

Field Trip Guide to Selected Locations Along the Baton Rouge Fault Trace
Spanning the Pleistocene–Holocene Transition in Western East Baton Rouge Parish

by

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Whitney J. Autin operated a truck-mounted hydraulic soil probe to drill the boreholes spotted on Figures 3 and 5, and shared his knowledge of soils in East Baton Rouge Parish (including the Sharkey clay) and their associations with surface-geologic map units. Tommy F. Hill originally made the author aware of the Pancho's restaurant lot (Stop 4) and its history.

PREFACE

The content presented herein originally was prepared as a contribution to a fall field trip of the New Orleans Geological Society on the subject of southeastern Louisiana surface faults. The trip segment covered by this material focused on the western extent of the Baton Rouge fault in East Baton Rouge Parish, where it transects Holocene strata of the Mississippi River flood plain in addition to the Pleistocene strata that underlie most of Baton Rouge. The field trip was organized by Sherwood M. Gagliano (Coastal Environments, Inc.) and Kathy Haggar (Riparian, Inc.), and was conducted Saturday, October 18th, 2008.

**Field Trip Guide to Selected Locations Along the Baton Rouge Fault Trace
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Richard P. McCulloh

In this segment trip participants will visit several locations along the fault-line scarp of the Baton Rouge fault. We will begin at a site with geomorphic expression typical for places where the fault trace transects the Pleistocene terrace on which most of Baton Rouge is situated. From there we will move toward the Mississippi River flood plain, stopping at two localities where the fault juxtaposes Pleistocene and Holocene sediments, and ending at a locality where it transects Holocene Mississippi floodplain sediment. At this last locality, movement along the fault appears to have led to the demise of a restaurant building that formerly occupied the lot.

List of Stops:

Stop 1. (Pleistocene/Pleistocene)—Area along Corporate Blvd. east of College Drive just north of I-12

Stop 2. (Pleistocene/Holocene)—March Street near its T-intersection with Dalrymple Dr., north of LSU and just south of I-10

Stop 3. (Pleistocene/Holocene)—Highland Road north of LSU

Stop 4. (Holocene/Holocene)—Nicholson Drive north of LSU

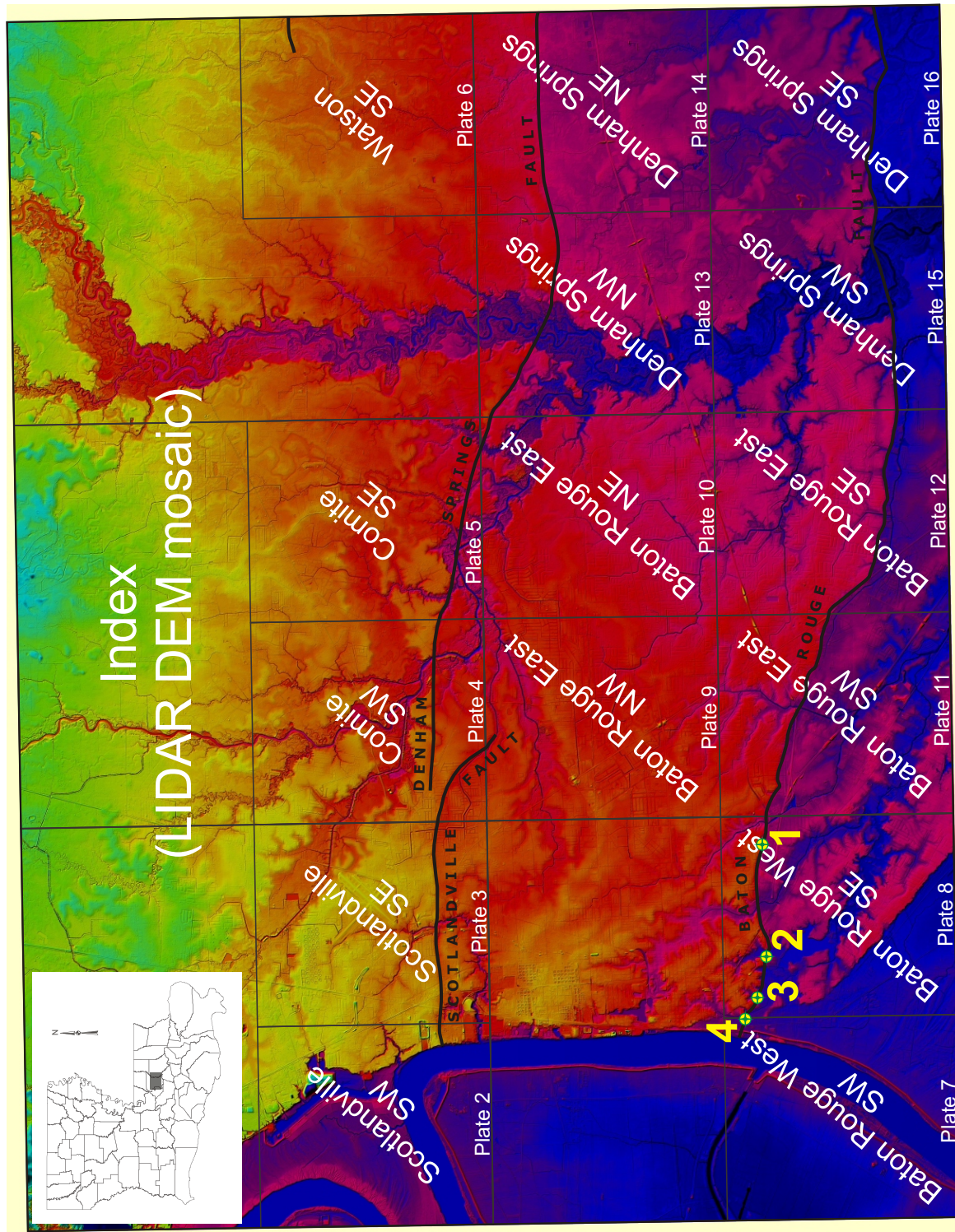


Figure 1. Index showing faults, greater Baton Rouge area, with trip stops (LIDAR DEM mosaic modified from McCulloh, 2008, LGS Public Information Series No. 13, Plate 1).

Stop 1. (Pleistocene/Pleistocene)—Area along Corporate Blvd. east of College Drive just north of I-12: the fault displaces the terrace surface at the top of the late Pleistocene Hammond alloformation, Prairie Allogroup.

Figure 3 shows topographic patterns of the fault-line scarp (5-ft / 1.5-m contour interval) characterized by regularly spaced, systematically converging and diverging elevation contours, interpreted by McCulloh (1996) as generally indicative of minimal colluviation. Numbers on the inset map refer to thicknesses (in meters) of interpreted colluvium encountered in boreholes; the queried value reflects uncertainty due to possible influence by the course of a stream incision (i.e., alluviation) near the hole location.

Stop 1 location is encompassed by segment **A** of Figure 3.

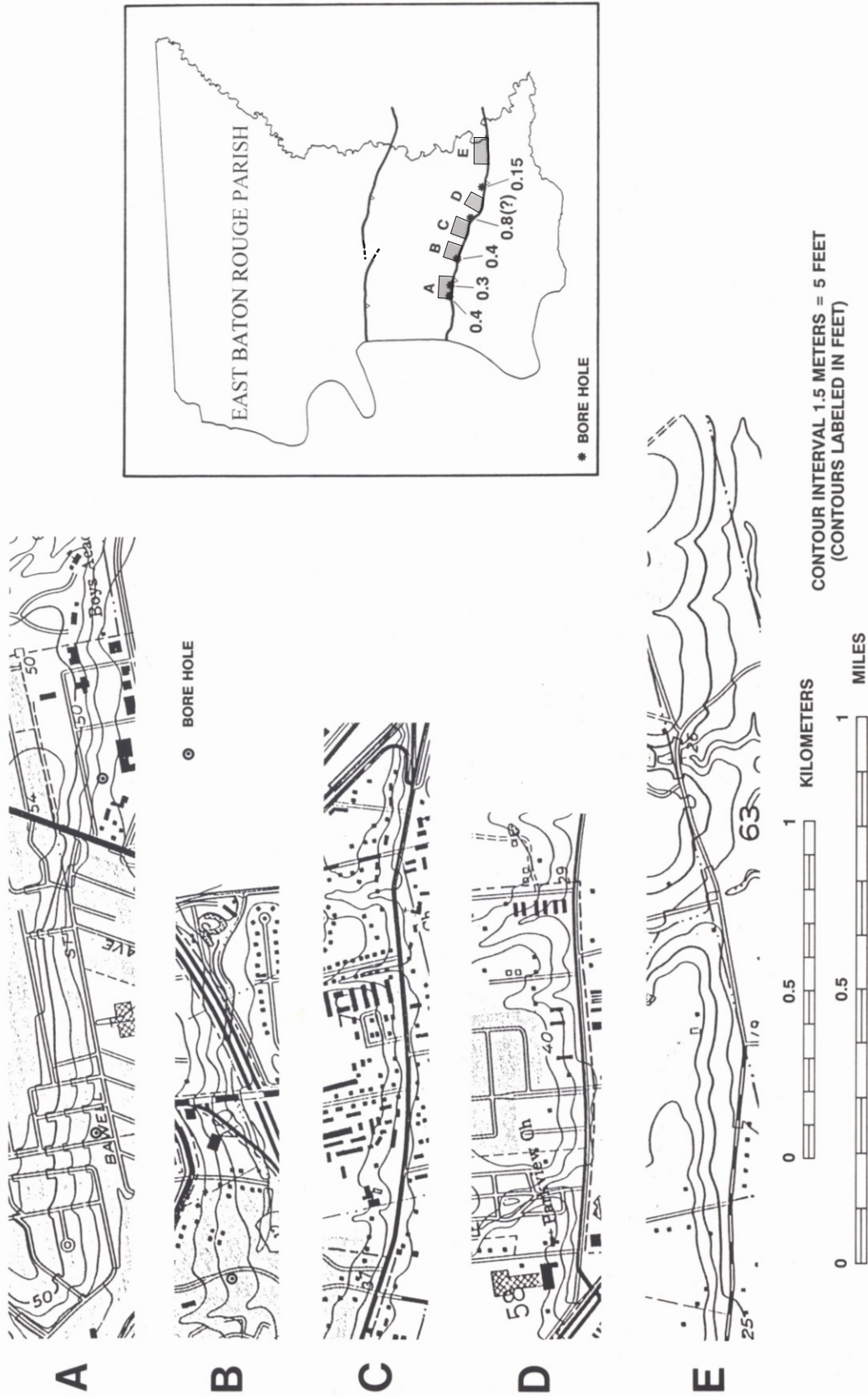


Figure 3. Topographic patterns of fault-line scarp, Baton Rouge fault (5-ft / 1.5-m contour interval, modified from McCulloh, 1996, LGS Open-File Series No. 96-01, Figure 2; eastern portion of segment **A** encompasses *Stop 1*).

Stop 2. (Pleistocene/Holocene)—March Street near its T-intersection with Dalrymple Dr., north of LSU and just south of I-10: the fault juxtaposes the Hammond on its upthrown block with a Holocene deposit and associated landform on the proximal edge of the downthrown block, marking the Pleistocene–Holocene terrace escarpment and contact. This area is the one noteworthy exception to the generalization of minimal colluviation of the fault-line scarp. The Holocene deposit is unique in East Baton Rouge Parish, and consists of colluvium derived from reworked loess (sand-sized aggregates of silt), lobes of which make up the landform. This type of deposit is present only here in the parish because the loess thickens abruptly toward the Mississippi River flood plain, and only in this area was it thick enough to rework in association with movement along the Baton Rouge fault. (This situation does not apply for the Scotlandville fault, which at the surface has much smaller displacement and consequently much less relief on its fault-line scarp.)

The colluvium at this stop overlies a Holocene backswamp mud (classed as Sharkey clay by soils scientists) deposited by the youngest course of the Mississippi River.

Figures 4 and 5 (modified from McCulloh, 1996) show the location of Stop 2 on an index map of faults in East Baton Rouge Parish, and a map and interpretive cross section (**A–A'**) showing the distribution of colluvium in this area and its geomorphic expression.

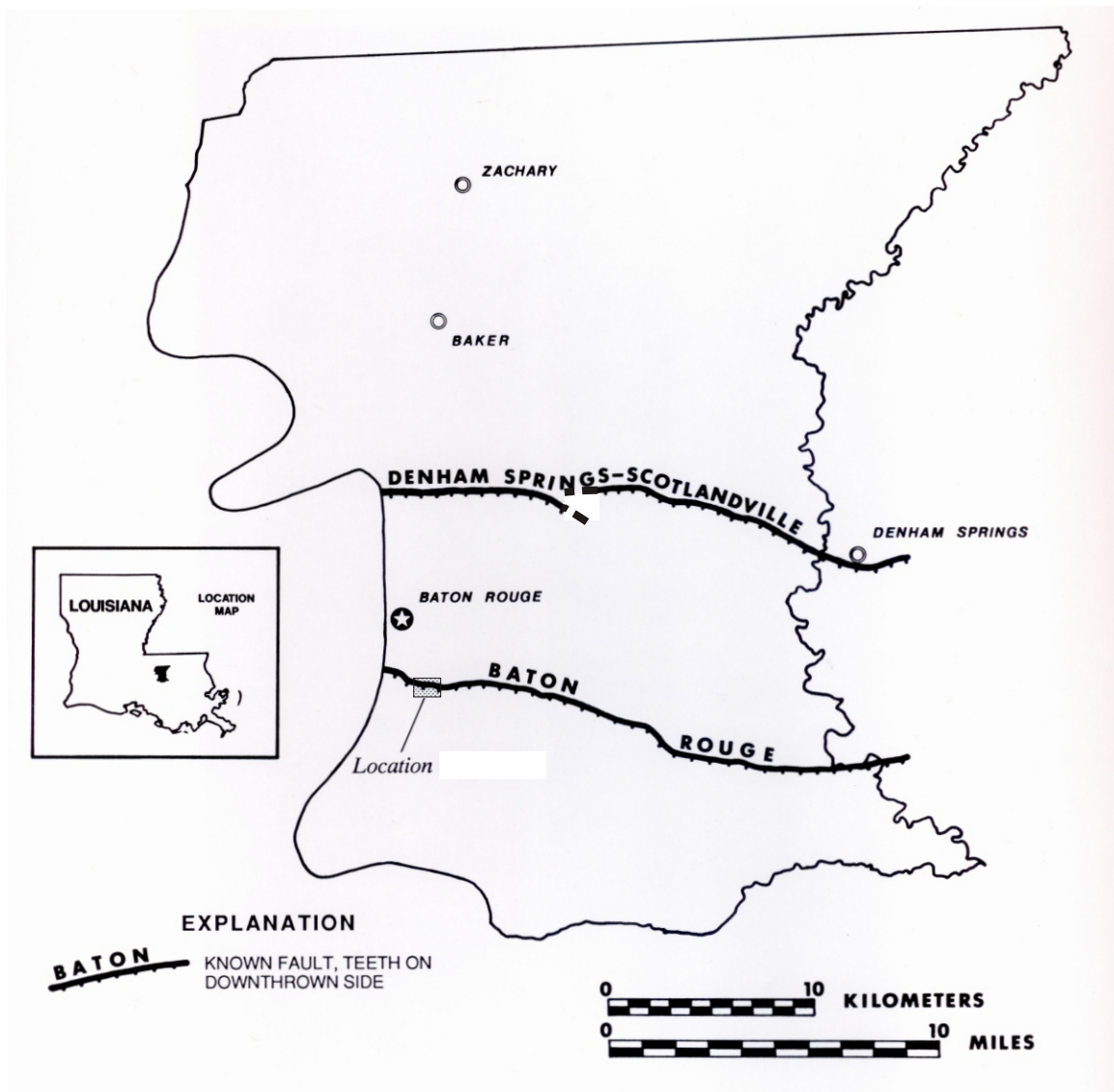


Figure 4. Index map showing location of *Stop 2* (modified from McCulloh, 1996, LGS Open-File Series No. 96-01, Figure 1).

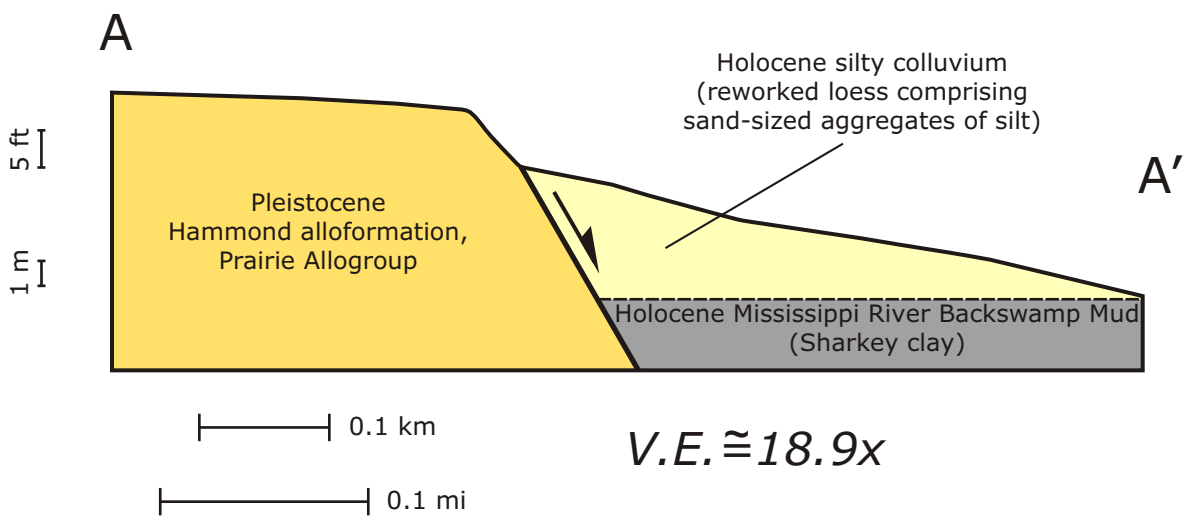
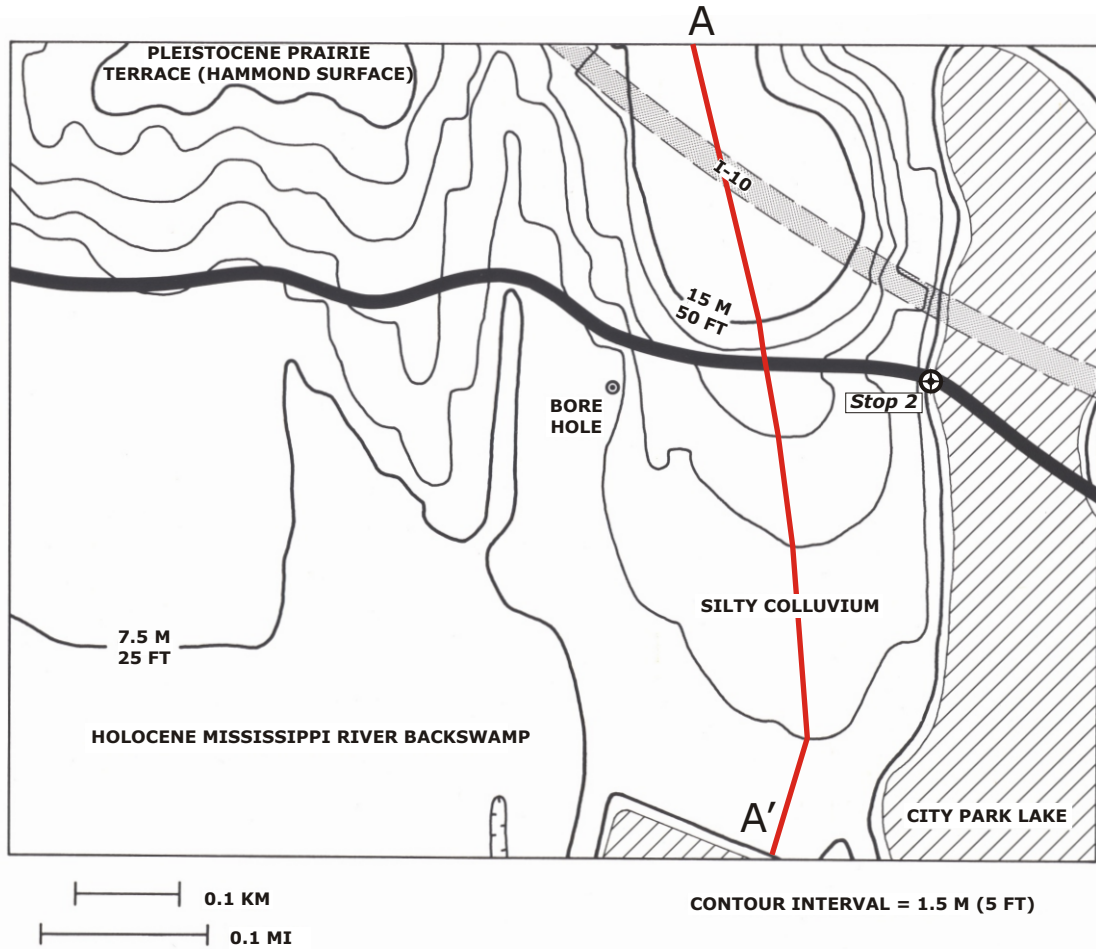


Figure 5. Map of area encompassing *Stop 2*, traced from portion of U.S. Geological Survey topographic map sheet for Baton Rouge West 7.5-minute quadrangle (modified from McCulloh, 1996, LGS Open-File Series No. 96-01, Figure 4), and interpretive cross section A-A'.

Stop 3. (Pleistocene/Holocene)—Highland Road north of LSU: the fault juxtaposes the Hammond (Pleistocene terrace) on its upthrown block with the Holocene Mississippi River backswamp deposit on its downthrown block, coinciding here (as at Stop 2) with the Pleistocene–Holocene terrace escarpment and contact.

Figure 6 consists of zoomed excerpts from the two front index maps, to show the areas of Stops 3 and 4 in greater detail; Figure 7 is a photo (from McCulloh, 2001) of the Stop 3 area in a view looking north-northwest (the line of red dots marks the approximate fault trace on the road).

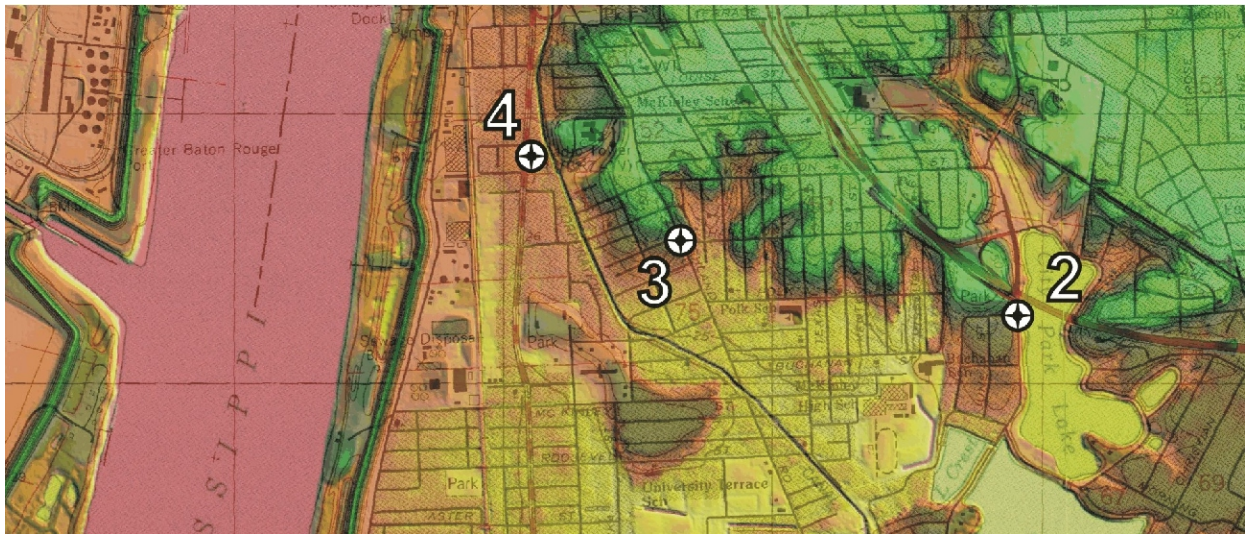
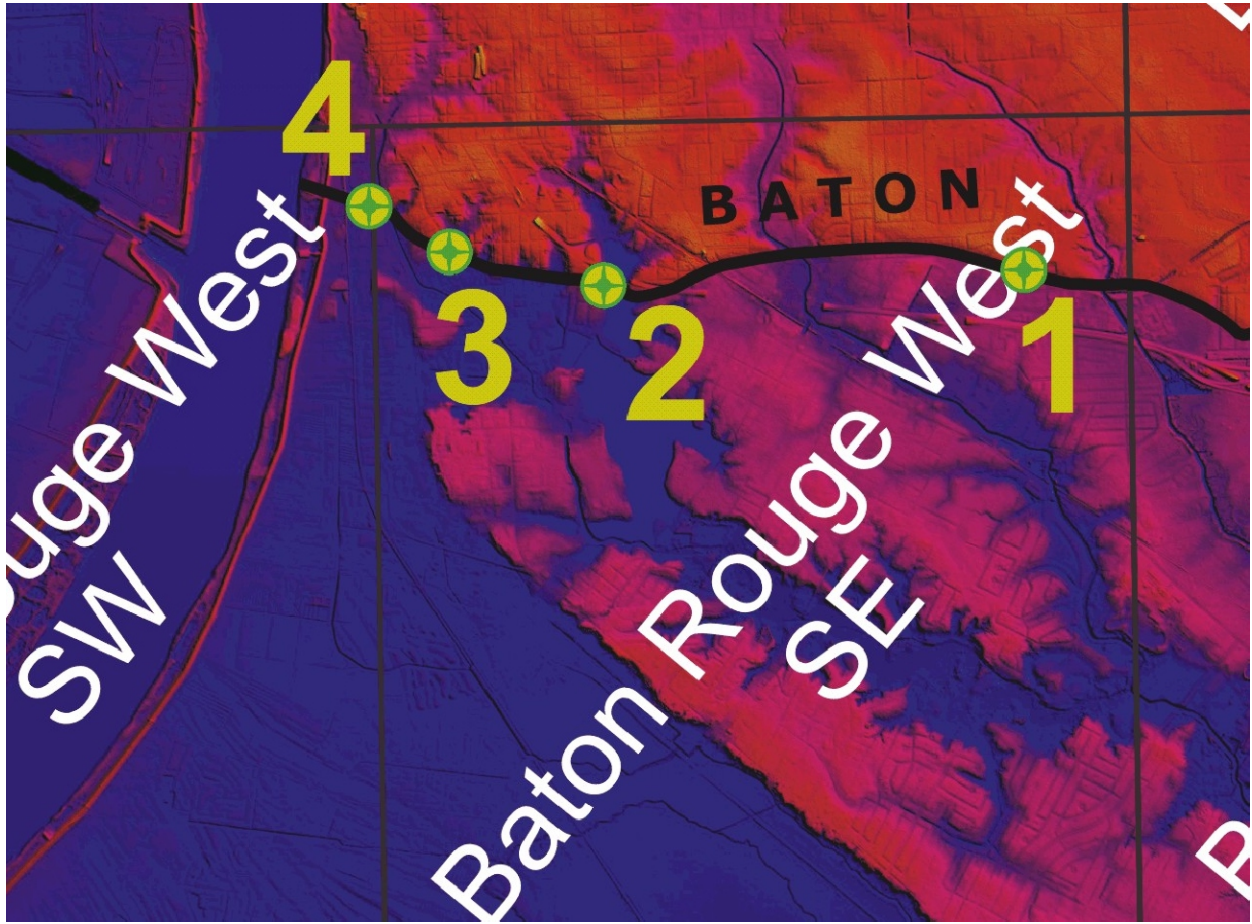


Figure 6. Excerpts from figures 1 and 2 to show *Stops 3 and 4* in greater detail.



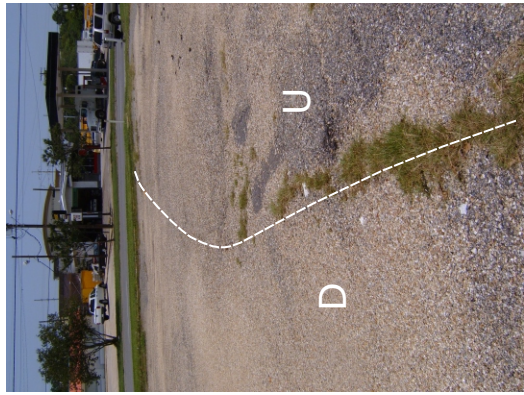
Figure 7. *Stop 3* photo (from McCulloh, 2001, Public Information Series No. 8, Figure 3); line of red dots marks approximate fault trace.

Stop 4. (Holocene/Holocene)—Nicholson Drive north of LSU (old Pancho’s restaurant lot, now empty except for remains of the foundation including some remaining tile): the fault displaces the Holocene Mississippi River backswamp deposit, and manifests in the parking-lot pavement as a monoclinial flexure with an apparent amplitude of approximately 10–25 cm (4–10 inches).

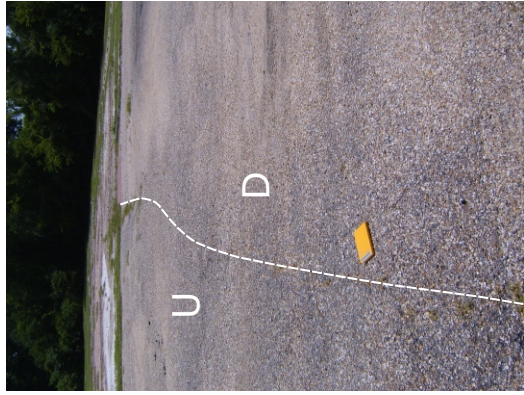
Figure 8 comprises photos taken at the Stop 4 locality and annotated to show the interpreted fault trace in the parking-lot pavement, in views looking west-northwest, northwest, and east-southeast.



(looking west-northwest)



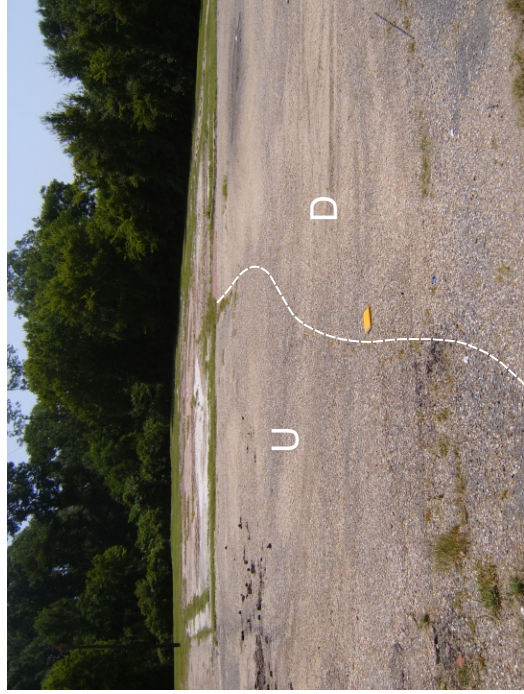
(looking west-northwest)



(looking east-southeast)



(looking north)



(looking east-southeast)

Figure 8. Photos taken at **Stop 4**; dashed line marks fault trace, U=upthrown block, D=downthrown block (field book measures 19 x 12 cm or 7.5 x 4.6 inches).

References

- Autin, W. J., and R. P. McCulloh, 1991, Geologic and derivative engineering geology hazard maps of East Baton Rouge Parish, Louisiana: Louisiana Geological Survey Open-File Series No. 91-01, prepared for East Baton Rouge Parish Department of Public Works under project no. 90-MS-CP-0024, 31 plates plus index and explanation.
- Heinrich, P. V., and R. P. McCulloh (compilers), 2000, Baton Rouge West, LA 7.5 minute geologic quadrangle: Open-File Map 2000-02, Louisiana Geological Survey, Baton Rouge, scale 1:24,000. [*Note: has edits of technical content pending, specifically, the Holocene colluvial lobes at Stop 2 are not depicted on the existing version*]
- McCulloh, R. P., 2008, The Scotlandville, Denham Springs, and Baton Rouge Faults—A Map Guide for Real Estate Buyers, Sellers, and Developers in the Greater Baton Rouge Area: Louisiana Geological Survey, Public Information Series No. 13, 38 p., accessible at <http://www.lgs.lsu.edu/deploy/uploads/BRFaultsGuide.pdf>.
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- Roland, H. L., T. F. Hill, P. Autin, C. O. Durham, and C. G. Smith, 1981, The Baton Rouge and Denham Springs-Scotlandville faults: mapping and damage assessment: report prepared for Louisiana Department of Natural Resources by Louisiana Geological Survey and Durham Geological Associates Consultants under contract no. 21576-80-01, 26 p. plus plates (16 oversized map sheets, scale 1 inch = 400 ft).