The Rise of Drone Utilization for Property Assessment

Charles Mondello
President
Property Drone Consortium

Review the growth and challenges of unmanned aerial system captured (UAS) aerial imagery and how it has shaped the public perception about the use of drones

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The Property Drone Consortium represents a not for profit collaboration among insurance carriers, roofing industry leaders and research organizations who have agreed to work together to promote research, and assess regulations for the use of Unmanned Aerial System (UAS) technology across their affected industries.

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If you intend to do the work yourself with a UAS you are now a pilot, image processor, imaging scientist, data manager, and lawyer

Current Regulatory Environment

2012
The FAA Modernization and Reform Act

2013
The FAA grants the first exemptions for commercial drone use to seven companies

2013
FAA UAS test centers announced

Snapshot of UAS Legislation

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2015 (Jan)
The FAA issues Law Enforcement Guidance for Suspected Unauthorized UAS Operations

2015 (Feb)
Notice of Proposed Rule Making

2015 (Mar)
FAA announced blanket COA's

2015 (Apr)
FAA policy expedites 333 grants

2015 (Dec)
Drone Registration

2016 (May)
Students Fly

sUAS & Part 107

2016 (Jun)

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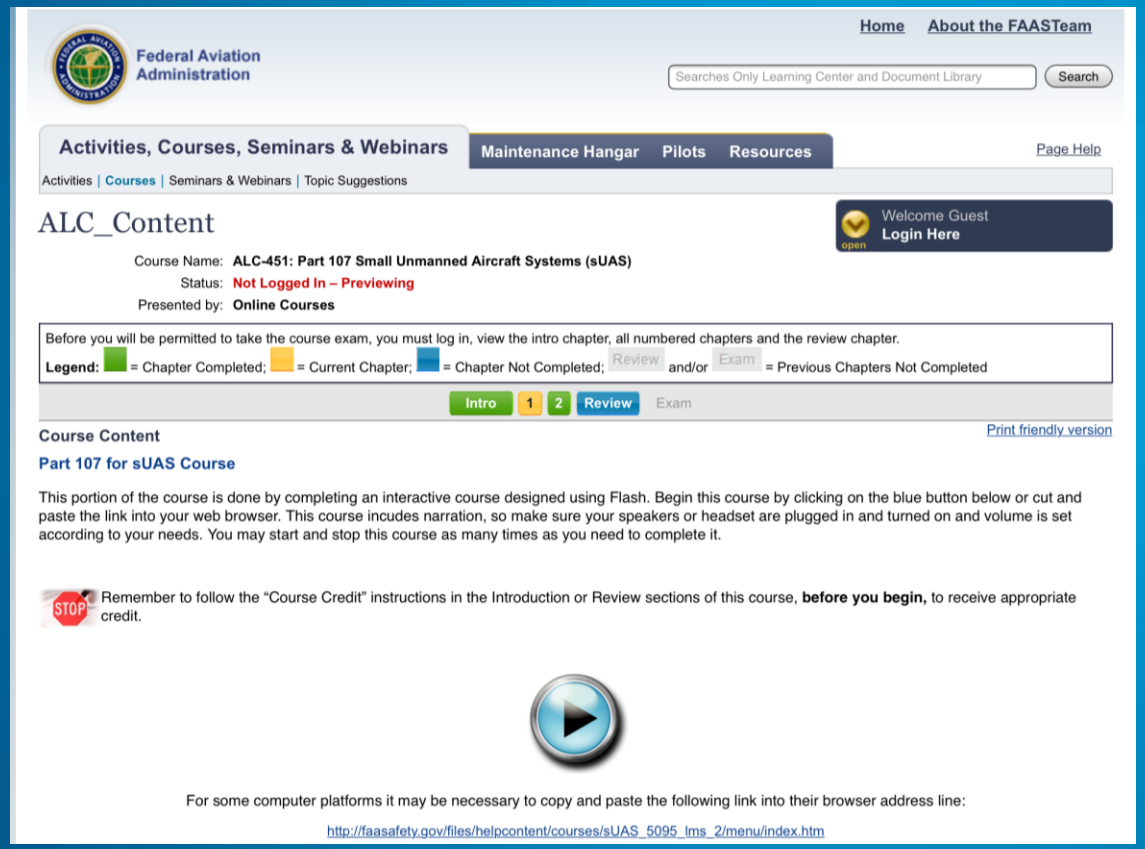
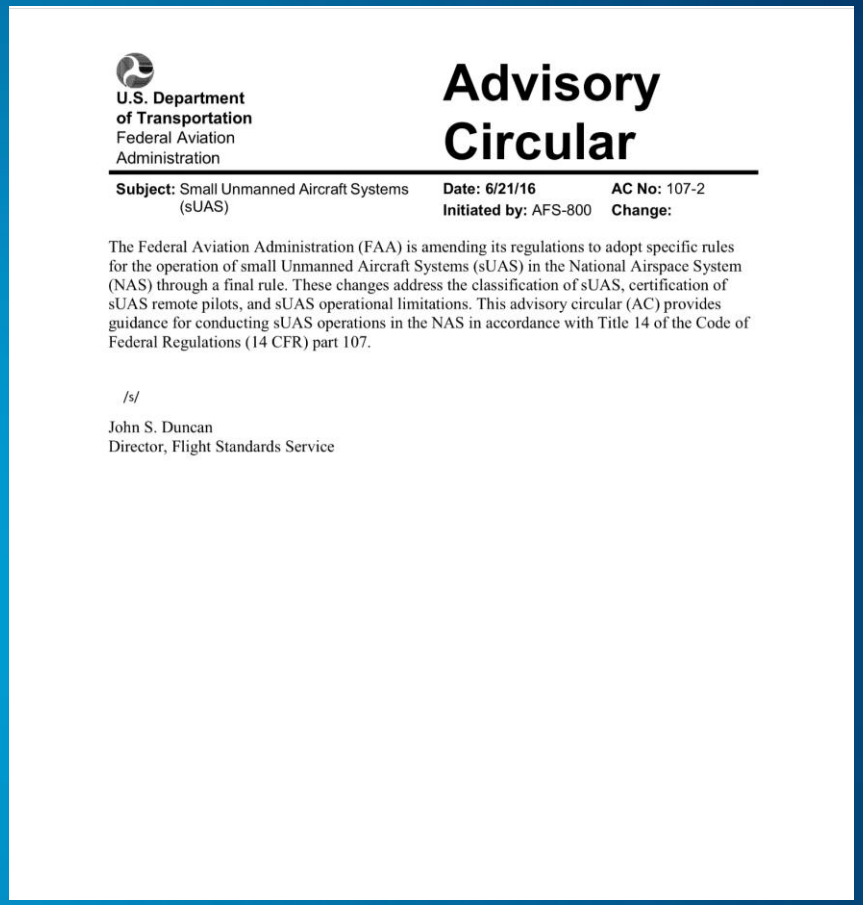
Part 107

- **Rules and Training are online**





U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Small Unmanned Aircraft Systems (sUAS)
Date: 6/21/16
AC No: 107-2
Initiated by: AFS-800
Change:

The Federal Aviation Administration (FAA) is amending its regulations to adopt specific rules for the operation of small Unmanned Aircraft Systems (sUAS) in the National Airspace System (NAS) through a final rule. These changes address the classification of sUAS, certification of sUAS remote pilots, and sUAS operational limitations. This advisory circular (AC) provides guidance for conducting sUAS operations in the NAS in accordance with Title 14 of the Code of Federal Regulations (14 CFR) part 107.

/s/

John S. Duncan
Director, Flight Standards Service

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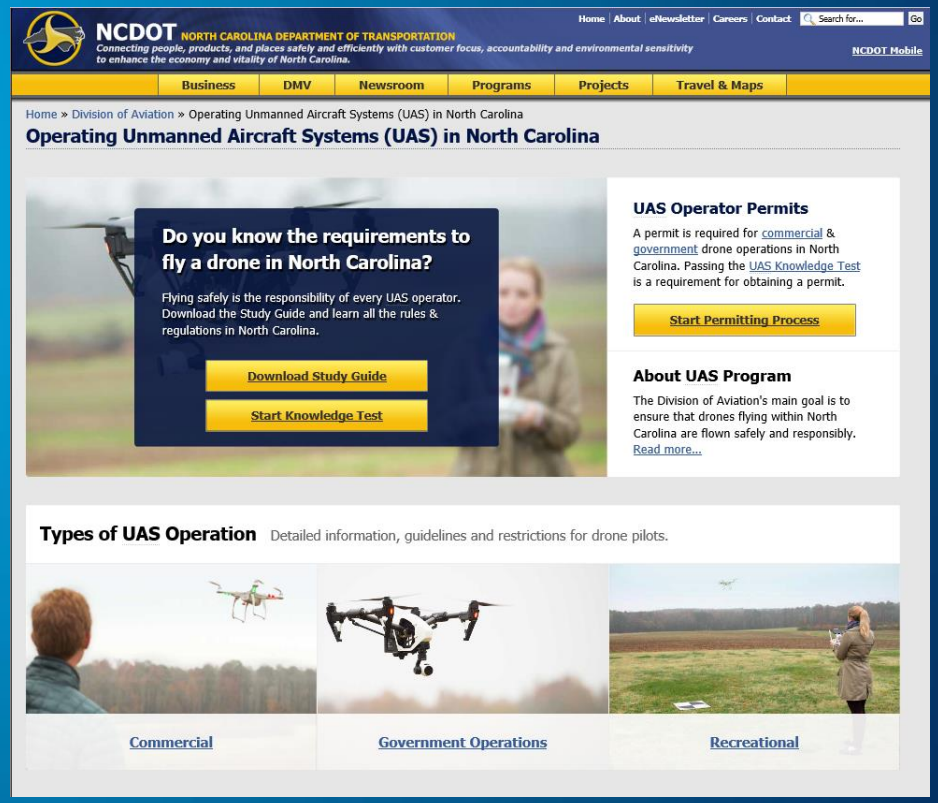
Variety of State Laws Introduced

- **Limit Use of UAS by State and Local Agencies**
- **Requiring Licensing for UAS Operations**
- **Prohibitions Against Using Drone Hunting**
- **Prohibitions Against Arming Drones**
- **Bans on UAS Operations**
- **Restrictions on Operations**
  - **Operational Restrictions**
  - **Data Collection/Use**
  - **Privacy? Safety?**



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Define the deliverable is the first step

Defining what is to be captured?

How and who will fly?

Does the end product require sensor fusion?

Is it a simple image or an extended data set?

Is it visualization or authoritative?

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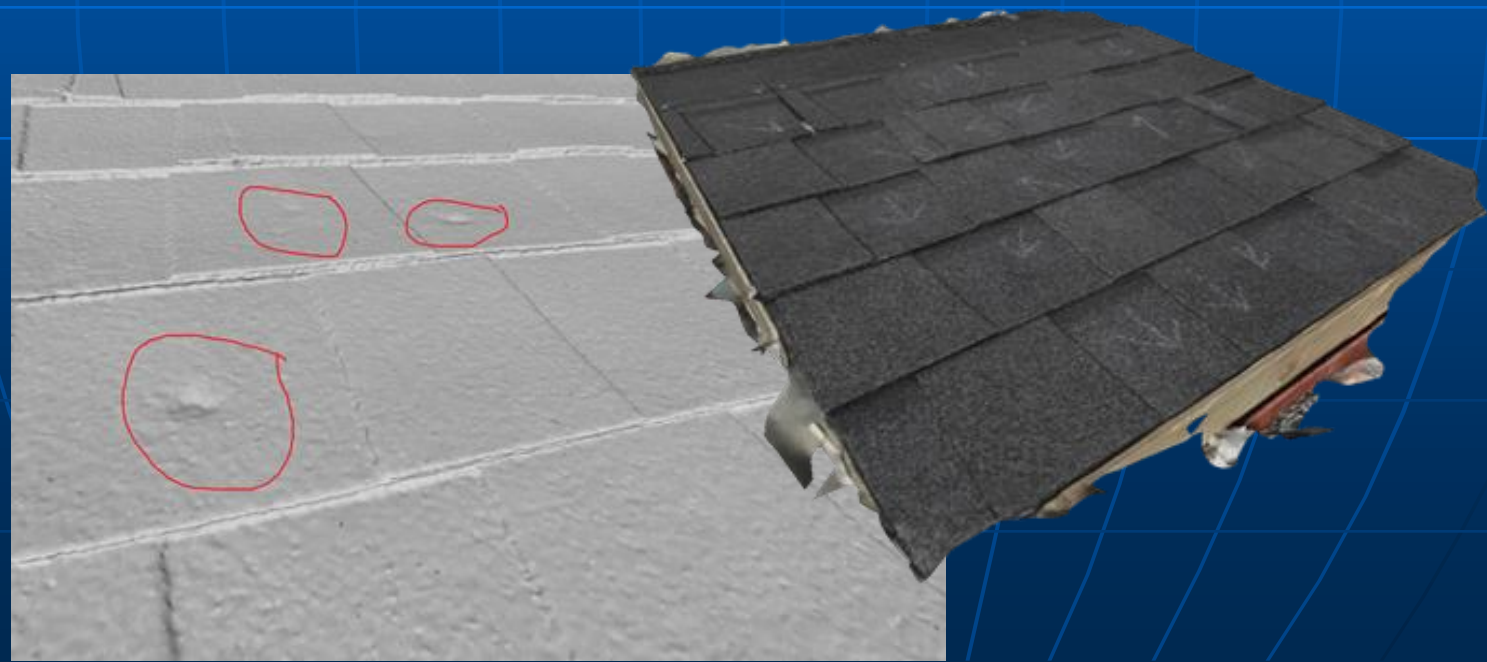
Defining the capture will follow

Spatial and Spectral metrics define what can be resolved by a sensor given understating of the device, imaging conditions, and the target



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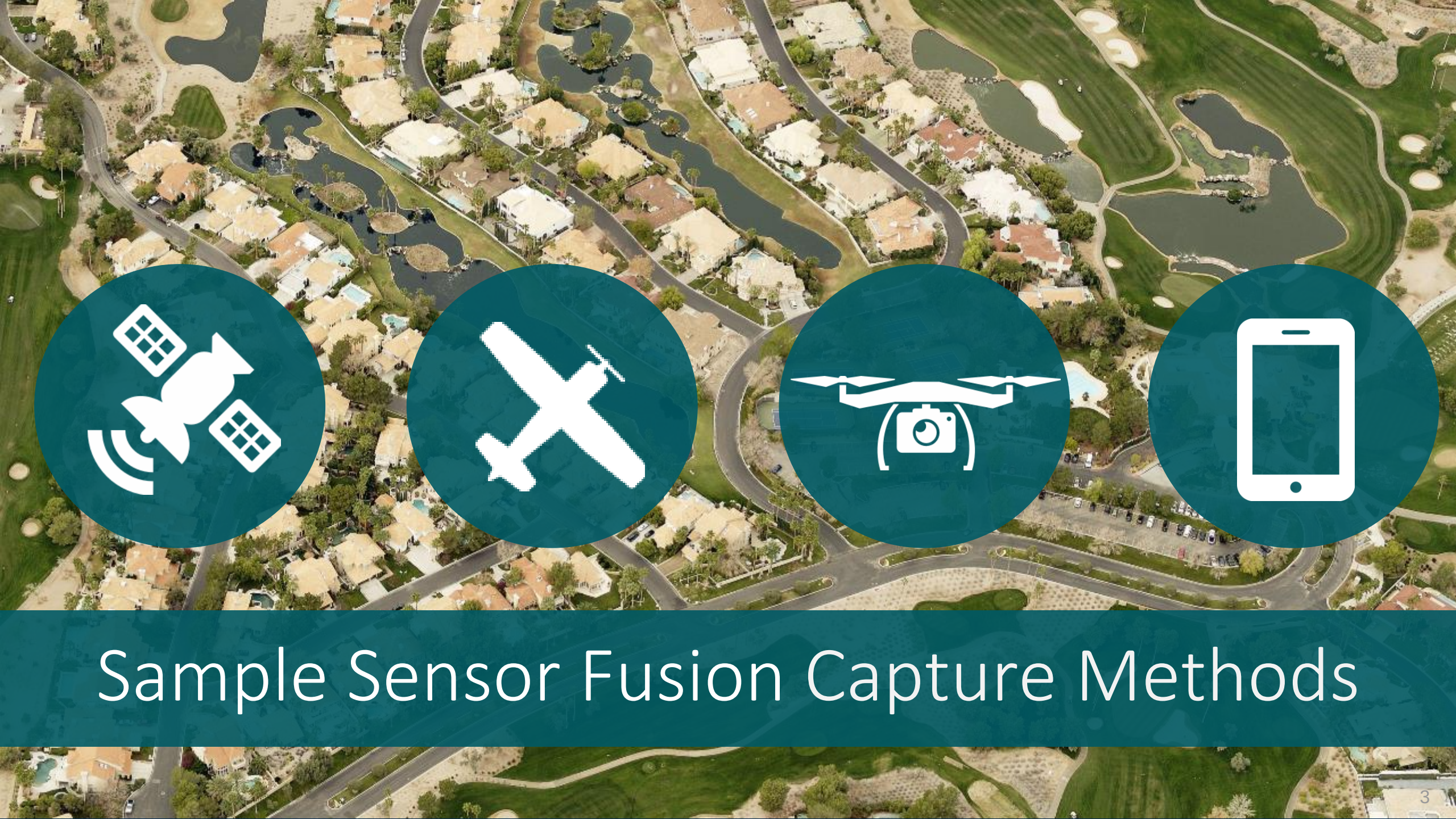
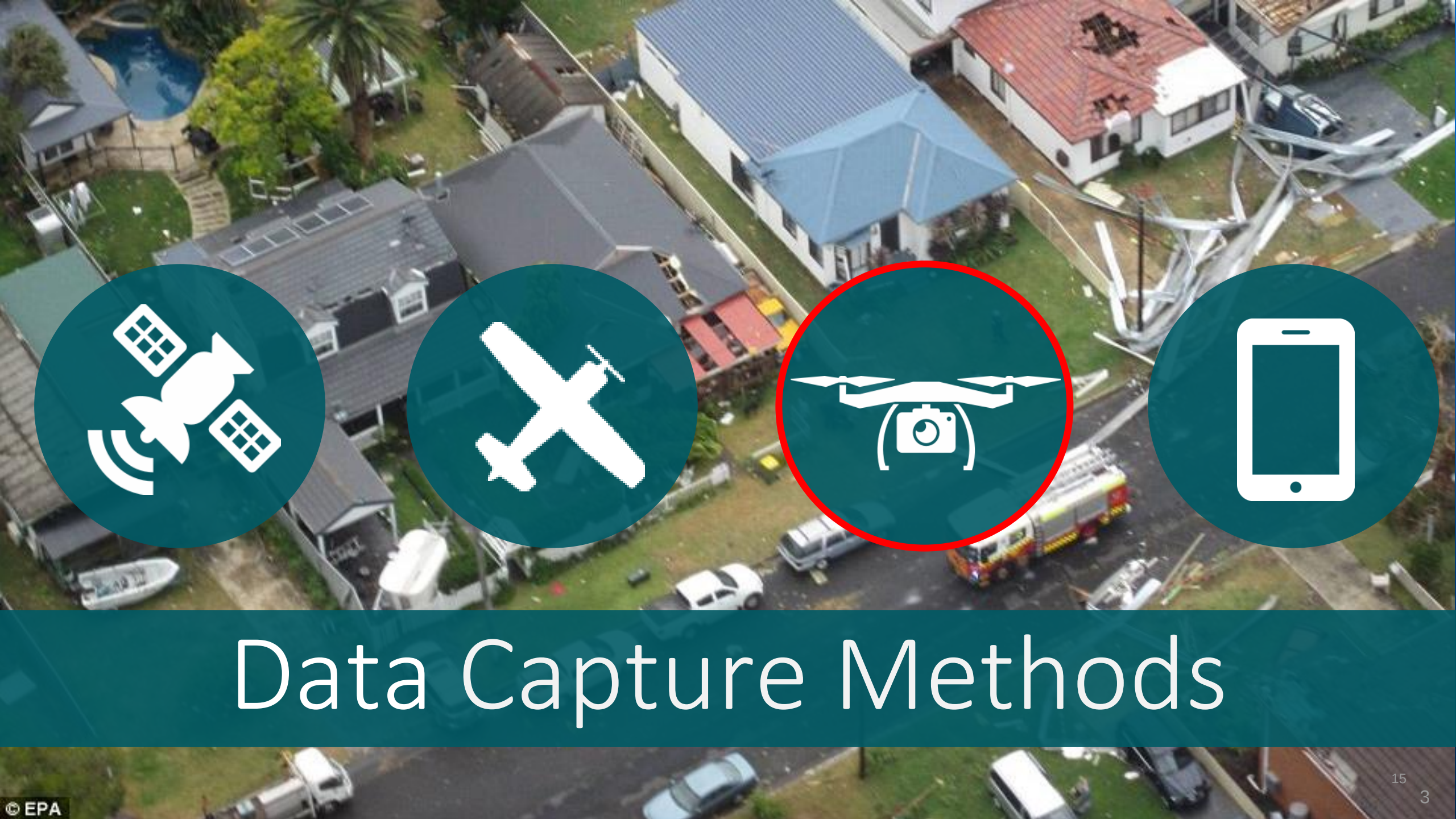


Sample Sensor Fusion Capture Methods

Data Capture Methods

Data Capture Methods

Data Capture Methods



Data Capture Methods

Data Capture Fusion

Simple image vs. Intelligent Images

Meta data based on Interior and Exterior orientation is a key

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Sensors can see details when specified accurately. Focal length, field of view all work in conjunction with the operations envelope

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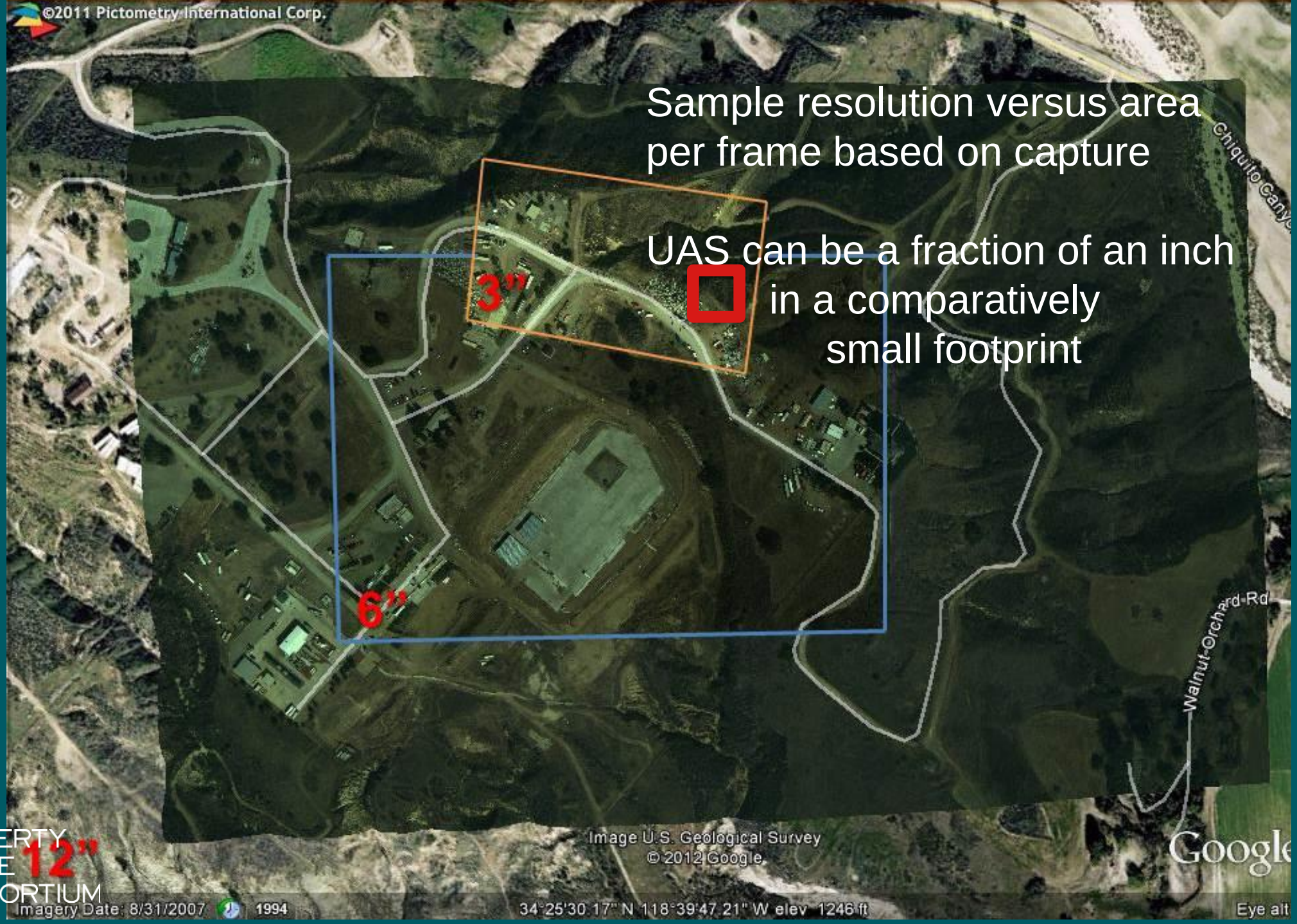

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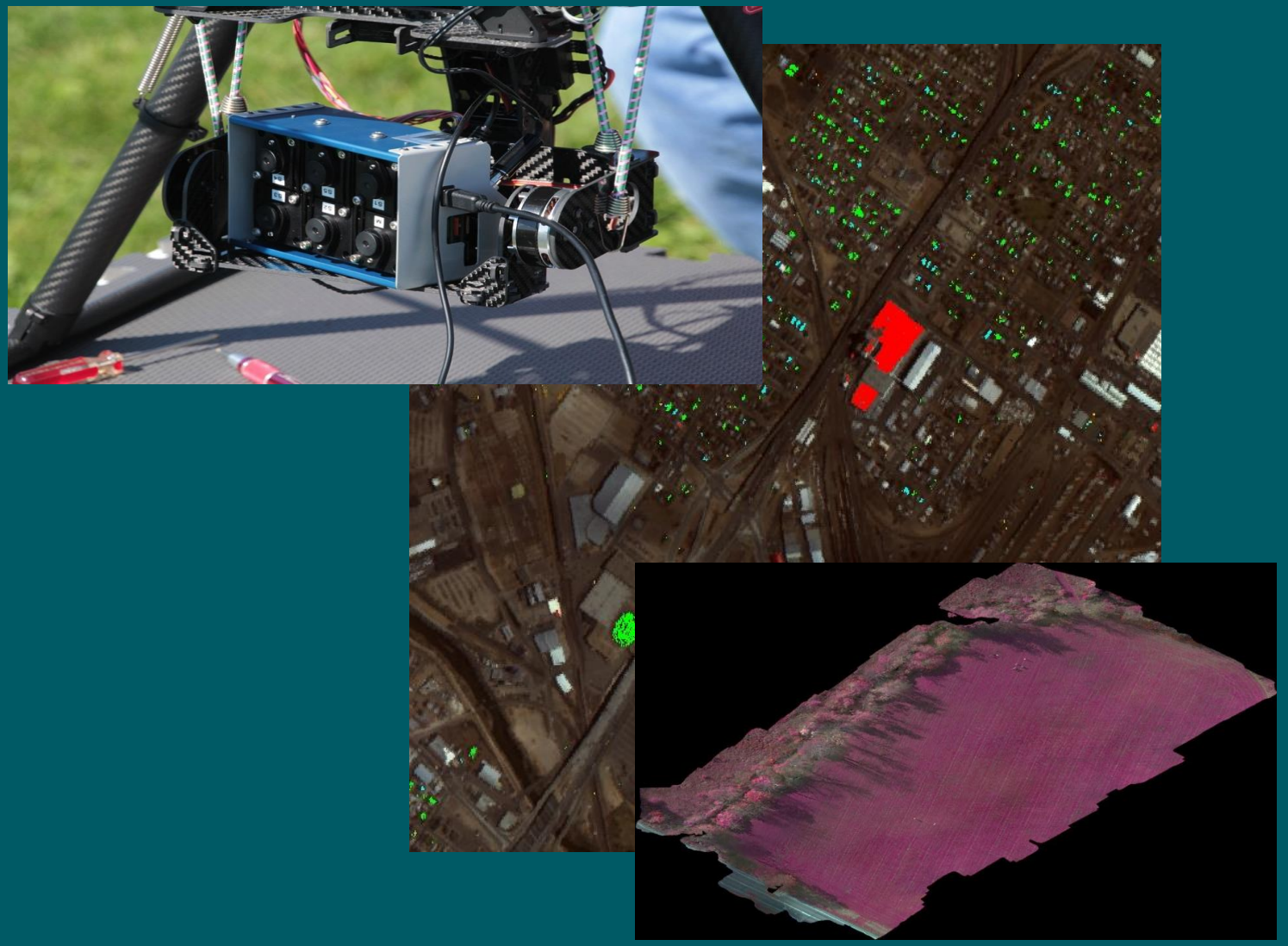

Sensors can see more than the eye and classify different materials in an automated fashion

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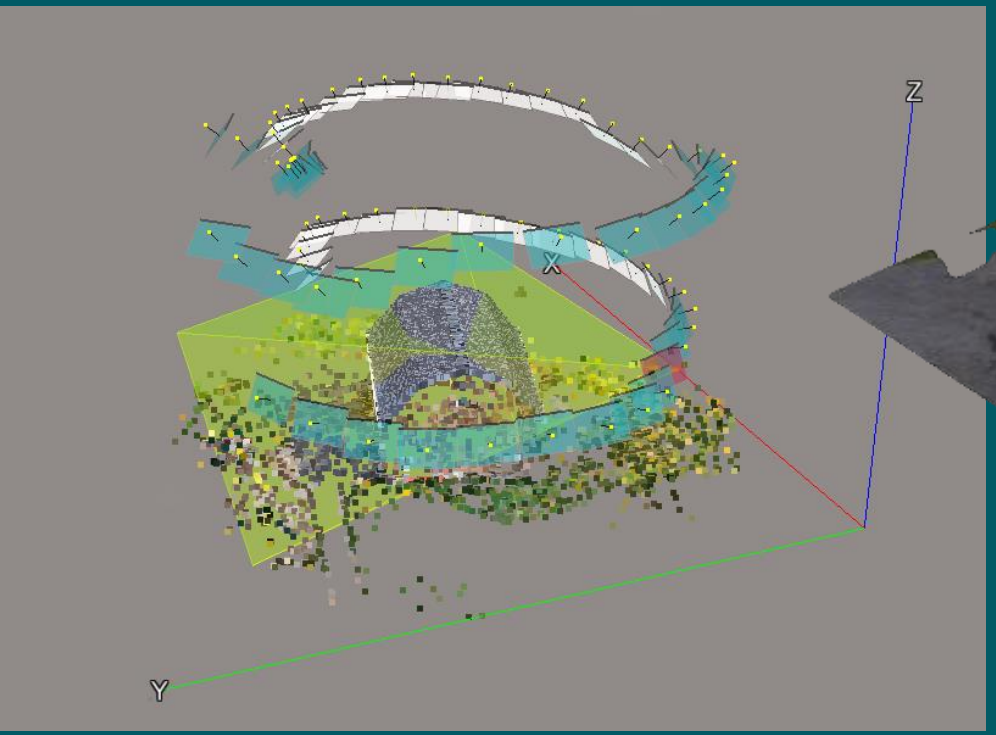
Mission Planned for 3D Spatial Analysis



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The Drone Attributes

Physical

- Format
  - —Fixed vs Rotary
- Weight
- Size

Sensing

- Spatial
- Radiometric
- Positional
- Awareness

The Drone Attributes

Operational

- Speed
- Duration
- Data storage
- Communication
- Autonomy
- Security
- Safety features
- Shielding

The Property Attributes

Physical

- Footprint
- Height
- Parcel

Sensing

- Material
- Condition
- Boundaries

The Property Attributes

Operational

- Access
- Capture process
- Occupancy
- Weather
- Region

The Operator Attributes

Physical

- Drone access
  - —Personal
  - —Office
  - —Regional
- Drone shipping

Sensing

- Line of sight
- Condition
- FPV

The Operator Attributes

Operational

- Contractor
- In house
- Sites per day
- Ferry between sites
- Transportation
- Part 107
- Region
- Skill
- Best practices
- Privacy
- Client interaction

Flying UAS Commercially in the U.S.

Case Study – Genesee Country Village & Museum

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Rapidly Assess Commercial Wall & Roof Condition

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Review Ancillary Structure Condition

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microdrones.com
Questions?
charles.mondello@propertydrone.org

IAAO Annual Conference

Tampa, Florida

August 28-31, 2016