

Aviation Weather Group

Right Sizing Project Briefing

Presented to: Interagency NextGen Weather Research
Review and Coordination Meeting

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Operational Readiness and Impact Team

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Federal Aviation
Administration



Agenda

- **Scope**
- **NextGen Guidance**
- **Key FAA Personnel**
- **FY09 Foundational Activities**
- **Team Members**
- **FY09 Deliverables**
- **FY10 Activities**



Scope

RWI Weather Observation Improvements - Addresses eliminating the gaps, inaccuracies, and inconsistencies in aviation weather observations.

| Problem/Performance Gaps | Solution |
|--|---|
| ➤ Non-optimized observational platforms Over/Under Sampling | ➤ Optimize Obs. Sensor Network – correct sensor mix of ground-based, airborne, and other sources. |
| ➤ Insufficient data resolution | ➤ Improve spatial and temporal resolution network, tailored to domain |
| ➤ Rigid, schedule driven data collection. | ➤ Event driven, adaptive control of observational frequency |

| Support to Goals |
|--|
| ➤ FAA Strategic Goal – Greater Capacity <ul style="list-style-type: none"> • Increase reliability and on-time performance of scheduled carriers • Increase capacity to meet projected demand and reduce congestion |

| Interdependencies |
|---|
| ➤ FAA sensor legacy programs |
| ➤ NNEW (4-D Weather Data Cube) |
| ➤ Aviation Weather Research Program |
| ➤ RWI Weather Forecast Improvements |
| ➤ Weather Technology in the Cockpit |
| ➤ FAA NextGen Solution Set Requirements for weather information integration |



NextGen Guidance

- **NextGen Functional and Performance Requirements**
 - Detailed performance requirements for SDO
 - Validation process ongoing
- **FAA Enterprise Architecture Weather Roadmaps**
 - Expect significant changes in observation roadmap in FY10



Key FAA Personnel

- **Right-Sizing Project Lead –** Victor Passetti
- **Airborne/In-Situ POC -** Tammy Farrar
- **Nowgen LWE POC -** Dino Rovito
- **Satellite POC -** TBD
- **Requirements Liaison -** Stewart Stepney
- **Project Management Support -** Ernest Sessa



FY09 Foundational Activities

- **Kick-off meeting held at WJHTC March 2009**
- **Project web site**
 - <http://wx.tc.faa.gov/rightsize>
 - Deliverables, supporting docs, POCs, action items, etc



Team Members

NCAR-

- Sub-team lead for airborne/in-situ, satellite and ground observations (including LWE)
- Leverage resources involved with existing FAA R&D weather efforts

Lab Lead

Satellite, Lightning, Wind Shear

Ceiling and Visibility

Remote Sensing

LWE

In-Situ, turbulence

Space Weather

Mathias Steiner

David Johnson

Paul Herzegh

John Hubbert

Roy Rasmussen

Greg Meymaris

Michael Wiltberger



Team Members

MIT/LL –

- Sub-team lead for radar applications
- Leveraging expertise in advanced radar techniques... MPAR, numerous convective weather and wind shear alert programs

Lab Lead

Mark Weber

John Cho

Suilou Huang



Team Members

University of Oklahoma, Indiana University –

- Sub-team lead for Advanced Data Management Applications and Demonstrations

University of Oklahoma Jerry Brotzge, Fred Carr, Chris Fiebrich

Indiana University Beth Plale, Suresh Marru, Scott Jensen

- **More info in Jerry's and Beth's presentations**



Team Members

ESRL-

- Demonstrations using alternative weather observations available from the MADIS network, in NNEW-compliant formats
 - Patty Miller

NSSL-

- Establish connectivity between NWEC and NMQ (<http://nmq.ou.edu/>), begin benchmarking of available products, begin exploring alternative radar solutions and gap fillers
 - Ken Howard



FY09 Deliverables

IOC Sensor Assessment

- This activity sets the stage for all future efforts!
- Team evaluated the anticipated state of the sensor network at NextGen IOC (2013)
- Team developed classifications for and preliminarily identified gaps in the anticipated 2013 network
- Report available on website
- Jump to spreadsheet



Types of Gaps

- **Knowledge** – What techniques to apply?
- **Engineering** – Does technology exist?
- **Operational** – Transferring capability from R&D
- **Product** – Does an algorithm exist?
- **Spatial Coverage** – Is the domain covered?
- **Temporal Coverage** – 24/7?
- **Performance** – All performance requirements satisfied?
- **Communications** – Data transfer structure adequate?
- **Metadata** – Sensor specifics properly characterized?
- **Dynamic** – Degraded operations mode?
- **Funding** – Can we afford it?



FY09 Deliverables

Right Sizing Master Plan:

- Outlines planning, evaluations, demonstrations, and implementation activities associated with right sizing effort
- Focused on identifying activities associated with EA roadmap decision points, mitigating discovered sensor gaps, and exploring and demonstrating dynamic sensing and control in a SOA environment
- A living document, updated as interdependencies and investment decisions evolve
- More on this from Jerry and Beth



FY10 Activities

Major efforts:

- Sensor Gap identification for Super Density Terminal (SDO) airspaces
 - Quality of results proportional to availability of user-vetted functional and performance requirements
- Investigate and adapt advanced sensor systems and sources to function in the NextGen environment
 - Collaborate with NNEW
 - NMQ and MADIS
 - More from Beth



FY10 Activities

- **Planning for Demonstrations (FY11 and beyond)**
 - Case study based approach
 - Address gap mitigation, reduce duplication, high priorities
 - Adaptive sensing
 - More from Jerry



FY10 Activities

- **Airborne Activities**

- Multi-year R&D project addressing the needs of using aircraft platforms to observe or measure the state of the atmosphere
- Developing conuse, verifying and validating airborne obs requirements with stakeholders (government, industry, ICAO, WMO)
- Establishing policies related to required equipage, frequency of reporting, and cost sharing responsibilities
- R&D on calibration and indexing of airborne obs parameters by aircraft configuration



FY10 Activities

Outreach activities:

OFCM-CIOS, AMS, ATO-W, JPDO, NOAA - ESRL, NSSL, NWS

