

2015

## WTIC Research at Embry-Riddle Aeronautical University

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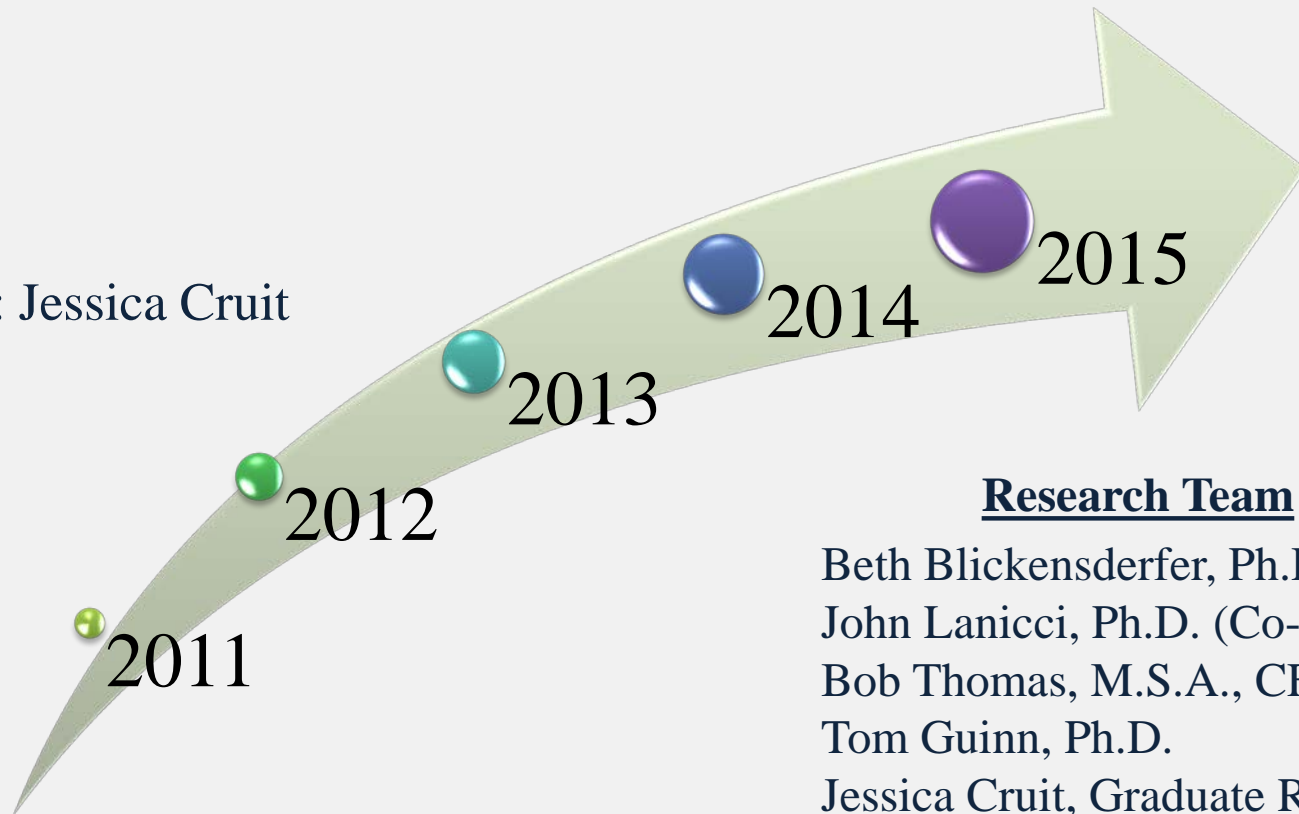
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# WTIC Research at Embry-Riddle Aeronautical University

Presented by: Jessica Cruit



## Research Team

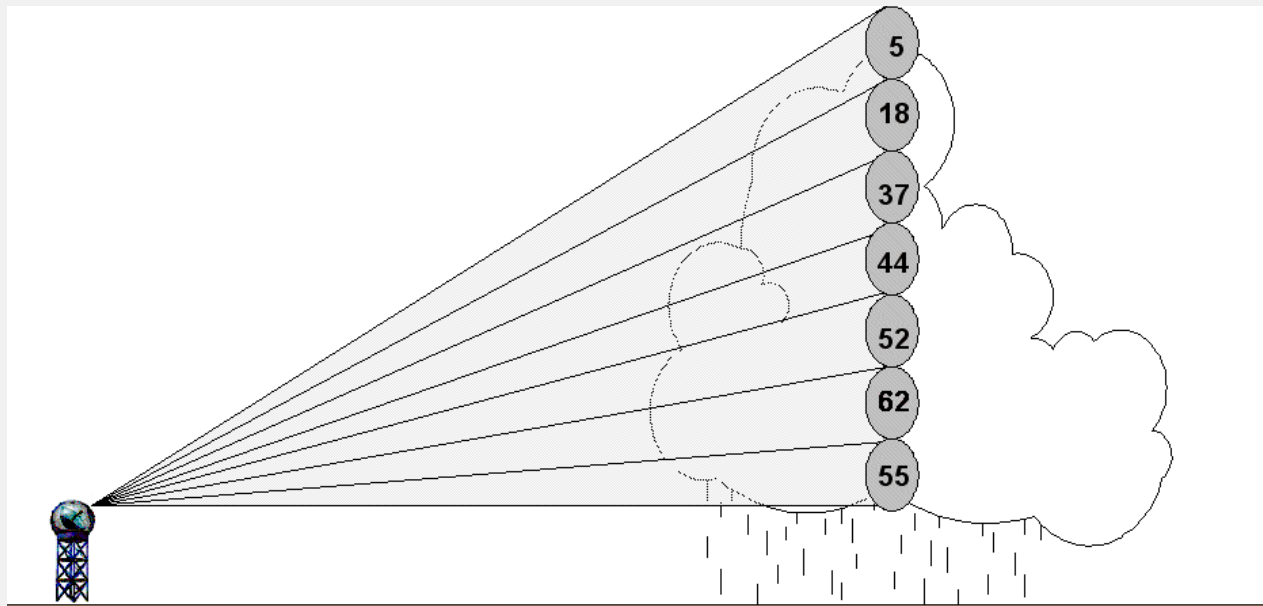
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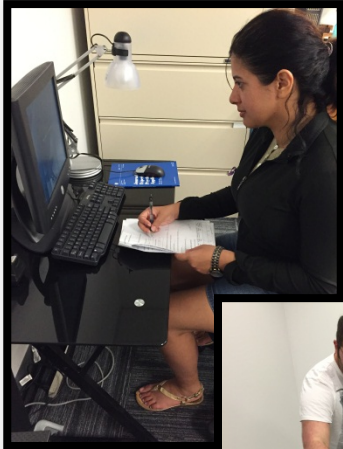
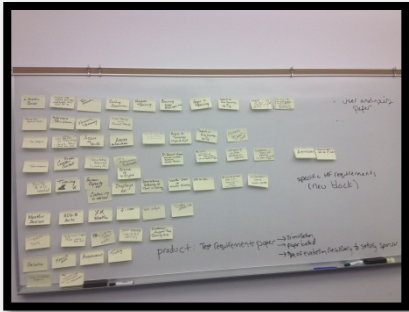
**2011** Designed NEXRAD Convective Wx training module (Roberts et al., 2011)

**2012** Developed NEXTRAD Course to train GA Pilots (Roberts et al., 2011)

**2013** Validated NEXRAD Convective Wx training module with GA Pilots

**2014** Transformed the NEXRAD course into an online training module (FAASafety.gov)

**2015** -Developed 113 test questions to assess aviation wx knowledge of GA pilots  
-Validating assessment with 300 GA pilots



# 2011-2013 NEXRAD Course

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## Needs Analysis

Pilot Discussion Boards, meetings, etc.

## NEXRAD Course

2.5-hour instructor-based training course

## Course Topics

Thunderstorms, Radar basics/Products, NEXRAD, Decision making

## Results

All GA Pilots who took course earned higher knowledge test scores after taking the course than those who did not



# 2014 Online Training Module

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**Motivation:** Dry PowerPoints aren't as effective as interactive online scenario courses in teaching pilots about wx

## The Atmosphere

- **Thermosphere:** a thermal classification of the atmosphere. In the thermosphere, temperature increases with altitude.
- **Exosphere:** the outermost layer of the Earth's atmosphere. The exosphere goes from about 400 miles (640 km) high to about 800 miles
- **Ionosphere:** it contains many [ions](#) and free electrons
- **Mesosphere:** is characterized by temperatures that quickly decrease as height increases.

## Clouds

- **How do clouds form?:**  
Clouds form from water vapor
- **Cirrus:** Thin, wispy, filamentous, or curly
- **Strato-cumulus:** Broad and flat on the bottom, puffy on top
- **Stratus:** Uniform, flat, thick to thin layered clouds will ill-defined edges

## Decision Making

- **D: Detect**
- **E: Estimate**
- **C: Choose**
- **I: Identify**
- **D: Do**
- **E: Evaluate**

**Excerpts from interactive online scenario courses:**

<http://canvaslib.erau.edu/coa-flight/wtic/03NEXRAD/story.html>

<http://canvaslib.erau.edu/coa-flight/wtic/10Scenario02/story.html>

# 2015-Assessing Aviation Wx Knowledge

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2015

Developed 113 test questions to assess aviation wx knowledge of GA pilots  
-Validating assessment with 300 GA pilots

<https://youtu.be/Z7g0AycOrzw>

# 2015-Assessing Aviation Wx Knowledge

## Psychometric Properties

Content  
Validity

Discrimination  
Index

Reliability

Criterion  
Validity

Discriminates between  
those with low and high wx  
knowledge.

Does the test predict GA  
pilot performance?

Test  
comprehensiveness

Test consistency &  
repeatability



# Future Wx Training for Pilots

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<https://youtu.be/l05fsP-bLxU>

# Take Aways

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- Are GA pilots accurately assessed on aviation weather knowledge and skills?
  - 113 question assessment and test validation helps to answer question
- There is more we can do to train GA pilots about weather and technology
- Goal: Create dynamic, self-study scenarios that provide instant feedback in a cost-effective manner.