



# WEATHER DATA

AT YOUR FINGERTIPS

## Accurate and Timely

In support of the FAA's goal to modernize the country's air transportation system (NextGen), NCAR has created a foundation of timely, accurate, and consistent weather data and distribution products to pilots and air traffic decision makers.

### COMMON SUPPORT SERVICES-WEATHER (CSS-WX) SYSTEM

Weather has a considerable impact on aviation operations; delays, cancellations, and rerouting are costly to both passengers and the airlines. Until recently, access to weather information has been a challenge for pilots and air traffic managers due to outdated and inconsistent standards and practices. The delivery of timely, accurate weather information will help mitigate such costs in both dollars and labor; NCAR's Aviation Applications Program is dedicated to providing integrated information and technologies that impact aircraft operations.

### A VIRTUAL REPOSITORY OF WEATHER DATA

In support of the FAA's Common Support Services-Weather (CSS-WX) System, NCAR has designed and developed software and prototype systems for a network-based infrastructure for distributing weather data. Over the past decade, NCAR has collaborated with NOAA, MIT, and MITRE to develop a web-based service that distributes gridded weather data based on the Open Geospatial Consortium's (OGC) Web standards.

## Benefits & Impacts

- Accurate, timely, and consistent weather information
- Flexible delivery of data
- Increased airspace capacity
- Optimized efficiency
- Improved safety

 [ral.ucar.edu](http://ral.ucar.edu)

 [@NCAR\\_RAL](https://twitter.com/NCAR_RAL)

 [info@ral.ucar.edu](mailto:info@ral.ucar.edu)

NCAR and its partners continued their work with the OGC to extend the Web Coverage Service (WCS) standard where necessary to accommodate three- and four-dimensional gridded weather data sets. The team then developed a first-generation reference implementation of the FAA WCS server software for weather data. Some of the more notable capabilities of this server are its ability to spatially and temporally subset the weather data as will be required for NextGen weather data queries.



**The flow of operation-specific weather-related data and information to end users is critical.**

**WEATHER DATA DISCOVERY AND ACQUISITION**

CSS-Wx is being built upon a Service Oriented Architecture (SOA) of web services to enable effective, efficient opportunities for data dissemination. SOA integrates services (applications) running on heterogeneous platforms using common standards (e.g., HTTP, SOAP, XML, etc.). In the case of CSS-Wx, the service-orientation focus is on service interfaces, with no requirement to use particular implementations of those interfaces. The SOA concept facilitates data exchange, as well as interactions in support of an outcome (e.g., product generation). Services are well-defined, self-contained, and do not necessarily depend on the state of other services.

Standards and specifications developed and/or used by CSS-Wx are layered on top of 'core' services provided by the FAA System-Wide Information Management (SWIM) program. Both CSSWx and SWIM are, in turn, layered on top of the FAA Telecommunication Infrastructure (FTI), the basic network connectivity layer.

**REAL-TIME WEATHER DATA**

The CSS-Wx web services provide real-time weather data to consumers at various levels using identical protocols. The NextGen Weather Processor (NWP) uses CSS-Wx to access weather model output and observations for its forecasting algorithms, then provides the outputs of those hosted algorithms back into CSS-Wx for distribution to other consumers. Air Traffic Control (ATC) facilities access CSS-Wx data through the Aviation Weather Display (AWD) software in addition to their legacy systems. Airlines, dispatchers, and other public consumers will also have access to the same services used internally by the FAA.

As the FAA proceeds with acquiring the CSS-WX system for implementation and operational deployment through a contract with a commercial vendor, NCAR will take an expert advisory role. Based on years of experience during the development of CSS-Wx program concepts and proof-of-concept prototypes, NCAR's Aviation Applications Program will advise the FAA on technical issues related to the contractor's development of the system.



**The delivery of timely, accurate weather information will help mitigate costs in both dollars and labor.**

