Neither will it be possible to achieve comparable production capacities.

In both the United States and the rest of the world, given the required drilling effort, small fields will be found far into the future. They probably will not be able to offset the eventual decline of the world's large fields but will sustain a viable industry well into the 21st century.

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Sedimentation and Tectonics of Diffuse Plate Boundary: Canadian Arctic Islands from 80 Ma to Present

Use of a revised magnetic-anomaly time scale provides a more accurate chronology of sea-floor spreading events in the Labrador Sea and Baffin Bay. New stratigraphic data from the Meighen and Remus basins in the eastern Arctic Islands show that sedimentary and tectonic events there can be correlated with relative movements of Greenland between 80 and 36 Ma caused by Labrador Sea-Baffin Bay spreading. Within the eastern Arctic Islands these movements generated the Eurekan orogeny across the diffuse Greenland-Canada plate boundary.

Three discrete phases of movement have been recognized: (1) oblique compression, culminating in late Paleocene thrust faulting and fanglomerate progradation; (2) transcurrent movement from late Paleocene to mid Eocene; (3) near-orthogonal compression during the major deformation phase of the orogeny in the late Eocene to early Oligocene. Clastic depositional systems show numerous lateral facies changes reflecting the various movement styles.

From the Oligocene to mid Miocene, the Arctic Islands were affected by uplift and erosion. Extensional faulting and renewed clastic sedimentation occurred between 15 Ma and the present, and during this final phase the Arctic Islands area was fragmented into its present physiography of mainly fault-bounded islands.

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Sedimentation on an Early Proterozoic Continental Margin: Gowganda Formation (Huronian), Elliot Lake Area, Ontario, Canada

Eight continuous cores up to 150 m (500 ft) long and spaced an average of 200 m (650 ft) apart plus nearby outcrops, yield a detailed insight into the composition and architecture of an ancient continental-margin sequence.

Continental glaciers provided an abundant supply of coarse debris but, apart from rainout deposits from floating ice, played little or no part in Gowganda sedimentation. The basal 50 m (165 ft) of the Gowganda Formation represents a continental-slope depositional system. It consists mainly of gravelly and sandy sediment gravity flow deposits, interbedded with minor rain-out units of diamictite, and argillite containing dropstones. Ten types of sediment gravity flow are distinguished. An overlying submarine-channel depositional system, 10–50 m (30–165 ft) thick, consists of pelagic argillites containing dropstones and showing deformation structures. These are interbedded with well-sorted channel-fill sandstones. A submarine point bar 4.5 m (15 ft) thick demonstrates a meandering channel geometry. This channel-fill sequence probably formed during a period of high sea level and reduced sediment supply, possibly reflecting retreat of the ice. The subsurface sequence is completed by a blanket of massive rain-out diamictites up to 55 m (180 ft) thick, and a younger slope sequence of sediment gravity flow diamictites and sandstones.

The complex architecture of this formation reflects the interplay of numerous depositional and erosional processes that are now known to occur on continental margins. The traditional submarine-fan models may have no relevance to this type of continental margin, with its numerous sediment sources and frequent changes in sea level.

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Physical Stratigraphy and Facies Analysis, Lower Cretaceous, Maverick Basin and Devils River Trend, Uvalde and Real Counties, Texas

The formations of the Fredericksburg and lower Washita Groups in Uvalde and Real Counties, Texas, were deposited on a broad platform behind the Stuart City reef trend. Nine distinct lithofacies and corresponding depositional environments occur within this lower Cretaceous depositional regime: (1) nodular and burrowed mollusk lime wackestone lithofacies representing an open-marine platform, low wave-energy environment; (2) rudist, shell fragment, miliolid wackestone to packstone lithofacies representing a partially restricted to open-marine platform, low to moderate wave- and current-energy environment; (3) rudist, shell fragment, miliolid, grainstone to wackestone lithofacies representing an open-marine platform and bank, moderate to high wave- and current-energy environment; (4) evaporite collapse breccia lithofacies representing a hypersaline platform interior environment; (5) miliolid, shell fragment wackestone and *Texigryphaea* bed lithofacies representing a platform interior, shallow subtidal to intertidal transitional environment; (6) alternating thin evaporite collapse breccia with laminated mudstone and pellet packstone lithofacies representing an evaporite-dominated tidal mud flat environment; (7) carbonaceous lime mudstone lithofacies representing a platform interior euxenic lagoonal environment; (8) pellet intraclast lime wackestone to packstone lithofacies representing a restricted platform interior environment; and (9) pelagic lime mudstone to wackestone lithofacies representing a deep, open to slightly restricted platform interior environment.

The Fredericksburg-early Washita depositional history is characterized by 2 distinct cycles of deposition. The first cycle is interpreted as an initial marine transgression over the partially eroded Glen Rose tidal flat deposits, followed by a period of regional shoaling, culminating with the deposition of the Kirschberg Evaporite within the Devils River formation and northward, and deposition of the lower McKnight evaporite-dominated tidal mud flat sediments to the south. The second cycle of deposition is interpreted as a gradual marine transgression culminating in the deposition of open-marine platform rudist bank facies (upper Devils River) and partially restricted to open deep platform interior deposits (Salmon Peak) prior to middle Washita emergence and erosion forming the pre-Del Rio unconformity.

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Landsat 4 Thematic Mapper Imagery: Improved Tool for Geologic Mapping in Eastern Overthrust

The central Appalachians were studied using Landsat 4 thematic mapper (TM) data to evaluate the improved spatial resolution (30 × 30 m, 100 × 100 ft) of TM for mapping capabilities. The TM bands 2, 3, and 4 were contrast stretched and edge enhanced using digital processing techniques. Photogeologic analysis of the 1:125,000-scale TM image examined drainage, landform, lineament, and structural features.

The study area comprises the junction of the central and southern Appalachians where fold axes change from N30°E to N60°E. Southeast-dipping thrust faults trend northeastward across the area. Cambrian through Devonian rocks are involved in and exposed by the thrust faults.

Recognition of drainage relationships (density and pattern) are important in identifying lithologies. Landforms reflect structure and lithology through characteristic topographic expression. Improved identification and delineation of drainage and landform characteristics on TM imagery support structural and lithologic interpretations.

Lineaments were identified by drainage, tonal, and topographic characteristics. Two major lineaments trending N83°E and N56°W, at the junction of the southern and central Appalachians, were identified. Identified structural features include fold axes, thrust faults, strike-slip faults, and thrust-faulted folds. Detailed lineament and structural mapping on TM imagery aids in unraveling complex surface geologic patterns in this critical area of the eastern overthrust.

Digitally enhanced Landsat 4 TM data proved advantageous for accurate mapping of drainage, landform, lineament, and structural features. Improved accuracy on a regional scale allows reliable geologic mapping and therefore subsurface interpretations, benefiting hydrocarbon exploration.

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United States Geothermal Energy Overview—Current Status

Geothermal energy development and utilization in the United States date back to the pioneer days when thermal waters were developed and