the emerged part constitutes 143,000 sq km. The shelf width ranges from about 80 km at Cape Hatteras (Cape Hatteras is actually well out on the shelf) to about 195 km off Raritan Bay and on Georges Bank. Preliminary conclusions suggest a considerably thicker sediment section than has been described previously and, locally, fairly complex structures. Onshore horizons of unconformity such as the base of the Miocene, base of the Tertiary, and base of the Upper Cretaceous, appear to continue seaward as horizon markers. Samples and sample analyses made it possible to construct a preliminary geologic map of the shelf and slope to a depth of 2,000 m. The oldest beds cropping out in the submarine canyons and on the slope are of early Late Cretaceous age. Beds of Jurassic and Triassic age are known in deep wells onshore and probably are present beneath the shelf in the area of this study. Such beds are reported beneath the Scotian Shelf where they include limestone, salt, and other evaporites. The region is large, the sediment wedge is thick, structures such as folds and faults are present, and the hydrocarbon potential may be considerable.

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Structural History and Oil Potential of Offshore Area From Cape Hatteras to Bahamas

The present Atlantic Coastal Plain and continental shelf were parts of the crystalline Appalachians in late Paleozoic time when North America was joined to Africa according to current interpretation of plate tectonics. In Early Triassic time a series of rift valleys developed in this province having trends roughly parallel with the present continental rise where the continents began to separate. The rise was the site of the main rift system and also apparently the site of a line of upwelling lava as the precursor of the Mid-Atlantic Ridge. This rift system connected the Mediterranean Sea with the newly opened Gulf of Mexico which were areas of extensive evaporite deposition in Late Triassic and Early Jurassic time.

Normal sea water entered during Smackover deposition which permitted development of great carbonate banks and reefs in the southern part of the area. As active separation of the continents continued, the distance from the Mid-Atlantic Ridge to the eastern margin of North America increased. This permitted a downward flexing of this margin with deposition of sediments generally keeping pace with the sinking.

The subject area lies between the Bahama carbonate platform and the clastic depositional province north of Cape Hatteras. The stratigraphy is presumed to be transitional in character. The shallow-water carbonate rocks may be expected to include many rocks with excellent reservoir properties and source beds for petroleum should be abundant. Cap rocks should be present due to influence of clastics coming in from the north and may include evaporites. Whereas evidence for folding is mainly negative, there will be compaction over basement and bank topography, along trends related to early rifting.

Because of rapid lateral changes in sedimentary facies and structure the offshore areas present a challenge for imaginative thinking on the part of geologists. Areas of oil accumulation may be determined by a variety of conditions rather than simple structure. Water depths over the Blake Plateau present another type of challenge which should not be insurmountable if oil prospects are great enough.

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Geology of Georges Bank Basin

The Georges Bank basin is an asymmetrical, roughly oval depression approximately 175 mi long, 80 mi wide, and centered about 41° N lat., 68° W long. The deepest part of the basin may contain more than 24,000 ft of Mesozoic and Cenozoic sediments. This estimate is based on interpretation of geophysical data utilizing new velocity information from wells drilled on the western Scotian Shelf.

Overall stratigraphic similarity to rocks in the western Scotian Shelf is likely. The Lower Cretaceous and Jurassic of the Georges Bank basin probably are thicker than the western Scotian Shelf equivalents and are composed of predominantly marine units. Geophysical data indicate the existence of more than 5,000 ft of Jurassic carbonate rocks, marine shales, and consolidated sands. Salt diapirs, similar to those in the Scotian Shelf, have not been detected. Structural deformation is apparent in basement rocks in the Georges Bank basin, and consists of high-angle normal faulting. Sediment thickness is greatest in down-dropped blocks.

Estimates of recoverable oil and gas from sediments beneath the continental shelf and continental slope have been made by petroleum industry groups and federal agencies. The 30,000 cu mi of Lower Cretaceous and Jurassic sedimentary rocks in Georges Bank basin may contain a significant share of these hydrocarbon reserves, assuring the basin a favorable place among eastern North America's frontier exploration areas.

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Geology and Petroleum Possibilities in and Around Gulf of St. Lawrence

The Gulf of St. Lawrence is the largest embayment on the Atlantic Coast of North America between Florida and the Labrador Sea. In this region, surface geology provides the main control for defining four structural units which can be extended into or across the Gulf using published geophysical data and available well control. Prospective beds are found in early, middle, and late Paleozoic formations which in turn overlie Precambrian, Taconic, and Acadian basement. Acadian basement rocks underlying the Maritimes basin, Sydney basin, Fundy basin, *etc.*, are exposed in parts of Nova Scotia, and continue south beneath the great Mesozoic and Tertiary sedimentary wedge of the Scotian basin.

Production has not been obtained in the Anticosti basin, but most Ordovician formations have yielded gas and oil shows. The thick, gently dipping, early Paleozoic section is fairly prospective. Many seeps and shows, but insignificant oil recoveries, come from Devonian formations in the Gaspe fold belt; the Silurian also may be prospective in this structurally complex area. The Cambro-Ordovician section in both the klippe and autochthonous sequences in the western Newfoundland fault belt is prospective; seeps, shows, and very minor oil production have come from Ordovician porous zones. In the Maritimes basin, the presence of one small oil and gas field, many shows and seeps, oil shale and albertite, pronounced structures, and a thick sedimentary section have maintained interest and activity in this large intermontane basin of Late Devonian to Permian sedimentary rocks. Carboniferous