



Uncovering the Ancient Mound Builders Using Open Data and FOSS Software

Calvin J. Hamilton - publisher@solarviews.com



Watson Brake



Poverty Point



Miamisburg Mound, Ohio – Adena

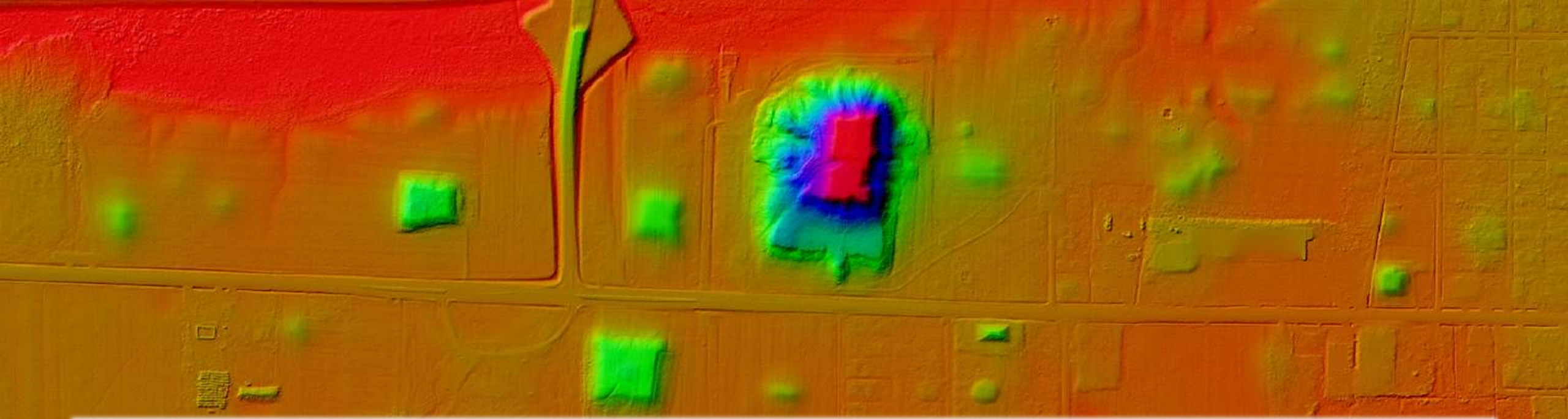


Hopewell Culture National Park, Ohio



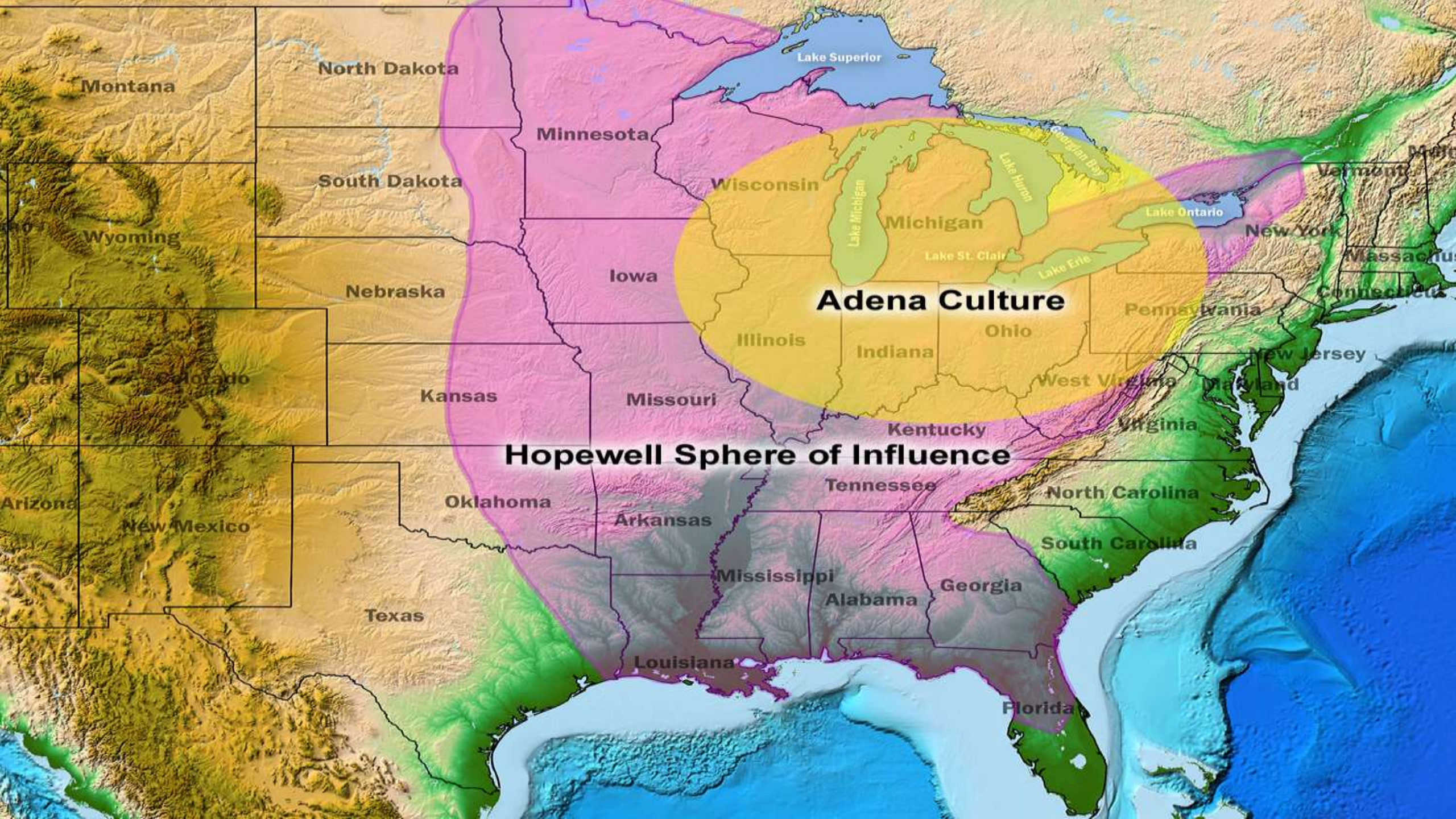






Mound Building Cultures

- Adena Culture / Early Woodland
 - 1500 BC to 300 BC
- Hopewell / Middle Woodland
 - 300 BC to 400 AD
- Mississippian Cultures
 - 800 AD to 1600 AD



Montana

North Dakota

Lake Superior

Minnesota

South Dakota

Wisconsin

Wyoming

Michigan

Lake Michigan

Lake Huron

Lake Ontario

Nebraska

Iowa

Lake St. Clair

Lake Erie

Adena Culture

Illinois

Indiana

Ohio

Pennsylvania

Utah

Colorado

Kansas

Missouri

West Virginia

Maryland

New Jersey

Connecticut

Hopewell Sphere of Influence

Kentucky

Virginia

Arizona

New Mexico

Oklahoma

Arkansas

Tennessee

North Carolina

South Carolina

Texas

Mississippi

Alabama

Georgia

Louisiana

Florida

Massachusetts

Vermont

MISSISSIPPIAN AND RELATED CULTURES



Courtesy Herb Roe



ANCIENT MONUMENTS
OF
THE MISSISSIPPI VALLEY:

COMPRISING THE RESULTS OF
EXTENSIVE ORIGINAL SURVEYS AND EXPLORATIONS.

BY
E. G. SQUIER, A.M., AND E. H. DAVIS, M.D.

ACCEPTED FOR PUBLICATION
BY THE SMITHSONIAN INSTITUTION,
JUNE, 1847.



Octagon Earth Works

The Great Circle Earthworks

OHIO

INDIANA

Fortified Hilltop

Fort Ancient

Cedar Bank Earthworks

Hopeton Earth Works

Mound Cemetery

Fortified Hill Works

Hopewell Mound Group

Ancient Work Near Bournville

Miami Fort

Seip Mound

Fort Hill

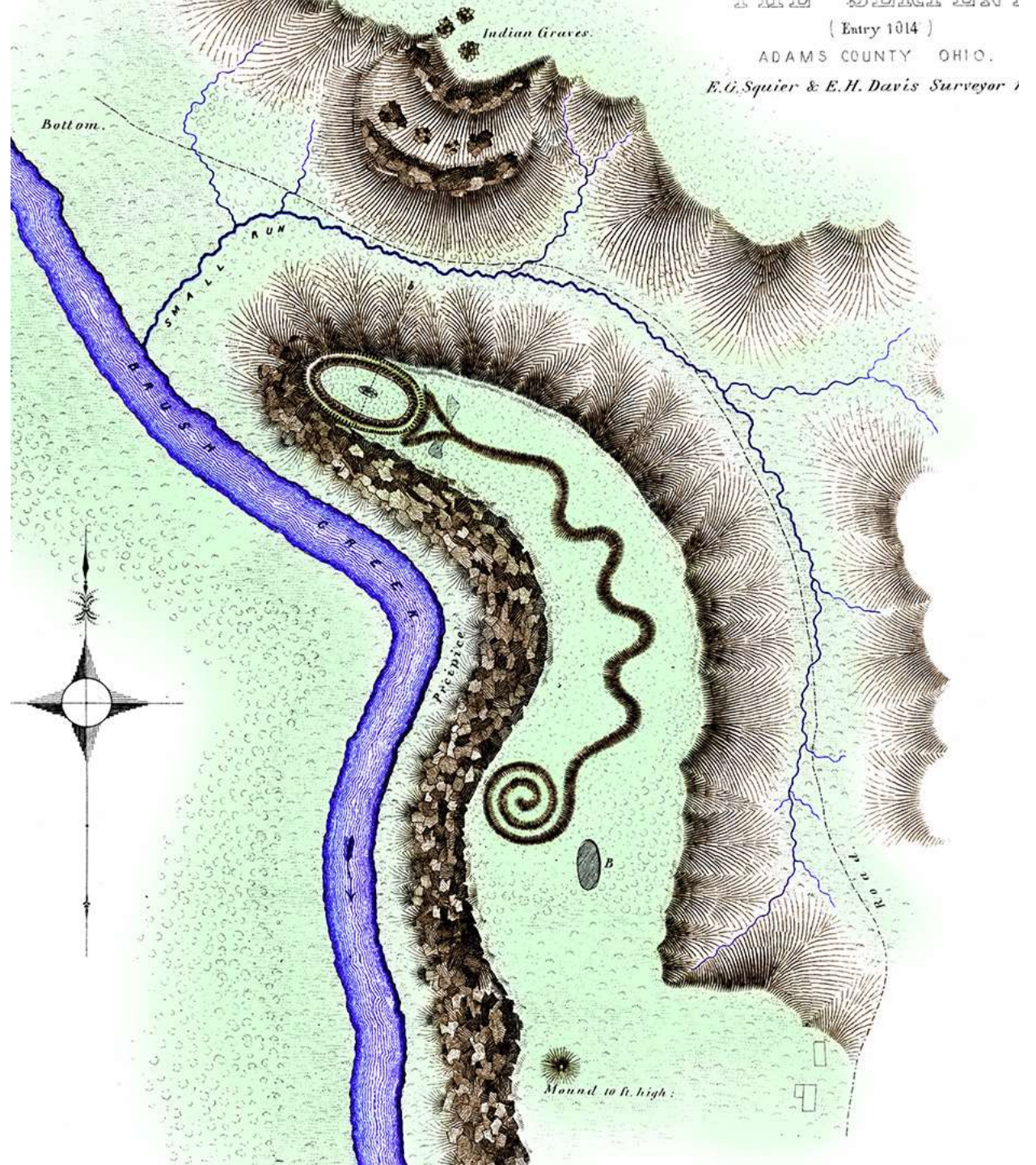
Serpent Mound

WEST VIRGINIA

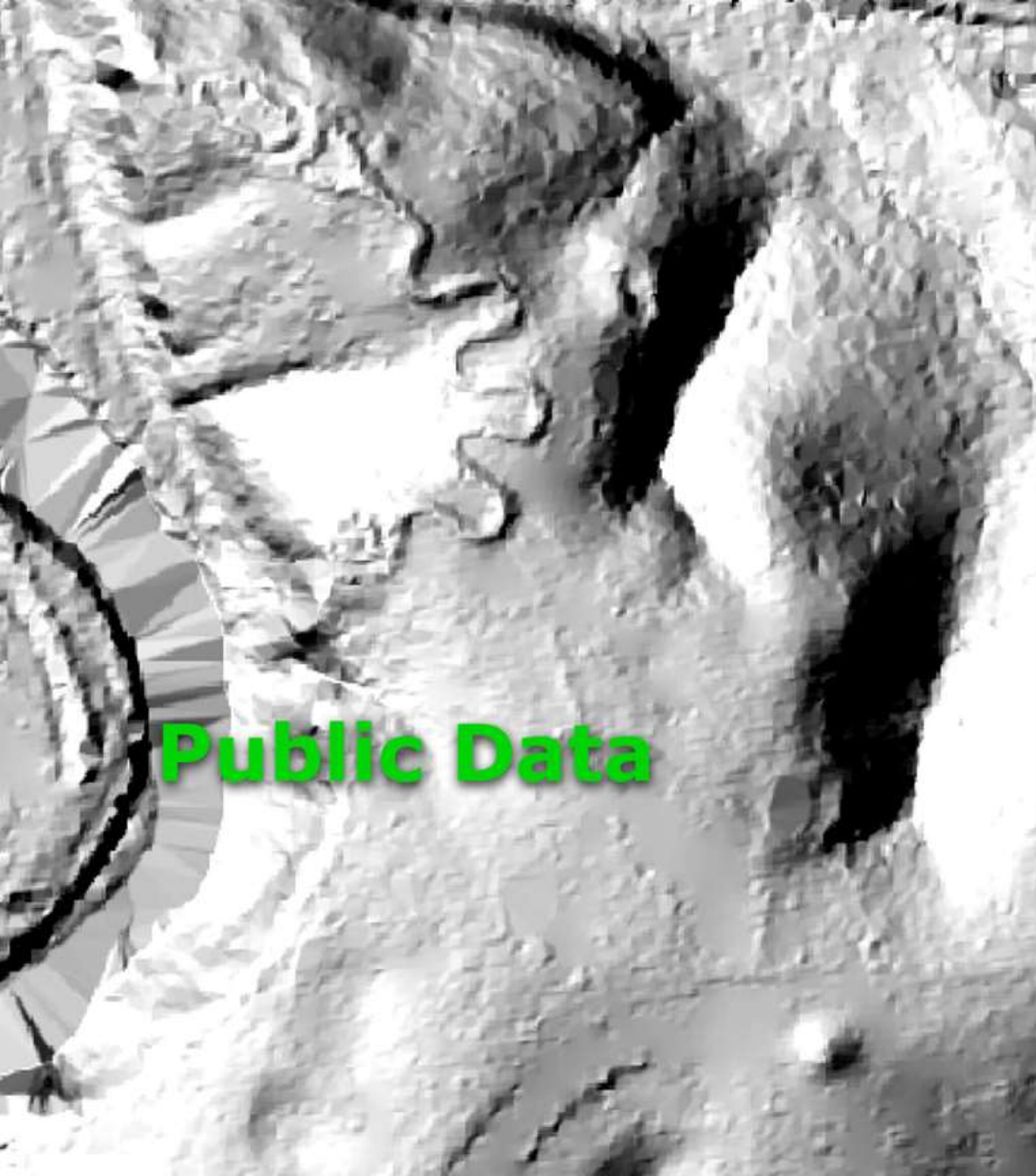
KENTUCKY

Serpent Mound, Ohio

- Effigy mound.
- Surveyed by E. G. Squier and F. H. Davis in 1846.
- 1,348 foot long.
- 3 feet high.







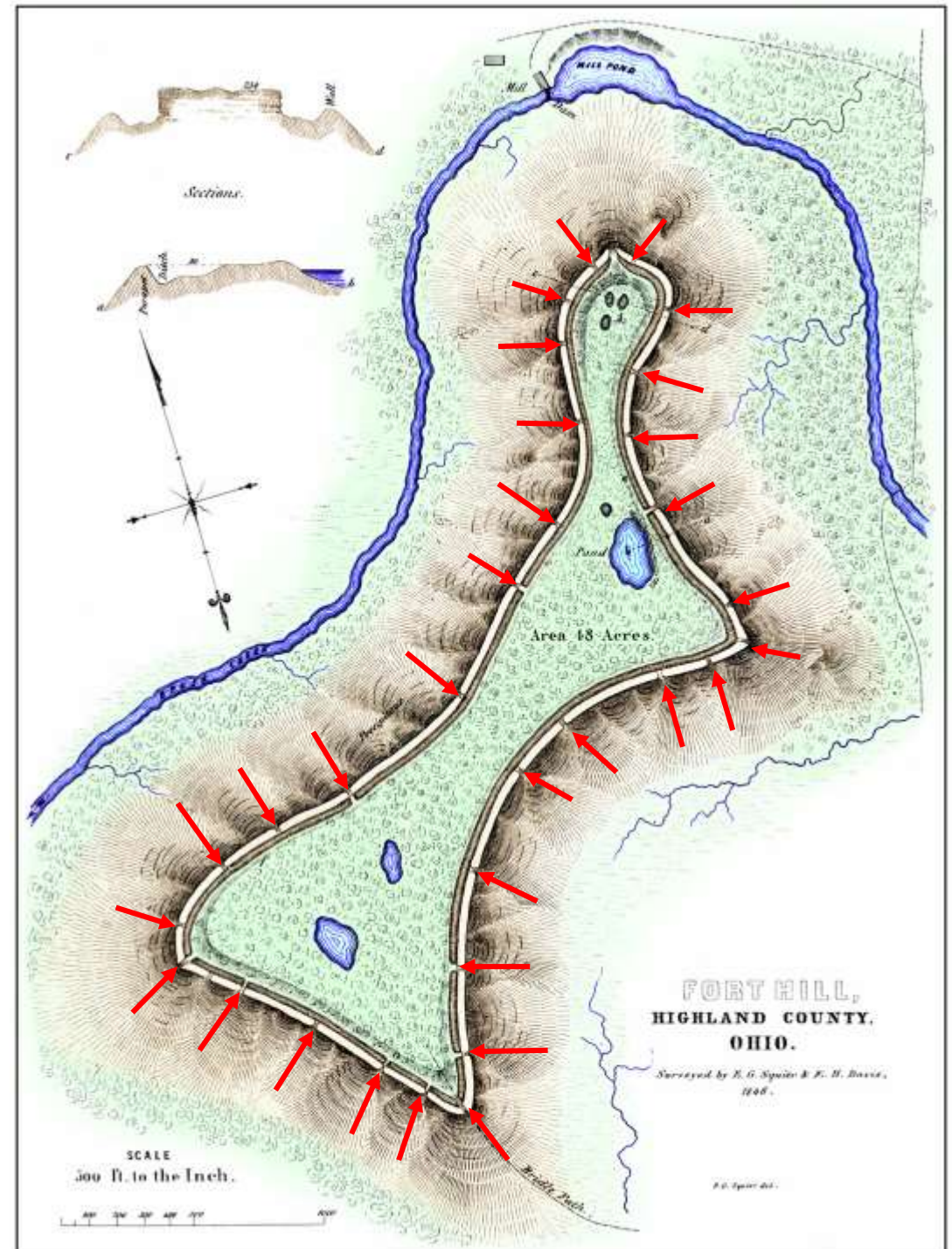
Public Data



Commercial Data

Fort Hill, Ohio

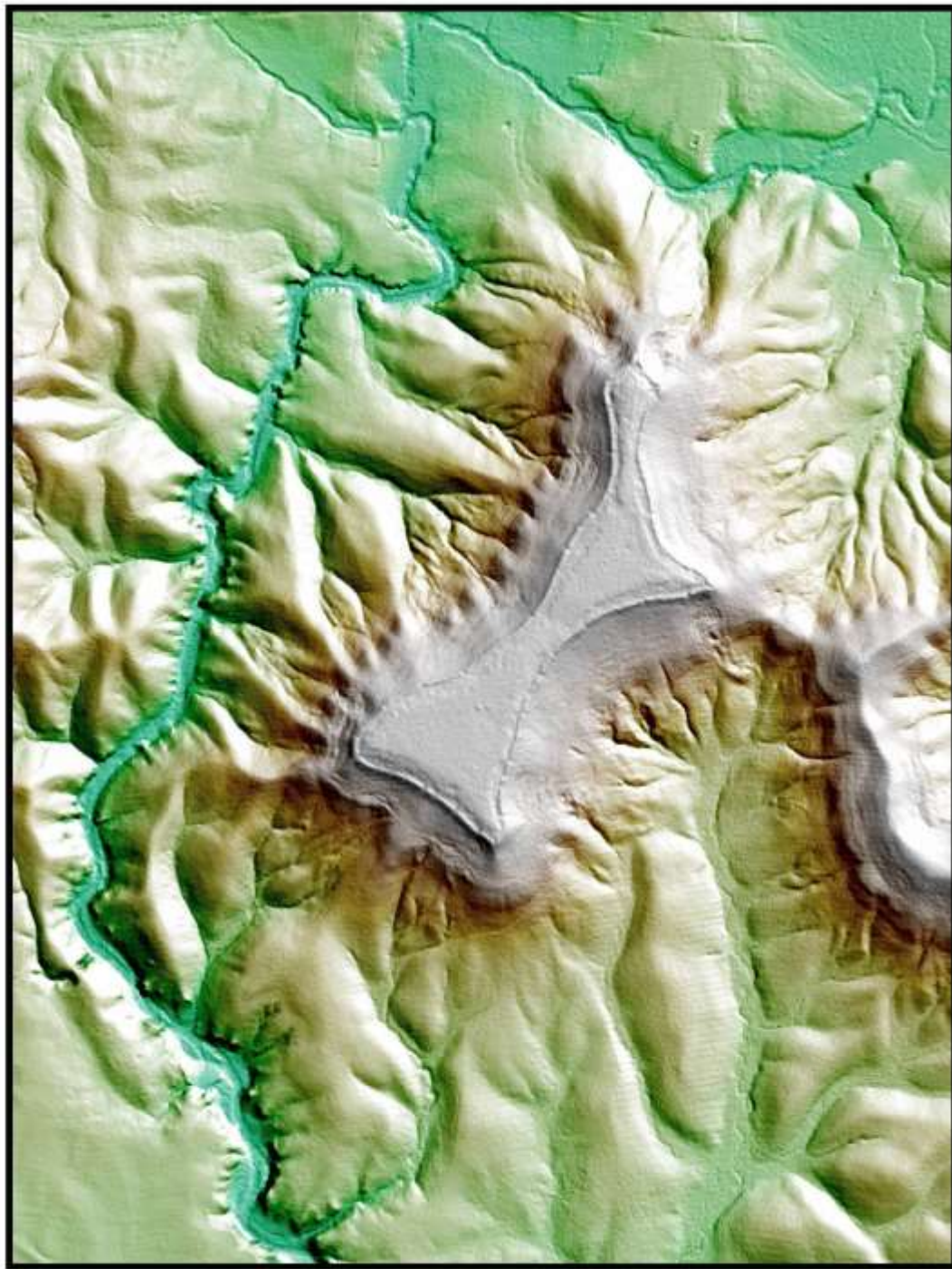
- Surveyed by E. G. Squier and F. H. Davis in 1846.
- 40 Acre enclosure.
- 1.5 miles of earthen walls.
- Walls 6-15 feet high.

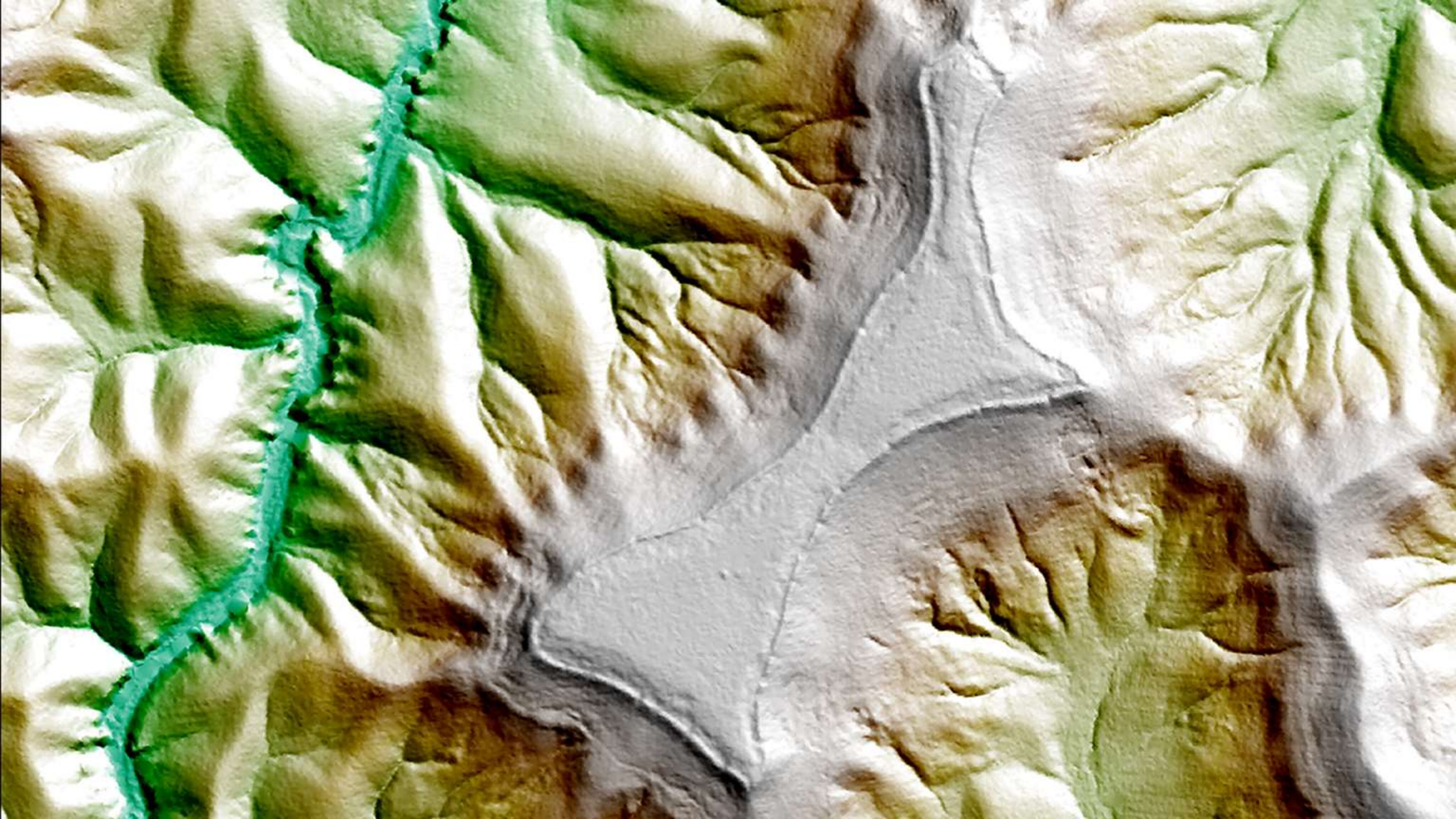


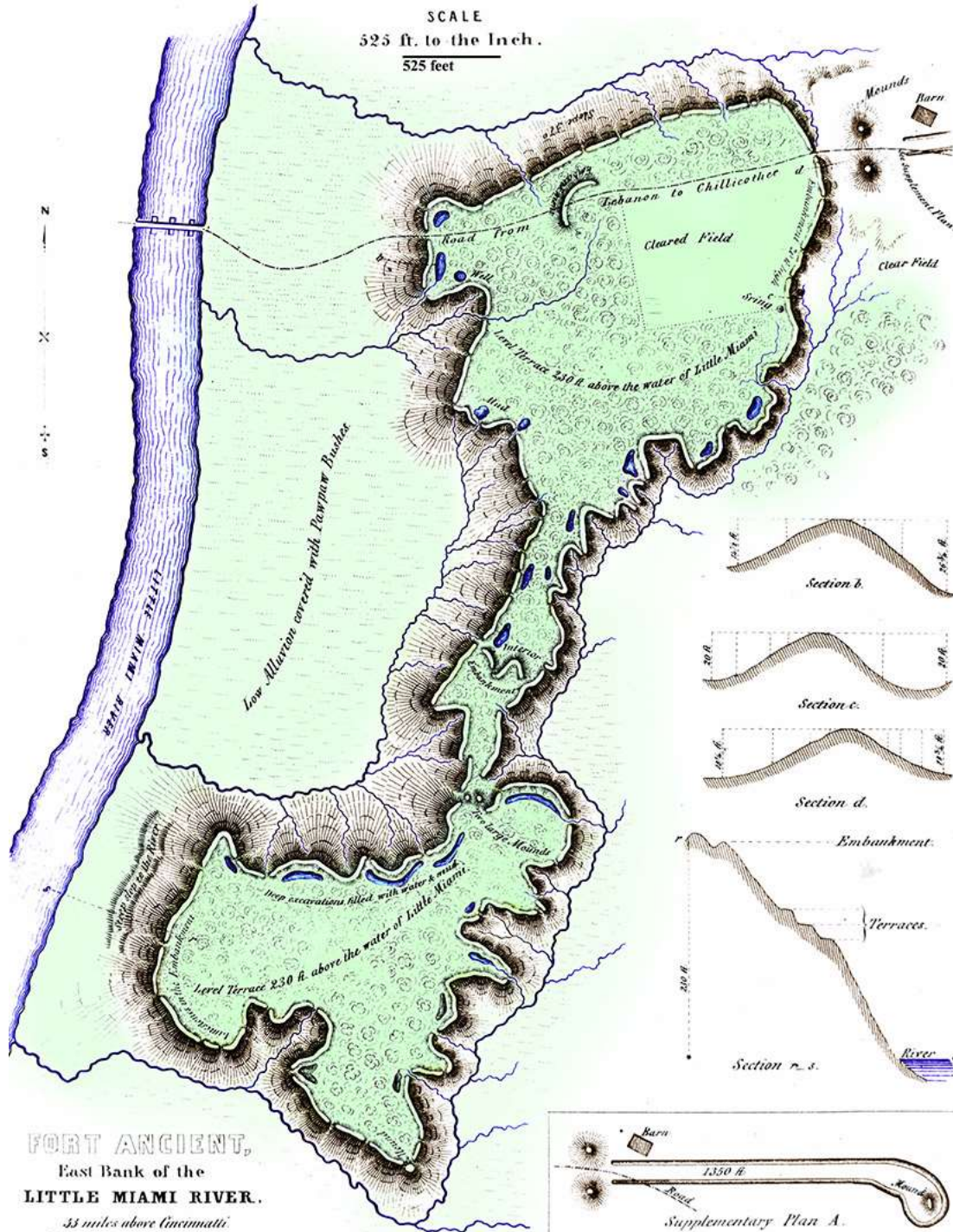








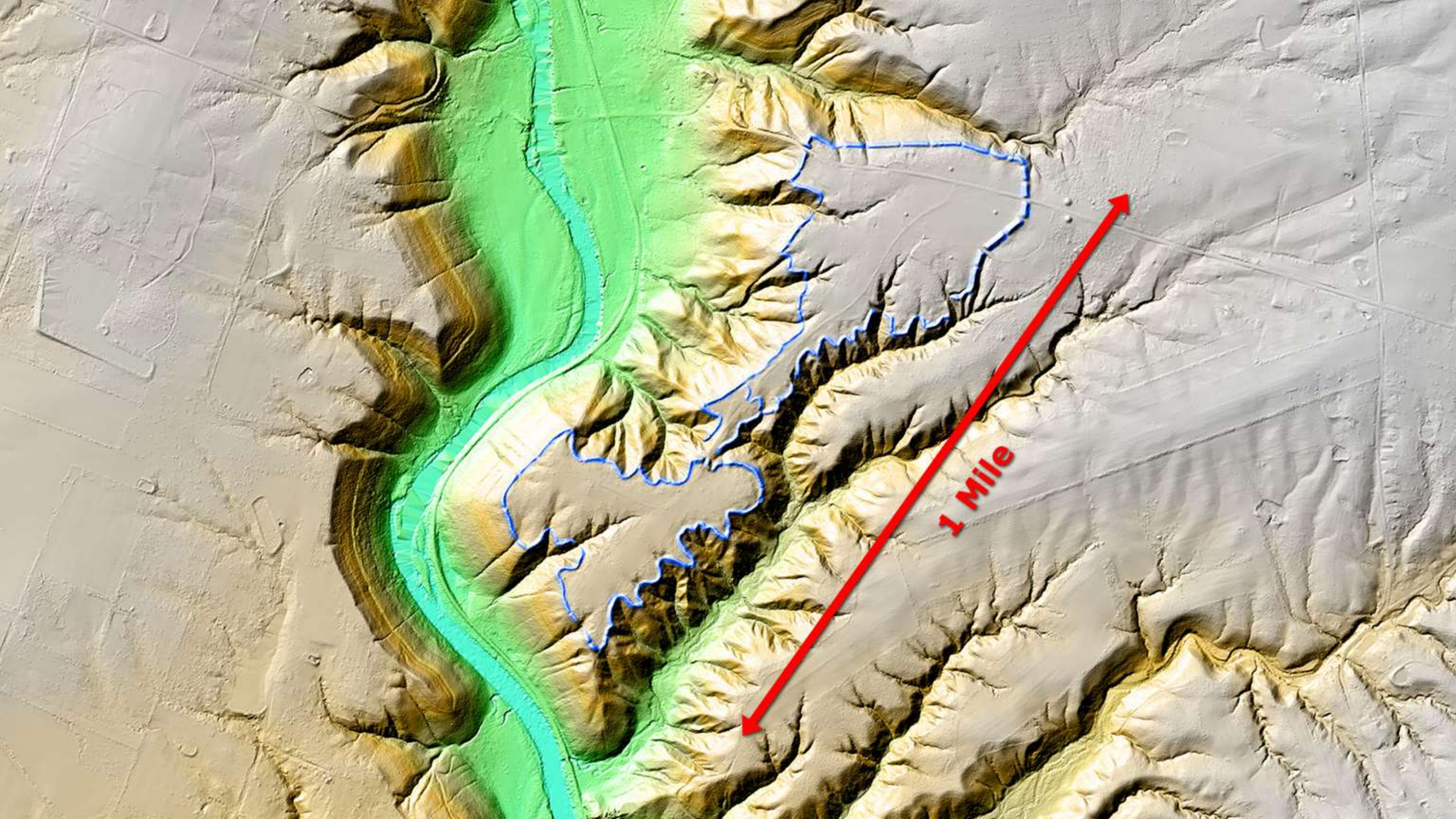




Fort Ancient Ohio

FACTS

- 100 Acre complex
- 18,000 Feet of earthen walls
- 553,000 Cubic yards of Soil
- Earthen Walls 20 feet high



1 Mile

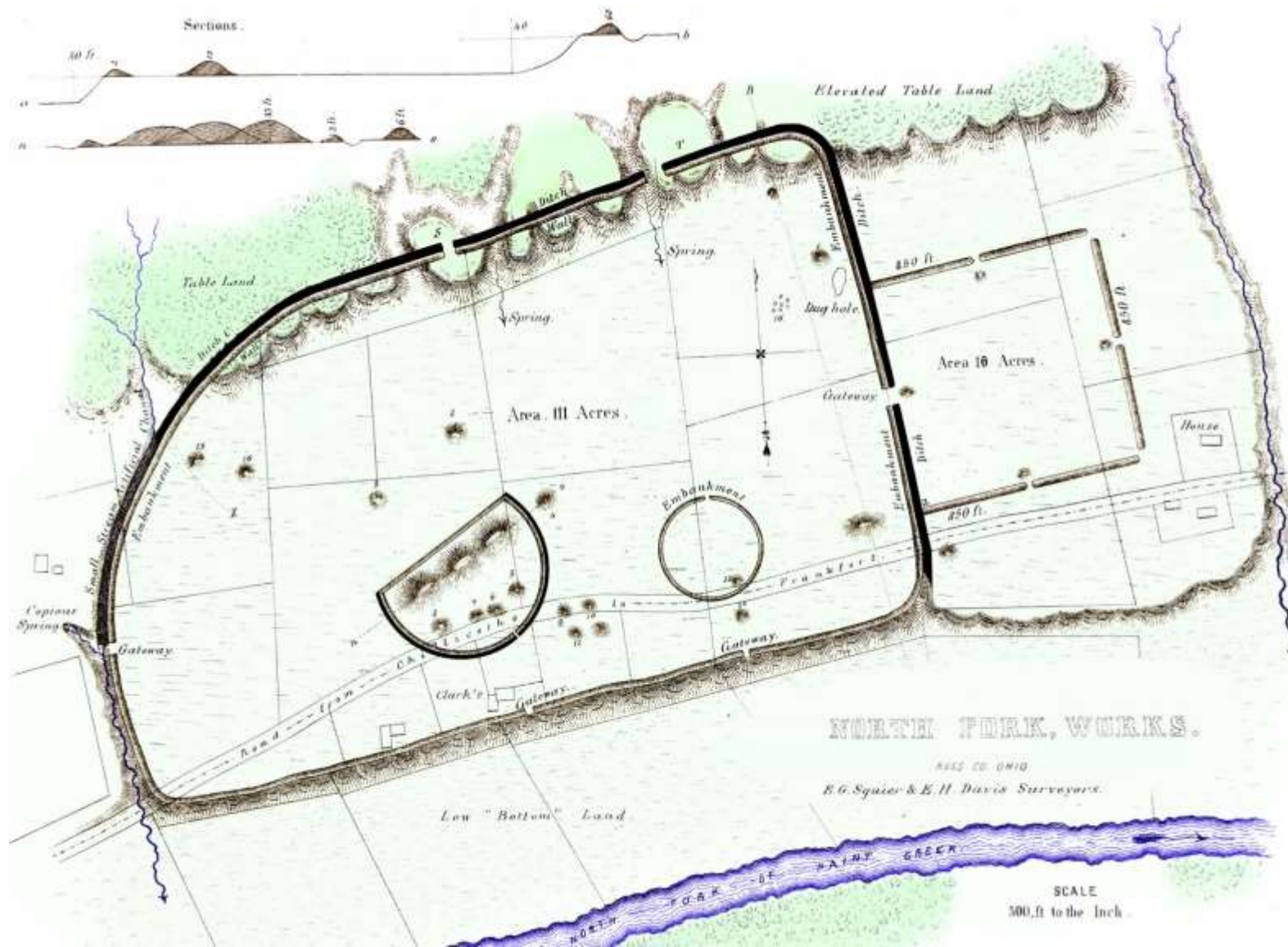








Hopewell Mound Group



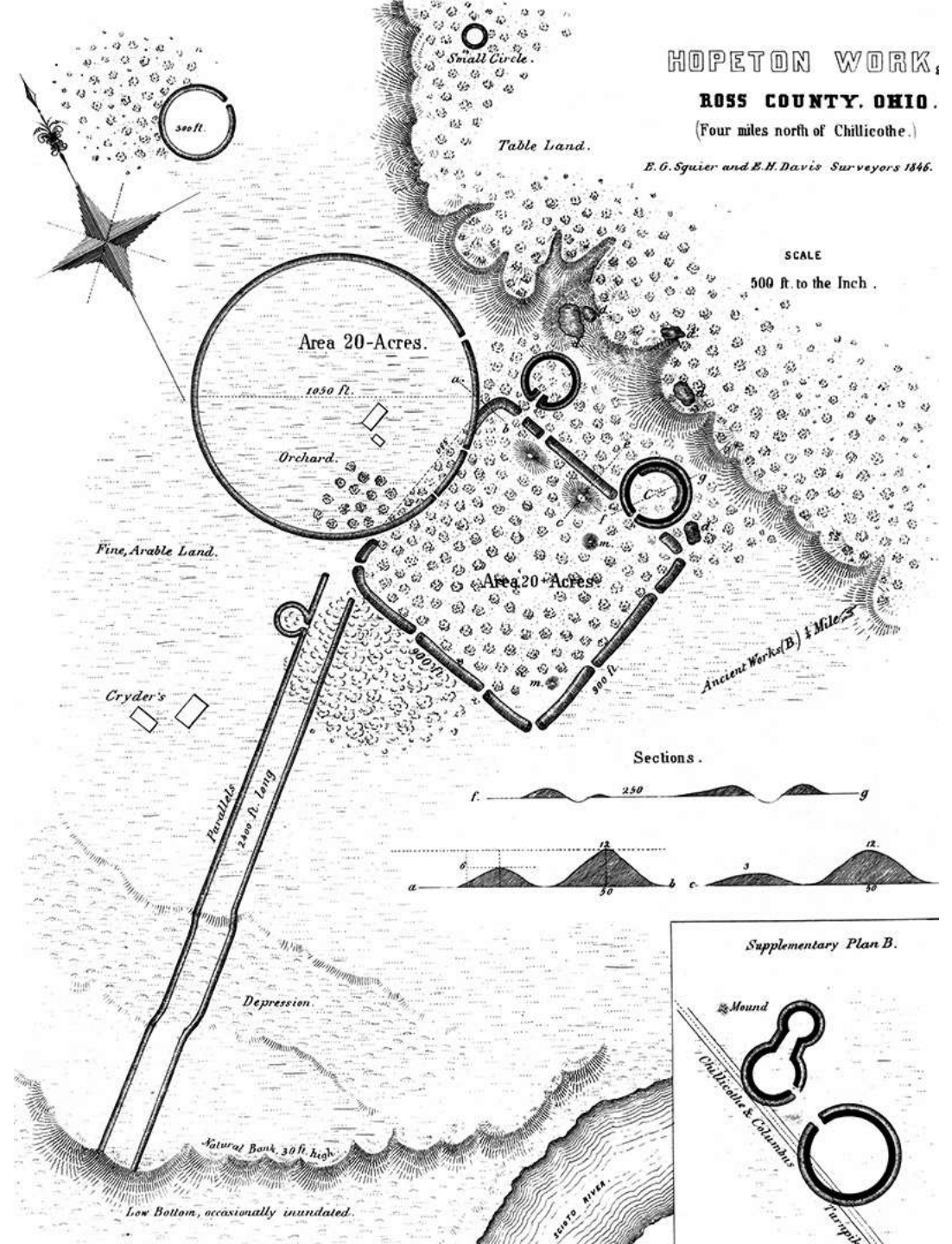




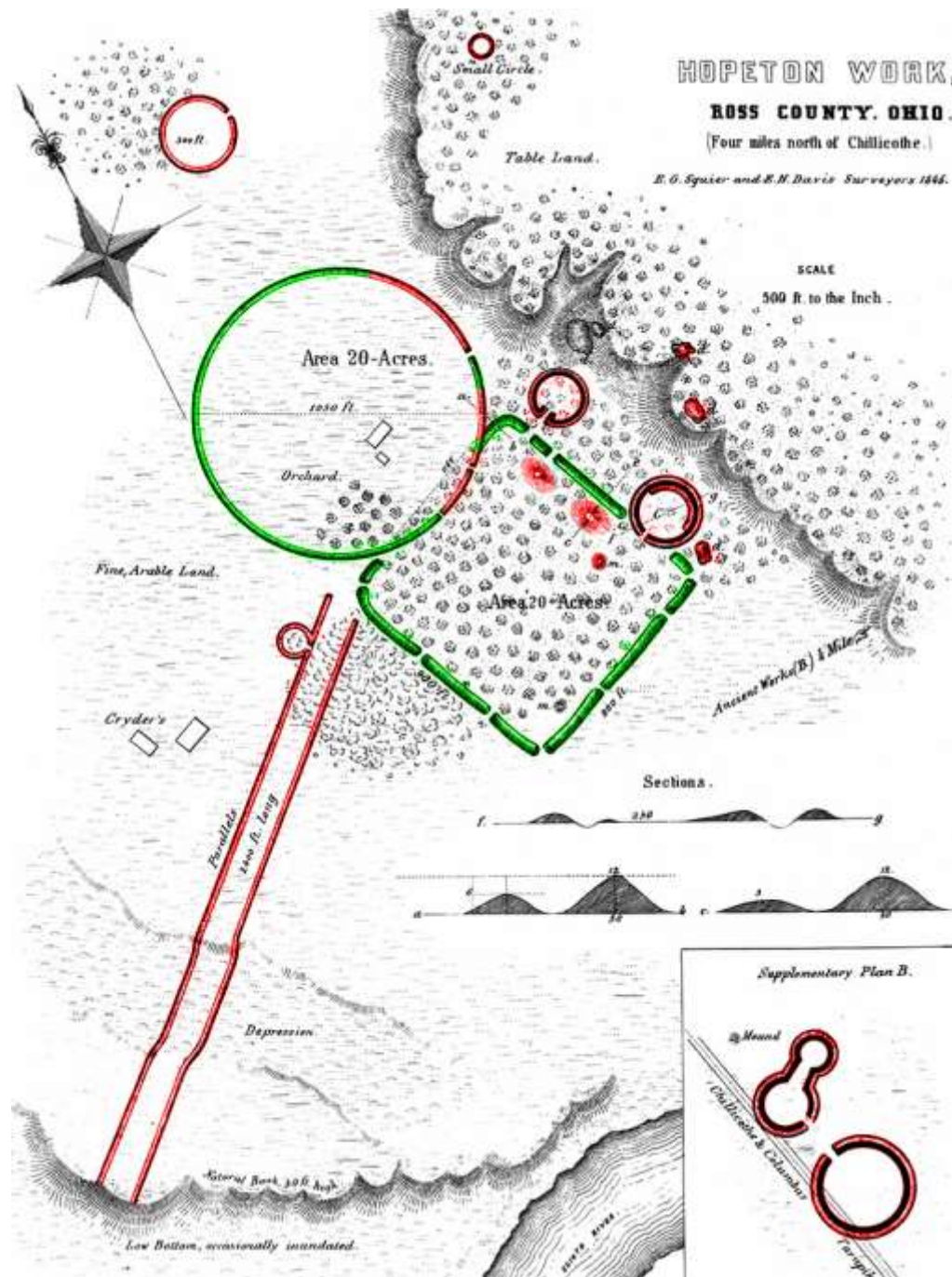




Hopeton Earthworks, Ohio





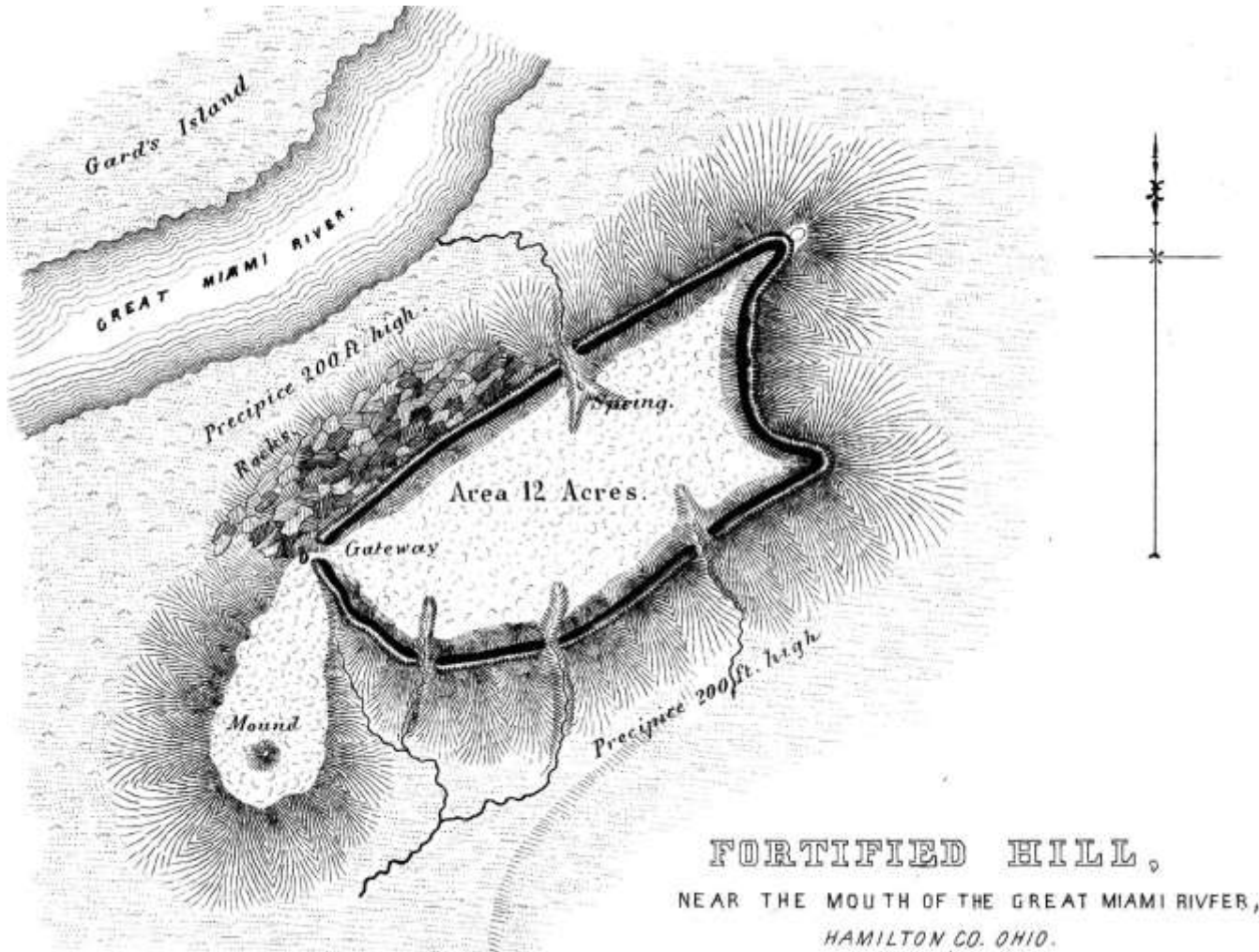


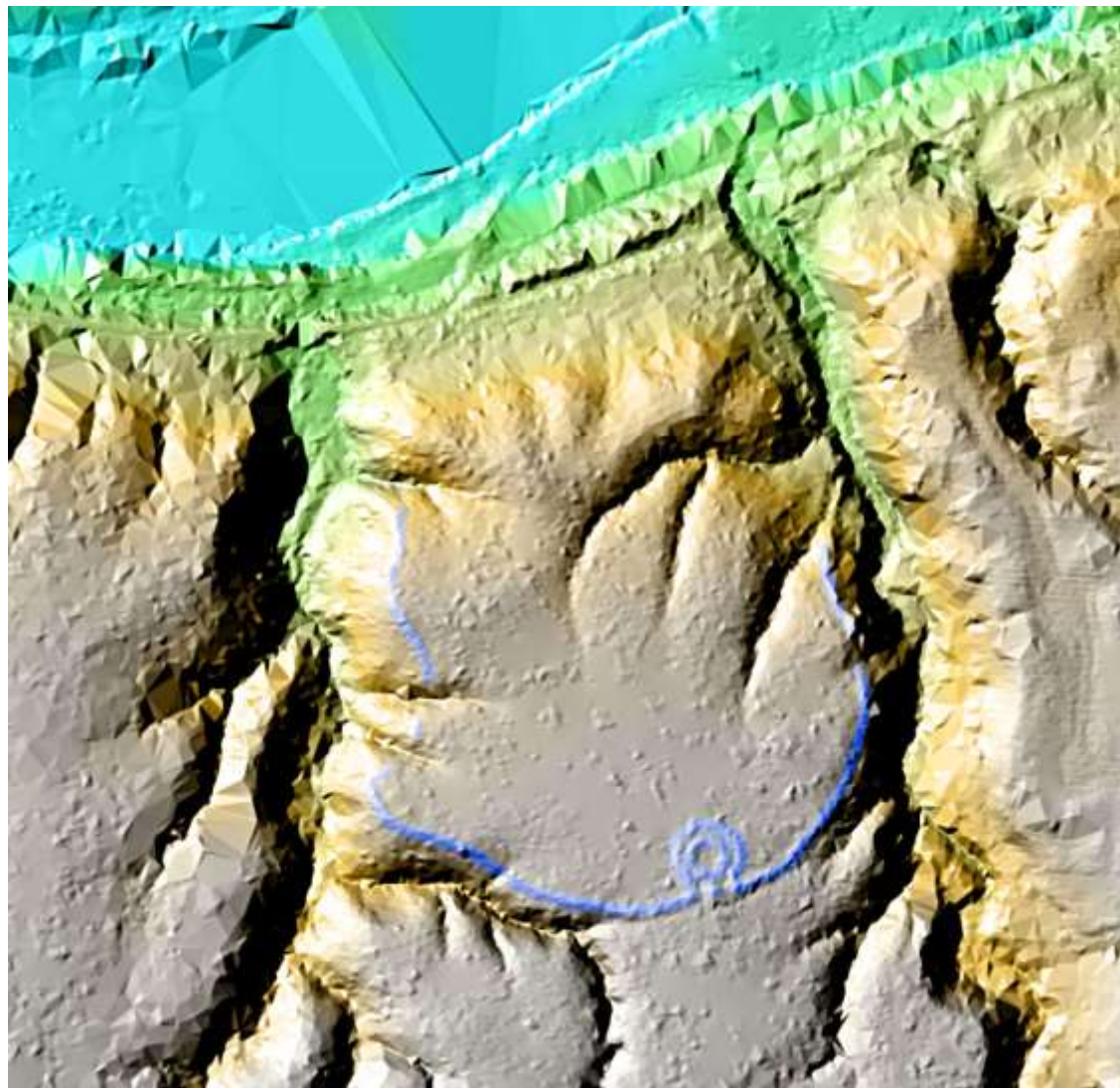
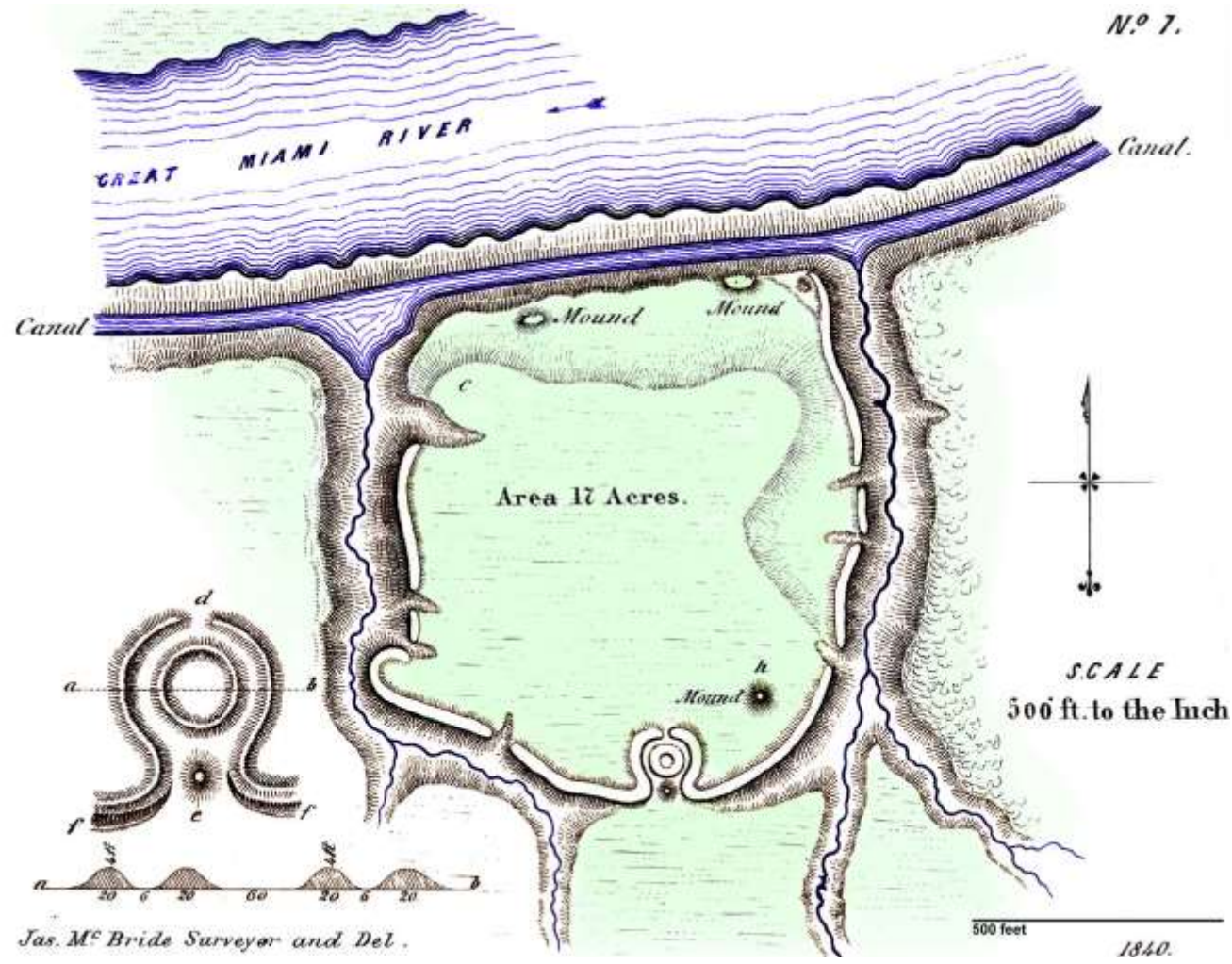
Visible in Lidar



Destroyed

Miami Fort





Cedar Bank Earthworks



Cedar Bank Earthworks

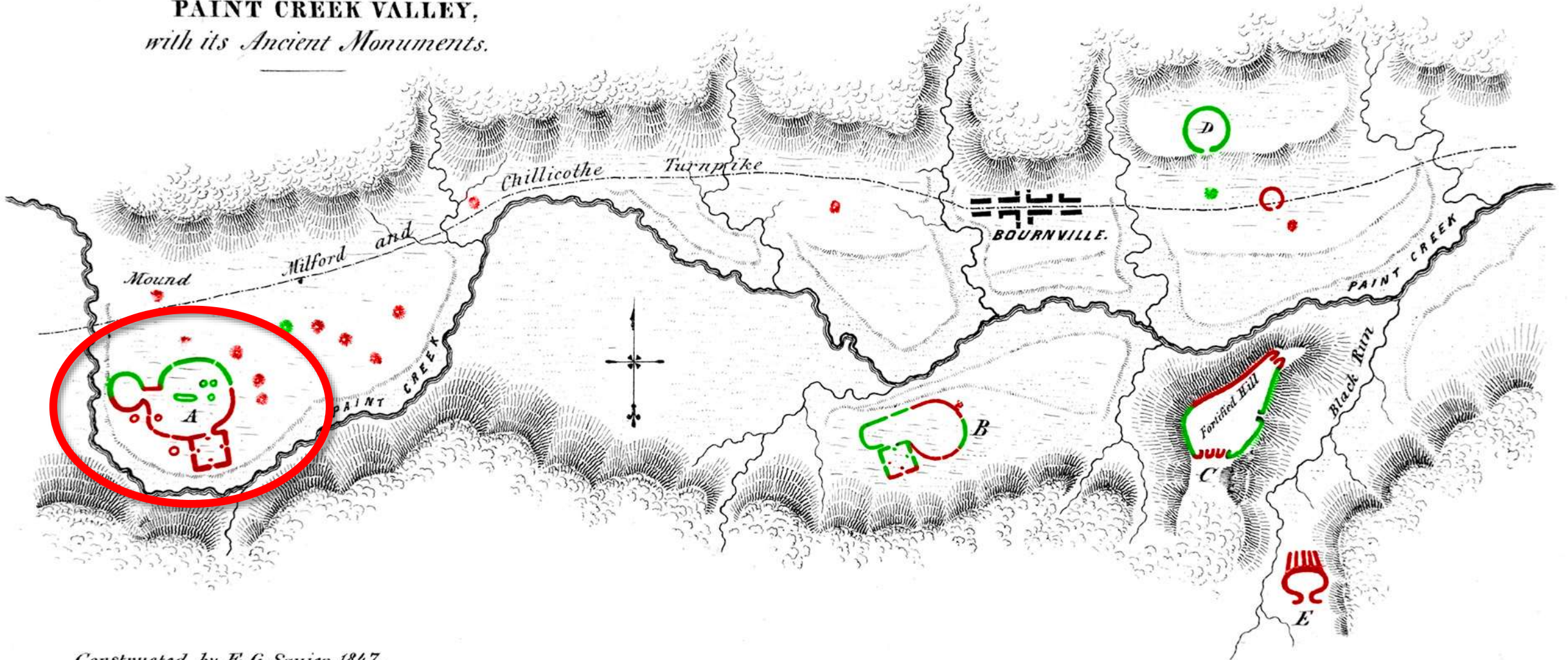




EXPLANATIONS.

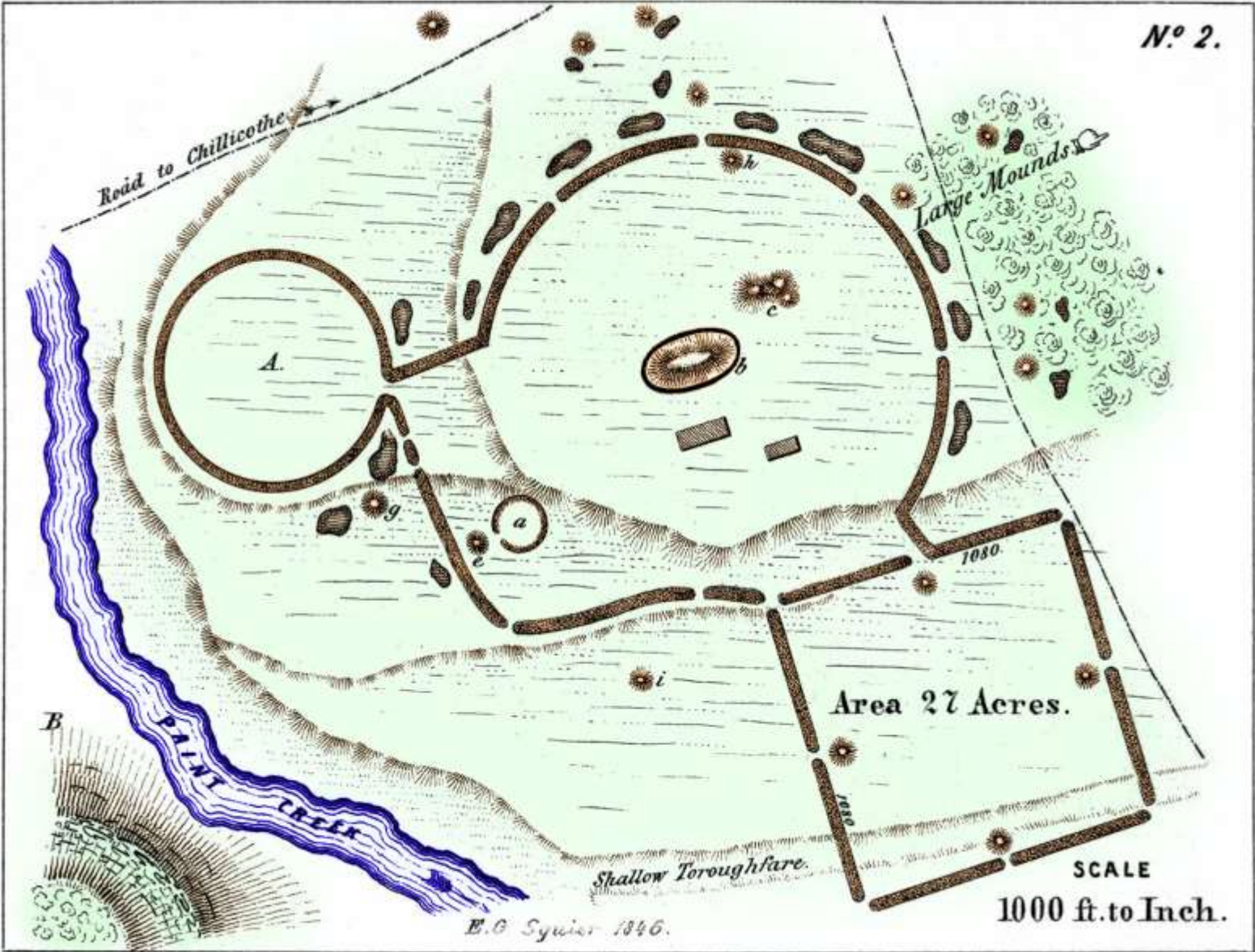
Paint Creek Valley

EXHIBITING A SECTION OF SIX MILES
of the
PAINT CREEK VALLEY,
with its Ancient Monuments.



Constructed by E. G. Squier 1847.

Seip Mound Complex





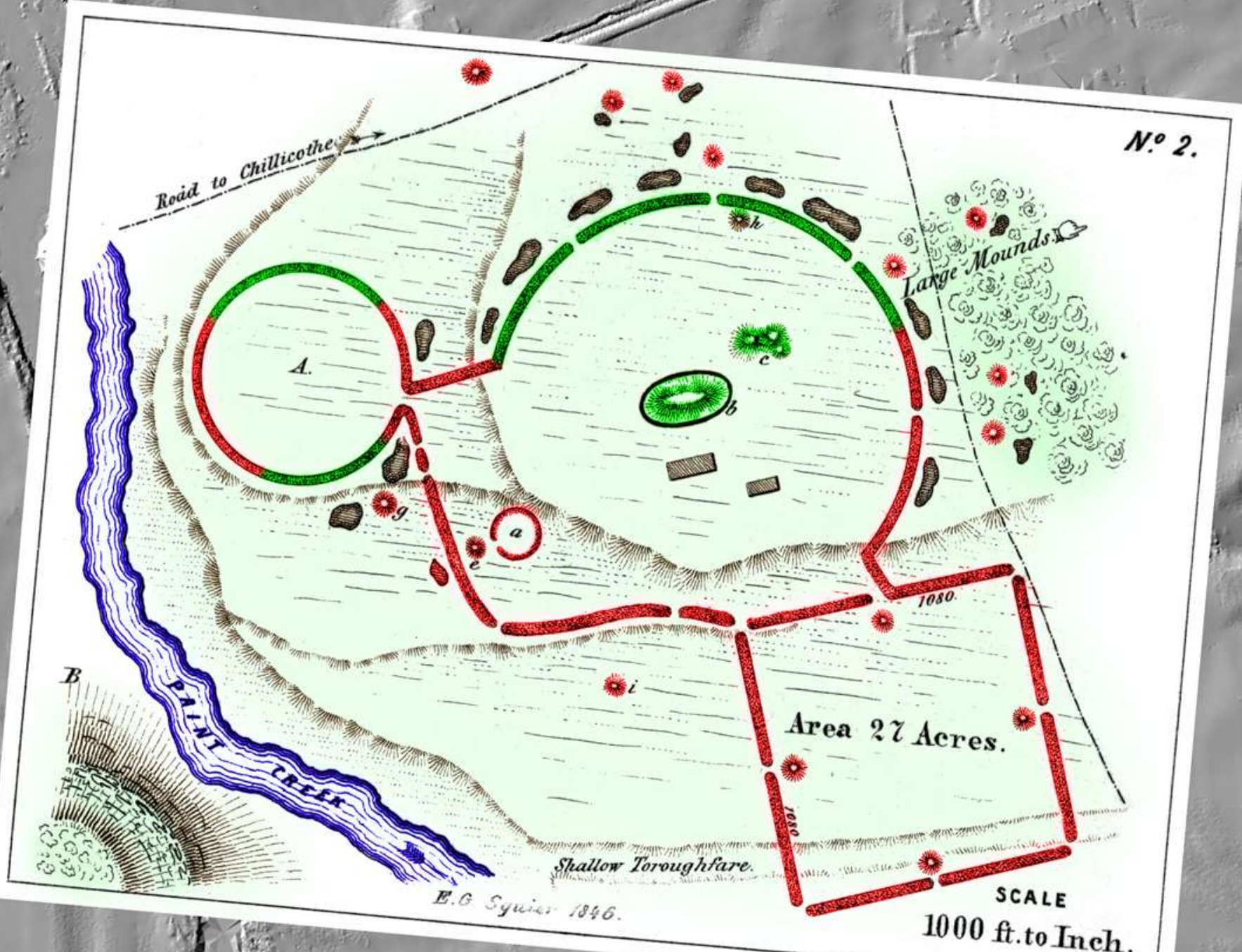
Seip Mound Complex

- Seip Mound is 240 feet long, 130 feet wide and 30 feet high.
- It is the 2nd largest Hopewell mound.
- Surrounded by a large 121 acre earthwork complex with 10,000 feet of embankment walls.
- Walls originally 10 feet high and 50 feet thick at the base.





N^o 2.



Road to Chillicothe

A.

Large Mounds

Area 27 Acres.

B

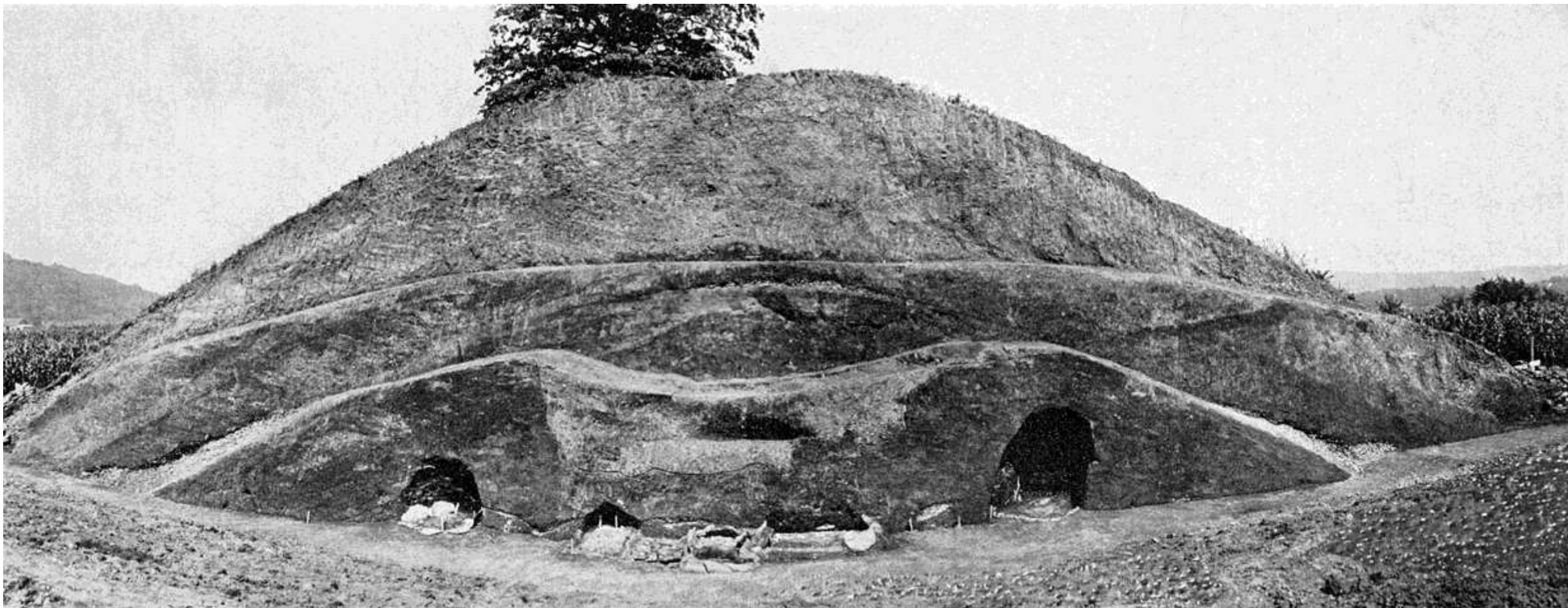
PAINT CREEK

Shallow Troughfare.

E. G. Squier 1846.

SCALE
1000 ft. to Inch.

Seip Mound During Excavation

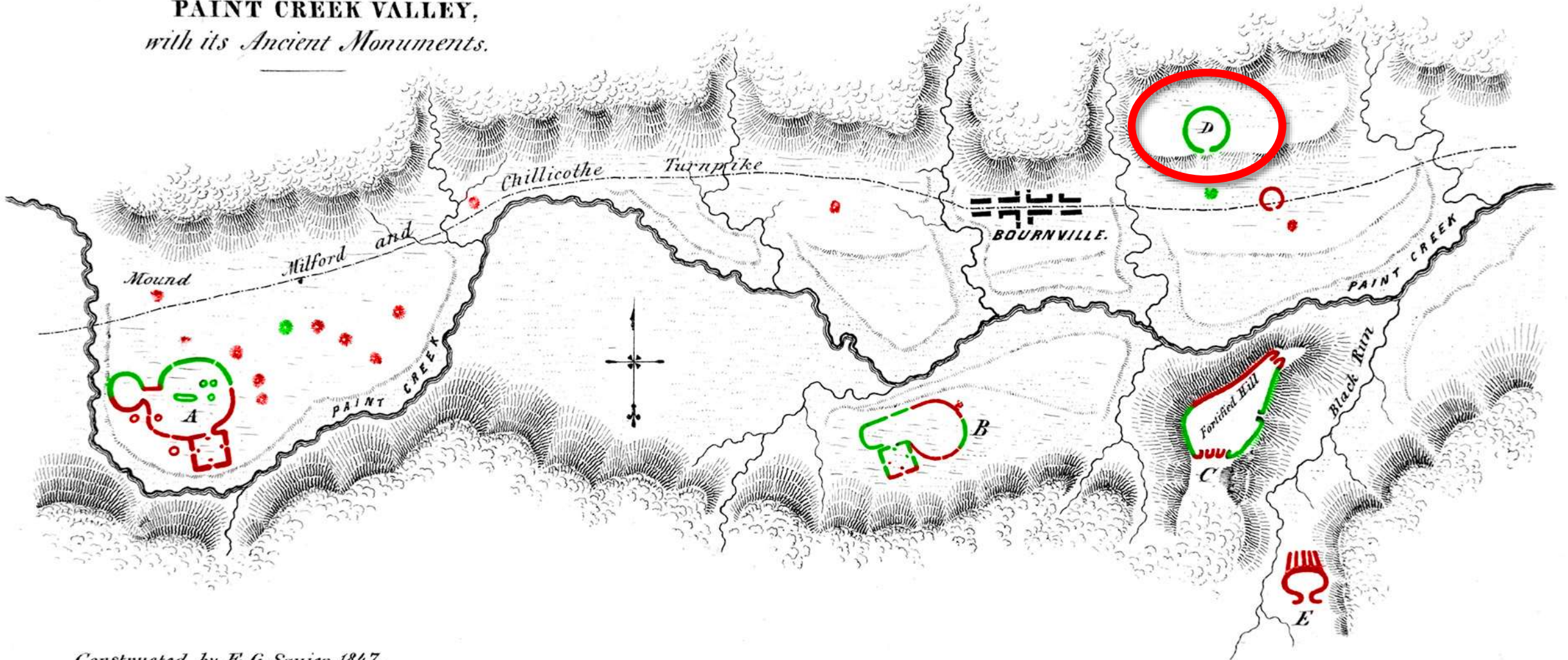


Seip Mound Artifacts

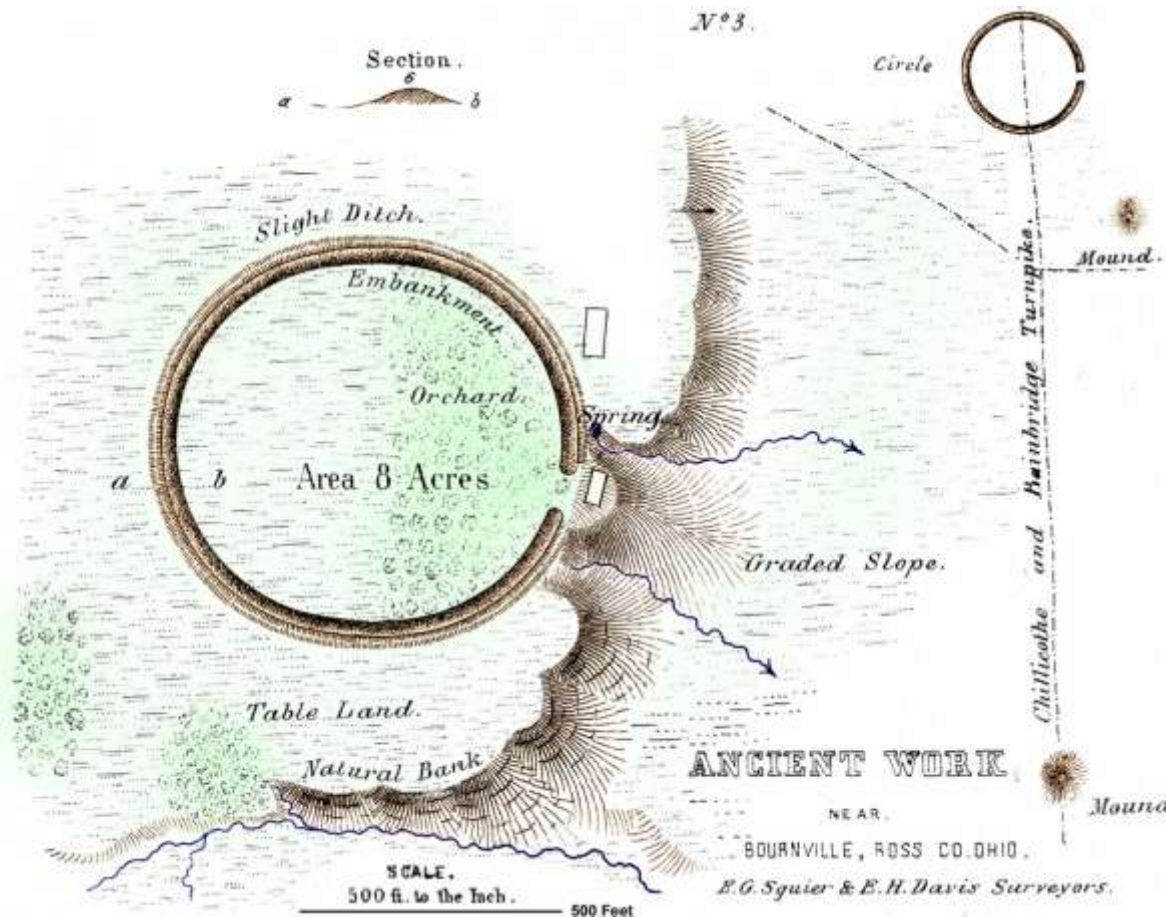


Paint Creek Valley

EXHIBITING A SECTION OF SIX MILES
of the
PAINT CREEK VALLEY,
with its Ancient Monuments.



Ancient Work Near Bourneville, Ross County, Ohio.

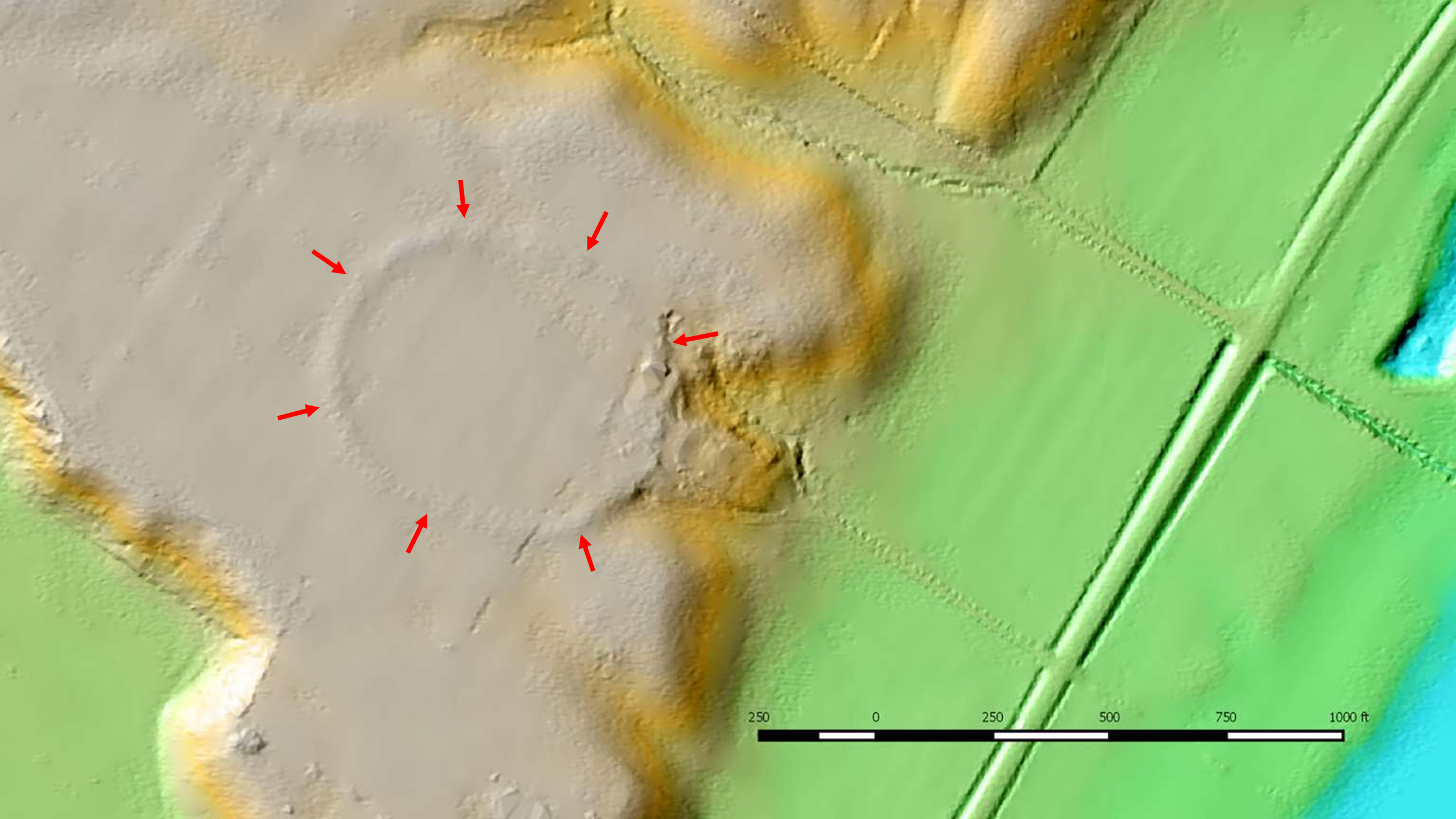


“The small work here figured is **one of the most beautiful in the State of Ohio**. It consists of a wall of earth, eight or ten feet in height, with a broad and shallow exterior ditch. It has a gateway one hundred and twenty feet wide, leading into it from the south-west...

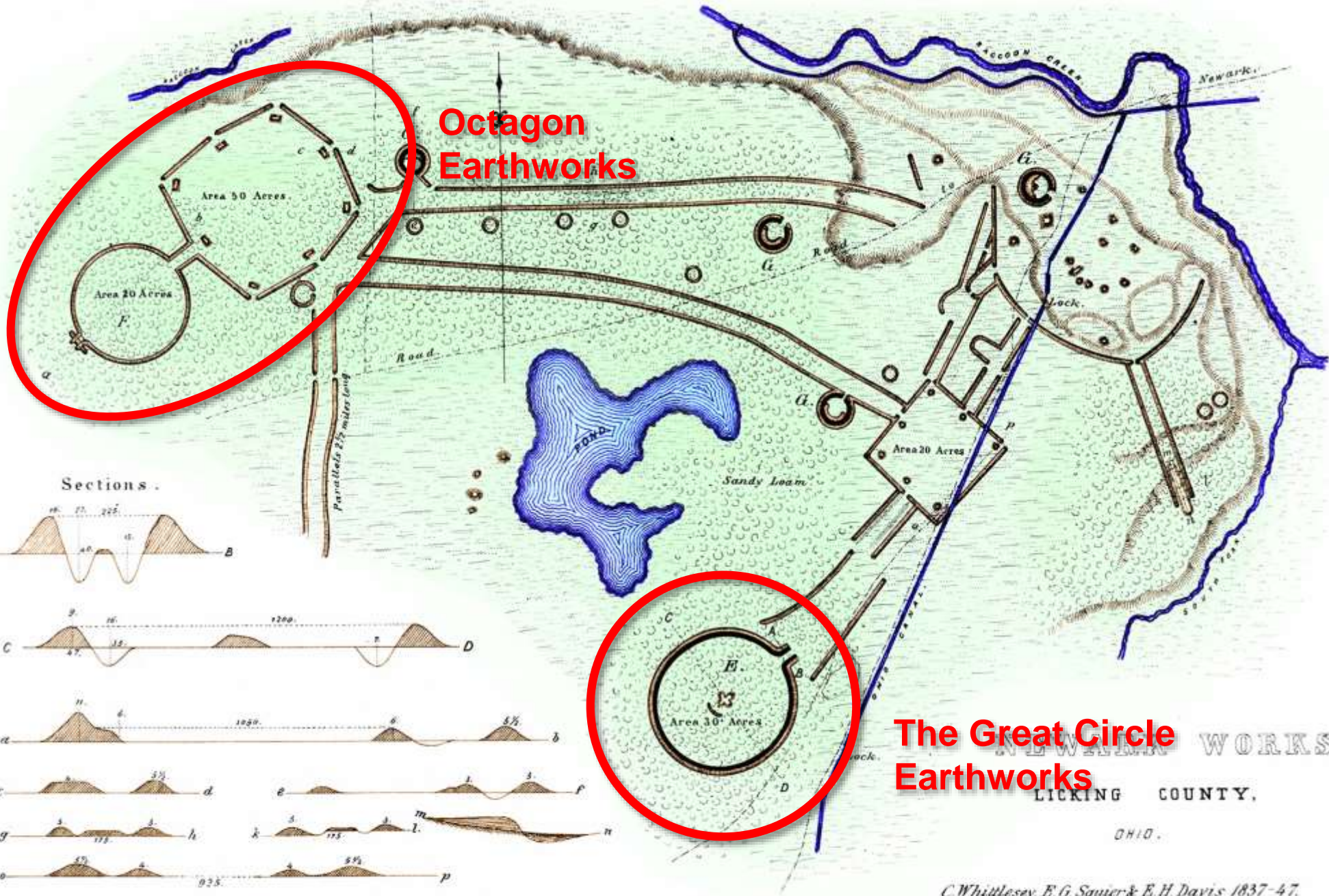
This work is admirably preserved, and is remarkable as being the only circular work at present known, which has its ditch exterior to the walls.”



250 0 250 500 750 1000 ft

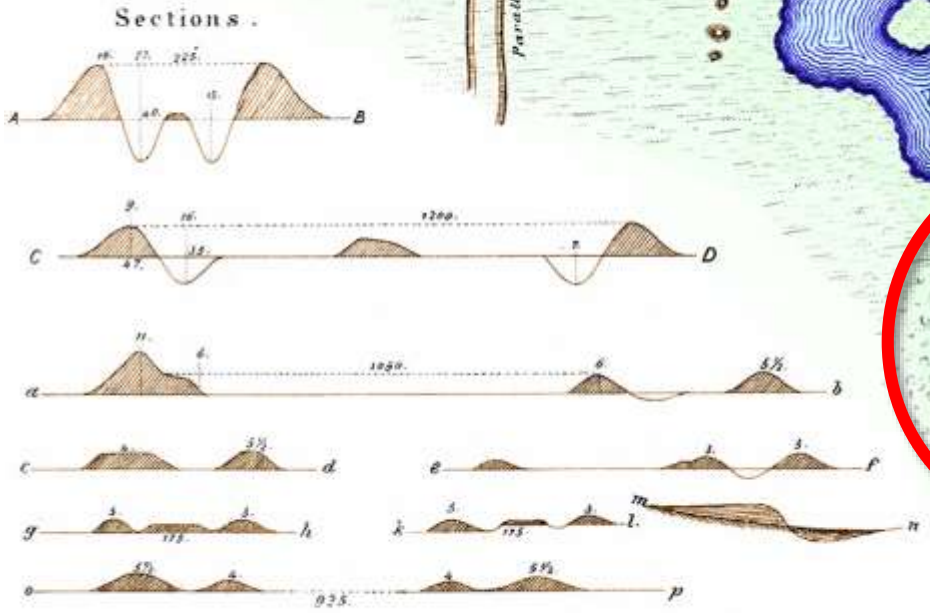


250 0 250 500 750 1000 ft



Octagon Earthworks

The Great Circle Earthworks



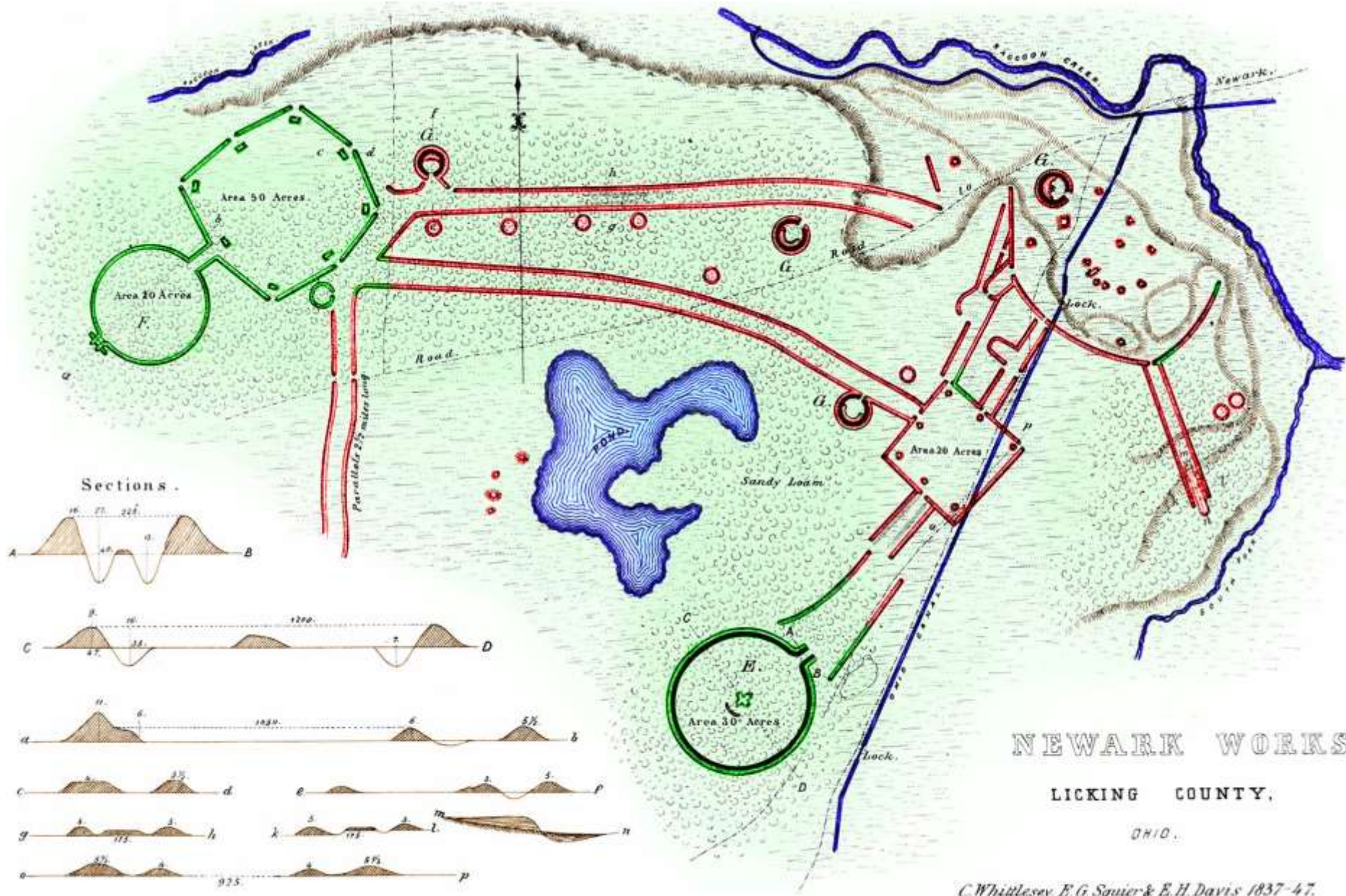
C. Whittlesey, E. G. Squier & E. H. Davis 1837-47.

SCALE.
1300 ft. to the Inch.
1300 feet









Visible in Lidar

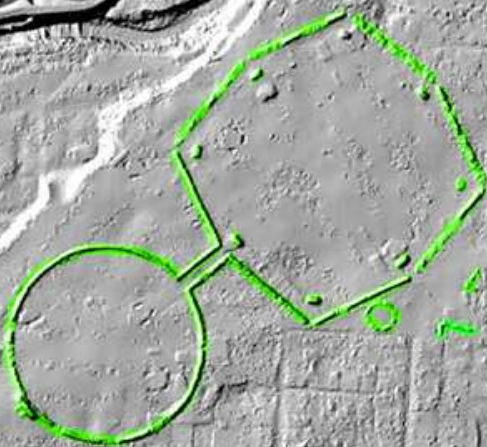
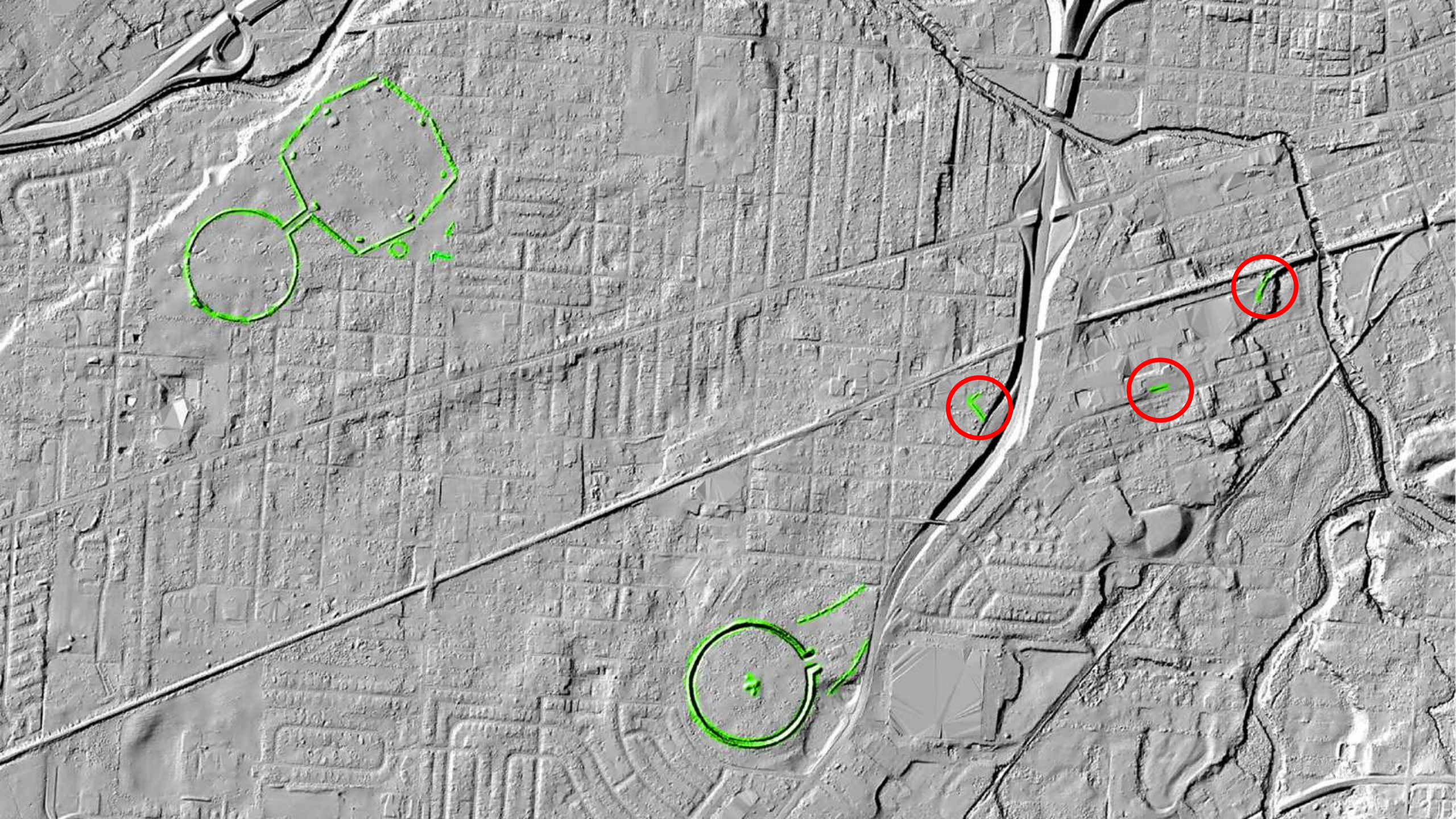


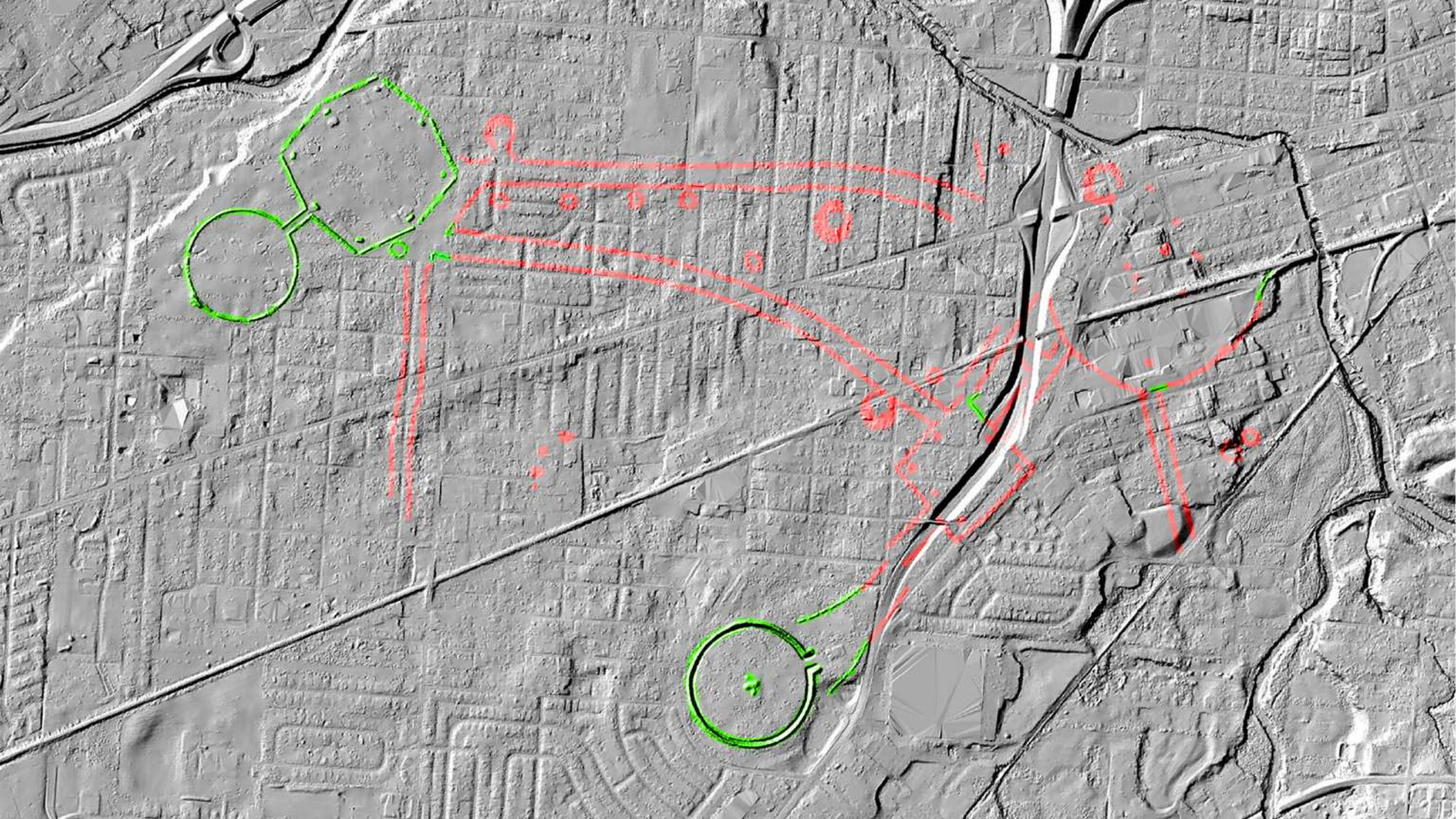
Destroyed

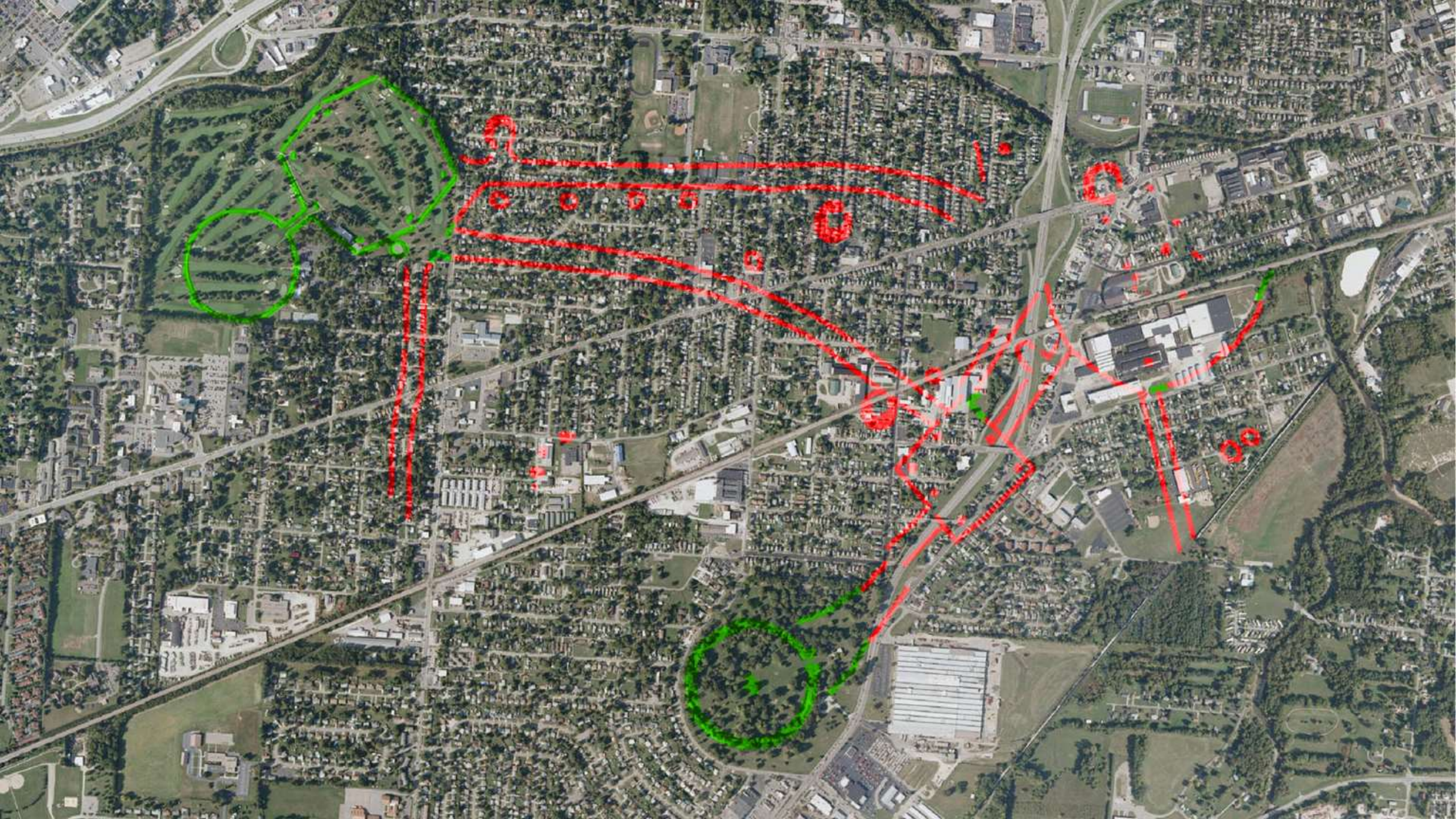
NEWARK WORKS
LICKING COUNTY,
OHIO.

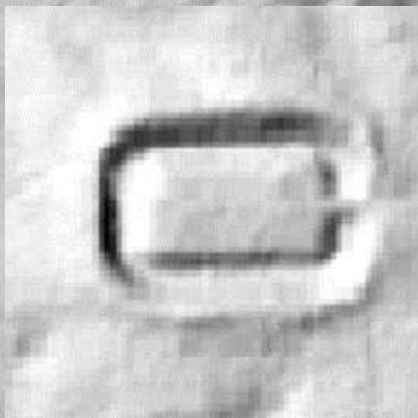
C. Whittlesey, E. G. Squier & E. H. Davis 1837-47.

SCALE.
1300 ft. to the Inch.
1300 feet









<http://scienceviews.com/squier>

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Ephraim George Squier



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Ephraim George Squier



History of Ephraim George Squier

Ephraim George Squier (1821-1888) archaeologist, author, businessman, editor, and diplomat was born in Bethlehem, New York, June 17, 1821. As a young man he published the village newspaper and then later became the editor of several publications...



Ancient Monuments of the Mississippi Valley

This is a reproduction of E.G. Squier and E.H. Davis' monumental work *Ancient Monuments of the Mississippi Valley* published in the *Smithsonian Contributions to Knowledge*, Vol. I. It provides an invaluable glimpse of a long lost culture.



Aboriginal Monuments of the State of New York

This is a reproduction of E.G. Squier's monumental work *Aboriginal Monuments of the State of New York* published in the *Smithsonian Contributions to Knowledge*, Vol. II. It provides an invaluable glimpse of a long lost culture.



ANCIENT MONUMENTS OF THE MISSISSIPPI VALLEY

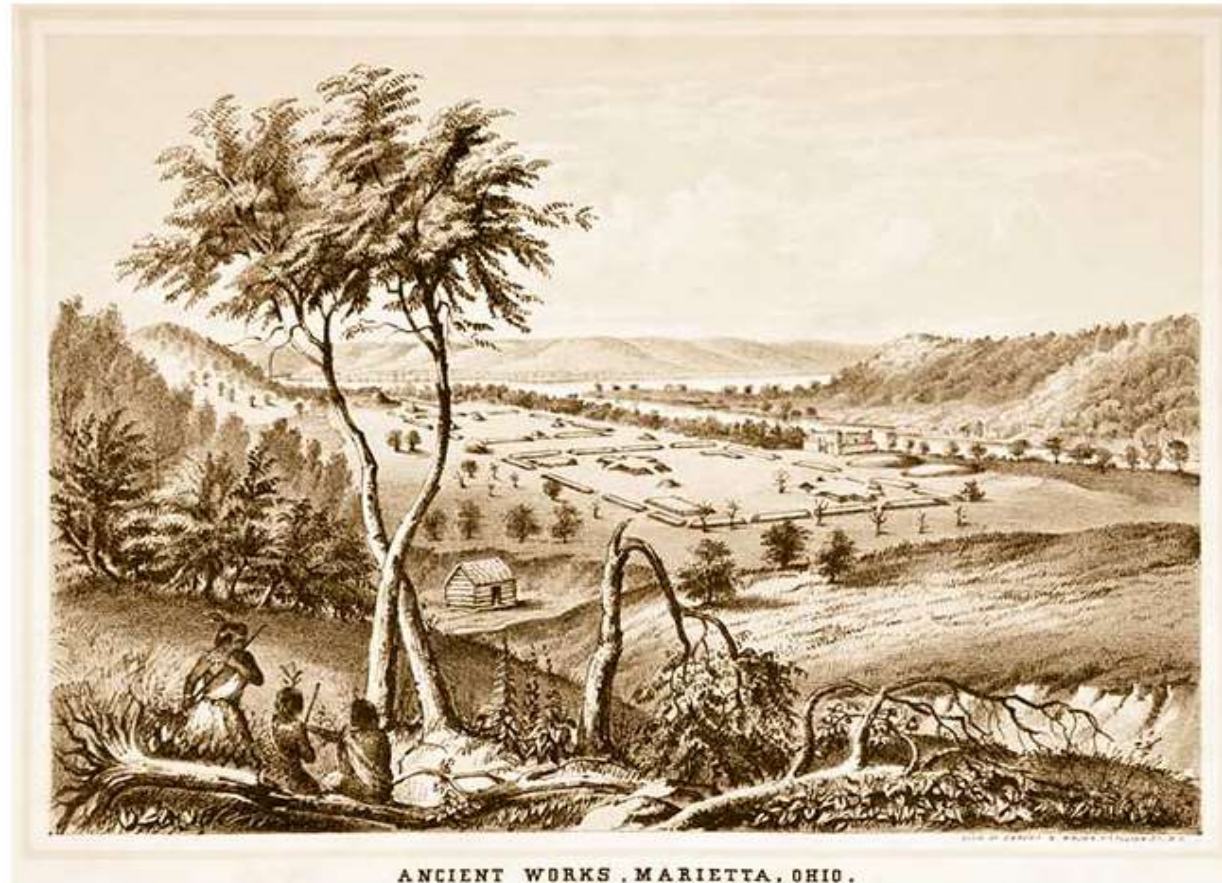
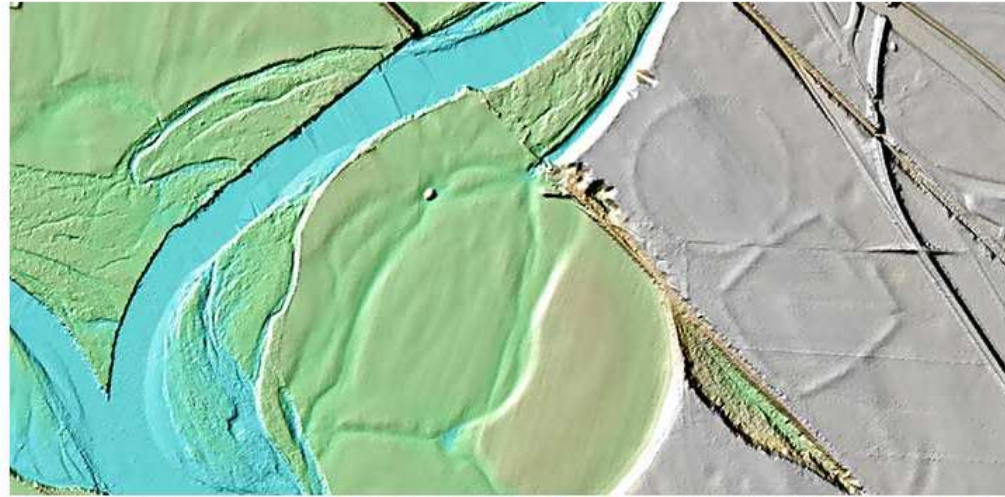


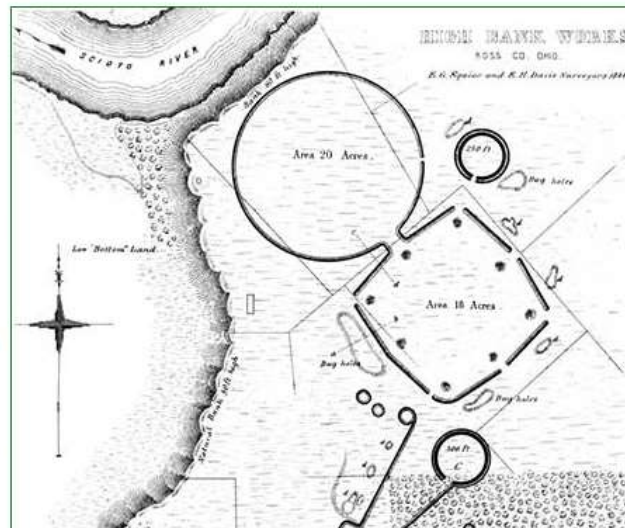
PLATE XVI. ³⁸

High Bank Works, Ross County, Ohio.



This is a Lidar Image of High Bank Works as it appears today. Due to constant cultivation since the 1800s, only the main circle and octagon can be seen today. The rest of the site has been destroyed. When this site was surveyed in 1846, the walls were between 11 and 12 feet high with a base thickness of 50 feet. Today the walls are less than three feet high and are spread out for more than 100 feet.

THE beautiful group here represented is situated on the right bank of the Scioto river, five miles below the town of Chillicothe, near the road from that place to Jackson. It occurs at a place where the river has cut its way up to the third terrace, which in consequence here presents a bold bank, rising seventy-five or eighty feet above the water. This point is generally known as the "High Bank," and gives its name to these works. The third terrace here spreads out into a beautiful, level plain of great extent. The principal work consists of an octagon and a circle; the former measuring nine hundred and fifty feet, the latter ten hundred and fifty feet, in diameter. The coincidences, in the dimensions, between this and the "Hopeton Works," (Plate XVII.) will be at once observed. The octagon is not strictly regular: although

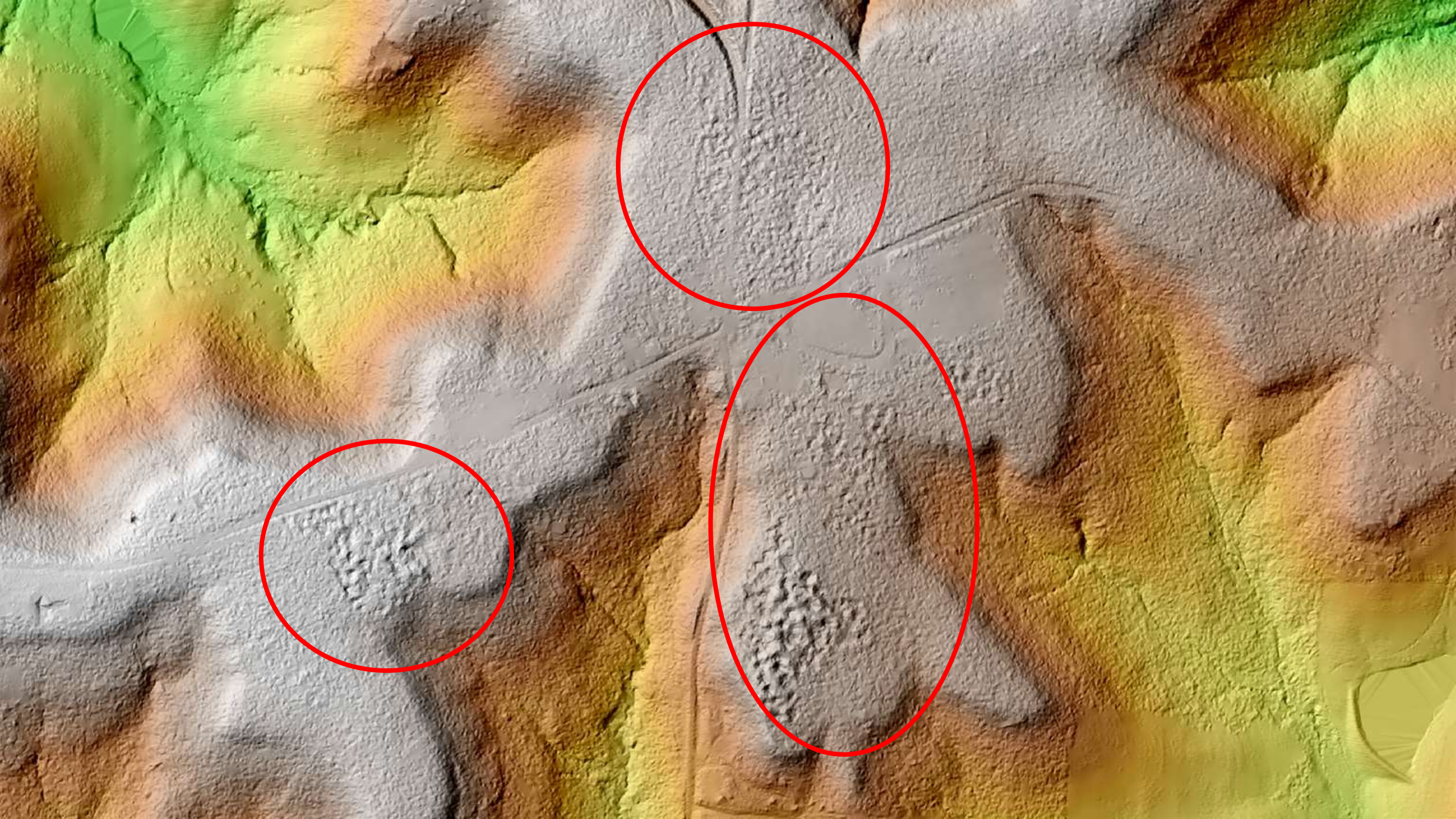


Flint Ridge

- One of the most important Native American flint quarries.
- Hundreds of quarry pits and workshops.
- Rainbow-colored flint especially prized by the Hopewell culture.
- Artifacts from Flint Ridge found throughout eastern North America.









EFFIGY MOUNDS



NATIONAL MONUMENT

Headquarters-Visitor Center-Museum →



Effigy Mounds
National Monument

Park Hours: 8:00 AM - 5:00 PM



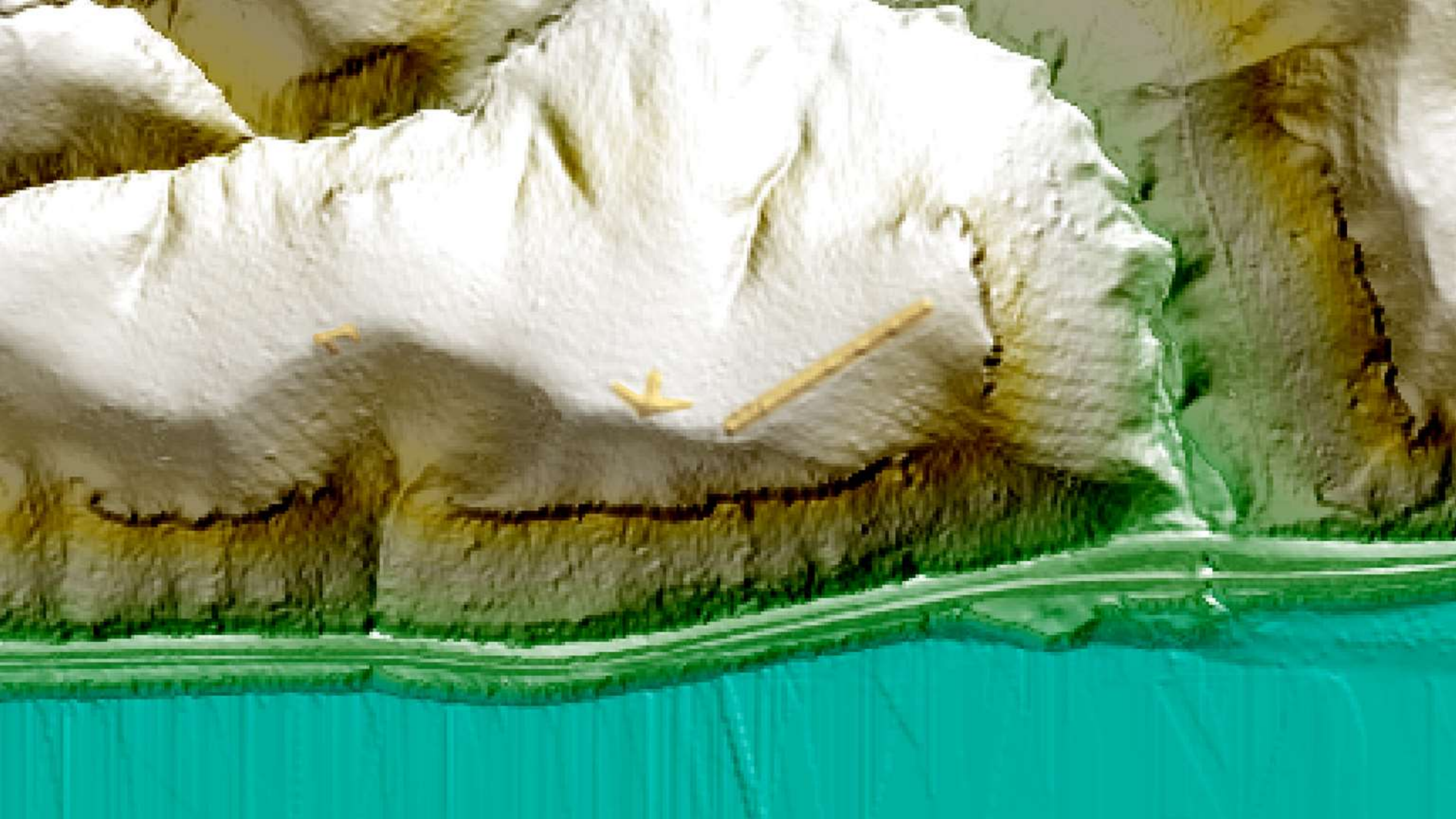
ONE WAY

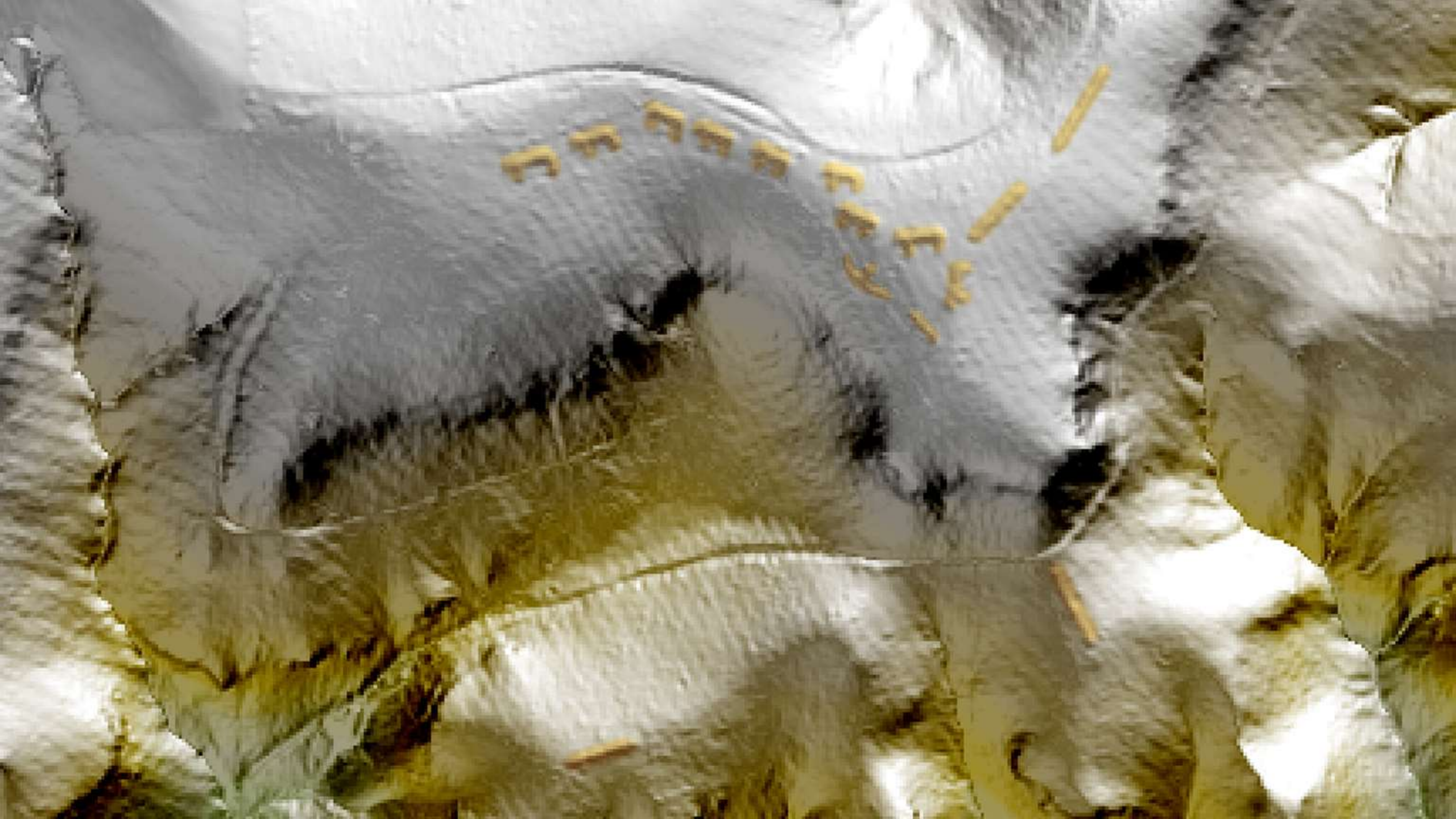


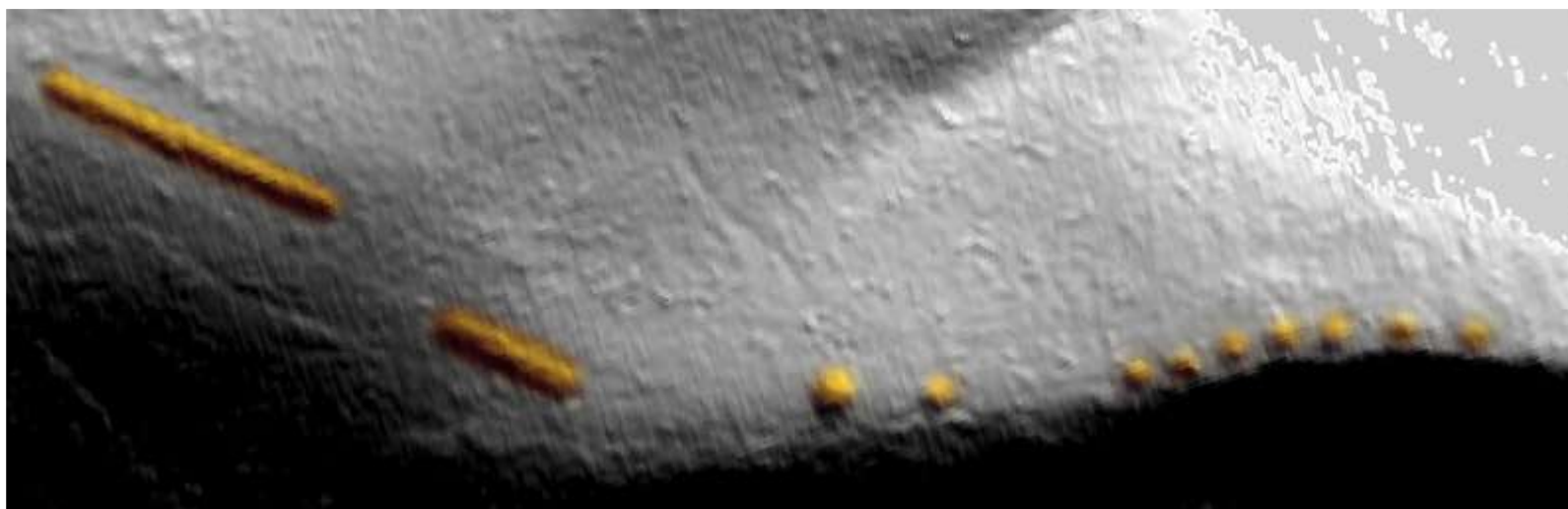
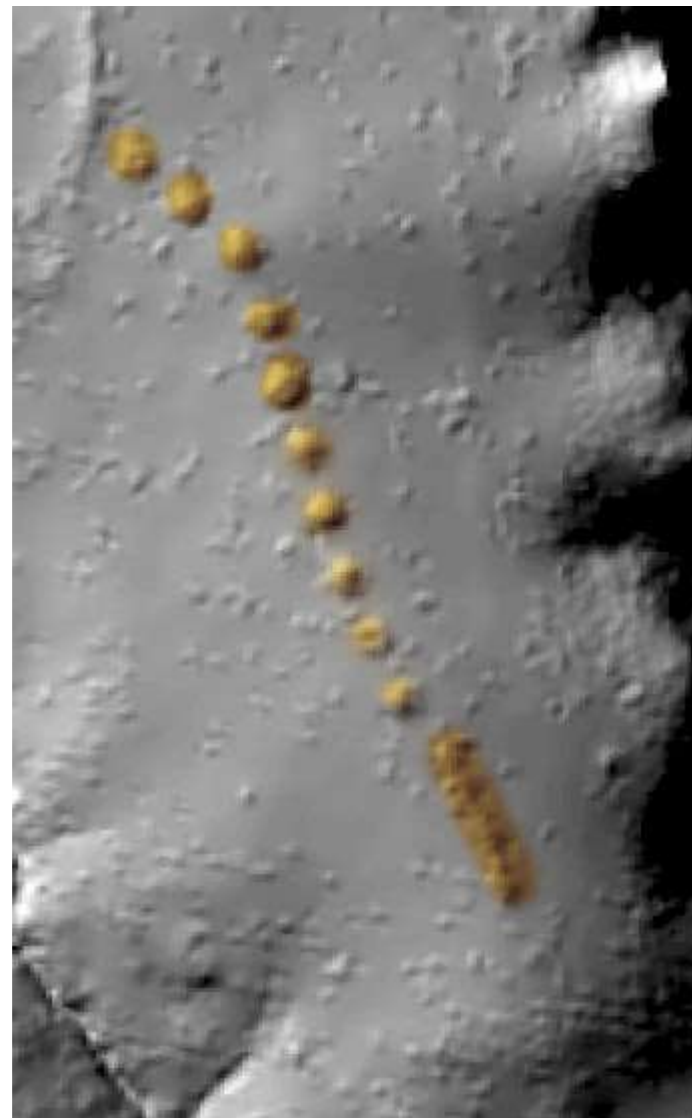
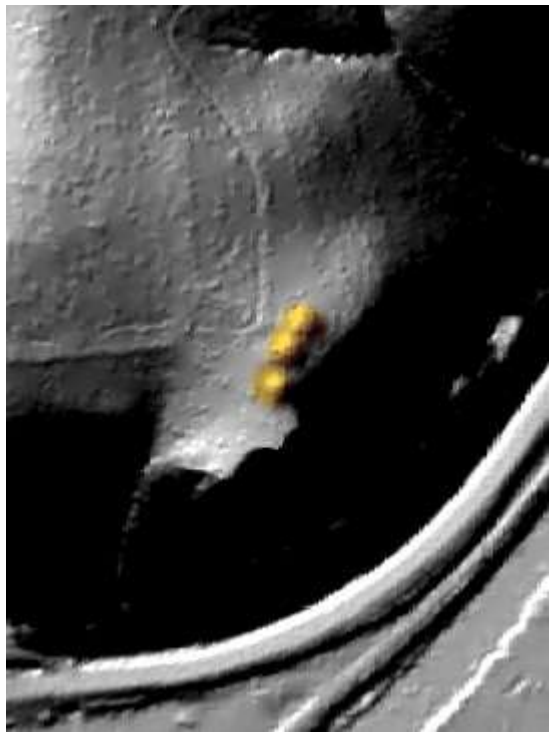




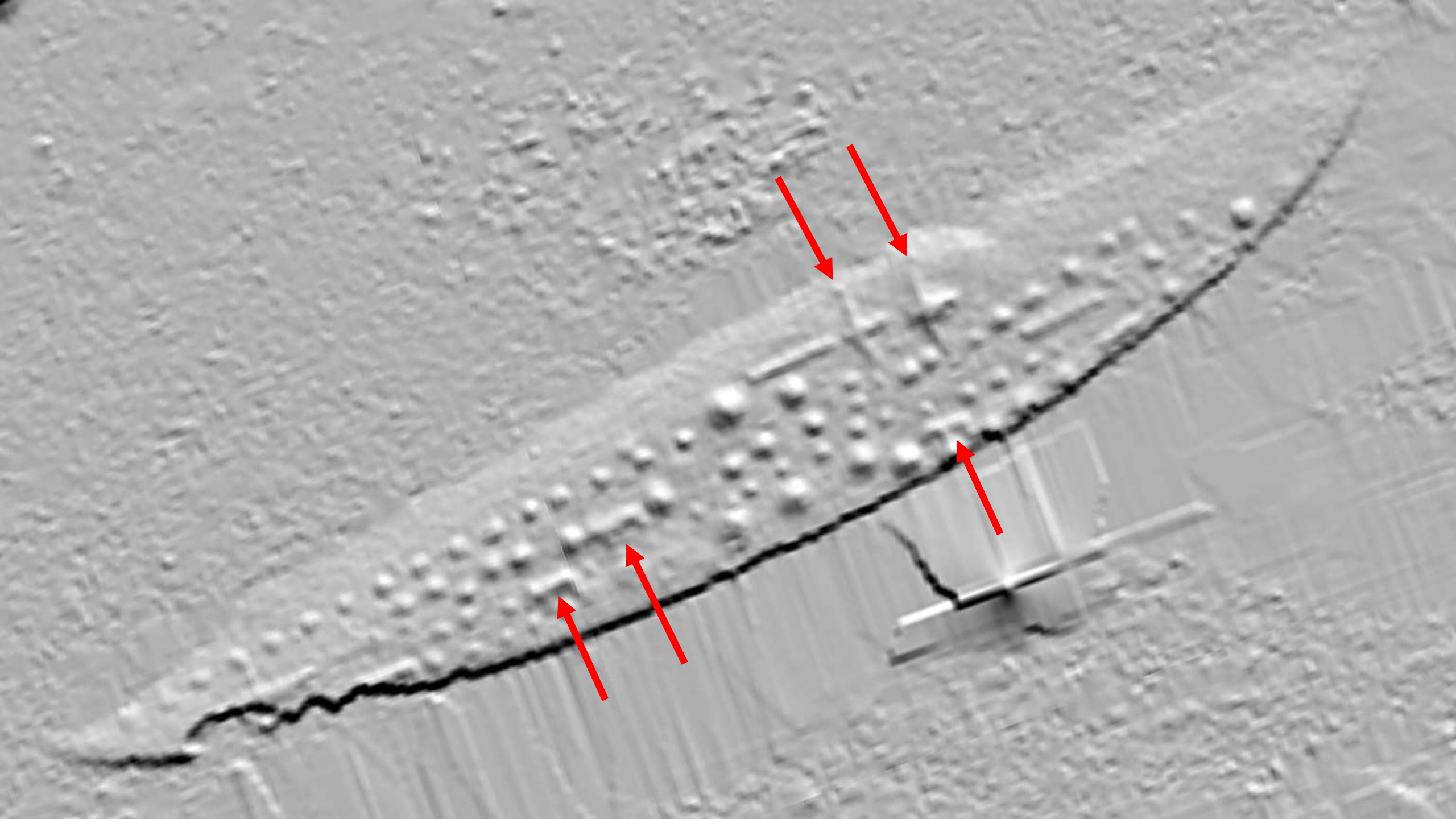










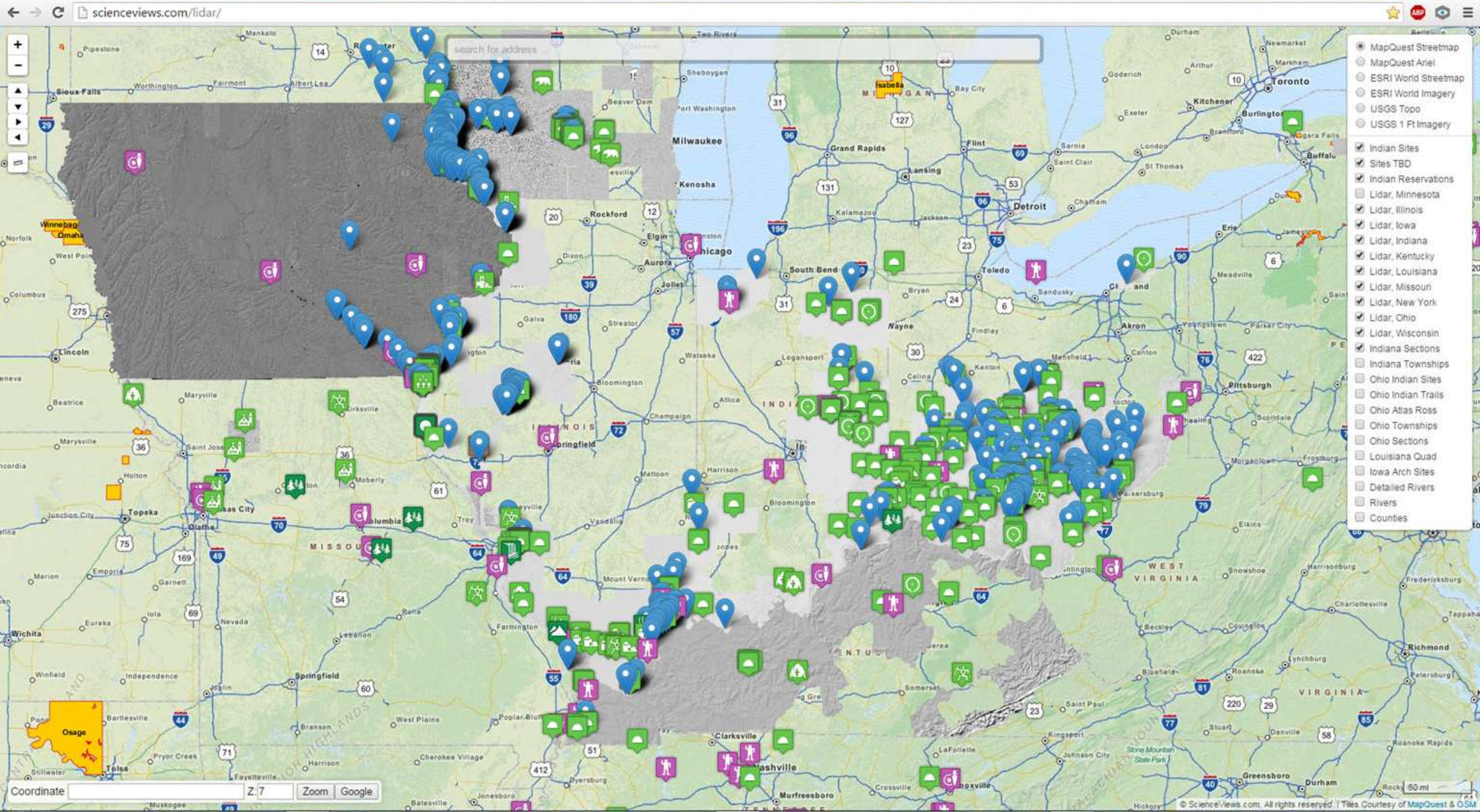


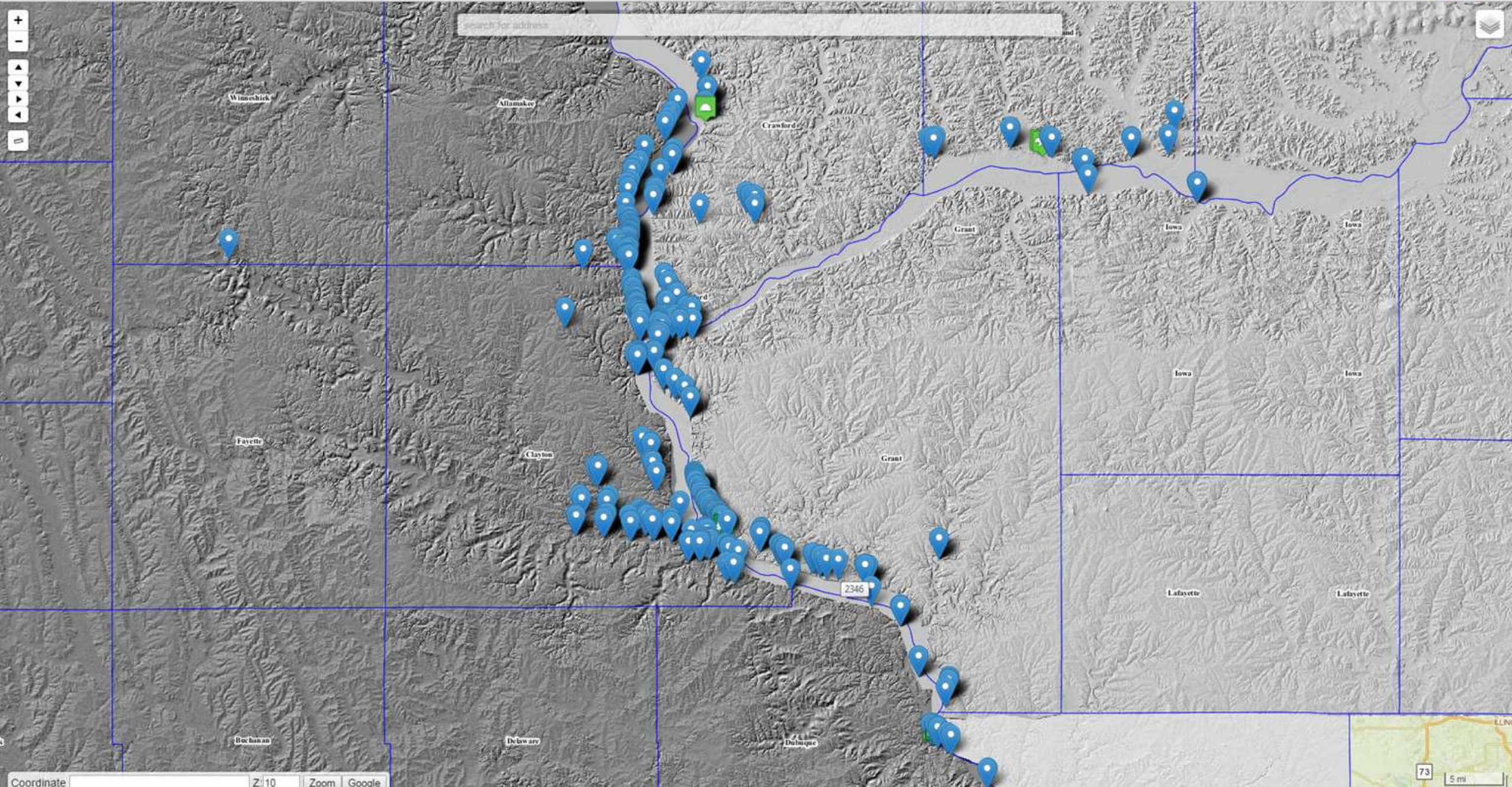
Malchow Mounds Preserve



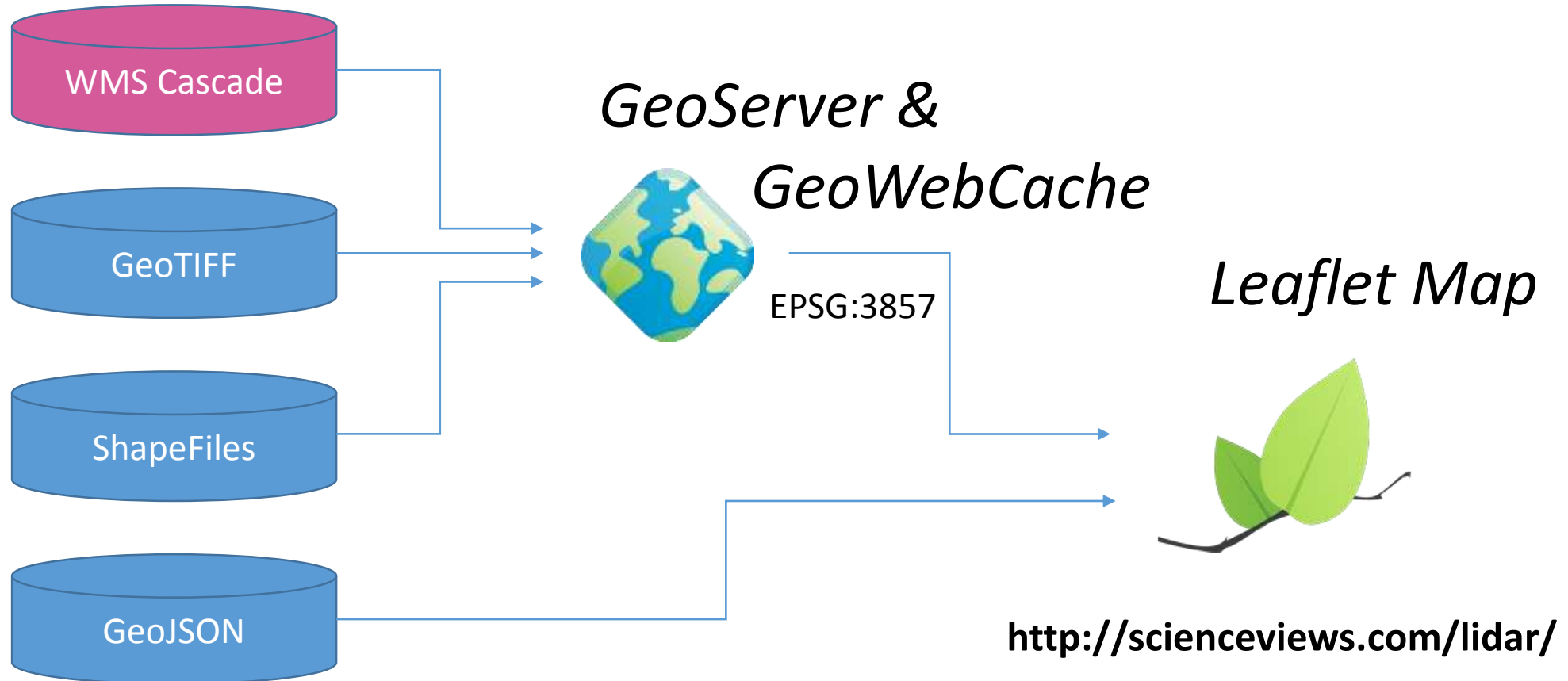
Searching For Earthworks

- Used PostGIS database tables for.
 - Verified archaeological sites.
 - Likely archaeological sites.
- Compare archaeological publications with hillshade to locate earthworks.
- Used brute force searching for earthworks in likely locations.
- Wrote a QGIS plugin to zoom to, and snapshot coordinates in the format of “latitude, longitude” to seamlessly work with Google Earth, Google Maps, and my own map.

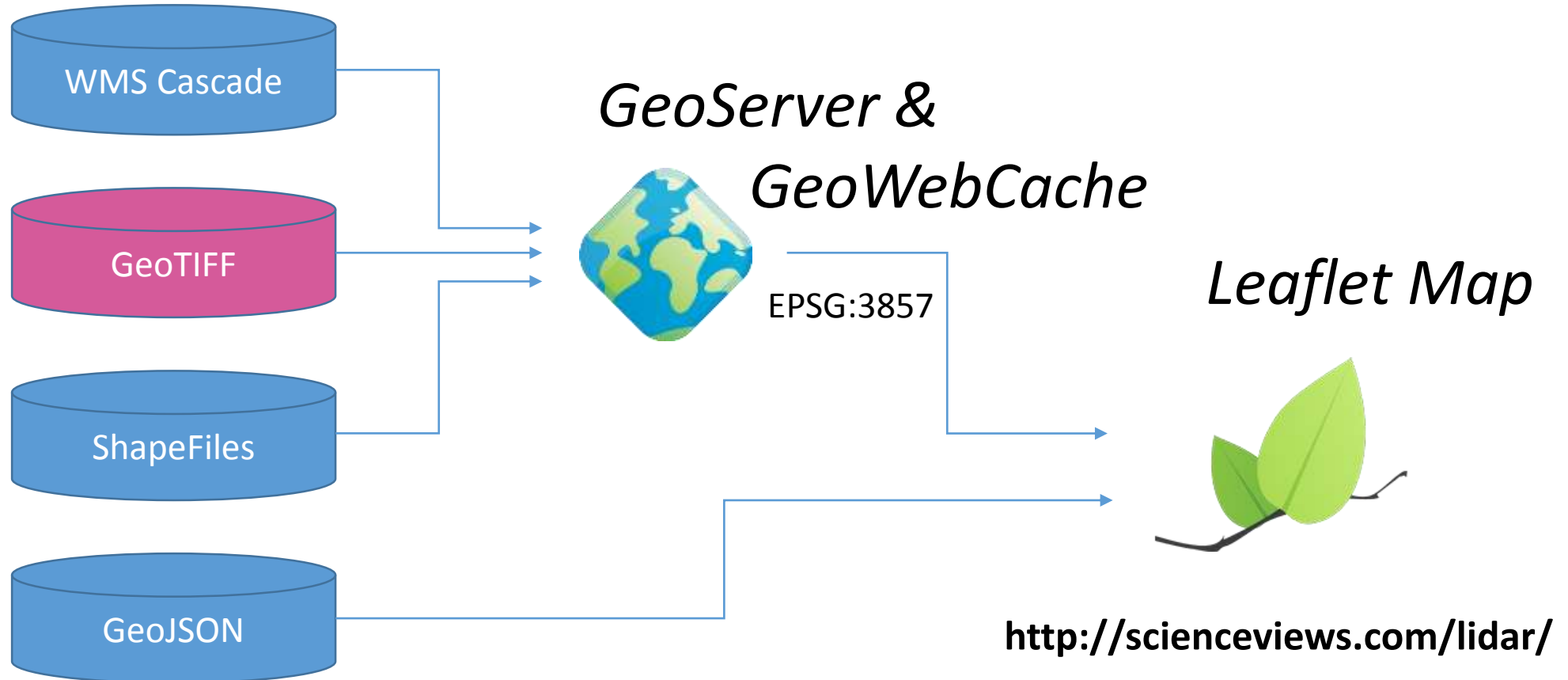




Architecture



Architecture



GeoServer ImageMosaic GeoTIFF Data Store

- Usually states provide county DTM/DEM data derived from Lidar.



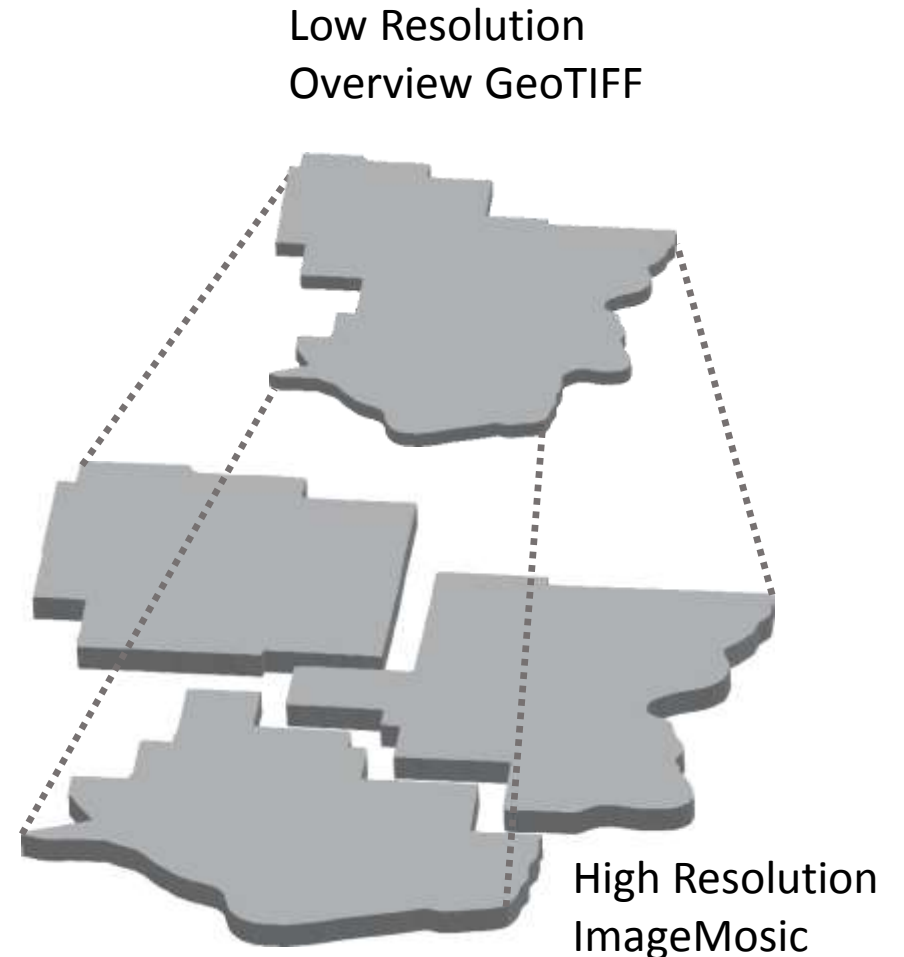
- Use QGIS to create a Hillshade of each county using EPSG:3857.



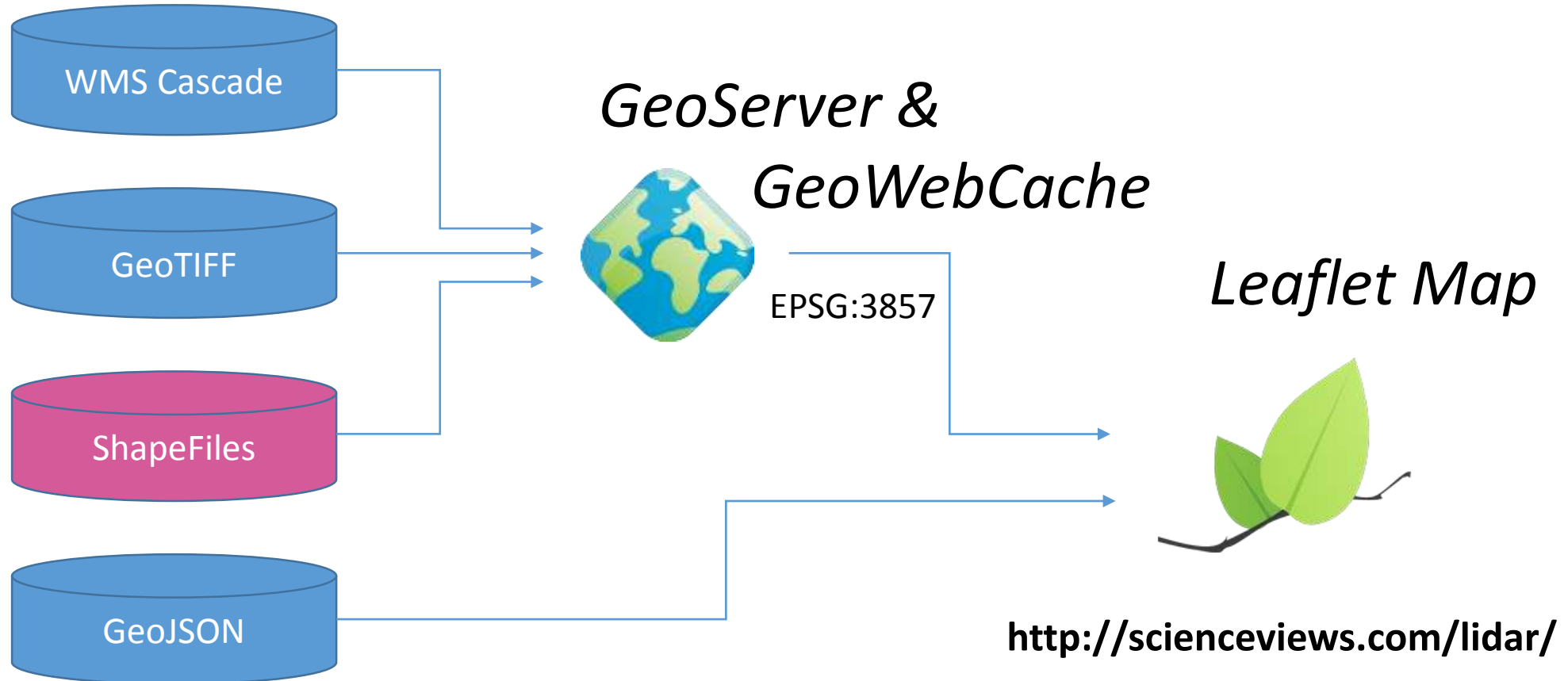
- Create a GeoServer ImageMosaic for each state with county hillshade GeoTIFFs.



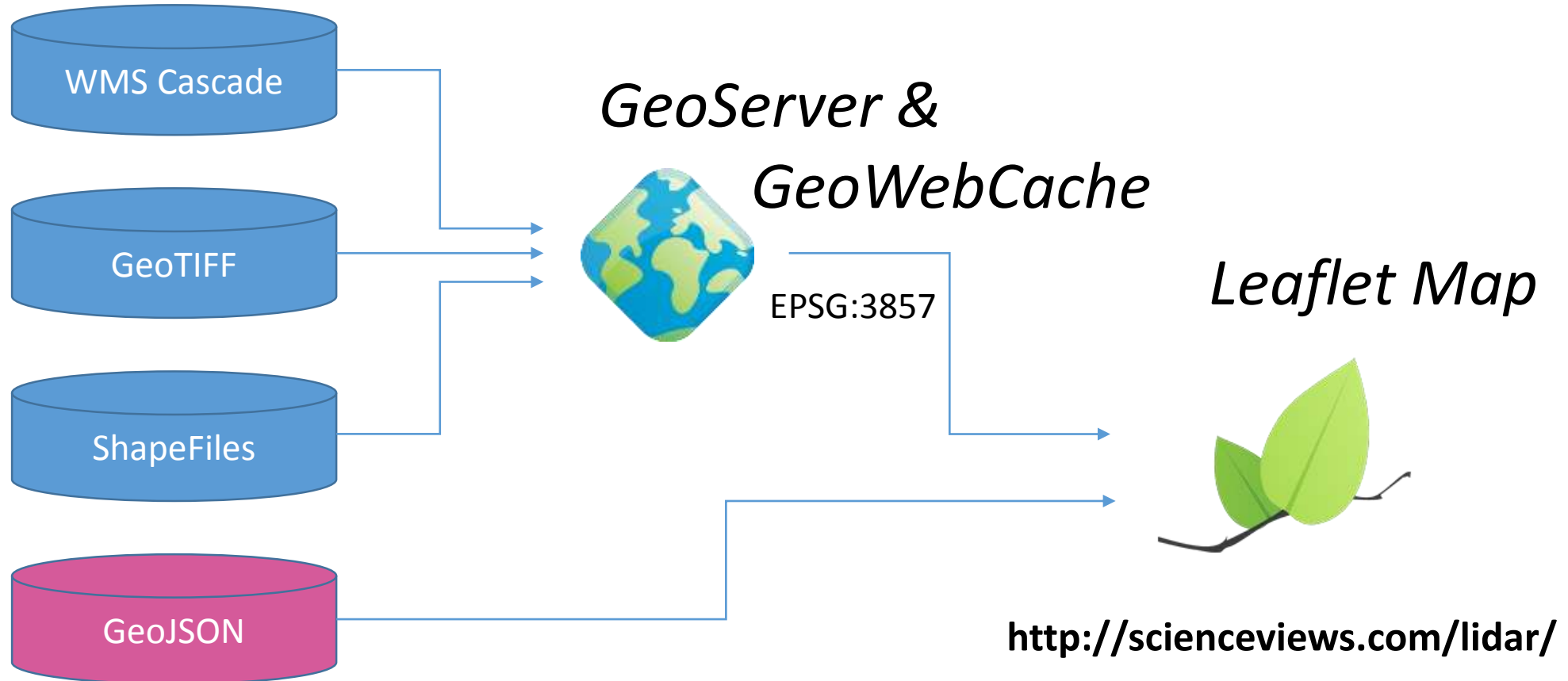
- Use GDAL to create an overview image of all the counties for low resolution viewing.



Architecture



Architecture



Results

State	Verified Archaeological Sites	Likely Archaeological Sites
Illinois	132	185
Indiana	63	49
Iowa	22	611
Ohio	143	170
Wisconsin	42	435
All State Summary	647	1516

What is this?



Smile!

Map URL

<http://scienceviews.com/lidar>



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Evaluate the Sessions



-1 0 +1