



# NATIONAL WEATHER SERVICE

## Aviation Weather Center

# Recent Activities of the Aviation Weather Testbed

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*NOAA Aviation Weather Center (AWC)*



# Quick Response Polling

We will be using interactive polling. Please use your phone or laptop.



<https://pollev.com/snowycow503>

# How familiar are you with the Aviation Weather Testbed?

I've been involved in a past AWT Experiment  
and/or evaluation

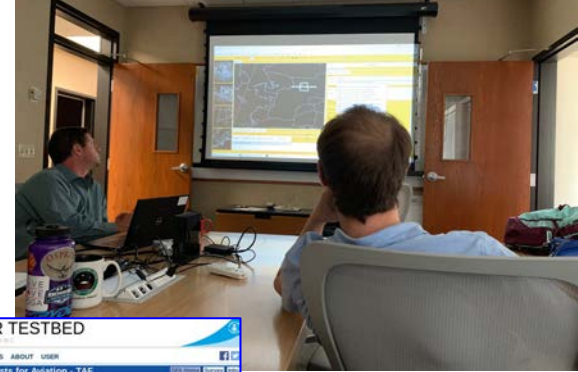
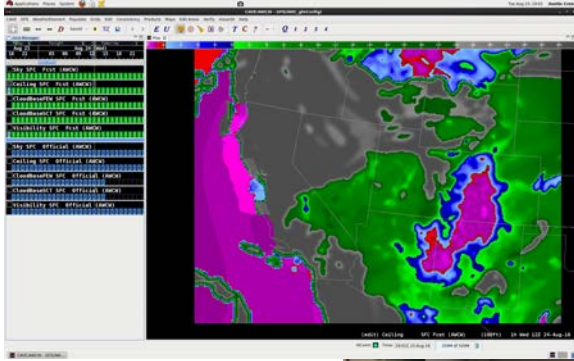
I've never participated personally, but I'm  
familiar with past evaluations and outcomes

I've heard of the AWT, but honestly not sure  
what it is or what they do.

The Aviation Weather What?! Never heard of  
it!



# Aviation Weather Testbed (AWT)



# Research to Operations



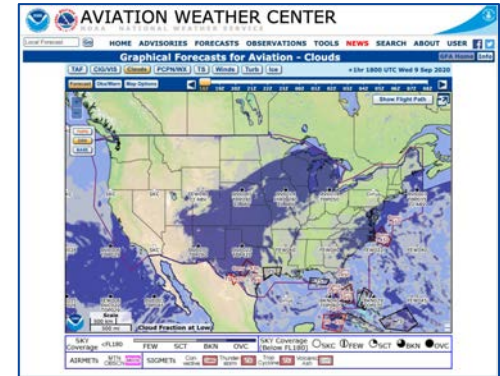
**Vision:** “A destination facility as the enterprise leader in realizing the best science, technology, and training for operational aviation meteorology.”



Evaluation



Operational Implementation



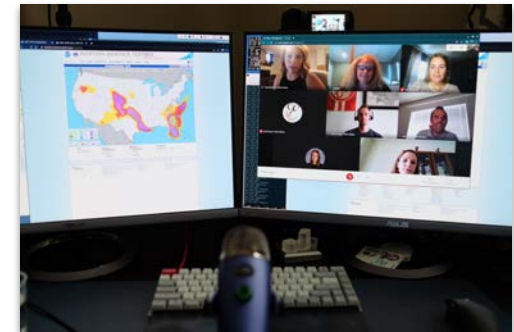
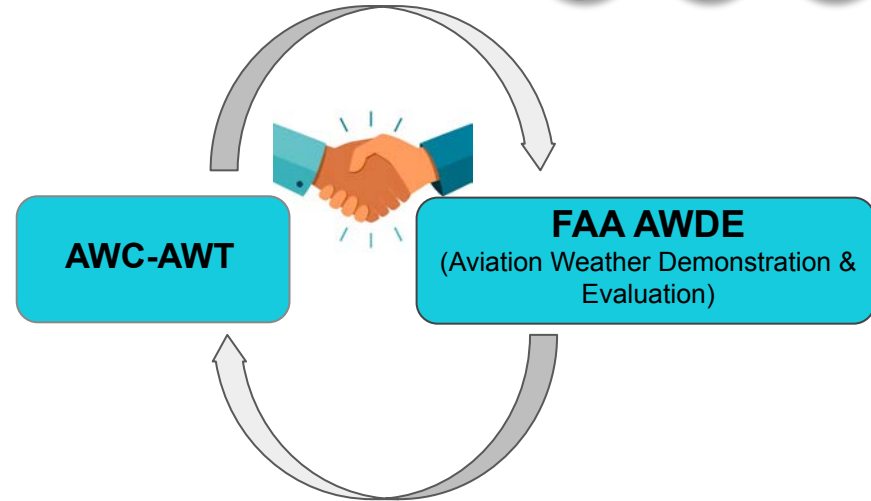
# Who Uses AWT Products?



# Social Sciences in the AWT



- Collaborative relationship with the FAA's Aviation Weather Demonstration and Evaluation (AWDE) Services group.
- AWDE provides human factors experts; meteorologists
- Evaluate products based on AWT/AWC needs/goals
- Will recruit users locally, remotely, virtually
- Collaborative process to develop/execute assessment plan
- Final report includes findings and recommendations



2022 DAS Hybrid Experiment



2022 AWT Summer Experiment



## Recent Experiments in the AWT

2023 AWT May Experiment



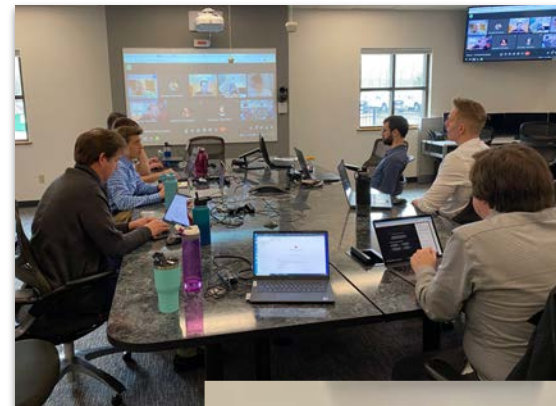


# Recent AWT Experiments



## 2022

- Digital Aviation Services (DAS)
  - March, 2022 - Joint with the OPG
  - Hybrid (participants joined virtually)
- September “Summer” Experiment
  - Fully In-person
  - 2 Major Themes
    - Evolution of the TCF
    - Outlook Graphics for GA



## 2023

- May “Spring” Experiment (in-person!)
  - Hazard Services for Aviation
  - Probabilistic Forecasting/User Interpretation
  - Cloud Forecasting with RRFS & LAMP

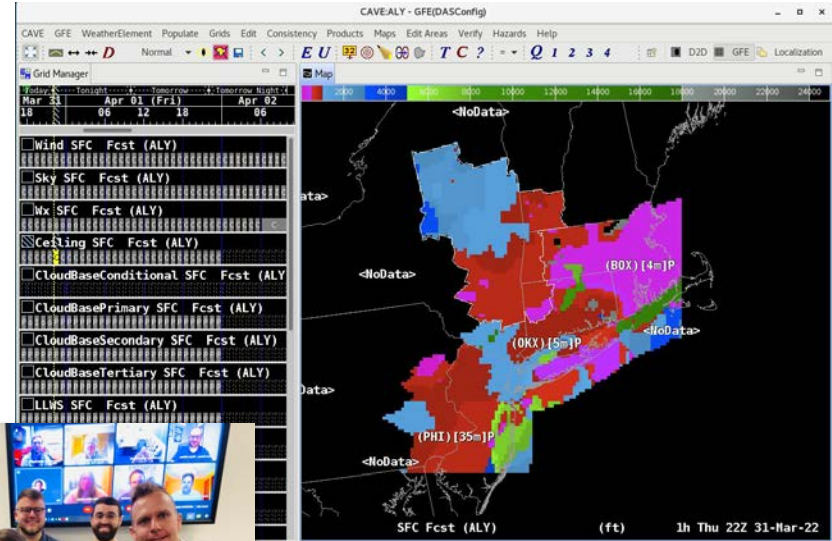
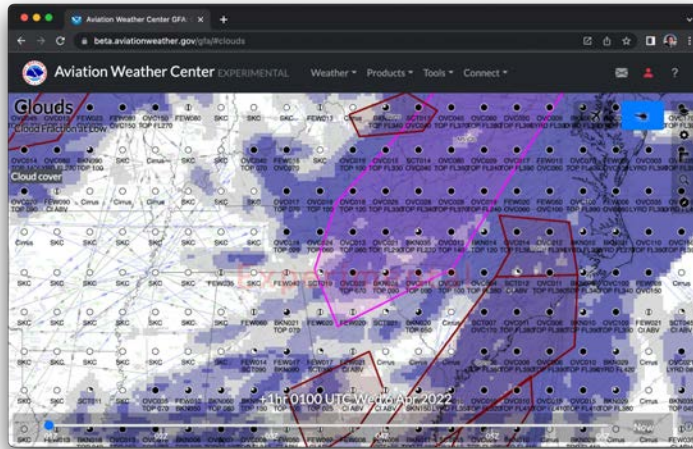


# 2022 Digital Aviation Services (DAS)

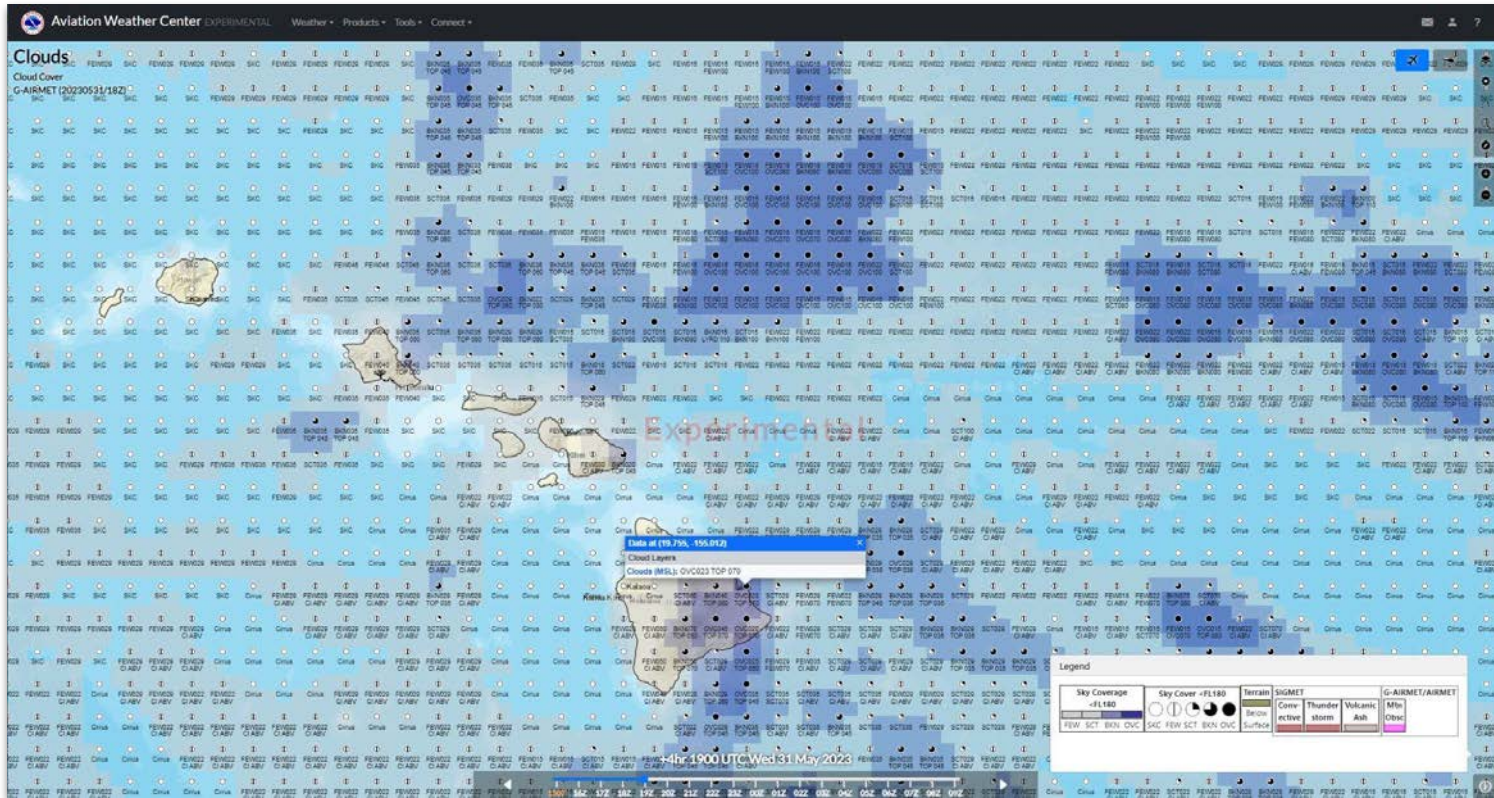


- **Experiment Focus**

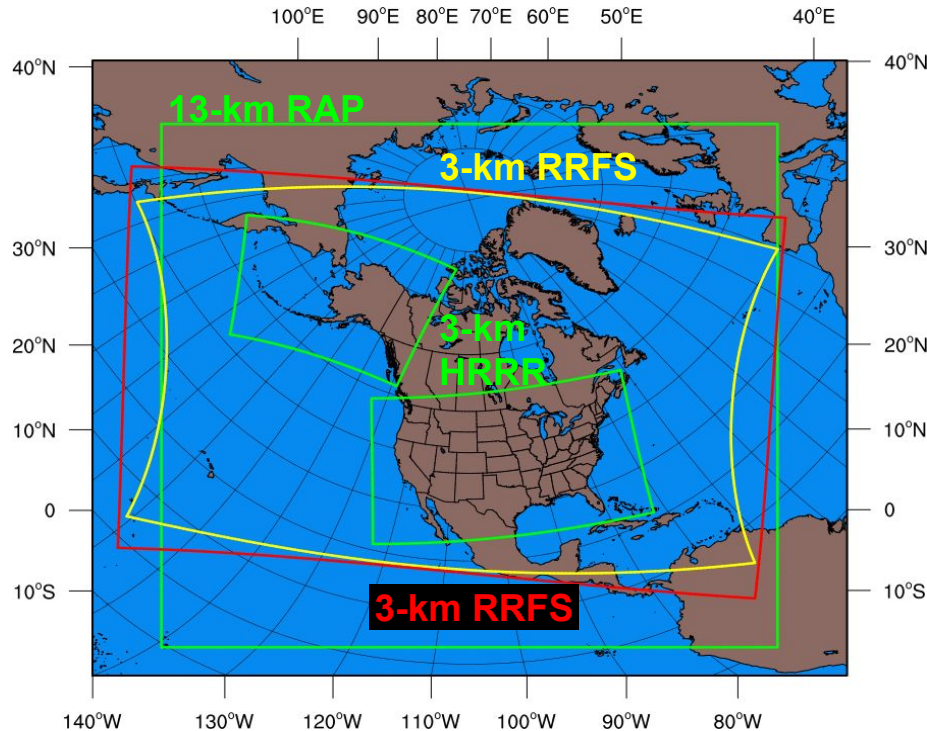
- Use Cloud AWIPS to test potential workflow
  - (AWC/NBM > WFO > AWC)
- Collaboration with neighbors
- Consistent multi-layer cloud forecast



# Digital Aviation Services (DAS)



# Rapid Refresh Forecast System

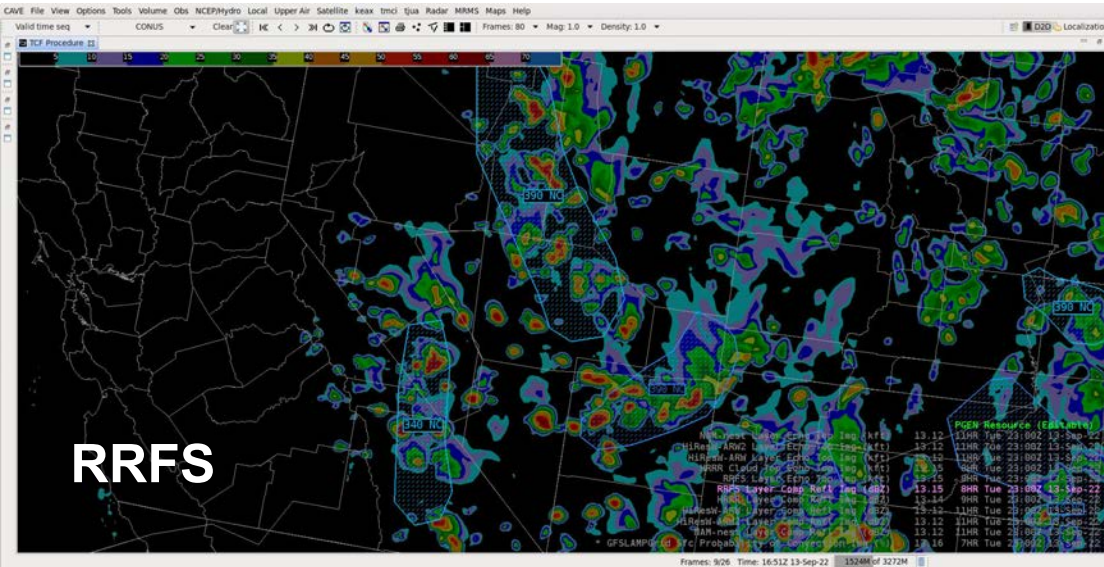


- Evaluated during the **2022 Summer & 2023 May Experiments**
  - Focus on convection and 3D clouds
- Next gen convection allowing modeling suite
  - Currently under development at GSL/EMC
  - Fall 2024 implementation
- Will replace HRRR, HREF, RAP, Hires Windows, NAM, NAM Nest



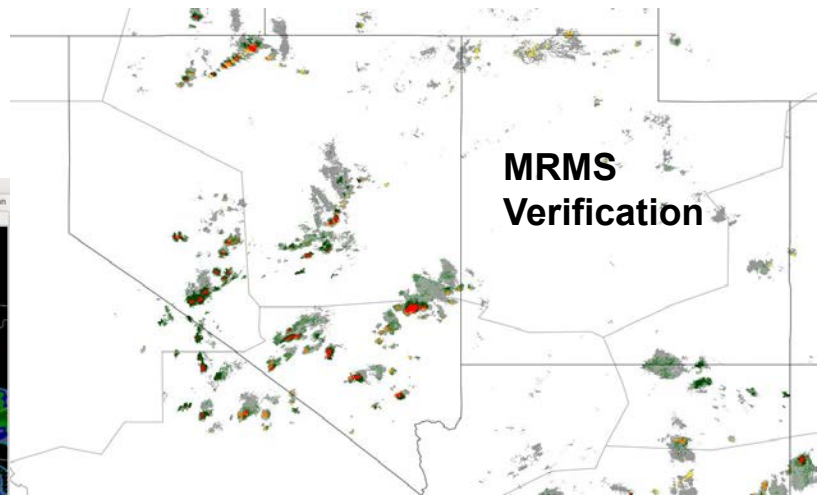


# RRFS/HRRR Comparison

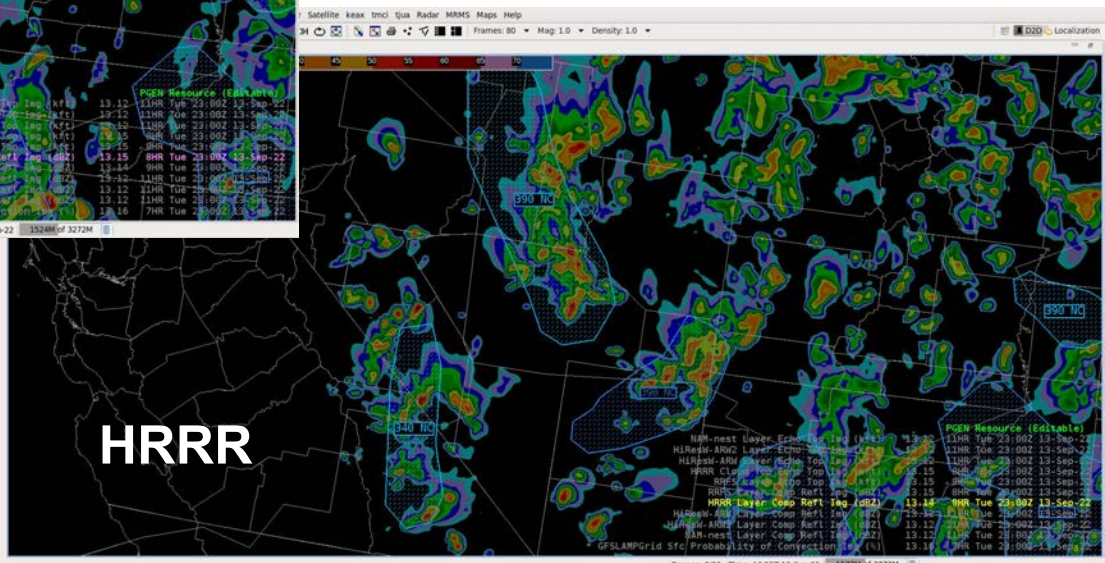


RRFS

- RRFS running “hotter” than HRRR
- Increase in discrete cells that are more “circular” in appearance than other CAMs



MRMS  
Verification

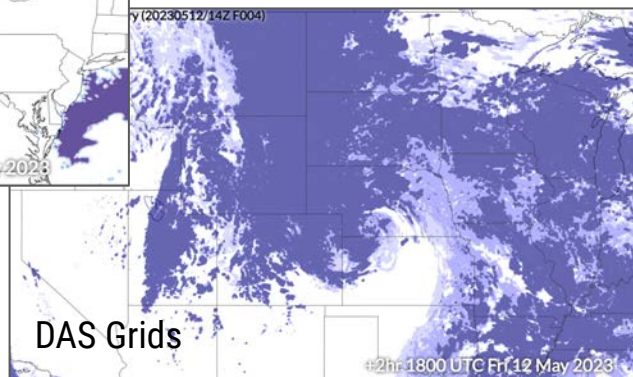
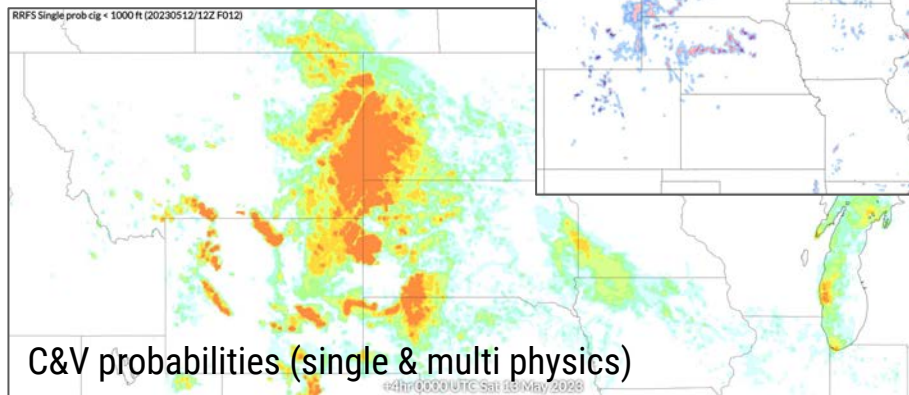
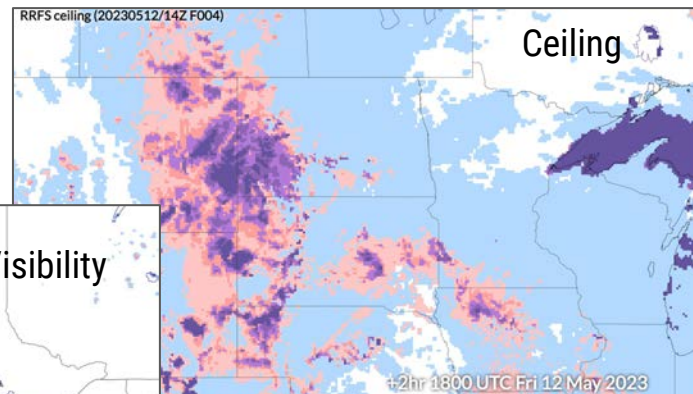
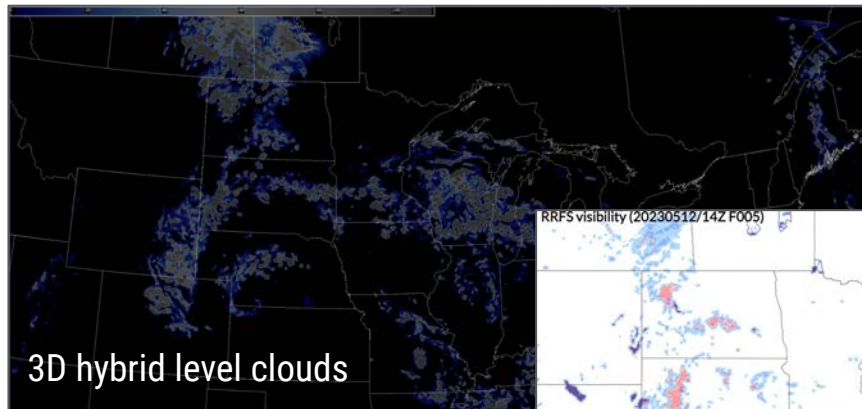


HRRR

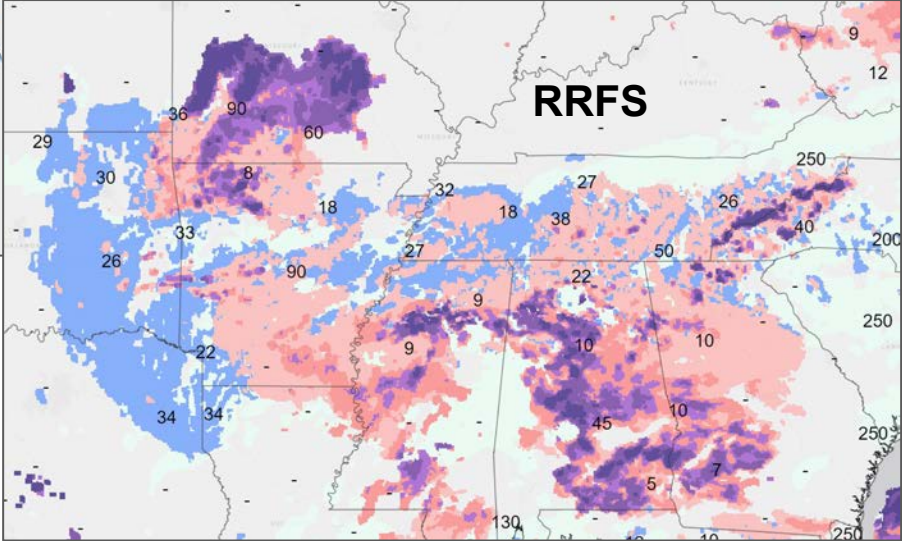
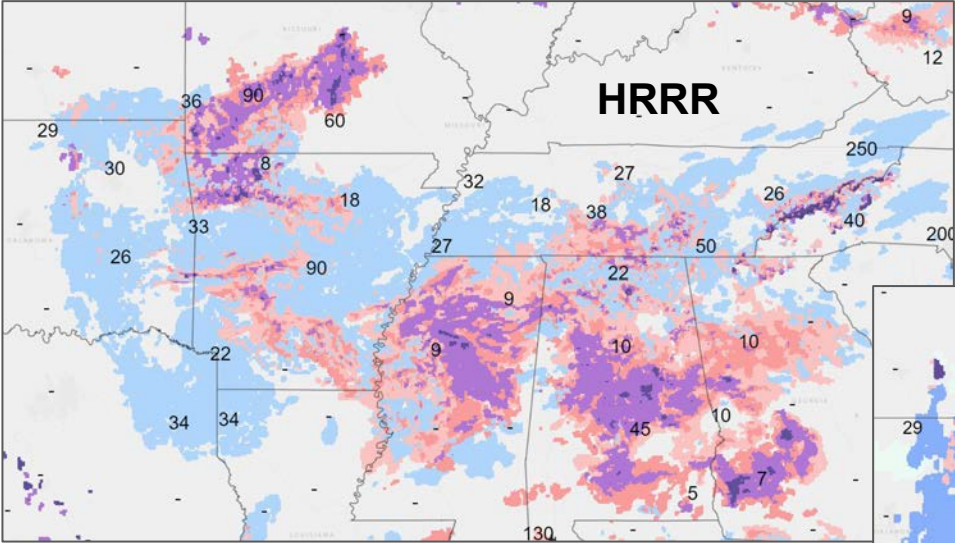


NATIONAL WEATHER SERVICE

# 2023 RRFS Cloud Evaluation

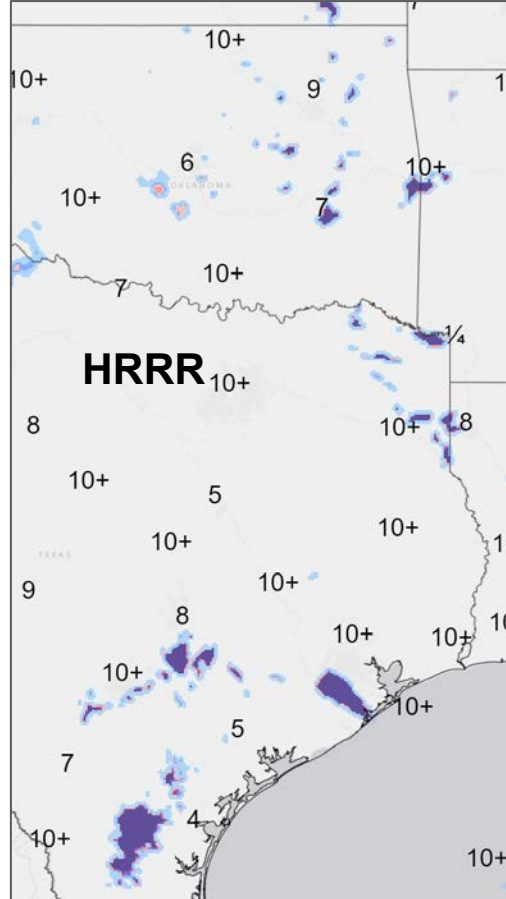
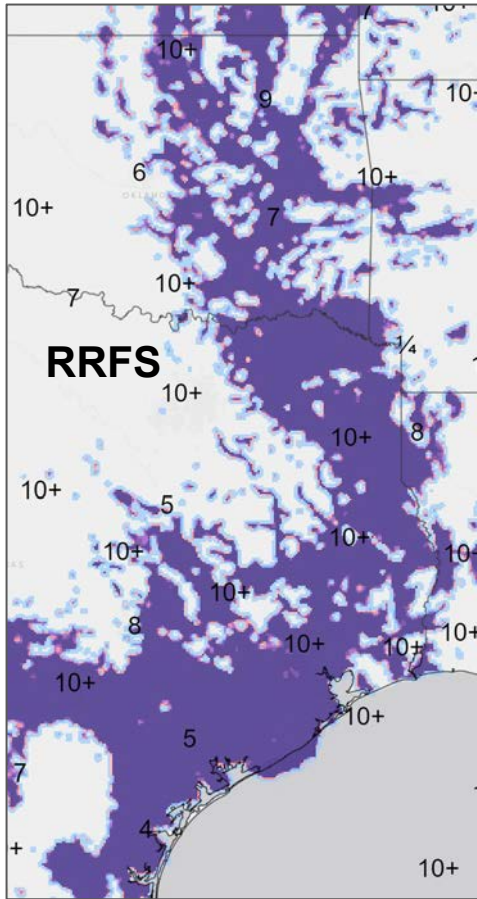


# RRFS Ceilings

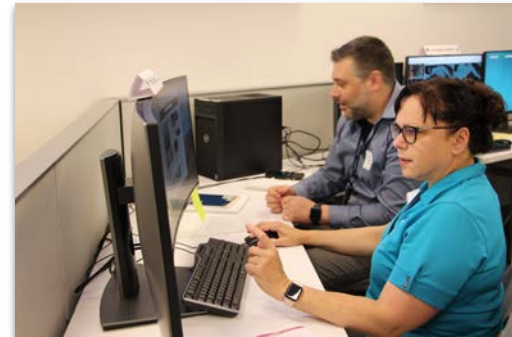
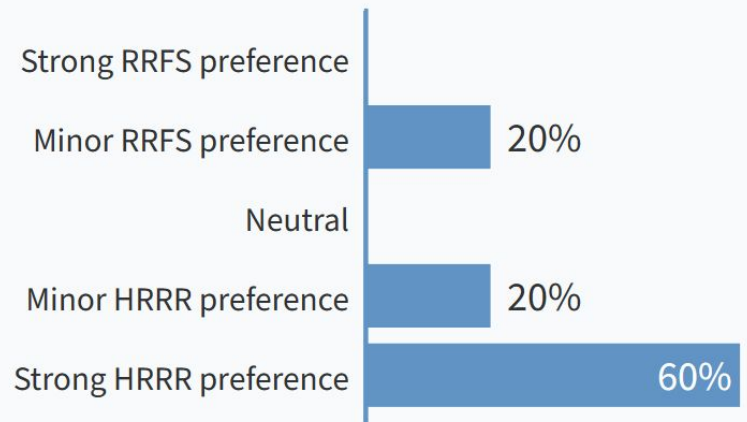




# RRFS vs HRRR Visibilities

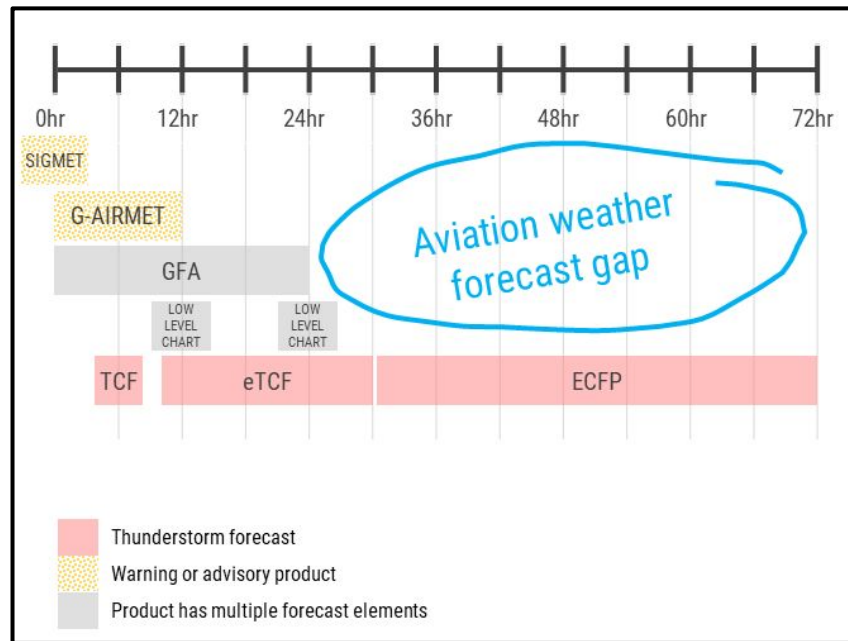


## Select an option for RRFS/HRRR visibility performance preference



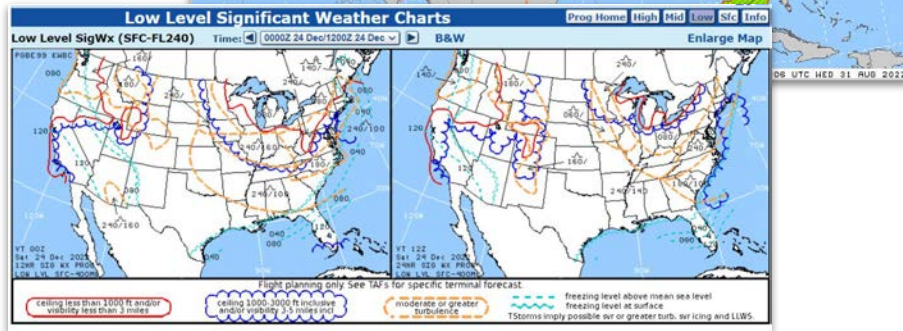
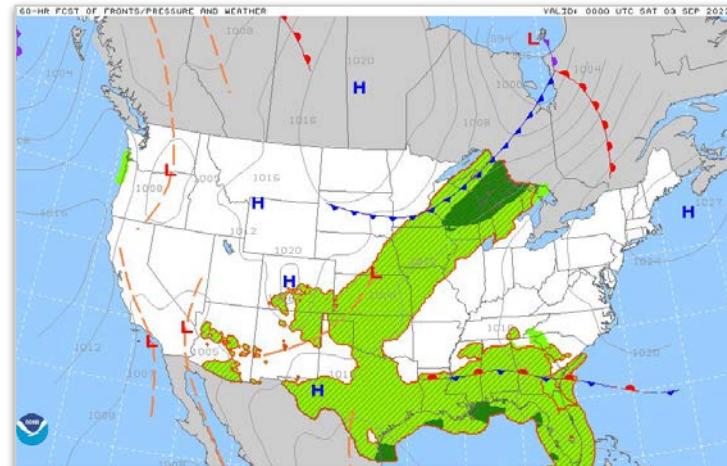
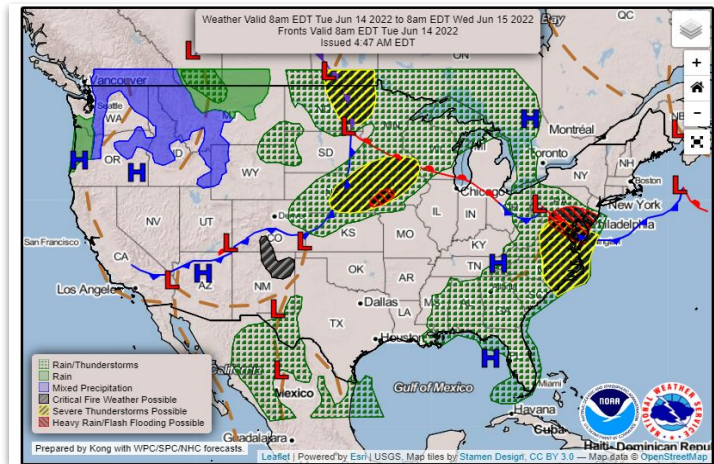
# Planning Support for the GA Community

- Current (non-convective) AWC products do not go out beyond 24hrs
- Additional guidance to assist GA fliers with planning identified as a need by the NTSB
- Explored ways to fill this gap in both 2022 Summer & 2023 May experiments
  - Outlook Graphics
  - Probabilistic Guidance



# Outlook Graphics for GA

- Goal is to produce Day1, Day2 & Day3 “Quick Look” graphics for general aviation use
  - Similar to the Weather Prediction Center (WPC)’s Outlooks
- ProgCharts are very popular among the GA community



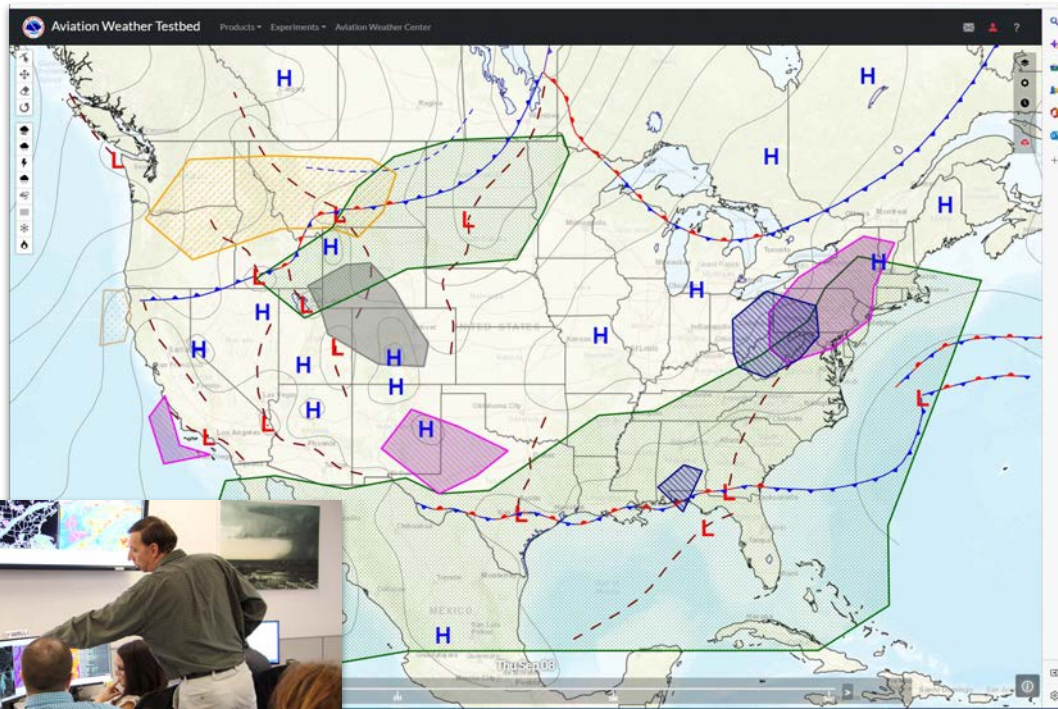
- AWC’s forecaster produced Low Level Significant Weather chart is antiquated and not really sure if it is used much currently



# Outlook Graphics for GA



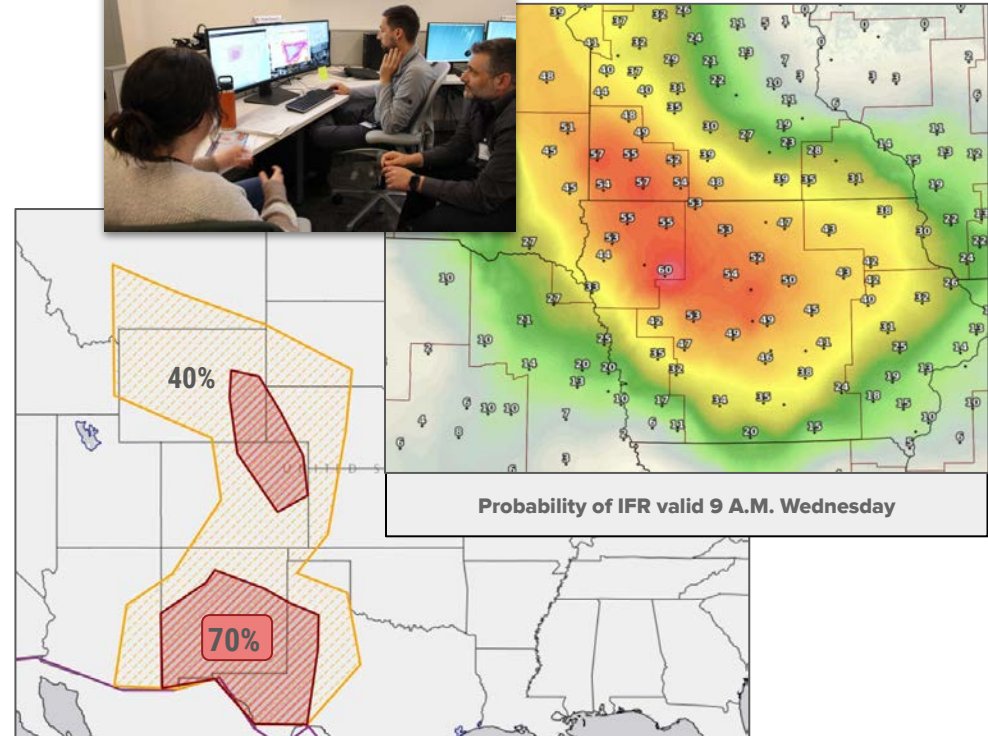
- Participants focused on development process
  - Guidance used
  - Workload
  - What is impactful?
- Low-level impacts
  - Turbulence, Icing, IFR, Smoke, Low Level Winds
  - Precip/Wx from WPC
- Feedback
  - Are polygons enough?
  - Guidance in the extended range is sparse
  - Human Factors



# Probabilistic Guidance & Use



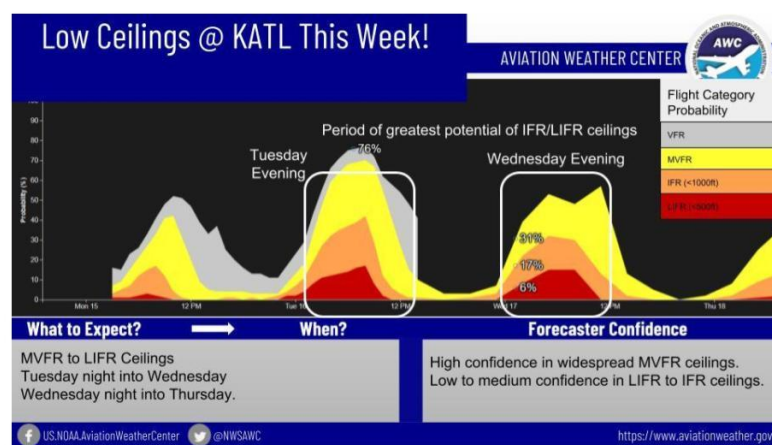
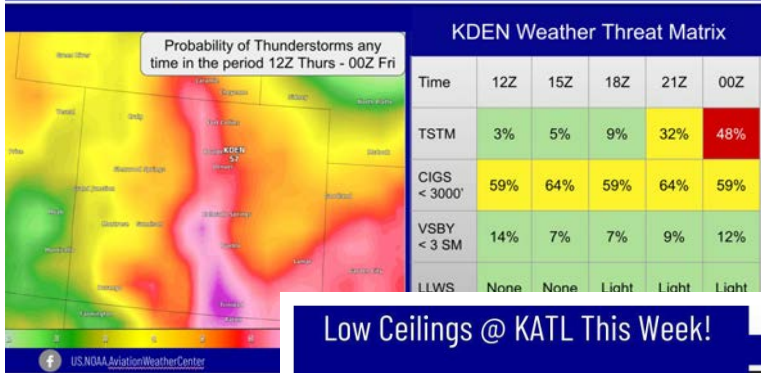
- 2023 May Experiment focus area
- How do forecasters utilize probabilistic guidance (NBM, HREF, GEFS) for aviation?
- Explore using non-deterministic methods for communicating aviation hazards
  - Assigning probabilities, incorporation of model uncertainty, forecaster confidence
- Focus on GA planning beyond the TAF forecast period
  - IFR, Turbulence, Icing



# Probabilistic Guidance & Use



## Aviation Impacts for Denver (KDEN) 12Z Thurs - 00Z Fri



*\*overall goal was to explore the use of probabilistic data...graphics were a catalyst to achieve that!*

- Participants were tasked with developing “IDSS” type graphics to message pending hazards in the Days 2-3 timeframe
- Creativity was encouraged!
- Final graphics were then presented to attendees of the Friends and Partners in Aviation Weather (FPAW) Spring Meeting to gather feedback



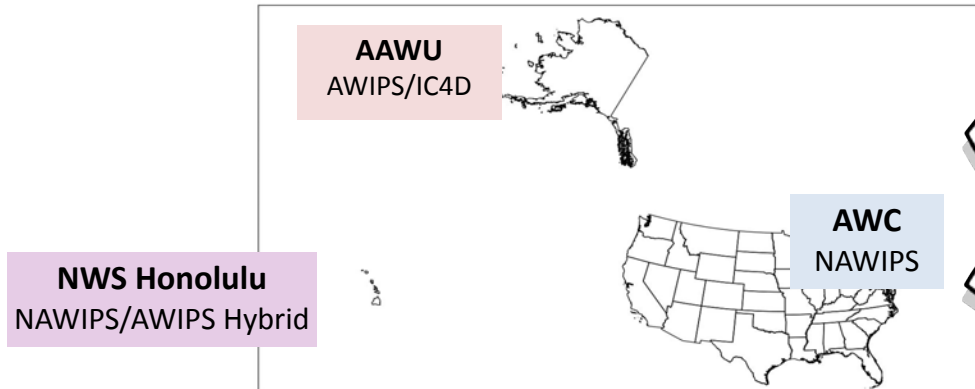
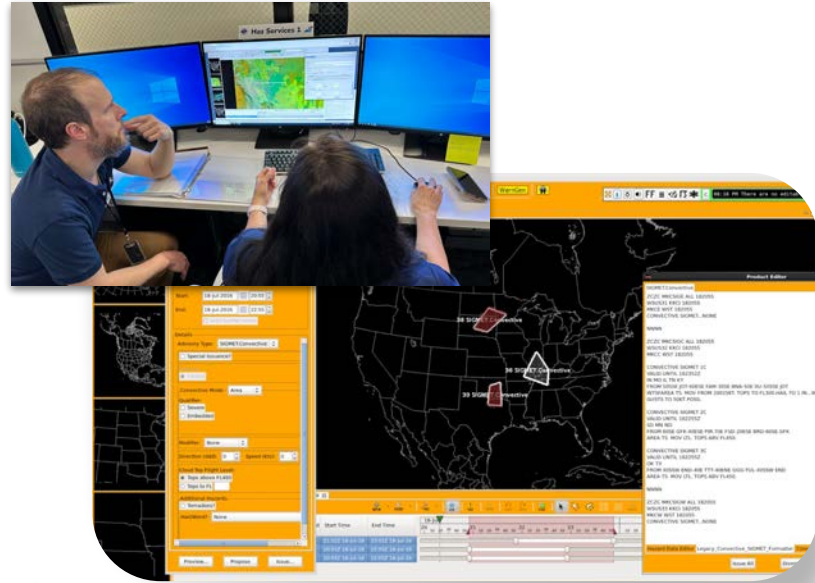
# Additional Activities from the 2023 May Experiment

- Hazard Services for Aviation
- High-Resolution Ceiling analysis over San Francisco Airport (SFO)



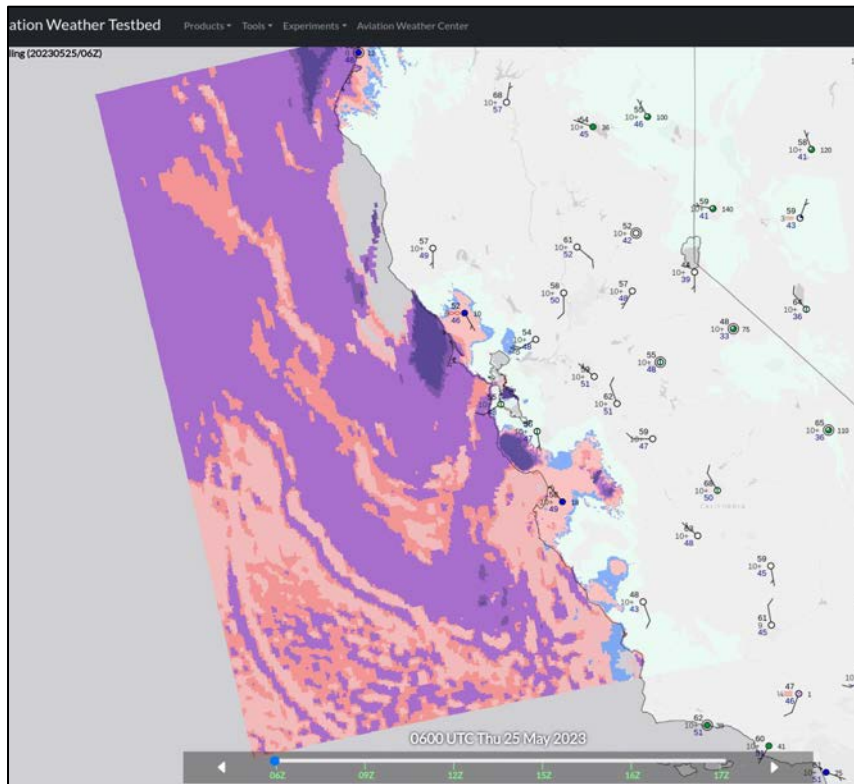
# Hazard Services Evaluation

- Common Aviation Production Platform
- AWIPS transition path for US Met Watch products
- Reps from GSL, AAWU, Alaska & Pacific Regions
- Tested workflows for producing SIGMETs, VAA, AIRMETs





# High-Resolution Ceiling Analysis over SFO



- MDL experimental 1.25km LAMP analysis of ceiling height over SFO
- Generated at 06Z, 09Z, 12Z, 15Z, 16Z & 17Z
- Determine utility for clearing times of low stratus and fog at SFO
- Feedback
  - Great tool in addition to obs to verify clearing
  - Rapidly updating forecast would be better!
  - Additional airports could also benefit

# Of the various projects/evaluations done recently in the AWT, which would be of most value to Pacific Region and/or HFO?

Digital Aviation Services (operational cloud forecast grids)

Evaluation of RRFs model guidance (convection, cloud forecasts, etc)

Outlook Graphics over Hawaii/Pacific Region

Utilization of probabilistic guidance for communicating aviation hazards

Hazard Services for Aviation

High-Resolution ceiling analysis data (ie. over SFO)





# Mahalo!

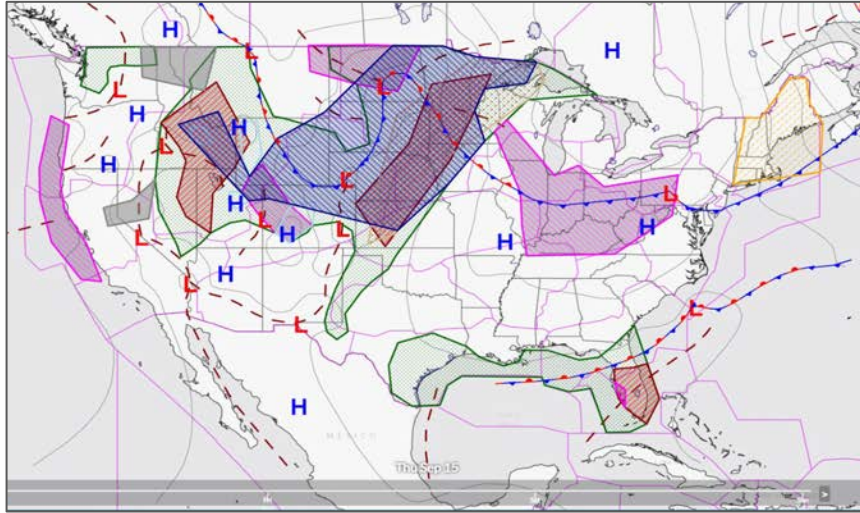
Stephanie Avey  
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Aviation Weather Center



[www.testbed.aviationweather.gov](http://www.testbed.aviationweather.gov)



# Outlook Graphics for GA



*Higher impact areas for day 1 include thunderstorms throughout the period and IFR conditions in the early hours over southern Florida, along with multiple hazards prevalent over the upper midwest and mid to northern Rockies. ...*

- Are polygons alone enough to convey the message?
- Should the outlook focus on risks, impacts, or hazards?
- What about probabilistic?
- Determine Utility -Human Factors (FAA's AWDE)
- How does this fit into our evolving desk structure at AWC?