WEATHER REPORTING IN THE NAS: CURRENT AND FUTURE NEEDS

PANEL 2, PRESENTATION 2

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RTMA Assessment

Update and Plans

Presented to: FPAW

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Federal Aviation Administration

What is the Problem?

- **Missing METAR information at Part 139 airports**
  - Missing observations, while infrequent, are usually due to hardware or software outages
  - Generally for a short period of time
  - No human observation backup or augmentation
  - Impacts aviation operators through delays, diversions, and cancellations

A Possible Solution

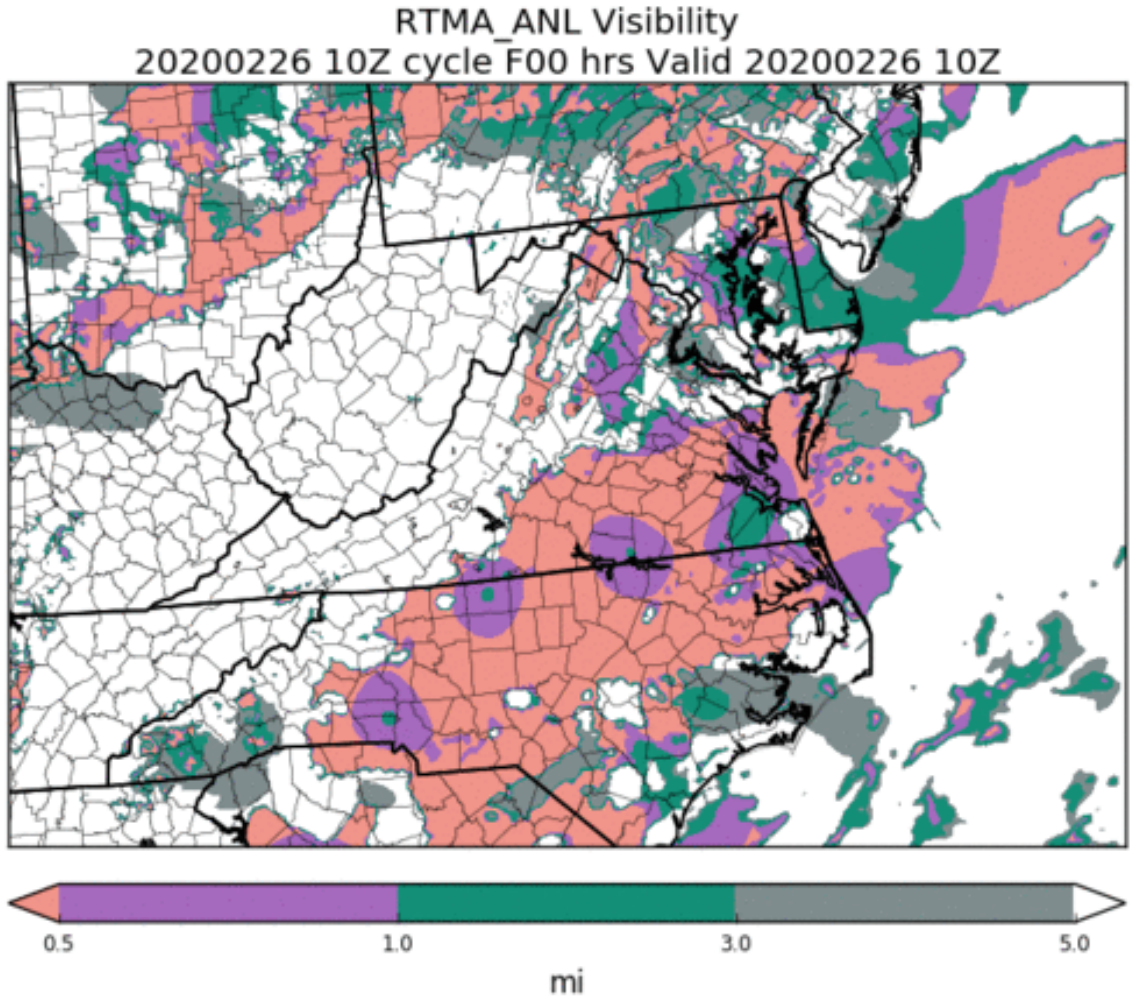
- **Real Time Mesoscale Analysis (RTMA)**
  - Produced by the National Weather Service
  - Since 2015 used for missing temperature reports in CONUS, Alaska, Hawaii, Puerto Rico and Guam
  - Can RTMA be used for other variables?
    - 10 meter wind and wind gust
    - Surface pressure
    - Visibility
    - Ceiling

RTMA Description

- **A 2-dimensional gridded meteorological analysis that uses:**
  - Numerical weather prediction model data for background fields
  - METAR surface observations
  - Mesonets (state/university, roadway information systems, etc.)
  - Buoys and ship surface-based observations
  - Satellite sky cover and low-level winds
- **Produces a close fit to observations**
- **2.5 km grid spacing for CONUS, HI, & PR; 3 km for AK**
- **Updated every 15 minutes (RTMA-RU) and hourly (RTMA)**
- **Originally developed to assist National Weather Service forecasters**
- **Provides the best estimate of the state of the atmosphere weighted by observation and background error**

RTMA Description

Example of Surface Visibility 26 February 2020 1000UTC

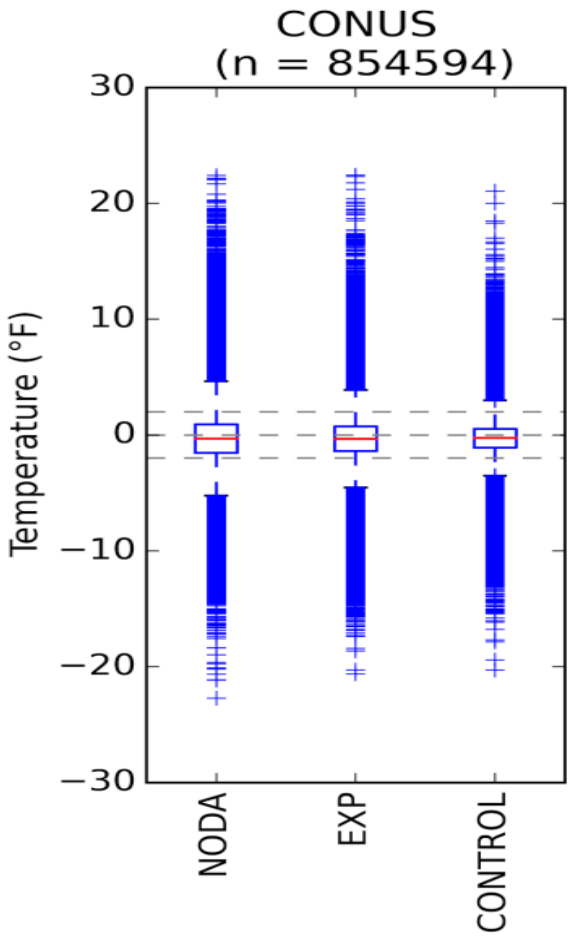


Phase 1 Assessment

- **Quantify the impact of missing observations**
- **Data denial experiment**
  - Worse case scenario with removal of all Part 139 airport (plausible in the case of a network failure)
  - Computationally expensive to rerun hundreds of data denial experiments
  - Produced a baseline for comparison

Phase 1 Assessment - Results

- **Ceiling:**
  - Very good results for VFR conditions
  - Outliers exist
  - Concern with mountainous regions
- **Visibility**
  - Very good VFR results but poor for low visibility
  - Outliers exist
- **Temperature**
  - RTMA likely suitable
  - Outliers exist
- **Surface Pressure**
  - RTMA likely suitable
  - Outliers exist
  - Concern in complex terrain
- **Wind Speed**
  - RTMA likely suitable for winds $\leq$ 15 knots



Phase 2 Assessment

- **Build upon foundation from Phase 1**
- **Outliers**
  - Determine trends if any
- **Regional**
  - Geographic, terrain, station density
- **Sensitivity Experiment**
  - Measure the impact from single observation or aggregate of observations
  - Does not require data denial
  - Real-time
  - Can be used for future RTMA upgrades

Next Steps

- **Contract discussions underway between FAA and NWS**
- **Upon award will be a minimum 13-month effort**

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