

# GA Pilot Weather Resources: Challenges and Suggestions for Improvement

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# Motivation

Stems from challenges encountered while developing new questions for FAA Private Pilot Knowledge Exam.

## Specific Challenges

- Guidance not keeping pace with new products
- Outdated or incorrect product information
- Limited focus on product interpretation
- Multiple overlapping resources for aviation weather

# Guidance not keeping pace with products

- Radar Example: “Ghost”

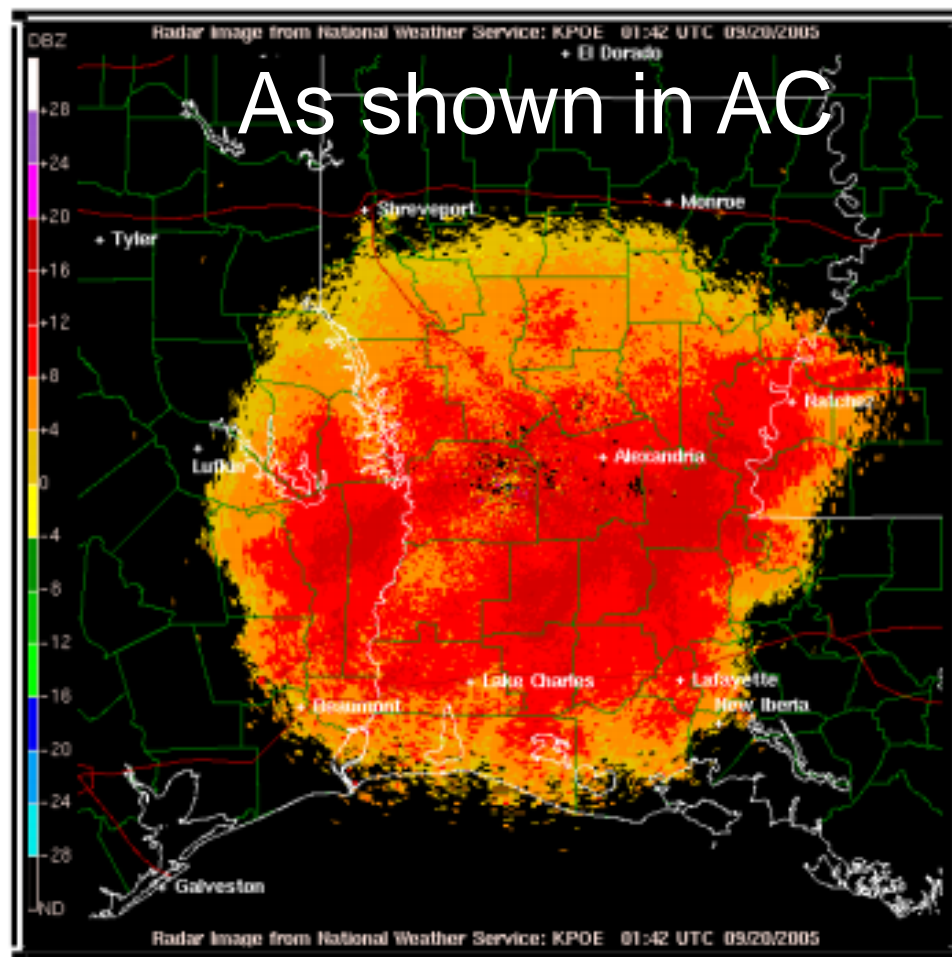
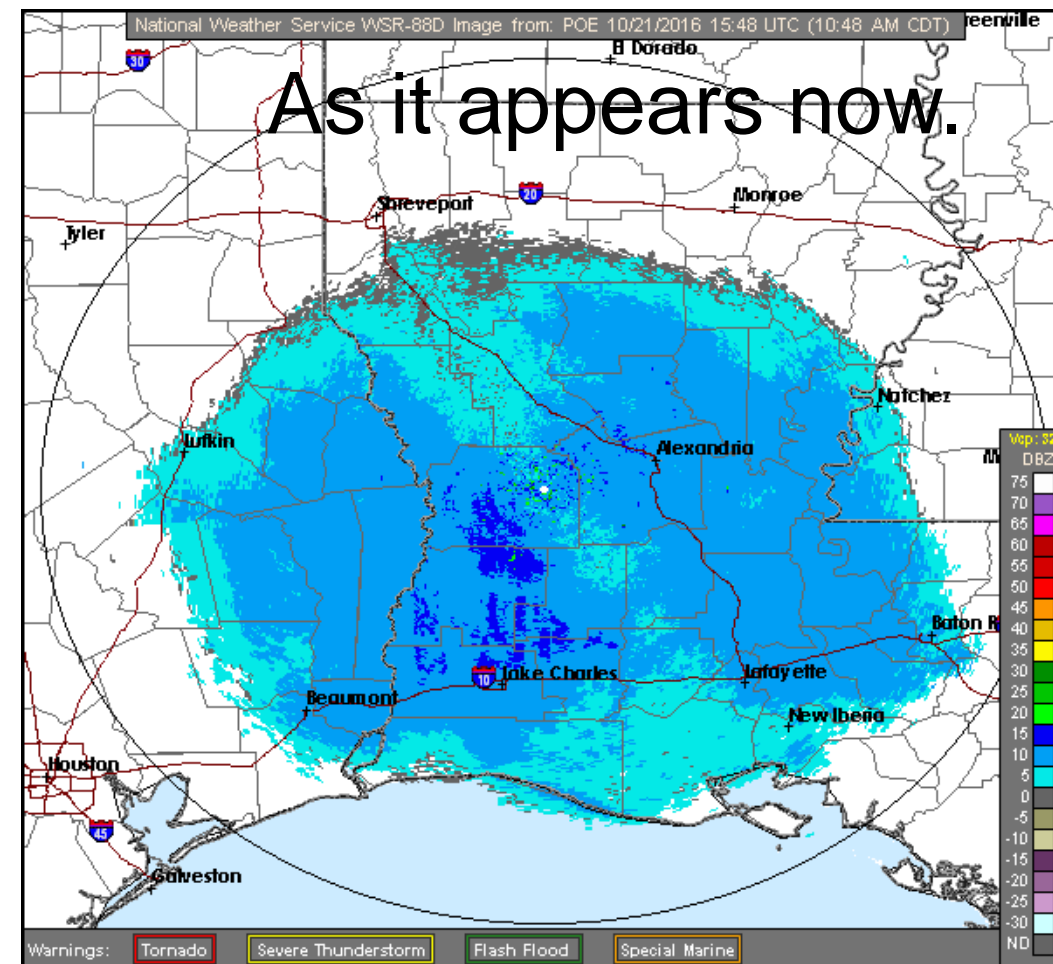


Figure 4-9. WSR-88D Weather Radar Ghost Example



Combined precip/clear air mode color bar legend changed several years ago. AC discusses new legend but the image of a ghost not updated.

# Guidance not keeping pace with products

- Graphical Turbulence Guidance Example

GTG2 - Maximum turbulence intensity (10000 ft. MSL to FL450)

Valid 1200 UTC Fri 18 Oct 2013 00-hr forecast from 1200 UTC 18 Oct

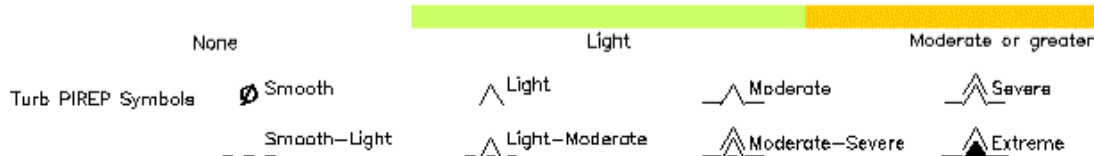
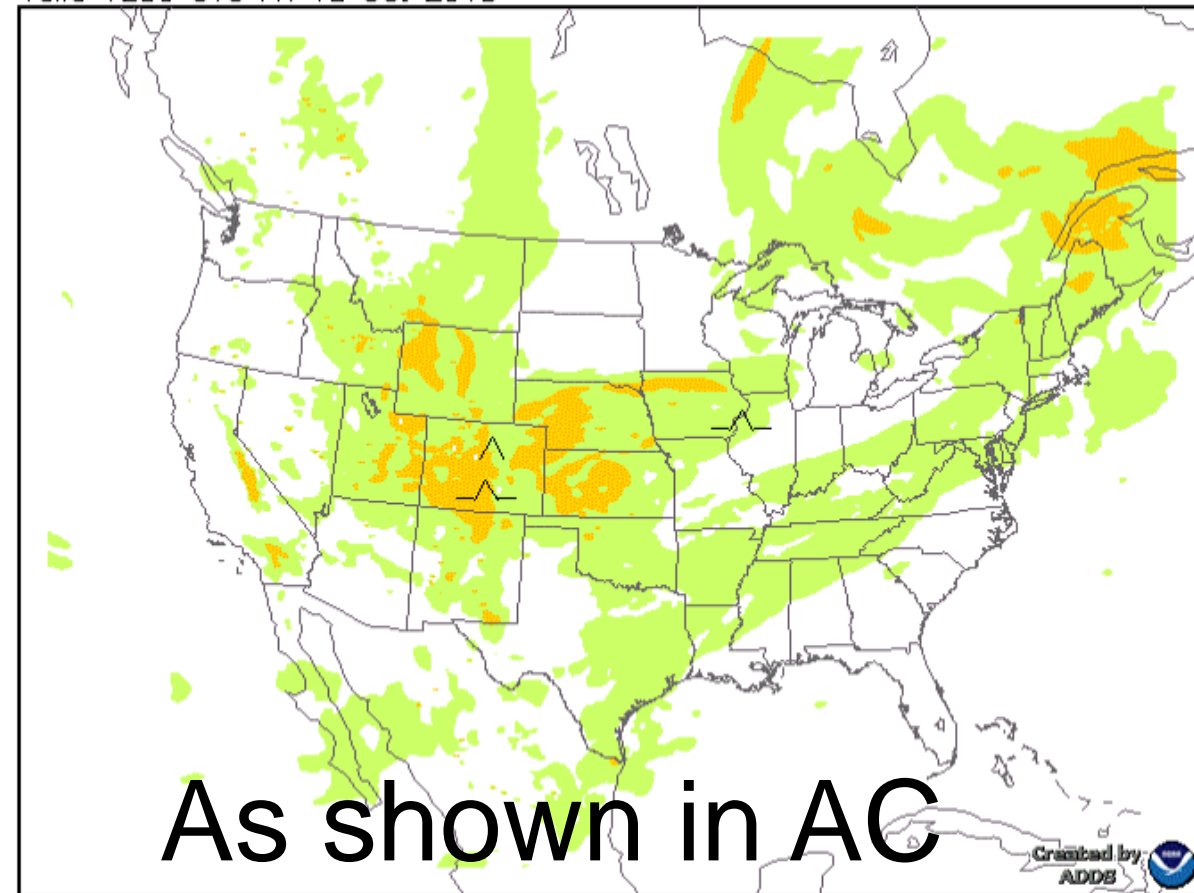
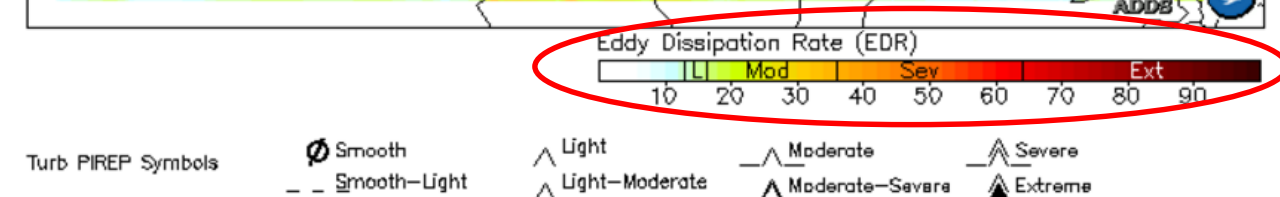
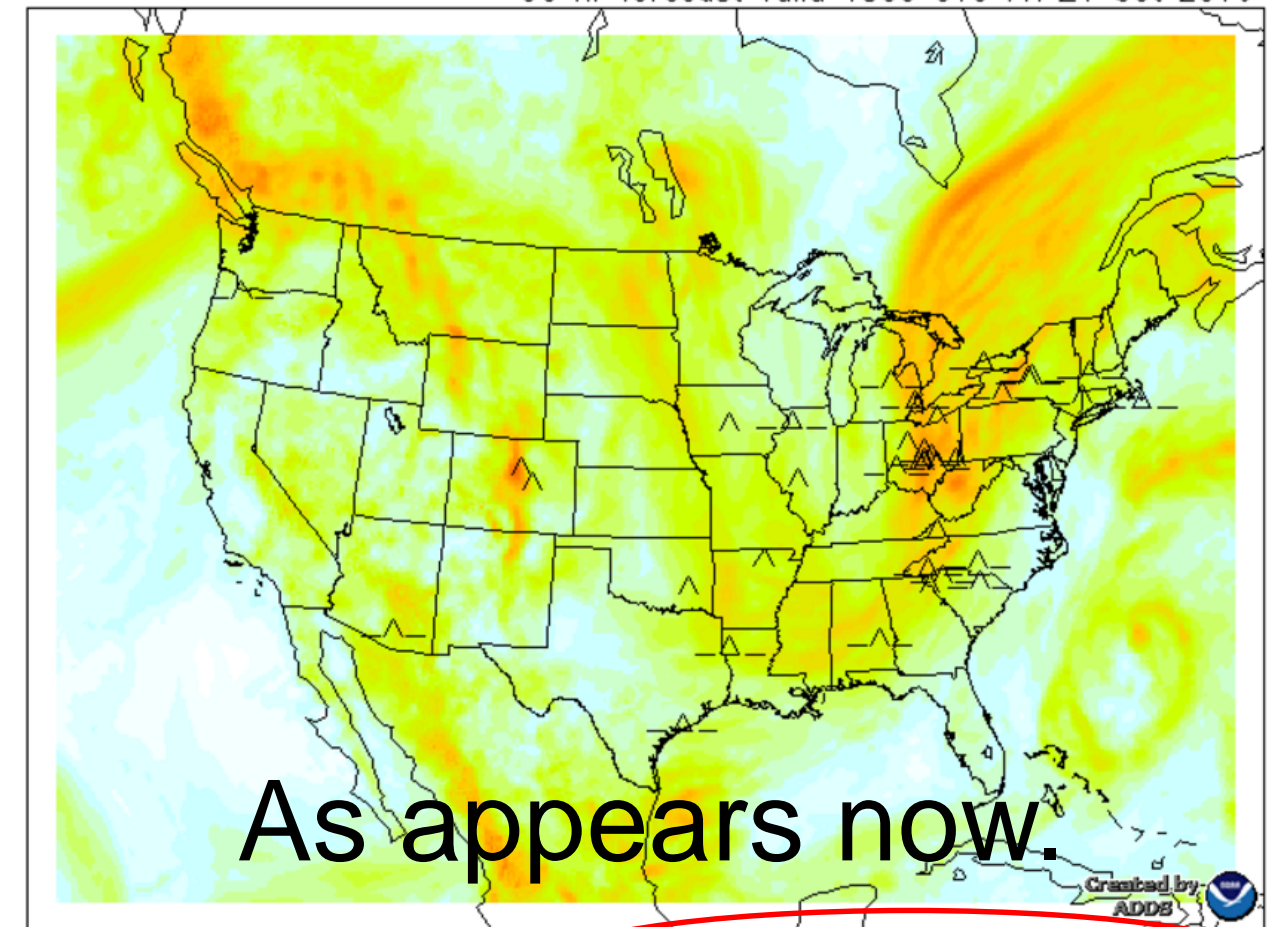


Figure 9-23. GTG Composite Example

GTG - Max combined intensity (1000 ft. MSL to FL500)

00 hr forecast valid 1500 UTC Fri 21 Oct 2016



Added additional levels, introduced concept of EDR.



# Guidance not keeping pace with products

- Surface Weather Prog Chart Example

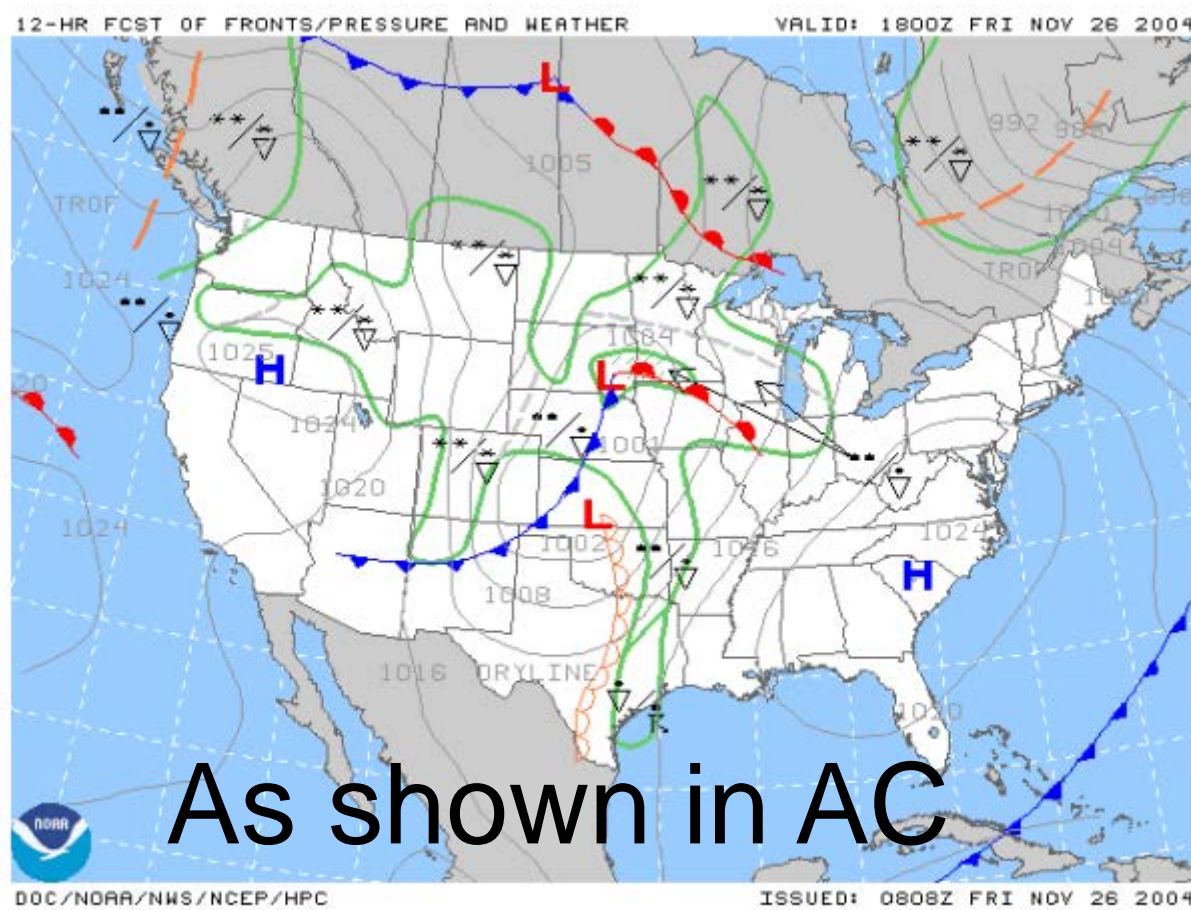
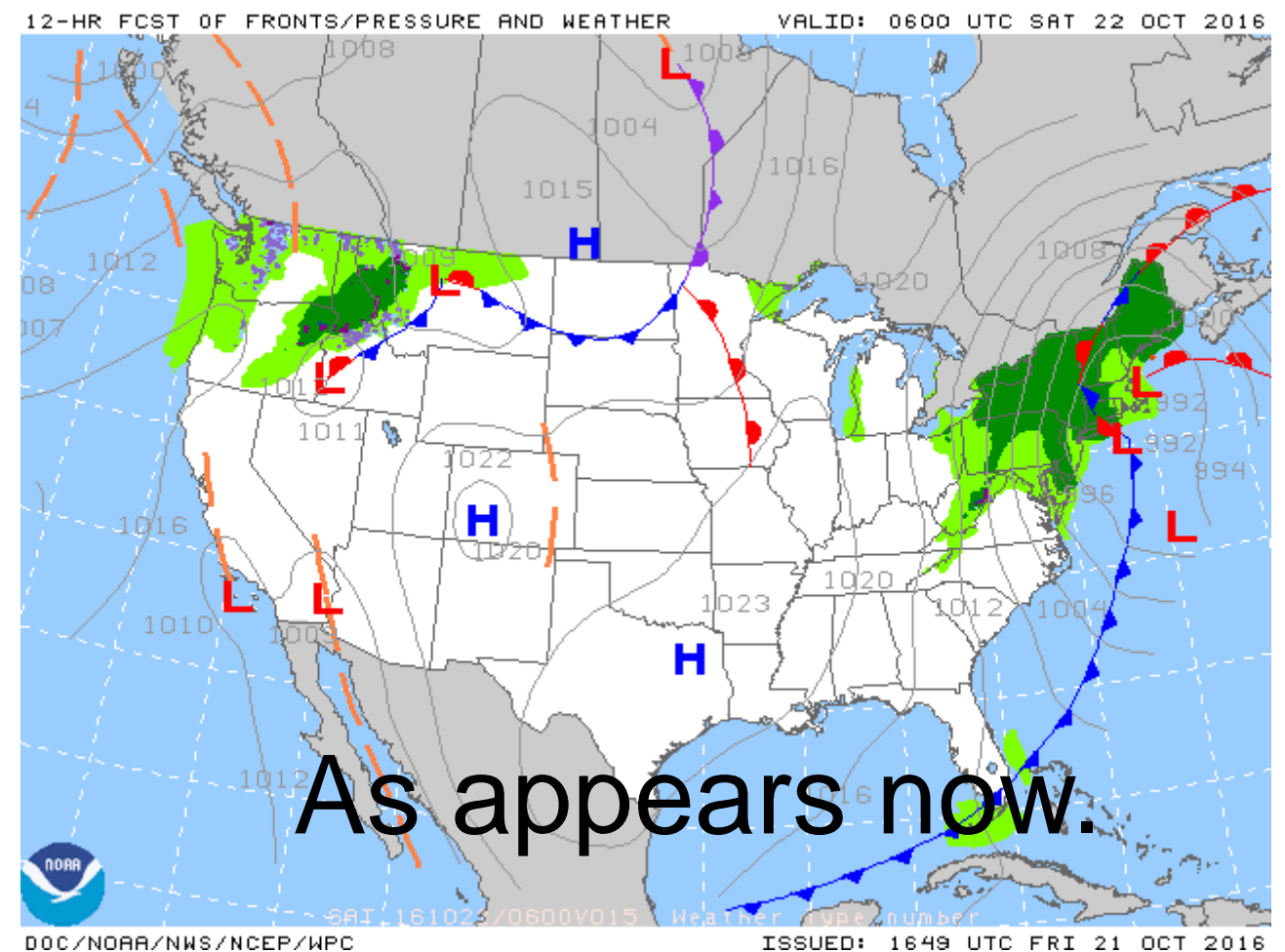


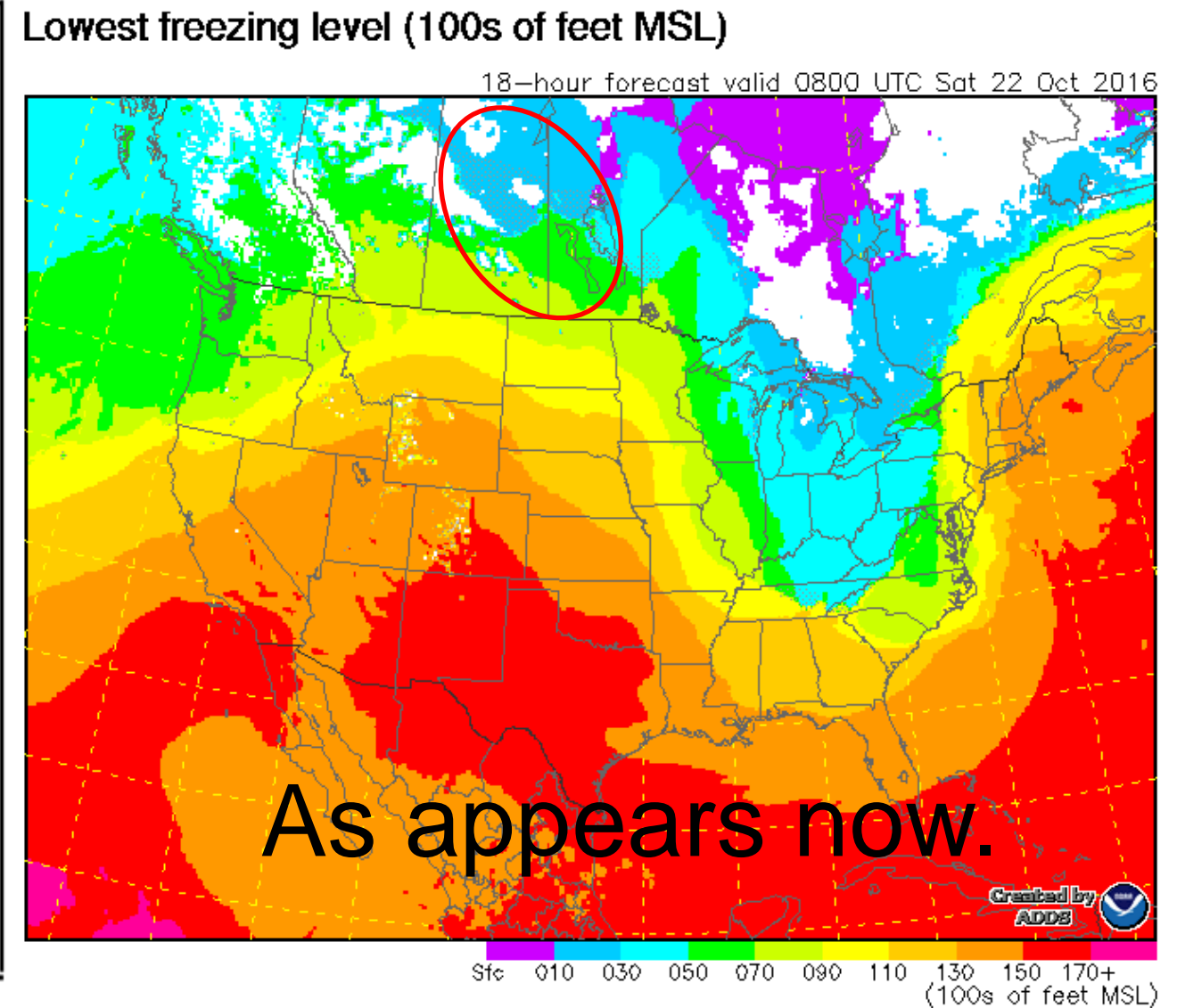
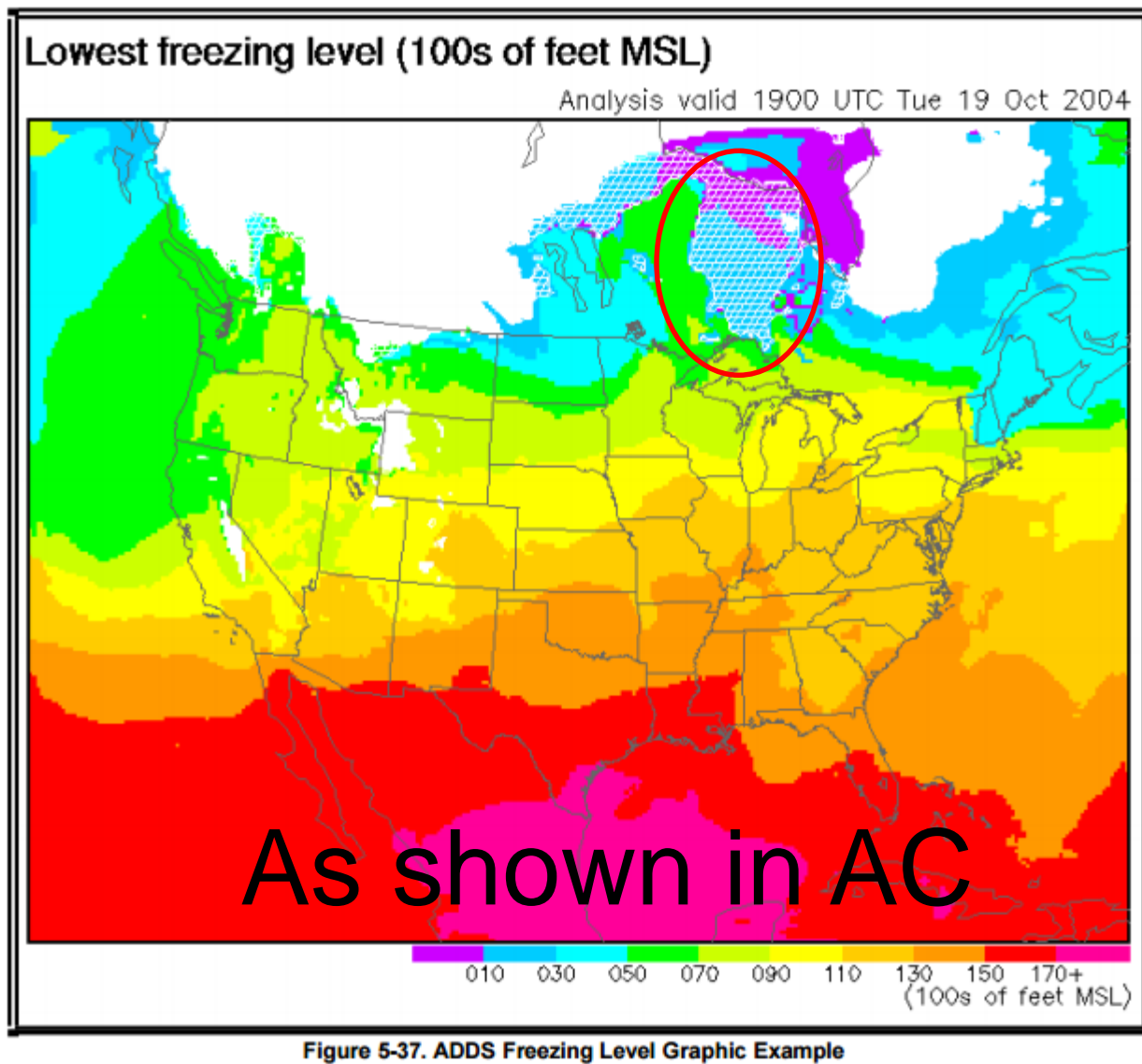
Figure 8-1. Surface Prog Chart Example



Now includes probability of precipitation.

# Guidance not keeping pace with products

- Freezing Level Chart Example



Stippling changed, more difficult to see.

# Outdated Products

- Example: Text Radar Observations (SD/ROB)

GRB 1135 AREA 4TRW+ 9/101 133/76 54W MT 310 45/47 C2428 AUTO

Green Bay, Wisconsin, automated Radar Weather Report at 1135 UTC. An area of echoes, 4/10 coverage, contained thunderstorms and heavy rain showers. Area is defined by points (referenced from GRB radar site) at 9 degrees, 101 nautical miles and 133 degrees, 76 nautical miles. These points, plotted on a map and connected with a straight line, define the center line of the echo pattern. The width of the area was 54 nautical miles; i.e., 27 nautical miles either side of the center line. Maximum top was 31,000 feet MSL located at 45 degrees and 47 nautical miles from Green Bay. Cell movement was from 240 degrees at 28 knots.

Product no longer disseminated by NWS. Should be removed from AC 00-45.

Information is consolidated in the Radar Summary Chart.

# Misleading Information

- Common Weather Symbols Chart

••	•••	••••	Rain (light,moderate,heavy)
••••	•••••	••••••	Snow (light,moderate,heavy)
⚡	⚡	⚡	Thunder (with rain,snow,no precipitation)
▽	▽		Shower (rain,snow)
	••		Drizzle
⚡	⚡		Freezing rain, Freezing drizzle
	△		Ice pellets/Sleet
=	≡		Fog (shallow,deep)
	∞		Haze

Should list all three intensities for consistency.

Should be Mist (BR), Fog (FG)

Figure 5-6. HPC Surface Analysis Chart Common Weather Symbols

Chart does reference user to the index, but the information in this table should be correct and consistent.



# Limited Focus on Product Interpretation

## Radar Displays

- Limited product interpretation of hazardous phenomena
- Focus mainly on deficiencies (ghosts, angels, anomalous propagation, beam blockage)
- Include more examples of hazardous signatures such as squall lines, thunderstorms, and outflow boundaries.
- Include comparisons with visual images or cockpit views.

# Limited Focus on Product Interpretation

## Satellite Data

- Limited information on using IR and VIS together to infer cloud types.
  - Fog and low cloud detection
  - Thunderstorm detection
  - Outflow boundaries
- Include more examples of hazardous phenomena.

# Weather Guidance Spread Over Multiple Advisory Circulars and Handbooks

Difficult to track content for consistency

## Examples

- AC 00-06B Aviation Weather
- AC 00-24B Thunderstorms
- AC 00-30C Clear Air Turbulence Avoidance
- AC 00-45G Aviation Weather Services
- AC 00-54 Pilot Windshear Guide
- AC 00-57 Hazardous Mountain Winds
- AC 00-63A Use of Cockpit Displays of Wx and Aero. Info.
- AC 91-74B Pilot Guide: Flight In Icing Conditions
- FAA-H 8083 25B Pilot Handbook of Aeronautical Knowledge
- FAR/AIM Fed. Avn. Regs / Aeronautical Info. Manual

# Recommendations and Suggestions

- Consolidate Information into two categories:  
Phenomenology and Product Interpretation
  - Phenomenology: AC 00-06
  - Product Interpretation: AC 00-45
- Consider Creating Aviation Weather “Handbook”
  - Consolidate all weather phenomenology
  - Handbooks tends to carry more “weight” with pilot community than circulars
  - Reduces overlap and potential for conflicting information



# Recommendations and Suggestions

- Use AWC to notify public of new or updated circulars related to weather.

Questions?