Anchorage Urban Region Aeromagnetics (AURA) - Preliminary Geophysical Results

Peter J. Haeussler, U.S. Geological Survey, Anchorage, AK 99508, 907-786-7447, haeussler@usgs.gov, Richard W. Saltus, U.S. Geological Survey, P.O. Box 25046, MS 964, Denver, CO 80225, 303-236-1375 saltus@usgs.gov

As part of the Anchorage Urban Region Aeromagnetics (AURA) project, the U.S. Geological Survey (USGS) has purchased 15,000 line-miles of high-resolution proprietary aeromagnetic data and flown an additional 4,000 line-miles of public-domain data spanning the upper Cook inlet in the vicinity of Anchorage, Alaska. Preliminary geophysical analyses of these data reveal geometric information about magnetic sources at several distinct structural levels in the basement and sedimentary section of the upper Cook Inlet basin. For example, the shallowest magnetic sources, contained in the upper Pliocene Sterling formation, trace structures including fault-cored folds within this part of the stratigraphic section. Linear features in the magnetic data (which at least locally correlate with the crests and/or steep flanks of fault-cored folds) can be traced for distances of 25 km and more.

Possible future motion on these structures could pose a significant earthquake hazard to the infrastructure and population of the region. A broad high in the aeromagnetic data over the axis of the basin reflects a highly magnetic unit within the pre-Tertiary basement. Isostatic residual gravity data require this unit to be of lower density than the surrounding basement rocks, suggesting that it was serpentinized.