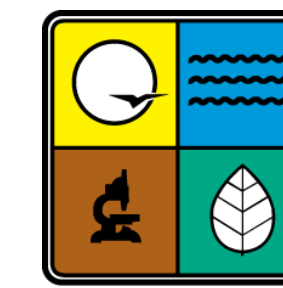


**SURFICIAL MATERIAL GEOLOGIC MAP OF THE GRAFTON 7.5' QUADRANGLE
ST. CHARLES COUNTY, MISSOURI**

Geology and Digital Compilation by David A. Gaunt,
Travis Carr, Vicki Dove and Edith Starbuck



2009

OFM-09-545-GS



**MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
GEOLOGICAL SURVEY PROGRAM
P.O. BOX 250, ROLLA MO 65402-0250
www.dnr.mo.gov/geology
573-368-2100**

**THIS MAP WAS PRODUCED UNDER A COOPERATIVE
AGREEMENT WITH THE UNITED STATES GEOLOGICAL
SURVEY'S NATIONAL EARTHQUAKE HAZARDS
REDUCTION PROGRAM**

Permission must be obtained to visit privately owned land

PHYSIOGRAPHY

The Missouri portion of the Grafton 7.5' quadrangle includes part of the large floodplain between the Missouri and Mississippi rivers. The floodplain is greater than nine miles wide in this area with approximately six miles on the quadrangle. The quadrangle lies within the Dissected Till Plains Section of the Central Lowland Province of the Interior Plains Physiographic Division. The lowest recorded elevation is less than 420 feet mean sea level (msl) and occurs along the edge of the Mississippi River on the eastern edge of the map. The highest elevation on the Missouri portions is 444 msl in the town of Orchard Farm in the south-central portion of the quadrangle. Total relief on the Missouri portion of the Grafton 7.5' quadrangle is approximately 24 feet.

DESCRIPTION OF MAP UNITS

- AF** **ARTIFICIAL FILL** – This unit comprises artificially emplaced fill material and is composed of a mixture of heterogeneous clay, silt, sand and gravel in various quantities. This unit may reach 40 feet in total thickness and comprises the material for highway and railroad beds, and waste water treatment facility fill. This artificial fill has typically been placed on undisturbed materials.
- Qcly** **QUATERNARY CLAY-CAPPED ALLUVIUM** – This unit has been deposited by the Missouri and Mississippi rivers. The approximate upper 15 feet of these deposits are composed predominantly of clay with variable amounts of silt and organic material. The material residing below the clay is predominantly sand to the top of bedrock. In the Missouri portion of the map in St. Charles County, the thickness of this unit reaches 120 feet between the large rivers. The water table is approximately 15 feet below ground surface, resulting in an interval of saturated sand greater than 100 feet thick. This unit is included in the cross sections as Quaternary alluvium.
- Qsilt** **QUATERNARY SILT-CAPPED ALLUVIUM** – This unit has been deposited by the Missouri and Mississippi rivers. The approximate upper 15 feet of these deposits are composed predominantly of silt with variable amounts of clay and organic material. The material residing below the silt is predominantly sand to the top of bedrock. In the Missouri portion of the map in St. Charles County, the thickness of this unit reaches 120 feet between the large rivers. The water table is approximately 15 feet below ground surface, resulting in an interval of saturated sand greater than 100 feet thick. This unit is included in the cross sections as Quaternary alluvium.
- Qsnd** **QUATERNARY ALLUVIAL SAND** – This unit has been deposited by the Missouri and Mississippi rivers. The composition of this unit is predominantly sand with variable amounts of clay, silt and organic material in the upper 15 feet. In the Missouri portion of the map in St. Charles County, the thickness of this unit reaches 120 feet between the large rivers. The water table is approximately 15 feet below ground surface here resulting in an interval of saturated sand greater than 100 feet thick. This unit is included in the cross sections as Quaternary alluvium.

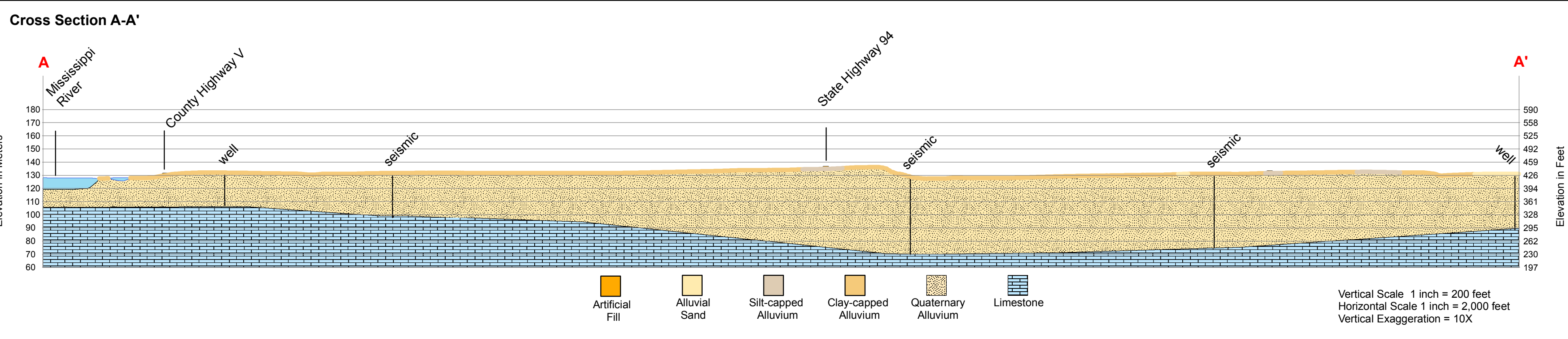
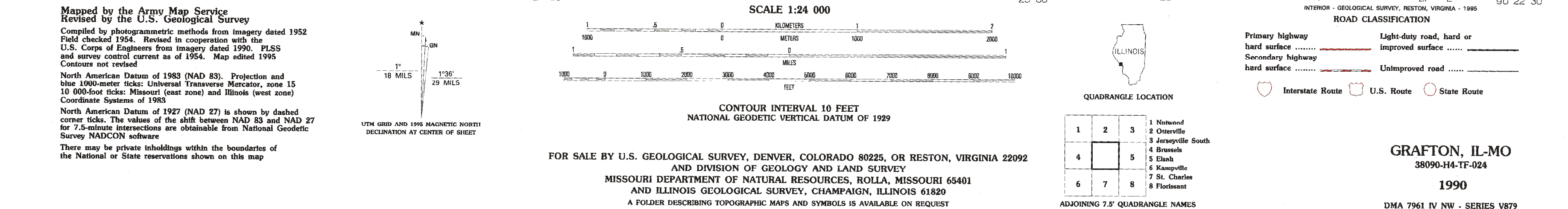
A—A' Lines locate the placement of the cross sections with end line symbols.

BIBLIOGRAPHY

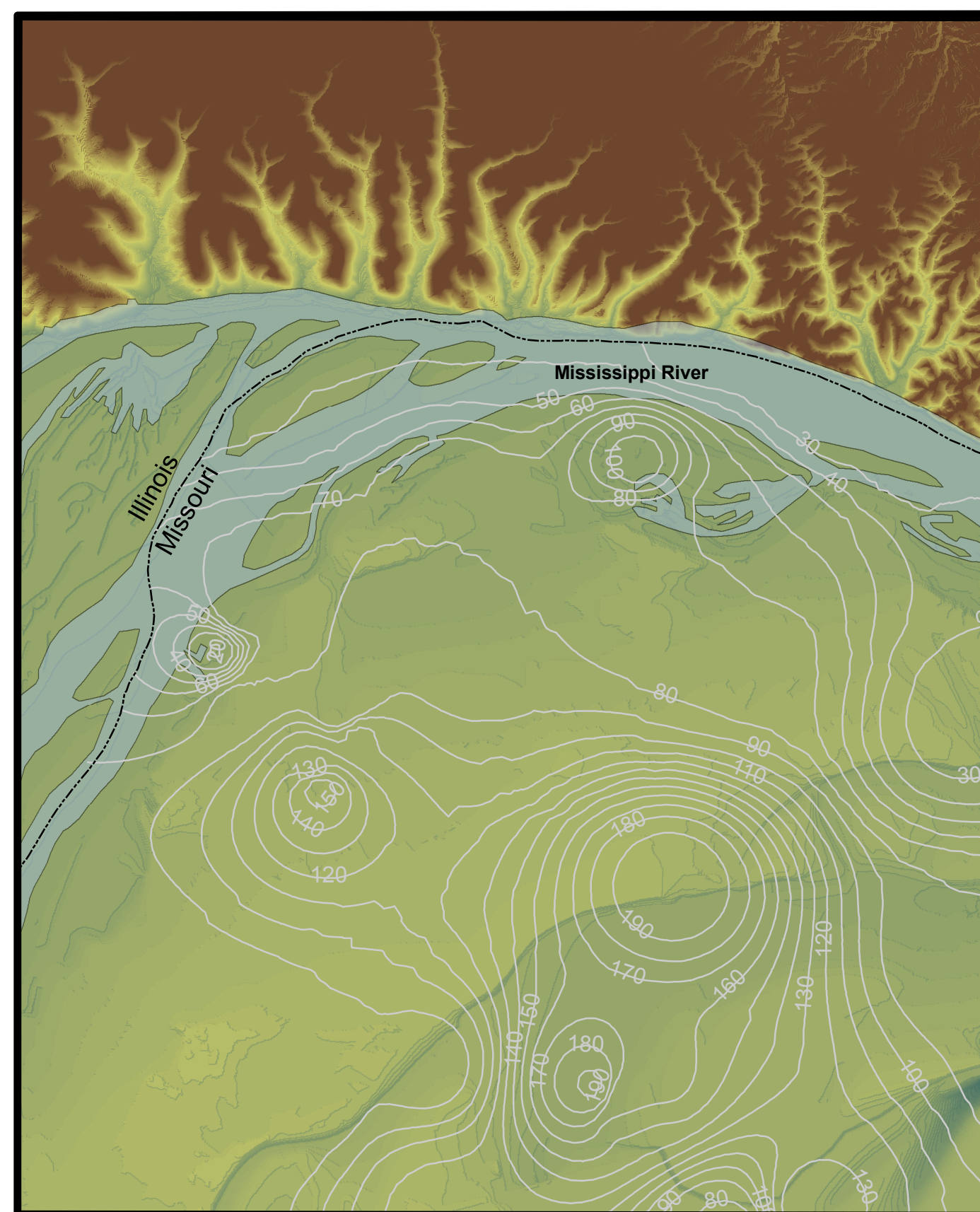
- Allen, W.H. and Ward, R.A., 1977, Soil, in The Resources of St. Charles County, Missouri, land, water, and minerals; Satterfield, Ira and Harris, Barbara, eds.; Missouri Geological Survey, Department of Natural Resources, 237 p.
- Goodfield, A.G., 1965, Pleistocene and surficial geology of the City of St. Louis and the adjacent St. Louis County, Missouri; unpublished Ph.D. dissertation, University of Illinois, Urbana, IL, 206p., 6 pl.
- Illinois State Geological Survey, Water and related wells in Illinois, ISGS map service: ILWATER 5/23/2007 <http://ablation.isgs.uiuc.edu/website/ilwater/viewer.htm>
- Missouri Department of Natural Resources, 2007, Well Logs, Wells Certified, Bedrock, Roads, IMOP, in Missouri Environmental Geology Atlas (MEGA); Division of Geology and Land Survey, Missouri Department of Natural Resources.
- Schrader, W.D., and Krusekoph, H.H., 1956, Soil survey of St. Charles County, Missouri; Soil Conservation Service, U.S. Department of Agriculture, 49 pages, 1 pl.
- Thompson, Thomas L., 1995, The stratigraphic succession in Missouri, v. 40 rev.; Division of Geology and Land Survey, Missouri Department of Natural Resources, 190 p.
- Williams, R.A., Odum, J.K., Stephenson, W.J., and Herrmann, R.B., 2007, Shallow P- and S-wave velocities in the St. Louis region, Missouri-Illinois: Earthquake Spectra, v. 23, no. 3, 711-726.

ACKNOWLEDGEMENTS

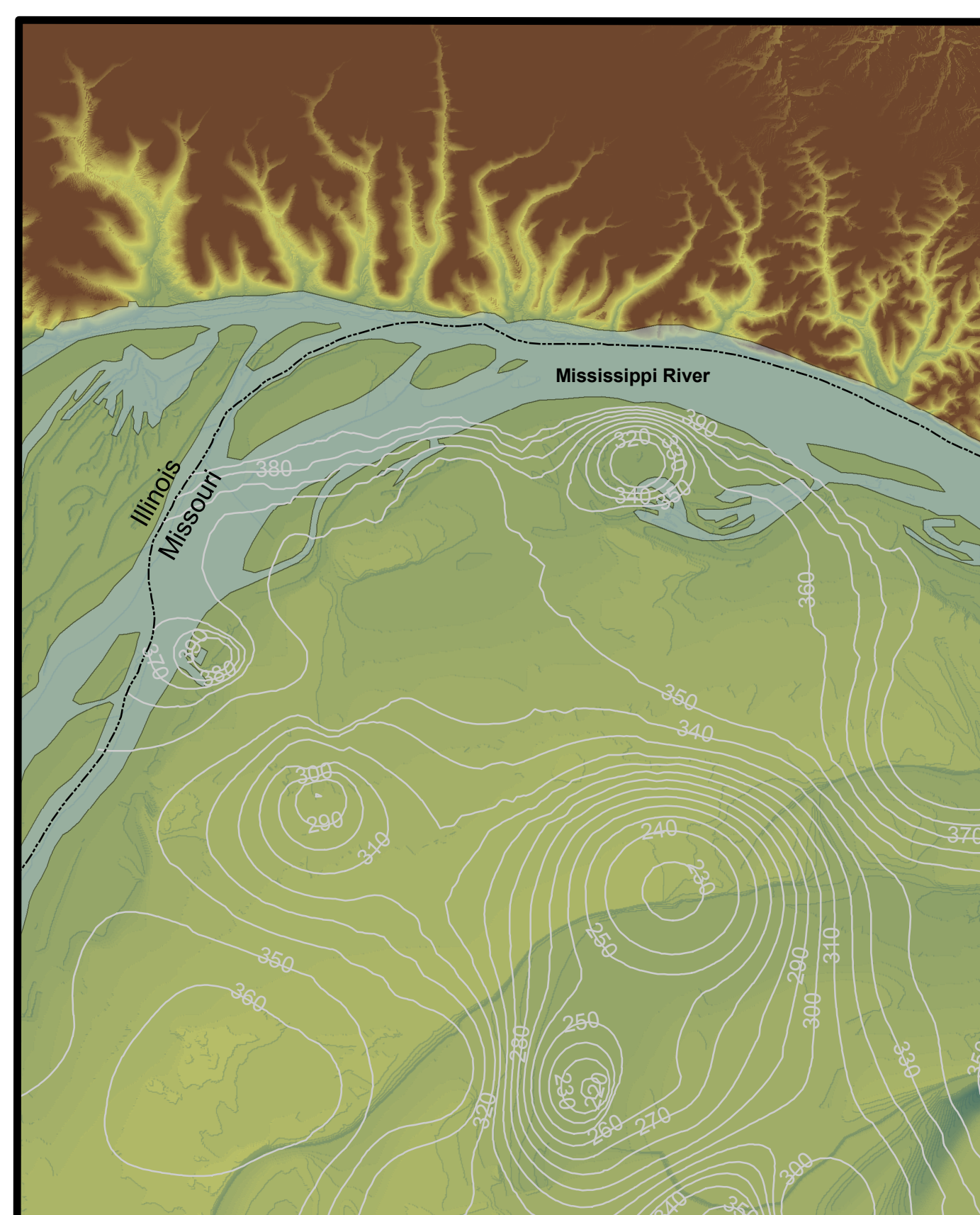
The authors would like to recognize Ali Atef and Uchenna Aboaja with the Missouri University of Science and Technology for their work collecting and processing seismic data and the division's graphical staff Mark Gordon and Hylan Beydler with the Division of Geology and Land Survey for their assistance in the production of the map.



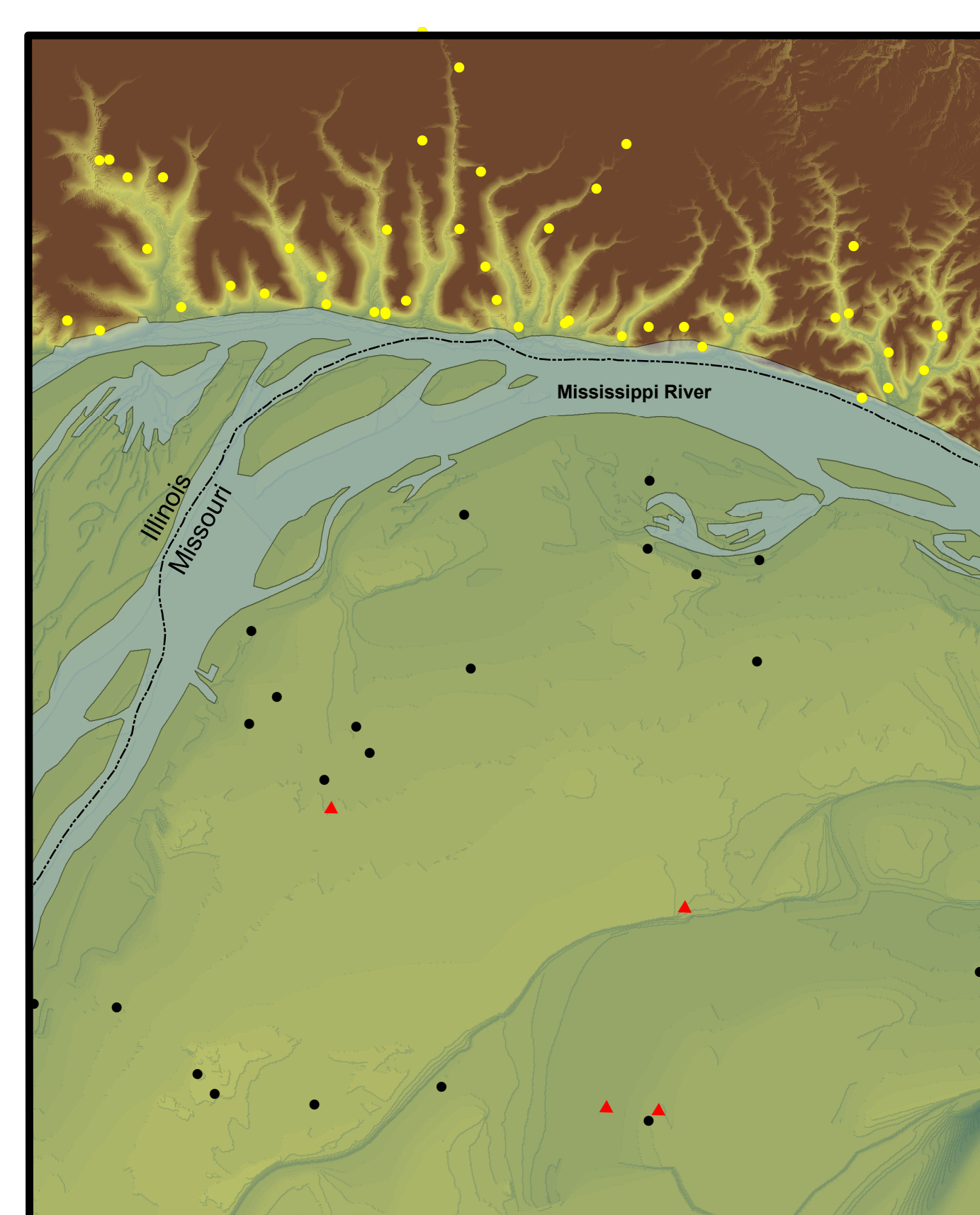
SURFICIAL MATERIAL THICKNESS



TOP OF BEDROCK ELEVATION



SUBSURFACE DATA POINTS

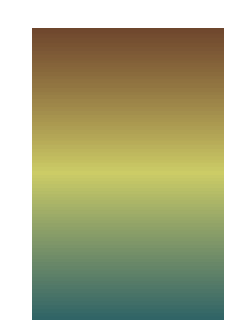


Inset Legend

- Quadrangle Boundary
- State Boundary
- ▲ Seismic Survey
- MoDGLS Boring
- Bedrock Boring
- ISGS Boring

Digital Elevation Model Value in Meters

High: 272
Low: 118



Scale 1: 60,000
Contour Interval = 10 feet