Blake Outer Ridge, (2) between Washington and Norfolk canyons, and (3) southeast of Long Island. Deposits resulting from these events extend across the rise to depths greater than 4,000 m. In the zone north of the Blake Outer Ridge, the deposits extend onto the Hatteras Abyssal Plain to a water depth of 5,400 m.

The distribution of most of the major slide zones appears to relate to the position of canyon systems and may be due to the rapid buildup of sediment overflowing from the canyons during the last glacial stage. Occasional large intraplate earthquakes such as the 1886 Charleston or the 1929 Grand Banks events may be the direct triggering mechanism. The ages of the slides are as young as middle Holocene. In time, the slope and rise probably will reach an equilibrium point (this may already be the situation), and the frequency of large-scale slides will decrease drastically until the next glacial stage.

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Environmental Regulations for In-Situ Uranium Mining, From Exploration to Restoration

In the past several years, laws have been passed and implemented through regulations to protect and improve the quality of our environment. Accordingly, uranium mining operations are closely controlled by many federal, state, and local laws and regulations. Therefore, persons in the industry should be aware of (1) the federal laws and regulations affecting in-situ uranium mining, (2) the source materials license and environmental statement process, including time and costs, (3) the monitoring requirements, including excursion detection and control, and (4) the restoration process.

The laws and regulations of Texas and of Wyoming differ in permit requirements.

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Progressive Cementation from Marine to Deep Subsurface Environments, Upper Smackover Formation

Several generations of carbonate cement are present in high-energy oolitic grainstones of the upper Smackover in seven wells in Arkansas, Texas, Louisiana, and Mississippi. The complete pattern of cementation reflects progressive lithification during burial. However, no single sample displays all cement types. The earliest cement was precipitated in the marine environment shortly after deposition; it consists of fibrous rims of nonferroan calcite "isopachously" surrounding grains. Small blocky crystals of either ferroan or nonferroan calcite formed after the marine cement. These crystals, which occur on the fibrous rims or irregularly encrust grains, are thought to have precipitated in the "shallow" phreatic environment. Subsequent compaction of the sediments with burial was inversely related to the degree of development of these early cements. Postcompactional cements consist of dolomite and coarse ferroan or nonferroan calcite, both of which are interpreted to have formed in the "deep" subsurface. The dolomite not only occurs as a void-filling cement, but also partially replaces grains. In places, dolomite rhombs transect sutured grain boundaries, providing conclusive evidence of their late origin. The coarse calcite comprises the final generation of cement and is the most common cement type. This cement may be poikilotopic; it commonly replaces dolomite rhombs. Porosity reduction is mainly the result of compaction and pore occlusion by this late calcite cement.

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Pore Space in Holocene Carbonate Sediments

Mean porosity and permeability of Holocene carbonate sediments from Florida and Great Bahama Bank, determined for 74 samples by water-flow rates in a falling-head permeameter, are related to depositional texture as follows: grainstone 44.5% (range 40 to 53%), 30,800 md (range 15,800 to 56,600 md); packstone 54.7% (45 to 67%), 1,840 md (32 to 9,300 md); wackestone 68% (64 to 78%), 228 md (38 to 6,570 md); very fine wackestone 70.5% (76 to 73%), 0.87 md (0.63 to 1.37 md); supratidal wackestone 63.5% (61 to 66%), 5,590 md (617 to 24,100 md).

The muddiest and finest grained sediments have the highest porosities but lowest permeabilities; this negative correlation between porosity and permeability is the reverse of the situation in carbonate rocks, even those as young as Pleistocene. High porosity and low permeability show a strong correlation with percentage of fines ($<64\mu m$). From capillary-pressure curves it is inferred that many of the pore entrances in muddy carbonate sediments are finer than $1\mu m$, at least after drying.

Cementation rates for simple models of upper-phreatic-zone cementation calculated from the measured permeabilities would require excessive time to produce the degree of cementation present in late Pleistocene rocks of Florida and the Bahamas. Climate, especially rainfall and evapotranspiration, emerges as the rate-controlling factor in the most reasonable models of phreatic-zone cementation.

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Miocene Carbonate Gravity Flows in Blake-Bahama Basin

Intraclastic chalk, radiolarian mudstone, and carbonate silt (inferred sediment gravity-flow deposits) comprise the Miocene section in the Blake-Bahama basin at DSDP Site 391. Greenish-gray radiolarian mudstones, comparable to hemipelagic sediments that form the North American continental-rise prism elsewhere in the North Atlantic, occur as numerous clasts and a few thin intervals indicating that they formed the background sedimentation. The intraclastic chalk and carbonate silt generally lack sedimentary structures, but gravity-flow deposition is indicated by reworked fossils (forams,