

SLEETMUTE ELECTROMAGNETIC AND MAGNETIC AIRBORNE GEOPHYSICAL SURVEY DATA COMPILATION

L.E. Burns, G.R.C. Graham, J.D. Barefoot, Fugro Airborne Surveys, and Stevens Exploration Management Corp.

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SLEETMUTE ELECTROMAGNETIC AND MAGNETIC AIRBORNE GEOPHYSICAL SURVEY DATA COMPILATION

L.E. Burns¹, G.R.C. Graham¹, J.D. Barefoot¹, Fugro Airborne Surveys, and Stevens Exploration Management Corp.

ABSTRACT

Sleetmute electromagnetic and magnetic airborne geophysical survey is located in western Alaska in the Aniak mining district, about 270 kilometers west of Anchorage, Alaska. The survey is adjacent to the Aniak and Holitna Basin geophysical surveys. Frequency domain electromagnetic and magnetic data were collected with the DIGHEM^V system in October 2002. A total of 5014.4 line kilometers were collected covering 1746.8 square kilometers. Line spacing was 400 meters (m). Data were collected 30 m above the ground surface from a helicopter towed sensor platform ("bird") on a 30 m long line.

PURPOSE

This airborne geophysical survey is part of a program to acquire data on Alaska's most promising mineral belts and districts. The information acquired is aimed at catalyzing new private-sector exploration, discovery, and ultimate development and production. The purpose of the survey was to map the magnetic and conductive properties of the survey area. Whereas the Aniak mining district has a history of placer gold mining, there are also inactive mercury mines and prospects in the area, including the Red Devil deposit. Other gold and base-metal anomalies, altered zones, favorable lithologies, and structural zones are known to exist throughout the survey area.

SURVEY OVERVIEW DESCRIPTION

This document provides an overview of the survey and includes text and figures of select primary and derivative products of this survey. A table of digital data packages available for download is provided to assist users in data selection. For reference, a catalog of the available maps is presented in reduced resolution. Please consult the metadata, project report, and digital data packages for more information and data.

ACKNOWLEDGMENTS

Funding was provided by the U.S. Department of Interior Bureau of Land Management (BLM).

¹ Alaska Division of Geological & Geophysical Surveys, 3354 College Road, Fairbanks, Alaska 99709-3707

AVAILABLE DATA

Data Type	Provider	Description
ascii_data	contractor	ASCII format line data, other ASCII data
databases_geosoft	contractor	Geosoft format database of final line data, other Geosoft format databases
documents	contractor and DGGs	Project and field reports, survey background information, gridded data explanations, other documentation
grids_ermapper	contractor and DGGs	Geographically registered gridded data, ER Mapper ERS format
grids_geosoft	contractor and DGGs	Geosoft-format grids, these grids can be viewed in ESRI ArcMap using a free plugin from Geosoft or the free viewer available from Geosoft
images_registered	DGGs	GeoTiff format images of all gridded data
kmz	DGGs	keyhole markup language (kml) kmz archive files of project data. Viewable in Google Earth and other compatible programs
maps_pdf_format	contractor and DGGs	Printable maps in pdf format. Includes a geographically registered pdf (GeoPDF) for use with mobile devices such as GPS enabled smartphones and tablets, other devices, and programs
maps_prn_format	contractor	Printable maps in HPGL/2 printer file format with extension .prn
profiles_stacked	contractor	Distance-based profiles of the digitally recorded geophysical data are generated and plotted at an appropriate scale. The profiles display electromagnetic anomalies with their respective interpretive symbols. Printable in pdf format
vector_data	contractor and DGGs	Line path, data contours, and survey boundary in ESRI shapefile (SHP) format, ESRI Geodatabase format, and/or AutoCAD dxf format
video_flightpath	contractor	Survey flight path downward facing video

REFERENCES

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- Burns, L.E., U.S. Bureau of Land Management, Fugro Airborne Surveys, and Stevens Exploration Management Corp., 2003, Line, grid, and vector data of the airborne geophysical survey data of the Sleetmute area, southwestern Alaska: Alaska Division of Geological & Geophysical Surveys Geophysical Report 2003-10, 1 DVD. <http://doi.org/10.14509/2994>
- Burns, L.E., U.S. Bureau of Land Management, Fugro Airborne Surveys, and Stevens Exploration Management Corp., 2003, Plot files of the airborne geophysical survey data of the Sleetmute area, southwestern Alaska: Alaska Division of Geological & Geophysical Surveys Geophysical Report 2003-9, 1 DVD. <http://doi.org/10.14509/2976>
- Burns, L.E., U.S. Bureau of Land Management, Fugro Airborne Surveys, and Stevens Exploration Management Corp., 2003, Portfolio of aeromagnetic and resistivity maps of the Sleetmute area, southwestern Alaska: Alaska Division of Geological & Geophysical Surveys Geophysical Report 2003-12. <http://doi.org/10.14509/2996>
- Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, V. 43, p. 144-172.
- Stephens, Mark, and Fugro Airborne Surveys, 2003, Project report of the airborne geophysical survey of the Sleetmute area, southwestern Alaska: Alaska Division of Geological & Geophysical Surveys Geophysical Report 2003-11, 211 p., 2 sheets, scale 1:63,360. <http://doi.org/10.14509/2995>

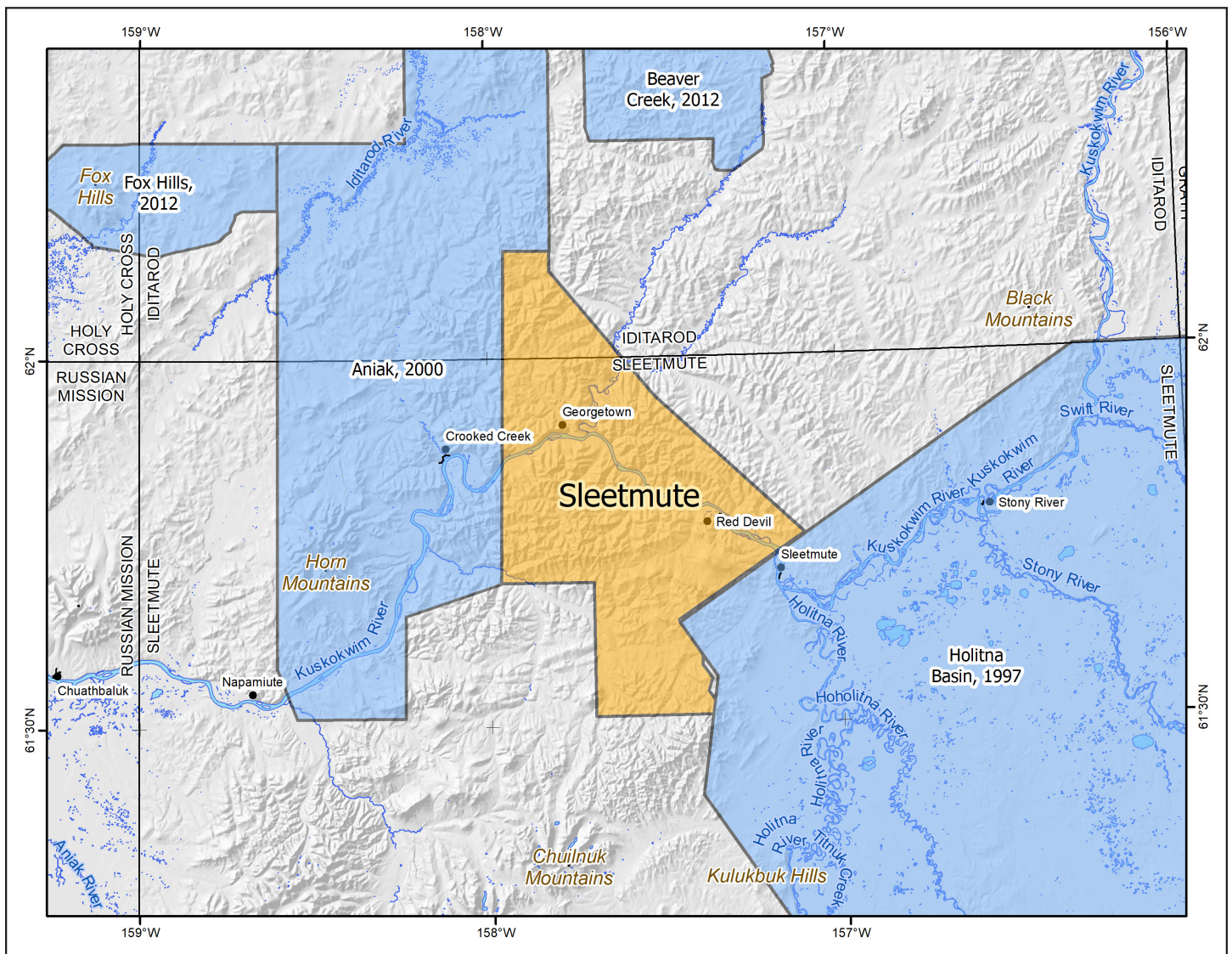


Figure 1. Sleetmute electromagnetic and magnetic airborne geophysical survey location shown in western Alaska (inset). Sleetmute survey area shown with adjacent DGGs geophysical surveys, landmarks, relevant 1:250,000-scale quadrangle boundaries, mountain ranges, rivers, glaciers, and elevation hillshade.



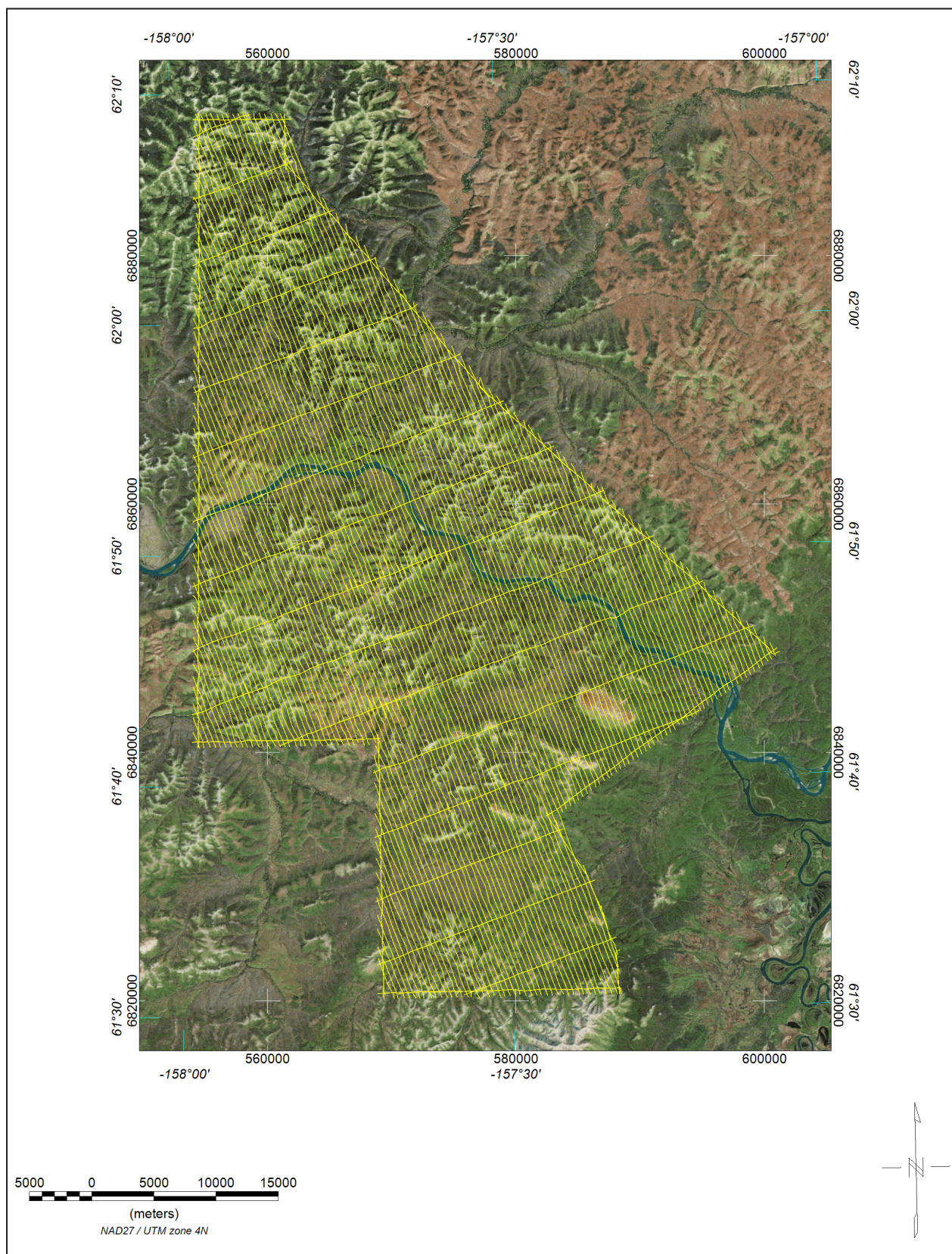


Figure 2. Flight path with orthometric image.

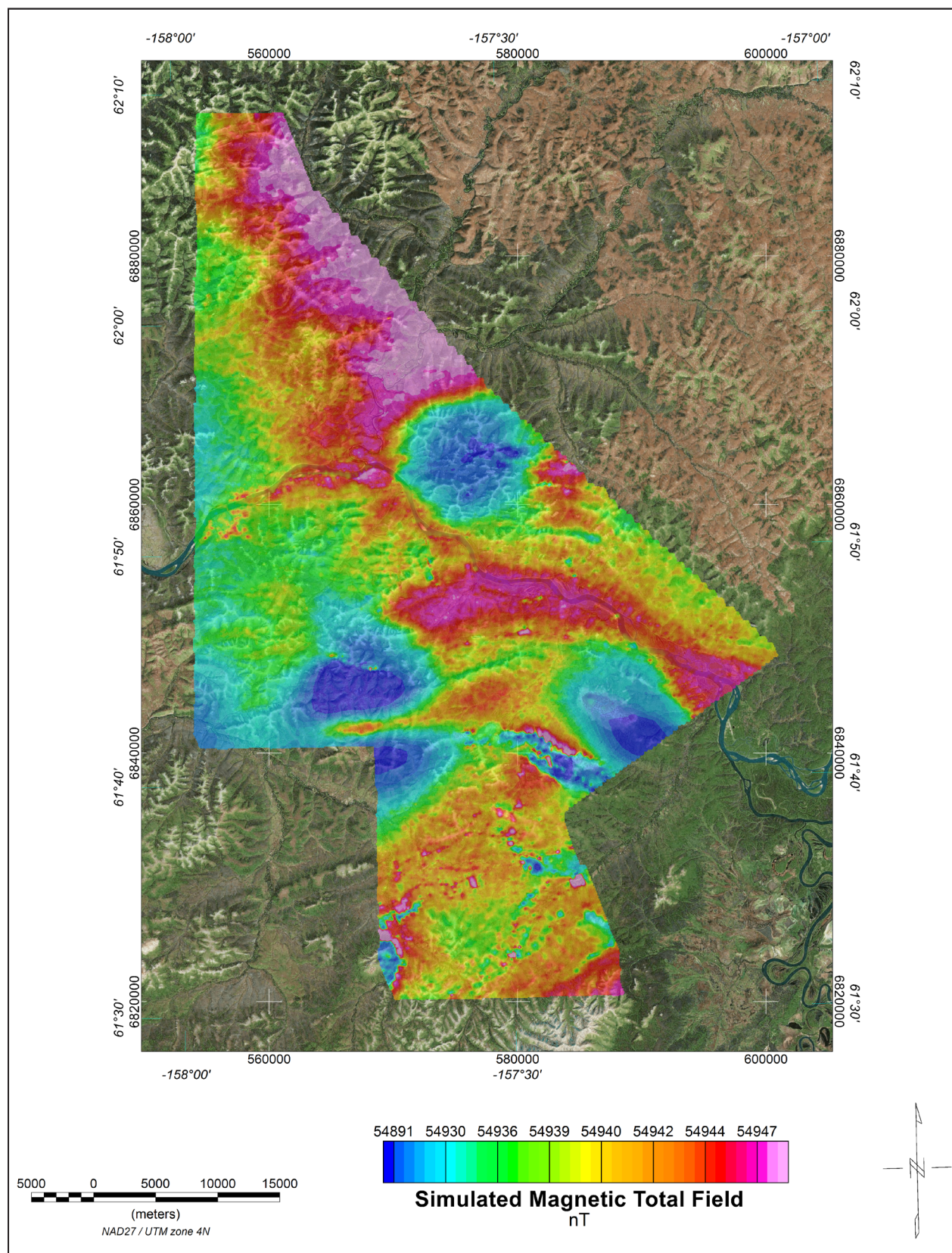


Figure 3. Simulated Magnetic Total Field Grid with orthometric image. The magnetic total field data were processed using digitally recorded data from a Scintrex cesium magnetometer. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtracting the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2000, updated to September 2002), (3) leveled to the tie line data, (4) a constant value of approximately 55,000 nT was added to all data, and (5) interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

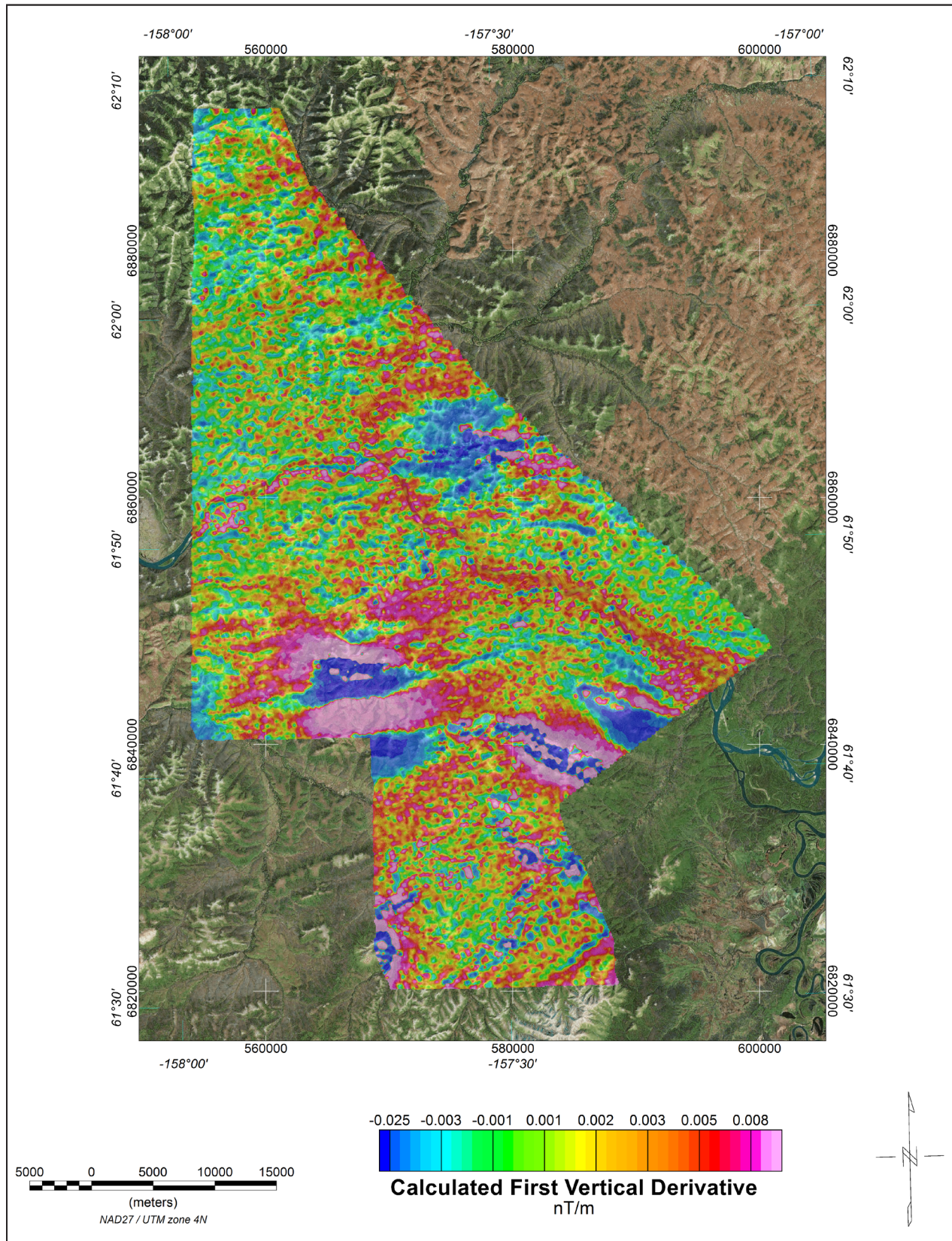


Figure 4. Calculated First Vertical Derivative Grid with orthometric image. The first vertical derivative grid was calculated from the diurnally-corrected, IGRF-corrected total magnetic field grid using a FFT base frequency domain filtering algorithm. The resulting first vertical derivative grid provides better definition and resolution of near- surface magnetic units and helps to identify weak magnetic features that may not be evident on the total field data.

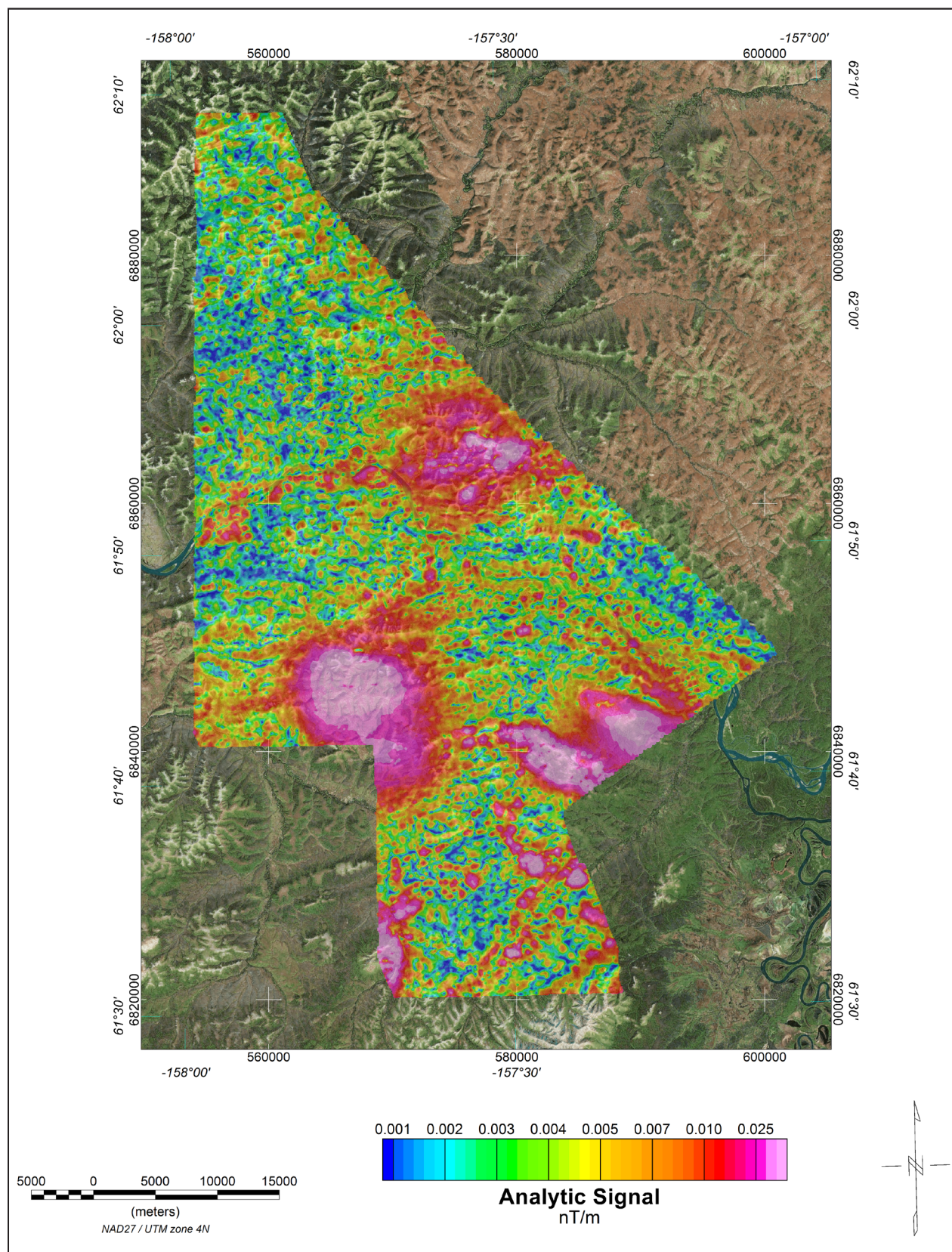


Figure 5. Analytic Signal Grid with orthometric image. Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source body edges and corners (such as contacts, fault/shear zones, etc.). Analytic signal maxima are located directly over faults and contacts, regardless of structural dip, and independent of the direction of the induced and/or remanent magnetizations.

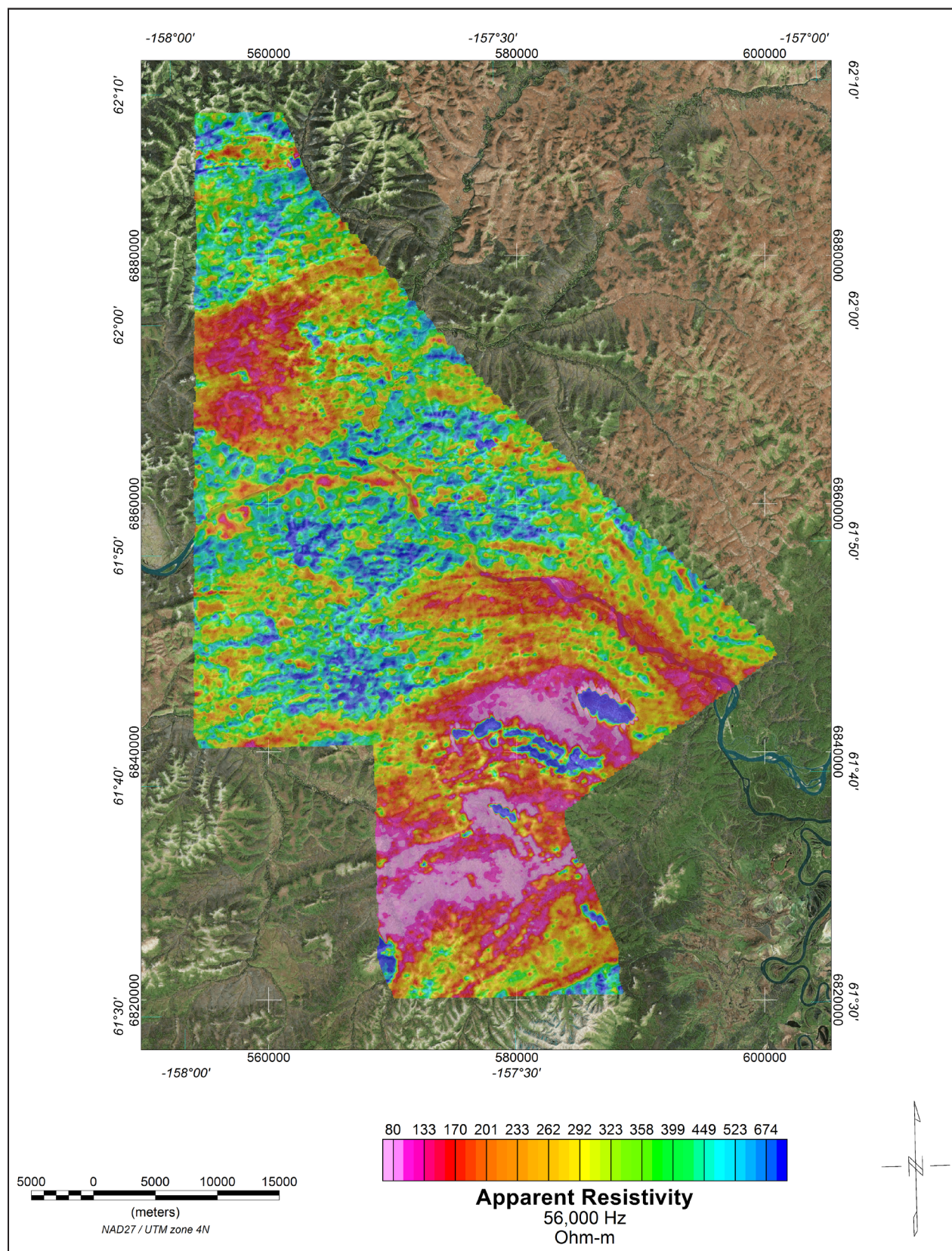


Figure 6. 56,000 Hz coplanar Apparent Resistivity Grid with orthometric image. The DIGHEM[®] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model (Fraser 1978). The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

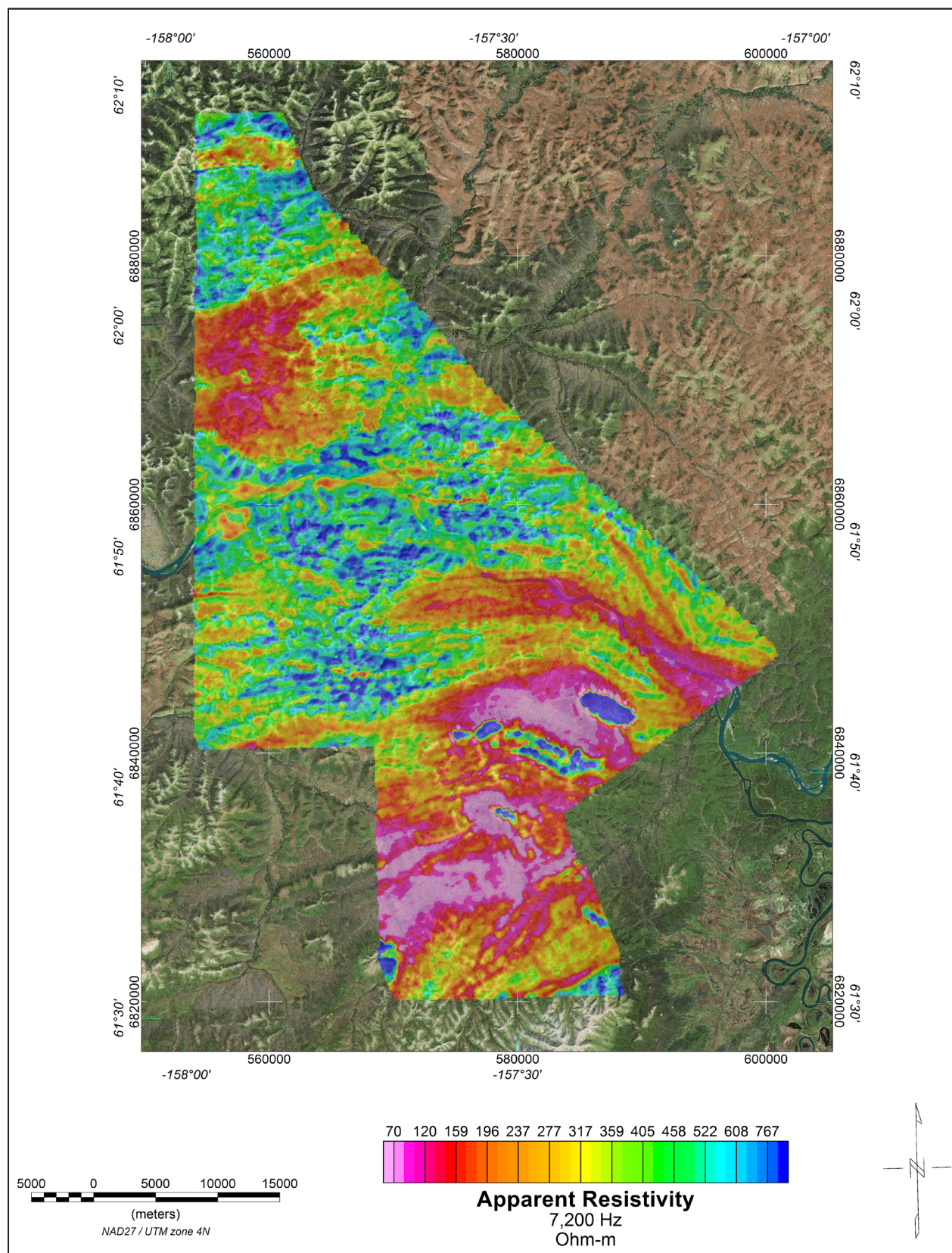


Figure 7. 7,200 Hz coplanar Apparent Resistivity Grid with orthometric image. The DIGHEM[®] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 7,200 Hz using the pseudo-layer half space model (Fraser 1978). The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

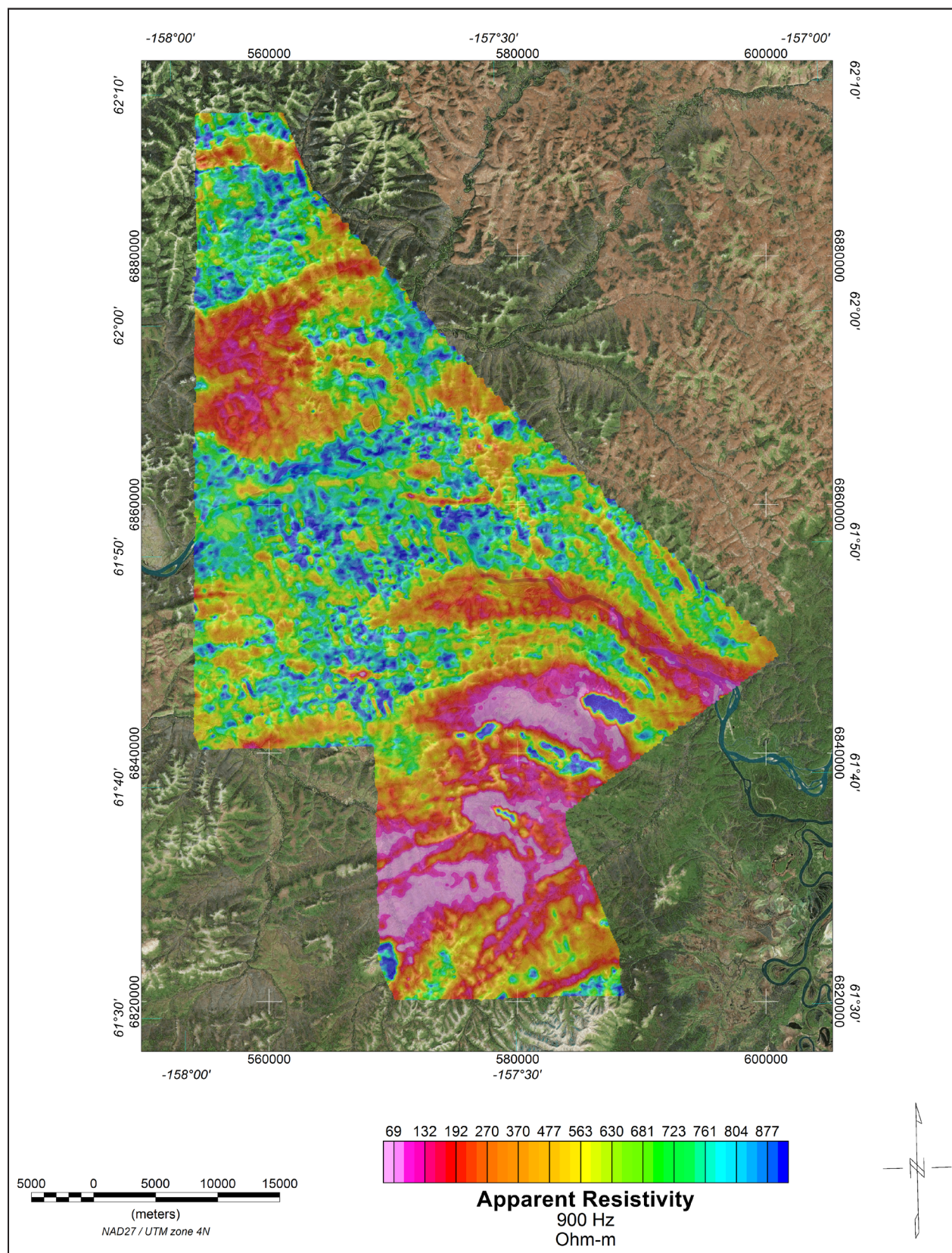


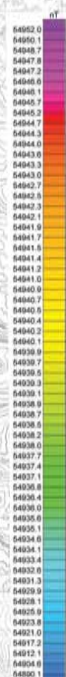
Figure 7. 900 Hz coplanar Apparent Resistivity Grid with orthometric image. The DIGHEM[®] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 900 Hz using the pseudo-layer half space model (Fraser 1978). The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

Table 1. Copies of the following maps are included at the end of this booklet. The low-resolution, page-size maps included in this booklet are intended to be used as a search tool and are not the final product. Large-scale, full-resolution versions of each map are available to download on this publication's citation page: <http://doi.org/10.14509/30223>.

Map Title	Description
sleetmute_sim_magtf_topo_map_1of2.pdf	simulated magnetic total field grid with topographic base map
sleetmute_sim_magtf_topo_map_2of2.pdf	simulated magnetic total field grid with topographic base map
sleetmute_sim_magtf_contours_plss_map_1of2.pdf	simulated magnetic total field grid and contours with public land survey system base layer
sleetmute_sim_magtf_contours_plss_map_2of2.pdf	simulated magnetic total field grid and contours with public land survey system base layer
sleetmute_sim_magtf_shaded_plss_map_1of2.pdf	shaded simulated magnetic total field grid with public land survey system base layer
sleetmute_sim_magtf_shaded_plss_map_2of2.pdf	shaded simulated magnetic total field grid with public land survey system base layer
sleetmute_emanomalies_sim_magtf_contours_plss_map_1of2.pdf	EM anomaly map with simulated magnetic total field grid contours and public land survey system base layer
sleetmute_emanomalies_sim_magtf_contours_plss_map_2of2.pdf	EM anomaly map with simulated magnetic total field grid contours and public land survey system base layer
sleetmute_emanomalies_sim_magtf_contours_detailed_topo_map_1of6.pdf	EM anomaly map with simulated magnetic total field grid contours and topographic base map
sleetmute_emanomalies_sim_magtf_contours_detailed_topo_map_2of6.pdf	EM anomaly map with simulated magnetic total field grid contours and topographic base map
sleetmute_emanomalies_sim_magtf_contours_detailed_topo_map_3of6.pdf	EM anomaly map with simulated magnetic total field grid contours and topographic base map
sleetmute_emanomalies_sim_magtf_contours_detailed_topo_map_4of6.pdf	EM anomaly map with simulated magnetic total field grid contours and topographic base map
sleetmute_emanomalies_sim_magtf_contours_detailed_topo_map_5of6.pdf	EM anomaly map with simulated magnetic total field grid contours and topographic base map
sleetmute_emanomalies_sim_magtf_contours_detailed_topo_map_6of6.pdf	EM anomaly map with simulated magnetic total field grid contours and topographic base map
sleetmute_res7200hz_topo_map_1of2.pdf	7,200 Hz apparent resistivity grid with topographic base map
sleetmute_res7200hz_topo_map_2of2.pdf	7,200 Hz apparent resistivity grid with topographic base map
sleetmute_res7200hz_contours_plss_map_1of2.pdf	7,200 Hz apparent resistivity grid with contours and public land survey system base layer
sleetmute_res7200hz_contours_plss_map_2of2.pdf	7,200 Hz apparent resistivity grid with contours and public land survey system base layer
sleetmute_res7200hz_bw_contours_plss_map_1of2.pdf	black and white 7,200 Hz apparent resistivity grid with contours and public land survey system base layer
sleetmute_res7200hz_bw_contours_plss_map_2of2.pdf	black and white 7,200 Hz apparent resistivity grid with contours and public land survey system base layer

Table 1, continued. Copies of the following maps are included at the end of this booklet. The low-resolution, page-size maps included in this booklet are intended to be used as a search tool and are not the final product. Large-scale, full-resolution versions of each map are available to download on this publication's citation page: <http://doi.org/10.14509/30223>.

Map Title	Description
sleetmute_res900hz_topo_map_1of2.pdf	900 Hz apparent resistivity grid with topographic base map
sleetmute_res900hz_topo_map_2of2.pdf	900 Hz apparent resistivity grid with topographic base map
sleetmute_res900hz_contours_plss_map_1of2.pdf	900 Hz apparent resistivity grid with contours and public land survey system base layer
sleetmute_res900hz_contours_plss_map_2of2.pdf	900 Hz apparent resistivity grid with contours and public land survey system base layer
sleetmute_res900hz_bw_contours_plss_map_1of2.pdf	black and white 900 Hz apparent resistivity grid with contours and public land survey system base layer
sleetmute_res900hz_bw_contours_plss_map_2of2.pdf	black and white 900 Hz apparent resistivity grid with contours and public land survey system base layer
sleetmute_flightpath_topo_map_1of2.pdf	flight lines with public land survey system base layer
sleetmute_flightpath_topo_map_2of2.pdf	flight lines with public land survey system base layer
sleetmute_interpretation_plss_map_1of2.pdf	interpretation based on geophysical data with public land survey system base layer
sleetmute_interpretation_plss_map_2of2.pdf	interpretation based on geophysical data with public land survey system base layer



SCALE 1:63,360

0 1 2 3 4 MILES

0 1 2 3 4 5 KILOMETERS

CONTour INTERVAL 400 FEET

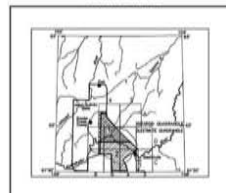


TOTAL MAGNETIC FIELD

Salinas, H., 1970, a sea urchin and holothurian and collection of the Association of Integrating Biologists, v. 17, no. 4, p. 585-592.

TOTAL MAGNETIC FIELD OF THE SLEETMUTE AREA, SOUTHWESTERN ALASKA

2003

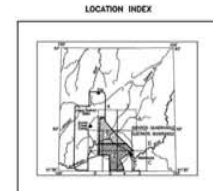


SURVEY HISTORY

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 (DGGG), and Stevens Exploration Management Corp., 10000 E. 1st Avenue, Suite 100, Anchorage, Alaska 99503, and processed by Fugro Airborne Surveys in 2002. Funding for the project was provided by the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGG), and Stevens Exploration Management (BLM). The Aniak survey data shown along the western edge of the current survey was collected by Fugro Airborne Surveys in 1994, acquired by BLM, and published by DGGG. Laura Burns was the contract manager for DGGG.

This map and other products from this survey are available to the public for a fee of \$4.00 per page. Contact: Stevens Exploration Management Corp., 10000 E. 1st Avenue, Suite 300, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Juneau District Office, 10000 E. 1st Avenue, Suite 100, Anchorage, Alaska, 99504.



2003

[illegible]

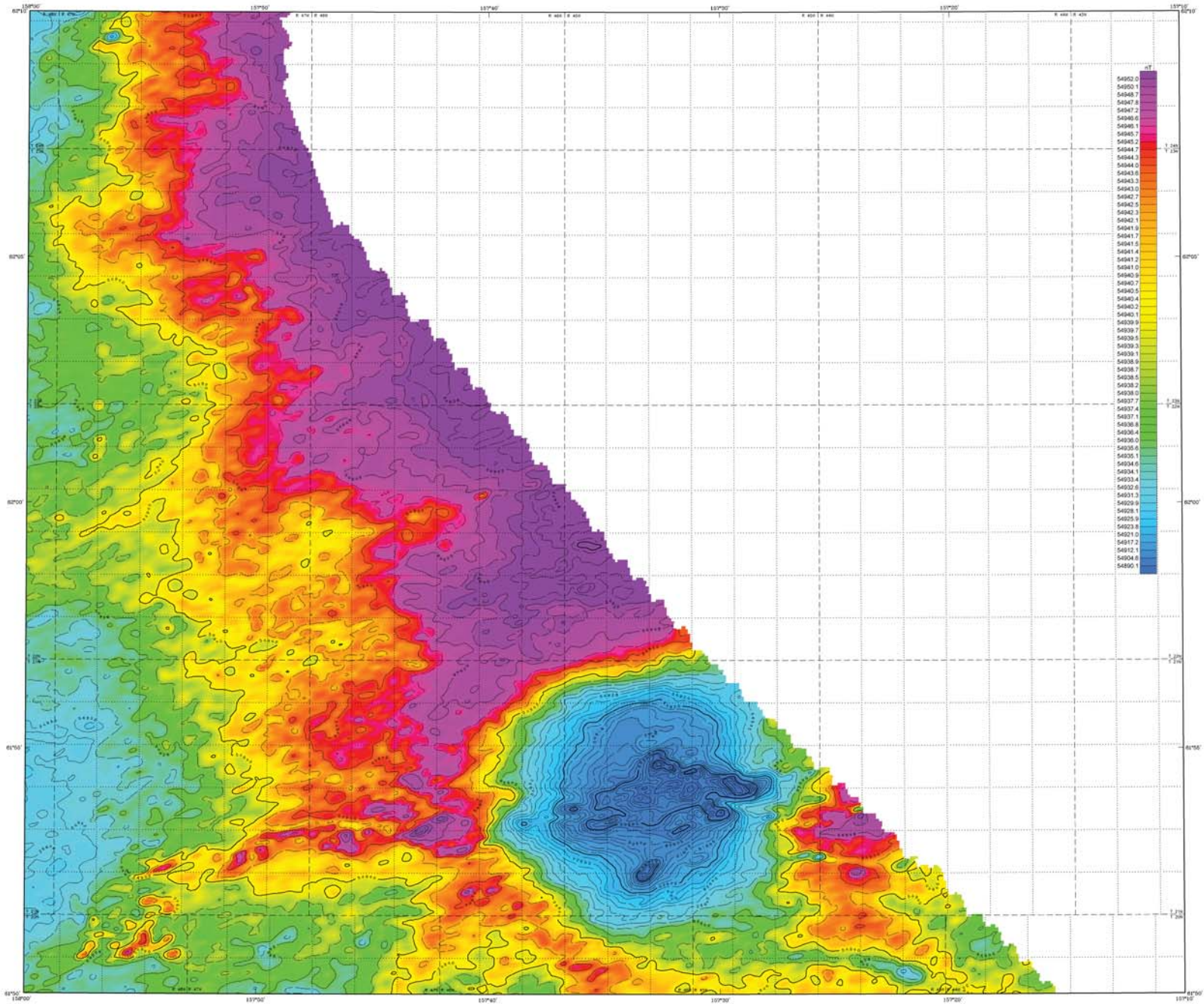
The total magnetic field data were acquired with a sampling interval of 0.1 seconds, and were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) leveled to the tie line data, and (3) interpolated onto a regular 100 m grid using a modified Asmo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

James, 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. 588-602.



This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Survey, and the U.S. Geological Survey. The Alaska Airborne Resources geophysical data for the area were acquired and processed by Fugro Airborne Surveys in 2000. The map was prepared by the U.S. Geological Survey, U.S. Department of the Interior, Bureau of Land Management (BLM). The Alaska survey data show along the eastern edge of the current survey area. The map was prepared by the U.S. Geological Survey, U.S. Department of the Interior, Bureau of Land Management, and published by GGGG, Lathrop Business and Contract Manager for GGGG.

The map and other products from this survey are available to the public at no charge. For more information, contact the U.S. Geological Survey, Alaska 200, Fairbanks, Alaska, 99709. Some products of this survey are also available in person only at the BLM's Juneau District Office, 100 Lakeside Road, Juneau, Alaska, 99802.



TOTAL MAGNETIC FIELD OF THE SLEETMUTE AREA, SOUTHWESTERN ALASKA **PARTS OF IDITAROD AND SLEETMUTE QUADRANGLES** **2003**



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEX[®] 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, 50/50 Hz monitors and video camera. Flights were performed with an AC308B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along N41-SE (340°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. The instrumentation and flight line direction, altitude, and spacing used for the 2003 survey (2000) were similar to the current survey.

An Ashtech G24 NAVSTAR / GLONASS Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using dual-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 4) spheroid, 1927 North American datum using a central meridian (CM) of 158° 0' 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.

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, 2003, updated to September 2003) was removed from the leveled magnetic data.

Hess, R., 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.

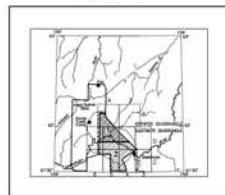


APPROXIMATE BEAR
DECLINATION 2002

MAGNETIC CONTOUR INTERVAL



LOCATION INDEX

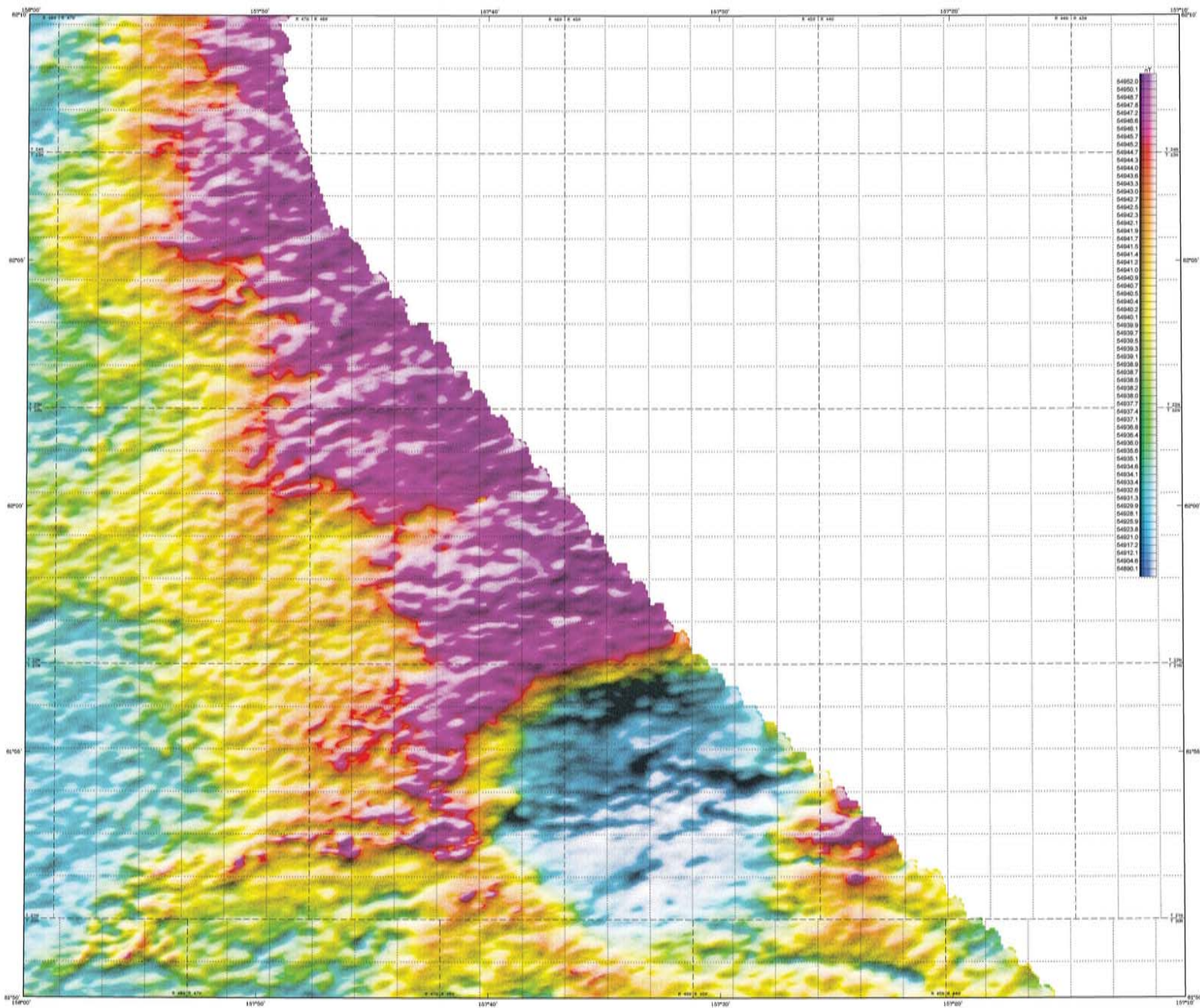


SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGGS), and Stevens Exploration Management Corp. (SEMC). The data were acquired and processed by Fugro Airborne Surveys in 2002. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM). The data were collected along the western edge of the current survey area flown by Fugro Airborne Surveys in 2000, funded by BLM, and published by DGGGS. Laurel Burns was the contract manager for DGGGS.

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





Source: Alaska State U.S. Geological Survey, 1994, 1:50,000.



DESCRIPTIVE NOTES

The geophysical data were acquired with a BIGHU[®] Electromagnetic (EM) system and a Sinteric datum magnetometer. Both were flown at a height of 100 feet. In addition, the survey recorded data from a radio altimeter, GPS navigation system, 50/50 Hz monitors and other sensors. Flights were performed with an AS350-2 helicopter at a mean terrain clearance of 200 feet along 160°-SE (340°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. The instrumentation and flight line direction, altitude, and spacing used for the Anvik survey (2000) were similar to the current survey.

An Ashtech G224 NAVSTAR / GLOPASS 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 4) spheroid, 1927 North American datum using a central meridian (CM) of 159° 30' north constant of 0 and an east constant of 500,000. Positional accuracy of the projected data is better than 10 m with respect to the UTM grid.

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 16 line data, and (3) interpolated onto a regular 100 m grid using a modified Anvik (1970) technique. The regional variation for IGRF gradient, 2000, updated to September 2002, was removed from the leveled magnetic data.

Notes: H, 1970, a new method of interpolation and anomaly curve fitting based on least-squares, *Journal of the Association of Computing Machinery*, v. 17, no. 4, p. 589-602.

COLOR SHADOW TOTAL MAGNETIC FIELD OF THE SLEETMUTE AREA, SOUTHWESTERN ALASKA

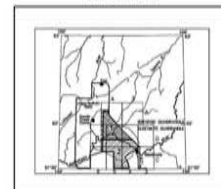
PARTS OF IDITAROD AND SLEETMUTE QUADRANGLES

2003

Sun Azimuth: 340 degrees

Inclination: 30 degrees

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 Engineering Management Corp., Anchorage. Geophysical data for the area were acquired and processed by Stevens Engineering Management Corp., U.S. Department of the Interior, Bureau of Land Management (BLM). The Alaska survey data shown along the western edge of the current survey were flown by Page Airline Corp. in 2000, funded by BLM, and published by DGGS. The current survey was the contract manager for DGGS.

This map and other products from this survey are available by mail order or in person from DGGS, 784 University Ave., Suite 200, Fairbanks, Alaska, 99701. Some products are also available in person only at the BLM's Juneau Mineral Information Center, 100 Siskine Road, Juneau, Alaska, 99824.



PARTS OF IDITAROD AND SLEETMUTE QUADRANGLES
2003

Sun Azimuth: 340 degrees
Inclination: 30 degrees

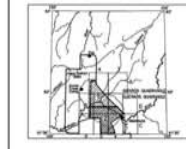
TOTAL MAGNETIC FIELD

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 Asmo (1970) technique. The regional variation (or IGRF gradient, 2000, updated to September 2002) was removed from the leveled magnetic data.

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. 584-602.



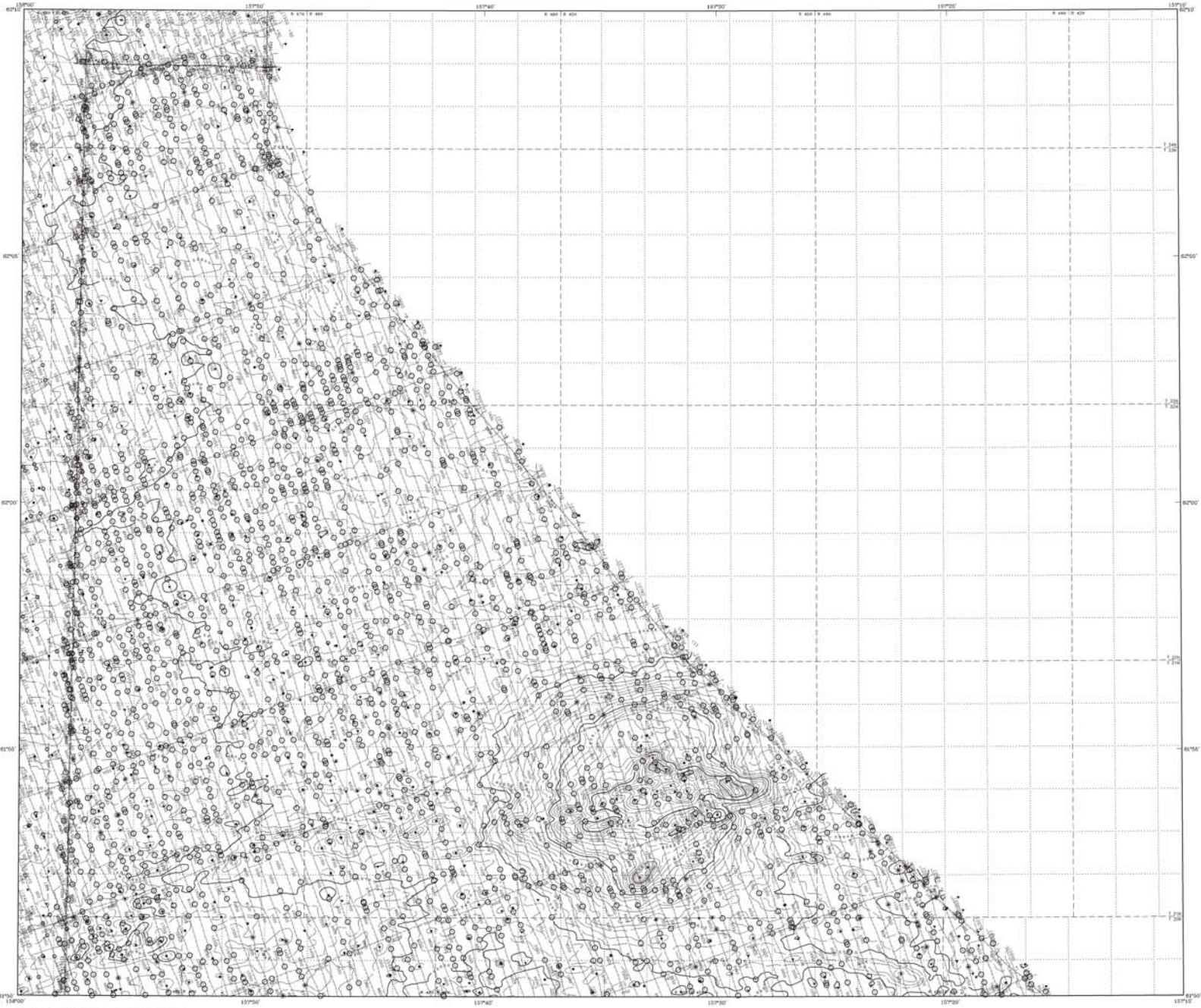
LOCATION INDEX



SURVEY HISTORY

SURVEY RESULTS
This map has been compiled from a contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geographical Surveys (DGGS), and Stevens Exploration Management Corporation. The map was compiled from data collected and processed by Fugro Airborne Surveys in 2002. Funding for the project was provided by the Stevens Exploration Management Corporation and managed by Stevens Exploration Management (BLM). The Aniak survey data show along the western edge of the current survey area. The Fugro Airborne Surveys were conducted by BLM, and published by DGGS. Laurel Hunt was the contract manager for DGGS.

This map and other products from this survey are available for sale to the public for \$100 per page. For more information, contact Stevens Exploration Management, Suite 200, Fairbanks, Alaska, 99708. Some products are also available in person only at the BLM's Fairbanks District Office, 100 Seward Road, Juneau, Alaska, 99824.



North arrow from U.S. Geological Survey sheet A-4 1000, 4-4, 1984.
Datum: NAD 83, GRS 80, ITRF 94, WGS 84, Geoid: Alaska, 1984



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system and a Scintrex cesium magnetometer. Data were flown at a height of 100 feet. In addition the survey recorded data from a radio altimeter, GPS navigation system, 50/50 Hz monitors and video camera. Flights were performed with an AC130B-2 Stinson helicopter at a mean terrain clearance of 250 feet along N40°E (340°) survey flight lines with a spacing of approximately 0.5 miles. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. The instrumentation and flight line direction, altitude, and spacing used for the 2003 survey (2000) were similar to the current survey.

An Ahtech GQ24 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 4) spheroid, 1927 North American datum using a central meridian (CM) of 158° 30' 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.

ELECTROMAGNETIC ANOMALIES

- Conductance
 ○ -50 Siemens
 ○ -50 Siemens
 ● Quadrature points
 - real conductivity associated with an EM magnetic response

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEM EM system measured magnetic and quadrature components at five frequencies. Two vertical coplanar-coil pairs operated at 1000 and 5500 Hz while three horizontal coplanar-coil pairs operated at 800, 7200, and 55,000 Hz. EM data were summed 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.

TOTAL MAGNETIC FIELD AND ELECTROMAGNETIC ANOMALIES OF THE SLEETMUTE AREA, SOUTHWESTERN ALASKA PARTS OF IDITAROD AND SLEETMUTE QUADRANGLES 2003

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) revised to the tie line data, and (3) interpolated onto a regular 100 m grid using a modified along (1970) technique. The regional variation (or IGRF) gradient, 2000, applied to September 2002 was removed from the leveled magnetic data.

Intensity, 1970 is a new method of interpretation and smooth curve of the magnetic field. The magnetic field is the result of the combination of the Earth's magnetic field and the magnetic field of the Earth's crust.

MAGNETIC CONTOUR INTERVAL

- - - - - 100 nT
 - - - - - 50 nT
 - - - - - 2 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 (DGGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys in 2002. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM). The 2003 survey data shown along the western edge of the current survey was flown by Fugro Airborne Surveys in 2000, funded by BLM, and published by DGGGS. Laurel Burns was the contract manager for DGGGS. This map and other products from this survey are available by mail order or in person from DGGGS, 704 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Junctional Mineral Information Center, 100 Seaside Road, Douglas, Alaska, 99824.



2003

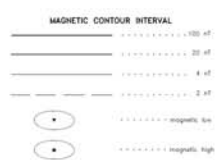
Ising, H., 1970. A new method of interpolation and smooth curve fitting based on local procedures. *Journal of the Association of Computing Machinery*, 17, no. 4, p. 588-601.

ELECTROMAGNETIC ANOMALIES

Accuracy	Conductance
●	>50 percent
○	<50 percent
⊕	Questionable accuracy
△	Weak conductivity associated with an EM magnetic response

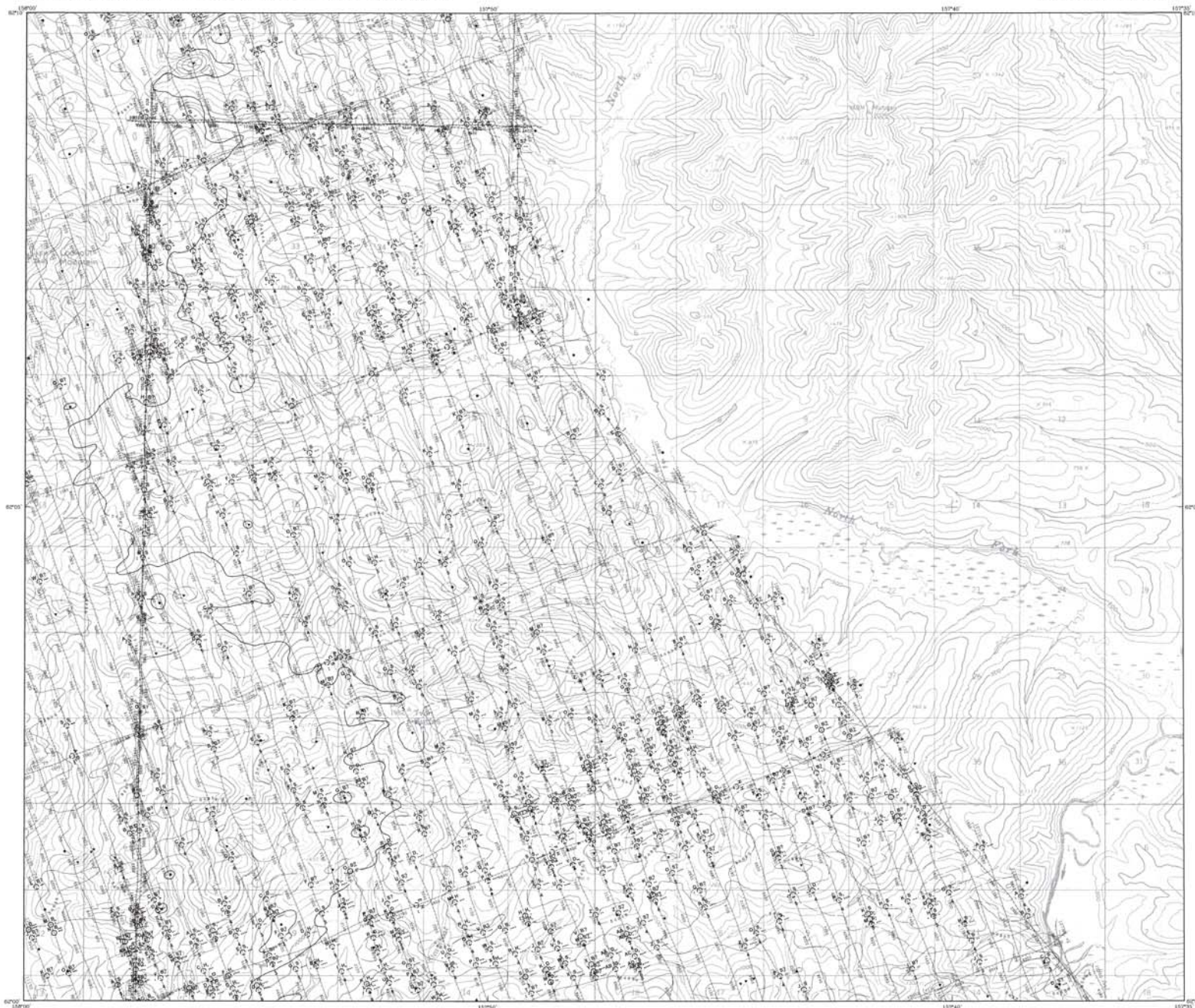
ELECTROMAGNETICS

boundaries, the SDEM-EM system measured impedance components at five frequencies. The coalbed-coal pore operated at 1000 and 5500 Hz, three horizontal capillary-coal pairs operated at 9 and 56,000 Hz. EM data were compiled at 0.1 m intervals. The EM system responds to bedrock or conductive overburden, and cultural sources. The line monitor and the right track video were exclusive cultural sources. The EM anomalies that are classified by conductance.



This map has been compiled and shown under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGG) and the University of Alaska Fairbanks, Institute of Marine and Coastal Resources. The original geophysical data for the area were acquired and processed for the Fugro Airborne Surveys in 2002. Funding for the project was provided by the U.S. Environmental Protection Agency, Office of Management (BLM). The tank survey data shown along the western edge of the current survey was collected by the U.S. Geological Survey, Alaska Division by BLM, and published by DGGG. Laurel Burns was the contract manager for DGGG.

This map and other products from this survey are available at www.dggg.alaska.gov. The University of Alaska Fairbanks, Institute of Marine and Coastal Resources, 221 Luke 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Juneau Mineral Information Center, 100 Seabird Road, Juneau, Alaska 99801.



Base Data: 1:50,000 Geological Survey (1984) and 1:50,000 Geological Survey (1984)

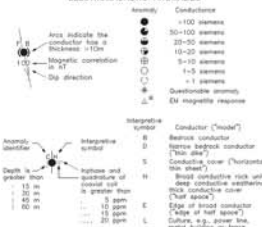


DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] 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 magnetic and side camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along N-12E (142°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. The instrumentation and flight line direction, altitude, and spacing used for the Alaska survey (2003) were similar to the current survey.

An Ashbach G224 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 41 spherical, 1987 North American datum using a central meridian (CM) of 159°, 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.

ELECTROMAGNETIC ANOMALIES





Base Map: U.S. Geological Survey, 1:50,000
Datum: NAD 83, UTM Zone 18N

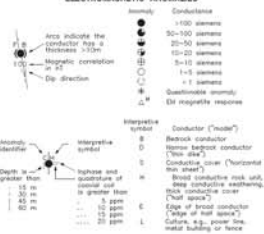


DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHD[®] Earthmagnetic (EM) system and a Solstice system 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 magnetic field sensor, and a real-time kinematic (RTK) survey. Flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines of interline of approximately 3 miles. The instrumentation and flight line direction, altitude, and spacing used for the Alaska survey (2003) were similar to the current survey.

An Ashtech G224 NAVSTAR 7 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 18N datum, 1927 North American datum using a central meridian (CM) of 159°, a north constant of 10 and an east constant of 800,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

ELECTROMAGNETIC ANOMALIES



TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF THE SLEETMUTE AREA, SOUTHWESTERN ALASKA

PARTS OF SLEETMUTE D-5 AND D-6 QUADRANGLES

2003

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHD[®] EM system measured phase and quadrature components of flux frequencies. Two vertical coil-coil pairs operated at 1000 and 5000 Hz while three horizontal coil-coil pairs operated at 400, 1200, and 50,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. The type of conductor is indicated on the electromagnetic map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the contour- and capacitor-coil responses, together with conductor and magnetic anomaly and topography. The power line monitor and the right track coils were employed to locate cultural sources.

TOTAL MAGNETIC FIELD

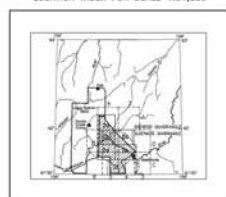
The total magnetic field data were acquired with a scanning interval of 0.1 seconds, and were corrected for diurnal variations by subtraction of the digitally recorded base station (topographic) data. The data were then processed using a modified Gauss (1970) technique. The regional variation (or drift) gradient, 2000, updated to September 2003, was removed from the filtered magnetic data.

Notes: 1. 100 uSMT is the value of magnetic field anomaly data (in Gauss) at the location of the magnetic field.

MAGNETIC CONTOUR INTERVAL



LOCATION INDEX FOR SCALE 1:51,680



SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Survey, and the U.S. Bureau of Land Management (BLM). Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM). The Alaska survey data shown on this map were acquired by the BLM, funded by BLM and published by DGGG. The contract manager for DGGG.

This map and other products from this survey are available by mail order or in person from DGGG, 700 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Alaska Mineral Information Center, 100 Saville Road, Douglas, Alaska, 99562.



TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF THE SLEETMUTE AREA, SOUTHWESTERN ALASKA

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DOME4 EM system measured both the magnetic and electric components of EM frequencies. The circuit coils/cable-coils pairs operated at 1000 and 5500 Hz and three horizontal coplanar-coil pairs operated at 903, 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 type of conductor is indicated on the permeametric map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes at the coaxial- and coplanar-coil responses, together with conductor and magnetic patterns and topography. The power line monitor, the flight back-views, were examined to locate cultural sources.

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 Ainsworth (1970) technique. The regional variation (or IGRF gradient, 2000, updated to September 2002) was removed from the leveled magnetic data.

Stoica, P., 1970, a new method of interpolation and smooth curve fitting based on local procedures. *Journal of the Association of Computing Machinery*, 17, no. 4, p. 589-602.

Figure 1 consists of two schematic diagrams. The top diagram shows a cross-section of a plasma column with a central magnetic flux of 100 aT. The magnetic field lines (B) are shown as concentric circles. The bottom diagram shows a cross-section of a plasma column with a central magnetic flux of 100 aT. The magnetic field lines (B) are shown as concentric circles. The diagrams illustrate the experimental setup for the study of the magnetic field effect on the plasma column.

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Survey, and the U.S. Geological Survey. The U.S. Geological Survey Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys in 2000. Funding for this project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM). The Alaska survey data showing the western edge of the continental shelf was from Fugro Airborne Surveys, 2000, funded by BLM, and published by DGGS. Laurel Burns was the contract manager for DGGS.

This map and other products from this survey are available to the public for use or reproduction. The survey is available to the public at the U.S. Geological Survey, 3400 Lafayette Avenue, Suite 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Juneau Management Center, 100 Semko Road, Juneau, Alaska, 99824.

[illegible]

Interpretive symbol

Depth is greater than

Increase and quadrature of conical cut is greater than

Backward conductor

Hollow backward conductor (iron stake)

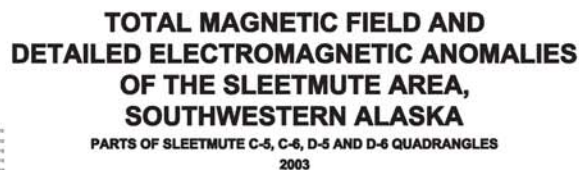
Conductive cover (hoof)

Broad conductive root (broad conductive root)

Thin conductive cover (hoof space)

Edge of broad conductor (edge of hoof space)

Conical cut, power line, metal building or fence

PARTS OF SLEETMUTE C-5, C-6, D-5 AND D-6 QUADRANGLES
2003

This map has been prepared and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. (SEMC). The map was prepared by the DGGS and processed by Fugro Airborne Surveys in 2002. Funding for the project was provided by the Stevens Exploration Management Corp. (SEMC) and the Bureau of Land Management (BLM). The Aniak survey data shown along the western edge of the current survey area was from Fugro Airborne Surveys, Inc. (FAS) and by BLM, and published by DGGS. Laurel Burns was the contract manager for DGGS.

This map and other products from this survey are available to the public for use in any form. The map is available in hard copy or by electronic download from the State 200, Fairbanks, Alaska, 99708. Some products are also available in person only at the BLM's Juneau Office, 10000 Highway 10, Juneau, Alaska, 99804.

[illegible]

Figure 1 consists of three diagrams labeled (a), (b), and (c), each showing a cross-section of a conductor. Diagram (a) is labeled 'Aerial conductor' and shows a central core with insulation, a steel core, and a depth of greater than 10 mm. Diagram (b) is labeled 'Intergrated conductor' and shows a central core with insulation, a steel core, and a depth of greater than 10 mm. Diagram (c) is labeled 'Bare conductor' and shows a central core with insulation, a steel core, and a depth of greater than 10 mm.

PARTS OF SLEETMUTE C-3, C-4, C-5, D-3, D-4 AND D-5 QUADRANGLES

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DONGFENG EM system measured magnetic induction and magnetic field intensity with a vertical coil-cable probe operated at 1000 and 5000 m/s wide frequency spectrum coil-cable probe operated at 500, 7200, and 10000 m/s. The system can detect EM anomalies in various environments. The EM system responds to conductive structures, conductive overburden, and cultural sources. The type of conductor is indicated on the aeromagnetic map by the magnetic intensity. The EM system can detect the location of the type of conductor is based on EM anomaly shape of the cultural- and coil-cable probe responses, together with conductor and magnetic patterns and topography. The power line conductor and light rail line were determined to locate cultural sources.

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 solar activity magnetic data, (2) reduced to the magnetic equator (1° latitude) and (3) averaged onto a regular 100 m grid using a modified Adams (1972) technique. The regional variation (or IGRF gradient, 2000, updated to September 2002) was removed from the limited magnetic data.



This map was compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys and the U.S. Geological Survey, Alaska Division. The geographical data for the area were acquired and processed by Fugro Airborne Surveys in 2002 and 2003. The map was prepared by the Alaska Division, U.S. Department of the Interior, Bureau of Land Management (BLM). The Ahtah survey data shown on this map were collected by the Alaska Division, BLM, from Fugro Airborne Surveys in 2000, followed by BLM, and published by DGGG. Laurel Burns was the contract manager for DGGG.

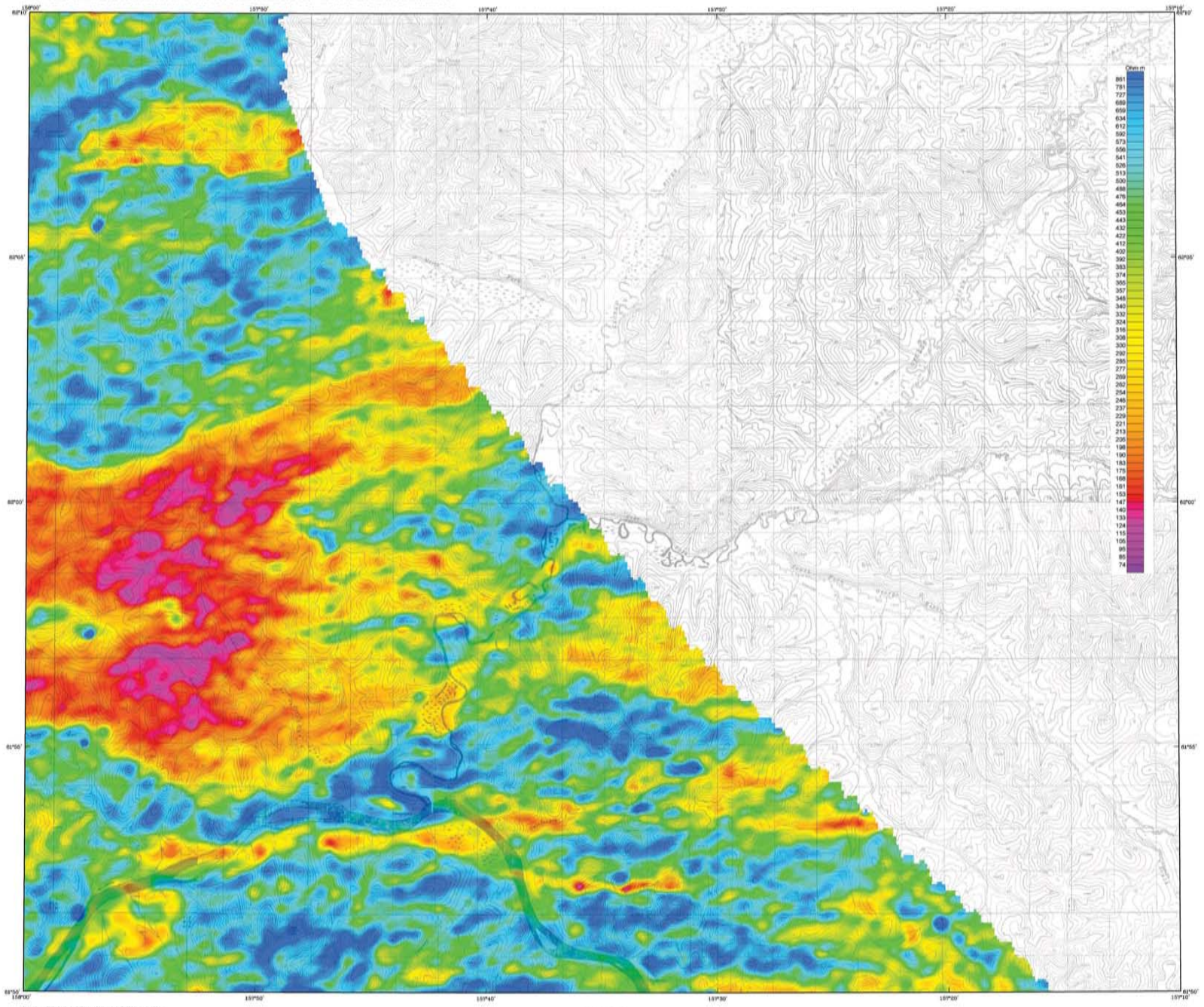
This map and other products from the Ahtah survey are available for use by anyone from DGGG, 784 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are available in person only at the BLM's Fairbanks Distribution Center, 100 Seward Road, Chugiak, Alaska, 99524.



SURVEY HISTORY

This map has been compiled and drawn under contract between the U.S. Geological Survey (USGS), Division of Geological & Geophysical Survey (DGGS), and Stevens Exploration Management Corporation (SEMC), a geophysical consulting firm, under a contract proposed for Fugro Airborne Surveys, Inc. in 2002. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), as part of the BLM's contract along the western edge of the current survey was flown by Fugro Airborne Surveys in 2000, funded by the public-private partnership, 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., Durham, NC 27705. The map is also available online at www.blm.gov and also available in person only at the BLM's Jackson, Wyoming office, 100 Snake Road, Douglas



Base from U.S. Geological Survey 1:50,000, 1:250,000, 1:500,000, and 1:1,000,000 scale maps.



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEN[®] Earthmagnetic (EM) system and a Sinterex cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a motor odometer, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AC350B-2 helicopter at a main rotor clearance of 200 feet along 191°SE (340°) 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. The instrumentation and flight line direction, altitude, and spacing used for the 2003 survey (2000) were similar to the current survey.

An Airtech G24 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 4) spheroid, 1927 North American datum using a central meridian (CM) of 156° 0' 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.

RESISTIVITY

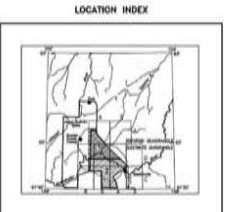
The DIGHEN[®] EM system measured in-phase and quadrature components of five frequencies. Two vertical coil-out pairs operated at 1000 and 2500 Hz with three horizontal coil-out pairs operated at 900, 7200, and 26,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the in-phase and quadrature components of the coplanar 7200 Hz using the pseudo-time half space model (Foster 1978). The data were interpolated onto a regular 100 m grid using a modified spline (1970) technique.

Nagy, H., 1970, A new method of interpolation and smooth curve fitting based on local minimization of the variance of the second derivative of the function, *Journal of the Association of Computing Machinery*, v. 17, no. 4, p. 658-670.

Foster, D.R., 1978, *Resistivity mapping with an airborne mutual electromagnetic system* (Geophysics, v. 43, p. 144-172).



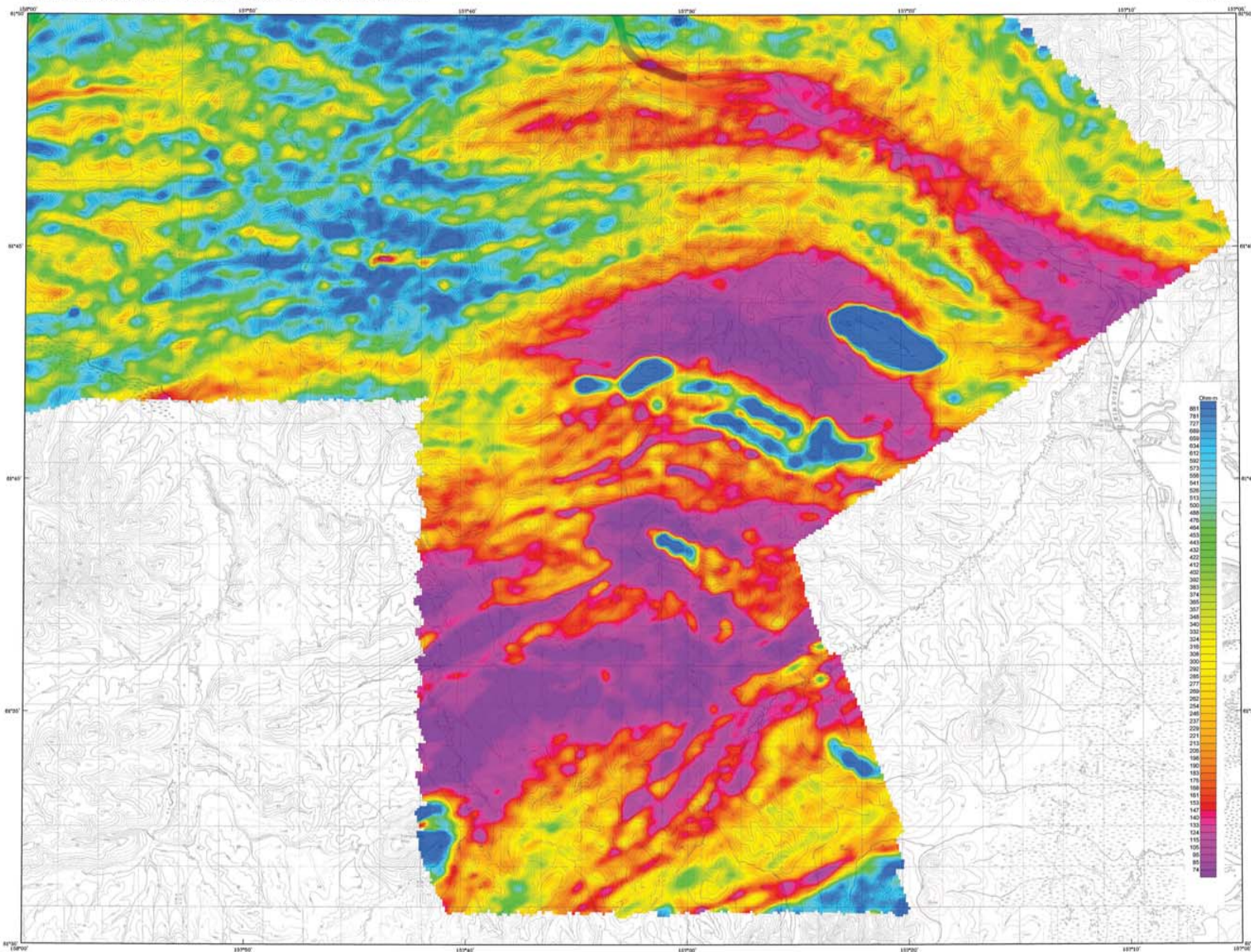
7200 Hz COPLANAR RESISTIVITY
OF THE SLEETMUTE AREA,
SOUTHWESTERN ALASKA
PARTS OF IDITAROD AND SLEETMUTE QUADRANGLES
2003



SURVEY HISTORY

This map has been compiled and shown under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGGS), and Stevens Exploration Management Corp. (SEMEC) geophysical data for the area shown acquired and processed by Fugro Airborne Surveys in 2002. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM). The Airborne data shown along the western edge of the current survey was flown by Fugro Airborne Surveys in 2000, funded by BLM, and published by DGGGS. Laurel Burns was the contract manager for DGGGS.

This map and other products from this survey are available by mail order or in person from DGGGS, 794 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Junctional Mineral Information Center, 100 Spake Road, Douglas, Alaska, 99524.



Map Sheet 9-3a, Sleatmute Area, Alaska, U.S. Geological Survey, 1:50,000 scale, 1997.



DESCRIPTIVE NOTES

The geophysical data were acquired with a GDEM¹ Electromagnetic (EM) system and a Sintera caesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radio altimeter, GPS navigation system, 50/50 Hz magnetic field data, and a digital data logger. The survey was flown on a Sikorsky HO4S helicopter. The survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. The instrumentation and flight line direction, altitude, and spacing used for the Alaska survey (2003) were similar to the current survey.

An Ashbach G224 HAUSTAR / GLOH455 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 4) spheroid, 1927 North American datum using a central meridian (CM) of 150° 0' 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.

RESISTIVITY

The GDEM¹ EM system measured in-phase and quadrature components of the frequency. Two vertical coplanar coils were operated at 7200 Hz using three horizontal coplanar coils operated at 800, 7200, and 10,000 Hz. The data were collected at 0.5 second intervals. The EM system responds to both conductive, conductive overburden, and cultural sources. Apparent resistivity is generated from the in-phase and quadrature components of the coupled 7200 Hz using the pseudo-resistivity half space model (Frasier 1979). The data were interpolated onto a regular 100 m grid using a modified spline (1975) technique.

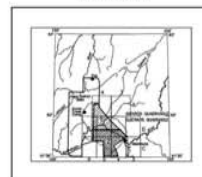
Allen, R. 1975. A new method of interpolation and smooth curve fitting based on the generalized spline function. *Journal of Geophysical Research*, v. 80, p. 684-685.

Frasier, R.L. 1979. *Resistivity mapping with an electromagnetic induction system*. Geophysical, v. 45, p. 144-152.



7200 Hz COPLANAR RESISTIVITY OF THE SLEATMUTE AREA, SOUTHWESTERN ALASKA PARTS OF IDITAROD AND SLEATMUTE QUADRANGLES 2003

LOCATION INDEX

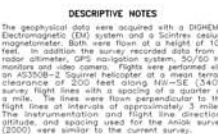


SURVEY HISTORY

This map has been compiled and shown under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGGS), and Federal Aviation Administration (FAA). Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM). The Alaska survey data shown along the western edge of the current survey were flown by Fugro Airborne Surveys in 2002, funded by BLM, and submitted by DGGGS. Laurel Burns was the contract manager for DGGGS.

This map and other products from this survey are available by web only or in paper form 2005. The University of Alaska, Fairbanks, Alaska, 99707. These products are made available in paper form only if the BLM's Bureau of Land Management Center, 100 Seward Road, Douglas, Alaska, 99624.





2003

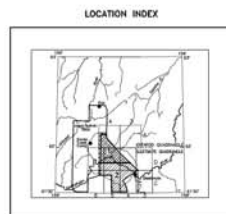
RESISTIVITY

The DIGHM™ EM system measured inphase and quadrature components of five frequencies. Two vertical coils of 1000 and 5500 mH with three horizontal coil-pair coils operated at 900, 7200, and 36,000 Hz. EM data were sampled at 0.1 second intervals. The system responds to bedrock conductors, conductive overburden, and cultural features. Aggregated resistivity is generated from the inphase and quadrature components of the coilpair 7200 Hz using the pseudo-true half space model (Freyer 1978). The data were integrated into a regular 100 m grid using a modified Gauss (1970) technique.

Alaina, R., 1972, A new method of integration and smooth curve fitting for resistivity data, *Geophysical Prospecting*, 20, 1-12.

Geophysical Computing Machine, v. 17, no. 4, p. 589-602.

Freyer, D.C., 1978, Resistivity mapping with an airborne multi-coil EM system, *Geophysics*, 43, 125-132.



SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Bureau of Land Management (BLM), and the U.S. Geological Survey (USGS), and Stevens Exploration Management Corporation. Geophysical data for the area were acquired by the Stevens Exploration Management Corporation in 2002. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM). The Anvik survey data shown on the inset map were acquired by the U.S. Geological Survey in 2002. The Fugro Airborne Surveys in 2000, funded by BLM, and published by USGS. Laurel Burns was the contract manager for this project.

This map and other products from this survey are available by mail order or person from USGS, 794 University Avenue, Suite 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Juneau District Office, 100 Seward Road, Juneau, Alaska, 99824.



RESISTIVITY

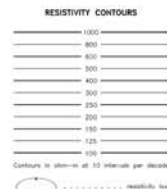
The SIGHEM EM system measured in-phase and quadrature components at five frequencies. Two vertical coils—each 100 cm long and 10 cm in diameter—were spaced 10 cm apart horizontally. A coplanar-cable pair, operated at 900, 7200, and 36,000 Hz, EM data were sampled at 0.1 second intervals. The EM system responds to ferritic conductors, conductive sediments, and cultural structures. Apparent resistivity is generated from the in-phase and quadrature components of the coplanar 7200 Hz using the pseudo-skin layer half space model (Fraser 1978). The data were integrated into a profile 1/32 m and used in a modified resistivity (1975) technique.

Stam, R., 1975, A new method of interpretation and smooth curve fitting of EM data, *Journal of Geophysical Research*, 80, 10, 6085-6092.

Stam, R., 1978, *Computerized EM Data Interpretation*, *Journal of Computing Technology*, v. 17, no. 4, p. 486-492.

Stam, R., 1979, *Computerized EM Data Interpretation*, *Journal of Geophysical Research*, v. 84, no. 1, p. 119-124.

Stam, R., 1980, *Computerized EM Data Interpretation*, *Journal of Geophysical Research*, v. 85, p. 119-124.



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SURVEY HISTORY

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geologist & Geophysical Surveys, and the Geological Survey of Canada. The original airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys in 2002. Funding for the project was provided by the U.S. Department of Energy, Office of Biological Management (BOM). The Alaska survey data shown along the western edge of the current survey, was flown by Fugro Airborne Surveys in 2000, funded by the project principal investigator, Laurel Burns, was the contract manager for DOGS.

This map and other products from this survey are available by mail order or in person from 2025, 794 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Fairbanks Alaska Information Center, 100 Spokane Road, Fairbanks, Alaska, 99704.



2003

The DGHM[®] DI system measured in-phase and quadrature components at five frequencies. Two vertical postcoil-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 averaged at 0.1 second intervals.

56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature components of the coplanar 7200 Hz using the pseudo-layer half space model (Freyer 1978). The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: *Geophysics*, v. 43, p. 164-172.



1000
900
800
700
600
500
400
300
200
100



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 Stratigraphic Data Systems, Inc. (SDSI). The geophysical data for this area were acquired, collected, and processed by Fugro Airborne Surveys in 2002. Funding for the project was provided by the U.S. Geological Survey, Alaska Division, Biological Management (BLM). The Aniak survey data shown along the western edge of the current survey area were collected by the U.S. Geological Survey, BLM, and published by DGGS. Laurel Burns was the contract manager for DGGS.

This map and other products from this survey are available to the public. For more information, contact the Alaska Division, U.S. Geological Survey, 421 University Avenue, Suite 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Juneau District Office, 1000 Commercial Center, 100 Sordani Road, Juneau, Alaska, 99824.



2003

The SOREM[®] EM system measured in-phase and quadrature components of five frequencies. Two vertical conductor-coil pairs operated at 1000 and 5500 Hz while three horizontal coplanar-coil pairs operated at 900, 7200, and 54,000 Hz. EM data were interpreted at 0.1 second intervals.

The DM system responds to seismic conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the sphere and quadrature components of the coplanar 1200 Hz using the pseudo-layer half space model (Frasier 1978). The data were interpreted into a model 1/4 in. to 100 ft. depth, using a 1200 Hz apparent

Prager, S.C.: 1979, 'Reactivity mapping with an airborne multibeam echosounder system', *Oceanography*, v. 43, p. 144-157.



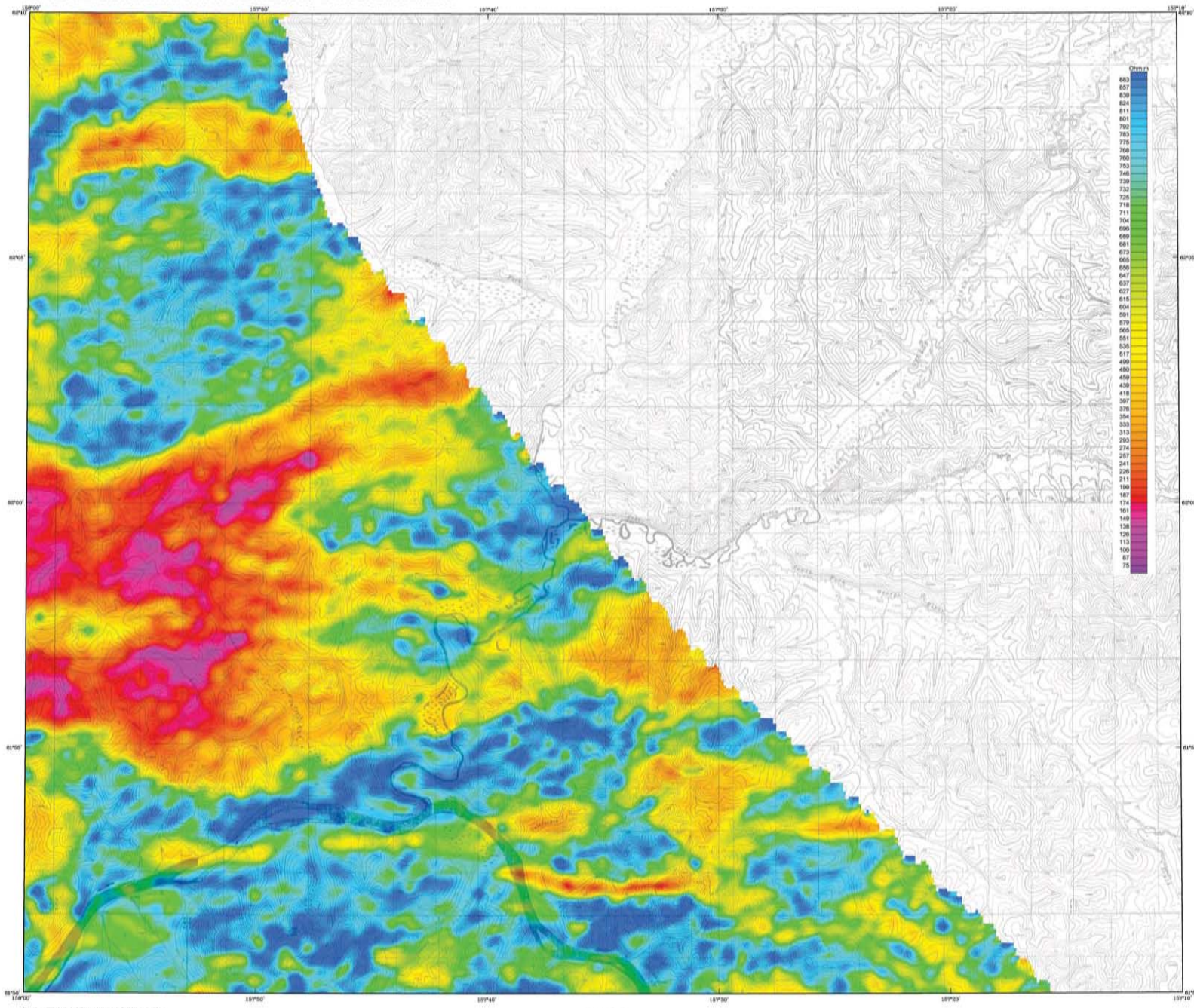
A vertical scale with horizontal grid lines. The numbers 100, 200, 300, 400, 500, 600, 800, and 1000 are marked on the right side of the scale.

Contours at glen-in at 1/3 intervals per decade

relative frequency

This map has been compiled and drawn from data collected by the State of Alaska, Department of Natural Resources, Division of Geologist & Geophysical Survey (DGGG), and the U.S. Geological Survey (USGS). The original geographic data for the area were acquired and processed by the Project Airborne Surveys in 2001. Funding for the project was provided by the U.S. Environmental Protection Agency, Office of Wetland Management (BLM). The Alaska survey data were along the eastern edge of the current survey area. The map was prepared by DGGG, Laurin Burns and the contract manager for DGGG.

This map and other products from the survey are available at the following locations: DGGG, 2002, 2003, Suite 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Juneau District Information Center, 100 Seaside Road, Juneau, Alaska 99801.



Base from U.S. Geological Survey 1:50,000, 1:250,000, 1:500,000, and 1:1,000,000 scale maps.



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEX[®] Electromagnetic (EM) system and a Sinterex cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a motor odometer, GPS navigation system, 50/50 Hz magnetometer and video camera. Flights were performed with an AC350B-2 G-2000 helicopter at a mean terrain clearance of 200 feet along 100°E (340°) 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. The instrumentation and flight line direction, altitude, and spacing used for the 2003 survey (2000) were similar to the current survey.

An Airtech G24 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 4) spheroid, 1927 North American datum using a center meridian (CM) of 150° 0' 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.

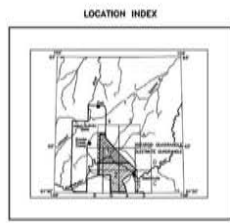
RESISTIVITY

The DIGHEX[®] EM system measured in-phase and quadrature components of five frequencies. Two vertical coil-pairs operated at 1000 and 2500 Hz with three horizontal coil-pairs operated at 900, 7200, and 56,000 Hz. EM data were recorded at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the in-phase and quadrature components of the coil-pair 900 Hz using the pseudo-layer half space model (Foster 1978). The data were interpolated onto a regular 100 m grid along a modified UTM (1970) subzone.

Nagy, H., 1970, A new method of interpretation and smooth curve fitting based on true resistivity, *Journal of the Association of Geophysical Engineers*, v. 17, no. 4, p. 88-90.

Foster, D.R., 1978, *Resistivity mapping with an airborne multi-frequency electromagnetic system* (Geophysics), v. 43, p. 144-172.

900 Hz COPLANAR RESISTIVITY OF THE SLEETMUTE AREA, SOUTHWESTERN ALASKA PARTS OF IDITAROD AND SLEETMUTE QUADRANGLES 2003



SURVEY HISTORY

This map has been compiled and shown under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGGS), and Stevens Exploration Management Corp. (SEMEC). Geophysical data for the map were acquired and processed by Fugro Airborne Surveys in 2002. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM). The Airtech survey data shown along the western edge of the current survey was flown by Fugro Airborne Surveys in 2000, funded by BLM, and published by DGGGS. Laurel Burns was the contract manager for DGGGS.

This map and other products from this survey are available by mail order or in person from DGGGS, 784 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Junctional Mineral Information Center, 100 Spake Road, Douglas, Alaska, 99524.

[illegible]

RESISTIVITY

The DIGEM EM system measured in-phase and quadrature components at five frequencies. Two vertical coils (vertical coils are not required) were placed in the center of a horizontal capacitor-coil pair operated at 800, 7200, and 56,000 Hz. EM data were compiled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural structures. Apparent resistivity is generated from the ratio of the quadrature component of the capacitor 800 Hz using the pseudo-layer half space model (Frasser 1978). The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

Fraser, R., 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.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological and Geophysical Surveys (DGGG), and Stevens Exploration Management Corp. Alaska geophysical data for the area were acquired and processed by Fugro Airborne Surveys, Inc. in 2002. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM). The Anishur Survey data shown on this map were collected by the BLM and were flown by Fugro Airborne Surveys in 2000, funded by BLM, and published by DGGG. Laurel Burns was the primary mapmaker for this project.

This map and other products from this survey are available by mail order or in person from DGGG, 794 University Ave., Suite 200, Fairbanks, Alaska, 99708. Some products are also available in person only at the BLM's Juneau District Office, 1000 W. 10th Avenue, Juneau, Alaska, 99802.



This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGG), and Glacier Geophysical Data Management Corp. The geophysical data for this map are acquired and processed by Fugro Airborne Surveys in 2002. Funding for the project was provided by the United States Department of the Interior, Bureau of Land Management (BLM). The knick survey data shown along the western edge of the current survey area were collected by Fugro Airborne Surveys in 1994 by BLM, and published by DGGG. Laura Harris was the contract manager for DGGG.

This map and other products from this survey are available for sale at a price of \$400 per copy. Contact information: Suite 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Juneau District Office, 1000 Commercial Center, 100 Seaboard Road, Douglas, Alaska, 99824.



2003



SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Science (DGGG), and Stevens Exploration Management Company (SEMC). The data were collected by DGGG and processed by Fugro Airborne Surveys in 2000. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM). The area shown is just about along the western edge of the current survey area flown by Fugro Airborne Surveys in 2000, funded by BLM, published by the Lauree Burns as the District Record DGGG.

This map and other products from this survey are available by mail order or in person from DGGG, 794 University Avenue Suite 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Juneau Office, 1000 1st Avenue, 99801.

[illegible]

2003

RESISTIVITY

The DGHM[®] EM data system measured inphase and quadrature components at five frequencies. Two vertical coaxial coils, operated at 1000 and 5500 Hz, were used to obtain inphase and quadrature data at 1000, 5500, 9000, and 7200 Hz. The 56,000 Hz EM data were sampled at 0.5 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature components of the EM response and the conductivity-depth of space model (Freyer 1978). The data were interpolated onto a regular 100 m grid using a modified kenna (1970) technique.

Winn, H., 1972. A new method of interpretation of resistivity data using both in phase and quadrature components. *Journal of the Association of Professional Geophysicists*, v. 17, no. 4, pp. 569-602.

Freyer, C. C., 1978. Resistivity mapping with a computerized resistivity data system. *Geophysics*, v. 43, pp. 1772-1779.



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 Strategic Environmental Systems, Inc. (SES). The geophysical data for this area were acquired and processed by Fugro Airborne Surveys in 2002. Funding for the project was provided by the U.S. Fish and Wildlife Service, Alaska Wildlife Management (BLM). The Aniak survey data shown along the western edge of the current survey area were collected by the U.S. Fish and Wildlife Service by BLM, and published by DGGS. Laurel Lewis was the contract manager for DGGS.

This map and other products from this survey are available for purchase from Strategic Environmental Systems, Inc., Suite 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Juneau Wildlife Management Center, 100 Sankara Road, Douglas, Alaska, 99824.





2003

RESISTIVITY

The SGRF™ EM system measures inphase and quadrature components of five frequencies. Two vertical conductive coils generate a magnetic field of 5500 G with three horizontal coplanar—coil pairs—operated at 900, 7200, and 36,000 Hz. EM dots are sampled at 0.3 second intervals. The EM system responds to ferritic conductors, conductive carbonbur, and cultural sources. Apparent resistivity is generated from the inphase and quadrature components of the capacitor 100 Hz using the pseudo-two-half space model (Fraser 1978). The dots were interpreted into a regular 100 m grid using a modified Gauss (1975) technique.



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SURVEY HISTORY

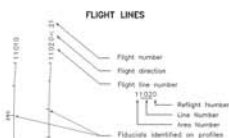
AIRBORNE SURVEY
This map is based on data from an under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGG), and Stevens Exploration Management Corp. (SEMC). The data were collected in 2002 and processed by Fugro Airborne Surveys in 2002. Funding for the project was provided by the U.S. Geological Survey, Alaska Land Management (BLM). The Alaska survey data shown along the western edge of the current survey was collected by Fugro Airborne Surveys and processed by BLM, and published by DGGG. Laurel Burns was the contract manager for DGGG.

For sale and other products from this survey are available to the public. For more information, contact: Stevens Exploration Management Corp., 99700, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Juneau District Office, 100 Sprague Road, Juneau, Alaska, 99804.



The geographical data were acquired with a GIGAMET Electromagnetic (EM) system and a Sinteron cephalometric radiograph. Both were flown at 100 m above the test site. 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 m (range 150–250 m). The survey flight lines with a spacing of a quarter of a mile. The flight lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. The instrumentation and flight line direction were similar to those used in the aerial survey (2000) were similar to the current survey.

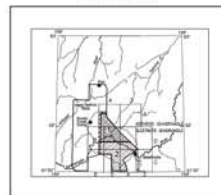
An Ashtech G024 NAVSTAR / GLOMASS Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 3 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 4) spheroid, 1927 North American datum using a central meridian (CM) of 159°, a north constant of 0 and an east constant of 500,000 m. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.



**FLIGHT LINES
OF THE SLEETMUTE AREA,
SOUTHWESTERN ALASKA**
PARTS OF IDITAROD AND SLEETMUTE QUADRANGLES
2003



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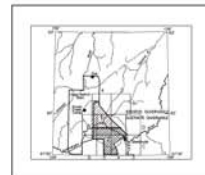
SURVEY HISTORY

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. The data were collected by Stevens Exploration Management and processed by Fugro Airborne Surveys in 2002. Funding for the project was provided by the State of Alaska, Division of Geological & Geophysical Management (BLM). The Aniak survey data shown along the western edge of the current survey area were collected by Fugro Airborne Surveys in 1994 by BLM, and published by DGGS. Laura Burns was the contract manager for DGGS.

This map and other products from this survey are available to the public at no charge. For more information, contact Sule 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Denali Management Center, 100 Seward Road, Douglas, Alaska, 99824.



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[illegible]

FLIGHT LINES

Flight number
Flight direction
Flight line number
Relight Number
Line Number was Number
Foliage identified on profile



ANNUAL MEETING
This program is being held in under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGG), and Stevens Exploration Management Corporation. The program was funded by the DGGG and procured by Fugro Airborne Surveys in 2002. Funding for the project was provided by the DGGG. Fugro Airborne Surveys is a subsidiary of Stevens Exploration Management (BLM). The Alaska survey data shown along the eastern edge of the current survey area was collected by Fugro Airborne Surveys in 2001 and is owned by BLM, and published by DGGG. Laurel Burns was the contract manager for DGGG.

Any data and other products from this survey are available to the public for use on a non-exclusive basis. For more information, contact: State of Alaska, Department of Natural Resources, 200 S. Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Juneau office, 1000 S. Douglas, Juneau, Alaska, 99804.

