

Abstracts of Additional Hydrocarbon Session Papers

Geophysical Surveys in Northeast Pacific

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The major tectonic and geological boundaries in the Northeast Pacific off British Columbia have been delineated by multiparameter geophysical surveys conducted by the Pacific Geoscience Center. Systematic magnetic, gravity, bathymetric, and seismic surveys on 5 mi (8 km) lines run perpendicular to the shelf edge to a distance of 224 mi (360 km) offshore, supplemented by detailed surveys, heat flow, ocean bottom magnetic and seismic measurements, sedimentological and geological studies have been used to produce an integrated picture of this very complex environment.

Major components include: the Queen Charlotte transform boundary, a complex continental slope averaging 19 mi (30 km) wide with an associate -70 mgal free air anomaly centered over the outer part of the slope suggesting that the slope is largely composed of sedimentary material; adjacent ocean floor with characteristic north-south-trending magnetic linears which are complicated by anomalies associated with the Kodiak-Bowie seamount chain and transform discontinuities, and the northern Juan de Fuca and Explorer plate region, an area of short spreading ridges with a history of plate fragmentation, rotation, and subduction beneath the North American plate.

These studies have resulted in a revised model of the evolution of the western Canadian continental shelf, which has implications for petroleum exploration and potential. Designers of petroleum exploration strategies for all active margins must be cognizant of plate dynamics. Recent reports of ridge axis polymetallic sulfide mineralization also illustrate the potential economic importance of regional studies of plate boundaries and behavior.