

# Product Description Document

## Graphical Forecasts for Aviation

### Part 1 – Mission Connection

**1. Product Description:** The Graphical Forecasts for Aviation (GFA) are a set of web-based displays that provide observations and forecasts of weather phenomena critical for aviation safety. This product covers the continental United States (CONUS) from the surface up to Flight Level 480 (FL480) or 48,000 ft. Mean Sea Level (MSL). Wind, icing and turbulence forecasts are available in 3,000 ft. increments from the surface up to FL180 (18,000 ft. MSL), and in 6,000 ft. increments from FL180 to FL480. Turbulence forecasts are also broken into LO (below FL180) and HI (FL180 and above) graphics. A maximum icing graphic and maximum wind velocity graphic (regardless of altitude) are also available.

Multiple fields of interest are combined in categories that the user is able to select from the top of the display. Data are time synchronized and available hourly from the previous 14 hours to present (now) on the *Observations/Warnings* tab, and from 1 to 18 hours in the future (+1 to +18 hours) in the *Forecasts* category. The data for each category is determined by the time period: Observations & Warnings (current time and the previous 14 hours) and Forecasts (valid up to 18 hours in the future). Details of each category are in the following table:

Category	Layer	Data Displayed
Observations & Warnings	METARs	Station Model METARs; SIGMETs; all NWS Warnings impacting aviation; Satellite/Radar  (Now -14 hours)
Observations & Warnings	Precipitation/Weather	Weather Symbols; Convective SIGMETs; tropical cyclone, tornado, severe thunderstorm, winter storm, freezing rain, ice, and lake effect snow warnings; Satellite/Radar  (Now -14 hours)
Observations & Warnings	Ceiling/Visibility	Flight Category symbol/number; Convective SIGMETs; tropical cyclone warnings; blowing dust, blowing sand and volcanic ash SIGMETs; winter storm, blizzard, blowing dust warnings; dense fog/freezing fog/marine dense fog advisories; Satellite/Radar  (Now -14 hours with selector for FLT CAT, CIG, VIS)
Observations & Warnings	PIREPs	PIREPs; all SIGMETs; Satellite/Radar  (Now -14 hours with vertical slider)
Observations & Warnings	Radar/Satellite	Radar/Satellite; all SIGMETs; all NWS warnings impacting aviation

		(Now -14 hours)
Forecasts	TAFs	Station Model TAFs; all SIGMETs; all NWS warnings impacting aviation  (+1 to +15 hours)
Forecasts	Ceiling/Visibility	LAMP Flight Category; ceiling & visibility with weather overlay including NDFD precipitation/weather type/intensity; IFR AIRMETs; Convective SIGMETs; tropical cyclone warnings; blowing dust, blowing sand, and volcanic ash SIGMETs; winter storm, blizzard, and blowing dust warnings; dense fog/freezing fog/marine dense fog advisories  (+1 to +15 hours with selector for FLT CAT, CIG, VIS)
Forecasts	Clouds	RAP Clouds Coverage, Bases, and Tops; mountain obscuration AIRMETs; Convective SIGMETs; tropical cyclone warnings; volcanic ash SIGMETs  (+1 to +15 hours with selector for TOPS/COV/BASE)
Forecasts	Precipitation/Weather	NDFD Precipitation Type/Chance/Intensity; NDFD Weather; Convective SIGMETs; tropical cyclone warnings; volcanic ash SIGMETs; tornado, severe thunderstorm, winter storm, ice, freezing rain, and lake effect snow warnings  (+1 to +15 hours)
Forecasts	Thunderstorms	NDFD Thunderstorms Coverage/Type/Intensity; Convective SIGMETs; tropical cyclone warnings; tornado and severe thunderstorm warnings  (+1 to +15 hours)
Forecasts	Winds	RAP/NDFD Wind Speed and Gust; low level wind shear and strong surface wind AIRMETs; Convective SIGMETs; tropical cyclone warnings; gale, high wind, lake wind, winter storm, blizzard, ice, storm, and blowing dust warnings  (+1 to +15 hours; vertical slider)
Forecasts	Turbulence	Graphical Turbulence Guidance; turbulence AIRMETs; turbulence SIGMETs  (+1 to +15 hours with vertical slider)
Forecasts	Ice	FIP; NDFD Winter Precipitation/Weather Type/Chance/Intensity; Icing AIRMETs; Icing SIGMETs; winter storm, blizzard, lake effect snow warnings; freezing fog advisories  (+1 to +15 hours with vertical slider)

Additional information is available in text format when mouse-clicking on the map or using the hover function. The “Settings” menu enables the user to customize the display, including the

basemap selection, specific data displayed, and map opacity, scales, and density. Overlays include airports, heliports, runways, jet routes, airways, airspace, Air Route Traffic Control Center (ARTCC)/Flight Information Region (FIR) boundaries, Navigational Aids (NAVAIDs), fixes, highways, roads, counties, and rivers for the CONUS. More detail is also revealed as you zoom in and individual layers can be turned on or off independently.

In addition to the graphical display, static images are also available on Lambert-Conformal Conic projections. These images are issued daily every three hours, beginning at 00 UTC, and provide information on clouds, visibility, surface winds, precipitation, and weather as summarized in this table:

Static Image	Weather Grid	Weather Overlay
Clouds	RAP Clouds Coverage	RAP Cloud Base, Layers, Tops
Visibility, Surface Winds, Precipitation, and Weather	LAMP visibility	NDFD Wind Speed & Gusts; NDFD Precipitation/Weather Type/Intensity

**2. Purpose/Intended Use:** In May 2015, the National Weather Service (NWS) received a formal request from the Federal Aviation Administration (FAA) to cease production of textual Area Forecasts (FAs), contingent upon the provision of equivalent meteorological information in support of aviation. The intent of the FAA in retiring the FA and transitioning to more modern digital and graphical forecasts allows the Aviation Weather Center (AWC) to focus the efforts of forecasters on maximizing operational benefit to aviation end users, resulting in improved weather information to decision-makers.

The majority of the weather elements contained in the FA are already available through existing NWS products. To maintain continuity of service, the GFA will ensure the availability of equivalent information in addition to adding graphical displays of the predominant weather, sky cover, and wind speed and direction. The AWC’s GFA will replace the textual FA for the CONUS.

The FAA, pursuant to Title 49 United States Code Section 44720, established requirements for this weather information and service which is necessary for the safe and efficient conduct of operations in the National Airspace System (NAS).

**3. Audience/Users:** Commercial and General Aviation pilots, operators, briefers and dispatchers.

**4. Presentation Format:** The GFA contain multiple displays of weather phenomena combined in a single interactive online domain, with the additional option to view static imagery. Overlays include airports, heliports, runways, jet routes, airways, airspace, ARTCC/FIR boundaries, NAVAIDs, fixes, highways, roads, counties, and rivers for the CONUS.

**5. Feedback Method**

For further information or to provide feedback, please contact:

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## **Part 2 – Technical Description**

**1. Format and Science Basis:** The GFA combine OpenLayers displays of multiple weather parameters on a single website, with the additional option to view static imagery. The graphical display itself is not a weather product; it is a repository that aggregates a number of existing weather products into a single, quick-glance, automated display. Underlying products, except cloud and flight category data, have gone through a safety risk management process. These various graphics are overlaid on high-resolution base-maps and can be selected from the “Settings” menu. The OpenLayers environment also offers more core functionality and support for mobile devices.

### **2. Training:**

No additional training is required to generate or use the product.

### **3. Availability:**

The GFA is available 24 hours a day, 7 days a week at:

[www.AviationWeather.gov/gfa](http://www.AviationWeather.gov/gfa)

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