

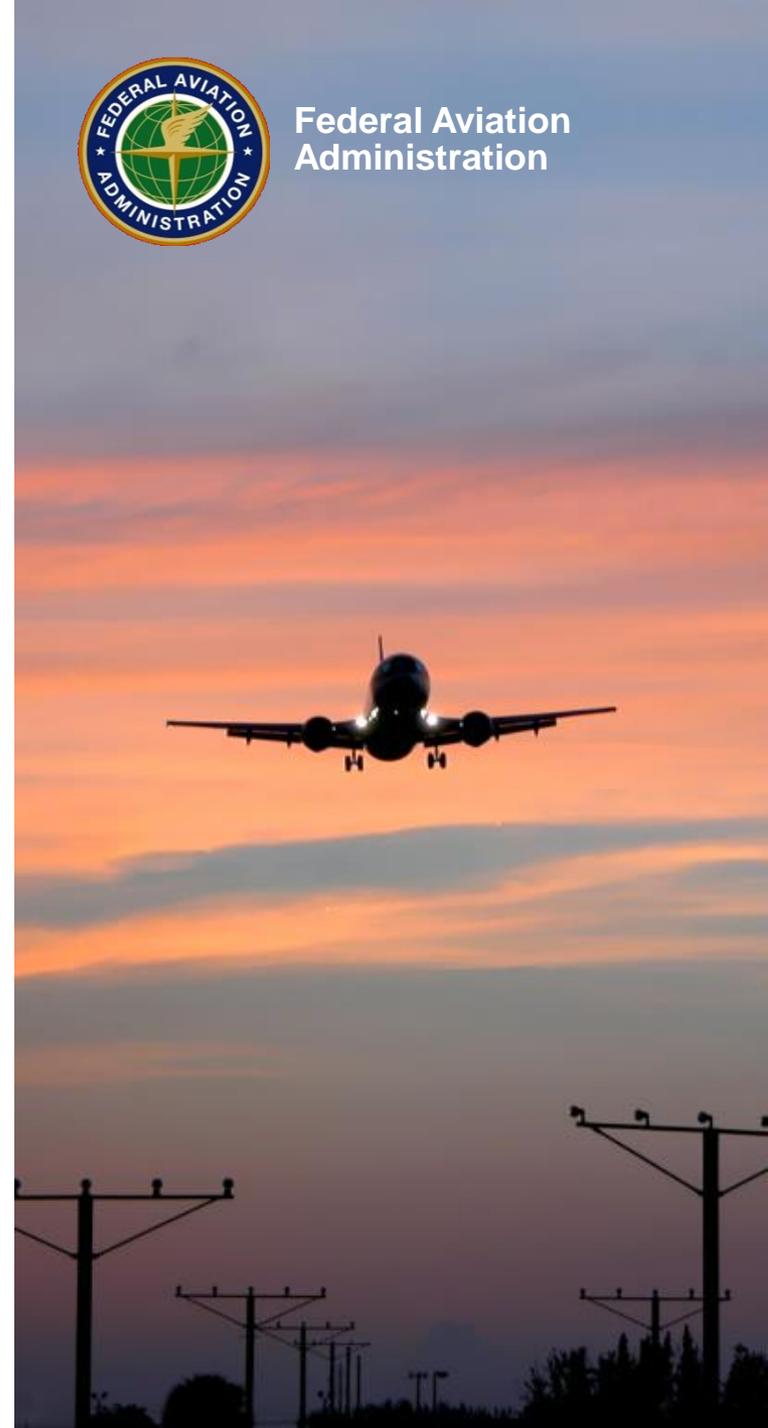
# SWIM Users Forum

April 12, 2018

**Presented by:** SWIM Program Office  
Washington, DC



Federal Aviation  
Administration



# Agenda

- **Common Support Services – Weather**
- **SCDS: How it works and what users can expect**
- **Migration to SWIM Cloud Distribution Service (SCDS)**
- **SFDPS Update**
- **For your reference:**
  - Follow-up questions from February 2018 Users Forum
  - Upcoming Events
  - STDDS News
  - NSRR Update

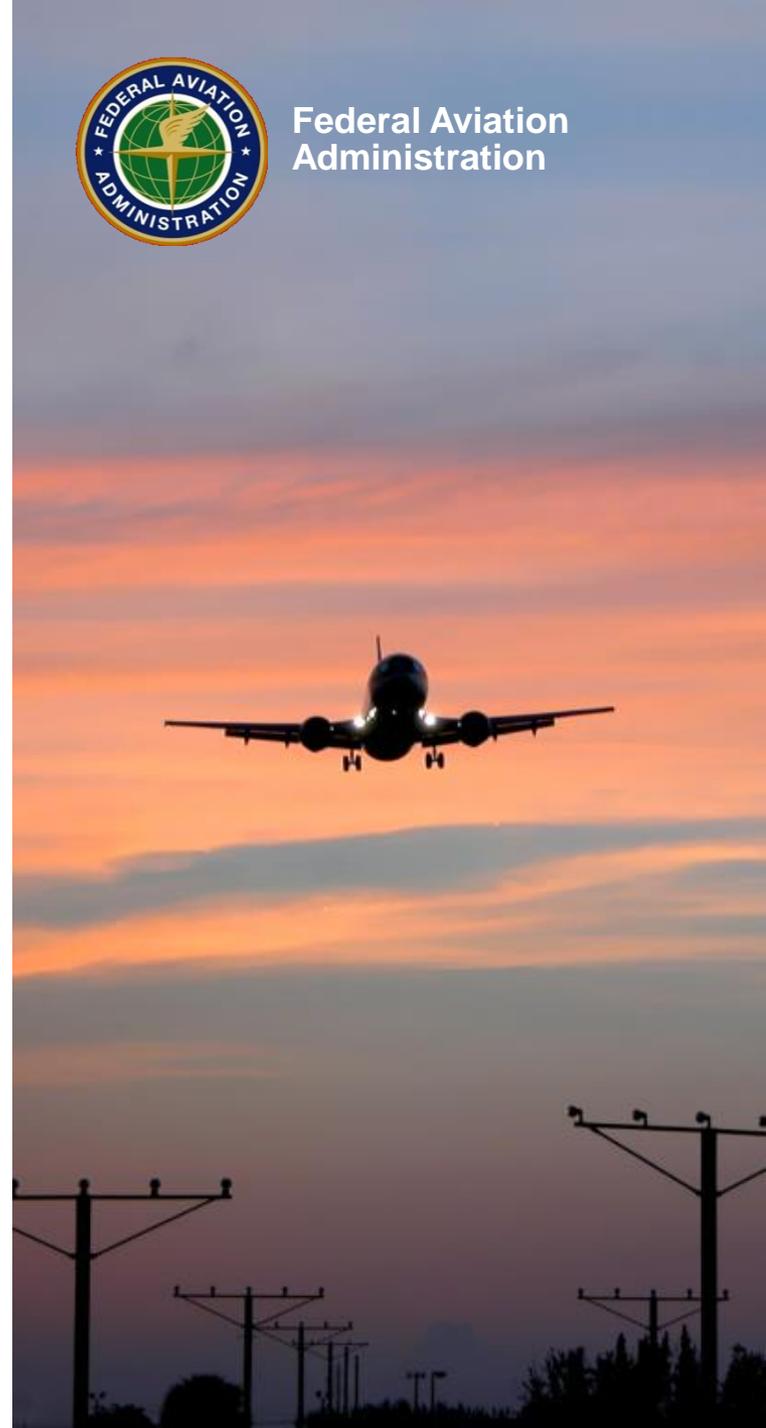


# Common Support Services- Weather

Presented by: Doug Wreath, FAA CSS-Wx



Federal Aviation  
Administration



# Purpose

- **Describe NextGen Weather Systems**
  - Common Support Services-Weather (CSS-Wx) being developed by Harris
  - NextGen Weather Processor (NWP) being developed by Raytheon
- **Highlight how NextGen Weather interacts with SWIM**

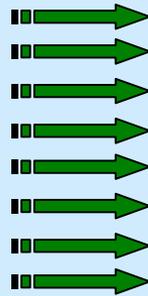
# Delivering NextGen Wx Improvements

## Legacy System

Radar  
 Inefficient Routes  
 Voice Communications  
 Disparate Information  
**Fragmented Weather Forecasting**  
**Weather Restricted Visibility**  
 Forensic Safety Systems  
 Nationwide Focus

## NextGen

Satellite  
 Performance Based Navigation (fuel savings)  
 Voice & Digital Communications  
 Automated Decision Support Tools  
**Integrated Weather Information**  
**Improved Access in Low Visibility**  
 Prognostic Safety Systems  
 Focus on Congested Metroplexes



<https://www.faa.gov/nextgen/programs>

Aviation Data



**Implementation**

TFDM   PBN   TBFM   ASIAs   AIM   **NWP**

**Transformational**

ADS-B   CATM-T   SWIM   **CSS-Wx**   NVS   DataComm

**Foundational**

Terminal Automation Modernization and Replacement      En Route Automation Modernization      Terminal Automation Modernization and Replacement

# Key Benefits of CSS-Wx and NWP

**Reduce FAA  
Operations Costs**



***\$2.0B Cost Avoidance Over 25 Year Lifecycle Including \$350M Ops Cost Savings***  
***Eliminates Need for Legacy System Tech Refreshes***

**Modernize National  
Airspace System**



***Decommission Outdated Systems Leveraging SWIM and FTI***  
***Cloud Compatibility***  
***Global Data Standardization***

**Improve Efficiency**



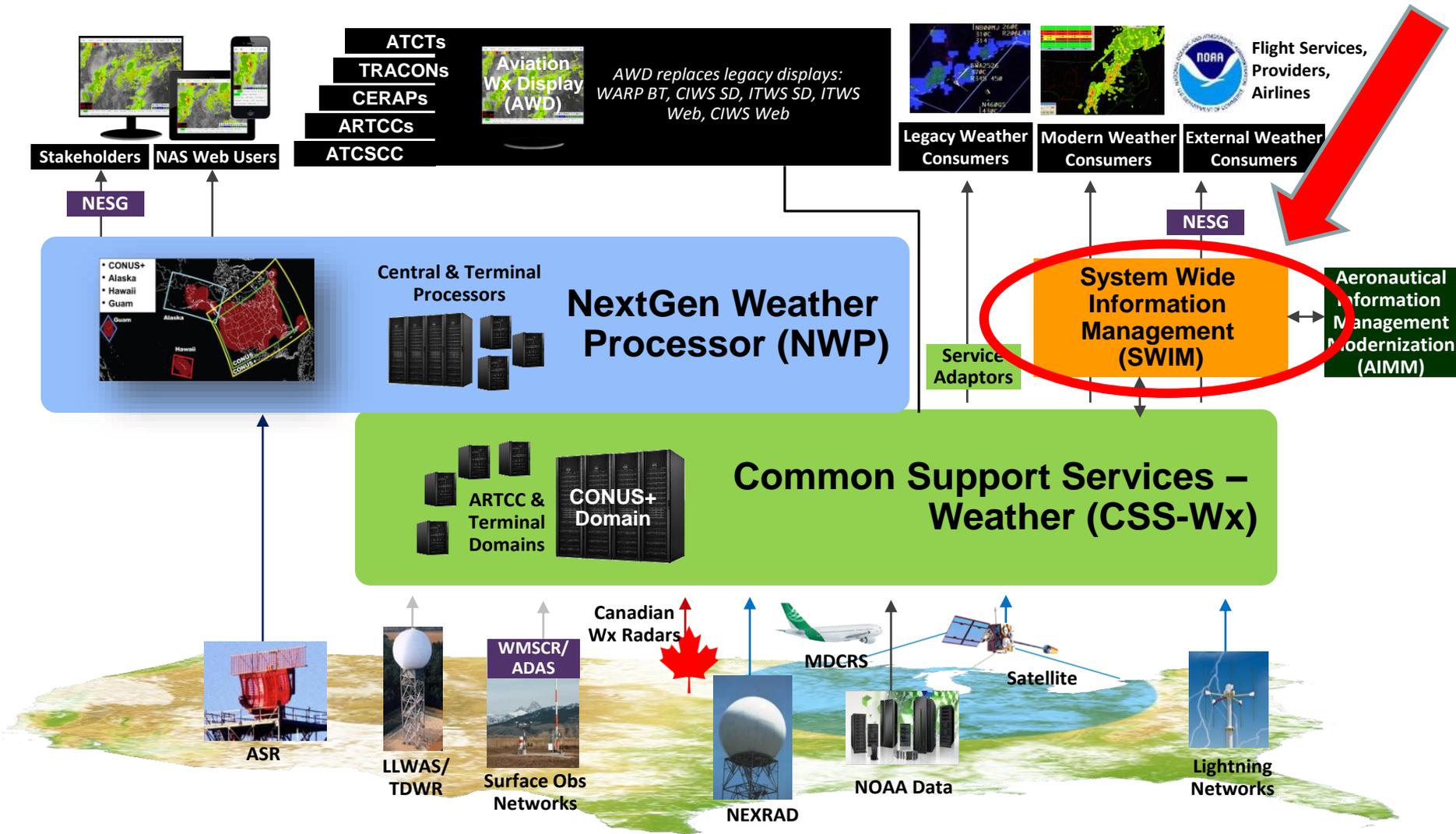
***Over \$2.8B of User Benefits***  
***Reduce Flight Delays***  
***Enable Collaborative Decision-making***

**Improve Safety**

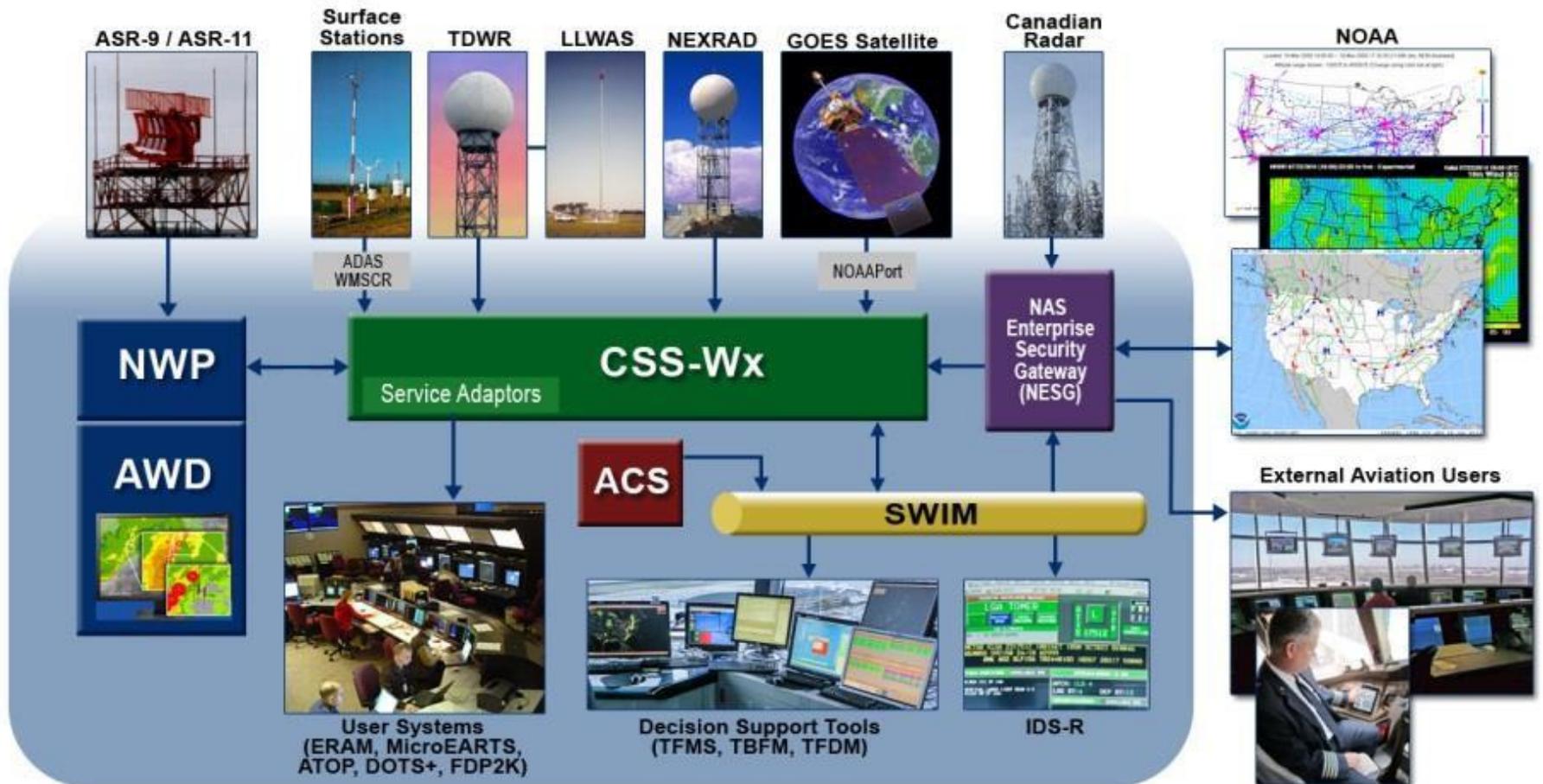


***Enhanced Weather Information***  
***Greater Access***  
***Common Situational Awareness***

# Wx Context Diagram



# NextGen Wx Providers/Consumers

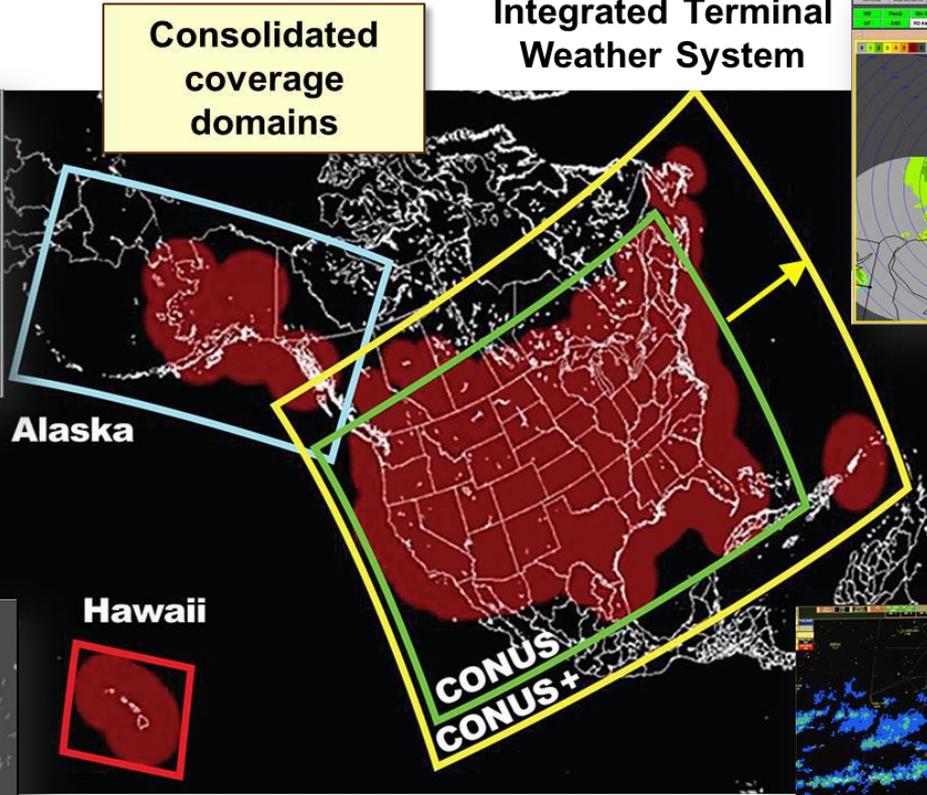


# NWP Consolidation and Modernization

Weather for Traffic Flow Management



Guam

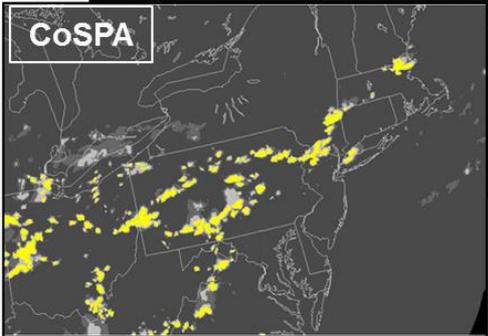
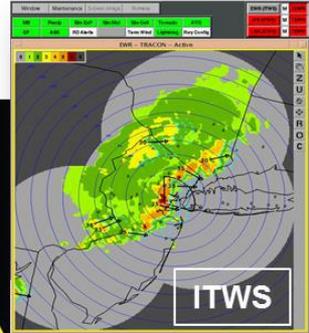


Alaska

Hawaii

CONUS  
CONUS+

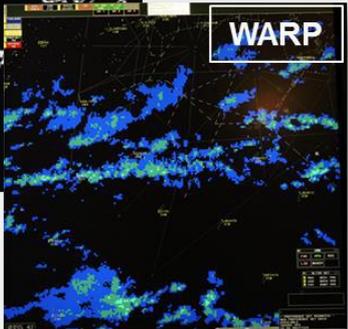
Integrated Terminal Weather System



CoSPA

8-hr  
Predictions  
(prototype)

Enroute Controllers'  
Mosaics



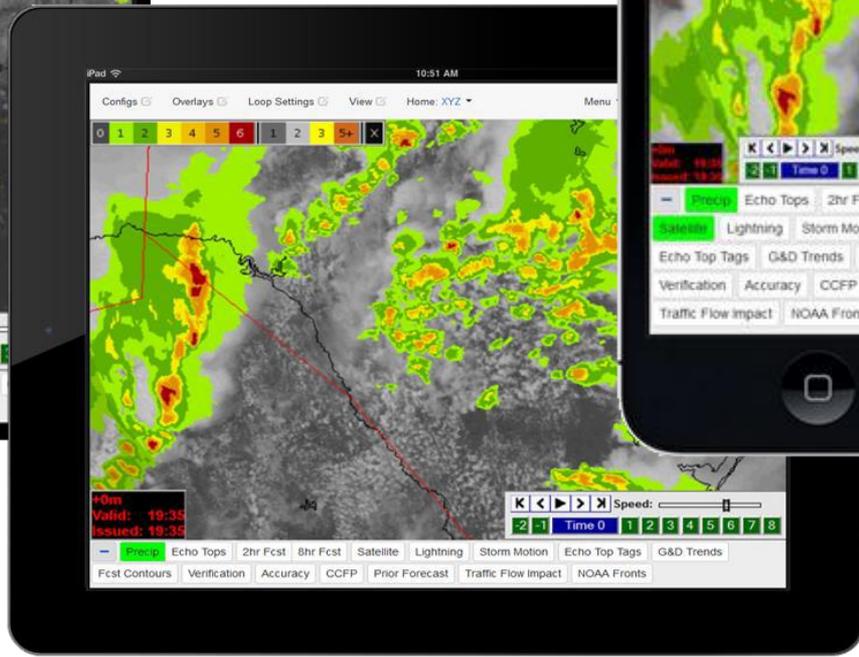
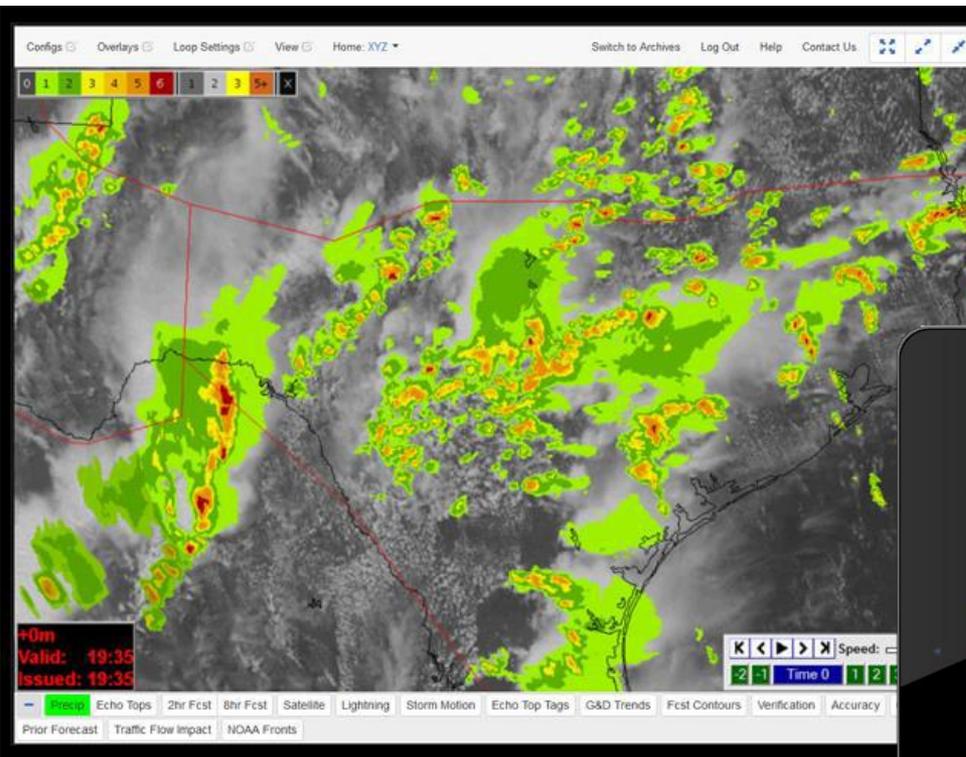
# NWP Aviation Weather Display

Desktop browser

Phone browser

- AWD dedicated and web displays share the same Angular Material framework

Tablet browser



# Damaging Hail and Turbulence Encounter

DENVER AND THE WEST

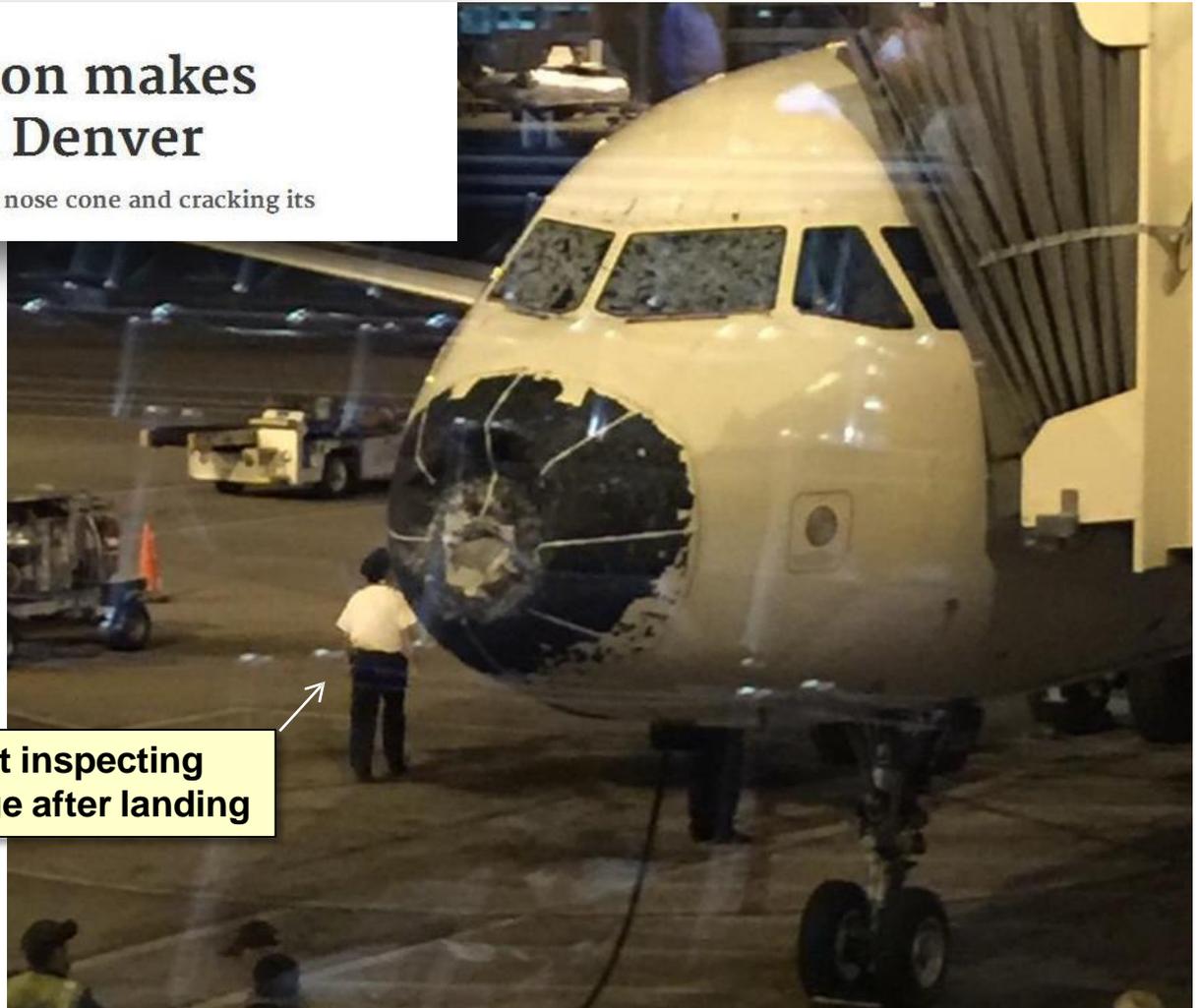
## Delta flight from Boston makes emergency landing in Denver

Jetliner pelted by hail, severely damaging plane's nose cone and cracking its windshield,

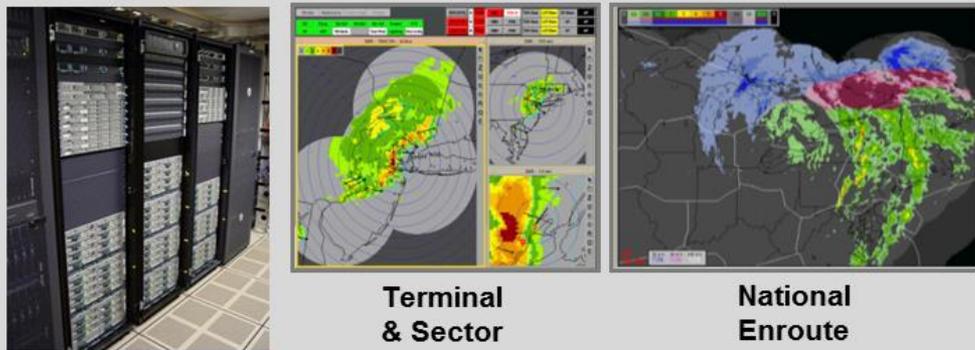
Use weather from this case to illustrate Enroute Mosaics

Pilot inspecting damage after landing

Occurred August 8, 2015  
around 2:00 UTC



# Safety Improvements



NextGen Weather Processor (NWP)



Convective Growth Hazard



TRACON Expansion

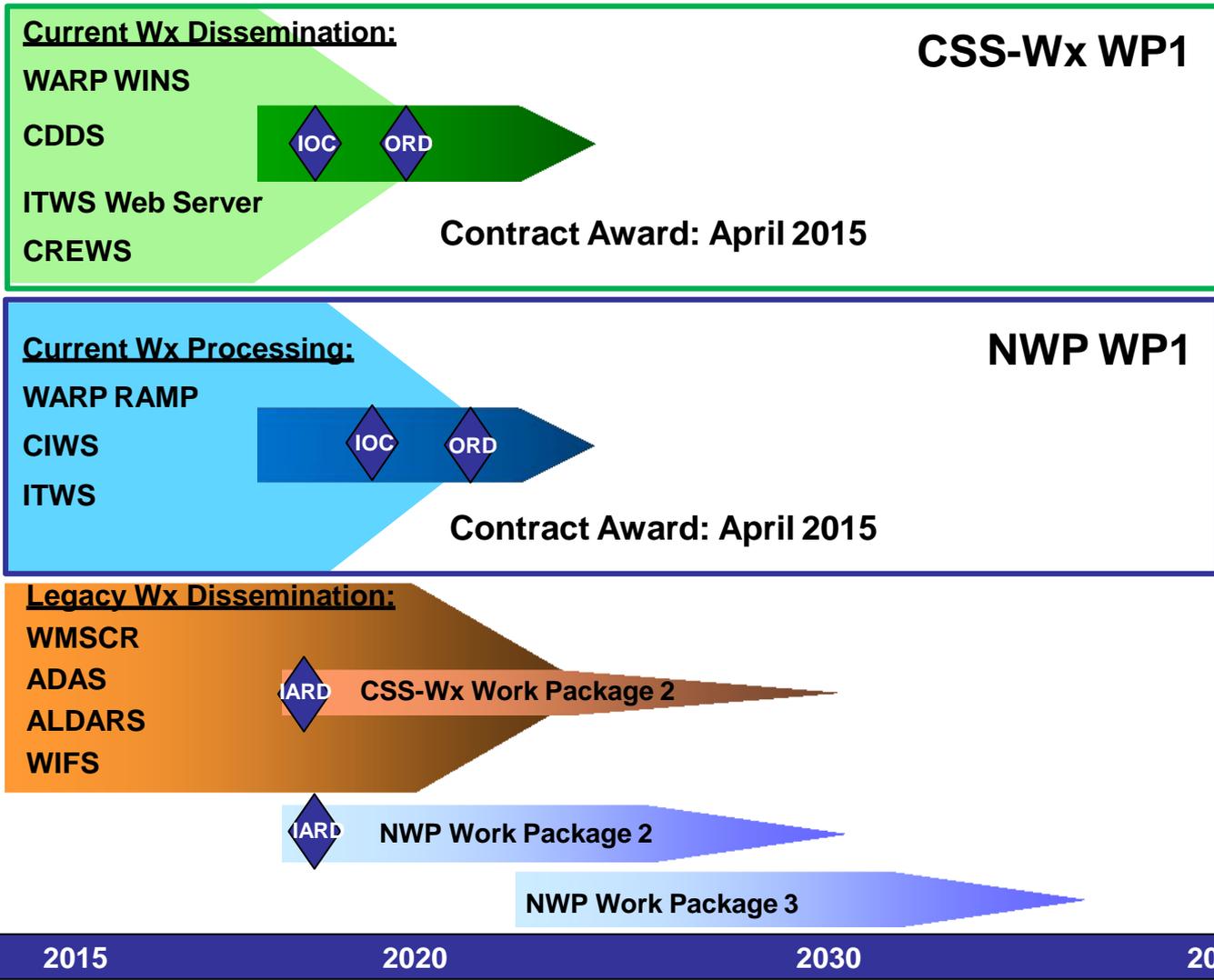


- New architecture makes terminal safety products available domain-wide
- New processing enables rapid convective growth detection
- New products provide low-cost options for expanding terminal weather coverage

# NextGen Weather Site Implementation



# NextGen Wx Implementation



# Summary

- **CSS-Wx and NWP are being developed by Harris and Raytheon, respectively**
- **CSS-Wx and NWP will provide improvements over legacy weather systems**
- **AJM-333 coordinating site surveys, site preparation and installations “as we speak”**



# Questions?

- Back-up slides are available at the end of this briefing
- For questions or comments, please contact [douglas.wreath@faa.gov](mailto:douglas.wreath@faa.gov)



# Overview of SWIM Cloud Distribution Service (SCDS)

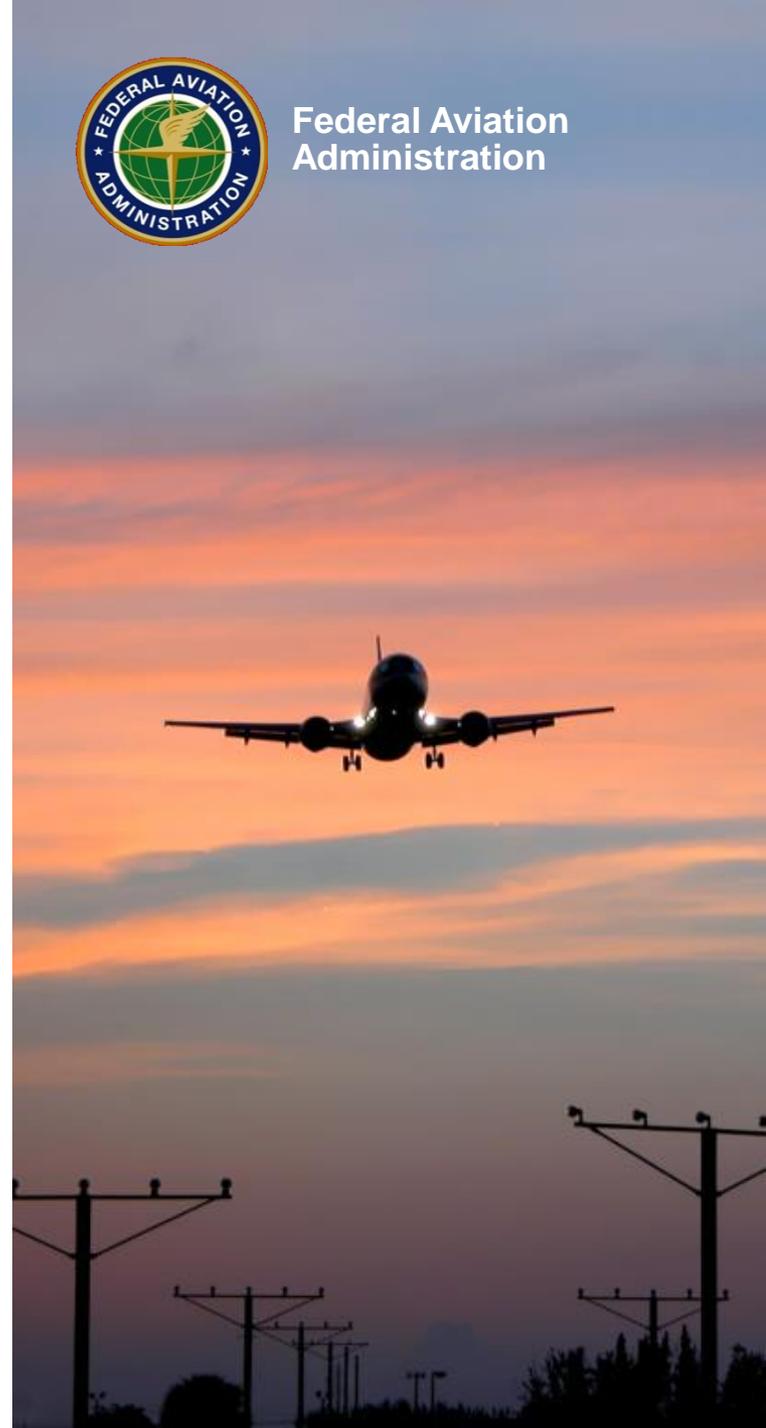
**Presented by:**

Chris Pressler, FAA

Tom Sherwood, DOT

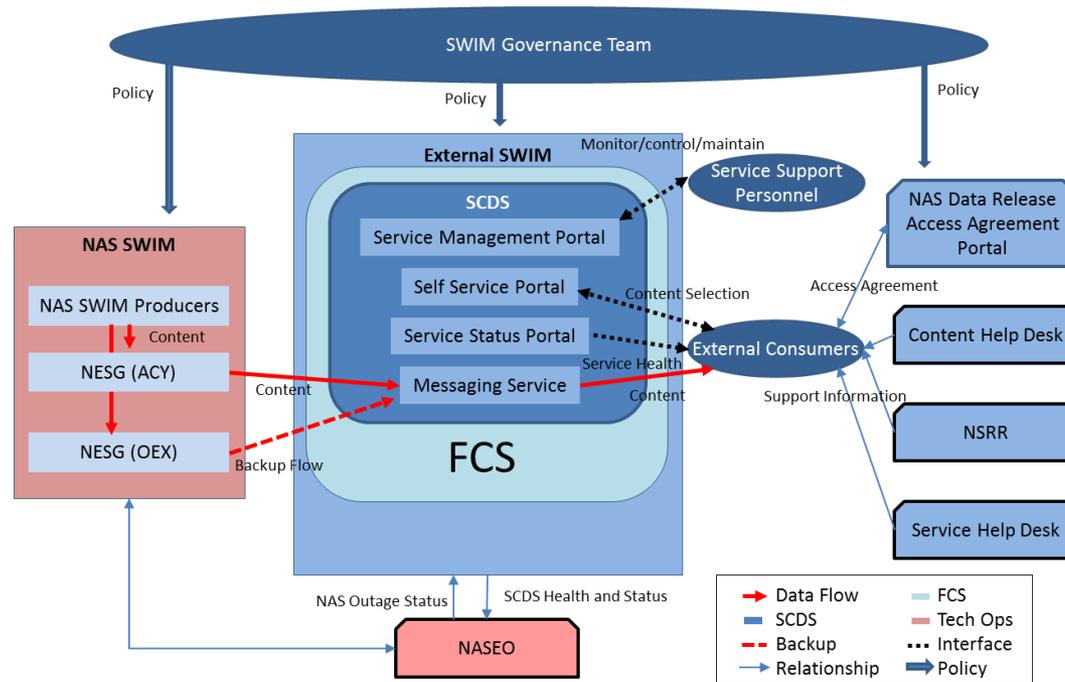


Federal Aviation  
Administration



# SCDS – SWIM Cloud Distribution Service Overview

- SCDS provides an information sharing alternative
- Leverages public cloud infrastructure service
- Reduces impact on existing infrastructure



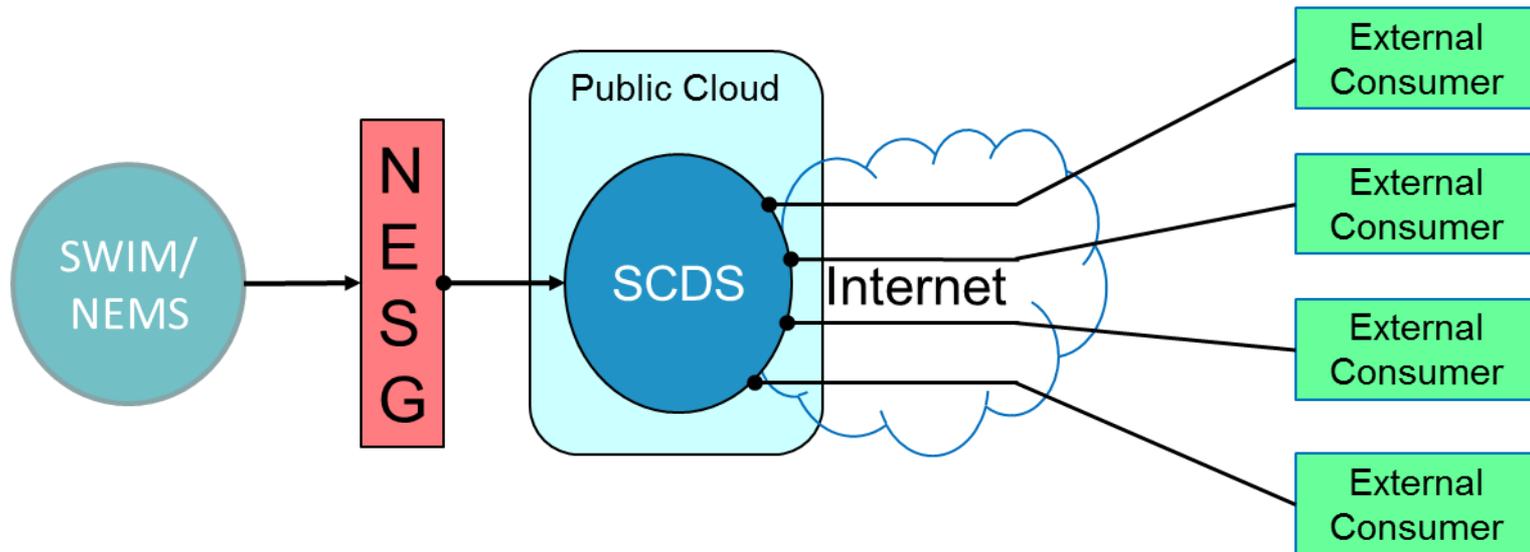
# SCDS – Features & Benefits

- **Features**

- Service Management
- Self Service Provisioning
- Service Status
- JMS Messaging Broker
- Service Help Desk

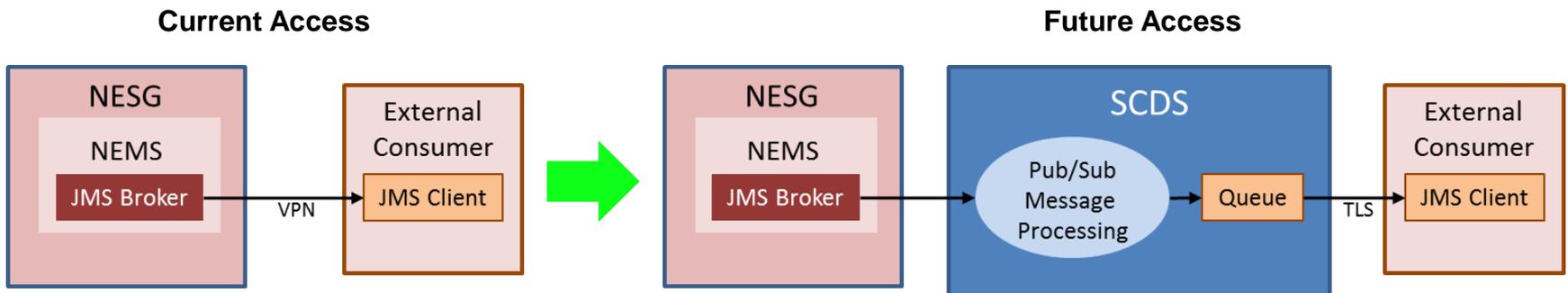
- **Benefits**

- Reduce impact on infrastructure
- Streamlined service delivery through automation
- Improved user experience
- Decreased on-ramping overhead
- Scalable platform for growth in services



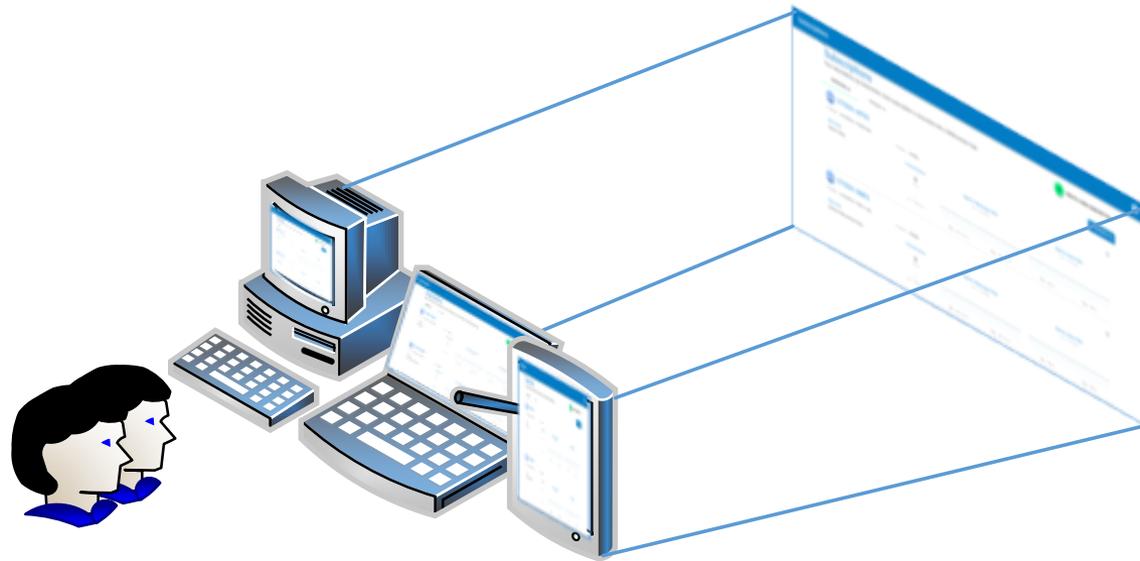
# SCDS – Messaging Service

- **Provides access to all publicly available SWIM data**
  - All data is filtered and approved for release (non-sensitive)
    - TBFM, ITWS, STDDS, SFDPS, TFMS, AIM FNS
  - Data is forwarded from NAS Enterprise Security Gateway (NESG) via a secure connection
  - Distributes data to SCDS users over a TLS connection
  - Same tech used as the NESG to lower impact to changes to user migration



# SCDS – User Portal

- **Automated Provisioning**
- **Subscription Status and Statistics**
- **Integrated Message Viewer**
- **Jumpstart Kit**



# SCDS Migration Plan

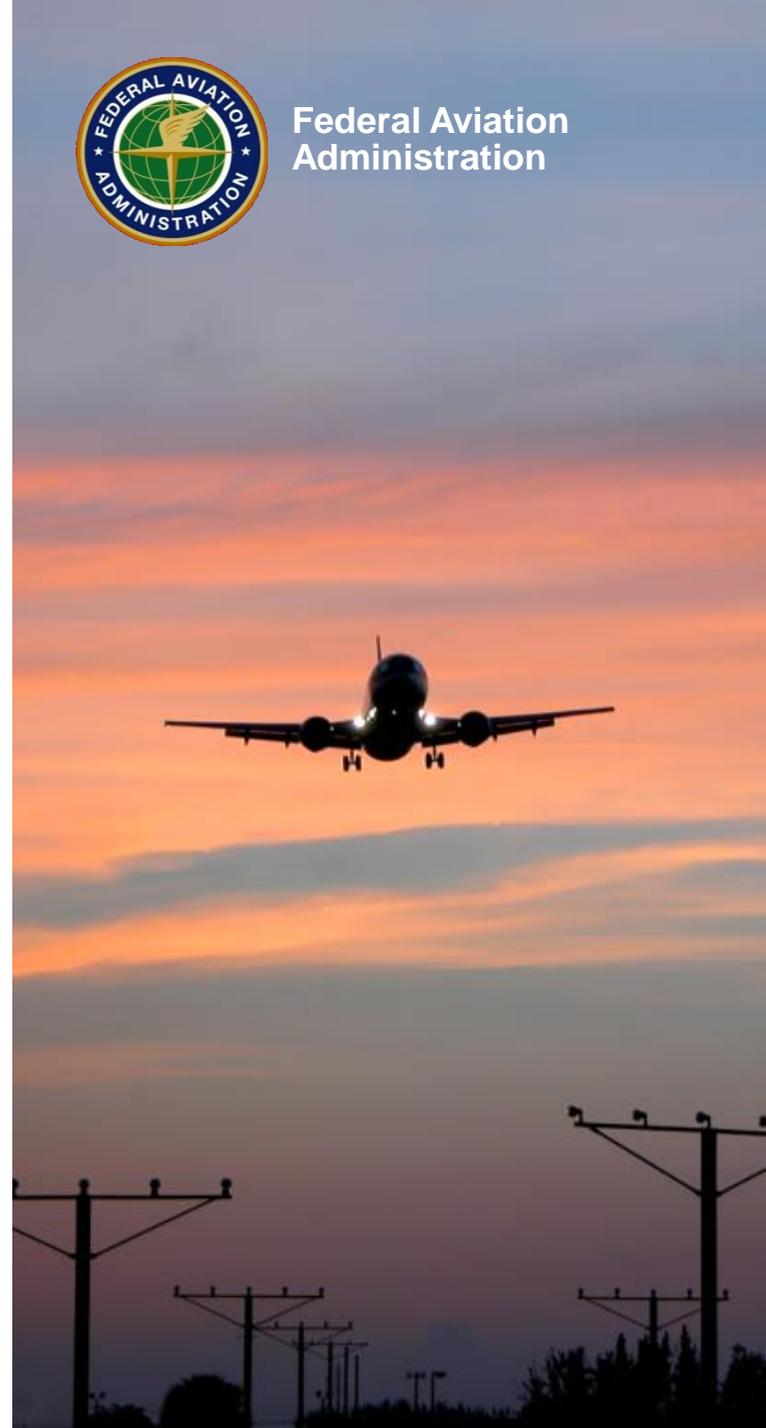
April 12, 2018

**Presented by:**

Felisa White, SWIM Implementation Lead



Federal Aviation  
Administration





# Migration Plan

## 1. Develop communications package

- When will the migration take place
- What does the user need to do to migrate
- Technical Migration kit to support interface swap
- SCDS User Guide

## 2. Conduct User Forum

- Inform users on migration plan, status and impacts
- Cloud Distribution Service Demonstration

## 3. Determine Cloud User Groups

## 4. Begin Migration - User Group #1

- Send communication package
- Gather feedback and incorporate lessons learned

## 5. Send out communications package to User Group #2

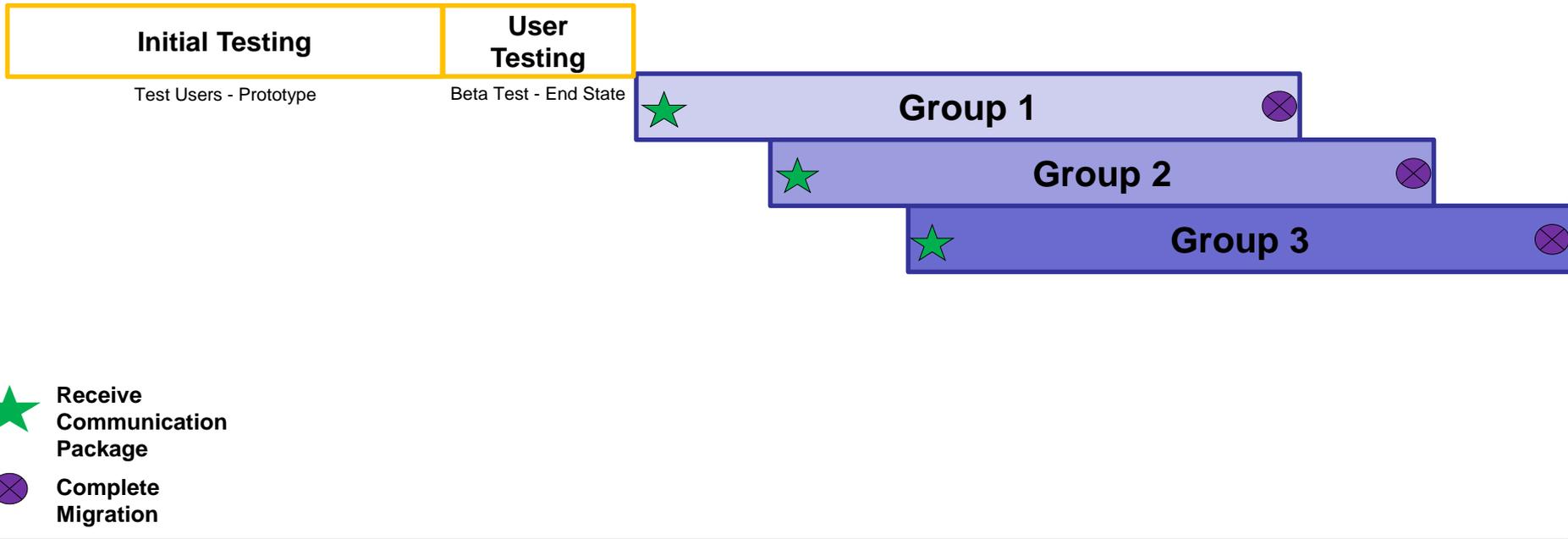
- Send communication package
- Gather feedback and incorporate lessons learned

## 6. Send out communications package to User Group #3

- Send communication package
- Gather feedback

# Notional Migration Timeline

## Overall Migration Time



# SCDS – Summary

- **Leverages cloud technologies to deliver a scalable information distribution solution for external users**
- **Provides an enhanced user experience**
- **Supports all existing JMS data flows**
- **Service help desk will be available**
- **Staggered User Migration**
- **Communications Package**

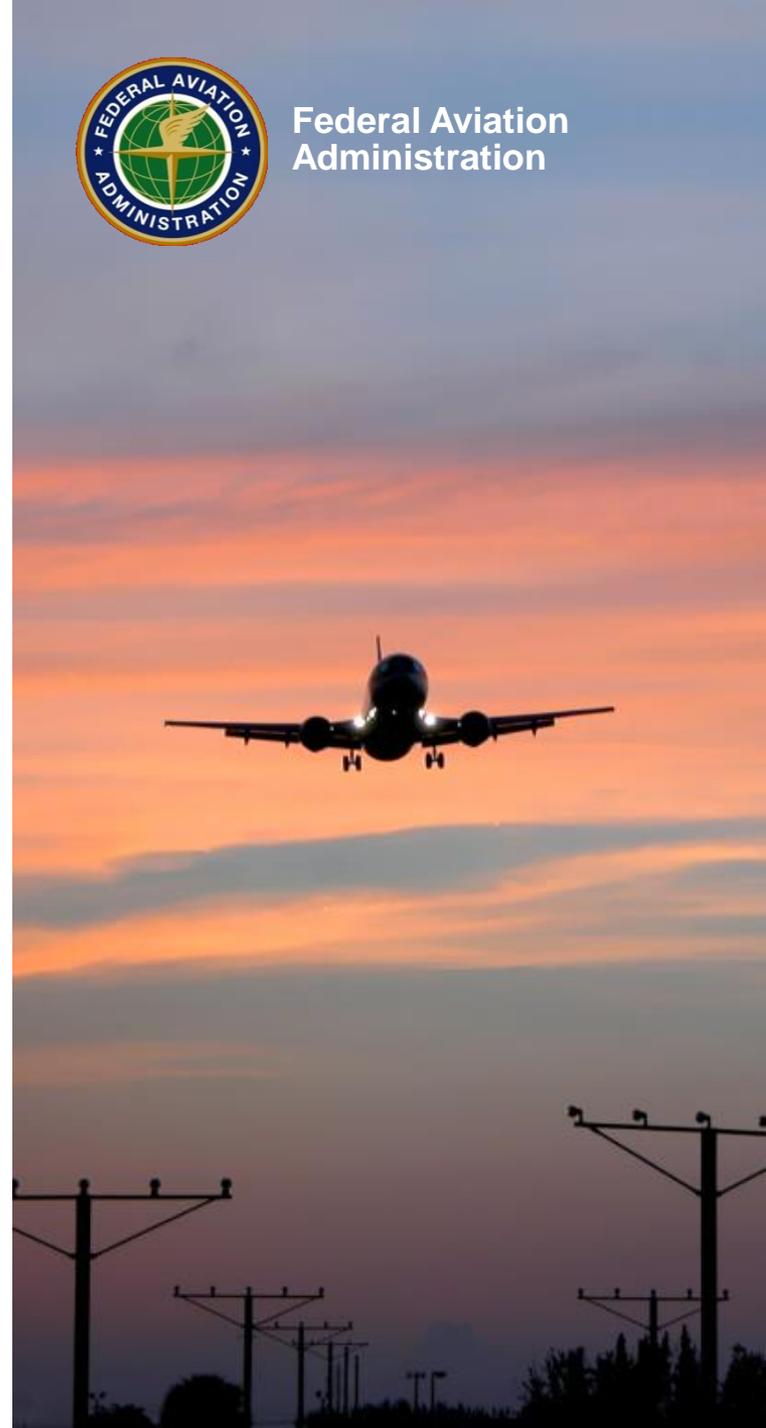


# For your reference: February 2018 Users Forum

A follow-up to your questions



Federal Aviation  
Administration



# During the February 2018 Users Forum...

- **From the STDDS Update:**

- *Is there any risk exposing this information via STDDS surface movement?*
  - The ASDE-X doesn't publish beacon codes, so no risk there
  - Flight plans are published in TAIS and the upcoming R4 will follow the same concept where beacon codes will not be published until the flight plan is active. Between now and the R4 release, there may be some exposure of pre-active beacon codes in flight plans, so this might apply to this as well.
- *Are there any plans to recommend or provide a standard code-generation guideline in languages like Java? For example, 'xjc' command line parameters and binding data.*
  - Not at this time, but it is certainly open for consideration.

# During the February 2018 Users Forum... *cont.*

- **A question about airports:**

- *Are you adding more airports to the SMES feed? We have only collected data for 12 airports.*

- SWIM: 12 airports sounds low. We're slowly adding to ASSC over the next couple of years. You should have more than that now.

- *Some airports that were listed as being accessible in the feed are not showing up in the SMES data, specifically IAD, BWI, and DCA*

- SWIM: Please reach out to your on-ramping team POC to see what's going on. The data should be there.

- **SWIM's follow-up with the attendee:**

- *Attendee (Feb. 28): We are still in the R&D phase, which could be why we weren't getting as many airports as we thought, but we are moving onto the next phase soon.*

# During the February 2018 Users Forum... *cont.*

- **A question about airports:**

- *Are you adding more airports to the SMES feed? We have only collected data for 12 airports.*
  - SWIM: 12 airports sounds low. We're slowly adding to ASSC over the next couple of years. You should have more than that now.
- *Some airports that were listed as being accessible in the feed are not showing up in the SMES data, specifically IAD, BWI, and DCA*
  - SWIM: Please reach out to your on-ramping team POC to see what's going on. The data should be there.

- **SWIM's follow-up with the attendee:**

- *Attendee (Feb. 28): We are still in the R&D phase, which could be why we weren't getting as many airports as we thought, but we are moving onto the next phase soon.*

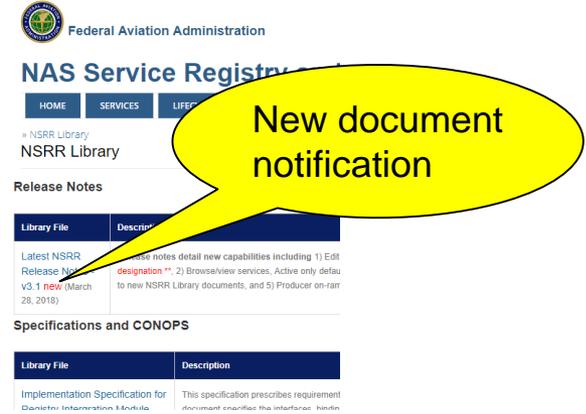
## NSRR Updates – Latest Release includes:

- Capability to Edit User Profile and update SWIM Consumer Designation
- Browse/view services page – active services only by default
- RESTful interface - authentication with email address
- User Notifications point to new NSRR Documents
- Producer on-ramping form messages are attached to PDF output in .csv format

**For questions or comments, contact the NSRR Team:**

<https://nsrr.faa.gov/contact>

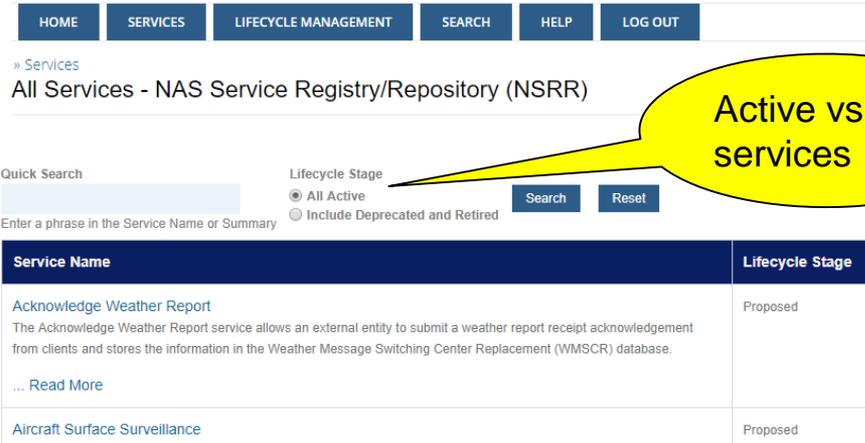
# Screen shots



## NAS Service Registry and Repository



## NAS Service Registry and Repository (NSRR)



### Personal Information

E-mail address \*  
sp1@noblis.org

A valid e-mail address. All e-mails from the system will be sent to this address. The e-mail address is not made public and will not be used for any other purpose.

Phone Number \*  
1564

Do you or your organization consume or plan to consume SWIM services? \*

Yes  
 No

▼ Locale settings

Time zone  
America/New York: Monday, April 9, 2018 - 14:41 - 0400

Select the desired local time and time zone. Dates and times throughout this site will be displayed using this time zone.

Save

# Screen shots

**Message Reliability:** Best effort

**JMS Provider:** ActiveMQ

## 4. Messages to On-ramp

**Message File:** [Message file for Service enroute-adp, Environment FNTB](#)

On-ramping form messages in .csv file

## 5. Related Documents

Document Name and Location	Document Type
<a href="#">FDPS Conops</a>	Service On-ramping Form
<a href="#">FDPS JMSDD</a>	Java Messaging Service Description Document (JMSDD)

.csv file displayed

Clipboard		Font		Alignment		Number		Styles	
A1 Message Name									
A	B	C	D	E	F	G	H		
Message Name	Message Description	Message Header Routing Attributes	Filter Criteria	Time to Live	Message Type	Topic/Queue	Delivery Mode	Frequency	Low
Adapted Route Status Reconstitution (DBRTRI/DBRTRI_AIXM)	The Adapted Route Status Reconstitution message is sent when a client first connects to a HADDS or when a client reconnects to a HADDS due to a disruption in communication. The payload described here is for DBRTRI. For DBRTRI AIXM please see the AIXM schema. Updated	FDPS_Authoritative		1000	Text	Topic	Non-Persistent		
Adapted Route Status Reconstitution (DBRTRI/DBRTRI_AIXM) Clone	The Adapted Route Status Reconstitution message is sent when a client first connects to a HADDS or when a client reconnects to a HADDS due to a disruption in communication. The payload described here is for DBRTRI. For DBRTRI AIXM please see the AIXM schema.	FDPS_Authoritative			Text	Topic	Non-Persistent		
Route Status: HR - Retest R-14321 IOS 14 on 07142015 11:24A	A Route Status message is used to communicate whether some adapted departure and or arrival routes are active or not. A route status is indicated by the route name followed by either ON or OFF. ERAM generates an HR when an assignment at a center changes or when reconstituting data. A single HR contains only route assignments for that one center and can include one or more routes.	FDPS_Recon			Stream	Topic	Non-Persistent		
Sector Assignment Status: SH_Test R-14321 IOs 14 Retest SP 071415 11:28A	Sector Assignment Status SH Message is used to communicate current sector and TRACON configurations. A sector or TRACON may either be closed or open. If the sector or TRACON is open it is composed of one or more FAVs.	FDPS_MessageType - ReTest R-14321 IOS 14 07142015			Stream	Queue	Non-Persistent		

# SFDPS Release 1.3.1

- SFDPS R1.3.1 addresses several data issues, including beacon code suppression for messages related to non-active flights
- Availability (Note: operational deployment has been delayed due to scheduling conflicts):
  - FNTB (February 2018)
  - R&D (April 2018)
  - Operations (scheduled for May 2018)
- A notification with the exact deployment date will be distributed via email shortly
- Operational consumers will see two versions of some messages **for a short period** during the operational upgrade – one with beacon codes and one without
- No interface (schema, WSDL) changes are required as a result of the new release
- One new JMS property has been added for NEMS routing
- Please refer to previous User Forum Slides ([https://www.faa.gov/air\\_traffic/technology/swim/users\\_forum/media/Users\\_Forum\\_Dec2017.pdf](https://www.faa.gov/air_traffic/technology/swim/users_forum/media/Users_Forum_Dec2017.pdf)) for further details on beacon code suppression
- Questions? Please contact: Your FAA SWIM project lead



# STDDS Update

- STDDS R4 test data is currently available on the R&D network. Contact your FAA POC for access.
- On 3/22, SWIM sent an email to TAIS consumers requesting feedback on proposed enhancements.
  - If you are interested in participating, it is not too late.
  - Please reply ([swim@faa.gov](mailto:swim@faa.gov)) in accordance with the directions on the email, and someone will contact you to schedule a feedback session.



# Upcoming Events/FYI

- **May 1:** SFDPS Release 1.3.1
- **May 15:** SWIM at the ATCA Technical Symposium
  - Meet members of the Program Office during Tech Tuesday, May 15, at the FAA's Tech Center atrium
- **June 14:** Next SWIM Users Forum



# Thank you for joining us today

For questions about today's Users Forum, email us at [swim@faa.gov](mailto:swim@faa.gov)

Slides will be made available via SWIM website after this forum:  
[https://www.faa.gov/air\\_traffic/technology/swim/users\\_forum/](https://www.faa.gov/air_traffic/technology/swim/users_forum/)



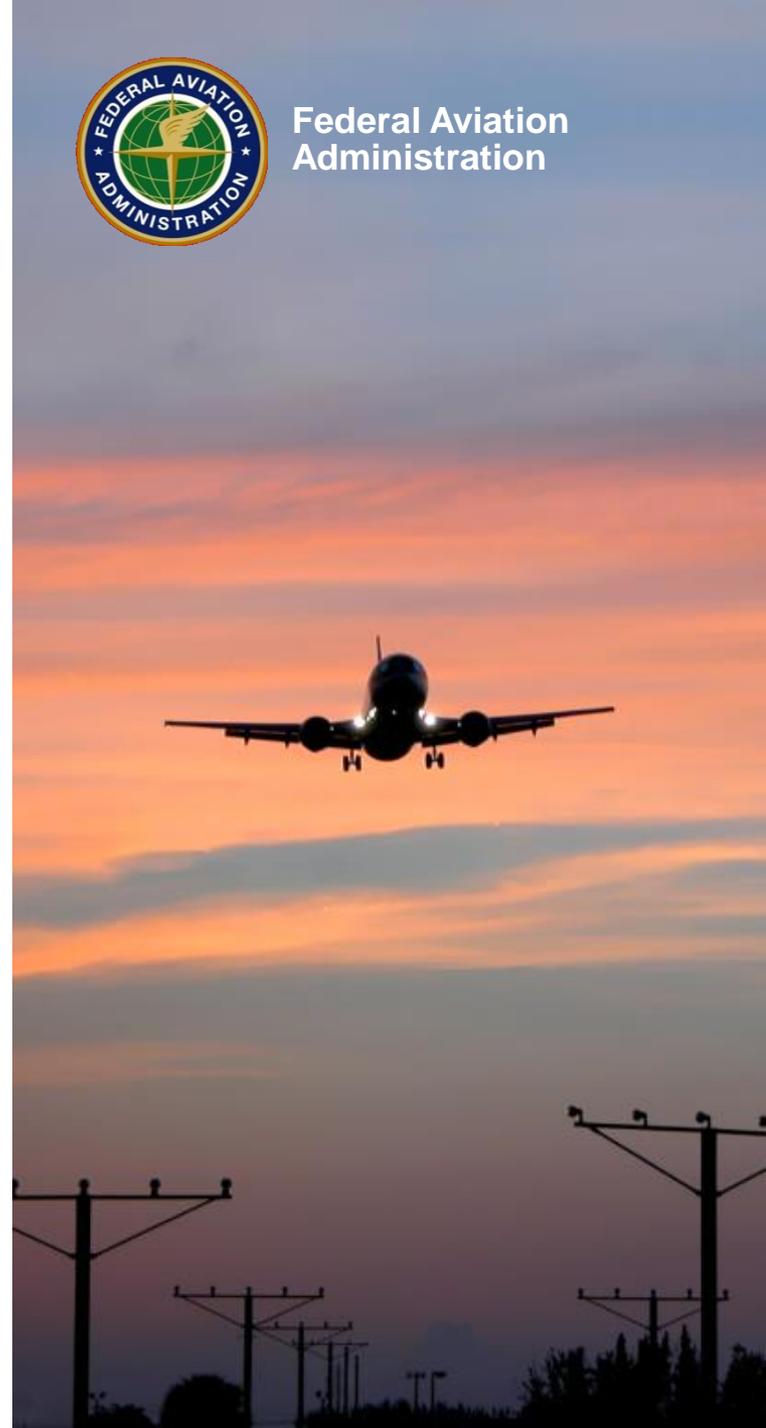
# Common Support Services- Weather

## Back-up Slides

Presented by: Doug Wreath, FAA CSS-Wx



Federal Aviation  
Administration



# CSS-Wx Data Access Services

- Ingests weather sensor, NWP data and NOAA data (e.g. Satellite, models)
- Makes weather data available through Web Services
- Adheres to international standards for handling and representing geospatial data
- Consumers subscribe to CSS-Wx products through SWIM
  - Web Service Description Documents (WSDDs)
  - Product Description Documents (PDDs)
  - Sample data
  - Client Library / Software



## Web Coverage Service

- Filters and transforms large gridded dataset
- NetCDF format

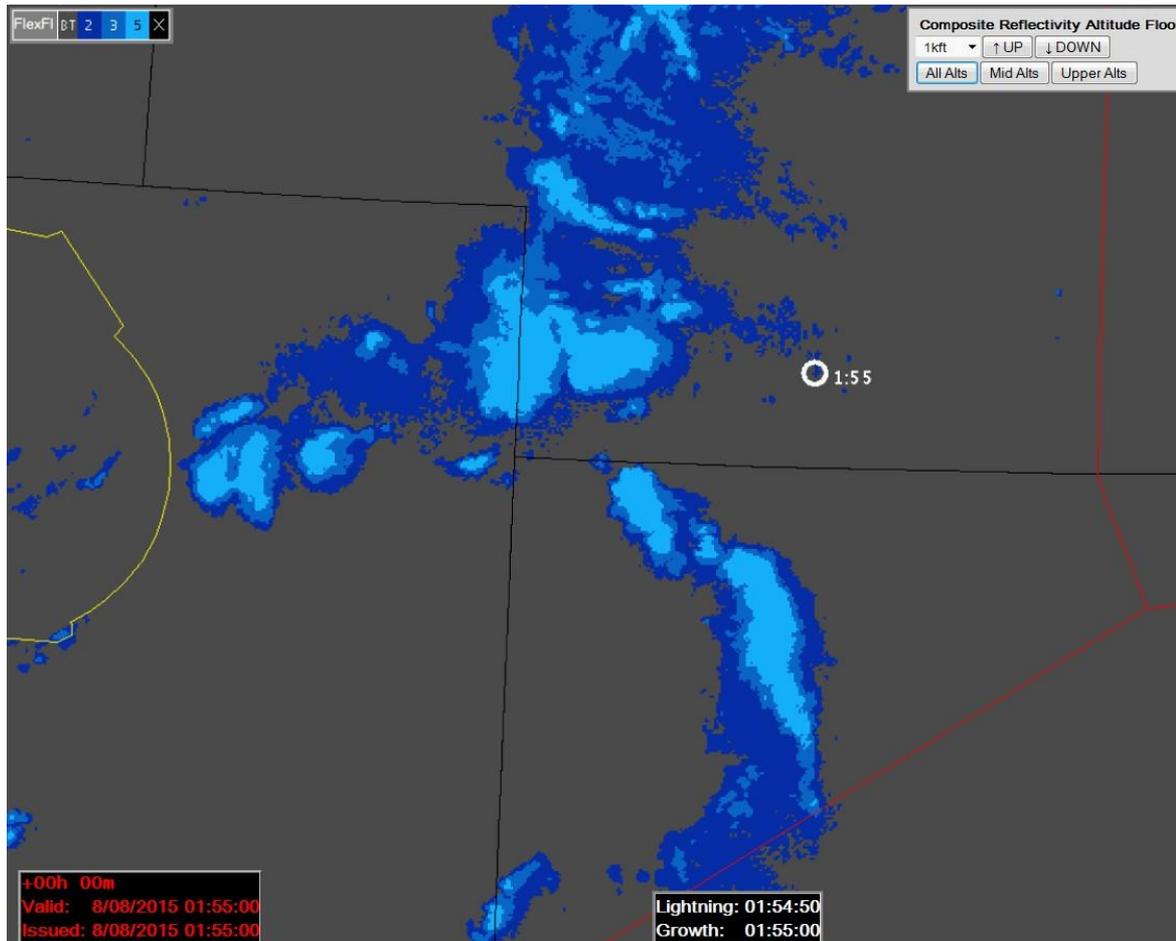
## Web Feature Service

- Filters and transforms non-gridded data sets
- WXXM 2.0 XML format

## Web Map Service

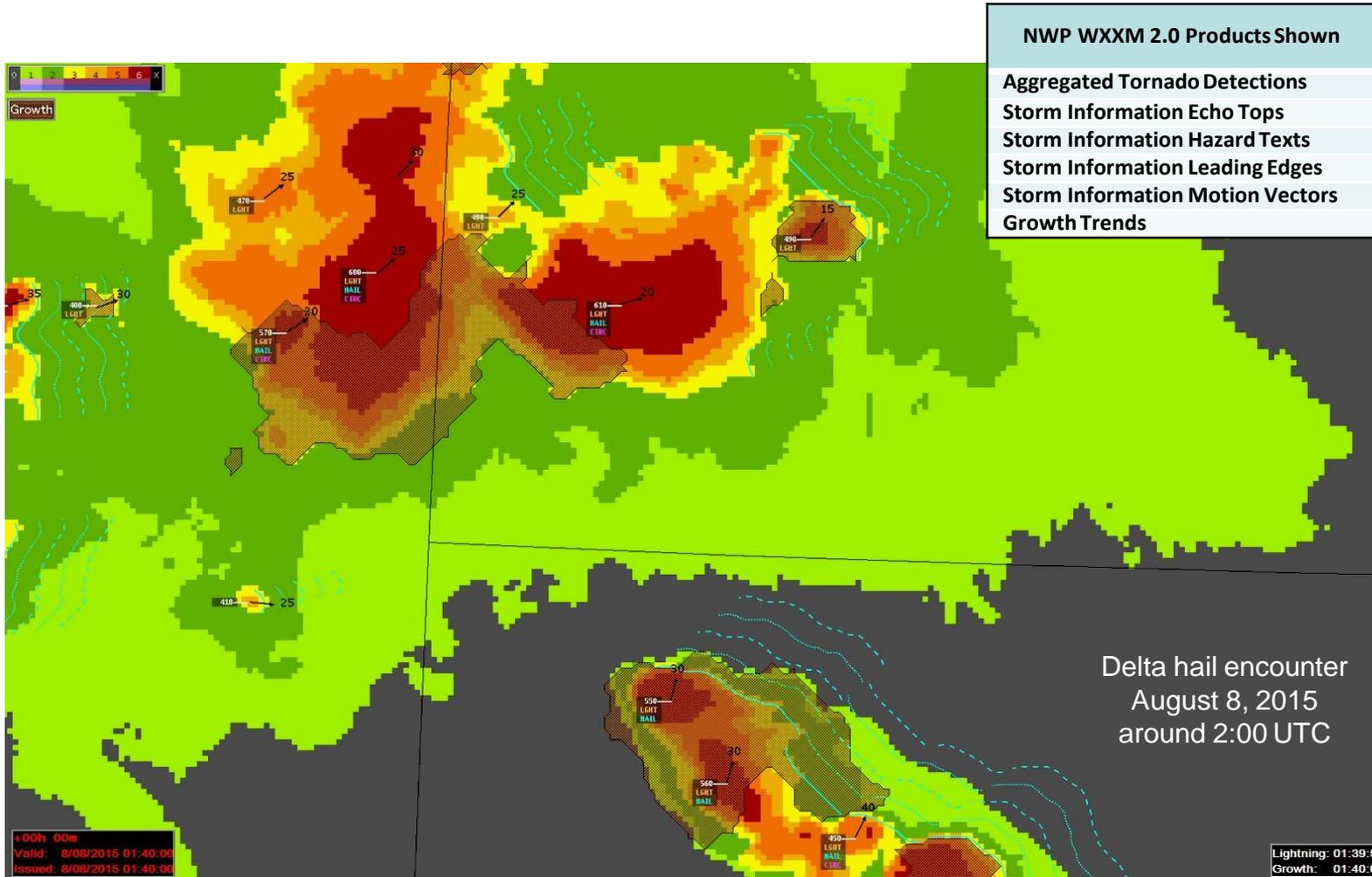
- Renders weather data as single large image or sets of tiled images for display
- JPEG, PNG, GIF, KML format

# NextGen Flexible Layer Mosaics



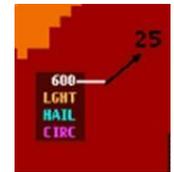
- **NWP reflectivity mosaics update every 25 sec**
  - New volumes are created with each new radar tilt
  - All tilts are time-aligned in each new volume
  - Trends are computed between 'like' volumes
  - All volume products are time-aligned in making multi-radar mosaics
- **Example shows Composite Reflectivity from “floor” to 60 Kft**
- **Layer bottom (“floor”) and layer top (“ceiling”) selectable in 1 Kft increments**
- **NextGen Weather radar mosaics contain fine-scale vertical storm structure**

# NextGen Storm Information



- NWP WXXM 2.0 Products Shown**
- Aggregated Tornado Detections
  - Storm Information Echo Tops
  - Storm Information Hazard Texts
  - Storm Information Leading Edges
  - Storm Information Motion Vectors
  - Growth Trends

Safety Benefits of NextGen Weather



Storm Info Hazard Text



Tornado Icon



Growth Trends 25 sec update

NWP Growth Trend shows danger 10 min before aircraft entered storms