

APPLIED AVIATION SCIENCES / COLLEGE OF AVIATION

AVIATION WEATHER EDUCATION CHALLENGES: FAA GUIDANCE & AWC PRODUCTS

1 April 2025

EMBRY-RIDDLE
Aeronautical University



Background

ERAU Daytona Beach:

- Teach over 600 professional pilot students in *Aviation Weather* each year.
 - Currently ~2400 Total Aeronautical Science/Aeronautics Majors
 - Both Part 141 and Part 61 Students
- Course focuses on both **phenomenology** (theory) and **product interpretation** (improved decision making)
- Primary sources for students:
 - Documentation: *Aviation Weather Handbook*
 - Products: *Aviation Weather Center & Storm Prediction Center*
- Course Goal: Give students knowledge and resources to improve weather decision making **and** be life-long learners.

Motivation

- Aviation Weather Handbook continues to improve and provide exceptional information, but challenges remain
- Most notably, information severely lags AWC products
- We can offer unique perspective on potential improvements since we use the Handbook in a classroom setting

Goal

- Share a few observations and suggestions of Aviation Weather Handbook and AWC Website to improve student education.

First things first

- Huge kudos for “Archive View”!
- Opens many more cases for labs and in-class activities

The screenshot displays the Aviation Weather Center website interface. At the top, the logo is on the left, followed by the text "Aviation Weather Center" and navigation links for "Weather", "Products", "Tools", and "Connect". The current time is shown as "15:12 UTC". The main content area features a "Ceiling & Visibility" map of the United States with various weather icons and a color-coded overlay. A white navigation menu is overlaid on the map, listing several options: "Terminal Weather Dashboard", "Winter Weather Dashboard", "Traffic Flow Management Portal", "Advanced Map", "Decision support imagery", "Fax charts", "Archive View" (highlighted with a red circle), "Data API", "Status", and "Submit a PIREP". At the bottom of the map, a timeline shows the current time "1512" and subsequent hourly intervals up to "09Z". A "Legend" button is visible in the bottom right corner.

Dangerous Handbook product information (repeat from 2018)

- Radar Example: “Ghost”

As it appears now on NWS site.

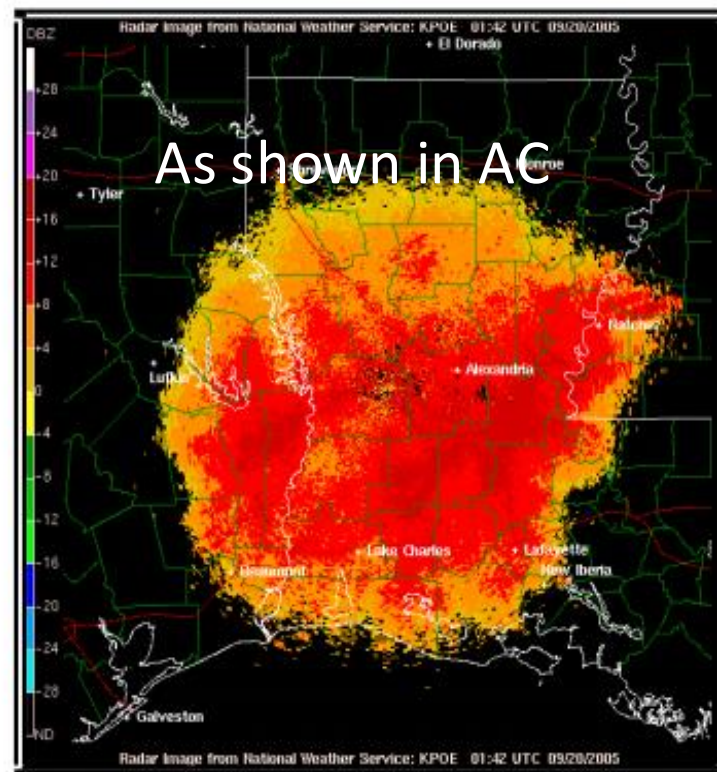
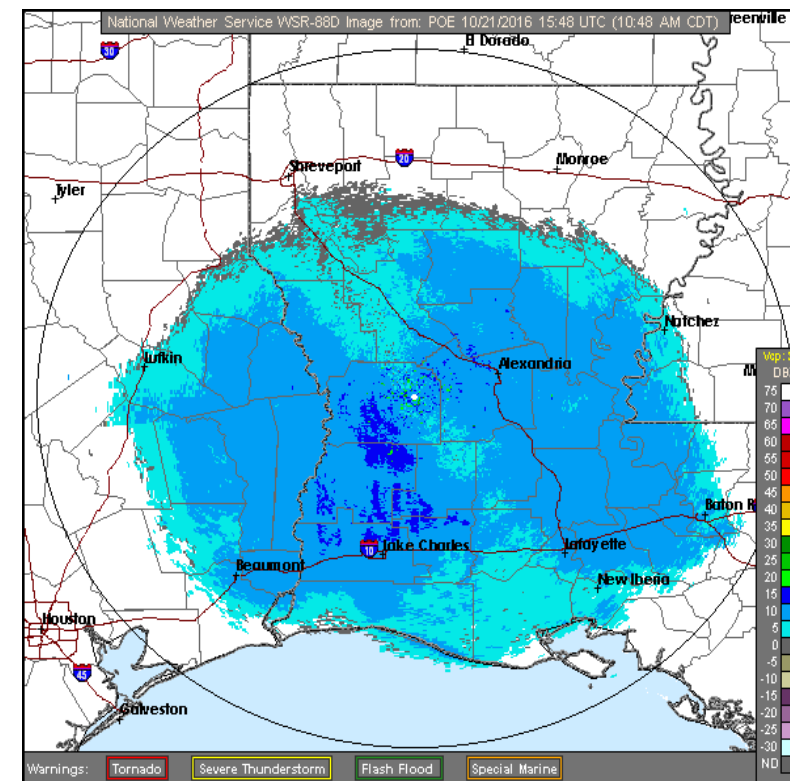


Figure 4-9. WSR-88D Weather Radar Ghost Example



Combined precip/clear air mode color bar legend changed several years ago. **Red is never safe.**

Radar Basic Theory Section is Excellent: *BUT Examples* are outdated

- Images inconsistent with current AWC displays
- Radar topic includes both theory and technical info under Ch 24 Observations

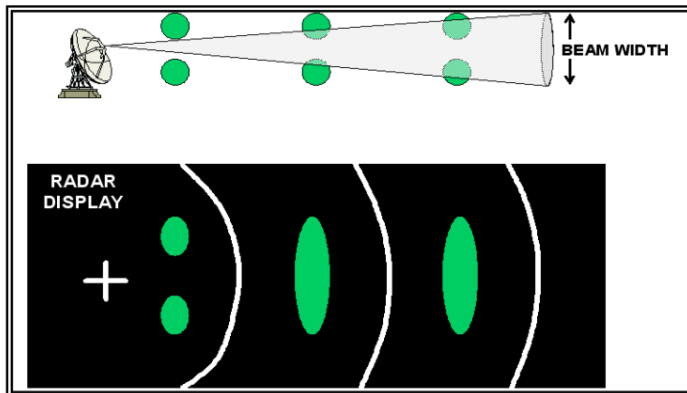
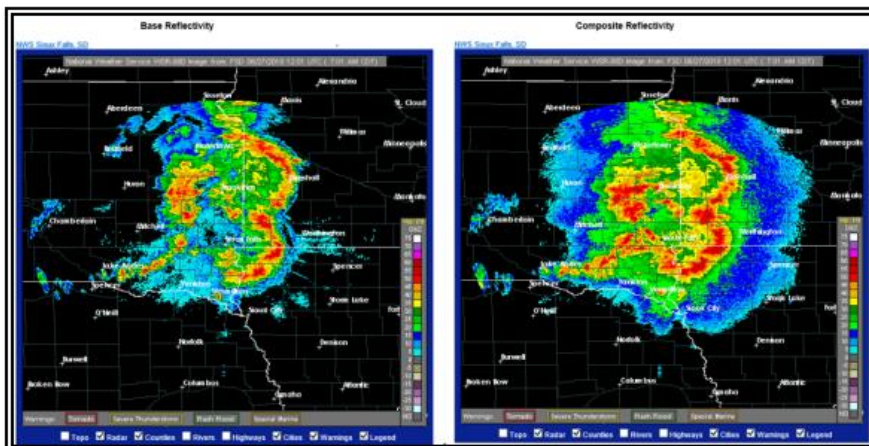
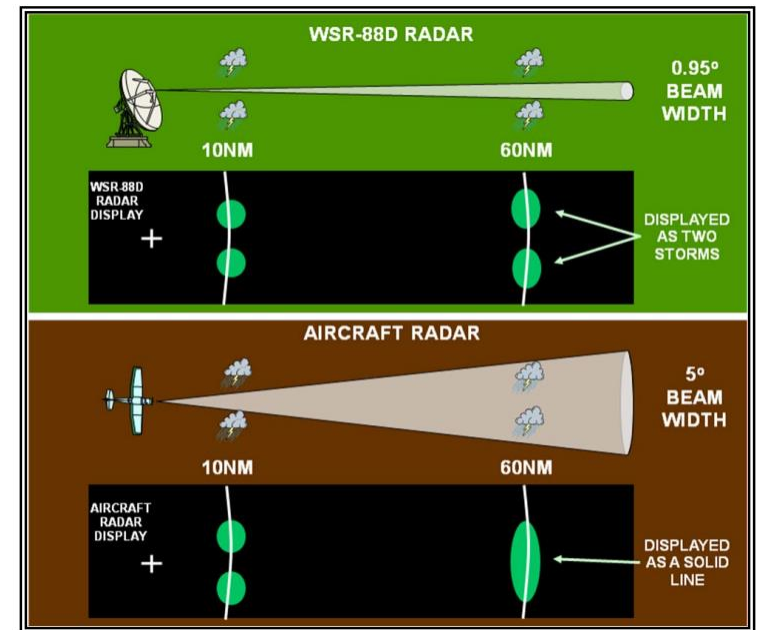
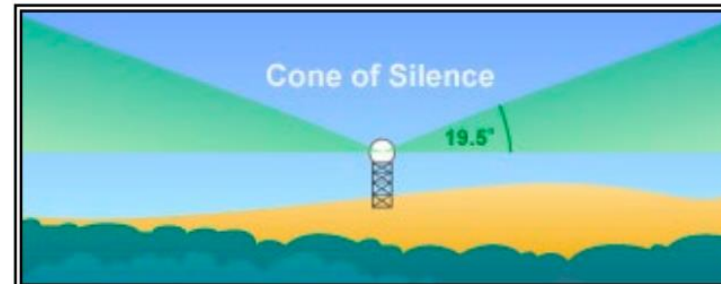


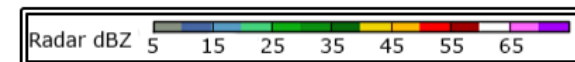
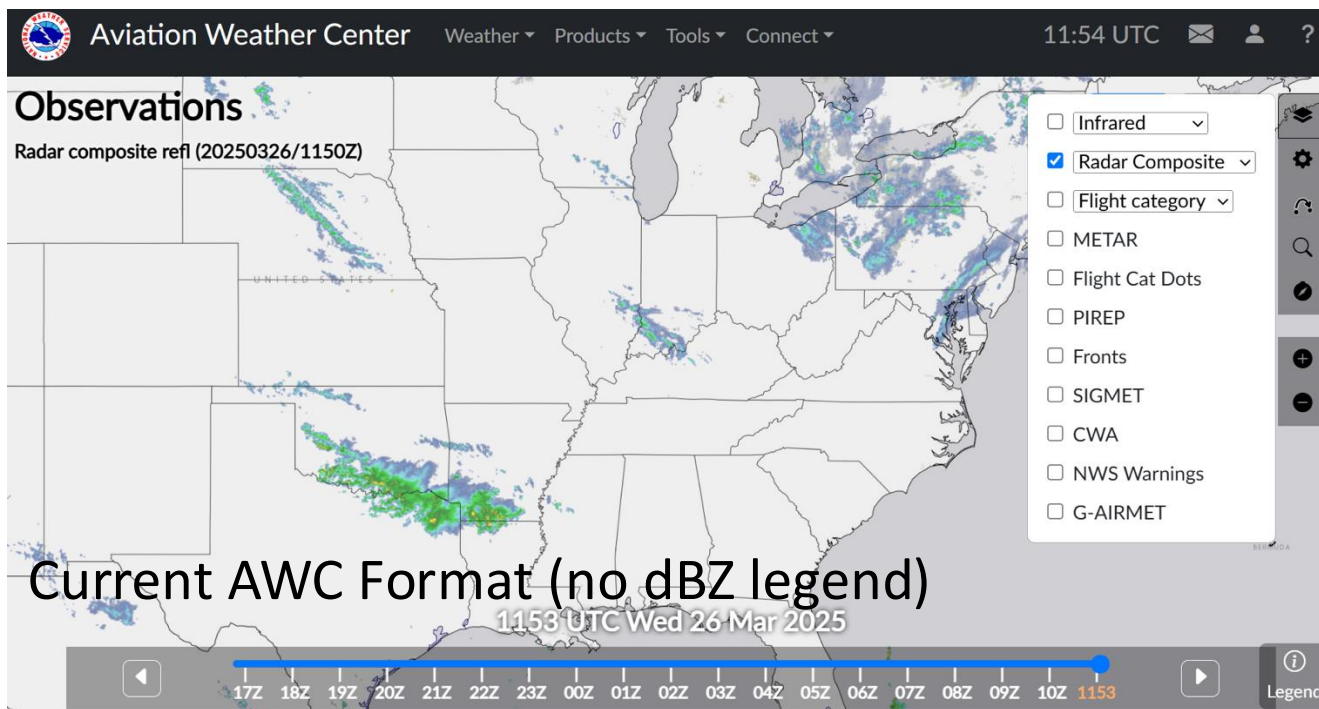
Figure 15-6. Beam Resolution



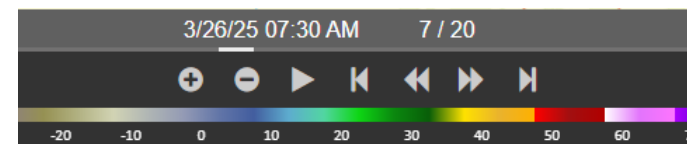
More on Radar

- Images on AWC tied only to mosaic—ground clutter filtered but discussed in Handbook
- Handbook shows variety of images that are old, wrong scale or unavailable
- Unable to view local radar
- No method of determining radar mode (clear air or precip)
- No legend for dBZ

Handbook Images



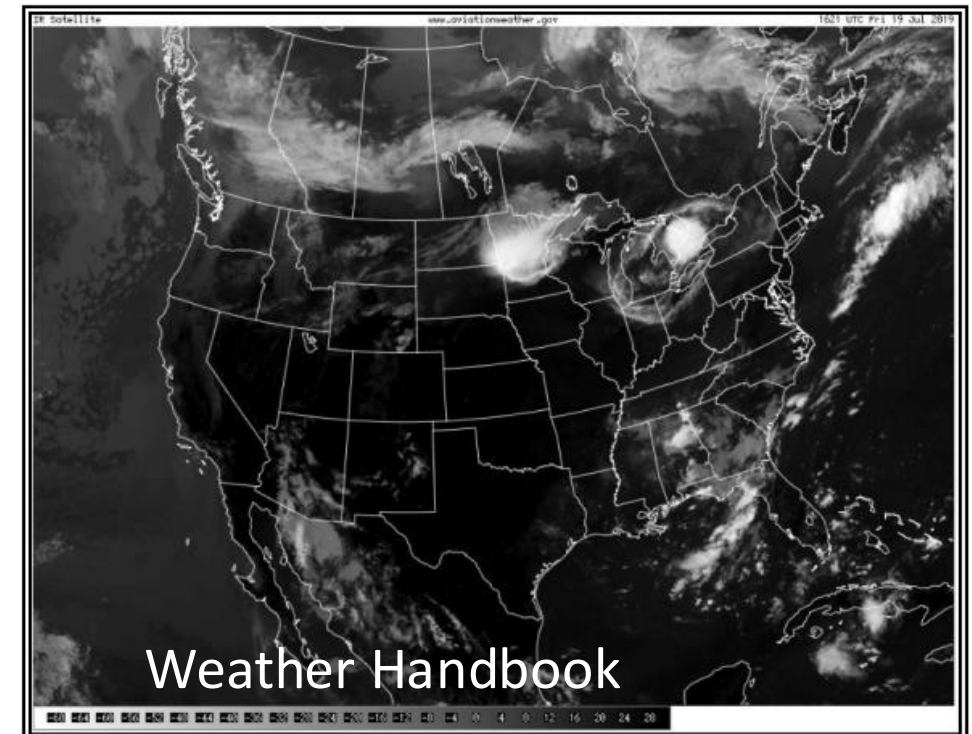
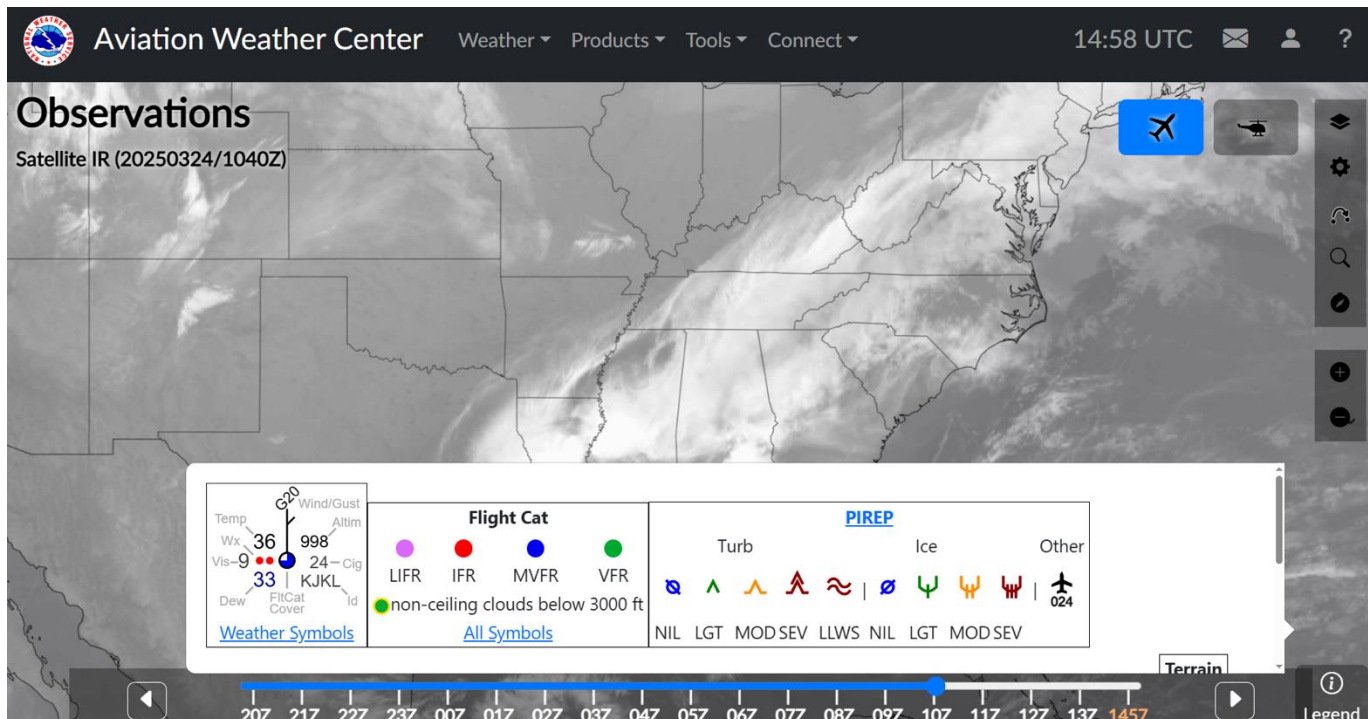
Handbook dBZ legend



Current NWS
dBZ legend

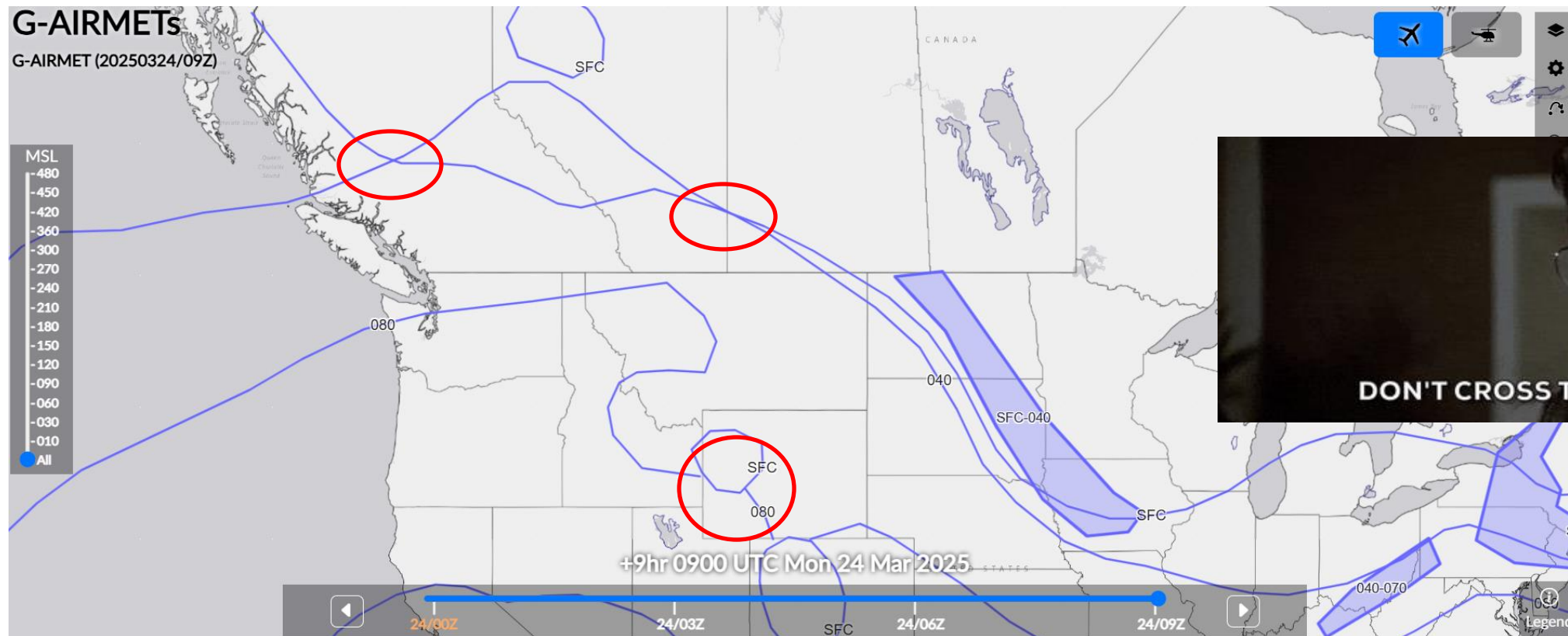
AWC Satellite Information Missing Key Elements

- Handbook Offers Exceptional Information, but AWC no longer hosts images shown in Handbook.
- Missing Temperature Scale (IR) and Reflectivity Scale (VIS)
- No satellite theory section only “technical info” under Ch 24 Observations



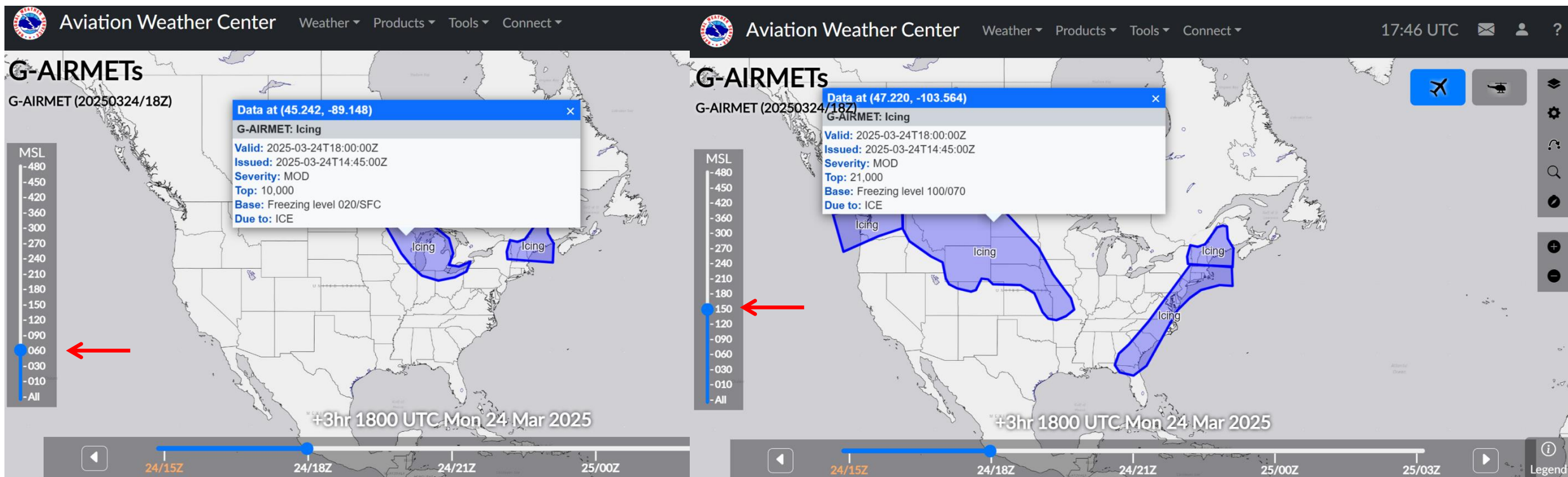
Product of Concern Example

- AIRMET FZLVL – Isopleths often intersect
- The zig-zag surface layer was more useful



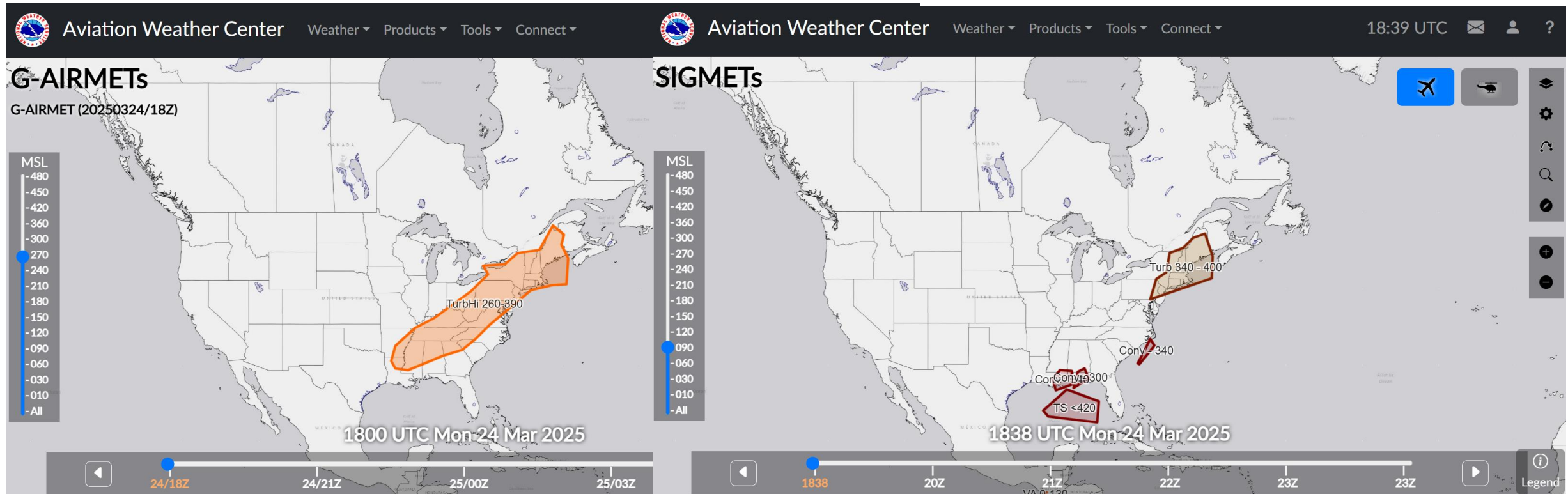
Icing display improvements and drawbacks

- Changing FL changes regions of icing displayed (great)
- User must click the image to get icing base level info (unlike old AIRMETS)
- Heights can be displayed on AIRMET, *but not by default*
- **Not specifically addressed in Handbook**



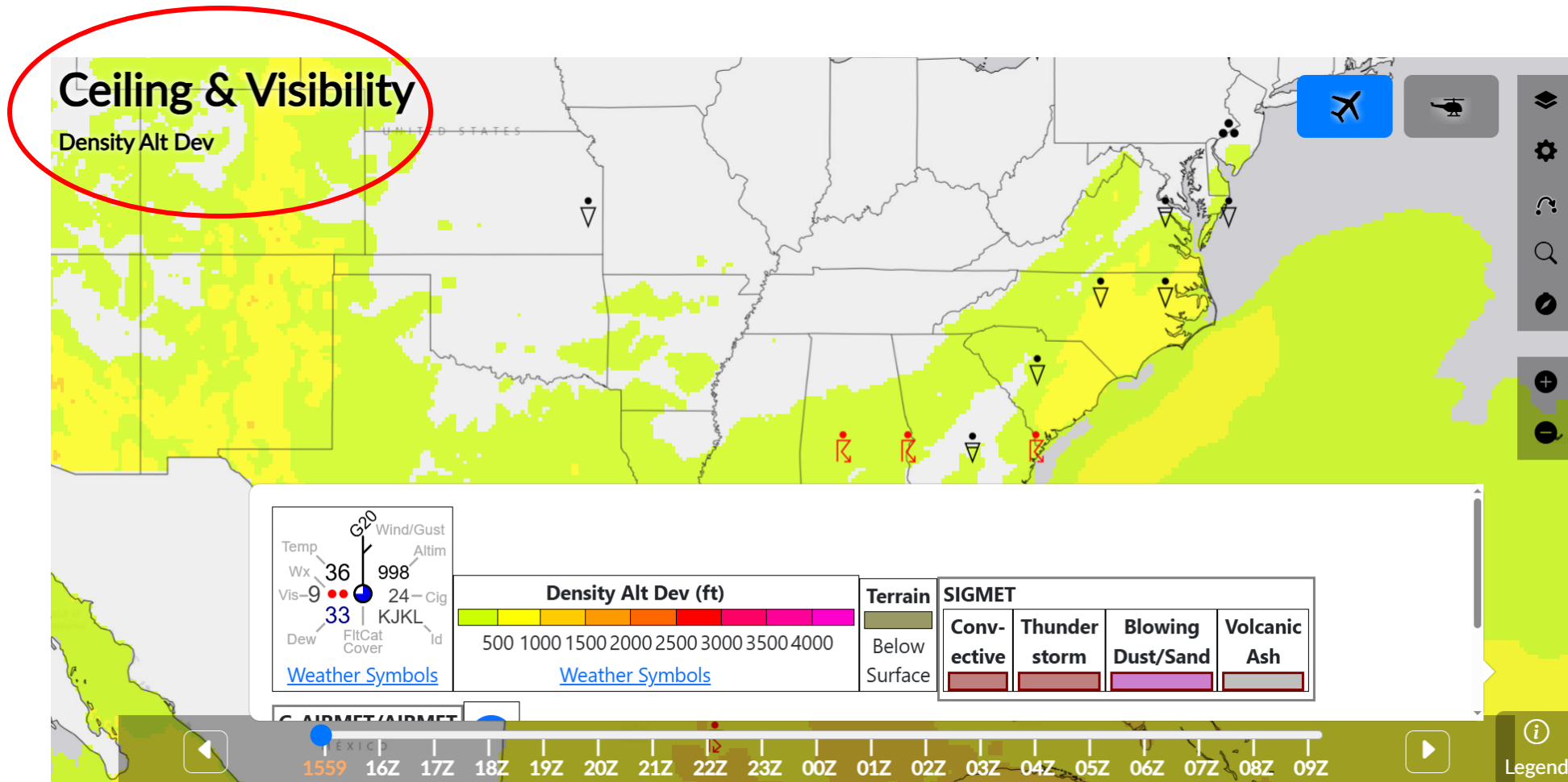
Turbulence product

- AIRMETs TANGO are sensitive to the FL (great)
- SIGMETs are not
- Heights not displayed by default



Product Confusion – Density Alt Dev

- Great product on AWC, but not in Handbook
- Confusing placement under Ceiling and Visibility

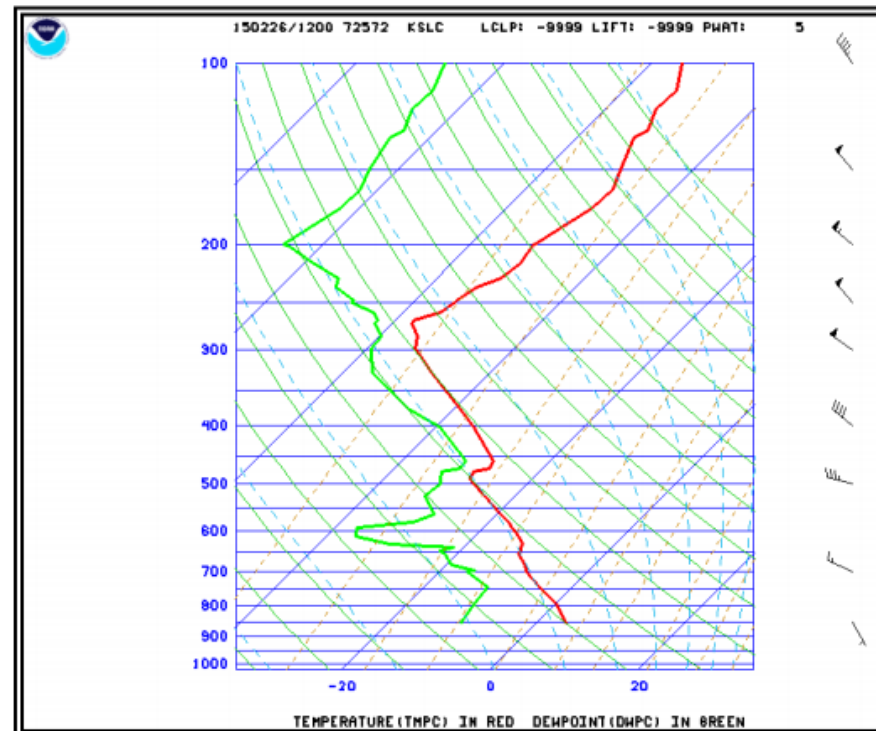


Why our Reliance on AWC Imagery vs Other Sources

- AWC imagery used in Foreflight – used almost exclusively by pilots
- Primary flight-planning tool for pilots
- Typical Part 91 (and Part 141) students do not have access to meteorologists as instructors

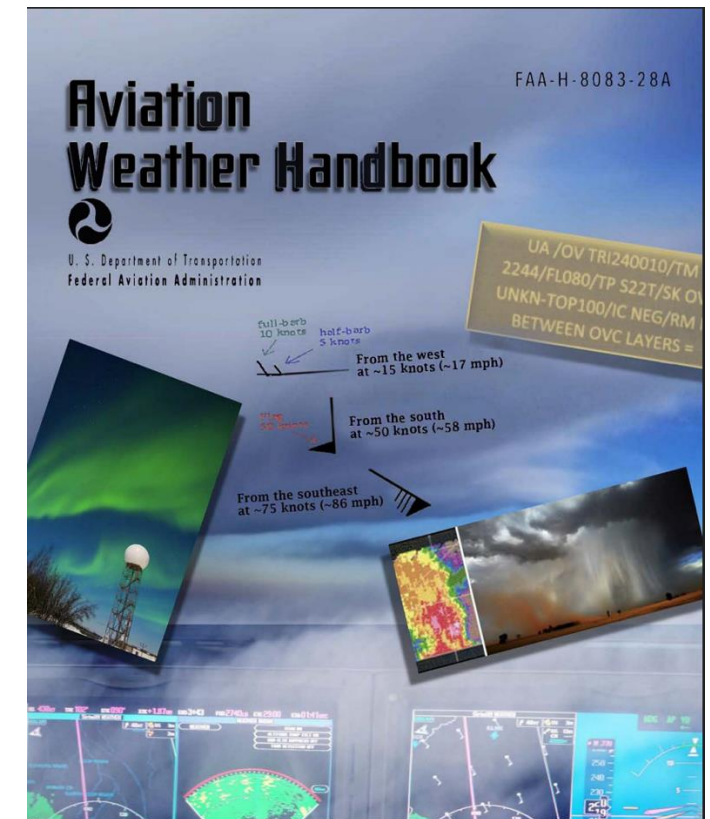
Potentially Unnecessary Handbook Product Information

- Skew-T Soundings
 - Guidance indicates information for meteorologist use only
 - Not enough instruction in Handbook to be useful for pilots or Meteorologists



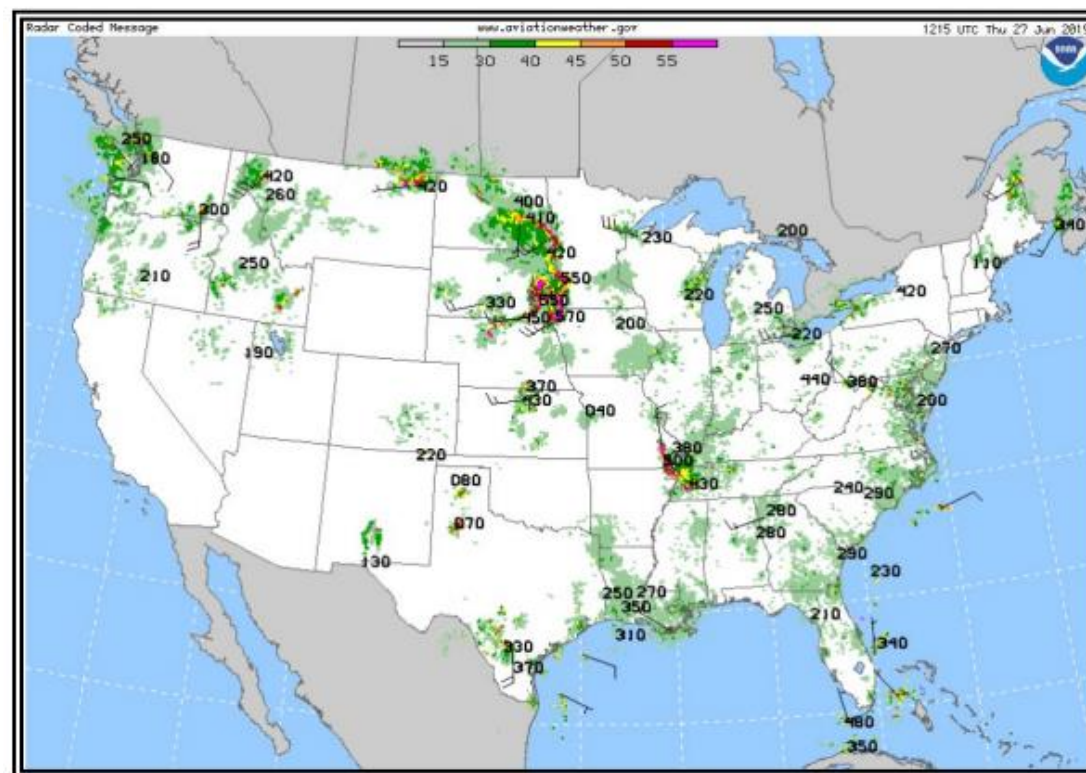
Recommendations and Suggestions

- Shift focus of Aviation Weather Handbook on weather phenomenology and theory (much like old AC—006B)
 - Minimize reference to specific products that change frequently
- Include “easy-to-find” product descriptions on AWC website and refer reader there
 - Update product descriptions when products updated.
- Beyond FPAW, could UAA help?



Sunset Product Example

- Radar Coded Message
 - No Longer available
 - Recommend deletion from Handbook



QUESTIONS?

THANK YOU

Thomas A. Guinn, PhD, Chair
Applied Aviation Sciences | College of Aviation
386.226.6858 | guinnt@erau.edu