15 existing giant fields in various parts of the world and interpreting whatever geologic data the images provided.

At this writing (December 8, 1978), the study has not been completed, but it seems apparent that the images would have been of considerable value in exploring for and pin-pointing the locations of most of the giant fields under study. Such a conclusion indicates that land-satellite images and remote-sensing data should be a top priority in the search for the future giants to be found in the remaining prospective areas of the earth.

HUBBARD, CLYDE, R. E. SHERIFF, and HOWARD BRISTER, Seiscom Delta Inc., Houston, Tex.

High-Resolution LANDSAT for Geologic Studies

LANDSAT images show large areas under the same illumination conditions and from a nearly constant viewpoint, thereby making it possible to see large but very subtle geologic features. Geometrically corrected images with resolving power as great as the intrinsic pixel size can be displayed in false color with the colors so distributed as to maximize the visibility of features. Evidence of geologic features as portrayed in LANDSAT images is obvious when shown with overlays.

JAMISON, H. C., and L. D. BROCKETT, Arco Oil and Gas Co., Dallas, Tex., and R. A. MCINTOSH, Arco Oil and Gas Co., Anchorage, Alaska

Prudhoe Bay, a Ten-Year Perspective

The Prudhoe Bay field is recognized as the largest oil field in the United States. The Permo-Triassic reservoirs, estimated to contain reserves of 9.6 billion bbl of oil and 26 Tcf of gas, have overshadowed other known substantial accumulations of hydrocarbons in formations ranging in age from Mississippian to Cretaceous in the general area of Prudhoe Bay. Reservoirs are in the Lisburne carbonate rocks, as well as the Kuparuk River sandstone. Other Permo-Triassic and Cretaceous accumulations are less significant.

Perhaps unrecognized, except in retrospect, is the significance of the planned sequential availability of both federal and state lands on the North Slope beginning in 1958. An 11-year period of land availibility followed a 14-year moratorium. Exploration that led to the discovery in 1968 culminated with the September, 1969, State of Alaska "Billion Dollar Sale."

The post-discovery sequence of exploration, development, and production in the area has been characterized by environmental, social, legal, political, and economic complexity and controversy. Comparison of the status of petroleum exploration today on the North Slope of Alaska with the history of the 1950s through the early 1970s is an object lesson for explorationists.

JONES, VICTOR T., and R. J. DROZD, Gulf Research & Development Co., Harmarville, Pa.

Predictions of Oil or Gas Potential by Near-Surface Geochemistry

A near-surface hydrocarbon soil-gas technique developed by Gulf Research & Development Co. has been shown to be capable of predicting whether oil or gas is more likely to be discovered in the prospect area. These predictions are made by using the percent compositions and ratios of methane to ethane and propane. Typical average values are:

	Methane	*Methane/Ethane*	*Propane/Methane (X1,000)*
dry gas	100-90	200-20	2-20
gas-cond.	90-75	20-10	2-15
oil	75-45	10-4	60-500

Intermediate values are expected for many hydrocarbon accumulations.

Extensive studies compiled and reported in the literature have clearly shown that reservoired hydrocarbons contain varying amounts of methane and heavier homologs. Frequency histograms of the sum or ratio of methane homologs illustrate that gas from gas deposits is quite distinguishable from gas in oil deposits. Gases from gas-condensate or combined oil and gad provinces plot intermediate between those of gas or oil only provinces as expected.

Light-hydrocarbon ratios have been used successfully to predict the petroleum potential of a formation by monitoring C_1 to C_5 hydrocarbons from a steam-still reflux gas sampling system during routine mud-logging operations. Individual ratios of the C_2 to C_5 light hydrocarbons with respect to methane have been demonstrated to provide discrete distributions which reflect the true natural variations of formation hydrocarbons between oil and gas deposits. Analyses of these same ratios for soil-gas hydrocarbons yield nearly the same limits for delineation of oil and gas potential. This correspondence with the actual formation gases shows that the upward migration of reservoired light hydrocarbons into near-surface soils represents a viable mechanism, allowing near-surface geochemical exploration techniques to be utilized for prospect evaluation.

Normalized histograms of composition data have been constructed which better represent the actual near-surface hydrocarbon populations.

MOUSSEAU, RICHARD J., and JOHN C. WILLIAMS, Gulf Research & Development Co., Harmarville, Pa.

Dissolved Hydrocarbons in Coastal Waters of North America

Dissolved methane and propane concentrations were measured aboard Gulf's exploration vessels, the R/V *Hollis Hedberg* and the M/V *Gulfrex*, on the continental margins of North America. Propane concentrations of less than 0.5 nL/L were observed in a majority of the samples in many of the areas studied. This observation is in agreement with open ocean concentrations reported by Swinnerton and Lamontagne. However, in a highly petroliferous area such as the Louisiana offshore, higher propane concentrations are more common with one-third of the samples exceeding 2 nL/L. In the Louisiana offshore, three-fourths of the samples contained