Geology of the Broussard 7.5-Minute Quadrangle, LA

Louisiana Geological Survey

Introduction, Location, and Geologic Setting

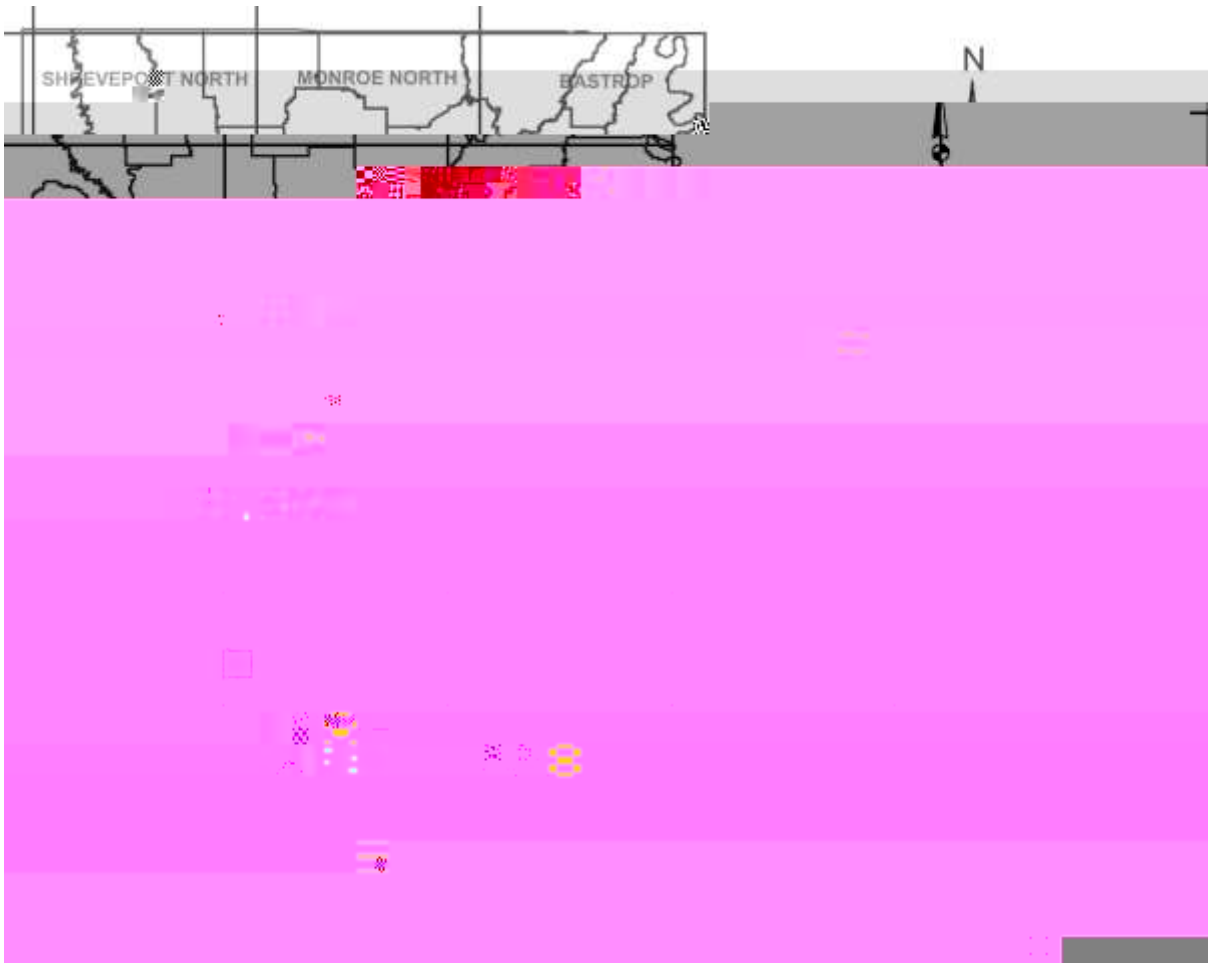
The study area lies within the Gulf Coast salt basin, directly north of the northwestern terminus of the Five Islands salt-dome trend in southwestern Louisiana. It straddles the western valley wall of the Holocene Mississippi River flood plain near the southern edge of coast-parallel outcrop belts of terraced Pleistocene strata.

The area covers portions of two parishes (Figures 1, 2), Lafayette and St. Martin. The basic framework of surface geology of the region encompassing the study area was detailed by Howe

(2002) detailed groundwater conditions pertinent to the Chicot aquifer; Milner and Fisher (2009) chronicled in detail the geological framework and groundwater hydrology of the aquifer; and Van Biersel and Milner (2010) summarized the aquifer's distribution, recharge area, proportions of water-use categories, and pumpage rates.

Methods

The investigators reviewed legacy information and made new interpretations consulting remotely sensed imagery (comprising aerial photography, lidar DEMs, and other sources) and soils databases published by the Natural Resources Conservation Service (NRCS) to develop a draft surface geology layer for the study area. Field work was conducted to access commercial excavations and to test the subsoil with hand-operated probes, to examine and sample the texture and composition of the surface-geologic map units. Field observations were then synthesized with the draft surface geology to prepare an updated integrated surface geology layer for the 7.5-minute quadrangle.



1. Location of Broussard 7.5-minute quadrangle, southeastern Louisiana.

QUATERNARY SYSTEM

HOLOCENE

Hua Holocene undifferentiated alluvium
Hb Backswamp deposits
Hml_3u Natural levee complex of Mississippi River meander belt 3, upper deposits
Hmc3u Crevasse complex of Mississippi River meander belt 3, upper deposits
Hmd_3u Distributary complex of Mississippi River meander belt 3, upper deposits
Hrm Meander-belt of the Teche course of the Red River
Hmm_3l Mississippi River meander belt 3, lower deposits

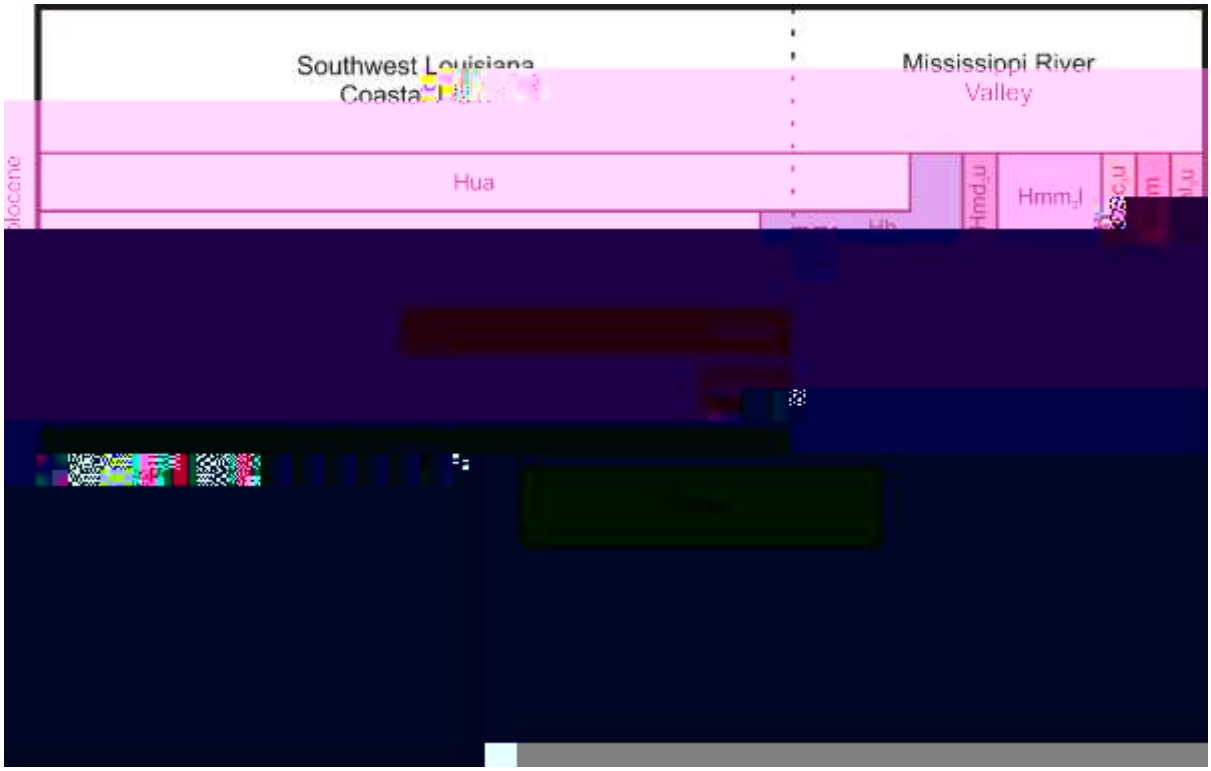
QUATERNARY UNDIFFERENTIATED
Qc Quaternary colluvium—undifferentiated colluvial deposits forming lobate to apronlike landforms.

PLEISTOCENE

LOESS
[pattern] Peoria Loess

PRAIRIE ALLOGROUP
Ppbcu Upper Big Cane alloformation
Ppbcl Lower Big Cane alloformation
Ppav Avoyelles alloformation
Ppbe Beaumont Alloformation

3. Units mapped in the Broussard 7.5-minute quadrangle.



4. Correlation of strata mapped in the Broussard 7.5-minute quadrangle.

Allostratigraphic Approach to Pleistocene Unit Definitions

Quaternary colluvium (Quaternary undifferentiated)

Colluvium (**Qc**) comprises sediment reworked from the Avoyelles and Big Cane alloformations and draped over Holocene sediment in places at the foot of the western valley wall of the Mississippi River flood plain. These colluvial deposits consist of dark reddish-brown to gray silt and silty clay containing calcareous and sesquioxide concretions with abundant roots and organic material. Most of the Quaternary colluvium consists of sediments, largely loess, eroded from adjacent terrace scarps of the Beaumont and Avoyelles alloformations.

Holocene alluvium

Mississippi River flood plain

The Broussard quadrangle overlaps the western edge of the Mississippi River flood plain,

U. S. Geological Survey, STATEMAP program, under cooperative agreement no. 1434–HQ–96–AG–01490, Louisiana Geological Survey, Baton Rouge, 1:100,000-scale map plus explanation and notes.