

10-17-2018

## Aviation Weather Education: Challenges Using Current FAA Guidance

Thomas A. Guinn  
*Embry-Riddle Aeronautical University, guinnt@erau.edu*

Robert Thomas  
*Embry-Riddle Aeronautical University, thomas7@erau.edu*

Follow this and additional works at: <https://commons.erau.edu/ga-wx-training-research>



Part of the [Aviation Commons](#), [Cognitive Psychology Commons](#), [Human Factors Psychology Commons](#), and the [Meteorology Commons](#)

---

### Scholarly Commons Citation

Guinn, T. A., & Thomas, R. (2018). Aviation Weather Education: Challenges Using Current FAA Guidance. , (). Retrieved from <https://commons.erau.edu/ga-wx-training-research/8>

This Article is brought to you for free and open access by the General Aviation Weather at Scholarly Commons. It has been accepted for inclusion in Aviation Weather Training Research by an authorized administrator of Scholarly Commons. For more information, please contact [commons@erau.edu](mailto:commons@erau.edu).

# AVIATION WEATHER EDUCATION: CHALLENGES USING CURRENT FAA GUIDANCE

Presented by

Thomas Guinn, Ph.D.  
&  
Robert Thomas, Ph.D., ATP, CFII

17 October 2018



# Background

ERAU Daytona Beach:

- We teach over 400 professional pilot students in Aviation Weather each year.
  - 1500 Total Flight Students
- Course focuses on both **phenomenology** (theory) and **product interpretation** (improved decision making)
- Utilize FAA Advisory Circulars for both phenomenology and product interpretation
  - 45H, 06B, 24C, etc.

*Big kudos for the improved AC 00-06!*

# Motivation

- Stems from observed challenges while teaching as well as during research on understanding GA pilot knowledge
- Advisory Circulars continue to improve with each iteration and provide exceptional information but challenges remain
- We can offer unique perspective since we use the ACs in a classroom setting
- Goal is to provide our observations and suggestions for improvements

# Observed Challenges

- Incorrect product information
- Guidance not keeping pace with new products
- Multiple formats of same product
- Potentially unnecessary information
- Missing product information
- Limited focus on interpretation

## Incorrect product information

- Radar Example: “Ghost”

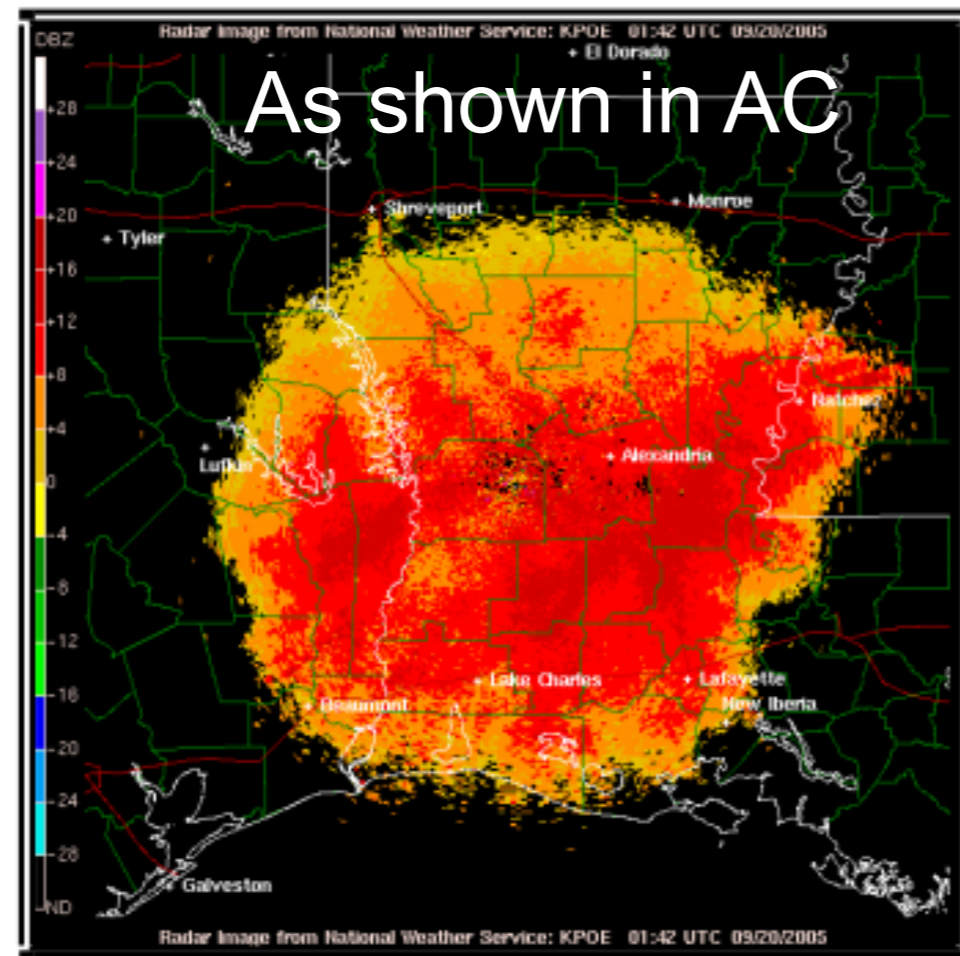
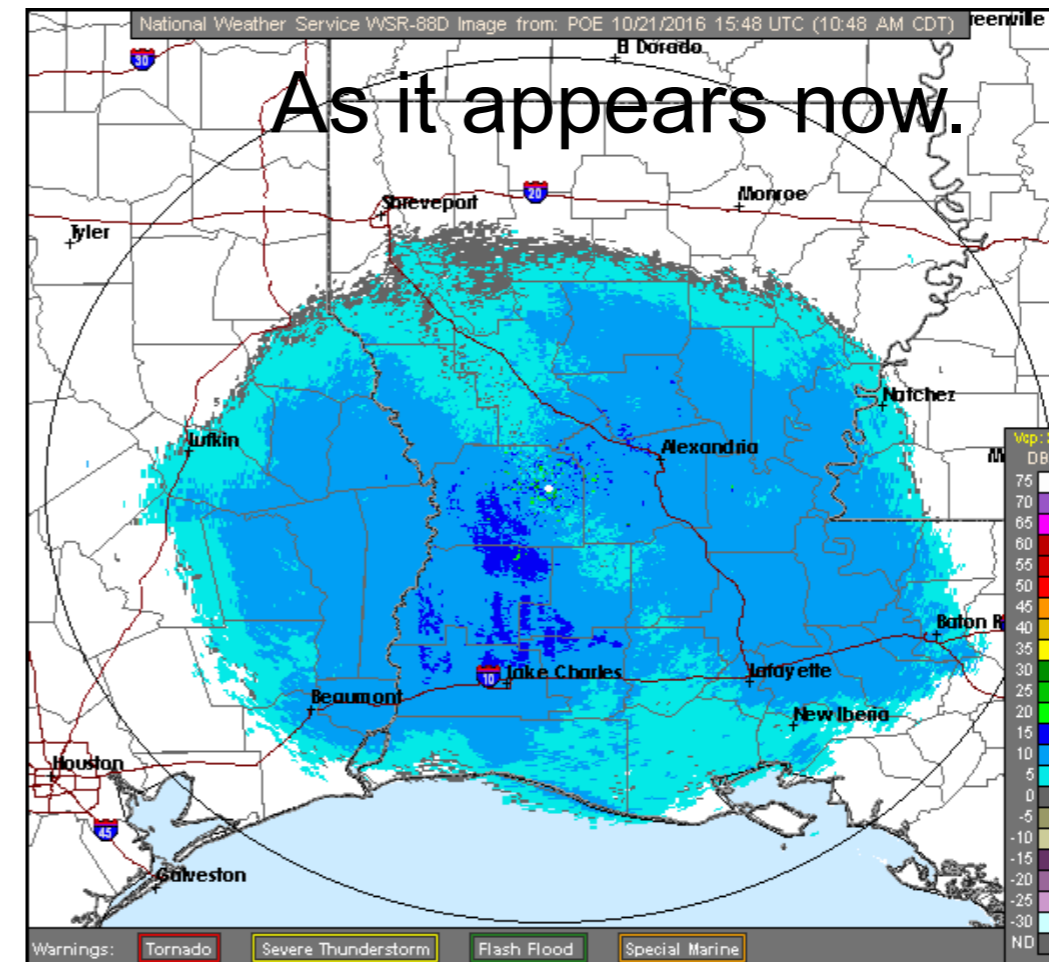


Figure 4-9. WSR-88D Weather Radar Ghost Example

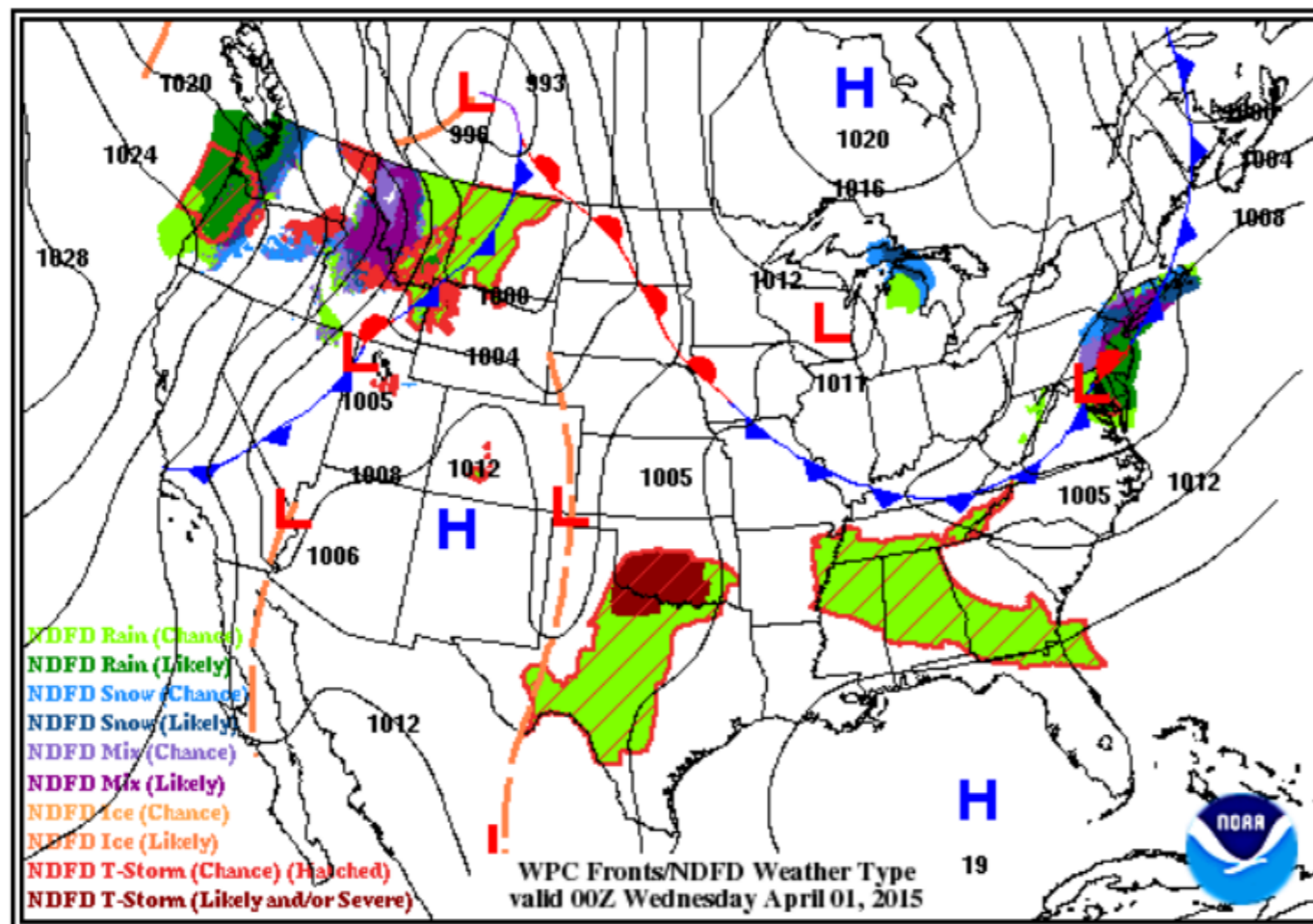


Combined precip/clear air mode color bar legend changed several years ago. **Red is never safe.**

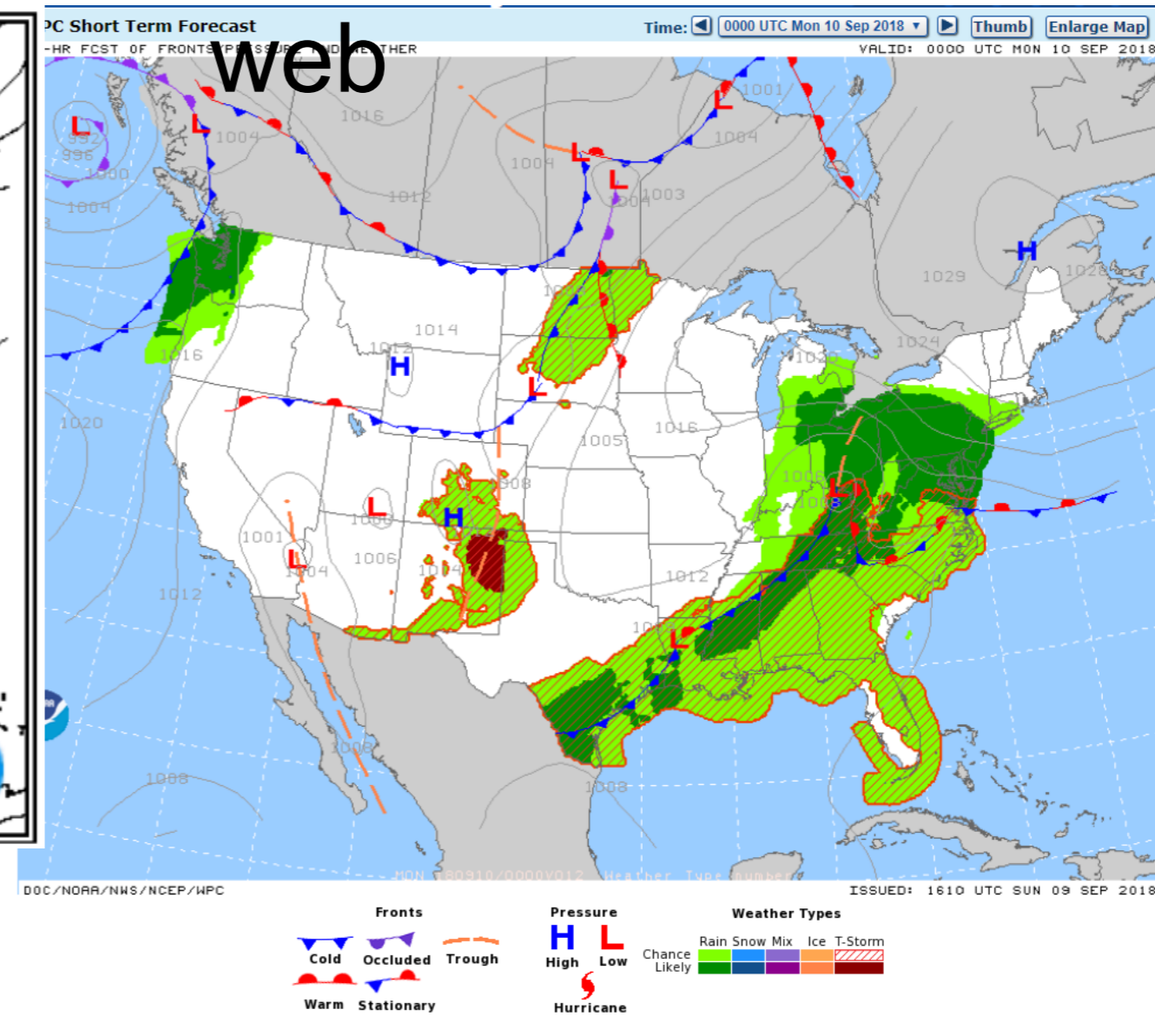
# Guidance not keeping pace with products

- Surface Weather Prog Chart Example

As shown in AC

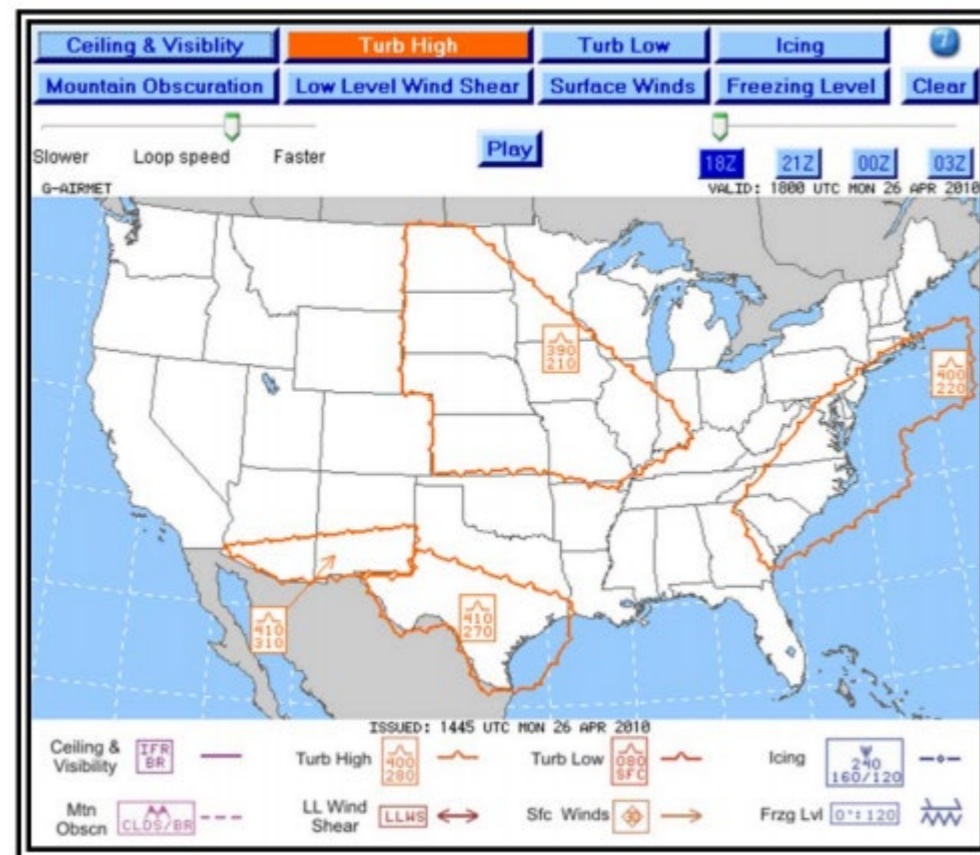


As appears on

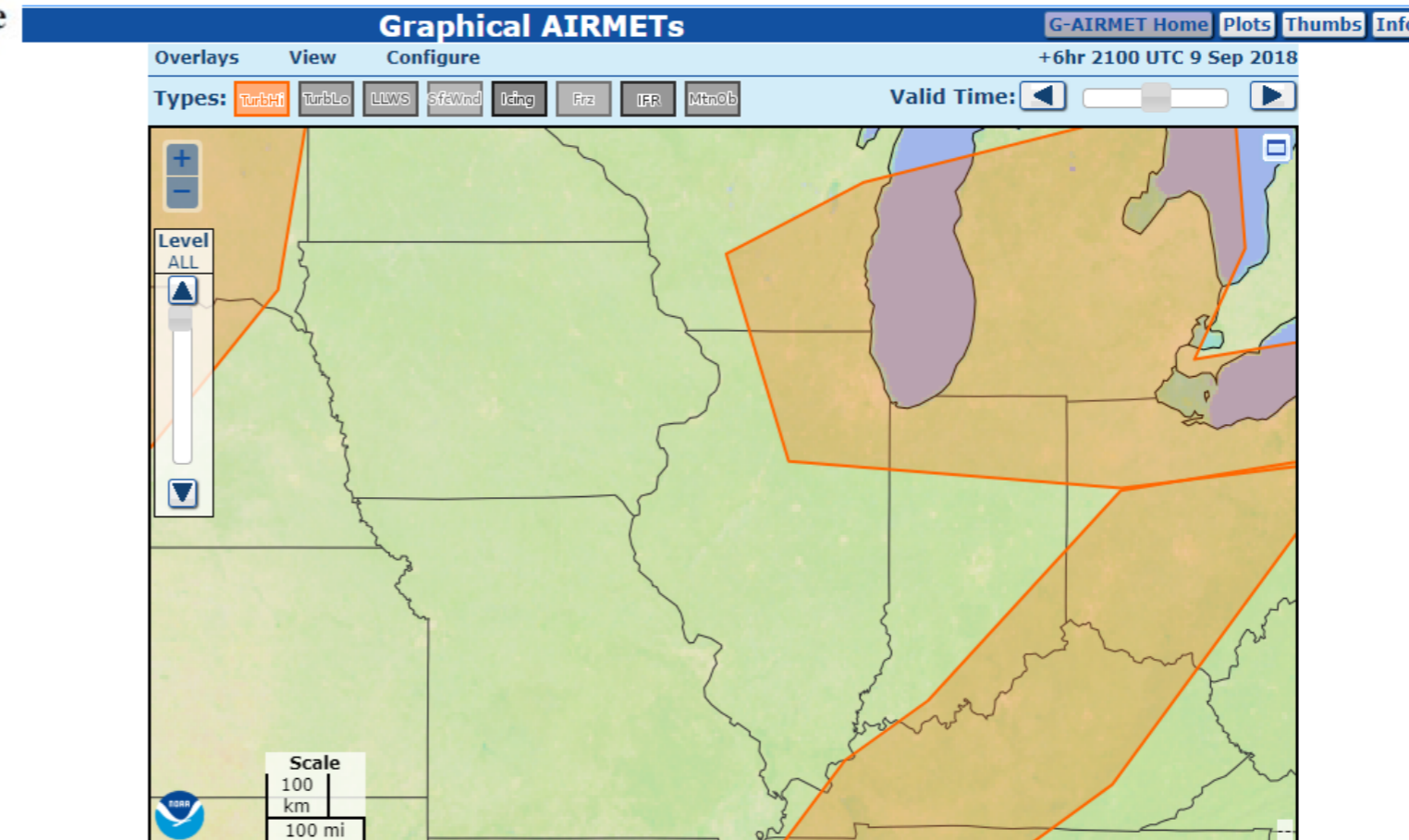


# Multiple formats of same images

Figure 5-16. G-AIRMET—Turbulence-High Snapshot Example



AC  
Example

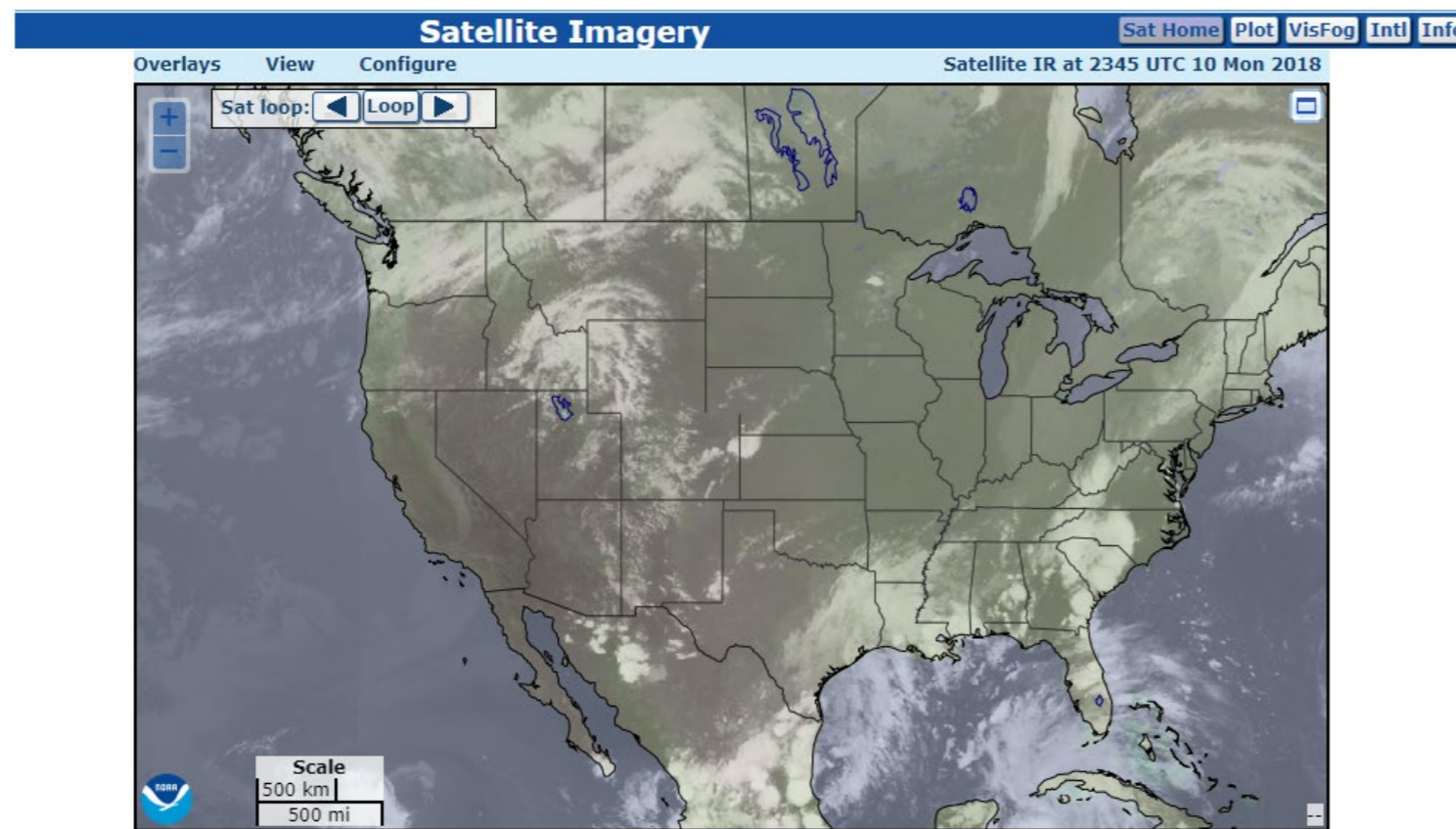


As it appears on website  
***splash page*** (not  
addressed in AC)

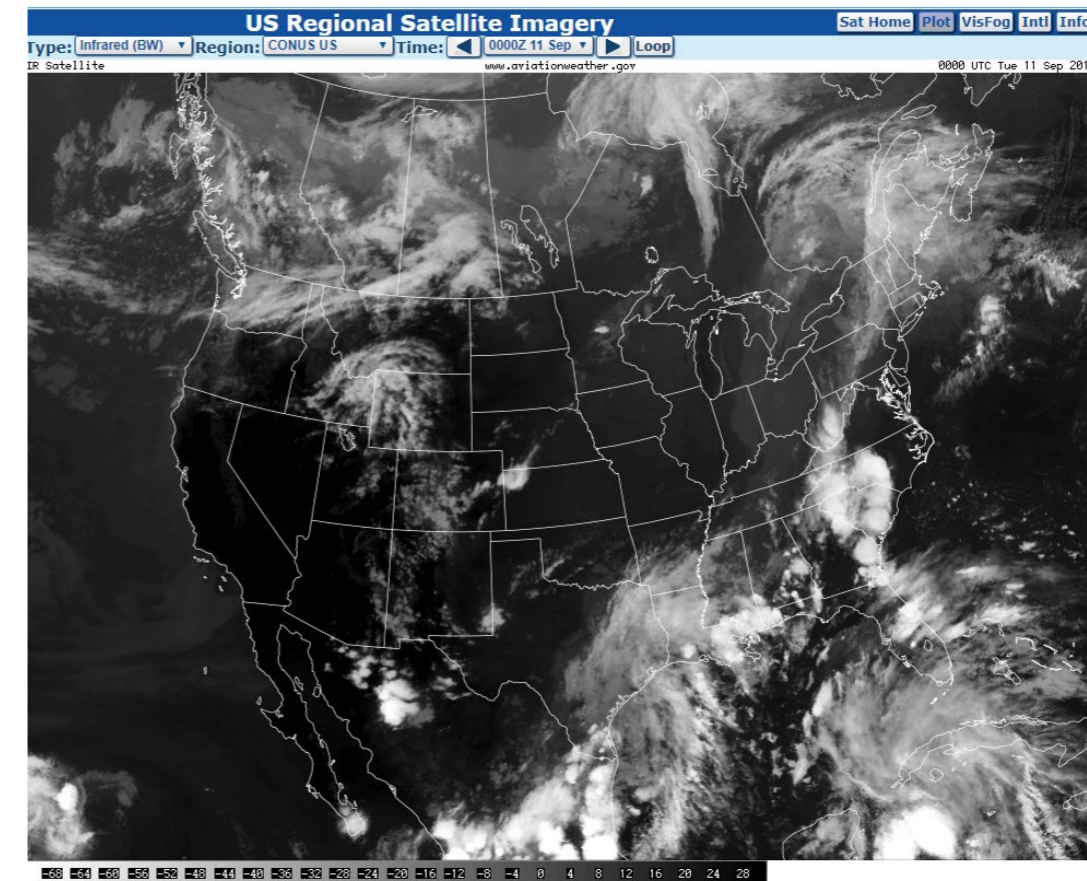


## Multiple formats of same data

- Satellite Imagery



Splash page

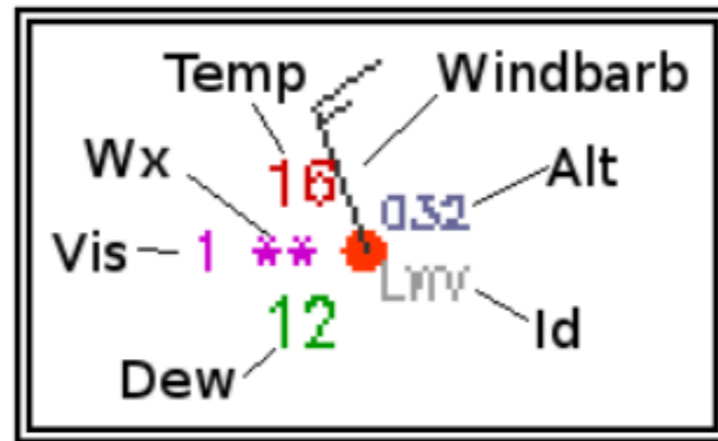


Format discussed in AC

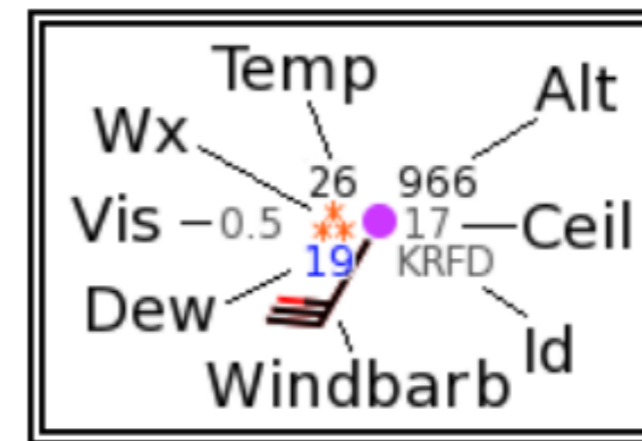
- Splash page not addressed in AC. Different format than other satellite images. No temperature scale.

# Multiple surface station plot formats

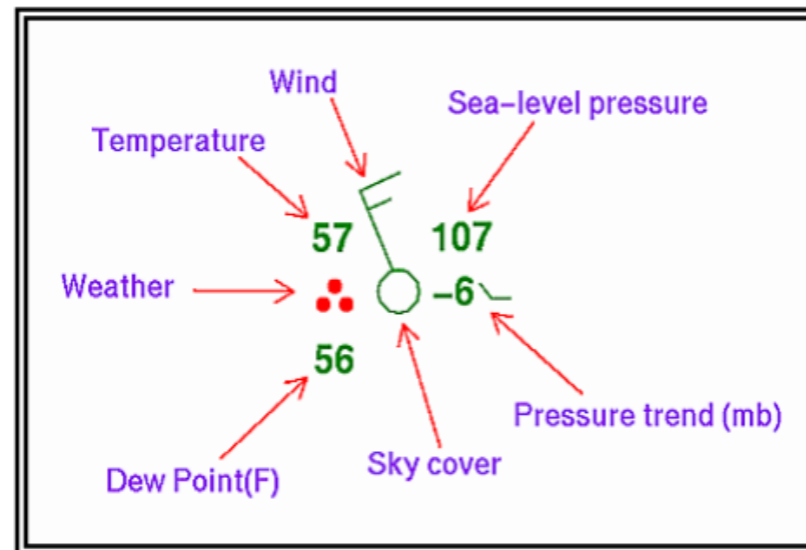
- Surface Weather Prog Chart Examples from AC 00-45H1



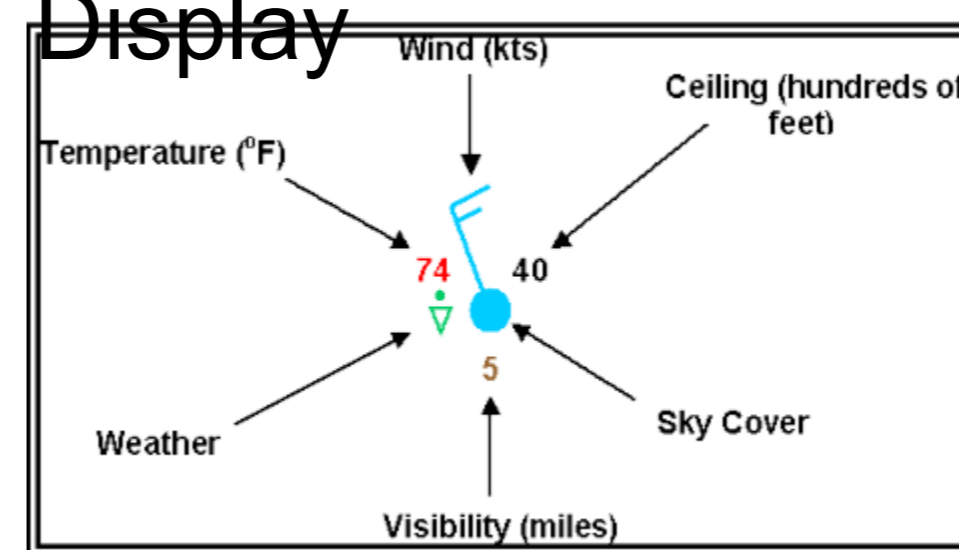
AWC Static Display



AWC Interactive Display



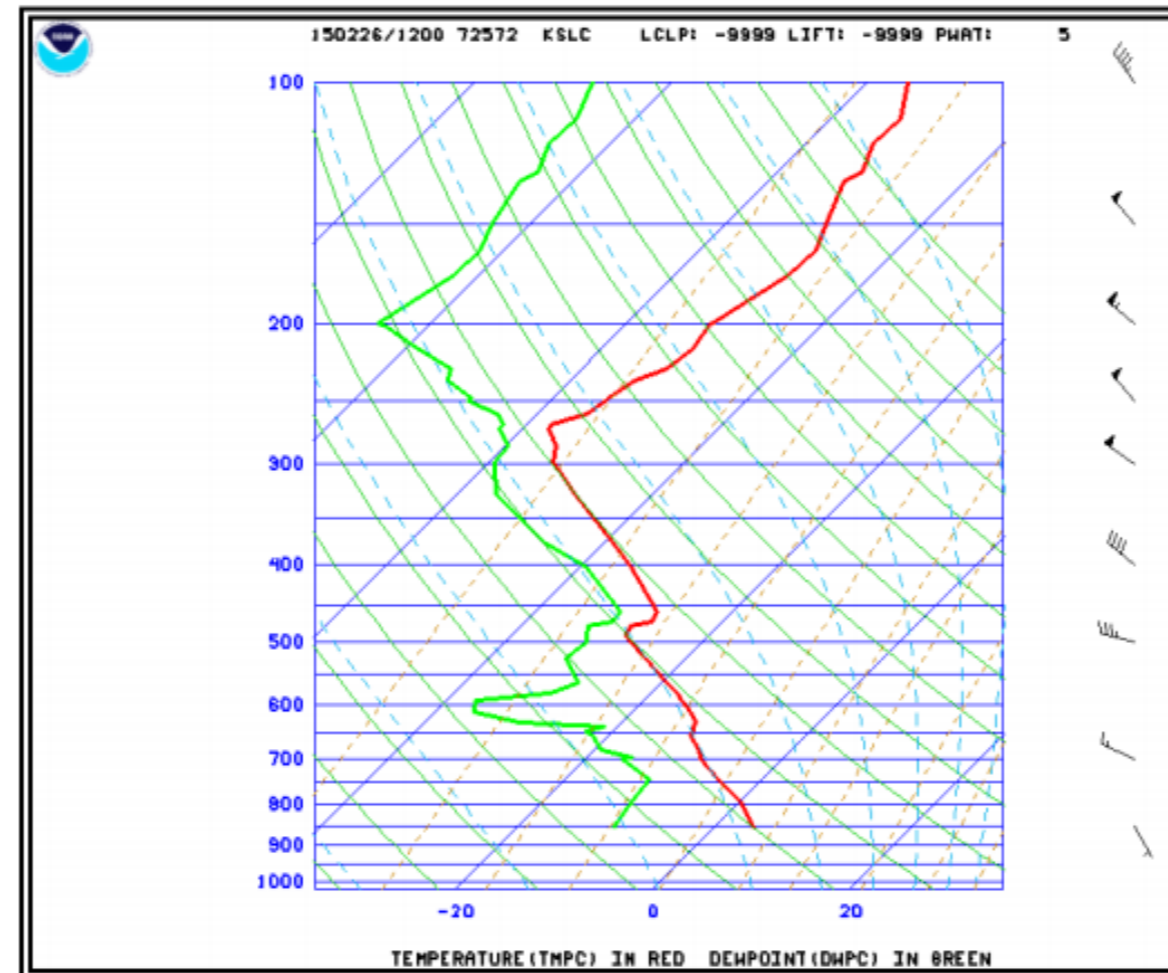
WPC Display



WPC for Aviation Display

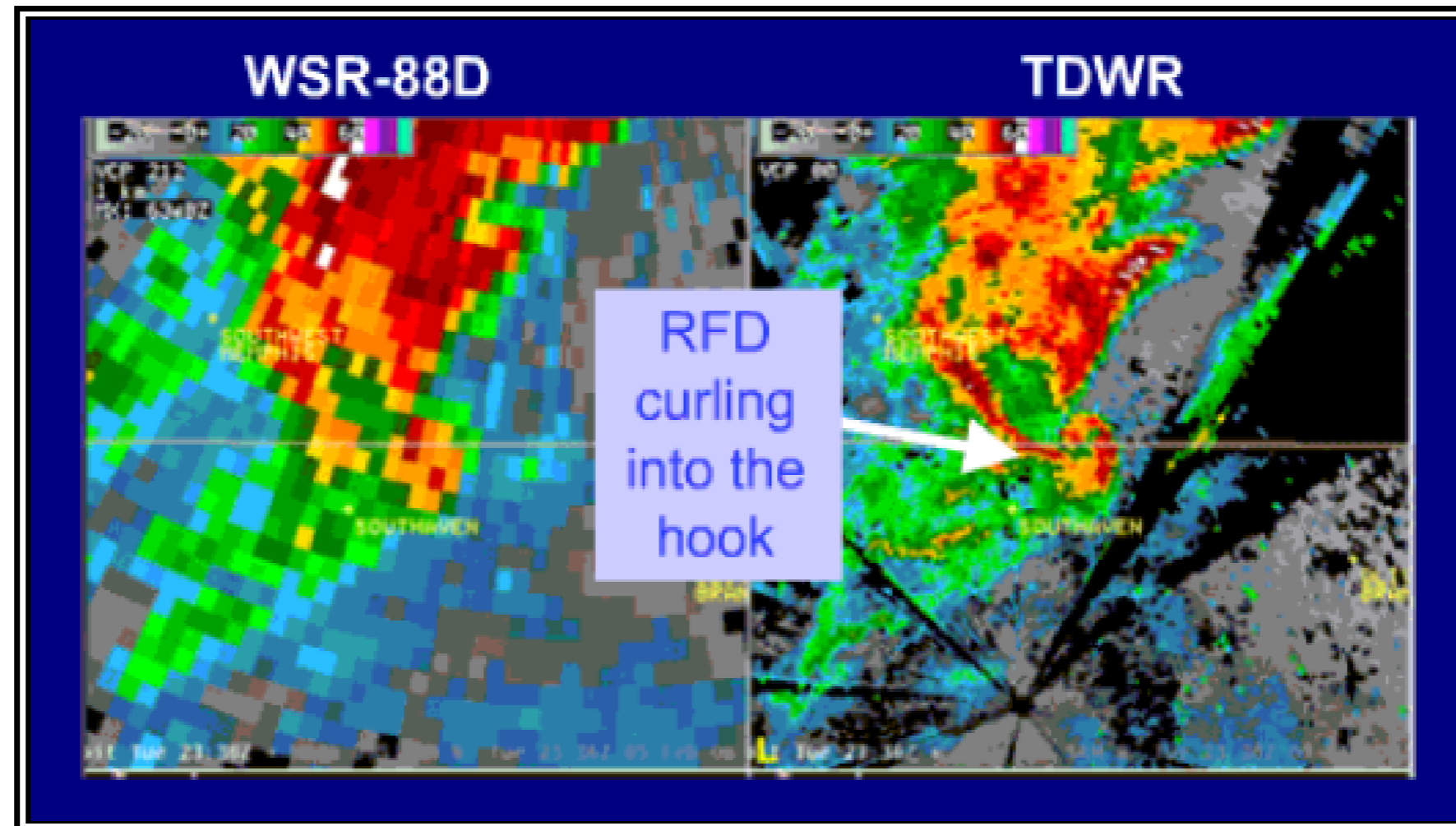
## Potentially Unnecessary Product Information

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



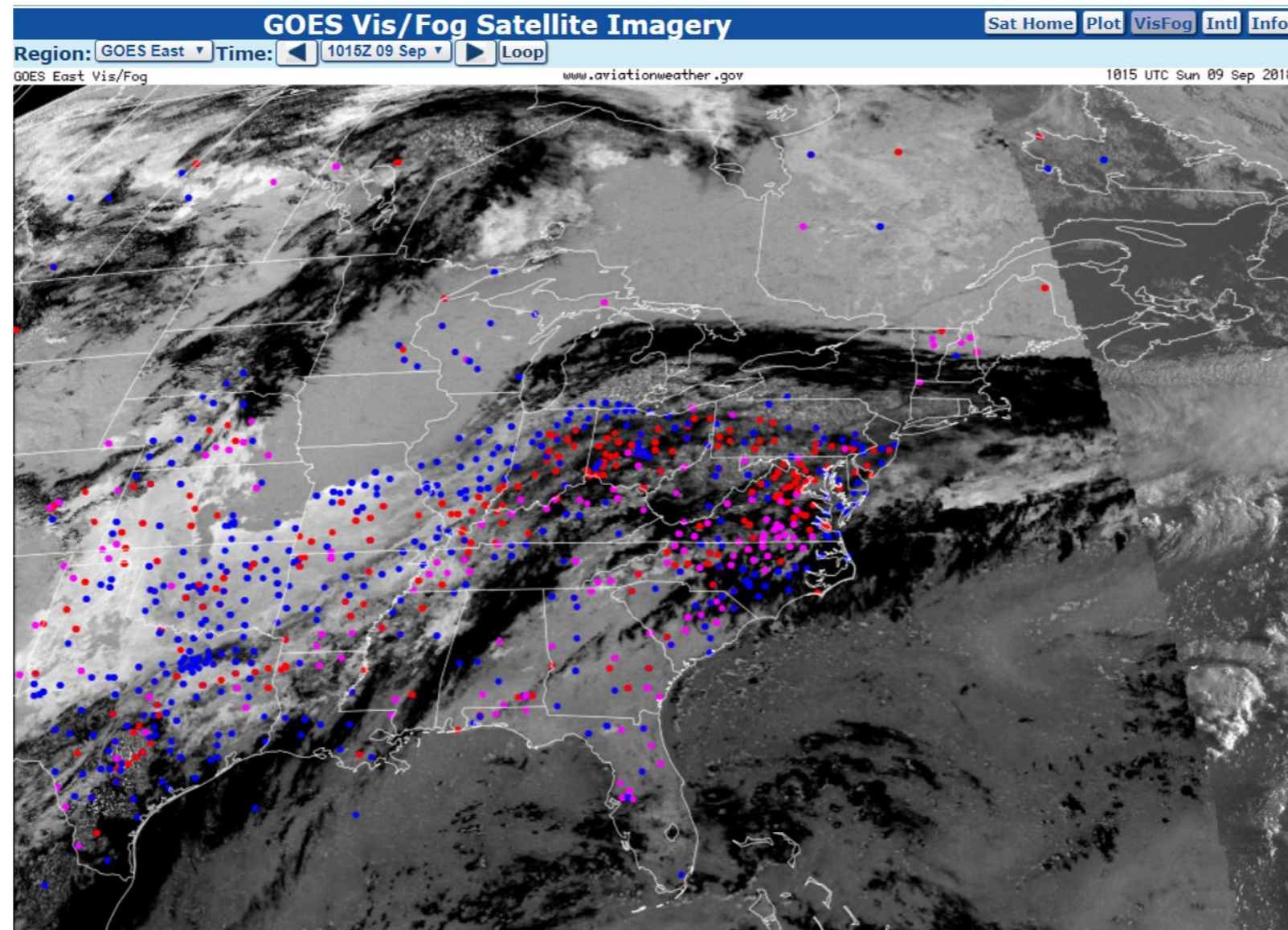
## “Potentially” Unnecessary Product Information

- TDWR
  - Cannot be accessed on AWC
  - May create confusion with traditional radar



## Product on website but not included in AC

- GOES Vis/Fog



- Great product, but requires detailed explanation

## Limited Focus on Product Interpretation

### Radar Displays

- Limited product interpretation of hazardous phenomena
  - Convective vs Stratiform was added in Change 1
- 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.
- Compare satellite and radar for same phenomena

## 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.
- Compare radar and satellite information

## Recommendations and Suggestions

- Use AWC to notify public of new or updated circulars related to weather.
- Include easy-to-find product descriptions on AWC website
  - Update as products are added
- Create Weather Handbook to consolidate weather information (more in next presentation)



Questions?