National Weather Service Graphical Hazards for Aviation

Graphical AIRMET (G-AIRMET)

July 2008

Graphical AIRMET
G-AIRMET

- G-AIRMET contains information related to the occurrence or expected occurrence of en-route weather phenomenon, which may affect safety of aircraft
- Issued at 03:00, 09:00, 15:00, and 21:00 UTC
  - Updates (e.g., amendments) issued as necessary
- G-AIRMET provided in Binary Universal Format Record (BUFR) format via NWS operation
  - Digital format intended for integration into customer and partners' systems
- Basic display interface on AviationWeather.gov

G-AIRMET Elements

Element	G-AIRMET
Turbulence (non-convective)	Moderate Turbulence Surface to 45,000 feet
Sustained Surface Winds	≥ 30 knots
Low Level Wind Shear (non-convective)	Wind shear (+/- 10 knots) below 2000 feet AGL
Surface Visibility	≤ 3 miles (IFR)
Cause of Surface Visibility restriction	Precipitation (PCPN), Mist (BR), Fog (FG), Haze (HZ), Smoke (FU), Blowing Snow (BLSN)
Low Ceilings	Ceiling ≤ 1000 feet (IFR)

G-AIRMET Elements (Cont.)

Element	G-AIRMET
Icing (non-convective)	Moderate Airframe Icing Surface to 45,000 feet
Freezing Level	Location of the freezing level at the Surface, 4,000, 8,000, 12,000, and 16,0000 feet
Multiple Freezing Levels	Area and vertical range
Mountain Obscuration	Area
Cause of Mountain Obscuration	Clouds (CLDS), Precipitation (PCPN), Mist (BR), Fog (FG), Haze (HZ), Smoke (FU)
SIGMETs	*Included in depiction but not provided as part of the G-AIRMET/GFA BUFR message*

G-AIRMET

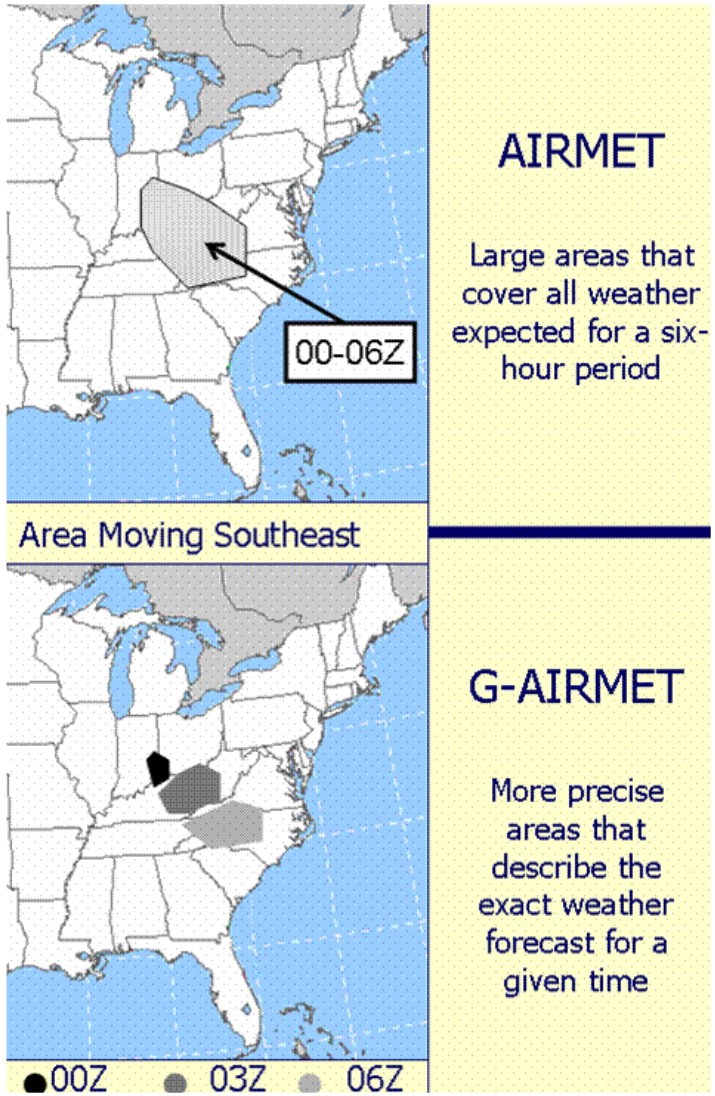
- **Intended to be displayed as a graphic**
  - Not a text message converted to a graphic
  - Data intended to be integrated into display systems
  - Not a “picture”
- **Identification of weather hazard**
  - Use Lat/Long instead of VORs
  - Uses many more points to describe with more precision
- **Quality of information**
  - More precision in time and space
  - More information than text can carry
  - Tiny communication costs

AIRMET and G-AIRMET

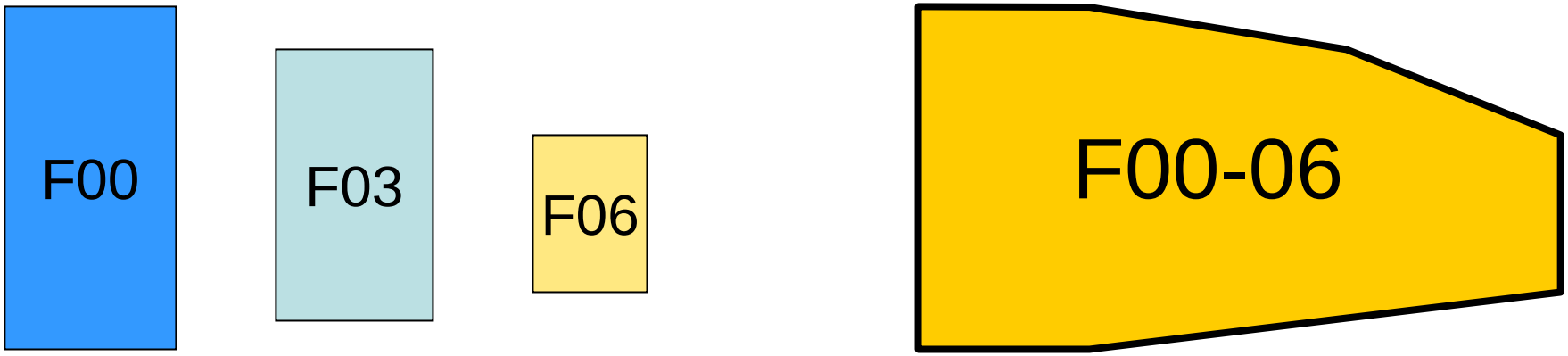
- **The text AIRMET is a product of the G-AIRMET**
  - **AIRMET and G-AIRMET fully consistent**
  - **The AIRMET contains less precision**
  - **Advisory for a period of up to 6 hours**
    - a time “smear”
  - **The text AIRMET is limited by number of characters**
  - **Uses VORs to describe extent of hazard over a period of time.**

Snapshot vs. Smear Example

- A Weather hazard is moving and expanding from southwestern North Carolina and increasing in size.
- The graphic representation of the text AIRMET at the top is forced to encompass this entire region for the full six-hour forecast period.
- The G-AIRMET at the bottom is able to depict the precise position, size, and shape of the area at three distinct times within the same forecast period.



Snapshot vs. Smear



G-AIRMET Snapshots

Area of Text AIRMET

F00 + F03 + F06 = 6 h smear

- **G-AIRMET production = Snapshots in time**
- **Snapshots turned into 6 hour smear**
- **6 h smear turned into Text AIRMET**
- **Very Similar to current forecaster practice**

Graphics-to-Text Formatter

- **In order to produce graphics and text in parallel a Graphics-to-Text Formatter is required**
  - **Translates graphical snapshots into the text version of the AIRMETS.**
  - **A formatter generates the text AIRMETs which generally do not require additional editing by the forecaster.**
- **Requires changes in current practice for text AIRMET**
  - **Proposals Adopted at G-AIRMET/AIRMET Workshop at the Aviation Weather Center, Kansas City, November 16-17, 2004**
  - **Final requirements pending final approval**

Demonstration

G-AIRMET Experimental Demonstration Display

http://aviationweather.gov/testbed/gfa/

- **Site is updated only when experiments are being conducted and is available intermittently.**
- **Data may be available some mornings.**