

Interagency Architecture Efforts for NextGen Weather

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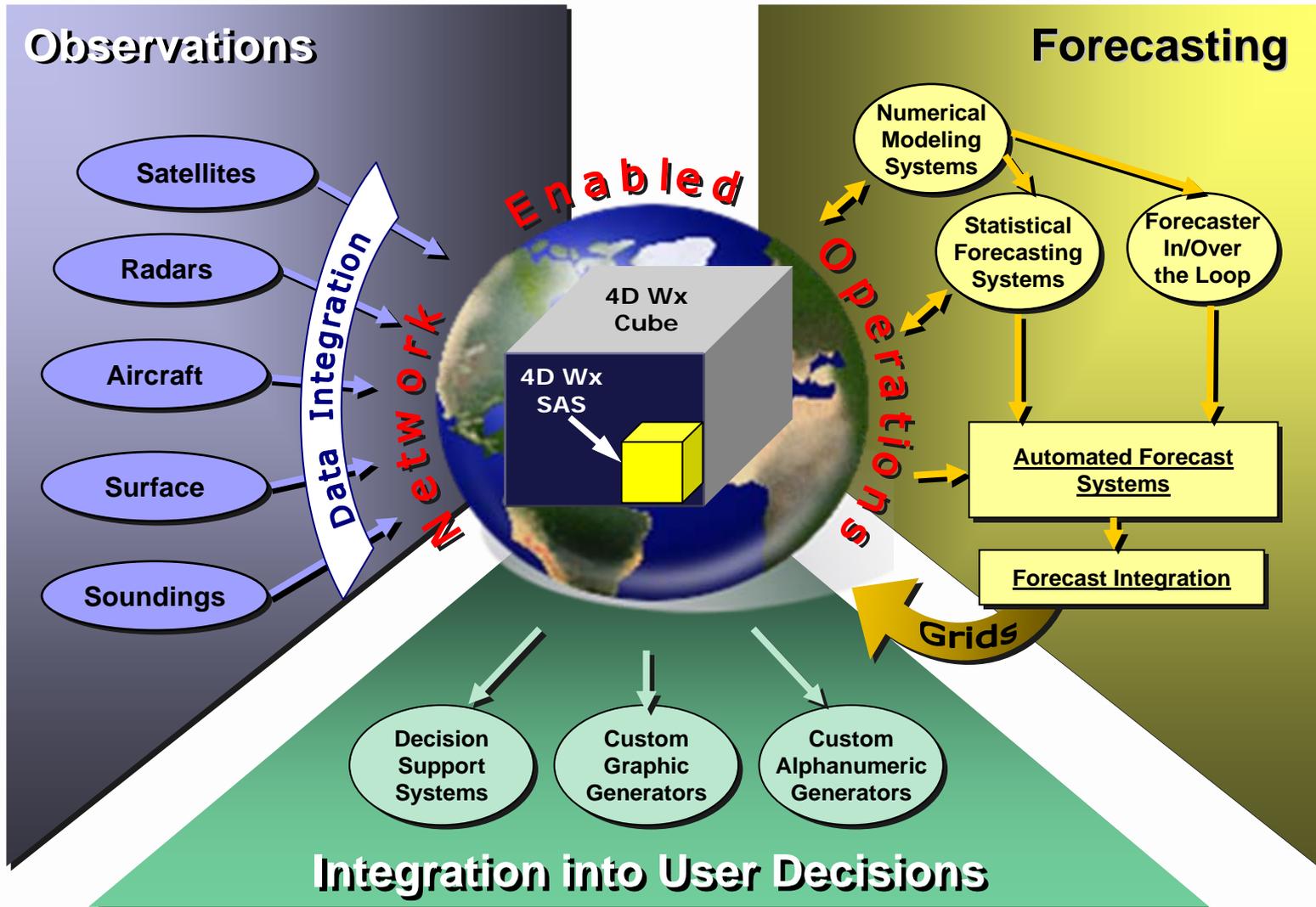
NOAA

Weather Working Group Co-Lead

Introduction to Weather Concept of Operations

- Weather providers deliver a four-dimensional set of weather information
 - Operators/Managers will have a common weather picture by using a subset of this information called the Single Authoritative Source
- In the NextGen ConOps, weather information will be fully integrated into operations and decision support tools
 - Data, rather than text and graphics becomes the “product”
- 4D weather will assist decision-makers by integrating with new tools that will describe the full range of available options to deal with weather issues
 - Identifies risk
 - Suggests strategies
 - Minimizes user disruptions

The 4-D Weather Cube: A Conceptual Model



Today vs. NextGen Weather Information Attributes

Today

- Not integrated into aviation decision support systems (DSS)
- Inconsistent/conflicting on a national scale
- Low temporal resolution (for aviation decision making purposes)
- Disseminated in minutes
- Updated by schedule
- Fixed product formats (graphic or text)

NextGen (new requirements)

- Totally integrated into DSS
- Nationally consistent
- High temporal resolution
- Disseminated in seconds
- Updated by events
- Flexible formats

The Assumptions

- Transformation, not evolution or transition
- A **highly automated** Trajectory Based Operations end-state
 - Becomes the premise for the “4D Weather Cube”
 - Subsequently drives the requirement for weather information consistency
- New and updated processes would be required
 - Monumental changes to both the weather provider community as well as the system “user” of that data

Weather Transformation

2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025



- Identify, align, or eliminate duplicative weather research and acquisition programs (FAA, NASA, DOC, DOD)
- Redirect existing research programs towards implementation of a national weather information collection and dissemination capability (FAA, NASA, DOC, DOD)
- Revisit and update decades old weather operational policies (FAA)

- Develop and implement weather information protocols and standards (FAA, DOC, DOD)
- Design and acquire 4D weather infrastructure (FAA, DOC, DOD)
- Migrate legacy weather systems towards 4D ConOps (FAA)
- Develop and implement technologies to populate weather information system under Single Authoritative Source concept (FAA, DCO, DOD)

- Integrate common weather information with decision support tools to enable a layered, risk-based operations approach (FAA, NASA)
- Ensure weather event information is well characterized and consistently passed across organizational and agency boundaries (FAA, NASA, DOC, DOD)
- Enable 4D trajectories that are routinely updated to incorporate the latest weather information (FAA, NASA)

- Ensure common weather situation awareness for all users of the NextGen System, promoting improved system capacity and safety (FAA, DOC, DOD)
- Streamline weather information architecture to reduce operations and maintenance cost for government and users (FAA, DOC, DOD)
- Ensure direct integration of weather information into NextGen decision support tools to enable “weather savvy” decision support automation (FAA, NASA, DOD)
- Inform decision makers of options, assist in the automated identification of potential decision risks, and pose suggested operational solutions along with projections of NextGen impacts (FAA, NASA, DOD)



Our Challenges

- Changing roles and requirements of weather providers
- Changing the operational use of weather information
- Developing a common lexicon and set of processes across agencies

What We've Done Management

- Stood up NextGen Executive Weather Panel (NEWP) to tackle cross-cutting issues
- Stood up interagency teams
 - Cube Team
 - Integration Team
 - Policy Team
 - Demo Team

What We've Done

EA

- Developed multiple use cases and scenarios
 - Operational use of weather information
 - Production of weather information
 - Architecture for sharing weather information
- Working with operational community to develop ATM-Weather Integration Plan to describe path towards integrating weather into planned DSTs
- Working with Mitre on mid-term scenarios based on NGIP
- SE Team works closely with FAA and NOAA to support development of interagency composite architecture for transition to the 4-D Cube and the SAS

- Good News
 - NextGen Executive Weather Panel formed and routinely meeting to work issues
 - Weather 4D Cube Plan out for comment
 - Weather Integration Plan in comment adjudication
- Join us for Friends/Partners of Aviation Weather
 - July 22nd at NTSB Conference facility