

FPAW – Segment 4 Data Centric Weather

Presented to: Friends and Partners of Aviation
Weather (FPAW)

Presented by: Alfred Moosakhanian, FAA

Date: October 31, 2012



Federal Aviation
Administration



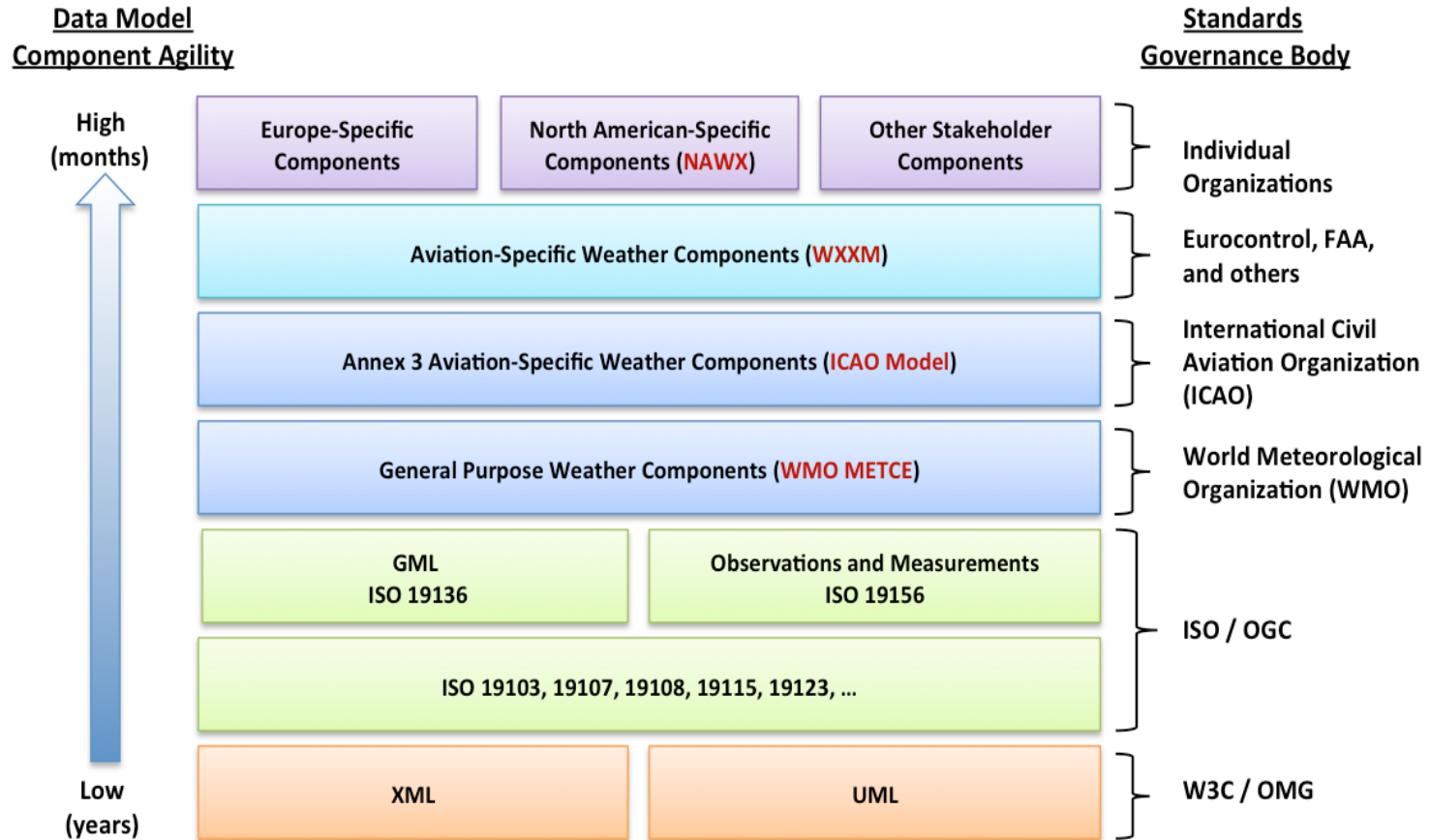
Data Centric Wx: Global Embrace

- **WMO and ICAO are jointly moving forward to enable data centric weather exchange**
- **In aviation, we are moving from text and product centric weather for:**
 - Observations
 - Forecasts
 - Accessing (Dissemination) and
 - Integration into Decision Support

WXXM Evolution

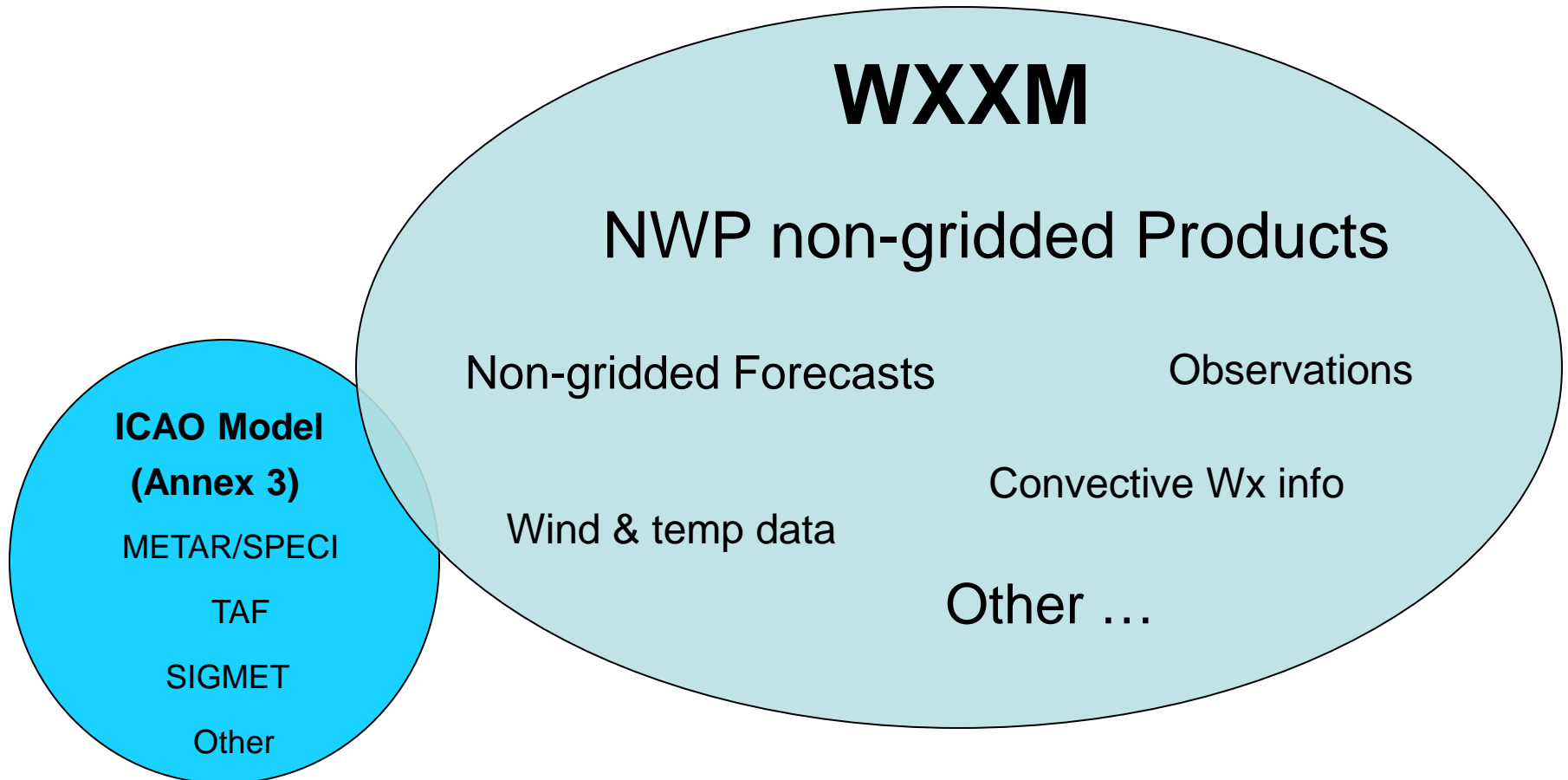
- **WXXM is key to data centric concepts and applications & NextGen/SESAR support**
 - FAA and NWS are leading the evolution in partnership with EUROCONTROL
 - The World Meteorological Organization (WMO) establishes the basis for global MET/Wx information exchange
 - ICAO establishes the basis for Meteorological Service for International Air Navigation (ICAO Annex 3)
 - Open Geospatial Consortium (OGC) provides the forum for establishing open standards for exchanges of geospatial referenced information

MET/Wx Standards Relationship

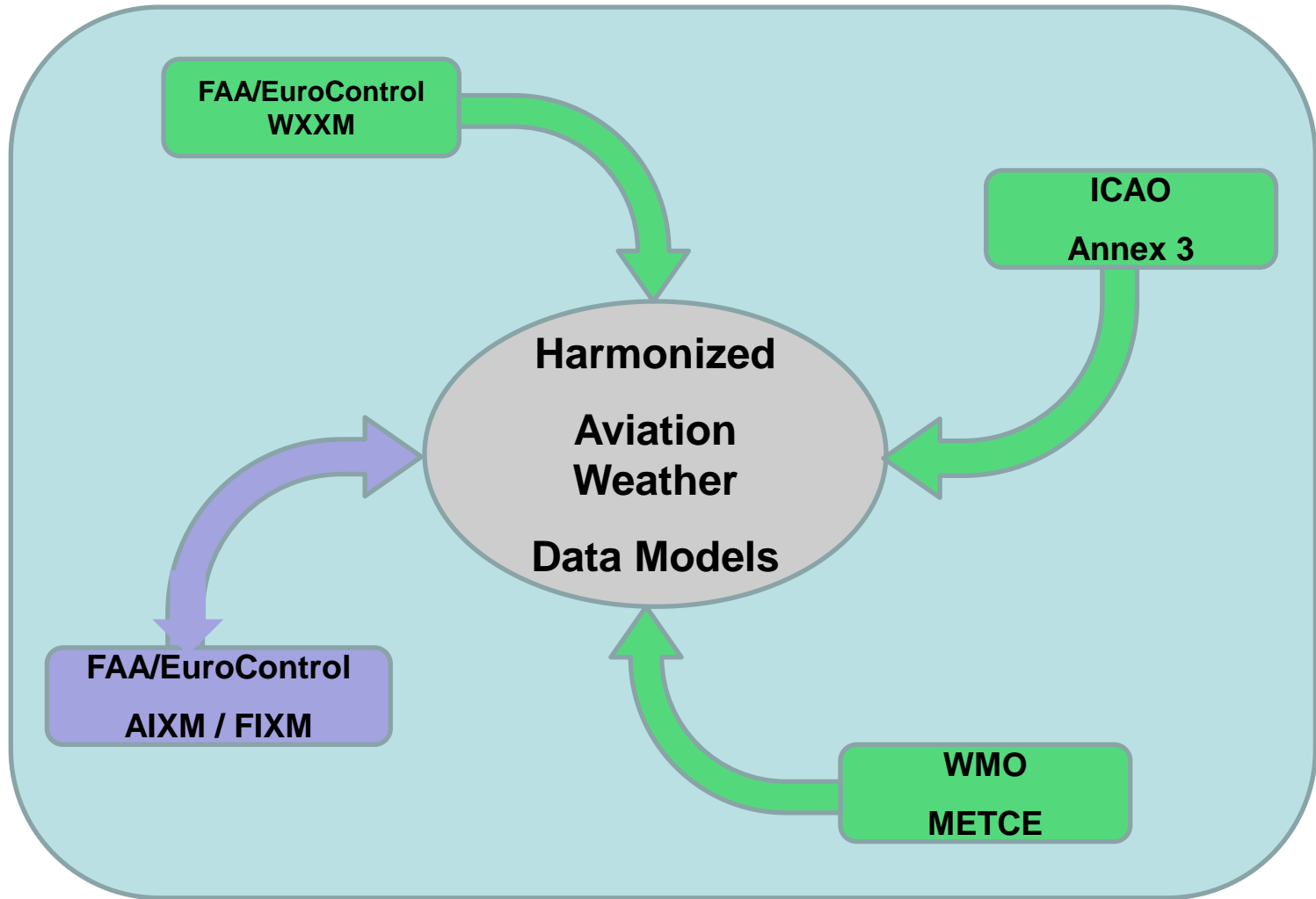


Open standards for weather information exchange ensure harmonization and ease of future enhancement and implementation

ICAO/WXXM Model Relationship



Harmonization: Converging Activities



ICAO Implementation – Annex 3

MET/Wx Info	2013	2016	2019
METAR/SPECI TAF SIGMET	States <u>in a position may structure</u> per ICAO Model / WXXM <u>and exchange</u> using XML/GML	States <u>should structure</u> per ICAO Model / WXXM <u>and exchange</u> using XML/GML	<u>Shall be structured</u> per ICAO Model / WXXM <u>and exchanged</u> using XML/GML
All Other MET/Wx Info		States <u>in a position should structure</u> per ICAO Model / WXXM <u>and exchange</u> using XML/GML	<u>Should be structured</u> per ICAO Model / WXXM <u>and exchanged</u> using XML/GML

FAA Common Support Services for Weather (CSS-Wx) & NextGen Weather Processor (NWP)

Presented to: Friends and Partners of Aviation
Weather (FPAW)

Presented by: Alfred Moosakhanian, FAA

Date: October 31, 2012



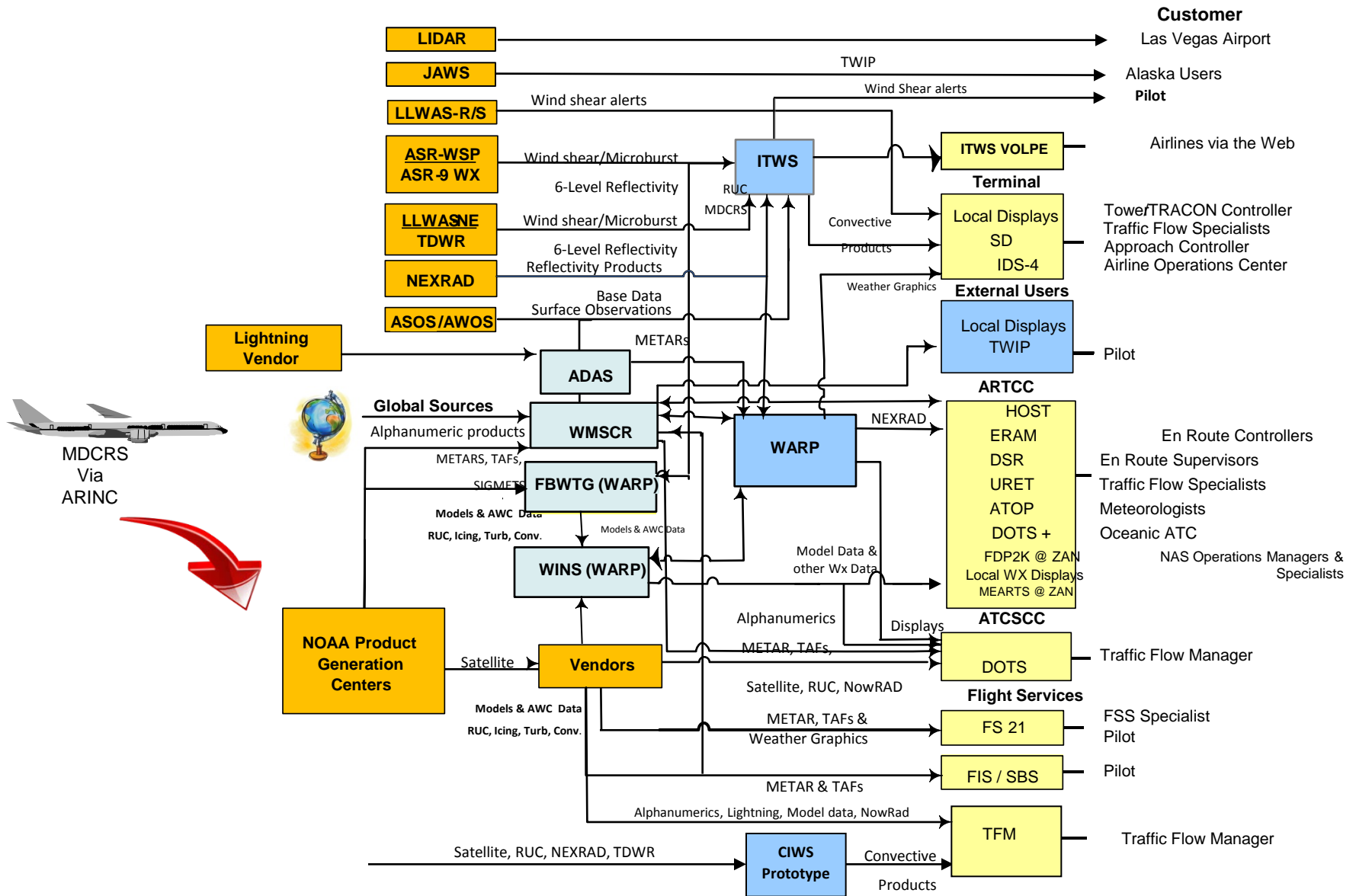
Federal Aviation
Administration



Background

- **FAA weather information today is limited by:**
 - Weather products only provide limited coverage area and update rate
 - Traffic managers and users must mentally interpret weather conditions, future traffic, and airspace information and their potential impact on decisions
 - Unique data types, fixed graphic or text products formats
 - Customized information sharing protocols
 - Fixed time and space resolution
 - Weather forecasts not integrated into Decision Support Tools (DSTs)

Notional Current Weather Architecture



Legacy Weather Systems Transformation

- **NextGen weather programs:**
 - Reduce legacy system complexity
 - Enable reuse, scalability, and agility
 - Fulfill varying needs of different systems/users
 - Transform legacy silos to SOA services
 - Improve services interoperability using SWIM



CSS-Wx Scope

- **Common Support Services for Weather (CSS-Wx) is a FAA NextGen Transformational Program**
- **CSS-Wx will be part of a National Airspace System (NAS) Common Support Services capability for deployment in 2016**
- **CSS-Wx will be the single provider of aviation weather information for FAA users**
 - Consolidate legacy weather provider systems
 - Filter weather information to support specific users needs
 - Standardize weather information into common formats
 - Enable integration of weather information into air traffic decision support tools



CSS-Wx Functionalities

- **CSS-Wx will publish advanced aviation specific information from NextGen Weather Processor, NOAA 4-D Wx Data Cube and other sources to consumers via System Wide Information Management (SWIM)**
- **Provide weather information via web services such as:**
 - Web Coverage Service (WCS) for gridded data
 - Web Feature Service (WFS) for non-gridded data
 - Web Map Service (WMS) for imagery
- **Standardize Weather information into the Open Geospatial Consortium (OGC) formats with the exception of radar data**
 - Network Common Data Form, version 4 (netCDF-4)
 - Weather Information Exchange Model (WXXM)
 - JPEG, PNG or GIF



NWP Scope

- **NWP establishes a common weather processing platform to**
 - Consolidate weather product generation by legacy weather processor systems
 - Produce advanced aviation specific weather, including translation of weather information into weather constraint areas
- **To be implemented over multiple work packages (WPs) with WP1 Initial Operating Capability (IOC) in 2016**



NWP

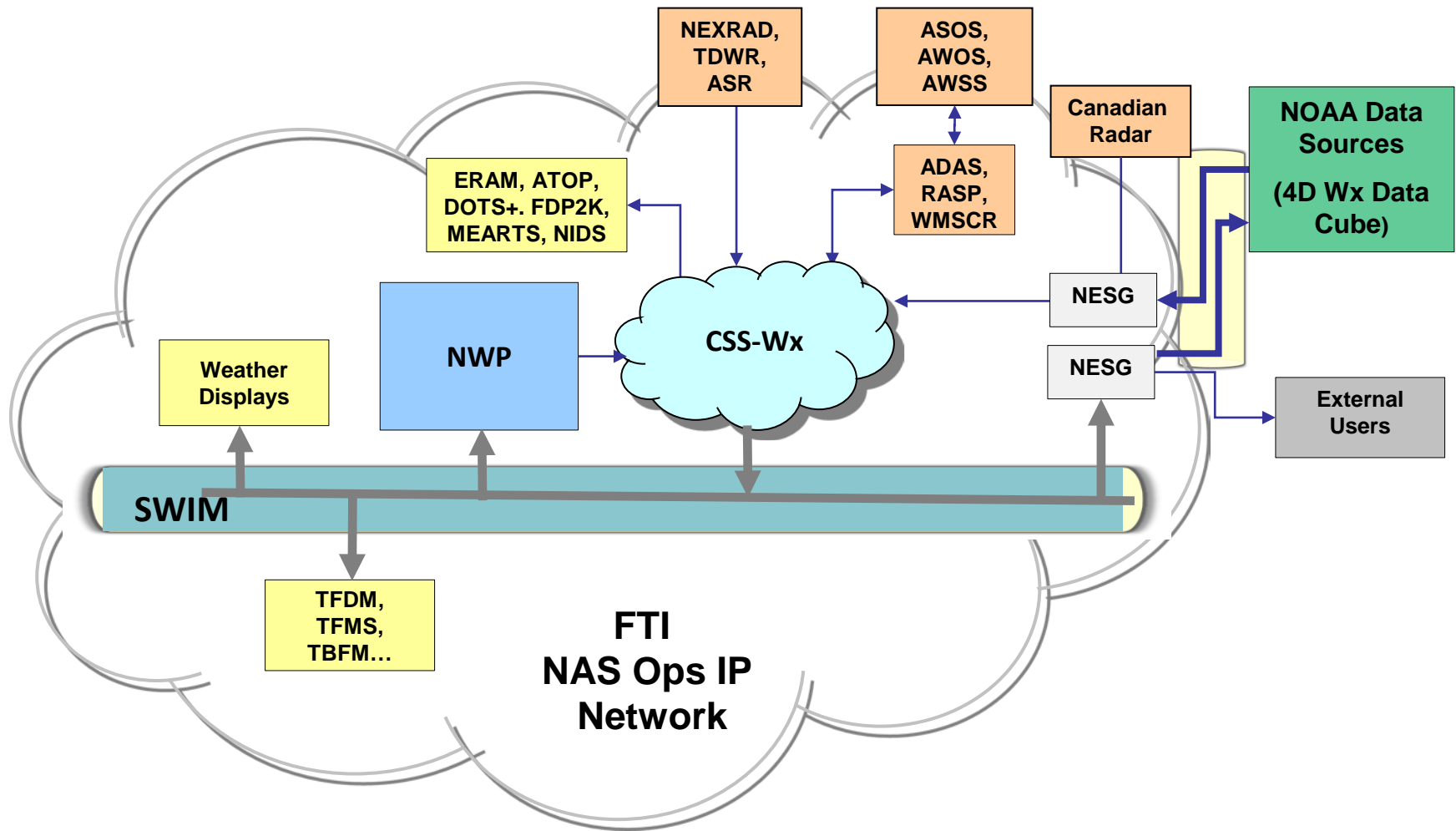
CIWS
ITWS
WARP

- Legacy Systems
- Rising operations and maintenance costs

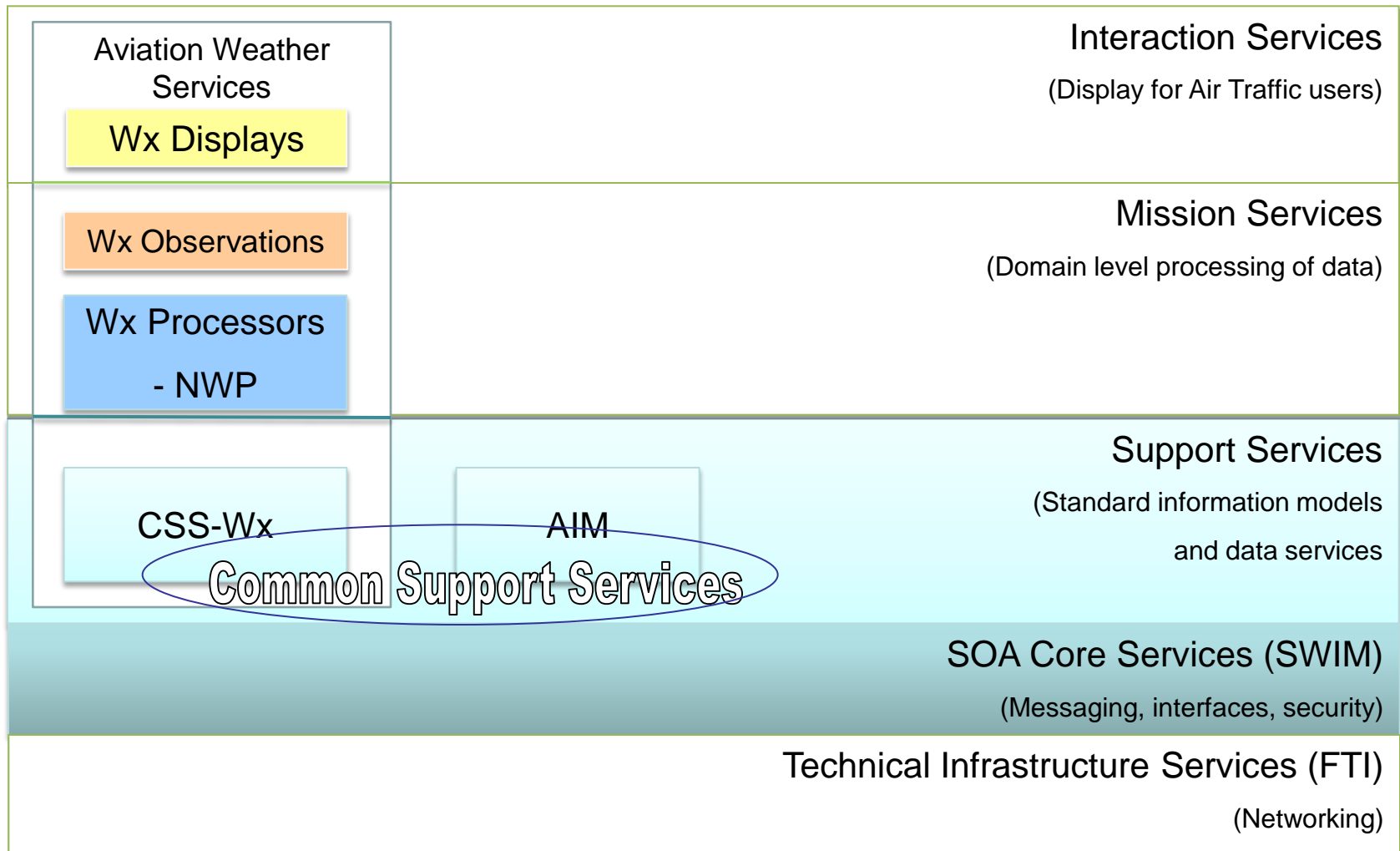
NextGen
Weather
Processor
(NWP)

- Subsume legacy systems
- Host new capabilities
- 2016 – 2035*

Weather CONOPS (2016)



Weather Programs in NAS EA SV-4 View



CSS-Wx & NWP Schedule & Milestones

- **Initial Investment Decision:** (CY12 - 4Q)
- **SIR Release:** (CY13 - 1Q)
- **Final Investment Decision:** (CY13 - 4Q)
- **Contract Award:** (CY14 - 1Q)
- **Initial Operating Capability:** (CY16)

CSS-Wx has also released 4 RFIs

*CY = Calendar Year

*Q = Quarter

* *The dates above are tentative and subject to change*

Summary

- **NWP focuses on weather processing & product generation**
- **CSS-Wx focuses on weather information management for FAA**
 - CSS-Wx will be the single provider of aviation weather information in the NAS
- **CSS-Wx uses open standards, and coordinates with international organizations in developing the standards**

Backup Slides



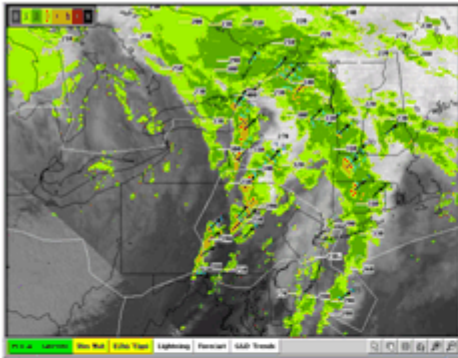
Weather Data Products

- **Weather Radars**
- **Weather Radar Mosaics**
- **Weather Forecasts**
- **NOAA Forecast models**
- **Alphanumerics such as Volcanic Ash Advisory**
- **Weather Observations (Surface and Airborne)**
- **Icing Information (Current and Forecast)**
- **Turbulence Information (Current and Forecast)**
- **Lightning**
- **Satellite Data**

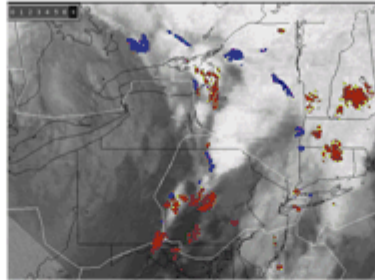


Key Products

Precipitation Mosaic



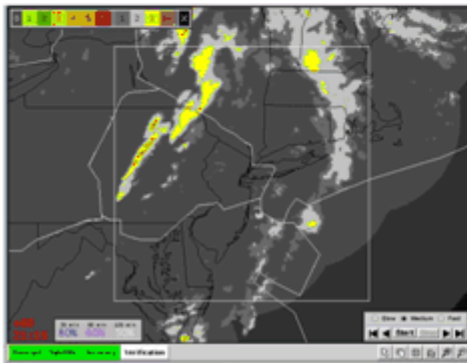
Growth and Decay Trends (shown on Satellite Mosaic)



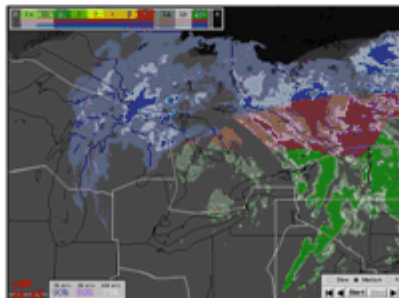
Echo Tops Mosaic



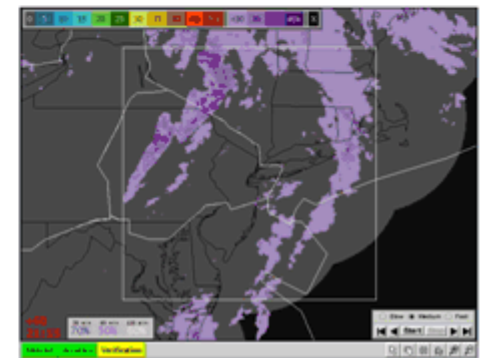
Assimilation of extended
NWS forecast models
with real time radar
extrapolation for
Precipitation



Assimilation of extended
NWS forecast models
with real time radar
extrapolation for Winter
Precipitation



Assimilation of extended
NWS forecast models with
real time radar extrapolation
for Echo Tops



Weather Avoidance Fields

