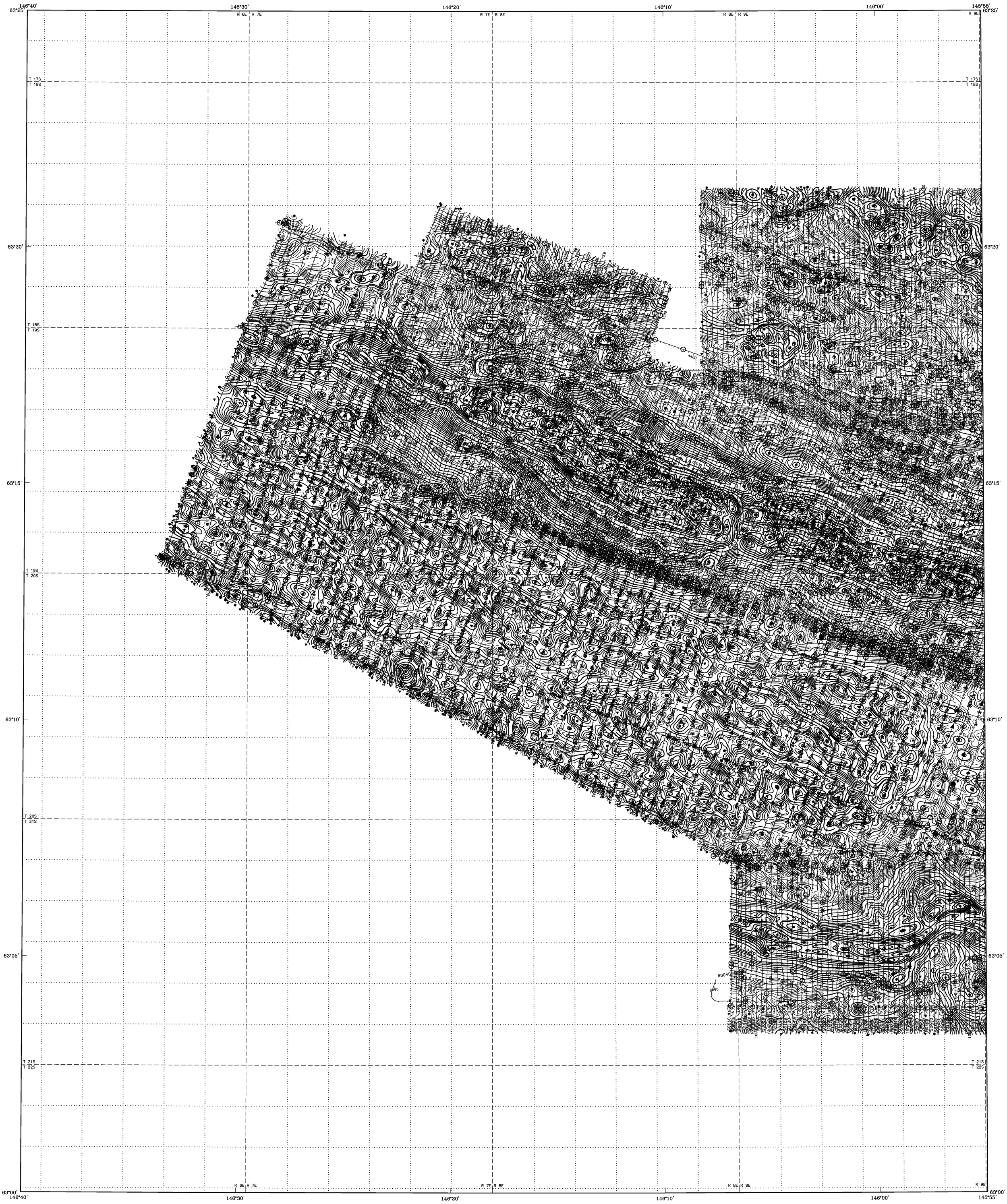
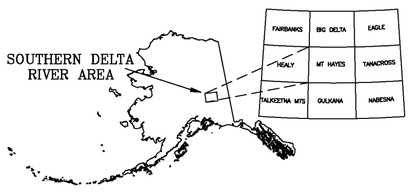


Section outlines from U.S. Geological Survey Mt. Hayes A–4, 1976; A–5, 1978; A–6, 1973; B–4, 1984; B–5, 1978; B–6, 1973; Quadrangles, Alaska



SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

TOTAL MAGNETIC FIELD AND ELECTROMAGNETIC ANOMALIES OF THE SOUTHERN DELTA RIVER AREA, EAST-CENTRAL ALASKA

PARTS OF MT. HAYES QUADRANGLE

2003

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^{V} Electromagnetic (EM) system and a Scintrex cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS350B–2 Squirrel helicopter at a mean terrain clearance of 200 feet along N20°E survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech GG24 NAVSTAR / GLONASS Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post–flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

PREVIOUSLY SURVEYED AREAS

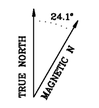
The previously acquired geophysical data were acquired with an Aerodat Condor Electromagnetic (EM) system and a Scintrex cesium magnetometer. The electromagnetic system utilized two vertical coaxial coil pairs at 936 Hz and 4,476 Hz and three horizontal coil pairs at 849 Hz, 4,189 Hz and 32,490 Hz. Mean terrain clearance for the magnetometer and EM system were slightly higher than 150 and 100 feet, respectively. In addition the survey recorded data from a radar altimeter, GPS navigation system, 60 Hz monitor and video camera. The GPS electronic positioning system operated in differential mode. The flight line direction varies from block to block as follows: Canwell N30°E, Eureka and Fish Lake N20°E, and Rainy and Tangle Lake N–S. The flight lines were one–eighth mile apart. Extended tie lines were flown with the current survey which cover both the 1995 and 2002 survey areas. The older survey was flown with a AS350B2 helicopter.

ELECTROMAGNETIC ANOMALIES

Anomaly	Conductance
●	>50 siemens
○	<50 siemens
✳	Questionable anomaly
△	Weak conductivity associated with an EM magnetite response

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial–coil pairs operated at 1000 and 5500 Hz while three horizontal coplanar–coil pairs operated at 900, 7200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. The power line monitor and the flight track video were examined to locate cultural sources. The EM anomalies that are indicated are classified by conductance.



APPROXIMATE MEAN DECLINATION, 2002

TOTAL MAGNETIC FIELD

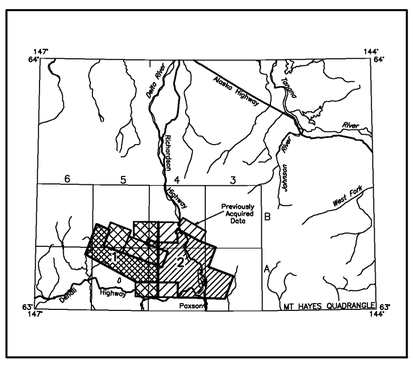
The total magnetic field data were acquired with a sampling interval of 0.1 seconds, and were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) leveled to the tie line data, and (3) interpolated onto a regular 100 m grid using a modified Akima (1970) technique. The regional variation (or IGRF gradient, 2000, updated to August 2002) was removed from the leveled magnetic data.

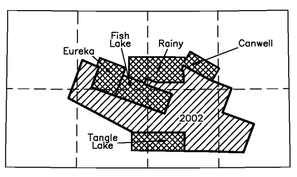
Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

MAGNETIC CONTOUR INTERVAL

———	250 nT
———	50 nT
———	10 nT
— — —	5 nT
▼	magnetic low
✱	magnetic high

LOCATION INDEX





SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the current area were acquired and processed by Fugro Airborne Surveys in 2002. Airborne geophysical data for the Canwell, Eureka, Fish Lake, Rainy and Tangle Lake areas were acquired in 1995 by Aerodat Inc. and were provided for publication by the BLM. The current survey was funded by the U. S. Department of Interior, Bureau of Land Management (BLM) and conducted in support of its mineral assessment program in the Delta River mining district. Laurel Burns was the contract manager for DGGS.

This map and other products from this survey are available by mail order or in person from DGGS, 794 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Juneau Mineral Information Center, 100 Savikko Road, Douglas, Alaska, 99824.