

The high-resolution, infrared imagery and analytical photogrammetric data in combination with more traditional geological information has proven to be a useful tool in this complex structural area.

TRAHAN, DRUKELL B., Louisiana Geol. Survey, Louisiana State Univ., Baton Rouge, LA

Monitoring Local Subsidence in Areas of Potential Geopressed Fluid Withdrawal, Southwestern Louisiana

Growth faulting, rapid deposition, and deep burial of sediments in south Louisiana have resulted in the abnormal pressurization of pore fluids within some sedimentary units. Fluid production from geopressed sandstones may result in pore-pressure reductions, clay compaction, and land-surface subsidence.

Subsidence is being monitored at the U.S. Department of Energy's Sweet Lake, Parcperdue, and Rockefeller Refuge geopressed-geothermal prospects in southwestern Louisiana. Reservoir-defining growth faults were extrapolated to the land surface. Surface lineations were mapped from aerial photographs, and historical elevator surveys were compared to obtain base-line subsidence rates.

Data from the Sweet Lake prospect indicate that no correlations exist between subsidence anomalies and lineations or fault projections. Subsidence here is probably a result of normal sediment compaction, salt dome-related land-surface adjustments, and/or historical subsurface fluid production. Conversely, a good correlation exists between the Parcperdue subsidence profile and the extrapolated updip extensions of mapped subsurface faults. Historical land-surface subsidence north of the Parcperdue prospect may have resulted from down-to-the-coast slumping along the growth faults that define the prospect. Subsidence at the Rockefeller Refuge prospect ranges from virtually zero on the eastern end of the prospect to 2 in. (50 mm) on its western end. The gradation may be due to oil- and gas-associated fluid withdrawals or land-management variations.

A subsidence analysis near Lake Charles, Louisiana, suggests that a more extensive historical record of leveling data could provide a more qualifying subsidence record. Repeated leveling surveys at the geopressed-geothermal prospects should aid in determining the causes of subsidence before and after depressurization of the geopressed aquifers.

TYLER, NOEL, AND JONG H. HAN, Bur. Econ. Geology, Univ. Texas at Austin, Austin, TX

Elements of High-Constructive Deltaic Sedimentation, Lower Frio Formation, Brazoria County, Texas

The lower Frio Formation in eastern Brazoria County, upper Texas Gulf Coast, was deposited in a high-constructive deltaic environment in the Houston delta system. Constructive elements of the stacked, elongate to lobate deltas that were intersected in core are storm-induced delta-front splays, delta-front slump deposits, and distributary-mouth bar, distributary channel, and delta-plain assemblages. Reworked and winnowed abandonment facies are volumetrically insignificant relative to constructive elements and are subdivided into a cross-bedded shoreface-foreshore subfacies and a cyclic sequence of fine-grained storm deposits on the distal delta front. Micropaleontologic evidence indicates that deposition of constructive and abandonment facies took place in water depths of less than 120 ft (36 m).

VERRASTRO, ROBERT T., Univ. Southwestern Louisiana, Lafayette, LA

Paleoecology of Mississippi River Mudlumps—Statistical Analysis of a Foraminiferal Assemblage

The foraminiferal species in a mudlump from the Mississippi River were recorded and the number of individuals of each species was counted. This population was compared to living Foraminifera to determine the paleoenvironment in which the mud accumulated. A Chi-square test was performed to determine whether conclusions based only on the number of species present in a sample are similar to conclusions that take into account the number of individuals found for each species.

The Foraminifera in a sample of mudlump material were identified and used to determine the depth, salinity, and temperature of the paleoenvironment. Comparison with living species indicated that water conditions were middle-shelf, open-marine; the depth was between 165 and 410 ft (50 and 125 m); the salinity was between 35 and 38 parts per thousand; and the temperature ranged between 63 and 77°F (17 and 25°C).

Interpretations were based on the frequency distributions relative to each of the environmental parameters. The frequency distributions of the numbers of individuals compared favorably with those of the number of species. Chi-square analysis confirmed that no significant differences existed between the distributions. This result verifies that conclusions based on either of the frequency distributions are similar.

WATERS, LAURA A., Univ. Alabama, University, AL, and ERNEST A. MANCINI, Alabama Geol. Survey and Univ. Alabama, University, AL

Lithostratigraphy and Biostratigraphy of Upper Eocene and Lower Oligocene Strata in Southwest Alabama and Southeast Mississippi

Upper Eocene and Lower Oligocene strata in the eastern Gulf Coast region are represented by the western, clastic-dominated deposits of Mississippi, and the eastern, carbonate-dominated deposits of Georgia and northern Florida. These lithofacies intergrade and intertongue across Alabama. The complexity of the lithofacies changes in the region has caused problems in the recognition of geologic ages. The stratigraphic position of the Eocene-Oligocene boundary, as determined by macrofossils and benthic microfossils, is different from that position indicated by planktonic foraminifers. The four members of the Yazoo Clay (North Twistwood Creek Clay, Cocoa Sand, Pachuta Marl, and Shubuta Clay Members), the lateral equivalent of the Shubuta Clay Member (Crystal River Formation), and the overlying Red Bluff Clay-Bumpnose limestone and their associated foraminifers were studied from exposures at St. Stephens quarry in Washington County, Alabama, at Little Stave Creek in Clarke County, Alabama, and on the Chickasawhay River in Wayne County, Mississippi. Based on vertical distributions of planktonic foraminifers at these localities, the Eocene-Oligocene boundary occurs at the top of the Yazoo Clay. The lowermost two members of the Yazoo Clay were not placed in any specific foraminiferal biozones at this time owing to the paucity of planktonic foraminifers in these beds, but these units have been assigned to the *Globigerinatheka semiinvoluta* Interval zone by Barker. The distributions of planktonic foraminifers in the Pachuta Marl and Shubuta Clay Members at both localities allow assignment of these units to the *Globorotalia cerroazulensis* (s.l.) Interval zone, while the Red Bluff Clay-Bumpnose limestone is assigned to the *Pseudohastigerina micra* Interval zone.