Quantification of Benefits of Aviation Weather

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Friends and Partners in Aviation Weather
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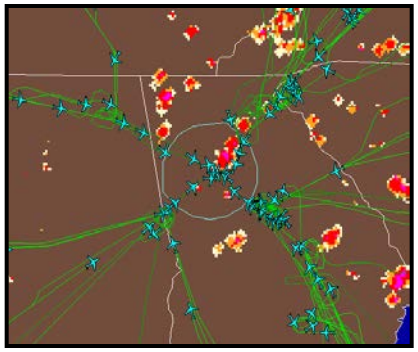
Quantification of Benefits of Aviation Weather

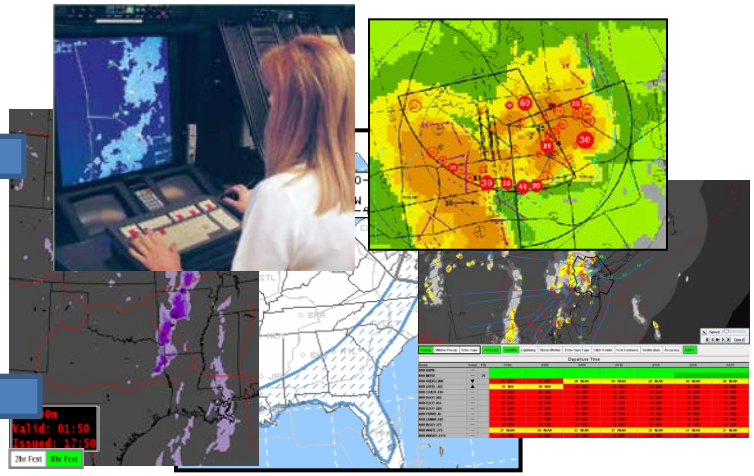
- **Introduction of Challenges & Opportunities** – Mike Robinson (AvMet Applications, Inc.) — 8 min
- **Assessing Contribution of Enhanced Weather Information to FAA Systems and Programs** – Dan Citrenbaum (FAA, Operations Research Group Manager, Office of Investment Planning and Analysis) — 8 min
- **FAA Operations (System Command Center) Activities and Perspective** – Steve McMahon (FAA System Efficiency Manager, System Operations) — 8 min
- **Airline Activities and Perspective** – Joe Bertapelle (Director, System Operation, JetBlue Airways) — 8 min
- **National Weather Service Activities and Perspective** – Cyndie Abelman (Chief, Aviation Services Branch and NOAA Aviation Weather Program Manager) — 8 min
- **Measuring Aviation Weather Forecast Performance and Operational Utility** – Missy Petty (Acting Chief, Forecast Impact and Quality Assessment Section, Global Systems Division, CIRA) — 8 min
- **Discussion** – Mike Robinson — 12 min

Motivation

Adverse Weather
Most Disruptive NAS Constraint



Improved Weather Guidance
To Assist Operations in Managing Constraints



Worthwhile Improvement?
What is Measuring Stick for Success?

Improved WX Info / Forecasts

COST $$

Improved Operations

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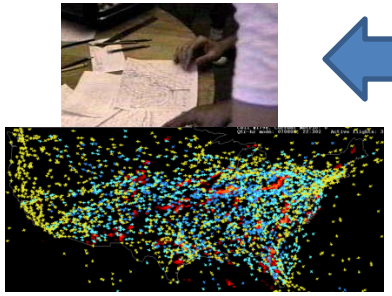
Operational Benefits
Delay / Cost Savings

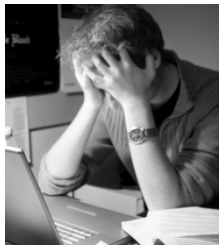
Significant Benefits Scrutiny
Investment Analysis

Seek *Objective*, Defendable, Repeatable, Data-Driven Aviation Weather Benefits

Rigorous Analysis Required



Very Challenging



Challenges to Quantifying Operational Benefits Attributed to Enhanced Weather Forecasts

- Weather event normalization

- Normalizing air traffic operations

- Attributing improved decisions to (a) improved forecasts, (b) USE of improved forecasts

- Estimating objective, data-driven, quantified benefits in NAS network

- "Breaking through" to where anticipated benefits become reality

"Of course wx delays were down this July compared to last…..there was 60% less convection"

"Of course delays are down, ORD demand was down 20%"

"Weren't those delay improvements associated with that new procedure / TMI?"

"You say delays were saved during all 200 days of convection in ZMA Center….how often were improved decisions derived from this new forecast?"

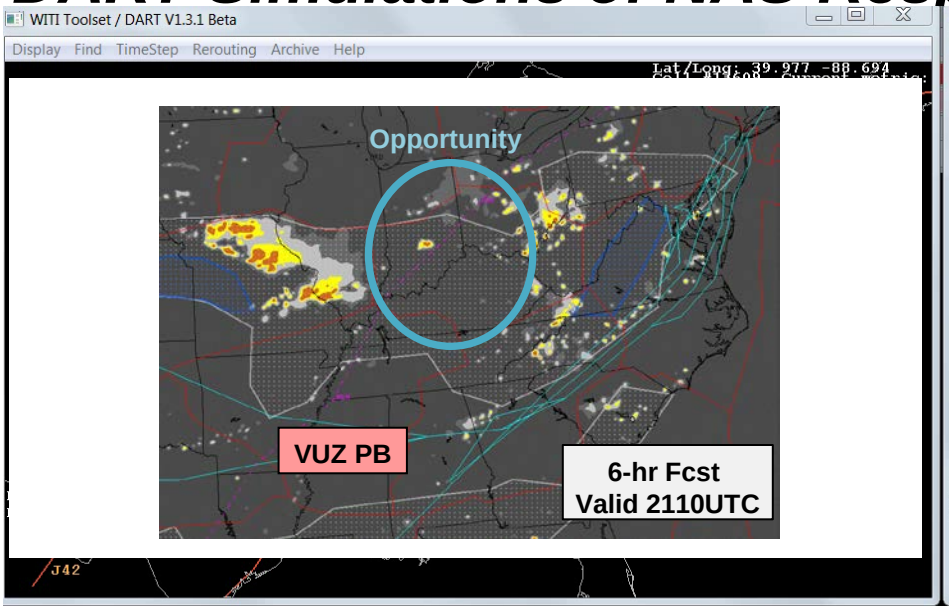
"We are in a tight fiscal environment…. I am not going to just take your word that measured forecast improvements equate to improved operational efficiency!"

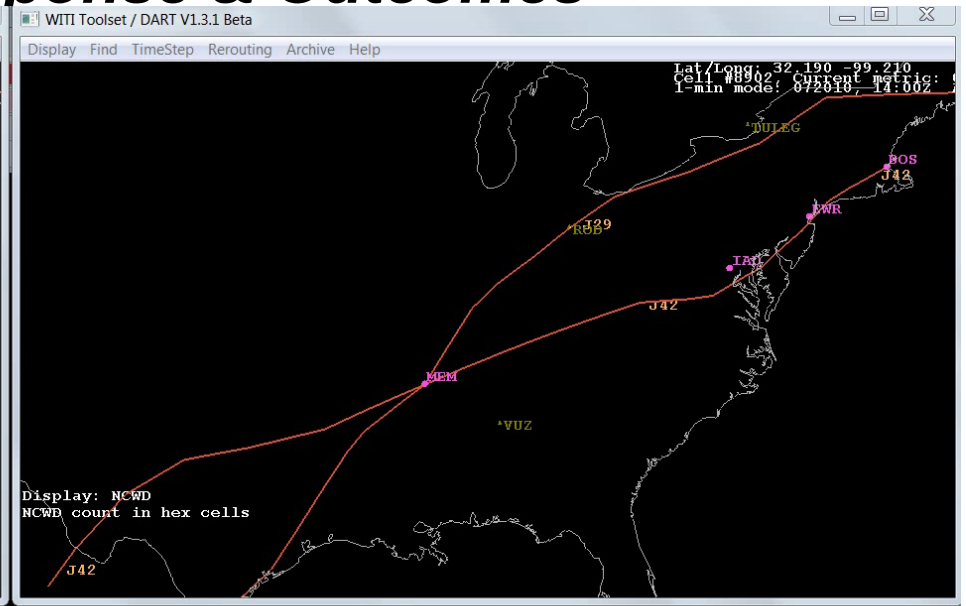
"What do you mean it takes 3-years to see full operational benefits?"

Aircraft equipage "chicken and egg"

Impact Management Decisions With/Without Fcst Aid

DART Simulations of NAS Response & Outcomes





With Forecast-derived Decision: Airway J29 open to relieve traffic on VUZ playbook reroute; reduced MIT, less delay

Without Forecast-derived Decision: VUZ playbook reroute traffic uses standard route; J29 closed; heavier MIT, longer delays

Only the traffic using NAS Playbook reroutes is shown; Color-coding by delay: 0-15, 15-20, 30-60, 60-120, >120 min arrival delay

Aviation Weather Benefits…..Consider This:

- Significant meteorological advancements may result in NO benefits to NAS operations (ex: product resolution and strategic ATM; benefits – cost balance)

- Seemingly ancillary weather / info dissemination improvements may result in significant operational benefits (ex: forecast scoring)
  - Human factors is an extremely important element

- Weather translation key to operational utility of meteorological information (ex: “penetrable” weather, capacity forecast, not storm forecast)

- Without close collaboration with operational community, aviation weather products will not be developed optimally for operational use (“embedded” partners; more than surveys and “spot-checks”)
  - More than Subject Matter Experts, need operations advocates

- Aviation weather operational benefits achieved when accompanying training is relentless