ments on the shelf occur as 6 well-defined facies: (1) the Alabama-Mississippi sand facies; (2) The Alabama-Mississippi reef and interreef facies; (3) the St. Bernard prodelta facies; (4) the Chandeleur Islands sand facies; (5) a facies transitional between facies 1 and 3; and (6) an estuary-influenced fine-grained facies.

Recognition of these aspects of the Alabama-Mississippi coastal zone depositional systems is an important consideration in planning and developing a petroleum exploration program.

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Leveed Channel Deposits, Turbidites, and Contourites in Deeper Part of Gulf of Mexico

Several leveed channels can be observed on bathymetric charts from the middle and outer fan of the Mississippi delta apron. Shallow seismic surveys indicate a complexity of shallow channels and associated low levees, although cores show only minor differences between subenvironments. The levees normally contain a higher plant debris content and finer material than the channels. The irregular surface smooths southeastward, and small ripples are present locally on its surface. These deposits are interpreted as contourites; fine sands and silts that are redeposited by deep-water bottom currents.

Off the Mississippi delta apron toward the west, the flat abyssal plain is present. The subbottom reflectors are dense and parallel with the surface, the cores indicate a general increase in sand-clay ratio followed by a decrease farther west. The deposits can be interpreted as distal turbidites.

Although the variation in aspect and the density of each sedimentary property differs little among the 3 depositional areas, the combination of lithologic alternations, sedimentary structures, high-resolution subbottom profiling, and bottom photography provide information for the development of interpretive models of recent and ancient sediments.

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Role of Geologist in Environmental Impact Study

The influence of shell dredging in San Antonio Bay, Texas, on the Aransas National Wildlife Refuge and surrounding bays was investigated by a team from Texas A&M University in order to prepare an environmental impact statement for the U.S. Army, Corps of Engineers. More than 60 scientists and technicians from the Wildlife and Fisheries, Biology, Meteorology, Geology, and Oceanography Departments were involved. The data indicate that shell dredging has no significant, irreversible effects on the ecosystem of the bay.

In addition to sedimentologic and subbottom studies, the geologists undertook most of the circulation, flushing, remote sensing, foraminiferal, and chemical studies. Some also were involved in investigating economics, reef silting, and dredge discharge.

San Antonio Bay has an average depth of 4 ft and contains numerous large and small reefs. As a result of the bay's shallowness, the circulation and flushing are controlled primarily by wind and river discharge, and therefore patterns of these aspects are erratic. Nevertheless, certain consistent patterns can be distinguished on the bay bottom as well as in the shallow subsurface. Heavy-mineral distributions and clay-mineral studies present complementary information. The distribution of modern reefs differs little from that of buried reefs. These distributions and several borings reveal the gross topography of the buried Pleistocene surface.

It is clear that in such an environmental impact study, a thorough investigation of the geologic, physical, and economic aspects is equally as important as understanding the biologic aspects of a coastal ecosystem.

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What Has Apollo Program Found Out about the Moon?

The moon was formed 4.6 b.y. ago at about the same time as the earth and meteorites. At the time of accretion, temperatures probably were below the solidus in the deep interior and at, or above, those of the liquids in the outer part. The material that formed the outer part of the moon was richer in some refractory elements and poorer in iron and some volatile elements than was the earth. From 4.6 to about 4.0 b.y. ago, a lunar crust about 65 km thick was formed; this highland crust is rich in anorthositic gabbro and other rocks of anorthositic affinity. During the period of highland formation and differentiation, the moon was bombarded heavily by asteroid-size bodies and circular mare basins were formed by the impact. The heavy bombardment caused considerable mixing of rock types and breccia formation. Pristine highland rocks and radiogenic clocks were reset during this period, so that crystallization ages greater than 4 b.y. are rare. Partial melting at depths between 150 and 400 km occurred from about 3.8 to 3.1 b.y. ago and produced pyroxenite basalts that filled the mare basins predominantly on the lunar front side.

Controversy exists as to whether the alumina-rich lunar crust is accretional in origin or was developed by widespread differentiation process in which a pyroxene-rich upper mantle and alumina-rich crust were formed. Surface magmatic activity virtually had ceased by 3 b.y. ago.

Lunar heat flow is about half that of earth; the bulk of potassium, uranium, and thorium is concentrated in the lunar crust. From 4 to 3.2 b.y. ago, the lunar surface was exposed to a magnetic field of at least 2,000 gammas, which was produced either externally or internally.

Seismic data indicate that the mantle is ultramafic (velocities 8–9 km/sec) and presently is rigid at temperatures below the solidus to a depth of 800 km. Below 1,000 km the mantle is partly molten and a small metal-rich core may exist. The moon has a bulk density of 3.35 g/cu cm and a coefficient of moment of inertia of about 0.4.

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Coccoliths from Desoto Canyon Region, Gulf of Mexico.

Coccolith assemblages from the northwest slope of the Florida coast indicate sedimentation rates and temperature variations during the past. Time counts of *Gephyrocapsa oceanica* from 4 cores produced correlative curves that reflect the sedimentation rate. Ratios of the frequencies of *Ceratolithus* species and *Discolithina* species indicate that these genera were affected by similar parameters; a ratio of *Discolithina* morphotypes yields an apparent temperature curve. A magnetic intensity change correlates with a significant decrease in coccolith frequency.