NOME ELECTROMAGNETIC AND MAGNETIC AIRBORNE GEOPHYSICAL SURVEY DATA COMPILATION

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Geophysical Report 2019-11

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DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

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NOME ELECTROMAGNETIC AND MAGNETIC AIRBORNE GEOPHYSICAL SURVEY DATA COMPILATION

Burns, L.E.[1], Barefoot, J.D.[1], Woods, Rebecca-Ellen[1], and Stevens Exploration Management Corp.

ABSTRACT

The Nome geophysical survey is located in western Alaska in the Nome mining district, about 825 kilometers west of Fairbanks, Alaska and just north of Nome, Alaska. Frequency domain electromagnetic and magnetic data were collected with the DIGHEMV system from August to September 1993. A total of 3856 line kilometers were collected covering 1361.02 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. Nearly 5 million ounces of placer gold have been produced in the Nome mining district since 1899. Mineral prospects in the survey area include the Rock Creek lode and Bulk Gold. Other gold and base-metal anomalies, altered zones, favorable lithologies, and structural zones are known to exist throughout the survey area.

SURVEY OVERVIEW DESCRIPTION

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

ACKNOWLEDGMENTS

Funding was provided by the Alaska State Legislature as part of the DGGS Airborne Geophysical/Geological Mineral Inventory (AGGMI) program.

KNOWN PROBLEMS

Additional data from non-DGGS Mt. Distin and Nome TWP surveys flown in 1987. The contractor incorporated this data into all grids except for the 56,000 Hz apparent resistivity grid. ESRI ArcMap compatible flightpaths for these surveys are located in the vector directory.

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

AVAILABLE DATA

Data Type	Provider	Description
ascii_data	contractor	ASCII format line data, other ASCII data
databases_geosoft	contractor	Geosoft format database of final line data, other Geosoft format databases
documents	contractor and DGGS	Project and field reports, survey background information, gridded data explanations, other documentation
grids_ermapper	contractor	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	Printable maps in pdf format
maps_prn_format	contractor	Printable maps in HPGL/2 printer file format with extension .prn
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

REFERENCES

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, n. 4, p. 589–602.

Alaska Division of Geological & Geophysical Surveys, WGM, Inc., and Dighem, 1994, Flight lines of Nome Mining district geophysical survey: Alaska Division of Geological & Geophysical Surveys Public Data File 94-1, 1 sheet, scale 1:63,360. http://doi.org/10.14509/1626

Alaska Division of Geological & Geophysical Surveys, WGM, Inc., and Dighem, 1994, 900 Hz coplanar resistivity of the Nome mining district: Alaska Division of Geological & Geophysical Surveys Public Data File 94-2, 1 sheet, scale 1:63,360. http://doi.org/10.14509/1627

Alaska Division of Geological & Geophysical Surveys, WGM, Inc., and Dighem, 1994, 7200 Hz coplanar resistivity of the Nome mining district: Alaska Division of Geological & Geophysical Surveys Public Data File 94-3, 1 sheet, scale 1:63,360. http://doi.org/10.14509/1628

Alaska Division of Geological & Geophysical Surveys, WGM, Inc., and Dighem, 1994, VLF - Electromagnetic contours of Nome mining district: Alaska Division of Geological & Geophysical Surveys Public Data File 94-4, 1 sheet, scale 1:63,360. http://doi.org/10.14509/1629

Alaska Division of Geological & Geophysical Surveys, WGM, Inc., and Dighem, 1994, Total field magnetics and electromagnetic anomalies of the Nome mining district: Alaska Division of Geological & Geophysical Surveys Public Data File 94-5, 4 sheets, scale 1:31,680. http://doi.org/10.14509/1630

Alaska Division of Geological & Geophysical Surveys, WGM, Inc., and Dighem, 1994, Clear mylar version of RI 94-1: Total field magnetics and electromagnetics anomalies of the Nome mining district: Alaska Division of Geological & Geophysical Surveys Public Data File 94-6, 1 sheet, scale 1:63,360. http://doi.org/10.14509/1631

Bundtzen, T.K., Reger, R.D., Laird, G.M., Pinney, D.S., Clautice, K.H., Liss, S.A., and Cruse, G.R., 1994, Progress report on the geology and mineral resources of the Nome mining district, Alaska: Alaska Division of Geological & Geophysical Surveys Public Data File 94-39, 21 p., 2 sheets, scale 1:63,360. http://doi.org/10.14509/1665

Burns, L.E., Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp., 2005, Line, gridded, and vector data, and selected plot files of the airborne geophysical survey data of the Nome mining district, Seward Peninsula, Alaska: Alaska Division of Geological & Geophysical Surveys Geophysical Report 2004-6, 1 DVD. http://doi.org/10.14509/7123

DGGS Staff, Dighem, and WGM, Inc., 1994, Total field magnetics of the Nome mining district: Alaska Division of Geological & Geophysical Surveys Report of Investigation 94-10, 1 sheet, scale 1:63,360. http://doi.org/10.14509/2496

DGGS Staff, Dighem, and WGM, Inc., 1994, Color shadow total field magnetics of the Nome mining district: Alaska Division of Geological & Geophysical Surveys Report of Investigation 94-11, 1 sheet, scale 1:63,360. http://doi.org/10.14509/2497

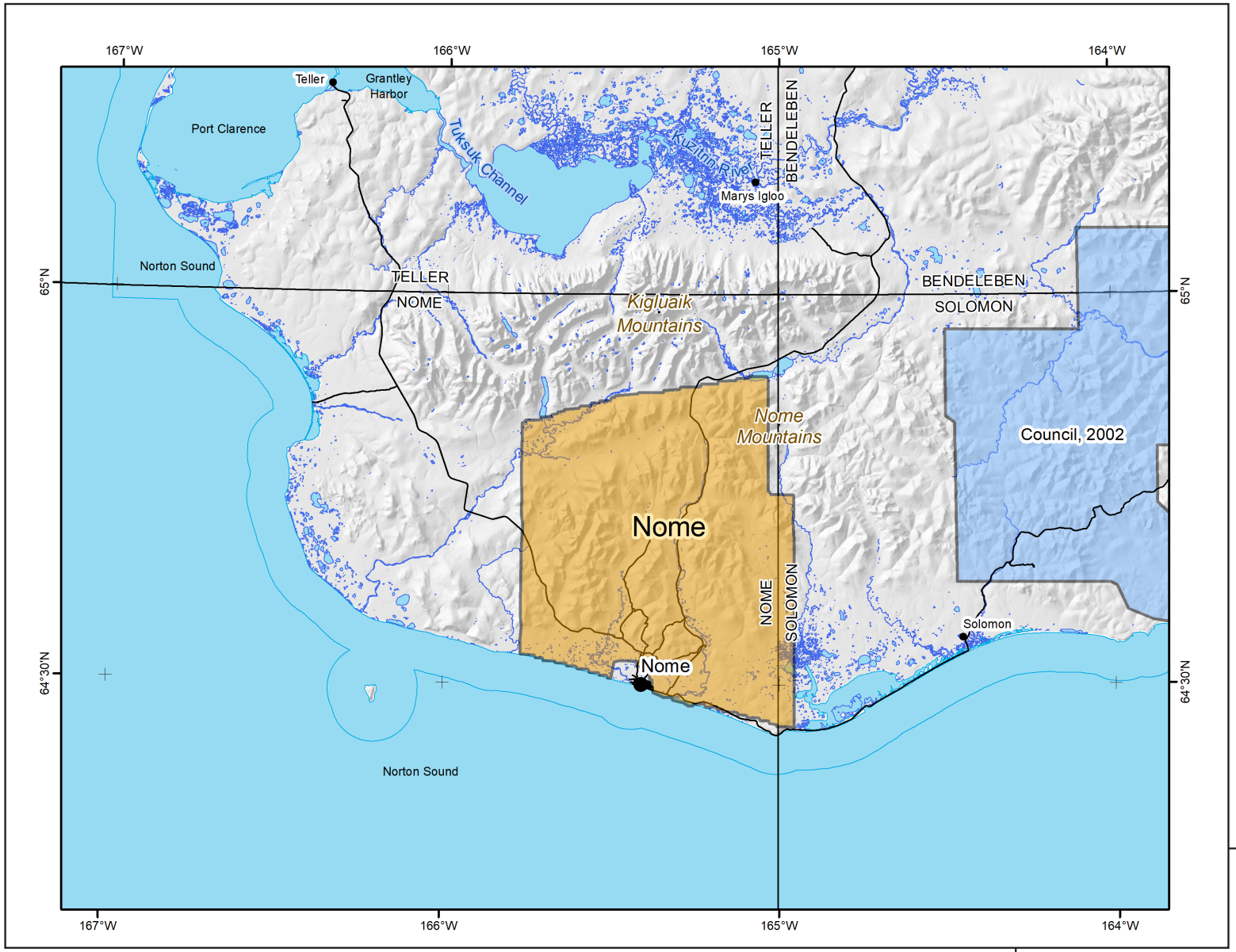
DGGS Staff, Dighem, and WGM, Inc., 1994, 7200 Hz coplanar resistivity of the Nome mining district: Alaska Division of Geological & Geophysical Surveys Report of Investigation 94-12, 1 sheet, scale 1:63,360. http://doi.org/10.14509/2498

DGGS Staff, Dighem, and WGM, Inc., 1994, 900 Hz coplanar resistivity of the Nome mining district: Alaska Division of Geological & Geophysical Surveys Report of Investigation 94-13, 1 sheet, scale 1:63,360. http://doi.org/10.14509/2499

DGGS Staff, Dighem, and WGM, Inc., 1994, CD-ROM digital archive files of 1993 survey data for Nome, Circle, Nyac, and Valdez Creek mining districts: Alaska Division of Geological & Geophysical Surveys Public Data File 94-15, 22 p. http://doi.org/10.14509/1640

DGGS Staff, WGM, Inc., and Dighem, 1994, Total field magnetics and electromagnetic anomalies of the Nome mining district: Alaska Division of Geological & Geophysical Surveys Report of Investigation 94-1, 1 sheet, scale 1:63,360. http://doi.org/10.14509/2487

McConnell, D.L., 1994, Final summary of 1993 airborne geophysical surveys of the Nome, Circle, Nyac, and Valdez Creek areas: Alaska Division of Geological & Geophysical Surveys Public Data File 94-36, 327 p., 4 sheets, scale 1:63,360. http://doi.org/10.14509/1662



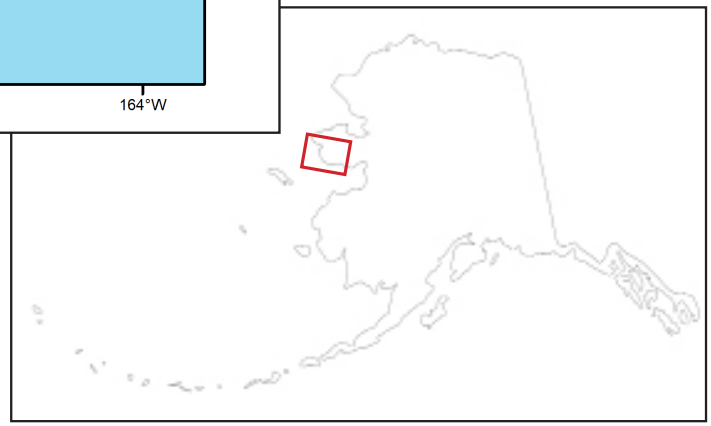


Figure 1. Nome electromagnetic and magnetic airborne geophysical survey location shown in interior Alaska (inset). Nome survey area shown with adjacent DGGS geophysical surveys, landmarks, relevant 1:250,000-scale quadrangle boundaries, mountain ranges, rivers, glaciers, and elevation hillshade.

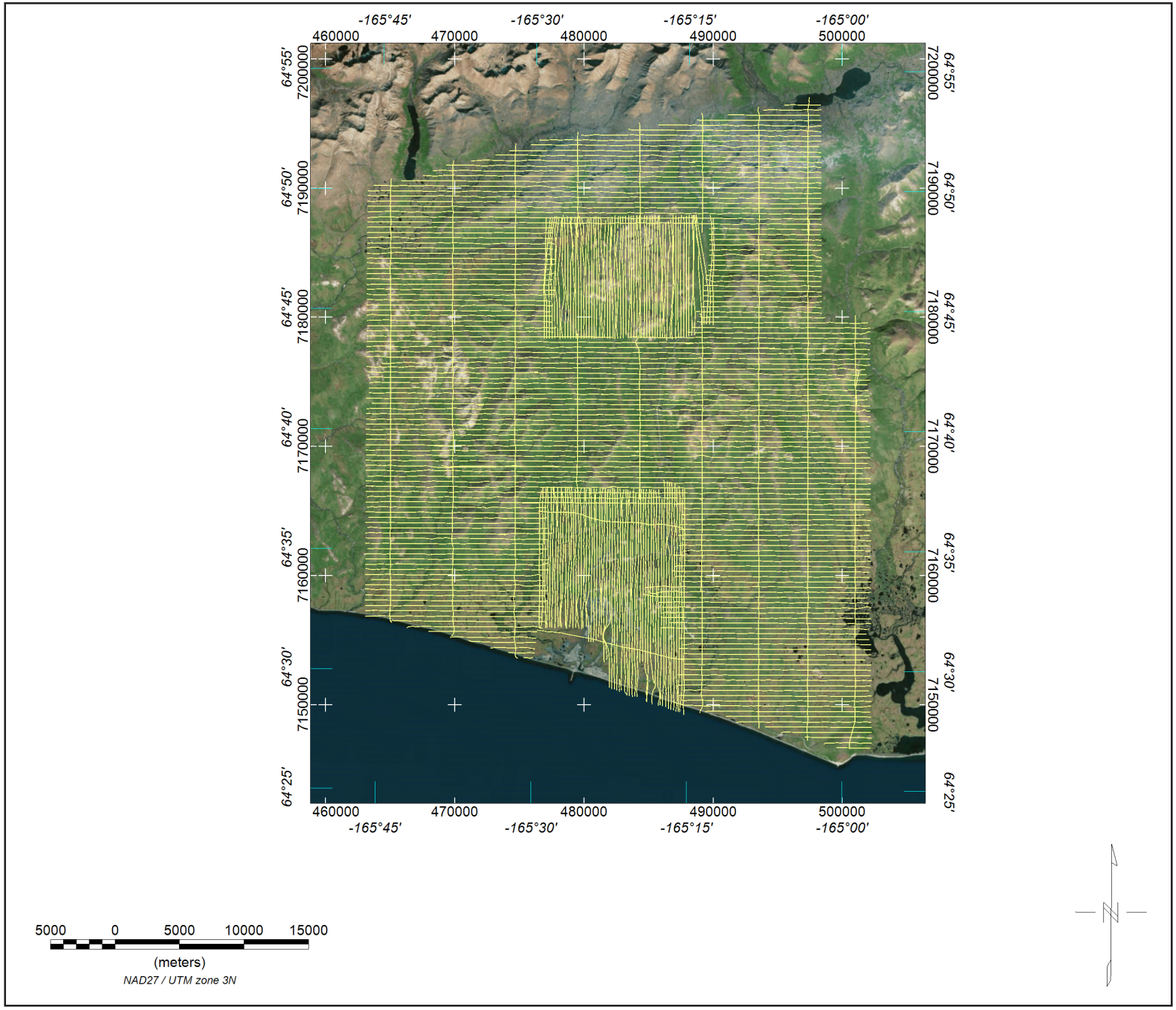


Figure 2. Flight path with orthometric image.

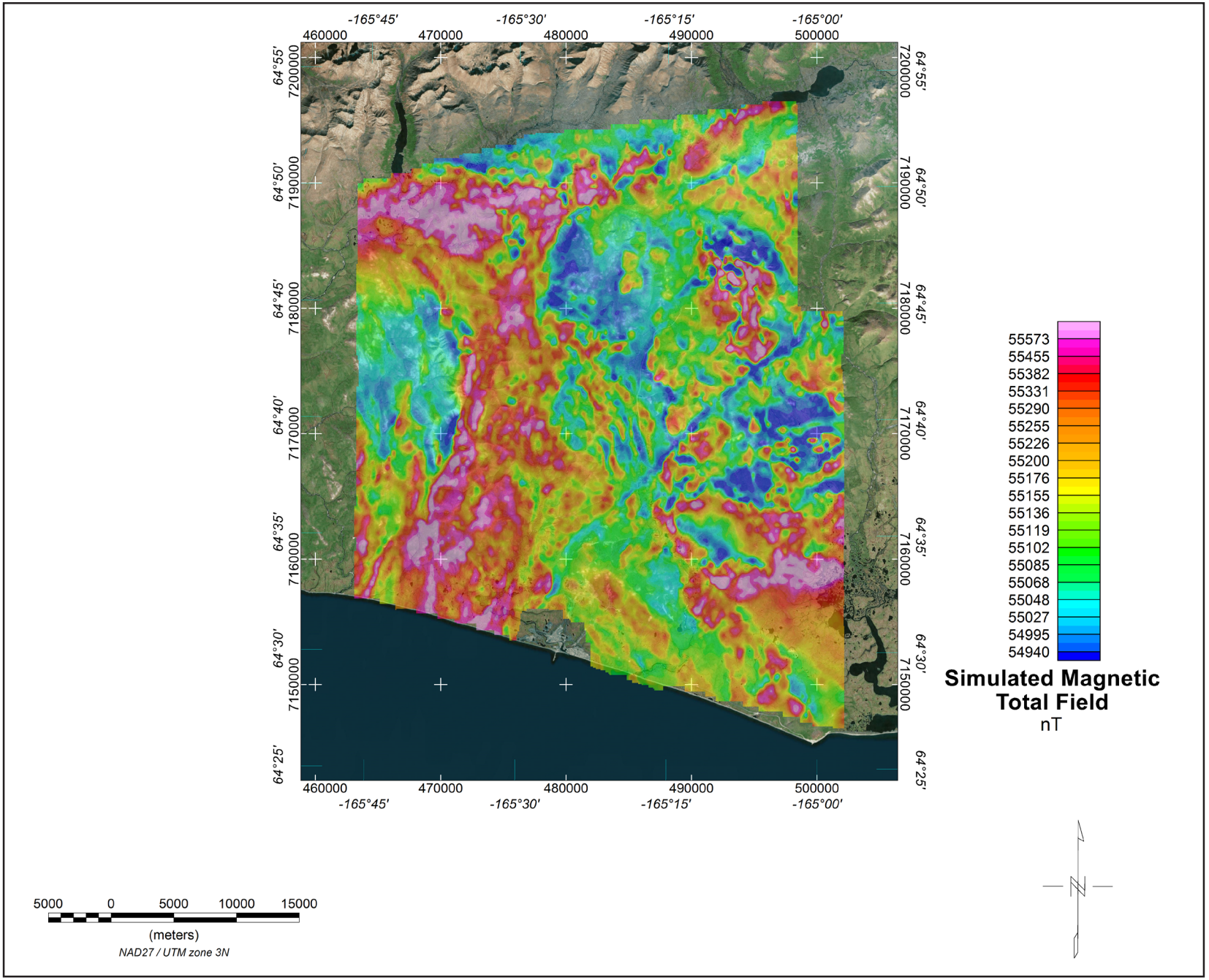


Figure 3. The simulated magnetic total field data were created using digitally recorded data from a Scintrex cesium CS2 magnetometer. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtracting the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 1987, updated August 1993, updated for date of flight and altimeter variations), (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.

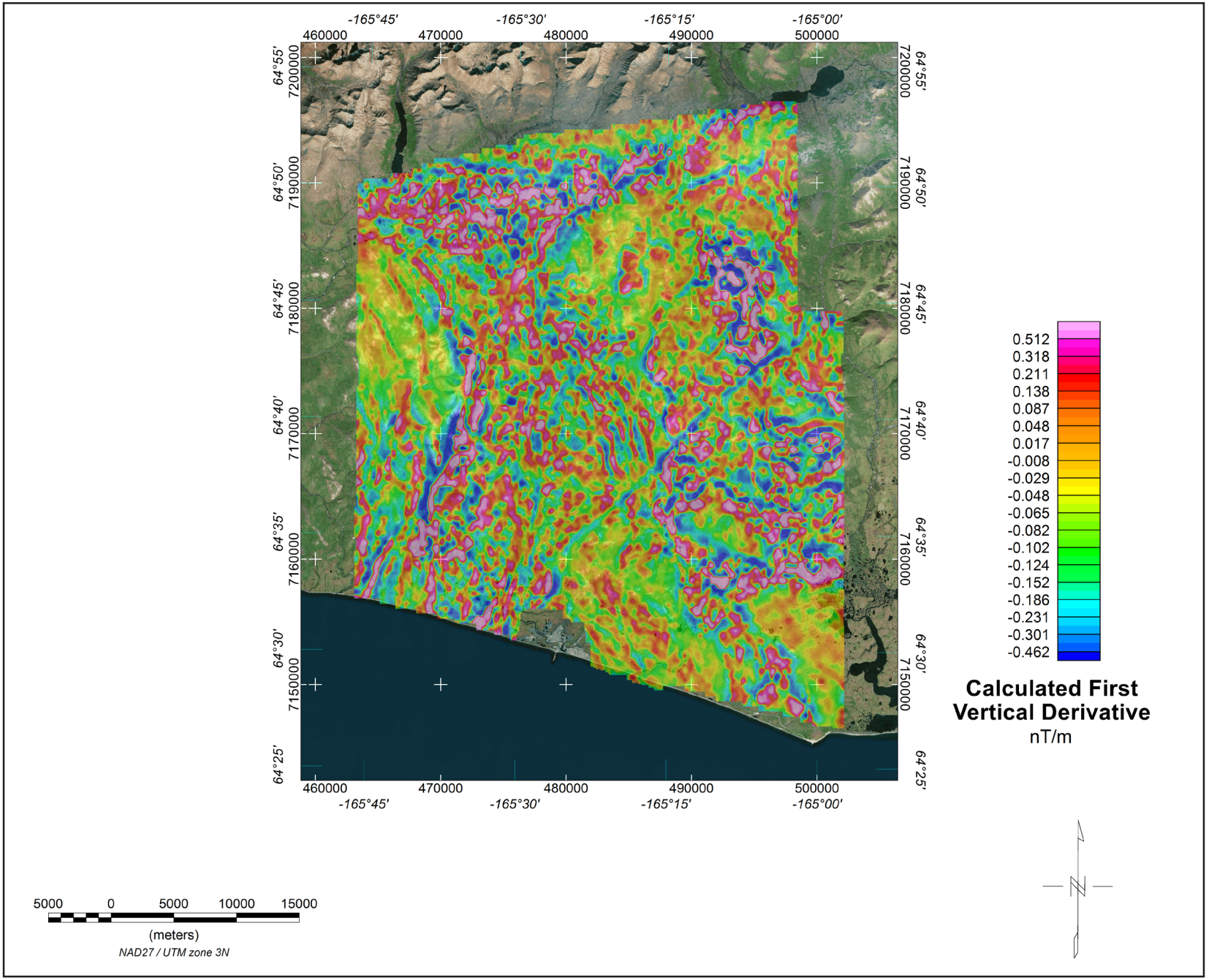


Figure 4. The first vertical derivative grid was calculated from the diurnally-corrected, IGRF-corrected total magnetic field grid using a FFT base frequency domain filtering algorithm. The resulting first vertical derivative grid provides better definition and resolution of near- surface magnetic units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

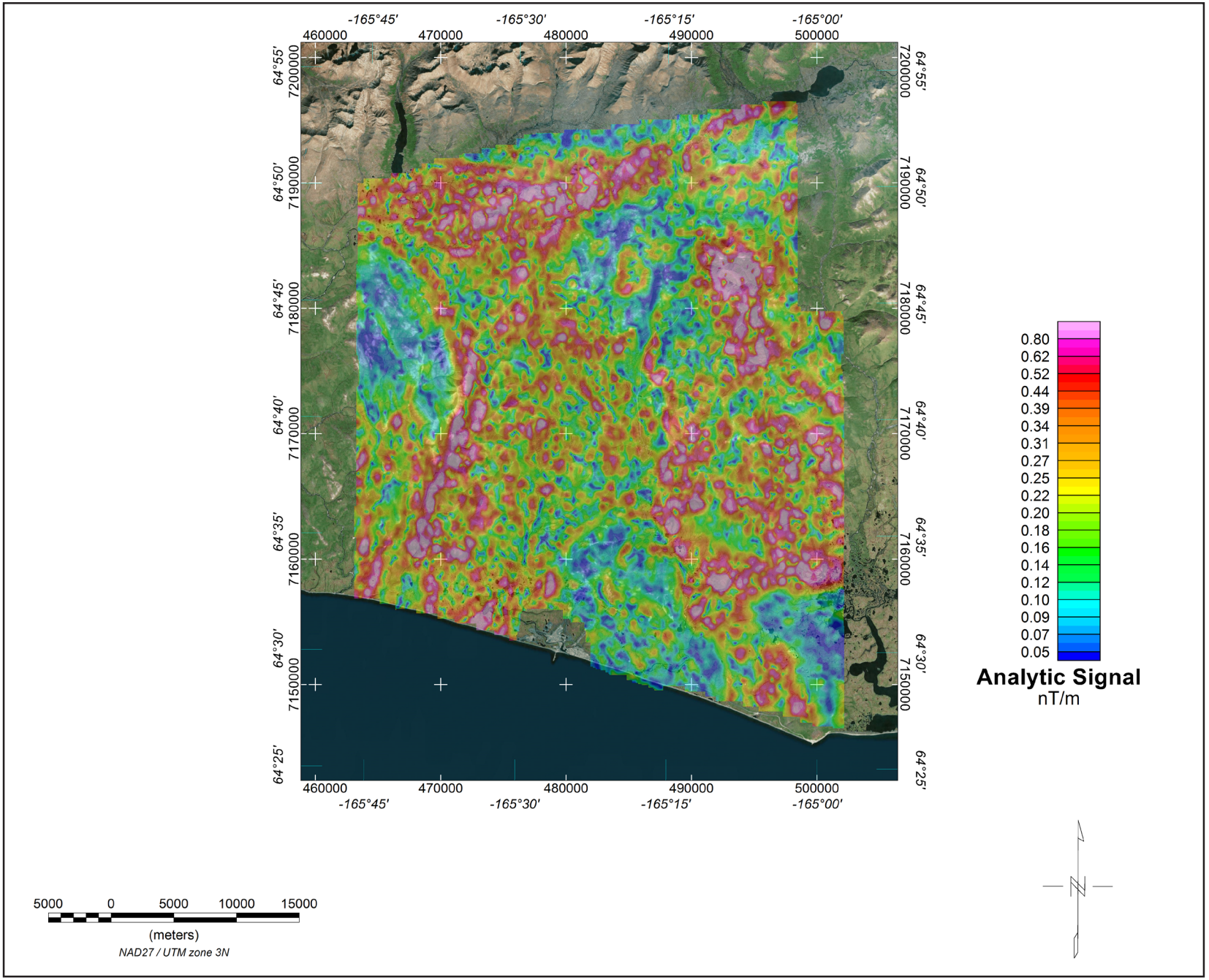


Figure 5. Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source body edges and corners (such as contacts, 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.

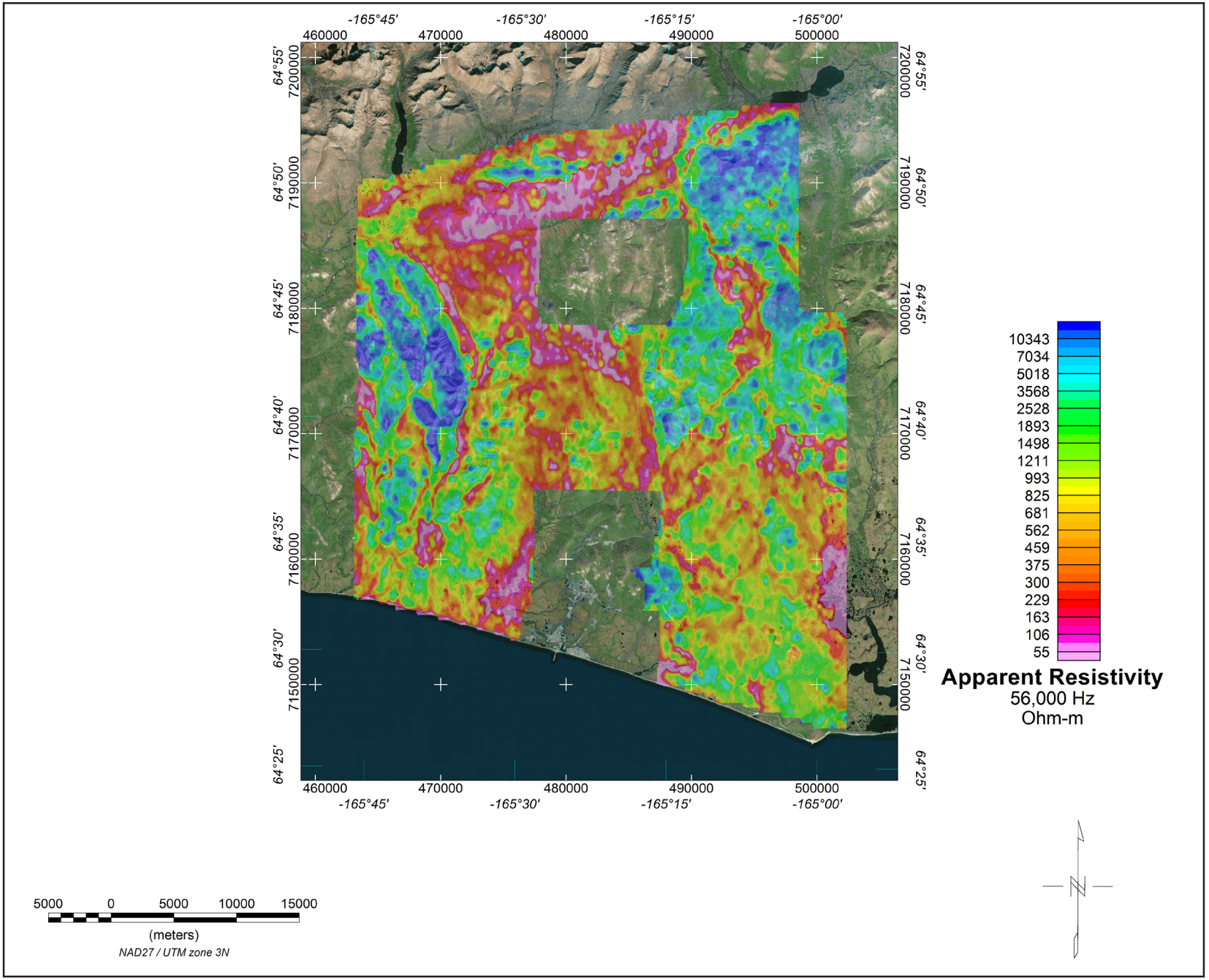


Figure 6. The DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 900 and 5,000 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system 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.

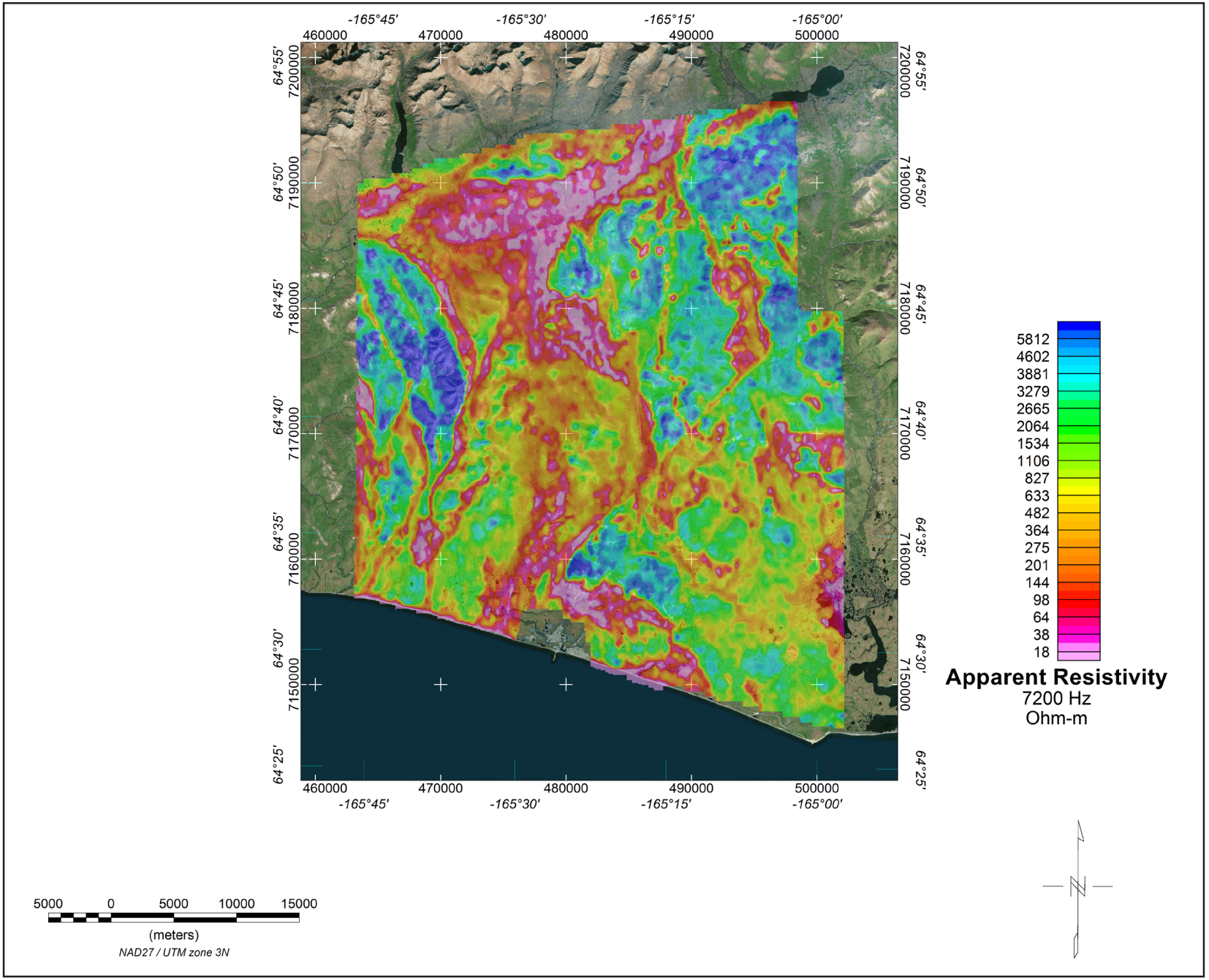


Figure 7. The DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 900 and 5,000 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system 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.

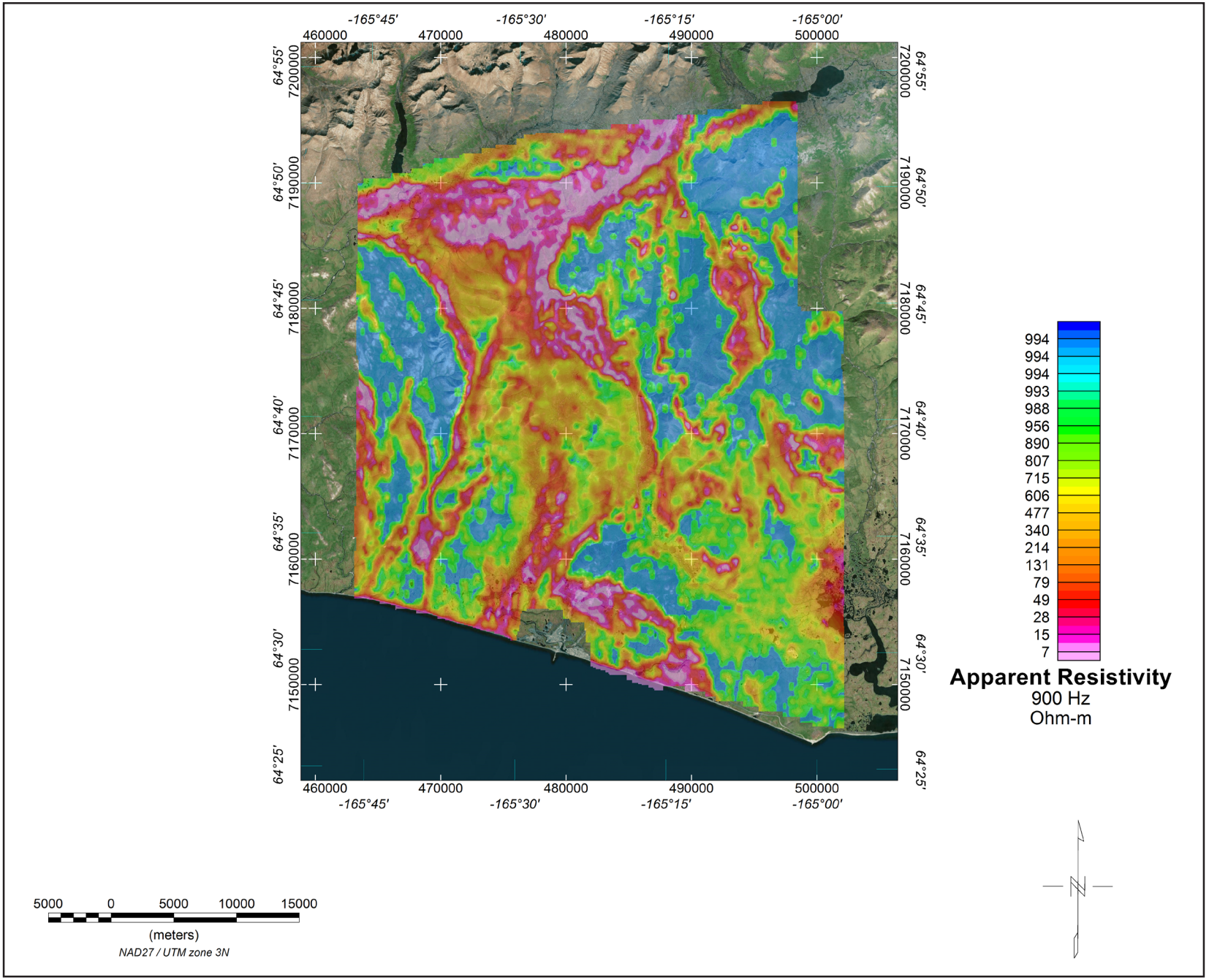
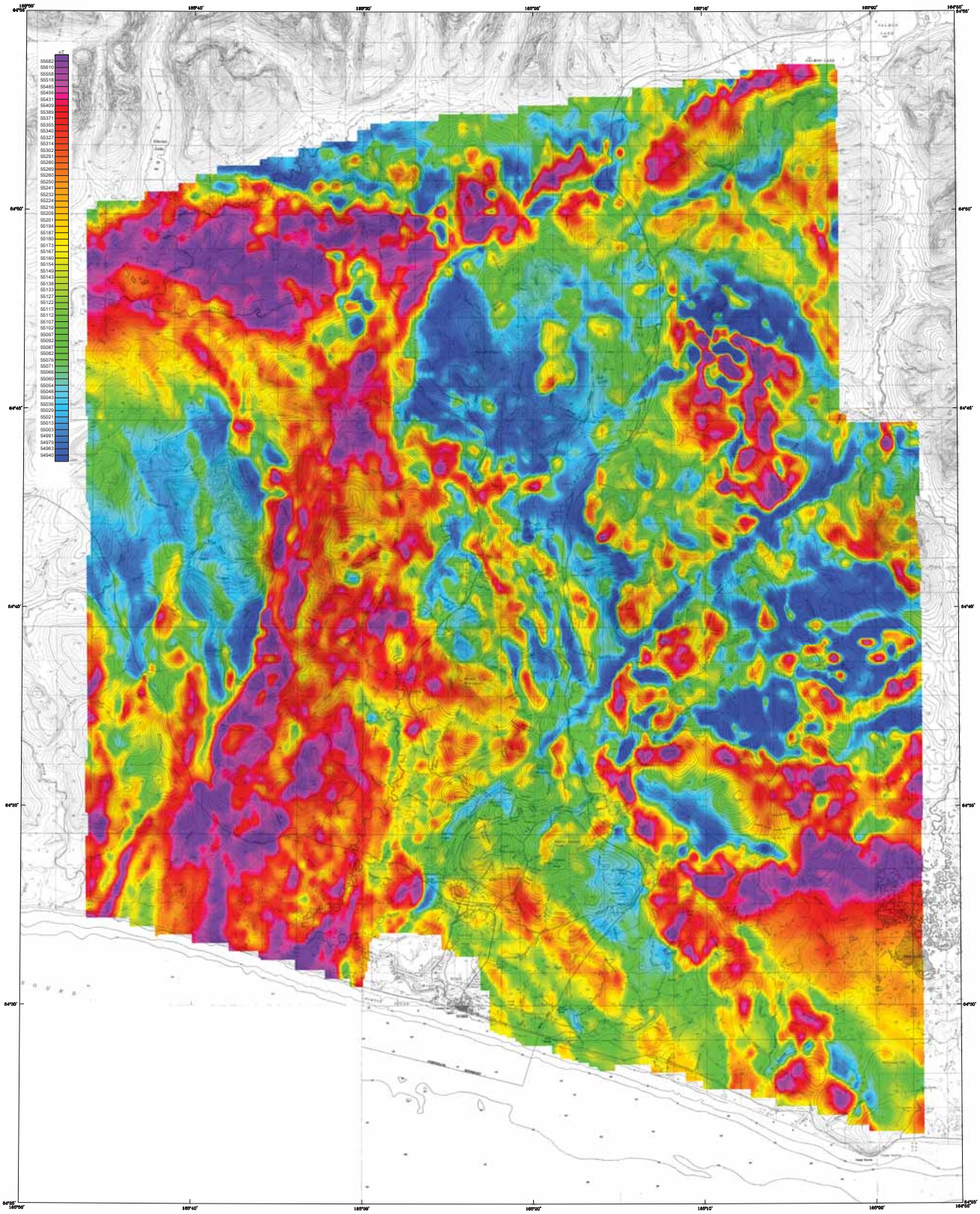


Figure 8. The DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 900 and 5,000 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system 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/10.14509/30189.

Map Title	Description
nome_sim_magtf_topo_map.pdf	simulated magnetic total field grid with topographic base map
nome_sim_magtf_contours_plss_map.pdf	simulated magnetic total field grid and contours with public land survey system grid
nome_res7200hz_topo_map.pdf	7,200 Hz apparent resistivity grid with topographic base map
nome_res7200hz_contours_plss_map.pdf	7,200 Hz apparent resistivity grid and contours with public land survey system grid
nome_res900hz_topo_map.pdf	900 Hz apparent resistivity grid with topographic base map
nome_res900hz_contours_plss_map.pdf	900 Hz apparent resistivity grid and contours with public land survey system grid
nome_interpretation_plss_map	interpretation map based on geophysical data with public land survey system grid



Base from U.S. Geological Survey topographic bases
Nome 2-3, 2-4, 3-3, Solomon 2-2, 2-3, 2-4, Teller 2-2, Candle, Alaska, 1950



SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM IS MEAN SEA LEVEL

TOTAL MAGNETIC FIELD OF THE NOME MINING DISTRICT, SEWARD PENINSULA, ALASKA

PARTS OF NOME AND SOLOMON QUADRANGLES

by

Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.

2004

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system, a Scintrex cesium CS2 magnetometer, and a Herz VLF system installed in an AS350B-2 Squirrel helicopter. In addition, the survey recorded 1 channel from a radar altimeter. Navigation was performed by Trimble and Ashtech GPS receivers. Data was performed at a mean terrain clearance of 200 feet along 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 three miles.

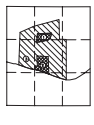
A Sercel Real-Time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight path recovery. The helicopter position was derived every 0.5 seconds using both real-time and post-processing differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM) spheroid, 1927 North American datum using a Central Meridian (CM) of 165°, 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

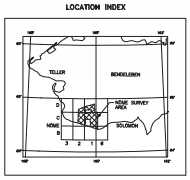
The magnetic total field contours were produced using digitally recorded data from a Scintrex cesium CS2 magnetometer, with a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) leveled 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, 1985, updated to August, 1993) 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.



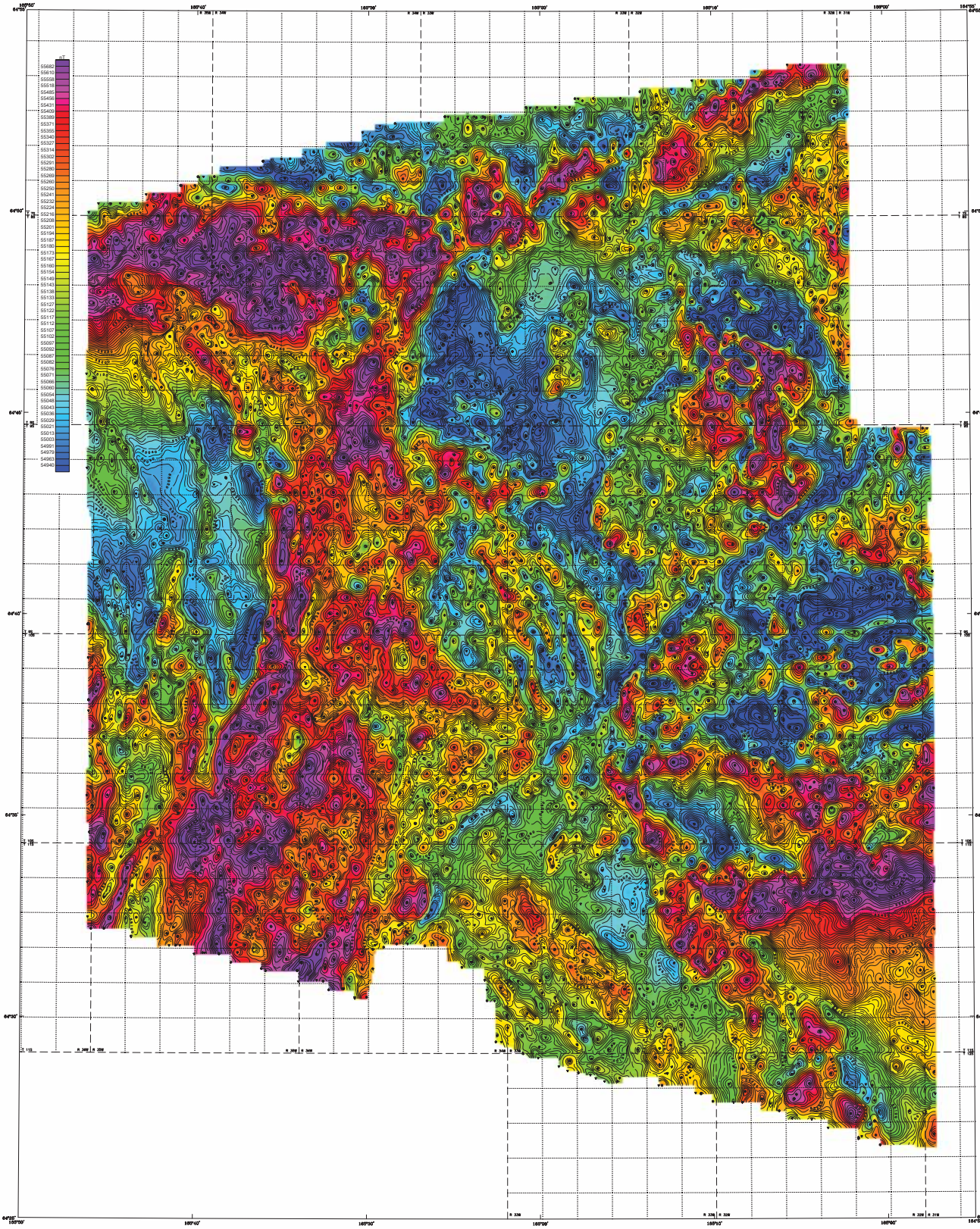


LOCATION INDEX



SURVEY HISTORY

The map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys, and Stevens Exploration Management Corp. The map was produced by Fugro Airborne Surveys and supercedes the earlier full color version released by DGGS in 1994 as Publication 103. Data for areas 1 and 2 were acquired and processed in 1993 under contract between DGGS and WGM, Mining and Geological Consultants, Inc. The data for areas 1 and 2 were provided by Bering Straits Native Corporation. The subcontractor acquiring and processing the data was DIGHEM, a division of CGG Canada Ltd. Other products from this survey are available from DGGS, 3354 College Road, Fairbanks, Alaska, 99709–3707.



Base from USGS 1:63,360 topographic maps
Nome A-1, C-1, C-2, D-1, D-2, Solomon B-2, C-2, D-2, Seahorse, Alaska, 1950

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NOME SURVEY AREA

TOTAL MAGNETIC FIELD OF THE NOME MINING DISTRICT, SEWARD PENINSULA, ALASKA

PARTS OF NOME AND SOLOMON QUADRANGLES

by

Laurel B. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.

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A Sercel Real–Time Differential Global Positioning System (RT–DGPS) was used for both navigation and flight path recovery. The helicopter position was derived every 0.5 seconds using both real–time and post–processing differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM) spheroid, 1927 North American datum using a Central Meridian (CM) of 165°00' and a scale factor at the CM equal to 0.9996000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

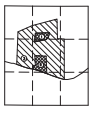
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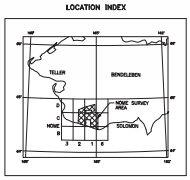
Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

MAGNETIC CONTOUR INTERVAL

- 250 nT
- 50 nT
- 10 nT
- 5 nT
- magnetic low
- magnetic high

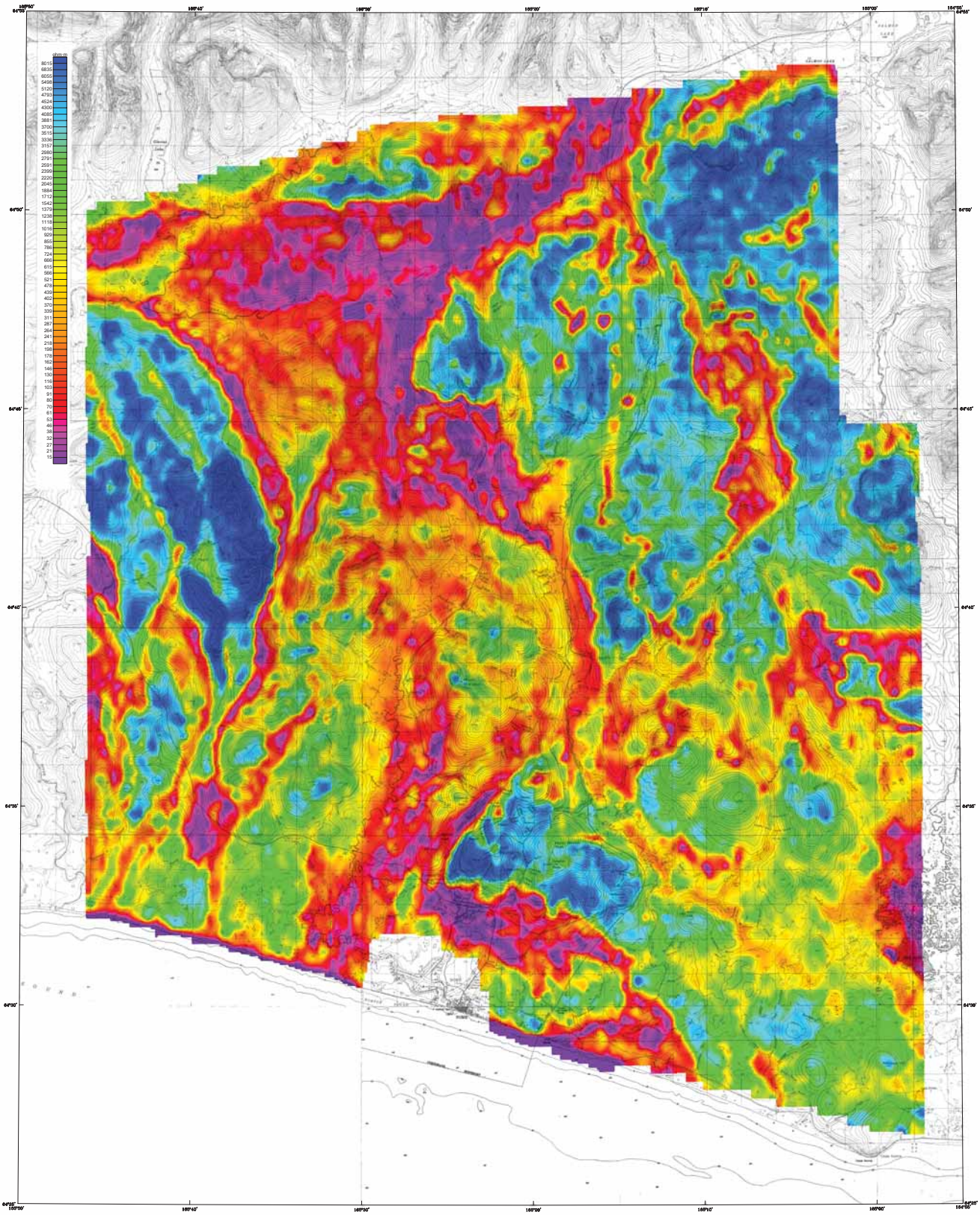


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Base from U.S. Geological Survey topographic bases
Nome D-1; C-1,2; D-1,2; Solomon A-6; C-6; D-6; Candle quadrangles, Alaska, 1950



SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM IS MEAN SEA LEVEL

MAG. VARIES 19° TO 21° EAST

APPROXIMATE MEAN DECLINATION, 1994

7200 Hz COPLANAR APPARENT RESISTIVITY OF THE NOME MINING DISTRICT, SEWARD PENINSULA, ALASKA

PARTS OF NOME AND SOLOMON QUADRANGLES

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2004

DESCRIPTIVE NOTES

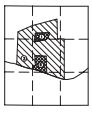
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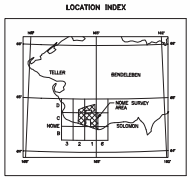
RESISTIVITY

The DIGHEM^V EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil–pairs operated at 900 and 5000 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 conductivity, conductive overburden and cultural features. Apparent resistivity is generated from the inphase and quadrature components of the coplanar 7200 Hz using the pseudo–layer half space model. 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.

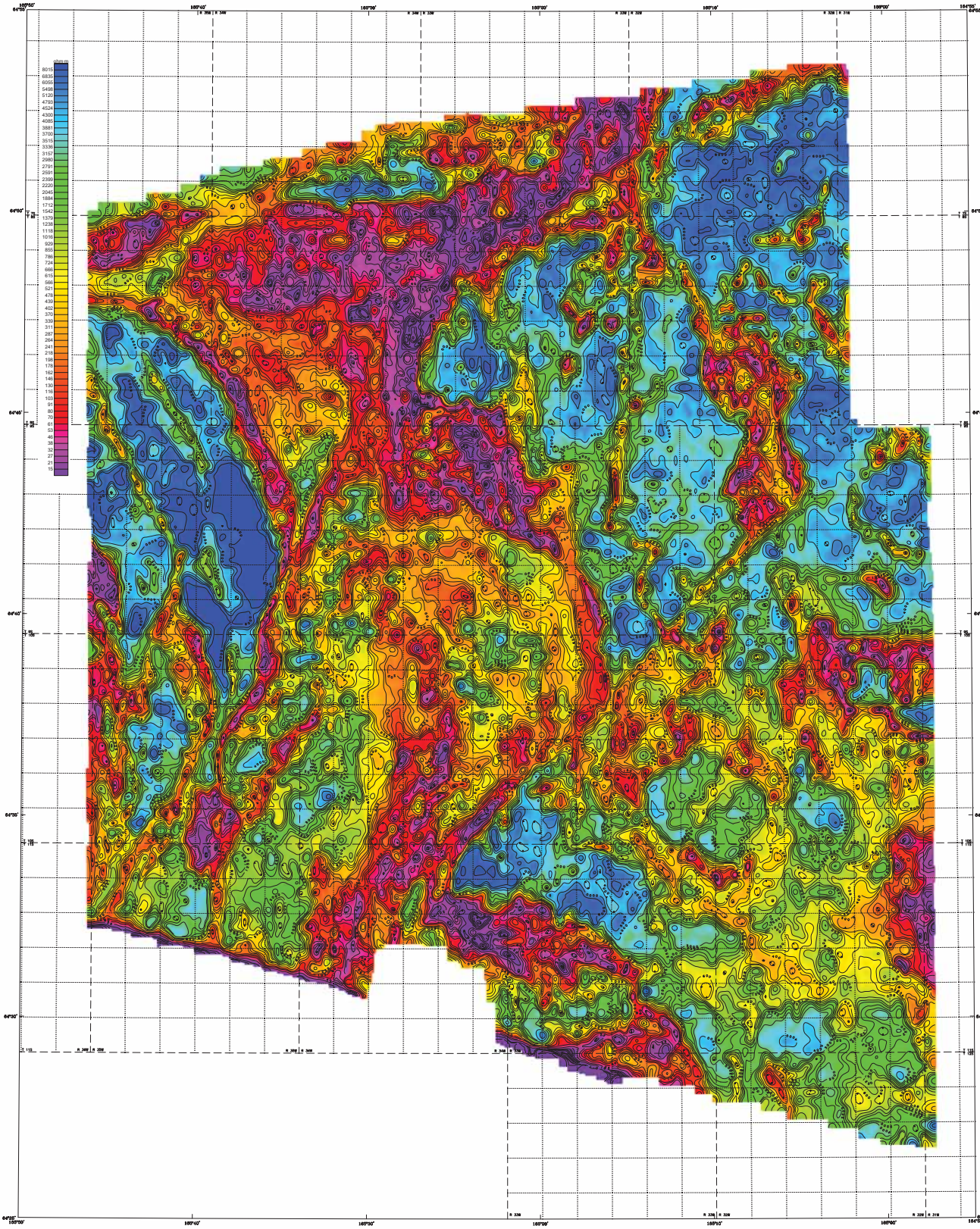


LOCATION INDEX



SURVEY HISTORY

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Base from USGS 1:63,360 Topographic Maps
Nome A-1; C-1,2; D-1,2 Solomon B-2; C-1; D-2 Teller Quadrangles, Alaska, 1950

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NOME SURVEY AREA

7200 Hz COPLANAR APPARENT RESISTIVITY OF THE NOME MINING DISTRICT, SEWARD PENINSULA, ALASKA

PARTS OF NOME AND SOLOMON QUADRANGLES

by

Laurel B. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.

2004

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system, a Scintrex cesium CS2 magnetometer, and a Herz VLF system installed in an AS350 B2 helicopter (registration C-GSUL). Ancillary recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed at a mean terrain clearance of 200 feet along 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 three miles.

A Sercel Real–Time Differential Global Positioning System (RT–DGPS) was used for both navigation and flight path recovery. The helicopter position was derived every 0.5 seconds using both real–time and post–processing differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM) spheroid, 1927 North American datum using a Central Meridian (CM) of 165°W, a latitude of origin of 0° and a scale factor of 0.9996000. 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 5000 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 conductivity, conductive overburden and cultural features. Apparent resistivity is generated from the inphase and quadrature components of the coplanar 7200 Hz using the pseudo–layer half space model. The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

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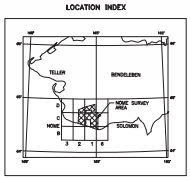
RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm–m at 10 Intervals per decade

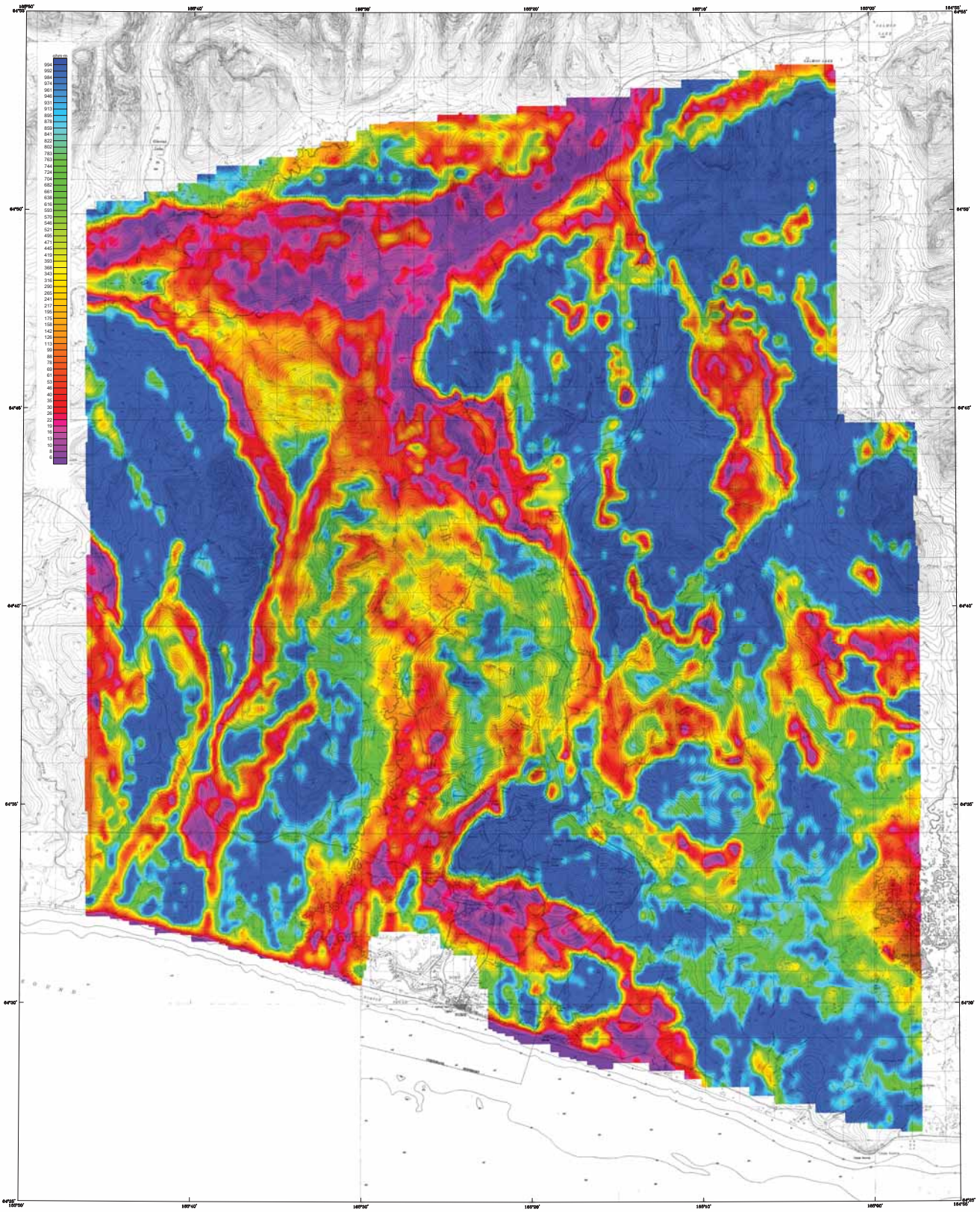
. . . . . resistivity low

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Base from U.S. Geological Survey topographic base:
Nome D-1; C-1,2; D-1,2; Solomon B-6; C-6; D-6; Candle quadrangles, Alaska, 1950



SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM IS MEAN SEA LEVEL



900 Hz COPLANAR APPARENT RESISTIVITY OF THE NOME MINING DISTRICT, SEWARD PENINSULA, ALASKA

PARTS OF NOME AND SOLOMON QUADRANGLES

by

Laurel B. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.

2004

DESCRIPTIVE NOTES

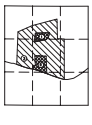
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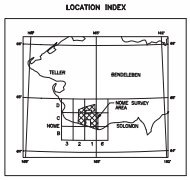
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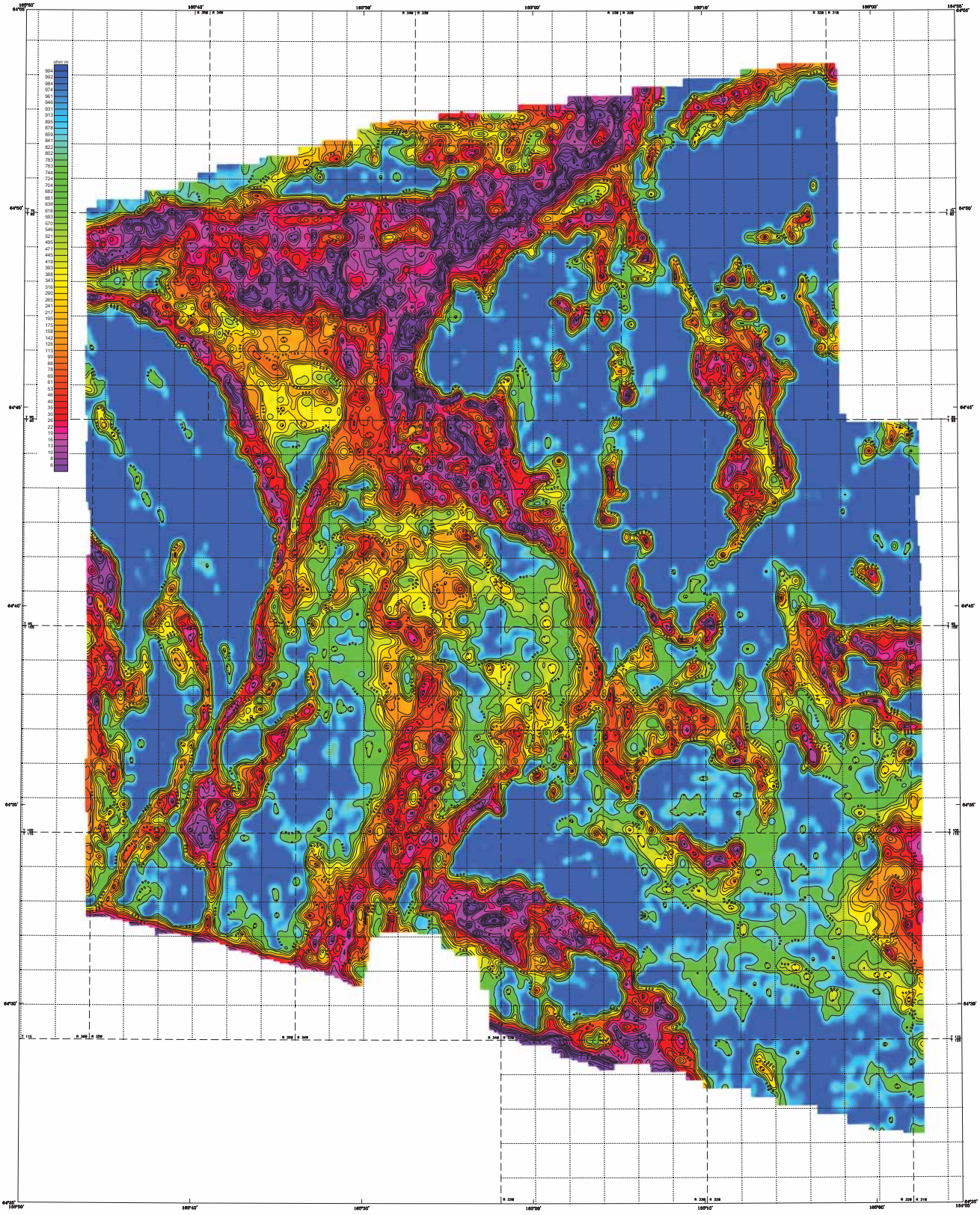


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Base map compiled from U.S. Geological Survey topographic maps
Nome B-1; C-1,2; D-1,2 Solomon B-3; C-3, 4 Candle, Alaska, 1950

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

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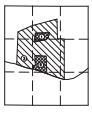
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RESISTIVITY CONTOURS

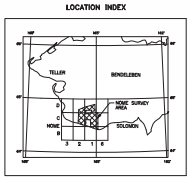
1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm–m at 10 Intervals per decade

. . . . . resistivity low



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INTERPRETATION MAP
OF THE NOME MINING DISTRICT
1994

LEGEND

Fault

Inferred Contact

Conductor Axis

Conductive Zone Boundary

Anticline Axis

The interpretation is based on the geophysical parameters with support from published and preliminary unpublished 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