



# **FME for UAS Operations Planning and Data Management**

**Fred Judson, GISP  
Ohio/Indiana UAS Center and Test  
Complex Operations**

# Background - Ohio Indiana UAS Center and Test Complex

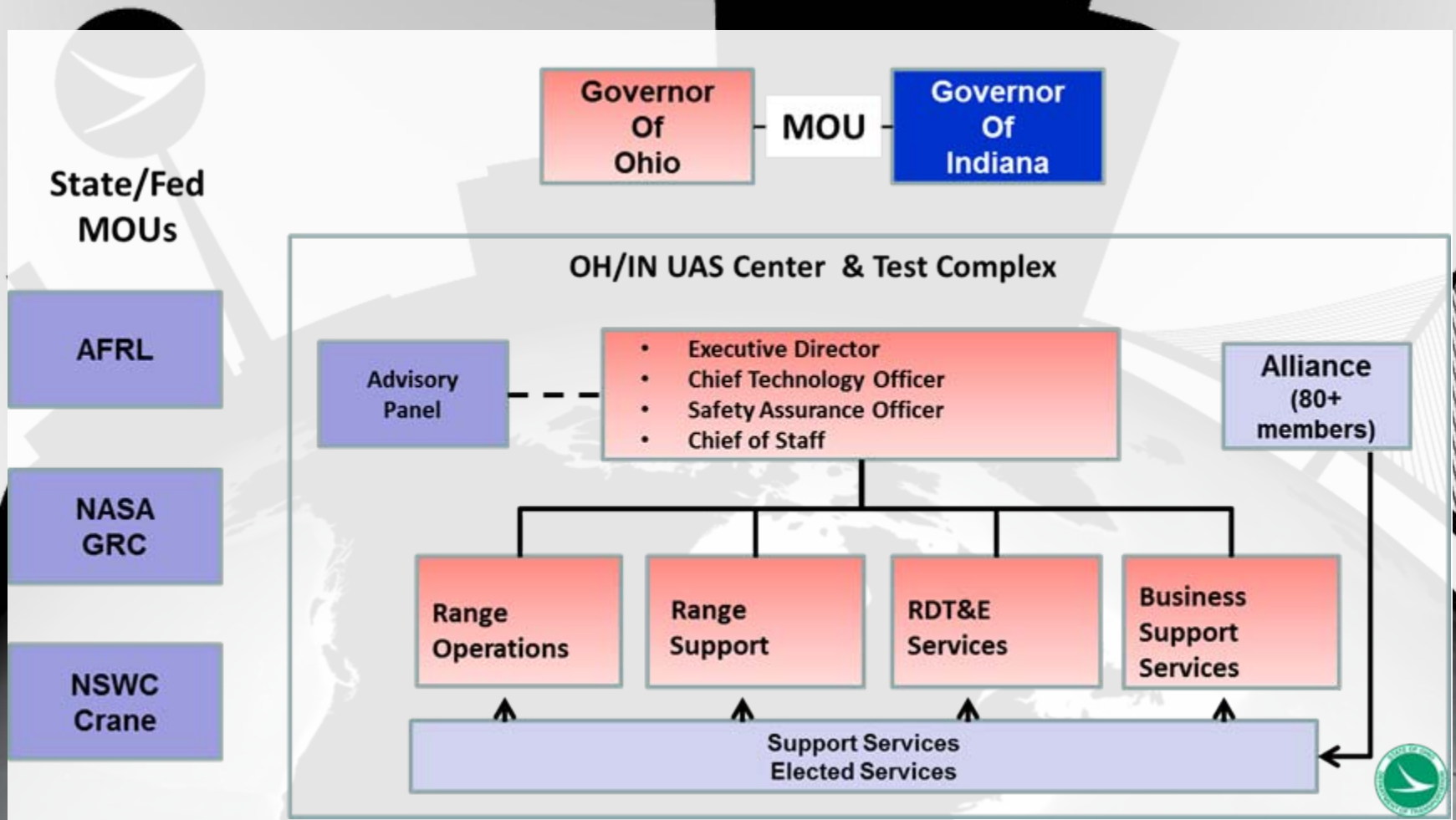
- Formed Spring 2013
- Director Named in August
  - Richard Honneywell
- Catalyst for commercialization and economic development for UAS within the State of Ohio
- Support UAS operations for all agencies in the State of Ohio
- Conduct UAS Test Center Operations



# Mission

- **Catalyst for UAS Commercialization and Economic Development**
- **UAS Test Center resource supporting State & Federal Partners**
- **UAS Test Center supporting Federal Research**

# Organization





# UAS Operations

- **Agencies UASC&TC Support**

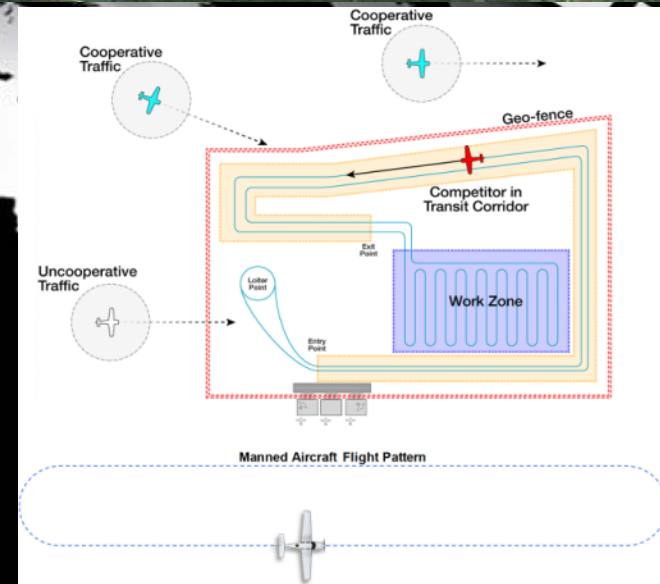
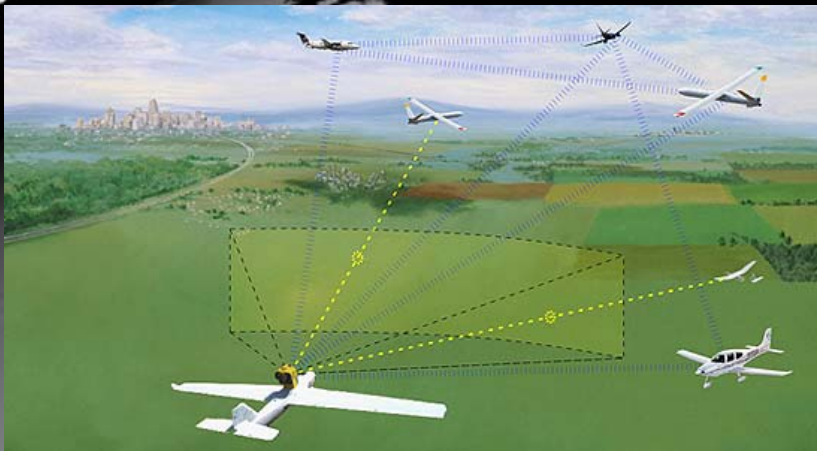
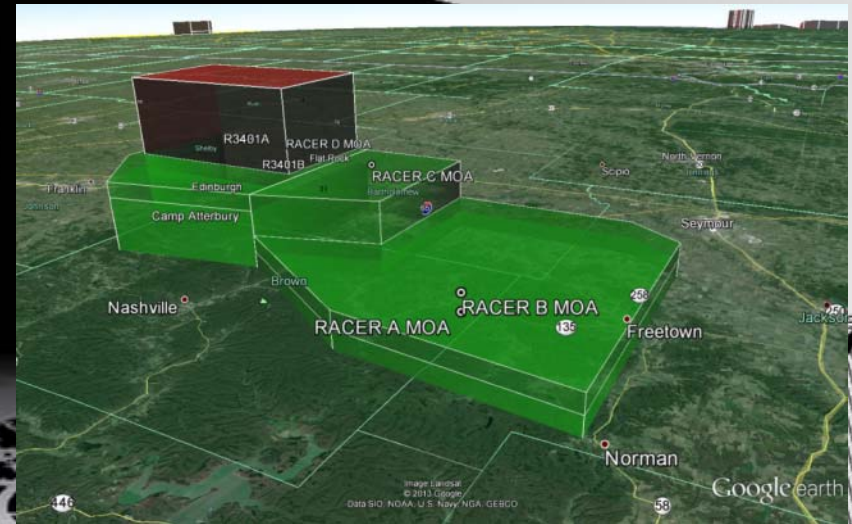
- Ohio Department of Transportation
- Ohio Department of Rehabilitation and Correction
- Ohio Department of Agriculture
- Ohio Department of Natural Resources
- Ohio Department of Public Safety
- Ohio Department of Environment Protection Agency
- Ohio Bureau of Workers Compensation
- Ohio Department of Commerce
- The Ohio Adjutant General
- Public Utilities Commission of Ohio
- Ohio Department of Youth Services
- Ohio Department of Administrative Services
- Ohio Department of Mental Health and Addiction Services
- Ohio Development Services Agency
- Ohio Department of Education
- Ohio Department of Health
- Ohio Department of Insurance
- Ohio Department of Job and Family Services
- Ohio Department of Medicaid
- Ohio Board of Regents
- Ohio Department of Taxation
- Ohio Department of Veteran Services

- **UAS = Sensors**

- Acoustic, sound, vibration
- Automotive, transportation
- Chemical
- Electric current, electric potential, magnetic, radio
- Environment, weather, moisture, humidity
- Flow, fluid velocity
- Ionizing radiation, subatomic particles
- Navigation instruments
- Position, angle, displacement, distance, speed, acceleration
- Optical, light, imaging, photon
- Pressure
- Force, density, level
- Thermal, heat, temperature
- Proximity, presence

# Background – NASA UAS Airspace Operations Challenge

- Advancement of UAS Technology for NAS Integration
- Phase 1 April 28 - May 7, 2014
- 500K in prizes
- Phase 2 - Next Year –up to 1 Million

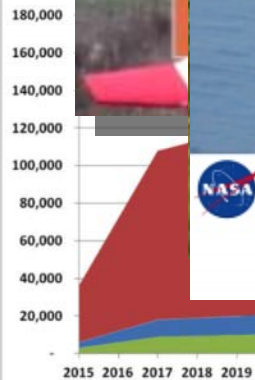




# Background - Industry

## Total Project

- Cur
- 13.0
- 82.1
- 70k
- 202
- US
- imp



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## CERTIFICATE OF WAIVER OR AUTHORIZATION

Ohio Department of Transportation

Operation of the Swinglet CAM Unmanned Aircraft System (UAS) in Class G airspace, at or below 250 feet Above the Ground (AGL), in Wood County, OH as depicted in Attachment 1, under the jurisdiction of Toledo Air Traffic Control Tower (ATCT)/Terminal Radar Service Area (TRACON). See Special Provisions.

N/A

1. A copy of the application made for this certificate shall be attached and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

## SPECIAL PROVISIONS

This certificate 2013-CSA-16 effective from April 11, 2013 through April 10, 2015 and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.

Air Traffic Manager, UAS Integration Office

FAA Form 7711-1 (7-74)



# Airspace Planning

- Geography
- Topology
- Airspace
- Population
- Altitude
- Time

Admin  
Review Check



ATC  
Feasibility  
Check



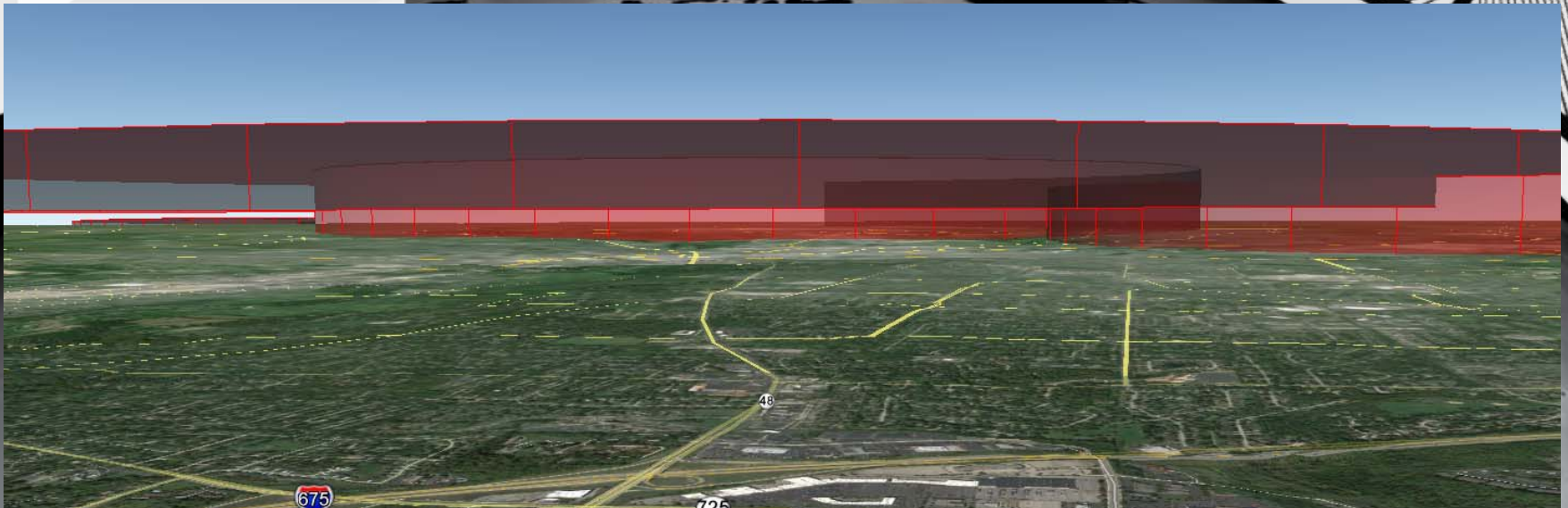
Safety Review



ATC  
Facility  
Coordination

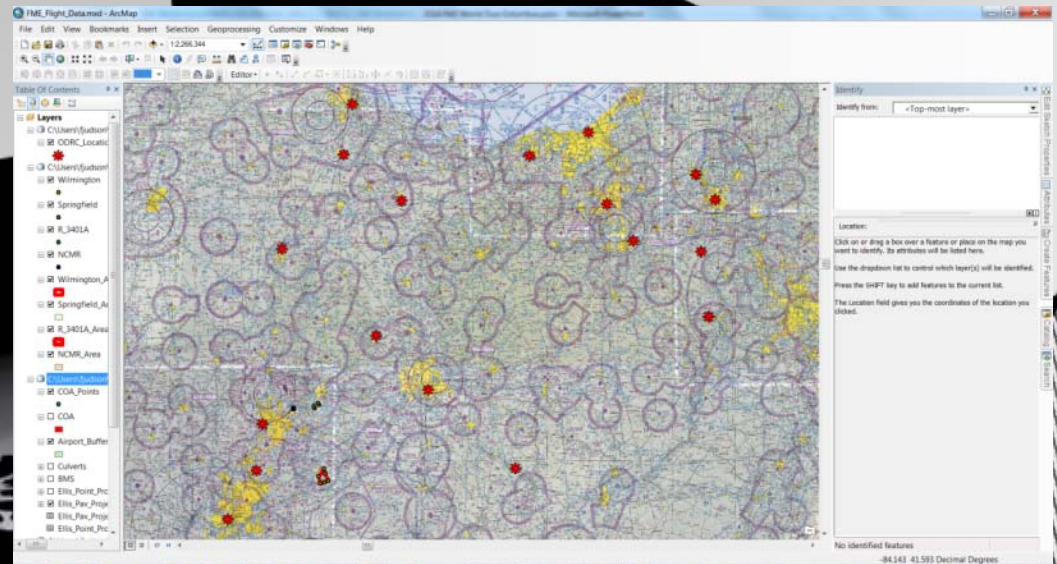


Signature



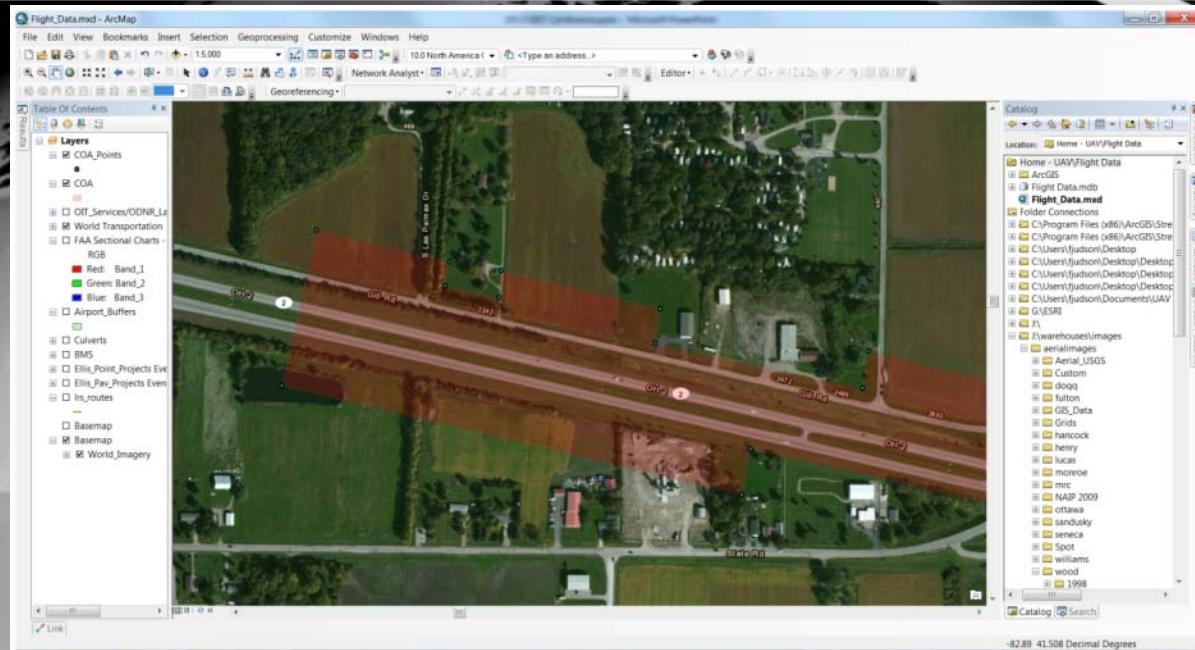
# Operations

- **Planning Locations**
  - Project Feasibility Study
- **FME to ESRI**
  - Locational Methods
    - Addresses
    - Coordinates
    - Place Names
    - Mile Markers
  - Locational Formats
    - Websites
    - Emails
    - CSV
    - Access.....



# Operations

- Area Delineation
- Point Delineation
- FME KML to Excel
  - COA Application





# FME Operational Planning

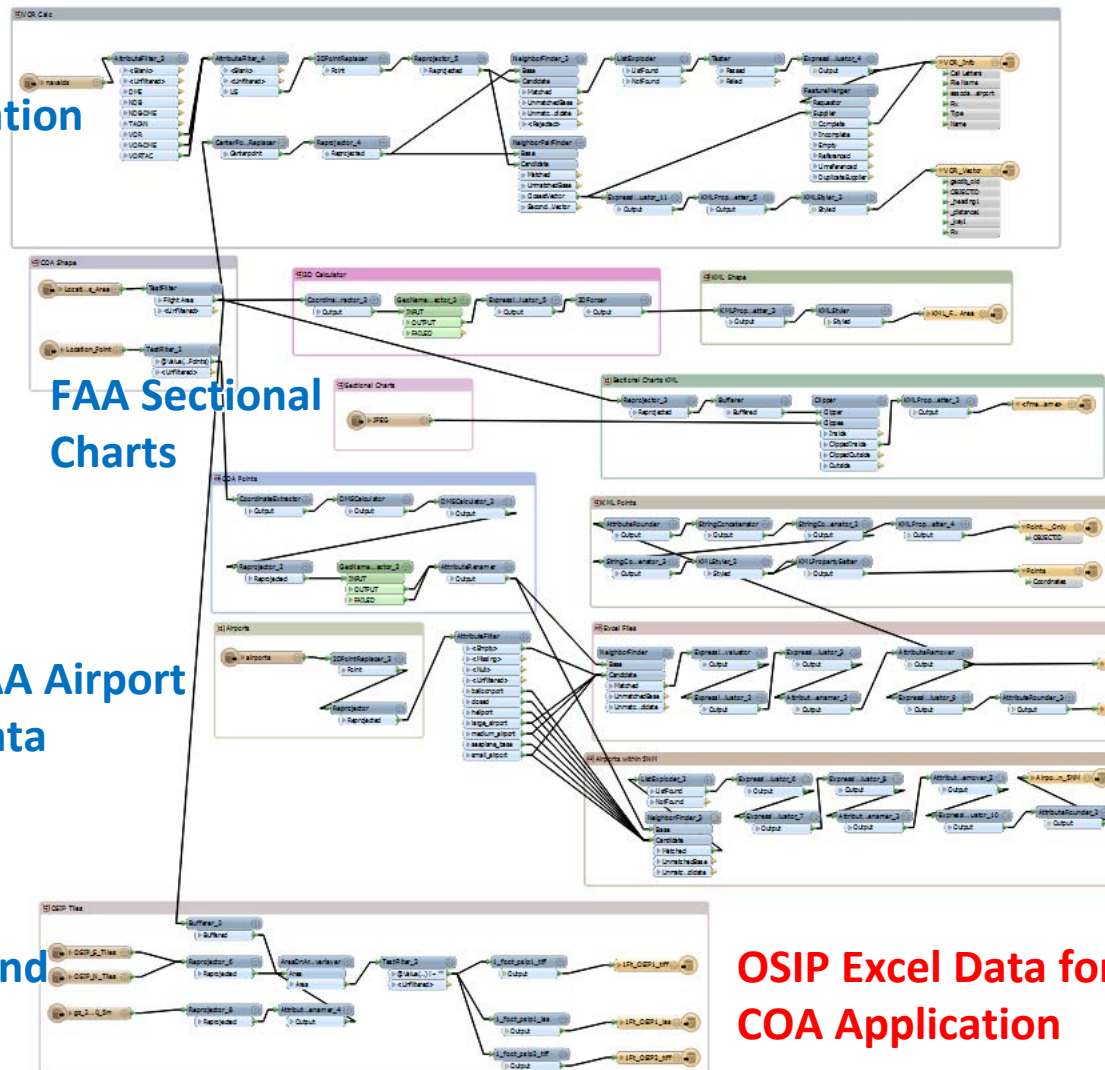
# FAA Navigation Data

# ESRI Flight Data

# FAA Sectional Charts

## FAA Airport Data

## OSIP Grids and County Data



## Nearest VOR

## Flight Area

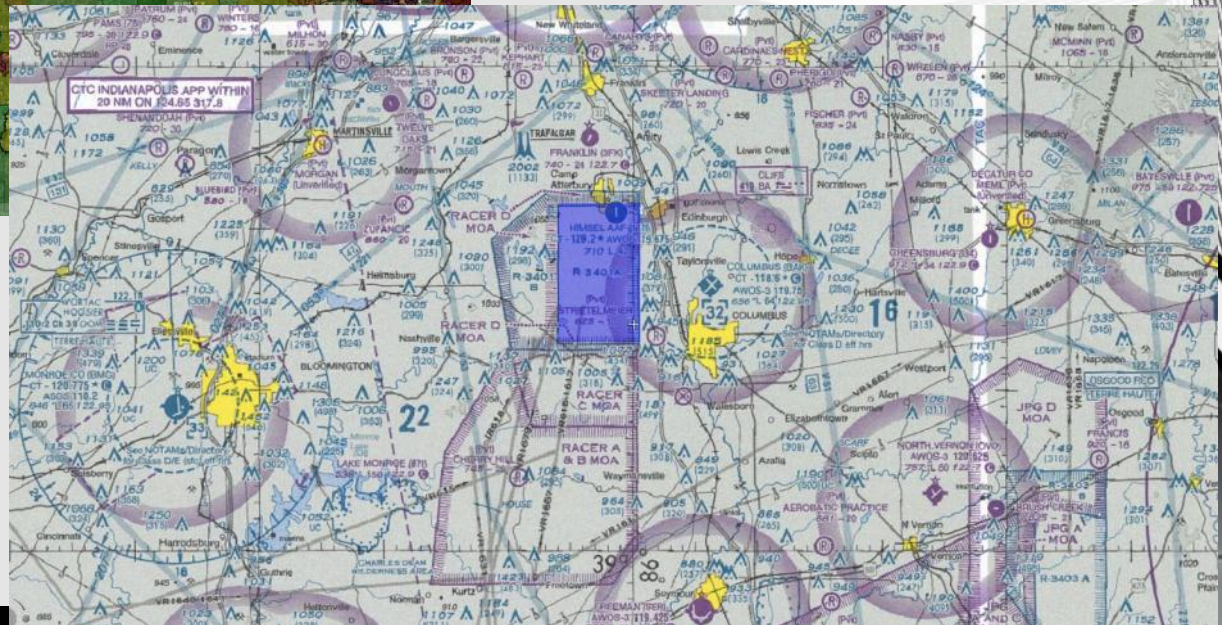
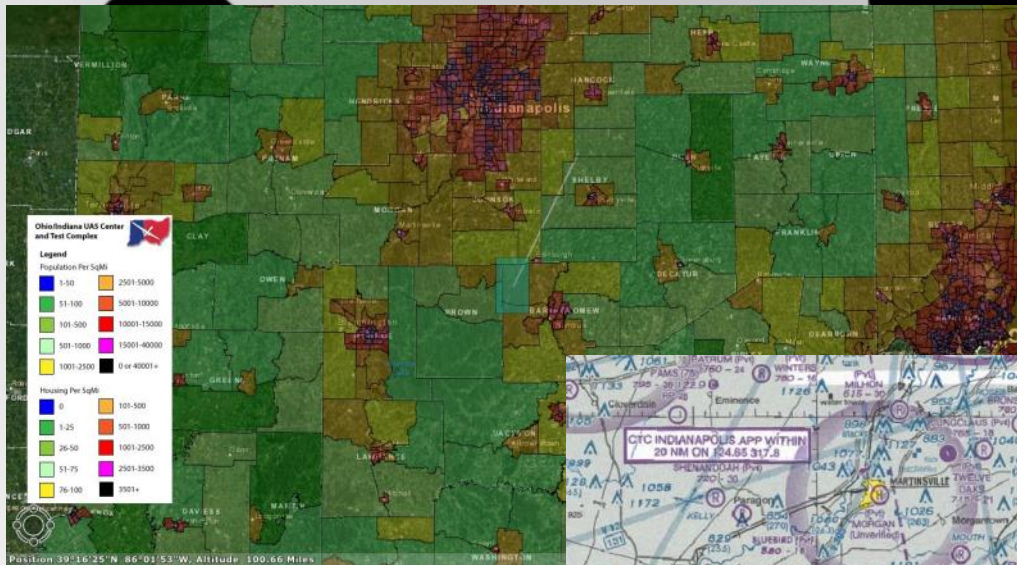
# FAA Sectional Charts

## Point Display for COA Application

## Excel Data for COA Application

## OSIP Excel Data for COA Application

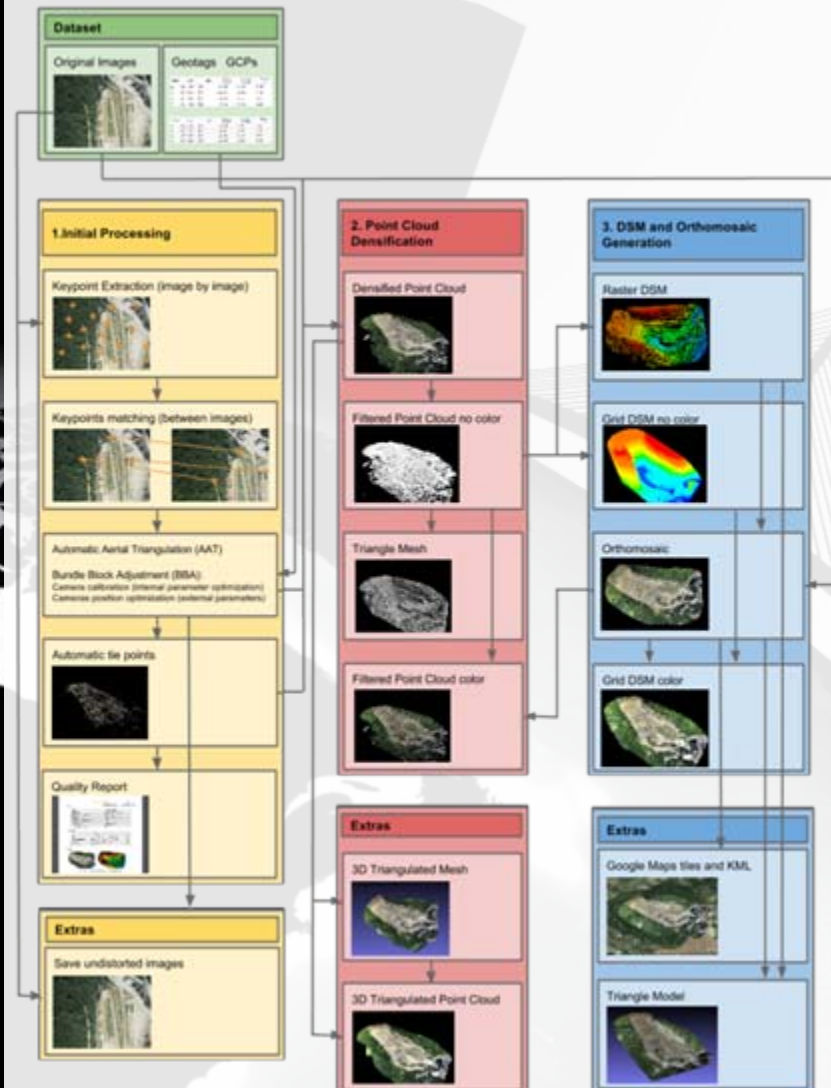
# FME Operational Planning





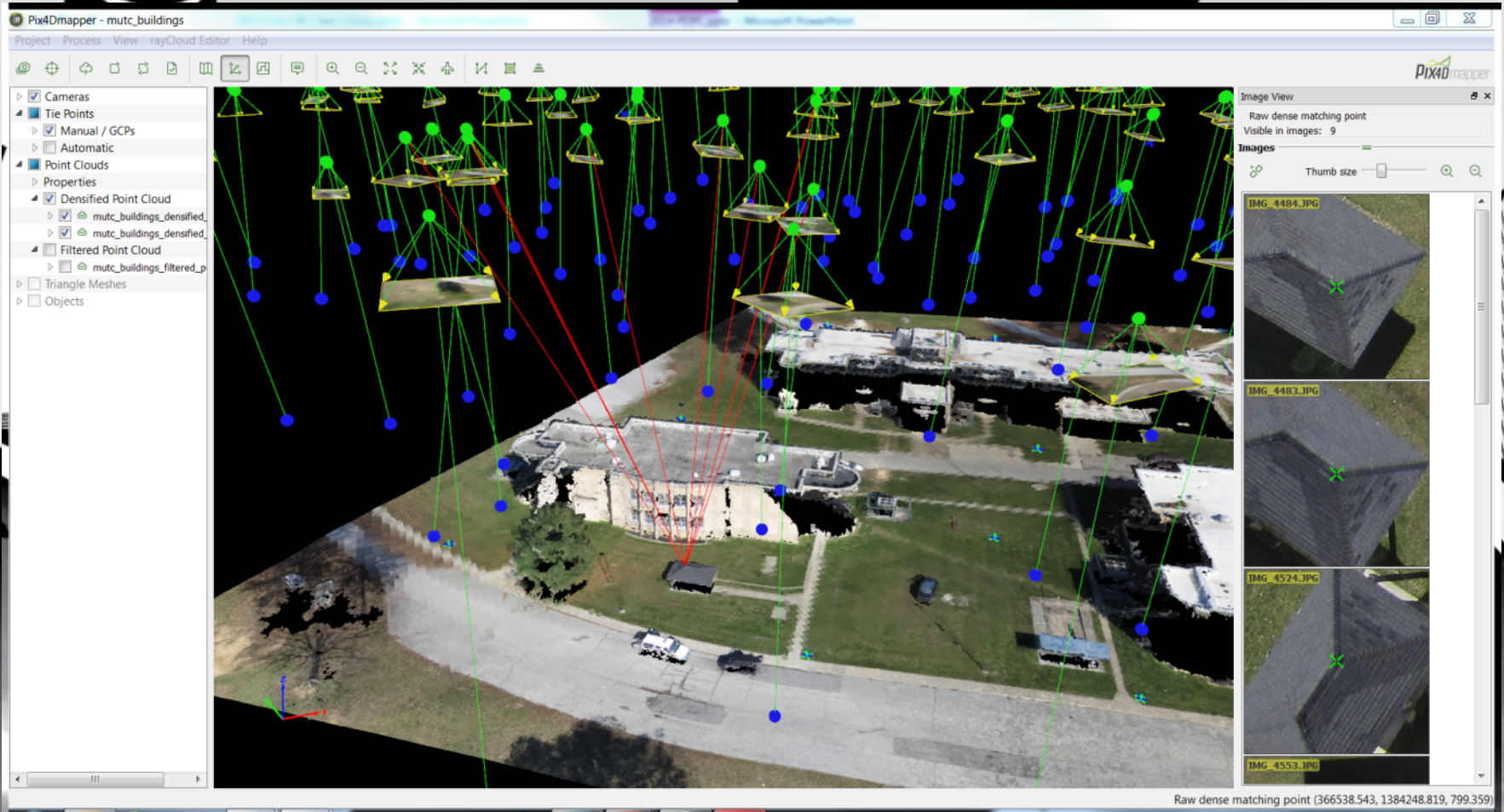
# Other Data Formats

- Camera
  - Raster Digital Surface Models
  - Orthomosaics
    - Color\IR
  - Point Clouds
  - Triangulated Mesh
    - TIN
- Data form other sensors
  - Video
  - Acoustical
  - Radiological
  - Etc.....

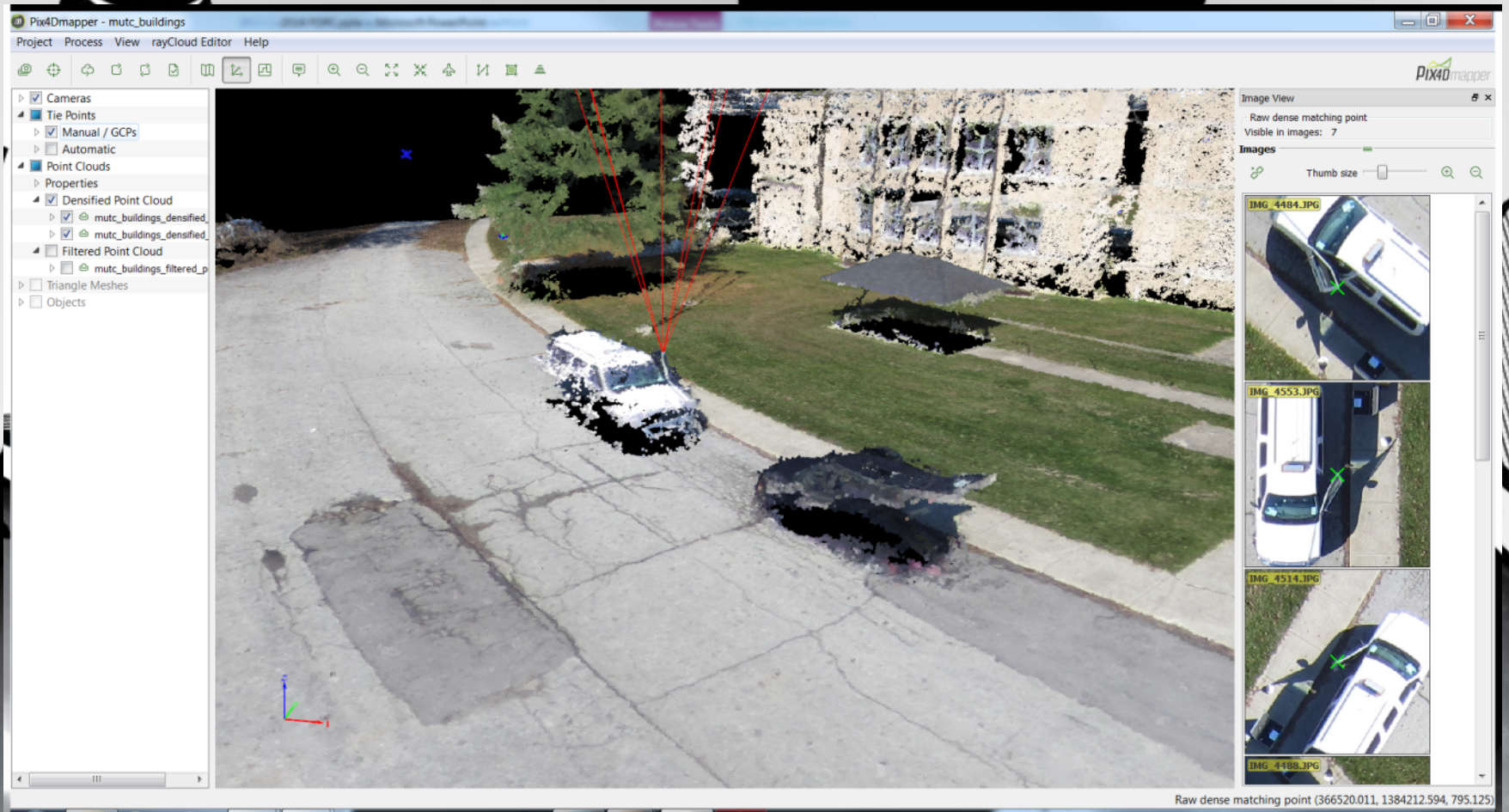




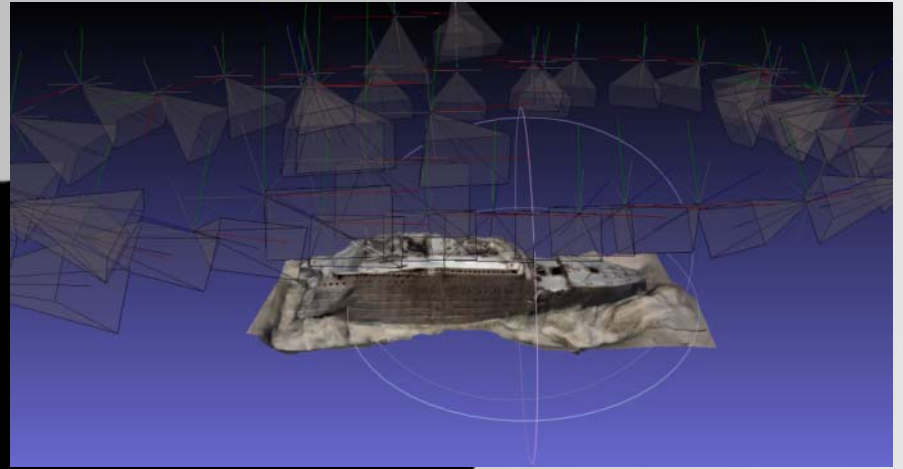
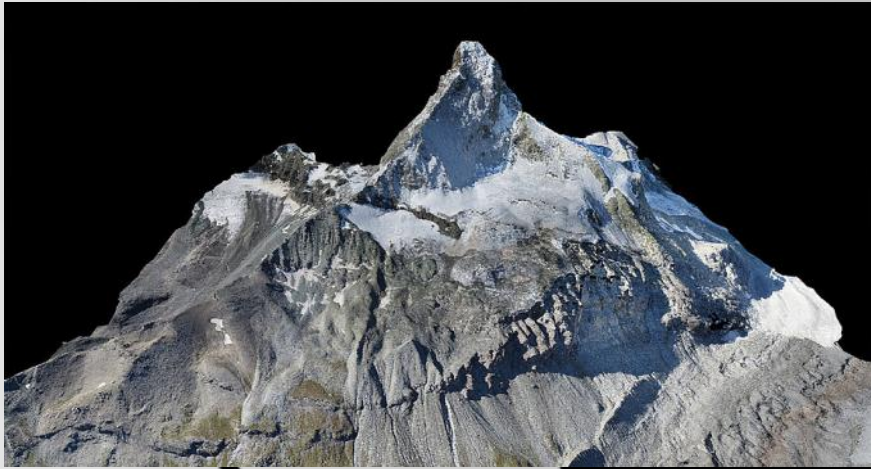
# Point Clouds



# Point Clouds







Questions

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