

# **Geology of the Epps 7.5-Minute Quadrangle, LA**

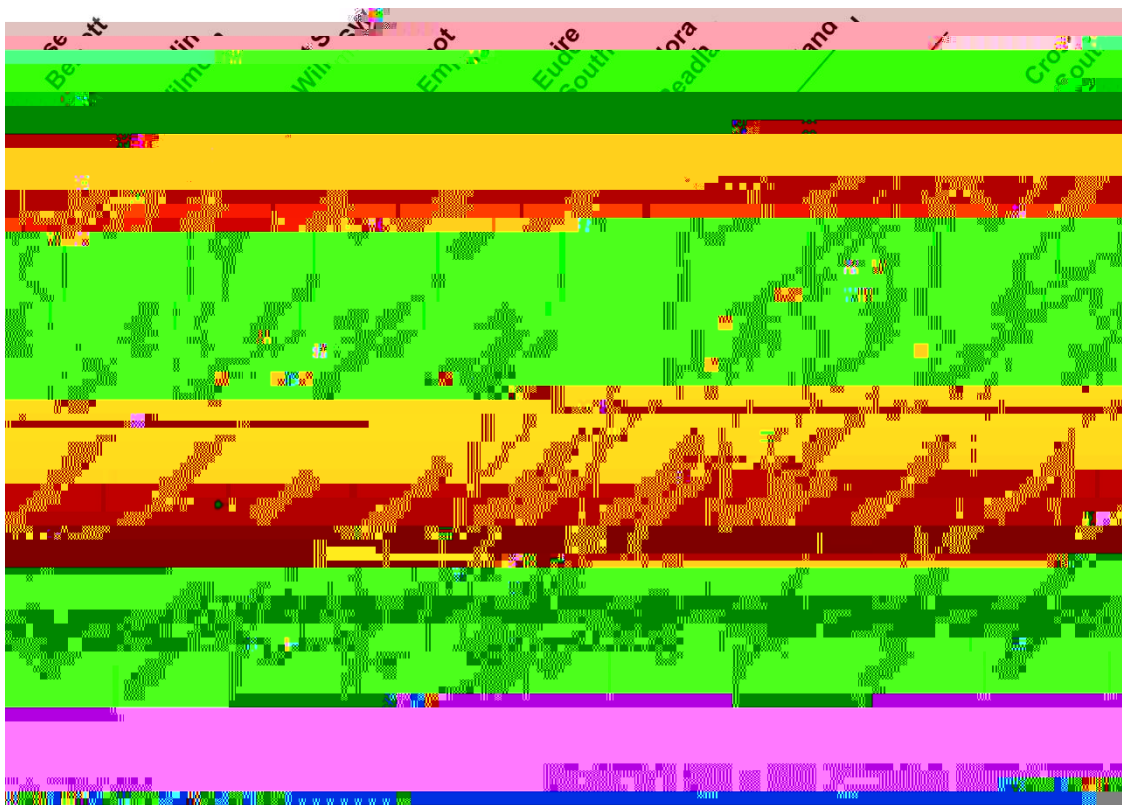
*Louisiana Geological Survey*

## **Introduction, Location, and Geologic Setting**

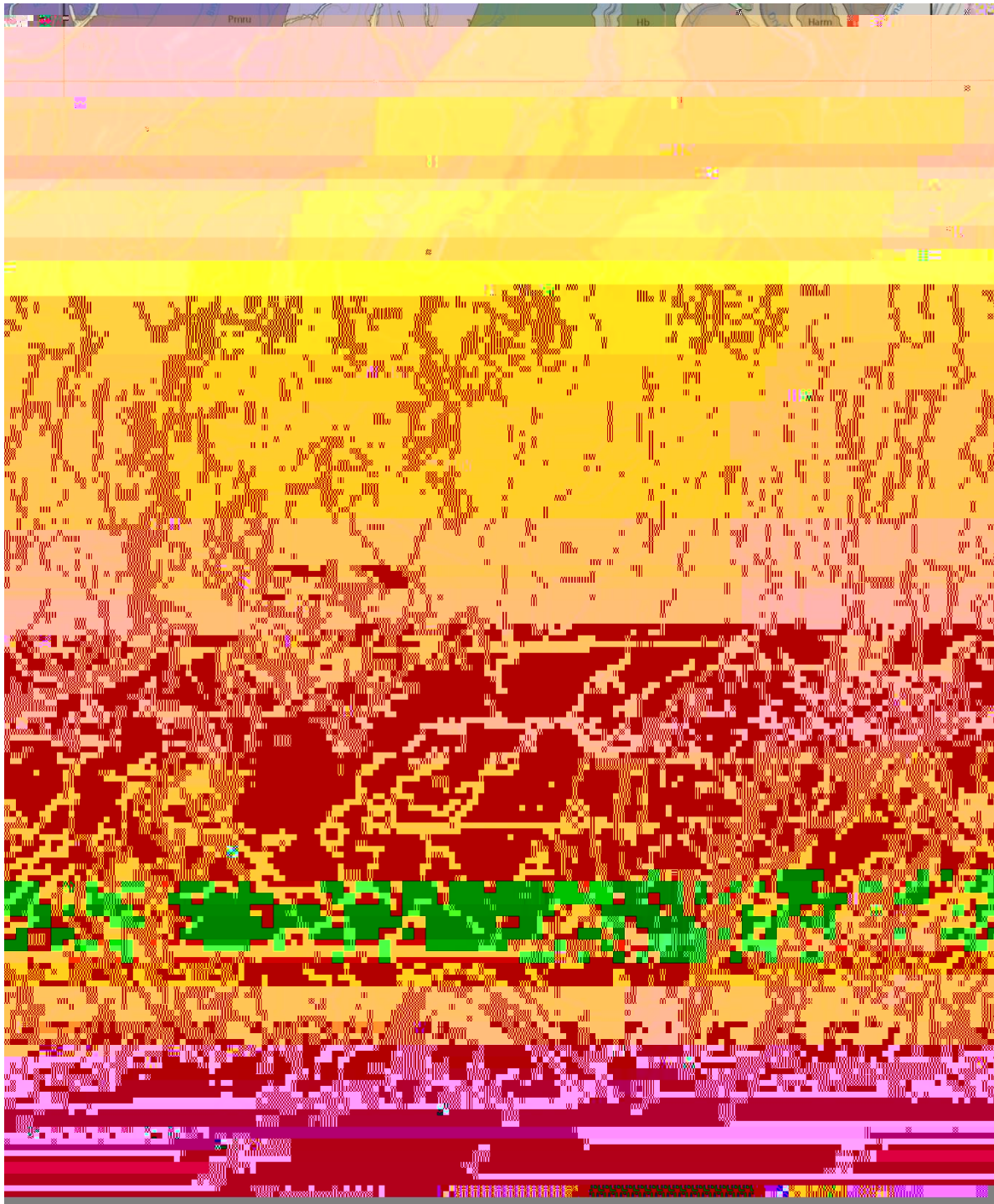
The Epps 7.5-minute quadrangle lies across the boundary between late Pleistocene uplands and Holocene alluvial deposits of the Mississippi River valley in the extreme northeastern portion of Louisiana (Figures 1-3). The quadrangle lies atop the Monroe uplift. Its surface consists exclusively of Holocene and terraced late Pleistocene strata (Figures 2, 3) deposited by the Mississippi River.



1. Location of Epps 7.5-minute quadrangle, northeastern Louisiana.



2. Epps 7.5-minute quadrangle in relation to generalized distribution of uplands (shaded), consisting exclusively of terraced late Pleistocene strata, and bottomlands (unshaded), consisting of Holocene river and stream deposits, in the Bastrop 30 × 60 minute quadrangle.



3. Surface geology of Epps 7.5-minute quadrangle and vicinity (adapted from Heinrich et al., 2015). (**Pmrl**, **Pmru**: lower and upper Macon Ridge alloformation (Pleistocene); **Hmm1**, **Hml1**: Holocene meanderbelt and natural levee deposits of Mississippi River course 1; **Hmm4**, **Hml4**, **Hmc4**: Holocene meanderbelt, natural levee, and crevasse complex deposits of Mississippi River course 4; **Harm**, **Harl**: Holocene meanderbelt and natural levee deposits of the Arkansas River; **Hb**, Holocene backswamp deposits; **Hsm**, **Hsl**, **Hscs**: Holocene meanderbelt, natural levee, and crevasse splay deposits of small rivers; **Hcr**, Holocene river channel remnants; **Hua**, Holocene undifferentiated alluvium.) The Arkansas River sediments were reclassified for this investigation as deposits of a Mississippi River distributary course as discussed in the text.



## **Allostratigraphic Approach to Pleistocene Unit Definitions**

In the late 1980s the LGS had begun exploring the application of allostratigraphic concepts and nomenclature to the mapping of surface Plio Pleistocene units (e.g., Autin, 1988). In Louisiana these units show a series of geomorphic attributes and preservation states

Extensive optically stimulated luminescence dating of the valley train sediments underlying their surface by Rittenour (2004) and Rittenour et al. (2005, 2007) found that these surfaces wi

Holocene fluvial sediments of the Tensas River Basin underlie the central and southeast portions of the Epps 7.5-minute quadrangle. This quadrangle straddles the western edge of the upper Tensas Basin that is defined by the scarp of Macon Ridge. The modern channel of the Mississippi River forms the eastern edge of the Tensas Basin. The northern end of this basin is defined by where the historic Mississippi River meander belt abuts Macon Ridge. Its southern end lies at Sicily Island, where the Ouachita River enters the Mississippi River alluvial valley (Fisk, 1944; Saucier, 1967). The geomorphology of the Tensas Basin is well known and the archaeology has been relatively well studied by Fisk (1944) and Saucier (1967, 1974, 1994a, 1994b, 1996). More recent research by Kidder (2006), Adelsberger and Kidder





- Autin, W. J., 1988, Mapping alloformations in the Amite River, southeastern Louisiana: Geological Society of America Abstracts with Programs, v. 20, no. 4, p. 252.
- Autin, W. J., S. F. Burns, B. J. Miller, R. T. Saucier, and J. I. Snead, 1991, Quaternary geology of the Lower Mississippi Valley, *in* Morrison, R. B., ed., Quaternary non-glacial geology: conterminous United States: Boulder, Colorado, Geological Society of America, The Geology of North America, v. K 2, Chapter 18, p. 547–582.
- Blum, M. D., and H. H. Roberts, 2012, The Mississippi Delta Region: Past, Present, and Future: Annual Review of Earth and Planetary Sciences, v. 40, p. 655–683.
- Dörrbecker, M., 2008, Map of the Poverty Point archaeological site: [http://en.wikipedia.org/wiki/Poverty\\_Point](http://en.wikipedia.org/wiki/Poverty_Point) (accessed 4 September 2014).
- Fisk, H. N., 1944, Geological investigation of the alluvial valley of the lower Mississippi River: Vicksburg, Mississippi, U.S. Army Corps of Engineers, Mississippi River Commission, 78 p. plus plates.
- Heinrich, P. V., J. Snead, and R. P. McCulloh (compilers), 2015, Bastrop 30 × 60 minute geologic quadrangle: Louisiana Geological Survey, Baton Rouge, Scale 1:100,000.
- Heinrich, P. V., J. Snead, and R. P. McCulloh (compilers), 2014, Bastrop 30 × 60 Minute Geologic Quadrangle: Unpublished map prepared in cooperation with U.S. Geological Survey, STATEMAP program, under cooperative agreement no. G13AC00166, Open-File Map 2014–01, Louisiana Geological Survey, Baton Rouge, Scale 1:100,000.
- Kidder, T. R., 2006, Climate change and the Archaic to Woodland transition (3000–2600 cal B.P.) in the Mississippi River Basin. *American Antiquity*, v. 71, p. 195–231.
- Kidder, T. R., K. A. Adelsberger, L. J. Arco, and T. M. Schilling, 2008, Basin-scale reconstruction of the geological context of human settlement: an example from the lower Mississippi Valley, USA: *Quaternary Science Reviews*, v. 27, p. 1255–1270.
- Kolb, C. R., W. B. Steinriede, Jr., E. L. Krinitzsky, R. T. Saucier, P. R. Mabrey, F. L. Smith, and A. R. Fleetwood, 1968, Geological investigation of the Yazoo basin, lower Mississippi valley: U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi, Tech report no. 3–480 [unpaginated oversized plates include 1:62,500-scale stacked-unit geologic maps in 15-minute quadrangle format].
- Louisiana Geological Survey (compiler), 1993, Jackson, MS., LA. 1:250,000 geologic quadrangle [Louisiana portion]: Unpublished map plus explanation and notes, prepared in cooperation with U.S. Geological Survey, COGEOMAP program, under cooperative agreement no. 1434–92–A–1070, scale 1:250,000.
- McCulloh, R. P., Heinrich, P. V., and Snead, J. I., 2003, Geology of the Ville Platte Quadrangle, Louisiana: Louisiana Geological Survey, Geological Pamphlet no. 14, 11 p.
- Rittenour, T. M., 2004, Fluvial evolution of the lower Mississippi valley over the last glacial cycle: Ph.D. dissertation, University of Nebraska, Lincoln, 295 p.



Survey, STATEMAP program, under cooperative agreement no. G13AC00166, Open-File Map 2014 02, Louisiana Geological Survey, Baton Rouge, Scale 1:100,000.