FLIGHTPROFILER™
aviation technology

TURN YOUR PHONE INTO A WEATHER SENSOR

Flipping the Observation Paradigm on its Head

FPAW 2025 Fall Meeting

FLIGHTPROFILER COMPANY INTRODUCTION

Background:

- Aviation tech (mostly CS-based & meteorological)
- VOSB, Founded 2006
- We use our own technology

Fellow FPAW'r
Matt Johnson

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More info at:

- flightprofiler.com
- lowaltitudeweathernetwork.com

WHY ARE WE HERE?

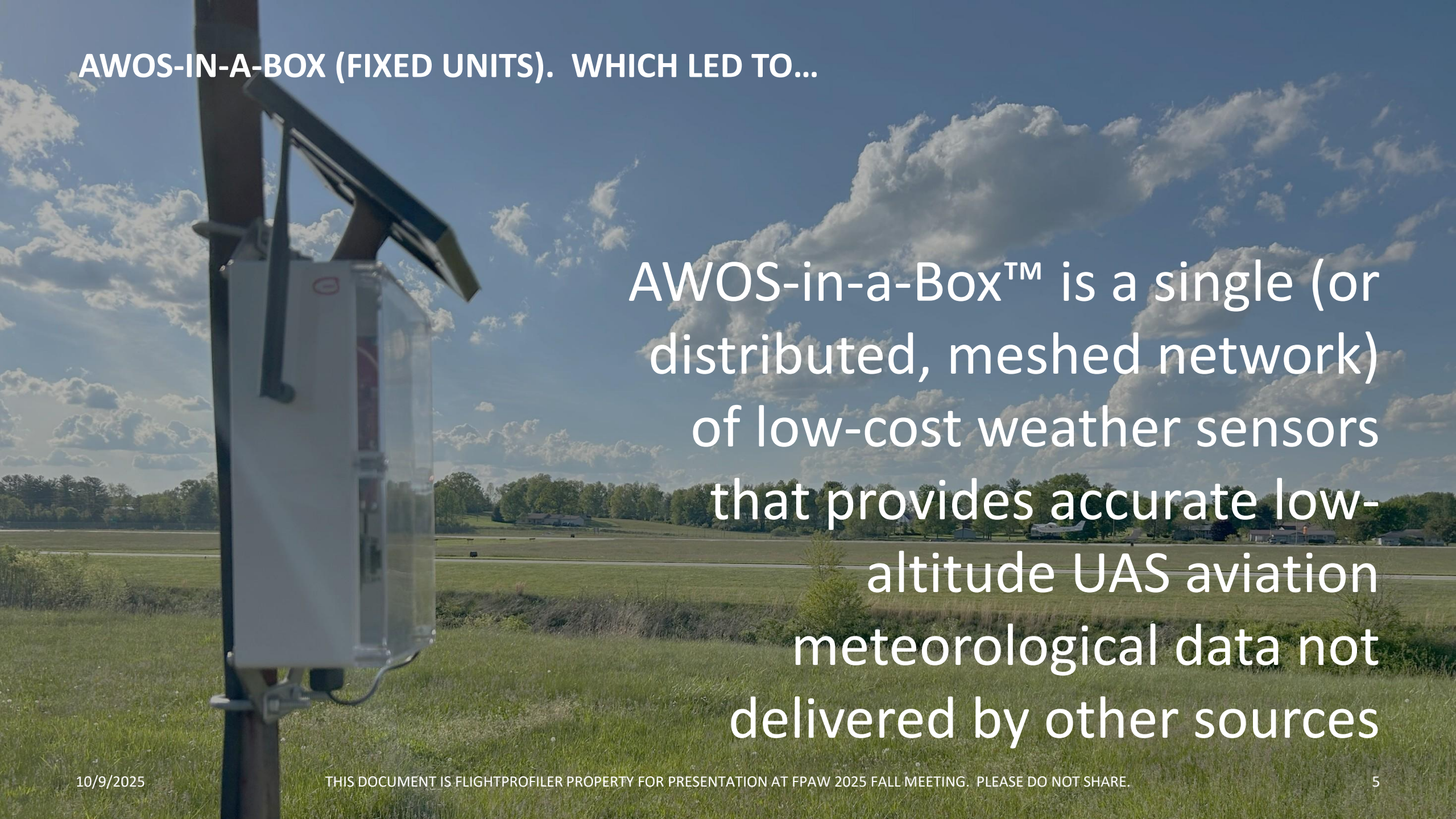
#1) Launch ‘Point & Click Weather’ Visibility Tool

#2) Obtain critical input & expert feedback

#3) Seek out collaboration

“3D WEATHER” DEVELOPED FOR FAA (PREFLIGHT PLANNING AND POSSIBLE ‘WEATHER RADAR ALTERNATE’) WITH A FOCUS ON REDUCING INADVERTNENT VFR INTO IMC… BUT HOW DO WE GET MORE DATA TO PILOTS?

AWOS-IN-A-BOX (FIXED UNITS). WHICH LED TO…

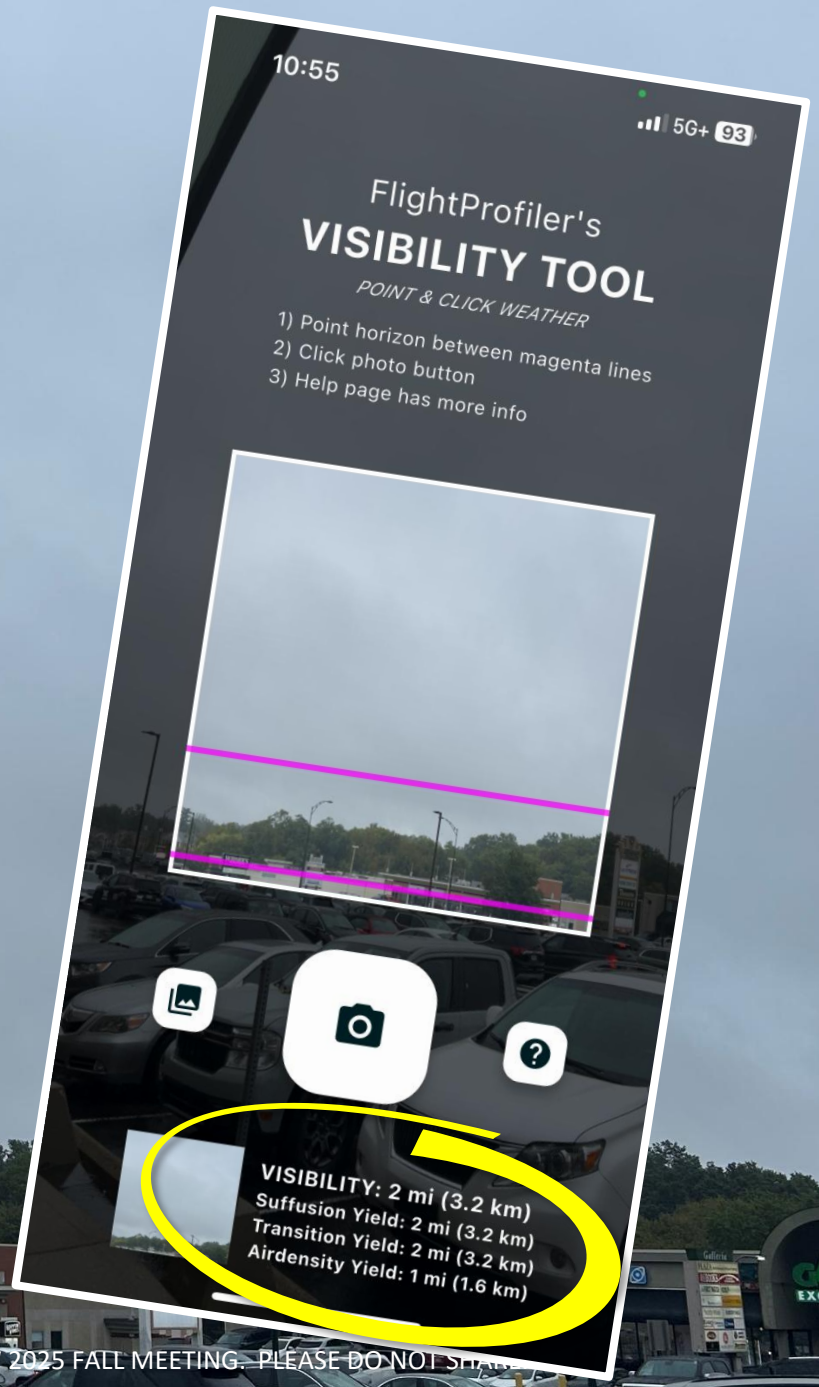


AWOS-in-a-Box™ is a single (or distributed, meshed network) of low-cost weather sensors that provides accurate low-altitude UAS aviation meteorological data not delivered by other sources

MOBILE UNITS. WHICH LED TO…

POINT & CLICK WEATHER™ VISIBILITY TOOL

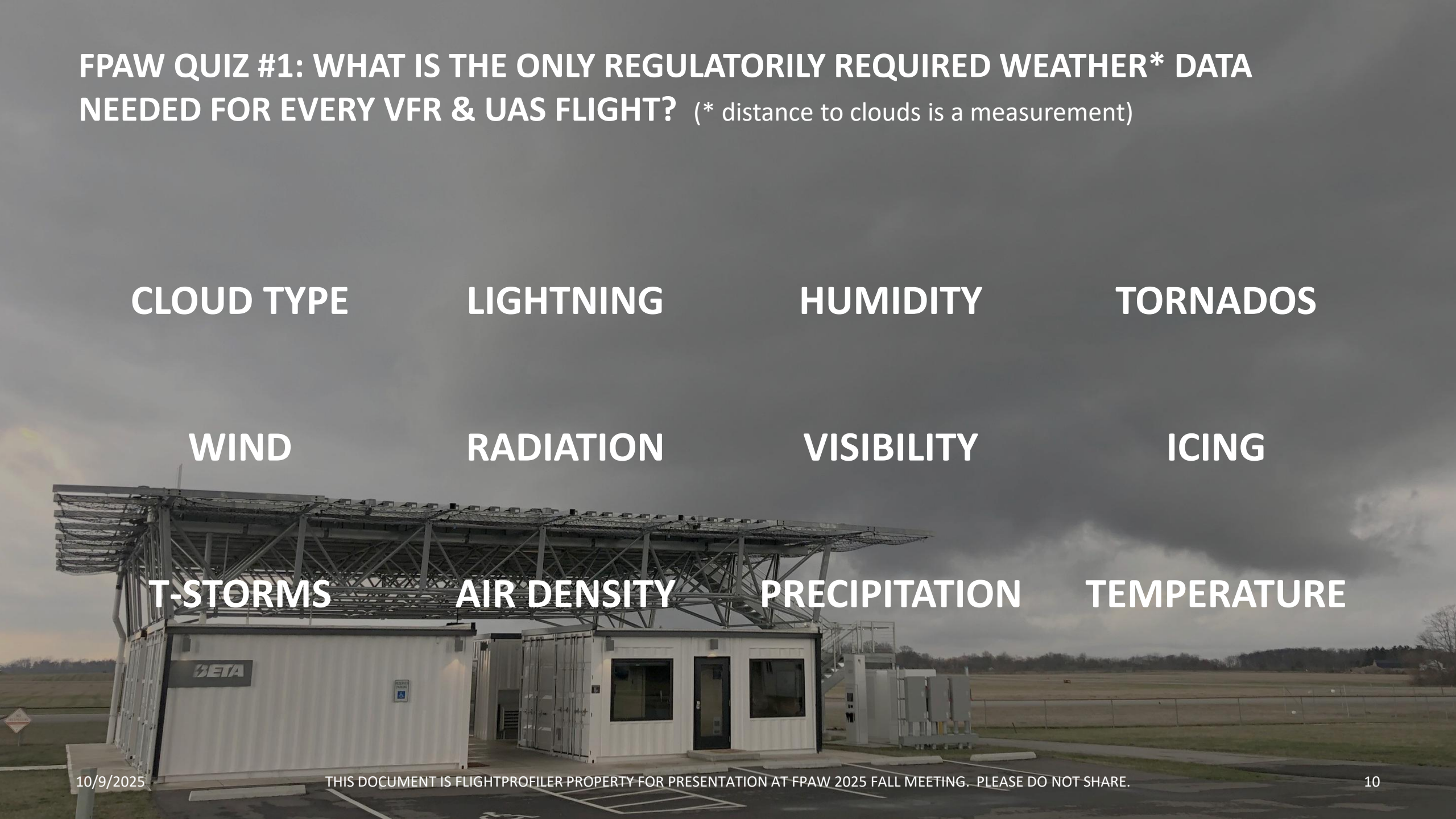
OCT 7, 2025 @ 10:55am EST NEAR CVG AMAZON WAREHOUSE



WHY IS A VISIBILITY TOOL NEEDED?

FPAW QUIZ #1: WHAT IS THE ONLY REGULATORILY REQUIRED WEATHER* DATA NEEDED FOR EVERY VFR & UAS FLIGHT? (* distance to clouds is a measurement)

CLOUD TYPE	LIGHTNING	HUMIDITY	TORNADOS
WIND	RADIATION	VISIBILITY	ICING
T-STORMS	AIR DENSITY	PRECIPITATION	TEMPERATURE



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CLOUD TYPE	LIGHTNING	HUMIDITY	TORNADOS
WIND	RADIATION	**VISIBILITY**	ICING
T-STORMS	AIR DENSITY	PRECIPITATION	TEMPERATURE

14 CFR 91.155 (VFR WEATHER MINIMUMS) and 107.51 (C) (MINIMUM FLIGHT VISIBILITY FOR A REMOTE PILOT IN COMMAND AND THE PERSON MANIPULATING THE FLIGHT CONTROLS OF THE SMALL UAS)

PART 91—GENERAL OPERATING AND FLIGHT RULES

91.155 Basic VFR weather minimums.

(a) Except as provided in paragraph (b) of this section and § 91.157, no person may operate an aircraft under VFR when the flight visibility is less, or at a distance from clouds that is less, than that prescribed for the corresponding altitude and class of airspace in the following table:

Airspace	Flight Visibility	Distance from Clouds
Class A	Not Applicable	Not Applicable
Class B	3 statute miles	Clear of Clouds
Class C	3 statute miles	500 feet below 1,000 feet above 2,000 feet horizontal
Class D	3 statute miles	500 feet below 1,000 feet above 2,000 feet horizontal
Class E: Less than 10,000 feet MSL	3 statute miles	500 feet below 1,000 feet above 2,000 feet horizontal
At or above 10,000 feet MSL	5 statute miles	1,000 feet below 1,000 feet above 1 statute mile horizontal
Class G 1,200 feet or less above the surface (regardless of MSL altitude). For aircraft other than helicopters:		
Day, except as provided in §91.155(b)	1 statute mile	Clear of clouds
Night, except as provided in §91.155(b)	3 statute miles	500 feet below 1,000 feet above 2,000 feet horizontal
For helicopters:		
Day	½ statute mile	Clear of clouds
Night, except as provided in §91.155(b)	1 statute mile	Clear of clouds
More than 1,200 feet above the surface but less than 10,000 feet MSL		
Day	1 statute mile	500 feet below 1,000 feet above 2,000 feet horizontal
Night	3 statute miles	500 feet below 1,000 feet above 2,000 feet horizontal
More than 1,200 feet above the surface and at or above 10,000 feet MSL	5 statute miles	1,000 feet below 1,000 feet above 1 statute mile horizontal

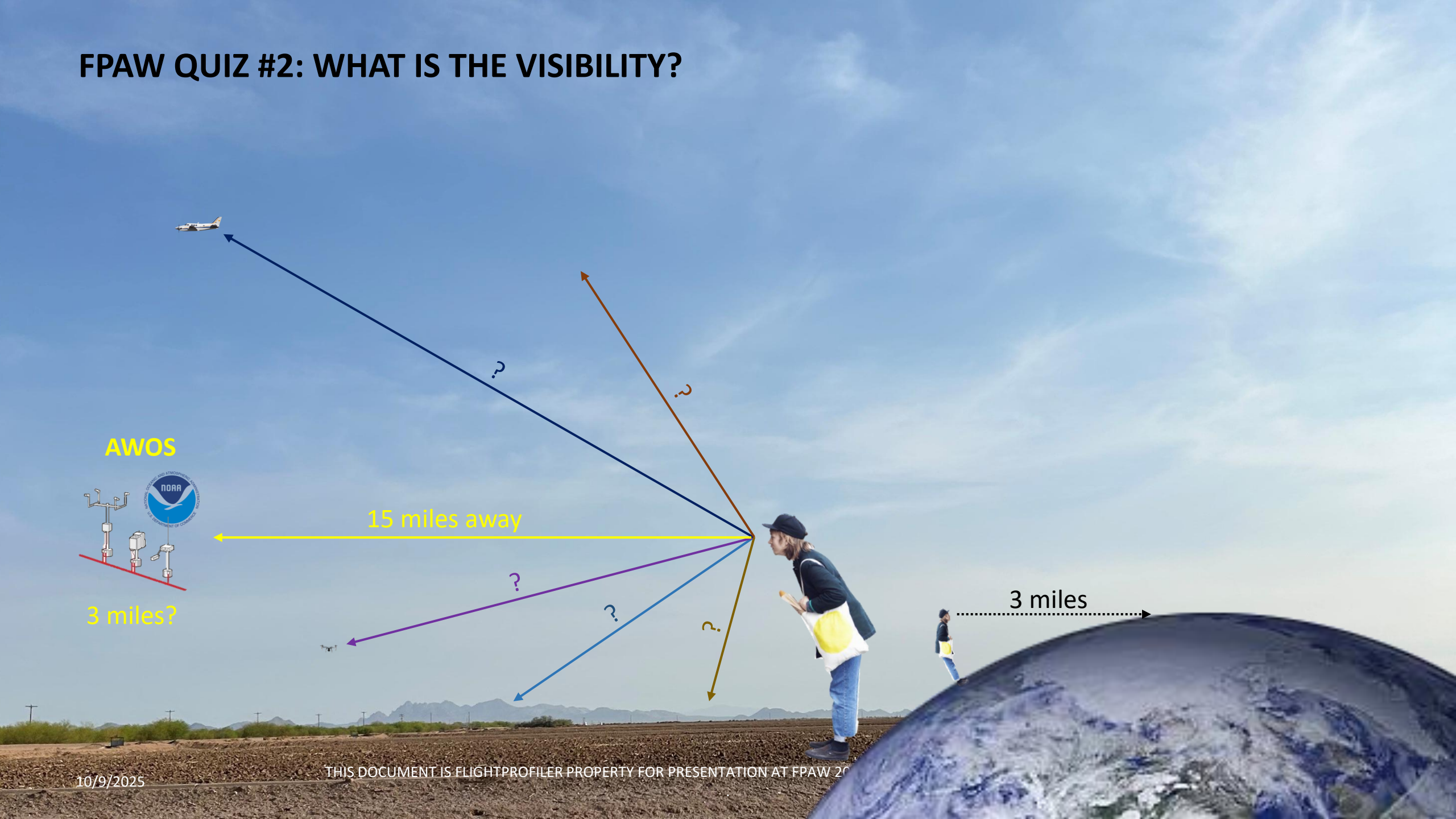
PART 107—SMALL UNMANNED AIRCRAFT SYSTEMS

107.51 Operating limitations for small unmanned aircraft.

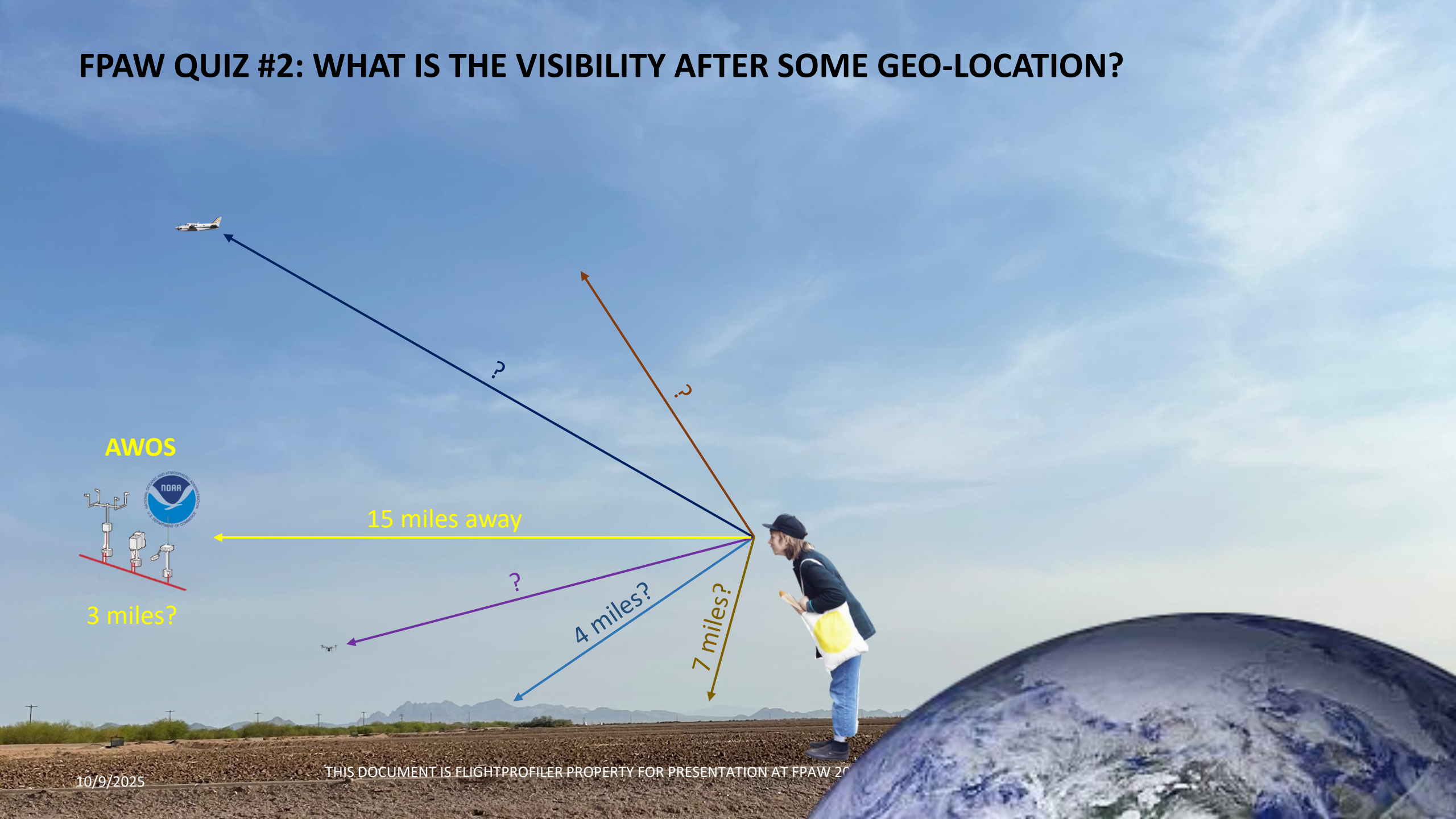
A remote pilot in command and the person manipulating the flight controls of the small unmanned aircraft system must comply with all of the following operating limitations when operating a small unmanned aircraft system:

(c) The minimum flight visibility, as observed from the location of the control station must be no less than 3 statute miles. For purposes of this section, flight visibility means the average slant distance from the control station at which prominent unlighted objects may be seen and identified by day and prominent lighted objects may be seen and identified by night.

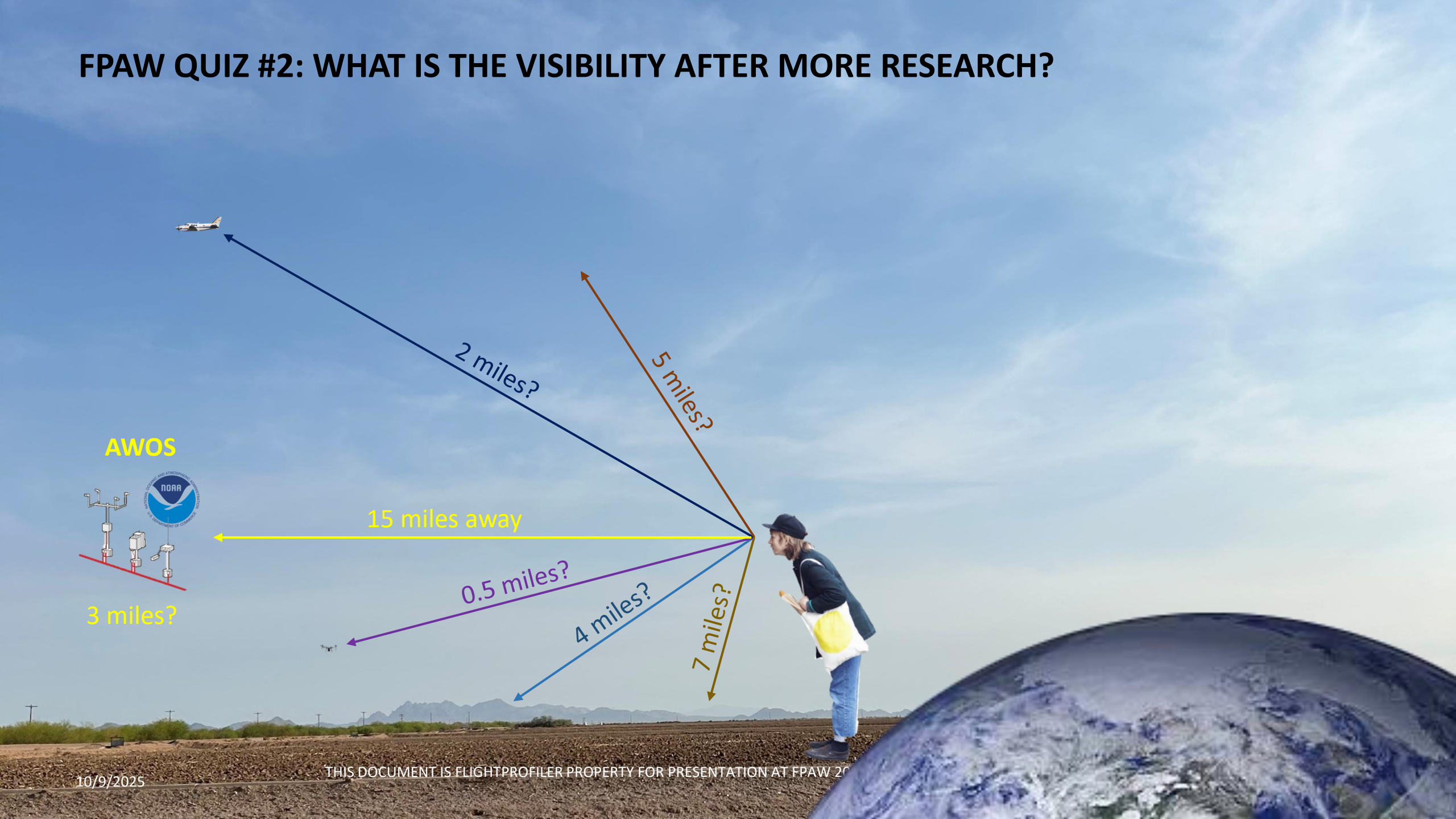
FPAW QUIZ #2: WHAT IS THE VISIBILITY?



FPAW QUIZ #2: WHAT IS THE VISIBILITY AFTER SOME GEO-LOCATION?

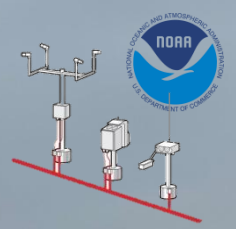


FPAW QUIZ #2: WHAT IS THE VISIBILITY AFTER MORE RESEARCH?



FPAW QUIZ #3: WHAT IS THE VISIBILITY HERE?

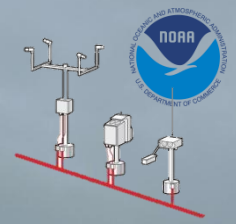
WHAT LOCATION TO USE?



10 miles

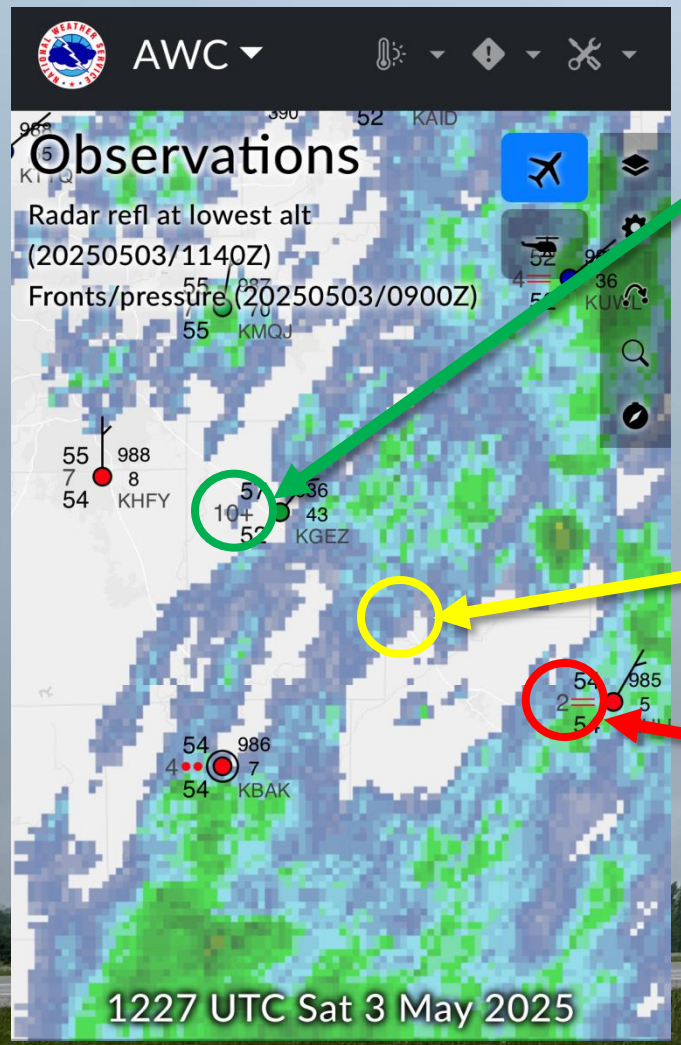
METAR: 10 miles away

METAR: 10 miles away



2 miles

WHICH METAR TO USE?

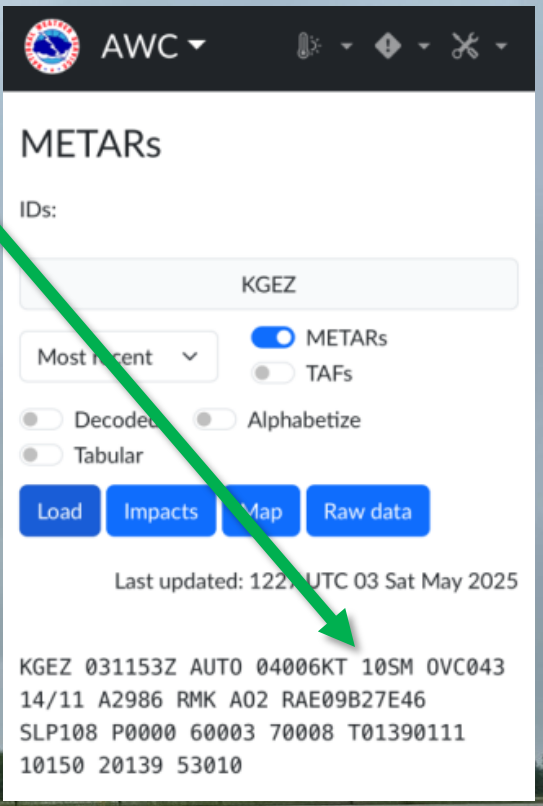


10 miles N/W

Shelbyville Indiana METAR: **10+ miles**

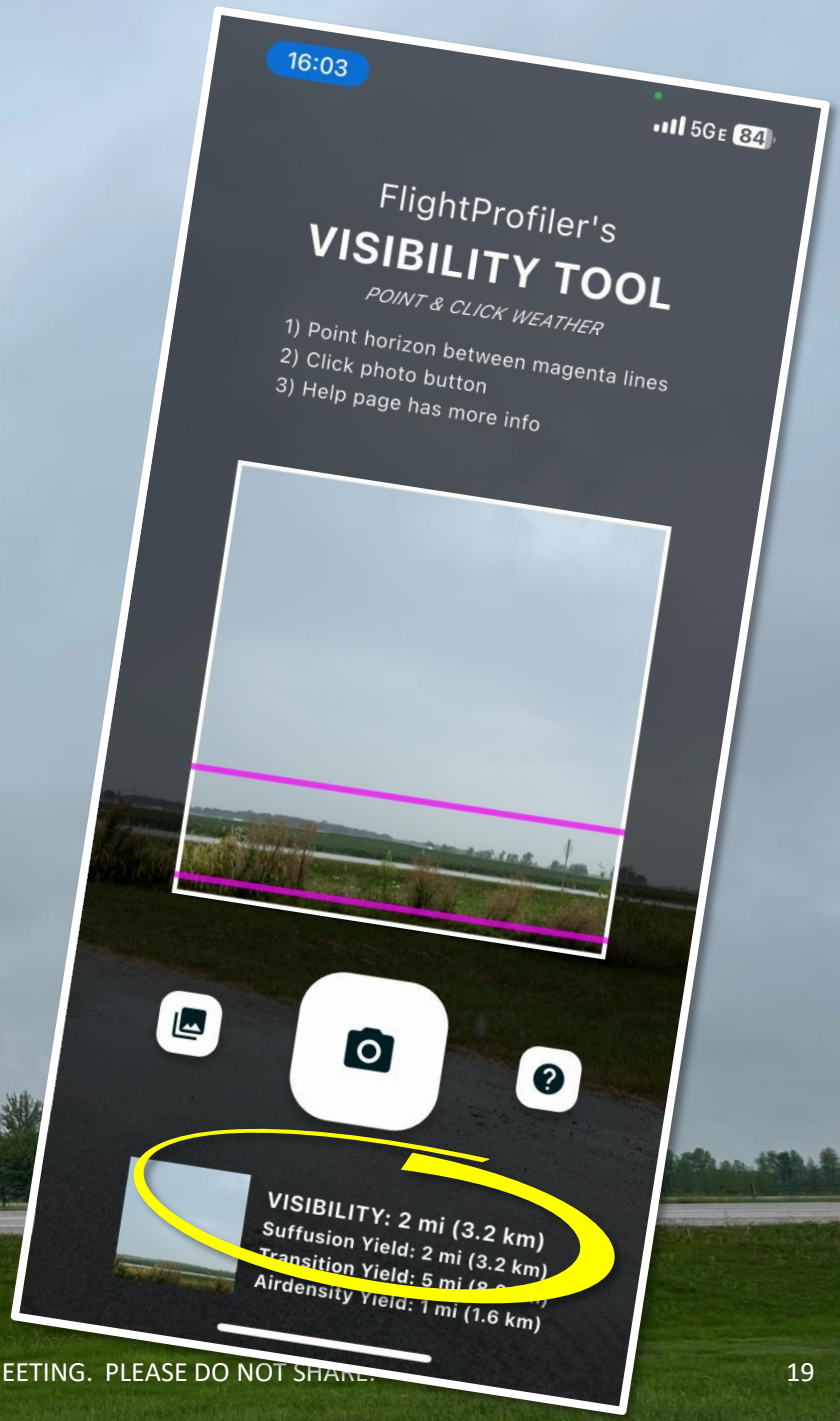
10 miles S/E

Batesville Indiana METAR: **2 miles**

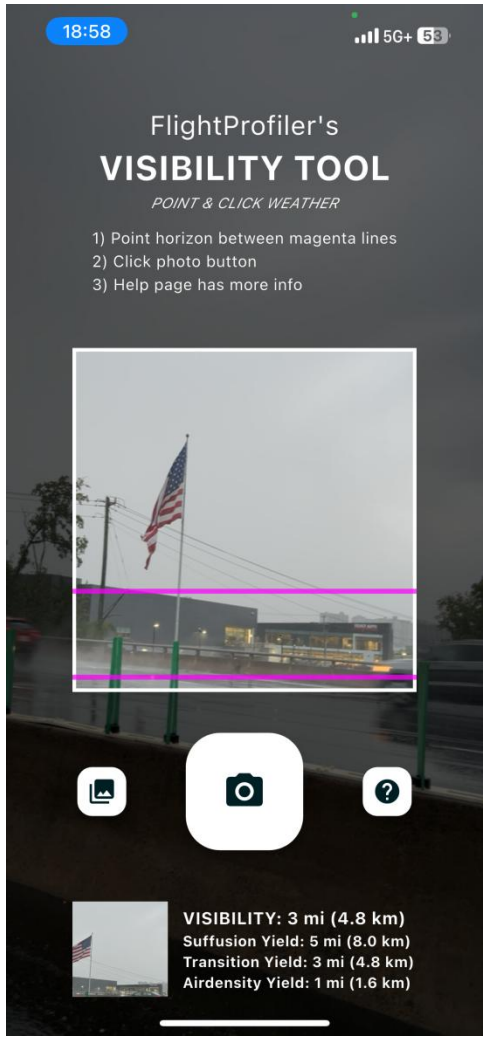


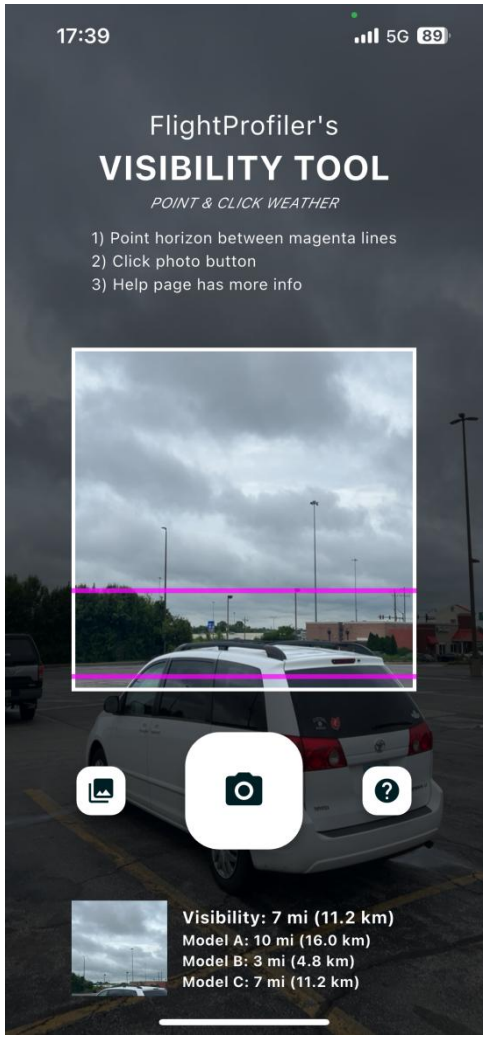
THE VALUE?

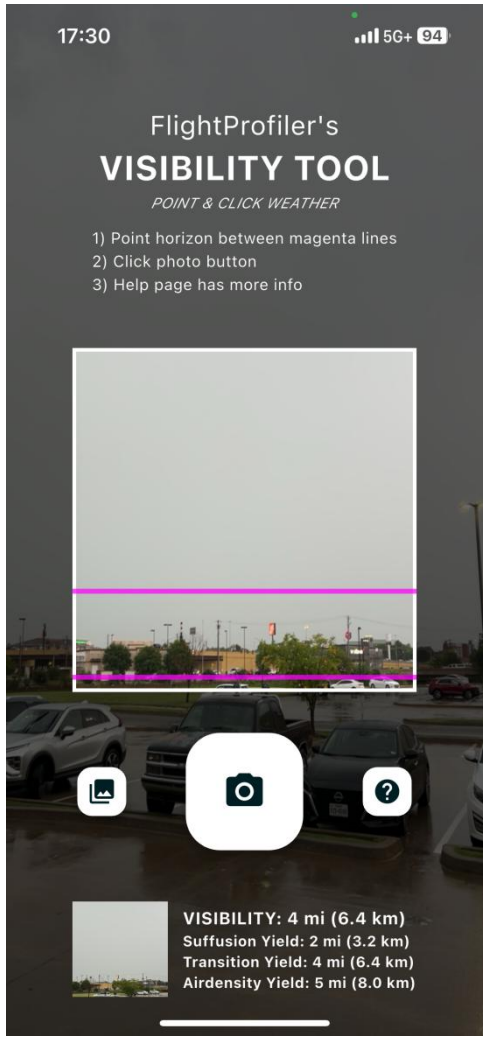
- COMPLIANT
- SAFE
- ACCURATE
- INSTANTANEOUS
- CHEAP
- MOBILE

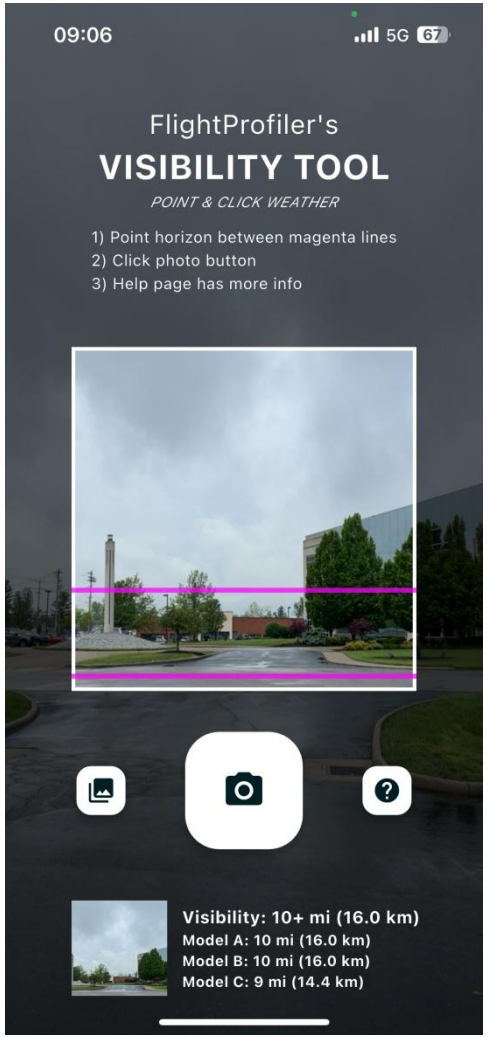


URBAN LOCATION EXAMPLES

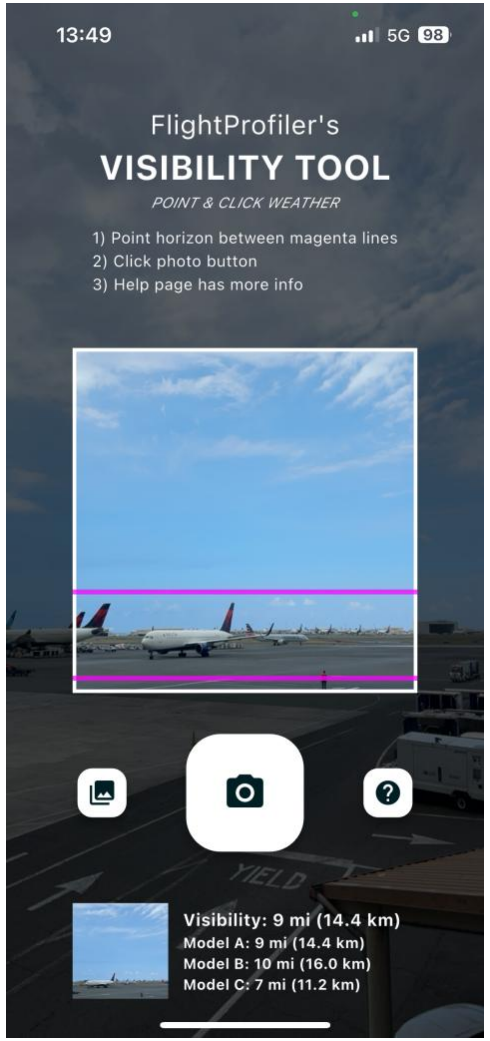


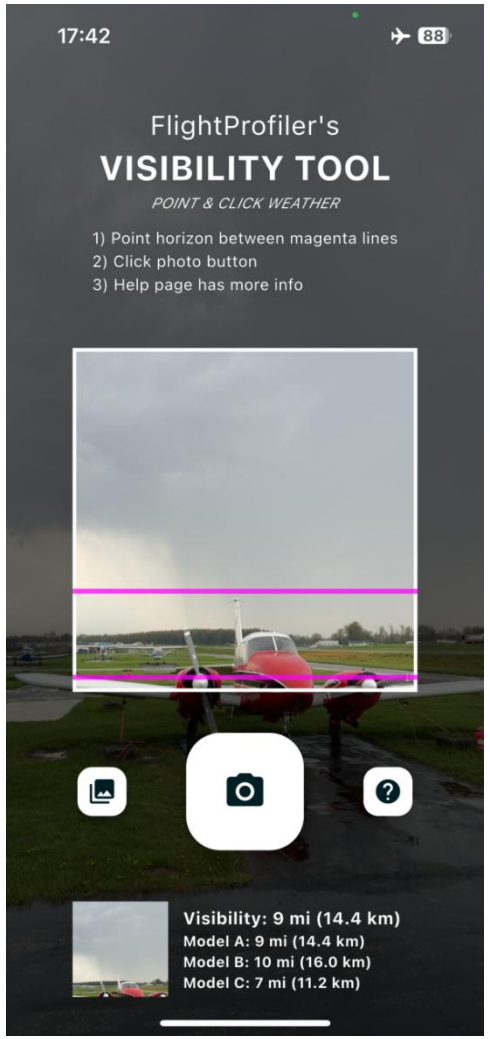


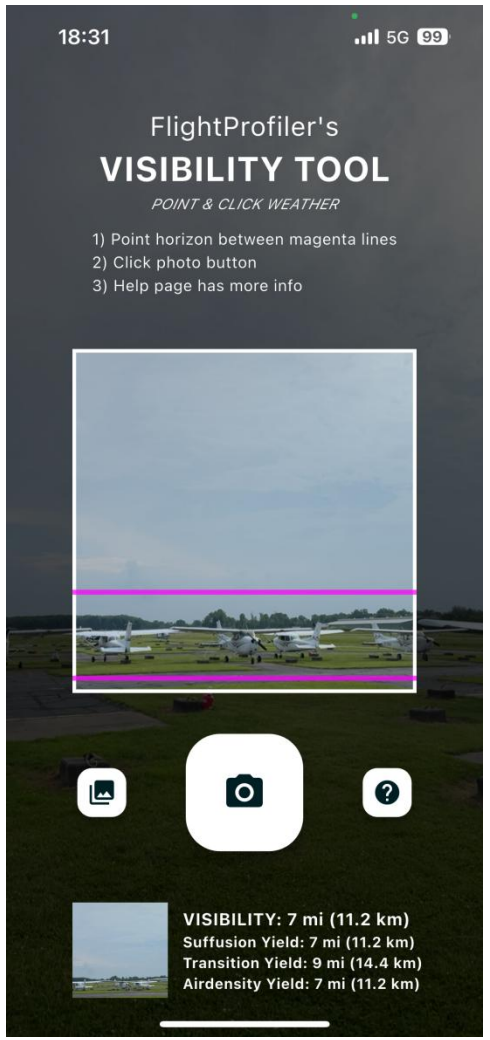


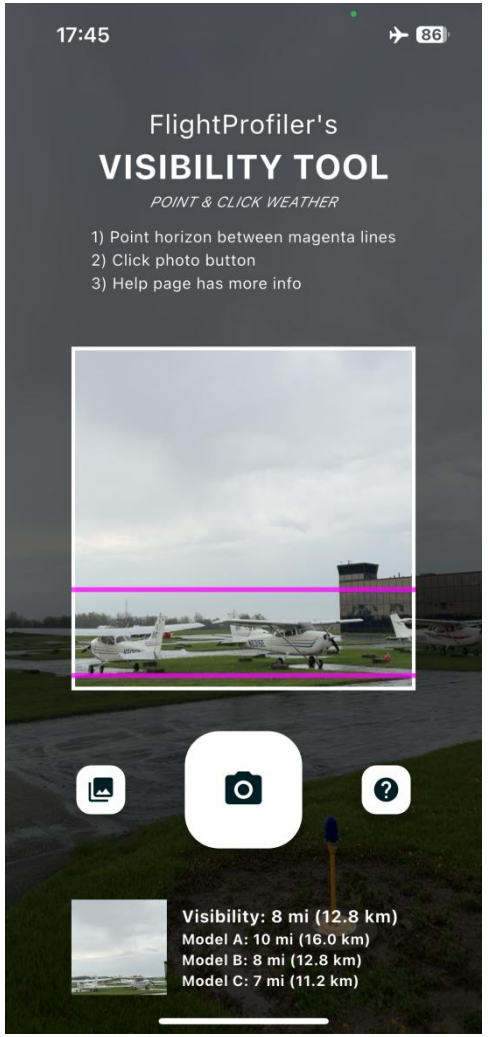


AIRFIELD LOCATION EXAMPLES

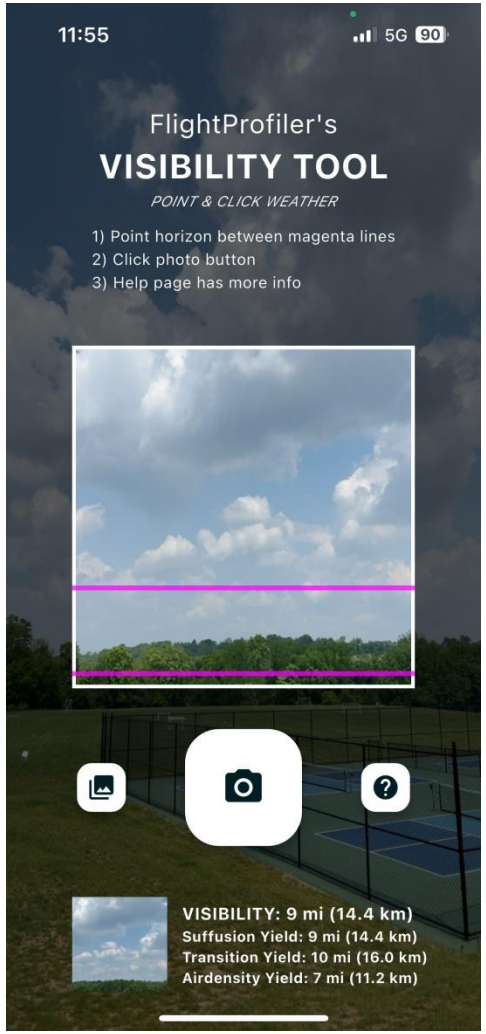


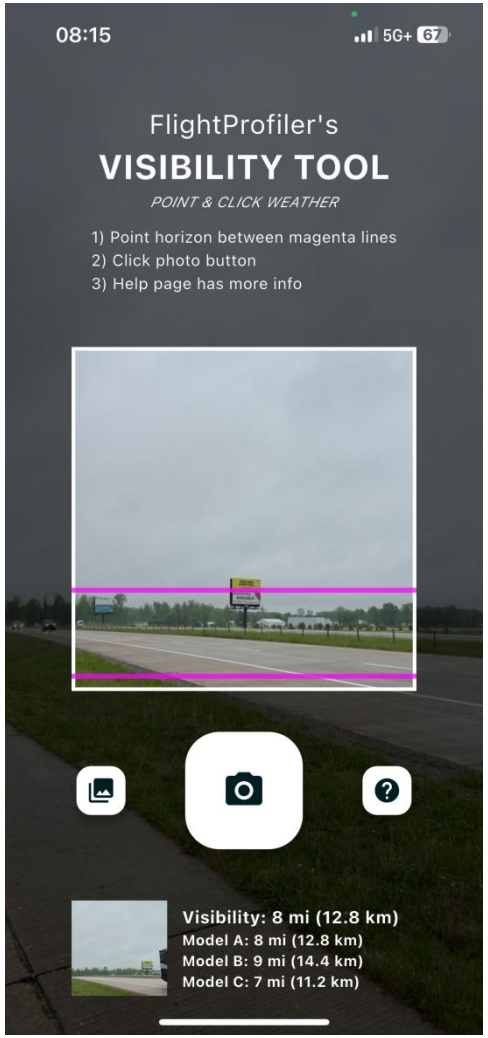


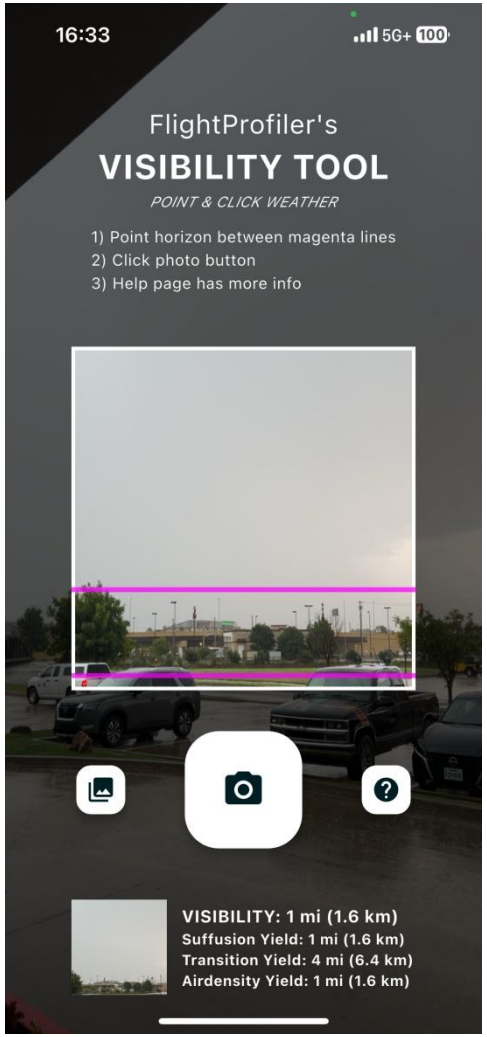


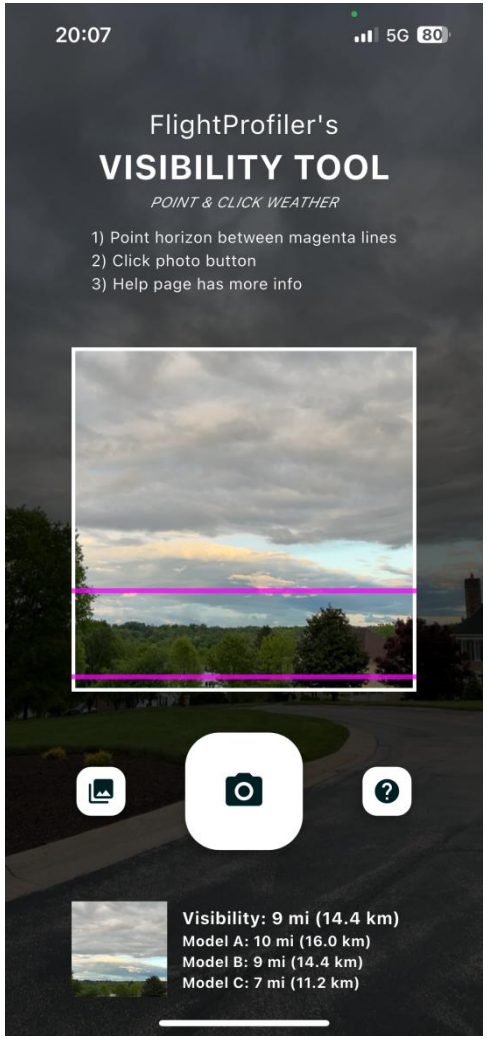


RURAL LOCATION EXAMPLES

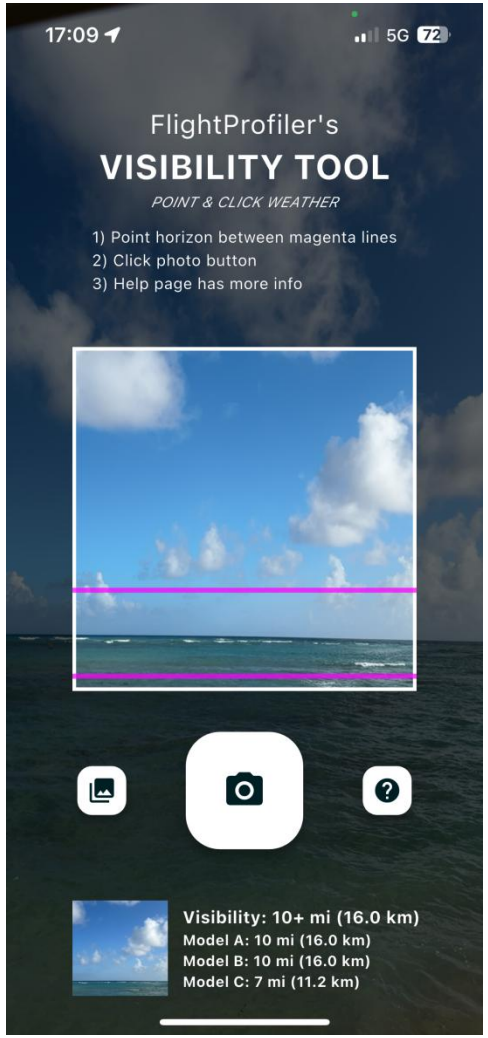


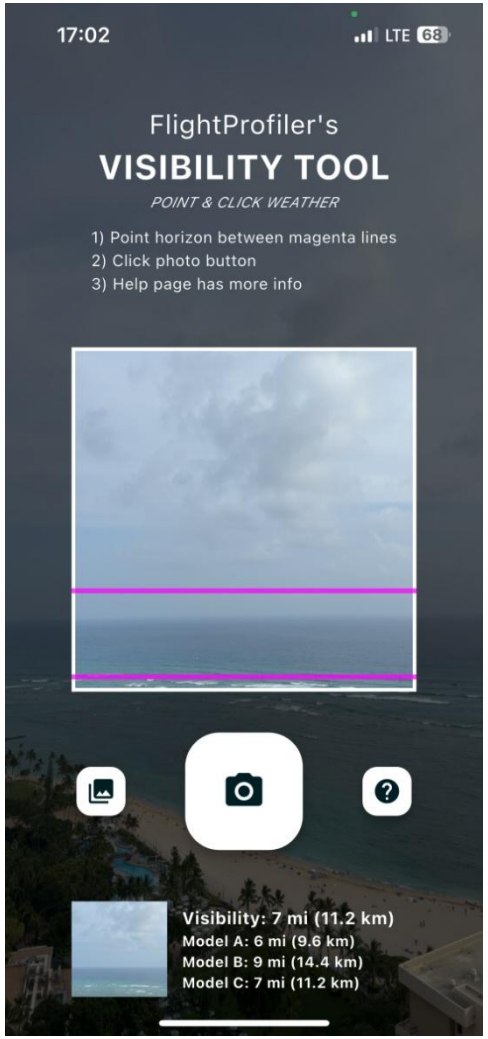


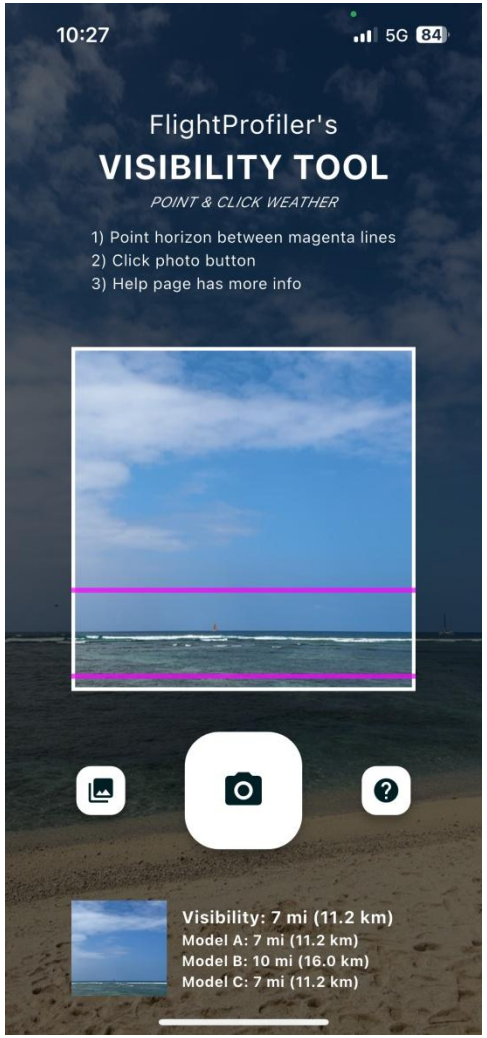




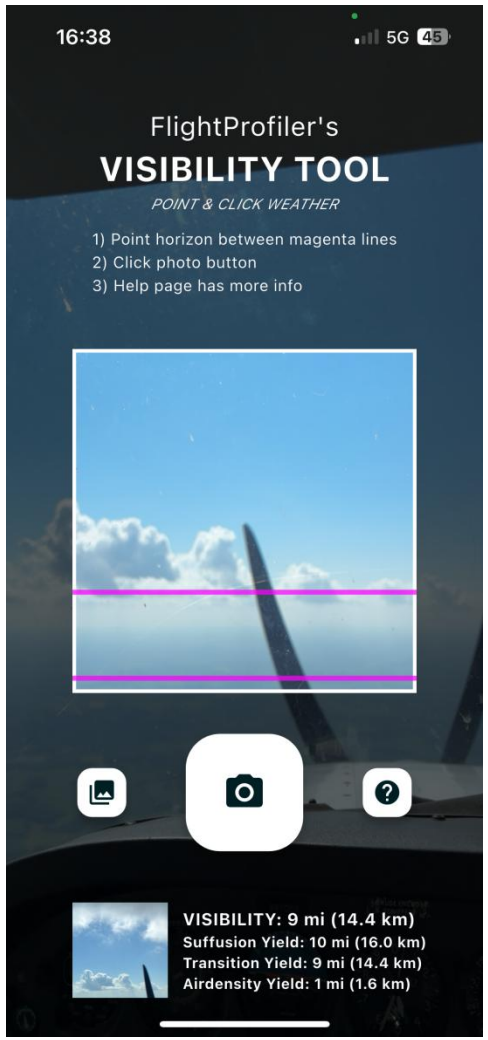
MARITIME LOCATION EXAMPLES

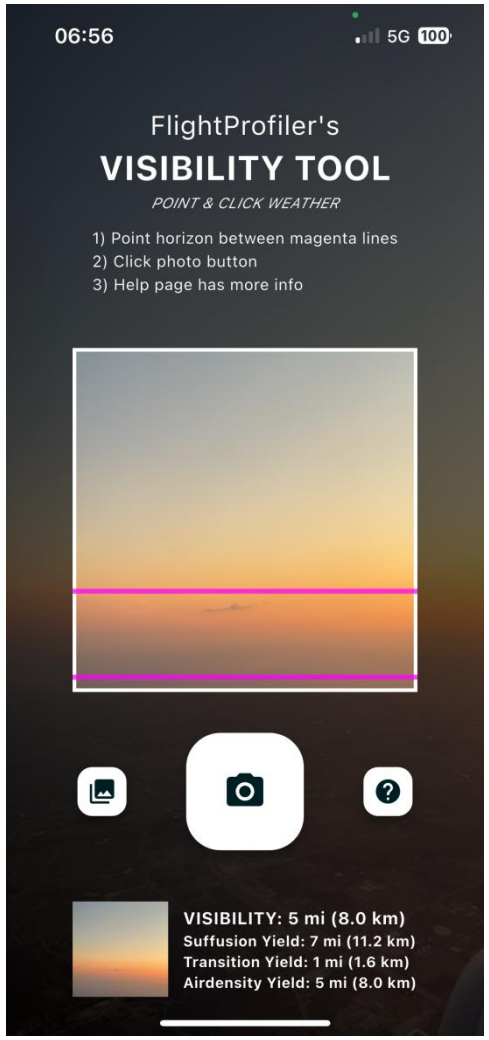


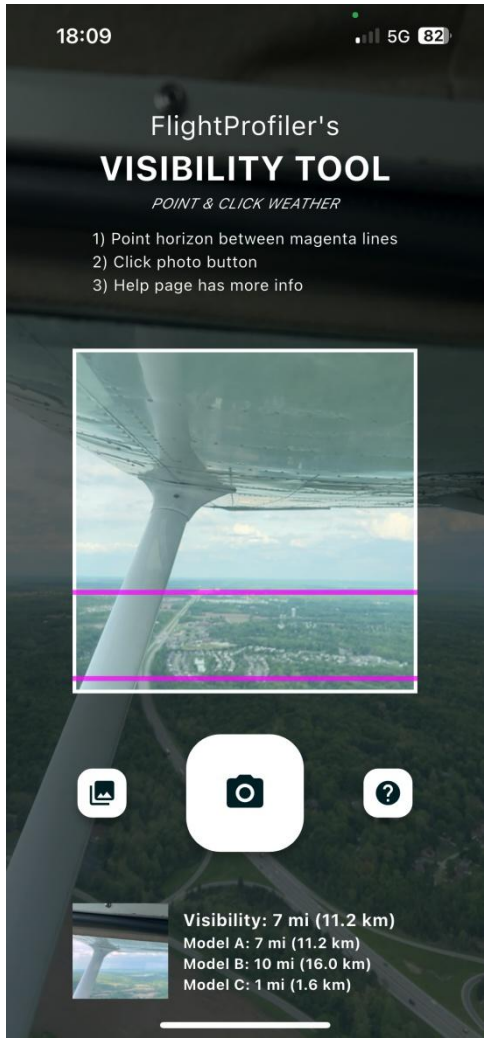


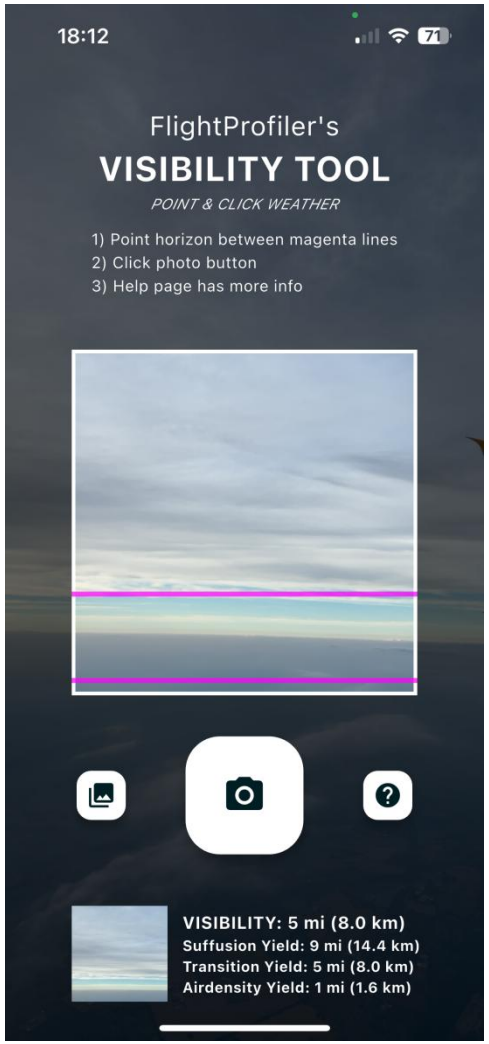


IN-FLIGHT LOCATION EXAMPLES (TO BE INCLUDED ON UAS FOR BVLOS)









TEAM BACKGROUND

- 20 Scientists, Meteorologists, Engineers & Coders
- 2 R1 Universities & 1 Business
- 4 Years of R&D
- 2 Years of testing
- $1,000,000 of USAF & Ohio Investment

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WE ARE INVOLVED IN THE INDUSTRY DISCUSSIONS INVOLVING MEASUREMENT

- Accurate: refers to how close the weather measurement is to its true “real world” value

NORTH STAR FOR US

- Precise: refers to the reproducibility of measurements (how close repeated measurements are to each other)
- Representative: refers to being within reasonable and expected bounds for a given environmental setting, etc.
- Certified: officially recognized as meeting certain standards
- Correlated: connected, mutual or related measurements
- Others…

WHAT'S NEXT?

- Scientific study publishing in process
- "Visibility Tool™" Continuous Improvement
- New "Point & Click™" Technologies on the way
- Feedback welcome
- We seek partnership to move this software to all optical sensors: fixed (ground), mobile (ground), mobile (flight)