



Preliminary Grid Data and Maps for an Aeromagnetic Survey of the Taylor Mountains Quadrangle and a Portion of the Bethel quadrangle, Alaska

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Abstract

A preliminary data grid and maps are presented for an aeromagnetic survey of the Taylor Mountains and a portion of the Bethel quadrangles, Alaska. The aeromagnetic survey was flown by McPhar Geosurveys Ltd. for the U.S. Geological Survey (USGS). A flight-line spacing of 1,600 meters (1 mile) and nominal flight height of 305 meters (1,000 feet) above topography (draped) was used for the survey. The preliminary data grid has a grid cell size of 350 meters (1150 feet). Final data processing and quality control have not been applied to these data. The purpose of this preliminary data release is to allow prompt public access to these data, which are of interest for active mineral exploration in the region. A more complete data release and description will be published later once the final data processing is complete.

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Introduction

An aeromagnetic survey of the Taylor Mountains quadrangle, including a small portion of the adjoining Bethel quadrangle (fig. 1), was completed in late May 2004. The survey was flown by McPhar Geosurveys Ltd. under contract to the U.S. Geological Survey (USGS). Previous public-domain airborne geophysical data for this region consist of 10 kilometer (km; 6 mile) east-west profiles collected under the National Uranium Resource Evaluation Program in the 1970s. A digital database, including this older survey and other Alaska aeromagnetic data, has been previously published (Connard and others, 1999). The new survey was commissioned by the USGS to improve data coverage for regional geologic mapping and for government assessment of mineral potential for the region.

The data grid and maps in this report are preliminary. The contractor has not yet completed data processing and quality control for this survey. Therefore, the data have not been formally accepted by the USGS at this time (July 2004). As the data appear to be of acceptable quality for geologic reconnaissance and mineral exploration, the USGS is releasing the data in the interest of timely public access.



Figure 1. Location map for the Taylor Mountains aeromagnetic survey (green patch). Coast lines are in black. Alaska 1:250,000 quadrangle boundaries are in red. The survey occupies the Taylor Mountains quadrangle and a portion of the Bethel quadrangle in southwestern Alaska.

Aeromagnetic Survey, Data, and Map Specifications

The Taylor Mountains aeromagnetic survey was flown in April and May 2004 by McPhar Geosurveys Ltd. under contract to the USGS. The flight lines are oriented northwest to southeast with an interline spacing of 1,600 meters (1 mile). Tie lines were flown in a perpendicular direction (northeast to southwest) with spacing of 12,900 meters (8 miles). The survey flights were

draped over topography using a preplanned flight surface with a nominal clearance of 305 meters (1,000 feet). Care was taken to avoid data collection during periods of intense diurnal disturbance of the Earth's magnetic field. Differential Global Positioning System (GPS) was used for flight navigation.

A preliminary data grid is included in this report [[HOT LINK TO FTP DATA AREA](#)]. This data grid is based on minimum curvature gridding of preliminary flight-line data. Data processing at this stage includes field corrections and office corrections. In the field: (1) Compensation for the airplane magnetic field, (2) heading correction (for the influence of the direction in which the magnetic sensor is traversing the Earth's magnetic field), (3) lag correction (compensation for the difference of position between the GPS and magnetic sensors). In the office: (4) Tie-line leveling, (5) International Geomagnetic Reference Field (IGRF) removal using IGRF 2000, and (6) microleveling to remove residual flight-line artifacts. Note that base station magnetic data were recorded at several field sites but have not yet been processed or applied to the preliminary data grid.

The data have not been subjected to contractor or USGS quality-control checks. The data appear consistent with previous aeromagnetic data and grids for this region (Saltus and Simmons, 1997). The grid is projected using the WGS 84 datum and Universal Transverse Mercator Zone 4. The X location of the bottom-left grid data point is 447,300 meters. The Y location of the bottom-left grid data point is 6,647,200 meters. There are 635 columns (west to east) and 346 rows (south to north) in the data grid. Each grid cell is 350 meters on a side. The grid is included in several formats: (1) Geosoft binary grid (taymtn.grd, taymtn.grd.gi), (2) Geosoft ascii grid exchange (taymtn.gxf), (3) ESRI ArcView binary raster grid (taymtn.flr), and (4) ER Mapper binary grid (taymtn, taymtn.ers).

Two maps have been prepared from the preliminary data grid: Figure 2 is a black and white contour map, and figure 3 is a color shaded-relief map. Both of these maps are available in several formats for download [[HOT LINK TO MAP DOWNLOAD](#)]. The formats are: (1) Adobe portable document format (*.pdf), (2) JPEG compressed image (*.jpg), and (3) ArcView Geotif (*.tif, *.tfw).

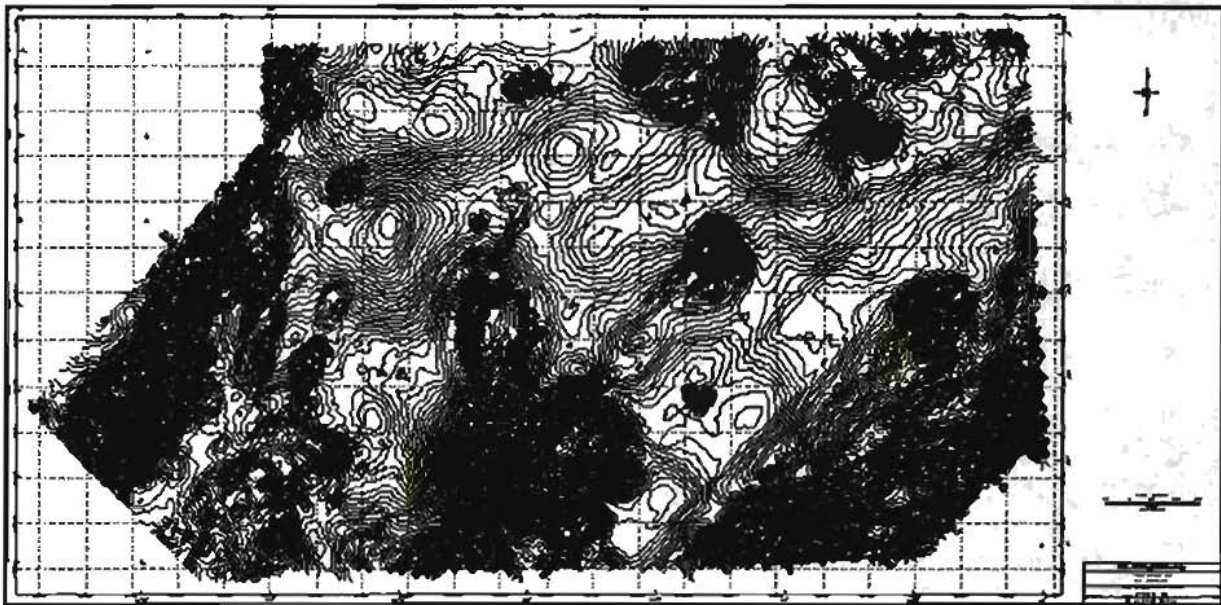


Figure 2. Taylor Mountains aeromagnetic survey preliminary total magnetic field contour map. This is a low-resolution thumbnail view — download map for a better view. Contour interval is 2 and 10 nanotesla (nT).

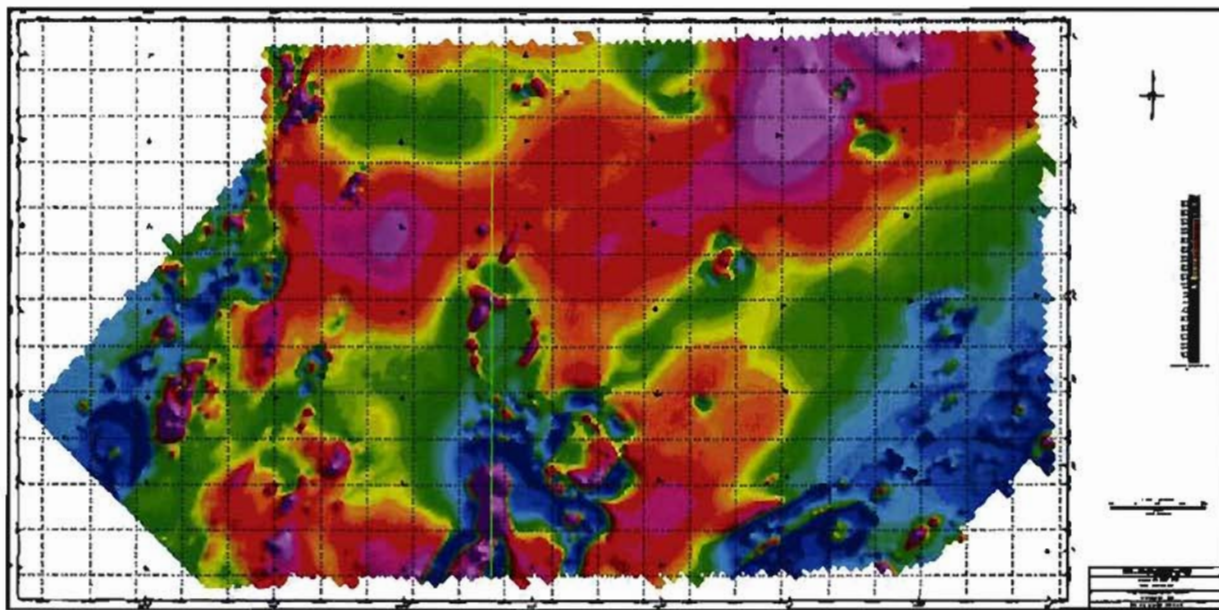


Figure 3. Taylor Mountains aeromagnetic survey preliminary total magnetic field color-shaded relief map. This is a low-resolution thumbnail view — download map for a better view. Shading is from the northeast. The color intervals are 2 to 10 nT.

Summary

In the interest of timely public data access in an active exploration region, preliminary data and maps are presented here for the Taylor Mountains quadrangle and a small portion of the adjoining Bethel quadrangle, southwestern Alaska. These data were collected by McPhar Geosurveys Ltd. for the USGS. A more complete USGS data release, including flight-line data, will follow once complete data processing and quality controls have been applied.

References

Connard, G.G., Saltus, R.W., Hill, P.L., Carlson, L., and Milicevic, B., 1999, Alaska digital aeromagnetic database description (on-line edition): U.S. Geological Survey Open-File Report 99-0503 [<http://pubs.usgs.gov/of/1999/ofr-99-0503/DBDESC.HTM>].

Saltus, R.W., and Simmons, G.C., 1997, Composite and merged aeromagnetic data for Alaska — A website for distribution of gridded data and plot files: U.S. Geological Survey Open-File Report 97-520 [<http://pubs.usgs.gov/of/1997/ofr-97-0520/>].