Mentimeter Poll

menti.com | use code 5547 9347

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Indiana Orthoimagery & Elevation 2025-2028 Program

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Indiana Geographic Information Office

Ryan E. Bowe, MGIS, GISP, PMP®
Woolpert

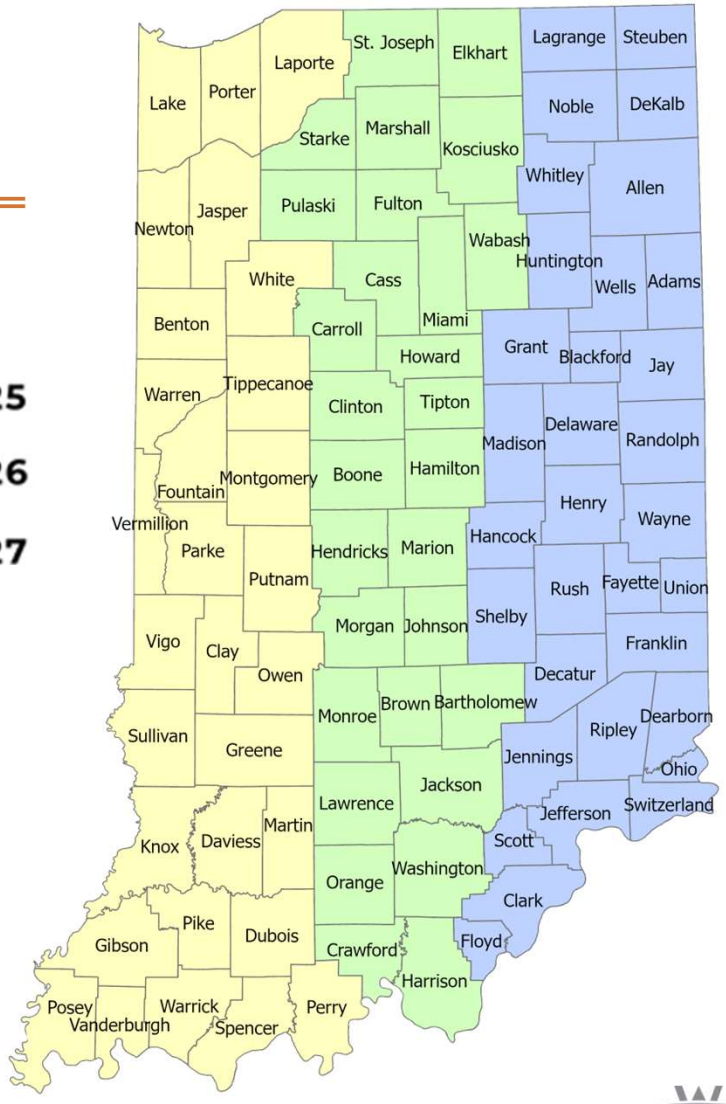
Indiana Program History

Orthoimagery

- 2005-2006
- 2011-2015
- 2016-2019
- 2021-2024
- 2025-2028

Lidar

- 2011-2013
- 2016-2019
- 2025-2028



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Why Statewide Imagery and Lidar

"State imagery has been invaluable to our organization."

"Elevation data, in the form of Lidar derived products, are the lifeblood of what we do at the Division of Water."

"Statewide projects have helped fill in the gaps for years we might have not flown otherwise."

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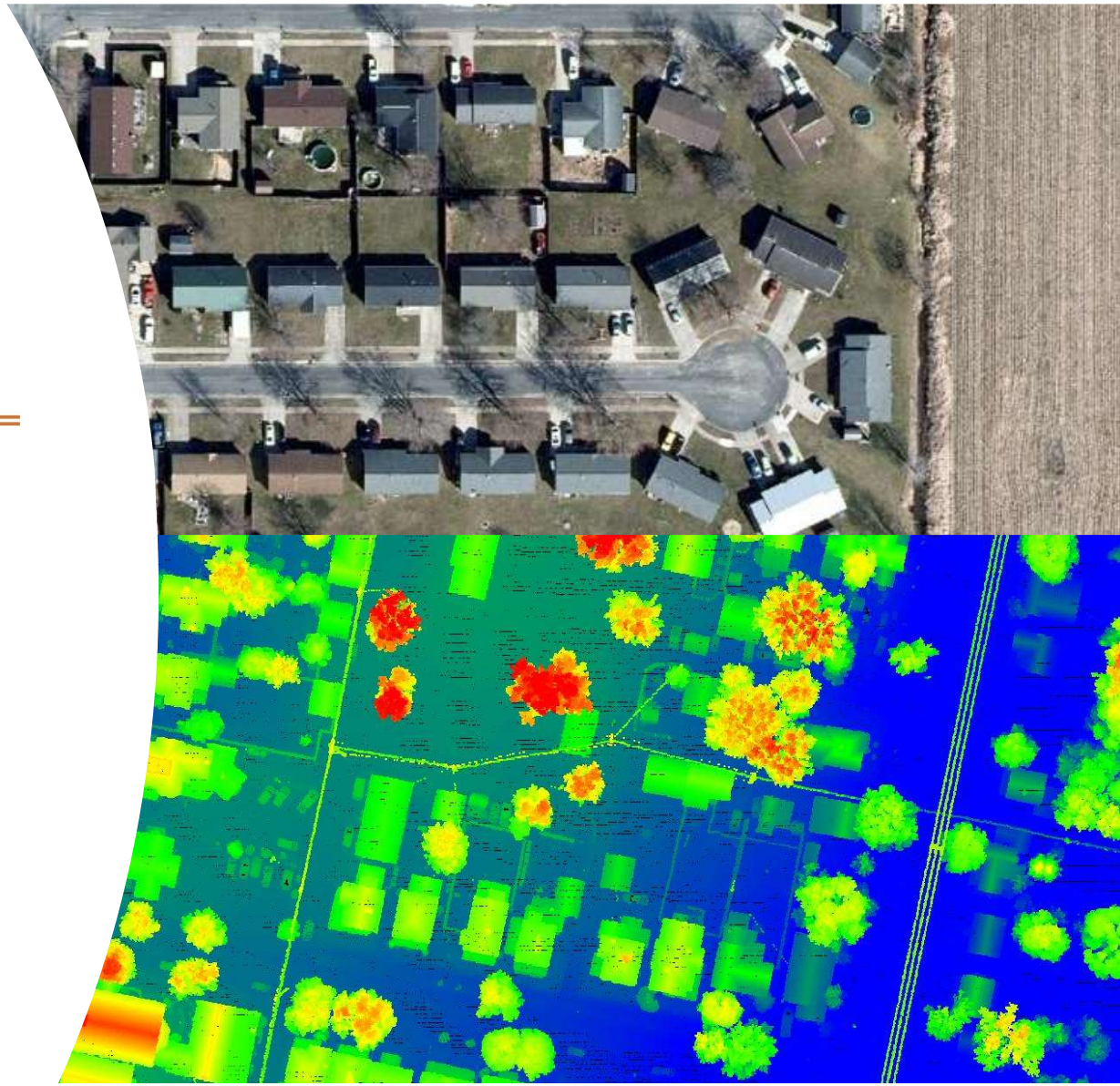
2025 - 2028 Program Specifications

- **Orthoimagery Base Products**
  - 6-inch (15-cm) pixel resolution
  - 4 -Band (R,G,B, NIR) imagery
- **Lidar Base Products**
  - QL1, 10 cm vertical accuracy with a point density of 25 ppsm



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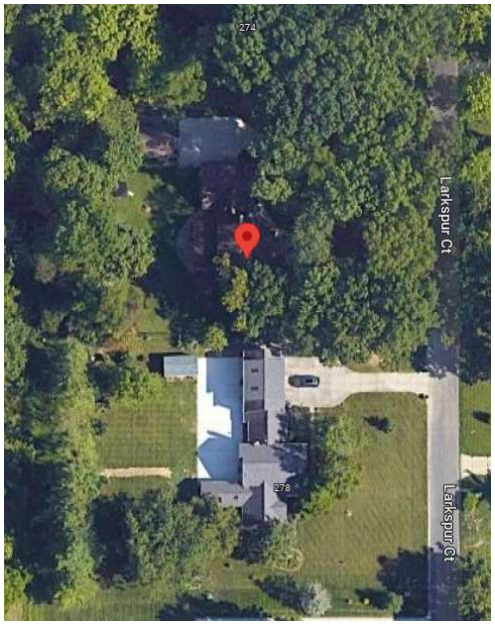
Why Statewide Imagery?



Google Imagery
Can you see the house?

2016 State Imagery
1-foot resolution

2021 State Imagery
6-inch resolution

2021 State Imagery
3-inch resolution

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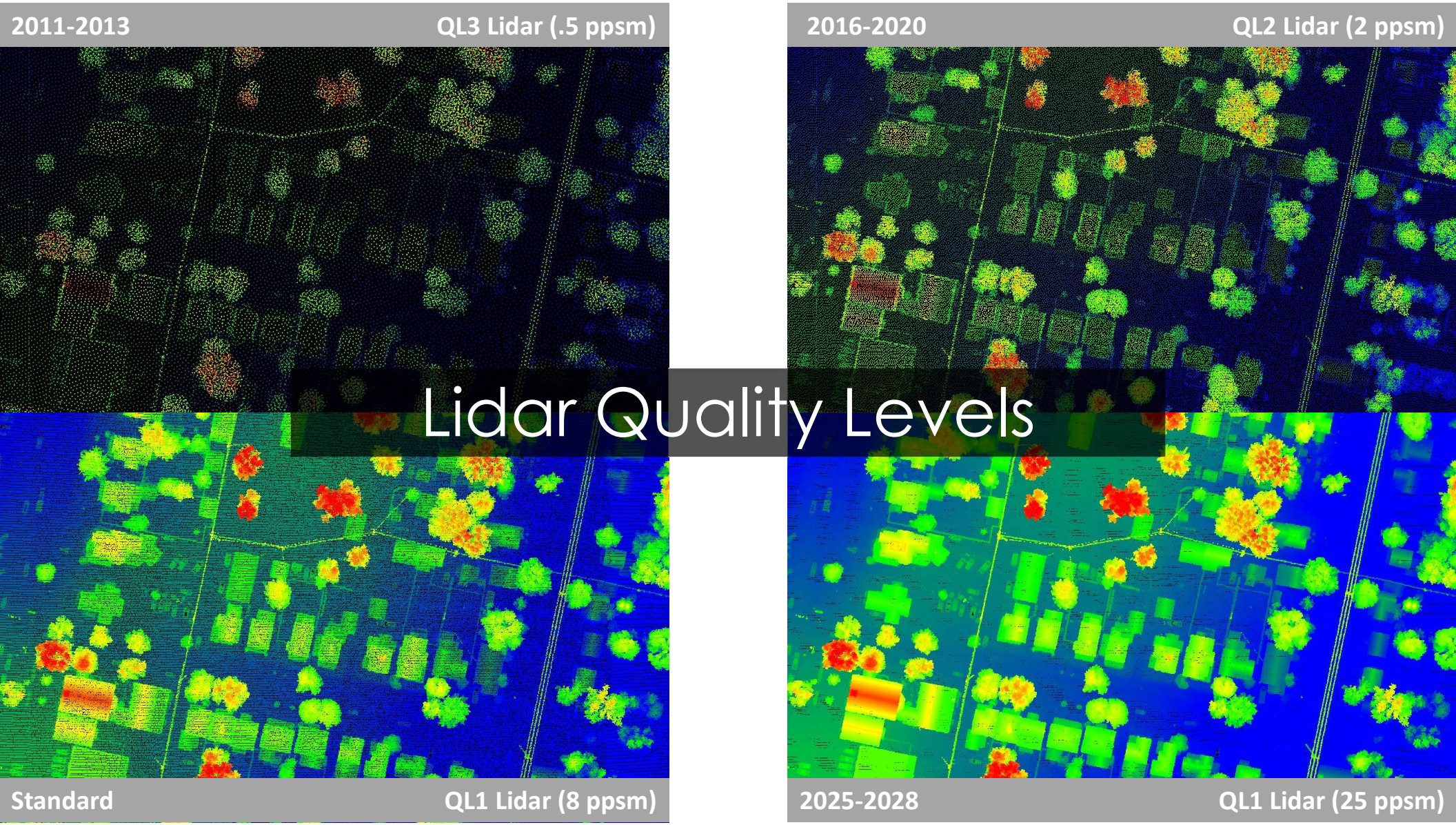
Lidar Quality Levels



Authoritative Data

- Defined resolution
- Known accuracy
- Federally adopted standards
- Professional-level QC
- Incorporated into USGS 3DEP

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Managed Collectively

Services provided by the IGIO

- Contract vehicle availability
- Procurement
- QC management
- Coordination of collective buying

Administered through Indiana Geographic Information Office (IGIO)

ALL Inquiries

Shaun Scholer

Indiana Geographic Information Office

Woolpert

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Managed Consistently

- Delivery on a designed timeline
- Stable negotiated pricing structure
- Standard level of quality for QC
- Consistent distribution

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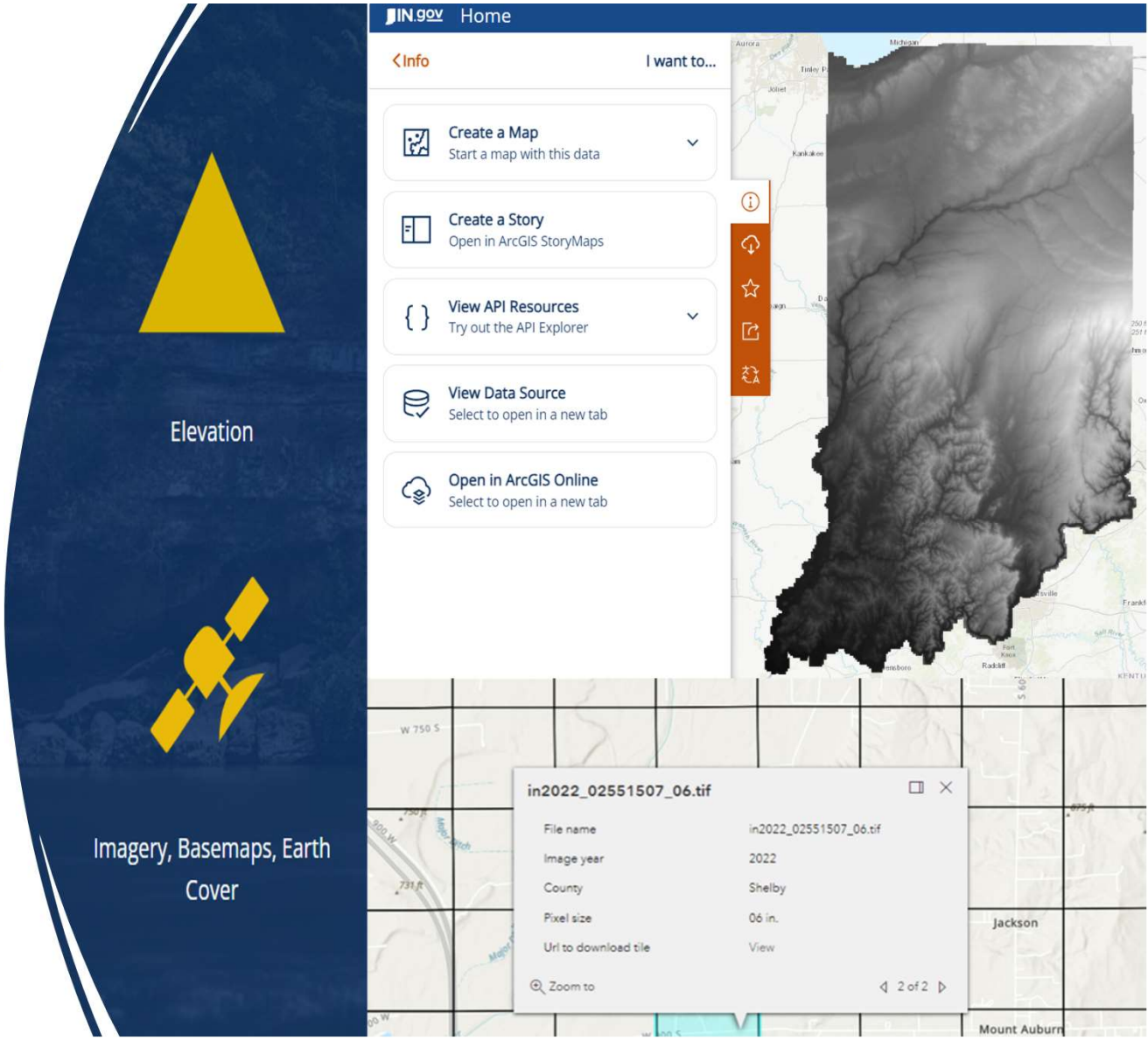
Easily Accessible

- Image services – Open Data
- Download – No Cost for the Public
- Web Map Applications



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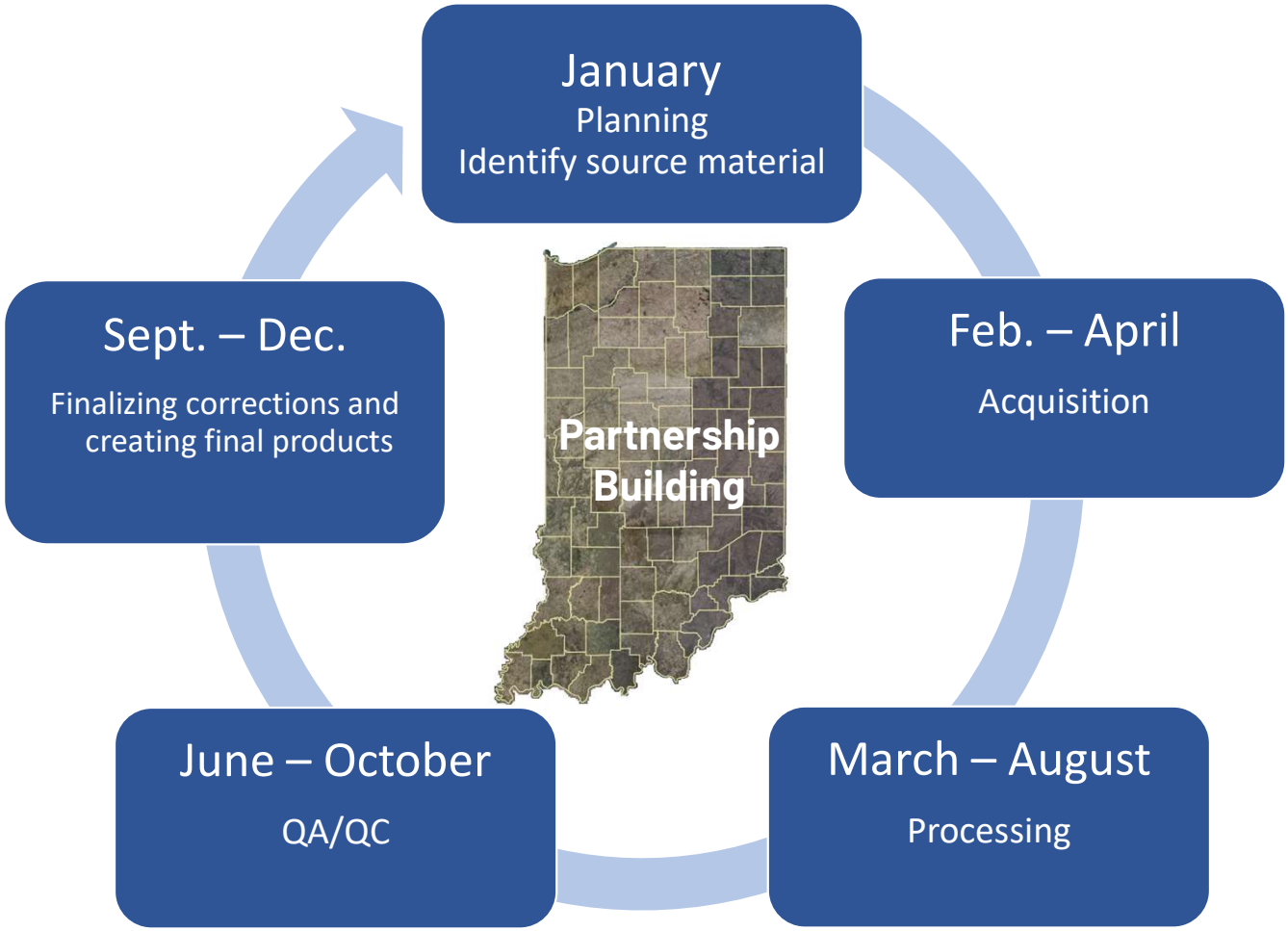
Timeline



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Program Partners

- **IGIO**
- **State Agencies**
- **Federal Agencies**
- **Local Government**

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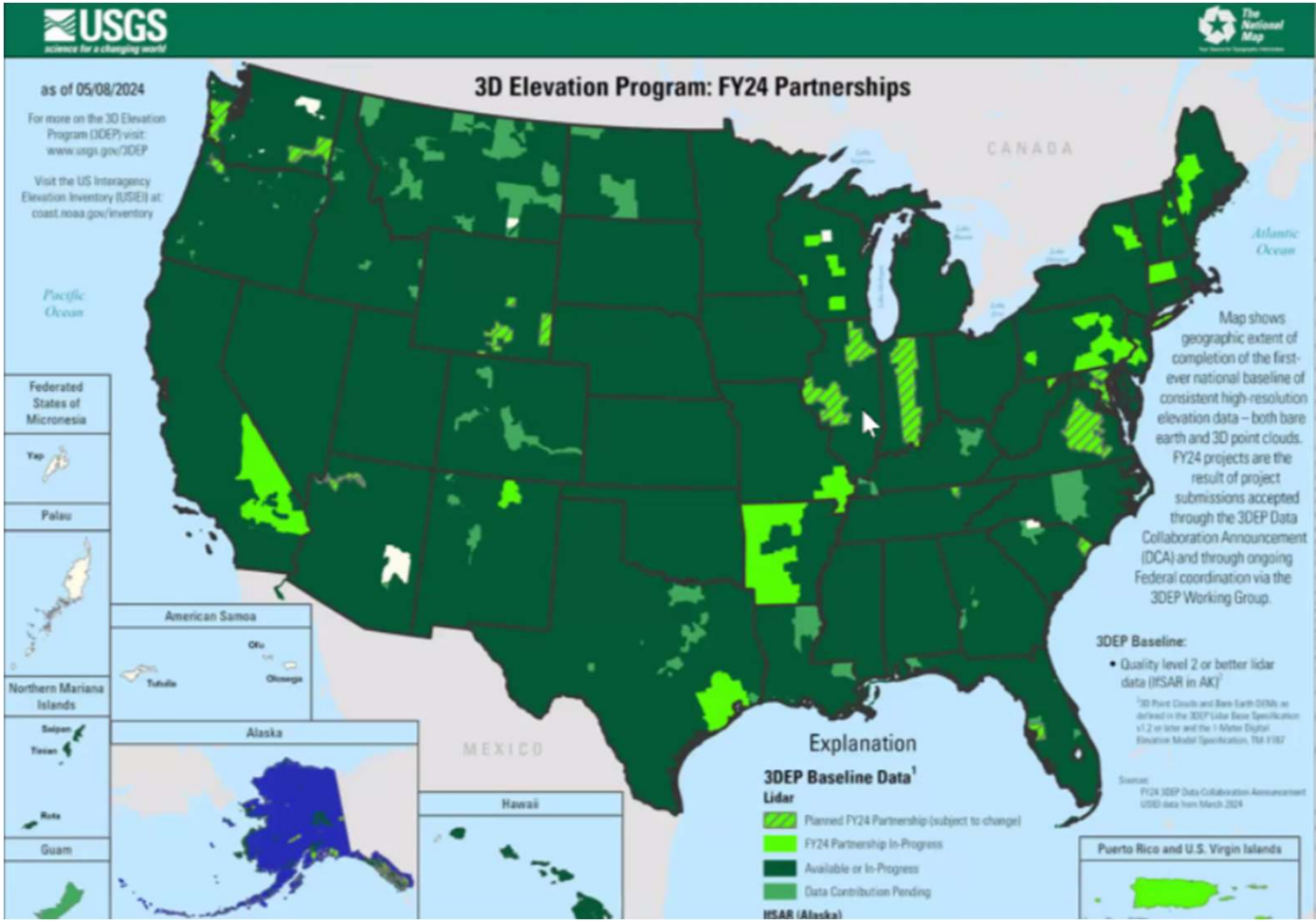
USGS 3DEP Program

- USGS (DCA) Grant
- Cooperative agreement
- QA/QC
- Base products



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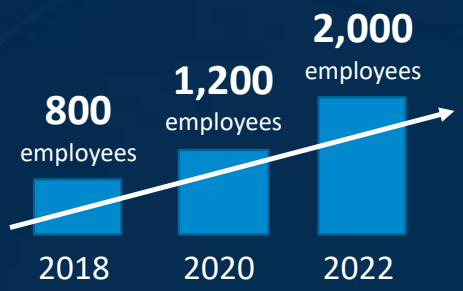
Woolpert is the Fastest-Growing Global AEG Firm



10 companies acquired in 4 years (4 international)

1000s of international projects completed

PARTNERSHIPS

esri Partner Network Gold

ERDC

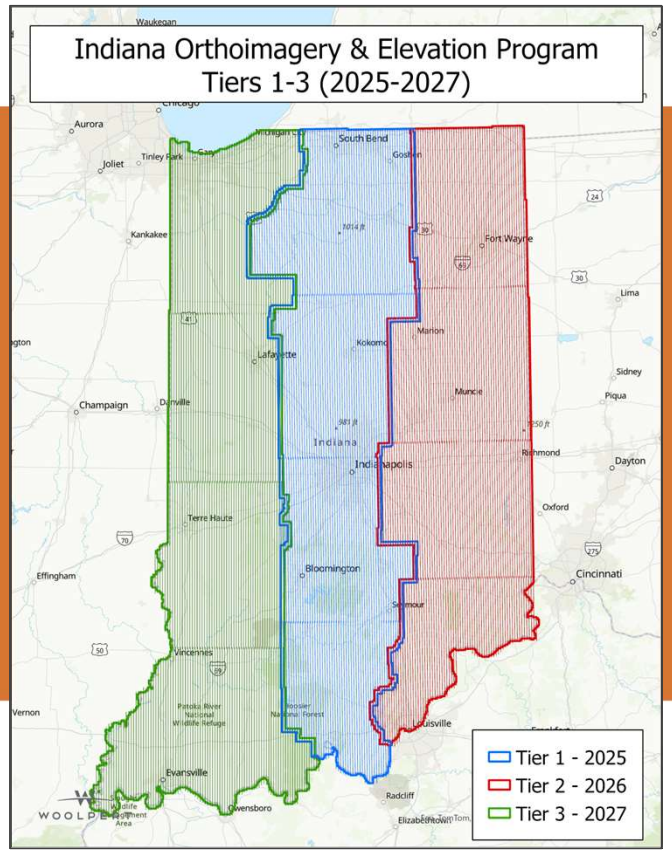
Google Cloud Partner

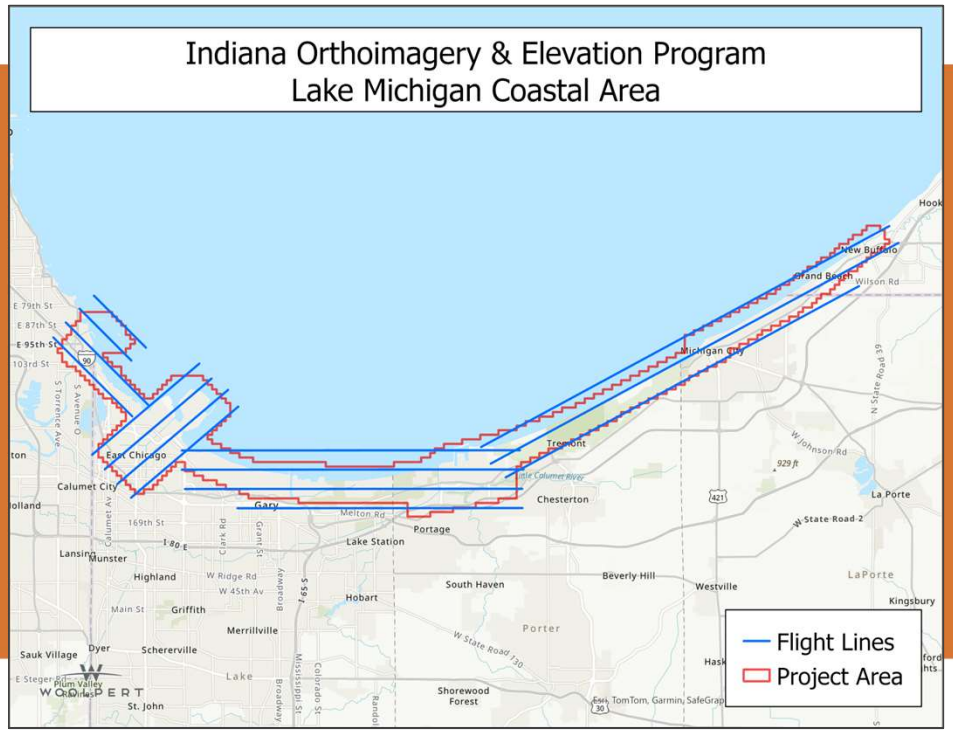
HBCU PARTNER

planet.

Trimble. Authorized Business Partner

Data Collection





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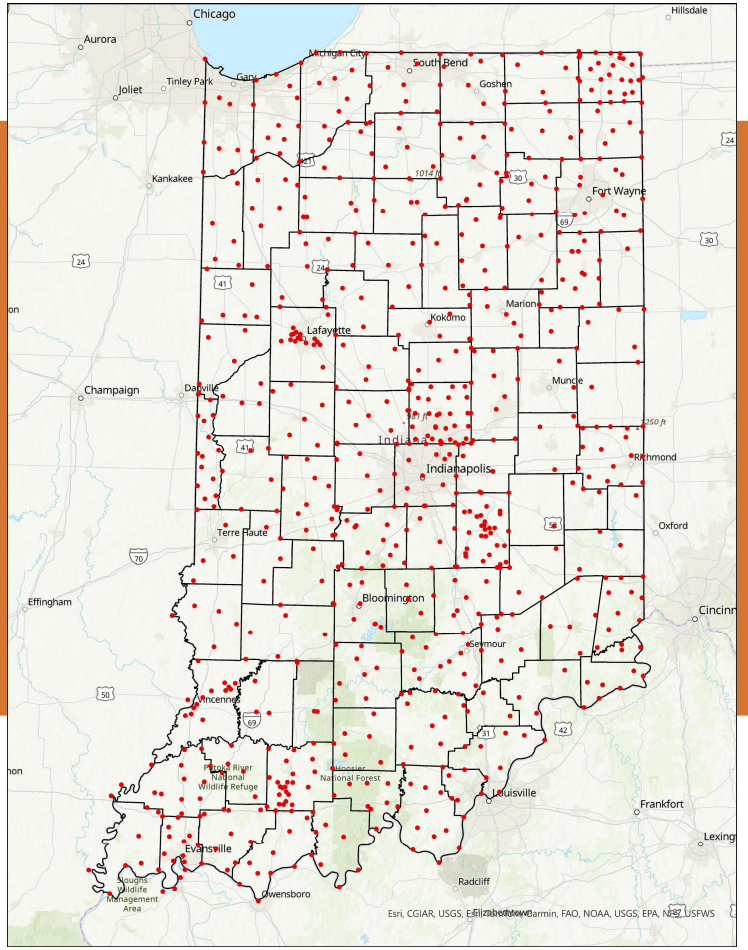
Ground Control Points



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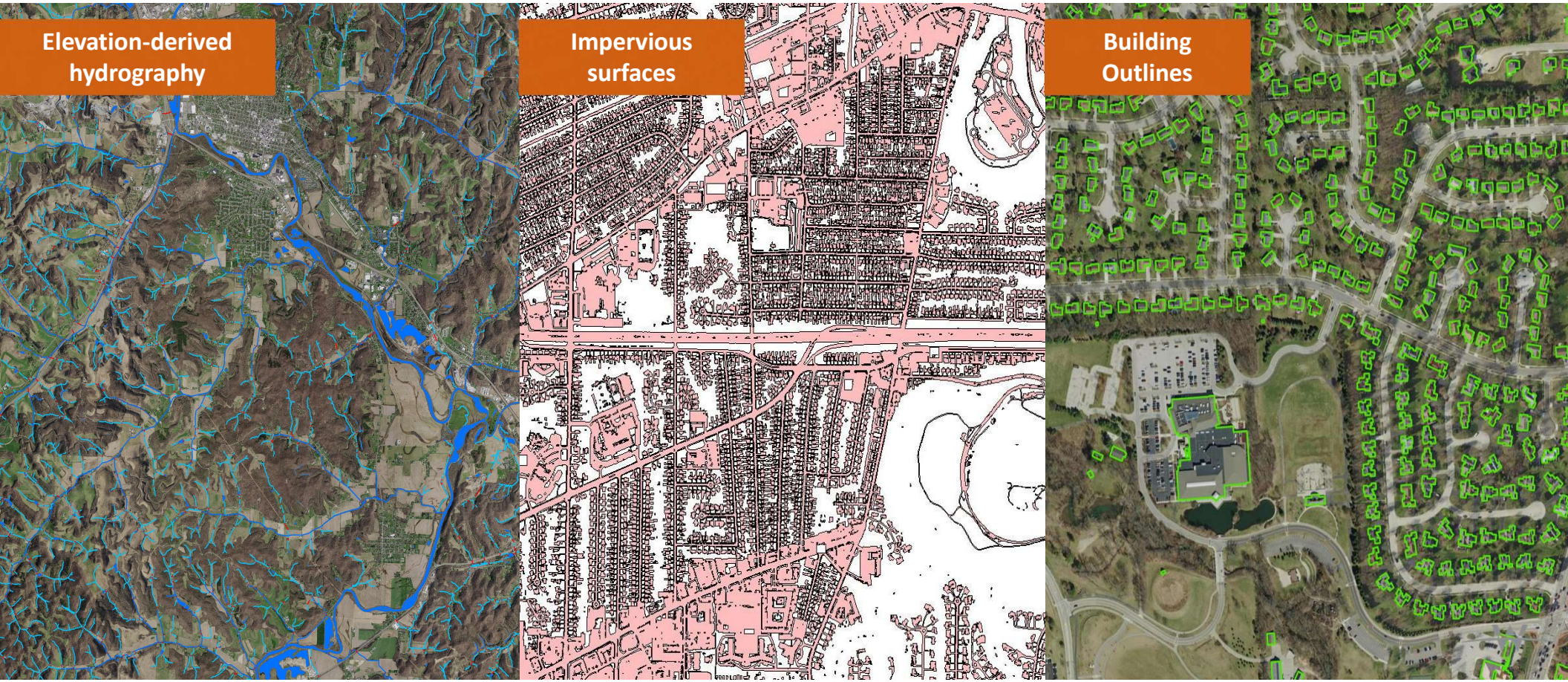
Benefits of co-collection

- Confidence in your data
- Accuracy and completeness of secondary products
- Increased number of features that can be delineated from AI/ML
- Co-registered, colorized point cloud makes a beautiful 3D point cloud

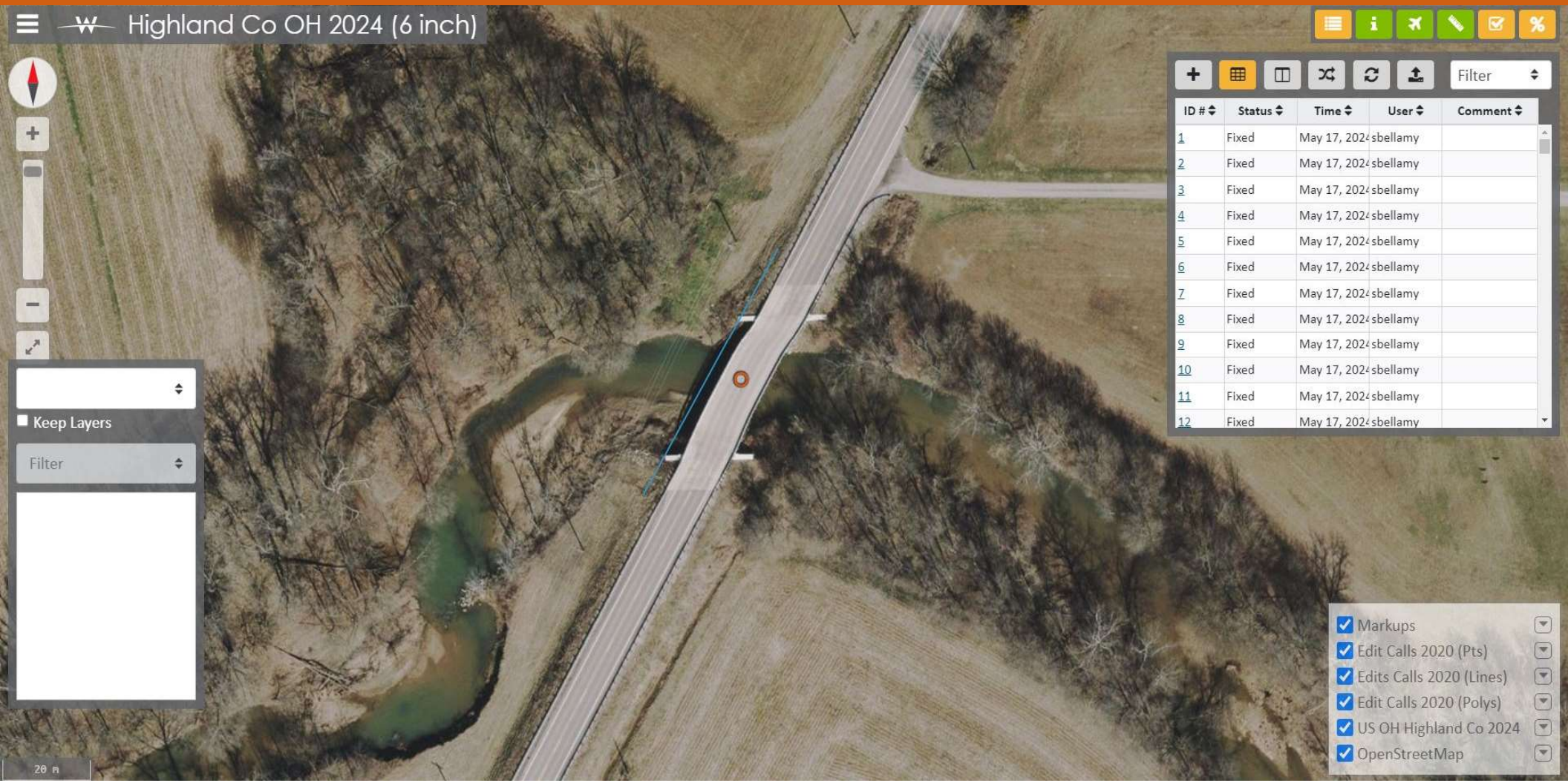
Value Added Datasets

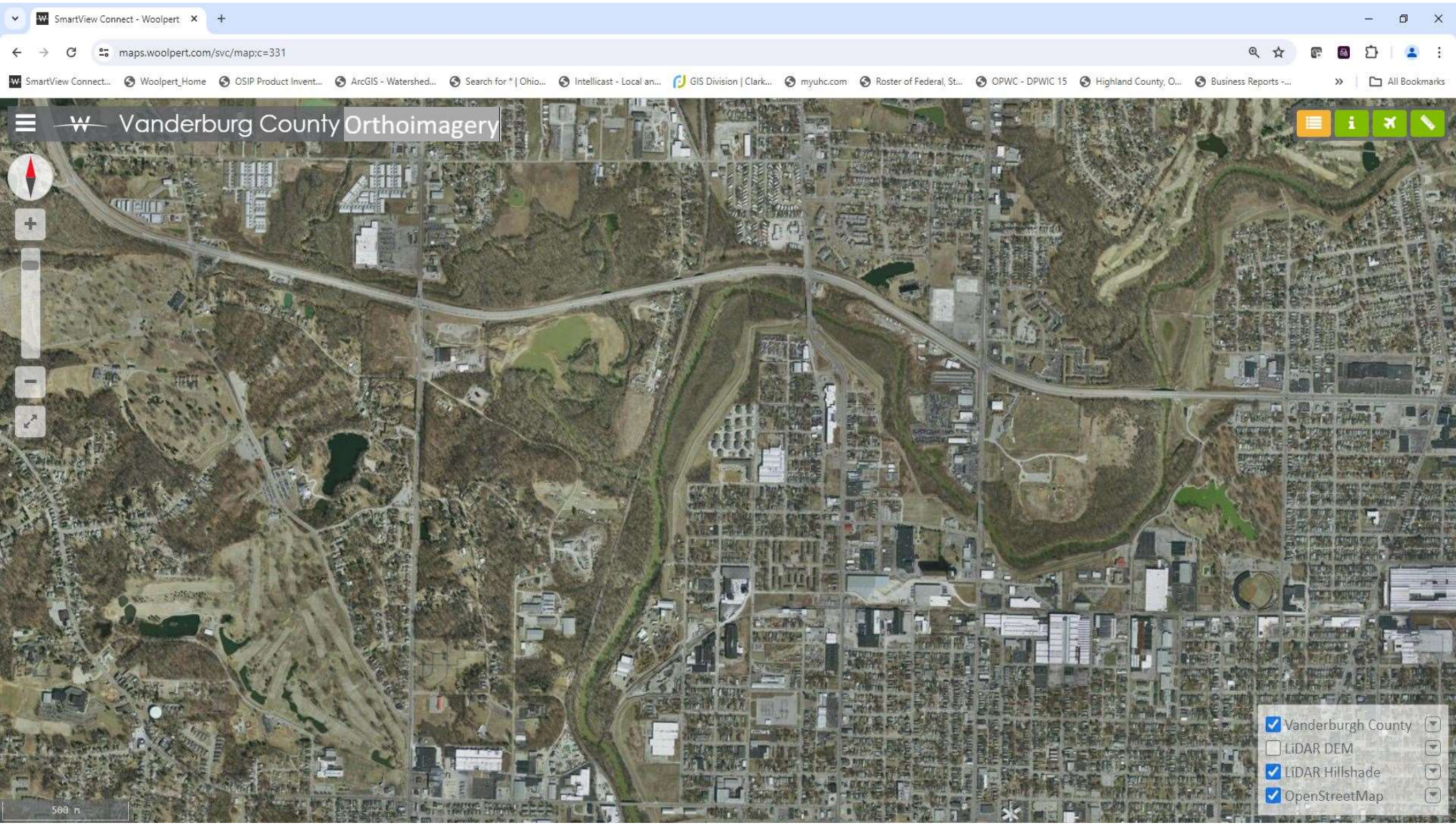
(Benefits of Imagery/Lidar Co-Collection)



Orthoimagery Processing (Ortho Corrections)

Orthoimagery Processing (Ortho Corrections)

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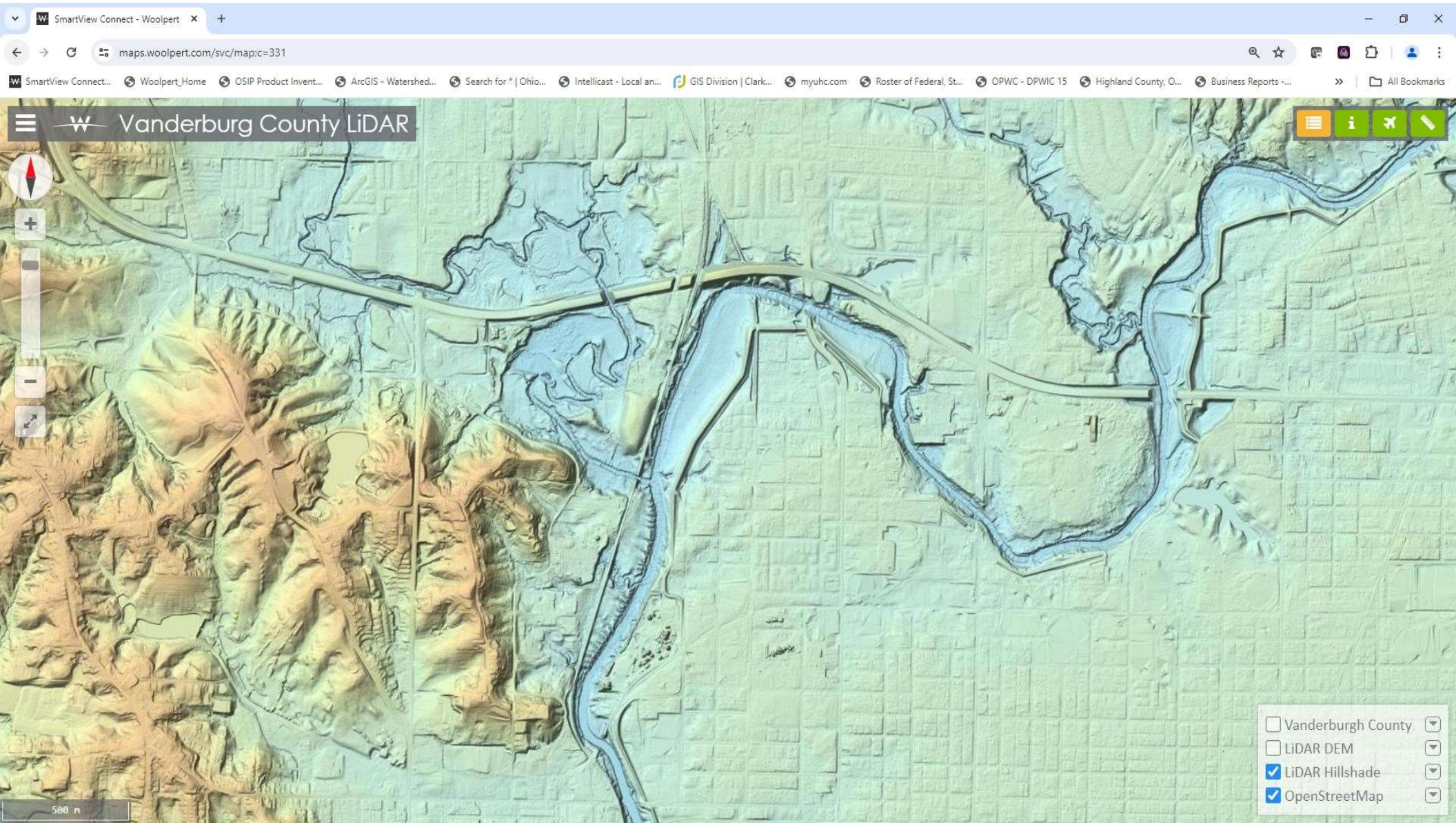
Business Reports -...
All Bookmarks
Vanderburg County Orthoimagery
Vanderburgh County
LiDAR DEM
LiDAR Hillshade
OpenStreetMap
500 m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ArcGIS - Watershed...
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Intellicast - Local an...
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Roster of Federal, St...
OPWC - DPWIC 15
Highland County, O...
Business Reports -...
All Bookmarks
Vanderburg County LiDAR
Vanderburgh County
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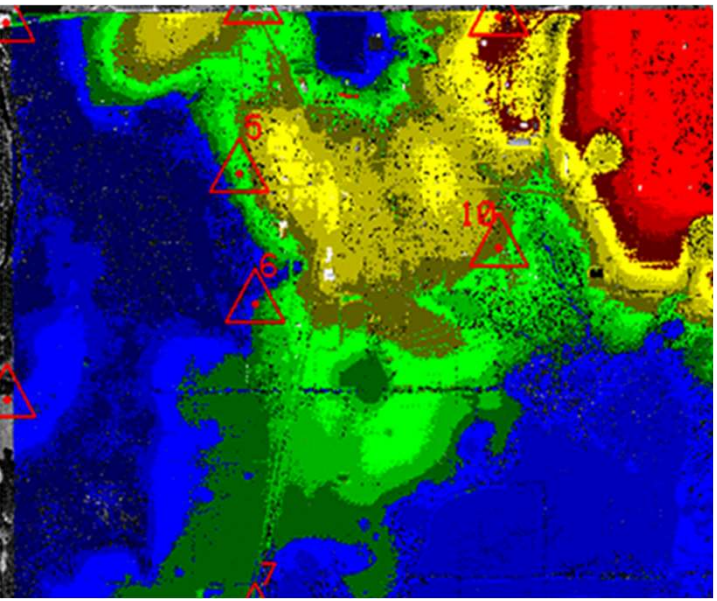
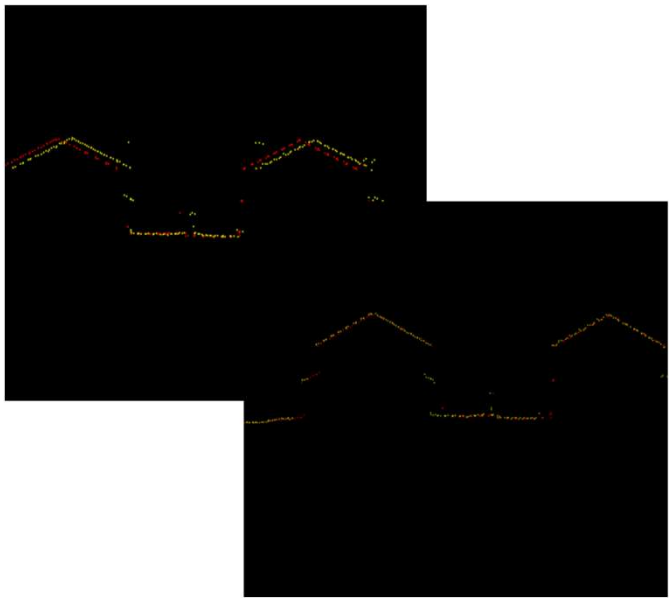
LiDAR Hillshade
OpenStreetMap
500 m

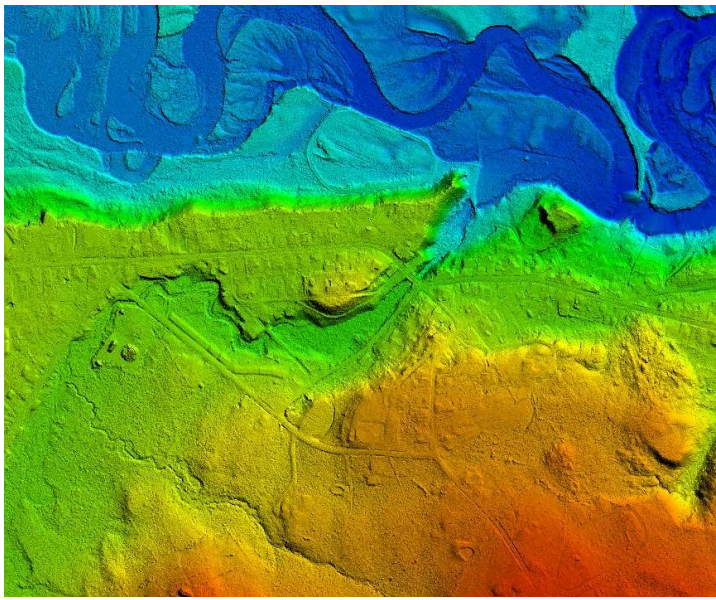
Lidar Processing



Calibration and Accuracy



Classification and Filtering



Bare Earth QA/QC

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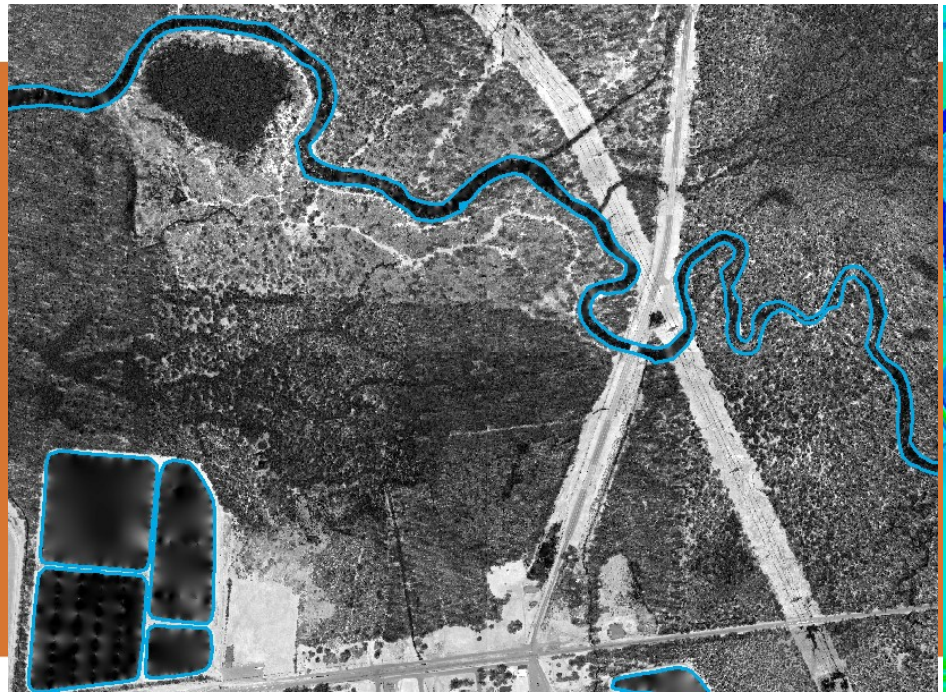
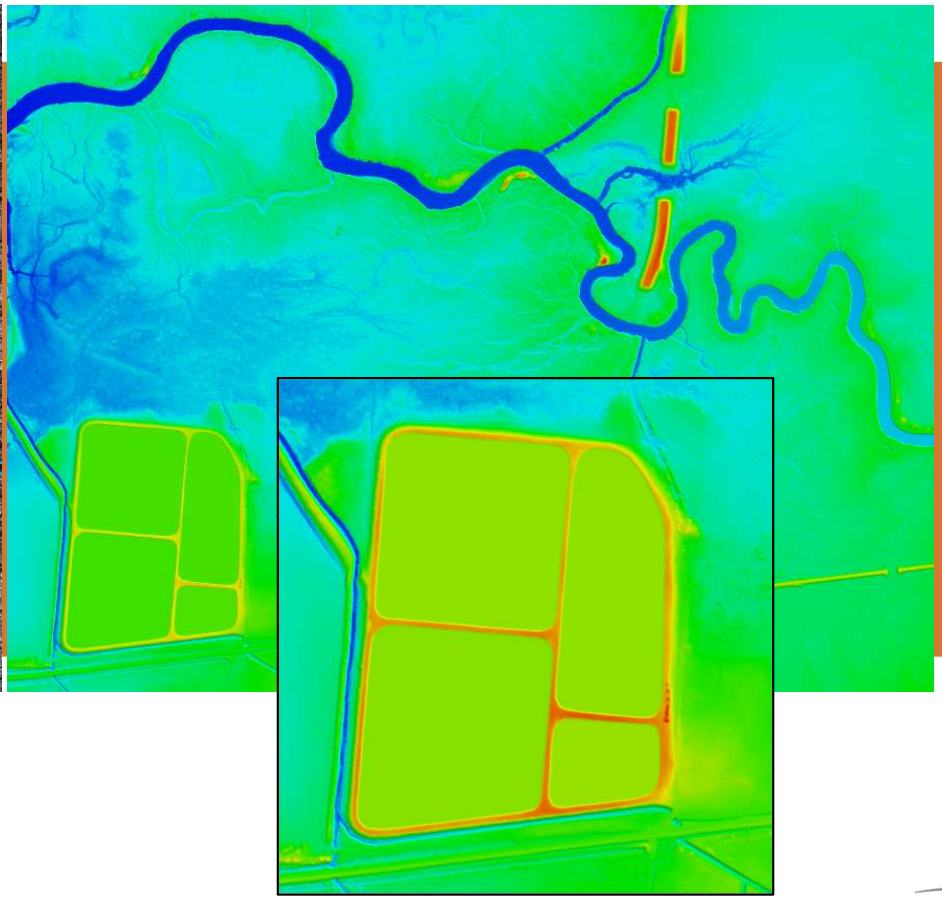
Hydrologic Flattening





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Sample USGS Data Summary Report

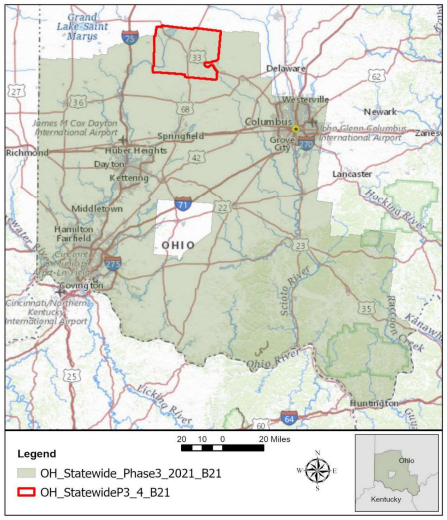
USGS science for a changing world

Data Validation Report

from the National Geospatial Technical Operations Center in Support of the 3D Elevation Program

OH_StatewideP3_4_B21

2024-04-11



Based on this review, the delivered data is EXPECTED TO MEET 3D Elevation Program requirements.

Work Unit Summary Information

Project Name: OH_Statewide_Phase3_2021_B21	**Project ID:** 222528	
WU Name: OH_StatewideP3_4_B21	**Work Unit ID:** 300167	
Mechanism: GPSC	**Lidar Base Spec:** Lidar Base Specification 2022 rev. A.	
Quality Level: 1	**P-Method:** 7 - Linear-Mode Lidar	
Horizontal EPSG Code: 6549	**Vertical EPSG Code:** 6360	**Geoid Model:** GEOID18
The National Map Help Desk Email: tnm_help@usgs.gov		

The U.S. Geological Survey evaluates absolute vertical accuracy of the lidar and lidar-derived bare earth digital elevation model (DEM) data at the project level. Data are produced to meet 9.8 cm absolute vertical accuracy at the 95-percent confidence level in non-vegetated, open terrain. To review vertical accuracy results, please see the project report

Breaklines

Based on this Review, the USGS-NGTOC **ACCEPTS** the Breaklines

Breaklines are visually reviewed in conjunction with the bare earth DEM for spatial and geometric accuracy. Breaklines are confirmed to be three dimensional (3D) features and that elevations are at or just below the immediately surrounding terrain. Single- and double-line drainages are reviewed to ensure downstream flow. The USGS recognizes that differences in collection methodology, resampling techniques, and other factors that are unique to proprietary production do occur, and these will result in minor horizontal and vertical differences between breaklines derived on the fly.

Reporting Metadata

Based on this Review, the USGS-NGTOC **ACCEPTS** the Reporting Metadata

Reports from the contractor, including calibration, collection, and processing methods, are reviewed for accurate information. For more information, please see the work units metadata.

FGDC XML Metadata

Based on this Review, the USGS-NGTOC **ACCEPTS** the FGDC XML Metadata

CSGDM .xml metadata are parsed using the USGS Geospatial Metadata Validation Service and reviewed for accurate information. CSDGM is maintained by the Federal Geographic Data Committee (FGDC).

Spatial Metadata

Based on this Review, the USGS-NGTOC **ACCEPTS** the Spatial Metadata

Spatial metadata from the contractor, including raster and vector datasets, are evaluated together with pertinent deliverables for geometric fidelity and attribution accuracy. For more information, please see the work units metadata.

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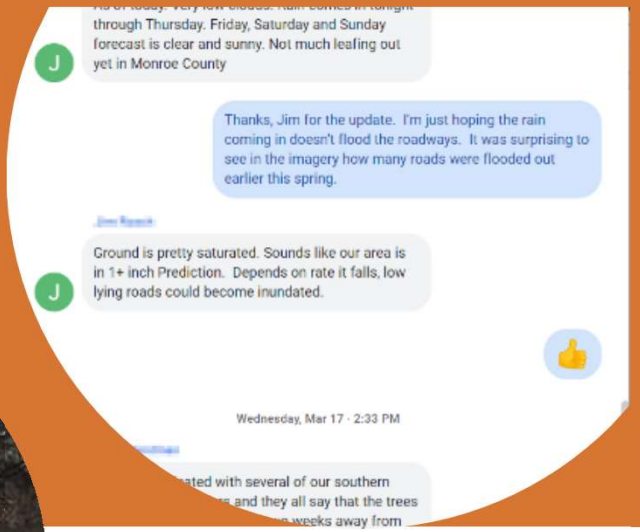
ROADSHOWS

Ryan Bowe – ryan.bowe@woolpert.com

Brian Stevens – brian.stevens@woolpert.com

Required Ground Conditions

- DNR Employees
- GIS Vendor Employees
- County GIS Managers
- County 911 Directors
- County IT Directors



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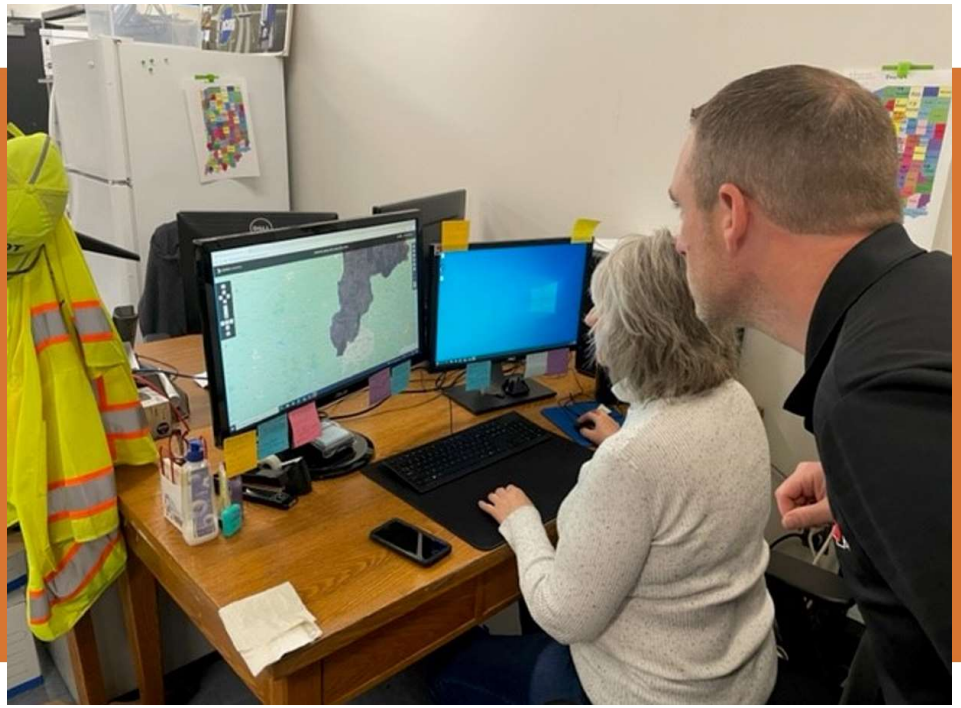
INDOT Aerial Survey's QC Team

- Orthoimagery
  - Review seam lines
  - Bridge decks
  - Tonal balance
  - Overall image quality
- Lidar
  - Bare Earth DEM



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SURVEYING • PHOTOGRAMMETRY/REMOTE SENSING
INDOT
LAND & AERIAL SURVEY OFFICE
InCORS

Program Lessons

- Data Acquisition and Availability
- Risk Assessment and Environmental Factors
- Communication and Stakeholder Management
- Proactive Measures and Troubleshooting
- Data Processing and Quality Control
- Data Pipeline and Delivery

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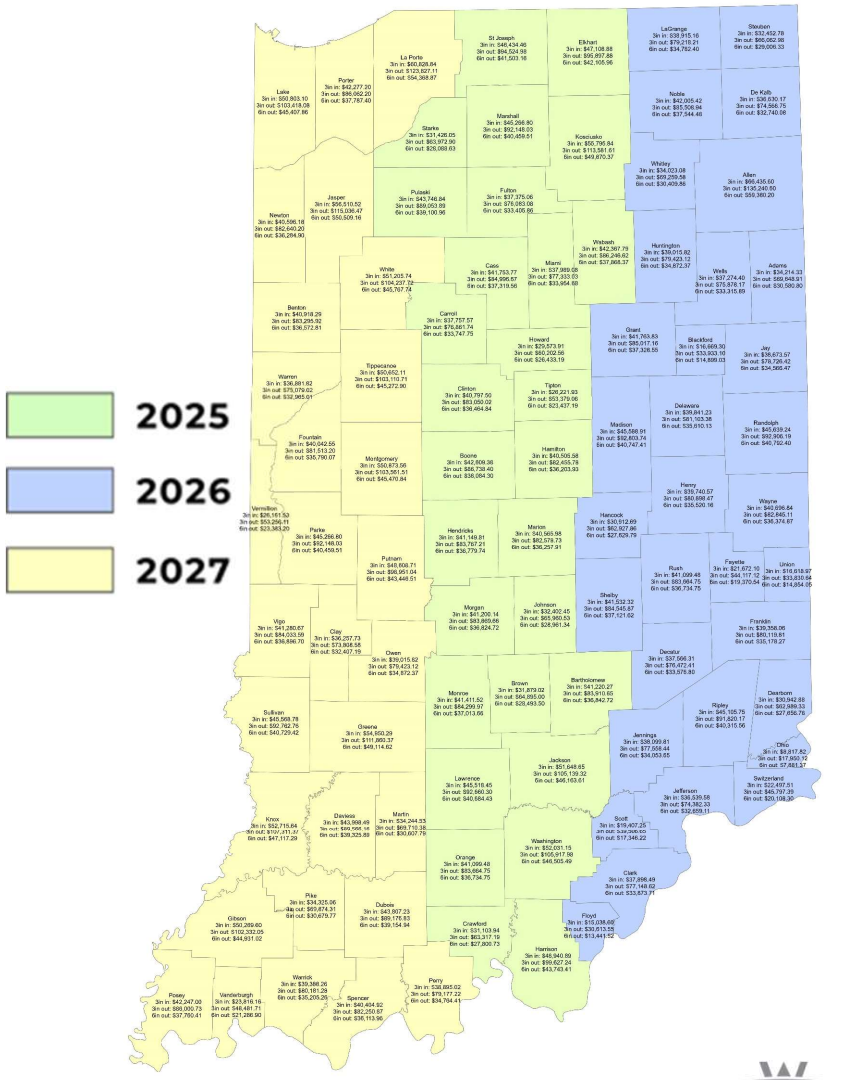
County Buy-up Costs

Product	Cost per Square Mile
In Cycle 3-inch Orthoimagery	$140.64 - $39.98 = **$100.66**
Out of Cycle 3-inch Orthoimagery	$204.91
Out of Cycle 6-inch Orthoimagery	$89.97
2-foot Contours	$46.15
1-foot Contours	$70.58

Additional pricing on ancillary products available upon request.



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Questions and Mentimeter Poll

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