BUREAU OF ECONOMIC GEOLOGY
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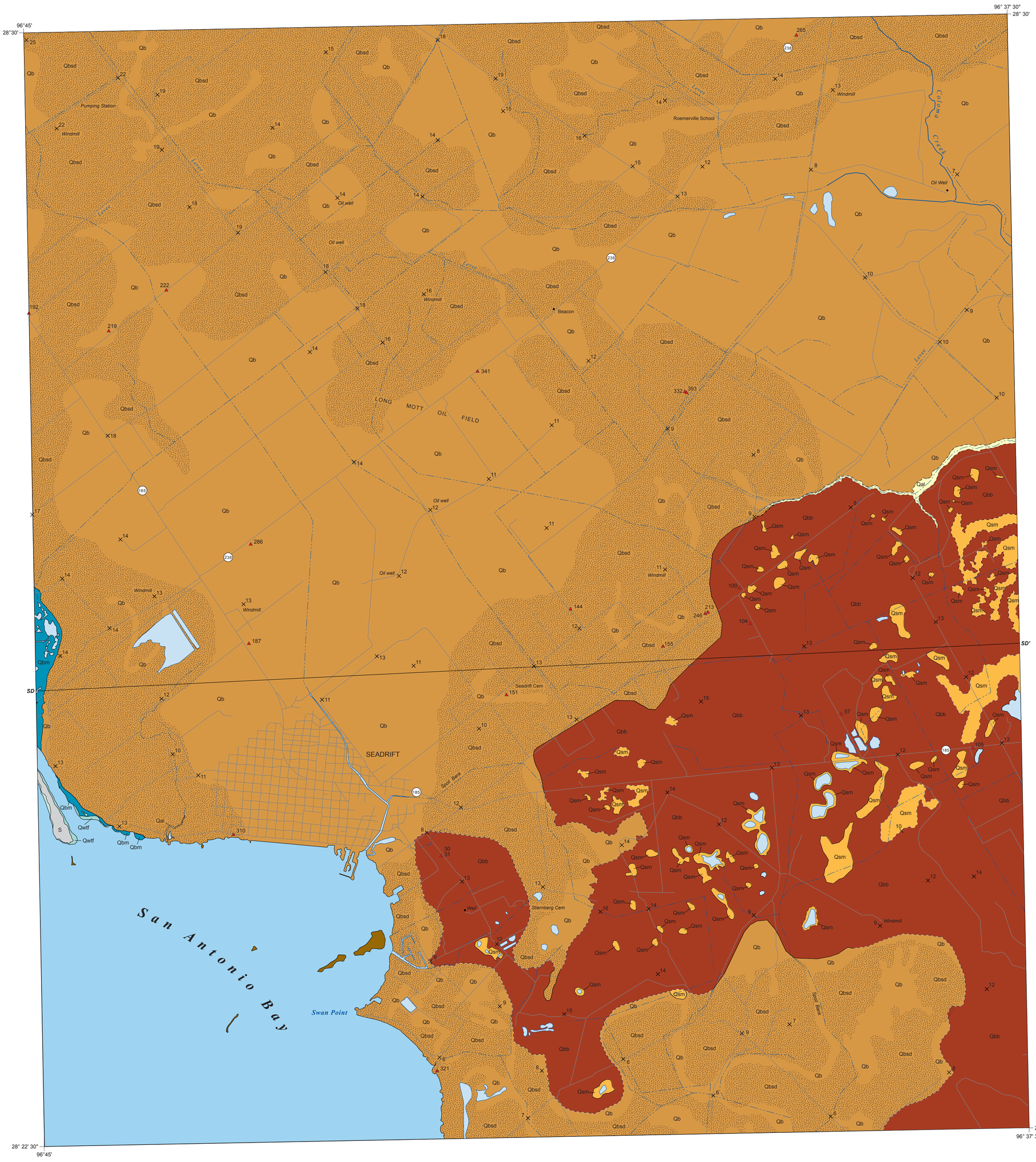
THE UNIVERSITY OF TEXAS AT AUSTIN
In cooperation with the STATEMAP component of the
National Cooperative Geologic Mapping Program,
administered by the U.S. Geological Survey

GEOLOGIC MAP OF THE GUADALUPE DELTA,
TEXAS GULF OF MEXICO COAST: SHEET 4,
SEADRIFT QUADRANGLE
OPEN-FILE MAP




SCALE 1:24,000
0 1 2 MILES
0 1 2 KILOMETERS
UNIVERSAL TRANSVERSE MERCATOR PROJECTION, ZONE 14N NAD 83

N
4° MN
Approximate 2013 Magnetic North
(MN) declination

## Explanation

### Modern to Holocene

**Qal—Alluvium of drainageways.** Sand, clay, less gravel.

**Qsm—Mud-filled-swale deposits.** Mud and less sand filling swales within sandy back-barrier to barrier deposits.

**Qwtf—Wind-tidal-flat deposits in emergent areas.** Sand and mud. Emergent areas that are exposed during periods of strong, prolonged, northerly winds.

**Qbm—Bay margin deposits.** Sand and mud.

### Pleistocene

**Qb—Beaumont Formation.** Clay, silt, sand, and minor gravel in fluvial-deltaic interdistributary and distributary setting. Includes stream-channel, point-bar, natural-levee, crevasse-splay, and back-swamp deposits. Some coastal-marsh, mud-flat, and lagoon deposits. Stippled pattern indicates sand-rich channel facies, **Qbsd**, having approximate contacts.

**Qbb—Beaumont Formation barrier deposits.** Sand and silt. Some sand, silt, and clay in back-barrier setting.

### MAP SYMBOLS

- Contact; dashed where approximate
- Water; bay
- Selected ponded water and streams; ponded water and channels of Guadalupe Delta include regularly flooded areas and intermittently flooded areas such as flats. Blue line indicates stream or canal with narrower channel
- Intermittent stream or canal
- Spoil
- Island
- 17× Elevation (ft)
- 174▲ Apparent electrical conductivity (in millisiemens per meter, or mS/m) of the ground measured using a Geonics EM31 ground conductivity meter in the vertical dipole coil orientation. Value shown is a bulk conductivity from the surface to depths of 10 to 20 ft (McNeill, 1980a, b).
- Road

Photography used in the study was 0.5-m-pixel digital imagery photographed in 2008–2009 and 1-m-pixel digital imagery photographed in 2010 and 2012. Both imagery sets were downloaded from the Texas Natural Resources Information System (TNRIS). The 1859 Guadalupe Delta shoreline shown on Sheet 1, Austwell Quadrangle, was adapted from the Guadalupe Delta shoreline mapped on U.S. Coast Survey Register No. 767 (Dennis, 1859), and the 1930 Guadalupe Delta shoreline was mapped using 1930 aerial photomosaics (1:24,000). Data from a 2013 airborne lidar survey of the delta were also used for this study. Previous regional maps that cover this area include the 1:125,000-scale *Environmental Geology Port Lavaca Sheet* (McGowen and others, 1976), the 1:125,000-scale map of *Distribution of Wetlands and Benthic Macroinvertebrates* (White and others, 1989), and the 1:250,000-scale *Geologic Atlas of Texas, Beeville—Bay City Sheet* (Aronow and others, 1975; revised 1987). Sand-rich facies, Qbsd, of the Beaumont Formation are adapted from 1:250,000-scale interpretations of the *Beeville—Bay City Sheet* (Aronow and others, 1975; revised 1987), review of soil maps (Carter and others, 1927; Mowery and others, 1978; Guckian and others, 1988; Miller and others, 1988), field observations, and ground-based electromagnetic conductivity measurements. The 1:250,000-scale interpretations of the Beeville—Bay City Sheet (Aronow and others, 1975; revised 1987) are displayed in digital data files developed by the Texas Water Development Board and U.S. Geological Survey as part of the 1:250,000-scale *Statewide Digital Geologic Atlas of Texas* created from hard-copy maps. Digital files for topographic elevation points came from TNRIS for U.S. Geological Survey topographic quadrangle maps Austwell, Bloomington SW, Green Lake, Seadrift, and Tivoli. Elevation points are used for the map base because existing topographic-line data files do not accurately illustrate the modern fluvial-deltaic system's topography. Digital files of roads and railroads were also obtained through TNRIS. Water bodies were adapted from aerial photographs and U.S. Geological Survey topographic maps. Leroy Reinecke, Texas Parks and Wildlife Department, assisted with access to Guadalupe Delta Wildlife Management areas. Daniel Alonso, San Antonio Bay Foundation, provided information on the study area and collected water-clarity data of the bay in support of the lidar survey. BEG staff Kutalmis Saylam, Tiffany Caudle, Aaron Averett, Ruth Costley, John Andrews, and Tom Tremblay performed lidar survey tasks. Editing was by Lana Dieterich. Work for this map was supported partly by the U.S. Geological Survey, National Geologic Mapping Program, with the assistance of STATEMAP Award No. G12AC20287, and partly by BEG STARR funds for geologic mapping and study of geologic hazards and resources. Views and conclusions contained in this map should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government. The authors disclaim any responsibility or liability for interpretations from this map or digital data or decisions based thereon.

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Graphics by Jana S. Robinson

### Selected References

Aronow, S., Brown, T.E., Brewton, J.L., Eargle, D.H., and Barnes, V.E., 1975, revised 1987, Beeville–Bay City Sheet: The University of Texas at Austin, Bureau of Economic Geology, Geologic Atlas of Texas, scale 1:250,000.

Carter, W.T., Simmons, C.S., Hawker, H.W., and Reitch, T.C., 1927, Soil Survey of Victoria County, Texas: U.S. Department of Agriculture Bureau of Chemistry and Soils, Series 1927, No. 21, 61 p.

Dennis, W.H., 1859, Map of Part of San Antonio Bay and Vicinity, Texas: U.S. Coast Survey, Register No. 767, scale 1:20,000.

Donaldson, A.C., Martin, R.H., and Kanes, W.H., 1970, Holocene Guadalupe delta of Texas Gulf Coast, *in* Morgan, J.P., ed. Deltaic Sedimentation, Modern and Ancient: Society of Economic Paleontologists and Mineralogists Special Publication No. 15, p. 107–137.

Guckian, W.J., Molina, R., and Divin, J.A., 1988, Soil Survey of Refugio County, Texas: U.S. Department of Agriculture, Soil Conservation Service, 123 p.

McGowen, J.H., Proctor, C.V., Jr., Brown, L.F., Jr., Evans, T.J., Fisher, W.L., and Groat, C.G., 1976, Environmental Geologic Atlas of the Texas Coastal Zone: Port Lavaca Area: The University of Texas at Austin, Bureau of Economic Geology, Geologic Atlas of Texas, scales 1:250,000 and 1:125,000, 107 p.

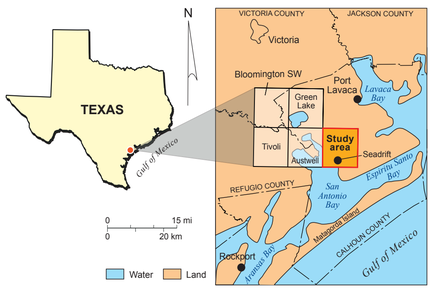
McNeill, J.D.,1980a, Electrical Conductivity of Soil and Rocks: Geonics Limited, Mississauga, Ontario, Canada, Technical Note TN-5, 22 p.

McNeill, J.D.,1980b, Electromagnetic Terrain Conductivity Measurement at Low Induction Numbers: Geonics Limited, Mississauga, Ontario, Canada, Technical Note TN-6, 15 p.

Miller, W.L., Clemmons, S.D., Flores, P.H., Peer, A.C., Bruns, R.H.L., Bower, J.E., and Mowery, I.C., 1988, Soil Survey of Victoria County, Texas: U.S. Department of Agriculture, Soil Conservation Service, 148 p.

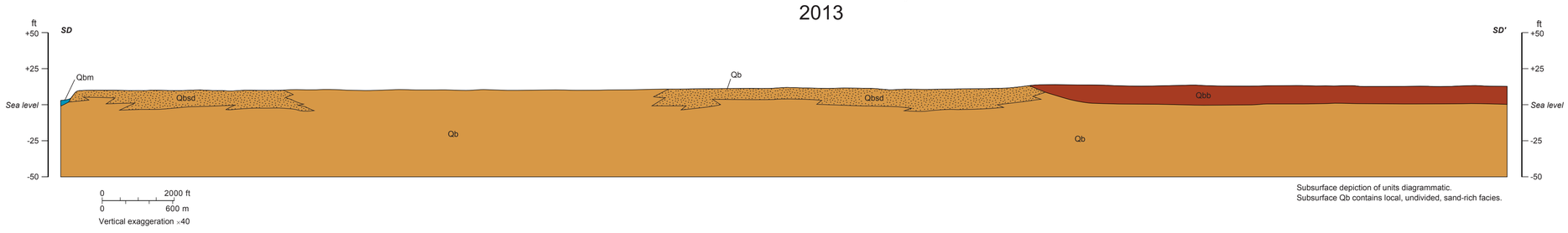
Mowery, I.C., Bower, J.E., and Bruns, R.H.L., 1978, Soil Survey of Calhoun County, Texas: U.S. Department of Agriculture, Soil Conservation Service, 61 p.

White, W.A., Calnan, T.R., Morton, R.A., Kimble, R.S., Littleton, T.G., McGowen, J.H., Nance, H.S., and others, 1989, Submerged Lands of Texas, Port Lavaca Area: Sediments, Geochemistry, Benthic Macroinvertebrates, and Associated Wetlands: The University of Texas at Austin, Bureau of Economic Geology, 165 p.




# GEOLOGIC MAP OF THE GUADALUPE DELTA AREA, TEXAS GULF OF MEXICO COAST: SHEET 4, SEADRIFT QUADRANGLE

Edward W. Collins and Jeffrey G. Paine
2013




Subsurface depiction of units diagrammatic.
Subsurface Qb contains local, undivided, sand-rich facies.

QAe2042