

Allan Spector, Allan Spector and Associates Ltd.

Aeromagnetic/Gravity Data and Hydrocarbon Exploration in the Appalachian Basin

Precambrian basement faults are resolved from a combination of aeromagnetic and gravity data. High-resolution aeromagnetic data (as opposed to reconnaissance data) is notably effective in mapping faults. Analysis of the data in profile form along flight lines is a pre-requisite for this purpose. We find that to a large extent, gravity data relates to Precambrian structure and lithology - Corroborate magnetic faults as well as structures that are weakly magnetic. - Locate potential basement "hot spots". - Locate lithologic changes in the sedimentary section that may be prospective for reservoir development. There are many areas where there are sufficient U.S. government gravity to be useful in this context. Basement faults are shown to have a remarkable association with oil and gas pools in Ontario, New York, West Virginia Ohio Kentucky and Tennessee. The pools may be categorized according to age; Cambrian, Ordovician, Silurian and Devonian. It can be demonstrated that this use of magnetic and gravity data maximized the utilization of seismic surveying, and much more expensive exploration food.