

Integrating Spatial Educational Experiences (Isee): A new way to visualize soil survey information

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Background

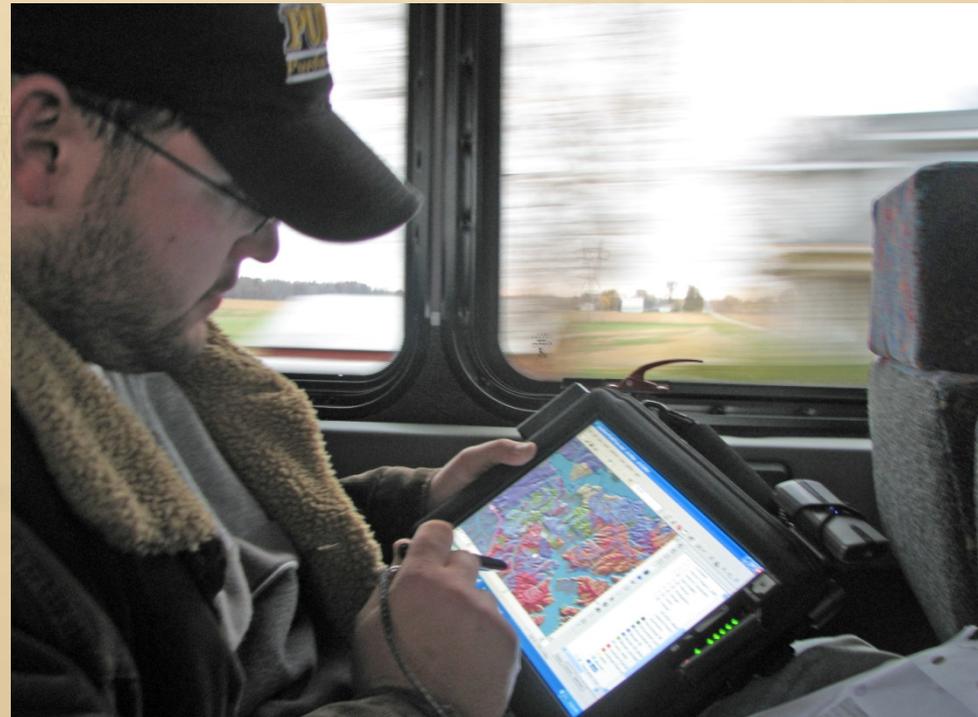
- Many concepts in our soil, crop, and environmental sciences courses are intrinsically spatial
 - soils vary spatially across landscapes
 - crops, cropping systems change with soils
 - environmental issues impact watersheds

Background

- National Research Council (2006)
 - *Learning to Think Spatially: GIS as a Support System in the K-12 Curriculum*
 - *Beyond Mapping: Meeting National Needs Through Enhanced Geographic Information Science*

Background

- Our students need geospatial skills
 - need to think spatially
 - conceptualize problems in their geospatial context
- Currently using mobile GIS to teach soil science in the field



Integrating Spatial Educational Experiences (Isee) into Crop, Soil, and Environmental Science Curricula

- **USDA – Higher Education Challenge Grant**
- **Goals - develop our students' ability:**
 - to use geospatial information to understand how and why soils and landscapes vary spatially at various scales
 - to understand how the spatial distribution of soils and landscapes impacts the distributions of crops, cropping systems, land use, and environmental and natural resource issues across Indiana

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- Tasks

- *Develop the Integrating Spatial Educational Experiences (Isee) Web Application*

- *Integrate Spatial Educational Experiences into our Curricula*

Primary Data Sets for Indiana

- Indiana 2005 Digital Elevation Model
 - Indiana Spatial Data Portal
 - 1.5 x 1.5 m, down-sampled to 5 x 5 m
 - hillshade & transparent color ramp
- SSURGO Soils
 - NRCS Soil Data Mart
 - detailed, 2nd order soil survey
 - covers almost all of agricultural areas of U.S.
 - soil parent material, loess thickness, drainage class
- Other maps
 - roads, towns, aerial photography, etc.

Soil Maps

- Dominant Soil Parent Material
 - based on soil series description
 - generally deepest material, or most unique material in profile
- Loess Depth
 - thickness of wind-blown silt
- Soil Drainage Class
 - presence of a seasonal high water table
- Additional thematic maps
 - to be developed

Software

- Google Earth API
 - Application Programming Interface
 - Web browser plugin
 - Fast, easy to navigate
 - Use Google imagery, roads, political boundaries, etc.
 - Use our own soils and interpretative layers



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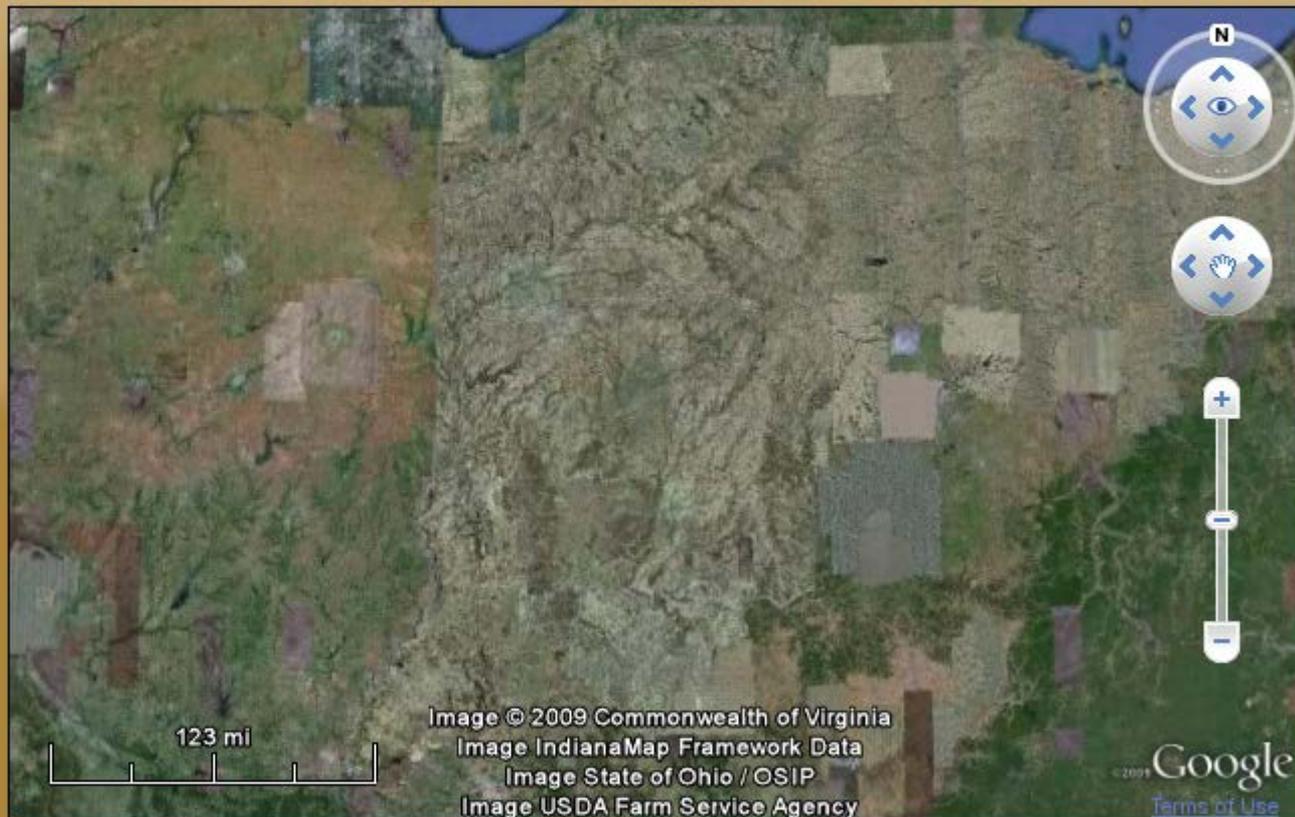
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Map Size



Overlays

Soil Materials



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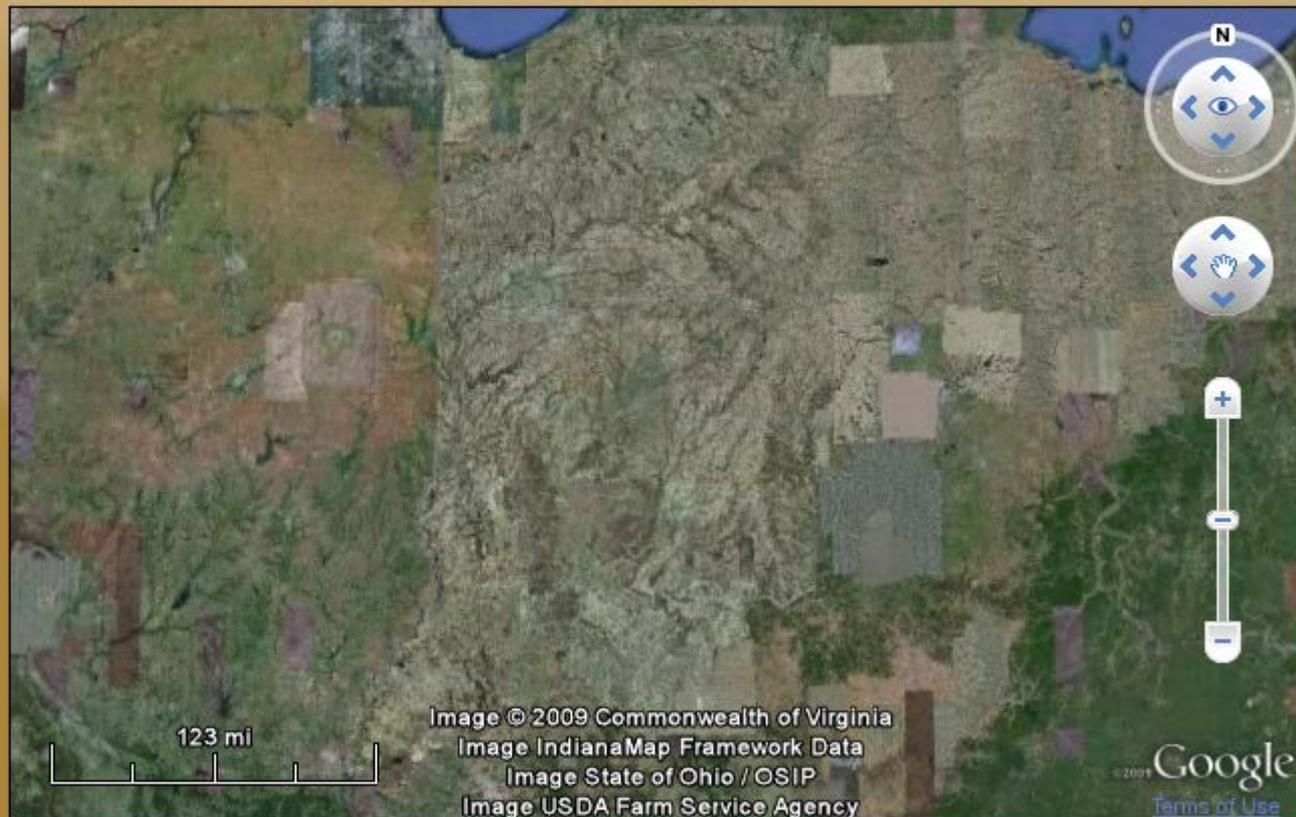
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Overlays

Soil Materials

- Elevation
- Dominant Soil Parent Material
- Hillshade
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- Water Holding Capacity*
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- Loess Depth*
- Soil Orders
- Erodability*
- Prime Farmland*
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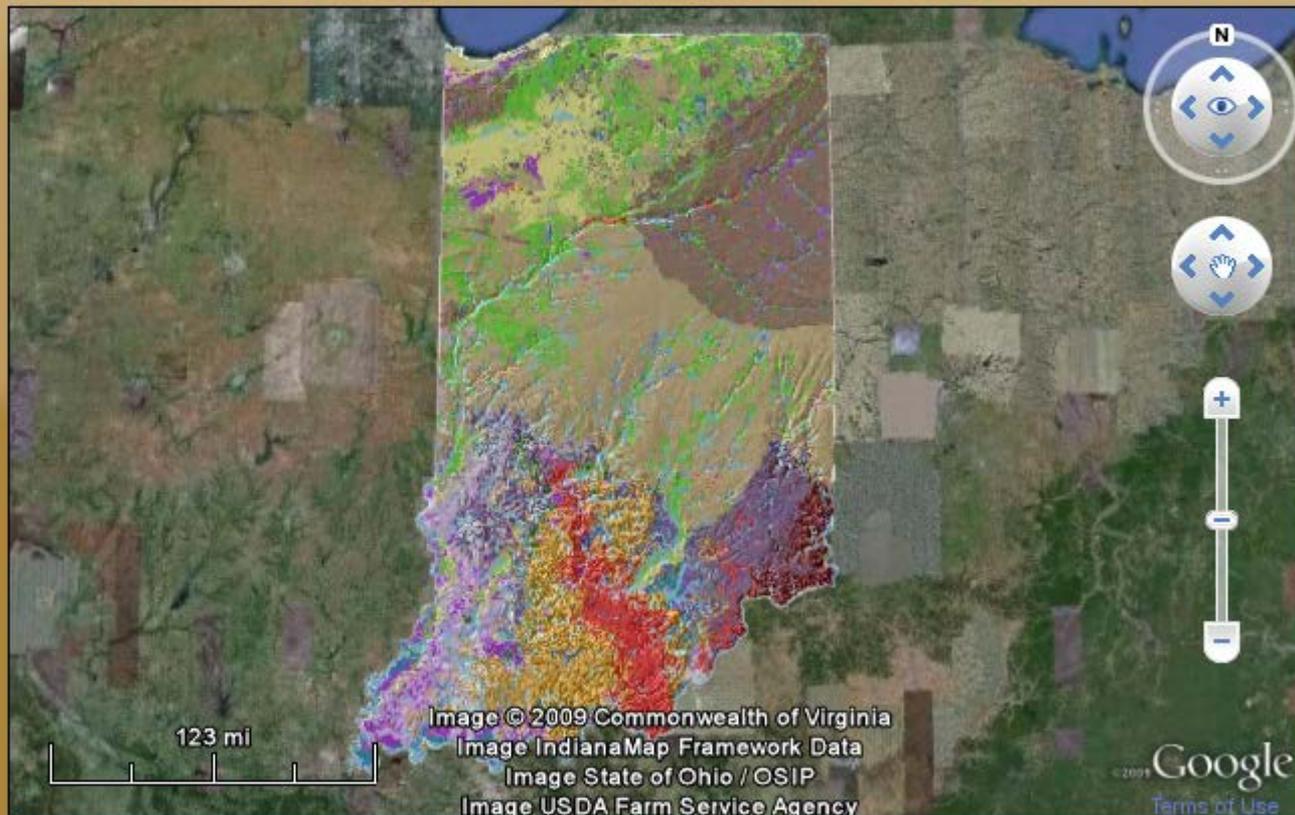
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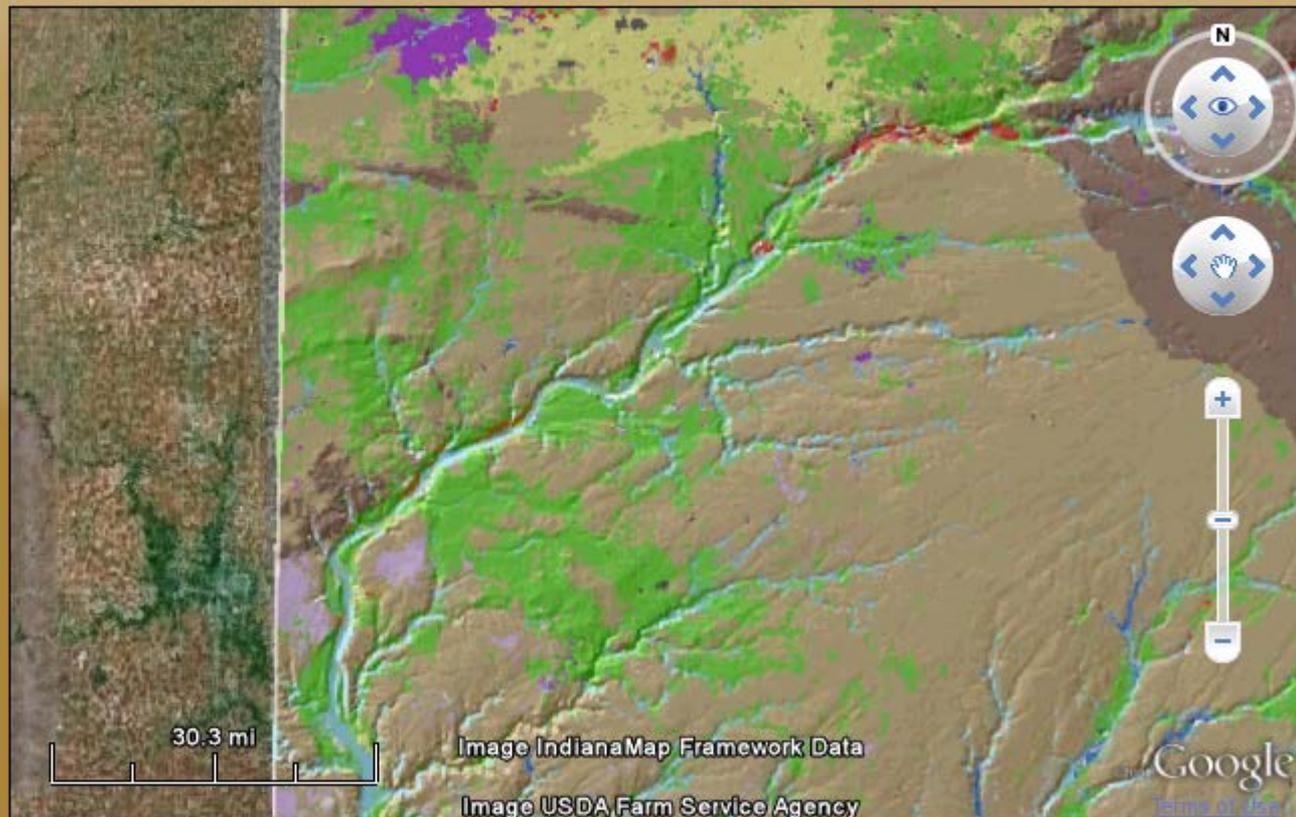
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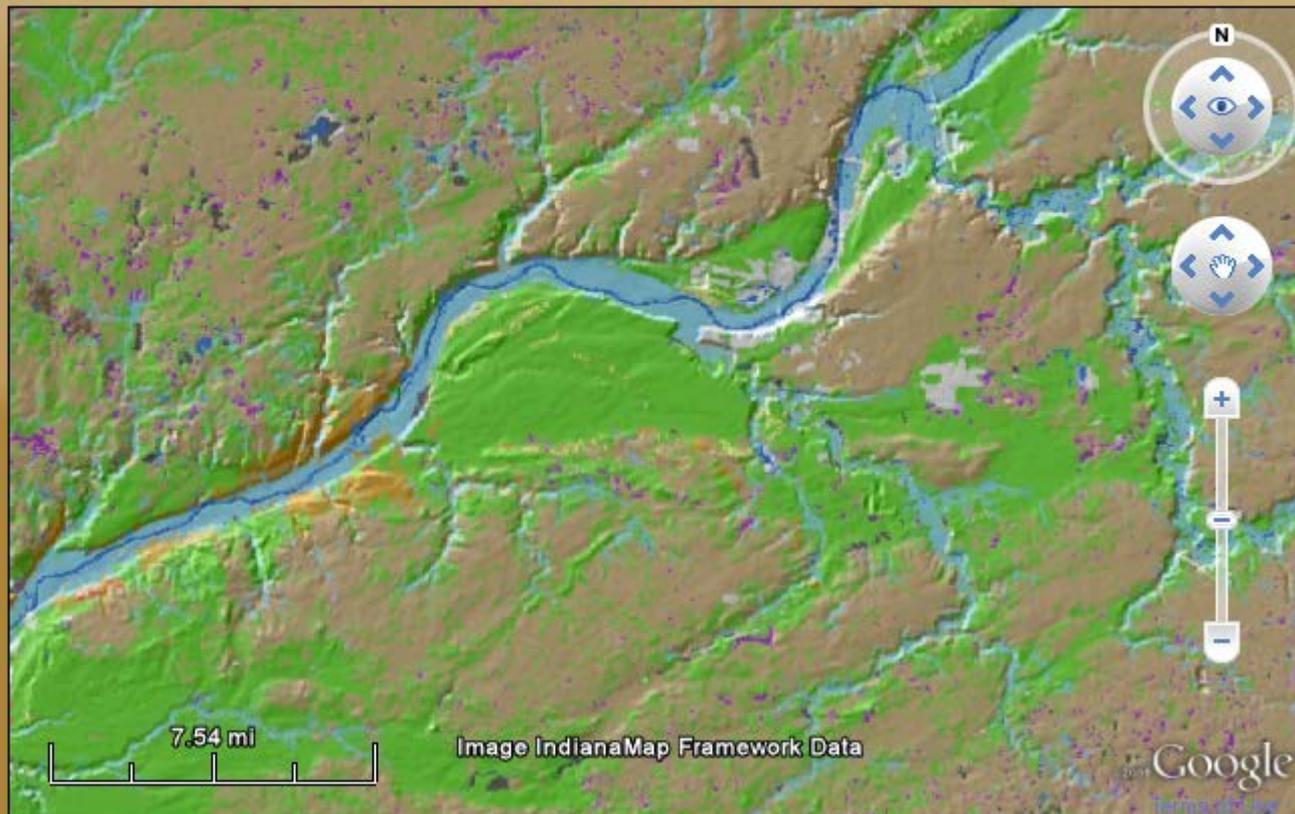


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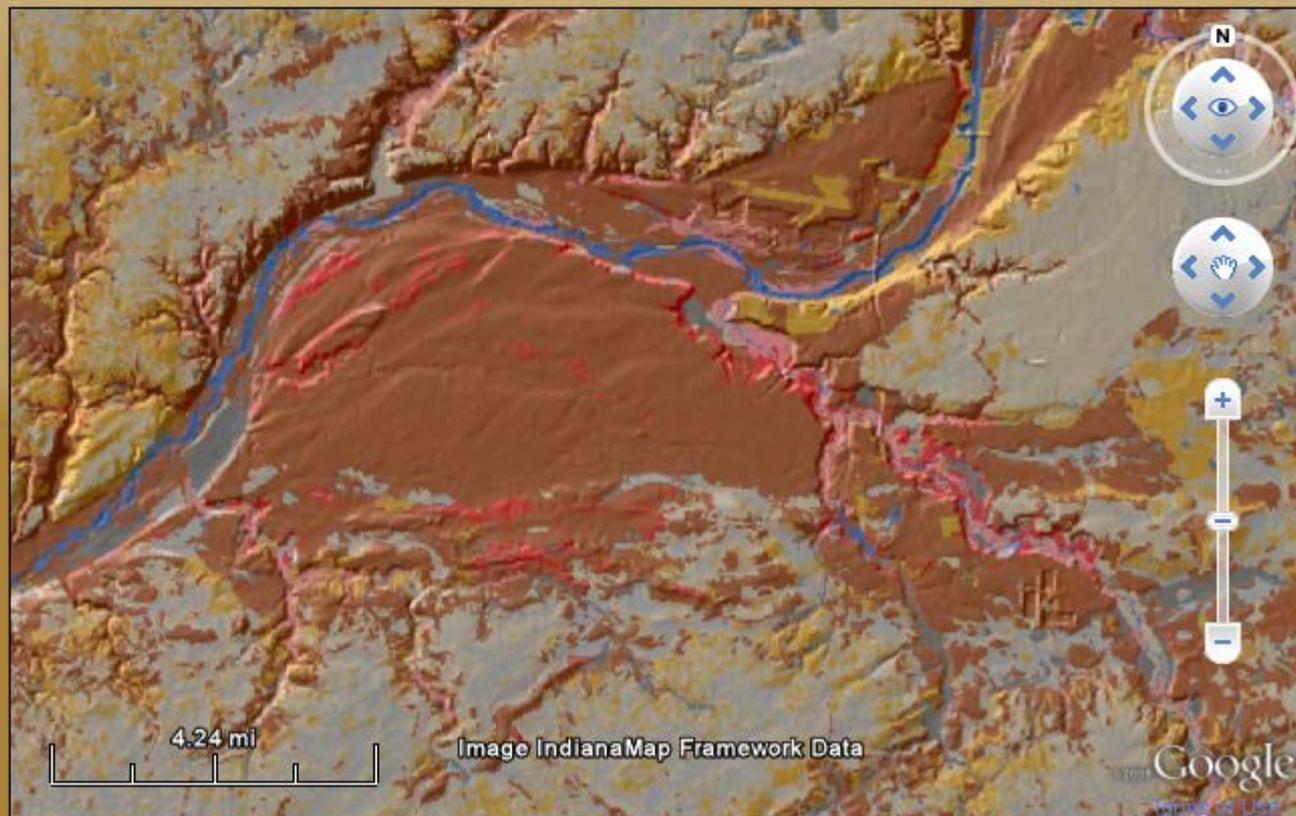
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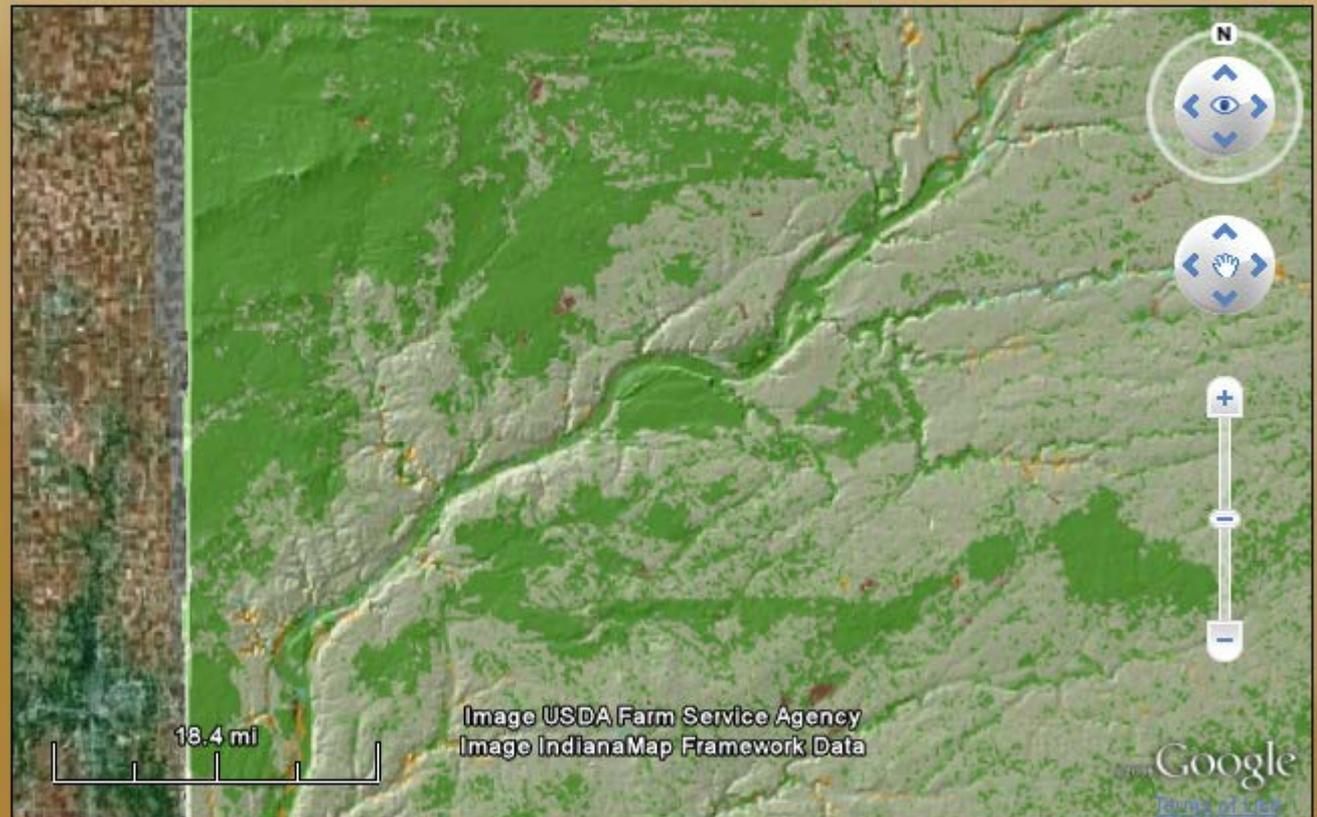
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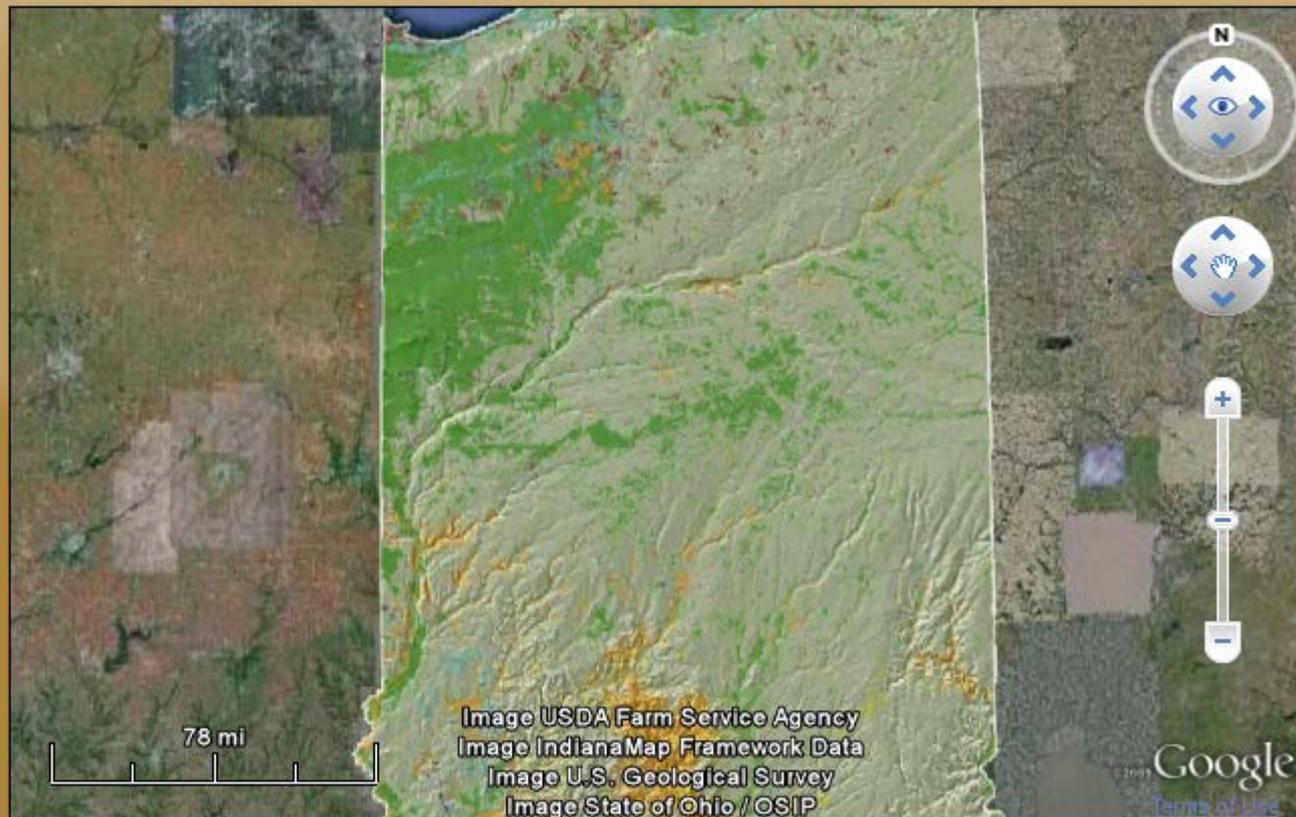
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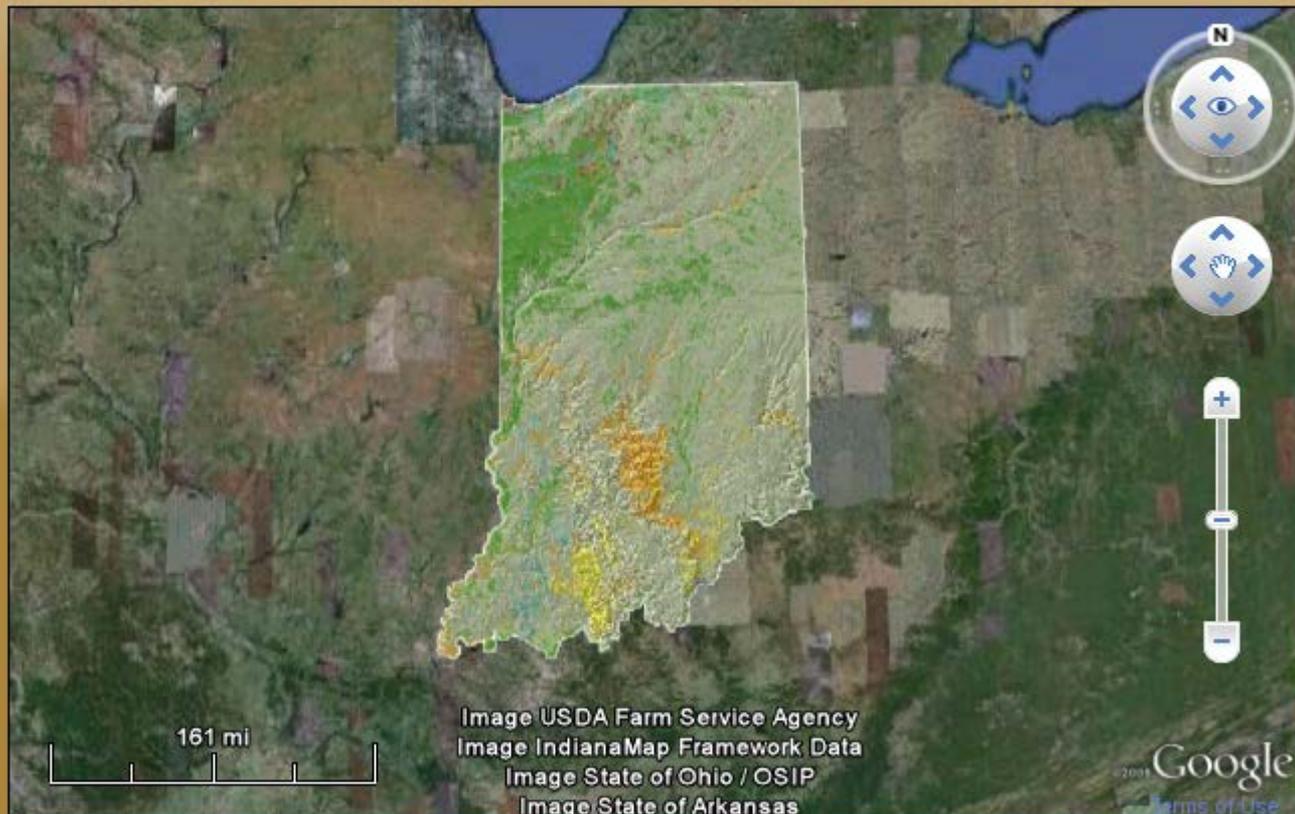


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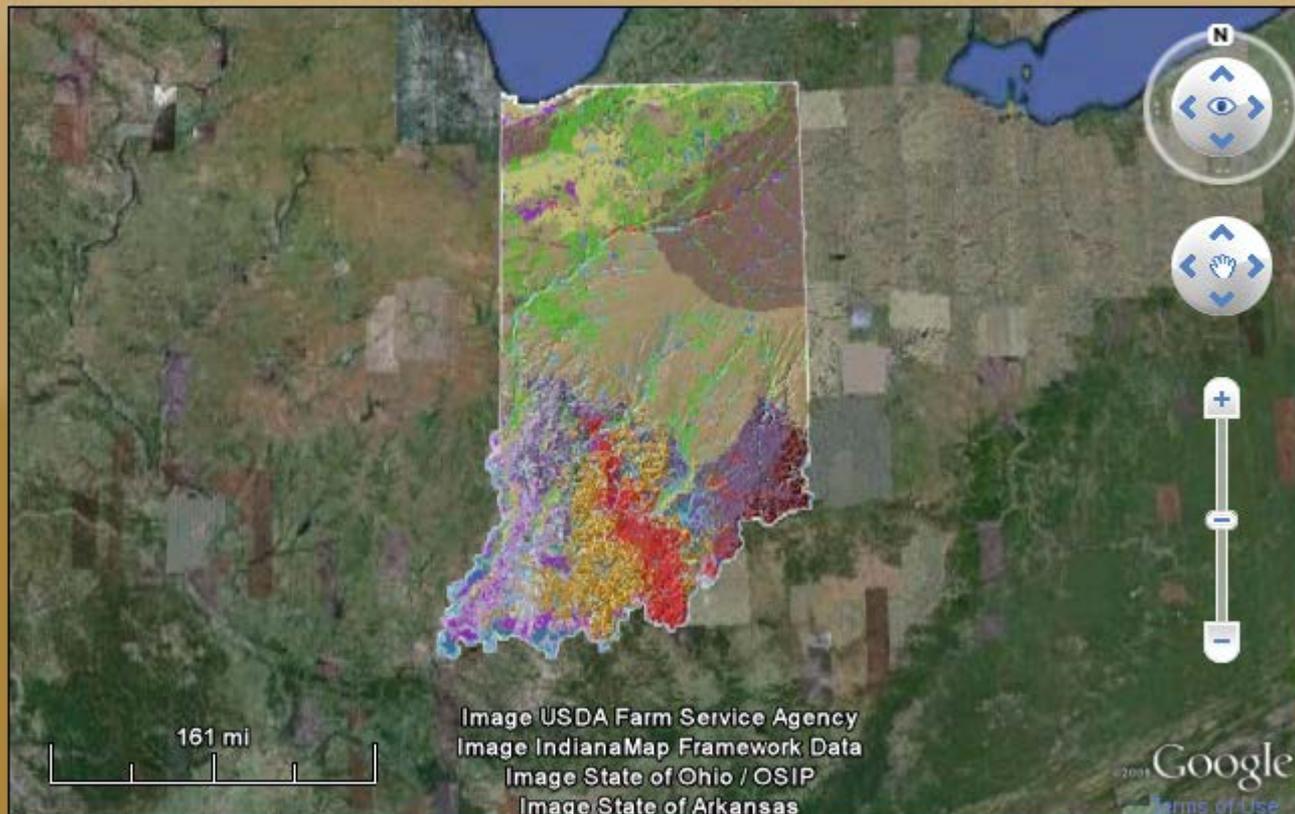


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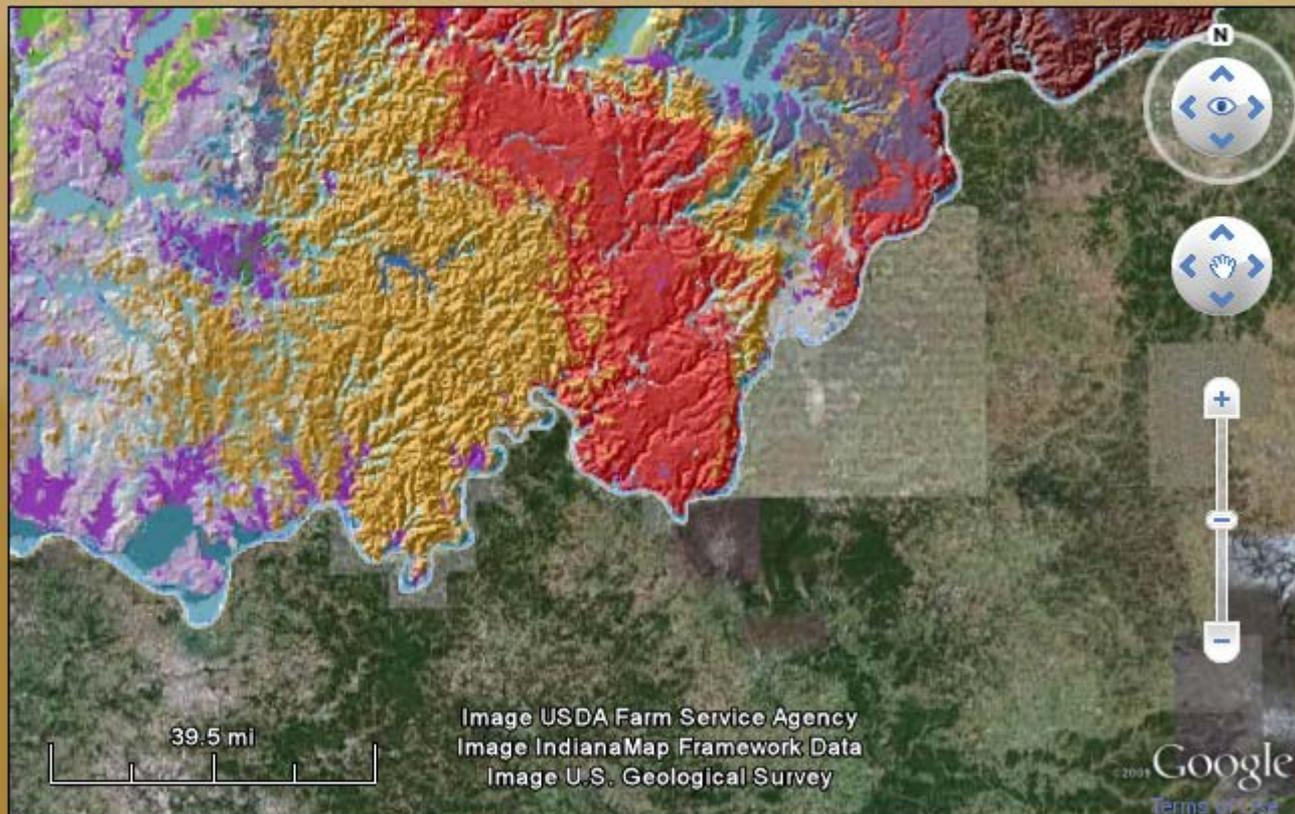


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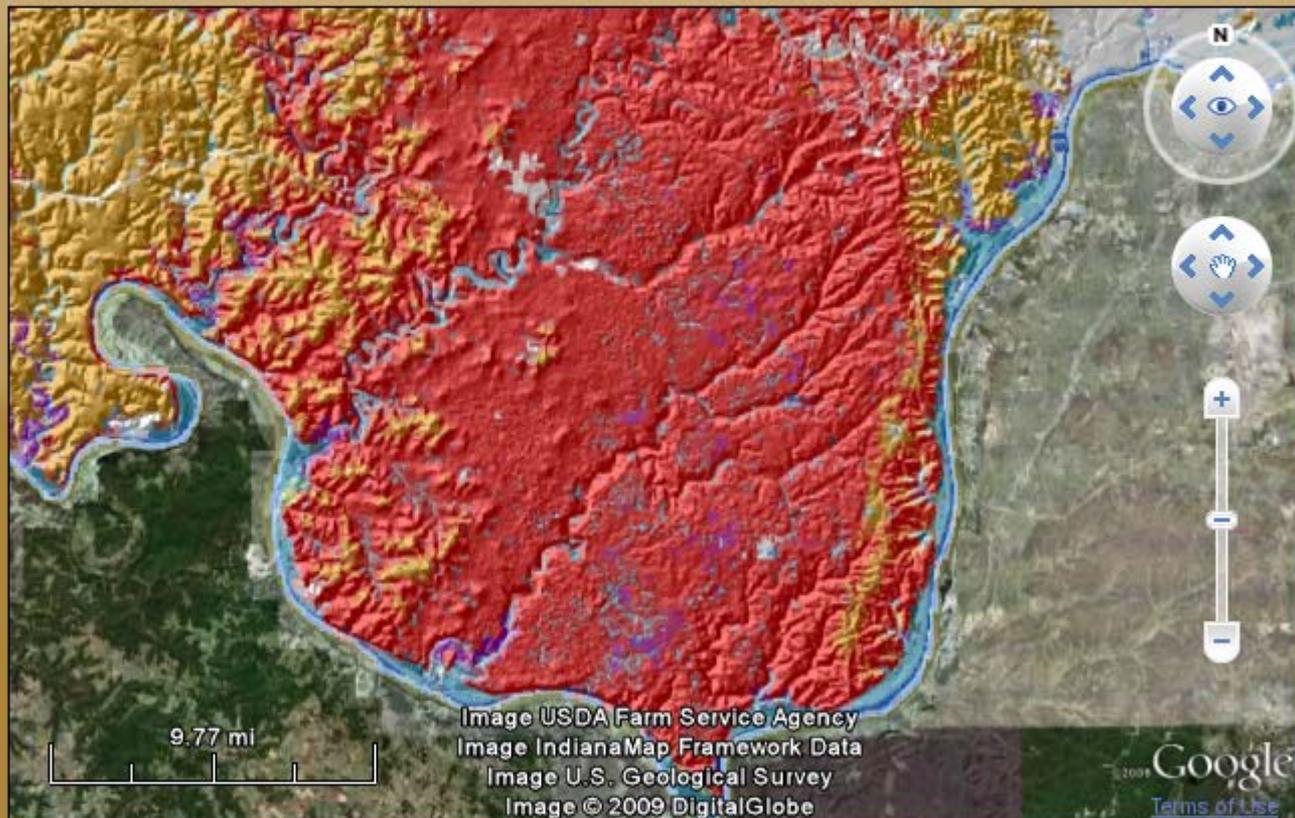
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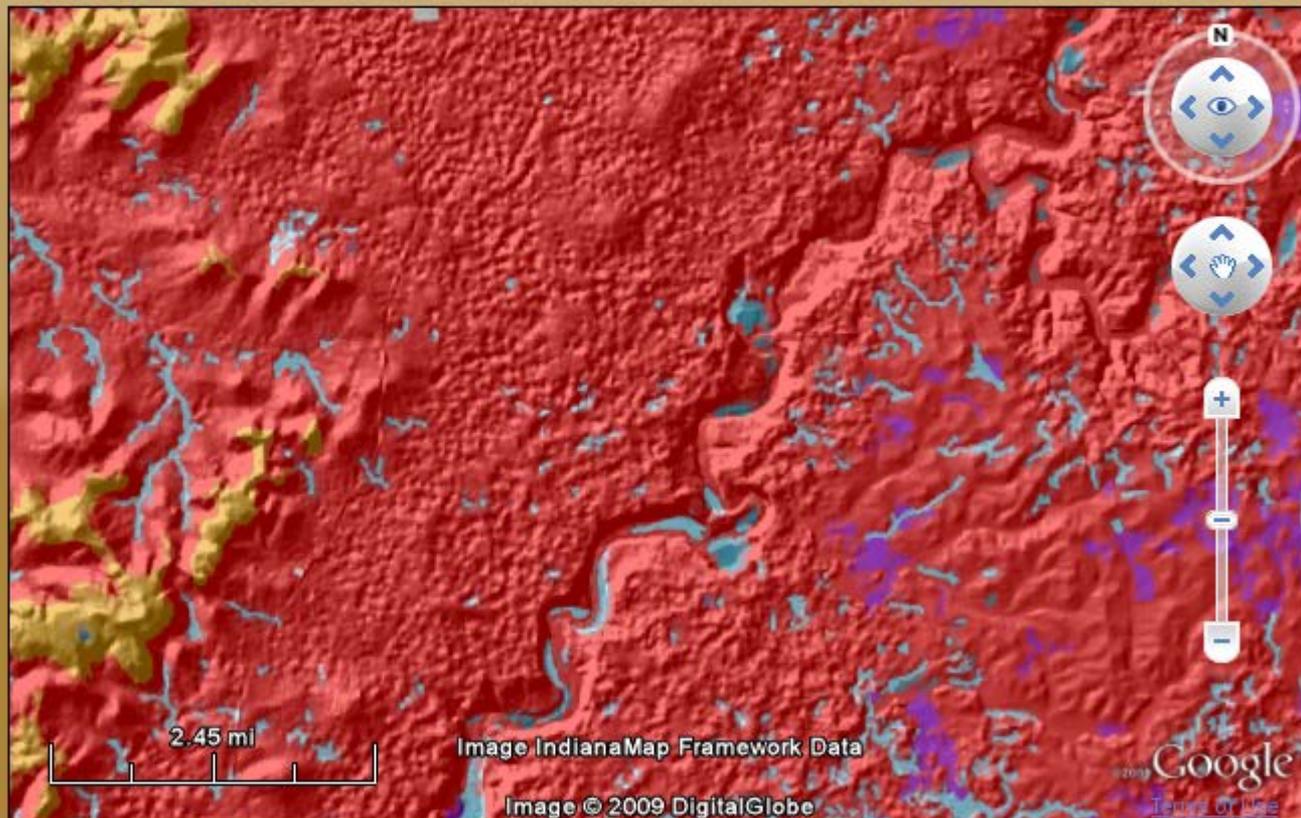


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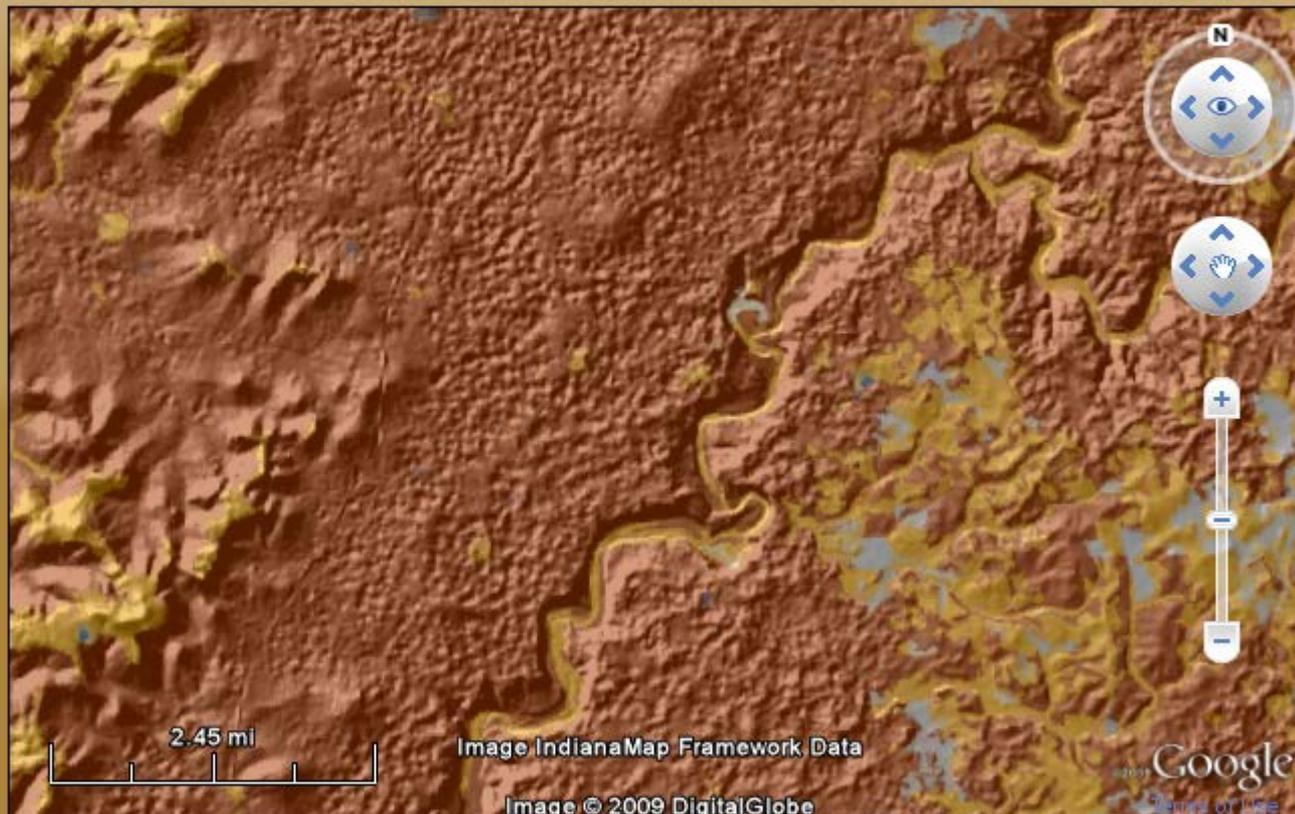
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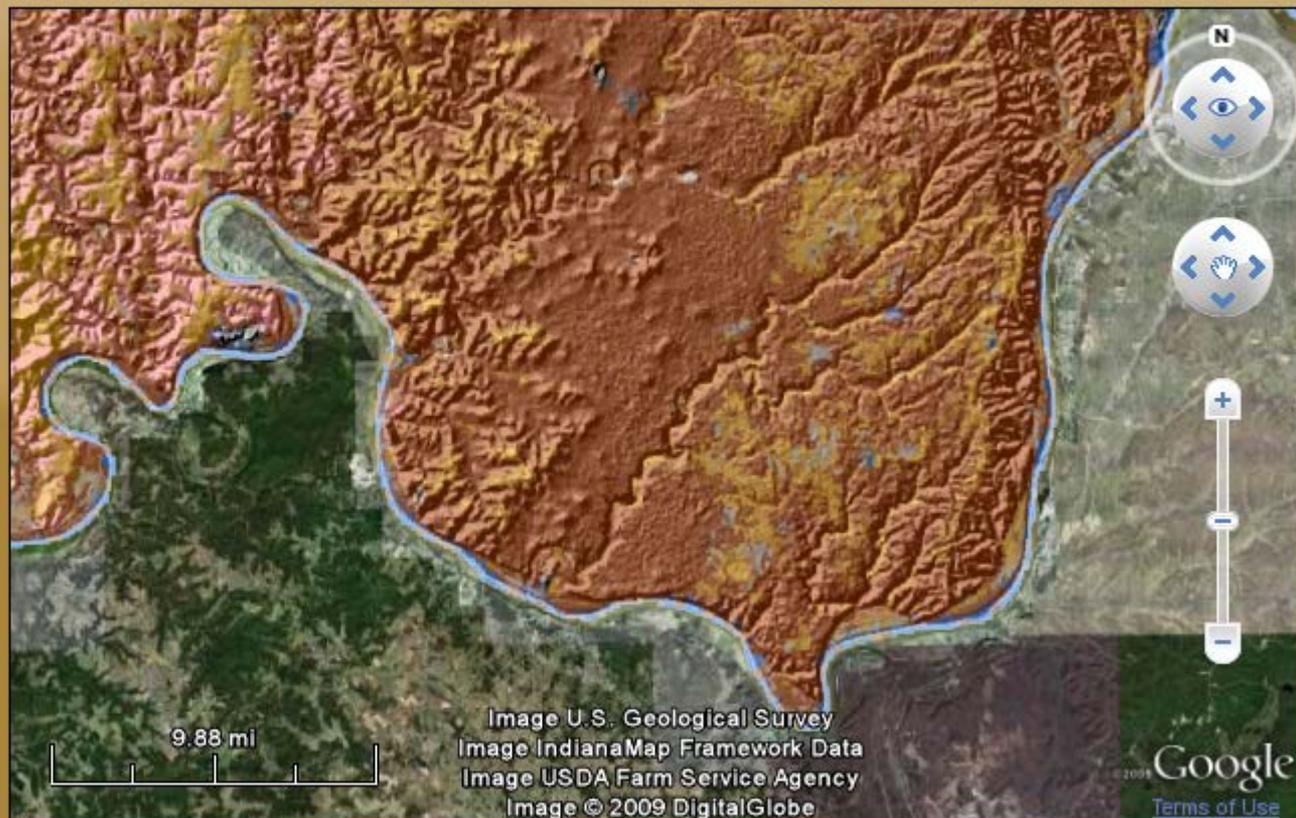
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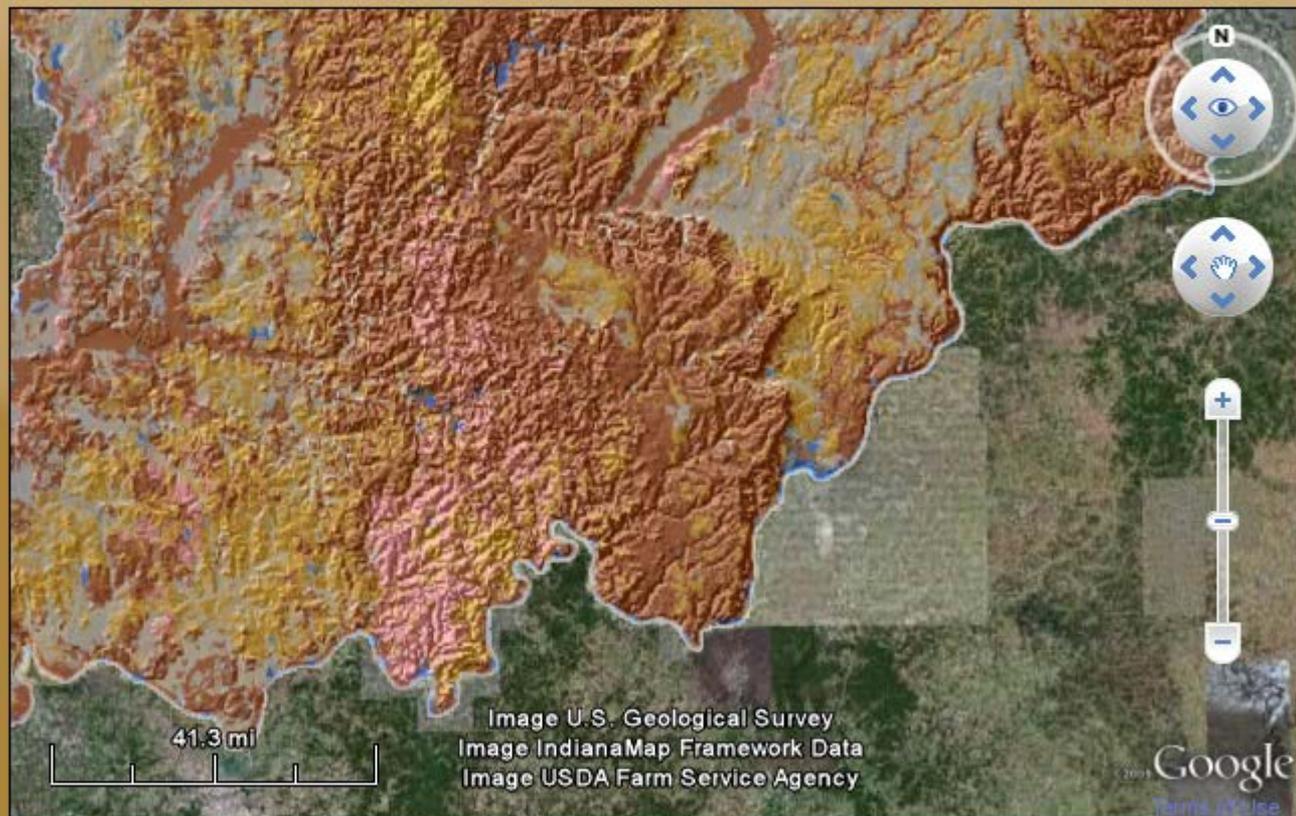
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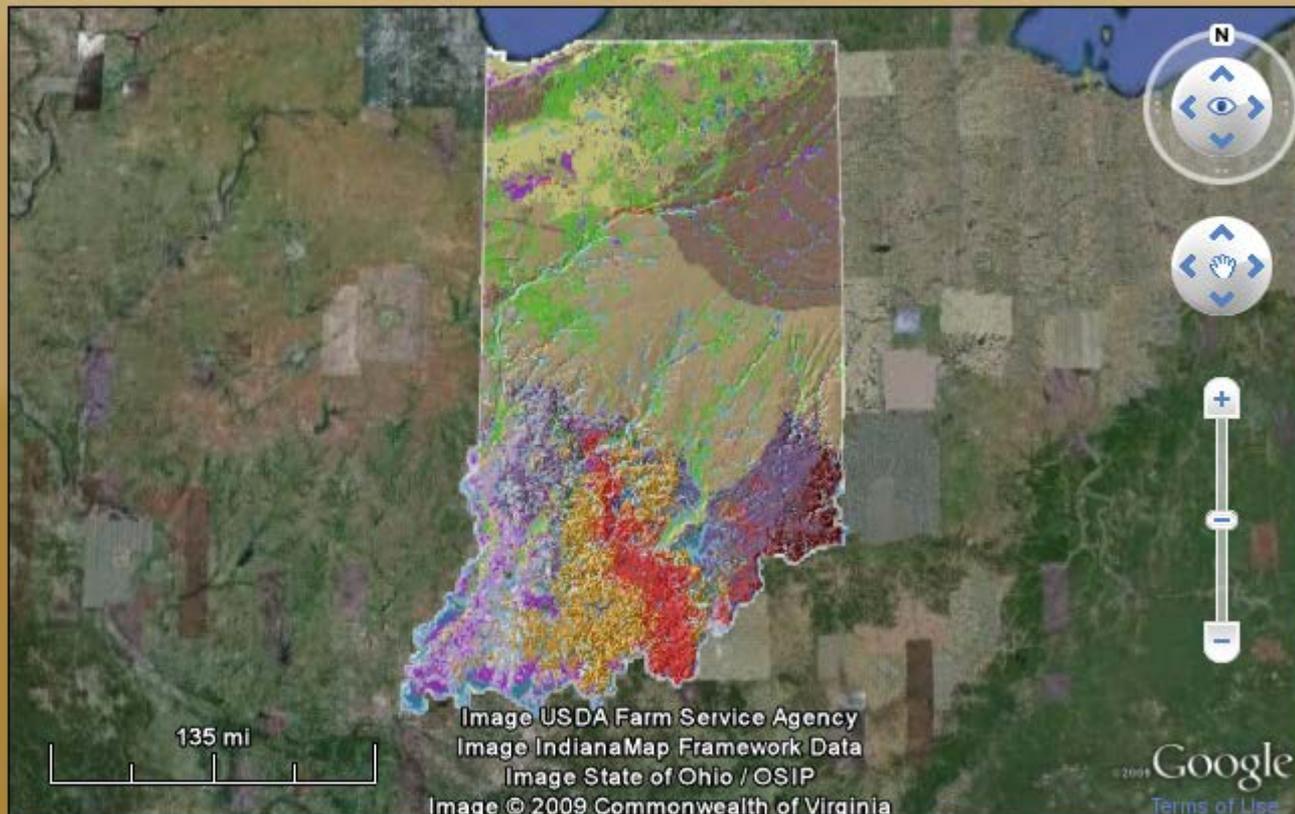
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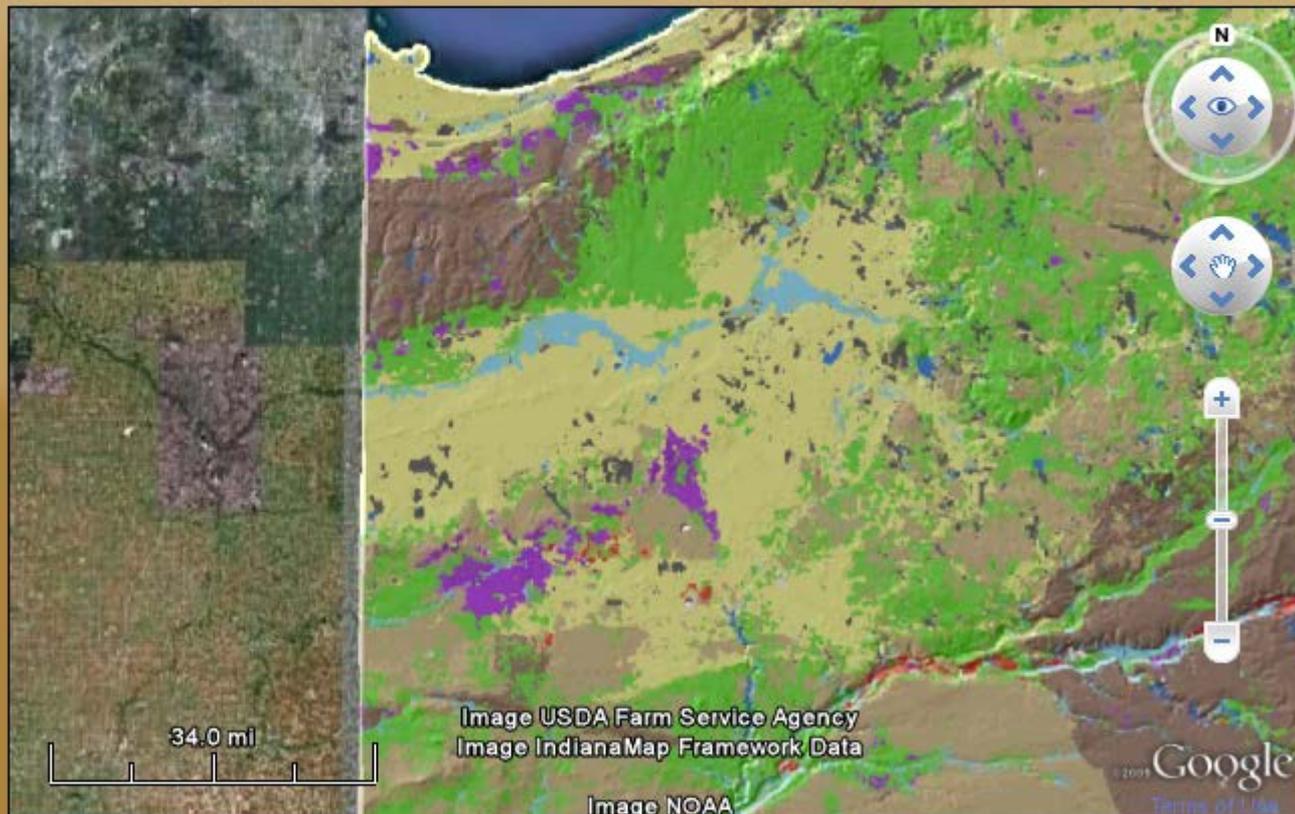


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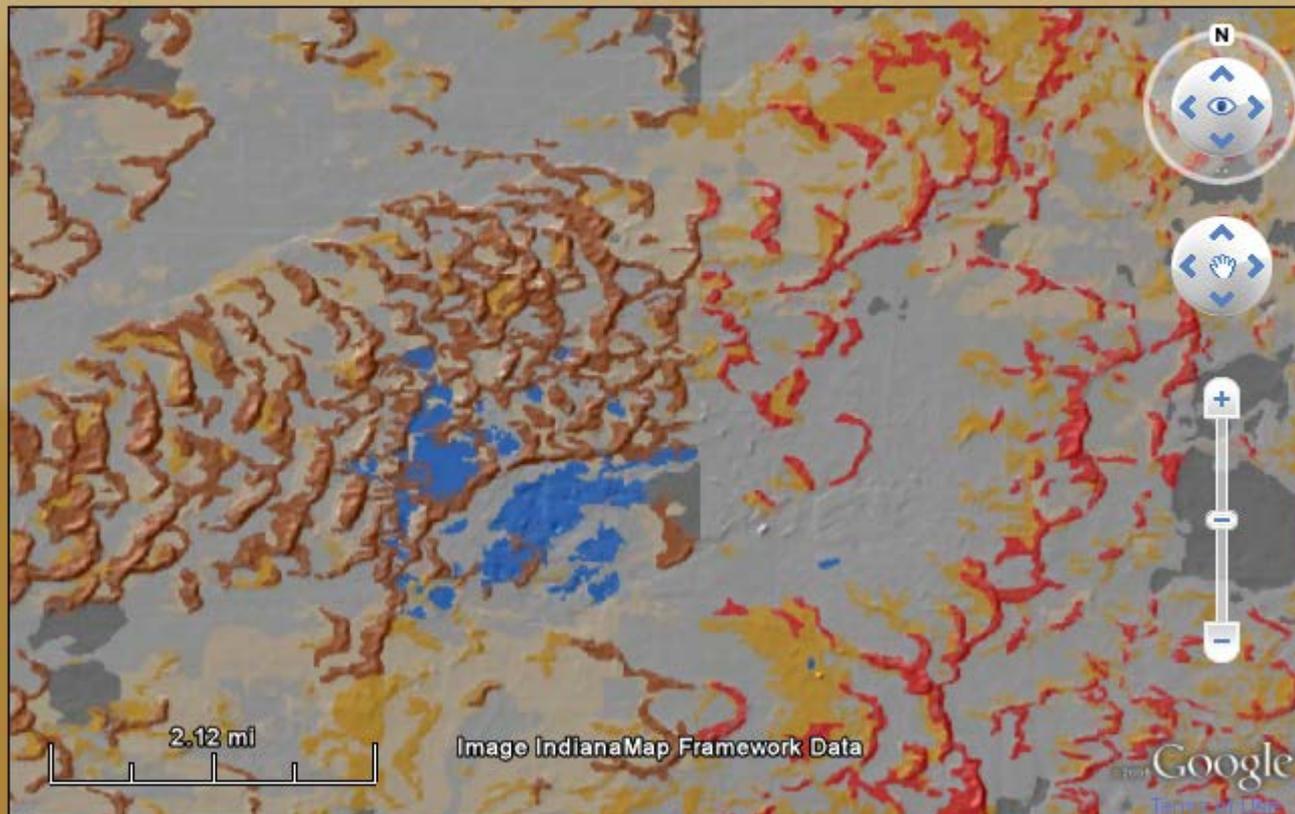
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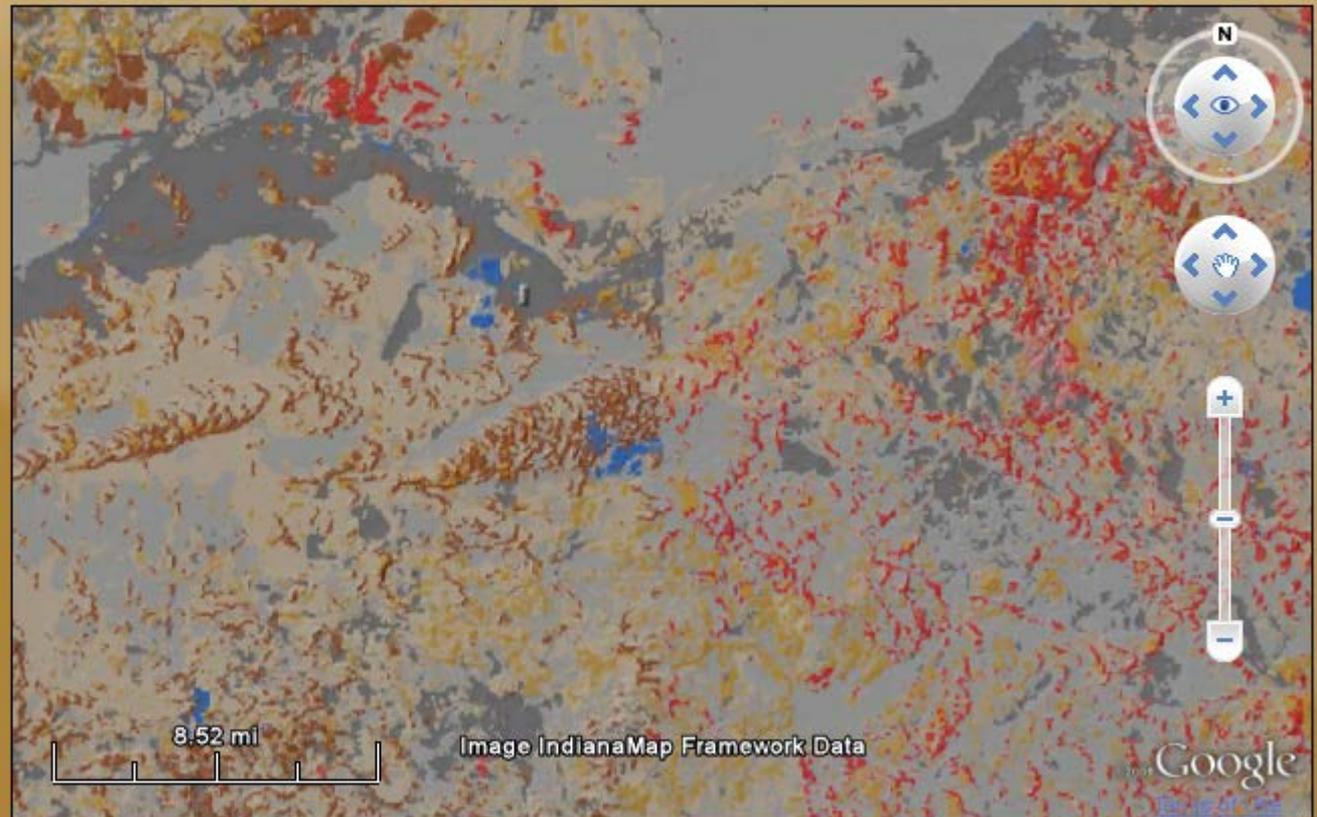
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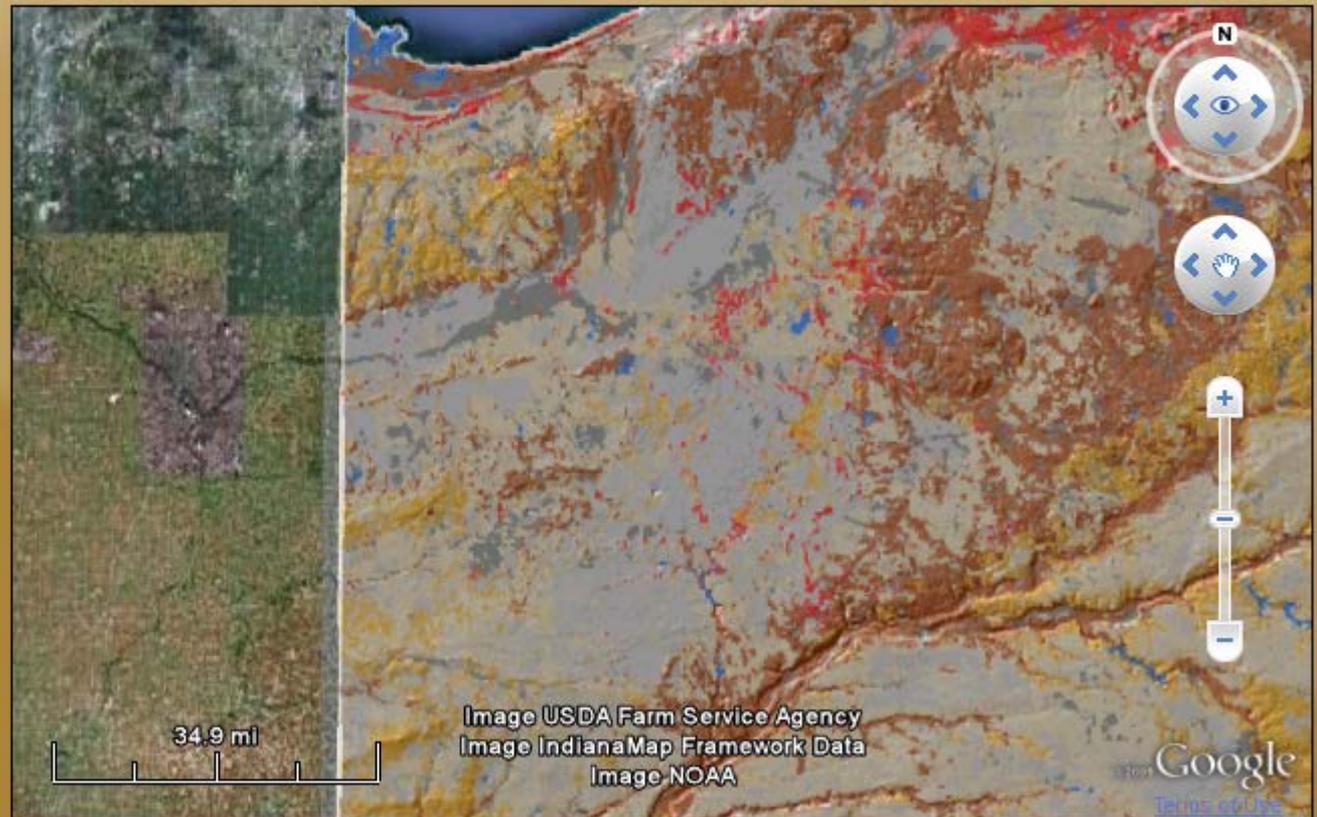
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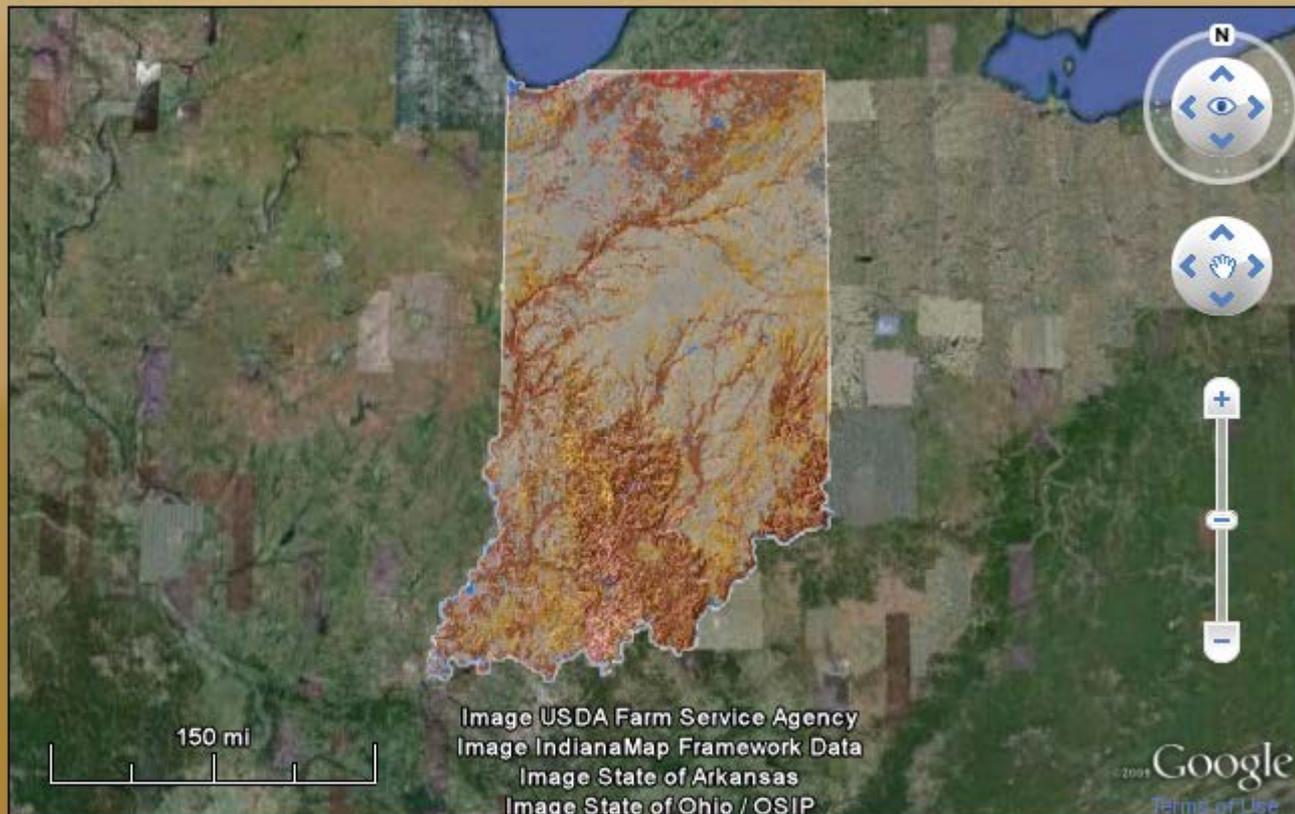
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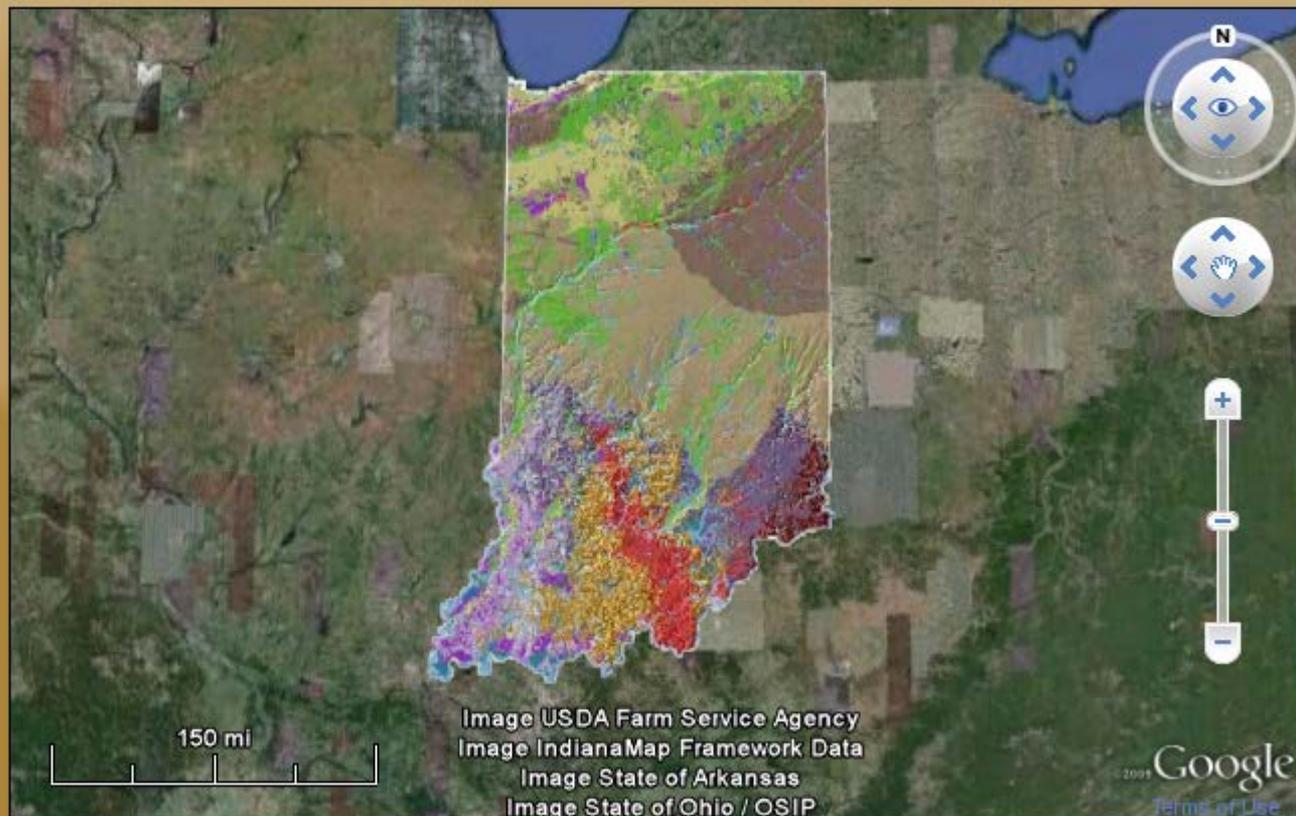


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Soil Materials

- Elevation
- Dominant Soil Parent Material

- Hillshade
- Presettlement Vegetation*
- Water Holding Capacity*
- Natural Soil Drainage Class
- Slope*
- Fragipans*
- Land Use*
- Natural Regions*
- Loess Depth*
- Soil Orders
- Erodability*
- Prime Farmland*
- None



The footer content & credits etc...

* These items are currently under development and will be available in the future.

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Digital Delivery of Soil Information

- Soil survey information can be viewed in many ways to many audiences
- There is a need to develop new inexpensive, fast and easy delivery options

“... a bird’s eye view
with x-ray vision ...”

