Graphical Forecast for Aviation (GFA)

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G-AIRMET Status

- October 1, 2008
  - AWC began making the G-AIRMET available Experimentally
  - Text AIRMET still the primary product
- Next Steps:
  - FAA to perform safety and operational suitability evaluations
  - If G-AIRMET accepted by the FAA, they will move from "experimental" directly to "primary" in designation - bypassing the "supplementary" category

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 operational communication circuits (TOC).
  - Digital format intended for integration into customers' and partners' systems
- Basic display interface on AviationWeather.gov.

AIRMET & G-AIRMET

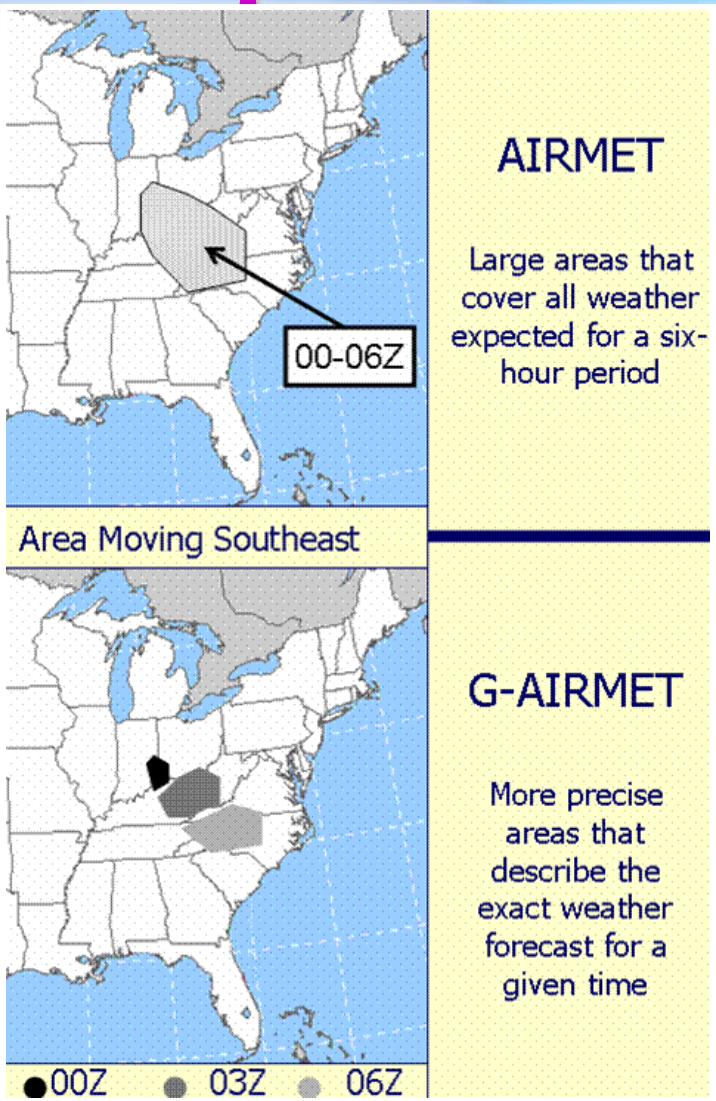
- **The text AIRMET is a product of the G-AIRMET**
  - **AIRMET and G-AIRMET fully consistent**
  - **The G-AIRMET contains more time and space precision**
    - Text AIRMET valid for a period of up to 6 hours
      - 6h time “smear”
    - Text AIRMET limited by number of text characters
    - Text AIRMET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

G-AIRMET

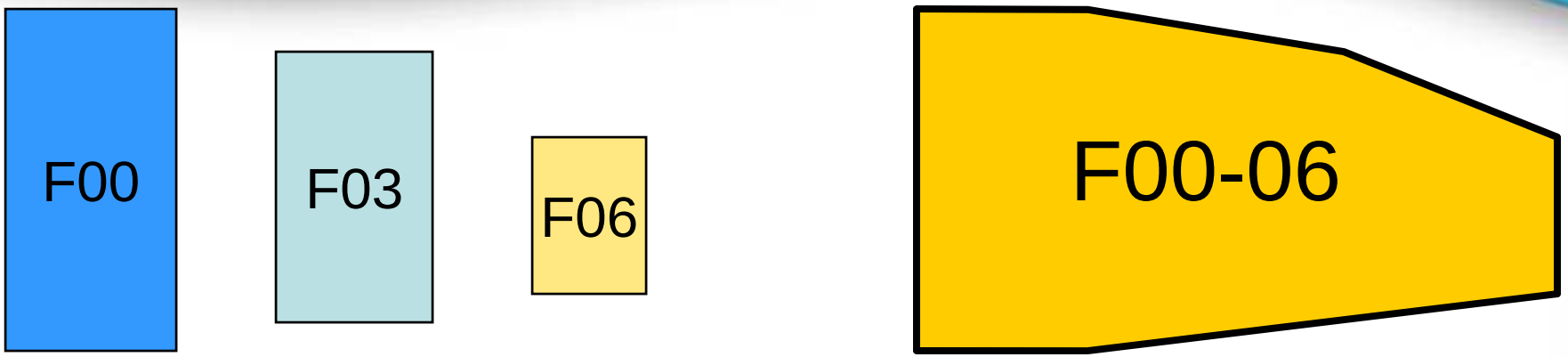
- Data intended to be integrated into display systems
  - Intended to be displayed as a graphic
  - Not a text message converted to a graphic
  - Not sent as a “picture”
- Identification of weather hazard
  - Use Lat/Long instead of VORs
  - Uses many more points to describe with more precision
- Quality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

Snapshot vs. Smear Example

- Hazard moving and expanding from IN/OH southeastward into NC.
- AIRMET graphic is forced to encompass this entire region for the full six-hour forecast period.
- G-AIRMET at the bottom able to depicts 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**

G-AIRMET/GFA Elements

Element	G-AIRMET	GFA
Turbulence (non-convective)	Moderate Turbulence Surface to 45,000 feet	
Sustained Surface Winds	≥ 30 knots	≥ 20 knots
Low Level Wind Shear (non-convective)	Wind shear (+/- 10 knots) below 2000 feet AGL	
Surface Visibility	≤ 3 miles (IFR)	3-5 miles (MVFR)
Cause of Surface Visibility restriction	Precipitation (PCPN), Mist (BR), Fog (FG), Haze (HZ), Smoke (FU), Blowing Snow (BLSN)	
Low Ceilings	Ceiling ≤ 1000 feet (IFR)	Ceiling ≤ 3000 feet (MVFR)

G-AIRMET/GFA Elements (Cont.)

Element	G-AIRMET	GFA
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	Area [Optional Base/Top]
Cause of Mountain Obscuration	Clouds (CLDS), Precipitation (PCPN), Mist (BR), Fog (FG), Haze (HZ), Smoke (FU)	

GFA Elements

GFA also includes all G-AIRMET Elements

Element	G-AIRMET	GFA
Mountain Wave		Moderate SFC-450
General Thunderstorms		Isolated or Occasional
Other Clouds (base)		Broken or Overcast With Bases below 180
Precipitation		*Derived from the National Digital Forecast Database (NDFD)*
Pressure Systems (Synopsis: Fronts, H/L)		*Provided by the Hydrological Prediction Center*
SIGMETs	*Included in depiction but not provided as part of the G-AIRMET/GFA BUFR message*	

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- **Second Phase:**
  Transition from text Area Forecast (FA) to a graphic.
- **Draft final requirements have been produced by FAA and shared with NWS. Final requirements have not been provided.**
- **Implementation** ON HOLD **- Due to the continued requirement for a text FA**
  - **Text FA used by Lockheed Martin as a required part of pilot briefings.**
- **Workload assessment by GFA team in 2007-2008 showed current staffing is not sufficient to do both text FA and GFA graphic**