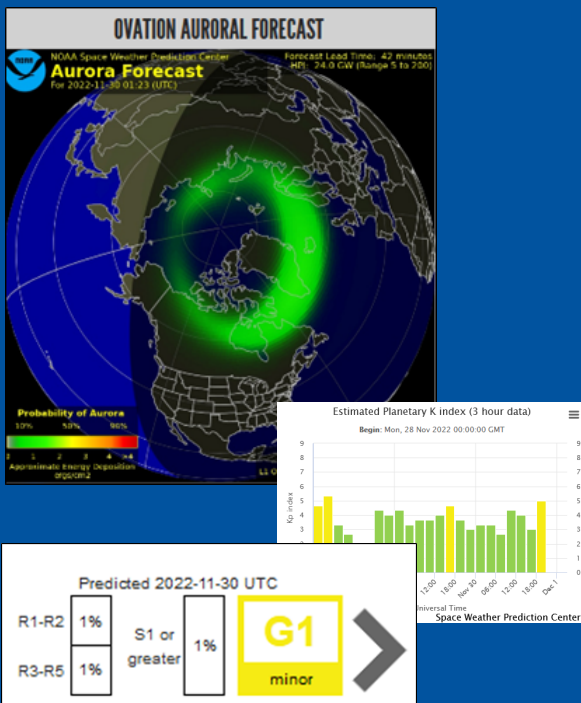


# Space Weather and Aviation

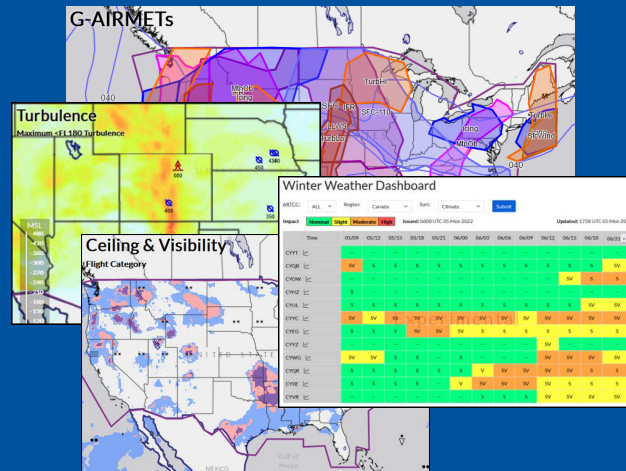
Space weather such as strong geomagnetic storms, solar flares, and other solar phenomena can affect aircraft in different ways. Solar flares and solar radiation storms can severely interfere with High Frequency (HF) radio communications and disrupt an aircraft's ability to stay in touch with the ground, especially when flying over remote areas such as the oceans and poles where HF radio usage is more common. Geomagnetic storms can negatively impact Global Positioning System (GPS) devices, resulting in significant range errors or a loss of lock on the GPS signal entirely. The Space Weather Prediction Center (SWPC) issues forecasts and advisories for solar flares, solar radiation storms, and geomagnetic storms. You can find SWPC's products at <https://www.swpc.noaa.gov/>

SWPC maintains a space weather aviation dashboard at <https://www.swpc.noaa.gov/content/aviation-community-dashboard>.



# Where to get Aviation Weather Information

The AWC website at <https://www.aviationweather.gov> provides up-to-date weather observations, forecasts, and warnings for the aviation community. Weather information is presented in an interactive map which has been customized for aviation users so they can gain a complete picture of the weather that may impact flights across the continental United States (CONUS), Alaska, and Hawai'i. The web page includes ground-based observations (METARs) as well as interactive forecasts of thunderstorms, clouds, flight category, precipitation, icing, turbulence, and wind.



To learn more about the various offices involved in aviation weather products and services as well as other aviation related information, please visit <https://www.weather.gov/aviation/>

A guide for pilots called "A Pilot's Guide to Aviation Weather Services" is available at <https://www.weather.gov/media/aviation/A%20Pilots%20Guide%20to%20Aviation%20Weather%20Services.pdf>



U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Weather Service



# AVIATION WEATHER SERVICES

"Accurate and timely weather information from takeoff to landing"

## Overview of NWS Aviation Weather Services

The National Weather Service (NWS) issues aviation products and services for the National Airspace System (NAS). Offices that issue aviation products include the Aviation Weather Center (AWC), the Alaska Aviation Weather Unit (AAWU), Center Weather Service Units (CWSUs) and Weather Forecast Offices (WFOs).

AWC, AAWU, and the WFO in Honolulu, HI (HFO) are also Meteorological Watch Offices (MWOs). MWOs are designated by the International Civil Aviation Organization (ICAO) to maintain a continuous watch over weather conditions that affect flight operations, and to issue warnings and forecasts for the aviation community.

This brochure outlines roles and responsibilities of NWS aviation offices.

## Aviation Weather Center (AWC)

AWC provides weather information to the NAS and is one of two World Area Forecast Centers (WAFCs) providing global forecasts. AWC issues several aviation weather products for the lower 48 states and adjacent coastal waters. These products include forecasts and advisories (AIRman's METeorological Information - AIRMETs) for turbulence, icing, visibility, low level wind shear, mountain obscurations, and strong surface winds as well as warnings (SIGnificant METeorological information - SIGMETs) for weather conditions that are hazardous to flying such as thunderstorms, severe turbulence and severe icing. AWC also issues aviation forecasts and SIGMETs for the Gulf of Mexico and parts of the Atlantic and Pacific Oceans. In addition, AWC disseminates graphical weather charts which contain global forecasts of jet streams, turbulence, thunderstorms and icing.

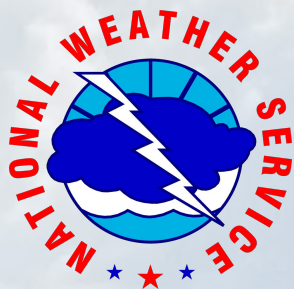
Other AWC staff are responsible for dataflow, research-to-operations and maintaining AWC's webpage. Additionally, a group of National Aviation Meteorologists (NAMs) are located at the FAA Air Traffic Control System Command Center (ATCSCC) to provide on-site tailored forecast and briefing support for the NAS.

## Alaska Aviation Weather Unit (AAWU)

AAWU provides aviation weather products and services to the flying community in Alaska. These products and services include Area Forecasts (FAs), AIRMETs, and SIGMETs for the Anchorage Flight Information Region (FIR).

In addition, the AAWU serves as the Anchorage Volcanic Ash Advisory Center (VAAC). The Anchorage VAAC is one of nine international offices providing forecasts and analyses of volcanic ash plumes. The Anchorage VAAC monitors parts of eastern Russia and Alaska along the historically active North Pacific "Ring of Fire".

The Washington DC VAAC monitors volcanic ash plumes across the remainder of the U.S. For more information on the Washington VAAC, please visit their website at <https://www.ospo.noaa.gov/Products/atmosphere/vaac/>.



## Weather Forecast Office in Honolulu, Hawai'i (HFO)

HFO maintains a meteorological watch across more than eight million square miles of the central and western Pacific. This area of responsibility covers the portion of the Oakland Oceanic FIR south of 30° N and west of 140° W. HFO issues aviation forecasts, advisories, and warnings for both domestic and international travel. These products include AIRMETs, SIGMETs, FAs, and TAFs. HFO also provides forecasts of wind and temperature aloft for the main Hawaiian Islands and surrounding waters.

## Center Weather Service Unit (CWSU)

CWSUs provide on-site tailored weather forecasts, advisories, and briefings to the 21 FAA Air Route Traffic Control Centers (ARTCCs) throughout the United States. CWSU meteorologists issue products such as the Center Weather Advisory (CWA) and Meteorological Impact Statement (MIS) to address stakeholder concerns and promote weather safety.

CWAs are short-term weather warnings, issued for periods of two hours or less. They either describe hazardous conditions not contained within national in-flight advisories and warnings (AIRMETs, SIGMETs or Convective SIGMETs) or define a hazardous area within the larger national in-flight advisory. For instance, a CWA may highlight an area of severe thunderstorms within a convective SIGMET. The MIS details weather conditions expected to adversely impact air traffic flow. The MIS is a free form product and can contain a variety of forecast information pertinent to en route air traffic control out to 12 hours and beyond.

## Weather Forecast Office (WFO)

One hundred and twenty-two NWS WFOs provide local expertise, forecasts, and warnings to their aviation communities. WFOs are staffed 24 hours a day, seven days a week. Their primary aviation responsibility is to issue Terminal Aerodrome Forecasts (TAFs). A TAF is a coded forecast consisting of aviation weather conditions expected within five statute miles of a given airport. TAFs are valid for 24 hours (30 hours at select international airports). TAFs are issued four times per day and updated as conditions warrant. TAFs include information about wind speed and direction, visibility, present weather, ceilings, and low-level wind shear. WFOs also issue an Aviation Forecast Discussion, which is a text product that highlights forecast uncertainty and possible aviation hazards not conveyed in the TAF. Airport Weather Warnings (AWW) for locally established criteria are also issued by WFOs. AWWs address weather phenomena which can adversely impact airport ground operations such as strong winds, freezing rain, heavy snow, and lightning.