

Forum Breakout Topic

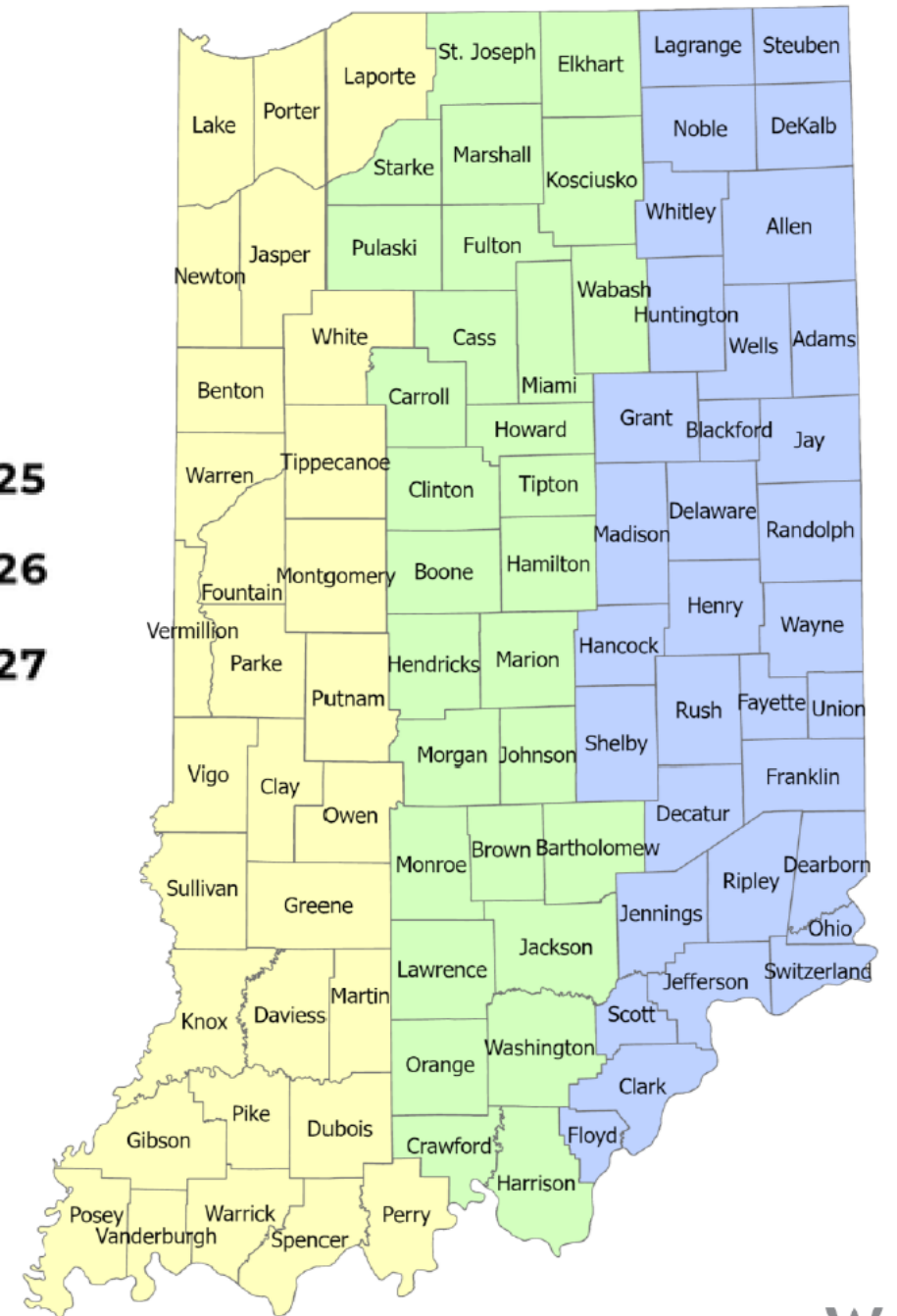
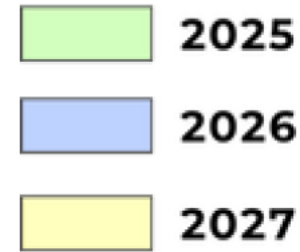
Orthoimagery, Lidar, and AI/ML

- IGIO's 2025-2028 Ortho-Lidar Program
- Coming Soon
- Derivative Ortho & Lidar Products
 - Custom, COTS/Licensed, and DIY
- AI/ML
 - GeoAI
 - Land Cover Mapping
(Hamilton Co Example)
 - Generative AI
(ChatGPT and more)
- Other?????

IGIO's 2025-2028 Ortho-Lidar Program

(Coming Soon)

Who is Buying-Up?



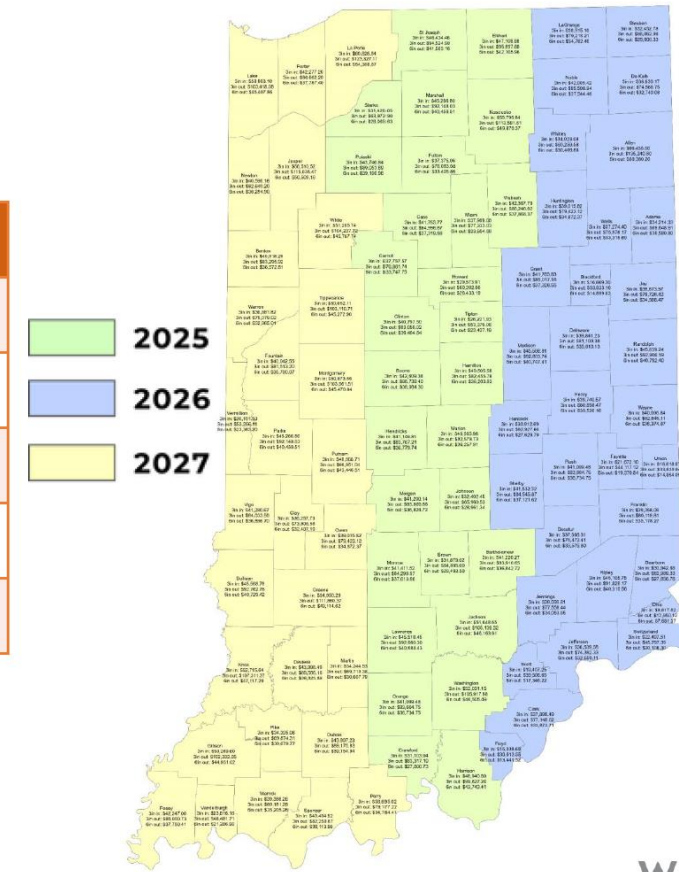
IGIO's 2025-2028 Ortho-Lidar Program

(Coming Soon)

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.



Who is Buying-Up?

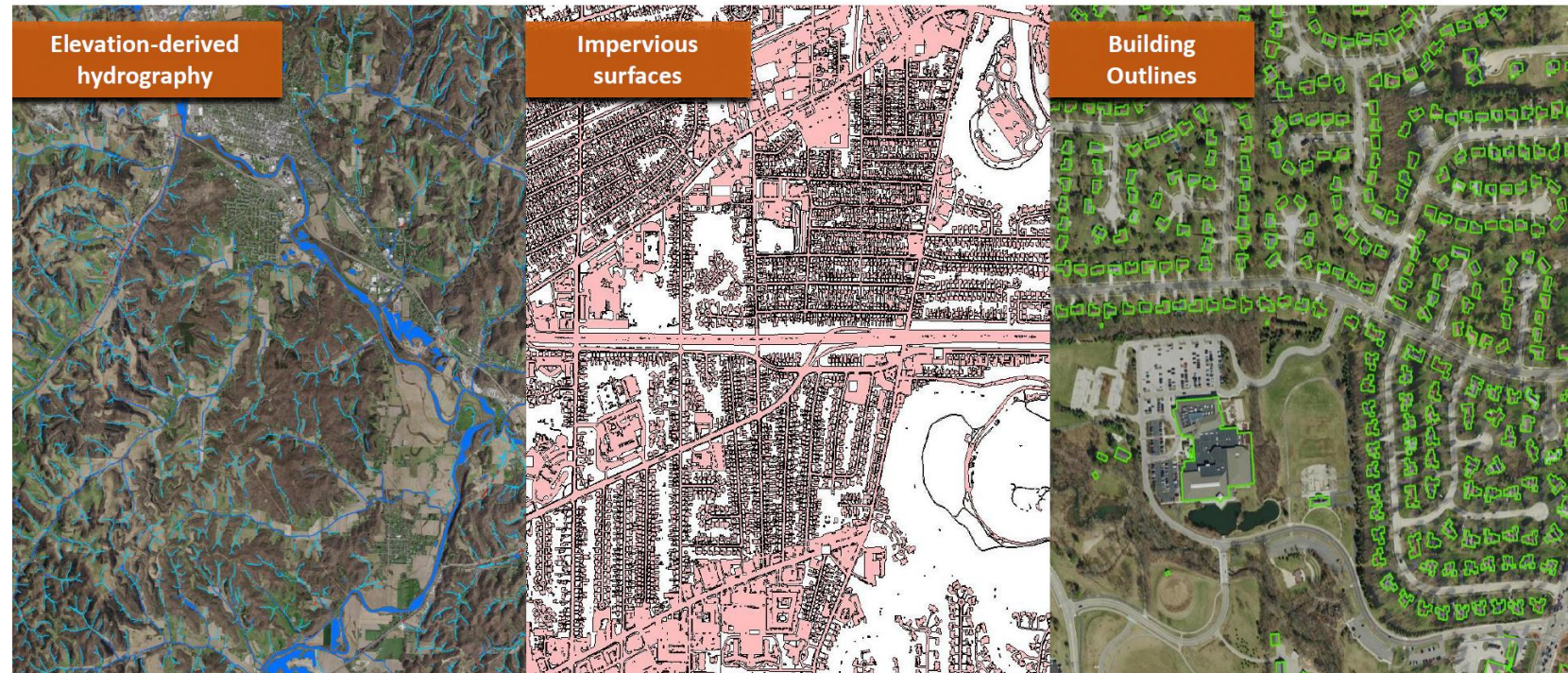
[LINK]



Derivative Ortho & Lidar Products

**Custom, COTS/
Licensed, and
DIY**

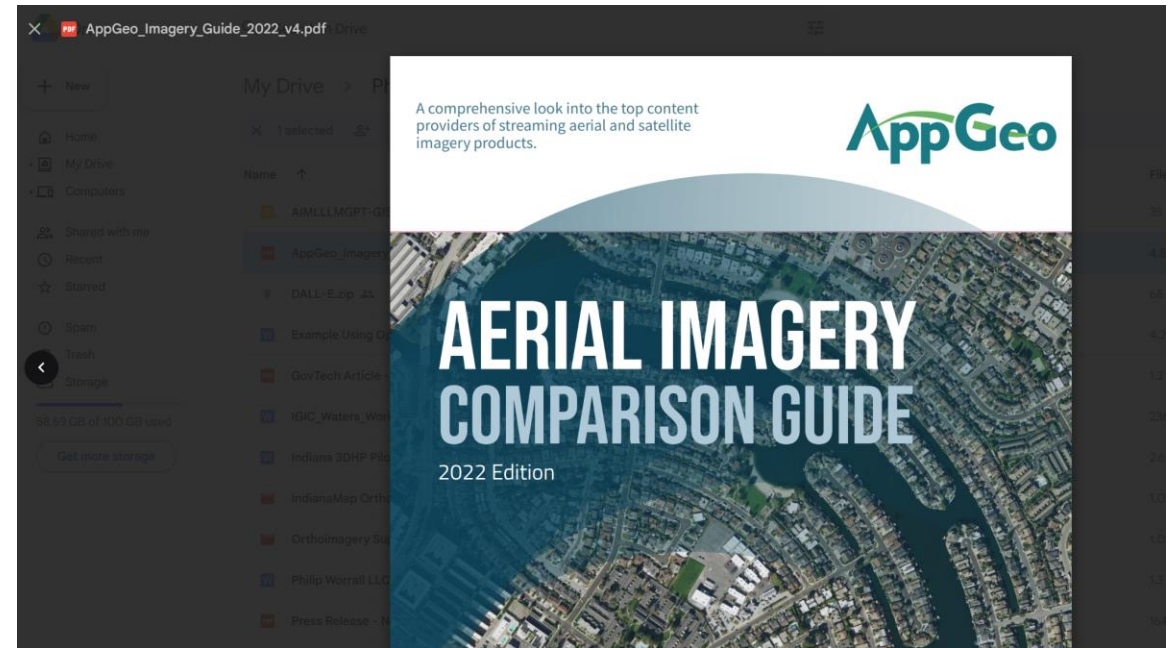
Value Added Datasets (Benefits of Imagery/Lidar Co-Collection)



Other: Digital Twins, etc...

Derivative Ortho & Lidar Products

Sanborn (AppGeo) Guide
[\[LINK\]](#)



Custom, COTS/ Licensed, and DIY

**NuView 3D Elevation Data
And More...**
[\[LINK\]](#)



Derivative Ortho & Lidar Products

Custom, COTS/
Licensed, and
DIY

Esri Living Atlas
AI/ML/DL Models
[\[LINK\]](#)

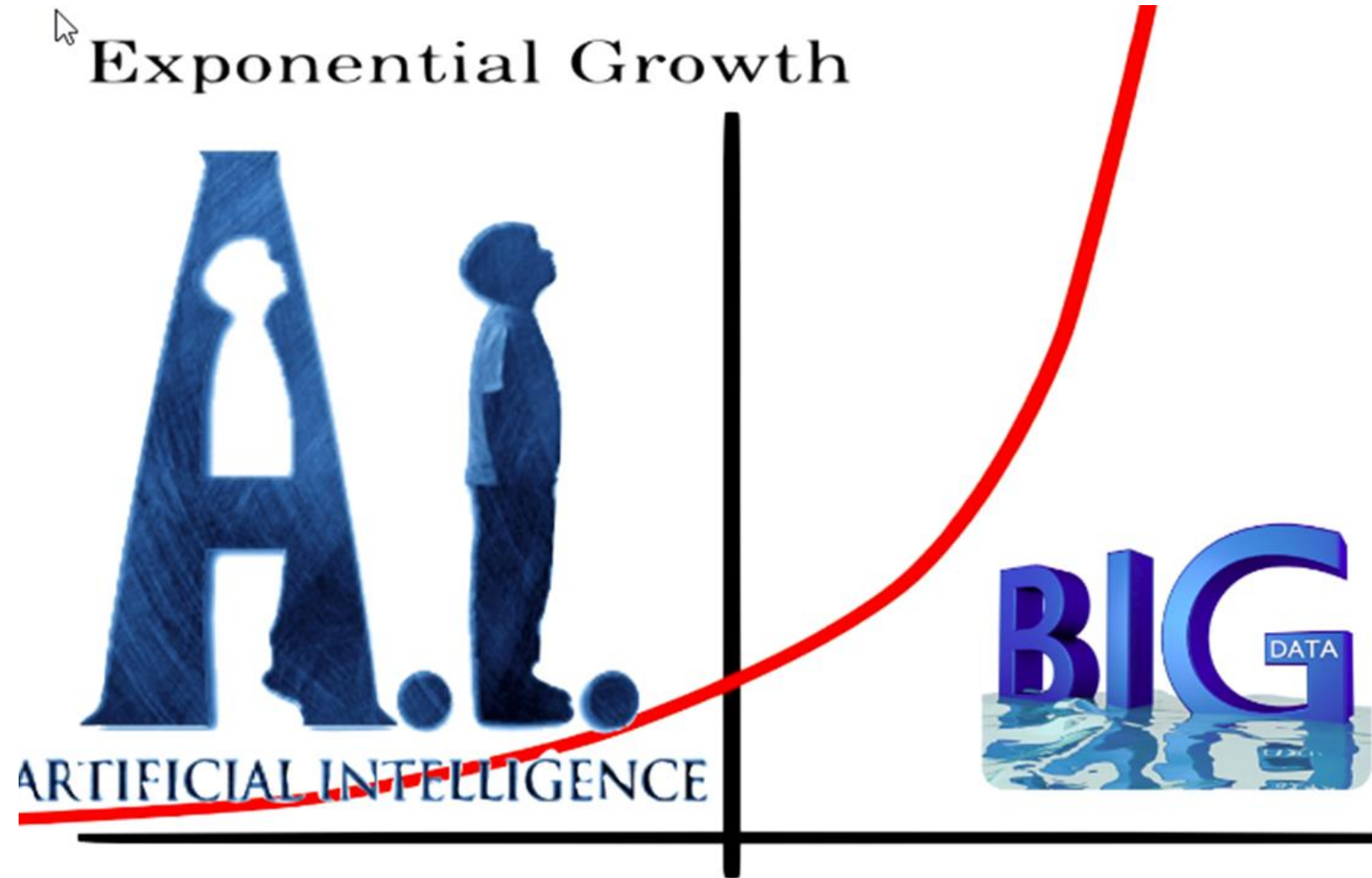
Univ. of TN (Qiusheng Wu)
GEE and much more
<https://github.com/giswqs>

Purdue (Jinha Jung)
Data to Science
<https://ps2.d2s.org/>

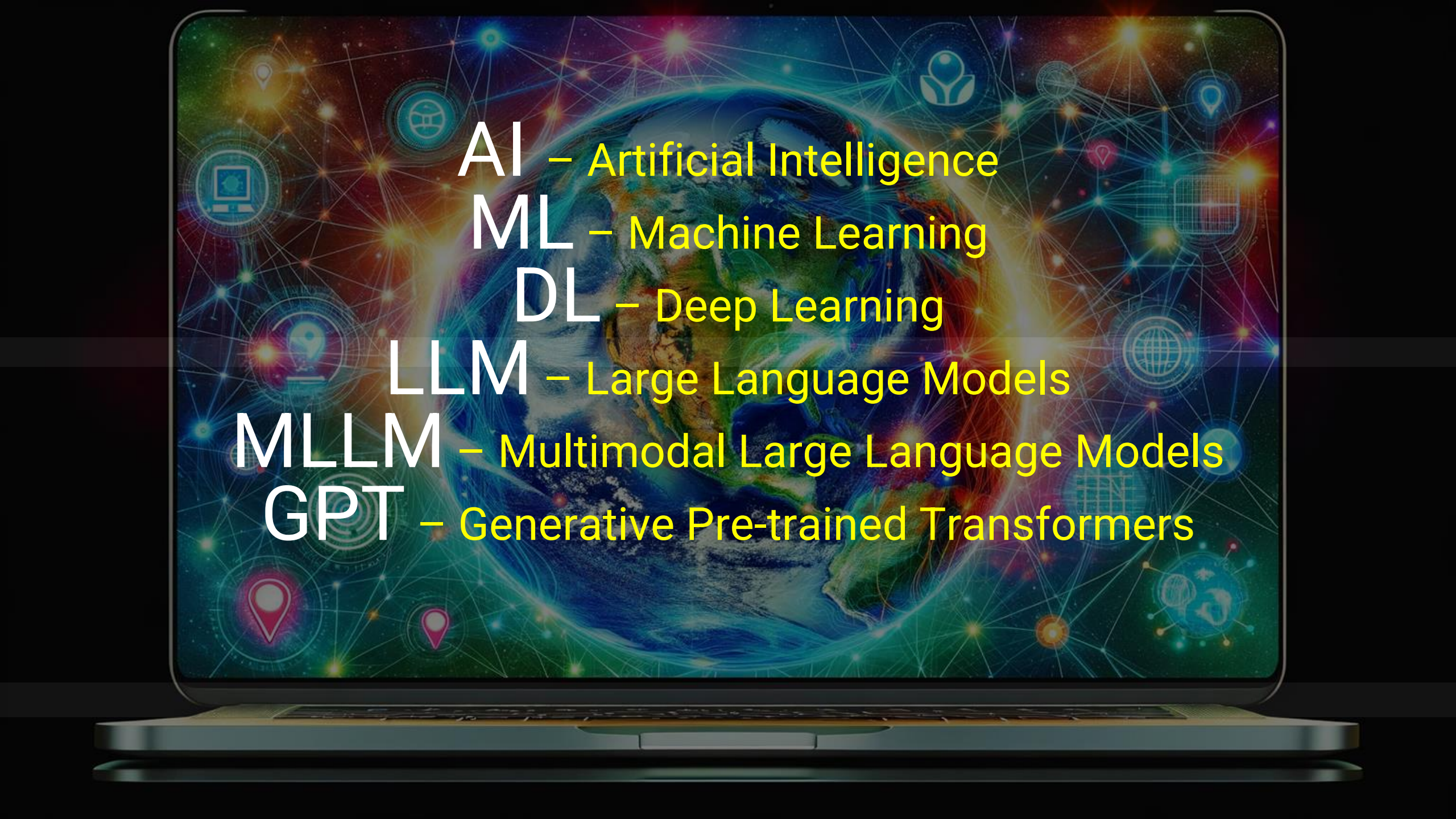
The image shows a composite of three screenshots. The top right is a screenshot of the Esri Living Atlas AI/ML/DL Models page, featuring a grid of model categories: Image feature extraction and detection, Pixel classification, Point cloud classification, Image reduction, and Object tracking. A large aerial image of a residential area is shown with a semi-transparent box over it titled 'Image feature extraction and detection', which lists features like buildings, vehicles, swimming pools, and solar panels. The bottom left is a screenshot of a GitHub profile for Qiusheng Wu, showing his profile picture, name, bio as an Associate Professor at the University of Tennessee, and a list of open-source projects including Linux, R, Python, and Google Earth Engine packages. The bottom right is a screenshot of a 3D visualization of a point cloud, showing a dense green forest canopy with a dark path or stream cutting through it.

AI/ML

- GeoAI
- Land Cover Mapping
(Hamilton Co Example)
- Generative AI
(ChatGPT and more)



<https://futuristgerd.com/>

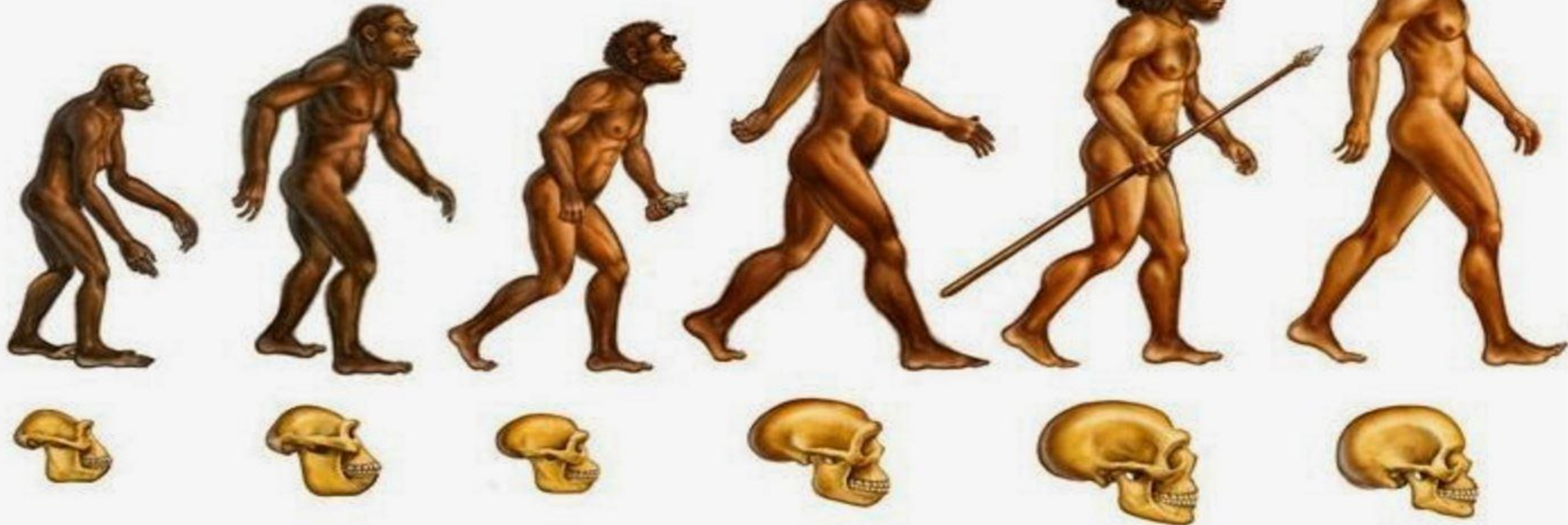


AI – Artificial Intelligence
ML – Machine Learning
DL – Deep Learning
LLM – Large Language Models
MLLM – Multimodal Large Language Models
GPT – Generative Pre-trained Transformers

The Evolution of AI in Geospatial (**GeoAI**)



We Are Here



Case Studies: Evolution of **GeoAI**

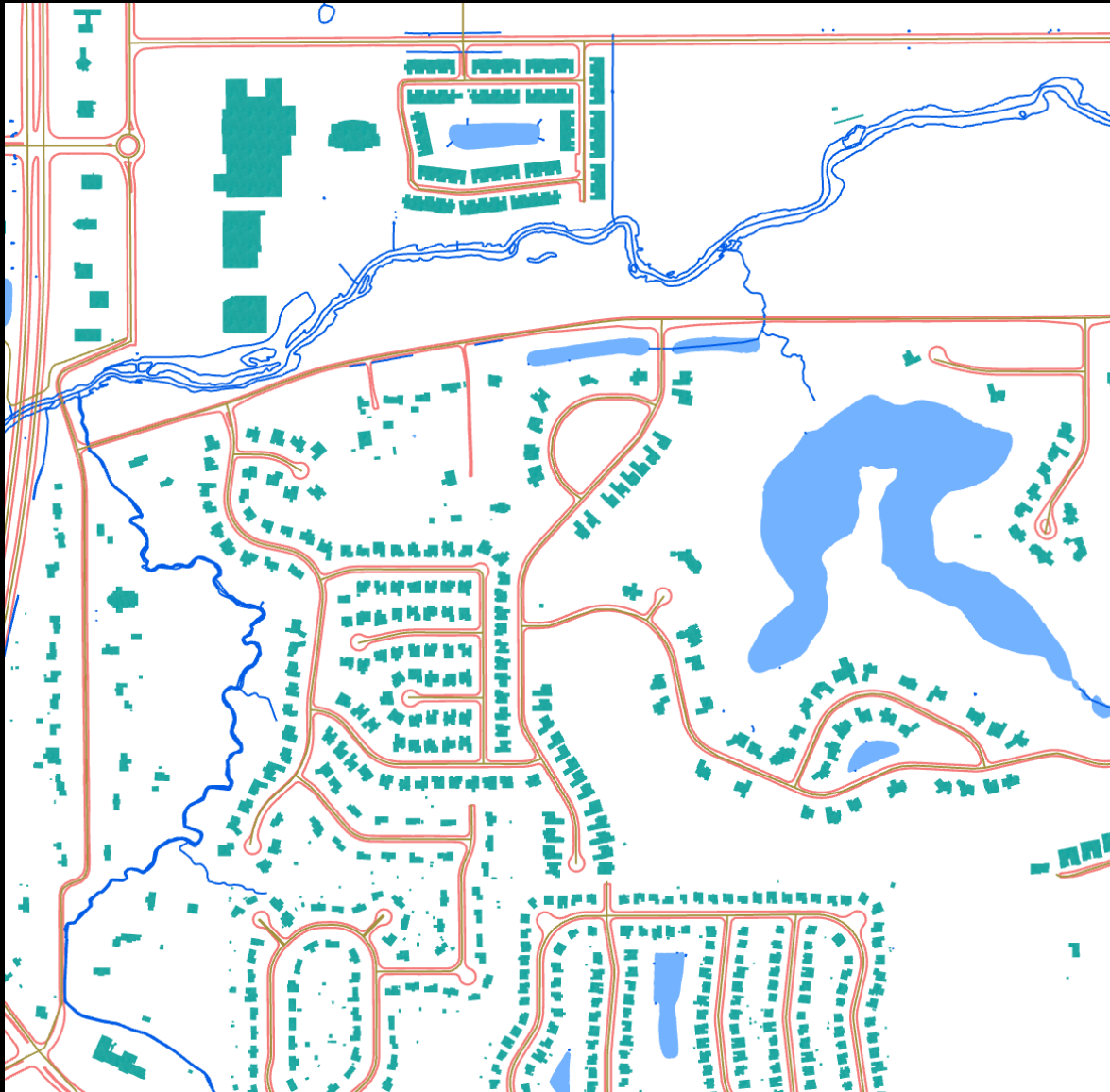
- **Digital Photogrammetry** – Aerotriangulation, Auto-Correlation, Imagery Analysis, etc...
- **AI/ML** - Land Cover Mapping versus Manual Digital Photogrammetry Planimetric Mapping
- **ChatGPT** – LLM & MLLM Case Studies

Digital Photogrammetry – Aerotriangulation, Auto-Correlation, Imagery Analysis, etc...

- AI is already entrenched into digital photogrammetry - Computer Vision and Pattern Recognition techniques supported by AI Machine Learning and Deep Learning training
- While some components of the photogrammetric data processing pipeline already work automatically,
- there is still substantial manual involvement required to obtain reliable, high-quality, and cost-effective results.

Microsoft Planetary Computer – PEARL (AI/ML)

<https://www.landcover.io/>



AI/ML

- GeoAI
- **Land Cover Mapping**
(Hamilton Co Example)
- Generative AI
(ChatGPT and more)



Hamilton County, IN

2024 Ortho, Lidar, and Basemap Update Project

Press Release [[LINK](#)]

Tech. Article [[LINK](#)]

Mapping a Brighter Future: Hamilton County's 2024 GIS Revolution



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2024 Orthophotography and Lidar Basemap Project

- Upgrade overall base mapping accuracy from 1"=100' scale to 1"=50' scale
- Acquisition of 3-inch pixel 4-band Orthoimagery
- Acquisition of 3DEP QL1 Lidar data
- Generate AI/ML-driven Planimetric 2D & 3D Land Cover Mapping from 3-inch orthos
- Generate 3D Elevation-Derived Hydrography from QL1 Lidar



Charting Hamilton County's Mapping Evolution

Analog Mapping

1996 – 2001 Film-based Aerial Photography with Planimetric and Topographic Photogrammetric Updates

Digital Mapping

2004 – Original Lidar Acquisition

2005 – Original 6" inch Orthos Acquired

2006 thru 2023 - Annual Digital Ortho collections with Quadrennial Photogrammetric Plan & Topo updates

2017 – 2024 - 3' inch Digital Orthoimagery (Buy-up)

GeoAI

2024 - Ortho-Lidar and Basemap Update Project



Hamilton County, IN

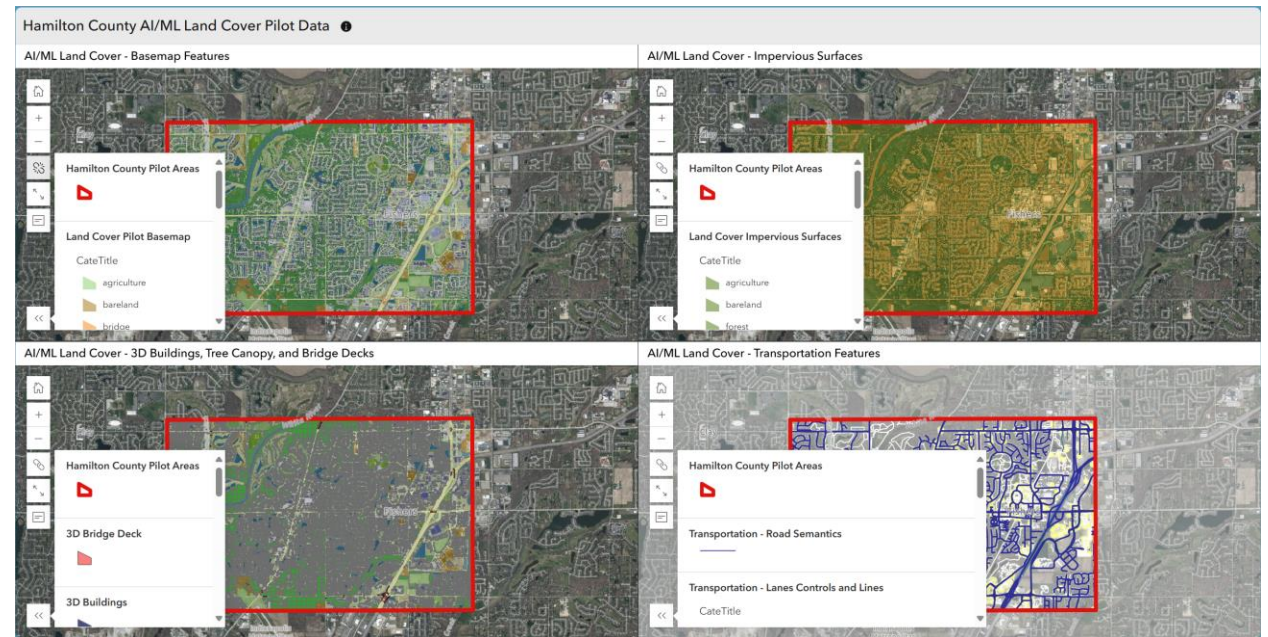
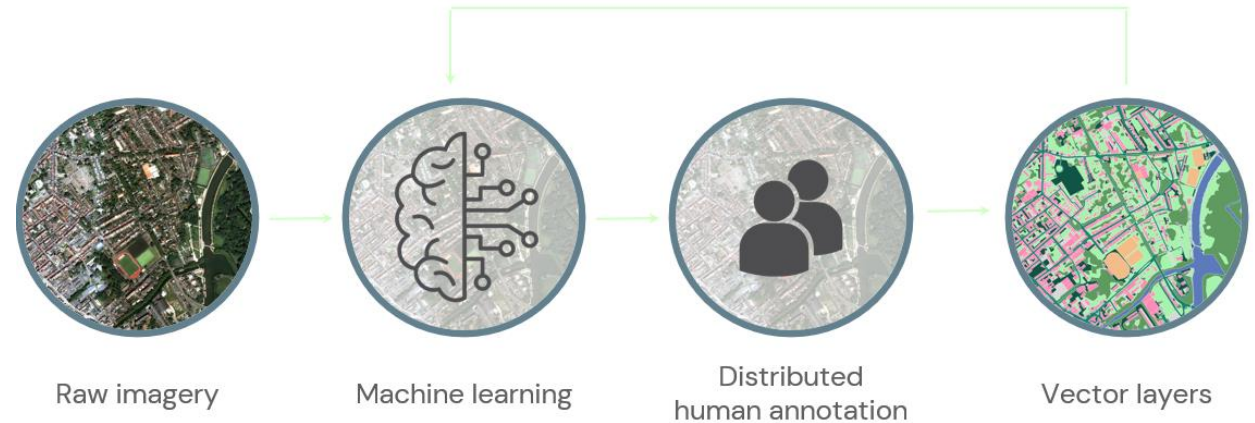
2024 Ortho, Lidar, and Basemap Update Project

Ecopia 2D & 3D

AI/ML Land Cover Mapping

Ecopia's core AI technology is the heart of this process

A distributed, highly scalable, accurate system

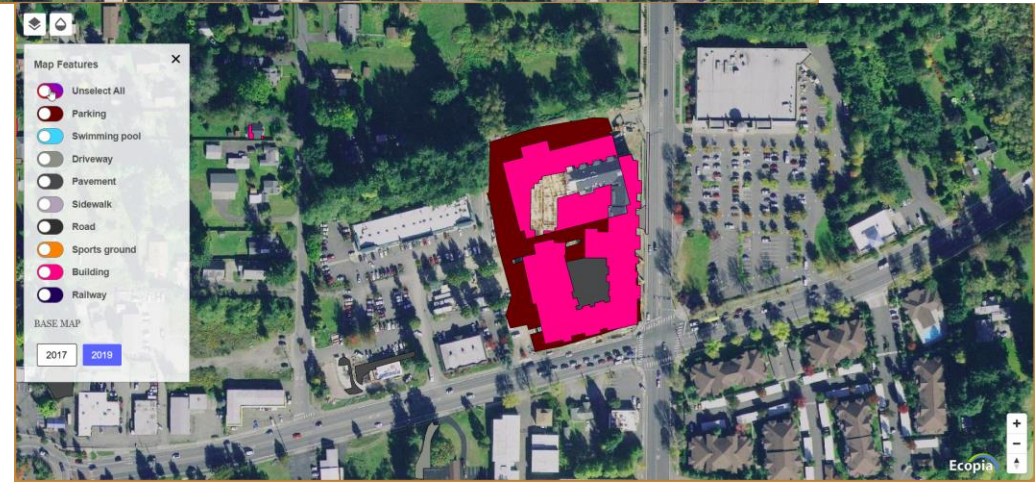
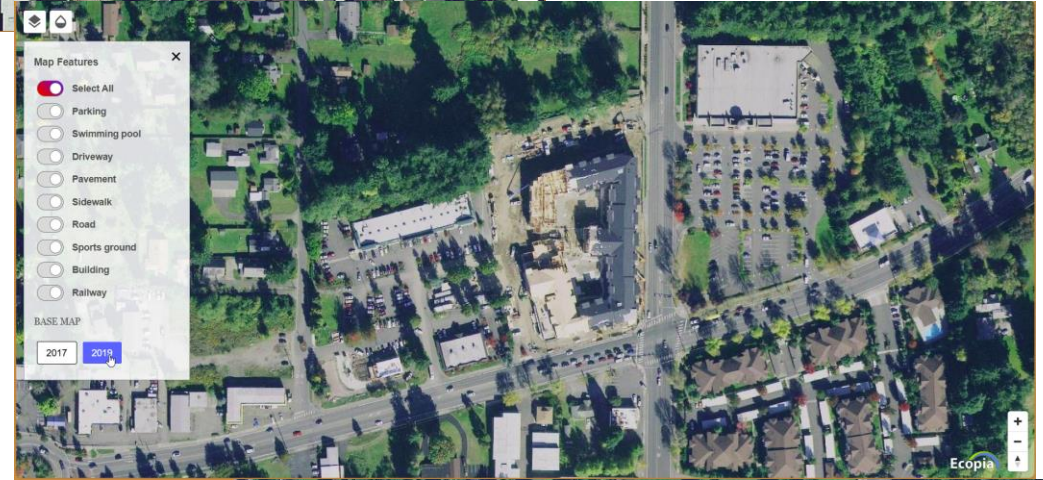


2D Land Cover Features Compare Application [LINK]

3D Scene App [LINK]

Hamilton County, IN

2024 2025 Ortho and Basemap Update Project



Ecopia 2D

AI/ML Land Cover Mapping
and Automated Change
Detection (2021 – 2024)

AI/ML

- GeoAI
- Land Cover Mapping (Hamilton Co Example)
- **Generative AI (ChatGPT and more)**

Esri
HELP, HUB, and More
[\[LINK\]](#)

Esri
DC Compass
[\[LINK\]](#)

NSGIC
3DHP FTN GPT Advisor
[\[LINK\]](#)

The image shows two screenshots. The top screenshot is from the 'esri Federal GIS CONFERENCE' and features a speaker on stage with the title 'ArcGIS and Generative AI Assistants'. The bottom screenshot is the 'Open Data DC' website, which has a navigation menu with items like 'Galleries', 'By the Numbers', and 'Foundational Data'. The main content area includes a search bar and four featured sections: 'Apps & Maps', 'Data Stories', 'Dashboards', and 'DC Compass'. Below this is the 'NSGIC 3D Hydrography Program For The Nation (3DHP FTN) Information Hub' with a search bar and a link to 'Ask Questions to NSGIC's new 3DHP For the Nation Custom GPT Expert Advisor BETA [HERE]'. The footer contains contact information for the NSGIC project.

OTHER?

Questions,
Comments,
and
Discussion

