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# NextGen Update

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# Agenda

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- What's changed?
- NextGen Background
- FAA NextGen Weather Architecture
  - NextGen Weather Processor
  - Aviation Weather Display
  - Common Support Services - Weather
- NWS "NextGen" Weather
- Digital Aviation Services
- Conclusion



# What's Changed?

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- The Joint Planning and Development Office (JPDO) has closed
  - Completed its purpose of setting the vision for NextGen
  - New Interagency Program Office handles R&D coordination and interagency NextGen planning
- NOAA has dropped “NextGen” from its weather program in favor of Science Applications and Integration



# Background

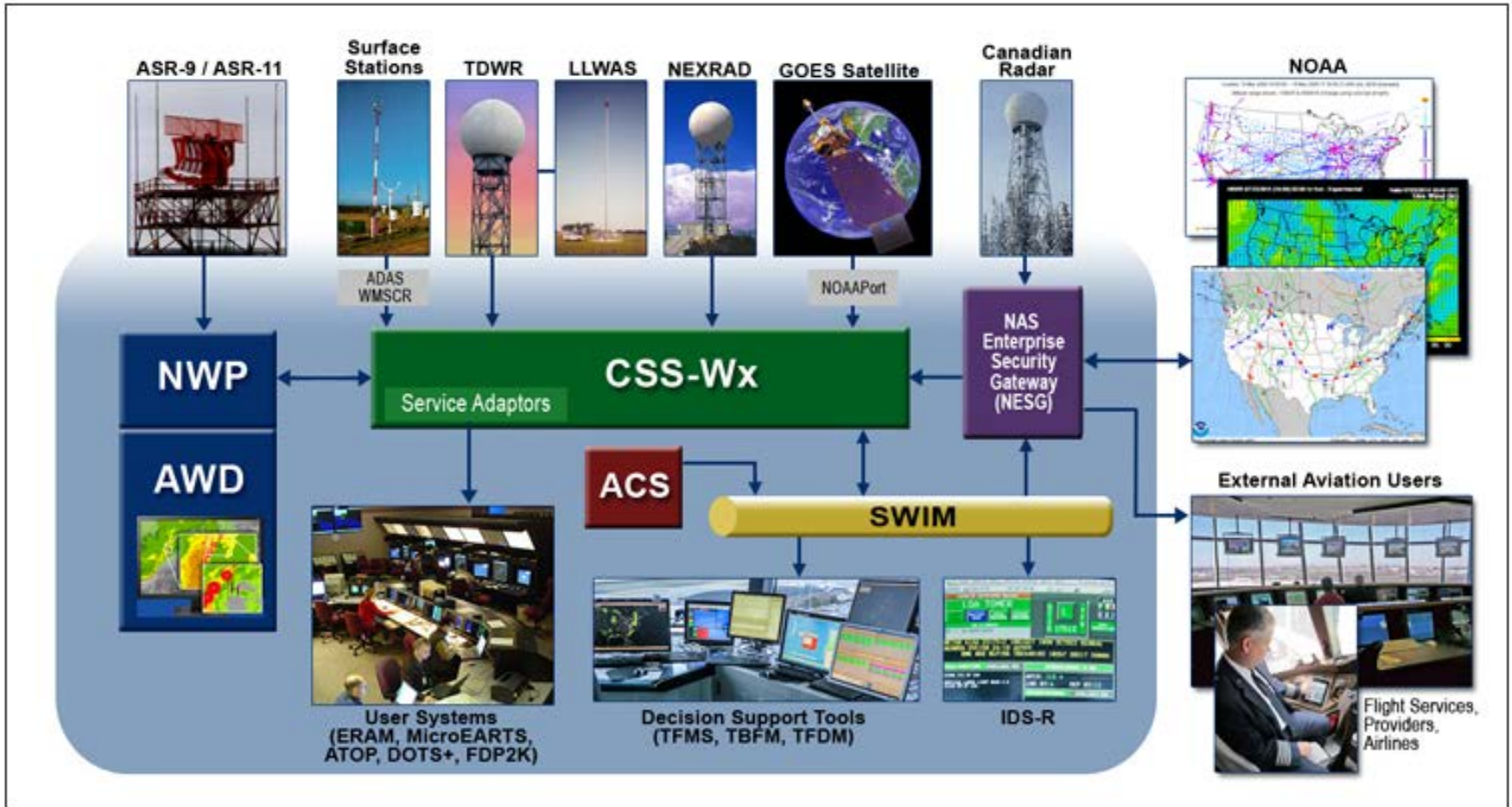
## Program Description

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- Next Generation Air Transportation System (NextGen) formed from a U.S. Congress mandate to modernize the U.S. Air Transportation System in order to:
  - Increase capacity and reliability
  - Improve safety and security
  - Minimize the environmental impact of aviation
- Partners
  - NextGen is a multi-department initiative: Transportation, NASA, Defense, Homeland Security, Commerce (NOAA/NWS), White House Office of Science and Technology Policy
  - NextGen Weather is primarily driven by Federal Aviation Administration (Department of Transportation)
  - NOAA's contribution is employing more modern technologies for access and distribution of required aviation weather information and increased accuracy of weather information

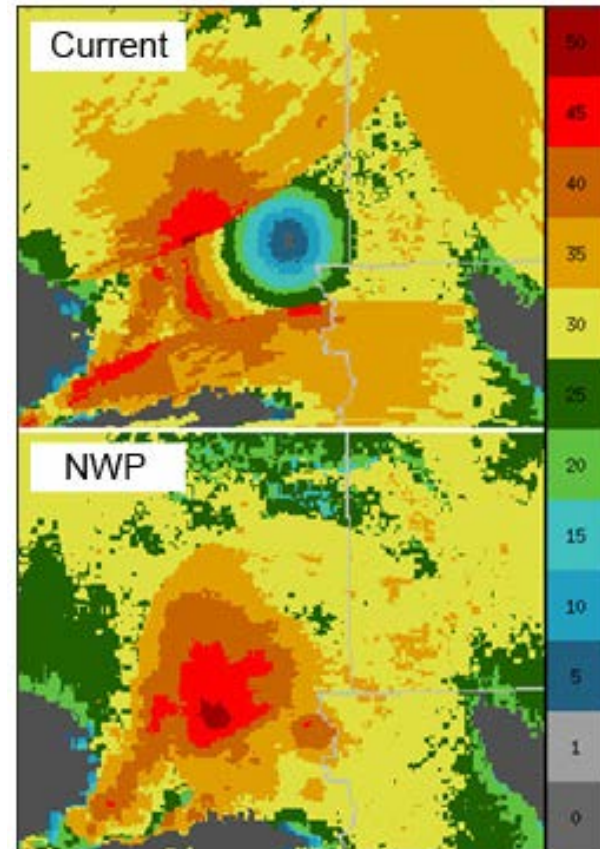
# FAA NextGen Weather Architecture



NextGen Weather Processor (NWP), Aviation Weather Display (AWD), Common Support Services – Weather (CSS-Wx)

# NextGen Weather Processor

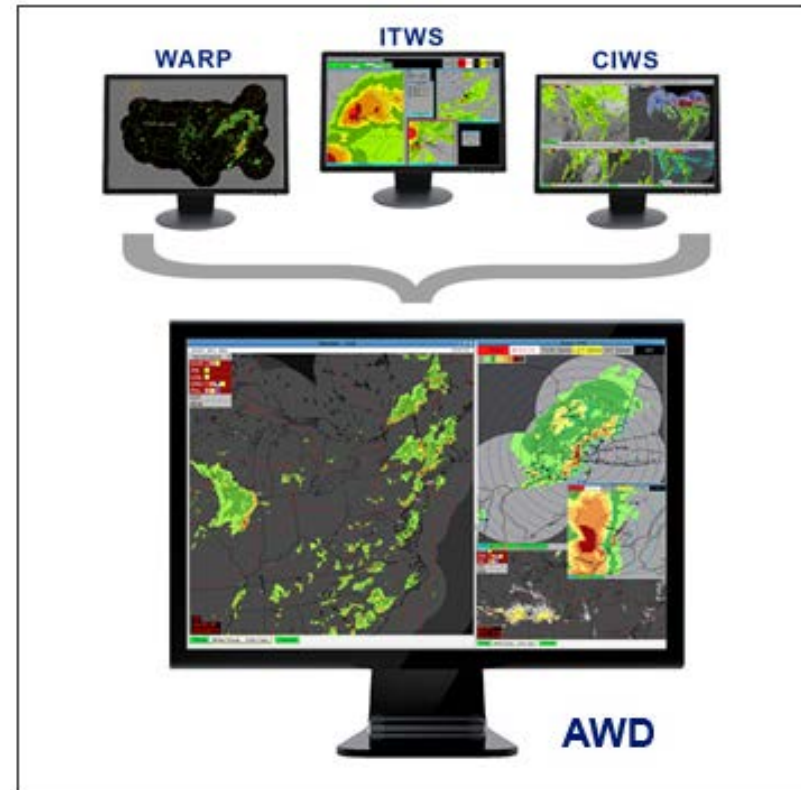
- NextGen Weather Processor (NWP) identifies terminal and enroute safety hazards, and provides translated weather information needed to predict route blockage and airspace capacity constraints up to eight hours in advance.
- Combines information from weather radars, environmental satellites, lightning, meteorological observations (from surface stations and aircraft), and NOAA numerical forecast model output to generate improved products



Example: Improved echo top mosaics

# Aviation Weather Display

- Combines current multiple weather displays from the Weather and Radar Processor (WARP), the Integrated Terminal Weather System (ITWS) and the Corridor Integrated Weather System (CIWS) for use by controllers
- More consistent weather depiction
- Downside: Controllers must still mentally integrate weather information with traffic on their scopes



Weather Display Consolidation



# Common Support Services - Wx

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- Provides weather data, products, and imagery within the National Airspace System (NAS), using standards-based weather dissemination via System-Wide Information Management (SWIM)
- Makes available both NOAA and FAA NWP weather products for integration into air traffic decision support tools





# NOAA “NextGen” Weather



- NOAA’s “NextGen” Weather Program formulated to enable improvements to support the Federal NextGen initiative
- Program divided into two main components: “IT/Web Services” and “Science and Applications”
  - IT/Web Services:
    - Near-term deliverable to improve access and discoverability of NOAA data for aviation
    - Transferred to Integrated Dissemination Program (IDP) in FY14
  - Science and Applications:
    - Longer-term research and development of applications to improve the accuracy and timeliness of aviation weather information



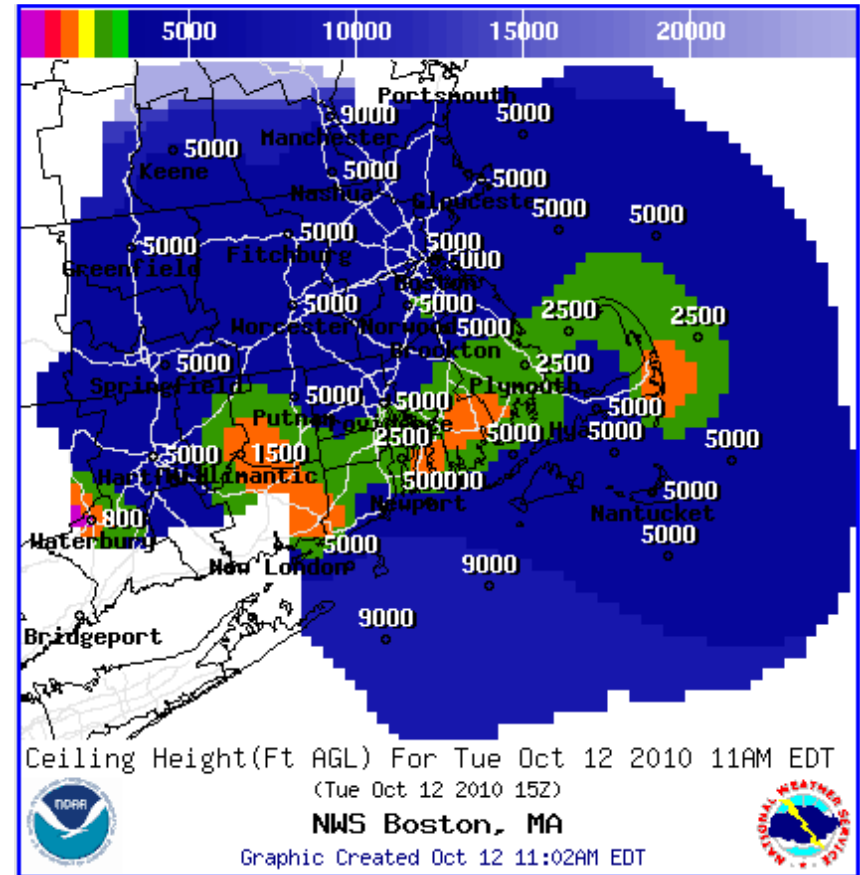
# NOAA “NextGen” Weather



- Major thrusts
  - NextGen IT/Web Services
  - Digital Aviation Services/Enhanced Digital Services
  - INtegrated Support for Impacted air Traffic Environments (INSITE) tool
  - CL31/PBL ceilometer extension
  - TRACON Approach and Departure Gate Forecast
  - Aviation Forecast Verification Tool

# Digital Aviation Services

- Adding aviation elements to the National Digital Forecast Database (NDFD)
  - Provide hourly graphical forecasts of ceiling and visibility out to 36 hours
- TAFs are generated from the database with forecaster oversight

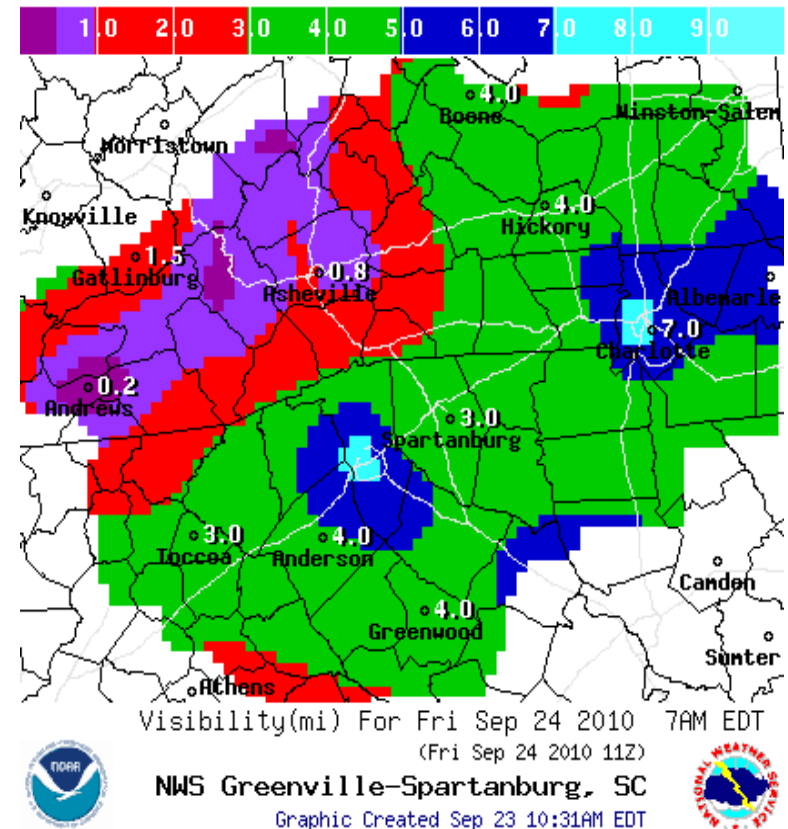




# Why Digital Aviation Services/ Enhanced Digital Services?



- **One event, one forecast**
- Moves toward NextGen requirement of a National Digital Ceiling and Visibility Grid
- Build a National Ceiling and Visibility Grid with 2-way collaboration from National Centers and Weather Forecast Offices
- Important guidance tool for medical services, search and rescue, and General Aviation
- Improves NWS forecast consistency with aviation forecasts and beyond





# Conclusion

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- NextGen continuing to make solid progress on several key activities
- Implementing state of the art dissemination technologies
- Enabling more accurate and timely forecasts of weather affecting the National Airspace System
- Developing additional NextGen capabilities which will help all NWS service areas

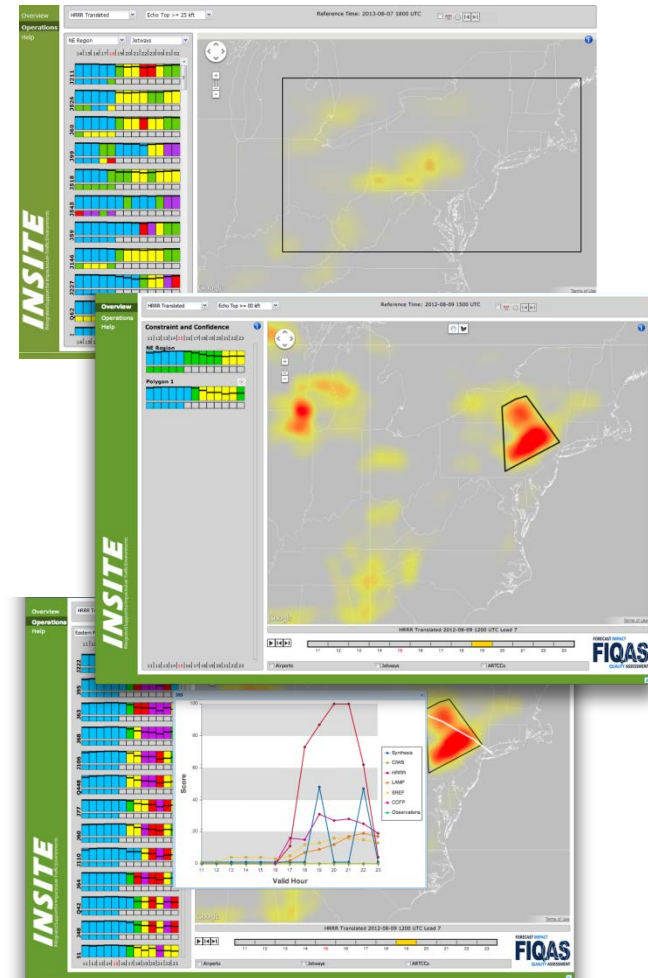


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# BACKUP

### Integrated Support for Impacted air-Traffic Environments (INSITE)

- Goal: Provide decision assistance tool for NWS forecasters to aid in the prediction of convective weather events that affect aviation
  - Test and evaluation continues at NWS Aviation Weather Center, FAA Air Traffic Control Command Center, two NWS Region Center Weather Service Units and two Weather Forecast Offices
  - Tool assists in CAWS preparation by defining constrained areas
  - Expect transition to operations in 2017
- Close coordination with NWS Aviation Services and FAA's Weather Evaluation Team (WET)



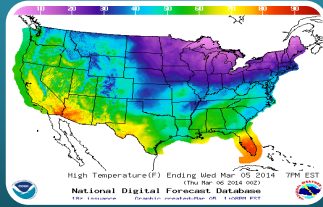


# Aviation Forecast Verification Tool (AFVT)



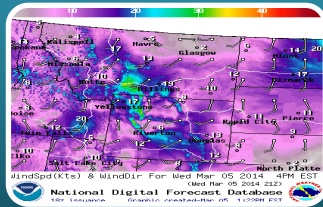
- Top Drivers
  - Meet the Federal Aviation Administration's (FAA's) quality management system requirements for verification of NWS Aviation products
  - Establish NWS performance for Aviation elements at national scale, regions, offices, individuals
  - Near-real time verification
- Benefits
  - Near-real time verification of Weather Elements important to Aviation (Ceiling Height, Visibility, Temperature, Dewpoint Temperature, Wind Speed, Wind Direction, Wind Gusts, Sky Cover)
  - Users submit queries for location, time period and parameters
  - Results provided for gridded verification as graphics or charts
  - Results computed for various levels (national, regional) for FAA and NWS





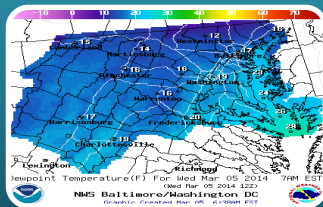
## National Digital Forecast Database Verification

- Verification of Aviation Weather Elements
- Near-real time results



## Verification of a Forecast for a Region

- NWS regions
- Air Route Traffic Control Center



## Verification of a Forecast for a WFO

- User defined areas
- For one specified County Warning Area



## Verification of a Forecast for an Airport or Point

- Core CONUS Airports
- User selected point locations



# Aviation Weather Elements

CL31



## CL31 PBL Project

- Benefits: Expands utilization of the current operational ASOS ceilometer from 12,000 ft to 25,000 ft, without infrastructure expenditures
- Goal: Investigate and validate the effectiveness of the selected CL31 ceilometer algorithm across the U.S., as provided by the Proof of Concept CL31 Test Sites Evaluation
- Objectives: (1) expand experience and knowledge of the CL31 Test Sites Evaluation (local) to the national scope, (2) ensure that the ceilometer algorithm selected performs as anticipated and the PBL profiles generated meet scientific rigor, (3) implement algorithm into ASOS operations
- Deliverable: PBL algorithm which extends CL31 profile detection beyond current range and implement into operations