Short-wave Length Gravity and Magnetic Anomalies Related to Shallow Sedimentary Structures, North Slope, Alaska (Examples from USGS Work Under Overall Direction of Ken Bird)

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The Tertiary stratigraphic section on the North Slope of Alaska is a complicated, “rumpled rug” of folded and faulted strata. Layered variations in density and magnetic properties of these strata produce short-wavelength gravity and magnetic anomalies that are related to the extent and geometry of structural disruption. We have examined medium to high resolution gravity and magnetic data for the ANWR 1002 area and for portions of the central State Lands and eastern NPRA as part of energy assessment work by the USGS. This work was conducted under the overall project leadership and with the strong support of Ken Bird. The results of these studies have helped to constrain the numbers and sizes of certain types of petroleum-prospective structures and have provided insights into the amount and extent of segmentation and faulting of possible structures. Our work has included interpretation of public-domain USGS data as well as some industry data (under limited licensing to the USGS). Our presentation focuses on examples from the Arctic National Wildlife Refuge 1002 area, from the central State Lands and from the eastern National Petroleum Reserve, Alaska foothills.