ANIAK ELECTROMAGNETIC AND MAGNETIC AIRBORNE GEOPHYSICAL SURVEY DATA COMPILATION

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

Geophysical Report 2019-14

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DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

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ANIAK ELECTROMAGNETIC AND MAGNETIC AIRBORNE GEOPHYSICAL SURVEY DATA COMPILATION

L.E. Burns[1], J.D. Barefoot[1], Fugro Airborne Surveys, and Stevens Exploration Management Corp.

ABSTRACT

The Aniak electromagnetic and magnetic airborne geophysical survey is located in western Alaska in the Iditarod and Aniak mining districts, about 450 kilometers west of Anchorage. The survey is adjacent to the Fox Hills, Iditarod, and Sleetmute geophysical surveys. Frequency domain electromagnetic and magnetic data were collected with the DIGHEM^{V} system from April to May 2000. A total of 9186.7 line kilometers were collected covering 3253.1 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 Iditarod and Aniak mining districts have a history of placer mining, the discovery of the Donlin Gold lode deposit has kept exploration activity high in the region. 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

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AVAILABLE DATA

Data Type	Provider	Description
ascii_data	contractor	ASCII format line data, other ASCII data
databases_geosoft	contractor and DGGS	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

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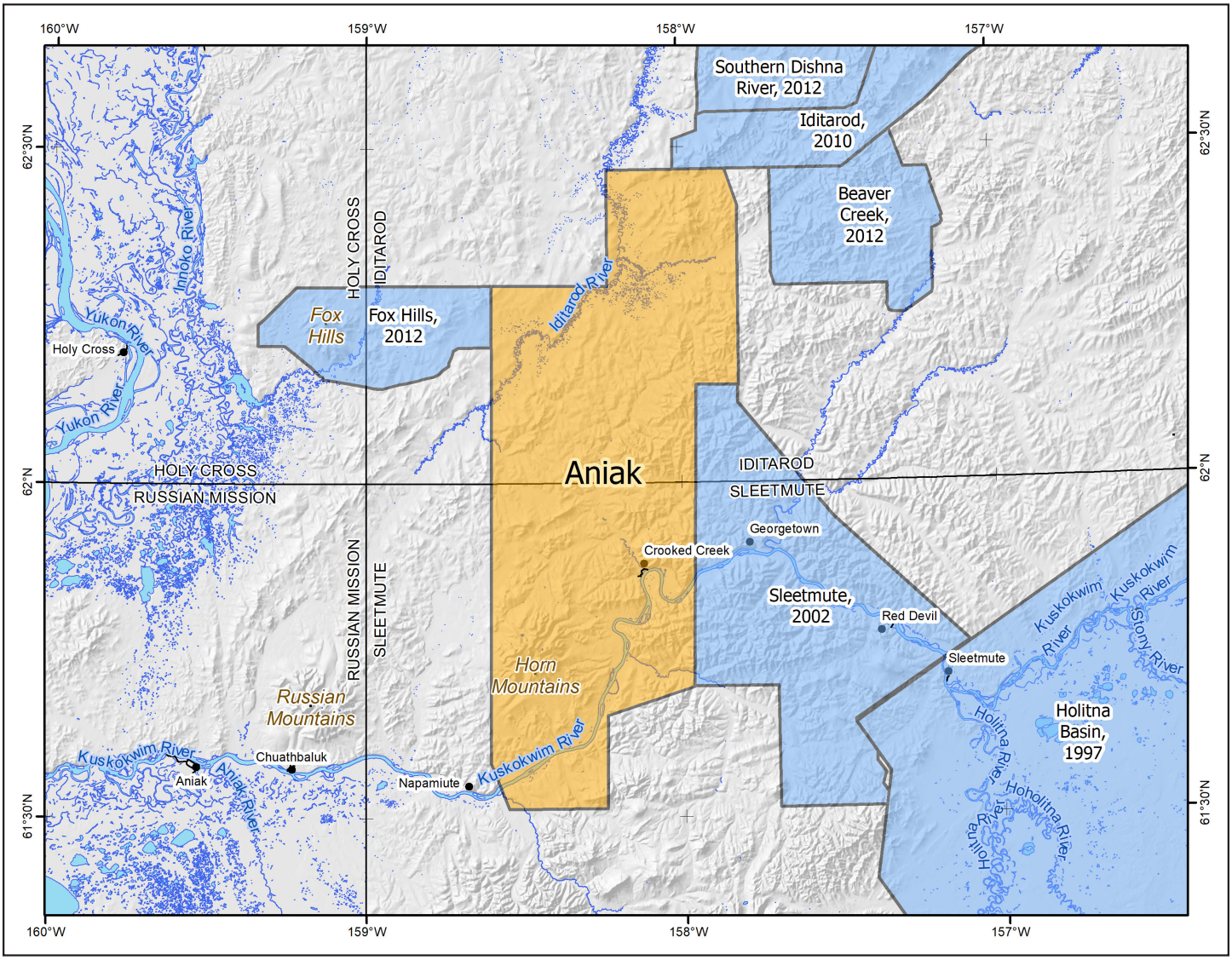


Figure 1. Aniak electromagnetic and magnetic airborne geophysical survey location shown in interior Alaska (inset). Aniak survey area shown with adjacent DGGS geophysical surveys, landmarks, relevant 1:250,000-scale quadrangle boundaries, mountain ranges, rivers, glaciers, and elevation hillshade.





Figure 2. Flight path with orthometric image.

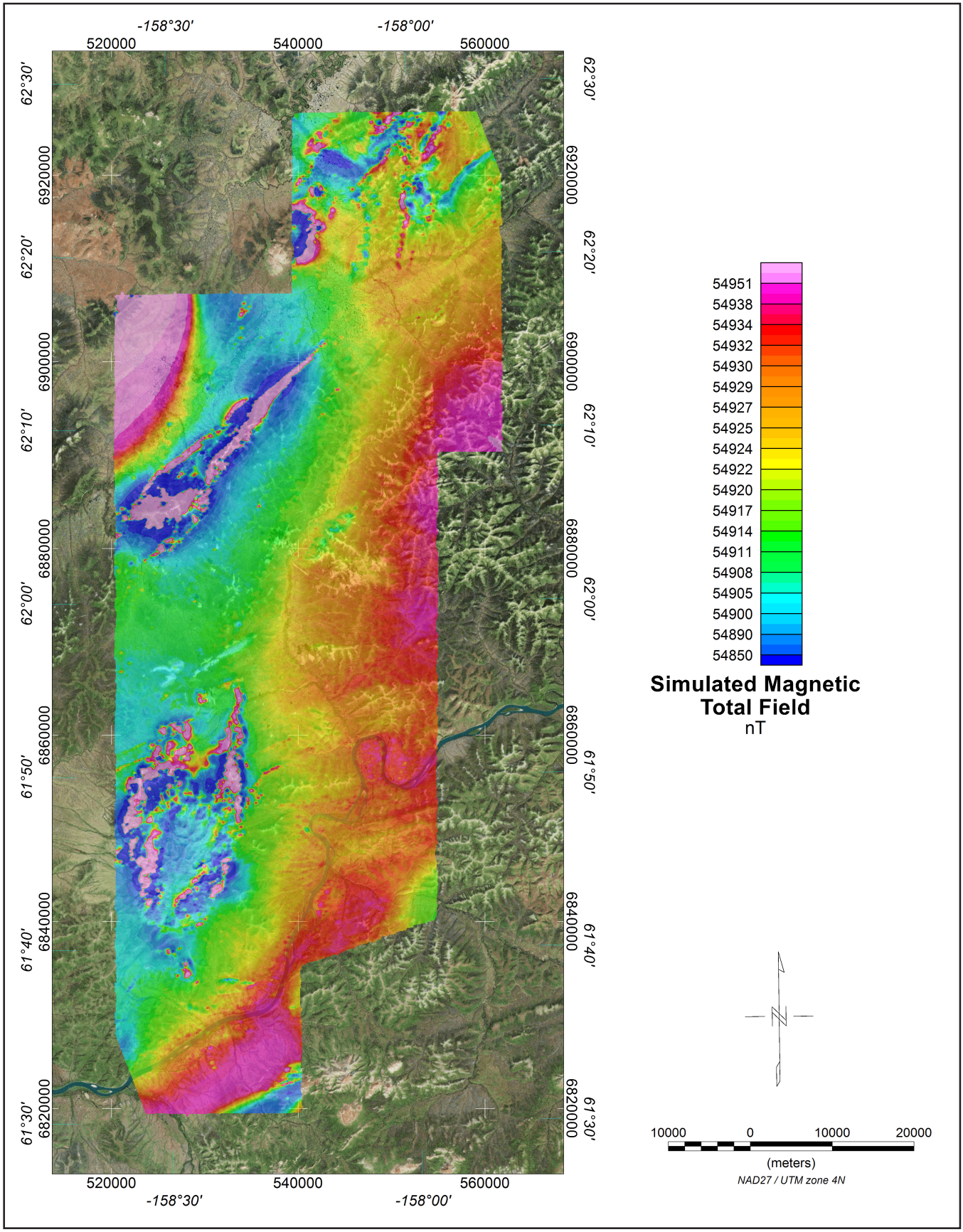


Figure 3. Simulated Magnetic Total Field Grid with orthometric image. The simulated magnetic total field data were created using digitally recorded data from a Scintrex cesium magnetometer. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtracting the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2000, updated to May 2000), (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.

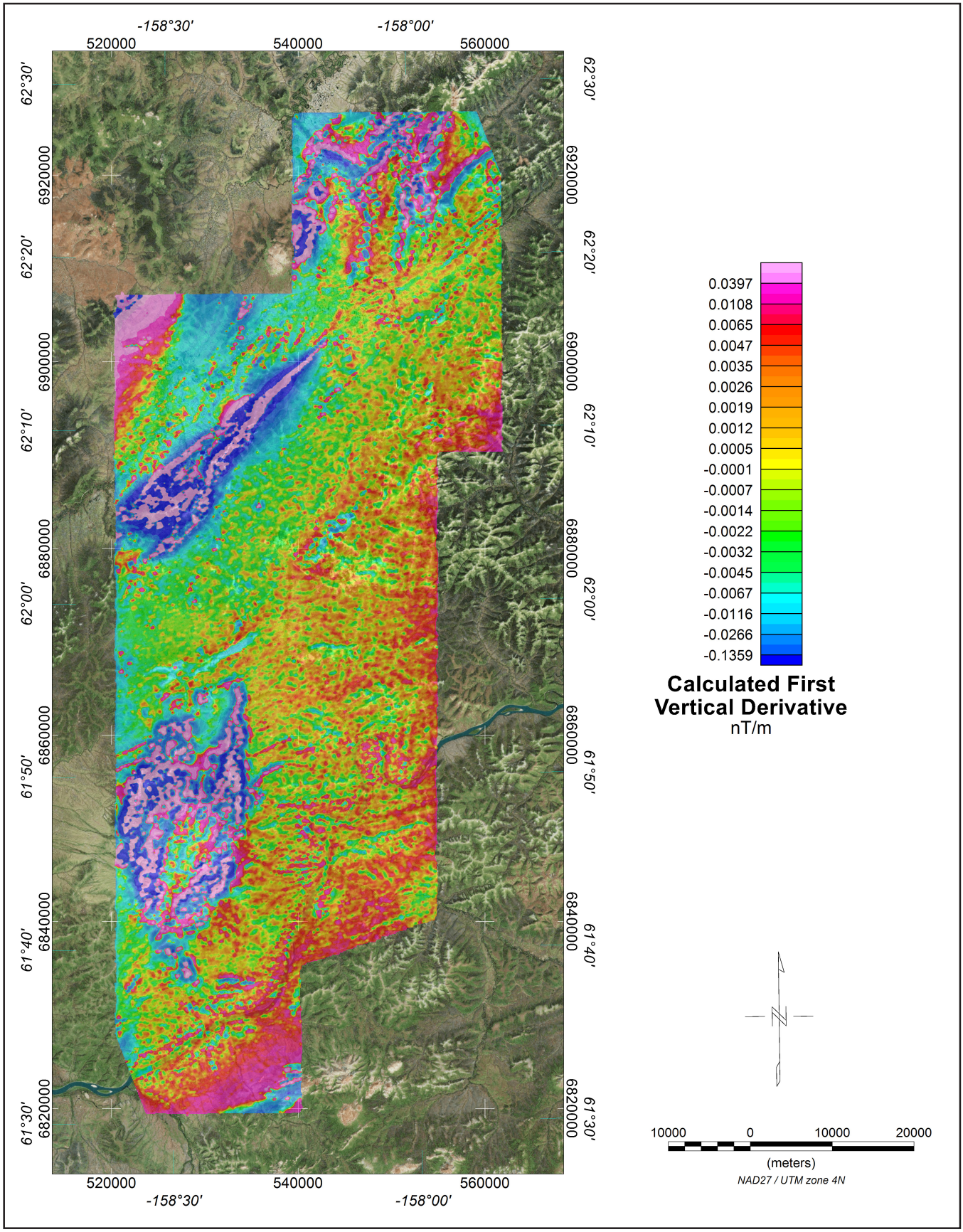


Figure 4. Calculated First Vertical Derivative Grid with orthometric image. The first vertical derivative grid was calculated from the diurnally-corrected, IGRF-corrected total magnetic field grid using a FFT base frequency domain filtering algorithm. The resulting first vertical derivative grid provides 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.

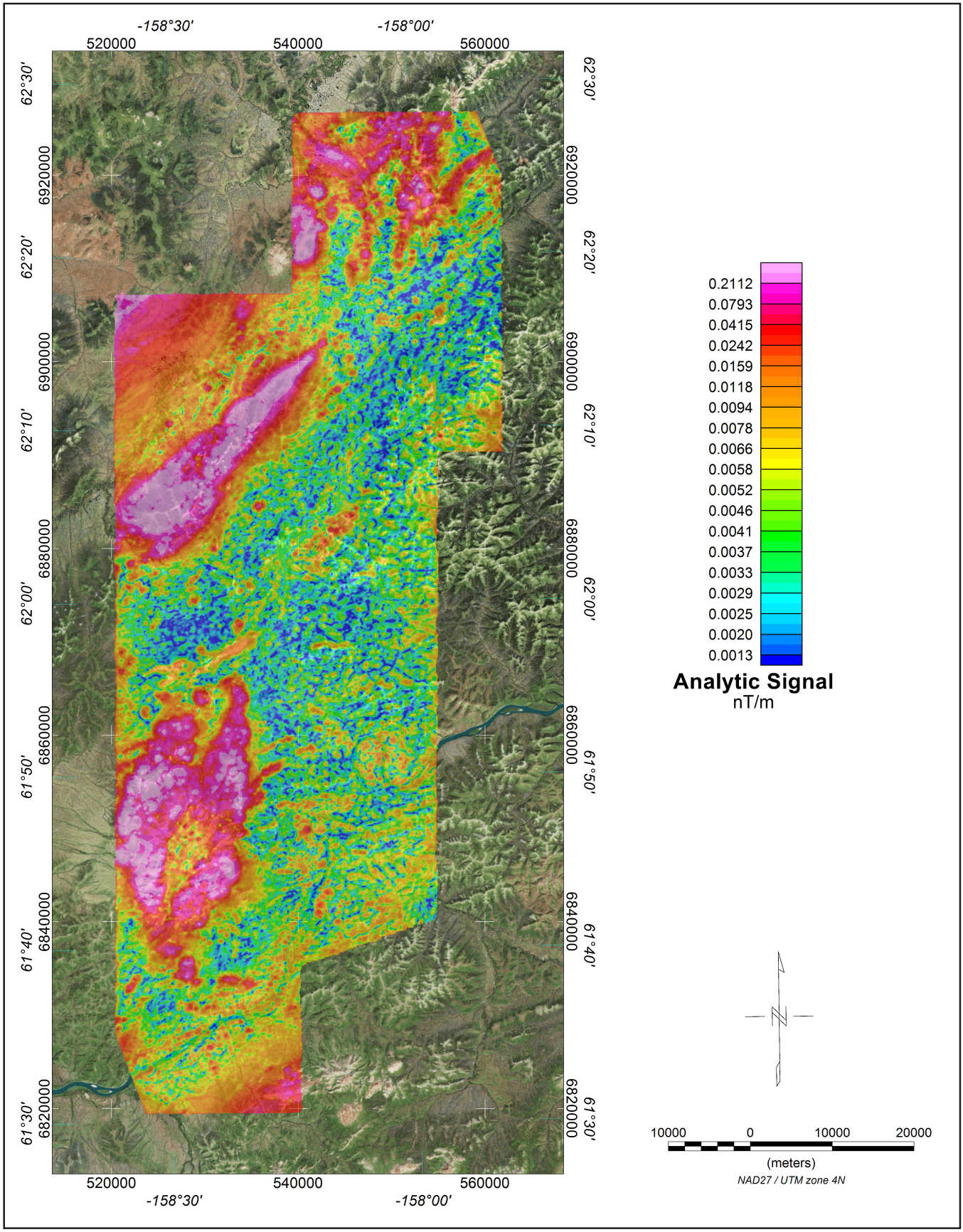


Figure 5. Analytic Signal Grid with orthometric image. Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source 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.

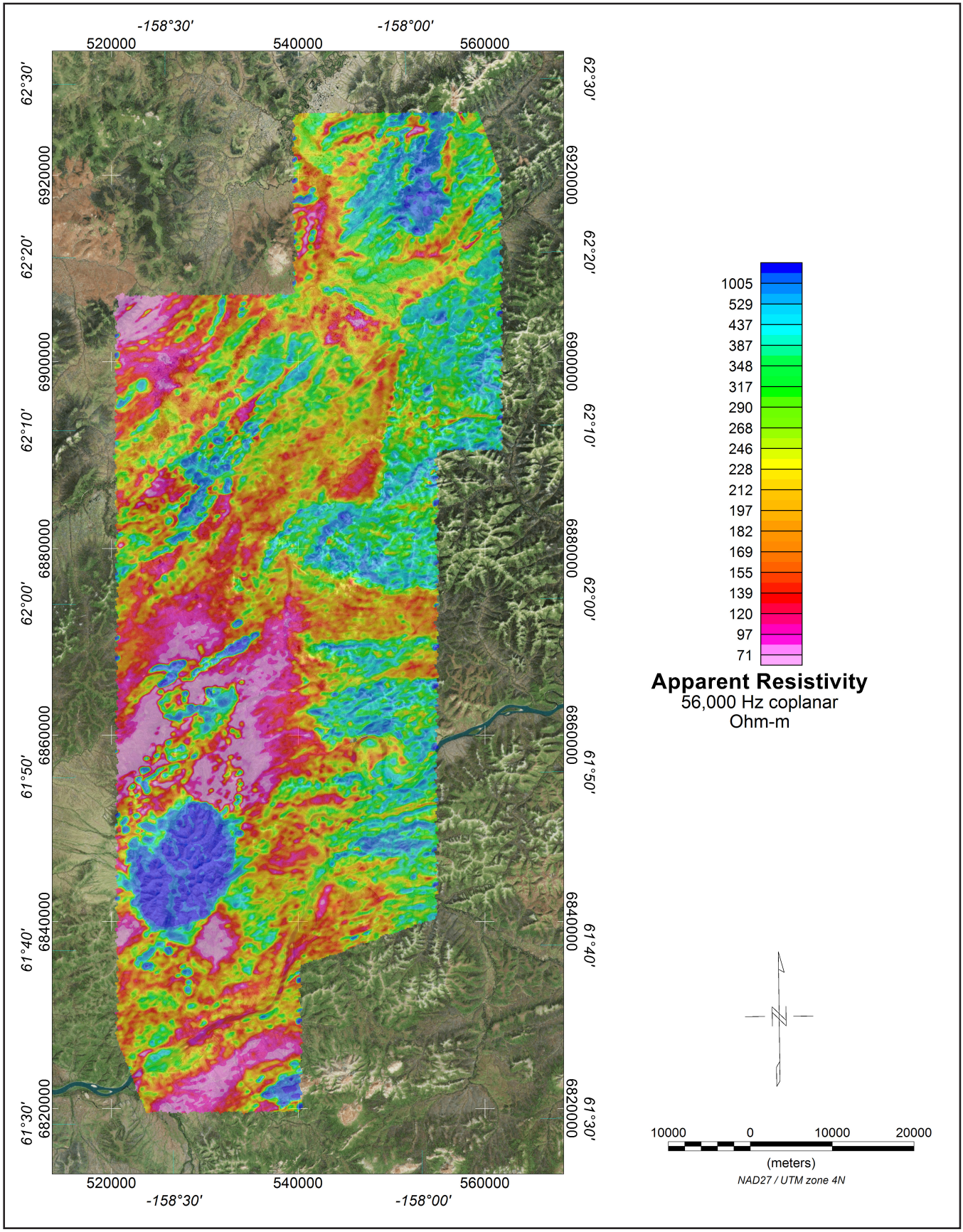


Figure 6. 56,000 Hz coplanar Apparent Resistivity Grid with orthometric image. The DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 900 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 56,000 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. The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

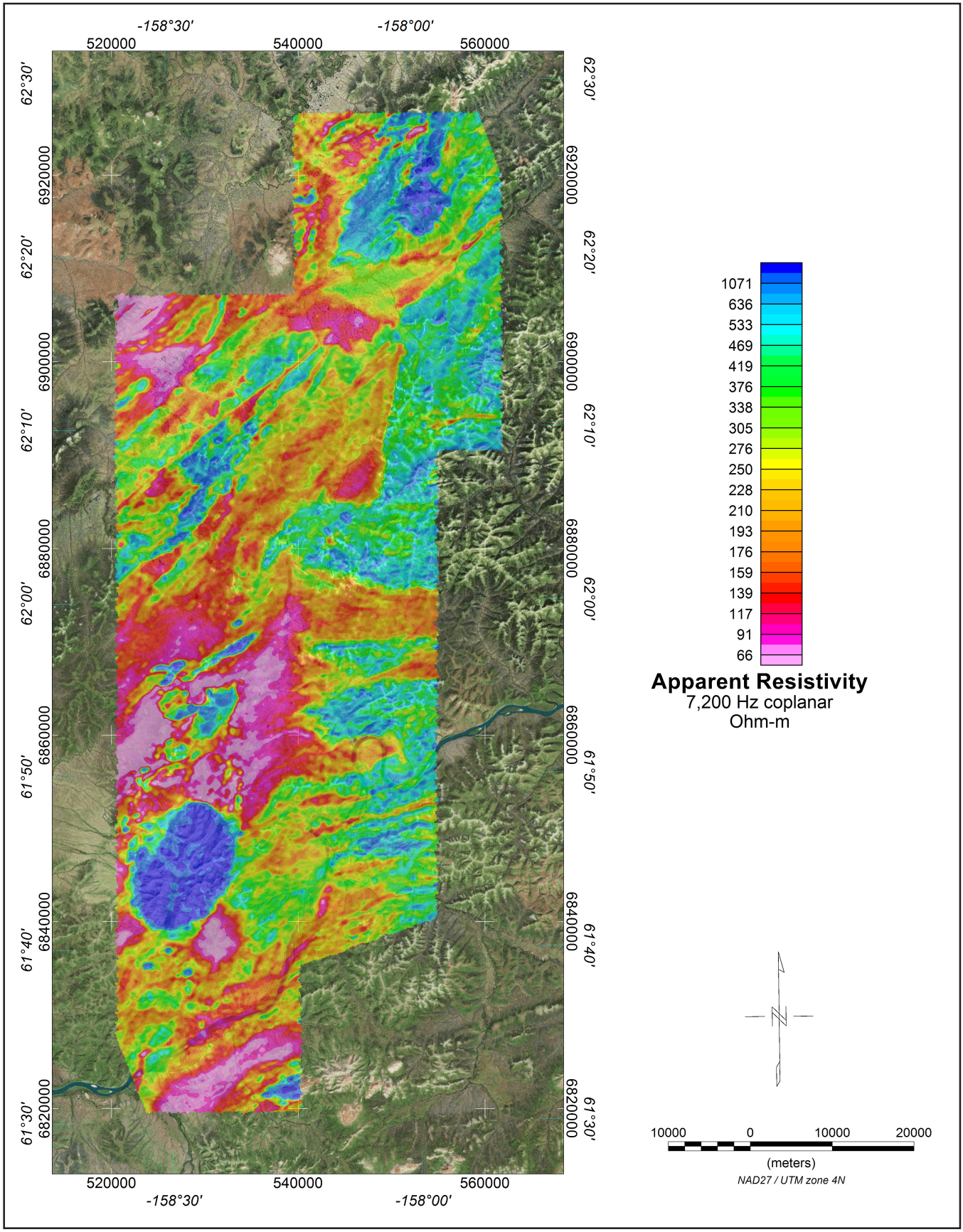


Figure 7. 7,200 Hz coplanar Apparent Resistivity Grid with orthometric image. The DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 900 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 56,000 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. The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

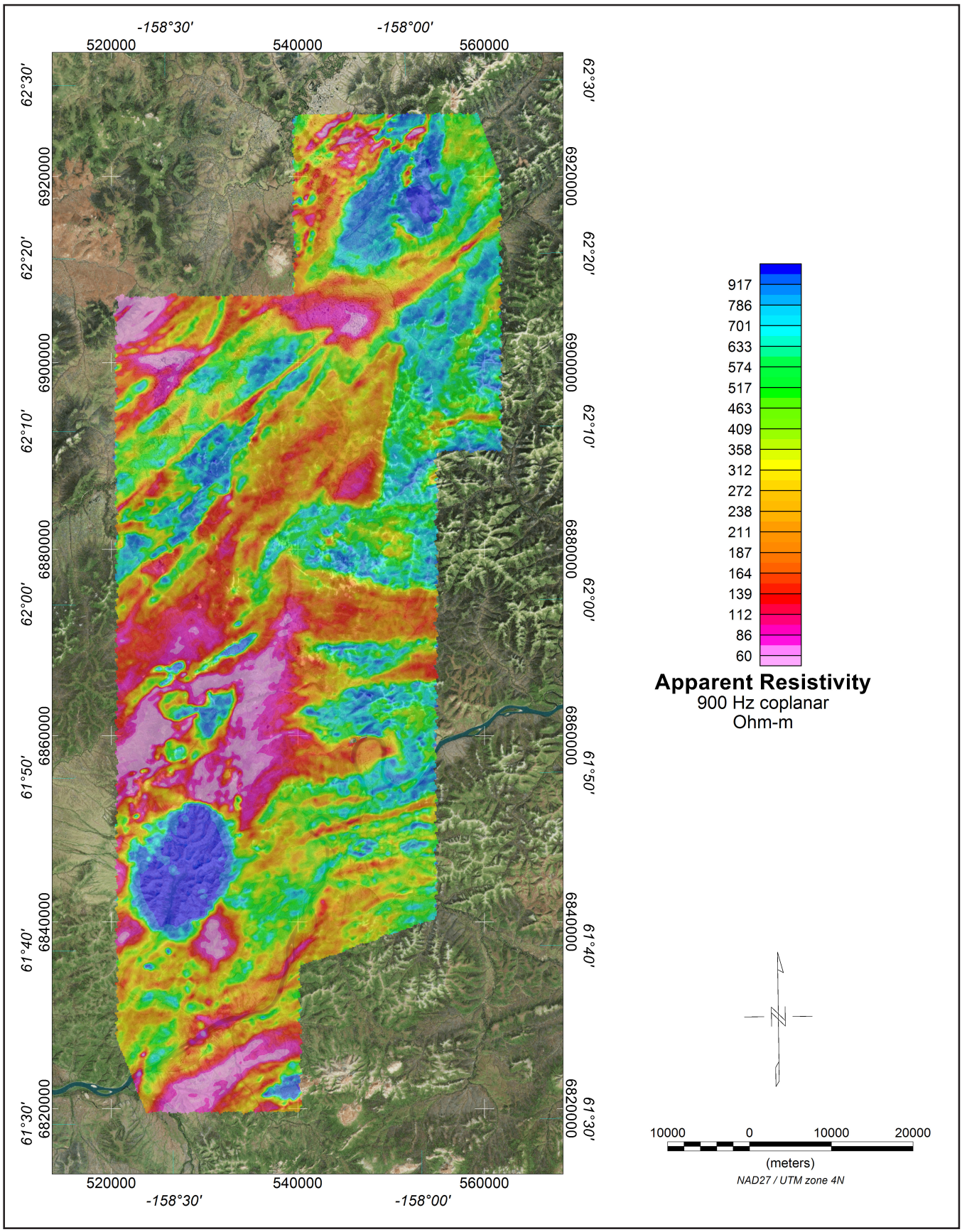


Figure 8. 900 Hz coplanar Apparent Resistivity Grid with orthometric image. The DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 900 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 56,000 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. The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

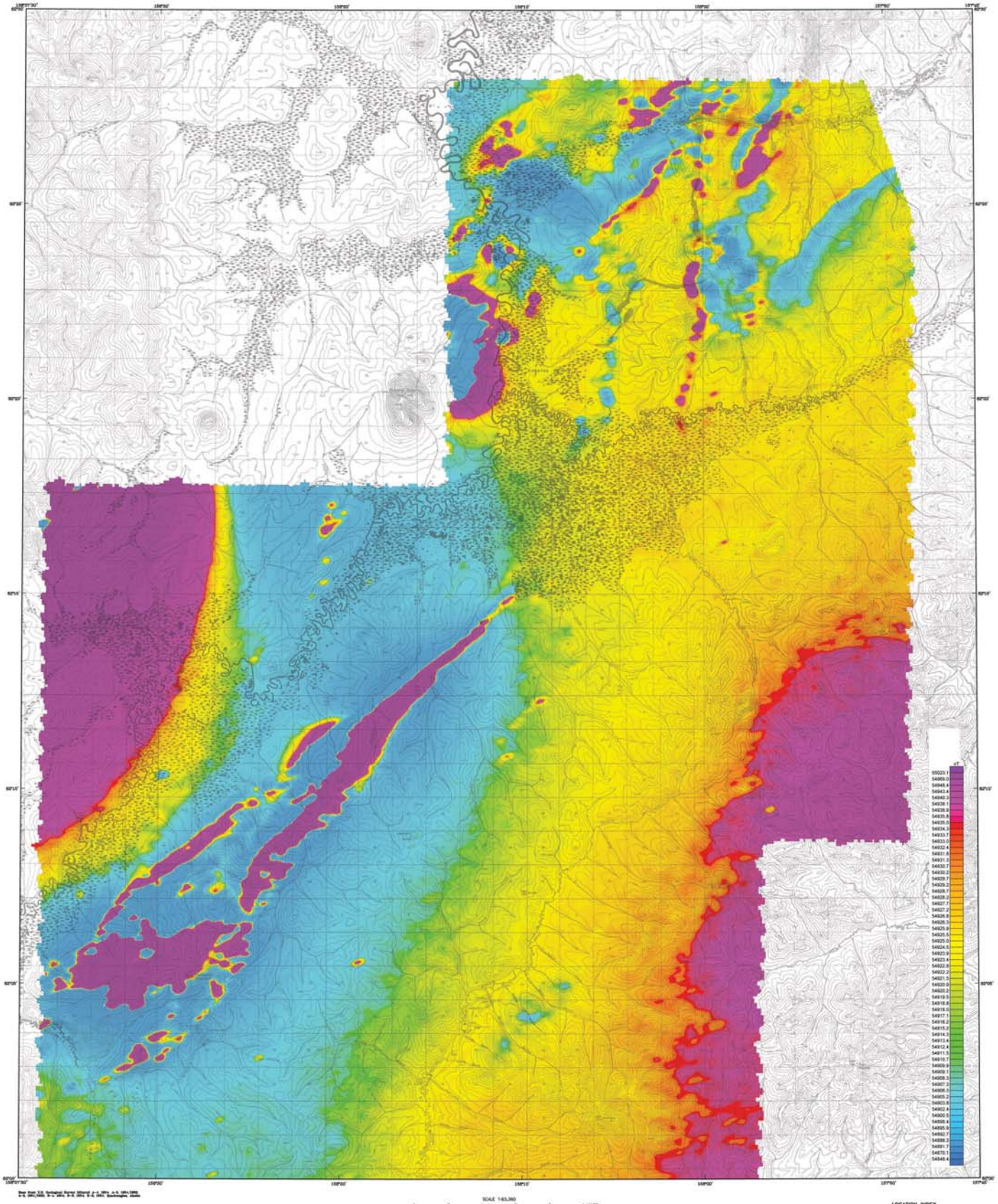
Table 1. Copies of the following maps are included at the end of this booklet. The low-resolution, page-size maps included in this booklet are intended to be used as a search tool and are not the final product. Large-scale, full-resolution versions of each map are available to download on this publication's citation page: http://doi.org/10.14509/30221.

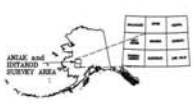
Map Title	Description
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aniak_sim_magtf_topo_map_2of2.pdf	simulated magnetic total field grid with topographic base map
aniak_sim_magtf_contours_plss_map_1of2.pdf	simulated magnetic total field grid and contours with public land survey system base layer
aniak_sim_magtf_contours_plss_map_2of2.pdf	simulated magnetic total field grid and contours with public land survey system base layer
aniak_sim_magtf_shaded_plss_map_1of2.pdf	shaded simulated magnetic total field grid with public land survey system base layer
aniak_sim_magtf_shaded_plss_map_2of2.pdf	shaded simulated magnetic total field grid with public land survey system base layer
aniak_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
aniak_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
aniak_emanomalies_sim_magtf_contours_detailed_topo_map_1of8.pdf	detailed em anomaly map with simulated magnetic total field grid contours and topographic base map
aniak_emanomalies_sim_magtf_contours_detailed_topo_map_2of8.pdf	detailed em anomaly map with simulated magnetic total field grid contours and topographic base map
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aniak_emanomalies_sim_magtf_contours_detailed_topo_map_7of8.pdf	detailed em anomaly map with simulated magnetic total field grid contours and topographic base map
aniak_emanomalies_sim_magtf_contours_detailed_topo_map_8of8.pdf	detailed em anomaly map with simulated magnetic total field grid contours and topographic base map
aniak_res7200hz_topo_map_1of2.pdf	7,200 Hz apparent resistivity grid with topographic base map
aniak_res7200hz_topo_map_2of2.pdf	7,200 Hz apparent resistivity grid with topographic base map
aniak_res7200hz_contours_plss_map_1of2.pdf	7,200 Hz apparent resistivity grid with contours and public land survey system base layer
aniak_res7200hz_contours_plss_map_2of2.pdf	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/10.14509/30221.

Map Title	Description
aniak_res7200hz_bw_contours_plss_map_1of2.pdf	black and white 7,200 Hz apparent resistivity data contours with public land survey system base layer
aniak_res7200hz_bw_contours_plss_map_2of2.pdf	black and white 7,200 Hz apparent resistivity data contours with public land survey system base layer
aniak_res900hz_topo_map_1of2.pdf	900 Hz apparent resistivity grid with topographic base map
aniak_res900hz_topo_map_2of2.pdf	900 Hz apparent resistivity grid with topographic base map
aniak_res900hz_contours_plss_map_1of2.pdf	900 Hz apparent resistivity grid with contours and public land survey system base layer
aniak_res900hz_contours_plss_map_2of2.pdf	900 Hz apparent resistivity grid with contours and public land survey system base layer
aniak_res900hz_bw_contours_plss_map_1of2.pdf	black and white 900 Hz apparent resistivity data contours with public land survey system base layer
aniak_res900hz_bw_contours_plss_map_2of2.pdf	black and white 900 Hz apparent resistivity data contours with public land survey system base layer
aniak_flightpath_topo_map_1of2.pdf	flight lines with topographic base map
aniak_flightpath_topo_map_2of2.pdf	flight lines with topographic base map
aniak_interpretation_plss_map_1of2.pdf	interpretation based on geophysical data with public land survey system base layer
aniak_interpretation_plss_map_2of2.pdf	interpretation based on geophysical data with public land survey system base layer

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT





SCALE 1:63,360

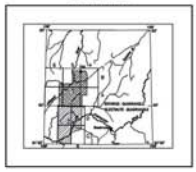
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

TOTAL MAGNETIC FIELD OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF IDITAROD QUADRANGLE

2000



LOCATION INDEX

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 monitor and video camera. Flights were performed with an AS350B2 helicopter at a mean terrain clearance of 200 feet along 119–SE (342°) 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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

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 4) spheroid, 1927 North American datum using a central meridian of 159° 00' 00", a scale constant of 0 and false 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, 2000), updated to May 2000) 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.

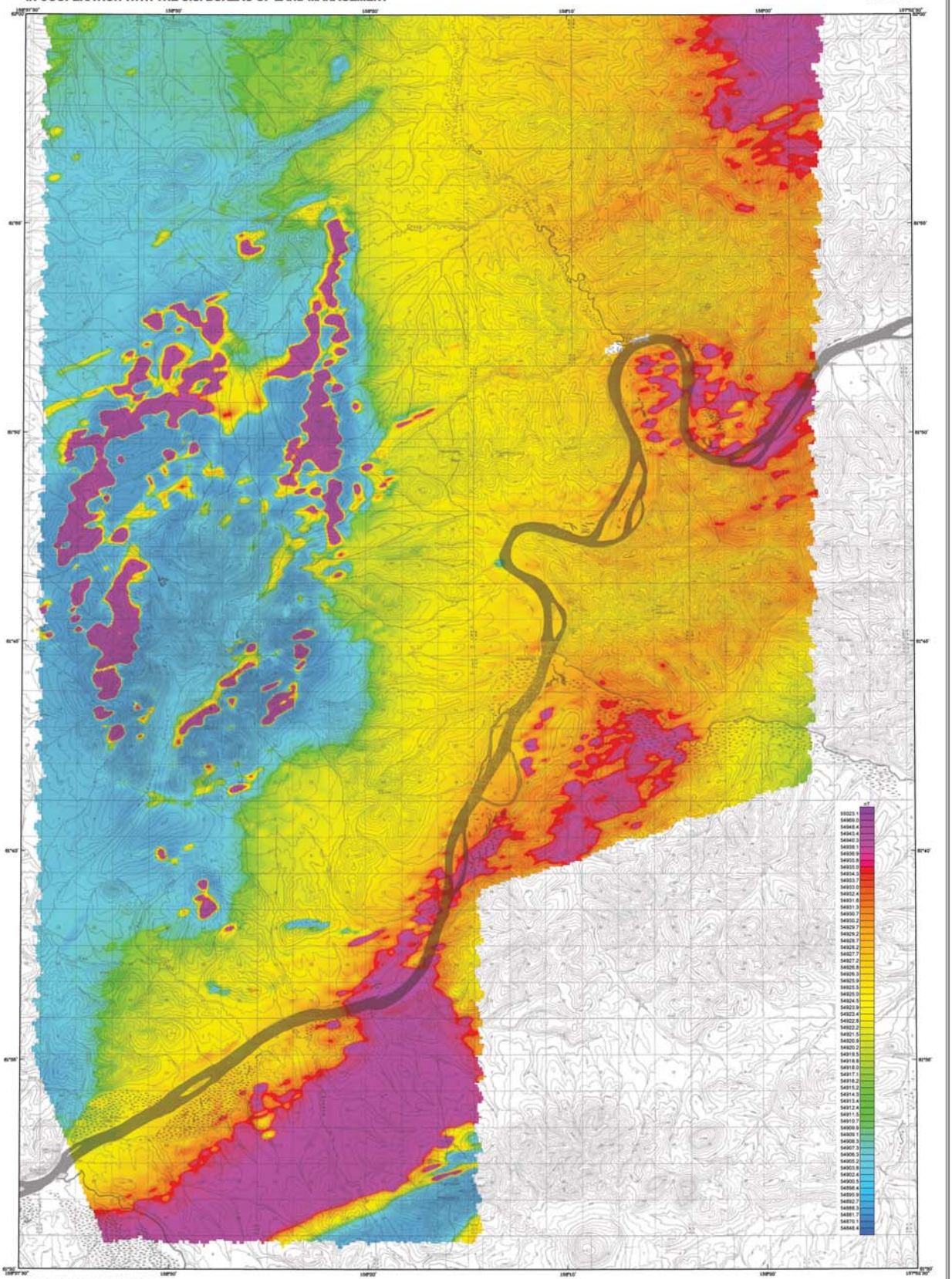
SURVEY HISTORY

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 area was acquired by Fugro Airborne Surveys in 2000. Funds for the survey were provided by the U.S. Department of Interior, Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT

GEOPHYSICAL REPORT 2000-25
Sheet 2 of 2



SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS



TOTAL MAGNETIC FIELD OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF SLEETMUTE QUADRANGLE

2000

LOCATION INDEX



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 N/W–S/E (144°/324°) lines with tie lines oriented perpendicular at 2 mile intervals. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. The blank regions indicate an area where the survey aircraft had to detour around populated areas.

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 4) spheroid, 1927 North American datum using a central meridian (CM) of 159° (a north zonal set of 0 and an east translation 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) levelled, and (3) gridded using a bi-directional gridding with a regular 100 m grid using a modified Akima (1970) technique. The regional variation (or IGRF gradient, 2000, updated to May 2000) was removed from the leveled magnetic data.

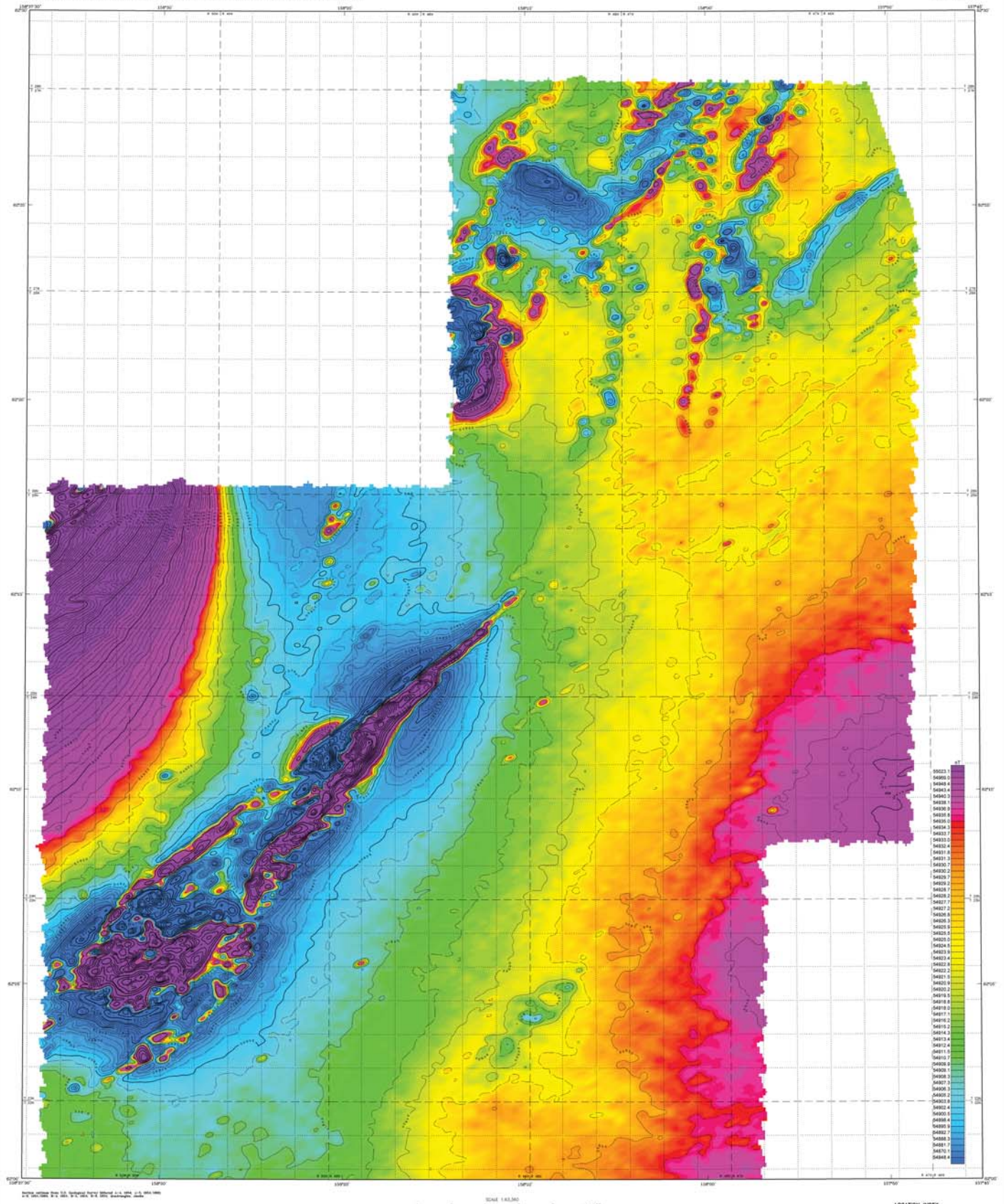
Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

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 area were acquired by Fugro Airborne Surveys in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT



SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS



TOTAL MAGNETIC FIELD OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF IDITAROD QUADRANGLE

2000

LOCATION INDEX



DESCRIPTIVE NOTES

The geophysical data were acquired with a DICHEM 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, a navigation system, and a barometric pressure/temperature system. The survey was performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along N30°–5E (345°) survey flight lines with a spacing of ¼ quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. The blank regions indicate an area where the survey aircraft had to detour around populated areas.

An Ashtech GG24 TAU/STAR / 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 recovery was performed using a Geosoft 1400 (UNIX core 4) program [GPS_North Arrow 3.4] using a central meridian (CM) of 158° and 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.

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 May 2000) was removed from the levelled 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.

APPROXIMATE MEAN MAGNETIC DIP

MAGNETIC CONTOUR INTERVAL

250 nT

50 nT

10 nT

5 nT

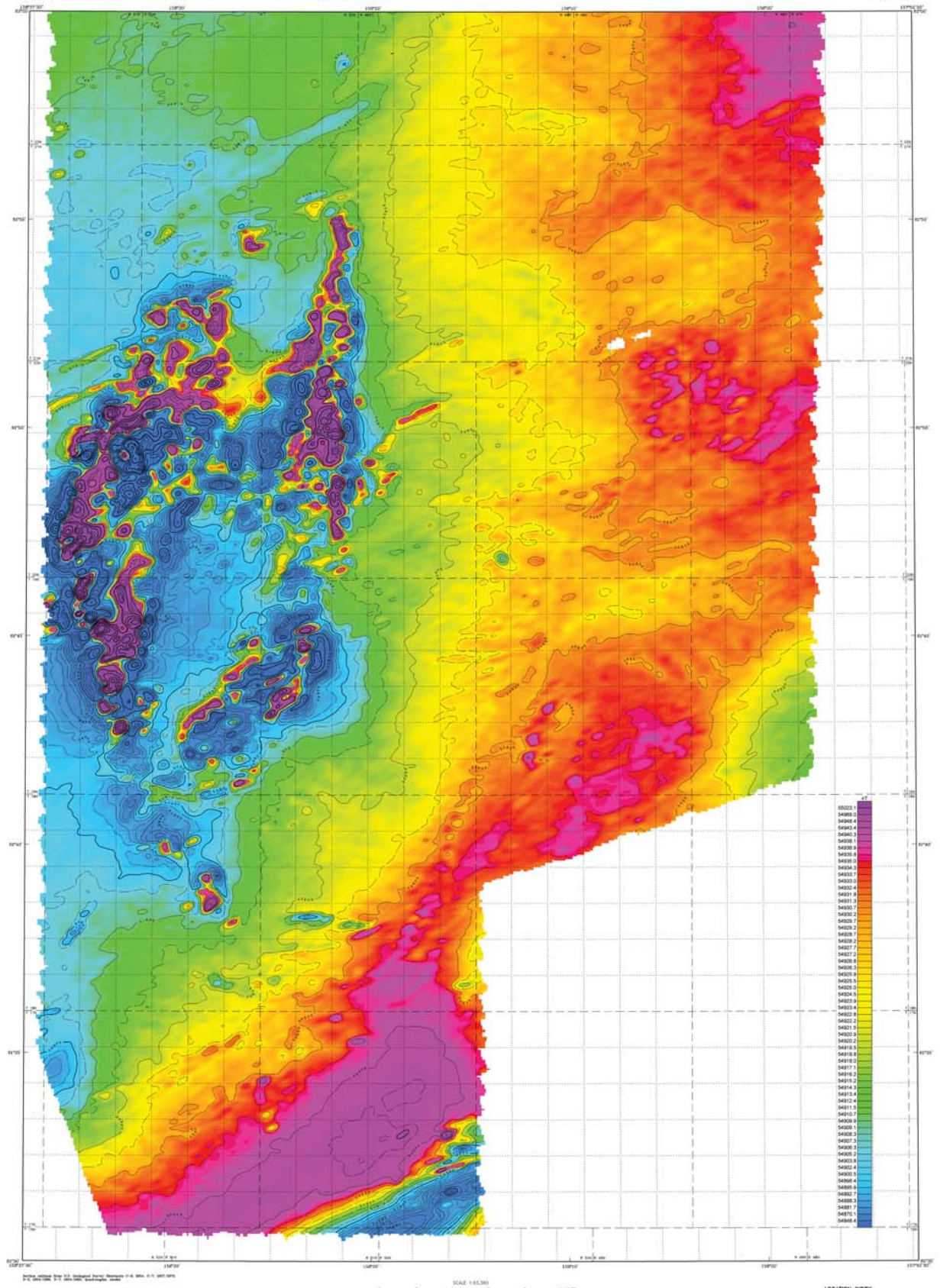
SURVEY HISTORY

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., Nanaimo, British Columbia, Canada. The survey was flown by Fugro Airborne Surveys in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
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GEOPHYSICAL REPORT 2000-26
Sheet 2 of 2



SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS



TOTAL MAGNETIC FIELD OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF SLEETMUTE QUADRANGLE

2000

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, a GPS navigation system, a 256 channel spectrometer, a magnetic base station magnetometer and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along NW–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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

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 was recorded in longitude and latitude (WGS 84) and UTM zone 41 (central 162° North American datum using a central meridian (CM) of 153°, 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.

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 May, 2000) 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

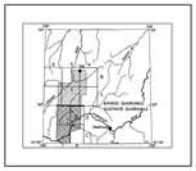
250 nT

50 nT

10 nT

5 nT

LOCATION INDEX



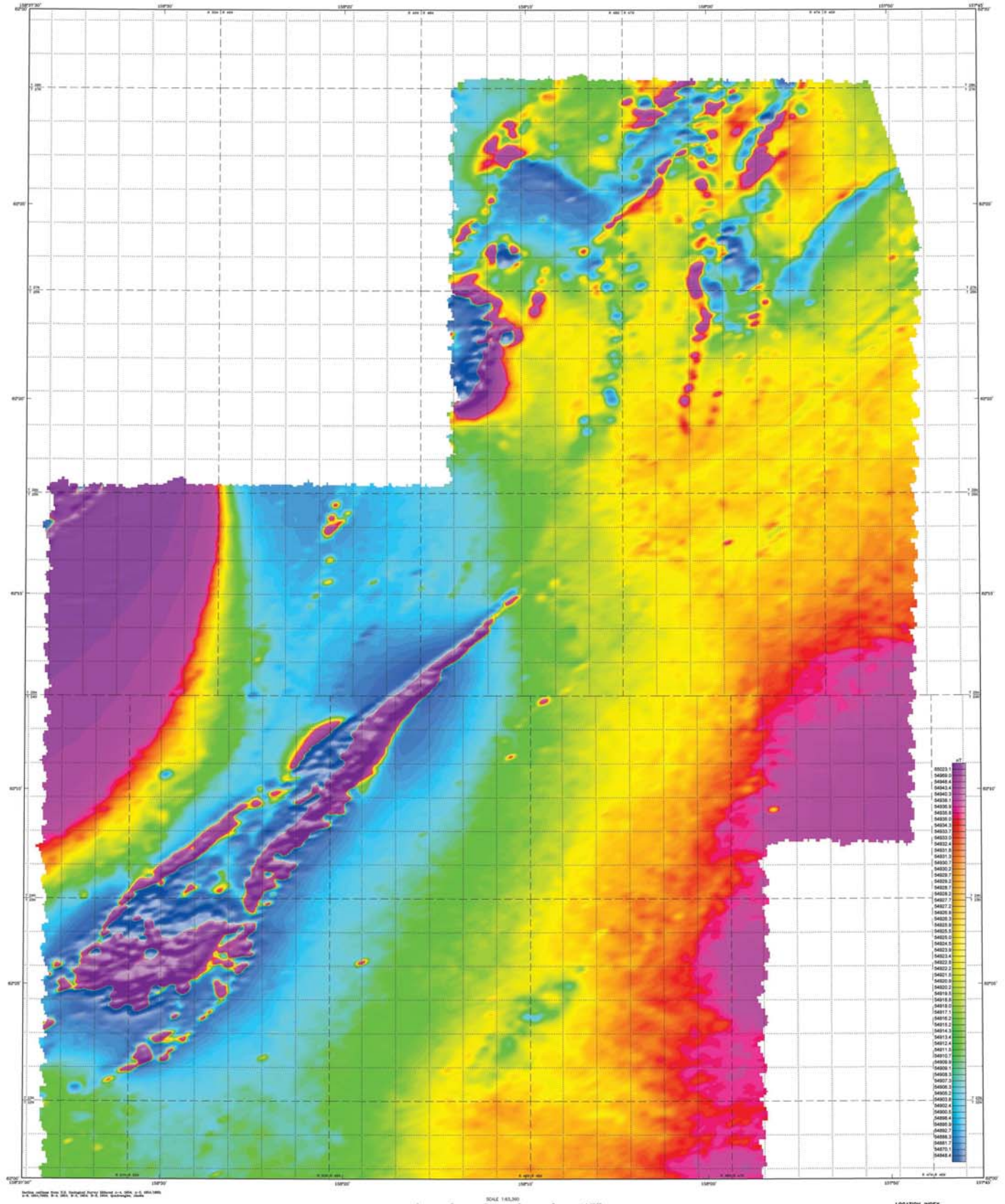
SURVEY HISTORY

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. (SEMCO) of Nanaimo, British Columbia. The magnetic and Fraser airborne surveys in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

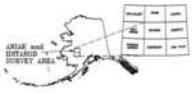
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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT

GEOPHYSICAL REPORT 2000-27
Sheet 1 of 2



SCALE 1:63,360
1 0 1 2 3 4 MILES
1 0 1 2 3 4 5 KILOMETERS



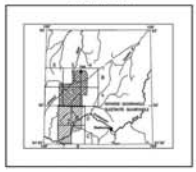
COLOR SHADOW TOTAL MAGNETIC FIELD OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF IDITAROD QUADRANGLE

2000

Sun Azimuth: 0 degrees

Inclination: 30 degrees



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 cameras. Flights were performed with a Eurocopter AS350 helicopter with a mean terrain clearance of 200 feet along N60−5E (345°) 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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

An Ashtech GD24 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 3 m. Flight path positions were projected into the Clarke 1866 (UTM zone 4) spheroid, 183° North American datum using a central meridian of 159°, a false northing constant of 0 and a scale constant of 0.9996. 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, 2000, updated to May 2000) was removed from the leveled magnetic data.

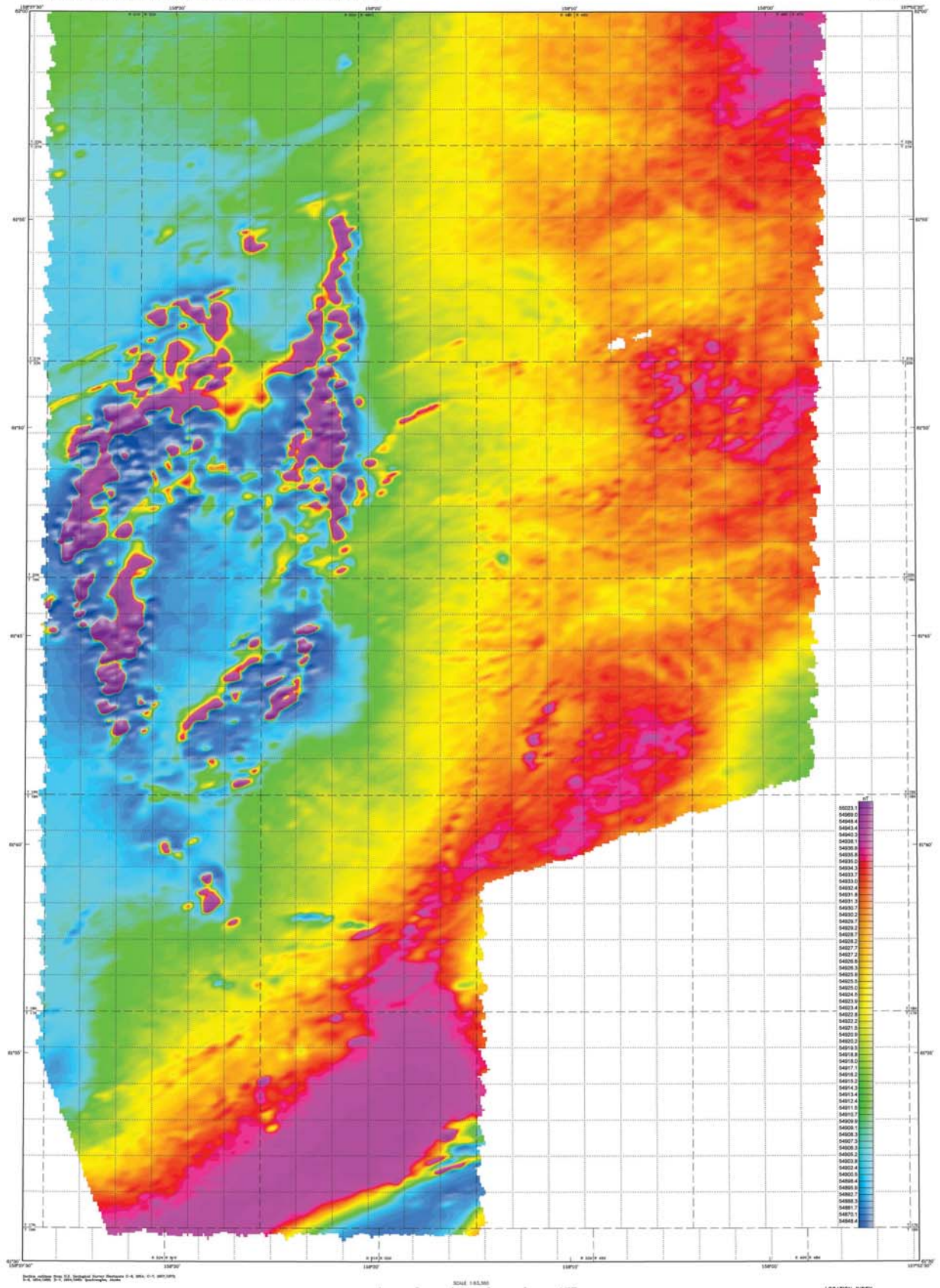
Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589−602.

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 area were acquired by Fugro Airborne Surveys, Inc. Funding for the project was provided by the U.S. Department of Interior, Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
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SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS



COLOR SHADOW TOTAL MAGNETIC FIELD OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

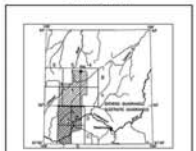
PARTS OF SLEETMUTE QUADRANGLE

2000

Sun Azimuth: 0 degrees

Inclination: 30 degrees

LOCATION INDEX



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 cps power line monitor, and flight path video. The survey was flown in the ANIAK and IDITAROD areas. Flight lines were oriented at an azimuth of 200 degrees (approximately NNE–SSW) with a nominal separation of 200 feet along tie lines (340°) and 2,000 feet along flight lines (110°). Tie lines were flown perpendicular to the flight lines at intervals of approximately 2 miles. The blank regions indicate an area where the survey aircraft had to detour around populated areas.

An Ashtech G12+ 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 into the Clarke 1866 (UTM zone 4 spheroid, NAD27) North American datum using a Universal Transverse Mercator (UTM) projection 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, 2000, updated to May 2000) was removed from the leveled magnetic data.

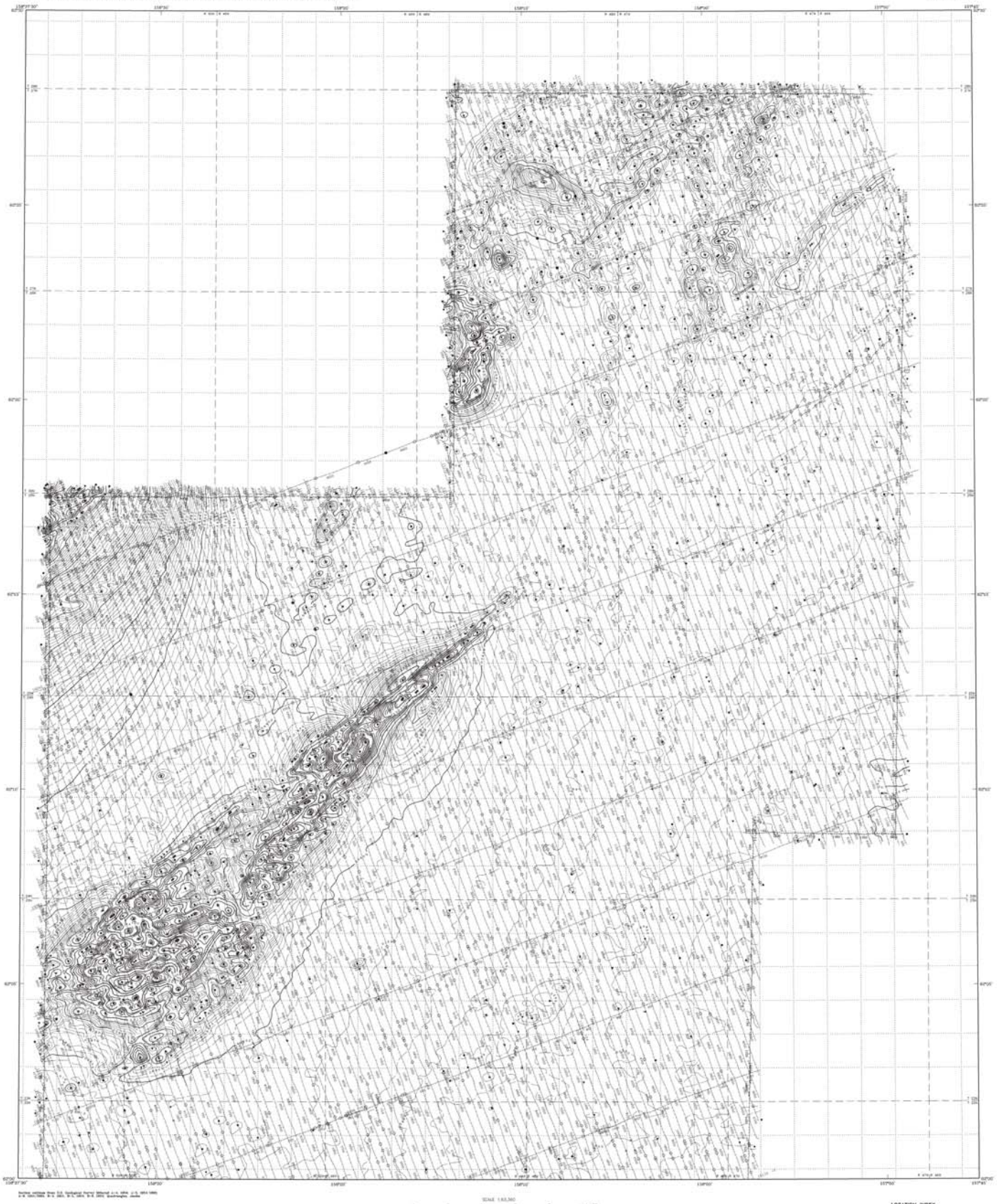
Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

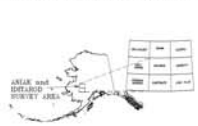
SURVEY HISTORY

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
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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 PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF IDITAROD QUADRANGLE

2000

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, a Global Positioning System (GPS) navigation system, and a video flight path recorder. The survey was performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along NW—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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

An Ashtech GG24 TAI/STAR / 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 recovery was provided by Fugro Earth Data, Inc. (GDI) now at Fugro Airborne Surveys in Ontario, Canada 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

Anomaly: Conductance

- ● -50 siemens
- ○ -50 siemens
- ✱ Quadrivalent 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 900 and 5500 Hz while three horizontal coplanar-coil pairs operated at 900, 7200, and 56,000 Hz. The EM system was towed 120 feet behind and 45 feet below the EM bird. 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

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 May 2000) 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.

TRUE NORTH

APPROXIMATE MEAN DECLINATION, 2000

MAGNETIC CONTOUR INTERVAL

- ——— ..... 250 nT
- ——— ..... 50 nT
- ——— ..... 10 nT
- — — — ..... 5 nT
- ⊛ ..... magnetic low
- ✱ ..... magnetic high

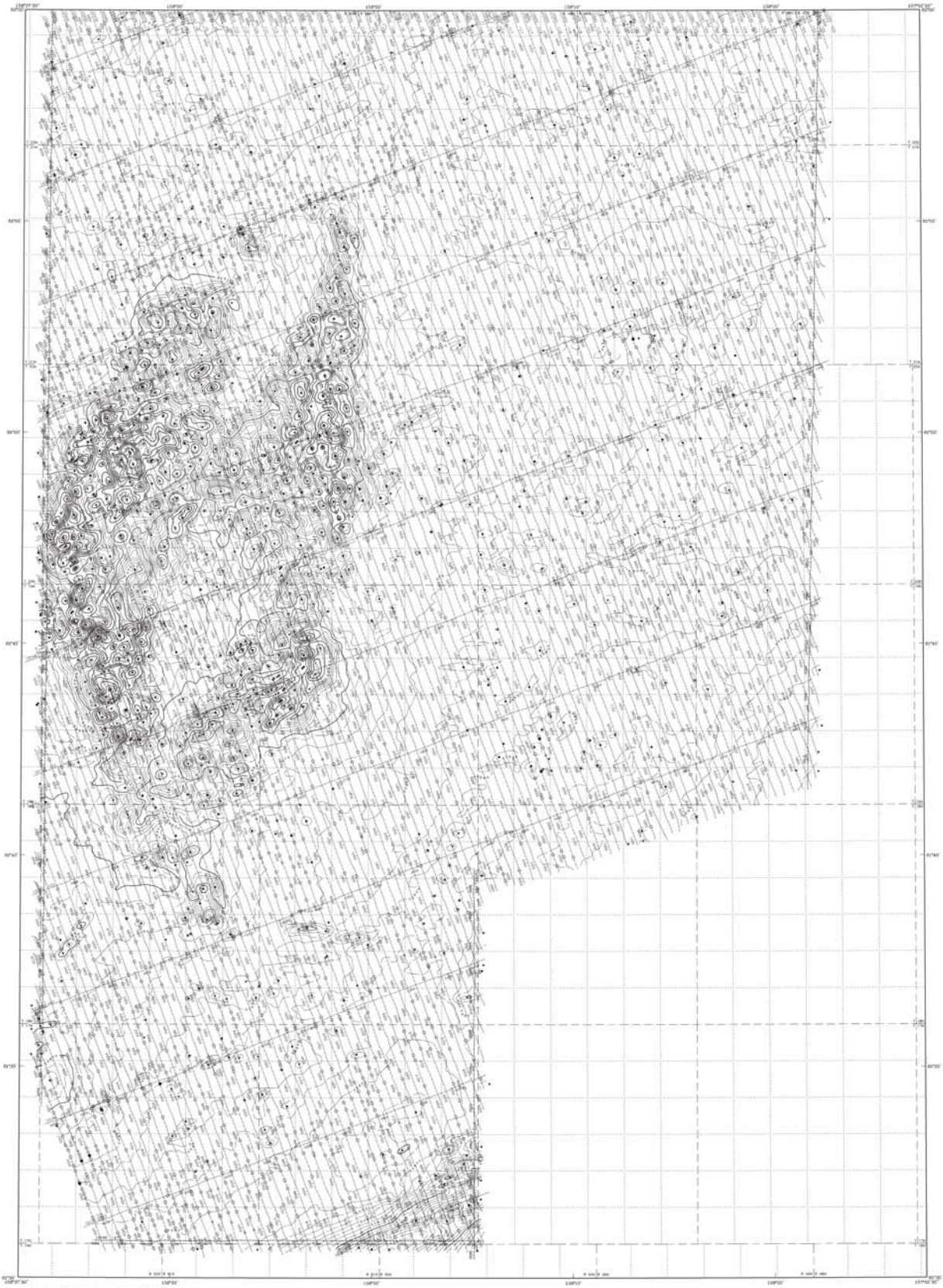
LOCATION INDEX



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., Nanaimo, British Columbia. The survey was flown by Fugro Airborne Surveys in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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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 PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF SLEETMUTE QUADRANGLE

2000



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, a barometric pressure sensor, a video monitor and rate camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along N30–35°E (345°) 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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

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 and final data were located in the field on NAD 27 UTM zone 41 (central 162° North) coordinate datum using a central meridian (CM) of 153°, 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

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

ELECTROMAGNETICS

To determine the location of EM anomalies on their boundaries, the DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies: two vertical coaxial–coil pairs operated at 900 and 5500 Hz while three horizontal coplanar–coil pairs operated at 900, 7200, and 56,000 Hz. The EM system responds to bedrock conductivity, 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

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 May 2000) 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

2 nT

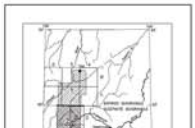
magnetic low

magnetic high

TRUE NORTH

APPROXIMATE DEAD DECLINATION, 1999

LOCATION INDEX



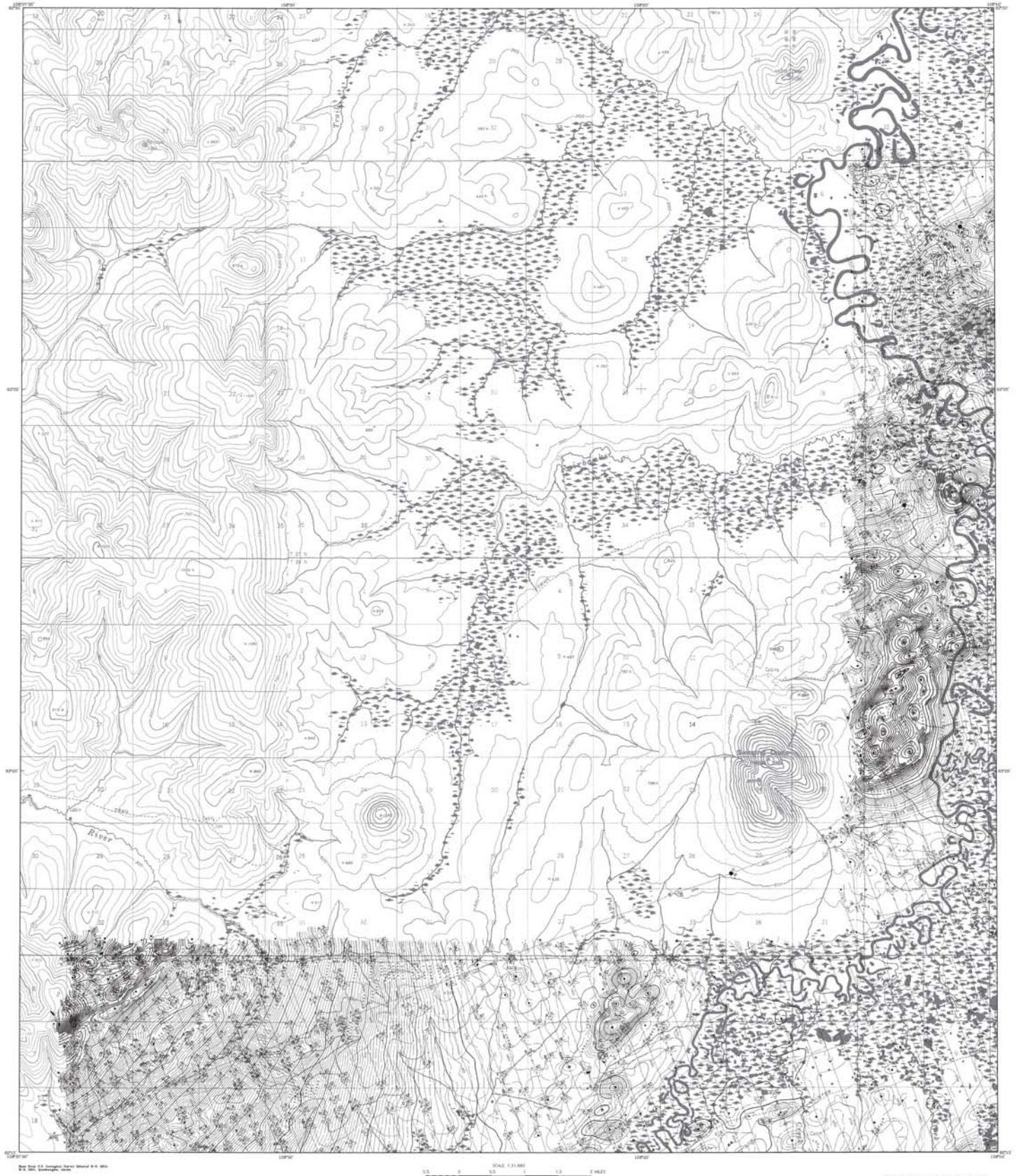
SURVEY HISTORY

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. (SEMCO) of Nanaimo, B.C. SEMCO flew the Aniak and Fayro airborne surveys in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT

GEOPHYSICAL REPORT 2000-30A
PARTS OF IDITAROD B-5 AND B-6 QUADRANGLES



TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF IDITAROD B-5 AND B-6 QUADRANGLES

2000

DESCRIPTIVE NOTES

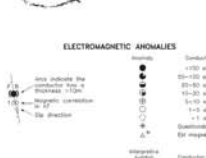
The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors and video cameras. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along NW–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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

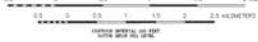
An Ashtech GG24 SBAS/GPS / GLONASS Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 4) spheroid, 1927 North American datum using a central meridian (CM) of 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.

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEM^V EM system measured in-phase and quadrature components of five frequencies, two vertical coaxial-coil pairs operated at 900 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 type of conductor is indicated on the aeromagnetic map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the coaxial- and coplanar-coil responses, together with conductor and magnetic patterns and topography. The power line monitor and the flight track video 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 Akima (1970) technique. The regional variation (or IGRF gradient, 2000, updated to May 2000) was removed from the leveled magnetic data.

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



MAGNETIC CONTOUR INTERVAL



LOCATION INDEX FOR SCALE 1:31,680



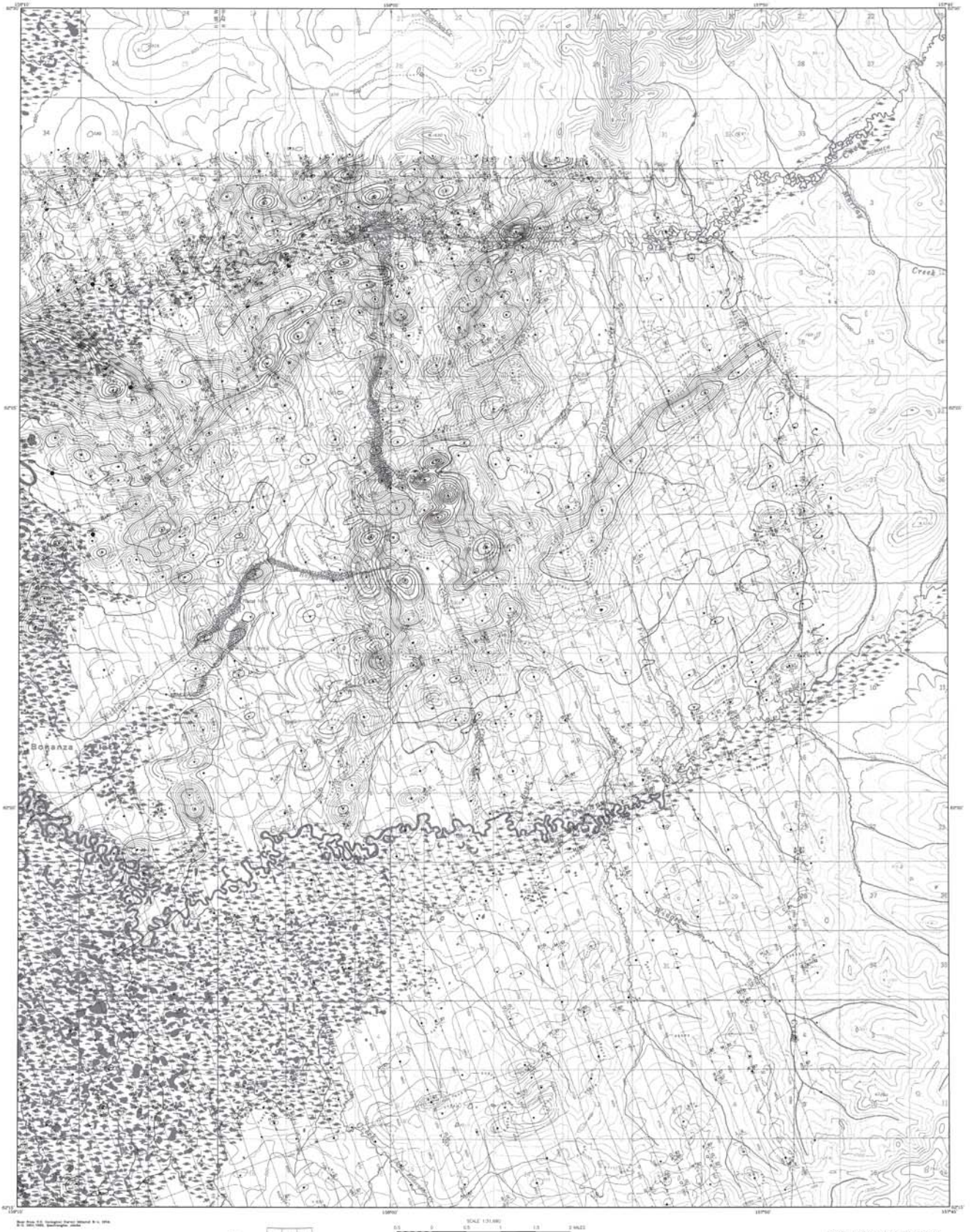
SURVEY HISTORY

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT

GEOPHYSICAL REPORT 2000-30B
PARTS OF IDITAROD B-4 AND B-5 QUADRANGLES



SCALE 1:31,680

0.5 0 0.5 1 1.5 2 MILES

0.5 0 0.5 1 1.0 2 2.5 KILOMETERS

TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF IDITAROD B-4
AND B-5 QUADRANGLES
2000

DESCRIPTIVE NOTES

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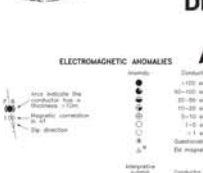
An Ashtech GG24 NAVSTAR / GLONASS Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 4) spheroid, 1927 North American datum using a central meridian (CM) of 159°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

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 900 and 1500 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 type of conductor is indicated on the aeromagnetic map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the coaxial- and coplanar-coil responses, together with conductor and magnetic patterns and topography. The power line monitor and the flight track video were examined to locate cultural sources.



ELECTROMAGNETIC ANOMALIES



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 (an IGRF gradient, 2000, updated to May 2000) was removed from the leveled magnetic data.

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MAGNETIC CONTOUR INTERVAL

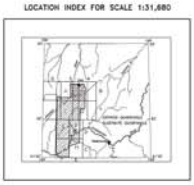


SURVEY HISTORY

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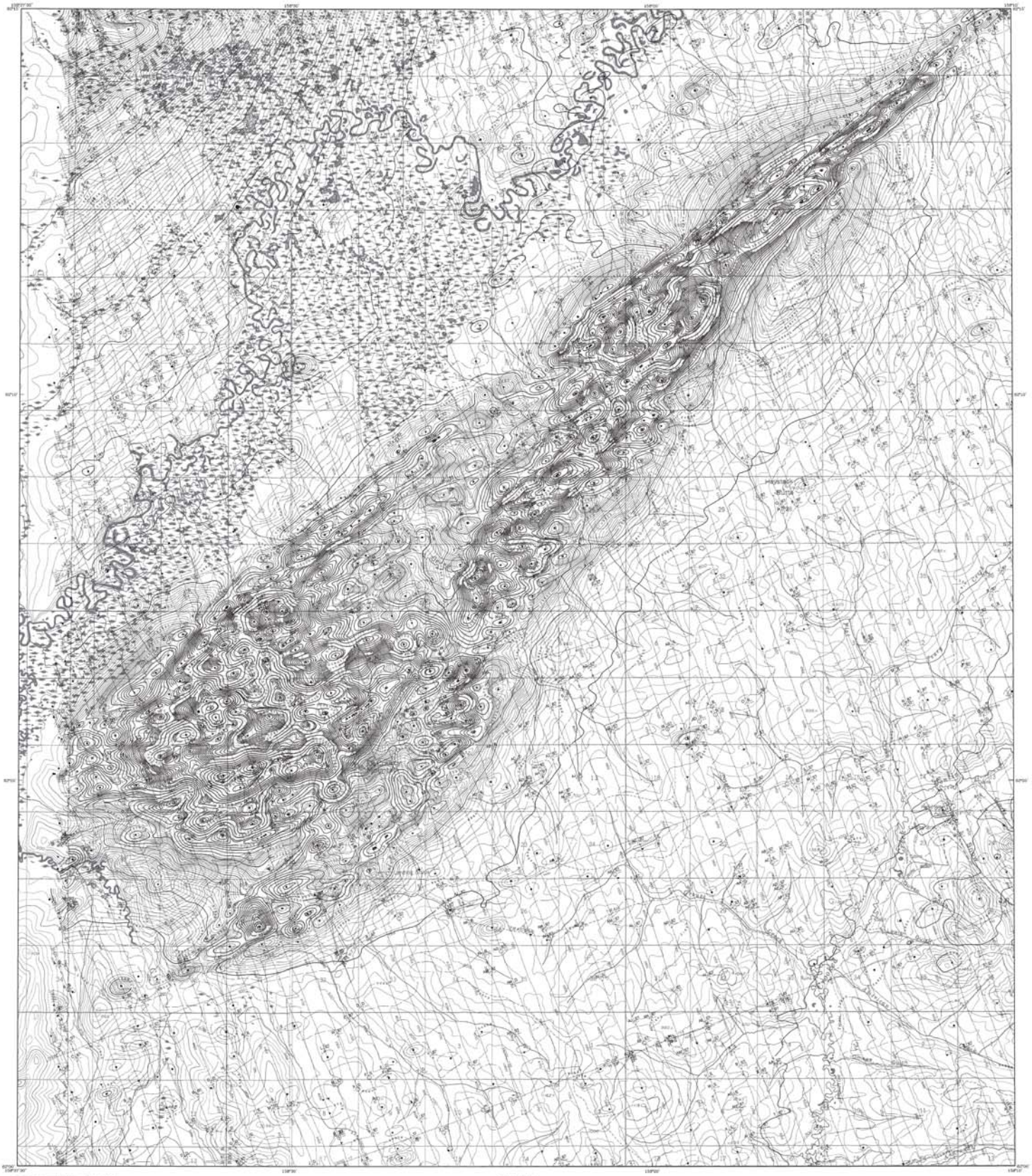
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LOCATION INDEX FOR SCALE 1:31,680



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT

GEOPHYSICAL REPORT 2000-30C
PARTS OF IDITAROD A-5 AND A-6 QUADRANGLES



TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF IDITAROD A-5 AND A-6 QUADRANGLES

2000

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 cameras. Flights were performed with an 412SOB-2 Squirrel helicopter at a mean terrain clearance of 200 feet along NW–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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

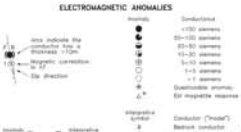
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ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEM^V EM system measured inphase and quadrature components of five frequencies. Two vertical coaxial–coil pairs operated at 900 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 type of conductor is indicated on the anomaglitic map by the interpretive symbol affixed to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the coaxial– and coplanar–coil responses, together with conductor and magnetic patterns and topography. The power line monitor and the flight track video were examined to locate cultural sources.



ELECTROMAGNETIC ANOMALIES



TOTAL MAGNETIC FIELD

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

SCALE 1:31,680

0 0.5 0 0.5 1 1.5 2 MILES
0 0.5 0 0.5 1 1.5 2 2.5 KILOMETERS

TOPOGRAPHIC BASE FROM USGS SCALE 1:63,360



MAGNETIC CONTOUR INTERVAL

100 nT
20 nT
4 nT
2 nT
magnetic low
magnetic high

LOCATION INDEX FOR SCALE 1:31,680



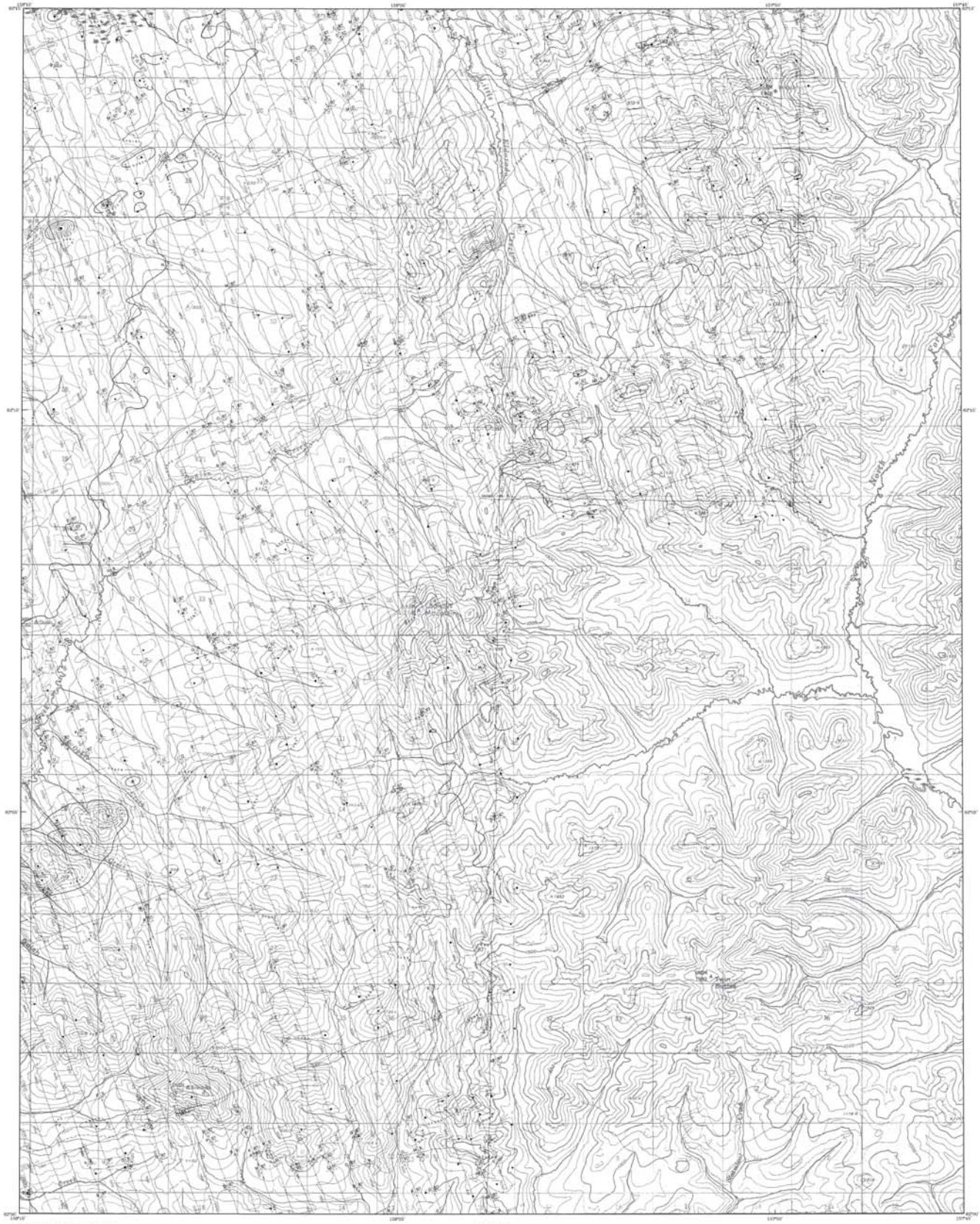
SURVEY HISTORY

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT

GEOPHYSICAL REPORT 2000-30D
PARTS OF IDITAROD A-4 AND A-5 QUADRANGLES







TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF IDITAROD A-4 AND A-5 QUADRANGLES

2000

DESCRIPTIVE NOTES

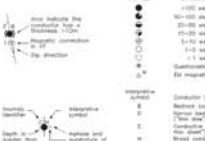
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An Ashtech GG24 SBAS/GPS / GLONASS Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 4) spheroid, 1927 North American datum using a central meridian (CM) of 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.

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEM^V EM system measured inphase and quadrature components of five frequencies, two vertical coplanar-coil pairs operated at 900 and 5001 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 type of conductor is indicated on the aeromagnetic map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the coaxial- and coplanar-coil responses, together with conductor and magnetic patterns and topography. The power line monitor and the flight track video were examined to locate cultural sources.





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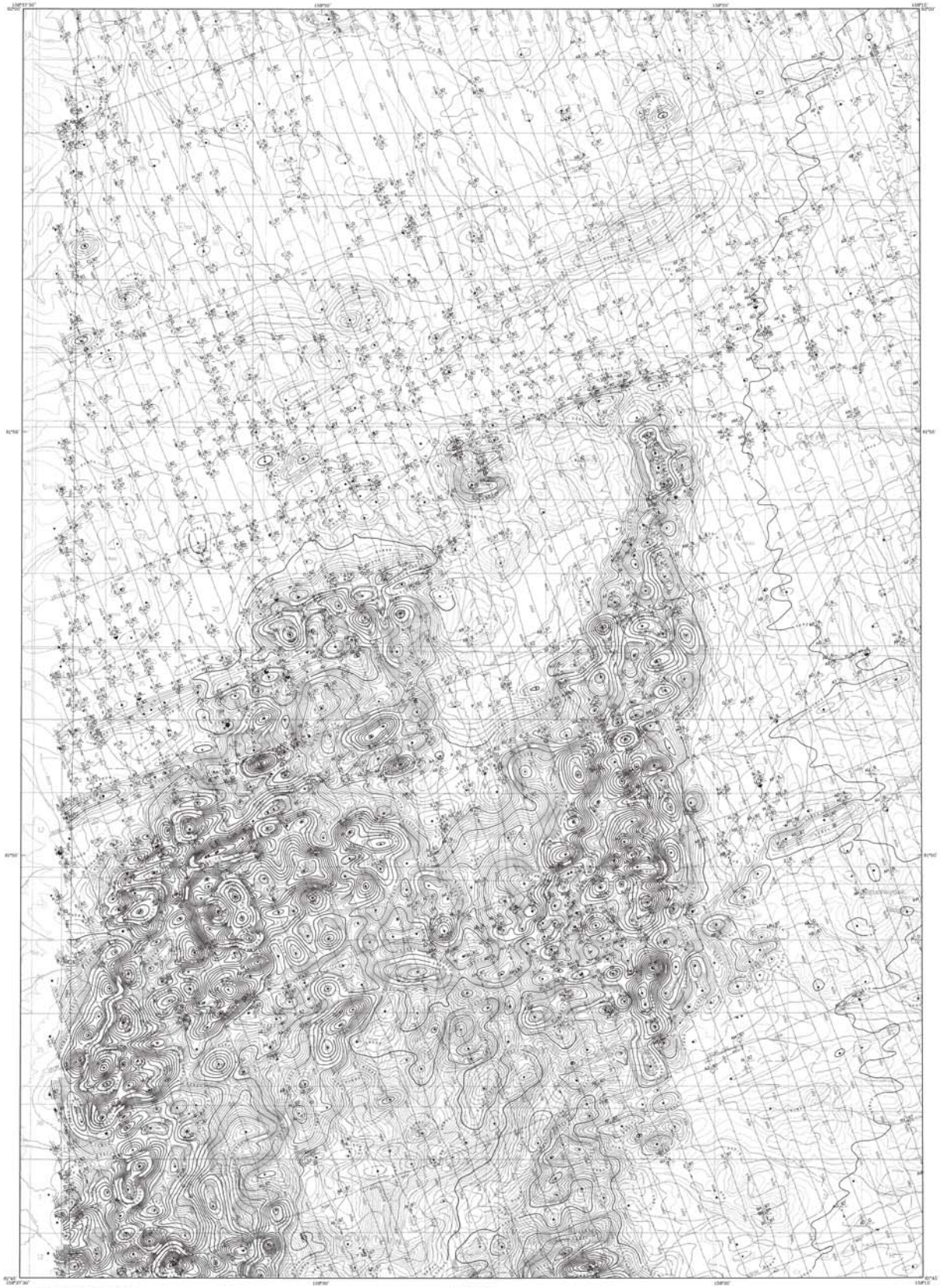
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LOCATION INDEX FOR SCALE 1:31,680





TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

SLEETMUTE D-7

2000

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 NW–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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

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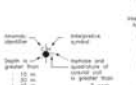
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ELECTROMAGNETIC ANOMALIES





Intensity	Conductance
	>100 siemens
	50–100 siemens
	10–50 siemens
	5–10 siemens
	1–5 siemens
	<1 siemens
	Gradiometer anomaly
	EM magnetite response

Interpretive symbol	Conductor ("model")
B	Bedrock conductor
G	Narrow bedrock conductor ("thin sheet")
S	Conductive cover (Horizontal thin sheet")
H	Broad conductive rock unit, fault zone, extensive weathering, thick conductive cover ("half space")
E	Edge of broad conductor ("edge of half space")
I	Culture, e.g., power line, metal building or fence

SCALE 1:31,680

0.5 0 0.5 1 1.5 2 MILES
0.5 0 0.5 1 1.5 2 2.5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM: MEAN SEA LEVEL

TOTAL MAGNETIC FIELD

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MAGNETIC CONTOUR INTERVAL

- ..... 100 nT
- ..... 20 nT
- ..... 4 nT
- ..... 2 nT

..... magnetic low

..... magnetic high

LOCATION INDEX FOR SCALE 1:31,680



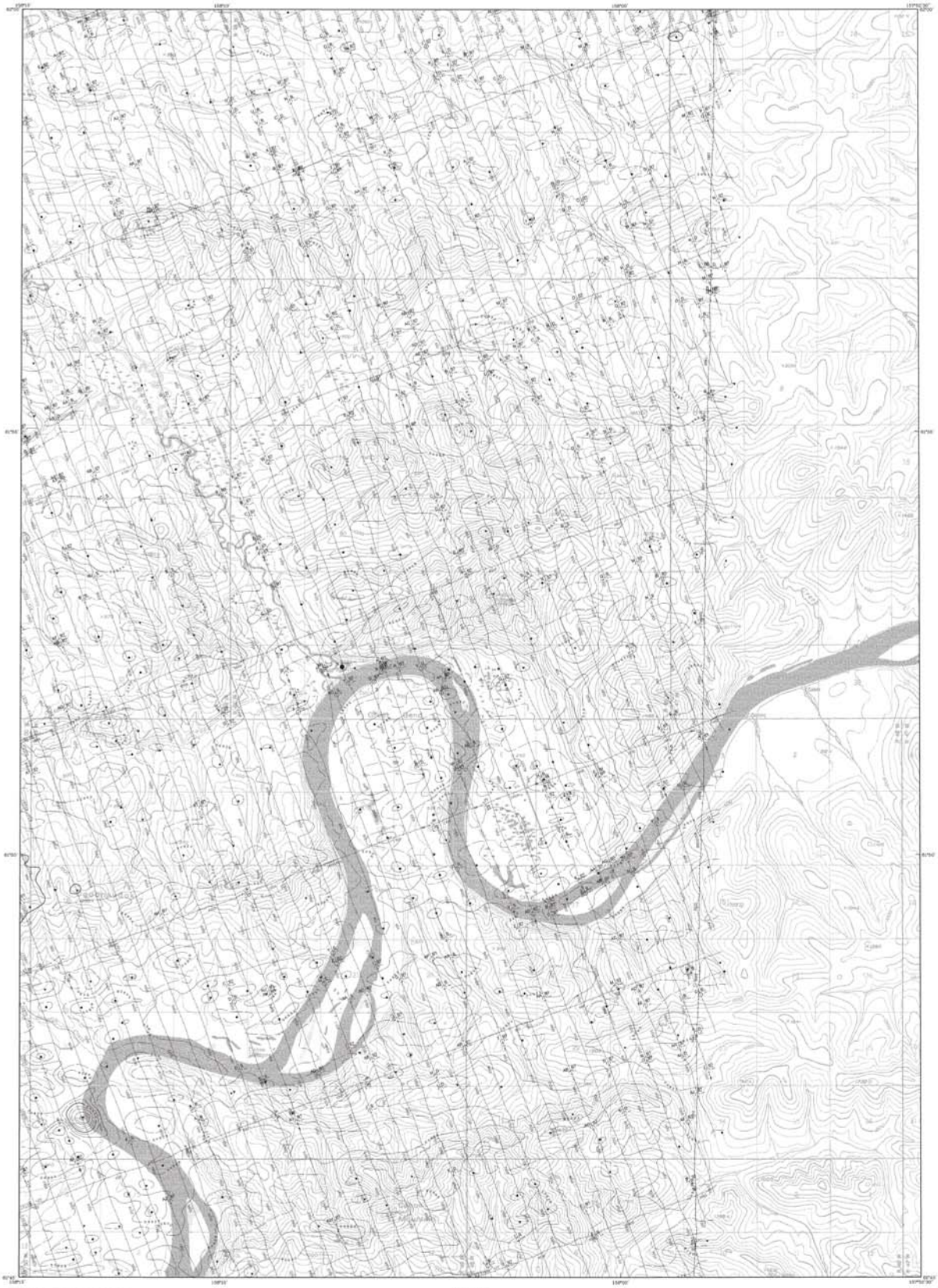
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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT

GEOPHYSICAL REPORT 2000-30F
SLEETMUTE D-6



TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

SLEETMUTE D-6

2000

DESCRIPTIVE NOTES

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ELECTROMAGNETICS

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SCALE 1:31,680

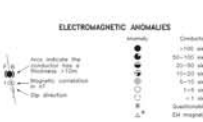
0.5 0 0.5 1 1.5 2 MILES

0.5 0 0.5 1 1.5 2 2.5 KILOMETERS

CONTOUR INTERVAL 100 FEET
SUPER SEA LEVEL DATUM

TRUE NORTH
APPROXIMATE MEAN DECLINATION, 2000

ELECTROMAGNETIC ANOMALIES



Anomaly	Conductance
	>100 siemens
	50–100 siemens
	20–50 siemens
	10–20 siemens
	5–10 siemens
	1–5 siemens
	<1 siemens
	Questionable anomaly
	EM magnetite response

Interpretive symbol	Conductor ("model")
B	Bedrock conductor
S	Narrow bedrock conductor ("thin sheet")
C	Conductive cover ("horizontal sheet")
H	Broad conductive rock unit, deep conductive overburden, thick conductive cover ("half space")
F	Type of broad conductor ("edge of half space")
L	Culture, e.g., power line, metal building or fence

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 (1978) technique. The regional variation (or IGRF gradient, 2000, updated to May 2000) was removed from the leveled magnetic data.

Akima, H., 1978, 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

———	100 nT
———	20 nT
———	4 nT
— — —	2 nT
	magnetic low
	magnetic high

LOCATION INDEX FOR SCALE 1:31,680



SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired by Fugro Airborne Surveys in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). 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.



SCALE 1:31,680

0.5 0 0.5 1 1.5 2 MILES

0.5 0 0.5 1 1.5 2 2.5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM: MEAN SEA LEVEL

TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

SLEETMUTE C-7

2000

ANIAK and IDITAROD SURVEY AREA

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 150 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 hz monitors and video cameras. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along N/N-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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

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 4) spheroid, 1927 North American datum using a central meridian (CM) of 153°, 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.

ELECTROMAGNETICS

To determine the location of EM anomalies on their boundaries, the DIGHEM^{V} EM system measured inphase and quadrature components of five frequencies, two vertical coplanar-coil pairs operated at 900 and 5500 hz and 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 type of conductor is indicated on the aeromagnetic map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the coaxial- and coplanar-coil responses, together with conductor and magnetic patterns and topography. The power line monitor and the flight track video were examined to locate cultural sources.

ELECTROMAGNETIC ANOMALIES

Arrow indicates the conductor has a thickness >15m

Magnetic correlation: ● ≥2 ○ <2

Dip direction

Anomaly identifier

Interpretive symbol

Depth is greater than: 10 m, 20 m, 40 m, 80 m

Amplitude and quadrature of coaxial coil is greater than: 10 ppm, 20 ppm, 40 ppm, 80 ppm

Anomaly	Conductance
A	>100 siemens
B	50–100 siemens
C	20–50 siemens
D	10–20 siemens
E	5–10 siemens
F	1–5 siemens
G	<1 siemens
H	Undetermine anomaly, EM magnetite response

Interpretive symbol	Conductor ("model")
B	Bedrock conductor
O	Narrow bedrock conductor ("thin dike")
S	Conductive cover ("horizontal thin sheet")
H	Broad conductive rock unit, thick conductive weathering zone, conductive cover ("half space")
E	Edge of broad conductor ("edge of half space")
L	Culture, e.g., power line, metal building or fence

Hanna, W., 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. 568–546.

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 (an IGRF gradient, 2000, updated to May 2001) was removed from the leveled magnetic data.

MAGNETIC CONTOUR INTERVAL

100 nT

20 nT

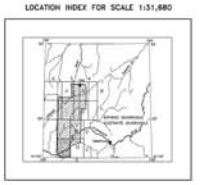
4 nT

2 nT

magnetic low

magnetic high

LOCATION INDEX FOR SCALE 1:31,680



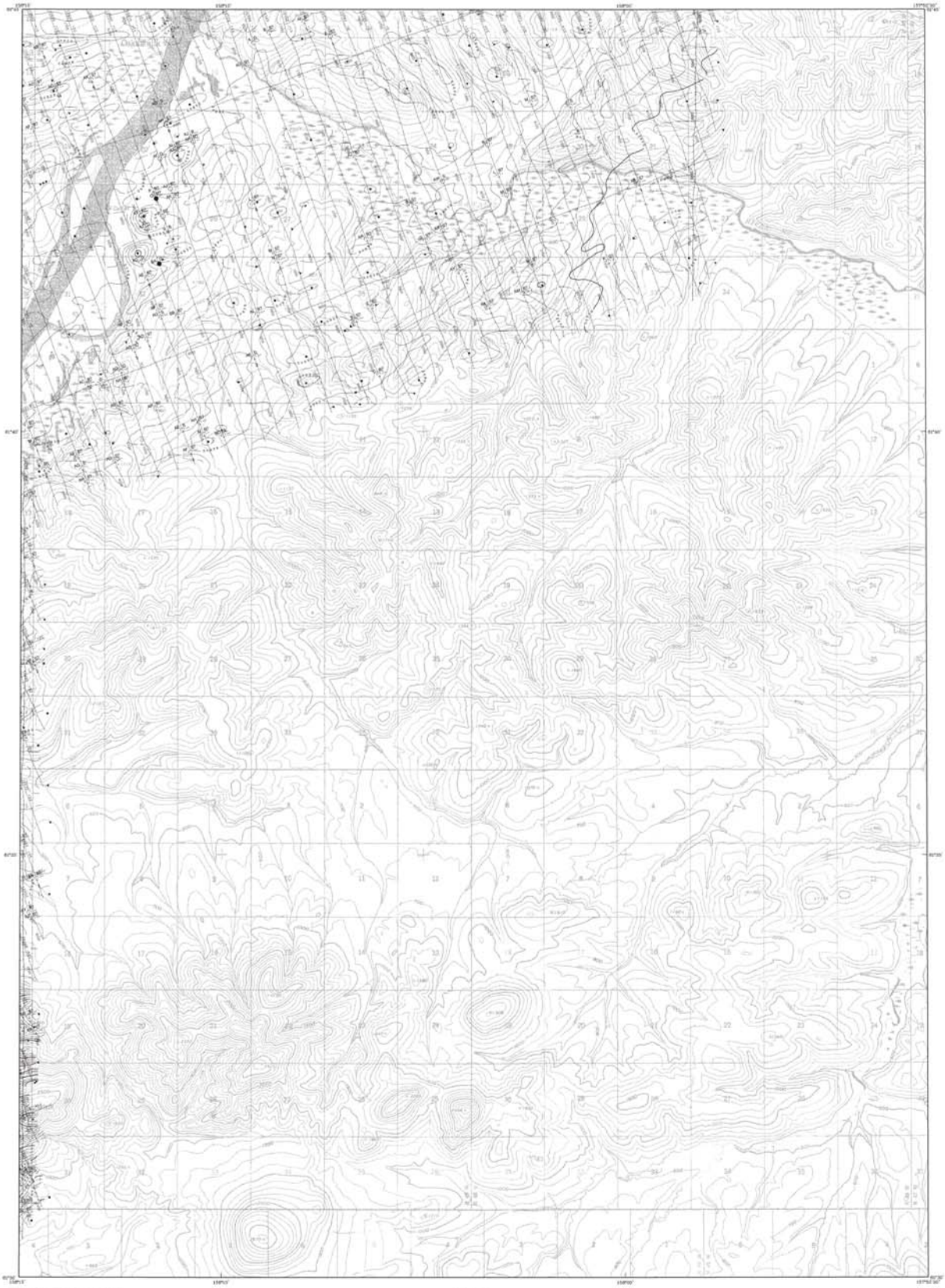
SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired by Fugro Airborne Surveys in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). 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.

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT

GEOPHYSICAL REPORT 2000-30H
SLEETMUTE C-6



TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

SLEETMUTE C-6

2000

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 NW–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 2 miles. The blank regions indicate an area where the survey aircraft had to detour around populated areas.

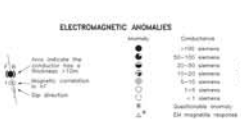
An Ashtech GG24 NAVSTAR / GLONASS Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 4) spheroid, 1927 North American datum using a central meridian (CM) of 159°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

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 900 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 type of conductor is indicated on the aeromagnetic map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the coaxial and coplanar-coil responses, together with conductor and magnetic patterns and topography. The power line monitor and the flight track video were examined to locate cultural sources.



ELECTROMAGNETIC ANOMALIES



SCALE 1:31,680

0.5 0 0.5 1 1.5 2 MILES

0.5 0 0.5 1 1.5 2 2.5 KILOMETERS

CONTOUR INTERVAL 100 FEET
EXTRA VALUE 50 FEET

APPROXIMATE VALUE OF MAGNETIC DECLINATION 2000

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 (1978) technique. The regional variation (or IGRF gradient, 2000), updated to May 2000, was removed from the leveled magnetic data.

Akima, H., 1978, 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

100 nT

50 nT

4 nT

2 nT

magnetic low

magnetic high

LOCATION INDEX FOR SCALE 1:31,680

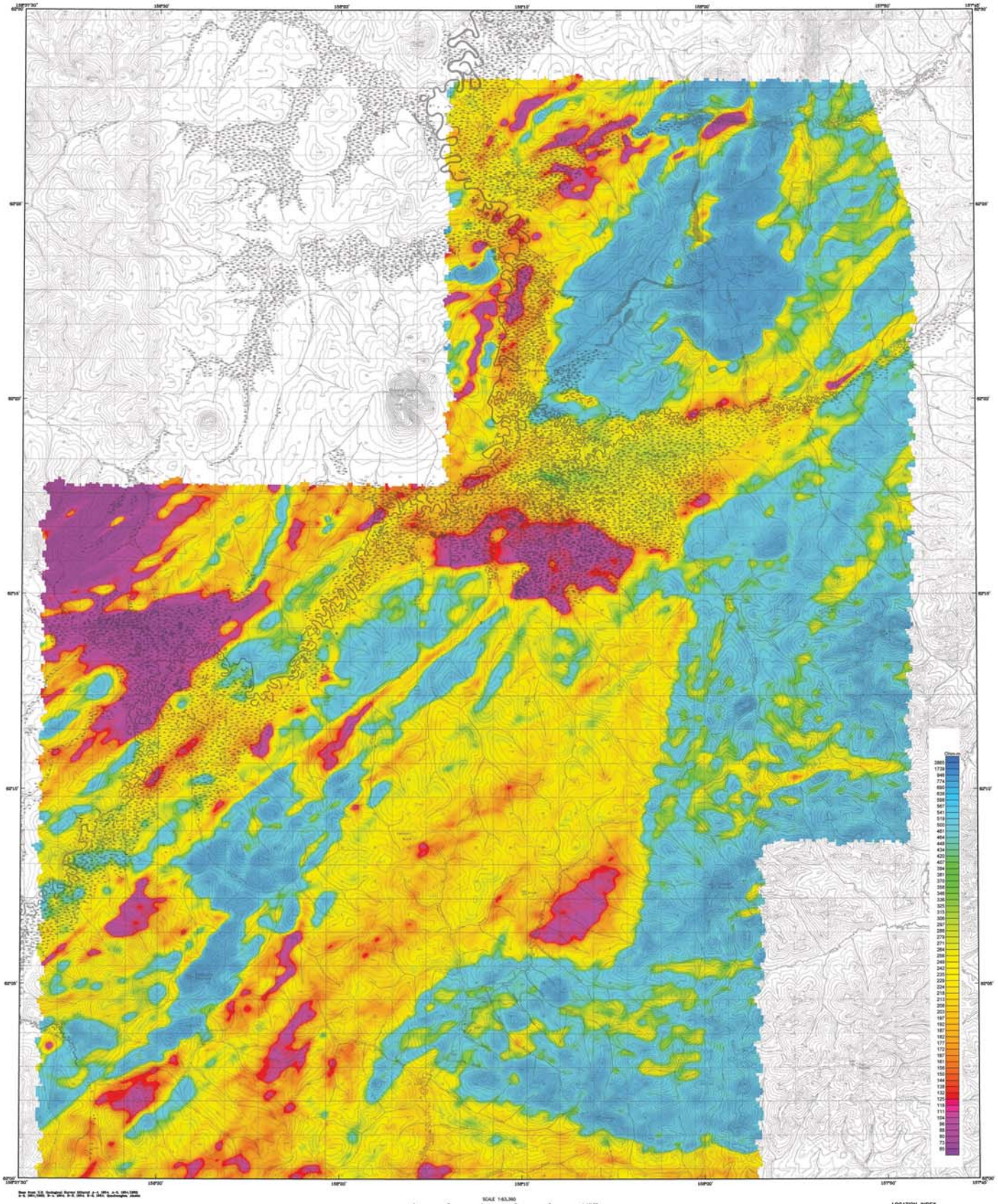


SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired by Fugro Airborne Surveys in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT



SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

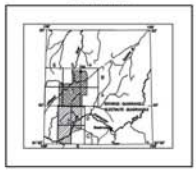


7200 Hz COPLANAR RESISTIVITY OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF IDITAROD QUADRANGLE

2000

LOCATION INDEX



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, 35/70 Hz monitored video camera. Flights were performed with an AS350B2 helicopter at a mean terrain clearance of 200 feet along 119–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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

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 4) spheroid, 1927 North American datum with a central meridian of 159° W, a scale constant of 0 and false east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM[V] EM system measured inphase and quadrature components of five frequencies. Two vertical coaxial–coil pairs operated at 900 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. Apparent resistivity is generated from the inphase and quadrature components of the coplanar 7200 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.

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.

Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p. 144–172.

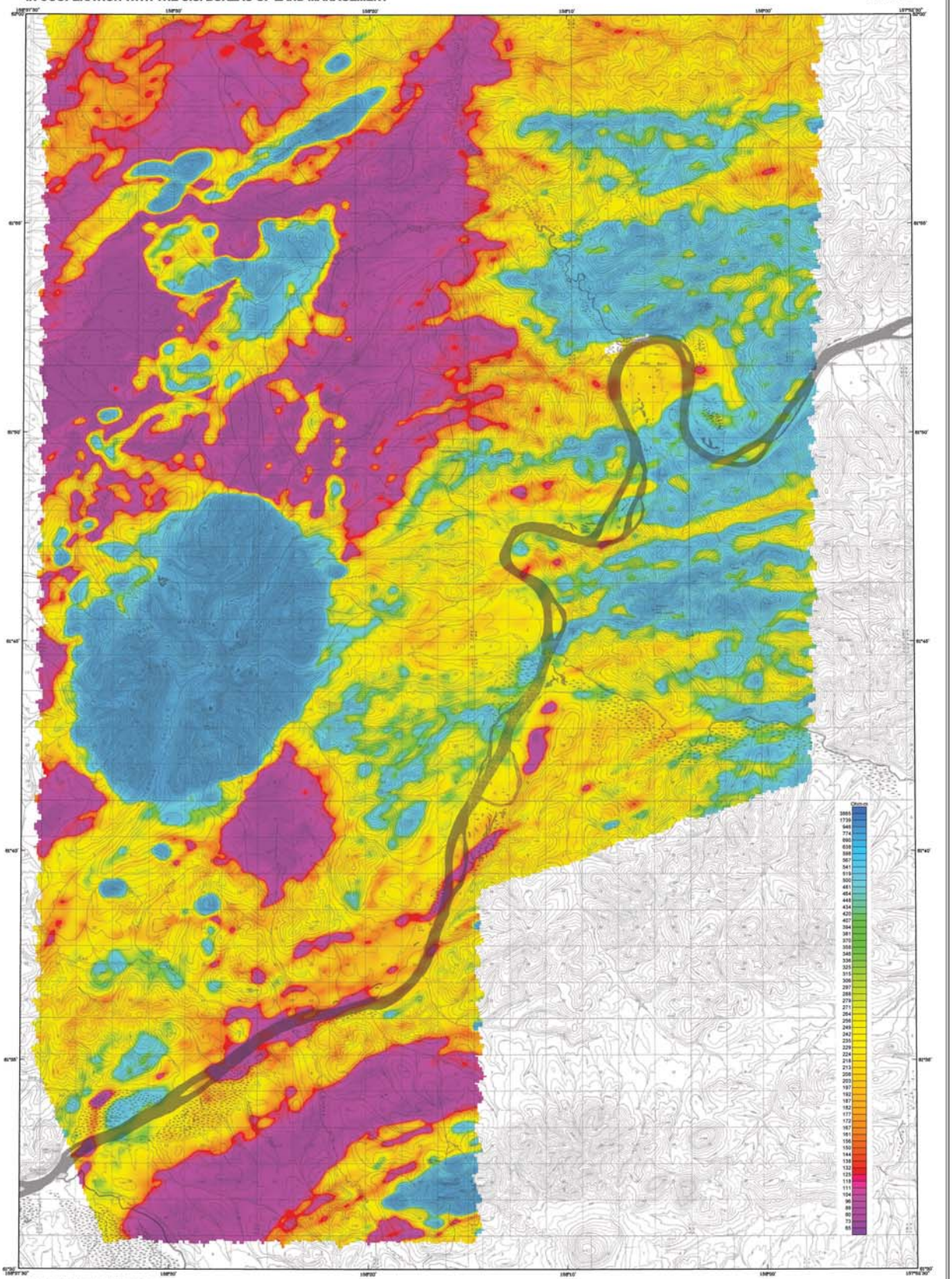
SURVEY HISTORY

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 area was acquired by Fugro Geoscience Inc. in 2000. Funds for the project were provided by the U.S. Department of Interior, Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT

GEOPHYSICAL REPORT 2000-31
Sheet 2 of 2



SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

7200 Hz COPLANAR RESISTIVITY OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF SLEETMUTE QUADRANGLE

2000



LOCATION INDEX



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 NW–SE (140°/320°) lines spaced 1/4 mile apart with tie lines spaced 1 mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. The blank regions indicate an area where the survey aircraft had to detour around populated areas.

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 4) spheroid, 1927 North American datum using a central meridian (CM) of 159° (3 north zone)and of 0 and an easting constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM^V EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial–coil pairs operated at 900 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. Apparent resistivity is generated from the inphase and quadrature components of the coplanar 7200 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.

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.

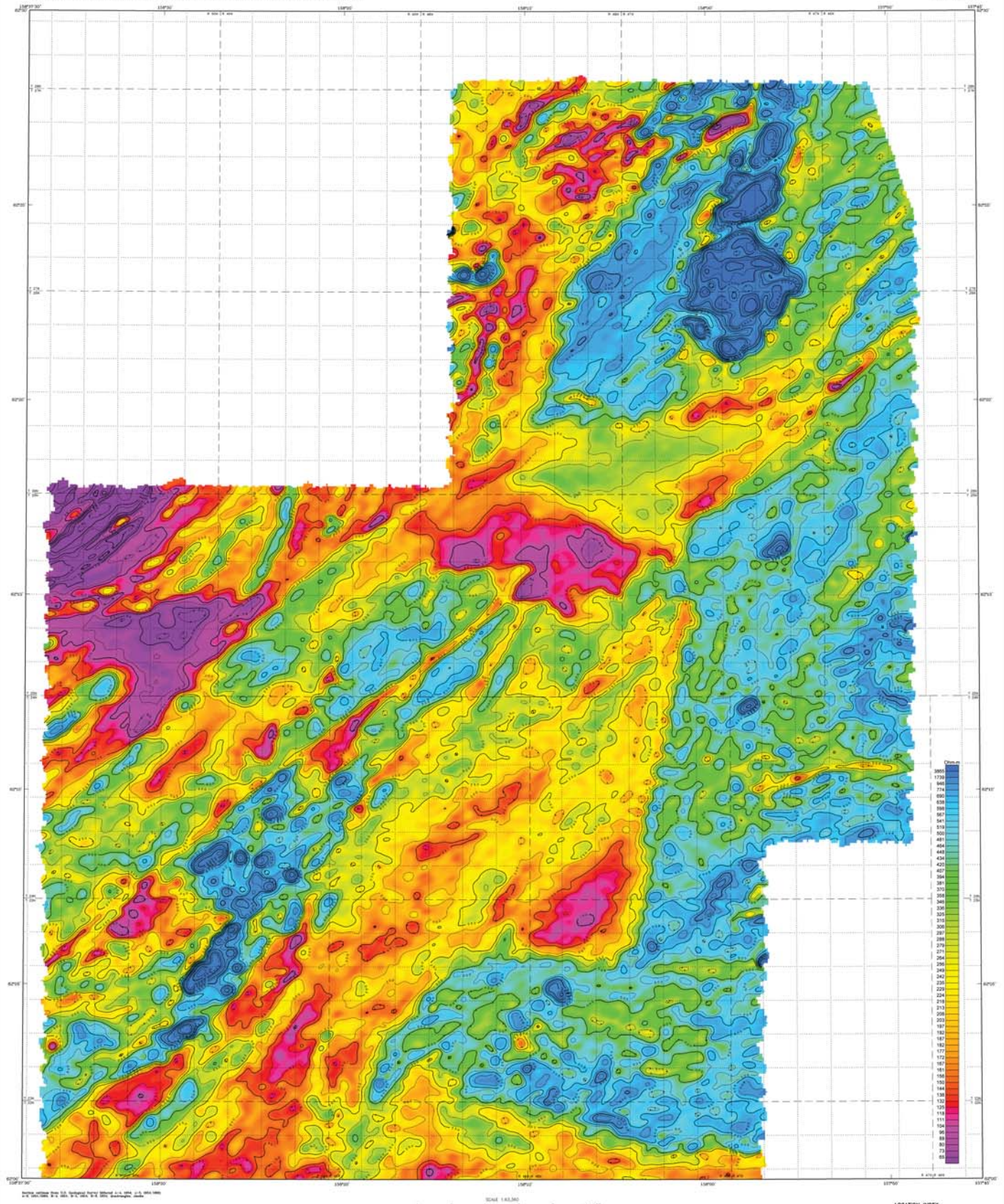
Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p. 144–172.

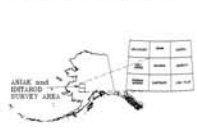
SURVEY HISTORY

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT





SCALE 1:63,360

7200 Hz COPLANAR RESISTIVITY OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF IDITAROD QUADRANGLE

2000

LOCATION INDEX



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^{V} Electromagnetic (EM) system and a Scintrex cesium magnetometer. Both were towed at a height of 100 feet. In addition the survey recorded data from a radar altimeter, a barometric pressure sensor, and a temperature sensor. Flight lines were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along N30°–5E (345°) survey flight lines with a spacing of ¼ quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. The blank regions indicate an area where the survey aircraft had to detour around populated areas.

An Ashtech GG24 TAU/STAR / 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 was recorded in geographic WGS 1984 and UTM zone 4[illegible] projected North American datum using a central meridian (CM) of 159° and 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.

RESISTIVITY

The DIGHEM^{V} EM system measured inphase and quadrature components of five frequencies. Two vertical coaxial-coil pairs operated at 900 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. Apparent resistivity is generated from the inphase and quadrature components of the coplanar 7200 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.

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.
Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p. 144–172.

RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

resistivity low

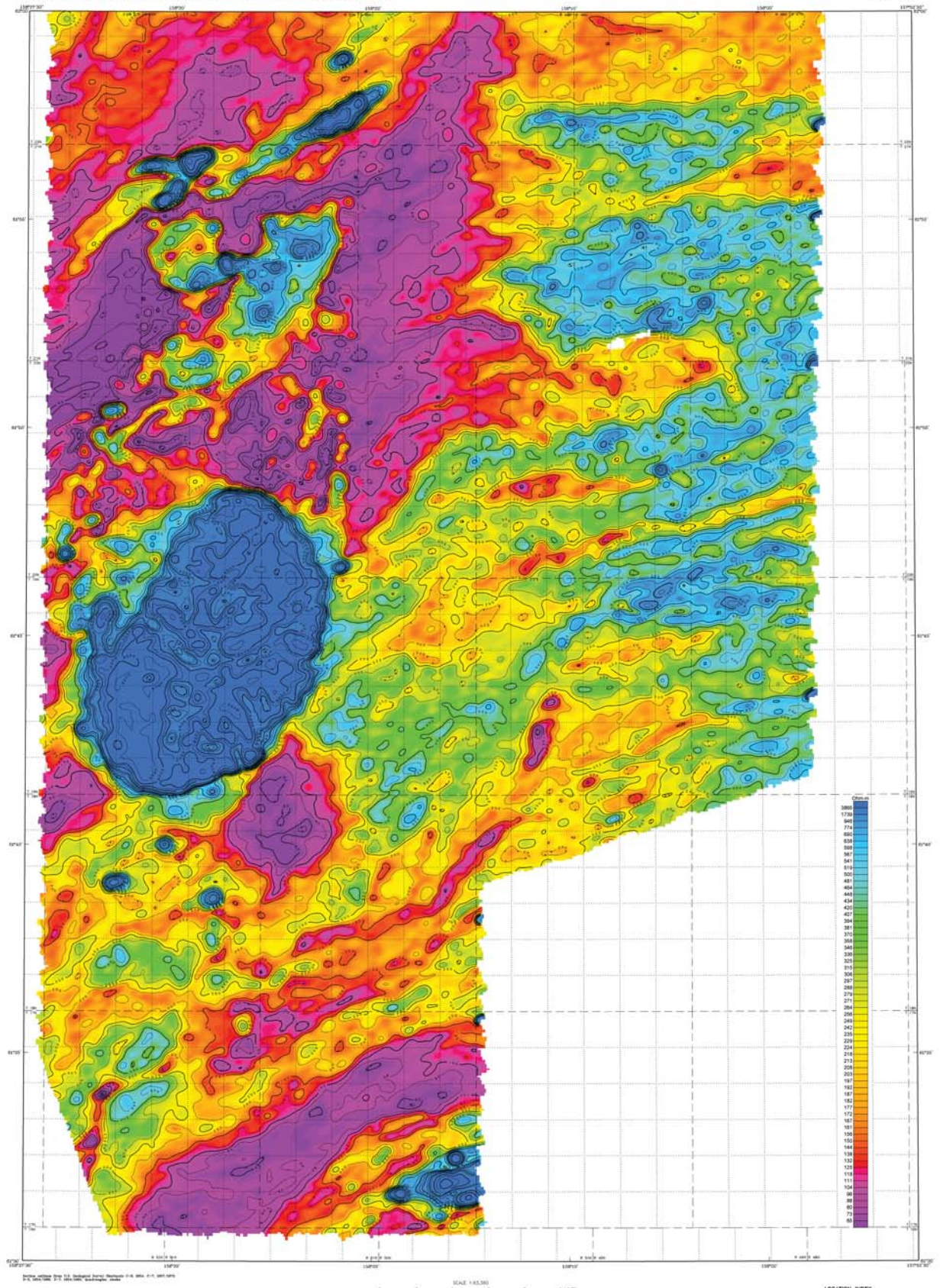
SURVEY HISTORY

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., Nanaimo, British Columbia, Canada. Funding for the Fugro airborne survey in 2000 was provided by the U.S. Department of Interior Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT

GEOPHYSICAL REPORT 2000-32
Sheet 2 of 2



SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS



7200 Hz COPLANAR RESISTIVITY OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF SLEETMUTE QUADRANGLE

2000

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, a barometric pressure sensor, a video monitor and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along NW–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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

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 10 m. Flight path recovery was performed using Ashtech PNAV 2000 GPS processing software. NAD 27 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.

RESISTIVITY

The DIGHEM[V] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial–coil pairs operated at 900 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. Apparent resistivity is generated from the inphase and quadrature components of the coplanar 7200 Hz coil pair 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.

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.

Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p. 144–172.

RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

resistivity low

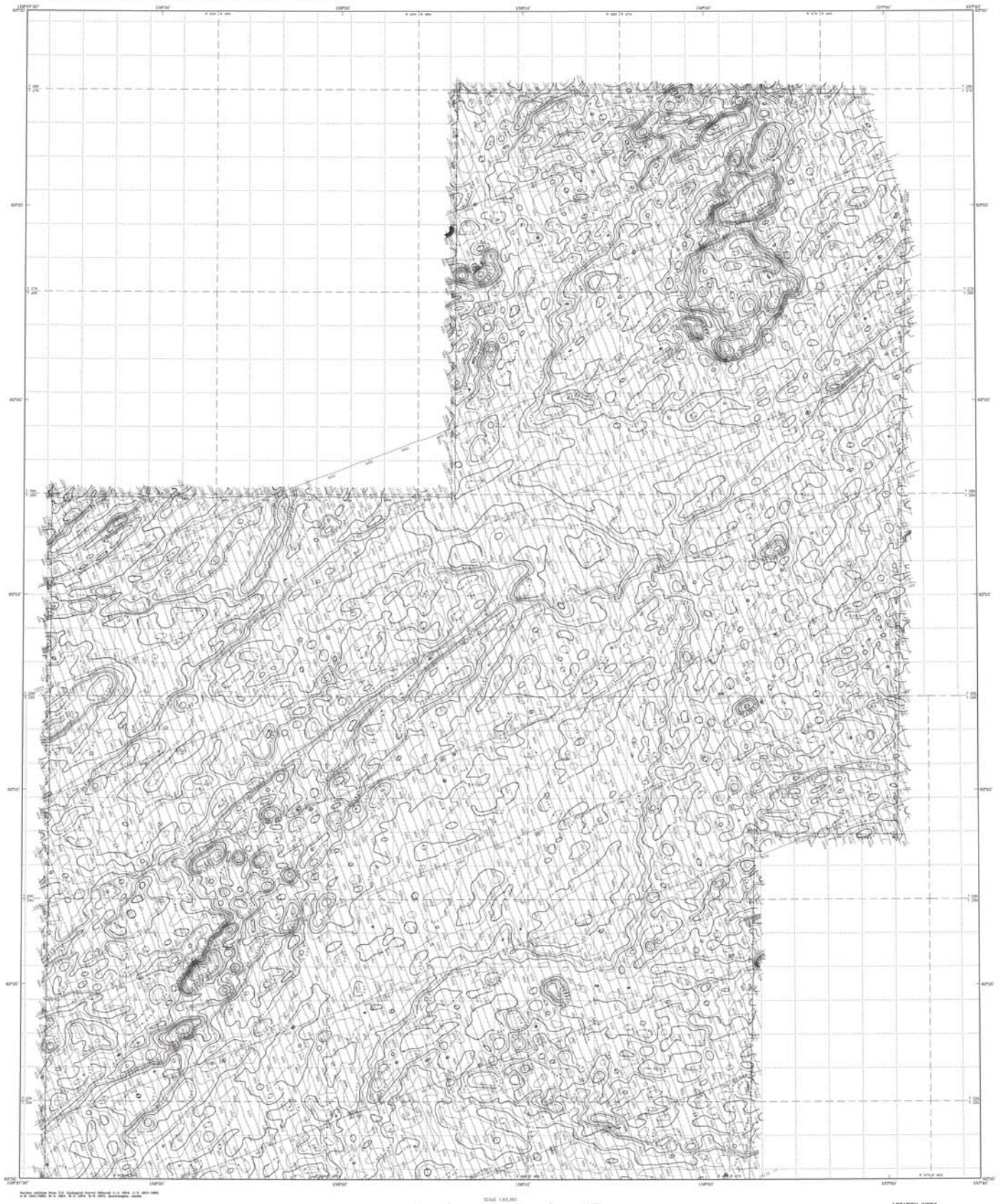
LOCATION INDEX



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., Victoria, British Columbia, Canada. The contractor flew the Fugro airborne survey in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

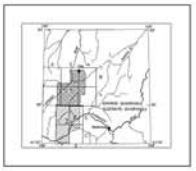


7200 Hz COPLANAR RESISTIVITY OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF IDITAROD QUADRANGLE

2000

LOCATION INDEX



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, barometric and temperature sensors. Complete coverage was performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along N60—5E (345°) 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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

An Ashtech GG24 TAI/STAR / 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 recovery was processed in NAD83 (CSRS) and then UTM zone 4T. A projection of North American datum using a central meridian (CM) of 153° W, 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.

RESISTIVITY

The DIGHEM^V EM system measured inphase and quadrature components of five frequencies. Two vertical coaxial-coil pairs operated at 900 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. Apparent resistivity is generated from the inphase and quadrature components of the coplanar 7200 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.

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.

Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p. 144–172.



RESISTIVITY CONTOURS

1000
600
400
300
250
200
150
125
100

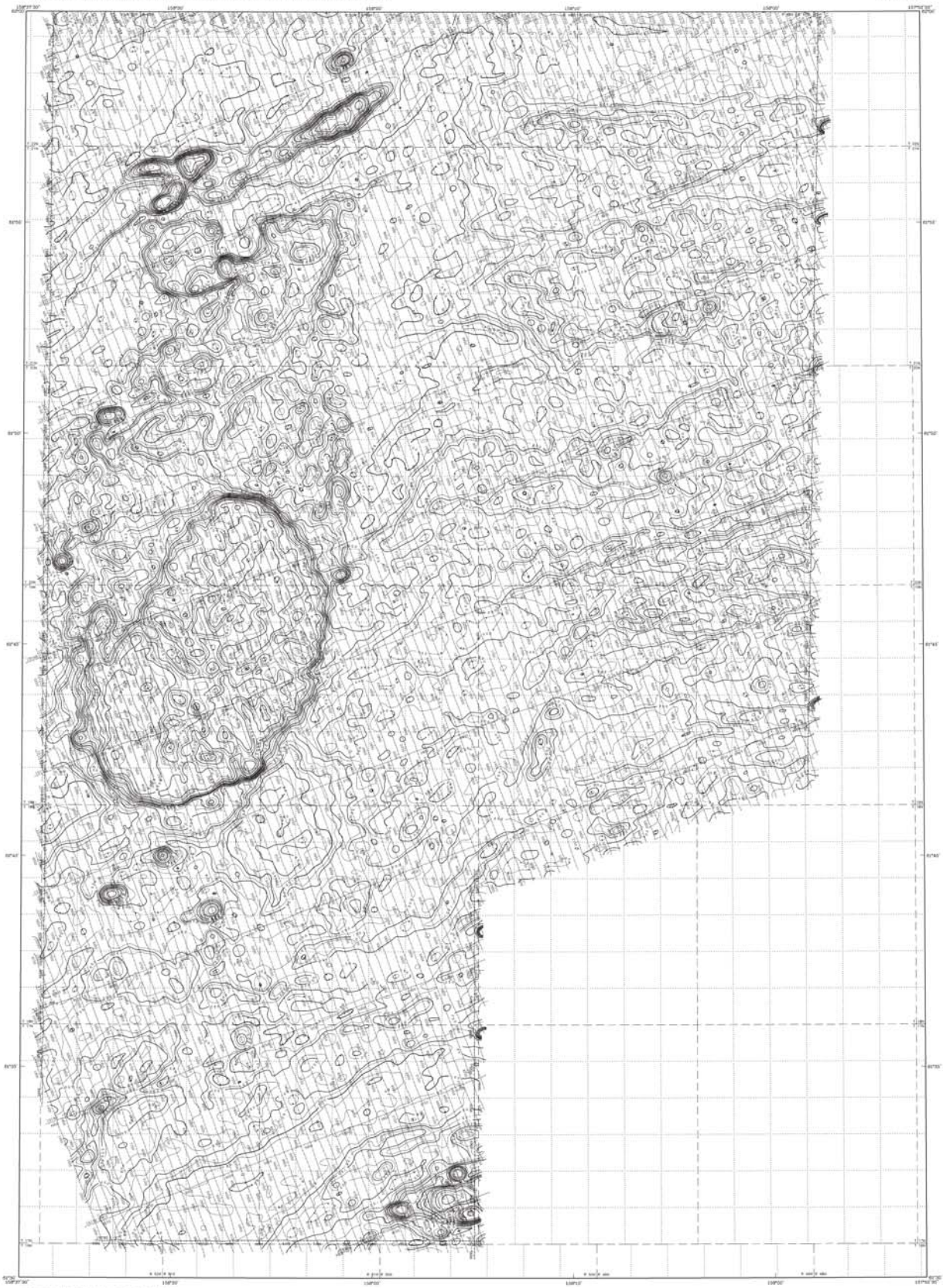
Contours in ohm-m at 10 intervals per decade

resistivity low

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., Nanaimo, British Columbia. The survey was flown by Fugro Airborne Surveys in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS



7200 Hz COPLANAR RESISTIVITY OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF SLEETMUTE QUADRANGLE

2000

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, a barometer, a GPS navigation system, a monitor and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along N10—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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

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 10 m. Flight path and final data are presented in the North American Datum (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. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM^V EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial-coil pairs operated at 900 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. Apparent resistivity is generated from the inphase and quadrature components of the coplanar 7200 Hz data 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.

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.

Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p. 144-172.

RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

resistivity low

LOCATION INDEX

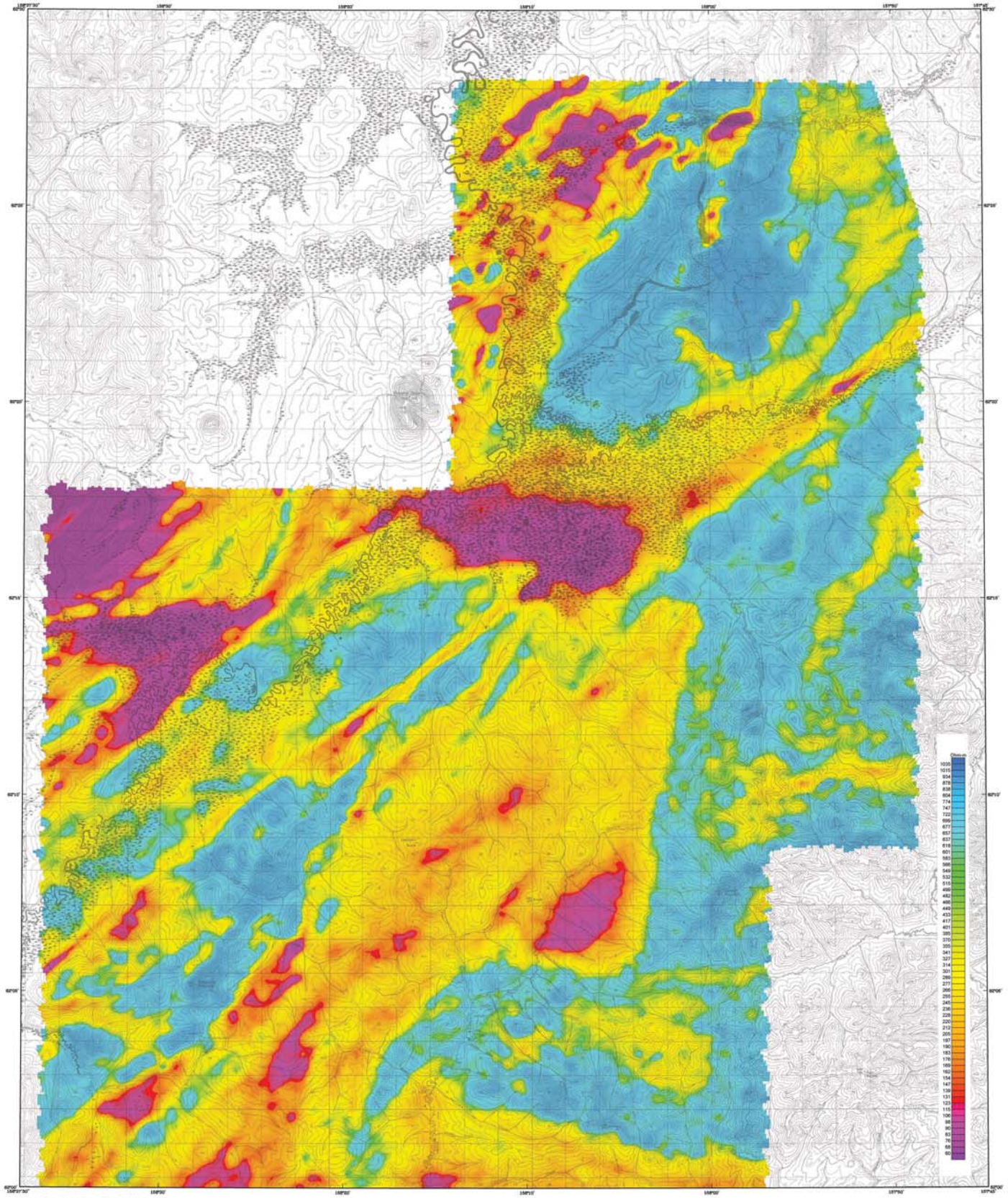


SURVEY HISTORY

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. (SEMCO) of Vancouver, B.C. SEMCO subcontracted Fugro airborne Surveys in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT





SCALE 1:63,360

1 0 1 2 3 4 MILES

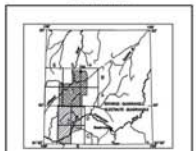
1 0 1 2 3 4 5 KILOMETERS

900 Hz COPLANAR RESISTIVITY OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF IDITAROD QUADRANGLE

2000

LOCATION INDEX



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 monitor and video camera. Flights were performed with an AS350B2 helicopter at a mean terrain clearance of 200 feet along 119–SE (342°) 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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

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 4) spheroid, 1927 North American datum (NAD27) using a central scale factor of 0.9996, a 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 DIGHEM[V] EM system measured inphase and quadrature components of five frequencies. Two vertical coaxial–coil pairs operated at 900 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. Apparent resistivity is generated from the inphase and quadrature components 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.

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.

Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p. 144–172.

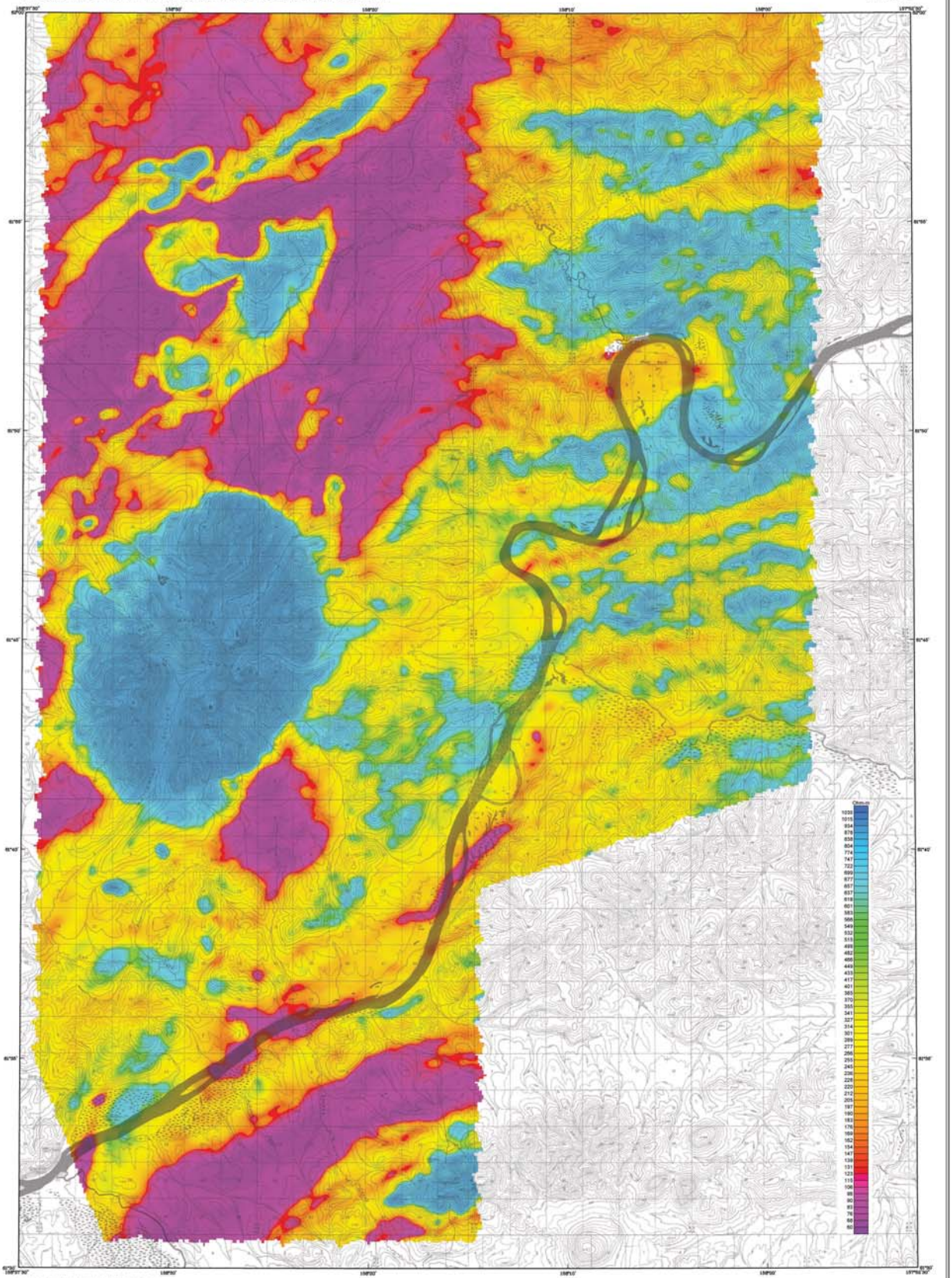
SURVEY HISTORY

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 area was acquired by Fugro Geoservices Inc. in 2000. Funds for the project were provided by the U.S. Department of Interior, Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT

GEOPHYSICAL REPORT 2000-34
Sheet 2 of 2



SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS



900 Hz COPLANAR RESISTIVITY OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF SLEETMUTE QUADRANGLE

2000

LOCATION INDEX



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 NW–SE (140°/320°) lines spaced 1/4 mile apart with tie lines spaced 1 mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. The blank regions indicate an area where the survey aircraft had to detour around populated areas.

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 4) spheroid, 1927 North American datum using a central meridian (CM) of 159° (a north zonal) of 0 and an east translation of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM^V EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial–coil pairs operated at 900 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. Apparent resistivity is generated from the inphase and quadrature components 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.

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.

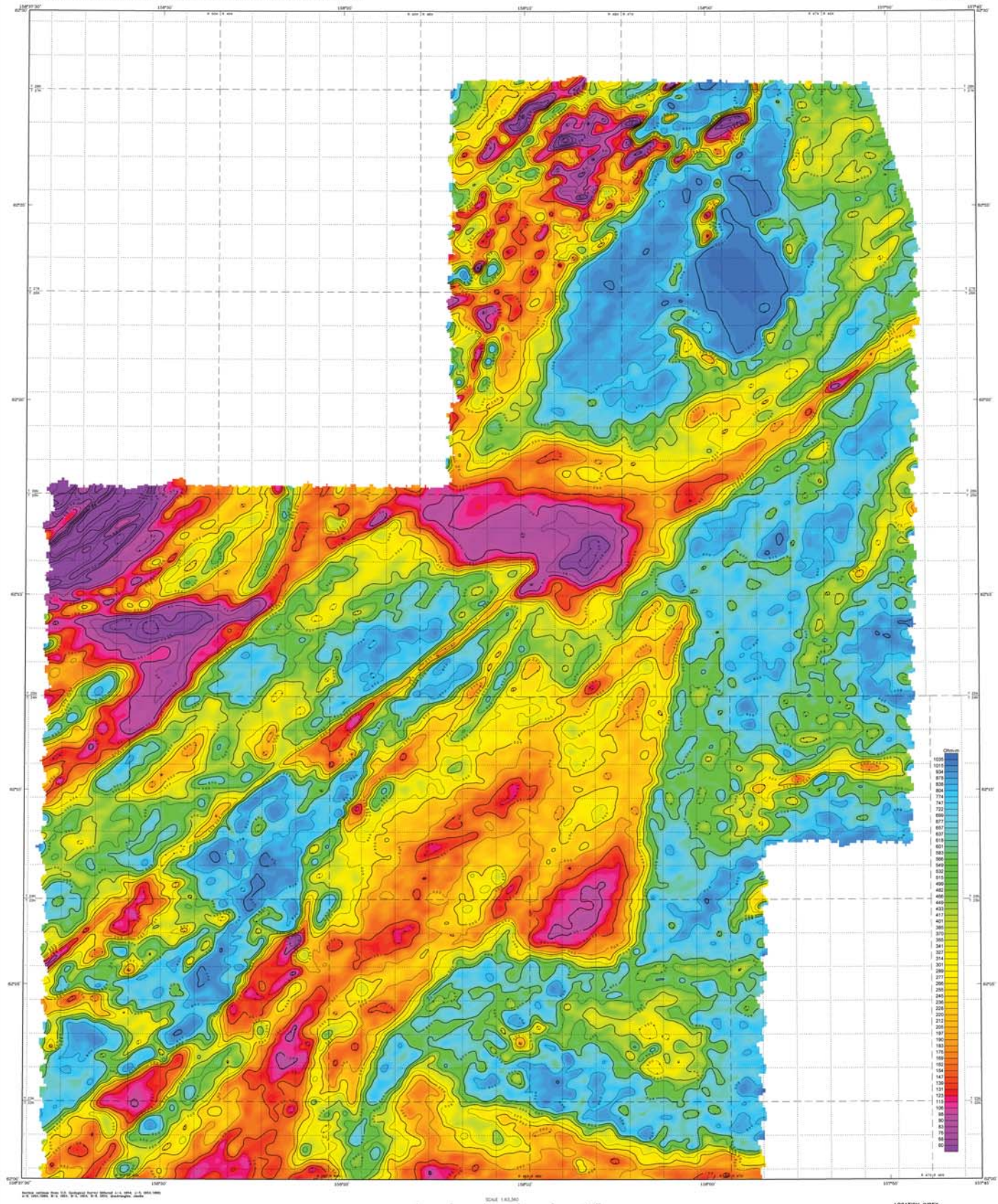
Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p. 144–172.

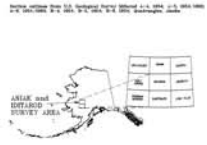
SURVEY HISTORY

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 area were acquired by Fugro Airborne Surveys in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT





SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

900 Hz COPLANAR RESISTIVITY OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF IDITAROD QUADRANGLE

2000

LOCATION INDEX



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, a barometric pressure sensor, a radiometric spectrometer. Flight lines were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along N30°–5E (345°) survey flight lines with a spacing of ¼ quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. The blank regions indicate an area where the survey aircraft had to detour around populated areas.

An Ashtech GG24 TerraSTAR / 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 was recorded in geographic WGS 84 coordinates (GRS) and projected into North American Datum using a central meridian (CM) of 158° west, 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 DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial-coil pairs operated at 900 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. Apparent resistivity is generated from the inphase and quadrature components of the coplanar 900 Hz using the pseudo-layer half space model (Fraser 1978). The data were interpolated into a regular 100 m grid using a modified Akima (1970) technique.

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.

Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p. 144–172.

RESISTIVITY CONTOURS

1000
800
600
300
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

resistivity low

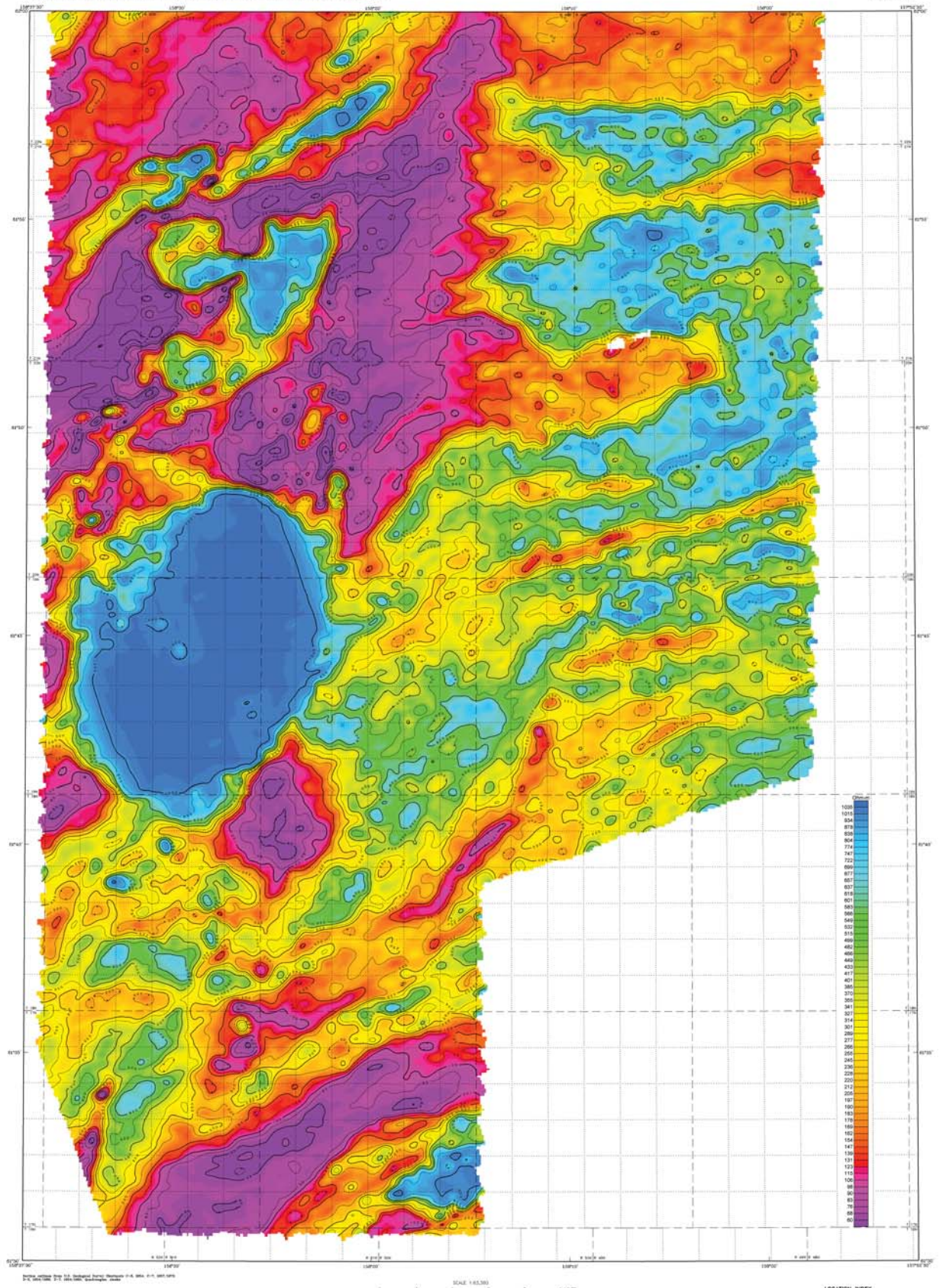
SURVEY HISTORY

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., Nanaimo, British Columbia, Canada. Processing of the Fugro airborne survey in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT

GEOPHYSICAL REPORT 2000-35
Sheet 2 of 2





900 Hz COPLANAR RESISTIVITY OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF SLEETMUTE QUADRANGLE

2000

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, a barometric pressure sensor, a monitor, and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along NW–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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

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 10 m. Flight path recovery was performed using GPSurvey 2.35 (UNB) software. The geodetic datum was defined using NAD 1927 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.

RESISTIVITY

The DIGHEM[V] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial-coil pairs operated at 900 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. Apparent resistivity is generated from the inphase and quadrature components of the coplanar coil pair 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.

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.

Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p. 144–172.

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

resistivity low

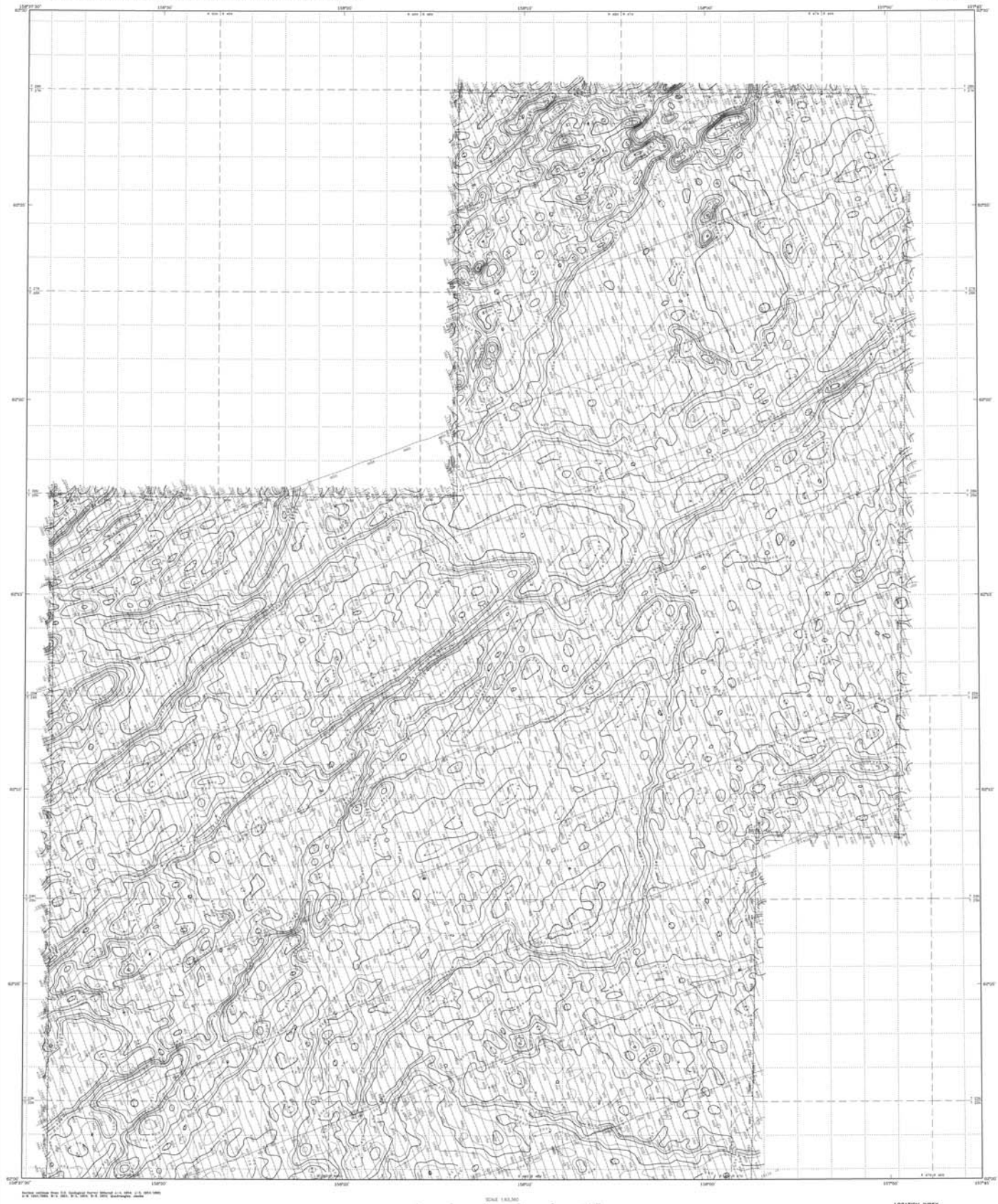
LOCATION INDEX



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. (SEMCO) of Nanaimo, B.C. Canada. SEMCO flew the Aniak-Fairbanks airborne survey in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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900 Hz COPLANAR RESISTIVITY OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF IDITAROD QUADRANGLE

2000

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, a fluxgate magnetometer, a barometric altimeter, Computer Aided Navigation performed on a KS300B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along N60°–58° 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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

An Ashtech GG24 TAI/STAR / 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 recovery was processed by Fugro Airborne Surveys (UK) Ltd. in Mississauga, Ontario, Canada using a central meridian (CM) of 159° a norm 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 DIGHEM^{V} EM system measured inphase and quadrature components of five frequencies. Two vertical coaxial–coil pairs operated at 900 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. Apparent resistivity is generated from the inphase and quadrature components 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.

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.

Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p. 144–172.

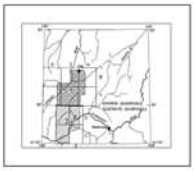
RESISTIVITY CONTOURS

1000
600
500
300
400
200
250
150
125
100

Contours in ohm–m at 10 intervals per decade

resistivity low

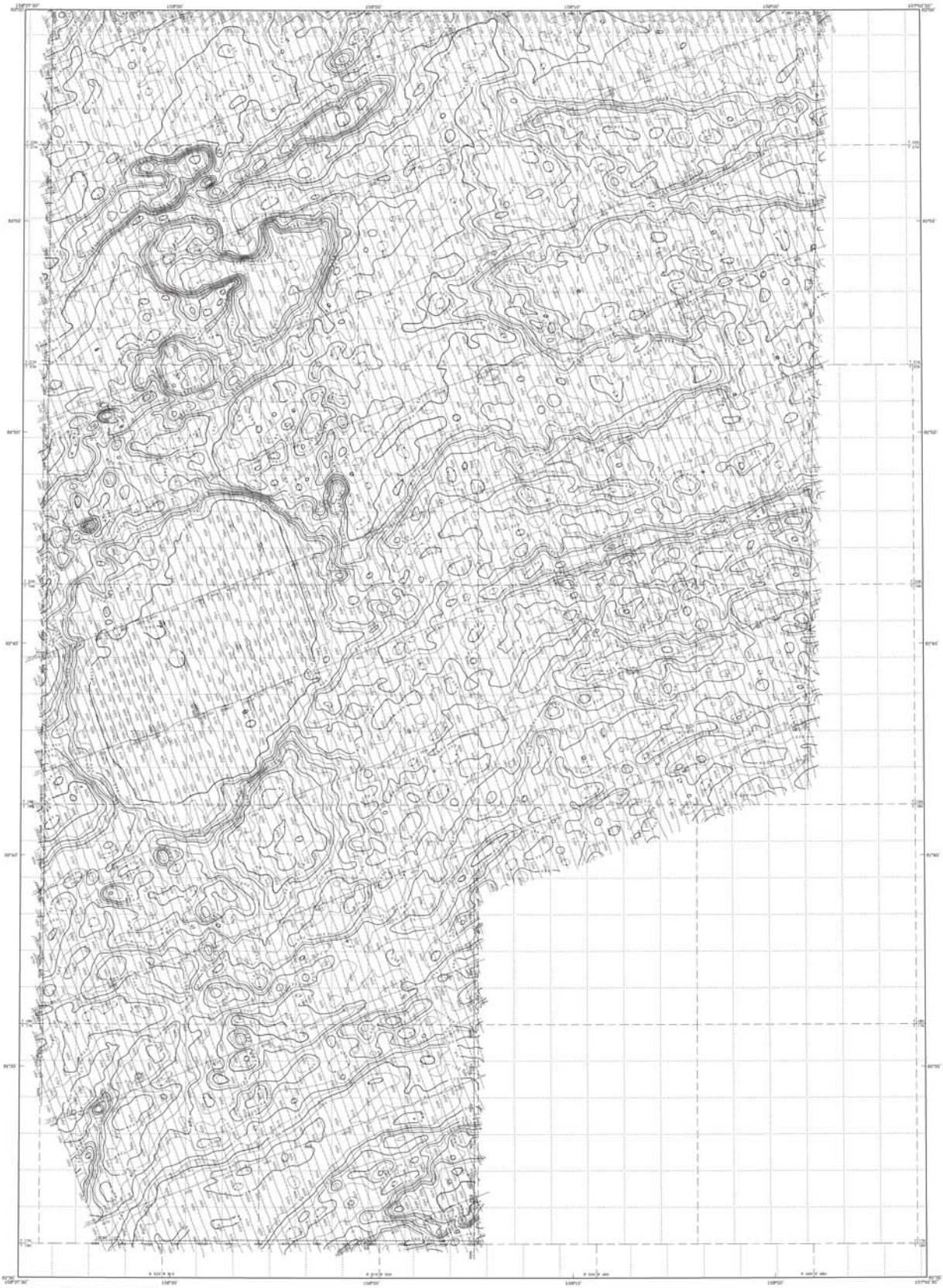
LOCATION INDEX



SURVEY HISTORY

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SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS



900 Hz COPLANAR RESISTIVITY OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF SLEETMUTE QUADRANGLE

2000

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 system, a GPS navigation system, a monitor and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along N30–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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

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 is presented in Universal Transverse Mercator (UTM) zone 4 (central 162° North American datum using a central meridian (CM) of 153°, a north constant of 0 and east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM^V EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial-coil pairs operated at 900 and 5500 Hz while three horizontal coplanar-coil pairs operated at 935, 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. Apparent resistivity is generated from the inphase and quadrature components of the coplanar coil pair 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.

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.

Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p. 144–172.

RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

resistivity low

LOCATION INDEX

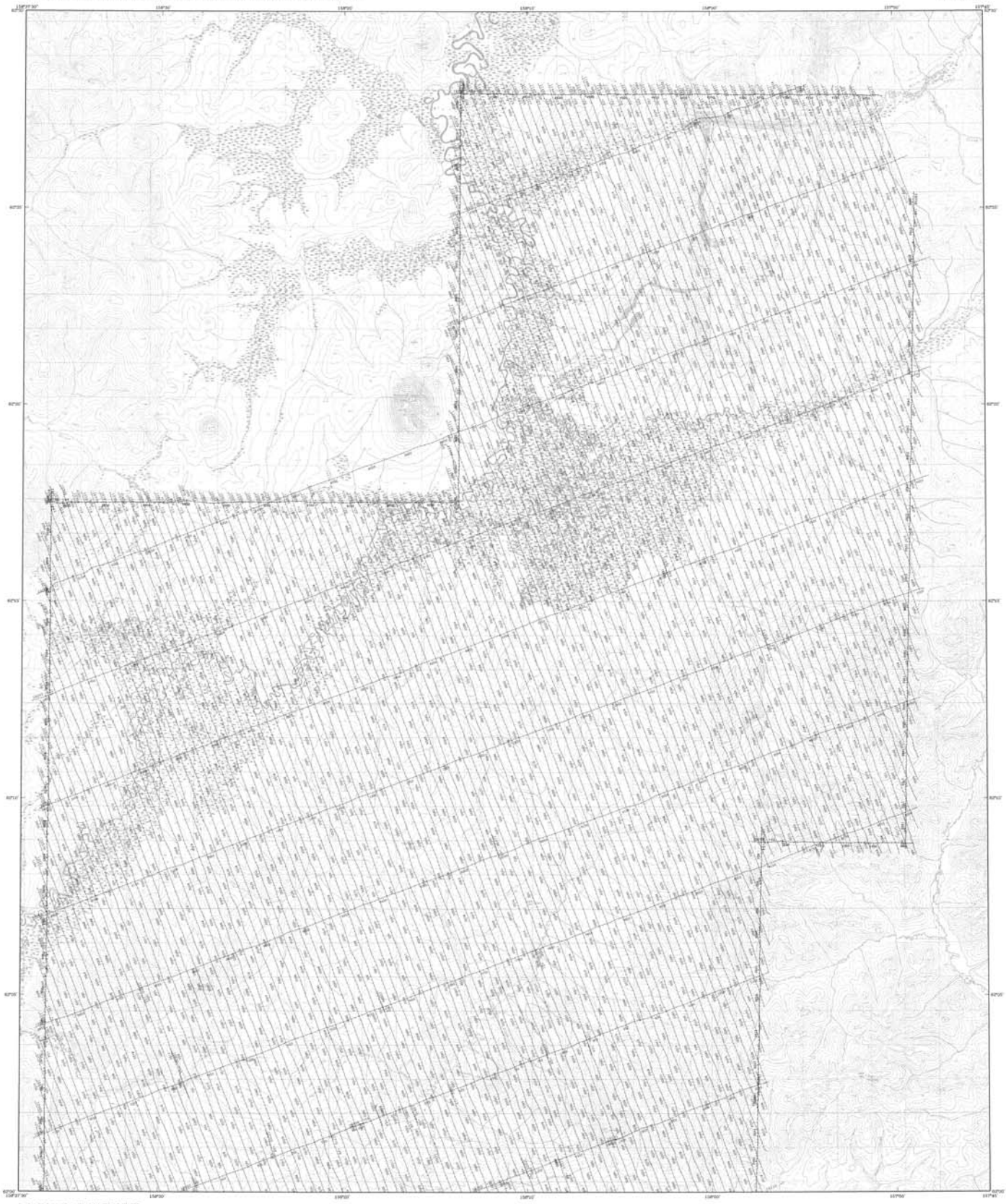


SURVEY HISTORY

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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT



SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM: MEAN SEA LEVEL



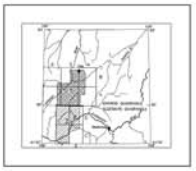
FLIGHT LINES OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF IDITAROD QUADRANGLE

2000



LOCATION INDEX

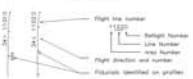


DESCRIPTIVE NOTES

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, a Global Positioning System (GPS) navigational system, Fluxgate magnetometer and an ASTRON-2 Squirrel helicopter at a mean terrain clearance of 200 feet along N60—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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

An Ashtech GG24 TAI/STAR / 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 positioning was provided in NAD83 Alaska 1983 coordinates at a projected 1:63,360 scale using a central meridian (CM) of 153° W, 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.

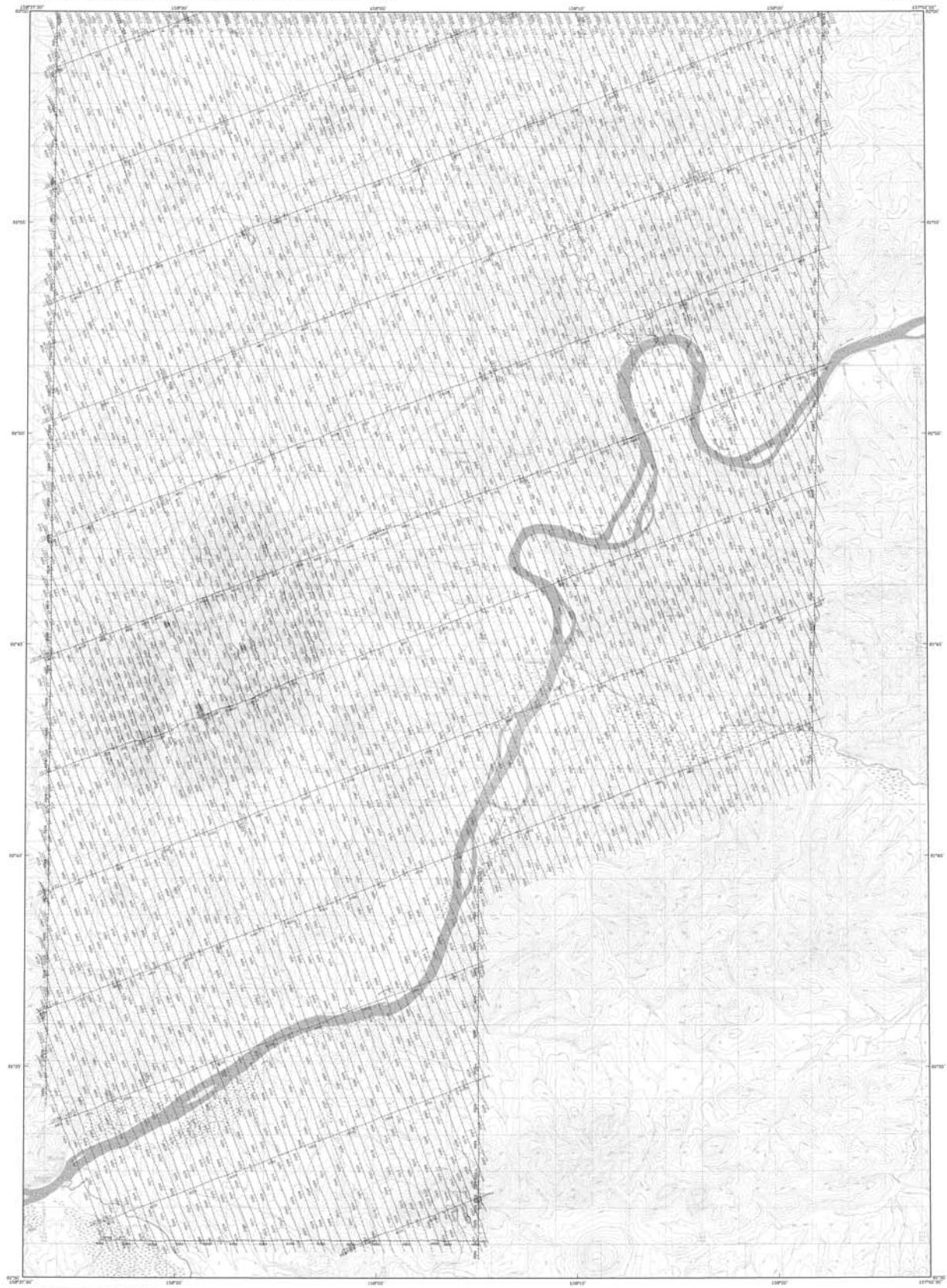
FLIGHT LINES



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., Nanaimo, British Columbia, Canada. Helicopter and Fugro airborne surveys in 2000. Funds for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). 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.



SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 6 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM: MEAN SEA LEVEL



FLIGHT LINES OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF SLEETMUTE QUADRANGLE

2000



LOCATION INDEX

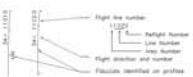


DESCRIPTIVE NOTES

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, a barometric pressure sensor, a video monitor and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along NW–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 blank regions indicate an area where the survey aircraft had to detour around populated areas.

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 and digital data were recorded in WGS84 and UTM zone 4 (central), NAD 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.

FLIGHT LINES



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. of Vancouver, British Columbia, Canada, who flew the Yukon airborne surveys in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

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INTERPRETATION MAP OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF THE IDITAROD QUADRANGLE
2000

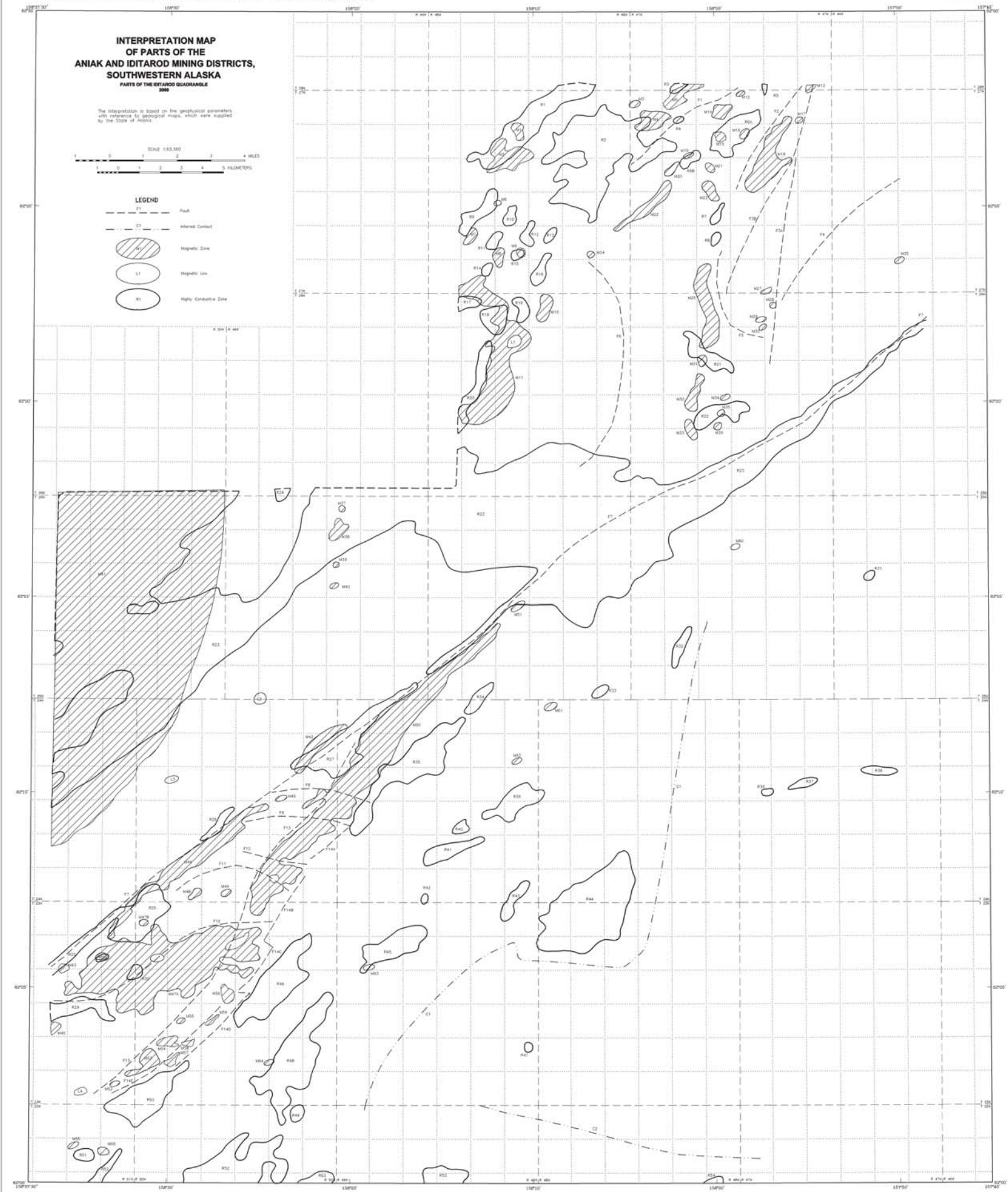
The interpretation is based on the geophysical parameters with reference to geological maps, which were supplied by the State of Alaska.

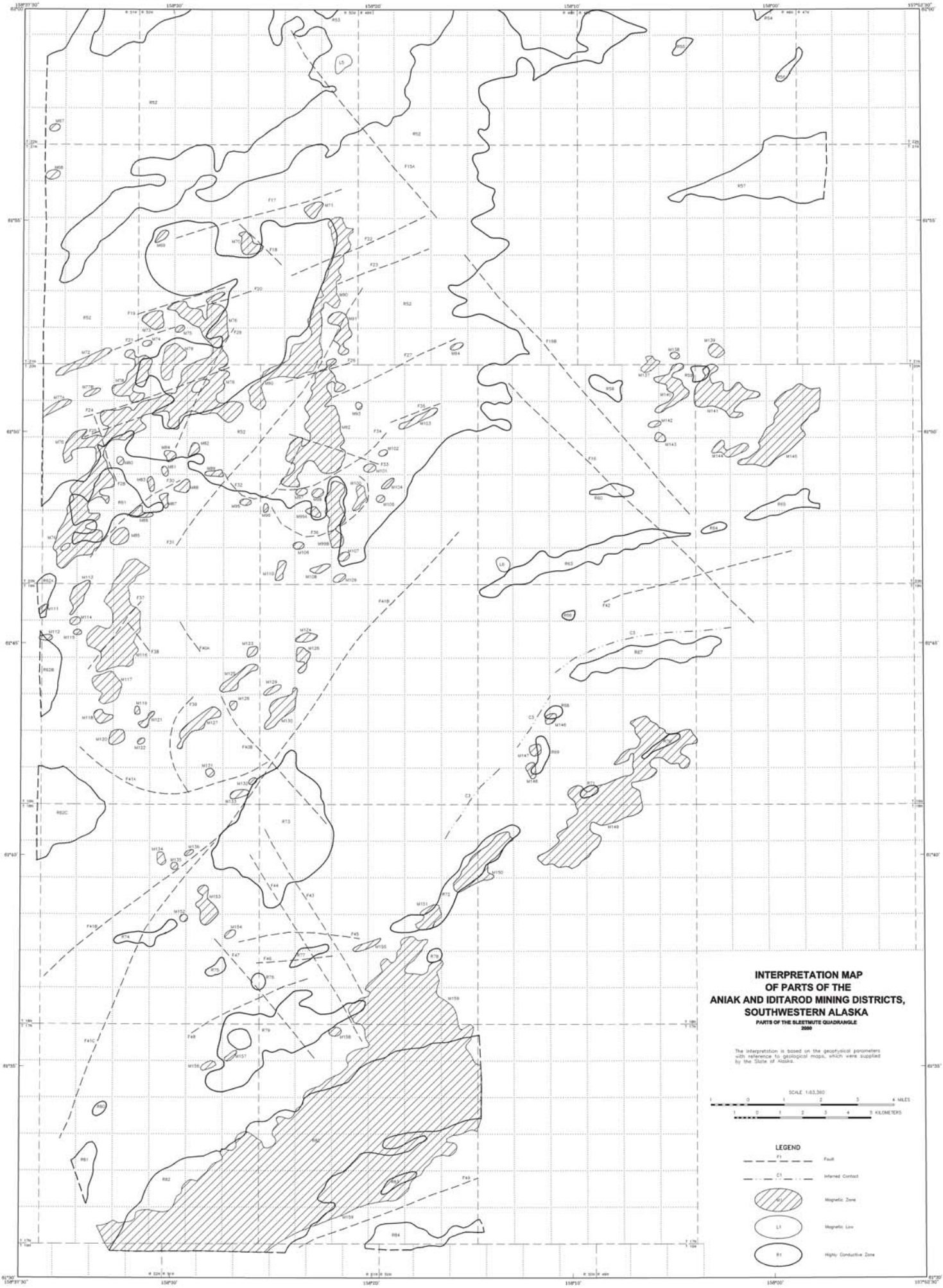
SCALE 1:63,360

1 0 1 2 3 4 MILES
1 0 1 2 3 4 5 KILOMETERS

LEGEND

- F1 — Fault
- C1 — Inferred Contact
- M1 — Magnetic Zone
- L1 — Magnetic Low
- R1 — Highly Conductive Zone





INTERPRETATION MAP OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

PARTS OF THE SLEETMUTE QUADRANGLE
2000

The interpretation is based on the geophysical parameters with reference to geological maps, which were supplied by the State of Alaska.

SCALE 1:63,360

1 0 1 2 3 4 MILES
1 0 1 2 3 4 5 KILOMETERS

LEGEND

F1 — Fault

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M1 — Magnetic Zone

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