

SWIM Users Forum

Presented to:
SWIM Users

By:
CSS-Wx and SWIM Program Offices

Date:
June 20, 2023



Federal Aviation
Administration



Agenda

- **CSS-Wx:
Existing and Upcoming
Weather Services**
- **SWIFT Portal
V4 Update**



Weather Data on SWIM

Existing and Upcoming Weather Services

Presented to: SWIM Users Forum

By: FAA NextGen Wx Program Office

Date: June 20, 2023



**Federal Aviation
Administration**



Purpose

- **Provide overview of NextGen Weather Systems**
 - Common Support Services – Weather (CSS-Wx)
 - NextGen Weather Processor (NWP) and Aviation Weather Display
- **Describe NextGen Weather Data Services**
 - Available weather products
 - How to access
- **Provide NextGen Weather Status**

NextGen Weather Programs Overview

Common Support Services – Weather (CSS-Wx)

NextGen Weather Processor (NWP)



- Improve weather information management and user access; provide new interface standards and formats
- Increase NAS efficiency and safety by improving weather product generation, translation, and display for aviation weather users
- Reduce FAA cost by enabling decommissioning of legacy weather dissemination and processor systems (e.g., WARP, WINS, FBWTG, CIWS, CDDS)



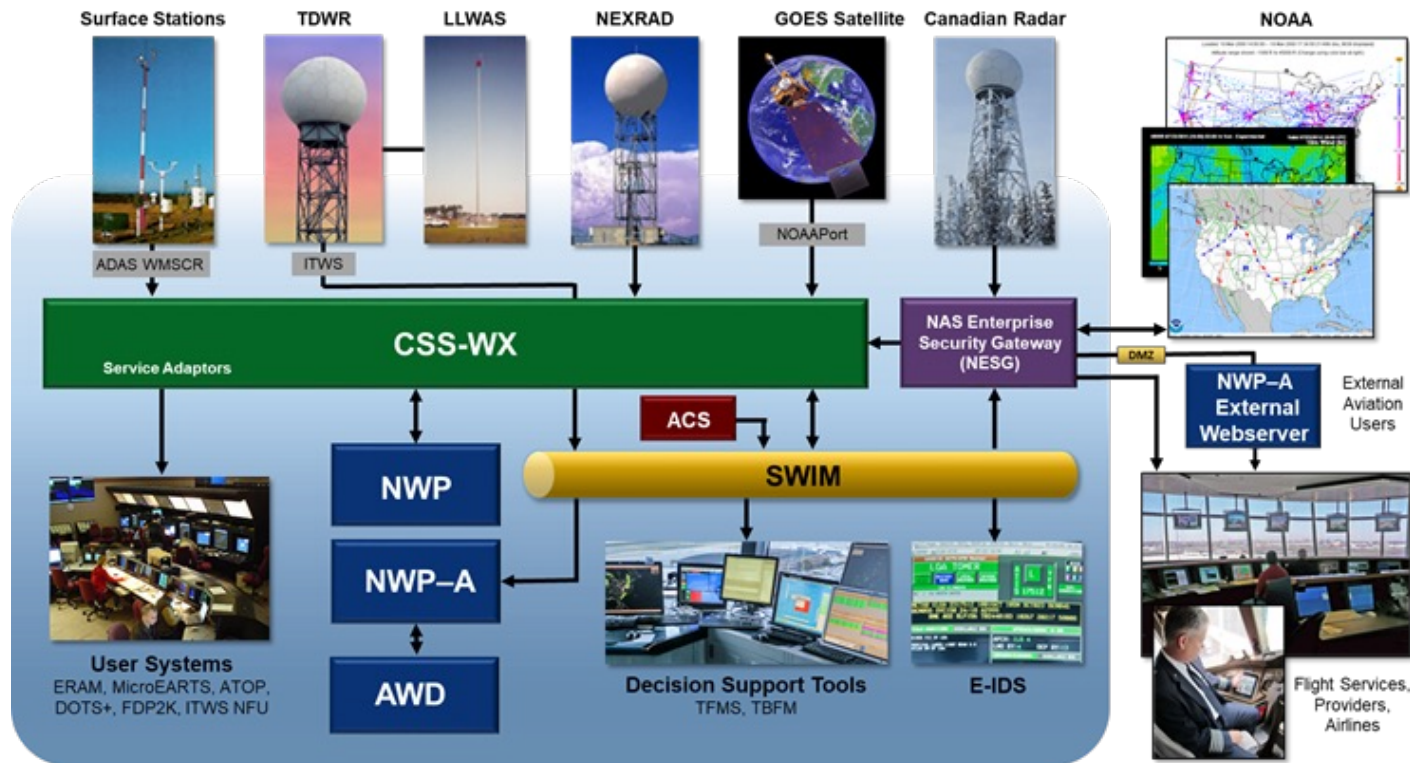
CSS-Wx Capabilities

- Single provider of weather data products within the NAS, using standards-based weather dissemination
- Makes weather products available from NOAA, NWP and other data sources for integration to air traffic systems
- Provides weather products via a set of common Web Services for weather, using international data access and data format standards

NWP Capabilities

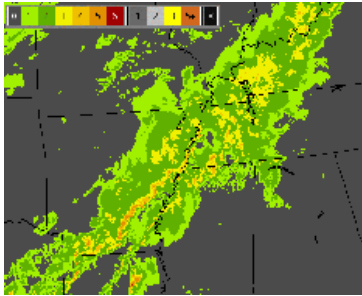
- Produces advanced aviation specific weather products, e.g.,
 - Real-time weather radar information (e.g., ERAM)
 - 0 to 8 hour aviation weather products
 - Convective Weather Avoidance Fields
- Translates weather information into weather avoidance areas for integration into decision support tools (e.g., TFMS, TBFM)
- Provides Aviation Weather Display (AWD) of NextGen weather information for AT users

NextGen Weather Providers/Consumers

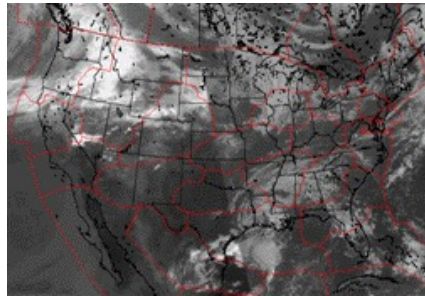


Types of Data Products: Gridded Data

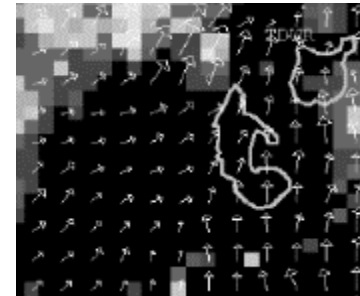
- Gridded products represented as uniformly spaced observations or computed values on rectangular arrays



Precipitation (VIL) Mosaic



Satellite Mosaic



Terminal Winds

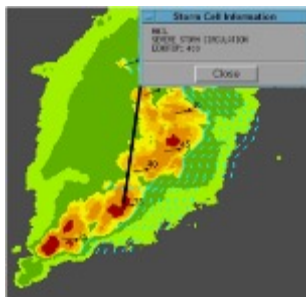
- Mapping projection needed to map data grid to earth's surface
 - Examples: Lambert Conformal, Lambert Azimuthal Equal Area
- Network Common Data format (NetCDF4) used to model gridded data products

Types of Data Products: Non-Gridded Data

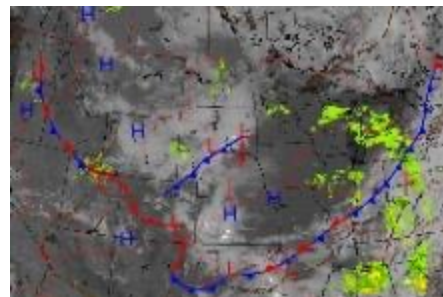
- **Non-gridded products express singular or sparsely distributed geospatial sets of observations or forecasts**
 - Contours, point products, text products



Precipitation Contours



Storm Motion Vectors,
Extrapolated Positions,
Hazard Text

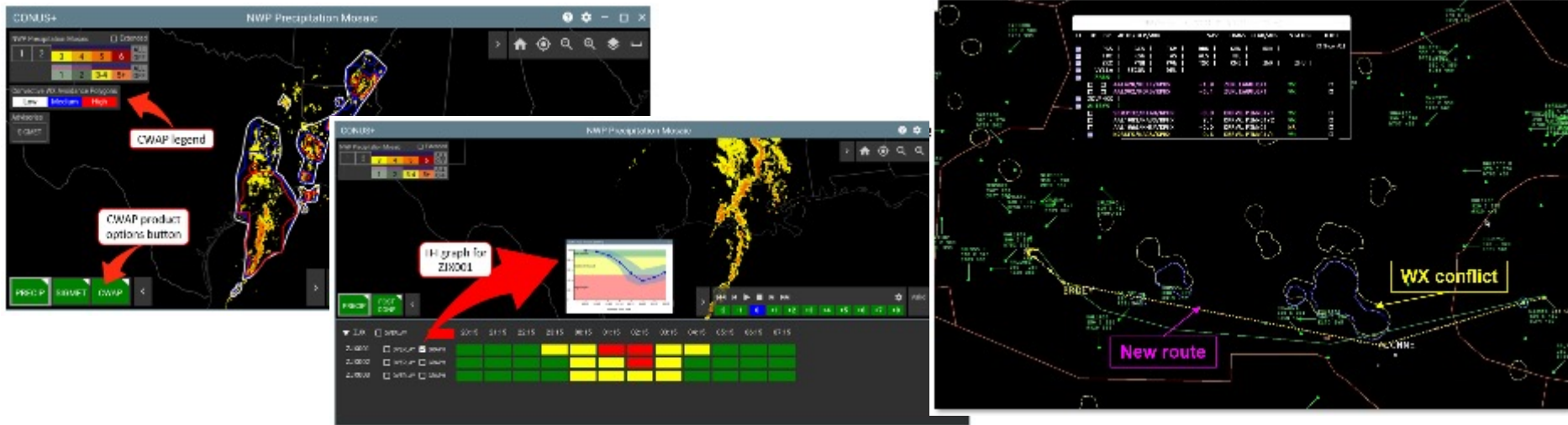


Fronts and Fronts Forecast

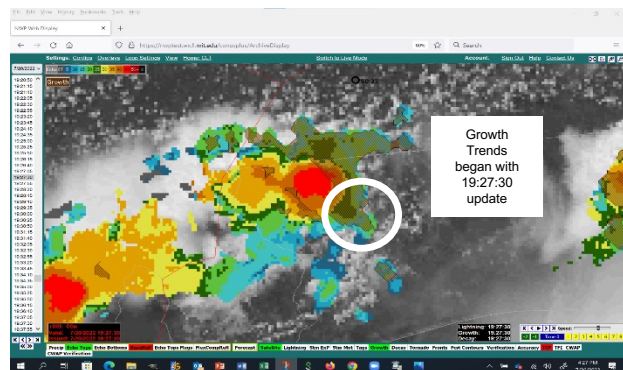
- **XML format and extensions used to represent non-gridded data**
 - Geography Markup Language (GML), ICAO Weather Exchange Model (IWXXM), etc.
- **Geo-reference coordinates (latitude, longitude) used to represent data locations.**

Convective Weather Avoidance Fields (CWAFF)

- **Translates weather information into areas to avoid**
 - Combines precipitation intensity and echo tops to produce probability of deviation
 - Current and forecast fields are available
- **Applications include ATC user display, traffic flow impact and dynamic route planning tools**



NextGen Wx Growth/Decay Trends



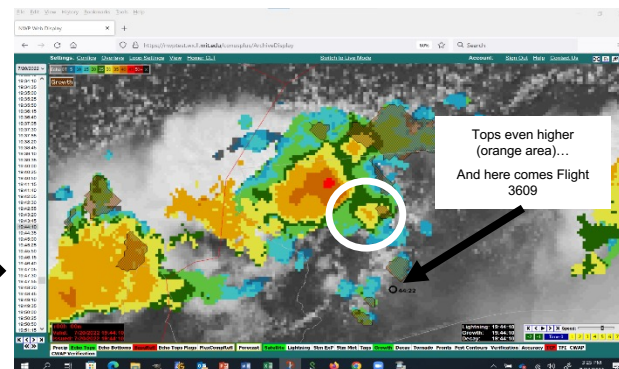
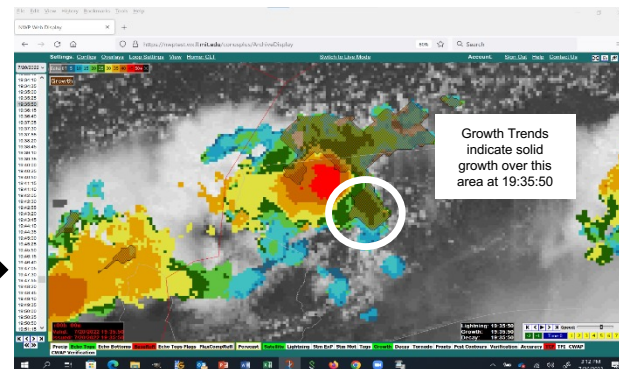
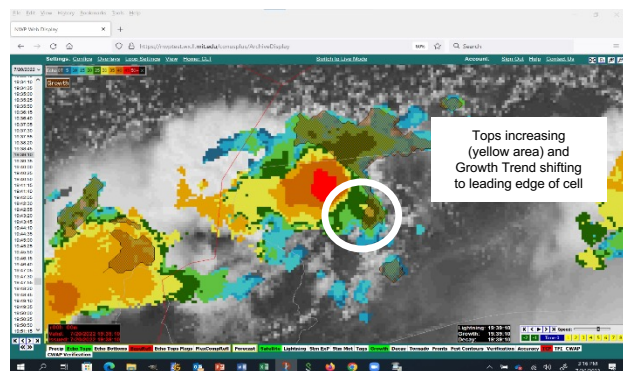
2:27:30 CDT

2:35:50 CDT

17 minutes

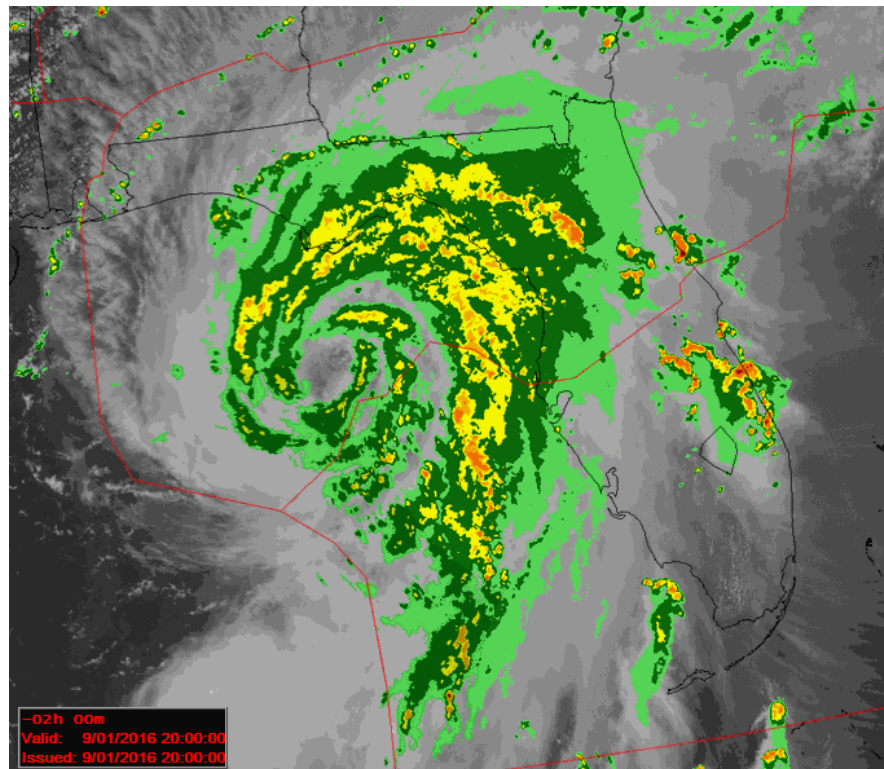
2:39:10 CDT

2:44:10 CDT



2-hr and 8-hr “Radar-Forward” Predictions

- **NWP extrapolates radar forward for 2-hr predictions**
 - Uses multi-scale advection technique
 - Combination of several complex algorithms
- **8-hr predictions combine multiple inputs**
 - Blends NWP extrapolation with HRRR model forecast
 - Includes prediction of Precip type (snow-mix-rain)



CSS-Wx Data Access Services

- Ingests weather sensor, NWP data and NOAA data (e.g., satellite, models, alphanumeric)
- Makes weather data available through Web Services/JMS
- Adheres to international standards for handling and representing geospatial data
- Consumers subscribe to CSS-Wx products through SWIM



Java Message Service

- Queue(s) configured to consumer's specific data needs
- Notifies as new data is published

Web Coverage Service

- Filters and transforms large gridded dataset
- NetCDF format

Web Feature Service

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

Web Map Service

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



NextGen Weather SWIM Data Services

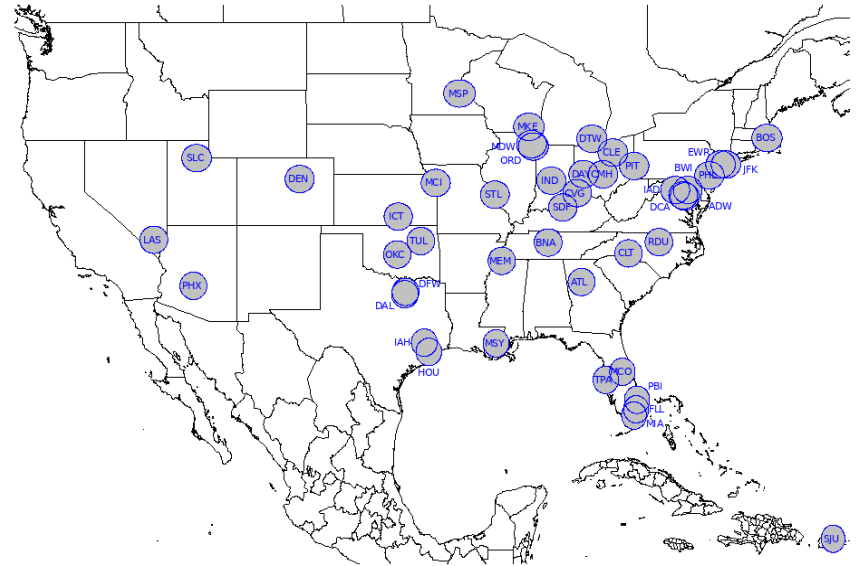
- **Product and access documentation will be provided on NAS Service Registry Repository (NSRR) <https://nsrr.faa.gov>**
 - Includes Product Descriptions, Web Service Descriptions, and Java Message Service Description documents and XML schemas
 - Sample products can be made available upon request (outside NSRR)
- **Users outside the FAA obtain products through Subscription Service**
 - Data available to consumers via SWIM
 - JMS destination is configured specifically for subscriber
 - Products distributed to subscriber as received

CSS-Wx and NWP Program Status

- **Reaching completion of Solution Implementation phase**
 - Next step in transition to operations is keysite testing
- **CSS-Wx and NWP upcoming working milestones**
 - Keysite system installation and Site Acceptance Test (SAT) begins in July 2023
 - Operational Test (OT) and Key-site Initial Operational Capability (IOC) in early 2024
 - In-Service Decision (ISD) in 2024
 - Continue deployment in 2025
- **Data will be operationally available to SWIM consumers beginning at IOC**
 - Users may access data prior to IOC, but continuous availability will not be guaranteed
- **Questions about CSS-Wx or NWP? Contact...**
 - Doug Murphy (douglas.e.murphy@faa.gov) or
 - Wil Brown (william.n.brown@faa.gov)

Terminal Doppler Weather Radar (TDWR)

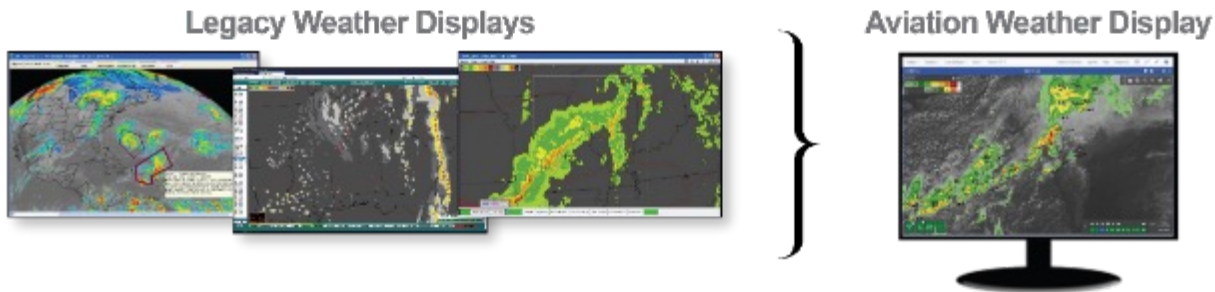
- **Compressed base TDWR data messages will be added to ITWS SWIM services**
 - Each message will contain an entire elevation scan from the radar
- **Decompression software will be provided on the NSRR**
- **Availability on SWIM targeted for Fall 2023**



Backup

Aviation Weather Display (AWD)

- **AWD provides users with access to aviation specific weather information from CSS-Wx generated by NWP, NOAA, other sources**
 - AWD Servers obtain information from CSS-Wx published on SWIM
 - AWD will be used in designated Air Traffic (AT) facilities by users such as AT specialists, Center Weather Service Units (CWSU) meteorologists
 - Authorized users internal and external to the FAA will have access to the AWD via the internet through the AWD website
- **Replaces legacy weather displays, e.g., WARP Briefing Terminals, CIWS Situation Displays and Website**



NextGen Weather Products – Gridded

Gridded Weather Data

- Precipitation (VIL)
- Precipitation (VIL) with Mask
- Precipitation (VIL) Forecast
- Precipitation (VIL) Forecast with Mask
- Echo Tops
- Echo Tops Forecast
- Precipitation (Base Reflectivity)
- Precipitation (Composite Reflectivity)
- Precipitation (Composite Reflectivity) with Mask
- Surface Precipitation Phase
- Surface Precipitation Phase Forecast
- Icing Layer
- Composite Icing
- Icing Layer Forecast
- Composite Icing Forecast
- Turbulence Layer
- Turbulence Layer Forecast
- Composite Turbulence
- Composite Turbulence Forecast
- Convective Weather Avoidance Fields
- Convective Weather Avoidance Field Forecast
- Satellite
- Terminal Winds
- *NOAA Model Data (RAP, HRRR, GFS, NAM)**

*NOAA Produced**

NextGen Weather Products – Non-Gridded

Non-Gridded Weather Data

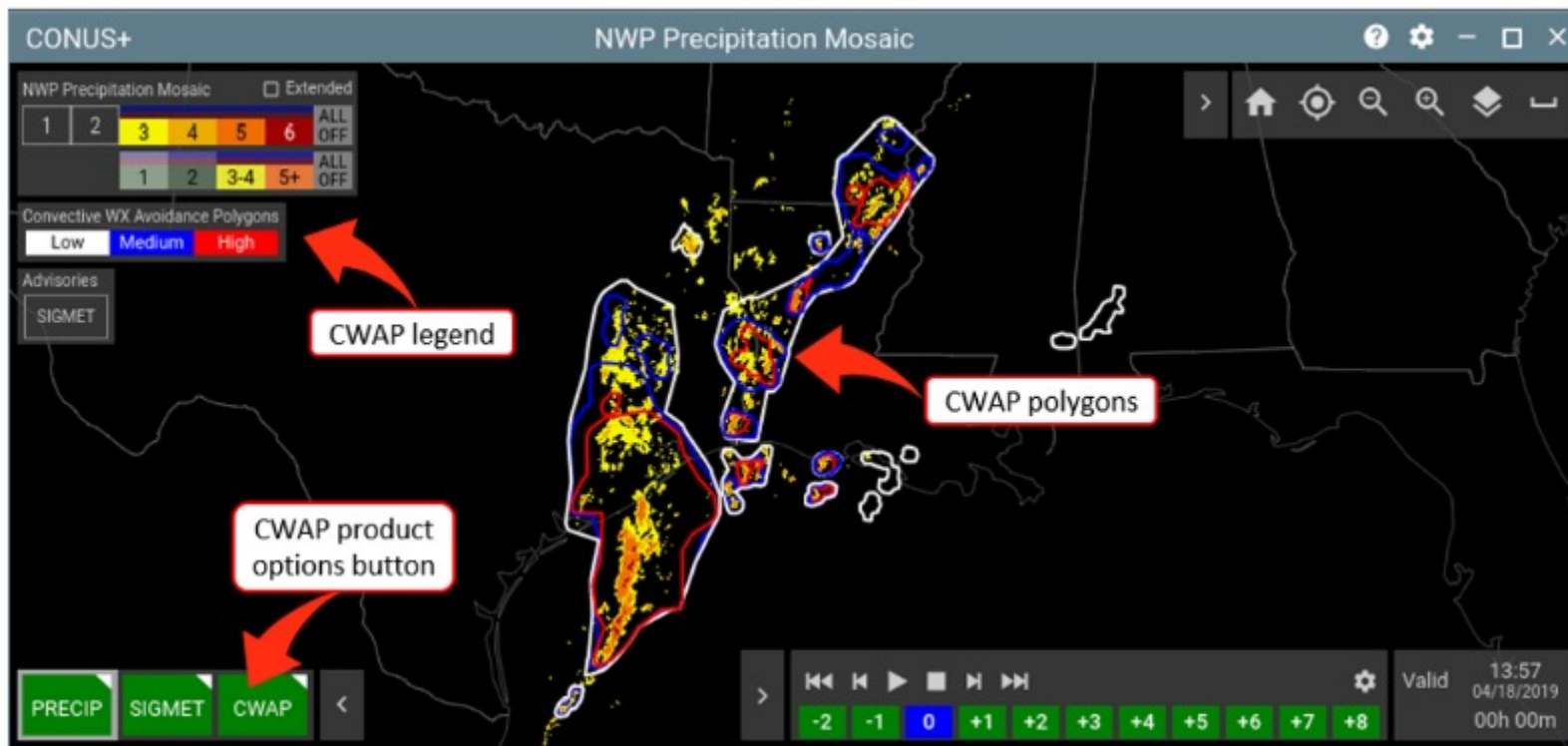
- | | | |
|---|--|--|
| <ul style="list-style-type: none"> • Precipitation (VIL) Forecast Accuracy • Precipitation (VIL) Forecast Contours • Echo Tops Forecast Accuracy • Echo Tops Forecast Contours • Lightning • Storm Information Hazard Text • Storm Information Leading Edges • Storm Information Motion Vectors • Fronts Forecast • Growth Trends • Decay Trends | <ul style="list-style-type: none"> • Forecast Confidence • Convective Weather Avoidance Polygons / CWAP Forecast • Wind Profiles • Tornado Detections • Icing Layer Contours • Composite Icing Contours • Turbulence Layer Contours • Composite Turbulence Contours • Pilot Report (PIREP) • Urgent Pilot Report (PIREP) • ICAO Aircraft Report (AIREP)* • Significant Meteorological* Information (SIGMET)* • Convective Significant Meteorological Information (Convective SIGMET)* • TFM Convective Forecast (TCF)* | <ul style="list-style-type: none"> • <i>Airmen's Meteorological Information Advisories (AIRMET)*</i> • <i>Graphical AIRMET (G-AIRMET)*</i> • <i>Winds Aloft Forecast*</i> • <i>Surface Weather Observations</i> • <i>Aviation Watch Notification*</i> • <i>Tornado Warnings*</i> • <i>Severe Thunderstorm Warnings*</i> • <i>Public Severe Weather Watch Notification (SEL)*</i> • <i>Volcanic Ash Advisory Statement (VAAS)*</i> • <i>Terminal Area Forecast (TAF)*</i> • <i>Center Weather Advisories*</i> • <i>Meteorological Impact Statements*</i> • <i>Severe Weather Statements (SVS)*</i> |
|---|--|--|

NOAA Produced*

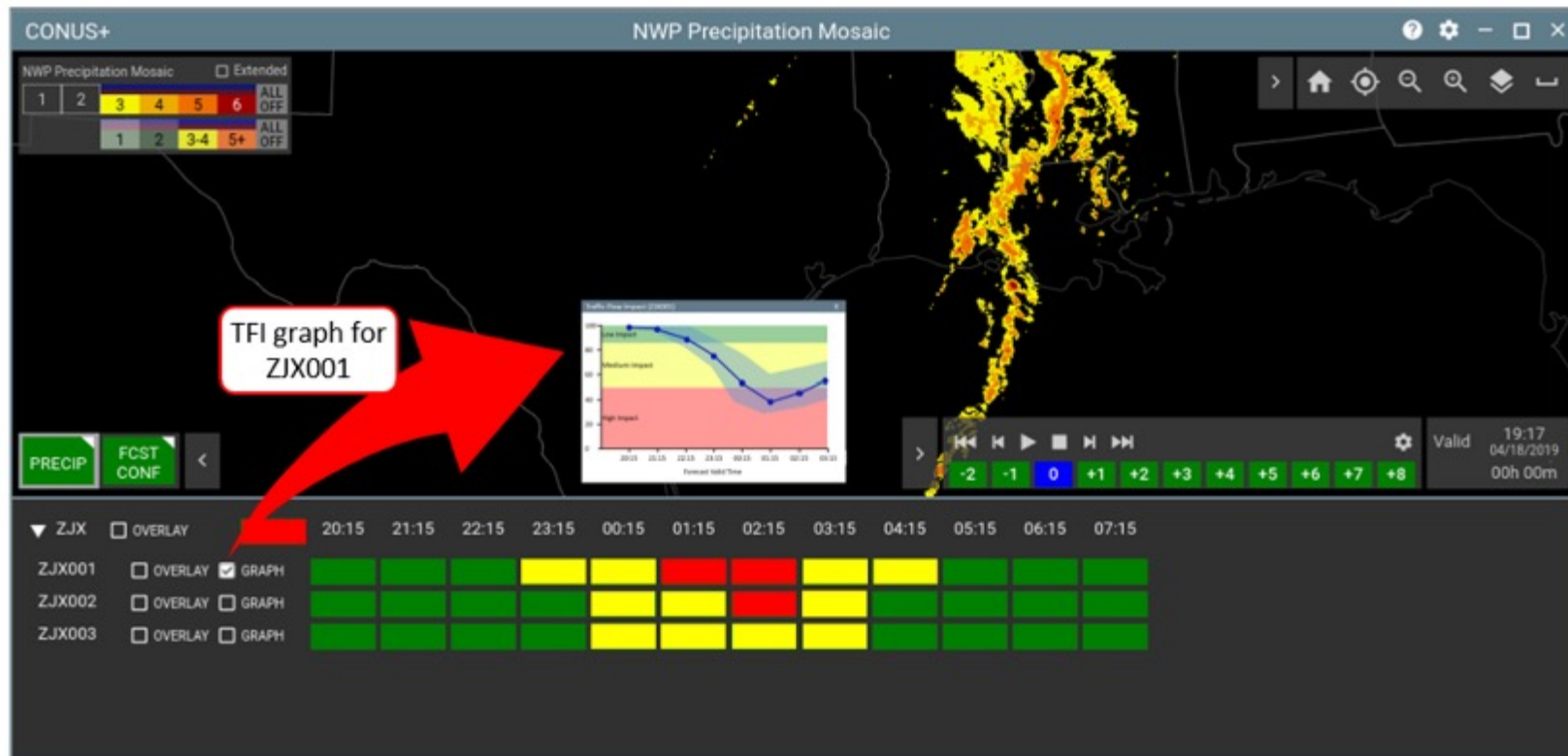


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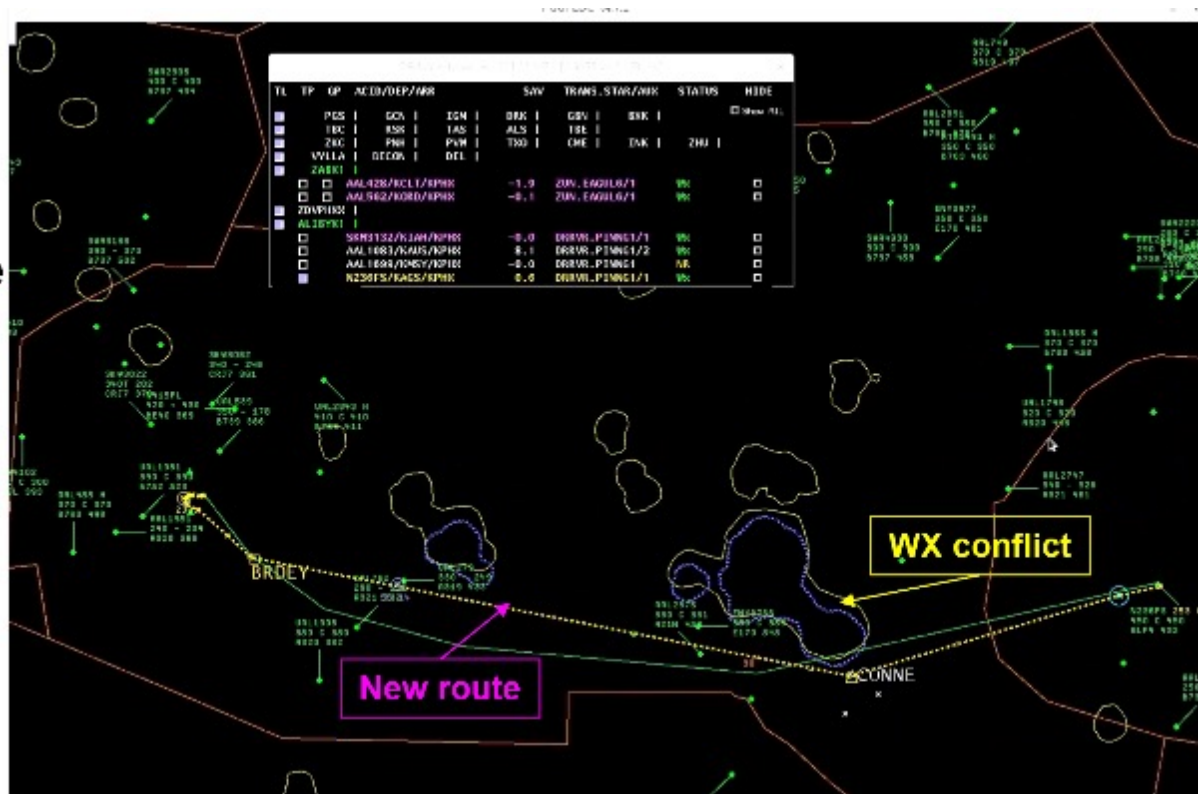
CWAF/CWAP on Aviation Weather Display



Traffic Flow Impact on Aviation Weather Display



CWAP/CWAF Applications – DRAW



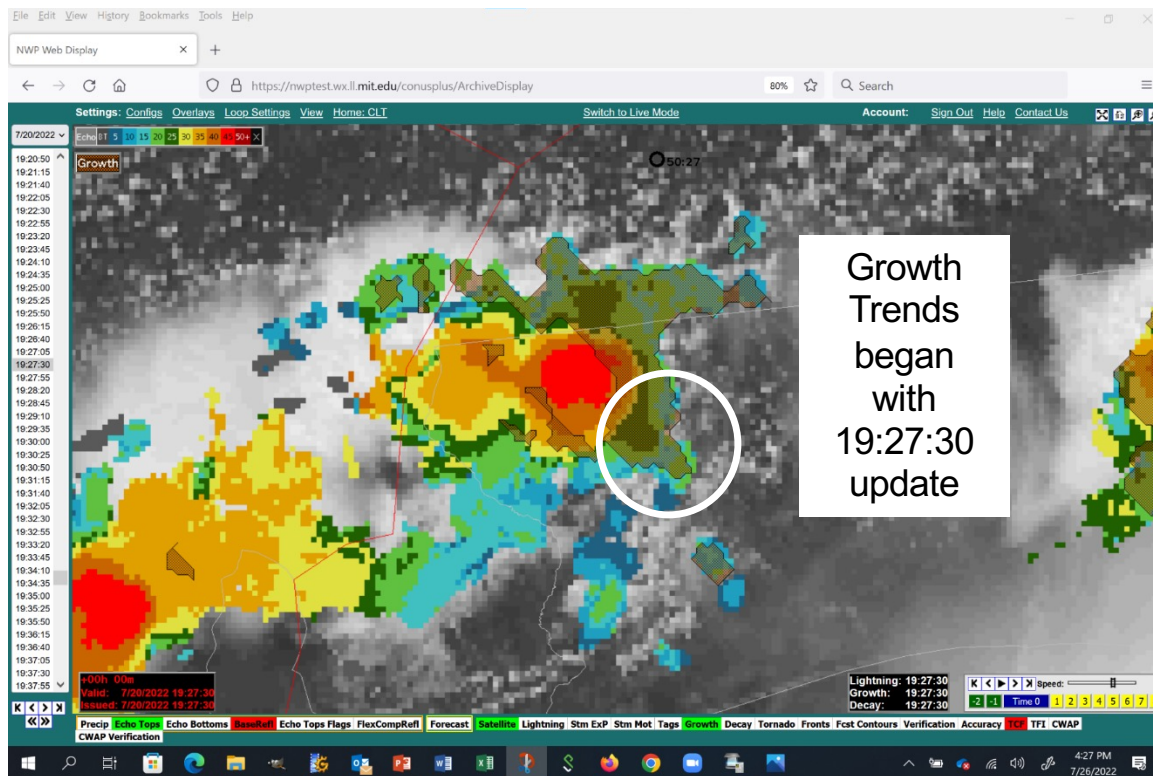
NextGen Growth/Decay Trends

2:27:30 CDT

2:35:50 CDT

2:39:10 CDT

2:44:10 CDT



Elapsed
Time
(mm:ss)

00:00

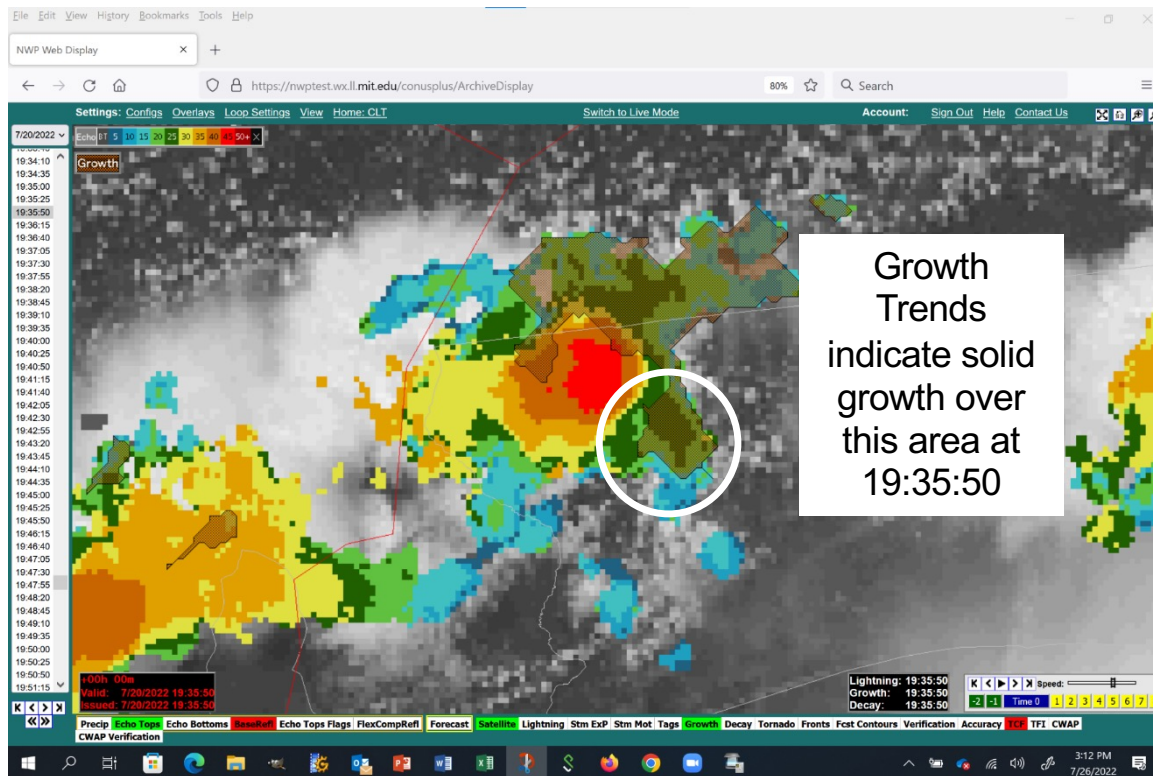
NextGen Growth/Decay Trends

2:27:30 CDT

2:35:50 CDT

2:39:10 CDT

2:44:10 CDT



Growth Trends indicate solid growth over this area at 19:35:50

Elapsed Time (mm:ss)

08:20

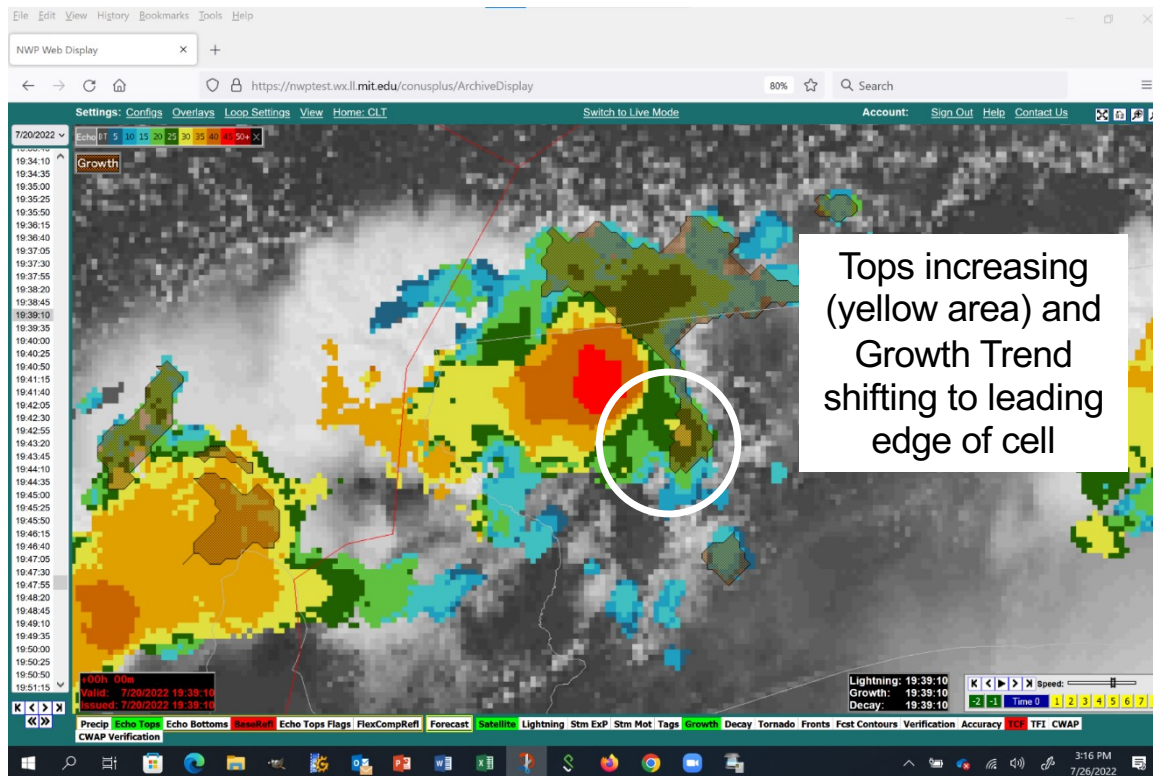
NextGen Growth/Decay Trends

2:27:30 CDT

2:35:50 CDT

2:39:10 CDT

2:44:10 CDT



Elapsed Time
(mm:ss)

11:40

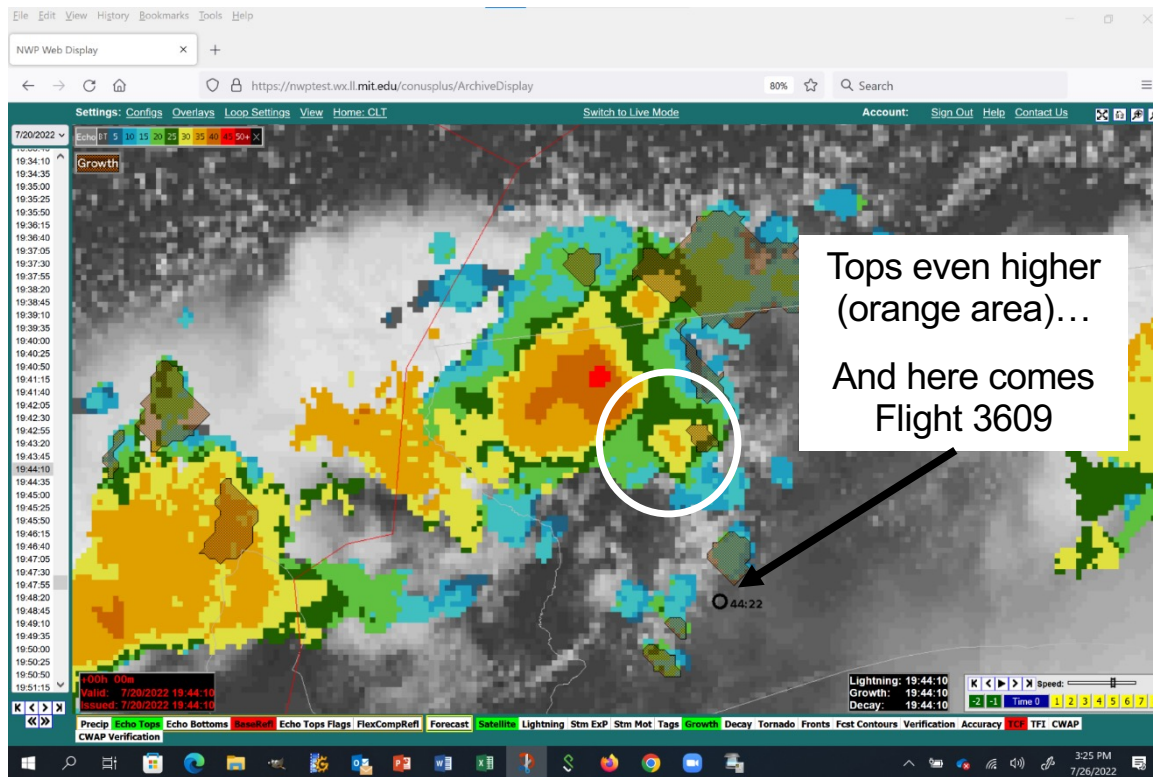
NextGen Growth/Decay Trends

2:27:30 CDT

2:35:50 CDT

2:39:10 CDT

2:44:10 CDT



**Elapsed
Time**
(mm:ss)

16:40

SWIM Users Forum

SWIFT Portal Update

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Date:
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Federal Aviation
Administration




Agenda

- **SWIFT Portal V4 Update**
- **TFMS R14 NAV Canada Discontinuation**
- **TBFM 4.15 Updates**
- **Questions**



SWIFT Portal

Home

Home

Discovery

Subscriptions

Status

Maintenance

Alerts

Community

Support

Data obtained via SWIM Cloud Distribution Service (SCDS) is **NOT** for OPERATIONAL USE.
All data has been pre-approved for public release by the NAS Data Release Board (NDRB).

Home

News

SCDS Data Not for Operational Use! 2/17/2023

All,

This is a friendly reminder to all SWIFT Portal Community members:

Data obtained via SWIM Cloud Distribution Service (SCDS) is **NOT** for OPERATIONAL USE.
All data has been pre-approved for public release by the NAS Data Release Board (NDRB).

Thanks!

- The SCDS Team

READ MORE

Subscriptions

REFRESH

Create a subscription to start consuming SWIM product data. Select the "Create New Subscription" button below to create a subscription.

CREATE NEW SUBSCRIPTION

Community

Recent Discussions

Traffic Flow Management System (TFMS) R13 to R14 Transition
3/1/2023, 1:04:33 PM | TFMS

SCDS Data Not for Operational Use!
2/17/2023, 3:24:02 PM | Community Forum Overview

FAA's SWIM Flight Data Publication Service (SFDPS) Features E...
1/13/2022, 1:34:14 PM | SFDPS

SWIFT #19 and Developers Workshop is coming up on August 2...
6/21/2022, 12:12:29 PM | Events

Call for feedback on the removal of Field #18 OPR from SFDPS
6/13/2022, 11:42:35 AM | SFDPS

More Discussions

Categories

Welcome to the Community!

Community Forum Overview

SWIFT Community – Rules and Guidelines

SWIFT Portal News & Announcements

Data Services

Other Topics

Administrators

All Categories

Service Status

REFRESH

Last Refresh: 3:09:30 PM

System	Service	SCDS
STDOS	ISMC	✓
STDOS	APDS	✓
STDOS	SMES	✓
STDOS	TDES	✓
STDOS	TAIS	✓
ITWS	Standard	✓

CONFIGURE

1-6 of 14



portal.swim.faa.gov

Important Reminder!!



Home

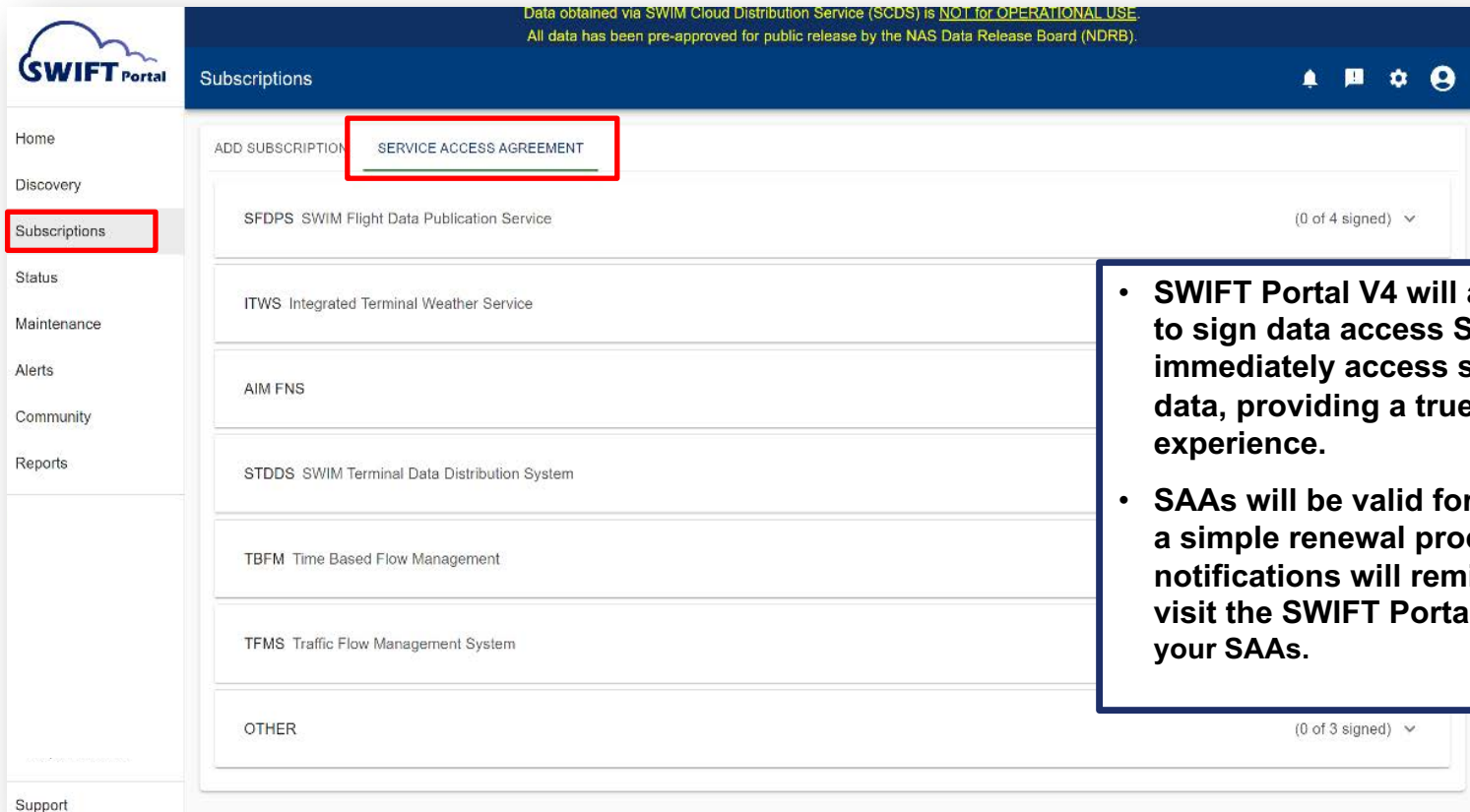
Data obtained via SWIM Cloud Distribution Service (SCDS) is NOT for OPERATIONAL USE.
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- Data obtained via SWIM Cloud Distribution Service (SCDS) is **NOT for OPERATIONAL USE**.
- All data has been pre-approved for public release by the NAS Data Release Board (NDRB)
- For external consumers of SWIM data for operational use, please continue to use your legacy NESG connections.



SWIFT Portal V4 Release

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SWIFT Portal

Subscriptions

Home
Discovery
Subscriptions
Status
Maintenance
Alerts
Community
Reports
Support

ADD SUBSCRIPTION **SERVICE ACCESS AGREEMENT**

SFDPS SWIM Flight Data Publication Service (0 of 4 signed) ▾

ITWS Integrated Terminal Weather Service

AIM FNS

STDDS SWIM Terminal Data Distribution System

TBFM Time Based Flow Management

TFMS Traffic Flow Management System

OTHER (0 of 3 signed) ▾

- **SWIFT Portal V4 will allow users to sign data access SAAs and immediately access subscription data, providing a true self-service experience.**
- **SAAs will be valid for 1 year with a simple renewal process. Email notifications will remind you to visit the SWIFT Portal and re-sign your SAAs.**

Signing SAAs After Portal Update

1. Sign in to SWIFT Portal
2. Navigate to the Subscription page and click on the Service Access Agreement tab
3. For each subscription service you have, select the appropriate program, drop down the menu and click “Sign” for the needed agreements

The screenshot shows the SWIFT Portal interface. The left sidebar contains navigation links: Home, Discovery, Subscriptions (highlighted), Status, Maintenance, Alerts, Community, Reports, and Support. The main content area is titled 'Subscriptions' and features a 'SERVICE ACCESS AGREEMENT' tab. Below this, there is a table of subscriptions. The first section is 'SFDPS SWIM Flight Data Publication Service' with a dropdown menu showing '(1 of 4 signed)'. The table lists four subscriptions, each with a 'SIGN' button. The second section is 'ITWS Integrated Terminal Weather Service' with a dropdown menu showing '(0 of 2 signed)'. The third section is 'AIM FNS' with a dropdown menu showing '(0 of 2 signed)'. The fourth section is 'STDDS SWIM Terminal Data Distribution System' with a dropdown menu showing '(3 of 5 signed)'.

Agreement	Service	Description	Agreement	Date Signed
SIT Dry Runs En Route Flight and Related Data - Flight FIXM	Flight FIXM	The System-Wide Information Management (SWIM) Flight Data Publication Service (SFDPs) provides en route flight data to National Airspace System (NAS) consumers. SFDPs allows consumers to receive real-time data for analytics, business processes, research, and other activities.	✓	03/07/2023 8:27PM
En Route Flight and Related Data - Airspace AIXM	Airspace AIXM	The System-Wide Information Management (SWIM) Flight Data Publication Service (SFDPs) provides en route flight data to National Airspace System (NAS) consumers. SFDPs allows consumers to receive real-time data for analytics, business processes, research, and other activities.	SIGN	
En Route Flight and Related Data - En Route General Publication	En Route General Message Publication	The System-Wide Information Management (SWIM) Flight Data Publication Service (SFDPs) provides en route flight data to National Airspace System (NAS) consumers. SFDPs allows consumers to receive real-time data for analytics, business processes, research, and other activities.	SIGN	
En Route Flight and Related Data - Status	Status	The System-Wide Information Management (SWIM) Flight Data Publication Service (SFDPs) provides en route flight data to National Airspace System (NAS) consumers. SFDPs allows consumers to receive real-time data for analytics, business processes, research, and other activities.	SIGN	

SWIFT Portal Best Practices



Access Agreements

- The new version of the SWIFT Portal will require users to renew all their Service Access Agreements
- Users will have 60 days to sign new Service Access Agreements following the release of the new version of the SWIFT Portal
- All existing subscriptions will be terminated after the 60 day Grace Period



Data Compression

- Data compression helps reduce SCDS operational cost.
- Please do not turn this feature off.
- Violators may be subject to account termination in the future.



Clients per Organization

- To further reduce SCDS operational cost, we ask that organizations please work to consolidate their Portal accounts. Please fan out (distribute) SWIM Data inside your organization.



**Help keep SCDS data
available and affordable!**



Traffic Flow Management System R14

NavCanada Discontinuation

- **NAV Canada flight data is now restricted to CDM members and will no longer be distributed by the SCDS Portal. Please contact the FAA CDM office if you have questions on how to become a CDM member by visiting this website:**



Time-Based Flow Management 4.15 Updates

- **TBFM 4.15 will introduce new data being populated in the JMS Header fields for Versioning, Departure Airport Information, and Destination Airport Information.**
- **Additionally, new fields are being added for CID, GUFU, Heartbeat Message and DEX_SOURCE_TYPE**
- **This will allow for additional filtering possibilities and new data**
- **<https://nsrr.faa.gov/>**

Update	Message Group	Nature of the Update	Message Type	Data Format/Range
Versioning		MIS JMS Header Update	All Message Types	N.N.N, where each N can range from 0-99
Departure Airport Information	<dap>	MIS JMS Header Update	Air Information (all); Configuration Information (subset of messages)	3-4 characters
Destination Airport Information	<apt>	MIS JMS Header Update	Air Information (all); Configuration Information (subset of messages)	3-4 characters
Computer ID (CID)	<cid>	New Aircraft Information Data	Aircraft Information Data	3 alphanumeric ASCII Character
GUFU (Global Unique Flight Indicator)	<gufu>	New Aircraft Information Data	Aircraft Information Data	10 character ASCII string with 10 characters: A-Z or 0-9
Heartbeat Message	<hb>	New Message for MIS Info	Heartbeat Data	Not Applicable
DEX_SOURCE_TYPE		Identifier used to group messages for a SWIM service utilizing the value of 'TBFM'		

Contact

✉ **Waldo E. Ford**
SWIFT Portal Lead
Waldo.E.Ford@faa.gov

✉ **SCDS Helpdesk**
9-ATO-SECC-OPS@faa.gov

