

# **EXPERIMENTAL PRODUCT DESCRIPTION DOCUMENT**

## **Aviation Digital Data Service**

**APPROVED** \_\_\_\_\_ **Date:** \_\_\_\_\_

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Product/Service Description Document  
Aviation Digital Data Service

Part I – Mission Connection

The objective of the National Weather Service (NWS) Aviation Weather Services Program is to provide quality weather forecast information and services to the aviation community for the protection of life and property, and to increase the efficiency of the National Airspace System.

The Federal Aviation Administration requires National Weather Service to operate ADDS to provide the safety benefit(s) intended from Safer Skies Joint Safety Analysis Team (JSAT) Recommendation 1: “Provide better information to pilots on the location severity of weather hazard areas, and better methods of using weather information to make safe decisions on how and when to make a flight.”

The AWRP is an initiative of the Weather and Flight Service Systems Integrated Product Team. The goal of the AWRP is to increase the scientific understanding of atmospheric conditions that cause dangerous weather, which in turn, impacts aviation. The research is aimed toward producing weather observations, warnings, and forecasts that are more accurate and more accessible. AWRP funds research into aviation meteorology as it relates to problems in aviation safety or National Airspace System capacity and traffic management which may be solved or mitigated by the results of dedicated scientific studies. Various partner organizations (<http://www1.faa.gov/aua/awr/partners.htm>) conduct or test the research. AWRP is part of the Weather Sensors and Aviation Weather Research Product Team.

The National Weather Service is responsible for placing many of the experimental products and services of the Aviation Weather Research Program into an operational environment. The Aviation Digital Data Service is one of those services.

a. Product/Service Description

The **Aviation Digital Data Service (ADDS)** makes available to the aviation community through the internet digital and graphical analyses, forecasts and observations of meteorological variables. Developed as the data distribution component of the Aviation Gridded Forecast System (AGFS), ADDS is a joint effort of NOAA Forecast Systems Laboratory ([FSL](#)), NCAR Research Applications Program (RAP), and the National Centers for Environmental Prediction (NCEP) Aviation Weather Center (AWC). ADDS makes access to National Weather Service aviation observations and forecasts easy by integrating this information in one location, and by providing visualization tools to assist the application of this information for flight planning.

The following information is available on ADDS. Product descriptions are available at the indicated website.

- Winds, temperatures, and streamlines aloft <http://adds.aviationweather.gov/winds/>
- Pilot Reports <http://adds.aviationweather.gov/pireps/>
- SIGMETs and AIRMETs <http://adds.aviationweather.gov/airmets/>
- TAFS <http://adds.aviationweather.gov/tafs/>
- METARS <http://adds.aviationweather.gov/tafs/>
- Radar <http://adds.aviationweather.gov/radar/>
- Satellite <http://adds.aviationweather.gov/satellite/>
- Current Icing Potential (CIP) and Forecast Icing Potential (FIP) <http://adds.aviationweather.gov/icing/>
- National Convective Weather Forecast (NCWF) <http://adds.aviationweather.gov/convection/>
- Graphical Turbulence Guidance (GTG) <http://adds.aviationweather.gov/turbulence>
- Surface Weather Prognostic Charts <http://adds.aviationweather.gov/progs/>

ADDS not only displays this information via static charts and text, but also incorporates visualization tools using java technology to improve user understanding of this information.

- For pilot reports, AIRMETs and SIGMETs, a *Java tool* can be used to zoom in on a specific part of the country and specify the type of hazard reported (icing, turbulence, sky and weather). The tool also allows the user to limit the data to specified altitudes and time periods. Map overlays including counties, highways, and VORs, and Air Route Traffic Control Boundaries are available. If left on-line, the tool can be made to update automatically as new information arrives.
- For TAFs, the java tool can be used to zoom in on specific parts of the country. Black squares identify the location where TAFs are prepared. When the cursor is pointed to a square, the TAF text appears on the screen. In addition to the java tool, ADDS parses the TAF information so the weather forecast derived from the TAFs is displayed at specified snapshots in time in three hourly increments. This allows users to see the TAF forecast at many locations for a specific time.
- For METARs, the java tool can zoom in on specific parts of the country. A station plot is plotted at each METAR location allowing the user to identify which observation appears (temperature, dew point, wind, altimeter setting, sky cover, color-coded ceiling, weather, visibility, and station identifier.) The tool automatically limits the number of stations displayed to avoid cluttering, but more or all can be added at the users discretion. As the cursor covers a station, the text METAR appears.
- For NCWF, the latest convection diagnostic is shown together with the one hour forecast. The java tool allows the user to toggle the height and speed of the

forecasted thunderstorm, as well as the one-hour forecast from the previous hour to help the user understand how well the NCWF is performing. The user can zoom on the desired part of the country. METARs and TAFs can also be overlaid and interrogated using the cursor. Also counties, highways, and VORs, and Air Route Traffic Control Boundaries can be overlaid.

- Flight Path Tool, which helps pilots visualize the high resolution products of CIP, GTG, and FIP together with winds aloft and pilot reports is described under a separate product description document.

#### b. Purpose and Intended Use

The safety of any flight depends on the effective integration of all of these weather products during preflight planning. Throughout aviation history, effective integration of this information to ensure a safe flight has been a difficult process not only because a pilot must understand the implication to safety in the horizontal, but also in the vertical. Ceilings, visibility, icing, turbulence, precipitation forecasts and applicable pilot reports must be applied to the planned route and altitude of flight.

For decades the skill of professional pilot weather briefers from the Federal Aviation Administration and National Weather Service have helped pilots interpret and apply weather observation and forecast information to a specific route of flight. Lately, with the increasing ability of pilots to directly access NWS forecasts over the internet and through federally sponsored programs such as DUATs, pilots do not have an intermediary to help interpret, integrate, and apply the various forecast products to the planned route of flight. Additionally, the desire for more accurate and specific icing, turbulence, ceiling and visibility information has resulted in product detail much more difficult to visualize, understand, and integrate with other information specific to the intended route of flight.

To maximize flight planning effectiveness for the purpose of safety, the Aviation Weather Research Program developed ADDS to help pilots integrate the various types of forecast information, especially high resolution forecast information such as CIP, FIP, and GTG.

A description of each product displayed on ADDS is available by clicking on FYI/Help links located within each product display.

#### c. Audience

Pilots, dispatchers, air traffic controllers, Flight Service Station weather briefers, and meteorologists are the targeted audience.

#### d. Presentation Format

A variety of formats are used to display the information contained in ADDS. They are described above. ADDS is accessed through <http://adds.aviationweather.gov>.

e. Feedback

Feedback concerning the Aviation Digital Data Service will be received through August 31<sup>st</sup>, 2003, can be sent to:

Mark Andrews  
National Weather Service W/OS23  
1325 EAST WEST HWY  
SILVER SPRING MD 20910-3283  
*ADDS-Comments@noaa.gov*

Part II - Technical Description

- a. Format and Science Basis – User interactivity is important to obtain maximum value from the four-dimensional, high resolution forecast information concerning icing, turbulence, and wind for the pilot geographic area of interest. Java was selected to facilitate this interactivity to allow users to interrogate the forecast data set at desired levels and along desired route segments. All products displayed on ADDS are either traditional National Weather Service products or new products approved by the Aviation Weather Technology Transfer Board.
- b. Availability
- ADDS is available 24 hours a day, 7 days a week.
- c. Additional Information – ADDS is operated by the Aviation Weather Center, Kansas City, Missouri. The development and maintenance of ADDS is done by the Aviation Forecast Product Development Team of the Aviation Weather Research Program. Comments and recommendations concerning the Aviation Digital Data Service can be submitted through the ADDS forum located at <http://NWS.ADDS.Comments@noaa.gov>. User recommendations to ADDS developers are provided to the Aviation Forecast Product Development Team by the Advanced ADDS User Group that includes representatives from Air Line Pilots Association, Aircraft Owners and Pilots Association, Small Aircraft Manufacturers Association, Air Transport Association, United Airlines, Delta Airlines, Airline Dispatchers Federation, FAA Flight Standards, Purdue University Department of Aviation Technology, and the National Association of Air Traffic Specialists. For more information on this process, contact Mark Andrews at the address indicated in Part I-e.