of subsidence. The initial, or shelf phase of deposition, produces deposits similar to most modern deltas, although the rates of progradation are enhanced by the cumulative effects of sedimentation and absolute sea level fall. Such deposits are relatively thin and widespread, and internally are characterized by low angle clinoform reflections. The second, or shelf margin phase, results when sea level reaches the shelf edge and deposition occurs on the upper continental slope, where steeper sea floor gradients and more rapid subsidence produce a more localized deposit.

Interpretations of over 35,000 km of single channel high-resolution seismic profiles of the continental shelf and upper continental slope of the northwest Gulf of Mexico indicate the existence of 5 late Wisconsinan shelf margin deltas, including the ancient Rio Grande and Mississippi deltas. The deltas were recognized by geomorphic pattern, high angle clinoform seismic reflections, and association with buried river systems. Isopach patterns show that the deltas range in size up to 5,000 km^2 (1,930 mi^2) and reach thicknesses of over 160 m (525 ft). The deposits are elongate parallel to depositional strike, indicating subsidence of the shelf margin as a whole, as well as reworking by marine processes. Internal reflection patterns show the deltas to be fluvially dominated. Multiple lobes can be recognized in most of the deltas studied, resulting both from short term eustatic sea level fluctuations and delta switching.

SUTER, JOHN R., SHEA PENLAND, and THOMAS F. MOSLOW, Louisiana Geol. Survey, Baton Rouge, LA

Geologic Framework of Sand Shoals on Muddy Mississippi Delta Shelf

More than 1,000 km 620 mi) of high resolution ore-Boomer and 3.5 kh_z subbottom seismic profiles correlated to seventeen 10-12 m (33-56 ft) vibracores provide the data base for analyzing the sedimentologic and stratigraphic framework of transgressive sand shoals on the Louisiana inner continental shelf. Trinity and Ship Shoals are comprised of reworked sands of the abandoned Holocene Teche and Maringouin deltas and provide a possible modern analog for some Cretaceous shelf sandstones of the Western Interior.

Ship Shoal transgressive sands lie disconformably over Maringouin deltaic muds. The sand body pinches out seaward on the erosional inner shelf and is terminated landward by a depositional surface. Maximum sand body thickness is 7 m (23 ft) in the western shoal region. Internally, the sand body is characterized by landward dipping subhorizontal reflectors. The underlying Maringouin deltaic sequence contains a series of low-angle seaward-dipping clinoforms and numerous small channels in the western shoal area. Core analysis reveals a 3-7 m (10-23 ft) thick upward-coarsening sequence of very fine to fine-grained (100-125μ) well-sorted, clean, quartzose sand. Grain size, percent sand and shell, and percent cross bedding increase upwards. The shoal sequence is capped by a 1-2 m (3-6 ft) thick deposit of horizontally laminated fine-grained (125-175μ) sand and shell. The lower two-thirds of the shoal sequence is massive in appearance with minor amounts of burrowing. The shoal sequence abruptly overlies a dark, organic rich, silty clay (prodelta?) with numerous wavy and lenticular interbeds of silt; burrowing is rare.

The Trinity Shoal sand body is 5-7 m (16-56 ft) thick and lies disconformably over Teche deltaics. Internally, the sand body is composed of a set of westward-dipping clinoform reflectors. Three levels of channeling related to sea level stands in the early Wisconsin, late Wisconsin, and Holocene (Maringouin delta) underlie and occur seaward of Trinity Shoal. Continued Atchafalaya delta sedimentation will soon encase Trinity Shoal in mud.

SWAIN, F. M., Univ. Delaware, Newark, DE

Some Ostracoda from Rodessa, Pearsall, Sligo, and Upper Hosston Formations (Lower Cretaceous) of Louisiana

A preliminary study of Ostracoda from core samples in the Rodessa Formation (lower Trinity Group), and from the Pearsall, Sligo, and upper Hosston Formations (Coahuila Series), Lower Cretaceous, of the subsurface of northern Louisiana, has yielded 52 species. Only a small fraction of the known ostracode assemblage is dealt with here.

On the basis of present limited knowledge, the Rodessa Formation contains common *Eocytheropteron, Hechticythere, Rehacythereis?*, and *Cornicythereis* suggesting an open shelf environment. The Sligo Formation contains common Schuleridea, probably representing an open shelf environment, as well as *Fabanella* and *Hutsonia*, representing brackish lagoonal or estuarine environments. The upper part of the Hosston Formation contains common Paraschuleridea (open shelf) and *Fabanella* (brackish water) and a variety of other forms that suggest a range of conditions from lagoonal and estuarine to open shelf habitats.

SWART, PETER K., and JEAN MICHEL DAWANS, Univ. Miami, Miami Beach, FL

Variations in Mg/Ca as a Control on Distribution of Strontium Concentrations and $\delta^{18}O$ in Upper Tertiary Dolomites from Bahamas

Strontium concentrations and $\delta^{18}O$ are commonly used to infer the gross composition of dolomitizing waters, yet the bases for such inferences are not firmly established. A new approach to calibrating these 2 parameters is suggested from analyses of a section of upper Tertiary dolomites from the Bahamas.

In an interval of dolomite, 120 m (394 ft) thick from a core taken on San Salvador Island, mole % $MgCO_3$ is correlated positively with $\delta^{18}O$, and negatively with strontium. Strontium substitutes mainly for calcium, thus the negative correlation with mole % $MgCO_3$. Dolomites are enriched between 3 to 7‰ in $\delta^{18}O$ as compared with coprecipitated calcite, and thus the positive correlation. These two covariations indicate the need to consider the stoichiometric coefficient of dolomites, and to normalize strontium concentrations and $\delta^{18}O$ with their respective stoichiometric coefficients before inferring their relationship with fluid composition.

SWIFT, B. ANN, and C. WYLIE POAG, U.S. Geol. Survey, Woods Hole, MA, DALE S. SAWYER, Univ. Texas at Austin, Austin, TX, and JOHN A. GROW U.S. Geol. Survey, Denver, CO

Tectonic Development of Baltimore Canyon Trough

New well data and a new gravity model across the southern end of Baltimore Canyon Trough provide a more complete history of the basin's tectonic evolution and deep crustal structure than was previously known. The basin, which formed during the separation of North America from Africa, narrows and shallows along strike, as basement depth decreases from about 18 km (59,000 ft) in the north near New York to about 4-6 km (13,123-19,685 ft) in the south near Cape Hatteras. Previous analysis of the Continental Offshore Stratigraphic Test (COST) B2 and B3 wells using "backstripping" techniques showed a seaward increase in the amount of stretching during the basin's formation. The new biostratigraphic and paleoenvironmental interpretations are from the USGS Island Beach well 1 just landward of the hinge zone in the basin. This well, along with the COST B2 and B3 data, provides a sampling of the sedimentary sections overlying continental, transitional (rift-stage), and oceanic crust. The subsidence histories derived from these data give a cross-sectional view of the basin's evolution.

A gravity model of the southern end of the basin, along USGS multichannel seismic line 28, primarily analyzes a 60-mgal shelfedge anomaly. This anomaly reflects the change in bathymetry and more important a change toward the continent in underlying crustal thickness from typical oceanic to thinned continental crust. The crustal thinning is compared to the broad thinning zone to the north. Well-defined rift structures on the landward edge of the basin are modeled as rift grabens near the hinge zone.

SZATMARI, PETER, EDISON J. MILANI, MARCOS C. LANA, and J. C. CONCEICÃO, PETROBRÁS Research Center (CENPES), Rio de Janeiro, Brazil

Rifting Mechanism of the Early South Atlantic and Its Control of Oil Reserve Distribution in Brazil

Drilling and geophysical observations in the Cretaceous coastal basins of Brazil, both onshore and offshore, coupled with published information on the African margin, have led to a better understanding of the rifting mechanism of the south Atlantic and the way it controls the distribution of oil reserves. This information is crucial at a time when high exploration cots and unstable oil process make it imperative to select