

# Scientific and Engineering Achievements in WoFS

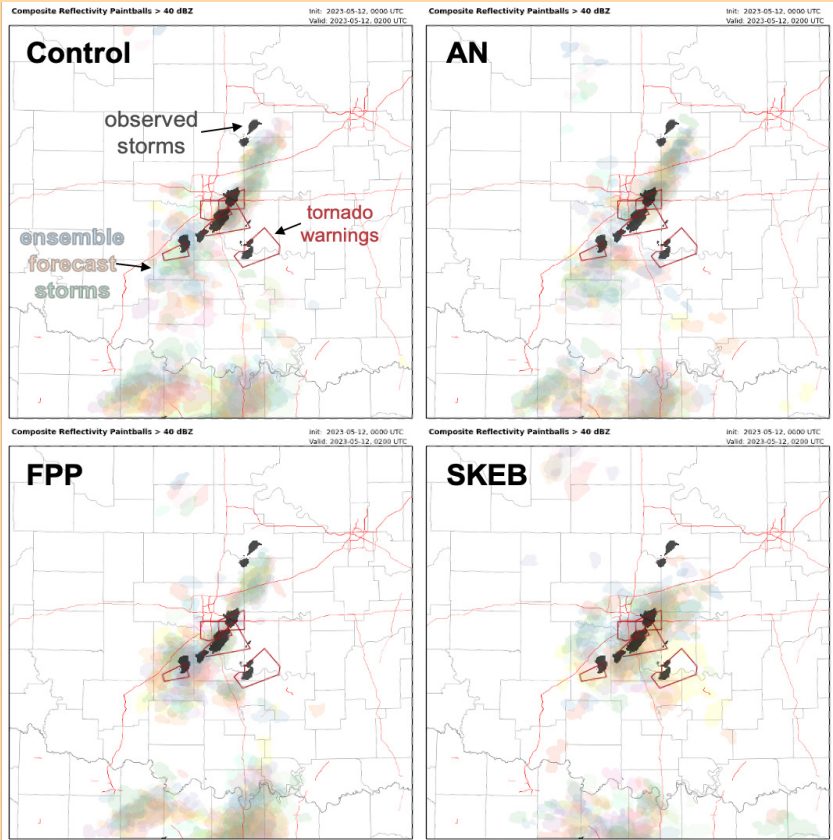
Saluting CIWRO researchers  
whose exceptional  
contributions in NSSL's  
Forecast Research and  
Development Division merited  
the prestigious Gold Medal  
from the U.S. Department of  
Commerce



# What is WoFS?

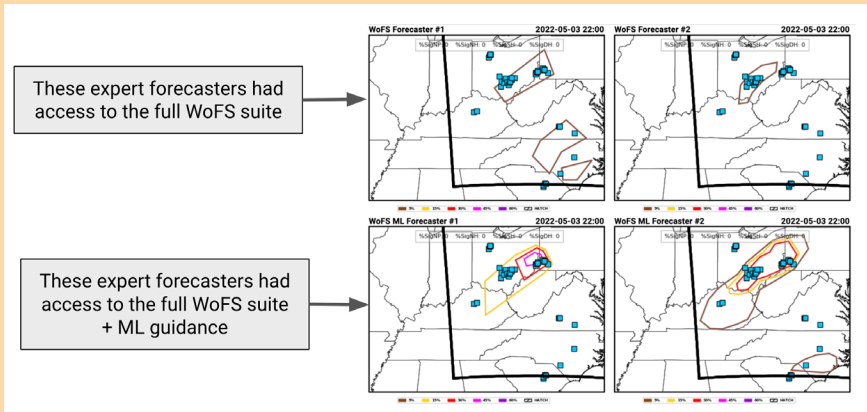
The Warn-on-Forecast System (WoFS) provides short-term probabilistic thunderstorm forecasts. This revolutionary NOAA prediction tool aims to increase lead time for tornado, severe thunderstorm and flash flood warnings. The following CIWRO researchers embedded within NSSL are critical to the advancement of WoFS.

## DEREK STRATMAN



Derek Stratman has been a part of the WoF team since 2016. His research has been focused on advancing WoFS through assessing and improving ensemble design, finding new ways to use NSSL phased-array radar data in WoFS, and helping develop a next-generation WoFS.

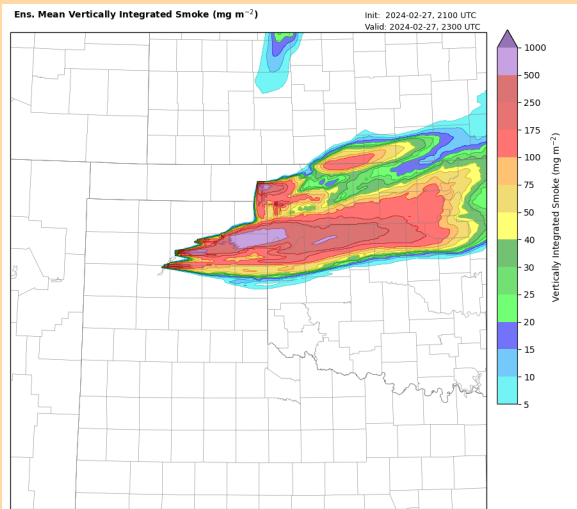
# MONTGOMERY FLORA



Montgomery Flora developed the first machine learning products integrated into WoFS. The WoFS-ML-Severe products offer near-warning-scale guidance on individual severe weather hazards. He also developed the main Python codebase for all of WoFS's post-processing and visualizations.

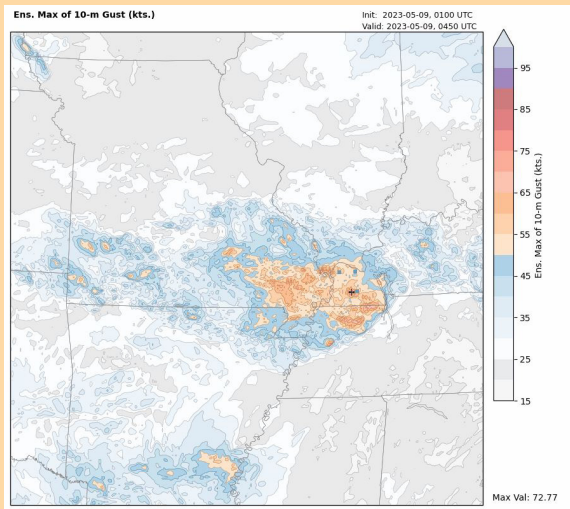
# THOMAS JONES

Integrating HRRR smoke data into the emerging WoFS is crucial to mitigating wildfires. Because of Thomas Jones's research, forecasters will ultimately receive fire updates in 5-min intervals. Today's existing smoke modeling systems are limited to just hourly.

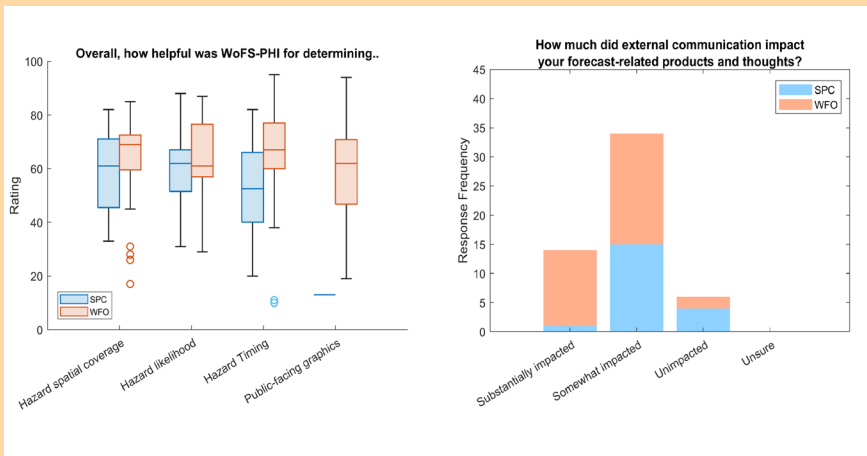


# PAT SKINNER

Pat Skinner works on the post-processing, visualization and verification of WoFS guidance. He tries to identify ways the system can provide unique forecast information, then works with NWS meteorologists to develop real-time products that visually communicate that information.



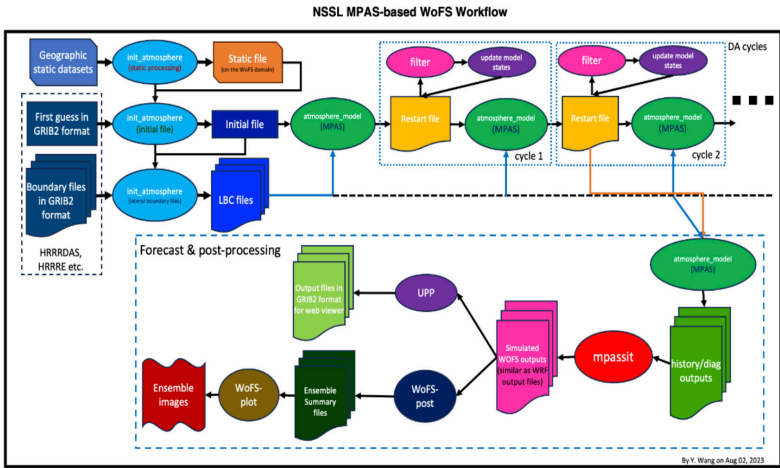
# MIRANDA SILCOTT



Miranda Silcott explores the operational usability of WoFS through experiments to examine how forecasters envision WoFS guidance fitting into their forecast process. Lately, she has been working on how WoFS influences forecast-related products and communication in the watch-to-warning space.

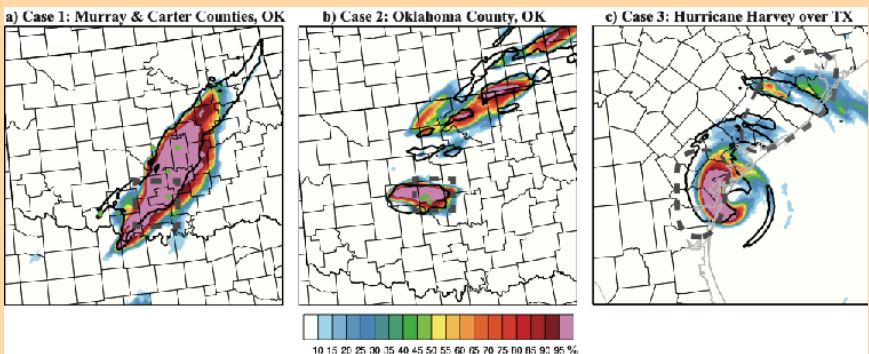
# YUNHENG WANG

## MPAS-DART-WoFS workflow



Dr. Yunheng Wang's work mainly focuses on the development of hybrid data assimilation method within the WoFS and the developments for next-generation WoFS, for example, the 1-km WoFS and the MPAS-based WoFS.

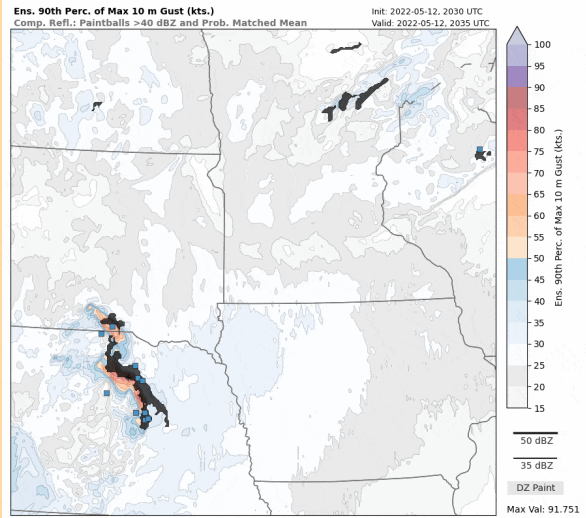
# NUSRAT YUSSOUF



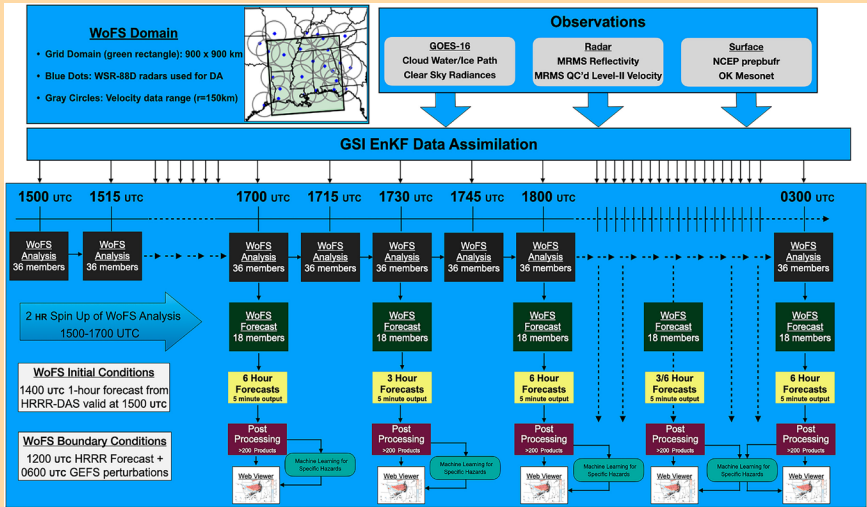
Nusrat Yussouf has been working on WoFS since its inception in 2009, and is one of the main developers of the modeling system, providing forecasters with probabilistic guidance of thunderstorm hazards with high temporal and spatial accuracy.

# JOSHUA MARTIN

WoFS is now cloud-based! Thanks to Joshua Martin's efforts, cb-WoFS now leverages cloud scalability, flexibility and cost-efficiency. Model runs are managed via a single web app, handling HPC provisioning, data management and visualization.

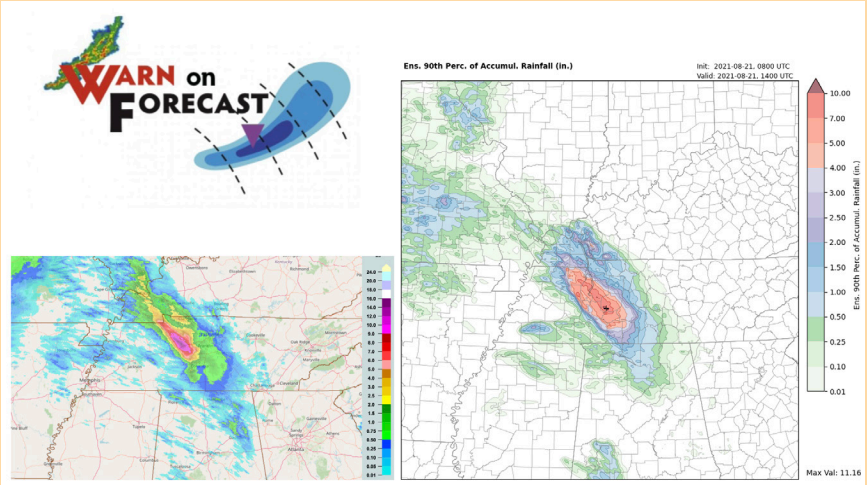


# KENT KNOPFMEIER



Evolution of WoFS into a real-time system requires an efficient workflow. Because of Kent Knopfmeier's development work, the WoFS can ingest datasets needed for initialization and assimilation, initiate the 15-min cycling, and launch forecasts every half-hour.

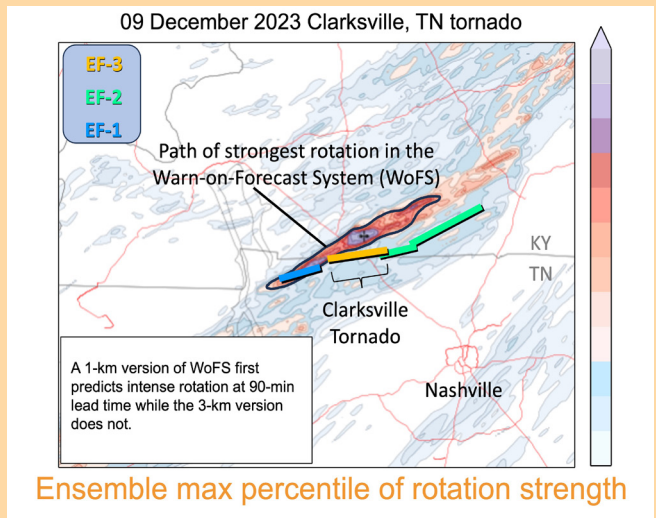
# BRIAN MATILLA



Predicting flash floods remains a major challenge. Research by Brian Matilla aims to improve WoFS skill in predicting heavy rainfall events with ample lead time. He also engages heavily with NWS forecasters and stakeholders for WoFS real-time runs.

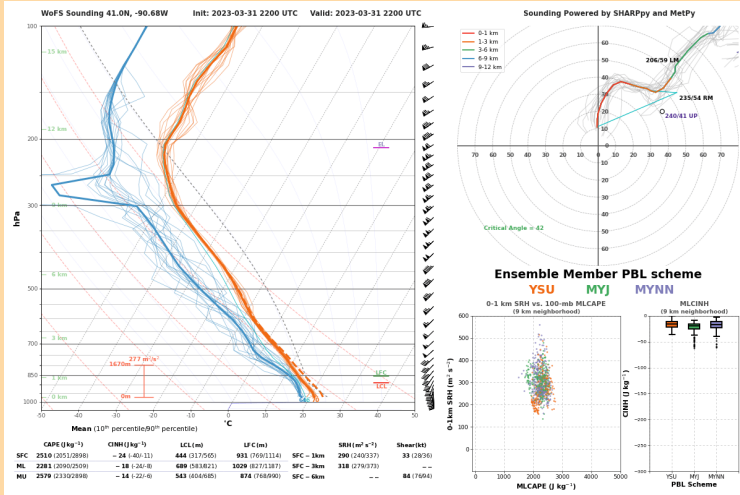
# CHRIS KERR

Chris Kerr has been associated with WoFS since 2012, first as a graduate student and now as a research scientist. His research has focused on improvements while also developing new usage methods. Lately, he has been working on the next-generation 1-km WoFS.



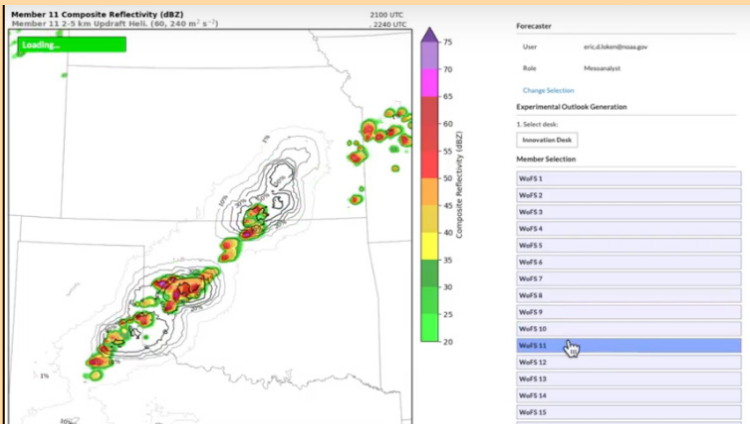
Ensemble max percentile of rotation strength

# KIMBERLY HOOGEWIND



Kim Hoogewind has contributed to post-processing and visualization of WoFS simulations, including the development of the WoFS sounding viewer.

# ERIC LOKEN



Eric Loken is working to advance WoFS severe weather prediction capabilities by merging WoFS and ProbSevere forecast output. This approach enables more frequent forecast updates and can reduce spatial displacement errors of WoFS storms. Eric also facilitates user-engagement experiments to solicit feedback from WoFS users.