with minor mica and feldspar. Heavy-mineral analysis indicates high ZTR and SSK ratios.

Stratigraphic and sedimentologic interpretation suggests deposition as channel fill and overbank deposits by meandering streams in a subaerial environment. Sediment source area was probably the crystalline highlands on the northwest.

COSTAIN, JOHN K., and LYNN GLOVER, III, Virginia Polytechnic Inst. and State Univ., Blacksburg, VA

Moderate-Temperature Geothermal Resources Beneath Atlantic Coastal Plain

The most promising geothermal resource in the eastern United States is warm water stored in the permeable sediments of Cretaceous and younger age beneath the Atlantic Coastal Plain. Optimum sites for high gradients are locations where the heat flow is high and sediment thermal conductivity is low. Low conductivity is characteristic of most of the Coastal Plain sediments.

Heat flow in the eastern United States varies from about 33 mW/m^2 to 100 mW/m^2. All variations in heat flow in the eastern United States are caused either by differences in the concentrations of the heat-producing isotopes of uranium, thorium, and potassium in crystalline rocks, or by differences in thickness of heat-producing crystalline rocks. The highest concentrations of heat-producing elements, and the highest heat flows, are in the relatively young (ca. 300 m.y.) unmetamorphosed granite stocks and batholiths. Similar granites also are present in the southeast in the basement beneath the Coastal Plain. Thus, optimum sites for the development of moderate-temperature geothermal resources beneath the Coastal Plain require a knowledge of the (1) distribution and thickness of heat-producing granites in the basement, (2) thermal conductivity and thickness of sediments above basement, and (3) nature and extent of aquifers in the sediments above basement.

A site for the first deep geothermal test on the Atlantic Coastal Plain was chosen at Crisfield, Maryland. A temperature of 57°C was found at a depth of 1.26 km. Economic analyses at this site and elsewhere by the Applied Physics Laboratory of Johns Hopkins University, aquifer pump tests, and numerical modeling of the thermal lifetime of a reservoir suggest that geothermal energy may be an important resource at some locations on the Atlantic Coastal Plain.

DEMAREST, JAMES M., Exxon Production Research Co., Houston, TX, and ROBERT B. BIGGS, Univ. Delaware, Newark, DE

Unconformities and Depositional Sequences During Transgression and Regression of Continental Shelf

Major transgressions and regressions are recognized on the basis of vertical sedimentary sequence between major unconformities in the stratigraphic record. The more laterally continuous an unconformity is, the more time significance it is interpreted to have. Studies of transgressions and regressions during the Holocene and Pleistocene provide new insights into the character of unconformities and the interpretation of depositional sequences. In addition, these studies indicate that extensive regressive deposits do not develop during falling sea level.

During transgressions, the base of the transgressive depositional sequence is marked by a subaerially eroded unconformity at the top of the pretransgression deposits. The deposits just above the basal surface are usually back-barrier lagoon or estuarine sediments. Three types of basal contacts can develop depending upon the material directly overlying the unconformity: fringing marsh, distal lagoon, or lagoonal beach sediment. The processes which develop these lithosomes also serve to make the contact lithologically indistinct. In fact, with lagoonal beach and distal lagoon the contact can become gradational owing to erosion and bioturbation, respectively. Considerable topographic relief is present on this surface, whereas paleosoil is rarely preserved. The most lithologically distinct contact developed during the transgression is the ravinement surface caused by shoreface retreat. This contact is also the most laterally continuous and has the least topographic relief; it is underlain by back-barrier lagoonal deposits and overlain by nearshore marine deposits.

During many transgressions and regressions, such as have occurred in the Quaternary, the sequence of back-barrier lagoon, truncated by the ravinement surface and overlain by nearshore marine deposits may be repeated several times in one vertical section. When the ravinement surface is mistaken for a major unconformity and the commonly obscured contact at the base of the lagoonal lithosome is taken as a gradational facies change, the vertical sequence is interpreted as prograding (regressive) shoreline deposits with nearshore marine overlain by lagoon. Each such sequence is interpreted to be separated by a transgressive surface. When the ravinement surface and the basal contact are recognized as such, the section is interpreted as a set of transgressive sequences with lagoon truncated by the ravinement surface, overlain by transgressive nearshore marine deposits.

DILLON, WILLIAM P., U.S. Geol. Survey, Woods Hole, MA

Geologic History of U.S. Eastern Continental Margin South of Cape Hatteras

The continental margin off the southeastern United States contains two major basins, the Blake Plateau Basin off Florida and Georgia and the Carolina Trough off South and North Carolina. The Blake Plateau is a large, equidimensional basin that probably is underlain by relatively thick rift-stage crust. It probably was filled dominantly by shallow-water carbonate platform deposits. Reef and carbonate-bank buildups occurred near its seaward edge and the platform deposits interfingered with continental facies deposits near its landward edge. Reef building was interrupted in Barremian time and ended after an Albian-Aptian pulse. Subsequently, deposition did not keep pace with subsidence, and a deep-water plateau was formed. Onset of Gulf Stream flow across the inner Blake Plateau during the Paleocene prevented seaward progradation of the continental shelf across the plateau, and major deep-water erosion removed the old continental slope, creating a steep cliff, the Blake Escarpment. The Carolina Trough is a long, narrow basin underlain by a narrow zone of rift-stage crust, much thinner than that beneath the Blake Plateau basin. This thin crust, presumably the result of major stretching of continental crust in the rift stage of ocean opening, floated deep isostatically and formed a salt-depositing basin early in continental-margin history. Later sediment loading caused the salt to flow into a series of slope diapirs, and withdrawal of the salt resulted in major subsidence of the block of sediment overlying the trough; movement occurred along growth faults.

DAVIES, THOMAS A., and WILLIAM W. HAY, Joint Oceanographic Institutions, Inc., Washington, D.C.

Ocean Margin Drilling Program