NextGEN WEATHER

Improving Safety and Efficiency in the National Airspace System

REDUCE WEATHER IMPACT

NextGen Weather is a critical part of the NextGen Air Transportation System, designed to transform the management and operation of how we fly. It helps reduce weather impact, resulting in safer, more efficient and predictable day-to-day NAS operations.

NextGen Weather harnesses massive computing power, unprecedented advances in numerical weather forecasting, translation of weather information into airspace constraints, and modernized information management services.

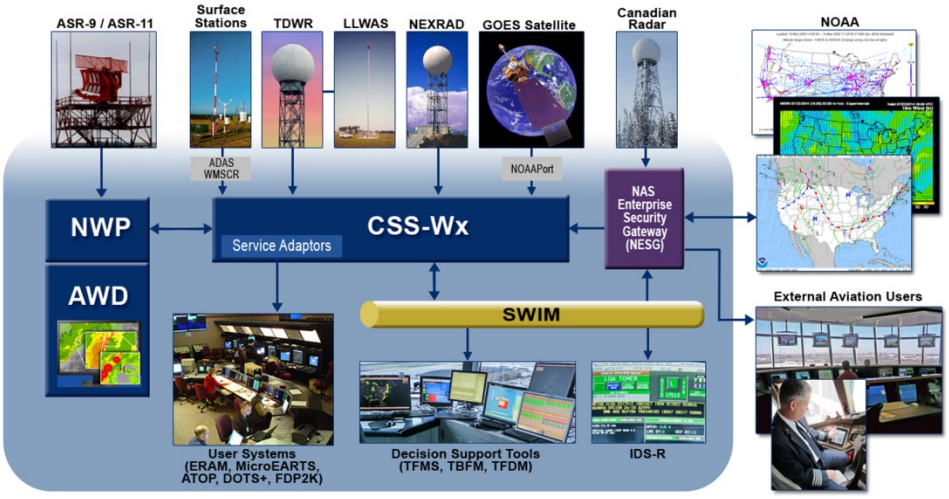
With this powerful combination, NextGen Weather can provide tailored aviation weather products within the NAS, helping controllers and operators develop reliable flight plans, make better decisions, and improve on-time performance.

NextGen Weather is accomplished through collaboration between FAA, NOAA, and NASA.

CSS-Wx

COMMON SUPPORT SERVICES - WEATHER

CSS-Wx is the single provider of weather data, products, and imagery within the National Airspace System (NAS), using standards-based weather dissemination via System Wide Information Management (SWIM). CSS-Wx makes available enhanced weather products for integration into air traffic decision support tools, improving the quality of traffic management decisions and reducing controller workload during severe weather.



High level view of NextGen Weather architecture, showing the relationship between CSS-Wx, the NextGen Weather Processor (NWP) and its Aviation Weather Display (AWD). Weather sensor inputs are shown across the top, where "Surface Stations" includes ASOS, AWOS, AWSS and Lightning. Consumers of weather information within the NAS are shown along the bottom. Incoming weather products from NOAA pass through the NESG, as do outgoing products for all external consumers.

CSS-Wx Weather Product Categories

NOAA	Numerical Forecast Models	Aviation Forecasts	Alphanumeric Products	Imagery
	RAP, HRRR, LAMP, SREF, NAM, etc.	Turbulence, Icing, etc.	METARs, Fronts, TAFs, PIREPs, etc.	Alaska and Guam Satellite, etc.
NWP	Mosaic Products	Analysis Products	Predictive Products	Translation Products
	Precipitation, Echo Tops, Satellite, etc.	Microbursts, Terminal Winds, Gust Fronts, etc.	8-hour Precipitation, Phase, Confidence; 2-hour Fronts; etc.	8-hour Convective Weather Avoidance Fields, etc.

CSS-Wx
COMMON SUPPORT SERVICES - WEATHER

Improvements with CSS-Wx

Facilitates consistent weather information
- Publishes weather datasets in broadly-adopted geographic standardized formats
- Simplifies global, national and inter-agency data exchange

Increases NAS weather access
- Increases availability of common weather information
- Provides image map rendering for consumer displays

Reduces interface development costs
- Eliminates custom point-to-point interfaces
- Transforms products into NAS legacy formats
- Stores and archives all aviation weather data sets

FAA user consults weather-aware decision support tools in New York Center (ZNY).

Reduces infrastructure / bandwidth costs
- Filters weather information to provide user-specific subsets
- Partners with SWIM to achieve enterprise-wide bandwidth efficiency
- Provides hosted algorithm capability to support local product generation and display

CSS-Wx Web Services

The CSS-Wx system makes weather data accessible through a set of common support services and broadly adopted data access and format standards from the International Standards Organization (ISO) and the Open Geospatial Consortium (OGC). The services provide a mature basis for communicating time dependent, geo-referenced weather information.

CSS-Wx Web Services

WCS

Web Coverage Service (WCS)
- Disseminates gridded weather products in **NetCDF4** format
- Filters and transforms large gridded data sets such as weather radar and satellite mosaics, upper level winds, icing and turbulence forecasts, etc.

WFS

Web Feature Service (WFS)
- Disseminates non-gridded weather products in **WXXM XML** format
- Filters and transforms non-gridded data sets such as wind shear alerts, storm cell information, terminal aerodrome forecasts, etc.

WMS

Web Map Service (WMS) and Web Map Tiling Service (WMTS)
- Disseminate weather product imagery in variety of formats (e.g., **JPEG, PNG, GIF, KML**).
- Render digital weather data as single large image or as sets of tiled images
- Enable weather product consumption by modernized displays and mobile applications
- Permit geographical overlay of information from multiple domains

FAA | CSS-WX
FAA | NWP
FAA | AWD

NOAA | RAP
NOAA | HRRR
NOAA | LAPS

NOAA | CCFP
NOAA | CIP/FIP
NOAA | GTG

NASA | CWAM
NASA | SATCAST
NASA | DWR