

Something LiDARish This Way Comes

By Carl Shields

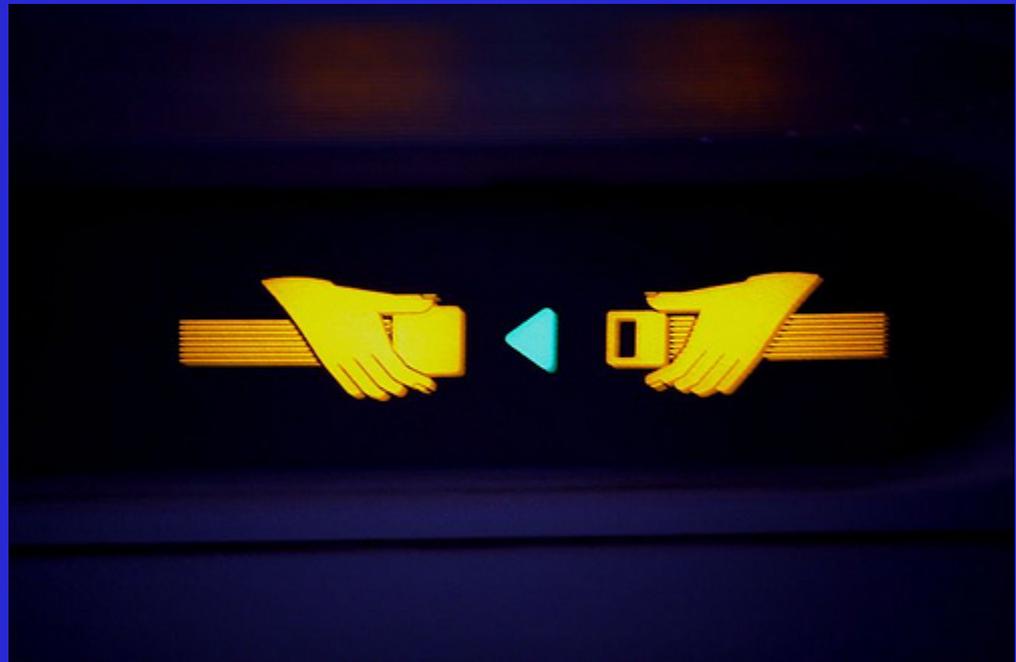
KYTC Division of Environmental
Analysis



No script...

a bazillion slides...

last presentation
of the day.



LiDAR



And ill-tempered sea bass.

LiDAR Technical Spec

- Supports ...
 - Transportation Phase I Design requirements.
 - *Also Phase II when supplemented with traditional survey.*
 - FEMA RiskMAP requirements
 - Local Gov't mapping requirements
- Nominal Pulse Spacing (NPS) no greater than 1 meter.
- Vertical Accuracy = 15 cm

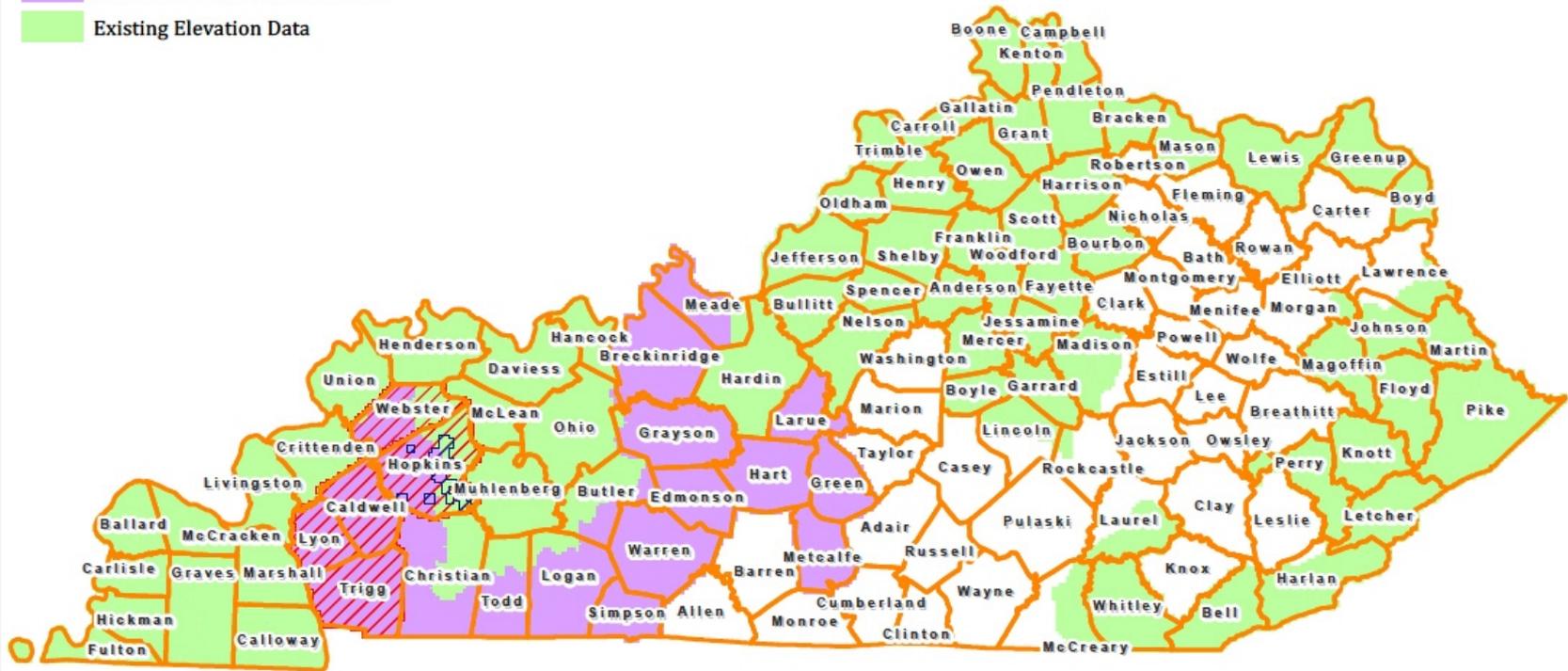
http://kygeonet.ky.gov/kyfromabove/pdfs/Specs_LiDAR_Production.pdf

Kentucky From Above

2014 Proposed Project Area



-  2014 Aerial Photography Data Collection - 12 Inch
-  2014 Aerial Photography Data Collection - 6 Inch Local Buy up
-  2014 Elevation Data Collection
-  Existing Elevation Data



MORE DATA IS COMING!!!

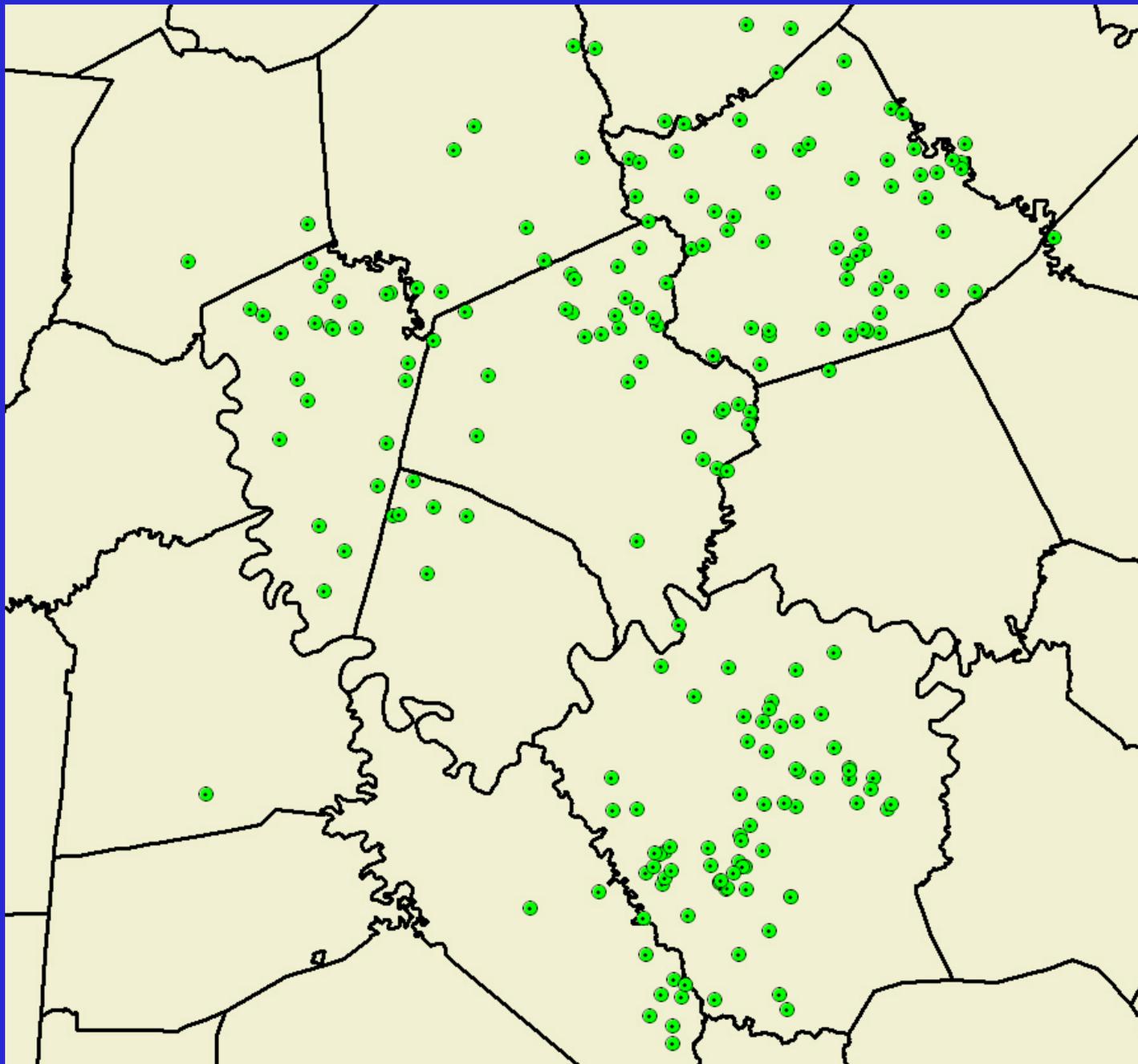
Photo Science has another 702 Square Miles to fly that they missed last year. This will fill everything in along the river up to and past (east of) Owensboro.

When that data goes online, over 50% coverage will have been achieved.

After the 2014 data collection, coverage will be nearly 70%.

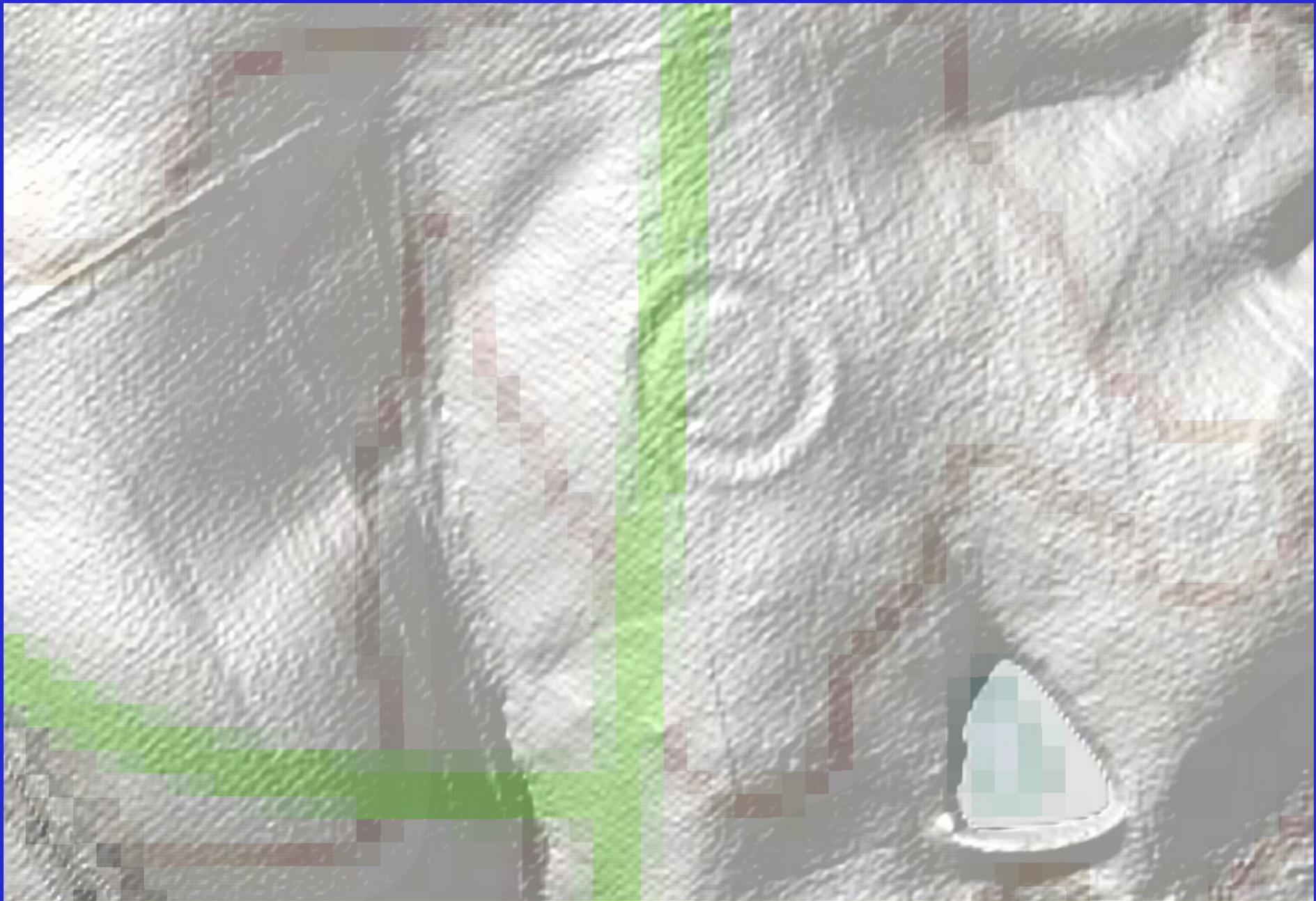
An update may come early this summer. This update will be transparent to users. They'll just note the expanded coverage out in Western Kentucky when they access the DEM service.

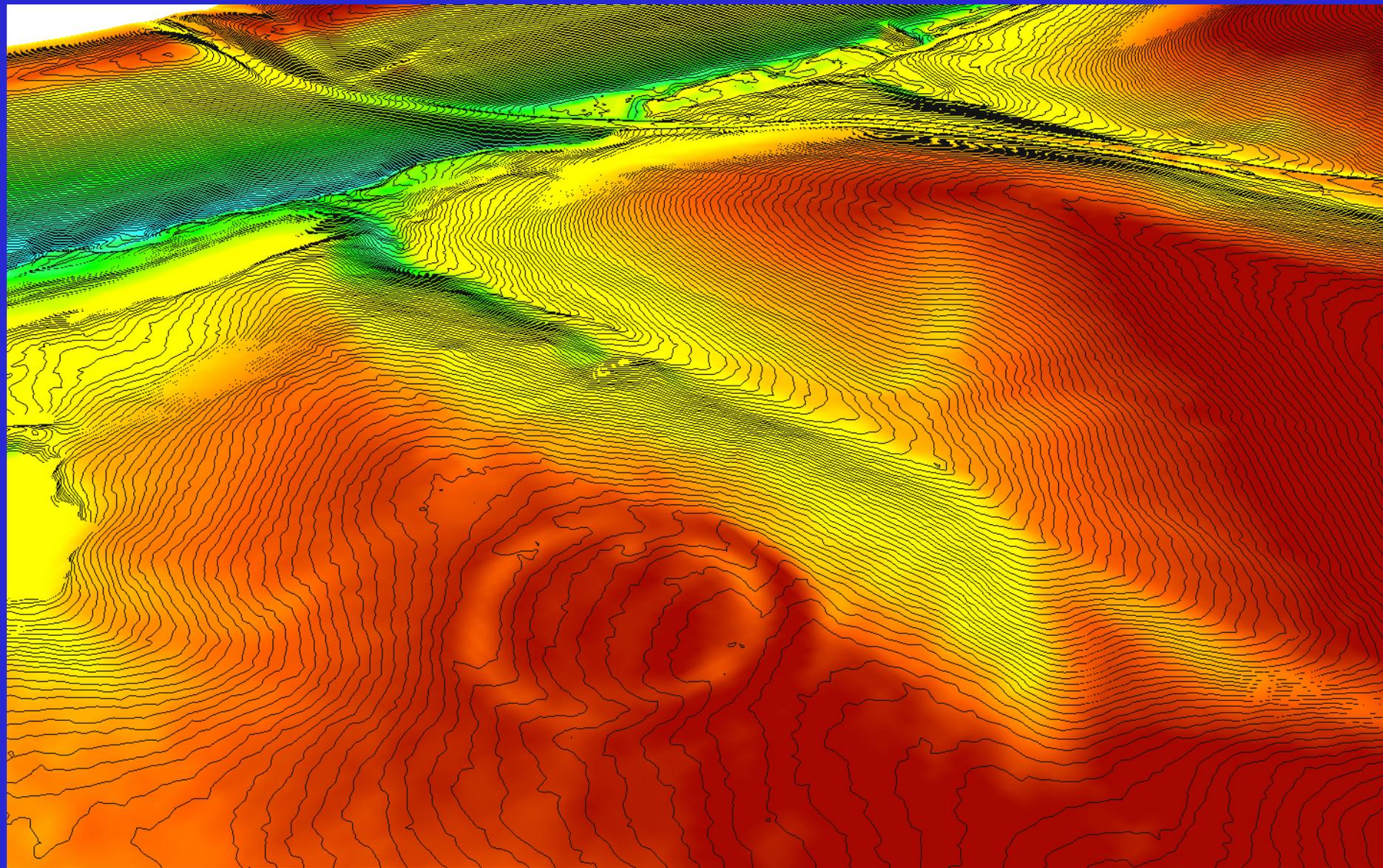
http://kyraster.ky.gov/arcgis/rest/services/ElevationServices/Ky_DEM_KYAPED_5FT/ImageServer

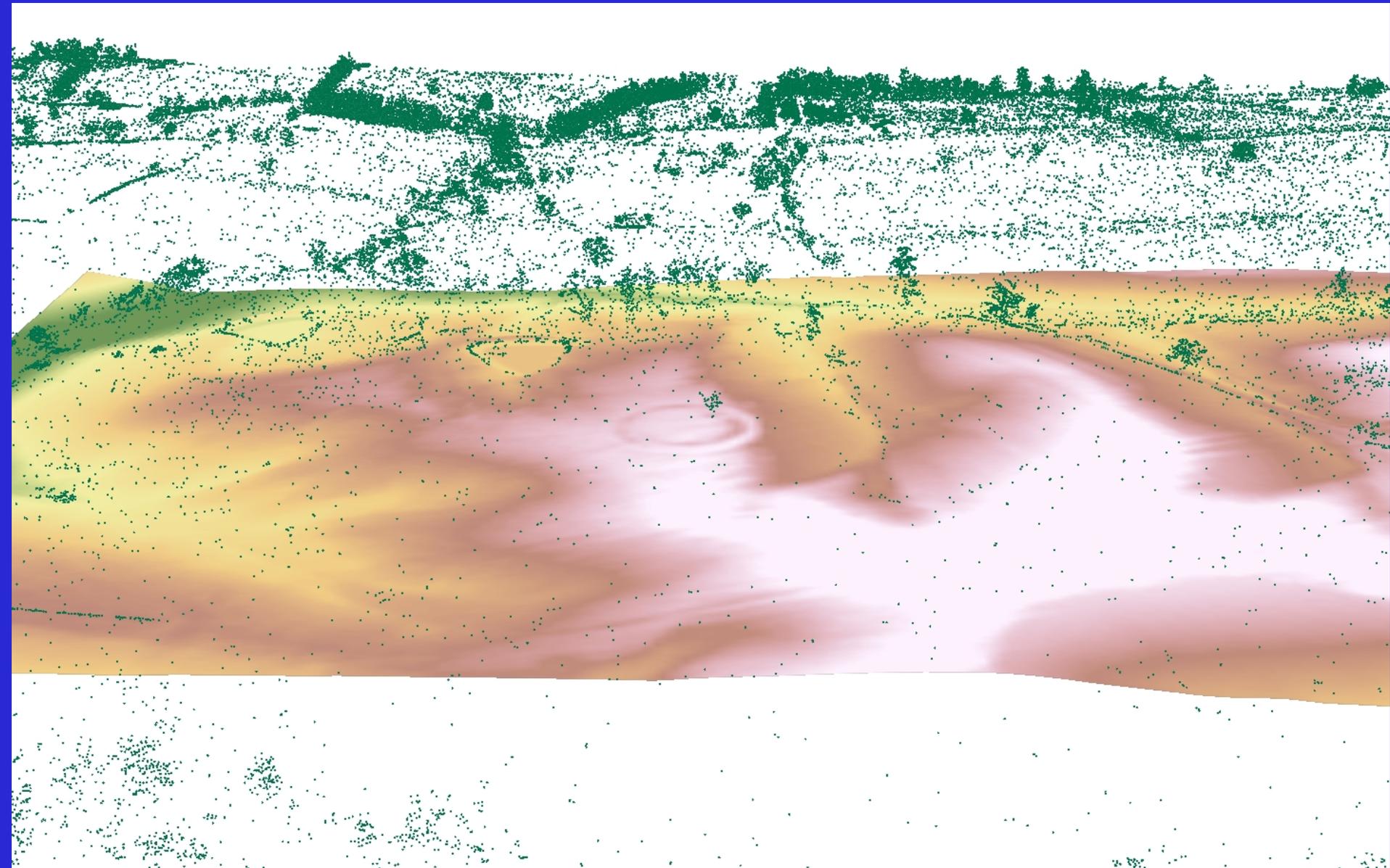


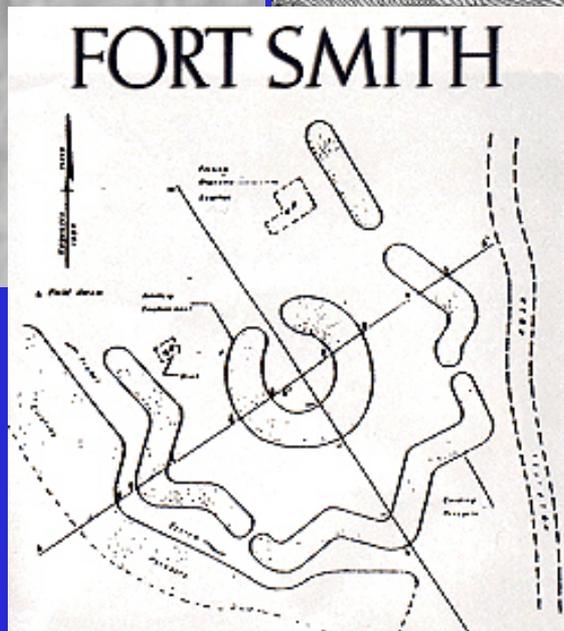
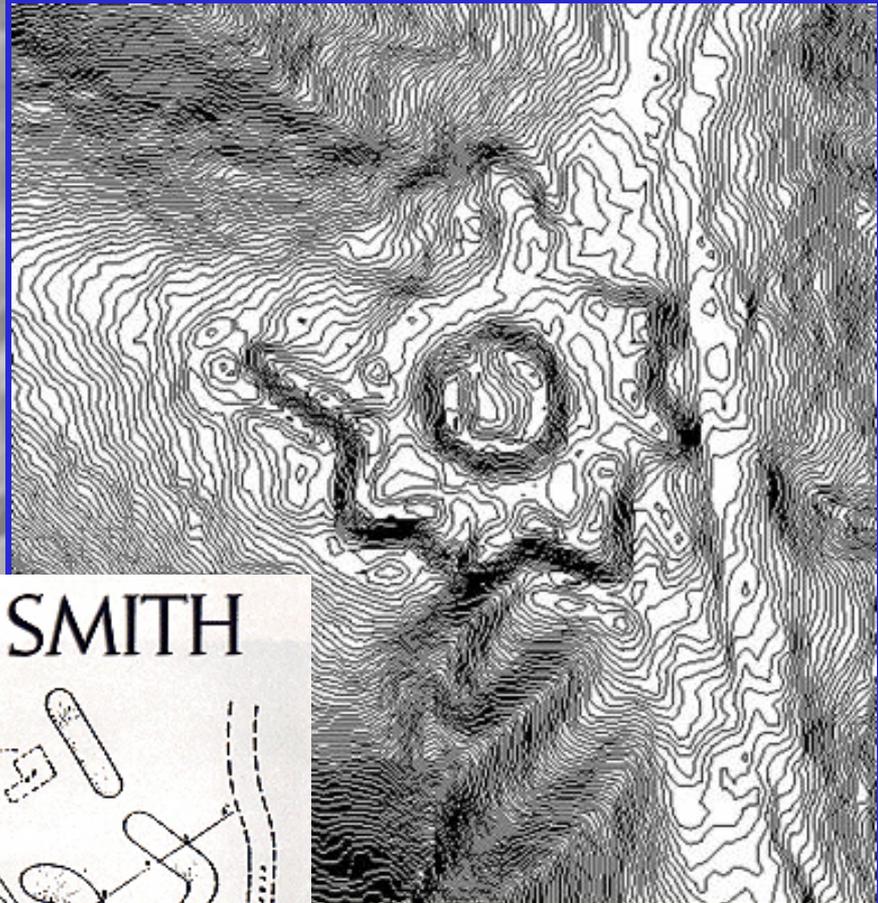
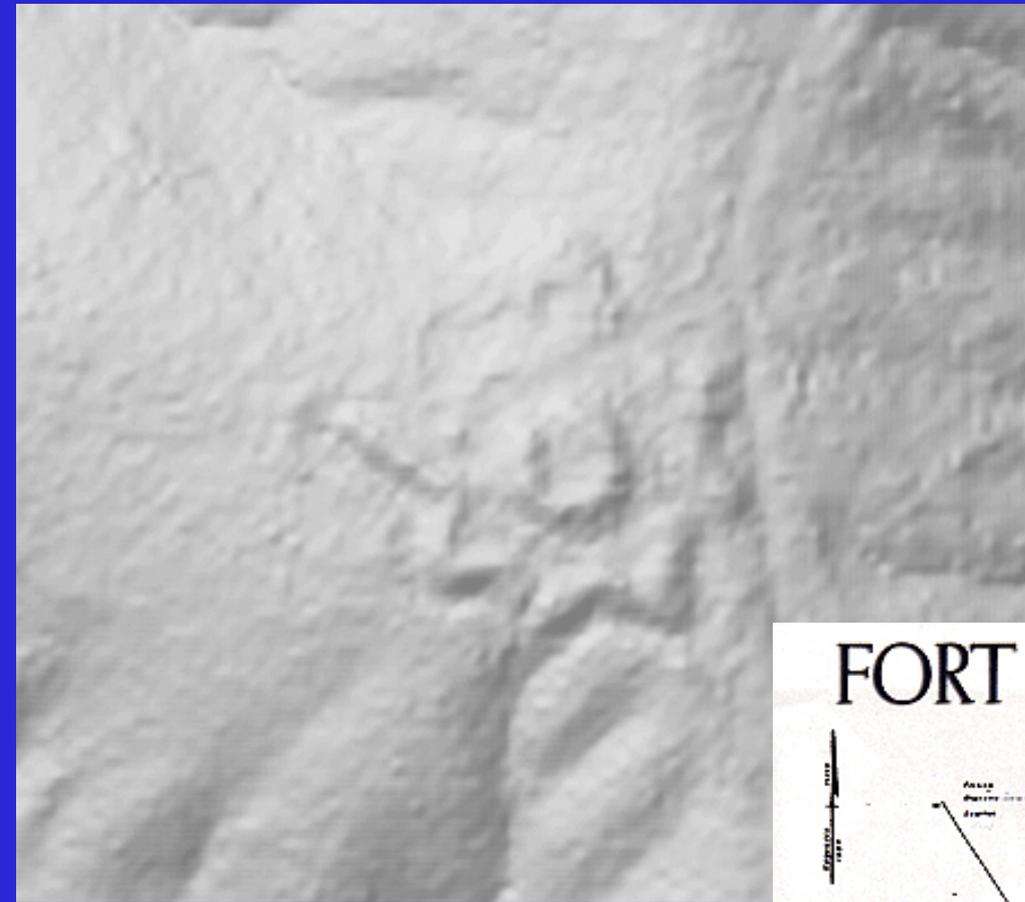
Over 1800
square
miles
examined.

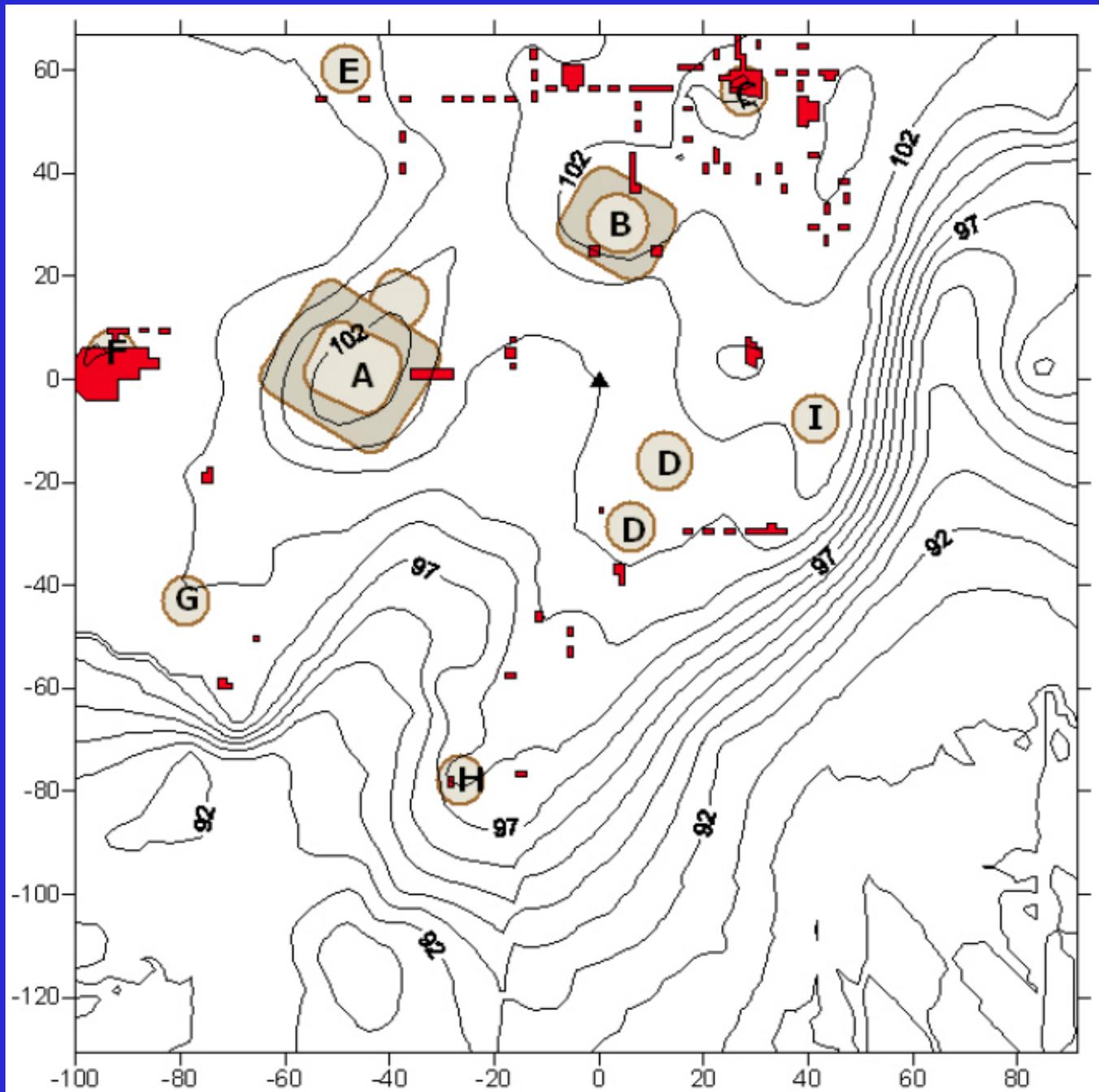
Over 100
possible new
mounds
and
earthworks.

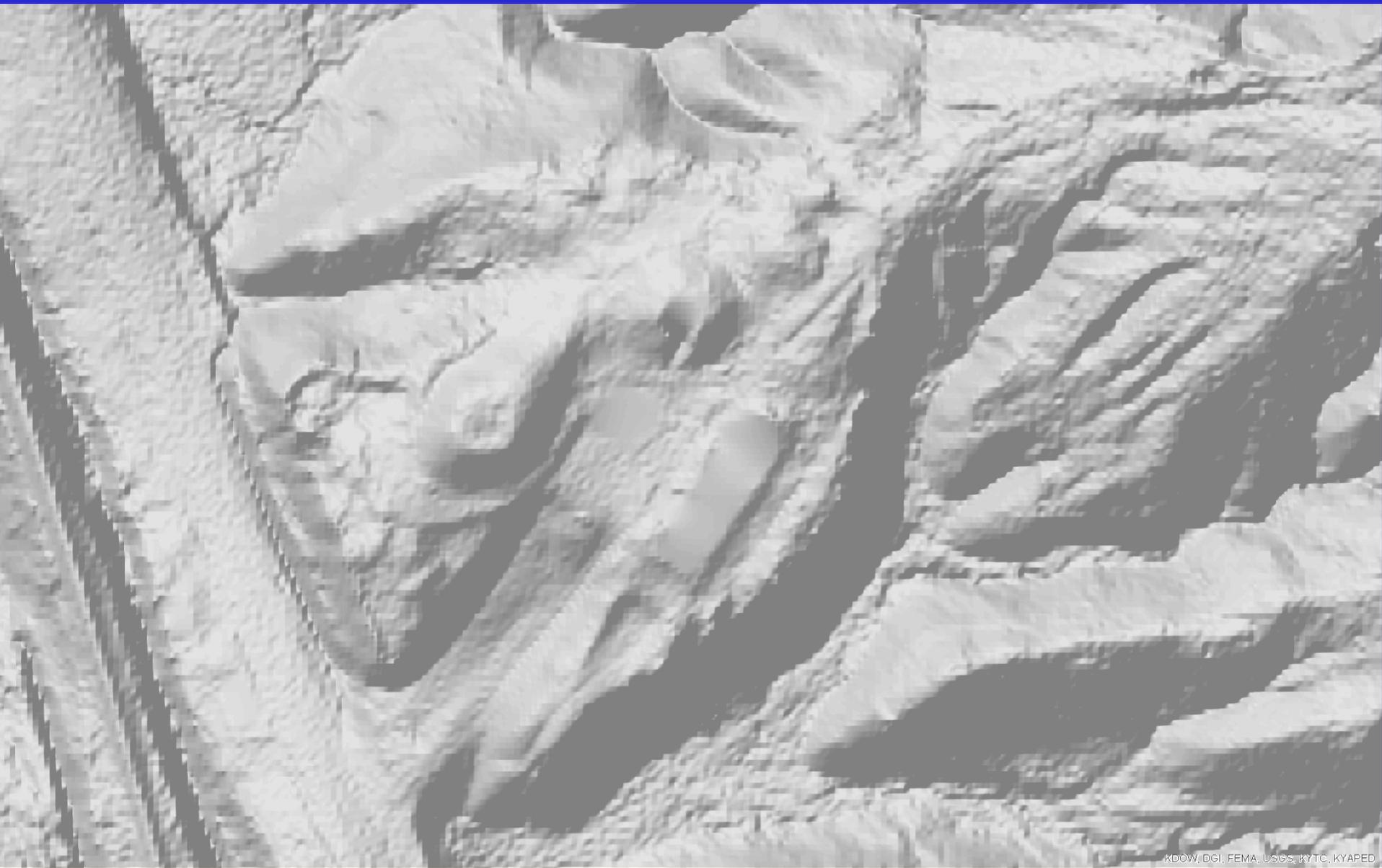


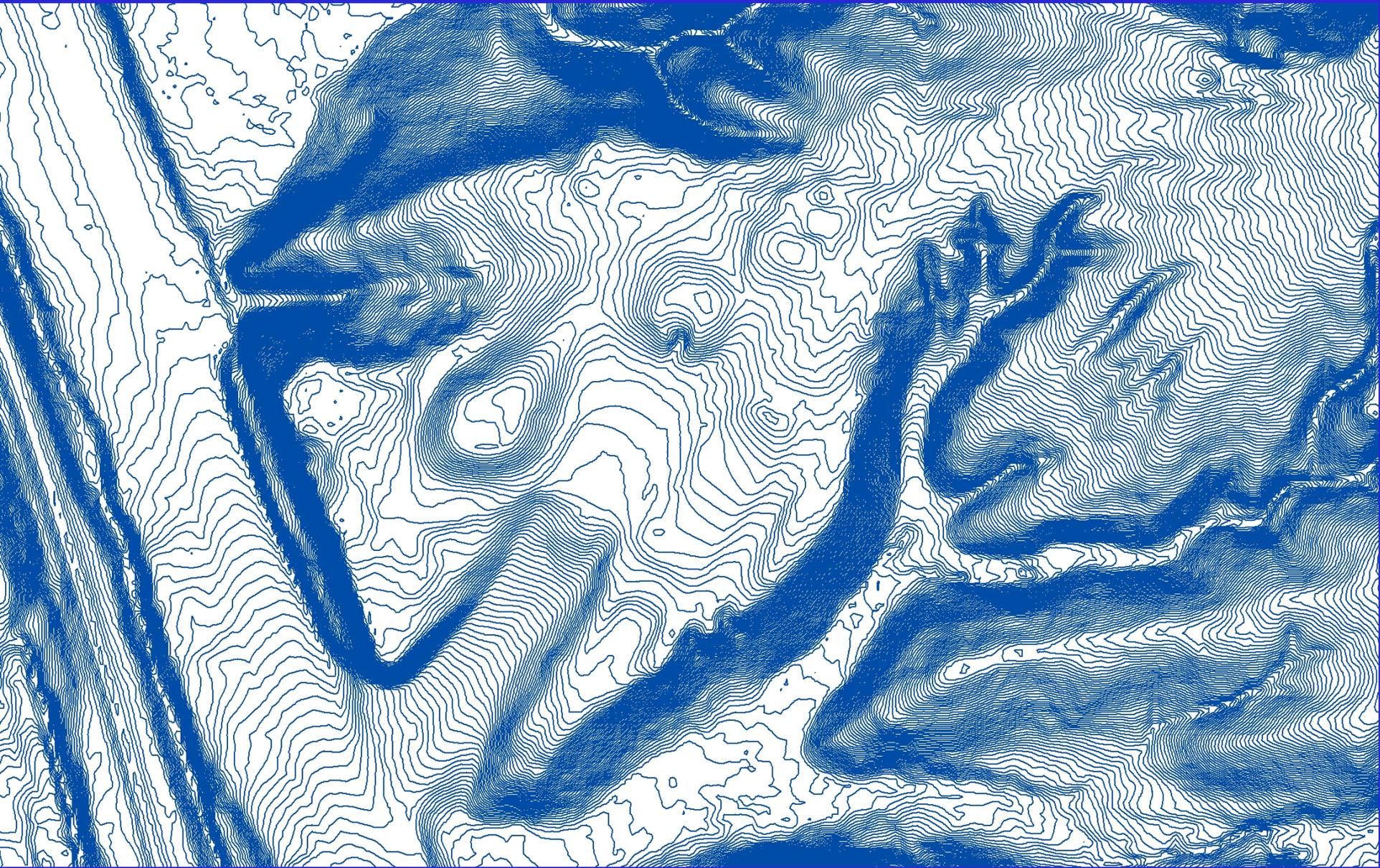


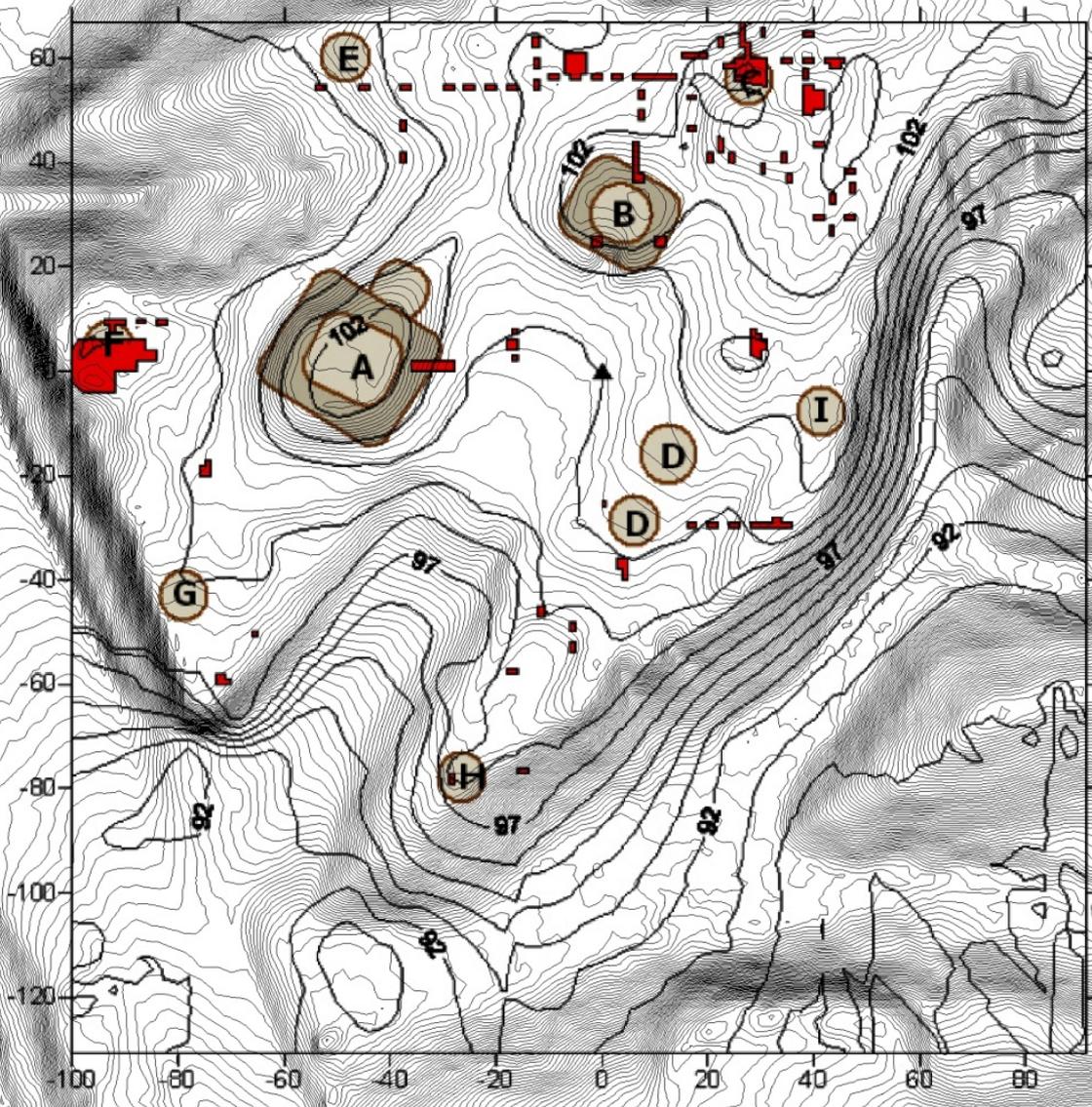


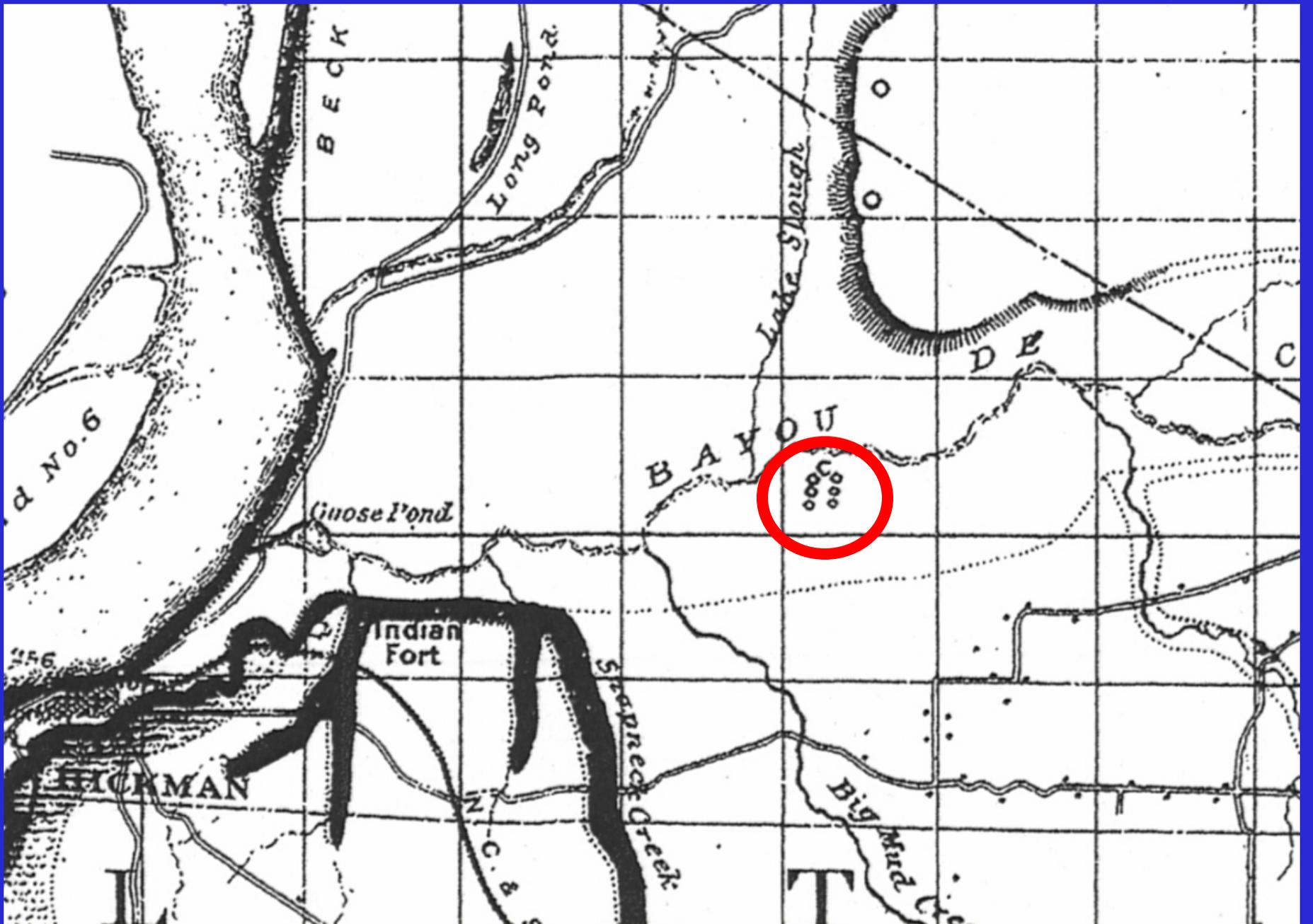


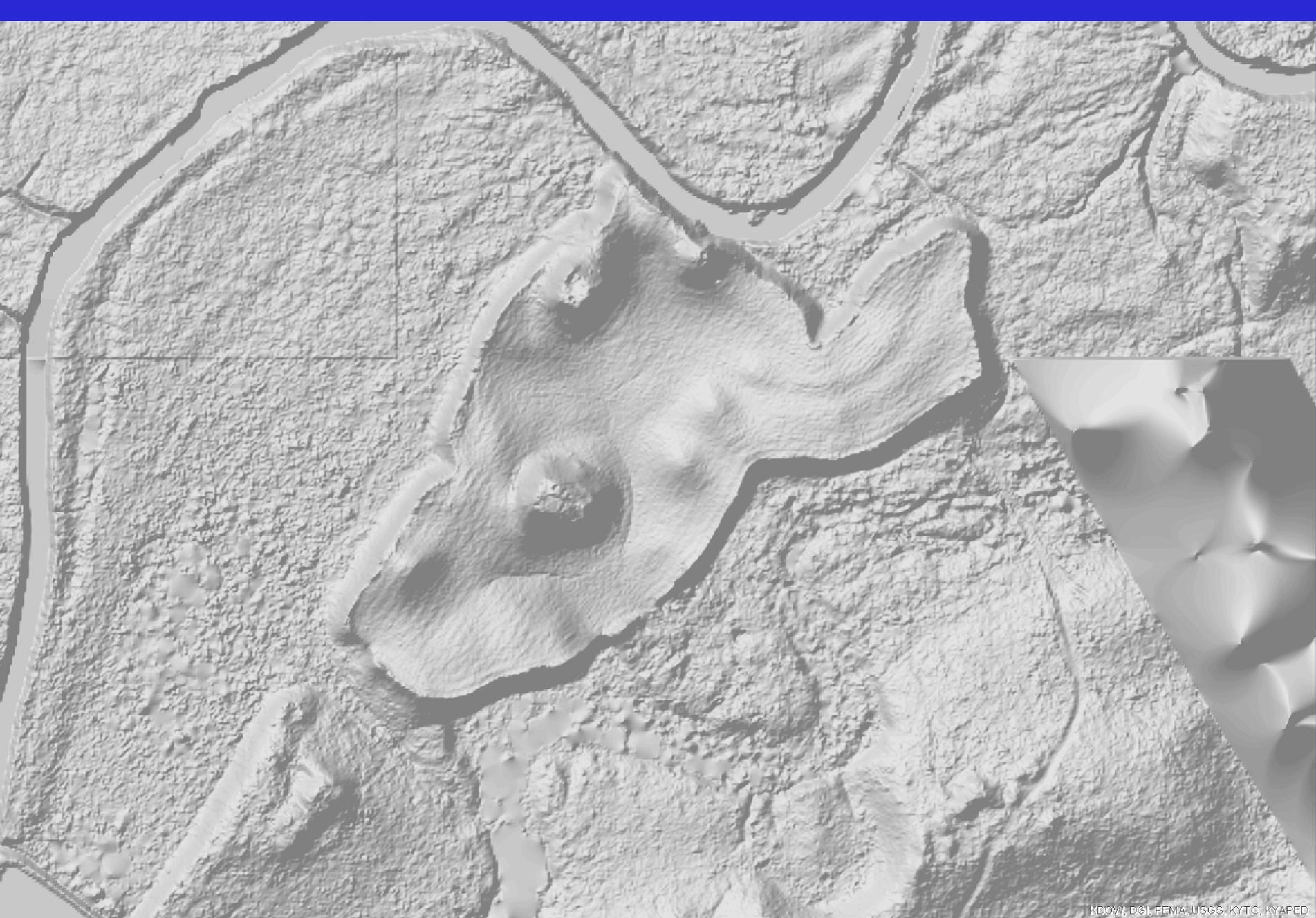


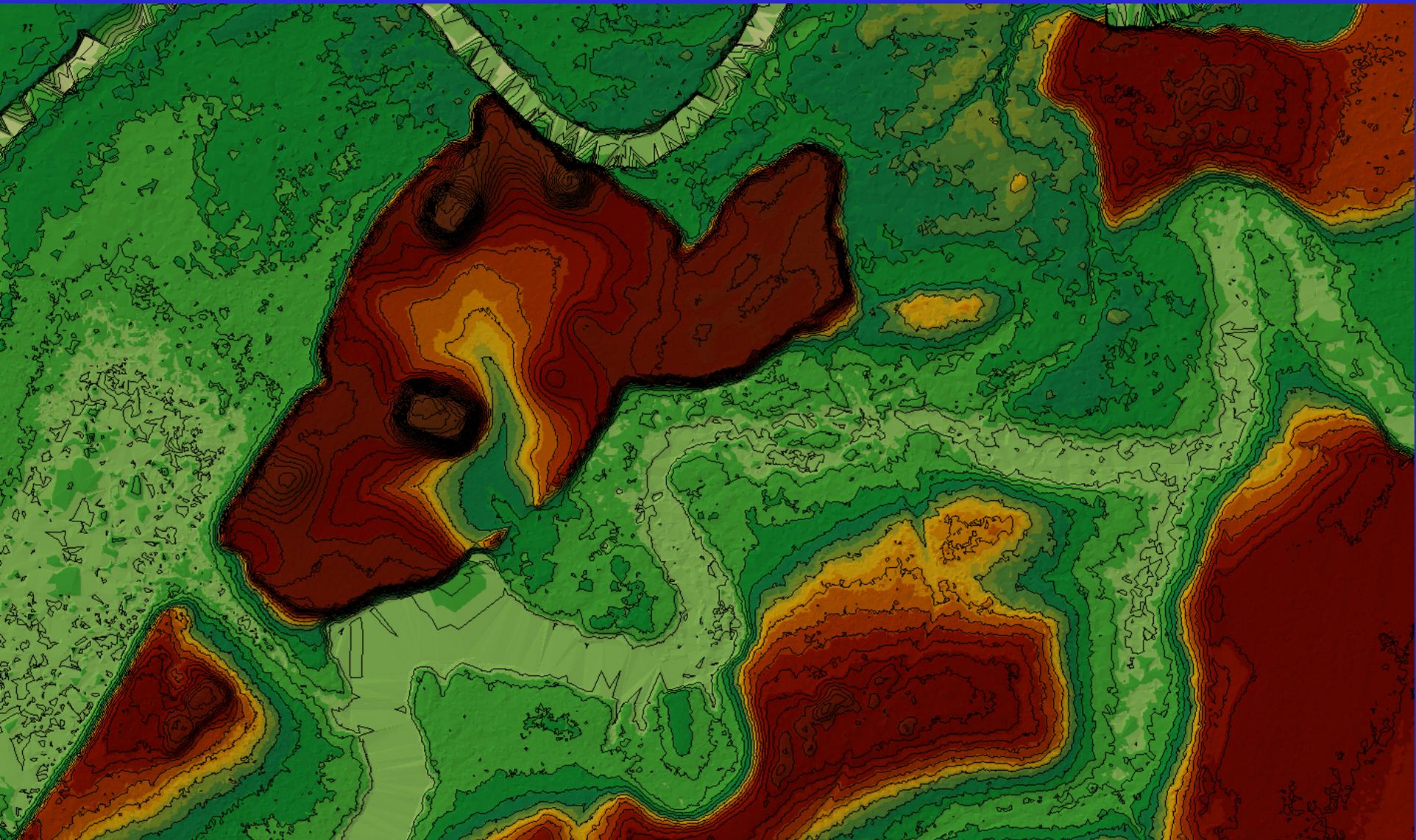


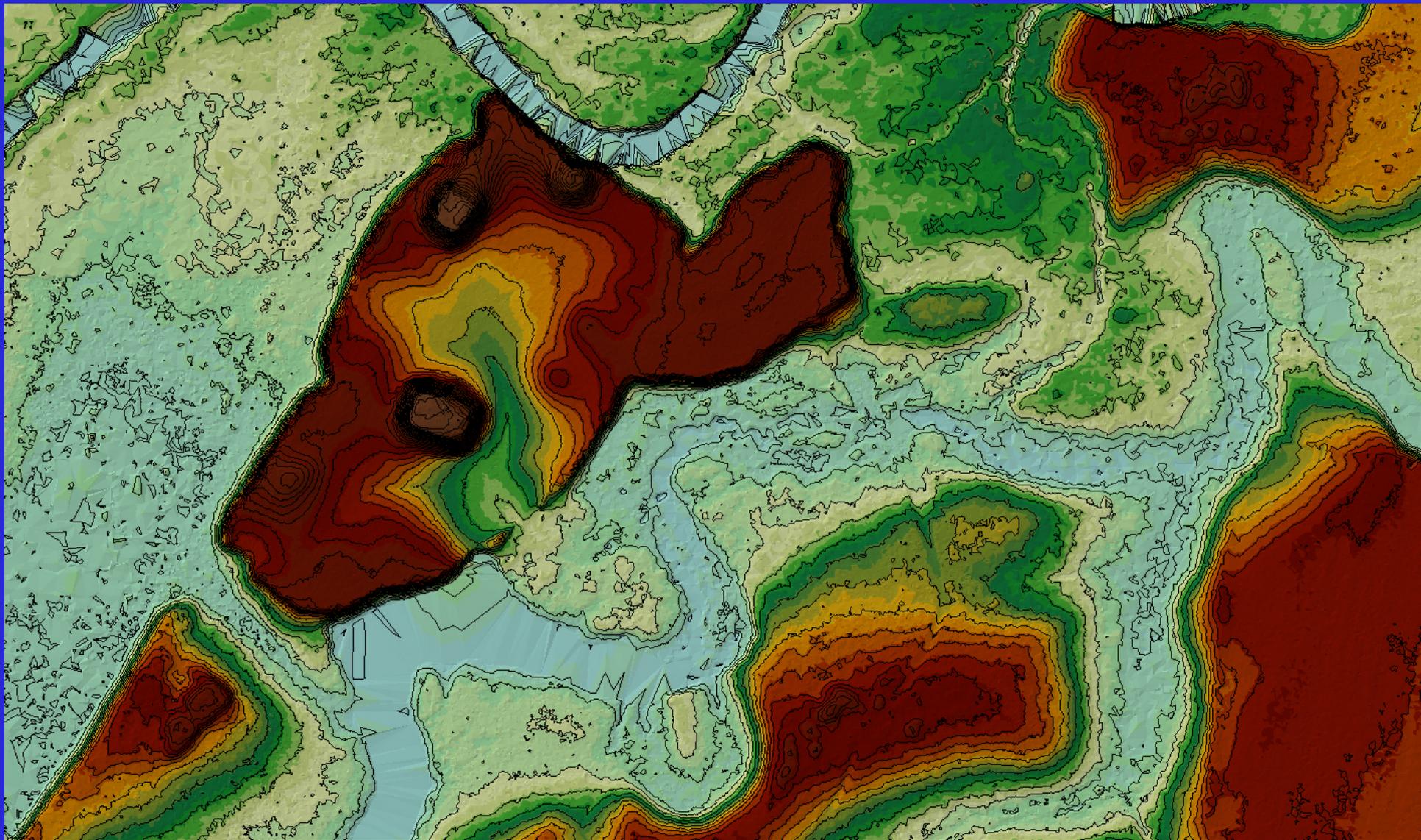


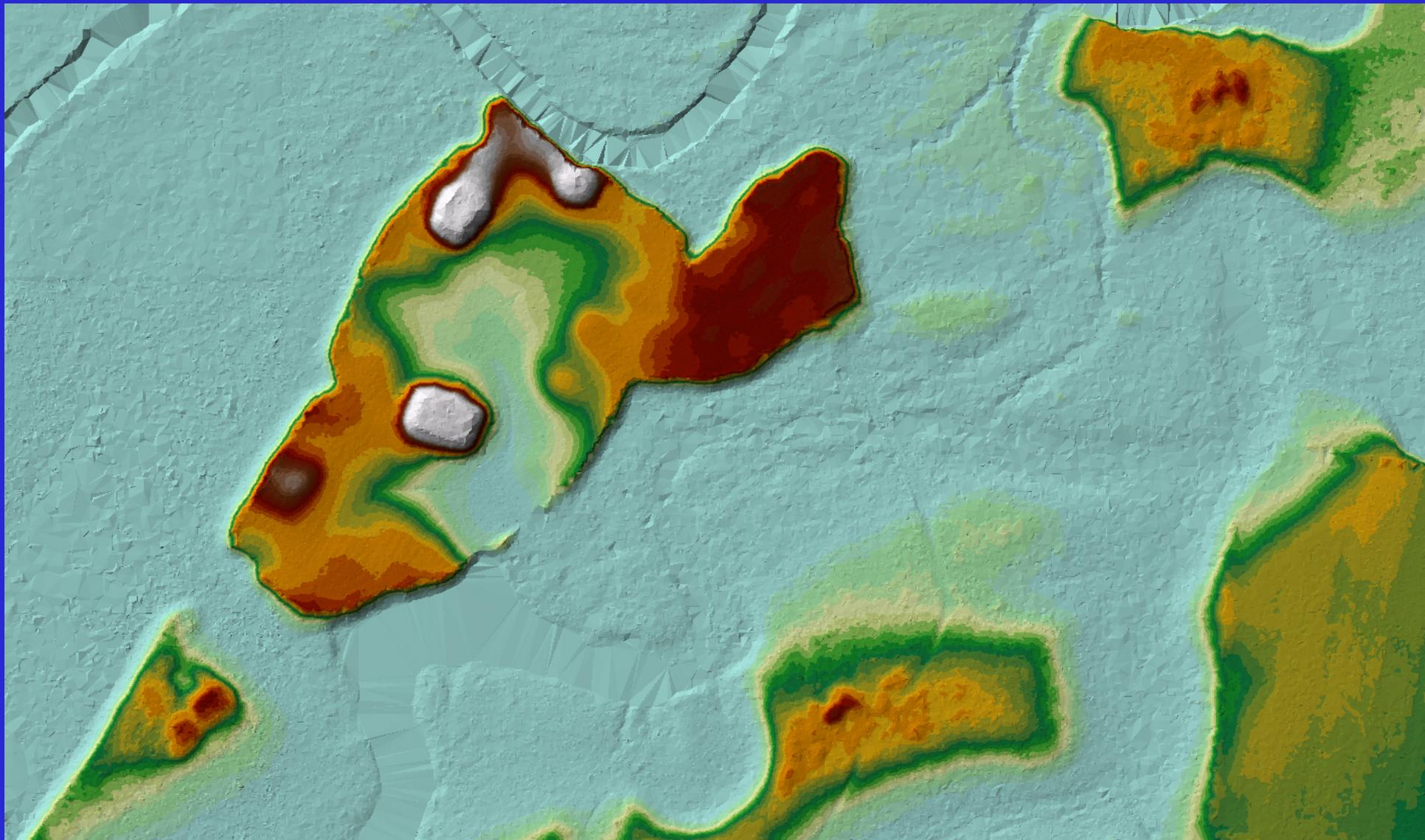


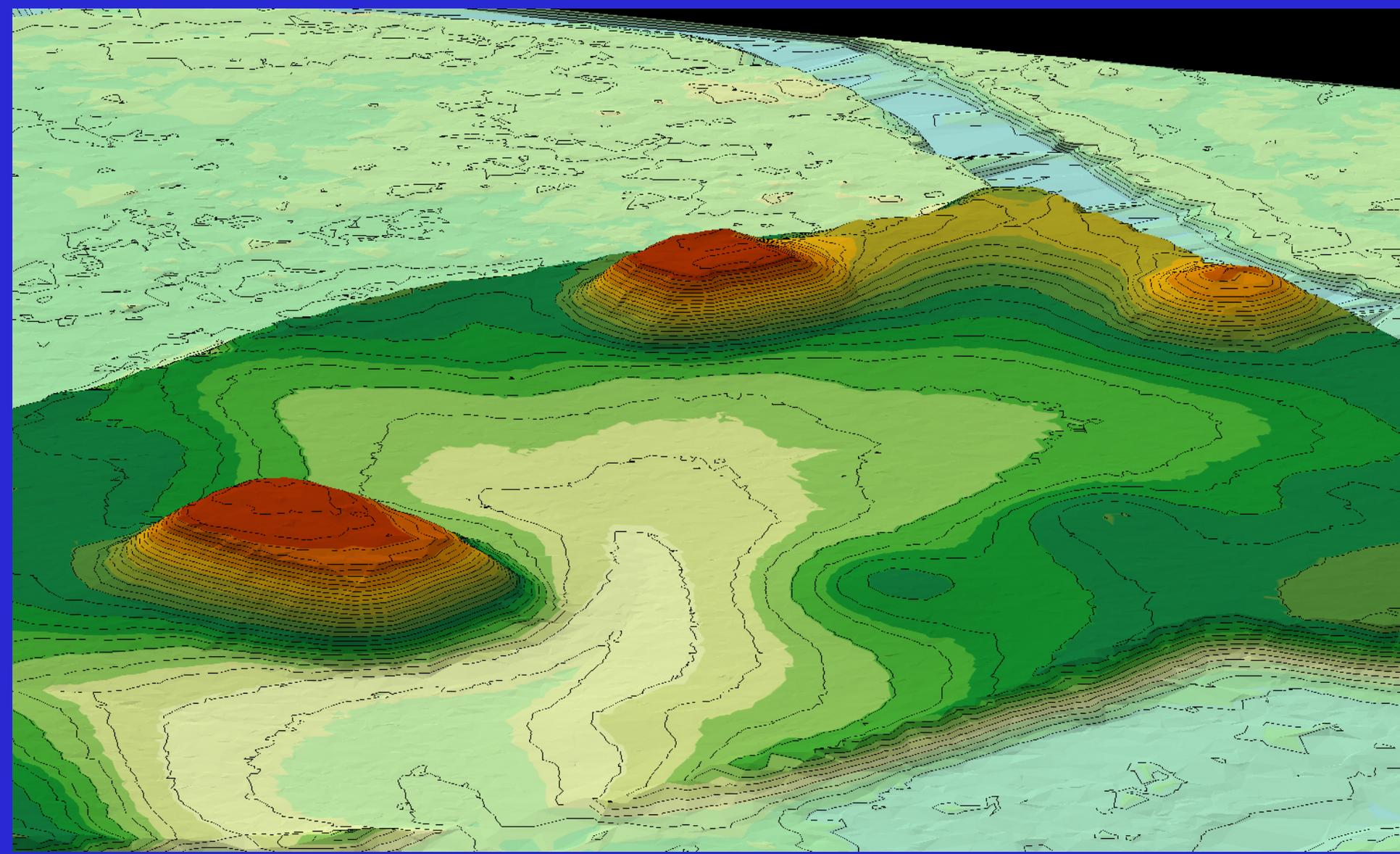


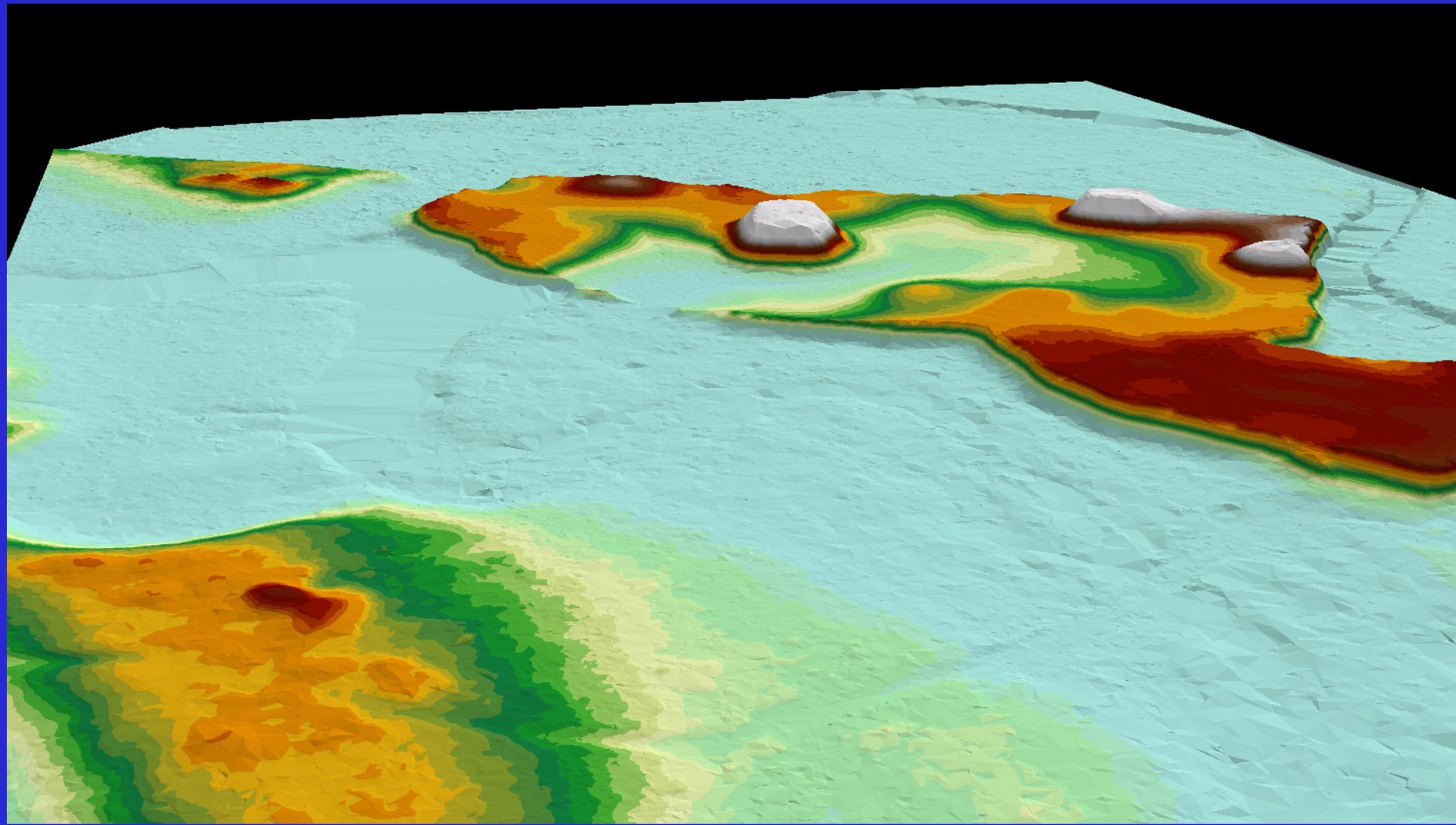


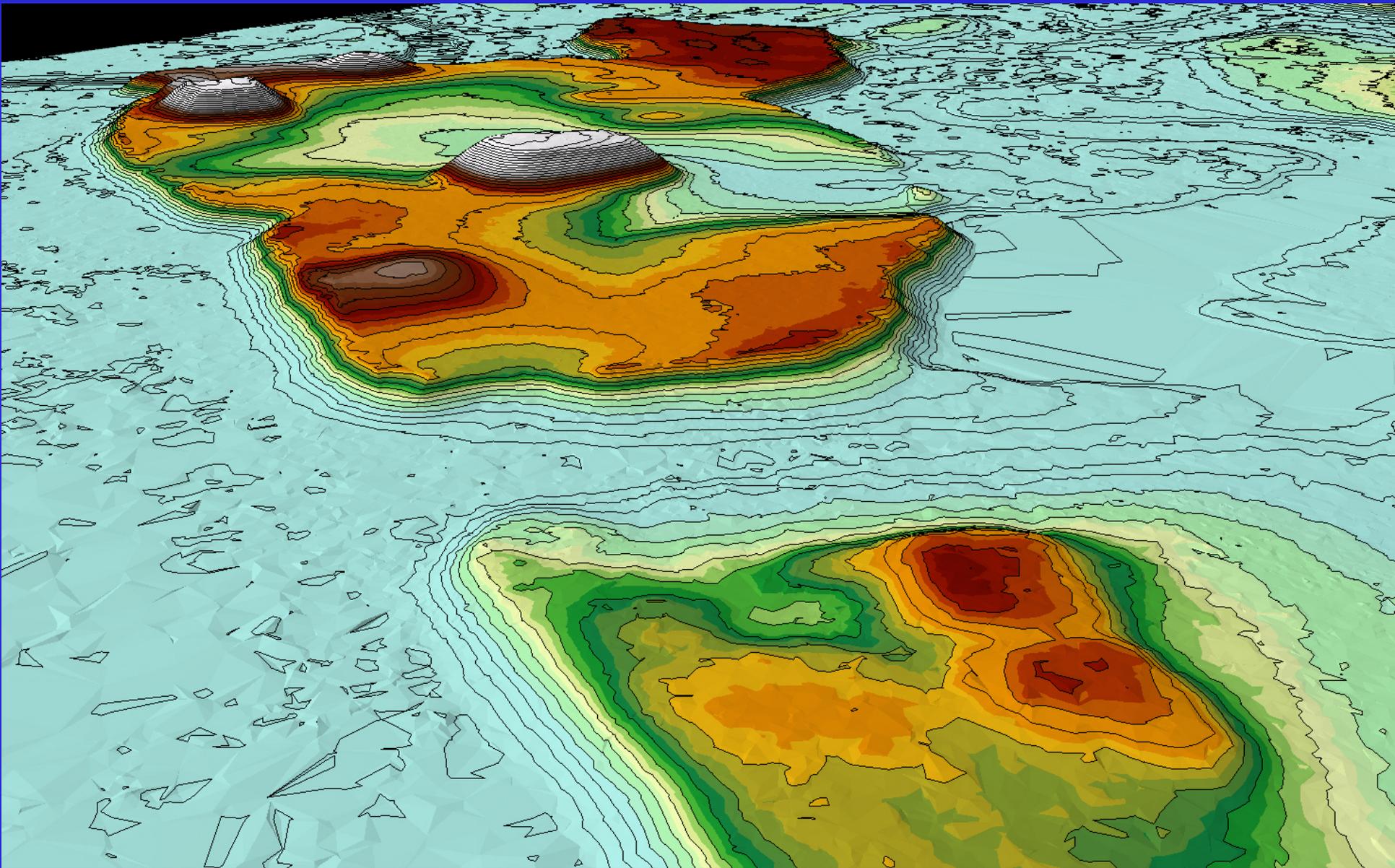
















I L L I N O I S

GEOLOGICAL SURVEY OF KENTUCKY
John R. Procter, Director.
MAP OF THE
JACKSON PURCHASE

COMPRISING
BALLARD, MC CRACKEN, MARSHALL, GRAVES,
CALLOWAY, HICKMAN and FULTON COUNTIES.

Geology by R. H. LOUGHBRIDGE
Map by J. B. HOEING H. R. AYRES, Aid.
Scale: 2 Miles = 1 Inch.
1885

COUNTY	AREA
GRAVES CO.	207.5
MC CRACKEN	207.5
FULTON	196
CALLOWAY	208
BALLARD	208
HICKMAN	208
MARSHALL	208

ASTRONOMICAL STATIONS			
1850	1854		
PADUCAH	37° 24' 40" N	87° 30' 40" W	
MADEIRA	37° 24' 40" N	87° 30' 40" W	
WILKINSON	37° 24' 40" N	87° 30' 40" W	

DECLINATION OF NEEDLE IN 1885			
PADUCAH	7' 47" East		
WILKINSON	7' 47" East		
MARSHALL	7' 47" East		



MAP OF A TERRAIN SHOWING THE EXTENT OF LONGITUDE EASTING

CONVENTION OF SIGNS

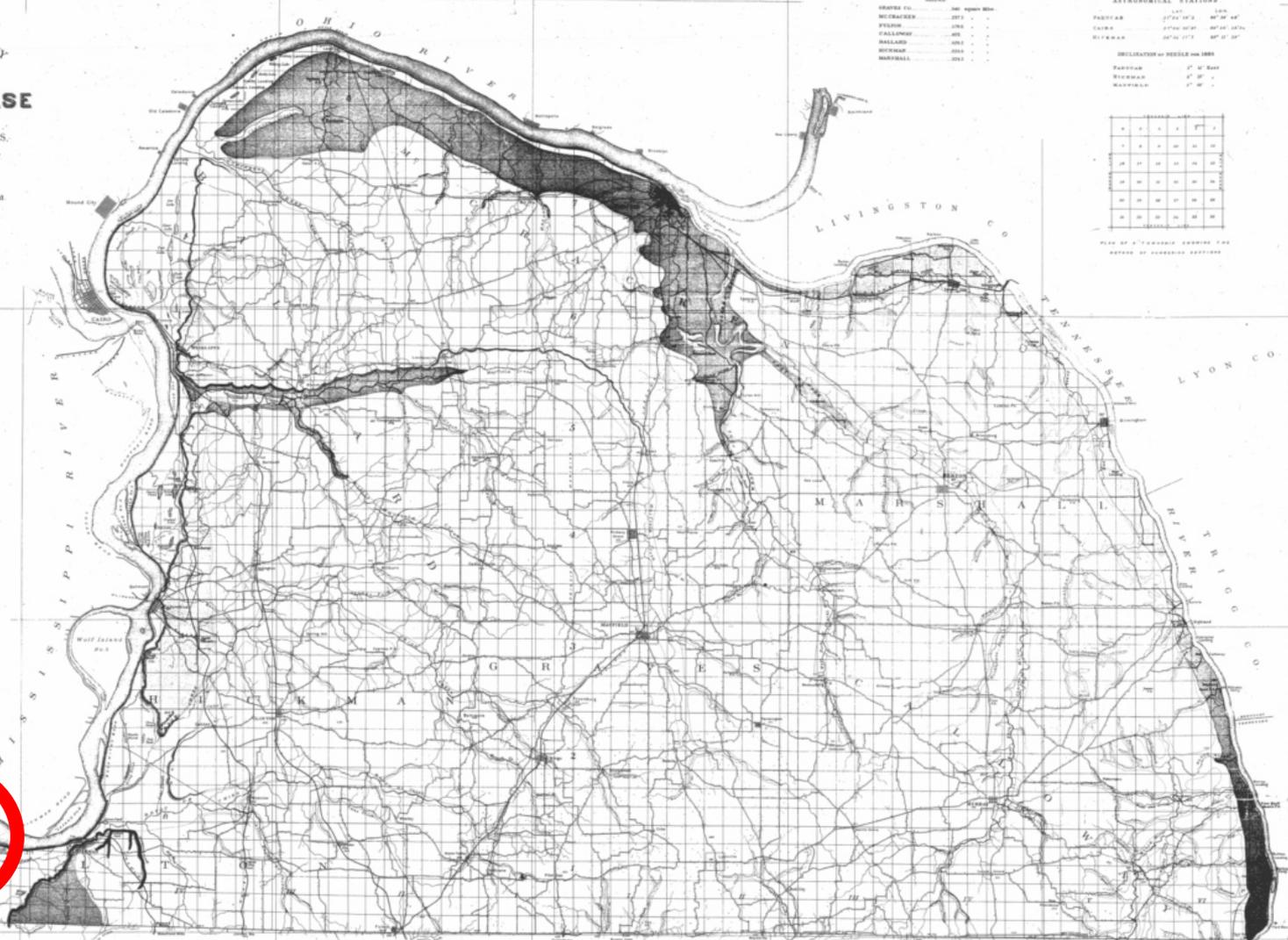
- Railway
- Canal
- Road
- Railroad
- Electric
- Telephone

NOTE: Figures in this column represent elevations of the spot above sea level.

SCHEMATIC OF STRATA

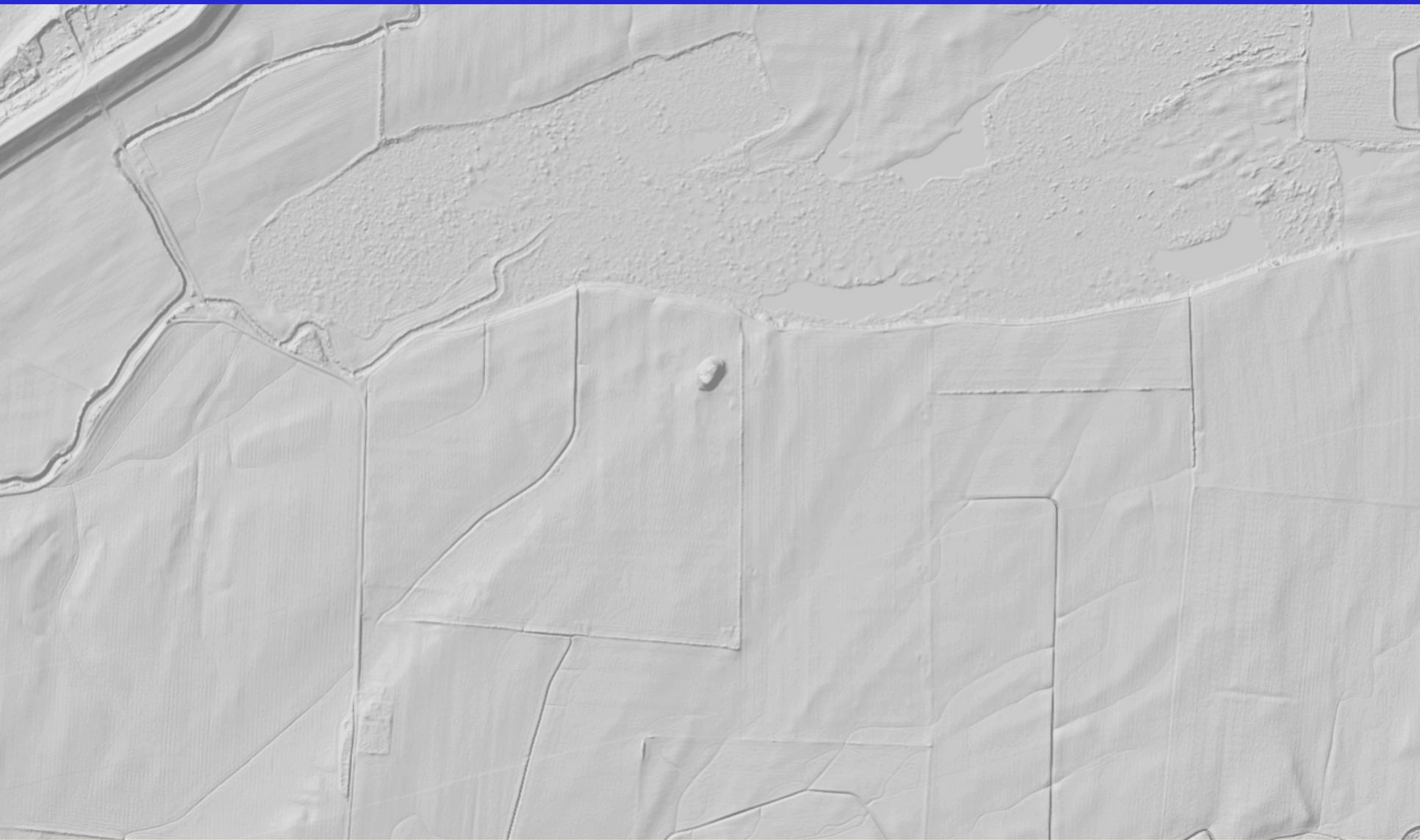
- Recent
- Pleistocene
- Pliocene
- Miocene
- Eocene
- Oligocene
- Tertiary
- Secondary
- Primary
- Lower Silurian
- Devonian
- Carboniferous
- Permian
- Triassic
- Jurassic
- Cretaceous
- Tertiary
- Quaternary

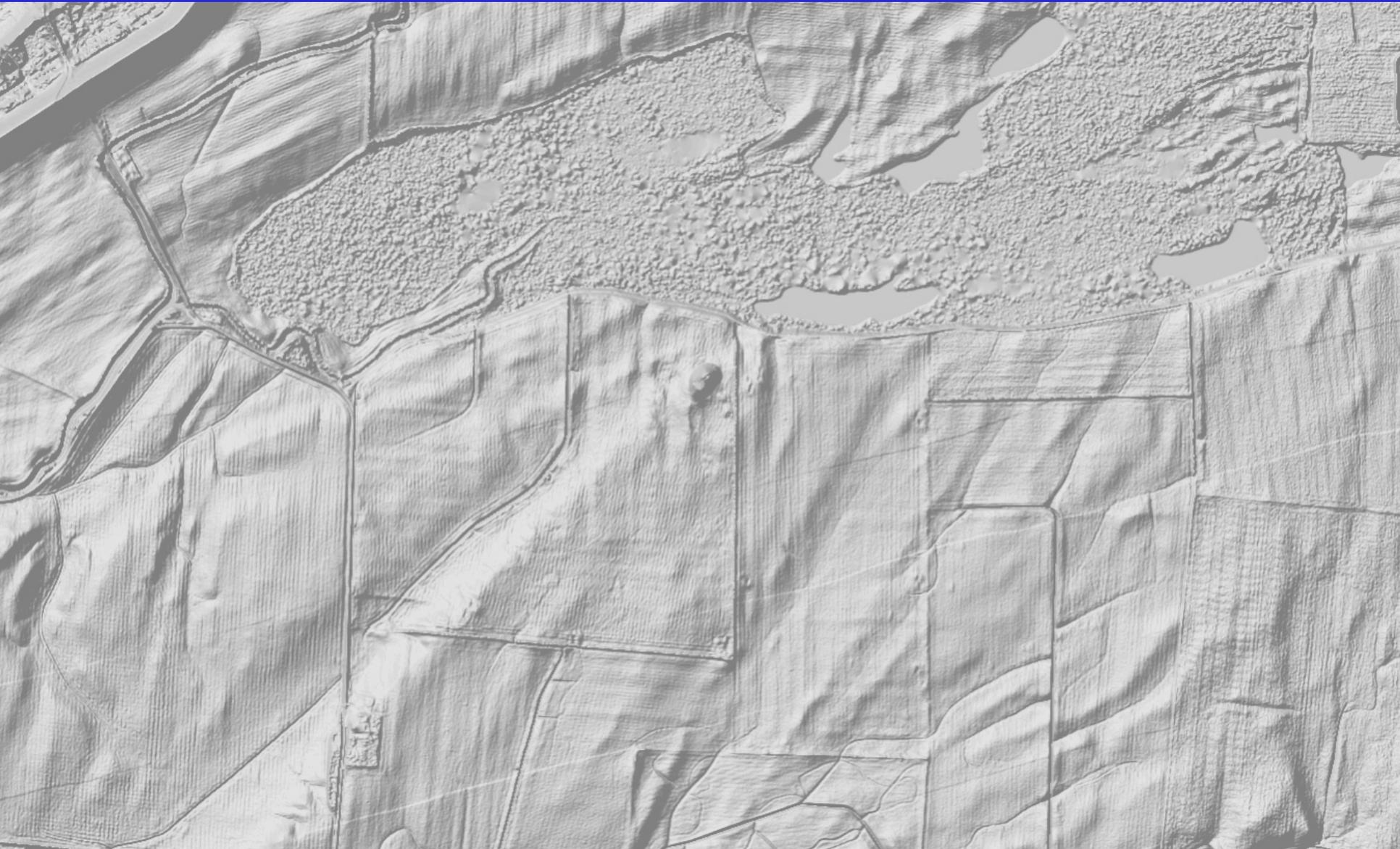
*The shaded (dark) material represents the Jackson Purchase.

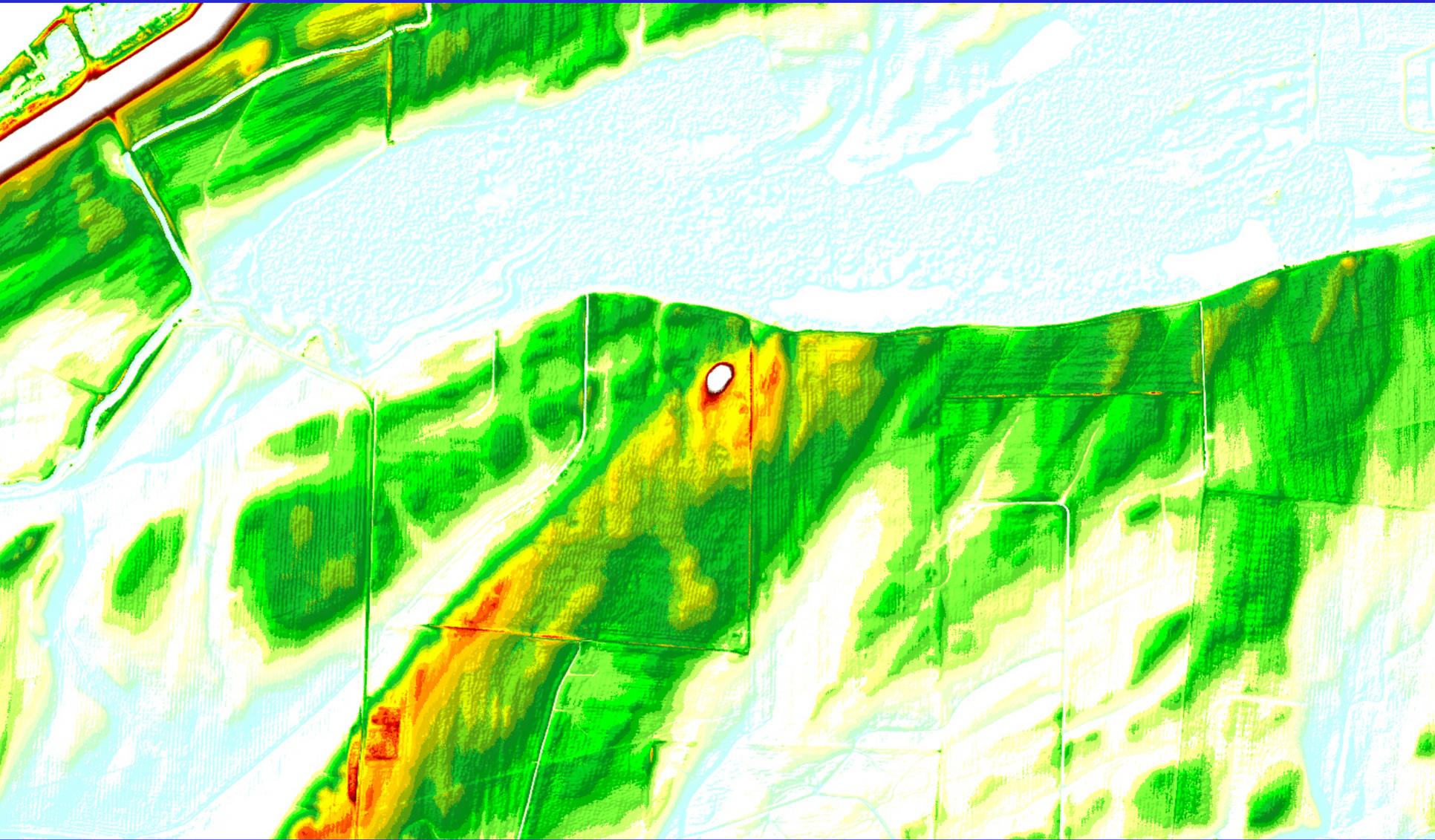


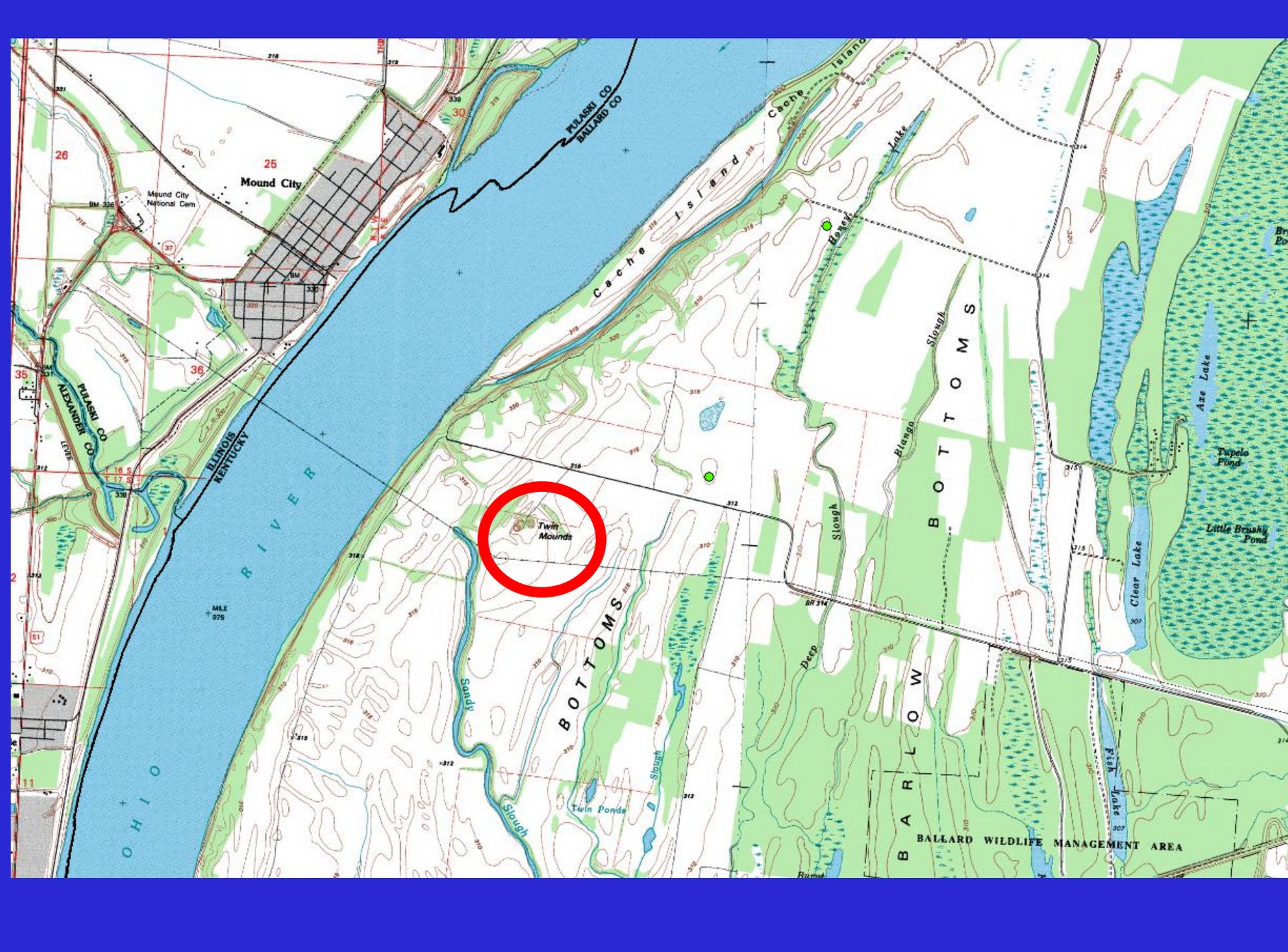
O B I O N C O . W E A R L E Y C O . H E N R Y C O .
T E N N E S S E E











26

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Mound City

Mound City National Cem

PULASKI CO
BALLARD CO

Cache Island

ILLINOIS
KENTUCKY

OHIO RIVER

Twin Mounds

BOTTOMS

BOTTOMS

BALLARLOW

BALLARD WILDLIFE MANAGEMENT AREA

Are Lake

Tupelo Pond

Little Brushy Pond

Clear Lake

Fish Lake

Deep

Slough

Slough

Slough

M.L.S.
976

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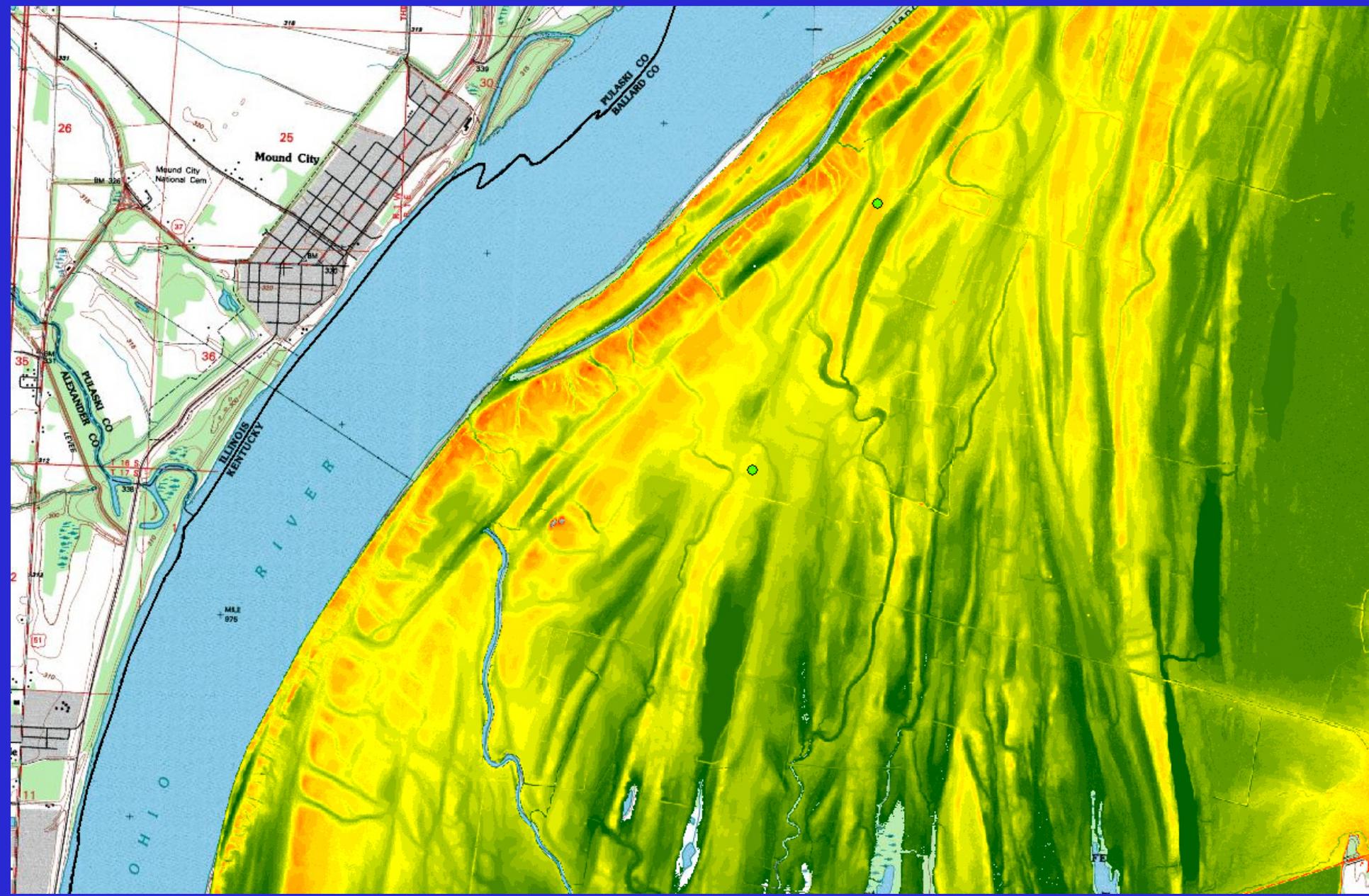
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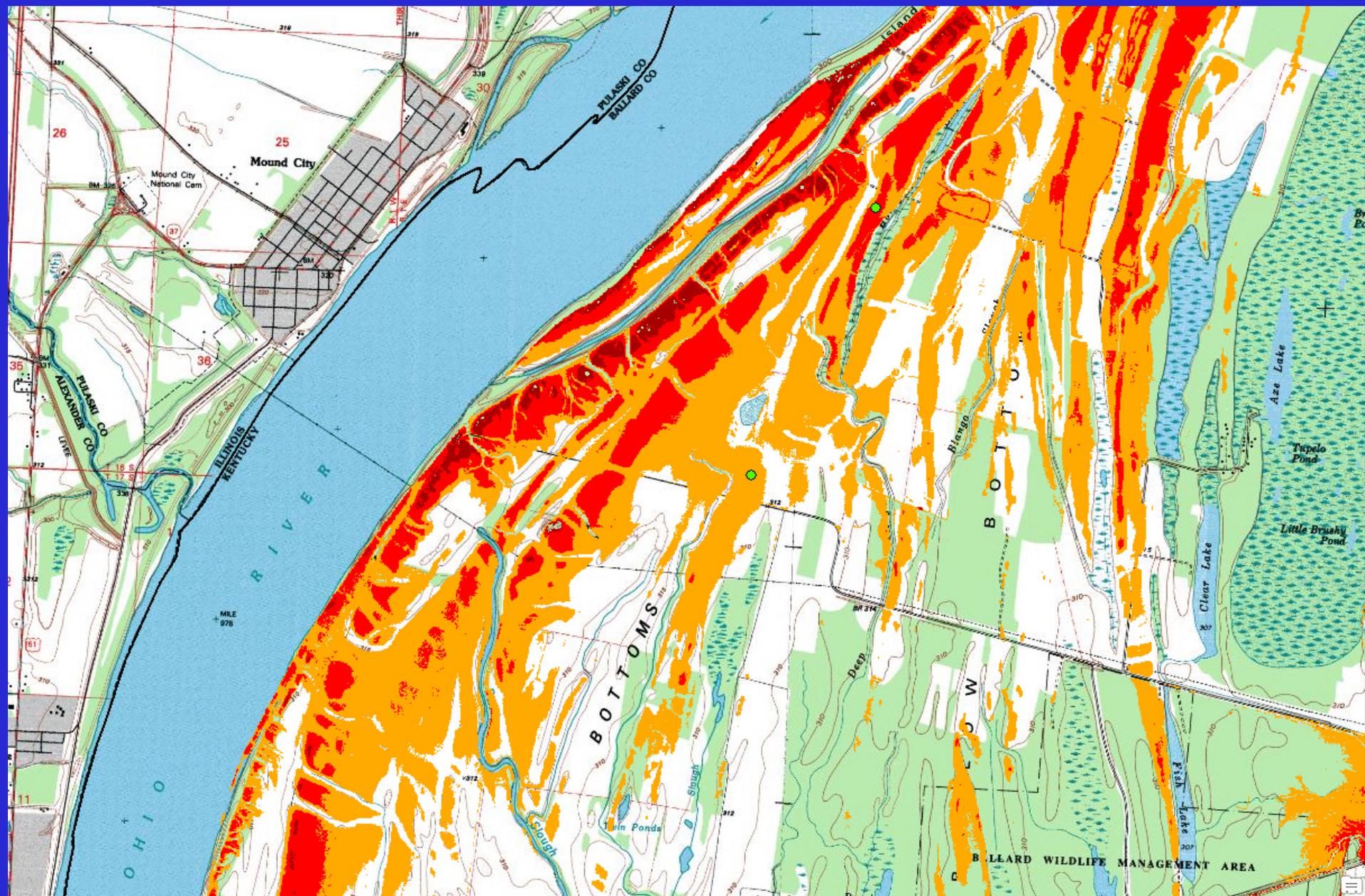
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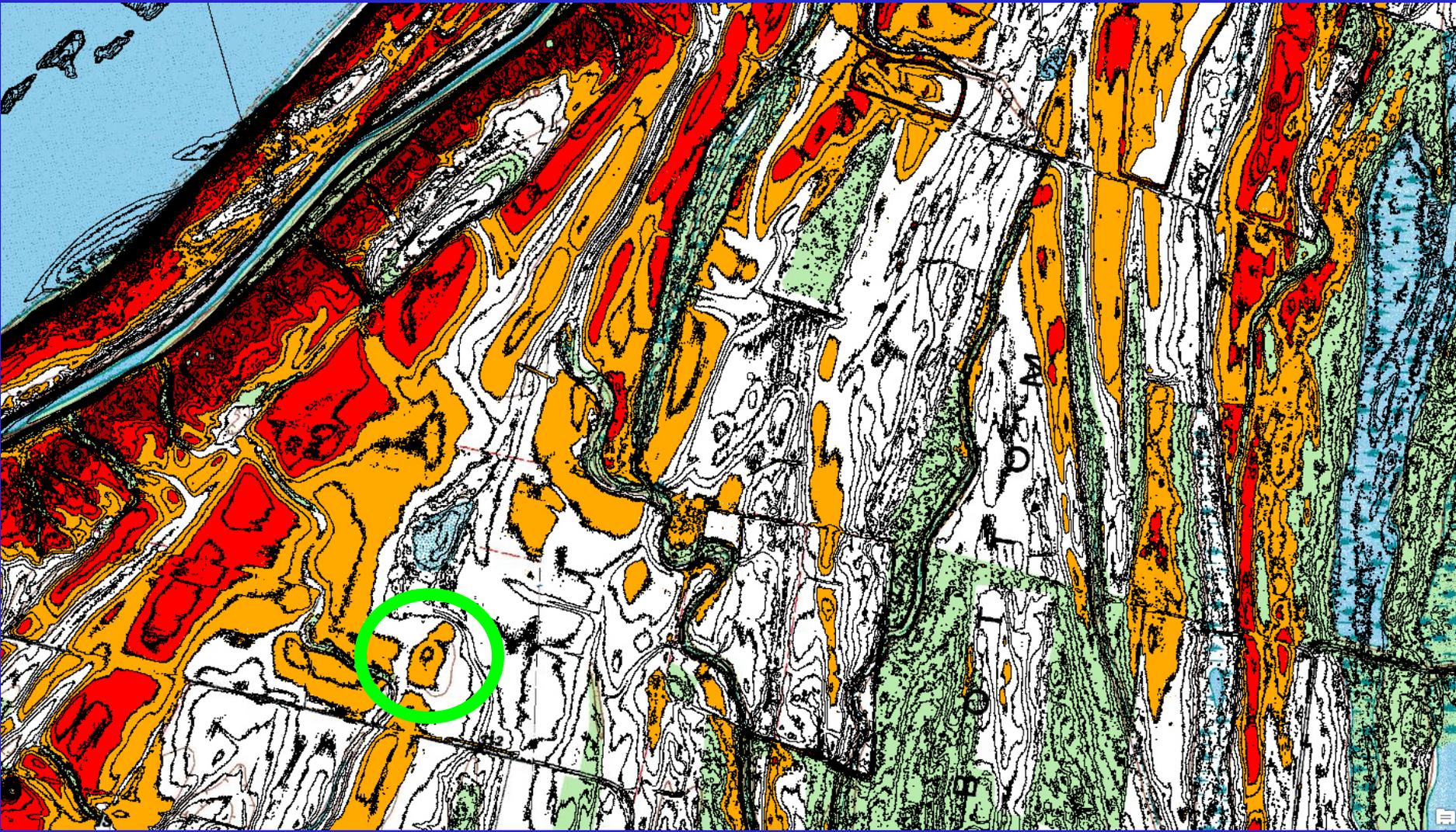
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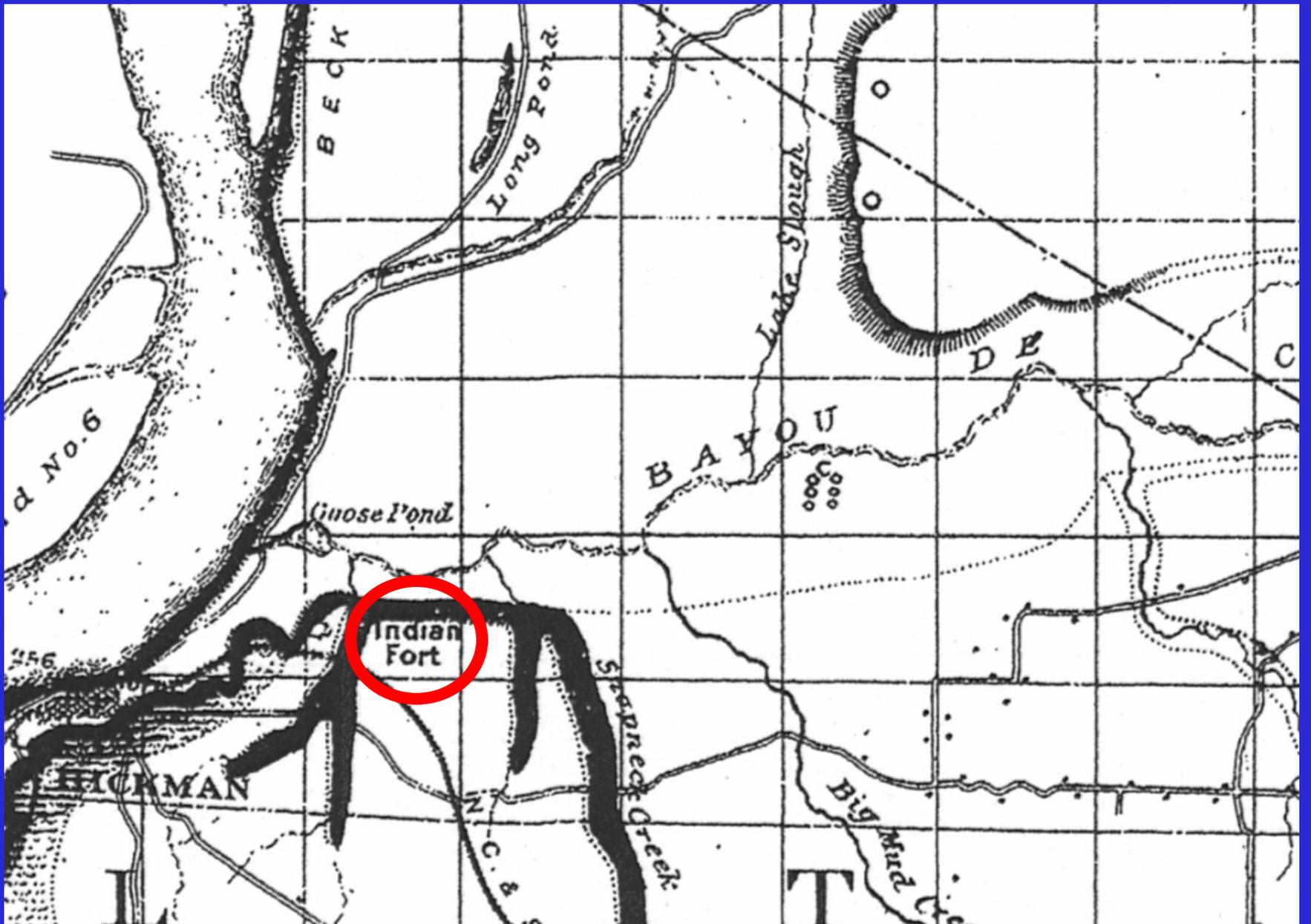
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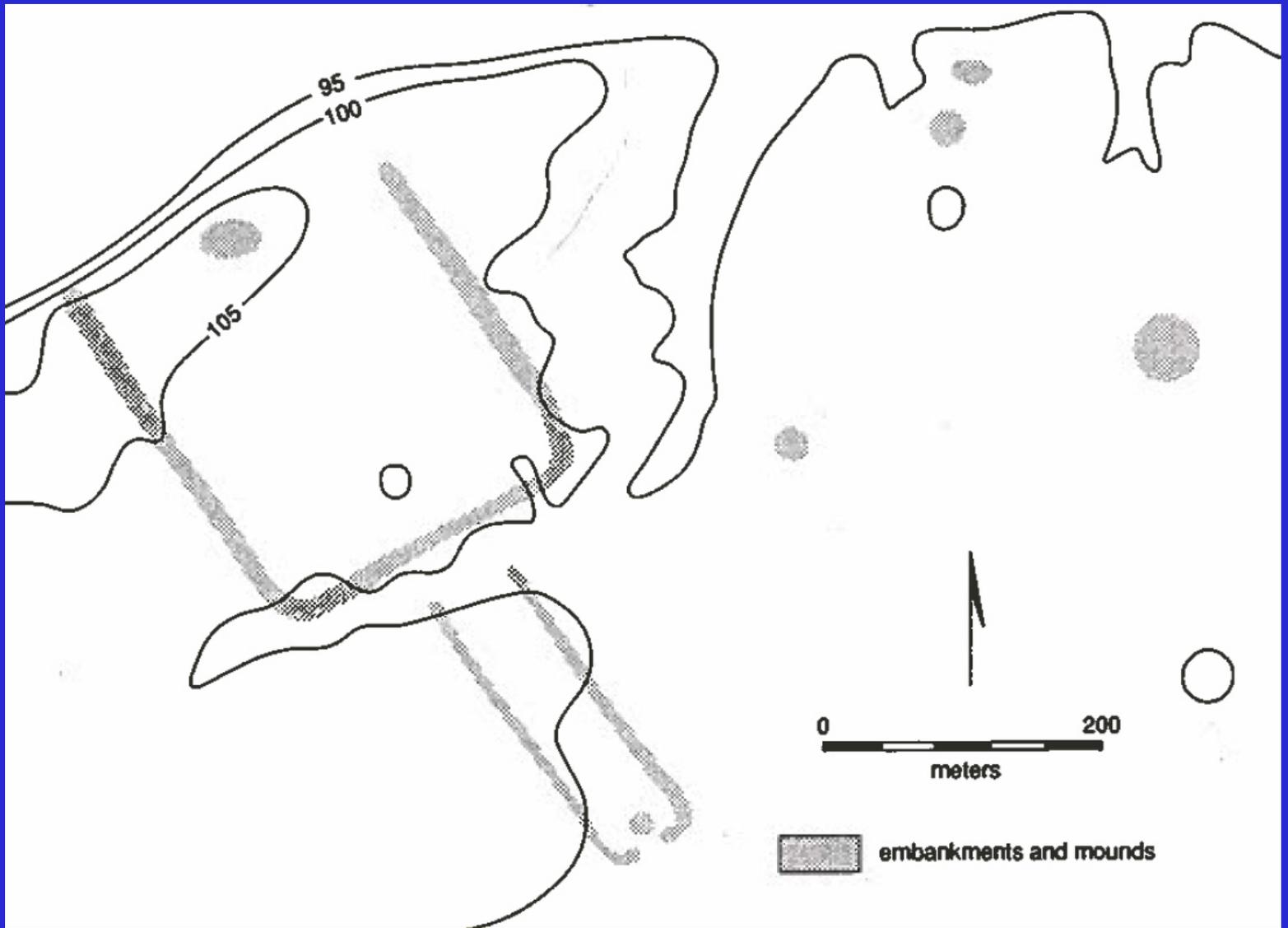
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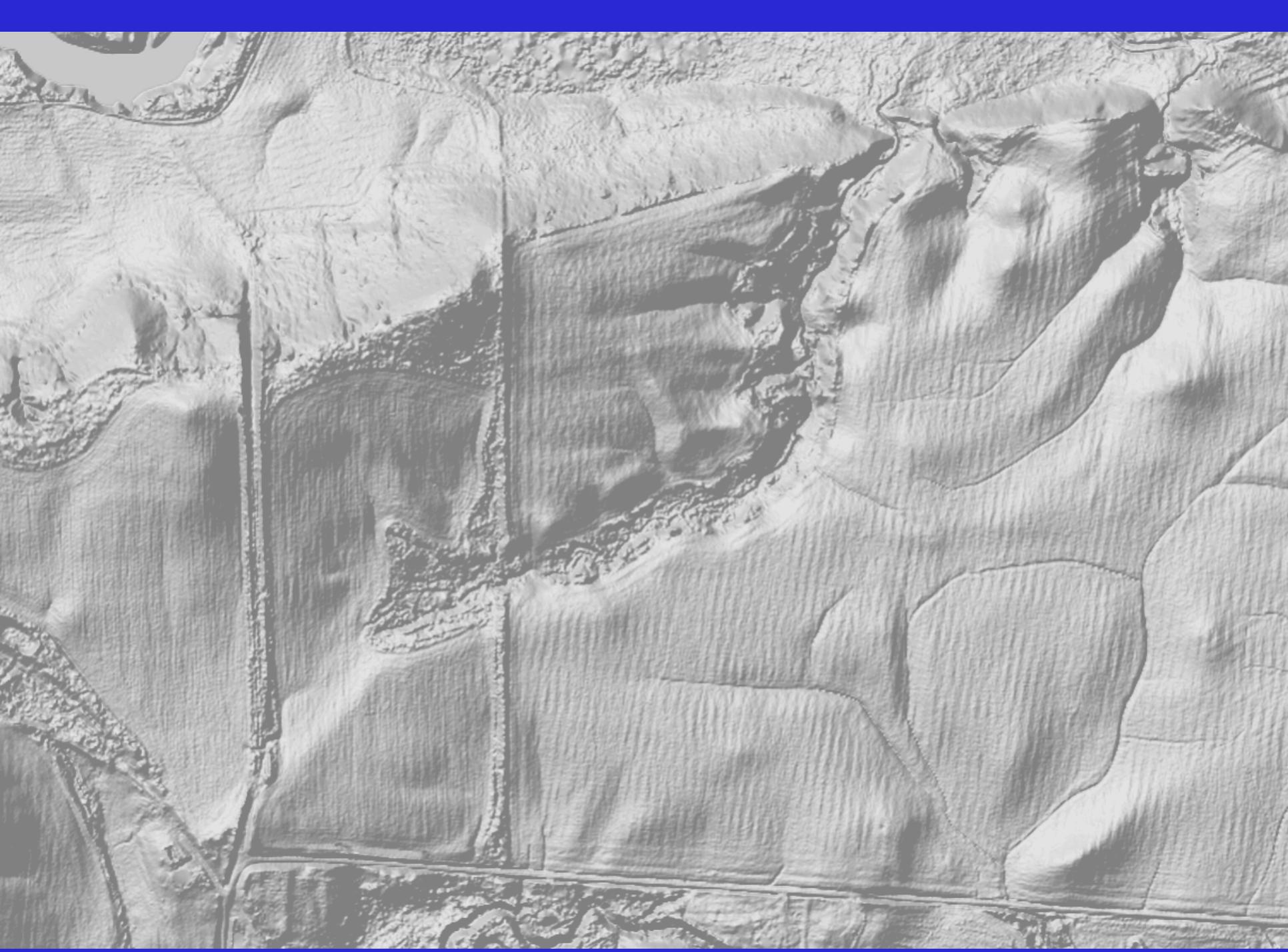


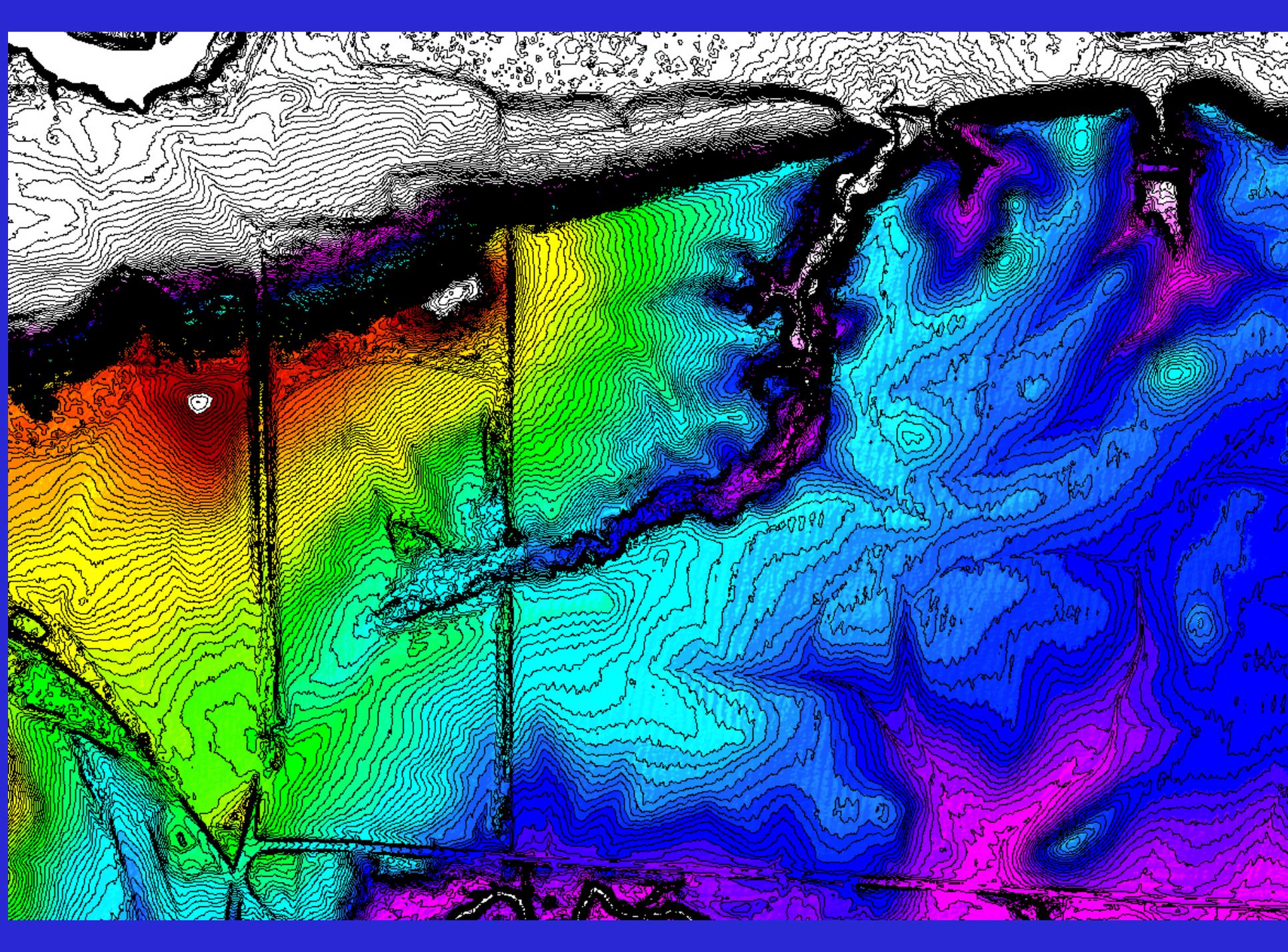




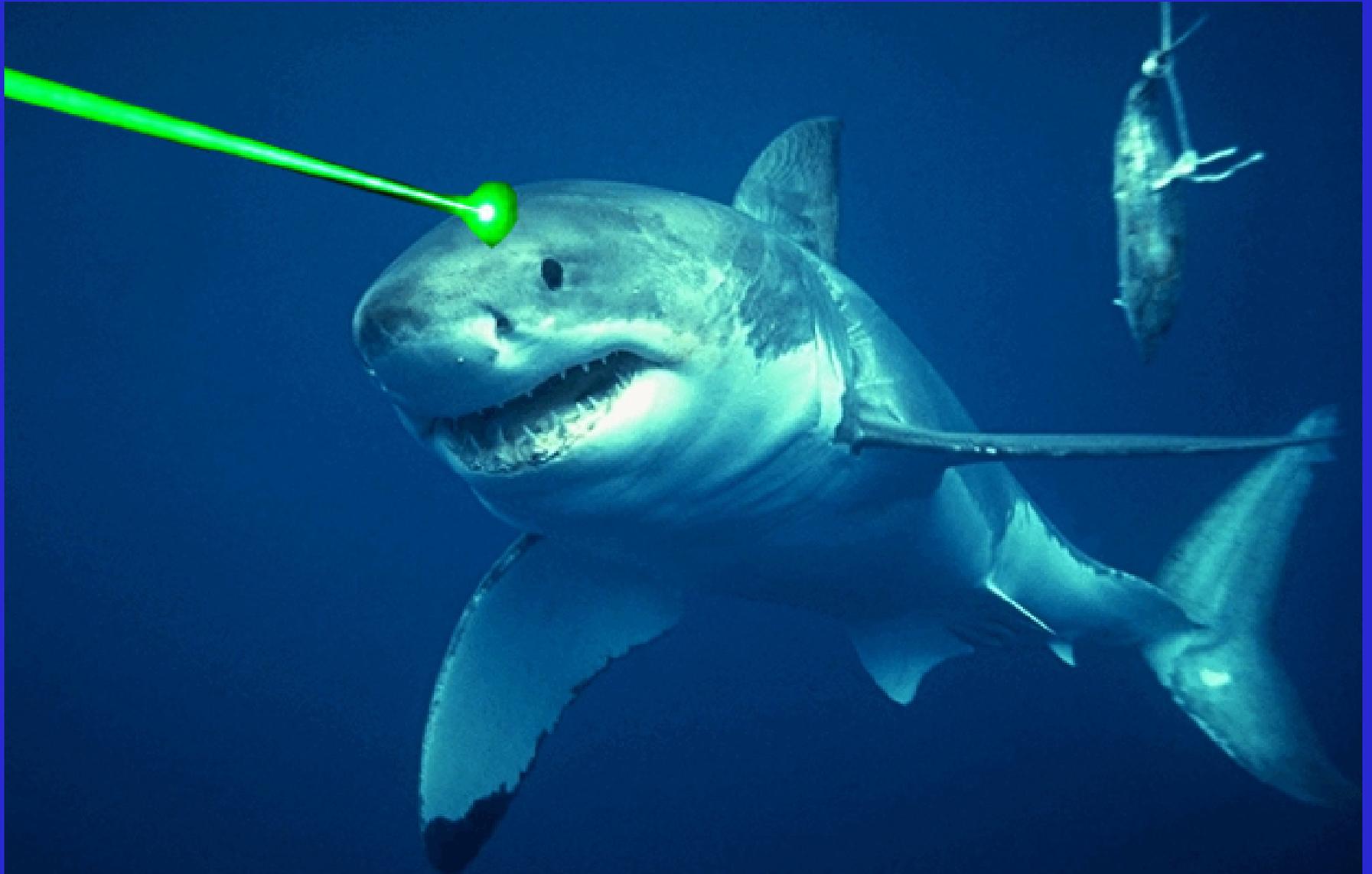


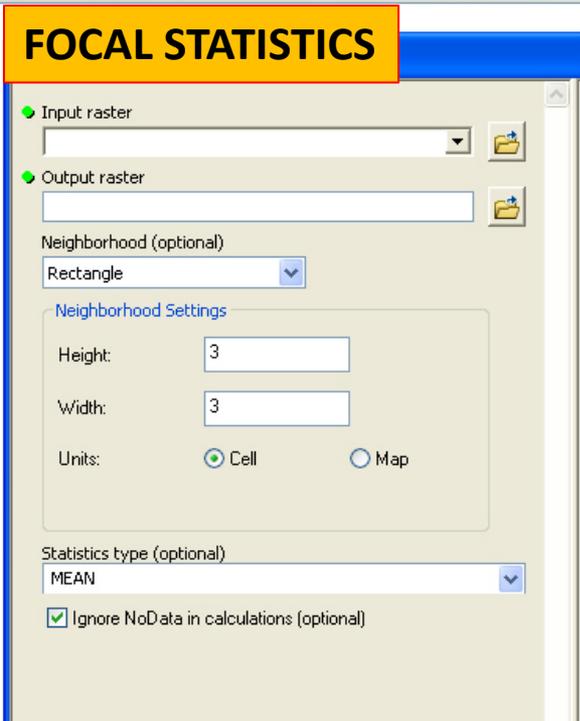
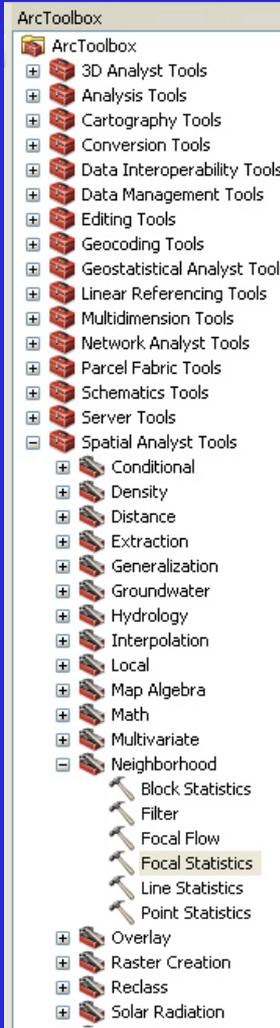






Still working on the shark-based data collection platform.





FOCAL STATISTICS

Statistics type (optional)

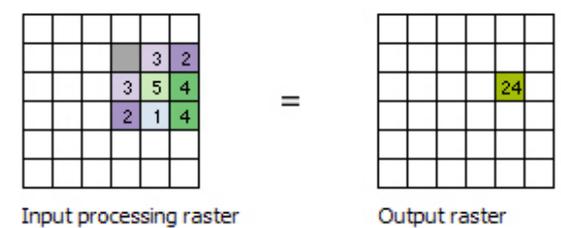
The statistic type to be calculated.

- MEAN — Calculates the mean (average value) of the cells in the neighborhood.
- MAJORITY — Calculates the majority (value that occurs most often) of the cells in the neighborhood.
- MAXIMUM — Calculates the maximum (largest value) of the cells in the neighborhood.
- MEDIAN — Calculates the median of the cells in the neighborhood.
- MINIMUM — Calculates the minimum (smallest value) of the cells in the neighborhood.
- MINORITY — Calculates the minority (value that occurs least often) of the cells in the neighborhood.
- RANGE — Calculates the range (difference between largest and smallest value) of the cells in the neighborhood.
- STD — Calculates the standard deviation of the cells in the neighborhood.
- SUM — Calculates the sum (total of all values) of the cells in the neighborhood.
- VARIETY — Calculates the variety (the number of unique values) of the cells in the neighborhood.

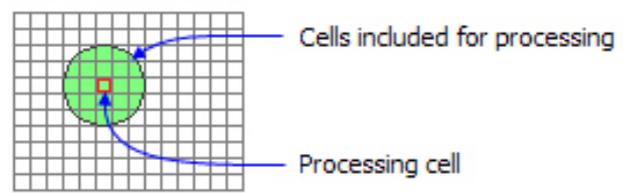
The default statistic type is MEAN.

Example

To illustrate the neighborhood processing for Focal Statistics specified. The sum of the values of the neighboring cells (3 + raster in the same location as the processing cell in the input

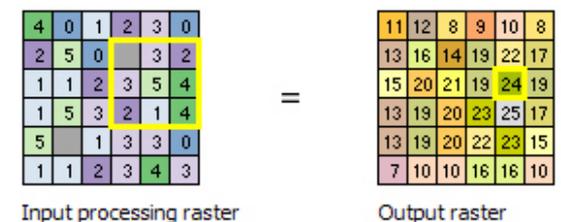


- Circle
 - A circle neighborhood is created by specifying a radius.
 - The radius is identified in cell or map unit in the processing neighborhood. First, the radius value is rounded down and one row operation.
 - The default circle neighborhood radius is 3.
 - An example illustration of a circle neighborhood is shown below.



Focal statistics with circle neighborhood illustration

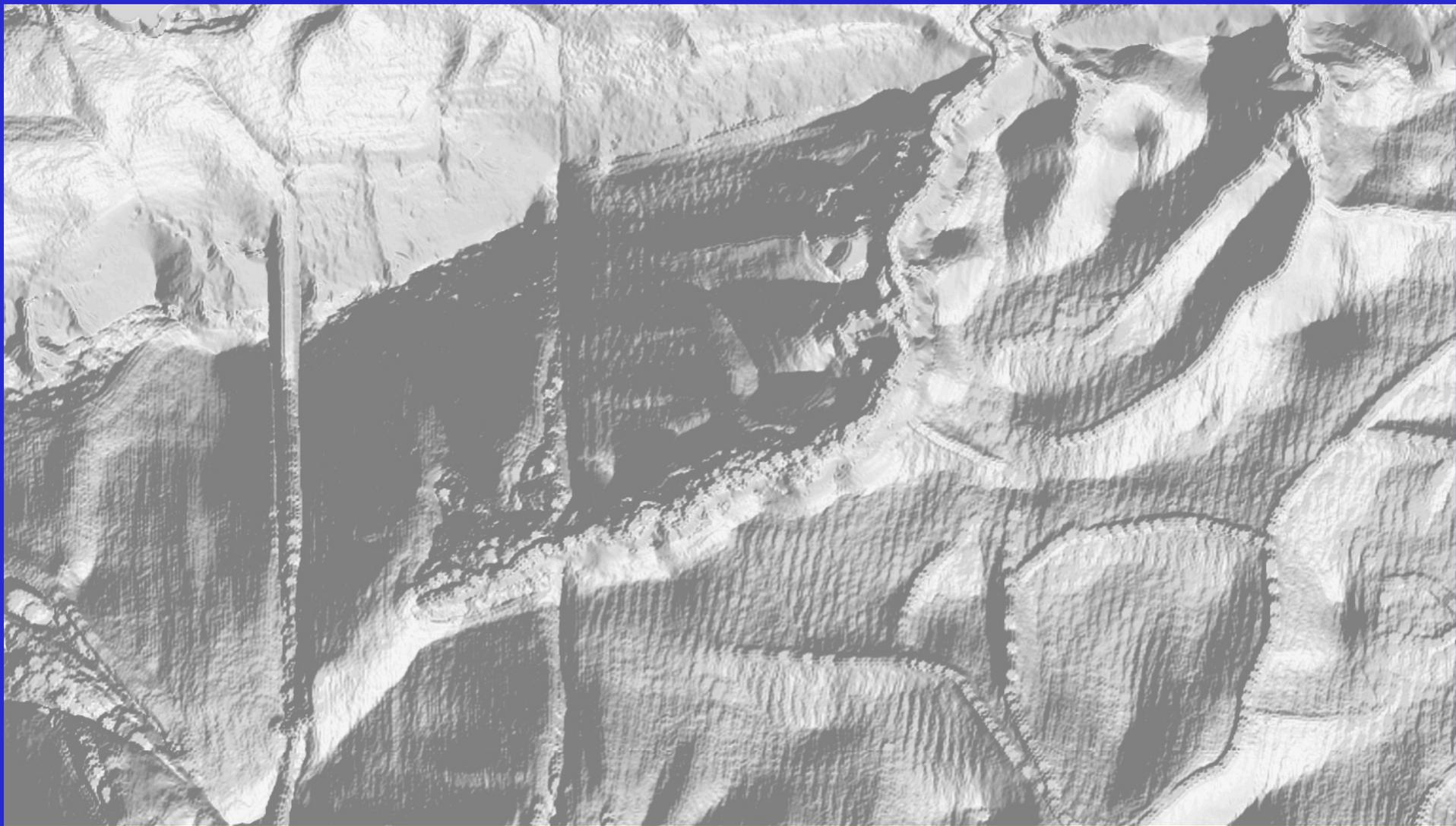
The above diagram demonstrates how the calculations are performed. The input raster is processed to identify the same processing cell and neighborhood as in the

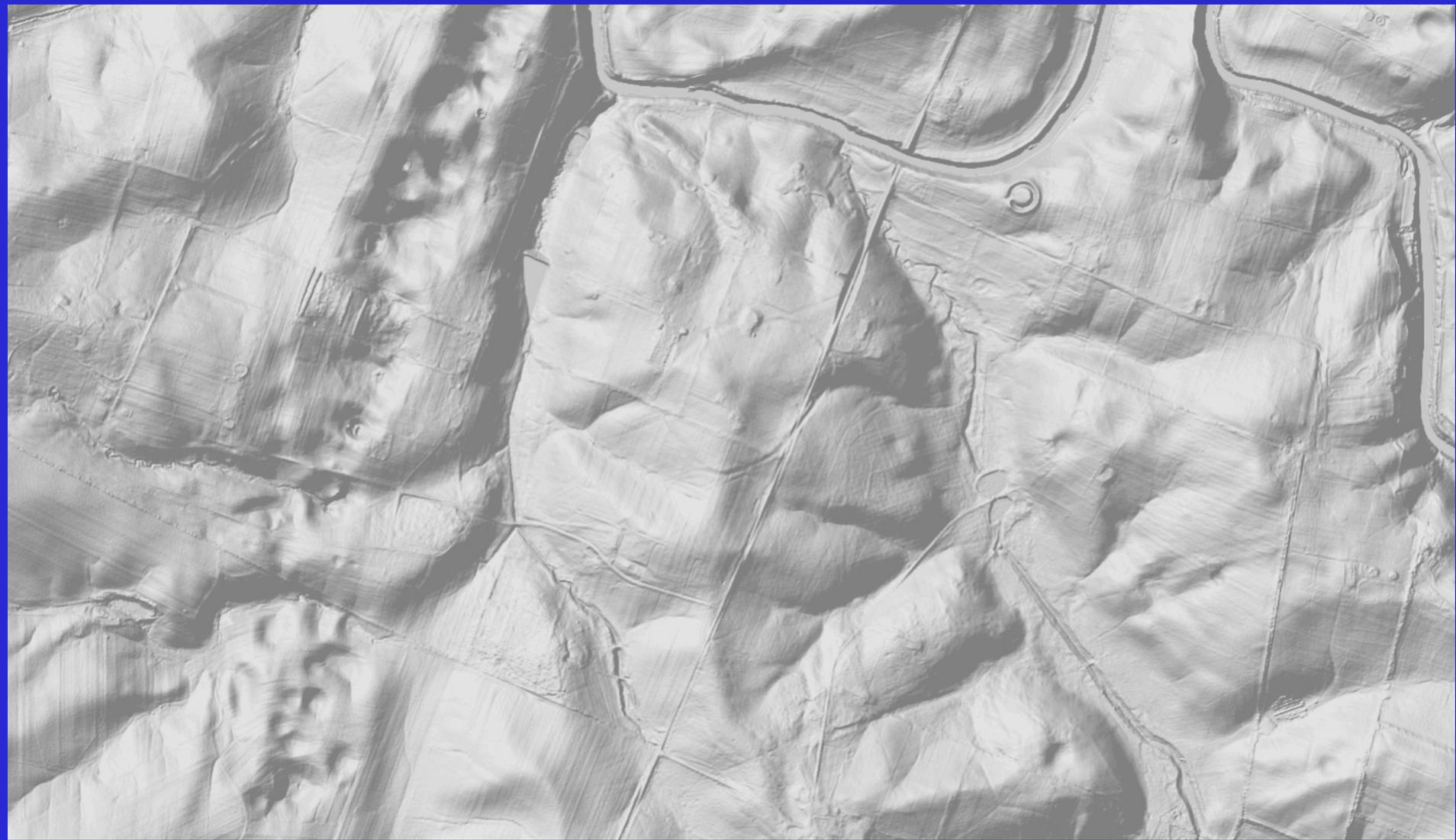


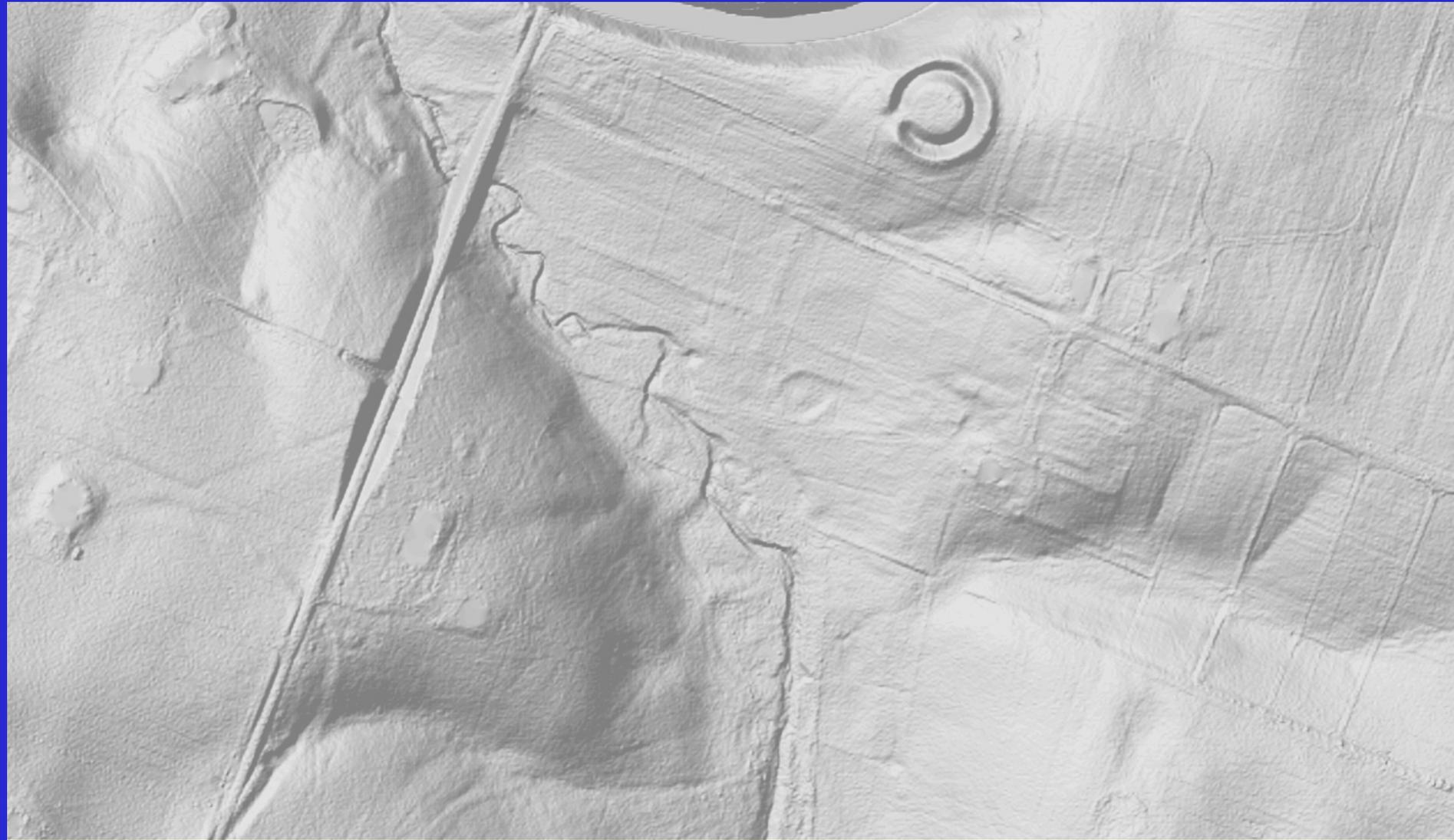
Maximum Height

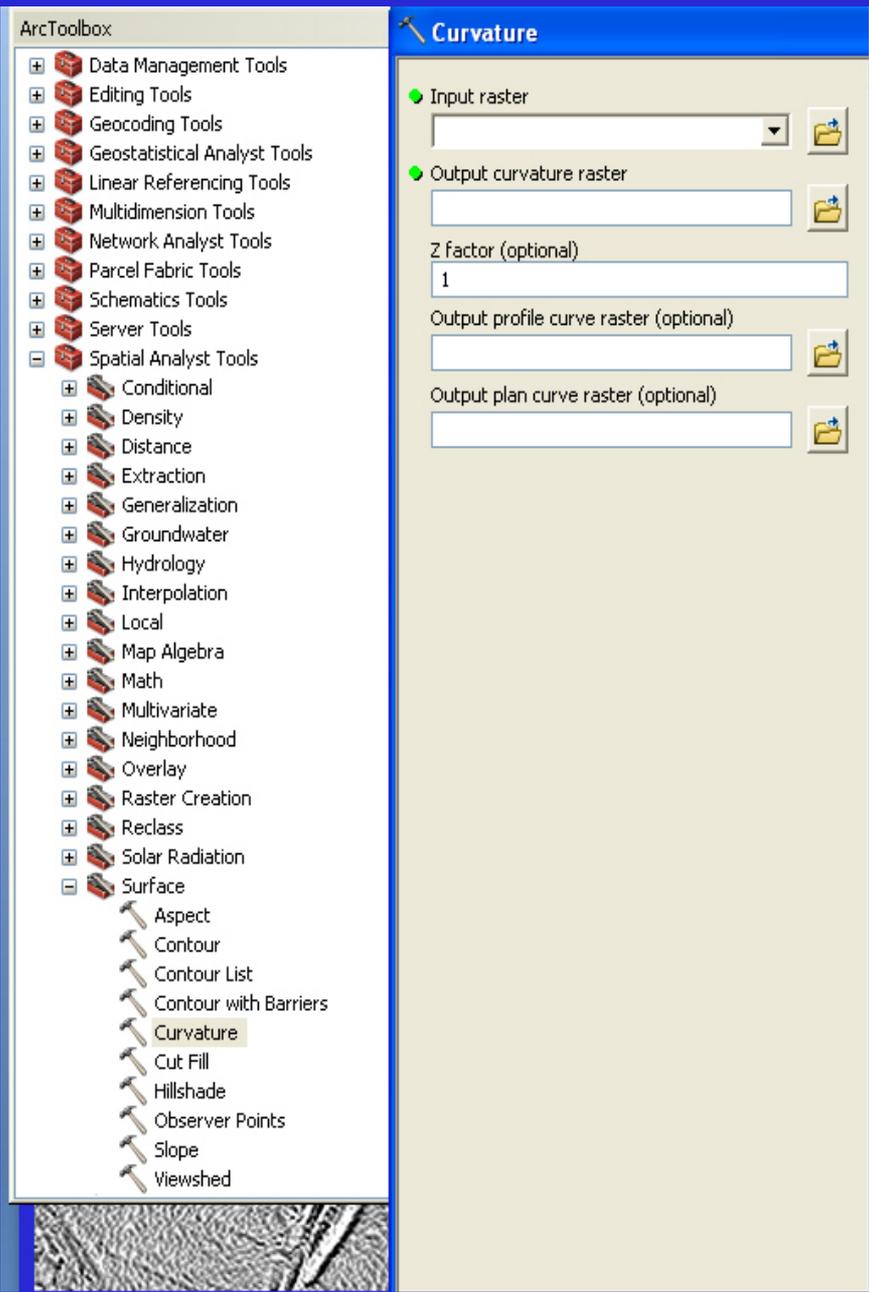


Minimum Height



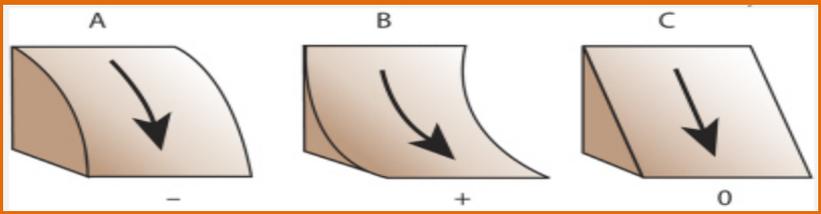




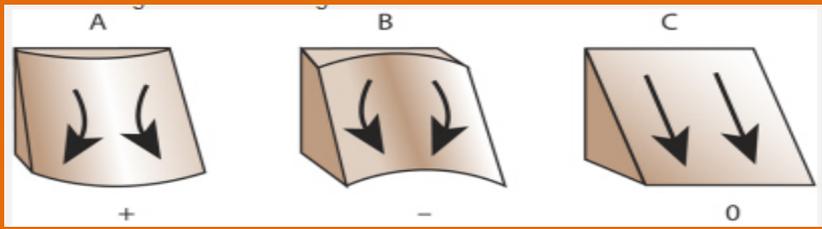


Curvature is the second derivative of the surface.

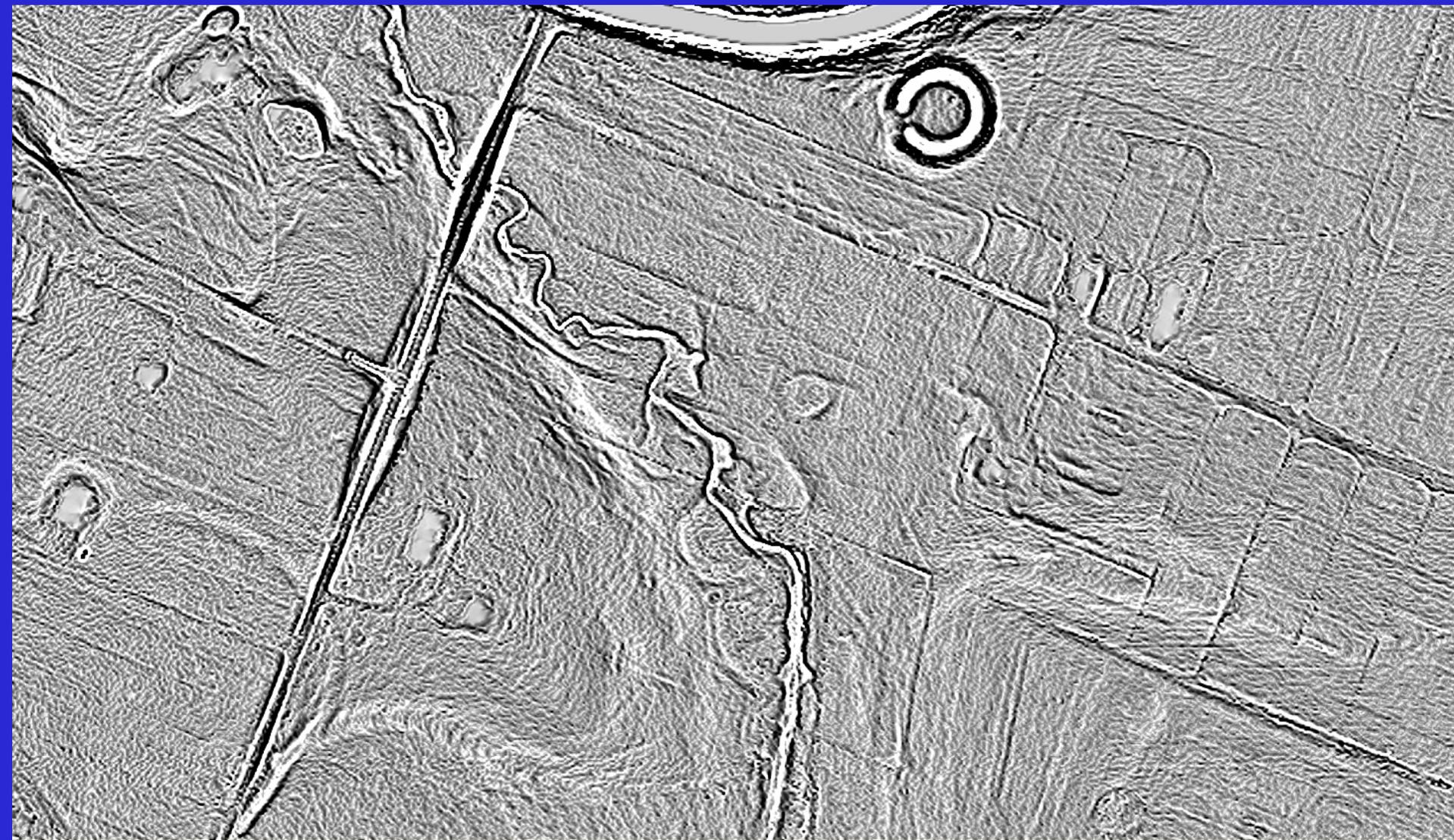
Profile curvature is in the direction of the maximum slope.



Plan curvature is perpendicular to the direction of the maximum slope.



PROFILE CURVATURE

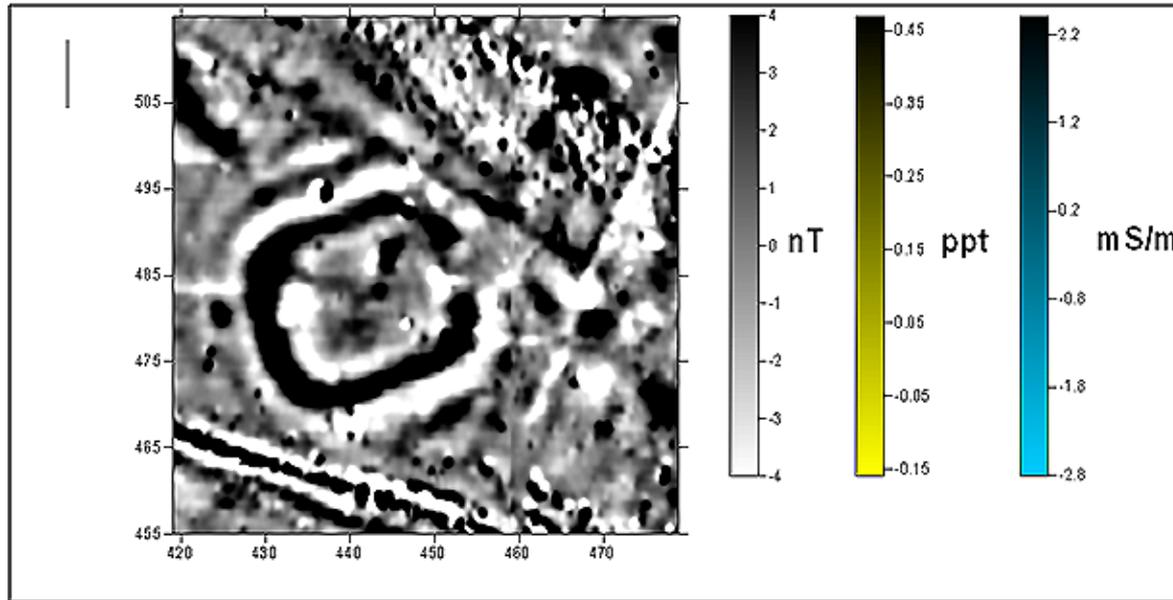


Geophysical Survey of the Winchester Farm Enclosure.

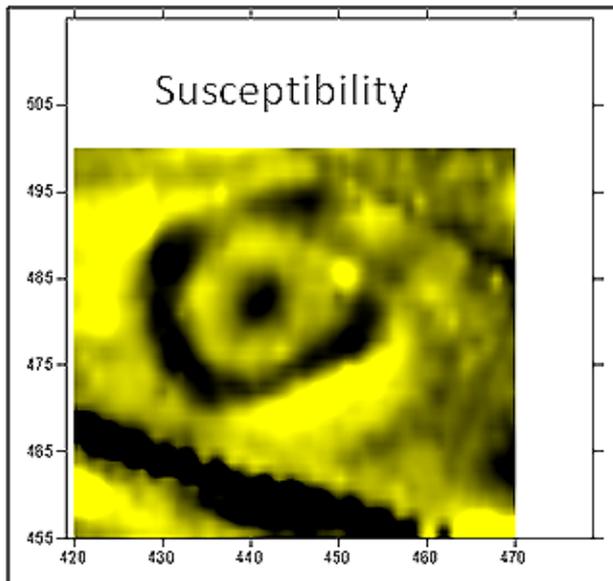


2010 Geophysical Survey Results

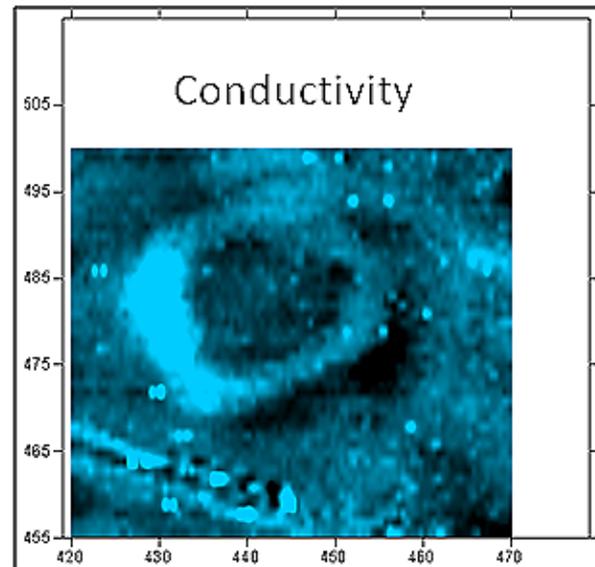
Gradiometer



Susceptibility

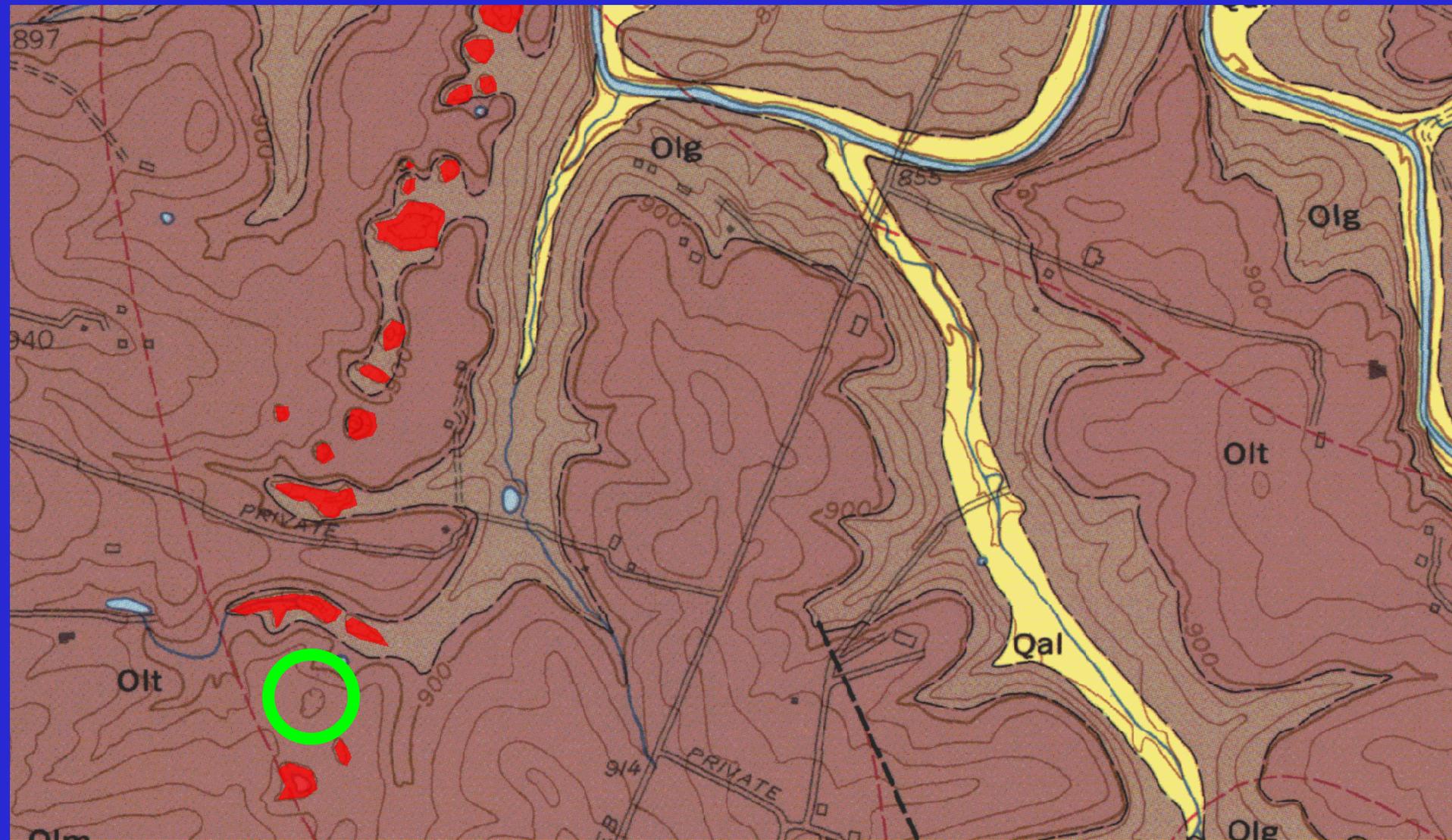


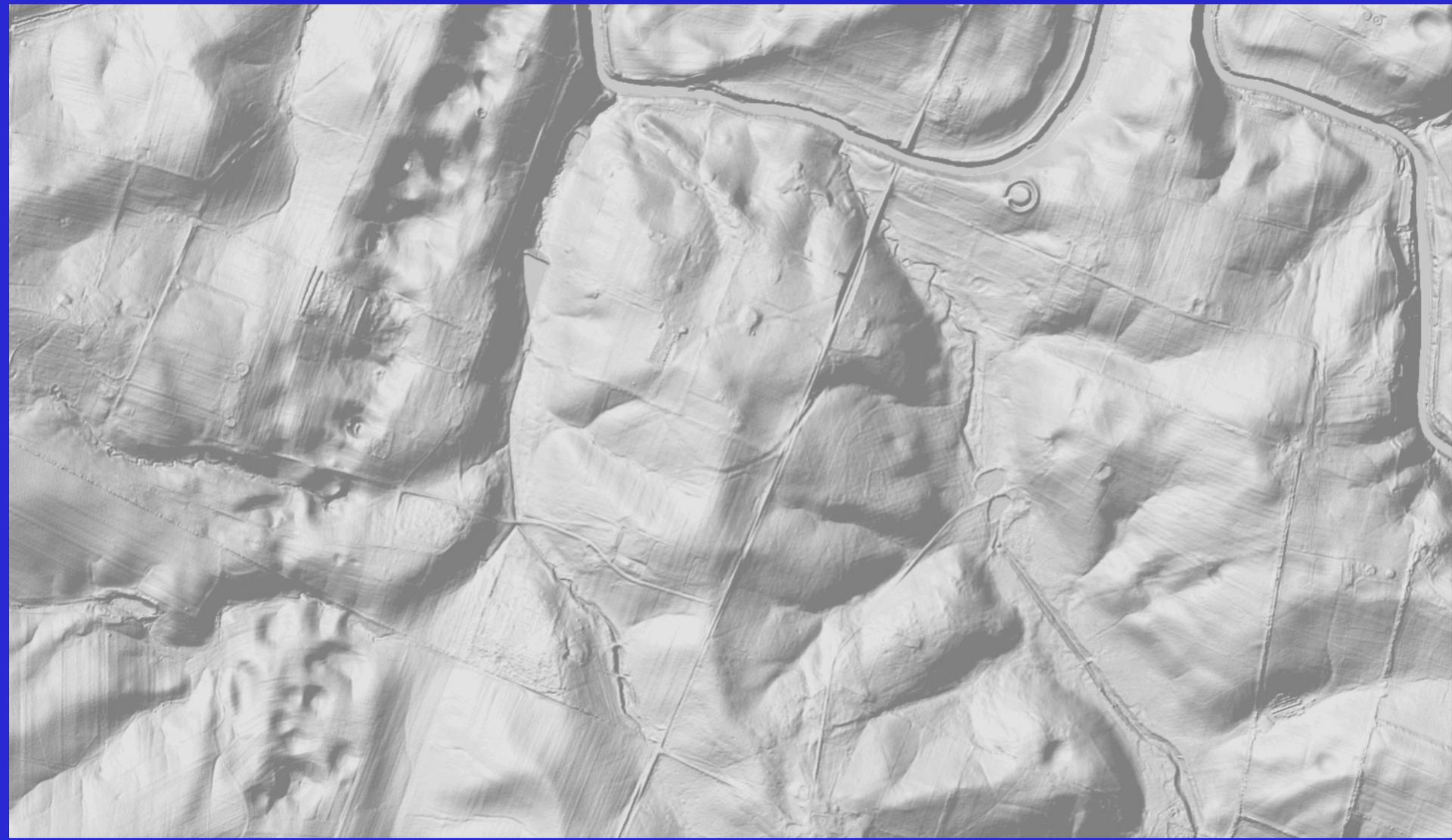
Conductivity



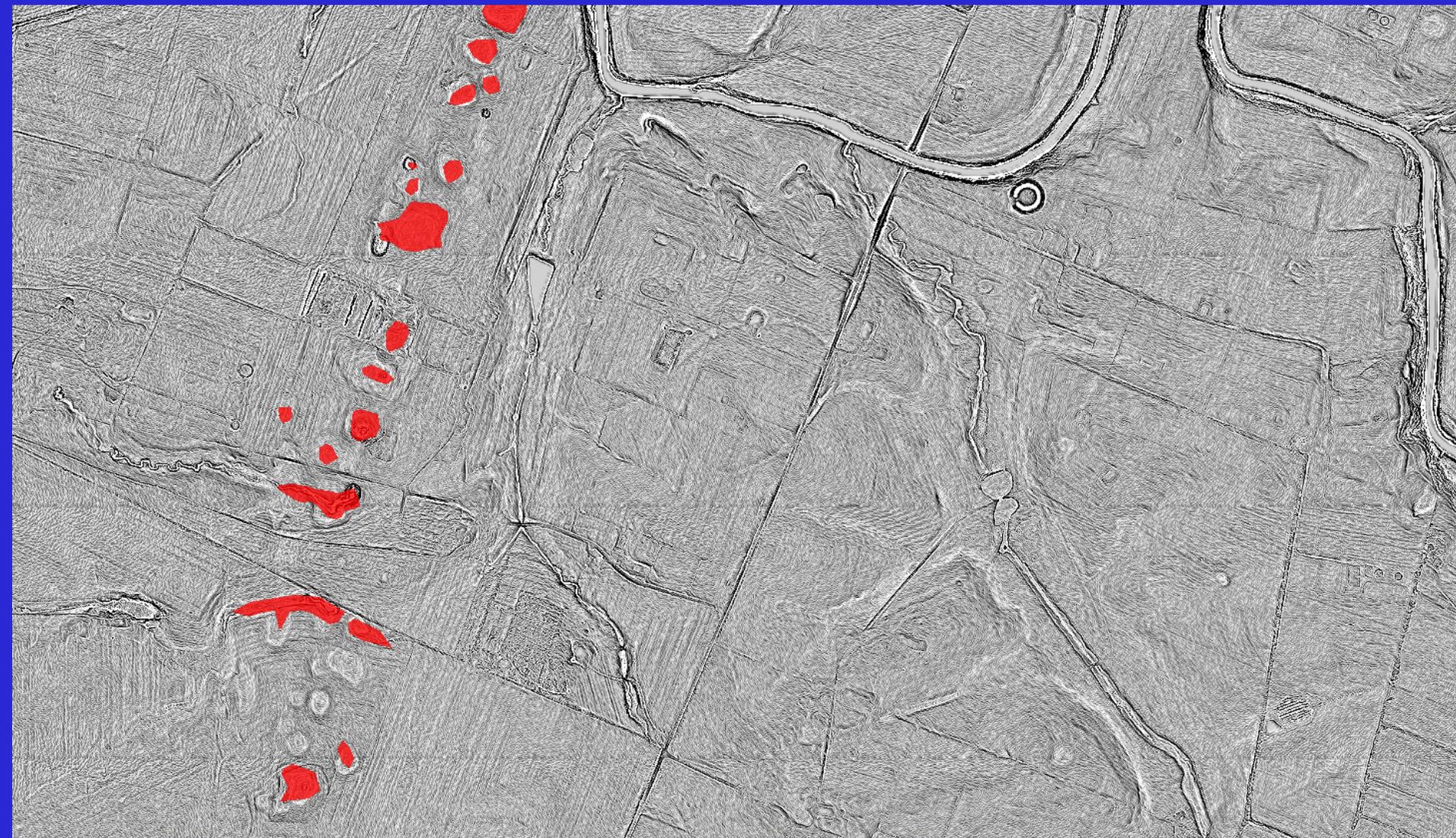


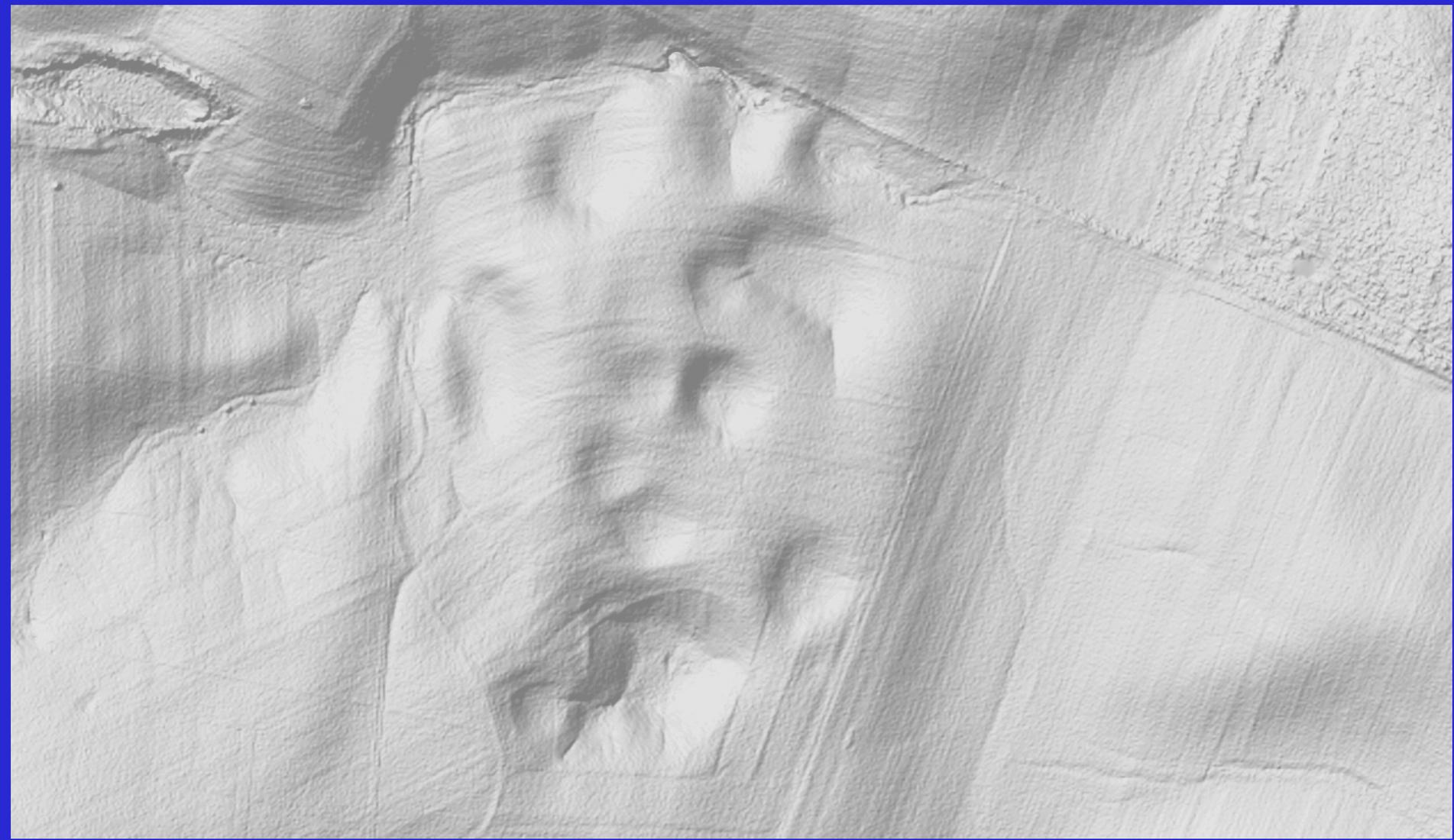
What about sinkholes?

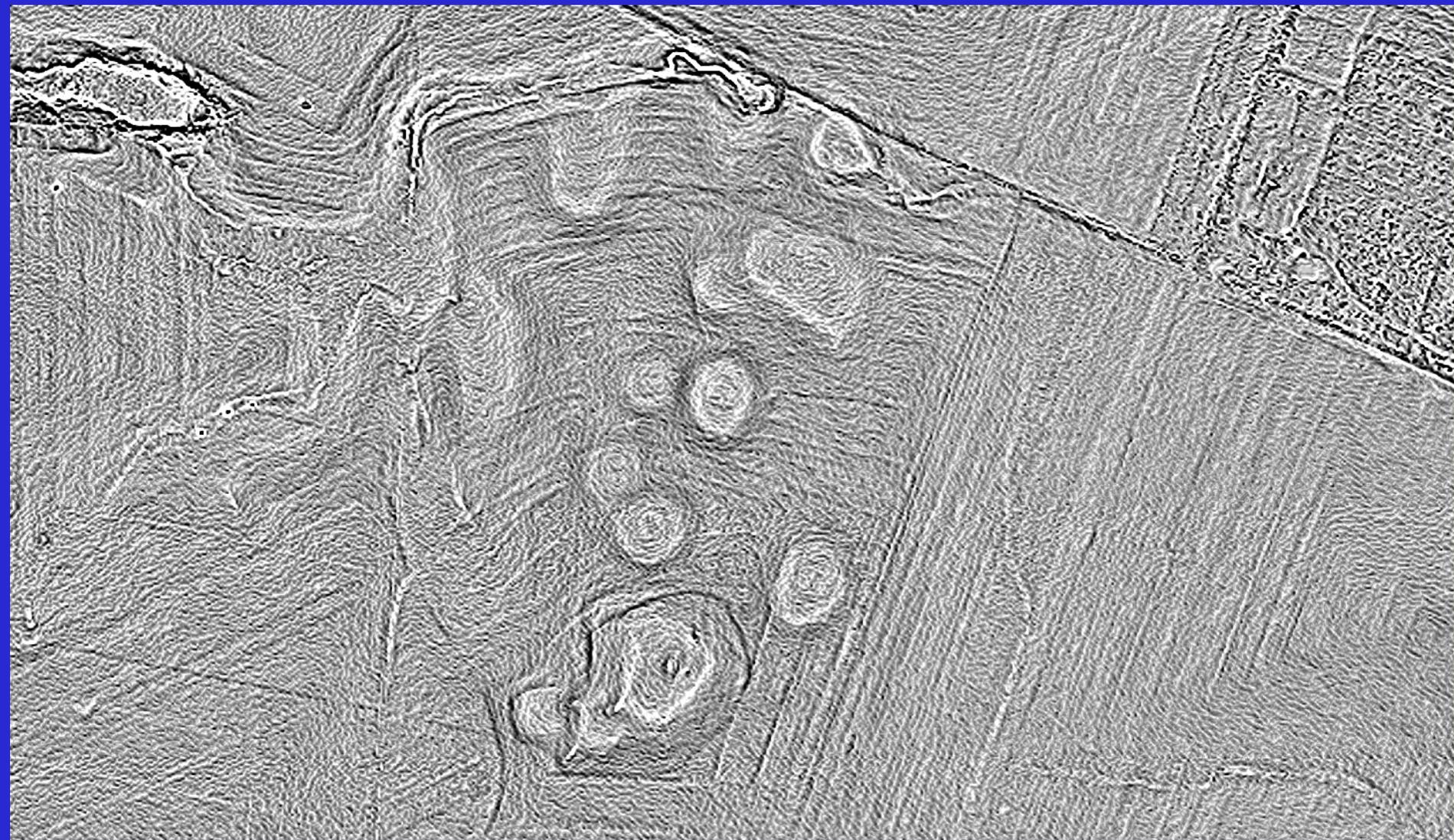














Archaeology

Floodplains

Sinkholes

Biology

Wetlands

Noise barriers

Learn and Think

Talk and Share



Keep a note pad handy.

**Consider new or bigger applications,
not just maps.**

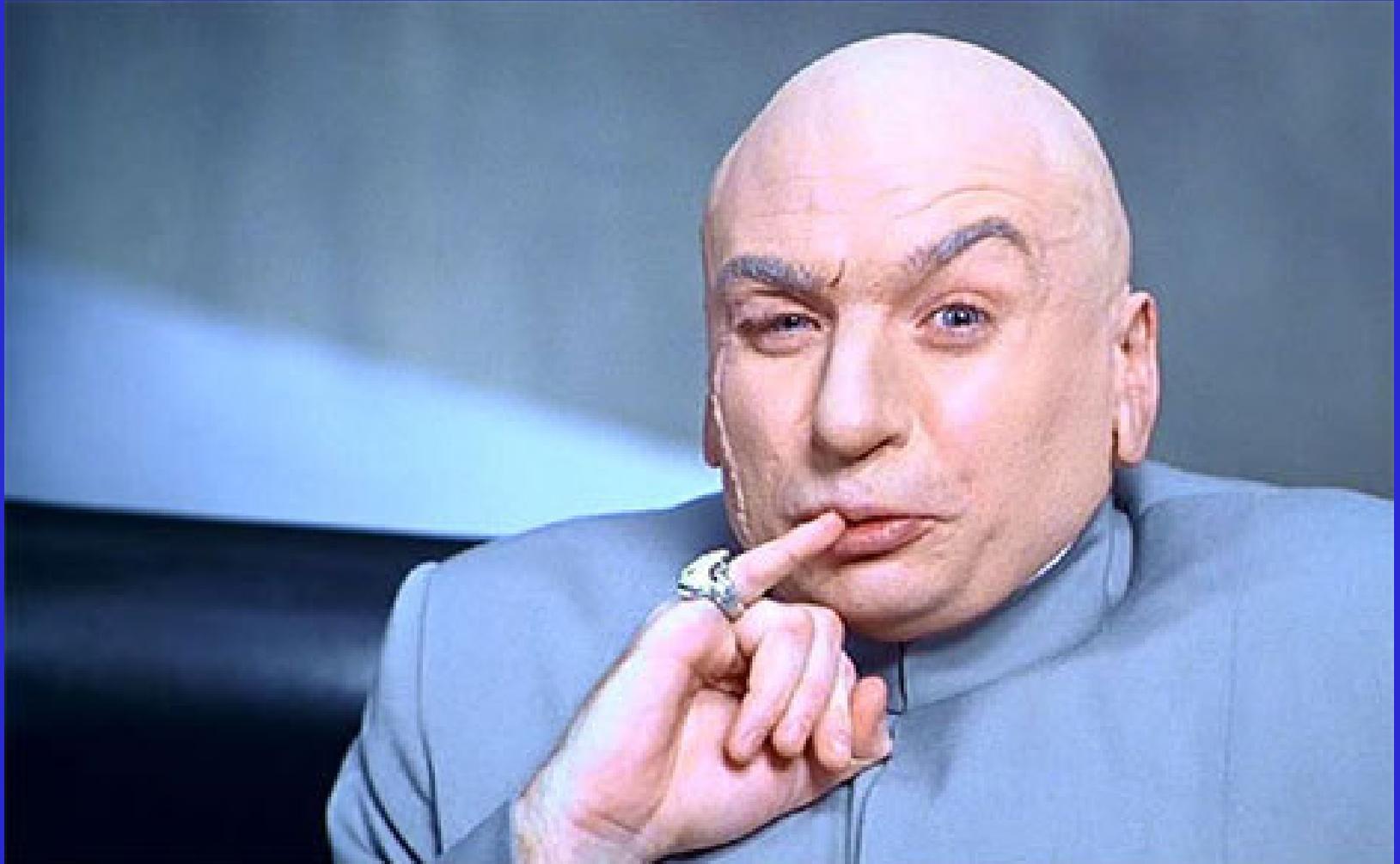
**Take the Arcgis Toolbox out for a spin
and push the limits.**

**Ask for help, make the heads of the
GIS support staff hurt.**



Doughnuts mend fences

So what ELSE can we do?



Thank you!