

A Pilot's Guide to Aviation Weather Services



October 1, 2020

National Oceanic and Atmospheric Administration (NOAA)



REVISION HISTORY

The table below identifies all changes that have been incorporated into this document.

Version	Draft Date	Summary of Changes
1.0	10/1/2020	Initial Release
1.01	11/5/2020	1, Removed ZOB Facebook link 2. Correction to High Level SIGWX link
1.02	11/20/2020	Added CWSU Memphis Facebook link in the Social Media section
1.03	12/4/2020	Added section 6.2 to add links to NWS office aviation web pages
1.04	9/8/2021	Update to a few office web page links in 6.2
1.05	12/9/2021	Added Aviation Weather Services webpage to section 6.2
1.06	12/21/2021	Renamed “Pre Flight” to “Mission Planning” to match standard aviation terms. Added new link to section 10.4 Added a FAA training link to AWC Standard Briefing description on page 18.
1.07	2/15/2022	Added Tropical Products section Added Volcanic Ash Advisory section Edit updates to several sections
1.08	1/17/2023	General corrections and updates

TABLE OF CONTENTS

<u>REVISION HISTORY</u>	2
<u>TABLE OF CONTENTS</u>	3
<u>PURPOSE AND SCOPE</u>	4
<u>MISSION PLANNING</u>	5
<u>DAY OF DEPARTURE</u>	8
<u>EN ROUTE PRODUCTS</u>	12
<u>AVIATION WEATHER TOOLS</u>	15
<u>DECISION SUPPORT TOOLS</u>	17
<u>SOCIAL MEDIA</u>	20
<u>NWS Aviation Webpages</u>	22
<u>ALASKA / HAWAII PRODUCTS</u>	25
<u>INTERNATIONAL PRODUCTS</u>	26
<u>TROPICAL PRODUCTS</u>	29
<u>VOLCANIC ASH ADVISORY PRODUCTS</u>	30
<u>Appendix A: Acronyms and Abbreviations</u>	31
<u>Appendix B: Products and Associated Links</u>	38

1 PURPOSE AND SCOPE

This guide helps you use the National Aviation Weather System to the fullest extent possible. The information and services described here are provided by the National Weather Service (NWS), and available through the Federal Aviation Administration (FAA), as well as information service companies.

The NWS issues a wide range of aviation weather products and services for the National Airspace System (NAS). The NWS products and services are provided by the Aviation Weather Center (AWC), the Alaska Aviation Weather Unit (AAWU), Center Weather Service Units (CWSU), and Weather Forecast Offices (WFO). These offices are staffed with skilled meteorologists who analyze atmospheric conditions, develop forecasts of aviation threats, and issue advisory and warning-level products for safe and efficient flight.

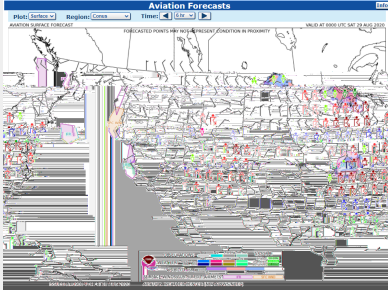
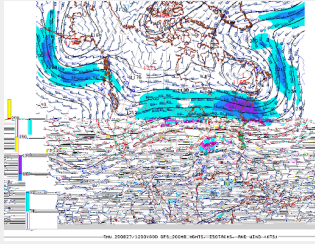
Offices as well as numerous agencies across the NAS collaborate daily to keep the aviation community safe and up to date with the latest aviation weather information.

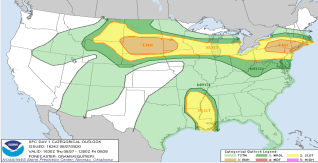
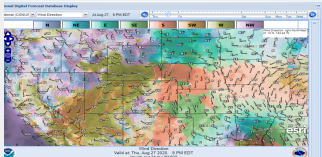
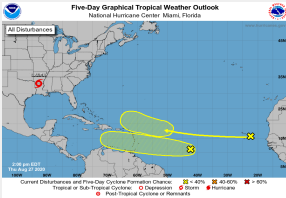
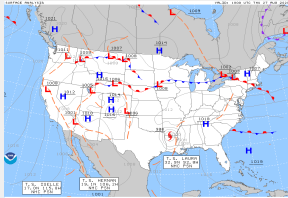
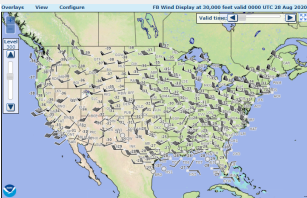
Aviation weather products and services are available to all pilots of the aviation community. The Preflight, Day of Departure, and En Route products portion of the guide cover services available during the aforementioned stage of flight planning. Some of these tools overlap during the decision making process, so it is important to understand how each product fits into your flying timeline. The Decision Support Tools section of the guide provides useful tools available from the Aviation Weather Center that incorporate various products into one easy to use application. The section also highlights additional web pages available for the decision making process, including social media sites.

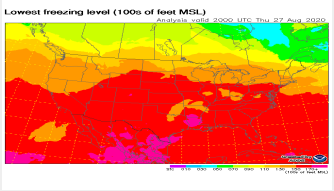
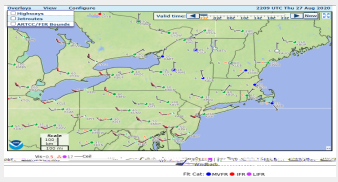
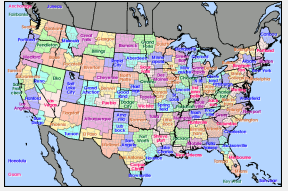
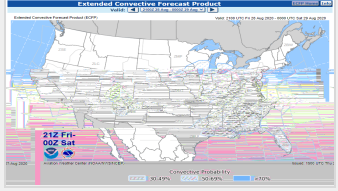
2 MISSION PLANNING



The products below will assist in flight planning and highlight any potentially hazardous weather expected in the days leading up to your expected day of departures.

<p><u>AVIATION SURFACE AND CLOUD FORECAST GRAPHICS</u></p>  <p>Help Page Product Description Document</p>	<p>The Aviation Surface Forecast and Aviation Clouds Forecast graphics are 18-hour snapshot images. These images are derived from a subset of the aviation weather forecasts valid for the continental United States (CONUS) and coastal waters. They are used within the Graphical Forecasts for Aviation interactive web-based display.</p>
<p><u>UPPER AIR FORECASTS</u></p>  <p>Users Guide Product Description Document</p>	<p>The Model Analysis and Guidance (MAG) website displays images from weather prediction models and observational data.</p>

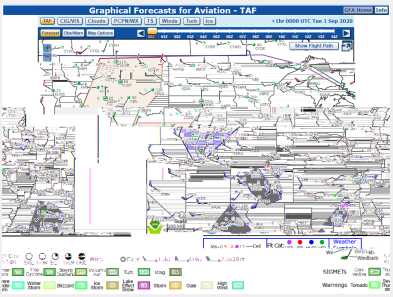
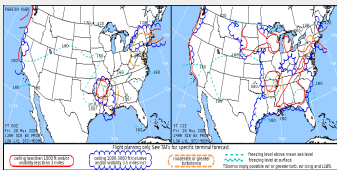
<p><u>CONVECTIVE OUTLOOK</u></p>  <p>Info on SPC Products</p>	<p>The NWS Storm Prediction Center (SPC) provides forecasts and watches for severe thunderstorms and tornadoes over the contiguous United States.</p>
<p><u>NATIONAL DIGITAL FORECAST DATABASE</u></p>  <p>Info on the NDFD</p>	<p>The National Digital Forecast Database (NDFD) is a suite of gridded forecasts of sensible weather elements.</p>
<p><u>TROPICAL WX OUTLOOK</u></p>  <p>Info on the NHC</p>	<p>The NWS National Hurricane Center (NHC) provides forecasts, watches, and warnings for tropical storms and hurricanes.</p>
<p><u>SURFACE PROG CHARTS</u></p>  <p>Info on the Surface Prog Chart</p>	<p>Prog Charts are forecasts for surface conditions. The Weather Prediction Center (WPC) provides an analysis updated every 3 hours plus 12 and 24 hour forecasts updated 4 times per day and a 36 and 48 hour forecast updated twice per day. WPC also issues medium range forecasts every day from 3-7 days . These forecasts are valid for the contiguous United States.</p>
<p><u>WINDS/TEMPS ALOFT</u></p>  <p>Info on Winds/Temp Aloft Page</p>	<p>The Winds/Temps page provides 2D graphics of winds and temperatures at a multitude of altitudes from the current time until multiple days in the future.</p>

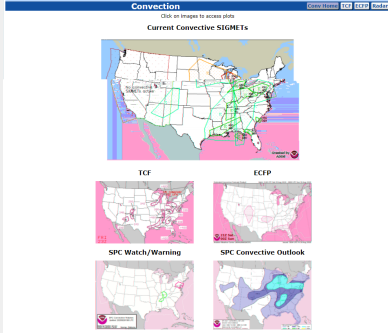
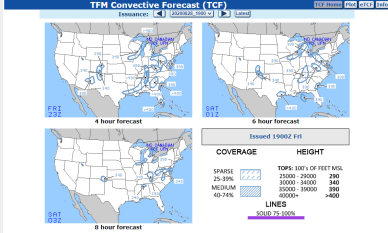
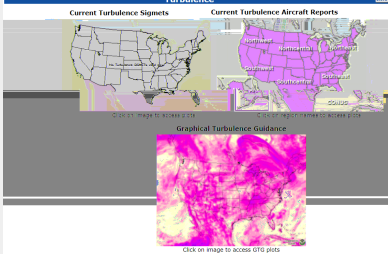
<p><u>FREEZING LEVEL FORECAST</u></p>  <p>Lowest freezing level (100s of feet MSL) Analysis valid 0000 UTC Thu 27 Aug 2020</p>	<p>The Freezing Level Forecast is an hourly graphical freezing level forecast. It goes out to 18 hours in the future.</p>
<p><u>TAF FORECASTS</u></p>  <p>How to interpret a TAF Forecast</p>	<p>A Terminal Aerodrome Forecast (TAF) is the international standard code format for terminal forecasts issued for airports. TAFs are valid for 24 or 30 hour time periods and are issued 4 times a day at 6 hour intervals.</p>
<p><u>NWS WFO DISCUSSIONS</u></p> 	<p>Aviation Area Forecast Discussions (AFD) are issued by each NWS weather service forecast office (WFO) to describe the weather conditions within their region as it relates to the creation of the TAF. These discussions point out aviation related issues that cannot be encoded into the TAF. The discussion also gives some reasoning behind the forecast. AFDs are generated roughly every 6 hours and correspond to the release of the latest TAFs for that office.</p>
<p><u>EXTENDED TCF</u></p>  <p>Extended TCF Help Page</p> <p>Extended TCF Product Description Document</p>	<p>The Extended Convective Forecast Product (ECFP) Planning Tool graphically depicts the forecast probability of thunderstorms. The product shows where in the U.S. thunderstorms are likely over the next 72 hours. The ECFP is intended to enhance the TFM Collaborative Forecast (TCF). The TCF is only valid out to 8 hours. The product is not a TCF forecast (it is not forecasting the exact TCF criteria), but intended to support the long range planning for TCF type of constraints in the National Airspace System.</p>

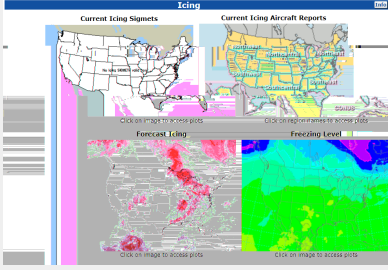
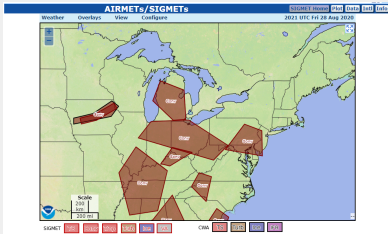
3 DAY OF DEPARTURE

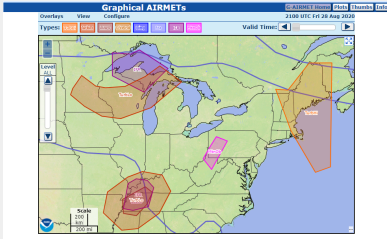
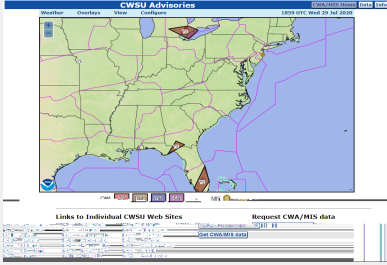


On your day of departure, review weather data found in the pre-flight section as well as the following products.

<p><u>GRAPHICAL FORECASTS FOR AVIATION TOOL</u></p>  <p>GFA Help Page</p> <p>Short GFA tutorial video</p> <p>NWS Product Description Document (PDD)</p>	<p>The Graphical Forecasts for Aviation (GFA) web page gives users a complete picture of the weather that may impact flights CONUS, the Gulf of Mexico, the Caribbean, Alaska and Hawaii, and portions of the Atlantic and Pacific Oceans.</p>
<p><u>LOW LEVEL SIG WEATHER</u></p>  <p>Low Level SigWX Chart Help</p>	<p>The low-level graphics product is a forecast of aviation weather hazards. It is primarily intended to be used as a guidance product for briefing the VFR pilot.</p>

<p><u>CONVECTIVE PRODUCTS</u></p> 	<p>On the AWC web page you can find information on convective impacts on aviation.</p>
<p><u>TRAFFIC FLOW MANAGEMENT CONVECTIVE FORECAST</u></p>  <p>TCF Product Description Document</p>	<p>The TCF is a high confidence graphic of forecasted convection meeting specific criteria for coverage, intensity, and echo top height. The TCF graphics are produced every 2 hours and are valid at 4-, 6-, and 8- hours after issuance time.</p> <p>TCF Help Page</p>
<p><u>TURBULENCE PRODUCTS</u></p>  <p>Turbulence Help Page</p> <p>GTG Graphics</p> <p>Tutorial on using the GTG</p>	<p>The Turbulence page depicts Graphical Turbulence Guidance (GTG). This product forecasts turbulence from the surface to FL 450 with 0, 1, 2, 3, 6, 9, 12, 15 and 18 hour lead-times. It is driven by and synchronized with NOAA's "Rapid Refresh" of the RAP forecast model.</p>

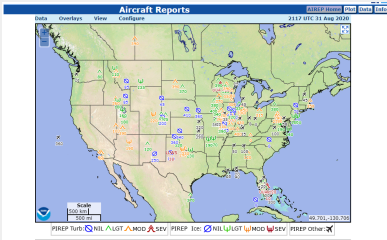
<p><u>ICING PRODUCTS</u></p>  <p>Icing Help Page</p> <p>Using the CIP/FIP pages</p> <p>How to Properly Use an Icing Forecast</p>	<p>On the AWC web page you can find information on forecast (FIP) and current icing (CIP) conditions.</p>
<p><u>SIGMETS</u></p>  <p>SIGMET Help</p> <p>SIGMET Display Help</p>	<p>A U.S. SIGMET advises of weather, other than convective activity, that is potentially hazardous to all aircraft. SIGMETs are issued (for the lower 48 states and adjacent coastal waters) for up to 6 hours. SIGMETS are issued for the following weather-related reasons:</p> <ul style="list-style-type: none">● Severe Icing● Severe or Extreme Turbulence● Dust storms and/or sand storms lowering visibilities to less than 3 miles● Volcanic Ash

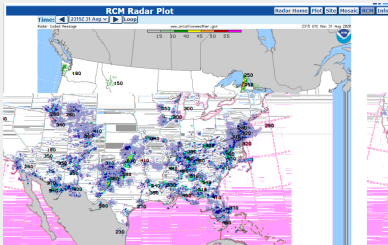
<p style="text-align: center;">G- AIRMETS</p>  <p>G-AIRMET Help</p> <p>G-AIRMET Display Help</p> <p>G-AIRMET Thumbnails</p>	<p>A G-AIRMET is a graphical advisory of weather that may be hazardous to aircraft. This product is for conditions less severe than SIGMETs. G-AIRMETS are issued at discrete times 3 hours apart for a period of up to 12 hours into the future (00, 03, 06, 09, and 12 hours). They are issued at 03:00, 09:00, 15:00 and 21:00 UTC, with updates issued as necessary.</p> <p>The aviation hazards depicted in the G-AIRMET are Turbulence, Low Level Wind Shear, Strong Surface WInds, Icing, Freezing Level, IFR and Mountain Obscuration.</p>
<p style="text-align: center;">CWSU ADVISORIES</p>  <p>CWSU Product Help</p>	<p>NWS Center Weather Service Units (CWSU) are co-located with FAA Air Route Traffic Control Centers (ARTCC) facilities. They issue two aviation products.</p> <p>The Center Weather Advisory (CWA) is valid for up to two hours for conditions meeting or approaching national in-flight advisory criteria (AIRMET or SIGMET).</p> <p>The Meteorological Impact Statement (MIS) is an unscheduled flow control and flight operations planning forecast. It is a non-technical forecast and briefing product for personnel at ARTCC, ATCSCC, TRACONS, and ATCTs who are responsible for making flow control-type decisions.</p>

4 EN ROUTE PRODUCTS

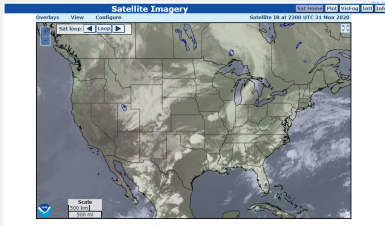


The products listed in the table below can be used for pre-flight, day of departure or en-route planning.

<p>AIRCRAFT REPORTS (PIREPS)</p>  <p>PIREP Plots Realtime PIREP raw data reports</p> <p>Aircraft Report Help</p> <p>Aircraft Report Plot Help</p> <p>Aircraft Report Data Help</p>	<p>An Aircraft Report is a report of actual weather conditions encountered by an aircraft while in flight. There are two types of reports, AIREPS and PIREPS:</p> <p>An AIREP is a routine, often automated report of in-flight weather conditions such as wind and temperature.</p> <p>A PIREP is a pilot report detailing encounters of hazardous weather such as icing or turbulence.</p> <p>Both reports are sent in real-time via radio to a ground station.</p>
---	---

<p style="text-align: center;">METARs</p>  <p>Impacts METAR Board METAR Plots Realtime METAR raw Data</p> <p>METAR Help Overview Impacts METARs Help Interpreting METARs Interpreting METAR Plots</p>	<p>Weather stations worldwide report conditions hourly using the WMO approved METAR format (see WMO code manual FM-15 and FM-16). These data are centrally collected by each country and distributed internationally by the WMO and other services.</p>
<p style="text-align: center;">RADAR IMAGERY</p>  <p>Static Radar Plot Radar Mosaics</p> <p>Radar Help Overview</p>	<p>There are 159 NEXRAD radars systems deployed in the United States and around the world. These radars use WSR-88D technology. The "Doppler" capability of these radars uses shifts in the phase of the reflected energy to determine the velocity of the particles towards or away from the radar. The effective detection range is between 80 and 140 nautical miles, depending on the intensity of the precipitation. In clear air mode, these radars transmit data every 10 minutes. In precip mode, they transmit every 4 to 6 minutes.</p>

SATELLITE IMAGERY



[Regional Satellite Imagery](#)

[International Satellite Imagery](#)

[Satellite Help Overview](#)

[Satellite Image Types](#)

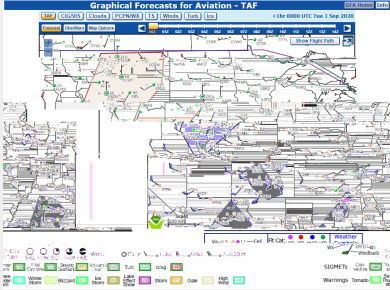
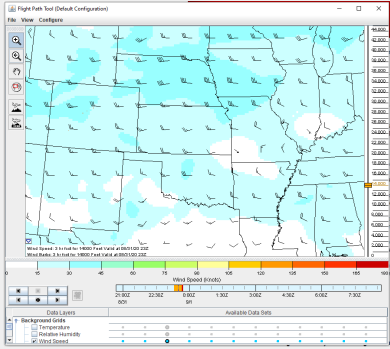
The satellite page contains links to national-scale and regional-scale satellite images from the GOES-17 (West) and GOES-16 (East) satellites, as well as international satellites from across the globe. There are also links to satellite images with the LIFR/IFR/VFR/MVFR icons overlaid.

Images are provided for three of the different wavelength sensors on the satellite: Infrared (IR), Water Vapor, and Visible/Fog.

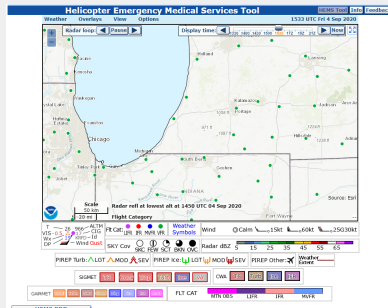
5 AVIATION WEATHER TOOLS



The Aviation Weather Center produces several tools that serve to help the aviation community.

<p>GRAPHICAL FORECASTS FOR AVIATION TOOL</p>  <p>GFA Help Page</p> <p>Short GFA tutorial video</p> <p>NWS Product Description Document (PDD)</p>	<p>The Graphical Forecasts for Aviation (GFA) web page gives users a complete picture of the weather that may impact flights CONUS, the Gulf of Mexico, the Caribbean, and portions of the Atlantic and Pacific Oceans.</p>
<p>FLIGHT PATH TOOL</p>  <p>Flight Path Tool Info</p> <p>Flight Path Tool Tutorial</p>	<p>The Flight Path Tool (FPT) is a comprehensive, interactive, geographical display that brings together all of the weather products available on ADDS. It runs as a desktop application for maximum performance.</p> <p>The Flight Path Tool can overlay multiple fields of interest: icing (probability, severity, and supercooled large drops), turbulence potential, convective diagnosis and forecast, ceiling, visibility, flight category, winds, relative humidity, temperature, radar (base and composite reflectivity), satellite observations (visible, infra-red, and water vapor wavelengths), AIRMETs and SIGMETs, METARs, TAFs, and PIREPs.</p>

**HELICOPTER EMERGENCY
MEDICAL SERVICES (HEMS)
TOOL**



[HEMS Overview](#)

[Products Help](#)

[Tutorial](#)

[Product Description Document](#)

This tool is designed to show weather conditions for short-distance and low-altitude flights that are common for the helicopter emergency medical services (HEMS) community.

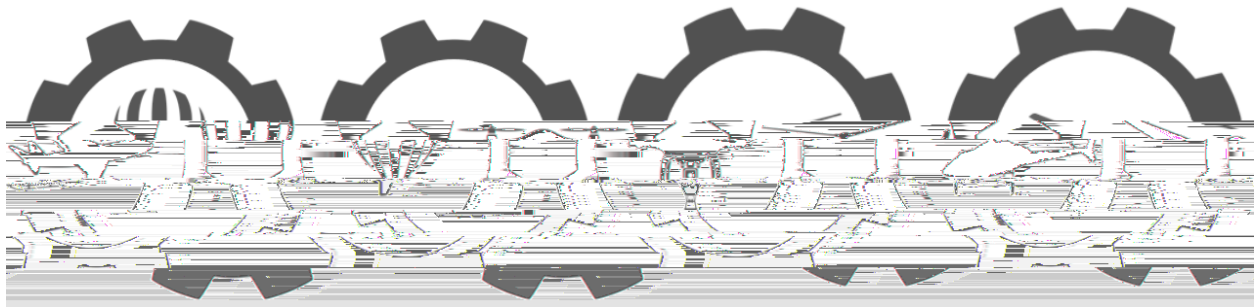
TEXT DATA SERVER (TDS)

```
<response version="1.3" xsi:namespaceSchemaLocation="
"http://aviationweather.gov/adds/schema/metar1_2.xsd">
<request_index>926</request_index>
<data_source name="metars"/>
<request type="retrieve"/>
<errors/>
<warnings/>
<time_taken_ms>5</time_taken_ms>
<data_num_results="7"/>
<METAR>
<raw_text>KDEN 062253Z 06009KT 10SM FEW090 SCT180 26/00 A3007
RMK AO2 5LP123 T02610000</raw_text>
<station_id>KDEN</station_id>
<observation_time>2013-06-06T22:53:00Z </observation_time>
<latitude>39.83</latitude>
<longitude>-104.65</longitude>
<temp_c>26.1</temp_c>
<dewpoint_c>0.0</dewpoint_c>
<wind_dir_degrees>60</wind_dir_degrees>
<wind_speed_kt>9</wind_speed_kt>
<visibility_statute_mi>10.0</visibility_statute_mi>
<altim_in_hg>30.070866</altim_in_hg>
<sea_level_pressure_mb>1012.3</sea_level_pressure_mb>
<quality_control_flags>
<auto_station>TRUE</auto_station>
</quality_control_flags>
<sky_condition sky_cover="FEW" cloud_base_ft_agl="9000"/>
<sky_condition sky_cover="SCT" cloud_base_ft_agl="18000"/>
<flight_category>VFR</flight_category>
<metar_type>SPIC</metar_type>
<elevation_m>1648.0</elevation_m>
</METAR>
...
```

The Text Data Server complements and enhances the AWC website by providing direct and queryable access to much of the real-time data that is depicted elsewhere on the site.

Current data is collected every five minutes and is available here in XML, CSV, and gzip formats.

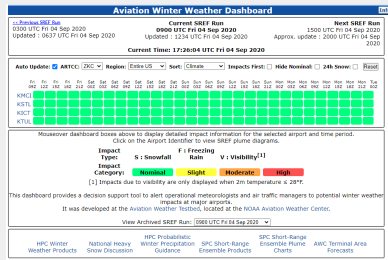
6 DECISION SUPPORT TOOLS



These tools are designed for specific aviation applications to aid both pilots and decision makers.

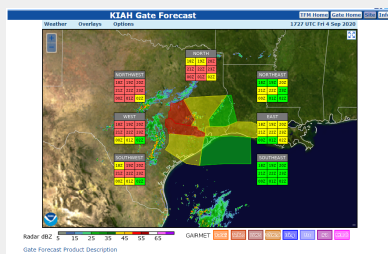
<p>TRAFFIC FLOW MANAGEMENT PORTAL</p>	<p>One stop shop for Traffic Flow Management decision makers.</p> <p>The webpage is broken down into three sections:</p> <ul style="list-style-type: none"> • Planning and Forecasting • Tactical • Post Analysis (Archive)
<p>IMPACTS TAF BOARD</p>	<p>The Impacts TAF Board is a fully customizable time series display of current and forecast conditions, color coded to alert the user to potential impacts.</p>

WINTER WEATHER DASHBOARD



This dashboard provides a decision support tool to alert operational meteorologists and air traffic managers to potential winter weather impacts at major airports.

TFM GATE FORECASTS



[Help Page](#)

[Gate Forecast Product Description](#)

There is a need for forecasts of significant weather in arrival and departure sectors for the top airports. These sectors, also called gates, are polygonal regions which roughly follow ARTCC low level sectors where arrivals and departures to these airports will be routed. It is important to know whether significant weather, such as thunderstorms, could affect large portions of the sectors so that traffic can be rerouted to other sectors if needed.

AWC STANDARD BRIEFING WEBPAGE



The AWC "Standard Briefing" page is designed to help pilots and aircrews with flight planning and familiarization. Use the page in conjunction with other pre-flight information sources needed to satisfy all the requirements of 14 CFR 91.103. It should not be your sole source of information to meet preflight action. Pilots can receive a complete preflight briefing from a Flight Service Station (1-800-WXBRIEF).

To have a better understanding what is recommended in a standard briefing, the FAA has training courses available [here](#).

<p><u>AIRPORT WEATHER WARNINGS (AWW)</u></p> <p>Airport Weather Warning</p> <p>Click on the specific site below to view the Airport Weather Warning product(s): NWS Weather Forecast Office Identifier</p> <ul style="list-style-type: none">AMA - Amarillo, TXAUS - Austin/San Antonio, TXBED -BMX - Birmingham, ALBRO - Brownsville, TXBUF - Buffalo, NYCRP - Corpus Christi, TXCRW - Charleston, WVDFW - Dallas/Fort Worth, TXELP - El Paso, TXEYW - Key West, FLGSP - Greer, SCGUM - Tivan, GuamHUN - Huntsville, ALMFR - Medford, ORMHT -MSO - Missoula, MTRDD -SAT - Austin/San Antonio, TXSHV - Shreveport, LASLC - Salt Lake City, UTTPA - Tampa Bay Area, FL	<p>The AWW alerts airports about weather with the potential to impact ground operations. Specific warning criteria are decided by local airport management and the supporting Weather Forecast Office. The AWW complements and is consistent with existing NWS warnings and forecasts to the maximum extent possible.</p>
---	---

6.1 SOCIAL MEDIA


Many offices and organizations maintain accounts on social media platforms such as Twitter, Facebook, etc. where they post aviation information that's relevant to their local areas.

DO NOT RELY ON SOCIAL MEDIA FOR CURRENT AVIATION WEATHER HAZARDS OR INFORMATION. Always visit www.weather.gov or www.aviationweather.gov for the latest weather observations and aviation forecasts.

Social media links		
Office	Twitter	Facebook
Aviation Weather Center (AWC)	https://twitter.com/NWSAWC	https://www.facebook.com/US.NOAA.AviationWeatherCenter
Alaska Aviation Weather Unit (AAWU)	--	--
Hawai'i Aviation Products	--	--
CWSU Albuquerque (KZAB)	https://twitter.com/NWSCWSUZAB	--
CWSU Anchorage (PAZA)	https://twitter.com/NWSCWSUZAN	--
CWSU Atlanta (KZTL)	--	--
CWSU Boston (KZBW)	https://twitter.com/NWSCWSUZBW	--
CWSU Chicago (KZAU)	--	--
CWSU Cleveland (KZOB)	--	--
CWSU Denver (KZDV)	--	--
CWSU Fort Worth (KZFW)	--	--
CWSU Houston (KZHU)	--	--
CWSU Indianapolis (KZID)	--	--
CWSU Jacksonville (KZJX)	--	--

CWSU Kansas City (KZKC)	--	--
CWSU Los Angeles (KZLA)	--	https://www.facebook.com/NWSCWSUZLA
CWSU Memphis (KZME)	--	https://www.facebook.com/CWSUMemphis
CWSU Miami (KZMA)	--	--
CWSU Minneapolis (KZMP)	--	--
CWSU New York (KZNY)	--	https://www.facebook.com/NWSCWSUZNY
CWSU Oakland (KZOA)	https://twitter.com/NWSCWSUZOA	https://www.facebook.com/NWSCWSUZOA
CWSU Salt Lake City (KZLC)	https://twitter.com/NWSCWSUZLC	--
CWSU Seattle, WA (KZSE)	https://twitter.com/NWSCWSUZSE	https://www.facebook.com/NWSCWSUZSE
CWSU Washington (KZDC)	--	--

6.2 NWS Aviation Webpages



Use this page to access a wide range of aviation weather information. Sections include NWS In Aviation, Hazards in Aviation, Aviation Partners, Supporting Offices, NWS Aviation Outreach, Aviation Technical Resources, and Aviation Careers.

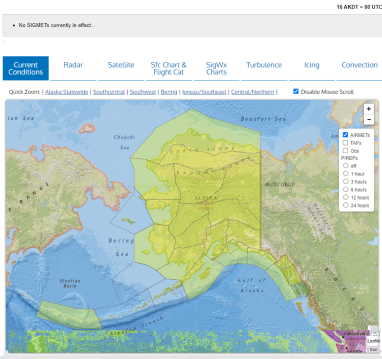
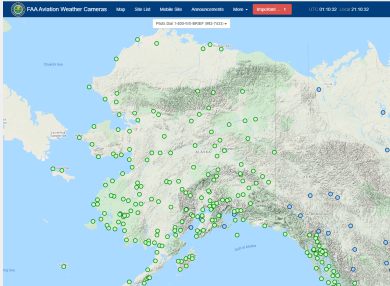
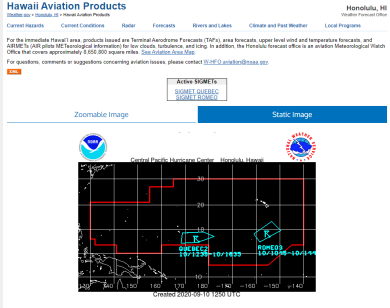
Many NWS offices have their own aviation meteorology web page. These pages are useful for local pilots to use to find pertinent information and links for their area.

NWS OFFICE		
Aberdeen SD	Great Falls, MT	Omaha, NE
Albany, NY	Green Bay, WI	Paducah, KY
Albuquerque, NM	Greer, SC	Pendleton, OR
Amarillo, TX	Guam	Philadelphia, PA
Anchorage, AK	Hanford, CA	Phoenix, AZ
Atlanta, GA	Hastings, NE	Pittsburgh, PA
Billings, MT	Honolulu, HI	Pleasant Hill, MO
Binghamton, NY	Houston, TX	Pocatello, ID
Birmingham, AL	Huntsville, AL	Portland, ME
Bismarck, ND	Indianapolis, IN	Portland, OR

Blacksburg, VA	Jackson, MS	Pueblo, CO
Boise, ID	Jackson, KY	Quad Cities, IA
Boston, MA	Jacksonville, FL	Raleigh, NC
Brownsville, TX	Juneau, AK	Rapid City, SD
Buffalo, NY	Key West, FL	Reno, NV
Burlington, VT	Knoxville, TN	Riverton, WY
Caribou, ME	La Crosse, WI	Sacramento, CA
Charleston, SC	Lake Charles, LA	Salt Lake City, UT
Charleston, WV	Las Vegas, NV	San Angelo, TX
Cheyenne, WY	Lincoln, NE	San Antonio, TX
Chicago, IL	Little Rock, AR	San Diego, CA
Cleveland, OH	Los Angeles, CA	San Francisco, CA
Columbia, SC	Louisville, KY	San Juan, PR
Corpus Christi, TX	Lubbock, TX	Seattle, WA
Denver, CO	Marquette, MI	Shreveport, LA
Des Moines, IO	Medford, OR	Sioux Falls, SD
Detroit, MI	Melbourne, FL	Spokane, WA
Dodge City, KS	Memphis, TN	Springfield, MO
Duluth, MN	Miami, FL	St Louis, MO
El Paso, TX	Midland, TX	State College, PA
Elko, NV	Milwaukee, WI	Sterling, VA
Eureka, CA	Minneapolis, MN	Tallahassee, FL
Fairbanks, AK	Missoula, MT	Tampa, FL
Flagstaff, AZ	Mobile, AL	Topeka, KS

Fort Worth, TX	Northern Indiana	Tucson, AZ
Gaylord, MI	Nashville, TN	Tulsa, OK
Glasgow, MT	New Orleans, LA	Wakefield, VA
Goodland, KS	New York, NY	Wichita, KS
Grand Forks, ND	Newport, NC	Wilmington, NC
Grand Junction, CO	Norman, OK	Wilmington, OH
Grand Rapids, MI	North Platte, NE	

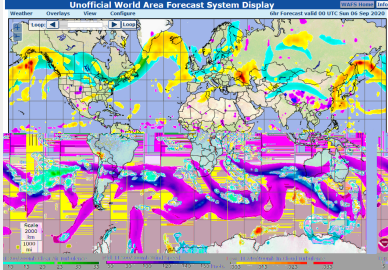
7 ALASKA / HAWAI'I PRODUCTS

<p><u>ALASKA AVIATION WEATHER UNIT (AAWU) WEBPAGE</u></p> 	<p>The AAWU is a one stop shop for aviation weather information for Alaska and the surrounding waters.</p> <p>The page is broken up into the following categories:</p> <ul style="list-style-type: none"> ● Current Conditions ● Radar ● Satellite ● Surface Chart and Flight Categories ● SigWX Charts ● Turbulence ● Icing ● Convection
<p><u>ALASKA AVIATION WEATHER CAMERAS</u></p>  <p>For Further Information</p>	<p>These webcams have been installed at airports throughout Alaska to provide additional weather data.</p>
<p><u>HAWAI'I AVIATION PRODUCTS</u></p>  <p>Forecast Area Map</p>	<p>Aviation products for the immediate Hawai'i area include: TAFs, area forecasts, upper level wind and temperature forecasts, and AIRMETs for low clouds, turbulence, and icing.</p> <p>In addition, the Honolulu forecast office is an aviation Meteorological Watch Office that covers approximately 8,650,800 square miles.</p>

8 INTERNATIONAL PRODUCTS



The AWC is one of two world area forecast centers with global responsibility. The other center is the UK Meteorological Office in Exeter, England.

<p><u>WORLD AREA FORECAST SYSTEM DISPLAY</u></p>  <p>WAFS Data Help</p> <p>WAFS Product Description Document</p> <p>WAFS Internet File Service (WIFS) Data (requires username and password)</p>	<p>The World Area Forecast Center (WAFC) in Washington, DC is one of two international WAFCS.</p> <p>The WAFC produces Global Significant Weather Charts used in flight planning and dispatch; the WAFC Internet File System (WIFS); WAFC global grids, and wind and temperature charts.</p> <p>The WAFS website demonstrates how the WAFS gridded data can be displayed. The display is not approved for use by either the FAA or ICAO, though the underlying gridded data are approved for use in support of flight planning. WAFS gridded data are available on the WAFS Internet File Service to FAA approved users. For more information on how to gain access to the gridded data, see the link to the WAFS website.</p>
--	--

INTERNATIONAL FLIGHT FOLDER PROGRAM



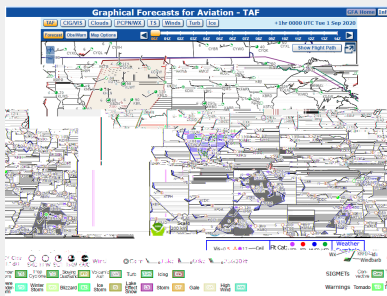
[Overview](#)

The flight folder consists of the following pertaining to the route of flight and approximate altitude:

- Wind and temperature aloft forecast charts SIGWX
- Significant weather charts (with abbreviated plain language descriptions of forecasts as appropriate)
- TAFs for departure, destination and alternate
- SIGMET charts of tropical cyclones and/or volcanic ash as appropriate
- For flights of 2 hours or less, aerodrome reports (METAR), special reports (SPECI), SIGMETs (for any phenomena), and appropriate special air reports (AIREP).

Flight folders in PDF format can easily be created.

GRAPHICAL FORECASTS FOR AVIATION TOOL



[GFA Help Page](#)

[Short GFA tutorial video](#)

[NWS Product Description Document \(PDD\)](#)

The Graphical Forecasts for Aviation (GFA) web page is intended to provide the necessary aviation weather information to give users a complete picture of the weather that may impact flight in CONUS, the Gulf of Mexico, the Caribbean, and portions of the Atlantic and Pacific Oceans.

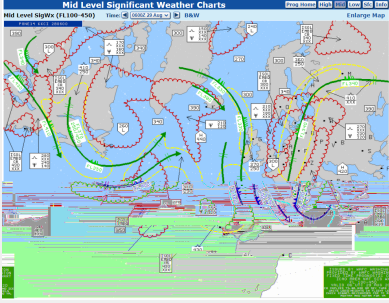
HIGH LEVEL SIG WEATHER



[High Level SigWX Chart Help](#)

High level SIGWX charts are valid at specific fixed times: 0000, 0600, 1200, and 1800 UTC. They show significant en-route weather phenomena over a range of flight levels from 250 to 630 as well as associated surface weather features.

**MID LEVEL SIG WEATHER
for the North Atlantic**



[Mid Level SigWX Chart Help](#)

The AWC routinely provides a Mid Level Significant Weather chart, between FL100 and FL450, for the North Atlantic Ocean Region (NAT).

The presentation of significant weather on the mid level significant weather chart is similar in many respects to that on High Level Significant Weather charts. The detail required, however, is more extensive because the bottom of the chart is now at FL100 instead of FL250. Aircraft flying at these lower levels in the atmosphere, below FL250, will more likely encounter larger areas of icing and turbulence.

VOLCANIC ASH ADVISORIES

Current Volcanic Ash Advisories
Washington VAAC

The five most recent messages are listed first, followed by an alphabetical listing by volcano name.
Where available, graphics are attached to the volcanic ash advisories.

Help To: - Flight, Forecast, Awareness, Support

Top Level: All Messages

Advisories Last Updated: Wed Sep 9 23:48:13 UTC 2010

Most recent five messages, regardless of volcano:

- 09 Sep 2010 22:25:15Z WASHINGTON VAAC (WAS) (L) (L) (L) (L) (L)
- 09 Sep 2010 22:25:15Z WASHINGTON VAAC (WAS) (L) (L) (L) (L) (L)
- 09 Sep 2010 22:25:15Z WASHINGTON VAAC (WAS) (L) (L) (L) (L) (L)
- 09 Sep 2010 22:25:15Z WASHINGTON VAAC (WAS) (L) (L) (L) (L) (L)
- 09 Sep 2010 22:25:15Z WASHINGTON VAAC (WAS) (L) (L) (L) (L) (L)

ALPHABETICALLY:

- 09 Sep 2010 22:25:15Z WASHINGTON VAAC (WAS) (L) (L) (L) (L) (L)
- 09 Sep 2010 22:25:15Z WASHINGTON VAAC (WAS) (L) (L) (L) (L) (L)
- 09 Sep 2010 22:25:15Z WASHINGTON VAAC (WAS) (L) (L) (L) (L) (L)
- 09 Sep 2010 22:25:15Z WASHINGTON VAAC (WAS) (L) (L) (L) (L) (L)
- 09 Sep 2010 22:25:15Z WASHINGTON VAAC (WAS) (L) (L) (L) (L) (L)

The five most recent messages are listed first, followed by an alphabetical listing by volcano name.

Where available, graphics are attached to the Volcanic Ash Advisories.

9 TROPICAL PRODUCTS



The National Hurricane Center (NHC) in Coral Gables, Florida and the Central Pacific Hurricane Center in Honolulu, Hawaii Produce Tropical Cyclone Advisories (TCA) for aviation interests.

<p>Tropical Cyclone ICAO Aviation Advisory</p> <p style="text-align: center;">Example -Tropical Cyclone ICAO (Aviation) Advisory</p> <pre> FKPZ22 KNHC 220858 TCAPZ2 TROPICAL STORM LONELL 30AO ADVISORY NUMBER 7 NWS NATIONAL HURRICANE CENTER PHSWS FL 09172020 0900 UTC TUE SEP 22 2020 TC ADVISORY DTG: 20200922/0900Z TC: KNHC TC: LONELL ADVISORY NR: 2020/087 ISS POS: 22/0900Z NO: 06G 11KT DIRT CHANGE: NC CI: 060000G MAX WIND: 080KT FCST POS 06 HR: 22/0900 N024 101550 FCST MAX WIND 06 HR: 045KT FCST POS 12 HR: 22/0900 N046 101737 FCST MAX WIND 12 HR: 045KT FCST POS 18 HR: 23/0900 N073 101840 FCST MAX WIND 18 HR: 050K FCST POS 24 HR: 23/0900 N093 101939 090K THE FORECAST POSITION INFORMATION IN THIS PRODUCT IS INTERPOLATED FROM OFFICIAL FORECAST DATA VALID AT 0900... 0900...1200...AND 1800Z. 20200922/0900Z NXT ISS: \$S </pre> <p>TCA Product Description Document</p> <p>Current TCA Advisories</p> <p>Historical TCA Advisories</p>	<p>The Aviation Tropical Cyclone Advisory is issued to provide short term tropical cyclone forecast guidance for international aviation safety and routing purposes.</p> <p>The TCA lists the current TC position, motion, and intensity, and includes 6, 12, 18, and 24 hour forecast positions and intensities. Position and intensity information for forecast hours (+06, +12, +18 and +24) is derived from interpolated forecast information – intensity is rounded to the nearest 5 knots.</p> <p>Issuance of the Aviation Tropical Cyclone Advisory occurs every six hours at the regular advisory issuance time of 0300, 0900, 1500, and 2100 UTC. The bulletin's information is valid at the routine advisory times (0300, 0900, 1500 and 2100 UTC) and is not anchored to the synoptic times.</p> <p>TCAs for special advisories will be issued for the same circumstances that apply for a standard advisory.</p> <p>World Meteorological Organization (WMO) and AWIPS (in parenthesis) headers: FKNT21-25 KNHC (MIATA ANT1-5) – Atlantic FKPZ21-25 KNHC (MIATCAPZ1-5) – E. Pacific FKPA21-25 PHFO (HFOTCAPA1-5) – C. Pacific</p>
--	---

11 Appendix A: Acronyms and Abbreviations

For a complete list of FAA approved acronyms, please refer to [Chapter 2 of FAA Contractions Manual](#).

Acronym - Term	Purpose/Area of Responsibility
AAWU - Alaska Aviation Weather Unit	NWS aviation weather unit in Alaska.
ADDS - Aviation Digital Data Service	Text, digital, and graphical forecasts, analysis and observations of aviation related weather variables.
AFD - Aviation Forecast Discussion	Discussion of forecast conditions that may affect TAFs and aviation issued by NWS WFO offices for their areas.
AIRMET - AIRman's METeorological Information	<p>An AIRMET is a concise description of the occurrence or expected occurrence of specified en route weather phenomena which may affect the safety of aircraft operations, but at intensities lower than those which require the issuance of a SIGMET.</p> <p>AIRMETs are intended to inform all pilots, but especially Visual Flight Rules pilots and operators of sensitive aircraft, of potentially hazardous weather phenomena. Freezing level information is included.</p> <p>AIRMETs are issued by the AWC and AAWU as soon as is practical to alert operators and aircrews of hazardous en route conditions.</p>
AIREP - Aircraft Report	A routine, often automated report of in-flight weather conditions, such as wind and temperature.
ARTCC - Air Route Traffic Control Center (ARTCC), also called "Center")	Provides air traffic control service to aircraft operating on IFR flight plans within controlled airspace, principally during the en route phase. When equipment capabilities and controller workload permit, ARTCC may provide advisory/assistance services to VFR aircraft. There are 21 ARTCCs in CONUS

<p>ATCSCC - Air Traffic Control Systems Command Center</p>	<p>The air traffic tactical operations facility responsible for monitoring and managing the flow of air traffic throughout the NAS.</p>
<p>ATCT - Air Traffic Control Tower</p>	<p>A terminal facility that provides air traffic control services to aircraft landing or taking off at a towered airport or transiting an adjoining Class D airspace.</p>
<p>AWC - Aviation Weather Center</p>	<p>The AWC provides a single source for aviation warnings, advisories and forecasts over the contiguous 48 states and large portions of the Atlantic and Pacific Oceans. The center provides meteorological watch office (MWO) services issuing Sigmet and Airmets over domestic and international U.S. Flight Information Regions (FIRs) to provide warnings and advisories of hazardous weather conditions to inflight aircraft.</p> <p>The AWC also prepares Area Forecasts of weather for general aviation over the contiguous United States. Specific meteorological services are additionally provided for continuous operations of the Federal Aviation Administration's Air Traffic Control System Command Center (ATCSCC).</p> <p>The AWC serves as a World Area Forecast Center (WAFC). The WAFC functions includes the distribution of gridded upper level wind and temperature forecasts, the provision of graphical of significant aviation weather for a large portion of the Northern Hemisphere, including volcanic ash dispersion after a volcano erupts.</p>
<p>AWW - Airport Weather Warning</p>	<p>NWS WFO issued weather warning for impacts to ground operations at certain airports.</p>
<p>CIP - Current Icing Product</p>	<p>AWC product for current icing SIGMETs and aircraft reports.</p>

CWA - Center Weather Advisory	CSWU advisory product.
CONUS - Continental United States	The 48 contiguous US states.
CWSU - Center Weather Service Unit	NWS weather units located in ARTCC facilities.
DSS - Decision Support Services	NWS program for providing meteorological support to emergency officials and decision makers.
ECFP - Extended Convective Forecast Product	AWC graphical representation of the forecast probability of thunderstorms. The product identifies where in the U,S, thunderstorms are likely over the next 72 hours.
FAA - Federal Aviation Administration	U.S. federal agency with the powers to regulate civil aviation.
FIP - Forecast Icing Product	AWC icing forecast product.
FPT - Flight Path Tool	AWC aviation weather tool.
Graphical-AIRMET - G-AIRMET	The Graphical-AIRMET (G-AIRMET), is a graphical forecast of en route weather hazards valid at discrete times no more than 3 hours apart for a period of up to 12 hours into the future (00, 03, 06, 09 and 12 hours). G-AIRMET is issued based on the same criteria as AIRMET.
GFA - Graphical Forecasts for Aviation	AWC tool for providing weather information.
GTG - Graphical Turbulence Guidance	AWC webpage for graphical turbulence forecasts.
HEMS - Helicopter Emergency Medical Services	AWC tool designed to show weather conditions for short-distance and low-altitude flights that are common for the HEMS community.

IFR - Instrument Flight Rules	Meteorological condition where ceilings are 500 to less than 1,000 feet above ground level and/or surface visibility is 1 mile to less than 3 miles. Areas of IFR are depicted in red on maps.
LIFR - Low Instrument Flight Rules	Meteorological condition where ceilings are less than 500 feet above ground level and/or surface visibility is less than 1 mile. Areas of LIFR are depicted in magenta on maps.
MAG - Model Analysis and Guidance	NWS suite of meteorological models.
METAR - Meteorological Terminal Air Report	A format for reporting weather information worldwide.
MIS - Meteorological Impact Statement	CWSU forecast product.
MVFR - Marginal Visual Flight Rules	Meteorological condition where ceilings are 1,000 to 3,000 feet above ground level and/or surface visibility is between 3 and 5 miles. Areas of MVFR are depicted in blue on maps.
NAS - National Airspace System	The common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas.
NDFD - National Forecast Digital Database	Seamless mosaic NWS gridded forecasts of sensible weather elements, mainly produced by NWS WFOs.

<p>NHC - National Hurricane Center</p>	<p>The National Hurricane Center (NHC) has been delegated overall national responsibility for providing hurricane forecast and warning services for the general public, the public sector, and all branches of the U.S. Government including the Department of Defense (DOD), Department of Commerce (DOC), and Department of Transportation (DOT).</p> <p>Similar responsibilities exist under the auspices of the World Meteorological Organization (WMO) to provide forecast and guidance products concerning tropical cyclones for the international community for the Atlantic, Caribbean, Gulf of Mexico, and Eastern North Pacific region. Many facets of data acquisition, from reconnaissance aircraft, satellites, ships, surface and upper air stations, radar, etc. and their analyses and interpretation, as well as interactive communication with the user communities are involved in this process.</p>
<p>NOAA - National Oceanic and Atmospheric Administration</p>	<p>Scientific agency within the U.S. States Department of Commerce.</p>
<p>NWS - National Weather Service</p>	<p>Scientific agency within NOAA tasked with providing weather forecasts, warnings of hazardous weather, and other weather-related products to organizations and the public for the purposes of protection, safety, and general information.</p>
<p>PIREP - Pilot Report</p>	<p>A report by a pilot to indicate encounters of hazardous weather such as icing or turbulence.</p>

<p>SPC - Storm Prediction Center</p>	<p>The Storm Prediction Center (SPC) is part of the National Weather Service (NWS) and the National Centers for Environmental Prediction (NCEP). Their mission is to provide timely and accurate forecasts and watches for severe thunderstorms and tornadoes over the contiguous United States. The SPC also monitors heavy rain, heavy snow, and fire weather events across the U.S. and issues specific products for those hazards. SPC uses the most advanced technology and scientific methods available to achieve this goal. Their very specialized mission requires meteorologists with a high level of expertise in convective storm forecasting, as well as excessive precipitation, winter weather, and conditions leading to high fire dangers.</p>
<p>SIGMET - Significant Meteorological Information</p>	<p>A SIGMET is a concise description of the occurrence or expected occurrence of specified en route weather phenomena which is expected to affect the safety of aircraft operations. SIGMETs are intended for dissemination to all pilots in flight to enhance safety.</p> <p>SIGMETs are issued by the AWC and AAWU as soon as is practical to alert operators and aircrews of hazardous en route conditions.</p>
<p>TAF - Terminal Aerodrome Forecast</p>	<p>A forecast product issued by NWS WFO offices for local airfields.</p>
<p>TCF - TFM Convective Forecast</p>	<p>A high confidence graphical representation of forecasted convection meeting specific criteria of coverage, intensity, and echo top height.</p>
<p>TDS - Text Data Server</p>	<p>Available from AWC, provides direct access with ability to query a large quantity of real time data.</p>
<p>TFM - Traffic Flow Management</p>	<p>The collaborative planning of air traffic to avoid exceeding airport and airspace capacity while making effective use of available capacity.</p>

TRACON - Terminal Radar Approach Control Facility	A terminal air traffic control facility that uses radar and non-radar capabilities to provide approach control services to aircraft arriving, departing, or transiting airspace controlled by the facility.
UTC - Coordinated Universal Time	The time standard used in aviation.
VFR - Visual Flight Rules	Meteorological condition where ceiling is greater than 3,000 feet and visibility is greater than 5 miles. Areas of VFR are depicted in green on maps.
WAFS - World Area Forecast Systems	WAFS provides the worldwide aviation community with operational meteorological forecasts and information about meteorological phenomena required for flight planning and safe, economic, and efficient air navigation.
WFO - NWS Weather Forecast Office	A local NWS office that issues forecasts and warnings for its specific area of responsibility. There are 122 WFOs.
WMO - World Meteorological Organization	Agency within the United Nations responsible for developing meteorological standards.
WPC - Weather Prediction Center	The Weather Prediction Center (WPC) interprets advanced numerical weather predictions in the preparation of forecast guidance products out to 10 days. These products along with the numerical predictions and their derivatives form the basis of forecasts issued by the field forecast offices of the NWS, other governmental offices and private weather services to the general public and other users of meteorological information. They also monitor the operations of communications computers and large scale computers and alerts users of NMC products of status or problems.

12 Appendix B: Products and Associated Links

12.1 Pre-Flight Products

AVIATION SURFACE AND CLOUD FORECAST GRAPHICS https://aviationweather.gov/gfa/plot
UPPER AIR FORECASTS https://mag.ncep.noaa.gov/
CONVECTIVE OUTLOOK https://www.spc.noaa.gov/products/outlook/
NATIONAL DIGITAL FORECAST DATABASE https://digital.weather.gov/
TROPICAL WX OUTLOOK https://www.nhc.noaa.gov/gtwo.php?basin=atl&fdays=5
SURFACE PROG CHARTS https://aviationweather.gov/progchart/sfc
WINDS/TEMPS ALOFT https://aviationweather.gov/windtemp
FREEZING LEVEL FORECAST https://aviationweather.gov/icing/frzlvl
TAF FORECASTS https://aviationweather.gov/taf/
NWS WFO DISCUSSIONS https://aviationweather.gov/fcstdisc
EXTENDED TCF https://aviationweather.gov/ecfp

12.2 Day of Departure

LOW LEVEL SIG WEATHER https://aviationweather.gov/progchart/low
CONVECTIVE PRODUCTS https://aviationweather.gov/convection
TRAFFIC FLOW MANAGEMENT CONVECTIVE FORECAST https://aviationweather.gov/tcf
TURBULENCE PRODUCTS https://aviationweather.gov/turbulence
ICING PRODUCTS https://aviationweather.gov/icing
SIGMETS https://aviationweather.gov/sigmet
G- AIRMETS https://aviationweather.gov/gairmet
CWSU ADVISORIES https://aviationweather.gov/gairmet

12.3 En Route

AIRCRAFT REPORTS (PIREPS) https://www.aviationweather.gov/airep
METARs https://www.aviationweather.gov/metar
RADAR IMAGERY https://www.aviationweather.gov/radar
SATELLITE IMAGERY https://www.aviationweather.gov/satellite

12.4 Aviation Weather Tools

GRAPHICAL FORECASTS FOR AVIATION TOOL https://www.aviationweather.gov/gfa
FLIGHT PATH TOOL https://www.aviationweather.gov/flightpath
HELICOPTER EMERGENCY MEDICAL SERVICES (HEMS) TOOL https://aviationweather.gov/hemst
TEXT DATA SERVER (TDS) https://aviationweather.gov/dataserver
FAA ADVISORY CIRCULAR PILOT'S GUIDE TO A PREFLIGHT BRIEFING https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_91-92.pdf

12.5 Decision Support Tools

TRAFFIC FLOW MANAGEMENT PORTAL https://aviationweather.gov/trafficflowmgmt/portal
IMPACTS TAF BOARD https://aviationweather.gov/taf/board
WINTER WEATHER DASHBOARD https://aviationweather.gov/decisionsupport/winterdashboard
TFM GATE FORECASTS https://aviationweather.gov/trafficflowmgmt/gate
AWC STANDARD BRIEFING WEBPAGE https://aviationweather.gov/briefing
AIRPORT WEATHER WARNINGS (AWW) https://forecast.weather.gov/product_sites.php?site=NWS&product=AWW

12.6 Alaska / Hawai'i Products

ALASKA AVIATION WEATHER UNIT (AAWU) WEBPAGE https://www.weather.gov/aawu/
ALASKA AVIATION WEATHER CAMERAS https://avcams.faa.gov/

HAWAII AVIATION PRODUCTS <https://avcams.faa.gov/>

12.7 International Products

WORLD AREA FORECAST SYSTEM DISPLAY <https://aviationweather.gov/wafs>

INTERNATIONAL FLIGHT FOLDER PROGRAM <https://aviationweather.gov/flightfolder>

GRAPHICAL FORECASTS FOR AVIATION TOOL <https://aviationweather.gov/gfa>

HIGH LEVEL SIG WEATHER <https://aviationweather.gov/progchart/low>

MID LEVEL SIG WEATHER FOR THE NORTH ATLANTIC <https://aviationweather.gov/progchart/mid>

VOLCANIC ASH ADVISORIES <https://www.ssd.noaa.gov/VAAC/messages.html>

12.8 Tropical Products

TROPICAL CYCLONE ICAO AVIATION ADVISORY
https://forecast.weather.gov/product_sites.php?site=NWS&product=PWS

12.9 Volcanic Ash Advisory Products

VOLCANIC ASH ADVISORIES <https://www.ssd.noaa.gov/VAAC/messages.html>