

# OH/IN UAS Center

- **The OH/IN UAS Center is a collaboration between the states of Ohio and Indiana established in 2013 by Governors John Kasich and Mike Pence**
- **Overall mission of the UAS Center : Create, Collaborate, and Fly**
  - ❑ **Catalyst for UAS Commercialization – Create, Opening airspace**
  - ❑ **Universities and Colleges, small business, service provider, R & D – Collaborate**
  - ❑ **Direct support to State & Federal Partners for UAS Research, Development, Test & Evaluation (RDT&E) and Operations – Fly**
- **These activities will enhance economic development and place Ohio in a leadership role as the FAA integrates UAS into the National Airspace System**



# What is a UAS?



- **UAS stands for Unmanned Aircraft System**
- **Remote Pilot – Individual on the flight controls**
- **Visual Observer– Individual that maintains visual contact with the aircraft (not required)**
- **Control station - Where individual or individuals monitor what's going on with the aircraft such as telemetry, sensor activity, and data recovery**



# What is a UAS?

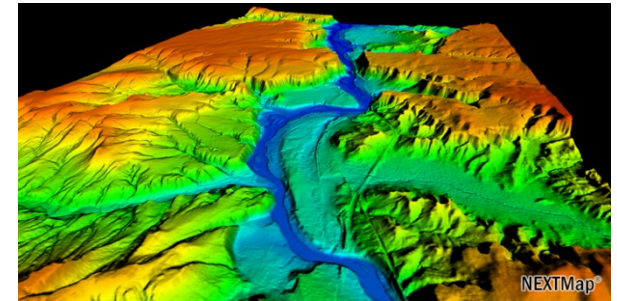
Aircraft



Sensor



Data



Knowledge Delivery = Value Proposition



# Mapping & Survey Opportunity



## Early Capabilities

- Inspect infrastructure
- Survey construction projects
- Monitor tree harvest/poaching
- Monitor drilling sites compliance
- Excavation monitoring
- Project monitoring & assessment
- Assess water quality & effluence
- Track invasive species
- Inspect amusement park rides
- Property Survey and monitoring

## Early Collaborations

- ODOT
- ODNR
- ODA
- Woolpert
- Merrill
- Cleveland Metro Parks
- Survey & Mapping Inc.



# Precision Agriculture



## Early Capabilities

- Crop Assessment
- Blight detection
- Track invasive insect species
- Precision Insecticide control
- Precision fertilization
- Moisture detection
- Harvest-ready detection
- Yield Estimates
- Insurance Evidence

## Early Collaborations

- ODA
- AFRL
- OSU
- Sinclair CC
- Southern CC
- Clark State CC
- Multiple Industry Partners



# First Responder/Fire/Police



## Early Capabilities

- Document Crime Scene/Disaster Area
- Establish Event Situational Awareness
- Document Accident
- Monitor traffic flow/alternative routes
- Restore Communications
- Detect and locate CBRN hazards
- Track active shooter
- Locate & monitor Illegal drug production

## Early Collaborators

- Ohio Fire Chief
- ODPS
- Ohio EMA
- UDRI
- Muscatatuck
- U of Cincinnati
- Montgomery County
- U. of Toledo
- Sinclair CC
- WSRI



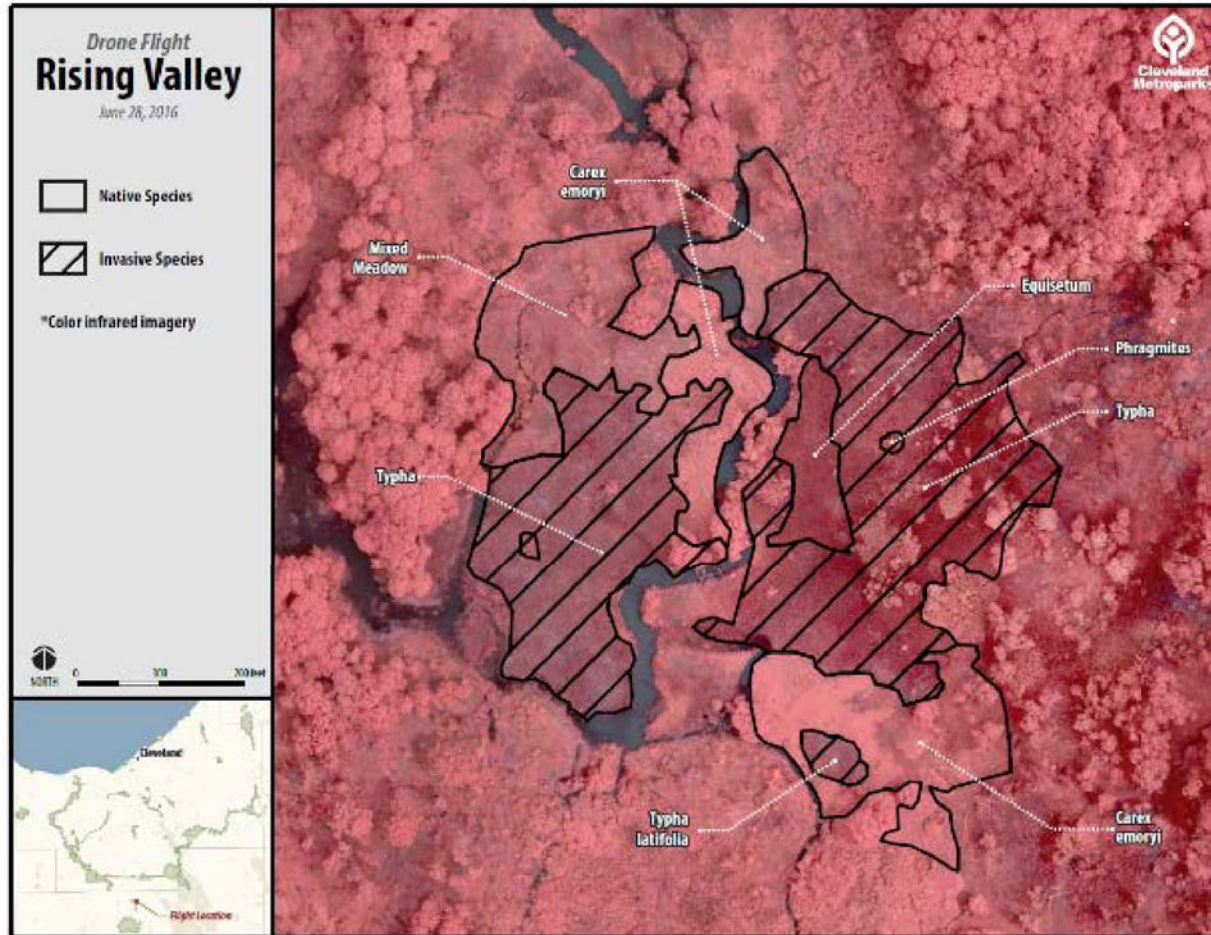
# UASC Projects



- **Federal Partnership– USAF and NASA Glenn Research Center**
- **Local Government & State Agency – Support & Flight Ops**
- **Colleges & Universities – R & D, Flight Training, AG**



# Cleveland Metroparks

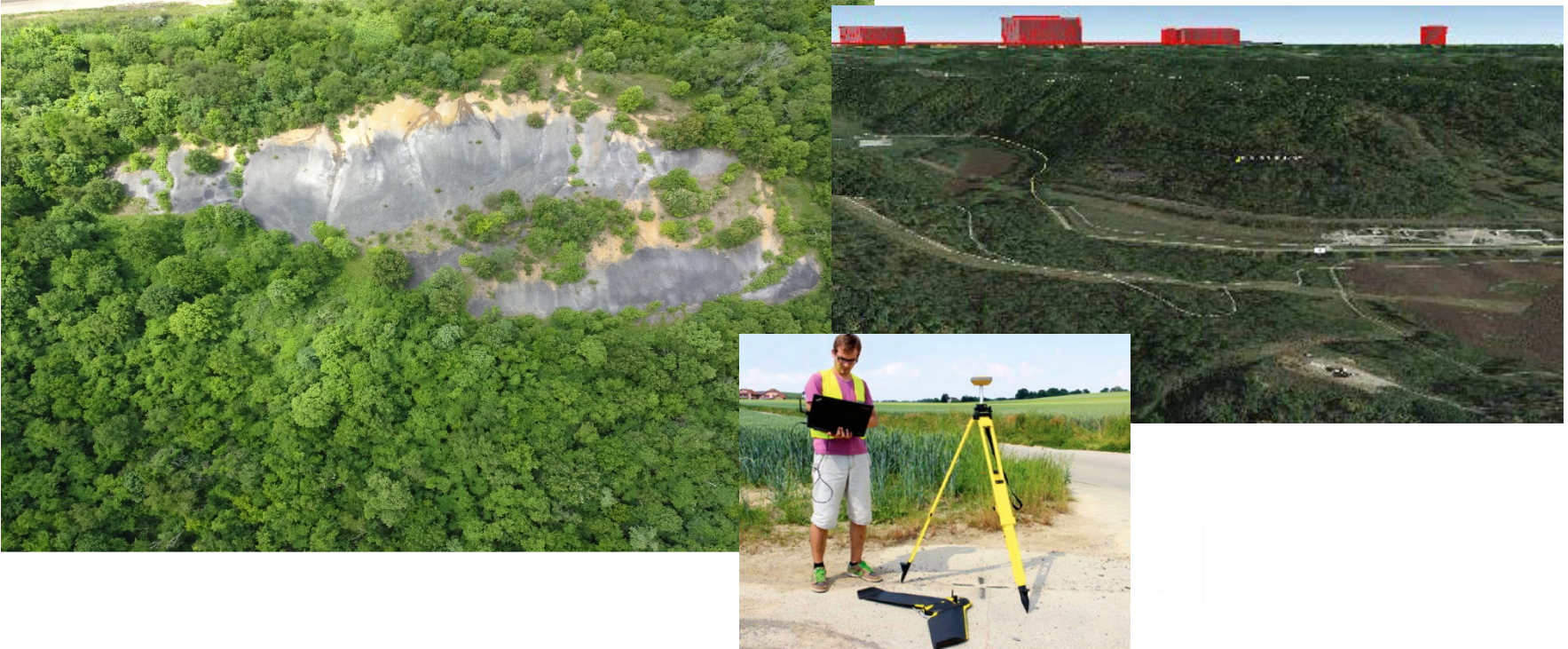


Ebee flight – Mapping and invasive specie assesment





# ODNR and ODOT Strip Mine Project



Ebee flight in Belmont County for ODNR on one of their reclamation sites and restoration project.

# ODOT/OTC Bridge Inspection



Structure investigation I80/I90 Bridge over Sandusky River. September 13

# ODOT Traffic Monitoring



Monitoring traffic for I75 bridge slide (replacement) over US 6

# ODOT Aerial Photography



Planning and condition assessment for ODOT bridge replacement on SR 582.

# Ohio Officers Training Police Academy



Thermal camera – parked car and a moving car



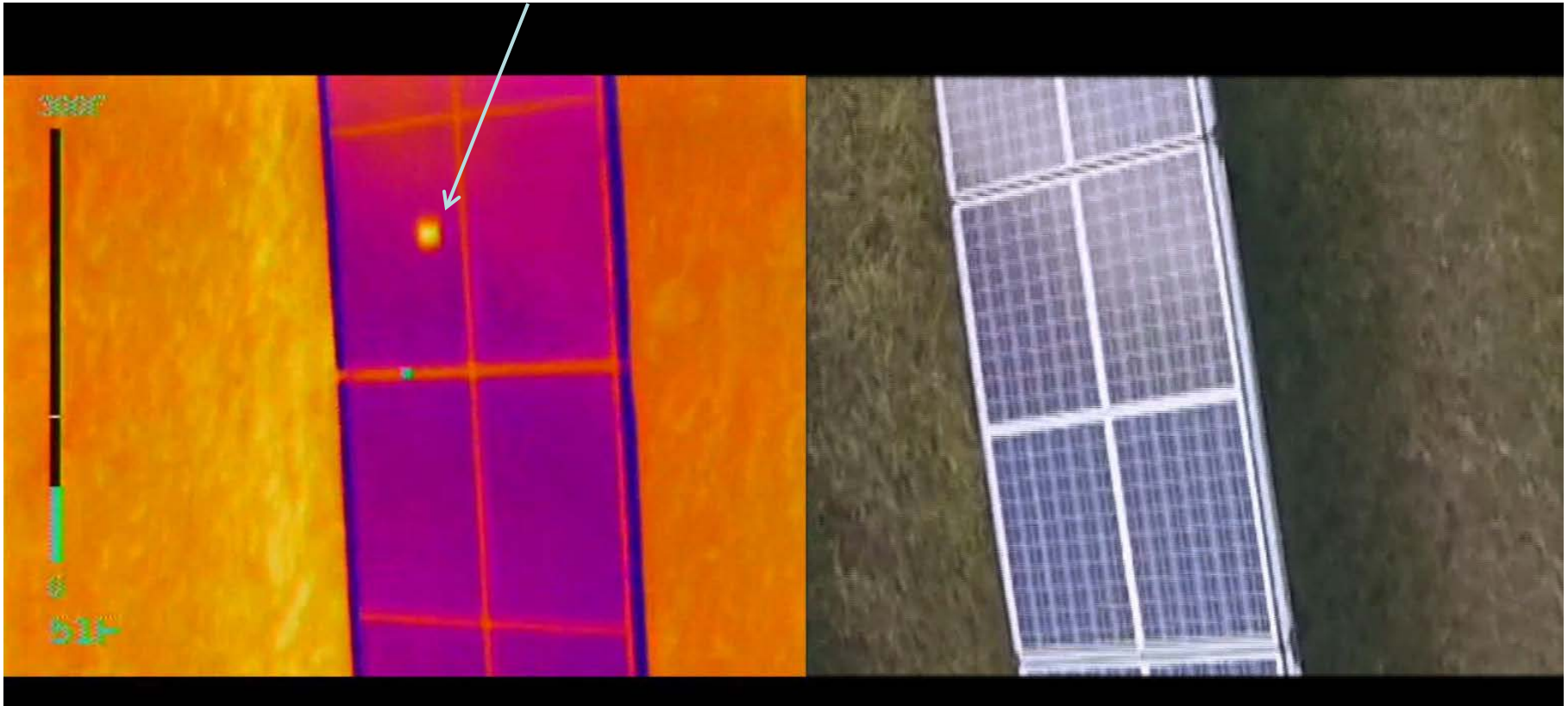
# Power Substation Inspections

Consolidated\_10302015\_F01



# Solar Panel Inspections

Hot Spot



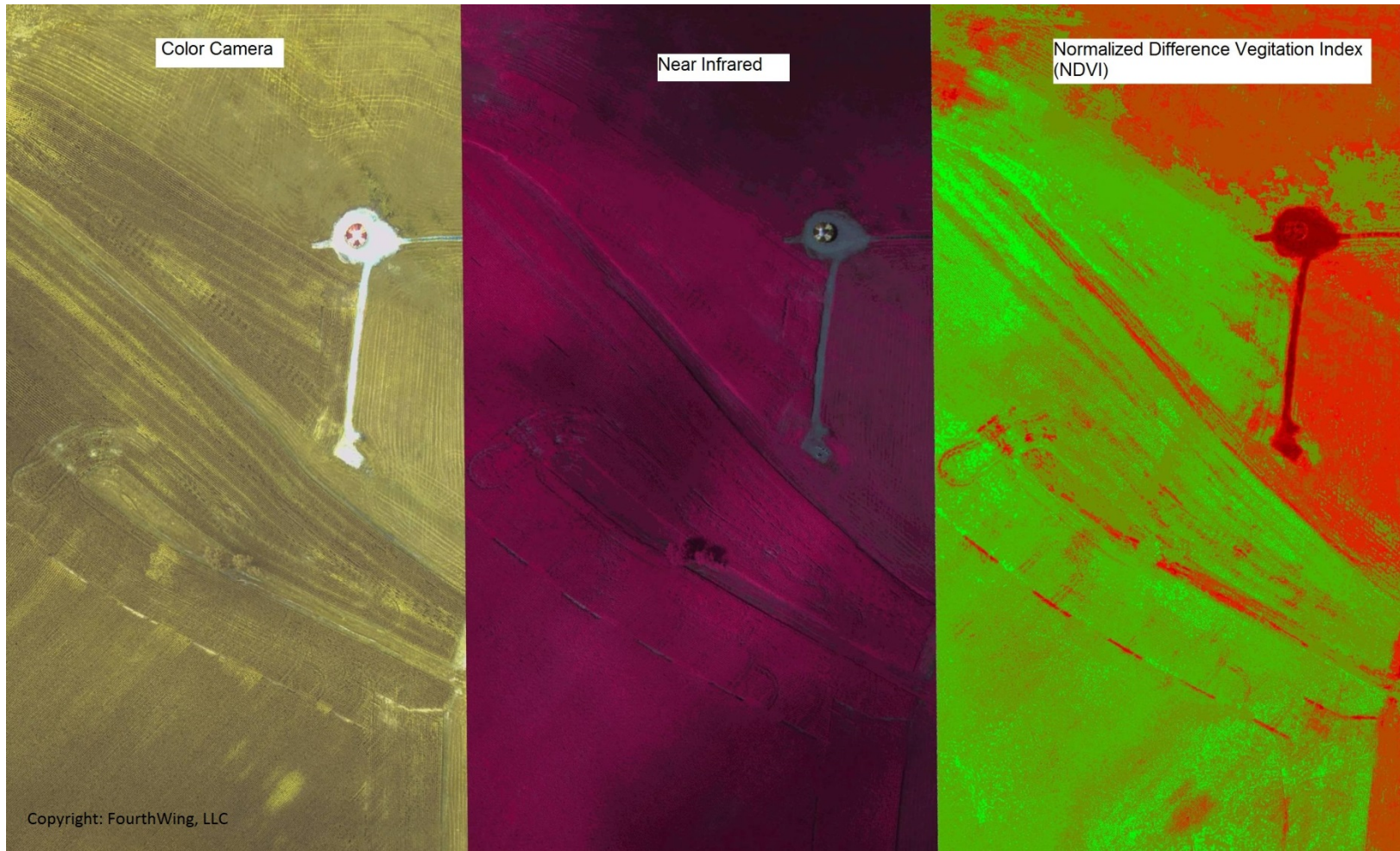
# Agriculture Applications

- Irrigation
- Crop Moisture
- Soil Moisture
- Fertilizer Concentration
- Mold
- Bug Infestation
- Chlorophyll Concentration
- Feed Lot Inspection
- Peak Harvest

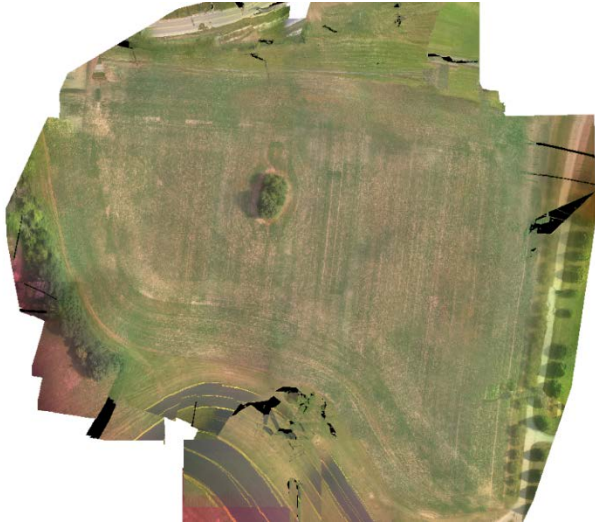




# Precision Agriculture



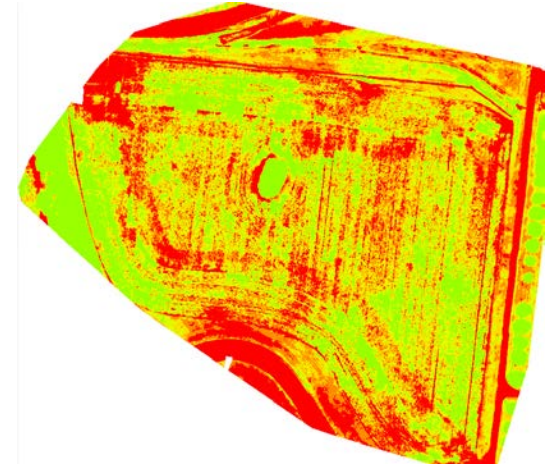
# Soy Field



Eclectic Optical – Normal  
View

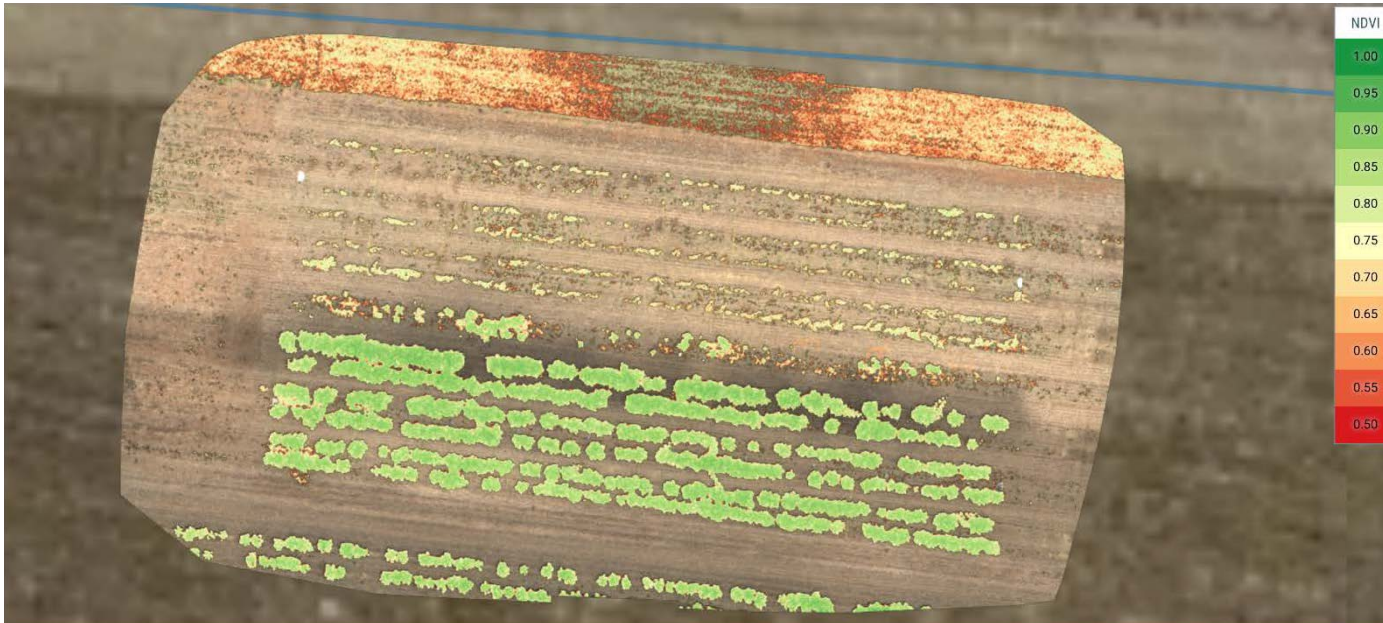


Infrared View



Normalized  
Difference  
Vegetation Index  
(NDVI)

# OSU Pest Management



Pumpkin Patch to the south and pickle field to the north. Green indicates health levels. Trying to detect powdery mildew and downy mildew on these crops.



# OSU – Food, Agriculture, and Biological Engineering

## Project 1 – Soil Compaction

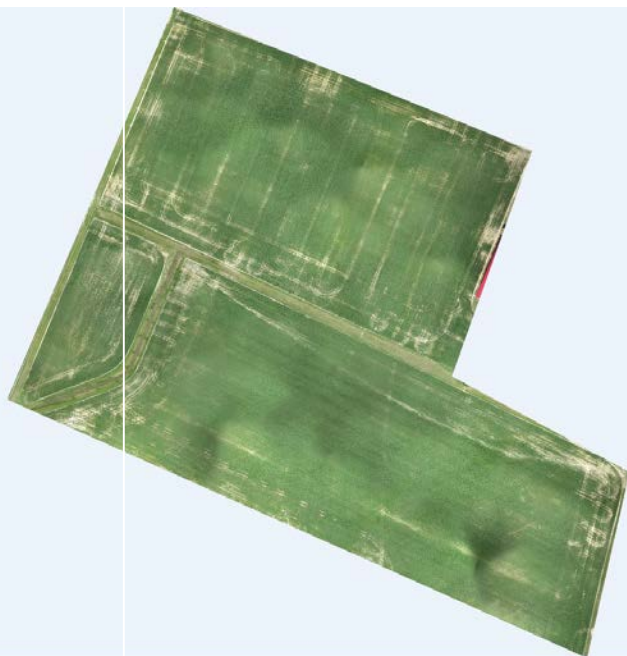
OSU is tracking large scale agriculture equipment (grain carts, combines, sprayers, manure spreaders etc.) and evaluate the economic impact to the yield effect for agricultural crops from seed to harvest. This research aims to make farmers aware of the effect and damage they are doing with large equipment.

## Project 1 – Nitrogen Plots

OSU is looking at the timing and models of nitrogen applied to grow corn crop throughout the growing season. If OSU can “feed” the corn when they need nitrogen they can reduce the amount of nitrogen needed for corn production thus be more sustainable and reduce farmers cost while increasing yield and becoming more profitable.

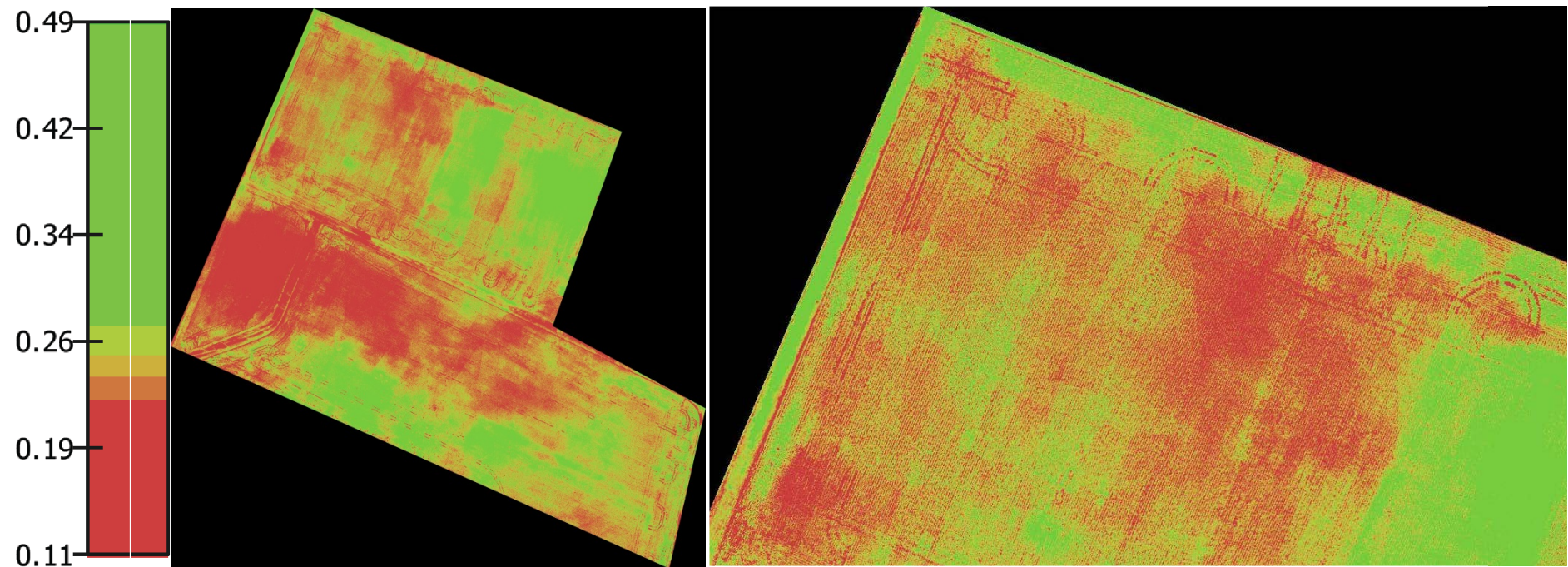
# OSU – Food, Agriculture, and Biological Engineering

- *Sense Fly eBee Flight - 06-24-2015*
- *RGB*



# OSU – Food, Agriculture, and Biological Engineering

- *Sense Fly eBee Flight - 07-18-2015*
- *Multi-Spectral – Red Edge*



# OH/IN UAS Center



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