Jason.Apke@colostate.edu](mailto:Jason.Apke@colostate.edu); Funding: GOES).



**Research of Convection Initiation with the OCTANE Optical Flow Cloud Top Cooling Product**

Tom Juliano<sup>1</sup>, Jason Apke<sup>2</sup>, Bill Line<sup>3</sup>, Steven Miller<sup>1,2</sup>

1- Colorado State University, Department of Atmospheric Science, Fort Collins, CO  
2- Cooperative Institute for Research in the Atmosphere (CIRA), Fort Collins, CO  
3- NOAA / NESDIS / STAR, Fort Collins, CO



**TC presentations at the HFIP Monthly Seminar:** Members of the Tropical Cyclone group presented 3 projects at the monthly Hurricane Forecast Improvement Program (HFIP) seminar on Wednesday 18th. Alan Brammer presented to the group about Probabilistic Tropical Cyclogenesis Forecasts by Combining Dynamical Ensembles with Machine Learning. Jon Martinez presented recent work on Updates to the National Hurricane Center Wind Speed Probability Program and Kate Musgrave presented an Evaluation of Tropical Cyclone Forecasts from Artificial Intelligence Weather Prediction (AI-WP) Models. Slides will be available on the HFIP website soon. <https://vlab.noaa.gov/web/osti-modeling/hfip/events> (POC: Alan Brammer, Jon Martinez, Kate Musgrave, Funding:HFIP)

### Training and Education activities

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

### Other

CIRA is the home of a newly awarded 3-year grant by the National Science Foundation in the [Collaborations in Artificial Intelligence and Geosciences \(CAIG\) program](#). The project seeks to use AI methods to gain a better understanding of the nature of cloud formation and of how that

process plays into past and future climates on Earth. It also involves scientists from atmospheric science and mathematics at CSU. For more details, see CSU's press release at <https://source.colostate.edu/nsf-funds-csu-research-projects-to-develop-ai-techniques-in-geosciences/>.

(POC: I. Ebert-Uphoff [Imme.Ebert-Uphoff@colostate.edu](mailto:Imme.Ebert-Uphoff@colostate.edu), YJ Noh, J. Haynes, L. Ver Hoef, C. White, H. Yu - CIRA. Funding: NSF)