

# Challenges of Weather-ATM Integration

*“How to NOT be Our Own Worst Enemy”*

## 1. Recognize that “Perfect” is the enemy of “Good”

### Convective Weather Forecast

Perception: “Precise”  
Reality: Imprecise and Uncertain

### Integrated ATM/Weather Decision Support

Perception: “Even More Precise”  
Reality: Layered Uncertainties, with Risk

Good  
Good

WATCH  
OUT!!!!

Forecast, Translation, Impact, and Solution UNCERTAINTY must be a fundamental consideration of Weather-ATM Integration R&D

*“Weather : ATM DST Development :: Uncertainty : Weather Integration Development”*

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## 2. Collaborate with Users, but do your homework

- **“See and Solicit, Simulate”** weather/integration requirements, do not **“interview”** requirements
- Collaborating with users, develop tools that enable envisioned capabilities, not act as crutch that support current operations
- The most passionate operators are not always the target user group

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## 3. NextGen is “Outside the Box”, weather support has to be too

### Targeted NextGen Solutions

- Satellite-based Navigation
- User-supplied Trajectory Option Sets
- Trajectory-Based Operations (TBO)
- Enhanced Separation Management
- Point-in-space Metering
- Surface TBO
- Staffed NextGen Tower
- Dynamic Airspace Configuration
- Etc.

### Weather / Integration Research Innovative Too:

- Weather Avoidance Fields
- Integrated Departure Route Planning (IDRP)
- HRRR Model, 0-8 Deterministic Precip/Tops Forecasts
- Weather-Aware Constraint ID/Resolution
- Etc...

### Let's Take It To Another Level:

- “Weather Attack Regions” (WAR zones)
- High-Certainty Impact-Free Forecasts
- “Wind Return” Predictions
- “Risk-Awareness” Maps
- Combined Terminal Weather Impact Thresholds
- Etc.

