Aviation Weather Programs

Friends and Partners of Aviation Weather, Vision Forum 2010

Jaime Figueroa
July 21, 2010
Objectives for NextGen Network Enabled Weather (NNEW) and Reduce Weather Impact (RWI)

Network-Enabled Information Access

Weather Assimilated into Decision-Making

-- 4-D Trajectory Operations

Improve Quality of Weather Information
Key Programs

• NextGen Network Enabled Weather (NNEW)
• Reduce Weather Impact (RWI)
• Aviation Weather Research Program (AWRP)
• System Wide Information Management (SWIM)
• Other NextGen Solution Sets
  – e.g. Collaborative ATM
NNEW

• FAA’s IT tool suite for aviation weather information dissemination
  – Information provided from NWS’ NextGen 4-D Weather Data Cube
  – Tailored information provided by value added services
  – Dissemination of Weather Translations

• Makes available FAA weather products including FAA observations to NWS
RWI

• Pre-Investment Solution Set portfolio to develop:
  - Improved Observations
  - Improved Forecasts
  - Translated weather information into NAS constraint and impact information for integration into DSTs
Aviation Weather Research Program

• Research Portfolio aimed at improving state of the science for detection and forecast of aviation-relevant weather

• Current research thrusts:
  – Convection
  – Turbulence
  – Ceiling and Visibility
  – Icing (Ground and Airborne)
  – Modeling
  – Observations
NextGen Weather Integration Concept

- **Primary:**
  - NWS
  - FAA-MET
  - FAA-ATM

- **4D Wx**
  - Performance Feedback
  - SAS

- **Weather Translation**
  - Translation to Aviation Constraints and Threshold Events
  - Weather Information
  - Translated Weather

- **ATM Impact Conversion**
  - Conversion to Operational NAS Impact and State Changes
  - Impact Estimate

- **ATM Decision Support**
  - Impact Mitigation Options

- **Weather Avoidance Fields (WAF)**
  - e.g., Turbulence, Icing, Convection
  - e.g., Convective Weather Avoidance Model (CWAM)

**NextGen Weather Integration Concept**

- e.g., Convective Weather Avoidance Model (CWAM)
- Weather Avoidance Fields (WAF)
Translating Weather to Impacts

Precipitation

Echo Tops

Weather Avoidance Field (WAF)

Pilot Deviation Prob

Weather Translation Techniques

Estimated Airspace Availability
Integration Evolution

• Near-Term – Route/Volume Data Extractor for utilization in DSTs.

• Mid-Term – Translations integrated into DSTs.
  – New datasets will translate weather information into operational thresholds or NAS constraints.

• Far-Term – Fully automated translations including advanced weather data.

*Translations in use to support ATC decision making will be available to external users (e.g., FOC, Flight Deck) to allow for common situational awareness*
JPDO Policy Team Architecture Concept

**Outside Aviation Wx Domain**
- Other Than NextGen Networks
- Public (i.e. Anonymous Entity)
- Identified Entity

**Approved Aviation Wx Suppliers**
- Authorized Commercial
- NOAA
- FAA
- Verification System

**NAS Operators**
- Pilots, Dispatchers, Etc.
- Other Federal Entities (e.g., DHS, NTSB, etc.)

**NextGen Network**
- NextGen 4-D Cube
- Non SAS
- ANSP

**NextGen NEO Governance**
- NextGen Wx Governance

**Multiple Governance Systems, All Outside NextGen**

Federal Aviation Administration
July 21, 2010
<table>
<thead>
<tr>
<th>Period</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Period</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Period</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FY10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FY11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FY12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Define 4-D Wx Single Authoritative Source**
- **Define 4-D Wx Data Cube**
- **Develop Governance Structure for NextGen 4-D Wx Data Cube**
- **Establish Initial Business Rules for Operating the 4-D Wx Data Cube**
- **Operational Initial NextGen Wx Capability Governance Structure**
- **Final Approval of Initial NextGen Wx Capability Governance Structure**

*Identify Regulatory Changes Needed to Accommodate the Operation and the use for the NextGen 4-D Wx Data Cube*
The RTO Process
Current and Near-Term Activities

• NNEW 4-D Wx Data Cube
  • FAA/NWS NNEW Capability Evaluation, Sep 2010

• Processing and Integration Demonstrations
  • In-situ Turbulence Demonstration, Ongoing
  • Advanced Convective Forecast Evaluation, Jun-Sep 2010
  • Wx into TBFM - NextGen Integrated Airport Evaluation, 2011

• Plans and Requirements
  • ATM Weather Integration Plan v2.0, Sep 2010
  • Observation Rightsizing Analysis Report, Dec 2010
  • Liquid Water Equivalent Initial Requirements, July 2010