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KASAAN ELECTROMAGNETIC AND MAGNETIC AIRBORNE GEOPHYSICAL SURVEY DATA COMPILATION

L.E. Burns[1], G.R.C. Graham[1], J.D. Barefoot[1], American copper & Nickel Company, Inc., Geoterrex-Dighem, and WGM, Inc.

ABSTRACT

This geophysical survey is located in southeast Alaska in the Ketchikan area, about 350 kilometers south of Juneau, Alaska. Frequency domain electromagnetic and magnetic data were collected with the DIGHEM^{V} system in May 1992. A total of 679 line kilometers were collected covering 133.6 square kilometers. Line spacing was 200 meters (m). Data were collected approximately 30 m above the ground cover or tree canopy from a helicopter-towed sensor platform ("bird") on a 30-m-long line. The large trees and steep terrain resulted in an average ground clearance of 150 m.

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. The survey area includes several historic copper mines, such as Mamie and Stevenstown, as well as other Cu-Fe skarn prospects, such as Tacoma and Peacock. 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	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

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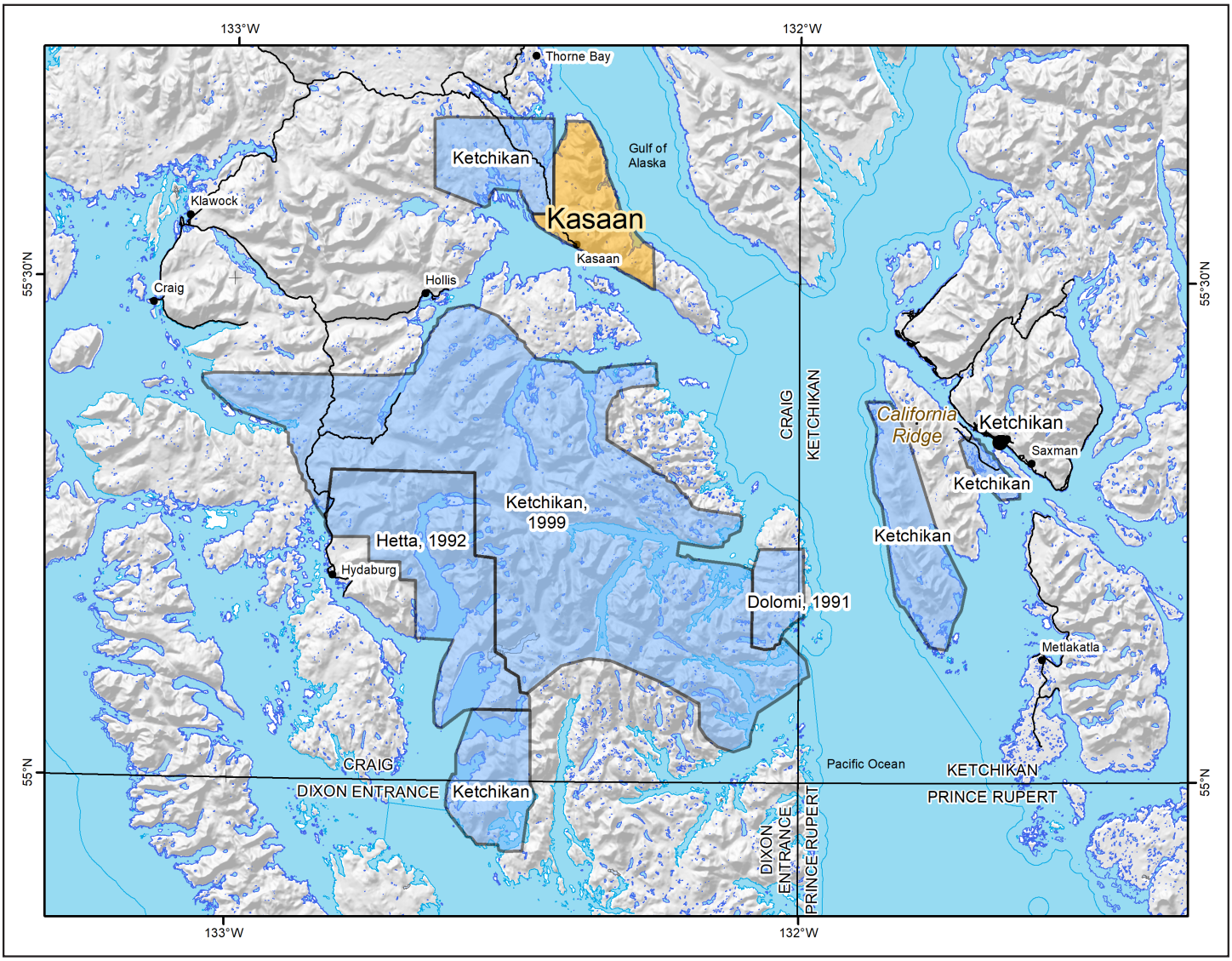


Figure 1. Kasaan electromagnetic and magnetic airborne geophysical survey location shown in interior Alaska (inset). Kasaan survey area shown with adjacent DGGS geophysical surveys, landmarks, relevant 1:250,000-scale quadrangle boundaries, mountain ranges, rivers, glaciers, and elevation hillshade.

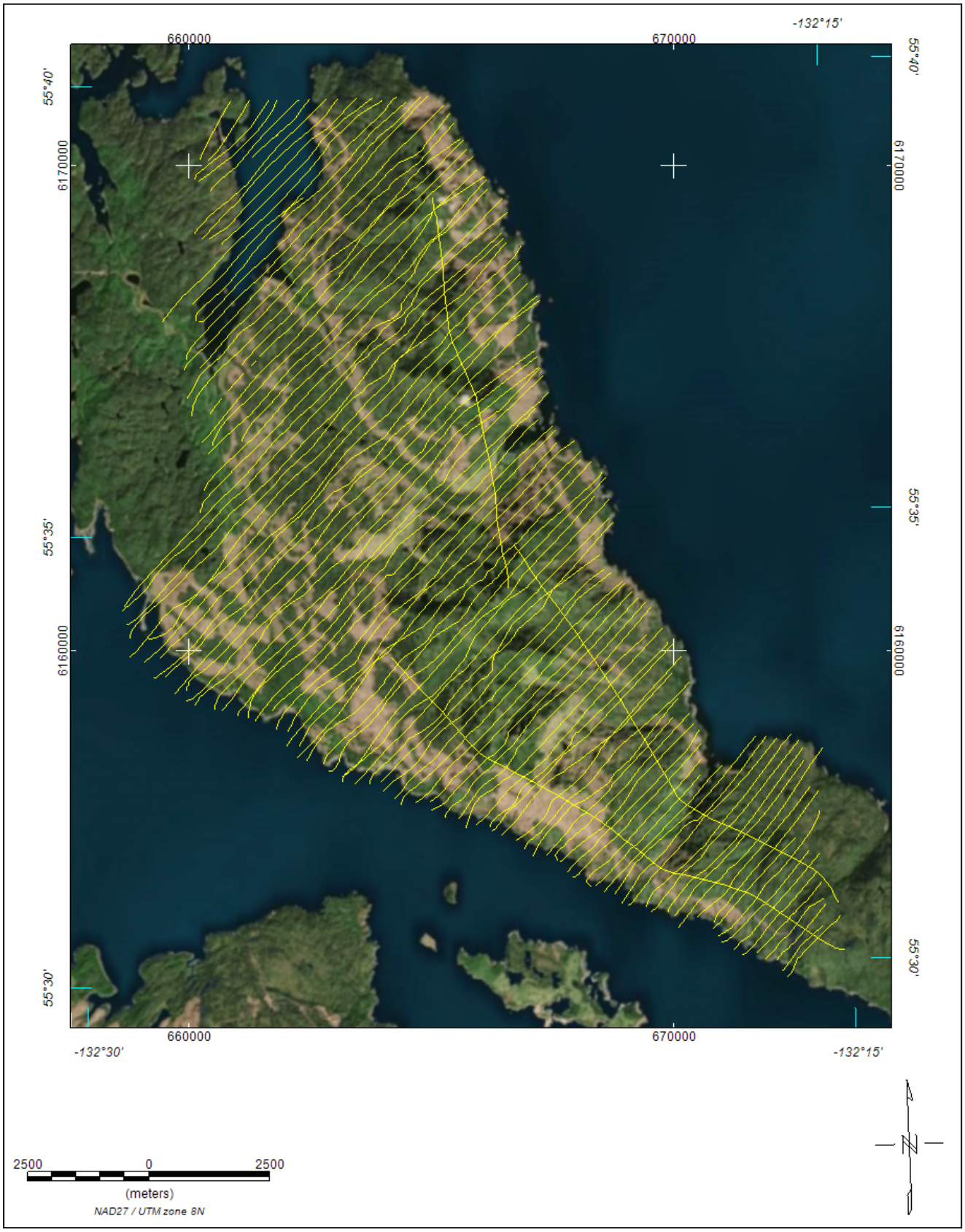


Figure 2. Flight path with orthometric image.

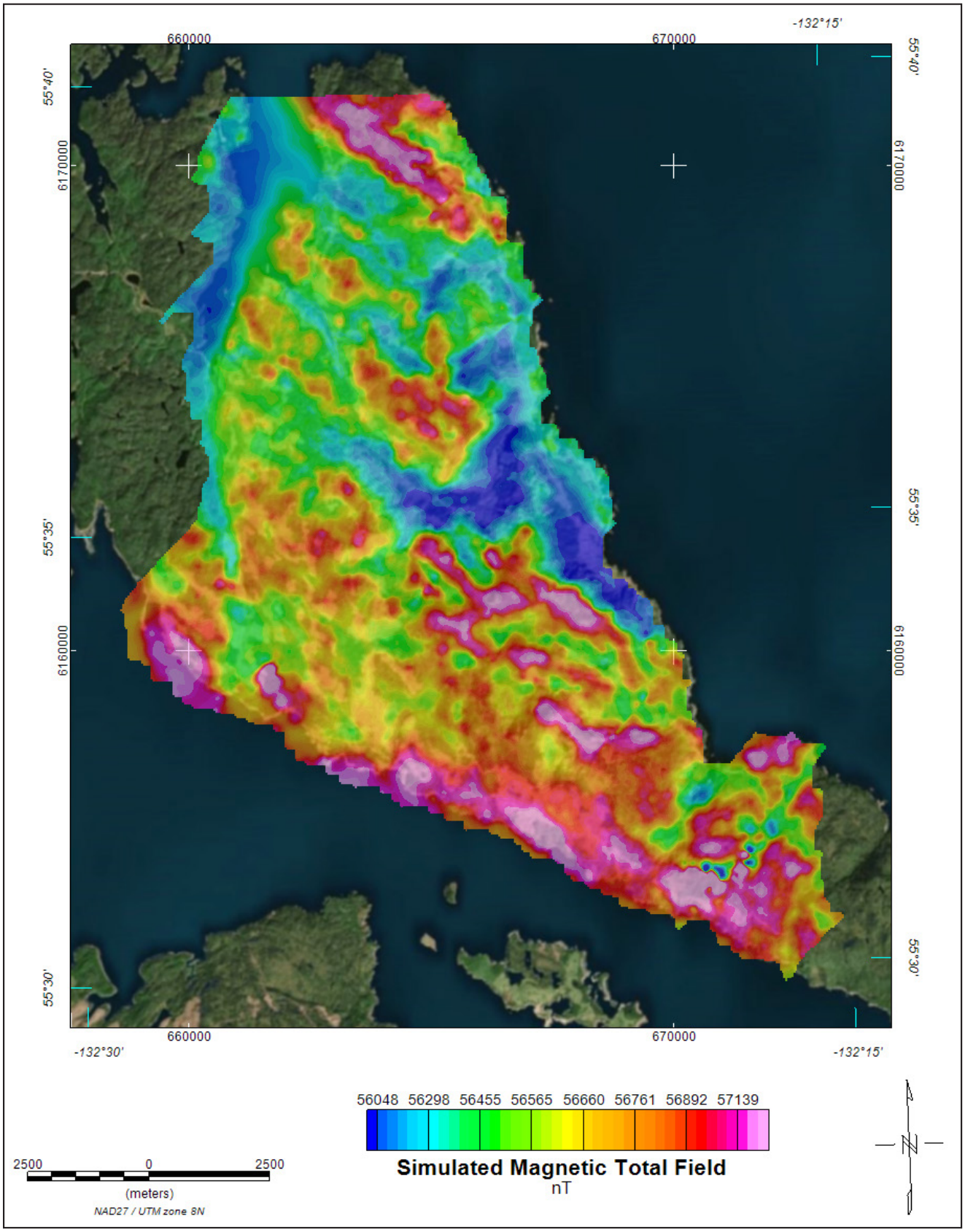


Figure 3. Simulated magnetic total field grid with orthometric image. The magnetic total field data were processed using digitally recorded data from a Scintrex cesium magnetometer. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtracting the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 1995, updated to March 1999), (3) leveled to the tie line data, (4) a constant value of approximately 57,000 nT was added to all data, and (5) interpolated onto a regular 50 m (1991 and 1992 surveys) or 100 m (1999 survey) grid using a modified Akima (1970) technique.

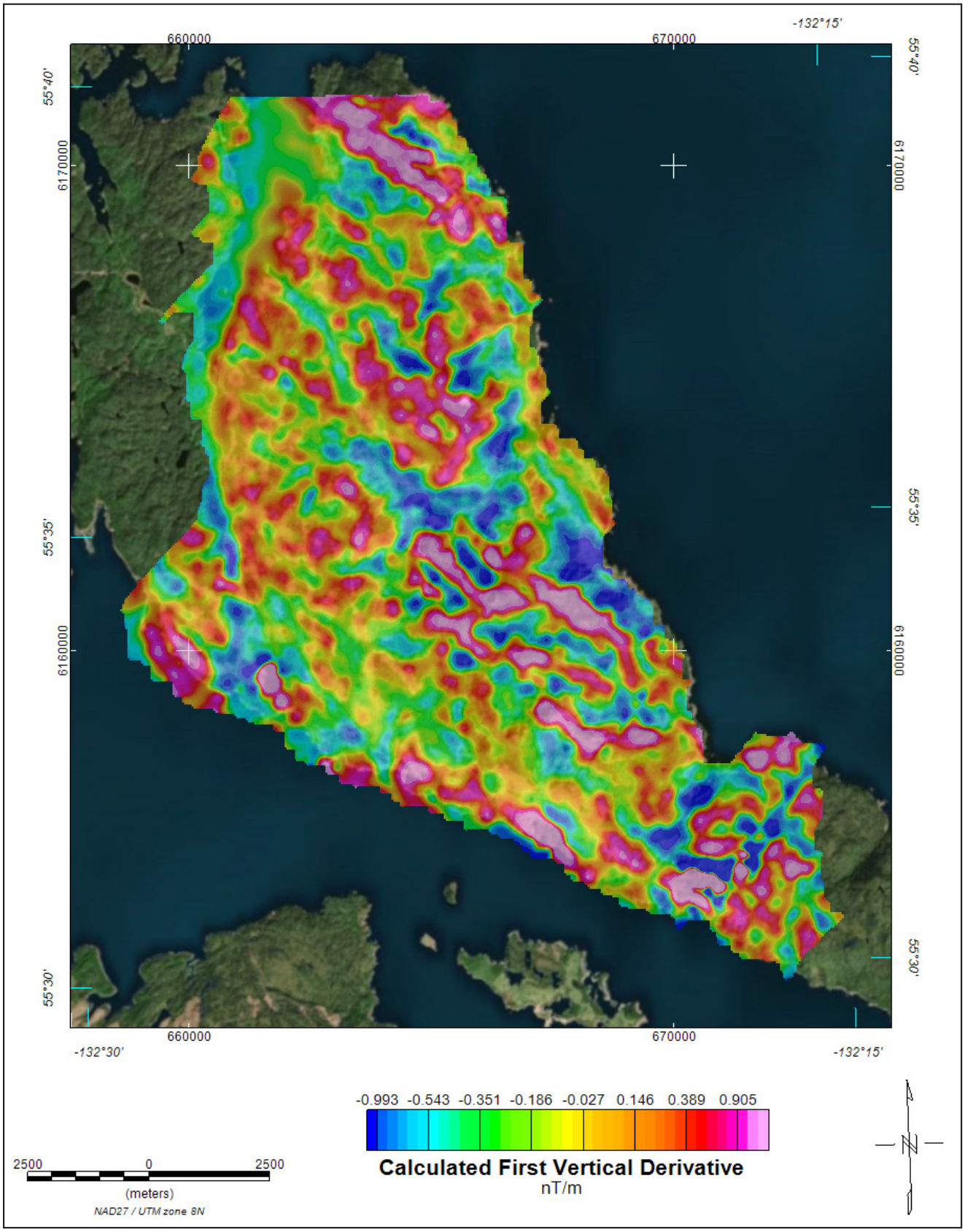


Figure 4. Calculated first vertical derivative grid with orthometric image. The first vertical derivative grid was calculated from the diurnally-corrected, IGRF-corrected total magnetic field grid using a FFT base frequency domain filtering algorithm. The resulting first vertical derivative grid provides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

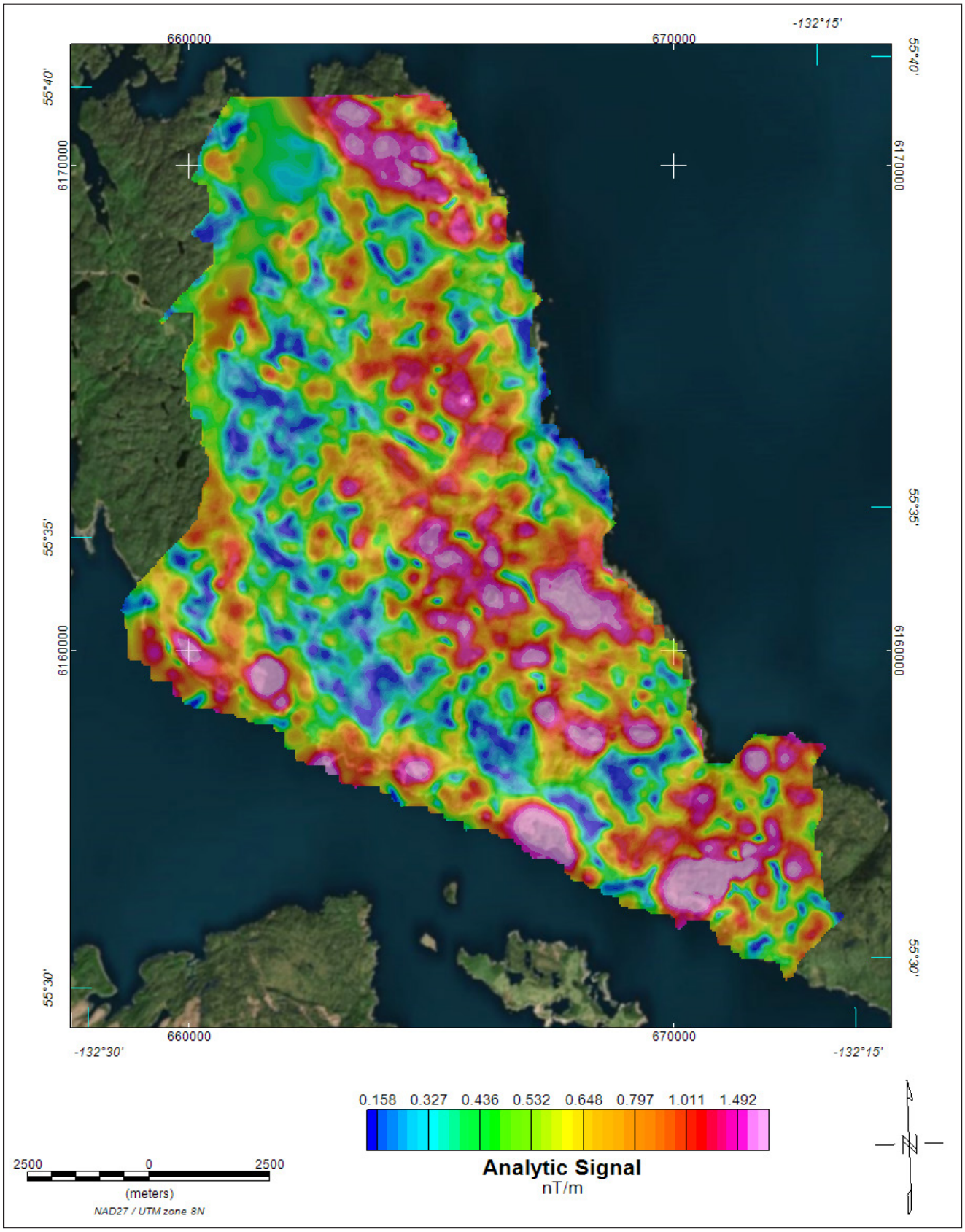


Figure 5. Analytic signal grid with orthometric image. Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source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

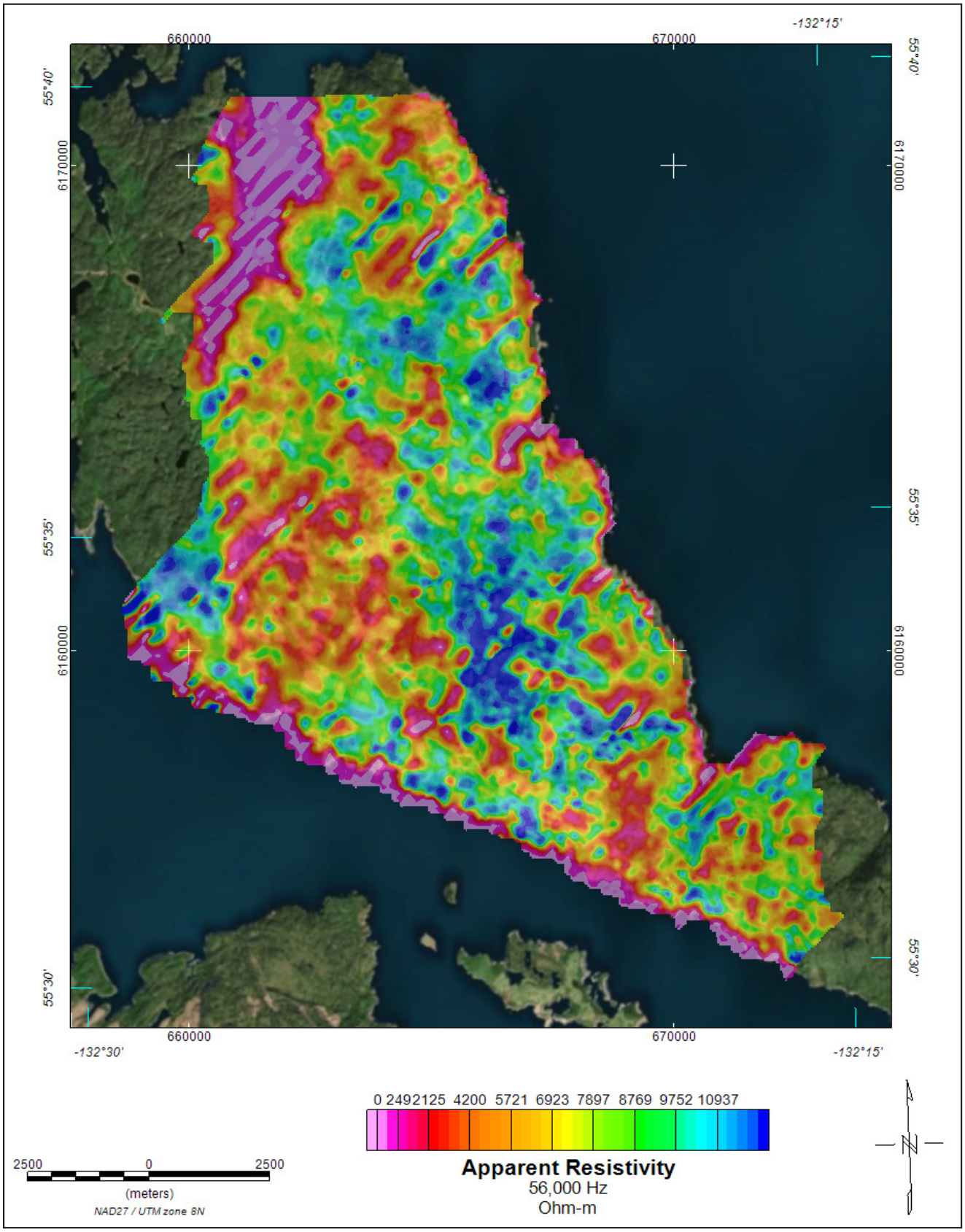


Figure 6. 56,000 Hz coplanar apparent resistivity grid with orthometric image. The DIGHEMI^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 900 and 7,200 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 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 50 m (1991 and 1992 surveys) or 100 m (1999 survey) grid using a modified Akima (1970). technique.

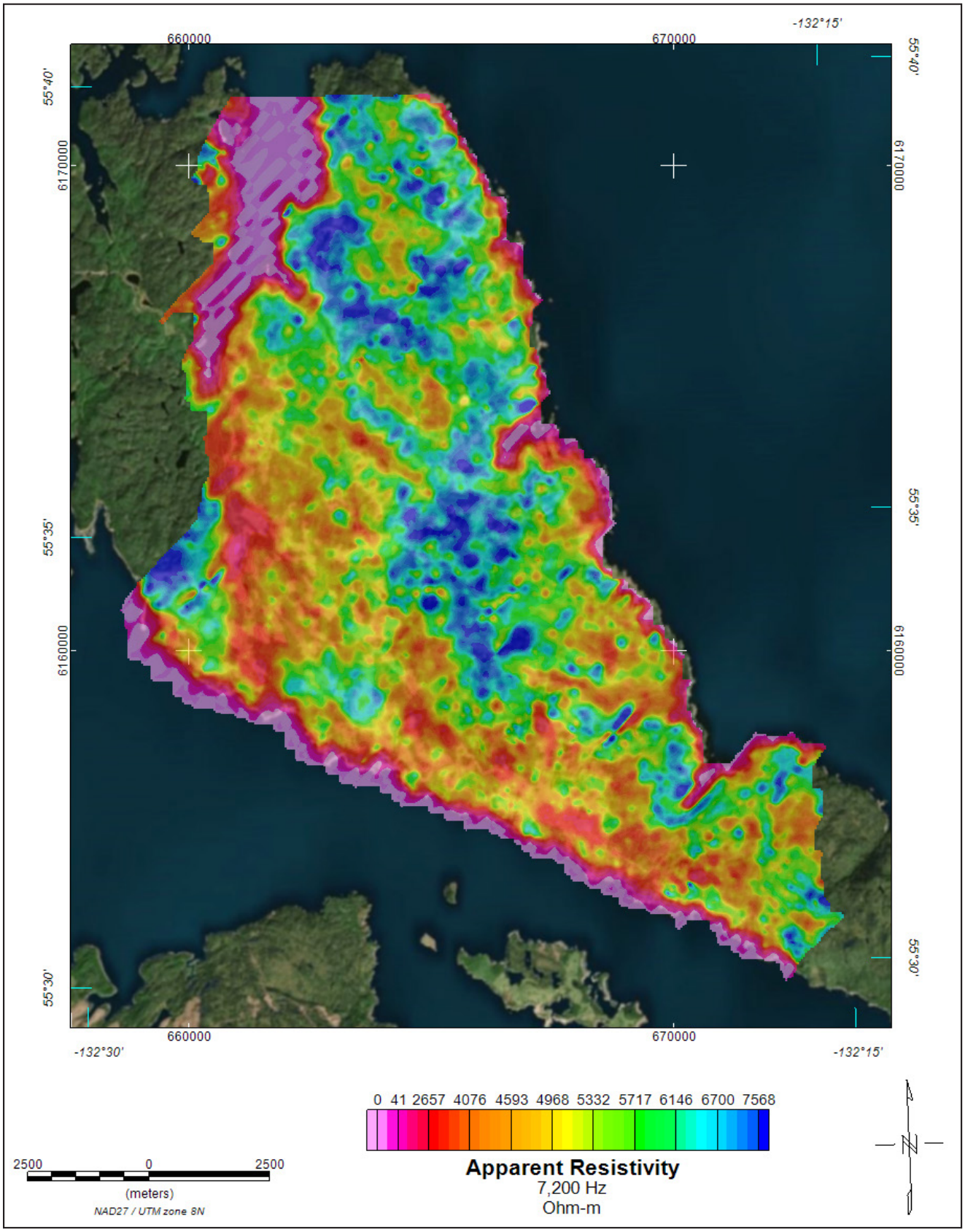


Figure 7. 7,200 Hz coplanar apparent resistivity grid with orthometric image. The DIGHEMI^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 900 and 7,200 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 56,000 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 50 m (1991 and 1992 surveys) or 100 m (1999 survey) grid using a modified Akima (1970). technique.

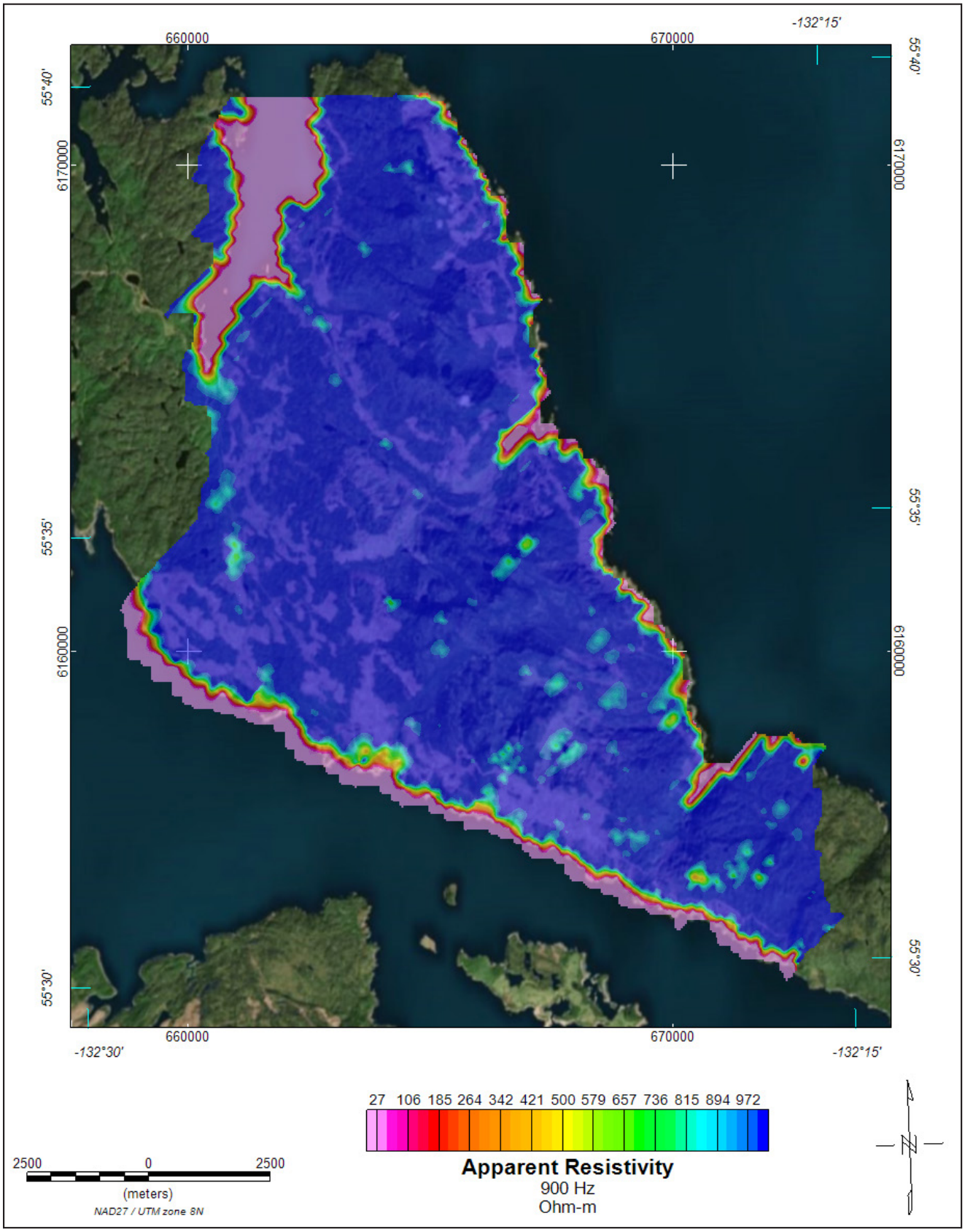


Figure 8. 900 Hz coplanar apparent resistivity grid with orthometric image. The DIGHEMI^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 900 and 7,200 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 56,000 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 50 m (1991 and 1992 surveys) or 100 m (1999 survey) 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/10.14509/30432

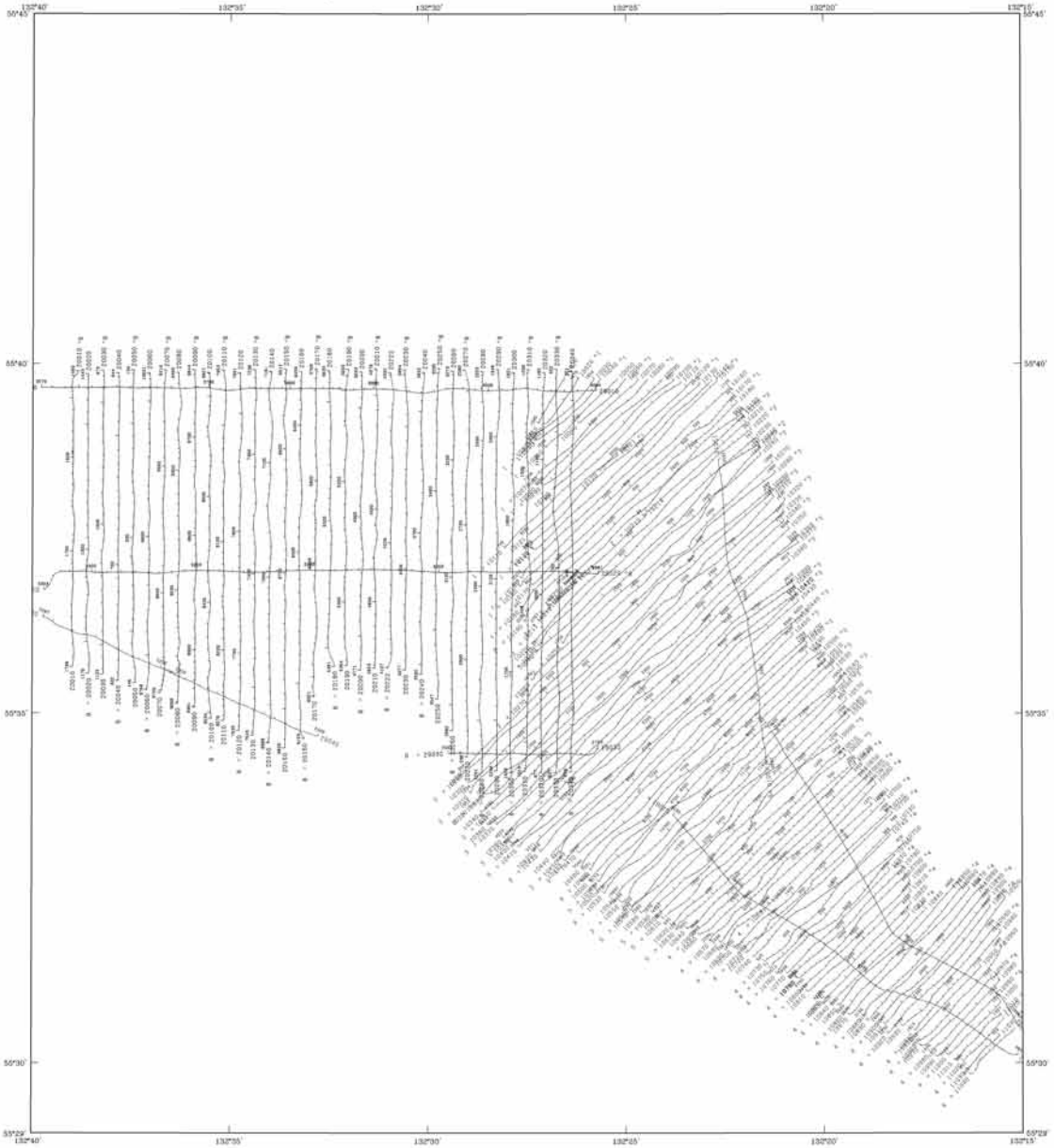
Map Title	Description
kasaan_flightpath_map_1of4.pdf	flight lines
kasaan_flightpath_map_2of4.pdf	flight lines
kasaan_flightpath_map_3of4.pdf	flight lines
kasaan_flightpath_map_4of4.pdf	flight lines
kasaan_sim_magtf_topo_map_1of4.pdf	simulated magnetic total field grid with topographic base map
kasaan_sim_magtf_topo_map_2of4.pdf	simulated magnetic total field grid with topographic base map
kasaan_sim_magtf_topo_map_3of4.pdf	simulated magnetic total field grid with topographic base map
kasaan_sim_magtf_topo_map_4of4.pdf	simulated magnetic total field grid with topographic base map
kasaan_sim_magtf_contours_plss_map_1of4.pdf	simulated magnetic total field grid and contours with public land survey system base layer
kasaan_sim_magtf_contours_plss_map_2of4.pdf	simulated magnetic total field grid and contours with public land survey system base layer
kasaan_sim_magtf_contours_plss_map_3of4.pdf	simulated magnetic total field grid and contours with public land survey system base layer
kasaan_sim_magtf_contours_plss_map_4of4.pdf	simulated magnetic total field grid and contours with public land survey system base layer
kasaan_sim_magtf_shaded_plss_map_1of4.pdf	shaded simulated magnetic total field grid with public land survey system base layer
kasaan_sim_magtf_shaded_plss_map_2of4.pdf	shaded simulated magnetic total field grid with public land survey system base layer
kasaan_sim_magtf_shaded_plss_map_3of4.pdf	shaded simulated magnetic total field grid with public land survey system base layer
kasaan_sim_magtf_shaded_plss_map_4of4.pdf	shaded simulated magnetic total field grid with public land survey system base layer
kasaan_res56khz_topo_map_1of4.pdf	56,000 Hz apparent resistivity grid with topographic base map
kasaan_res56khz_topo_map_2of4.pdf	56,000 Hz apparent resistivity grid with topographic base map
kasaan_res56khz_topo_map_3of4.pdf	56,000 Hz apparent resistivity grid with topographic base map
kasaan_res56khz_topo_map_4of4.pdf	56,000 Hz apparent resistivity grid with topographic base map
kasaan_res56khz_contours_plss_map_1of4.pdf	56,000 Hz apparent resistivity grid with contours and public land survey system base layer
kasaan_res56khz_contours_plss_map_2of4.pdf	56,000 Hz apparent resistivity grid with contours and public land survey system base layer
kasaan_res56khz_contours_plss_map_3of4.pdf	56,000 Hz apparent resistivity grid with contours and public land survey system base layer
kasaan_res56khz_contours_plss_map_4of4.pdf	56,000 Hz apparent resistivity grid with contours and public land survey system base layer
kasaan_res56khz_bw_contours_plss_map_1of4.pdf	black and white 56,000 Hz apparent resistivity data contours with public land survey system base layer
kasaan_res56khz_bw_contours_plss_map_2of4.pdf	black and white 56,000 Hz apparent resistivity data contours with public land survey system base layer
kasaan_res56khz_bw_contours_plss_map_3of4.pdf	black and white 56,000 Hz apparent resistivity data contours with public land survey system base layer
kasaan_res56khz_bw_contours_plss_map_4of4.pdf	black and white 56,000 Hz apparent resistivity data contours with public land survey system base layer
kasaan_res7200hz_topo_map_1of4.pdf	7,200 Hz apparent resistivity grid with topographic base map
kasaan_res7200hz_topo_map_2of4.pdf	7,200 Hz apparent resistivity grid with topographic base map
kasaan_res7200hz_topo_map_3of4.pdf	7,200 Hz apparent resistivity grid with topographic base map
kasaan_res7200hz_topo_map_4of4.pdf	7,200 Hz apparent resistivity grid with topographic base map

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/10.14509/30432

Map Title	Description
kasaan_res7200hz_contours_plss_map_1of4.pdf	7,200 Hz apparent resistivity grid with contours and public land survey system base layer
kasaan_res7200hz_contours_plss_map_2of4.pdf	7,200 Hz apparent resistivity grid with contours and public land survey system base layer
kasaan_res7200hz_contours_plss_map_3of4.pdf	7,200 Hz apparent resistivity grid with contours and public land survey system base layer
kasaan_res7200hz_contours_plss_map_4of4.pdf	7,200 Hz apparent resistivity grid with contours and public land survey system base layer
kasaan_res7200hz_bw_contours_plss_map_1of4.pdf	black and white 7,200 Hz apparent resistivity data contours with public land survey system base layer
kasaan_res7200hz_bw_contours_plss_map_2of4.pdf	black and white 7,200 Hz apparent resistivity data contours with public land survey system base layer
kasaan_res7200hz_bw_contours_plss_map_3of4.pdf	black and white 7,200 Hz apparent resistivity data contours with public land survey system base layer
kasaan_res7200hz_bw_contours_plss_map_4of4.pdf	black and white 7,200 Hz apparent resistivity data contours with public land survey system base layer
kasaan_interpretation_plss_map_1of4.pdf	interpretation based on geophysical data with public land survey system base layer
kasaan_interpretation_plss_map_2of4.pdf	interpretation based on geophysical data with public land survey system base layer
kasaan_interpretation_plss_map_3of4.pdf	interpretation based on geophysical data with public land survey system base layer
kasaan_interpretation_plss_map_4of4.pdf	interpretation based on geophysical data with public land survey system base layer
kasaan_emanomalies_sim_magtf_contours_map_1of4.pdf	electromagnetic anomaly map with simulated magnetic total field grid contours
kasaan_emanomalies_sim_magtf_contours_map_2of4.pdf	electromagnetic anomaly map with simulated magnetic total field grid contours
kasaan_emanomalies_sim_magtf_contours_map_3of4.pdf	electromagnetic anomaly map with simulated magnetic total field grid contours
kasaan_emanomalies_sim_magtf_contours_map_4of4.pdf	electromagnetic anomaly map with simulated magnetic total field grid contours
kasaan_emanomalies_sim_magtf_contours_detailed_map_1of8.pdf	detailed electromagnetic anomaly map with simulated magnetic total field grid contours
kasaan_emanomalies_sim_magtf_contours_detailed_map_2of8.pdf	detailed electromagnetic anomaly map with simulated magnetic total field grid contours
kasaan_emanomalies_sim_magtf_contours_detailed_map_3of8.pdf	detailed electromagnetic anomaly map with simulated magnetic total field grid contours
kasaan_emanomalies_sim_magtf_contours_detailed_map_4of8.pdf	detailed electromagnetic anomaly map with simulated magnetic total field grid contours
kasaan_emanomalies_sim_magtf_contours_detailed_map_5of8.pdf	detailed electromagnetic anomaly map with simulated magnetic total field grid contours
kasaan_emanomalies_sim_magtf_contours_detailed_map_6of8.pdf	detailed electromagnetic anomaly map with simulated magnetic total field grid contours
kasaan_emanomalies_sim_magtf_contours_detailed_map_7of8.pdf	detailed electromagnetic anomaly map with simulated magnetic total field grid contours
kasaan_emanomalies_sim_magtf_contours_detailed_map_8of8.pdf	detailed electromagnetic anomaly map with simulated magnetic total field grid contours

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-4A
Map A - Salt Chuck and Kasaan
Peninsula, Prince of Wales Island



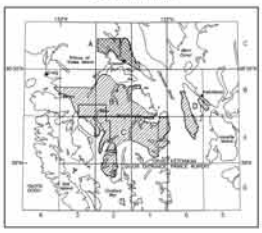
Base from U.S. Geological Survey Craig B-1, 1948; B-2, 1949;
D-1, 1950; D-2, 1948; Quadrangles, Alaska

FLIGHT LINES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP A - SALT CHUCK AND KASAAN PENINSULA, PRINCE OF WALES ISLAND

1999

LOCATION INDEX



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999
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 north-south flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

KASAAN SURVEY "Area 2" – May 1992
The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The northeast-southwest flight lines were flown one-eighth mile apart with tie lines flown parallel to the survey boundaries. The survey was flown with an AS350B-1 helicopter.

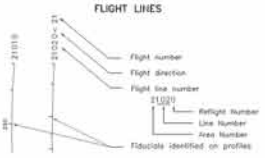
A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability. An error on the Craig C-2 topographic map sheet caused distortion of the positioning in the original 1992 data. The data were re-positioned in 1999 using a rubber sheet stretching technique to better match the topography and fit with the 1999 data.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGGS), and KGM, Mining & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geoterrex-Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Coffman Cove. The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

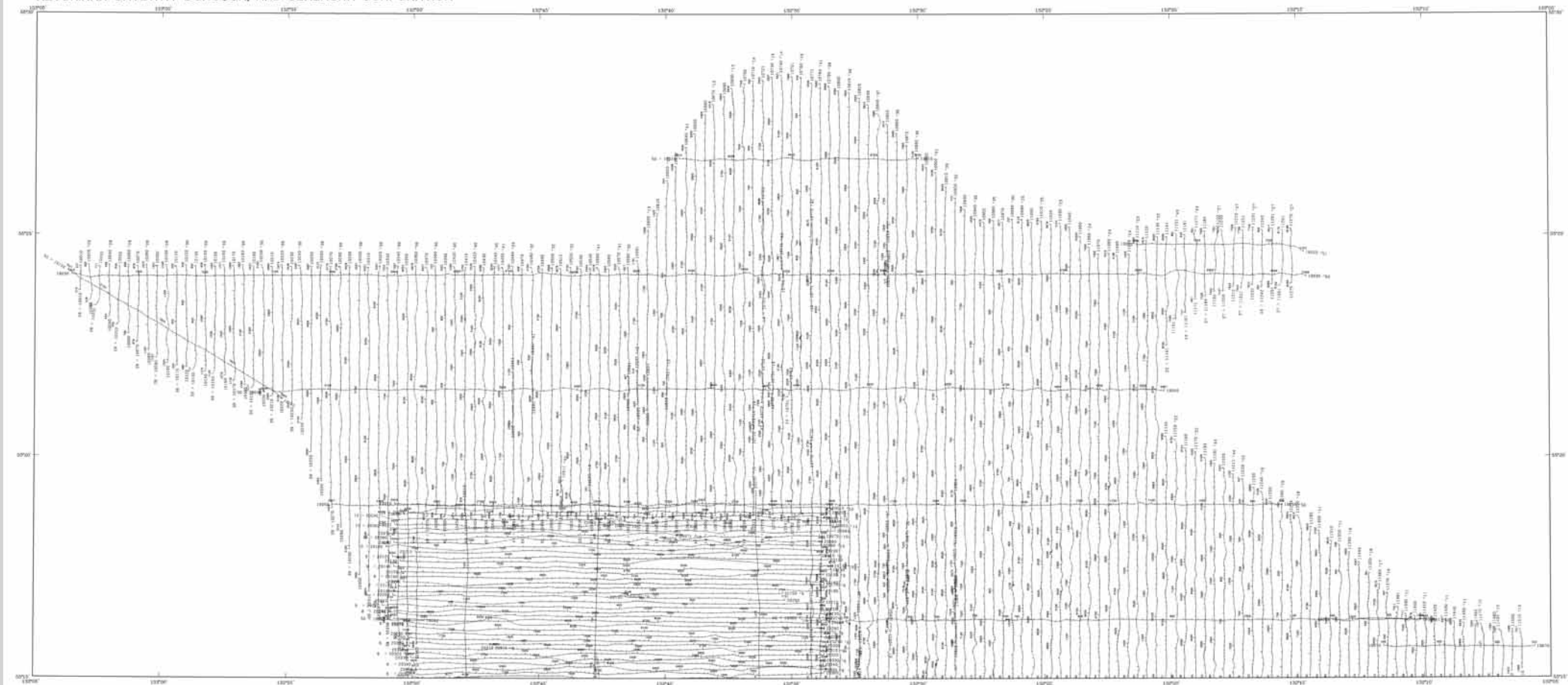
This map and other products from this survey are available by mail order, or in person, from DGGS, 794 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are also available, in person only, at the BLM's Juneau Minerals Information Center, Mayflower Island, Douglas, AK.

FLIGHT LINES



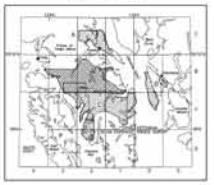
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-4B
Map B - Surveyed Area Immediately North of 55°15', Prince of Wales Island



SCALE 1:63,360

LOCATION INDEX



FLIGHT LINES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP B - SURVEYED AREA IMMEDIATELY NORTH OF 55°15', PRINCE OF WALES ISLAND

1999

DESCRIPTIVE NOTES

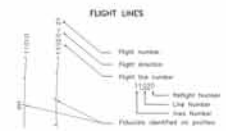
KETCHIKAN SURVEY "Area 4" – March 1999
The geophysical data were acquired with a DIGHEM^{V} Electromagnetic (EM) system and a Scintrex cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along north–south flight lines (nine-quarter mile apart). Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (TM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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 GPS grid.

HETTA SURVEY "Area 3" – May 1998
The geophysical data were acquired with a DIGHEM^{V} Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, GNF navigation system, 50/60 Hz monitors, VLF receiver and video cameras. The east–west flight lines were flown nine-eighth mile apart, with tie lines flown perpendicular to the flight lines. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual reckoning. Positional accuracy of the 1998 data should be considered of low reliability.

FLIGHT LINES



SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGGS), and Rice, Mining & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geoterrex–Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Coffman Cove. The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

This map and other products from this survey are available by mail order, or in person, from DGGS, 794 University Ave., Suite 205, Fairbanks, Alaska, 99709. Some products are also available, in person only, at the BLM's Juneau Minerals Information Center, MacKinnon Island, Douglas, AK.

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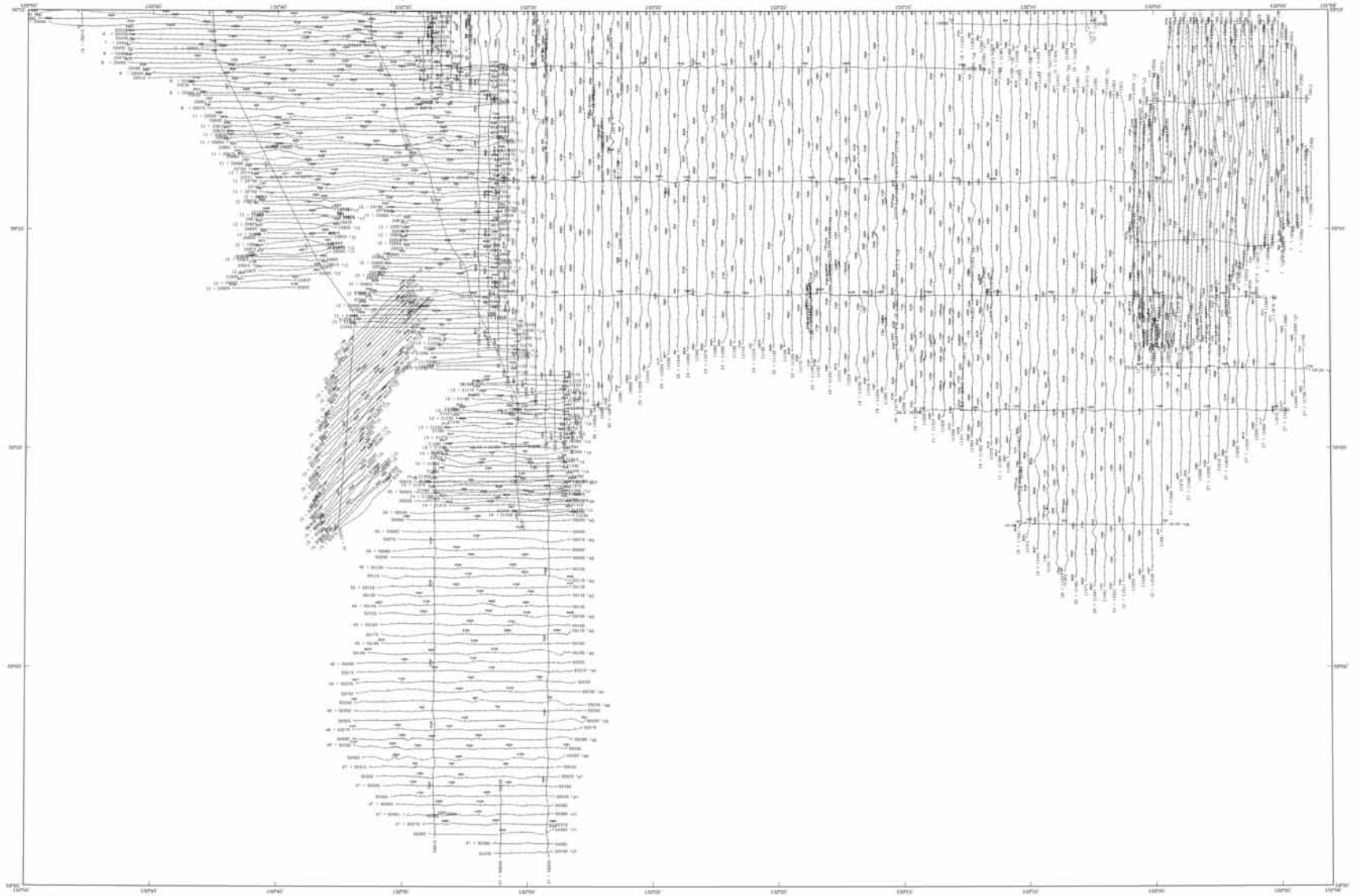
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-4C
Map C - Surveyed Area South of
55°15', Prince of Wales Island



LOCATION INDEX

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

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 AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along north–south flight lines for the northern portion and east–west flight lines for the southern portion one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 5 miles.

An Ashtech/Trimble Real-Time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight path recovery. The helicopter position was derived every 0.2 seconds using real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

HETTA SURVEY "Area 3" – May 1992
DOLOMI SURVEY "Area 1" – March 1991

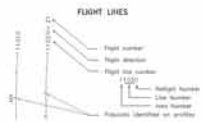
The geophysical data were acquired with DIGHEM^{V} (Dolomi Survey) and DIGHEM (Hetta Survey) Electromagnetic (EM) systems and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors, VLF receiver and video camera. The flight lines were flown with one-eighth mile line spacing with tie lines flown perpendicular to the flight lines. The Dolomi Survey was flown north–south with an AS350B helicopter. The Hetta Survey was flown with an AS350B-1 helicopter. The flight lines for Hetta Survey were flown east–west except for the peninsula between Cordova Bay and Hotsinia Inlet which was flown northeast–southwest.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1991/92 data should be considered at the meridian.

FLIGHT LINES
OF SELECTED AREAS NEAR
KETCHIKAN,
SOUTHEAST ALASKA

MAP C - SURVEYED AREA SOUTH OF 55°15',
PRINCE OF WALES ISLAND
1999

FLIGHT LINES



SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGGS), and Kim Mining & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geotech Ltd. (Geotech), a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management, the Ketchikan Gateway Borough, Sealaska Corporation, Alaska Mental Health Trust Land Office, and the State of Alaska, DNR, DGGS (AHRA). The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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, Mayflower Island, Douglas, AK.

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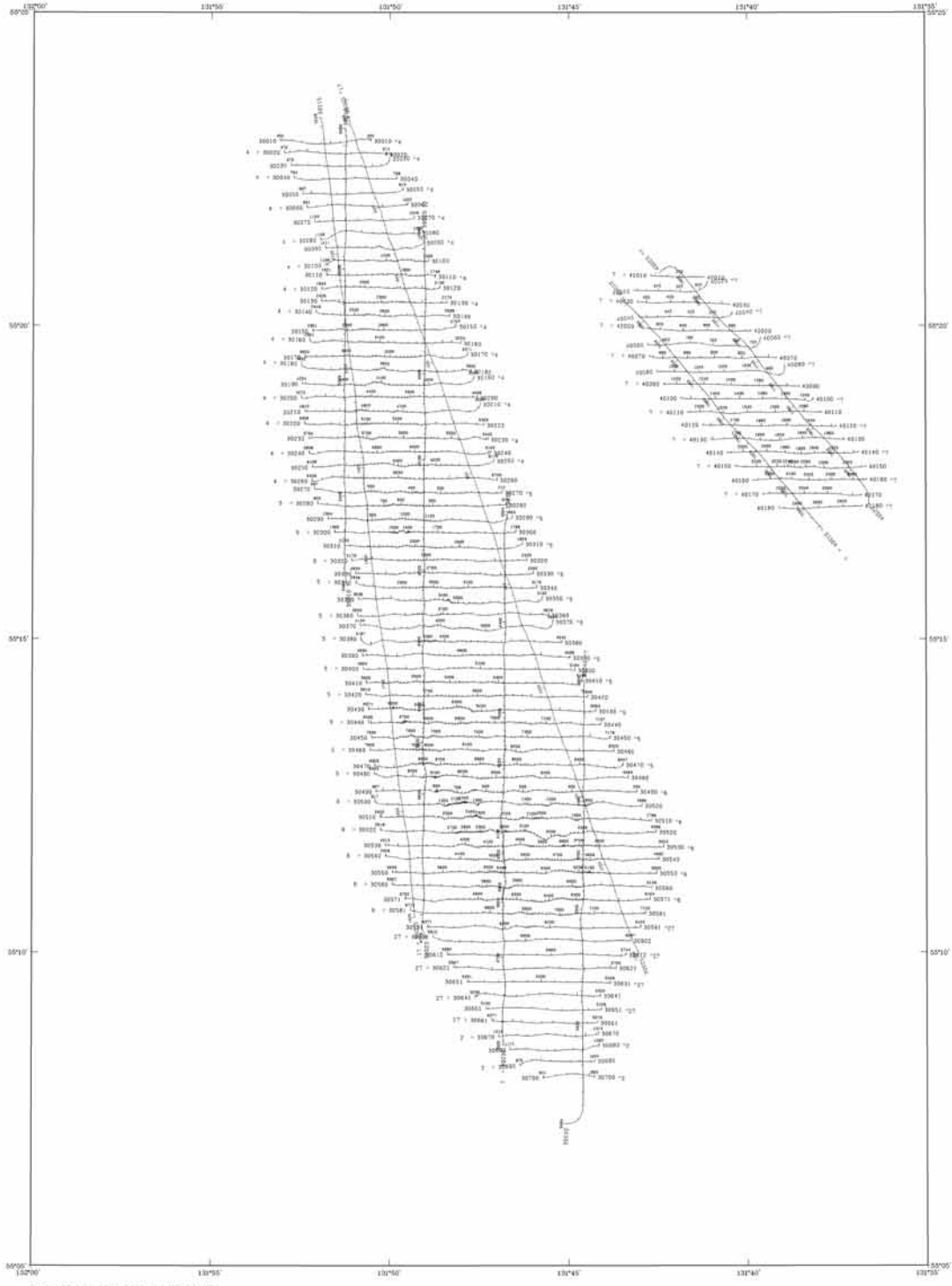
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-4D
Map D - Western and Eastern Parts, Gravina Island



Base from U.S. Geological Survey Ketchikan A-5, 1955; A-6, 1948; D-5, 1955; D-6, 1954; Quadrangles, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 200 FEET
DOTTED MEAN SEA LEVEL

APPROXIMATE MEAN DECLINATION 1999

FLIGHT LINES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND

1999

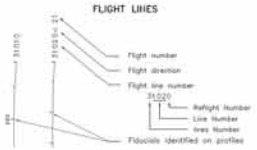
LOCATION INDEX

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 east–west flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 5 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 129°, 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

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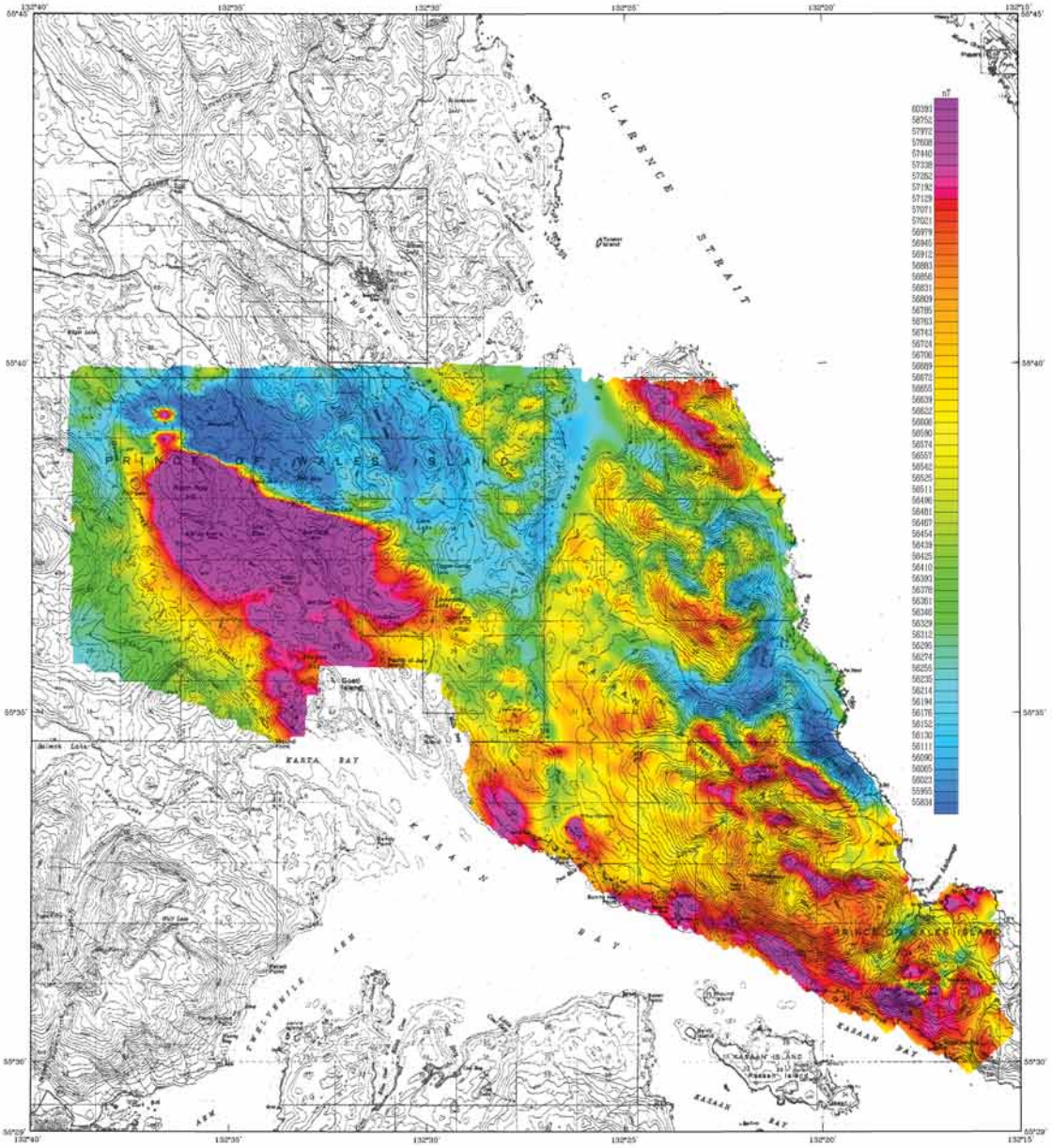
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

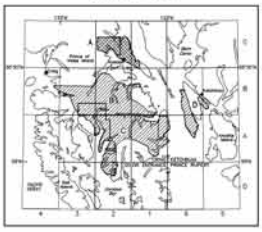
GEOPHYSICAL REPORT 1999-1A
Map A - Salt Chuck and Kasaan
Peninsula, Prince of Wales Island



Base from U.S. Geological Survey Craig B-1, 1948; B-2, 1948
C-1, 1951; C-2, 1949; Quadrangles, Alaska

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

LOCATION INDEX



TOTAL FIELD MAGNETICS OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP A - SALT CHUCK AND KASAAN PENINSULA, PRINCE OF WALES ISLAND

1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999
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 north-south flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

KASAAN SURVEY "Area 2" – May 1992
The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The northeast-southwest flight lines were flown one-eighth mile apart with tie lines flown parallel to the survey boundaries. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability. An error on the Craig C-2 topographic map sheet caused distortion of the positioning in the original 1992 data. The data were re-positioned in 1999 using a rubber sheet stretching technique to better match the topography and fit with the 1999 data.

TOTAL FIELD MAGHETICS

The total field magnetic 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, 1995, updated to March 1999) 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
24°
MAGNETIC NORTH
APPROXIMATE MEAN DECLINATION, 1999

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGGS), and WGM, Mining & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geoterrex-Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Coffman Cove. The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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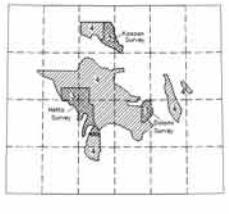
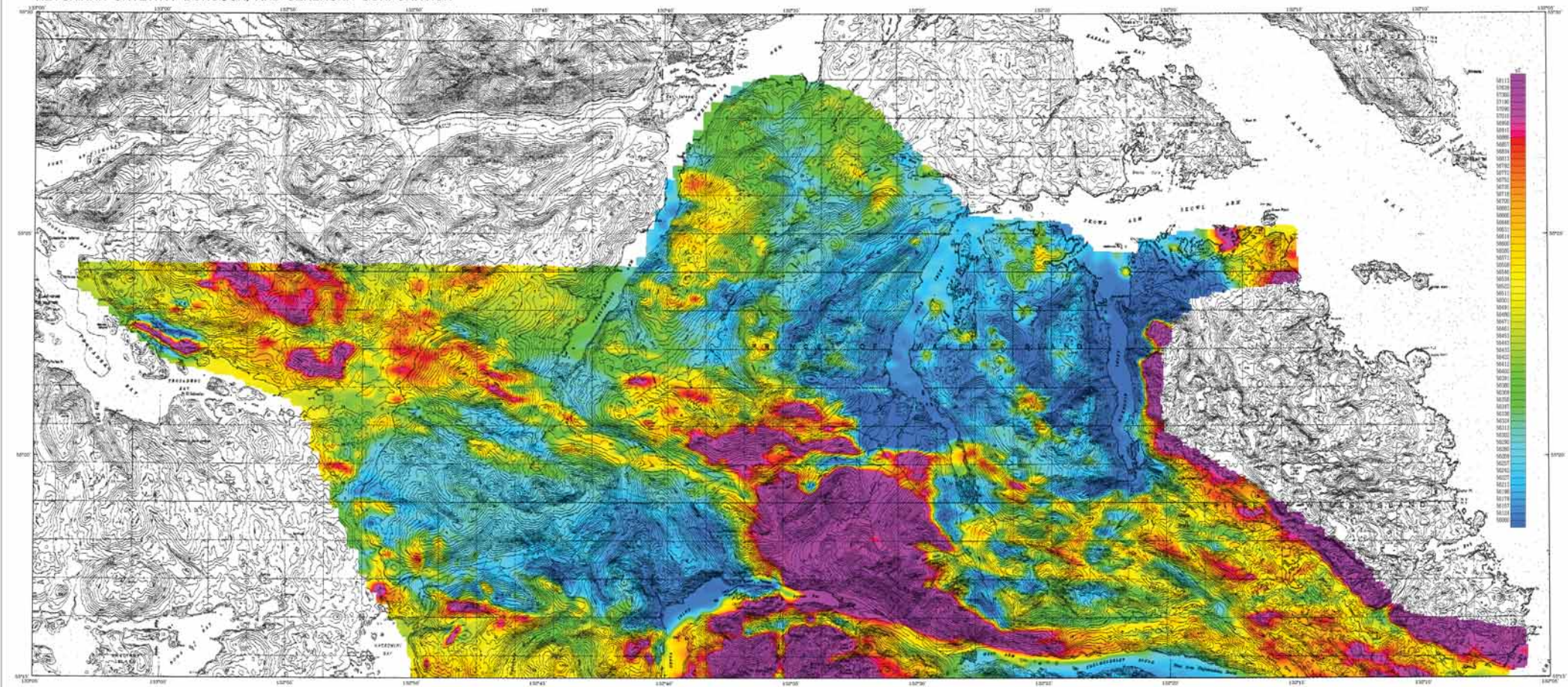


ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-1B
Map B - Surveyed Area Immediately North of 55°15', Prince of Wales Island



TOTAL FIELD MAGNETICS OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP B - SURVEYED AREA IMMEDIATELY NORTH OF 55°15', PRINCE OF WALES ISLAND

1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

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 north–south flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Trimble 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

HETTA SURVEY "Area 3" – May 1992

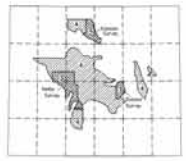
The geophysical data were acquired with a DIGHEM^{V} Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The east–west flight lines were flown one-eighth mile apart with tie lines flown perpendicular to the flight lines. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability.

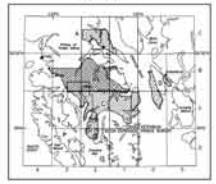
TOTAL FIELD MAGNETICS

The total field magnetic 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 correction (or IGRF gradient, 1995, updated to March 1999) 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

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGGS), and RGM, Mining & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geoterrex–Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Craftman Cove. The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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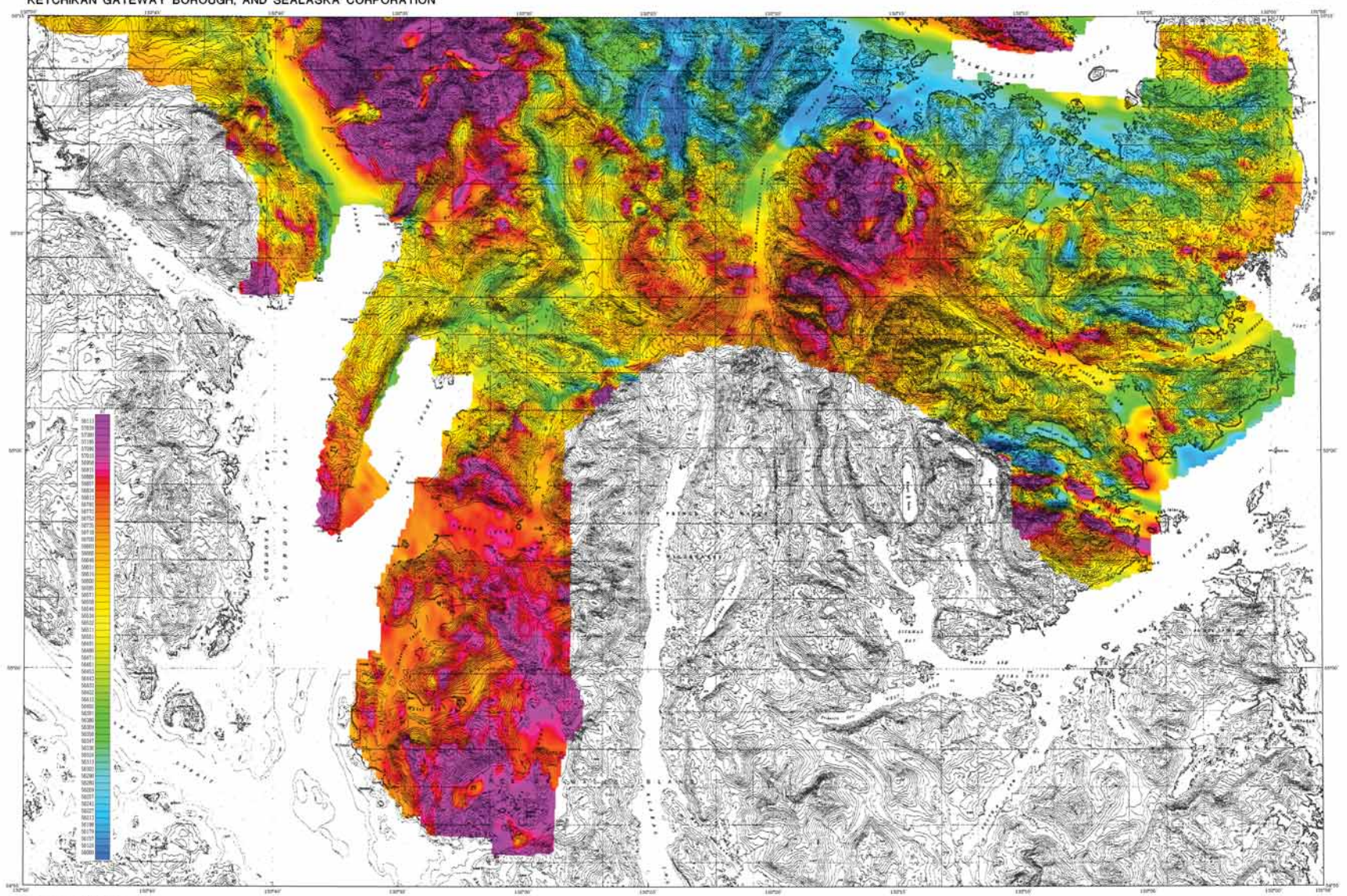
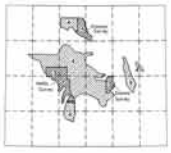
GEOPHYSICAL REPORT 1999-1C
Map C - Surveyed Area South of
55°15', Prince of Wales Island



TOTAL FIELD MAGNETICS OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP C - SURVEYED AREA SOUTH OF 55°15',
PRINCE OF WALES ISLAND

1999



LOCATION INDEX

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

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 north–south flight lines for the northern portion and east–west flight lines for the southern portion one-quarter mile apart. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Picos 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 real–time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

METTA SURVEY "Area 3" – May 1992
DOLOMI SURVEY "Area 1" – March 1991

The geophysical data were acquired with DIGHEM^{V} (Dolomi Survey) and DIGHEM^{V} (Metta Survey) Electromagnetic (EM) systems and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 253 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, VHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The flight lines were flown with one–eighth mile line spacing with tie lines flown perpendicular to the flight lines. The Dolomi Survey was flown north–south with an AS350B helicopter. The Metta Survey was flown with an AS350B–1 helicopter. The flight lines for Metta Survey were flown east–west except for the peninsula between Cordova Bay and Hunter Inlet which was flown northeast–southwest.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1991/92 data should be considered at the resolution

TOTAL FIELD MAGNETICS

The total field magnetic 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 to the tie line data, and (3) interpolated onto a regular 100 m grid using a modified Akima (1970) technique. The regional–residual (or IGRF) gradient, 1995, updated to March 1999) 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 for 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 (DNR), Division of Geological & Geophysical Surveys (DGGS), and Kirk Kenny & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1998 by Geoterrex–Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska Mental Health Trust Land Office, and the State of Alaska (GO Bond Program). The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were released for publication by Geosoft Corporation.

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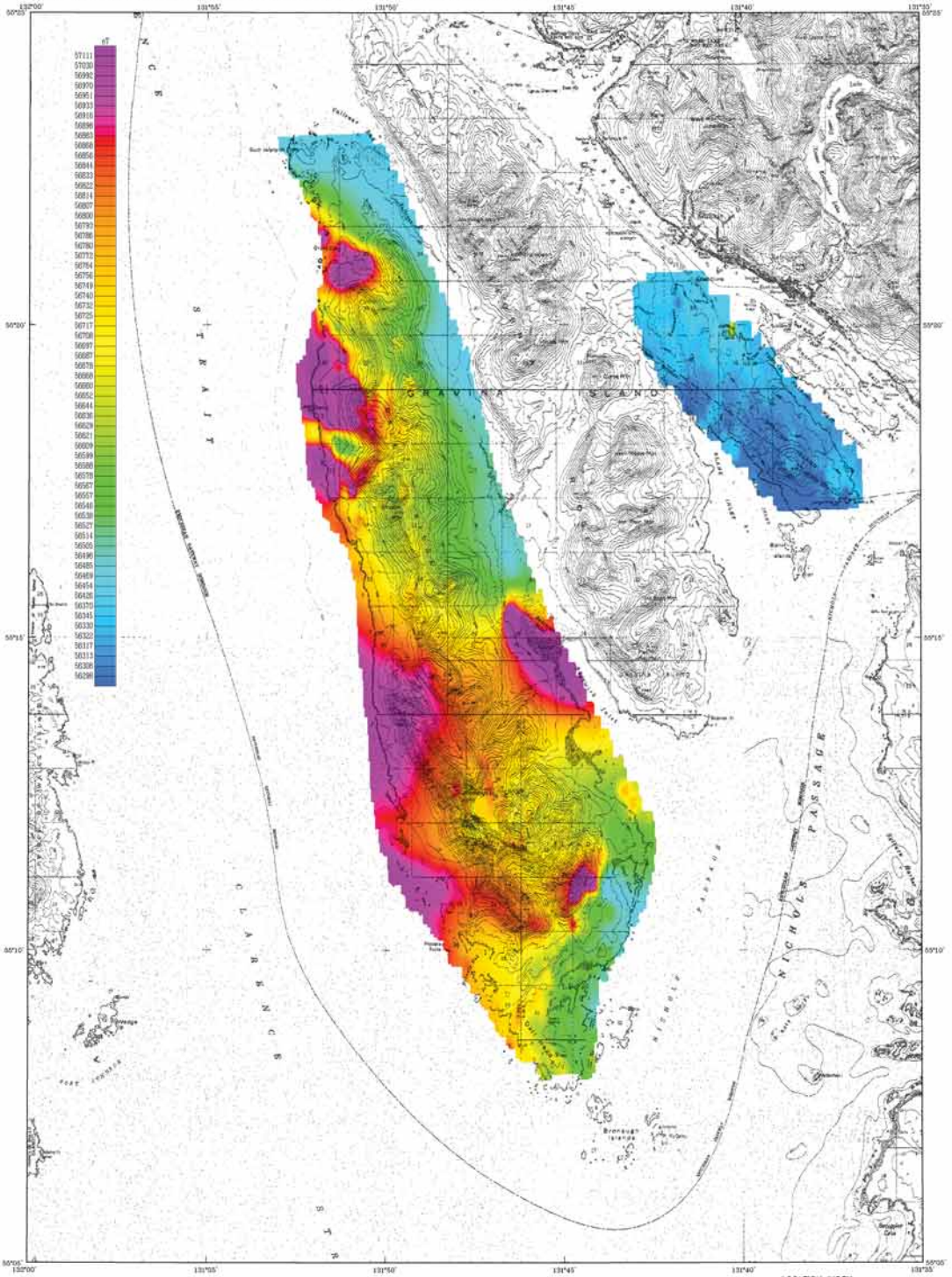
GEOPHYSICAL REPORT 1999-1D
Map D - Western and Eastern Parts, Gravina Island



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

LOCATION INDEX

TOTAL FIELD MAGNETICS OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND

1999

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 east–west flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

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TOTAL FIELD MAGNETICS

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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.

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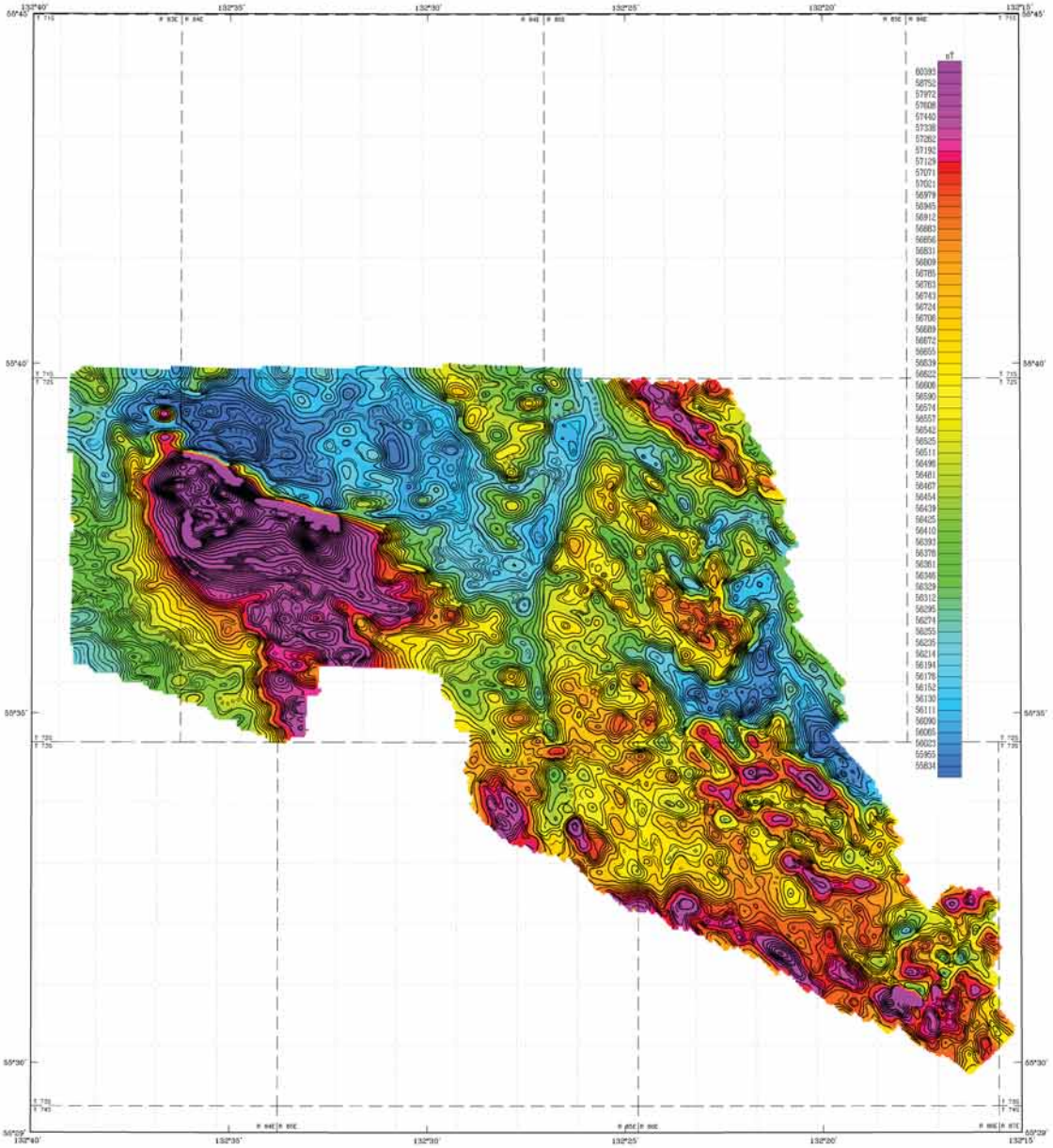
GEOPHYSICAL REPORT 1999-9A
Map A - Salt Chuck and Kasaan
Peninsula, Prince of Wales Island



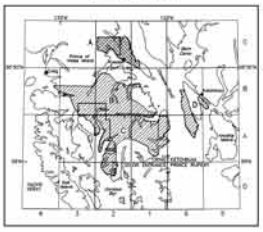
Section outlines from U.S. Geological Survey Craig B-1, 1949; B-2, 1949; C-1, 1950; C-2, 1949; Quadrangles, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX



TOTAL FIELD MAGNETICS OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP A - SALT CHUCK AND KASAAN PENINSULA, PRINCE OF WALES ISLAND

1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999
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KASAAN SURVEY "Area 2" – May 1992
The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The northeast–southwest flight lines were flown one–eighth mile apart with tie lines flown parallel to the survey boundaries. The survey was flown with an AS350B–1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability. An error on the Craig C–2 topographic map sheet caused distortion of the positioning in the original 1992 data. The data were re–positioned in 1999 using a rubber sheet stretching technique to better match the topography and fit with the 1999 data.

TOTAL FIELD MAGNETICS

The total field magnetic 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, 1995, updated to March 1999) 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

SURVEY HISTORY

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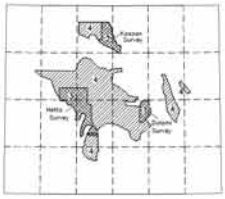

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
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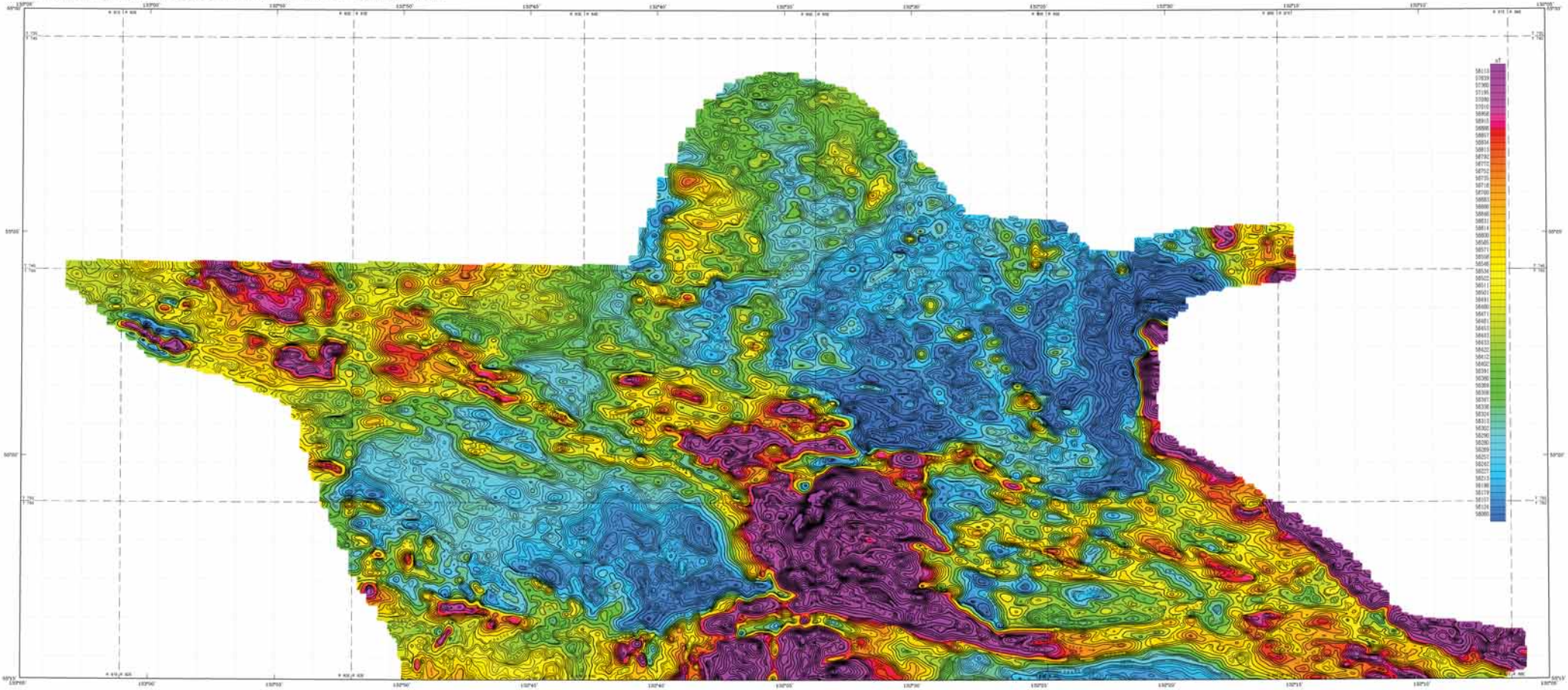
GEOPHYSICAL REPORT 1999-9B
Map B - Surveyed Area Immediately North of 55°15', Prince of Wales Island



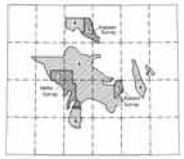
SCALE 1:63,360

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

TOTAL FIELD MAGNETICS OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP B - SURVEYED AREA IMMEDIATELY NORTH OF 55°15', PRINCE OF WALES ISLAND

1999



LOCATION INDEX

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999
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 north–south flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 2 miles.

An Ashtech/Magnavox 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

METTA SURVEY "Area 3" – May 1992
The geophysical data were acquired with a DIGHEM^{V} Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The east–west flight lines were flown one-eighth mile apart with tie lines flown perpendicular to the flight lines. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability.

MAGNETIC CONTOUR INTERVAL

250 nT
50 nT
10 nT
5 nT

TOTAL FIELD MAGNETICS

The total field magnetic 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, 1995, added to March 1999) 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.

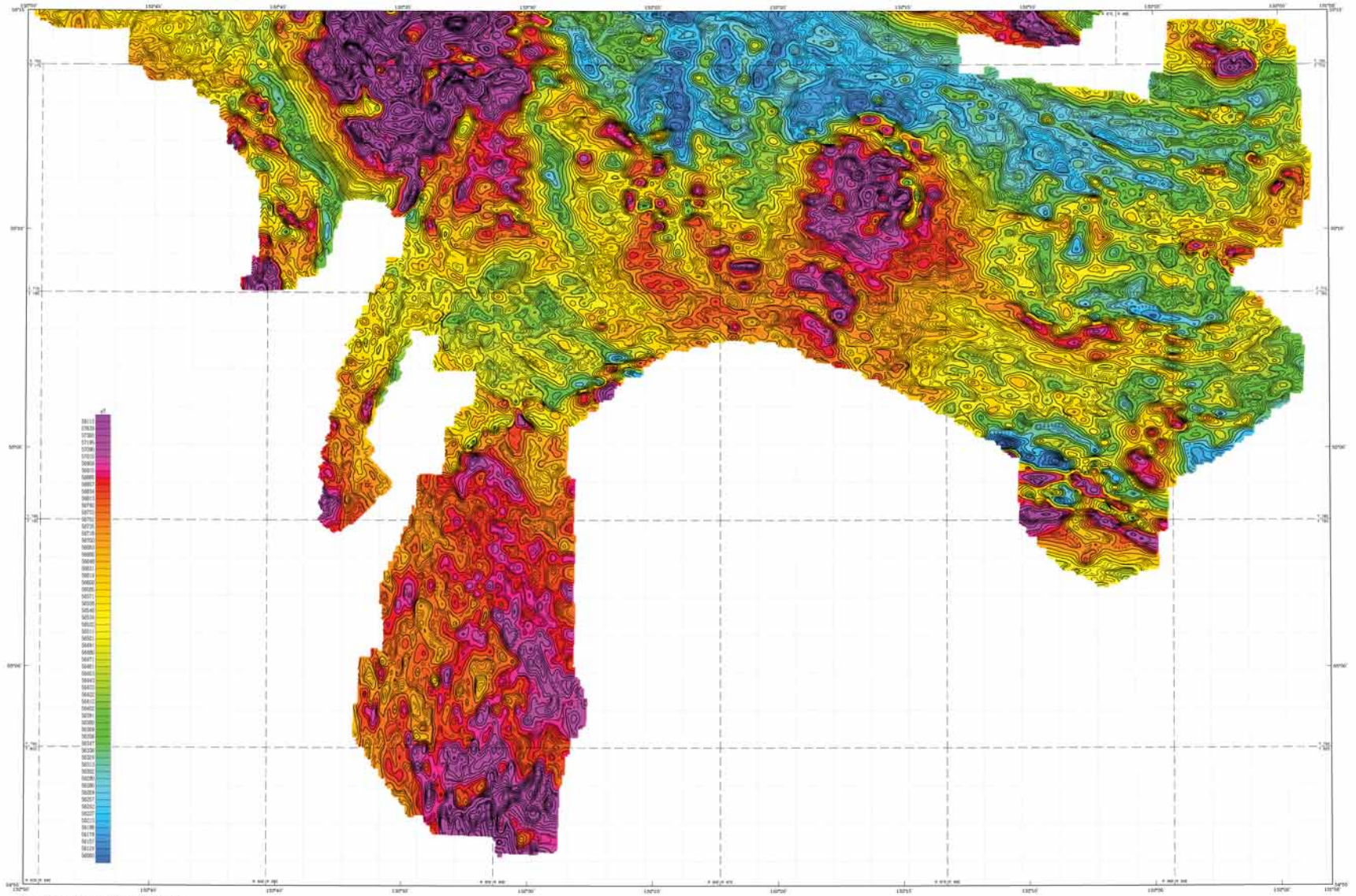
SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGGS), and RGM, Mining & Geological Consultants, Inc. Airborne geophysical data for areas 4 were acquired in 1999 by Geoterrex-Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Coffman Cove. The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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 Wilderness Information Center, Mayflower Island, Douglas, AK.

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-9C
Map C - Surveyed Area South of
55°15', Prince of Wales Island



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1998

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 north–south flight lines for the northern portion and east–west flight lines for the southern portion one-quarter mile apart. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Picos 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

METTA SURVEY "Area 3" – May 1992
DOLOMI SURVEY "Area 1" – March 1991

The geophysical data were acquired with DIGHEM^{V} (Dolomi Survey) and DIGHEM^{V} (Metta Survey) Electromagnetic (EM) systems and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, VHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The flight lines were flown with seven-eighth mile line spacing with tie lines flown perpendicular to the flight lines. The Dolomi Survey was flown north–south with an AS350B helicopter. The Metta Survey was flown with an AS350B-1 helicopter. The flight lines for Metta Survey were flown east–west except for the peninsula between Cordova Bay and Hunter Inlet which was flown northeast–southwest.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1991/92 data should be considered at the resolution

MAGNETIC CONTOUR INTERVAL

200 nT
50 nT
10 nT
5 nT

TOTAL FIELD MAGNETICS OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP C - SURVEYED AREA SOUTH OF 55°15',
PRINCE OF WALES ISLAND
1999

TOTAL FIELD MAGNETICS

The total field magnetic 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–residual (or IGRF) gradient, 1995, updated to March 1999) 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

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGGS), and Kirk Hinkley & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1998 by Geotech/ax-Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska Mental Health Trust Land Office, and the University of Texas at Austin (UTIG). The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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 Minerals Information Center, Mayflower Island, Douglas, AK.

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
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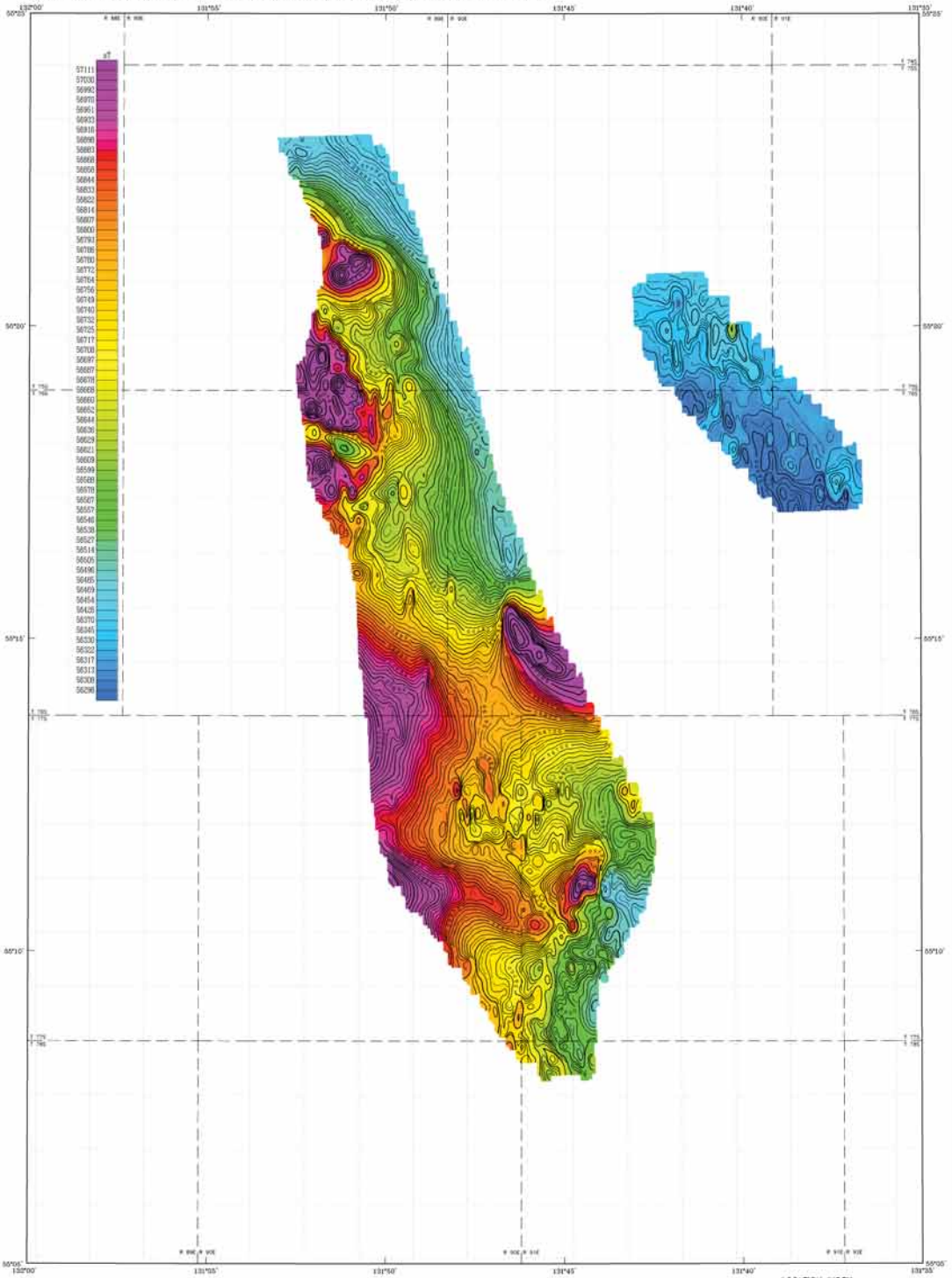
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-9D
Map D - Western and Eastern Parts, Gravina Island

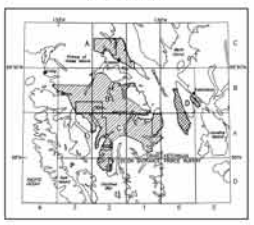


Section outlines from U.S. Geological Survey Ketchikan A-5, 1950; A-6, 1949; B-5, 1950; B-6, 1954; Quadrangles, Alaska

SCALE 1:63,360

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

LOCATION INDEX



TOTAL FIELD MAGNETICS OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND

1999

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 east-west flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 129°, 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.

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 (DNR), Division of Geological & Geophysical Surveys (DGGS), and RGM, Mining & Geological Consultants, Inc. Airborne geophysical data for the area were acquired in 1999 by Geoterrex-Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Coffman Cove.

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 Minerals Information Center, Mayflower Island, Douglas, AK.

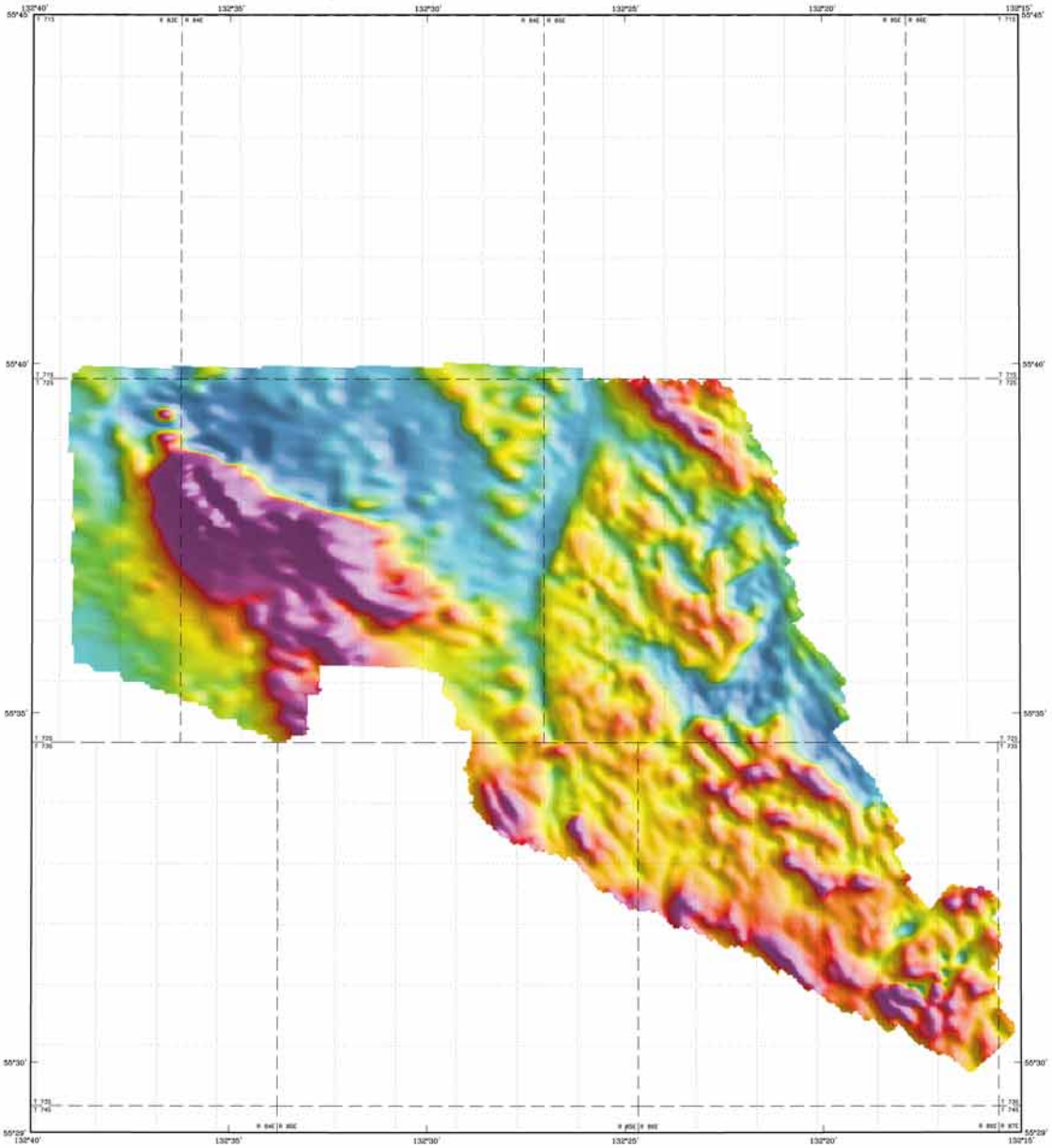
TOTAL FIELD MAGNETICS

The total field magnetic 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, 1995, updated to March 1999) 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.

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-10A
Map A - Salt Chuck and Kasaan
Peninsula, Prince of Wales Island



Section outlines from U.S. Geological Survey Craig B-1, 1948, B-2, 1948, C-1, 1950, C-2, 1948, Quadrangles, Alaska

SCALE 1:63,360

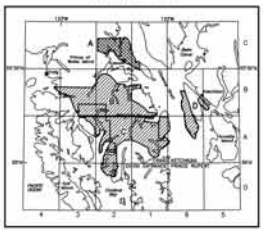
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

COLOR SHADOW TOTAL FIELD MAGNETICS OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP A - SALT CHUCK AND KASAAN
PENINSULA, PRINCE OF WALES ISLAND
1999
Sun Azimuth: 65 degrees
Inclination: 30 degrees

LOCATION INDEX



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999
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 north–south flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

KASAAN SURVEY "Area 2" – May 1992
The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The northeast–southwest flight lines were flown one-eighth mile apart with tie lines flown parallel to the survey boundaries. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability. An error on the Craig C-2 topographic map sheet caused distortion of the positioning in the original 1992 data. The data were re-positioned in 1999 using a rubber sheet stretching technique to better match the topography and fit with the 1999 data.

TOTAL FIELD MAGNETICS

The total field magnetic 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, 1995, updated to March 1999) 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 (DNR), Division of Geological & Geophysical Surveys (DGGS), and WGM, Mining & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geoterrex–Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Coffman Cove. The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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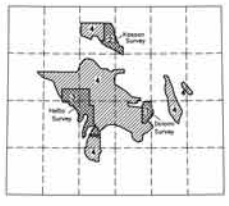

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
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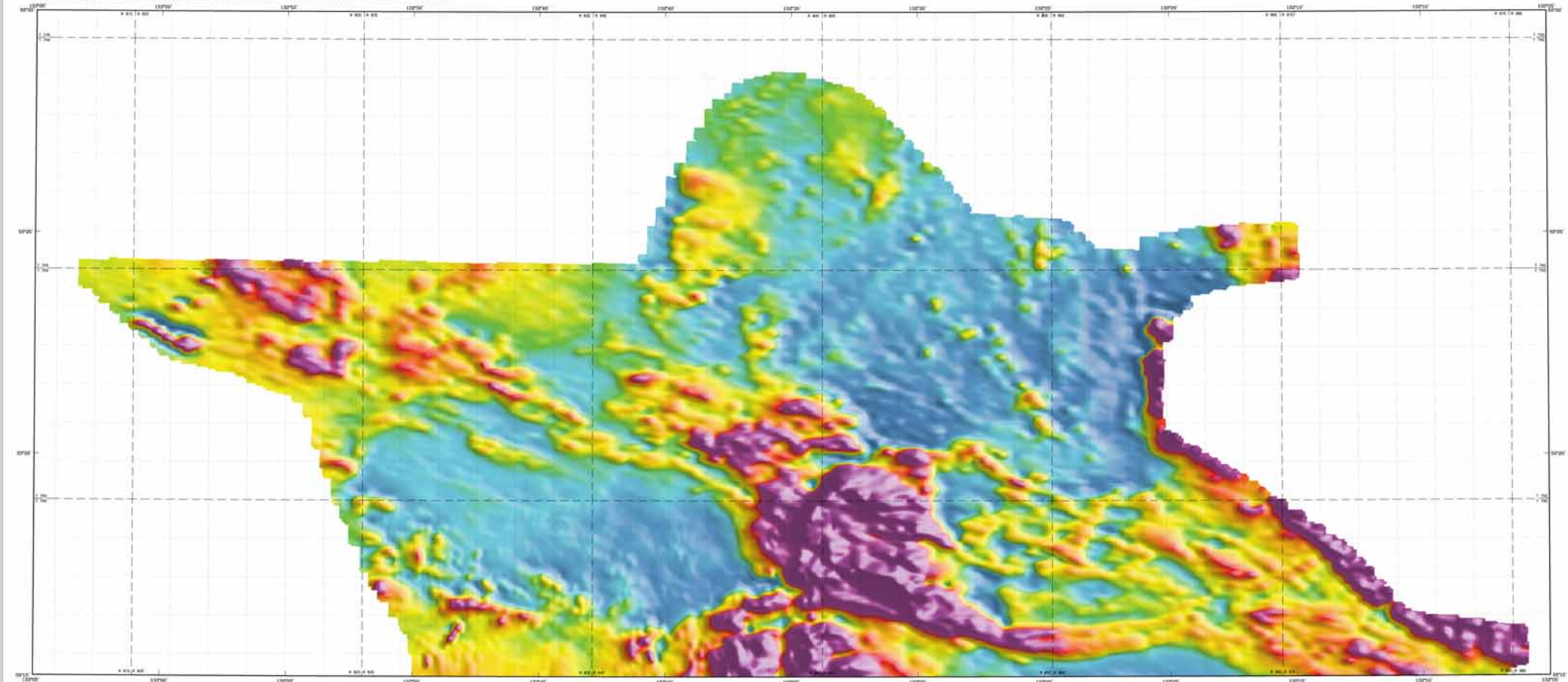
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

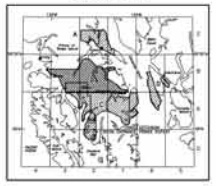
GEOPHYSICAL REPORT 1999-10B
Map B - Surveyed Area Immediately North of 55°15', Prince of Wales Island



COLOR SHADOW TOTAL FIELD MAGNETICS OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP B - SURVEYED AREA IMMEDIATELY NORTH OF 55°15',
PRINCE OF WALES ISLAND
1999
Sun Azimuth: 65 degrees
Inclination: 30 degrees

LOCATION INDEX



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" - March 1999
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 north-south flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Aantech/Ricoh 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

HETTA SURVEY "Area 3" - May 1992
The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 184 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The east-west flight lines were flown one-eighth mile apart with tie lines flown perpendicular to the flight lines. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability.

TOTAL FIELD MAGNETICS

The total field magnetic 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, 1995, updated to March 1999) 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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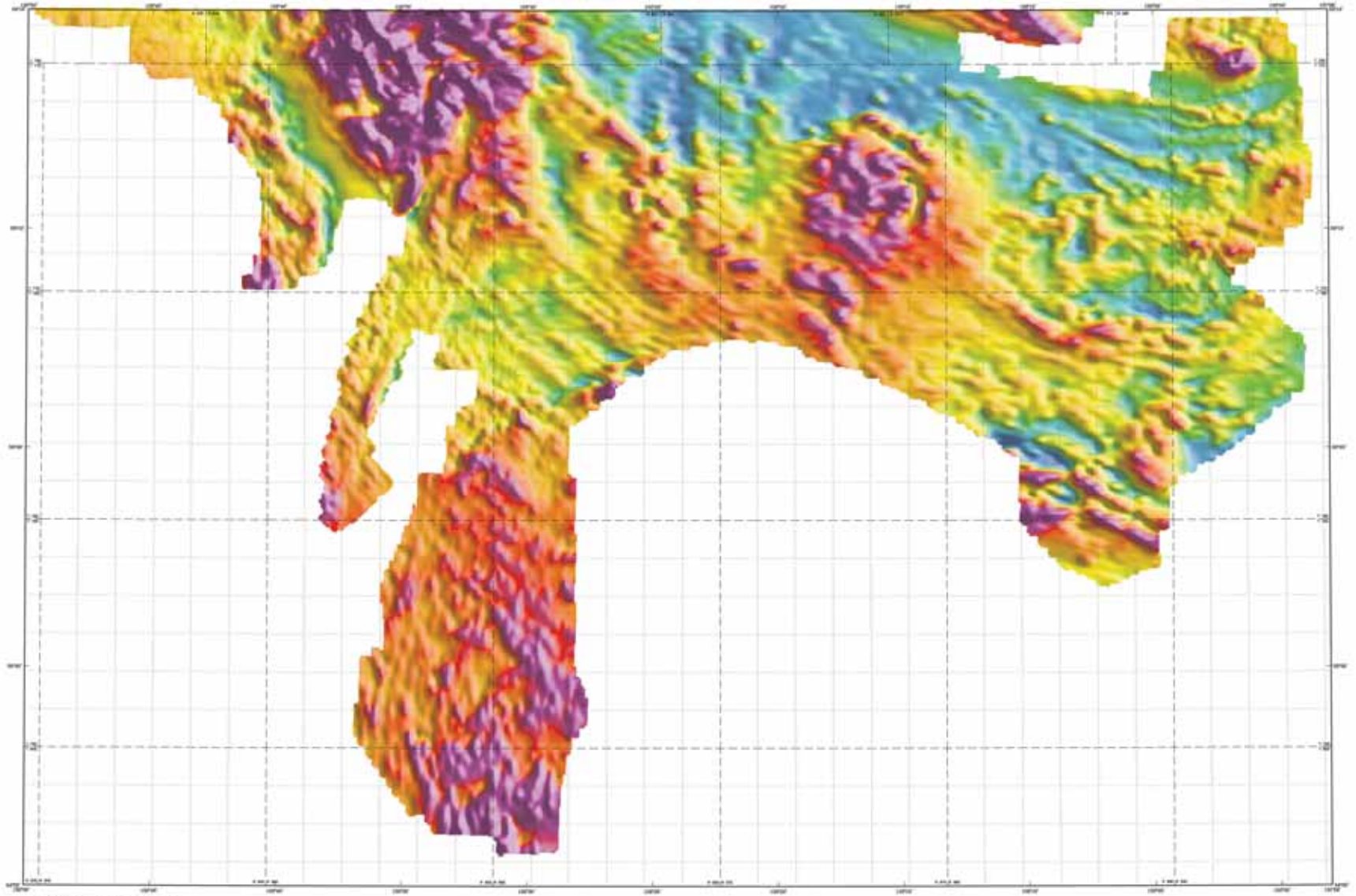
GEOPHYSICAL REPORT 1999-10C
Map C - Surveyed Area South of 55°15', Prince of Wales Island



COLOR SHADOW TOTAL FIELD MAGNETICS OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP C - SURVEYED AREA SOUTH OF 55°15',
PRINCE OF WALES ISLAND

1999

Sun Azimuth- 65 degrees
Inclination- 30 degrees

LOCATION INDEX

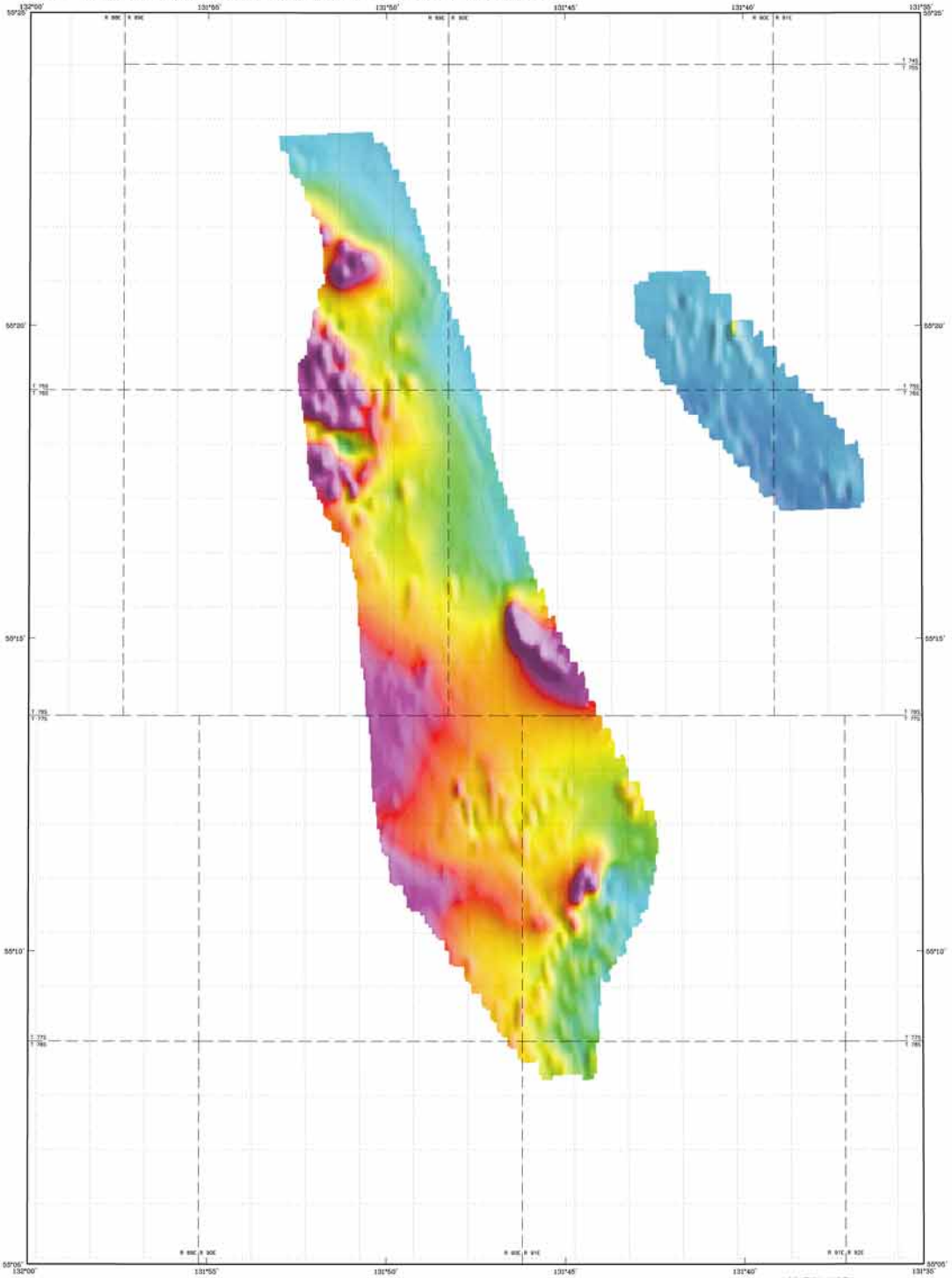
DESCRIPTIVE NOTES

SURVEY HISTORY

TOTAL FIELD MAGNETICS

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-10D
Map D - Western and Eastern Parts, Gravina Island



Section outlines from U.S. Geological Survey Ketchikan A-5, 1955; A-6, 1948; B-5, 1955; B-6, 1954; Wrangell, Alaska

SCALE 1:63,360

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

COLOR SHADOW TOTAL FIELD MAGNETICS OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

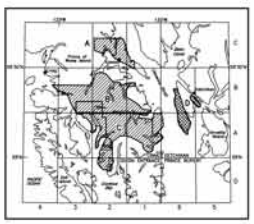
MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND

1999

Sun Azimuth: 65 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 Hz monitors and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along east-west flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 129°, 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.

SURVEY HISTORY

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TOTAL FIELD MAGNETICS

The total field magnetic 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, 1995, updated to March 1999) 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.

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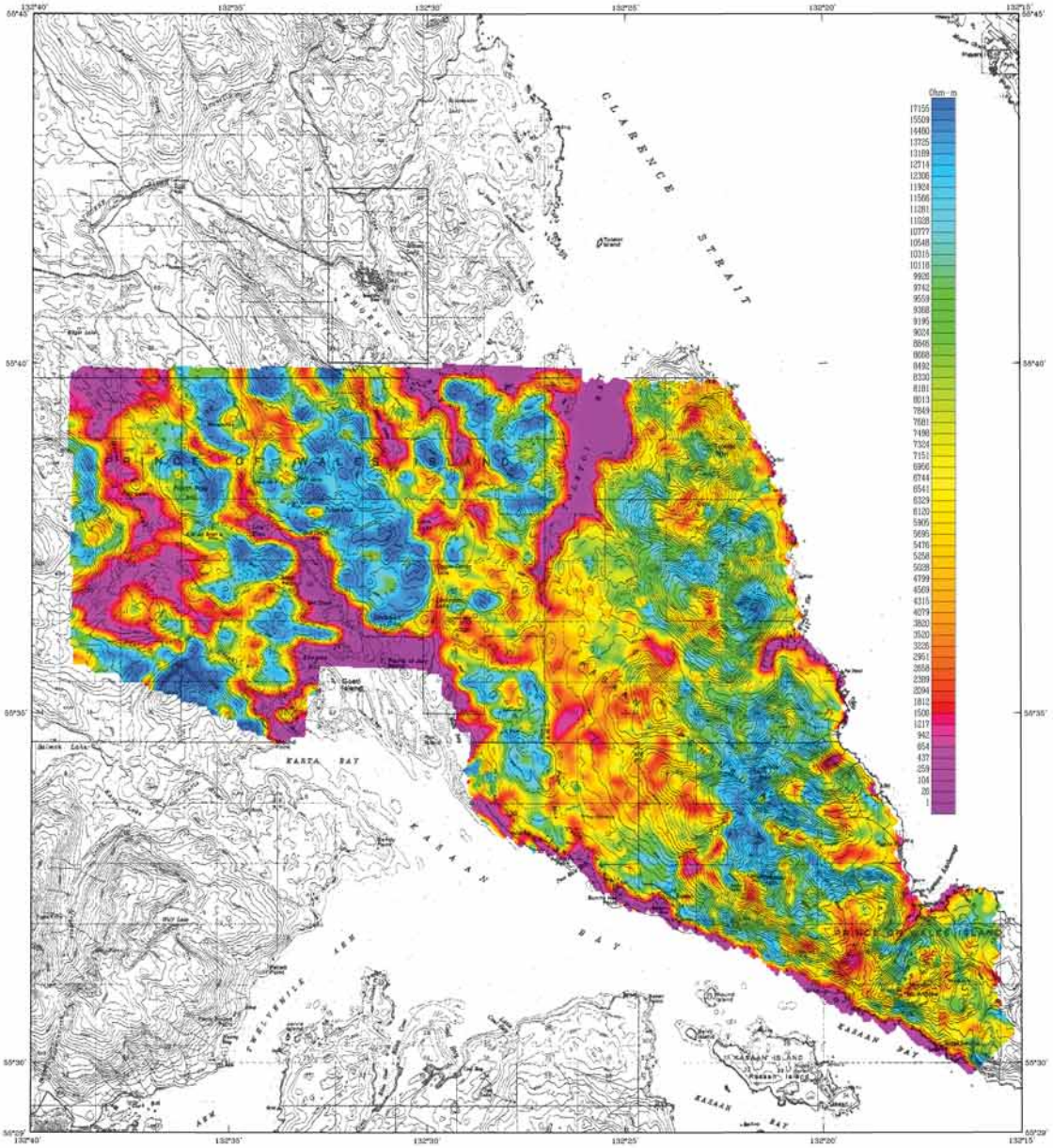
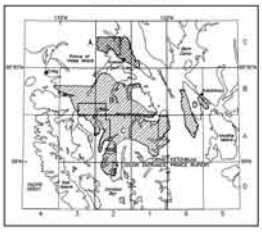
GEOPHYSICAL REPORT 1999-2A
Map A - Salt Chuck and Kasaan
Peninsula, Prince of Wales Island



Base from U.S. Geological Survey Craig B-1, 1948 B-2, 1948
C-1, 1951 C-2, 1949 Quadrangles, Alaska

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

LOCATION INDEX



56,000 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP A - SALT CHUCK AND KASAAN PENINSULA, PRINCE OF WALES ISLAND

1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999
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 north–south flight lines, one–quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real–time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

KASAAN SURVEY "Area 2" – May 1992
The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The northeast–southwest flight lines were flown one–eighth mile apart with tie lines flown parallel to the survey boundaries. The survey was flown with an AS350B–1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability. An error on the Craig C–2 topographic map sheet caused distortion of the positioning in the original 1992 data. The data were re–positioned in 1999 using a rubber sheet stretching technique to better match the topography and fit with the 1999 data.

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 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.

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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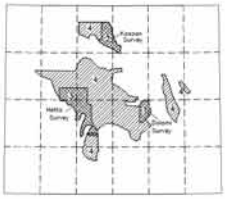
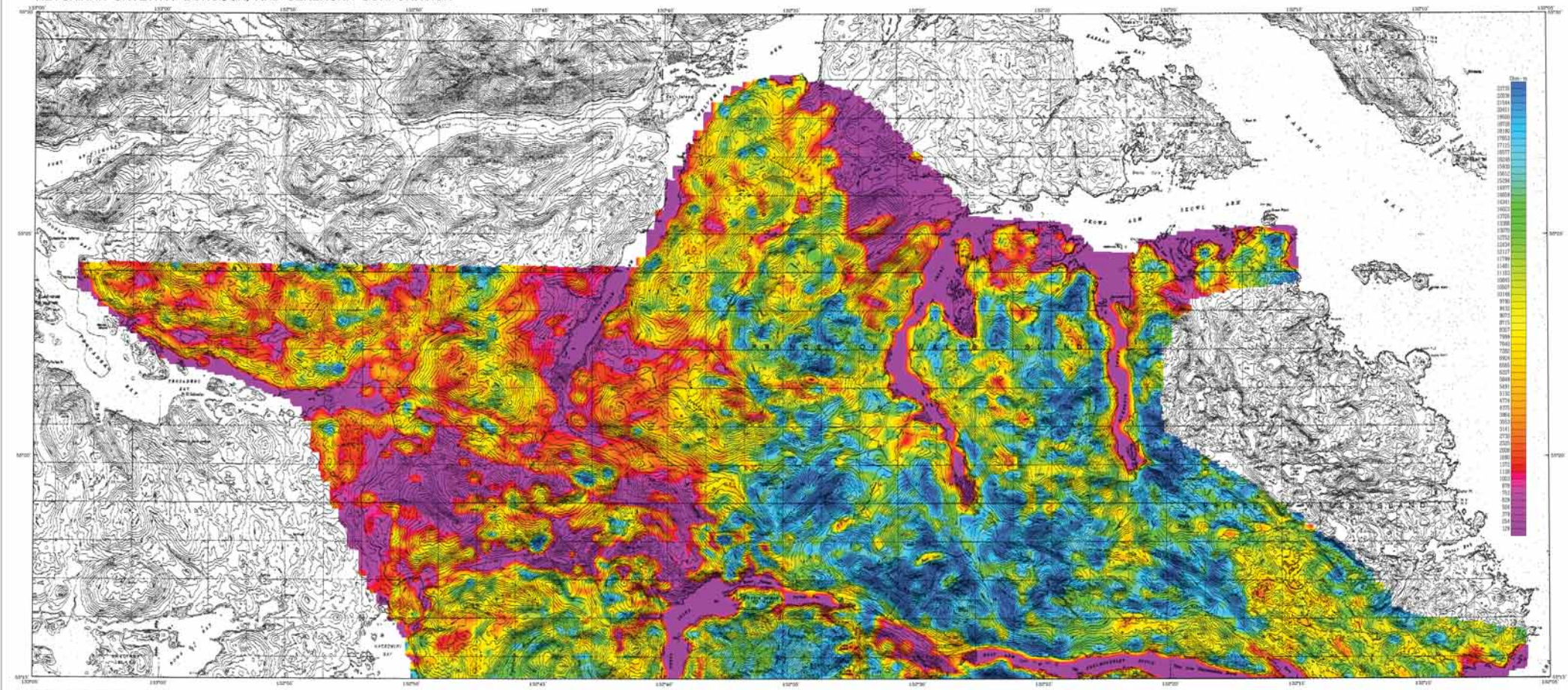


ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-2B
Map B - Surveyed Area Immediately North of 55°15', Prince of Wales Island

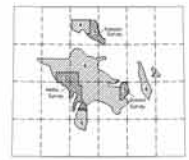


56,000 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP B - SURVEYED AREA IMMEDIATELY NORTH OF 55°15', PRINCE OF WALES ISLAND

1999

LOCATION INDEX



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

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 north–south flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

HETTA SURVEY "Area 3" – May 1992

The geophysical data were acquired with a DIGHEM^{V} Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors, VLF receiver and video camera. The east–west flight lines were flown one-eighth mile apart with tie lines flown perpendicular to the flight lines. The survey was flown with an AS350B-1 helicopter.

A Del Norte GPS electronic positioning system was used for navigation. Flight path recovery was done with a combination of GPS data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability.

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 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.

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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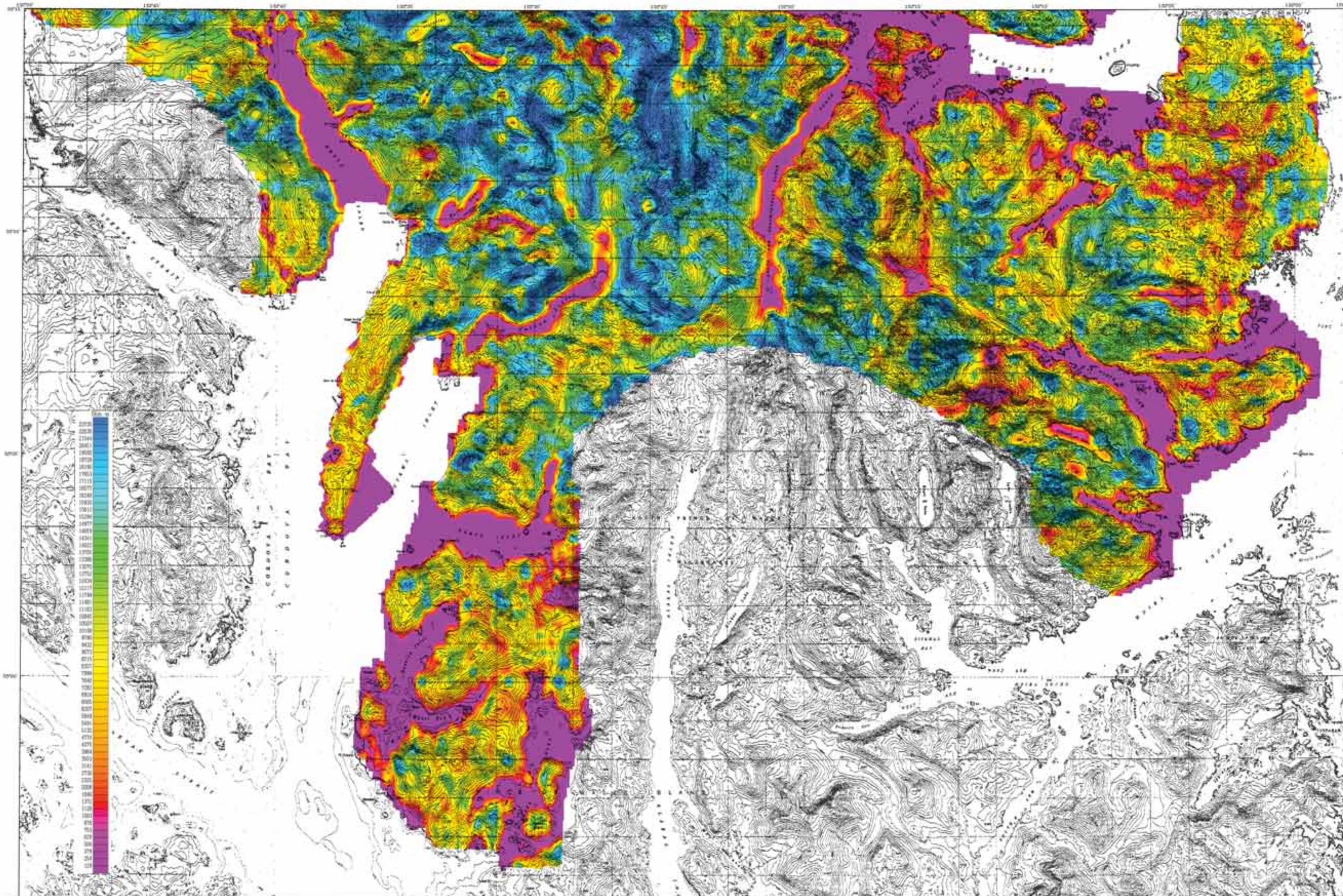
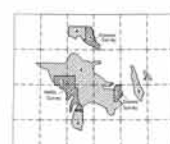
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-2C
Map C - Surveyed Area South of 55°15', Prince of Wales Island



56,000 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP C - SURVEYED AREA SOUTH OF 55°15',
PRINCE OF WALES ISLAND
1999



LOCATION INDEX

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999
The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system and a Scintrex cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along north-south flight lines for the northern portion and east-west flight lines for the southern portion one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

HETTA SURVEY "Area 3" – May 1992
DOLOMI SURVEY "Area 1" – March 1991
The geophysical data were acquired with DIGHEM (Dolomi Survey), and DIGHEM (Hetta Survey) Electromagnetic (EM) systems and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 104 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The flight lines were flown with one-eighth mile line spacing with tie lines flown perpendicular to the flight lines. The Dolomi Survey was flown north-south with an AS350B helicopter. The Hetta Survey was flown with an AS350B-1 helicopter. The flight lines for Hetta Survey were flown east-west except for the peninsula between Cordova Bay and Hetta Inlet which was flown northeast-southwest.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1991/92 data should be considered at the rendition.

RESISTIVITY

The DIGHEM 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 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.

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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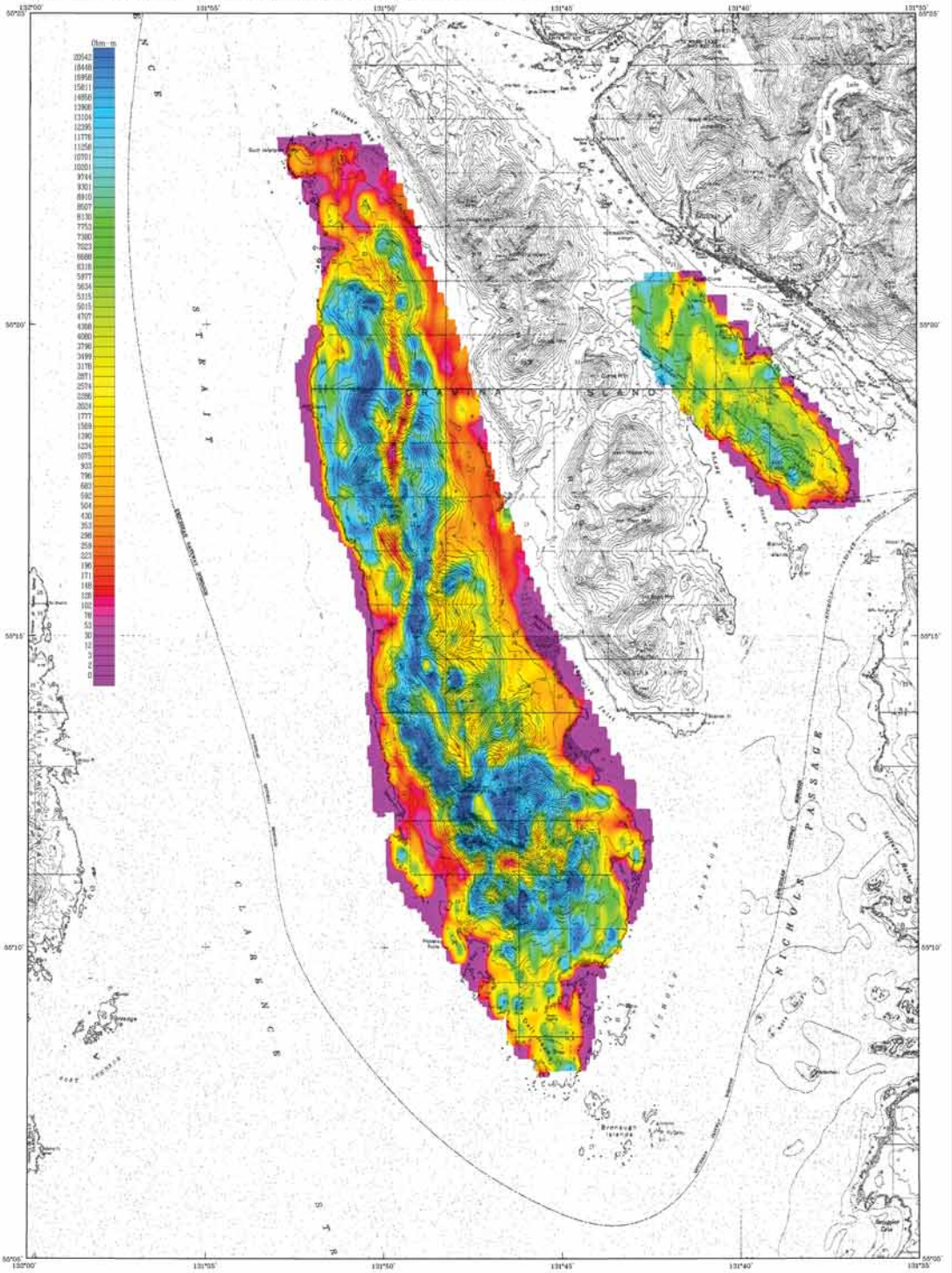
GEOPHYSICAL REPORT 1999-2D
Map D - Western and Eastern Parts, Gravina Island



Base from U.S. Geological Survey Ketchikan A-5, 1950, A-6, 1949; B-5, 1955, B-6, 1954, Quadrangles, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 200 FEET
DATUM MEAN SEA LEVEL

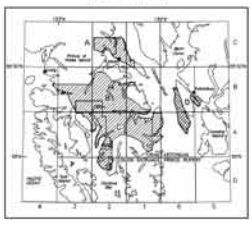
APPROXIMATE MEAN DECLINATION, 1999

56,000 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND

1999

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 east–west flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 129°, 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 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.

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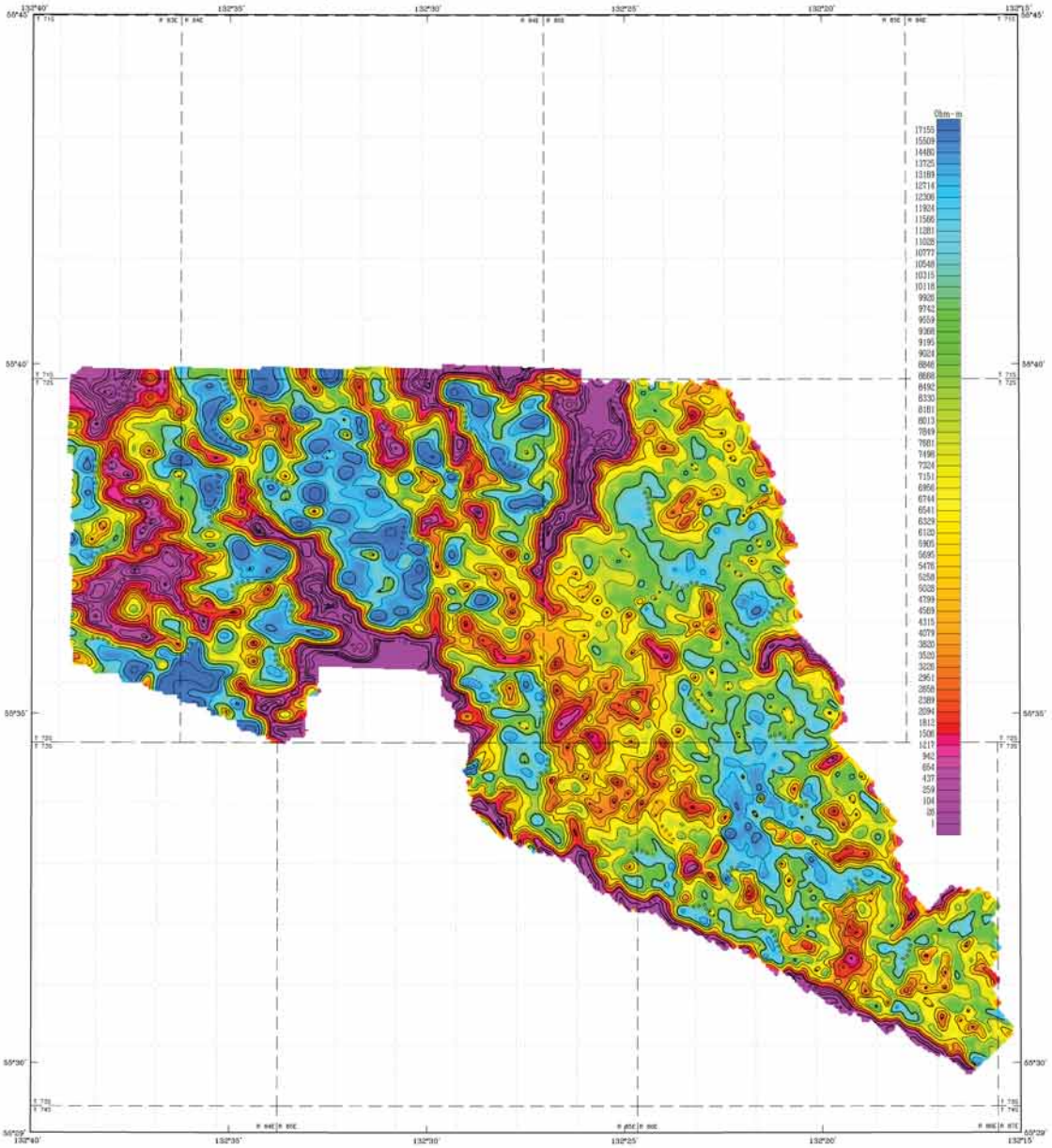
GEOPHYSICAL REPORT 1999-11A
Map A - Salt Chuck and Kasaan
Peninsula, Prince of Wales Island



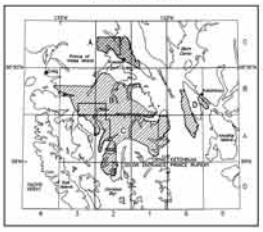
SCALE 1:63,360
1 0 1 2 3 4 MILES
1 0 1 2 3 4 5 KILOMETERS

56,000 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP A - SALT CHUCK AND KASAAN PENINSULA, PRINCE OF WALES ISLAND

1999

LOCATION INDEX



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

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 north-south flight lines, one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Magcal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

KASAAN SURVEY "Area 2" – May 1992

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The northeast-southwest flight lines were flown one-eighth mile apart with tie lines flown parallel to the survey boundaries. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability. An error on the Craig C-2 topographic map sheet caused distortion of the positioning in the original 1992 data. The data were re-positioned in 1999 using a rubber sheet stretching technique to better match the topography and fit with the 1999 data.

RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

resistivity low

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 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.

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SURVEY HISTORY

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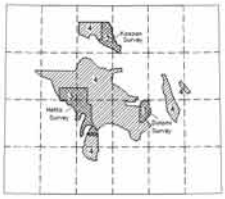

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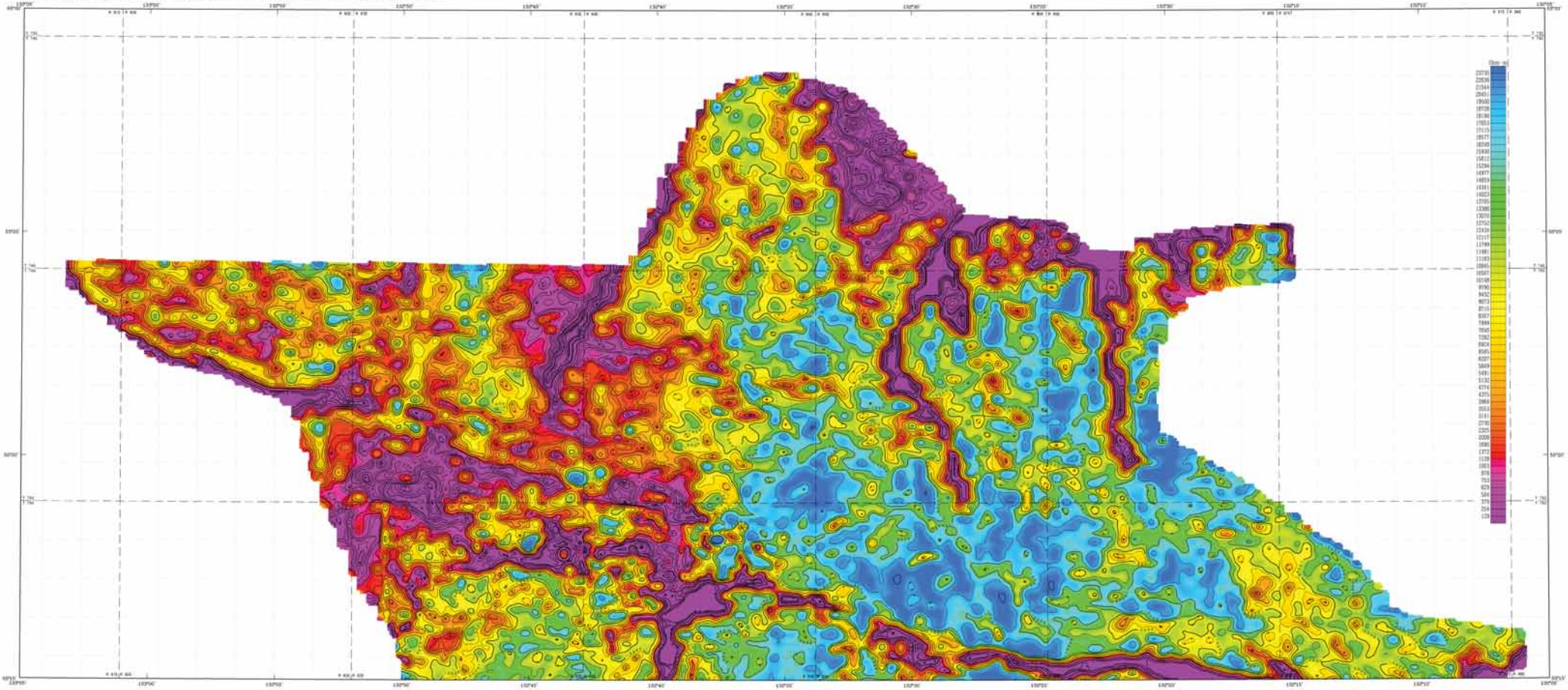
GEOPHYSICAL REPORT 1999-11B
Map B - Surveyed Area Immediately North of 55°15', Prince of Wales Island



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

56,000 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP B - SURVEYED AREA IMMEDIATELY NORTH OF 55°15', PRINCE OF WALES ISLAND

1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area A" – March 1999

The geophysical data were acquired with a DIGHEM[2] 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 north–south flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 2 miles.

An Ashtech/Magnavox 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

METTA SURVEY "Area 3" – May 1992

The geophysical data were acquired with a DIGHEM[2] Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The west–west flight lines were flown one-eighth mile apart with tie lines flown perpendicular to the flight lines. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low resolution.

RESISTIVITY

The DIGHEM[2] 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 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.

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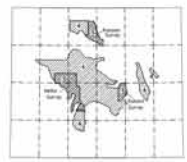
RESISTIVITY CONTOURS

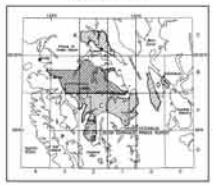
1000
800
630
500
400
315
250
200
160
125
100

Contours in ohm-m at 10 intervals per decade

resistivity low



LOCATION INDEX



SURVEY HISTORY

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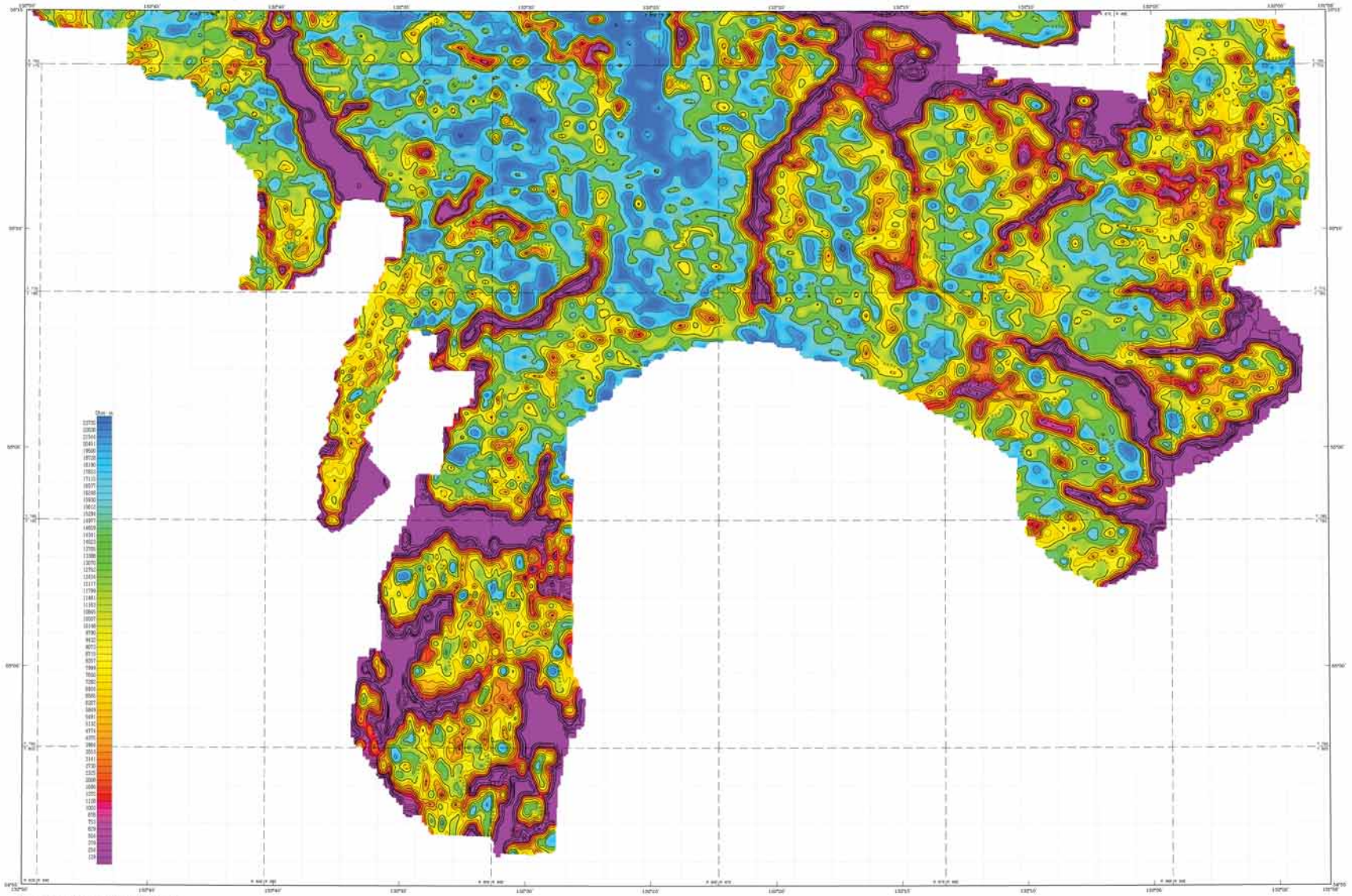
GEOPHYSICAL REPORT 1999-11C
Map C - Surveyed Area South of
55°15', Prince of Wales Island



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

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 north–south flight lines for the northern portion and east–west flight lines for the southern portion one-quarter mile apart. The lines were flown perpendicular to the flight lines at intervals of approximately .5 miles.

An Ashtech/Picos 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

METTA SURVEY "Area 3" – May 1992
DOLOMI SURVEY "Area 1" – March 1991

The geophysical data were acquired with DIGHEM^{V} (Dolomi Survey) and DIGHEM^{V} (Metta Survey) Electromagnetic (EM) systems and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, VHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The flight lines were flown with one-eighth mile line spacing with tie lines flown perpendicular to the flight lines. The Dolomi Survey was flown north–south on an AS350B helicopter. The Metta Survey was flown with an AS350B-1 helicopter. The flight lines for Metta Survey were flown east–west except for the peninsula between Cordova Bay and Hunter Inlet which was flown northeast–southwest.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1991/92 data should be considered at the resolution

SCALE 1:63,360
1 0 1 2 3 4 MILES
1 0 1 2 3 4 5 6 KILOMETERS

LOCATION INDEX

56,000 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP C - SURVEYED AREA SOUTH OF 55°15',
PRINCE OF WALES ISLAND
1999

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, 5000 and 56,000 Hz. Data were recorded at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the 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.

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

RESISTIVITY CONTOURS

Contours in ohm-m at 10 intervals per decade

resistivity line

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGGS), and Kirk Hinkley & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geotech/ex-Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska Mental Health Trust Land Office, and the Counties of Prince of Wales and Ketchikan. The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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 Minerals Information Center, Mayflower Island, Douglas, AK.

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
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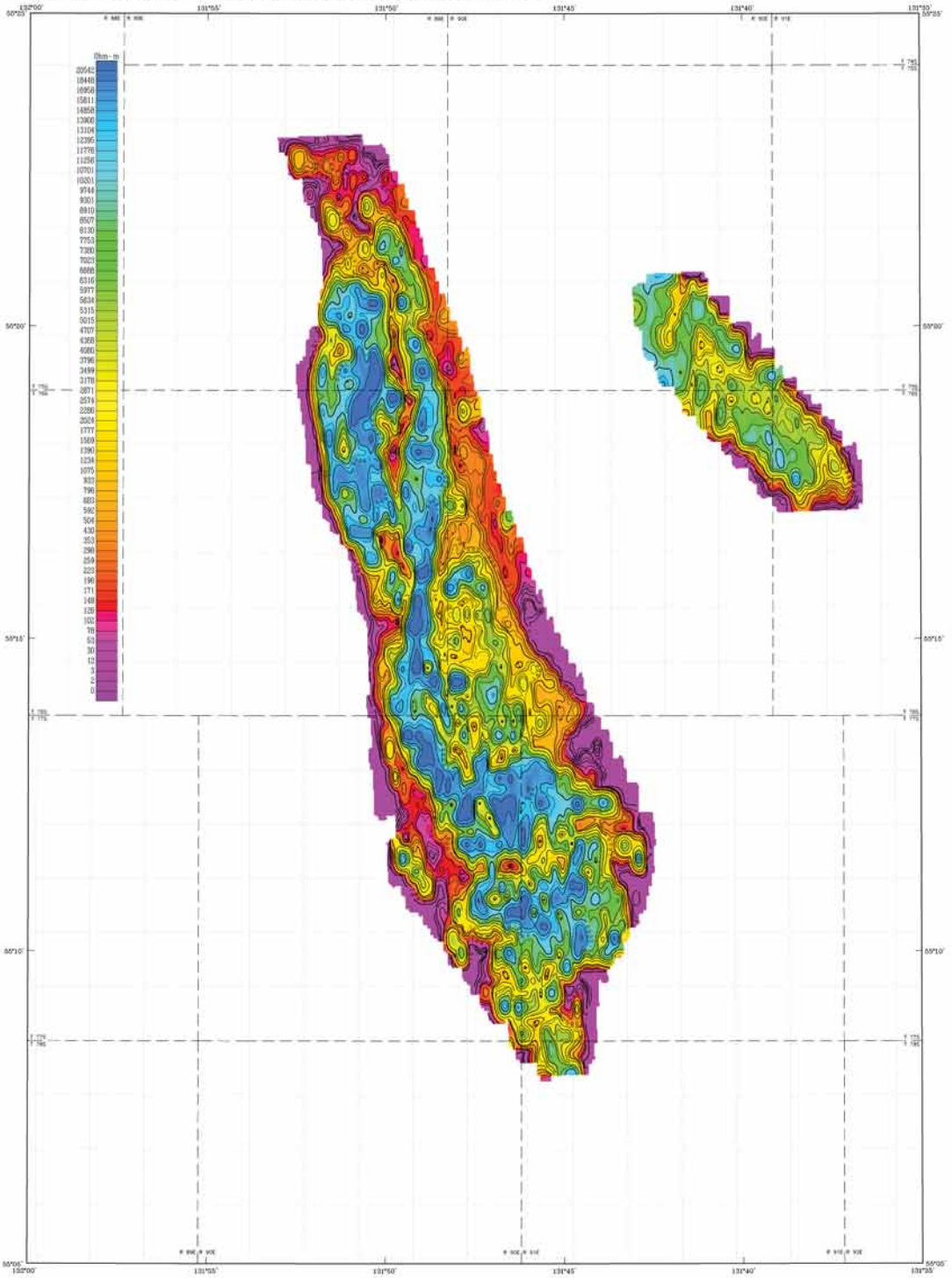
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-11D
Map D - Western and Eastern Parts, Gravina Island



Sections outlined from U.S. Geological Survey Ketchikan A-5, 1950; A-6, 1949; B-5, 1950; B-6, 1954; Quadrangles, Alaska

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

APPROXIMATE MEAN DECLINATION 1999

56,000 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND

1999

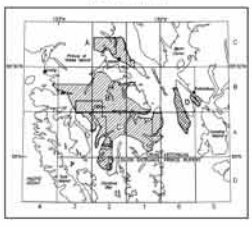
RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

resistivity low

LOCATION INDEX



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 east–west flight lines, one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 129°, 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 5900 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 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.

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 (DNR), Division of Geological & Geophysical Surveys (DGGS), and WGM, Mining & Geological Consultants, Inc.. Airborne geophysical data for the area were acquired in 1999 by Geoterrex–Dighem, a division of CGG Canada Ltd.. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Coffman Cove.

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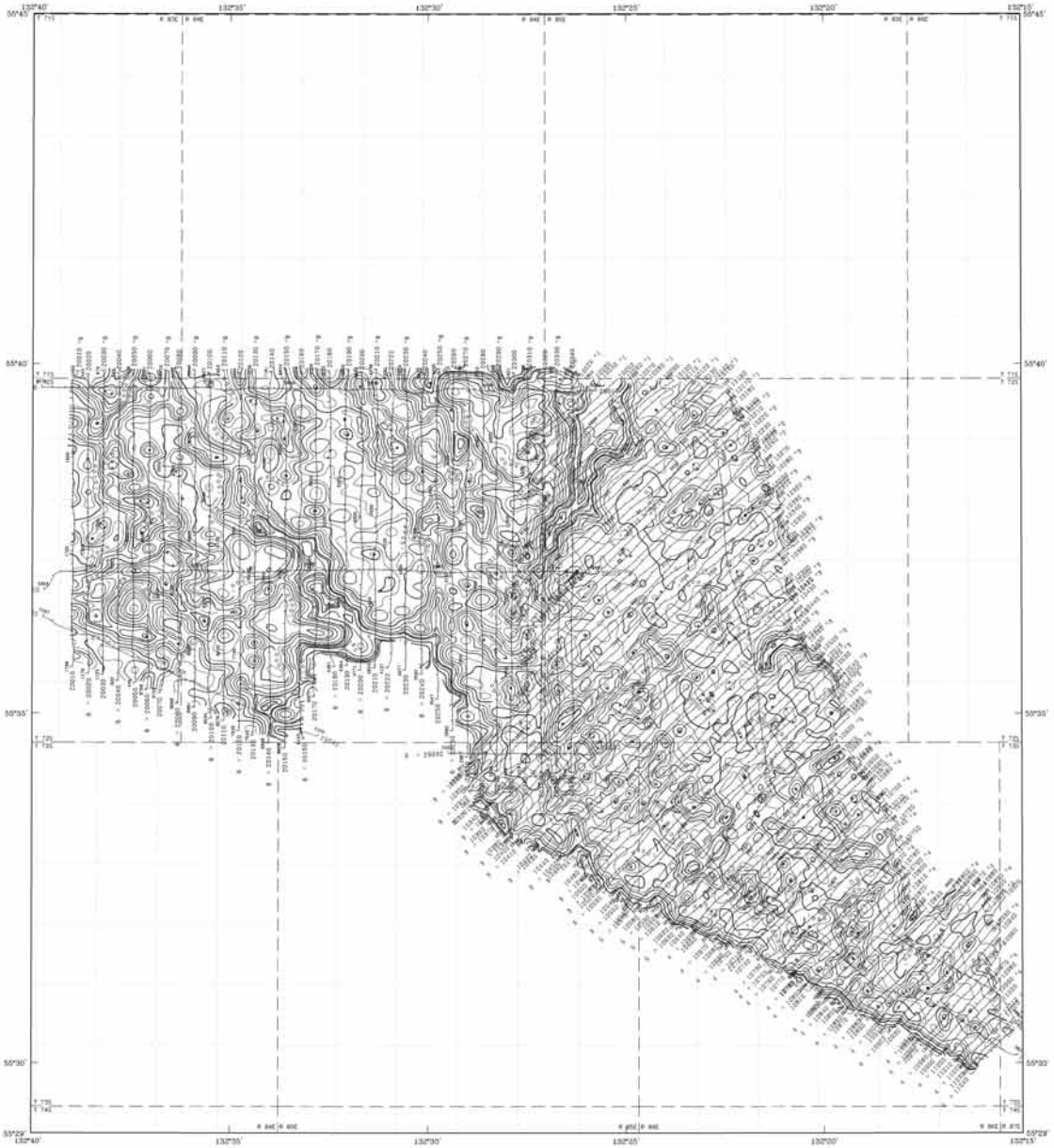
GEOPHYSICAL REPORT 1999-7A
Map A - Salt Chuck and Kasaan
Peninsula, Prince of Wales Island



Section outlines from U.S. Geological Survey Craig D-1, 1948; D-2, 1948; D-3, 1950; D-5, 1948; Ketchikan, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

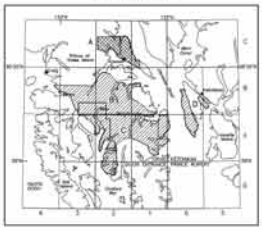
1 0 1 2 3 4 5 KILOMETERS

56,000 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP A - SALT CHUCK AND KASAAN PENINSULA, PRINCE OF WALES ISLAND

1999

LOCATION INDEX



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

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 north-south flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

KASAAN SURVEY "Area 2" – May 1992

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The northeast-southwest flight lines were flown one-eighth mile apart with tie lines flown parallel to the survey boundaries. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability. An error on the Craig C-2 topographic map sheet caused distortion of the positioning in the original 1992 data. The data were re-positioned in 1999 using a rubber sheet stretching technique to better match the topography and fit with the 1999 data.

RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

resistivity low

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 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.

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 (DNR), Division of Geological & Geophysical Surveys (DGGS), and RGM, Mining & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geoterrex-Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Coffman Cove. The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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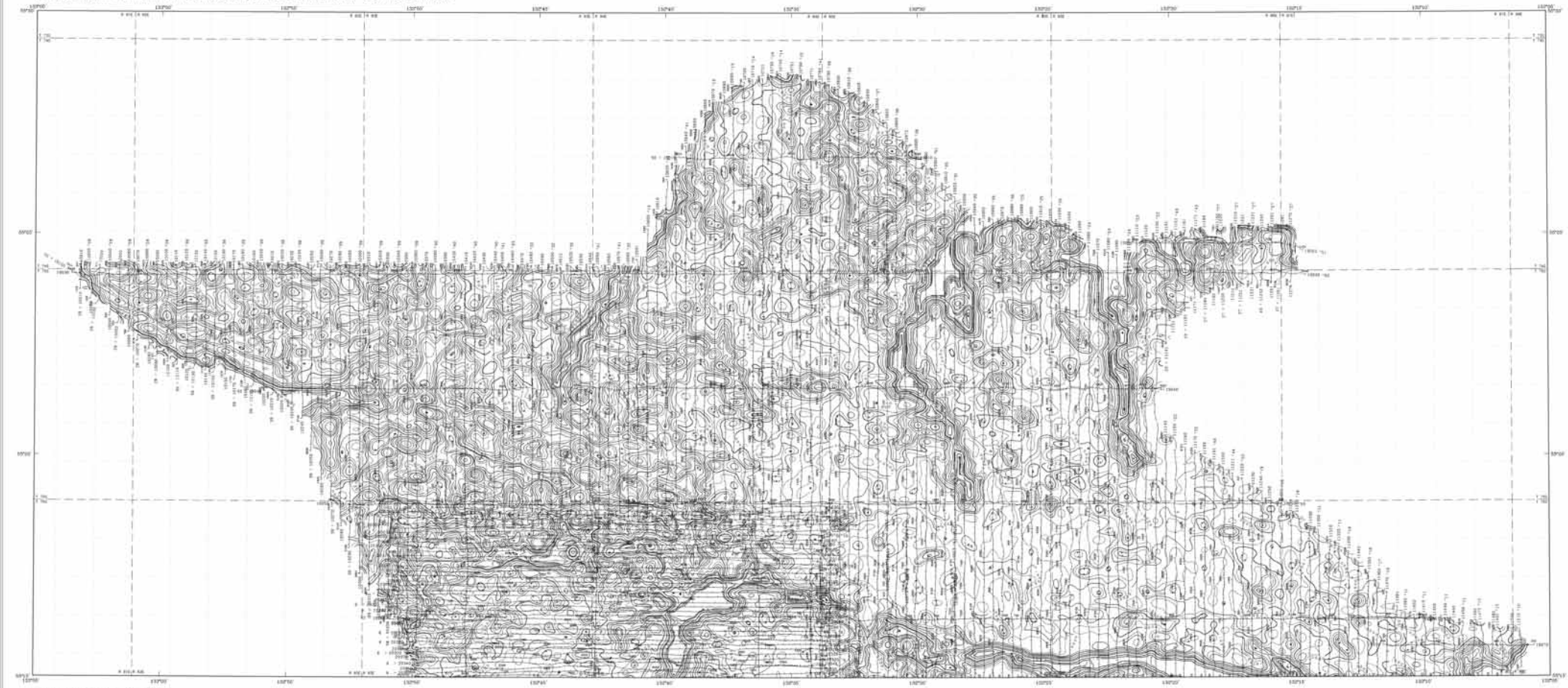
GEOPHYSICAL REPORT 1999-7B
Map B - Surveyed Area Immediately North of 55°15', Prince of Wales Island



SCALE 1:63,360

56,000 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP B - SURVEYED AREA IMMEDIATELY NORTH OF 55°15', PRINCE OF WALES ISLAND

1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

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 north–south flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 5 miles.

An Aerotech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 UTM zone 8T spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

HETTA SURVEY "Area 3" – May 1892

The geophysical data were acquired with a DIGHEM^{V} Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors, VLF receiver and video camera. The east–west flight lines were flown one-eighth mile apart with the lines flown perpendicular to the flight lines. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual reviews. Positional accuracy of the 1892 data should be considered of low reliability.

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 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.

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.

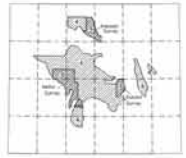
RESISTIVITY CONTOURS

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 (DNR), Division of Geological & Geophysical Surveys (DGGS), and RGM, Mining & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geotech/ax–Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Craftman Cove. The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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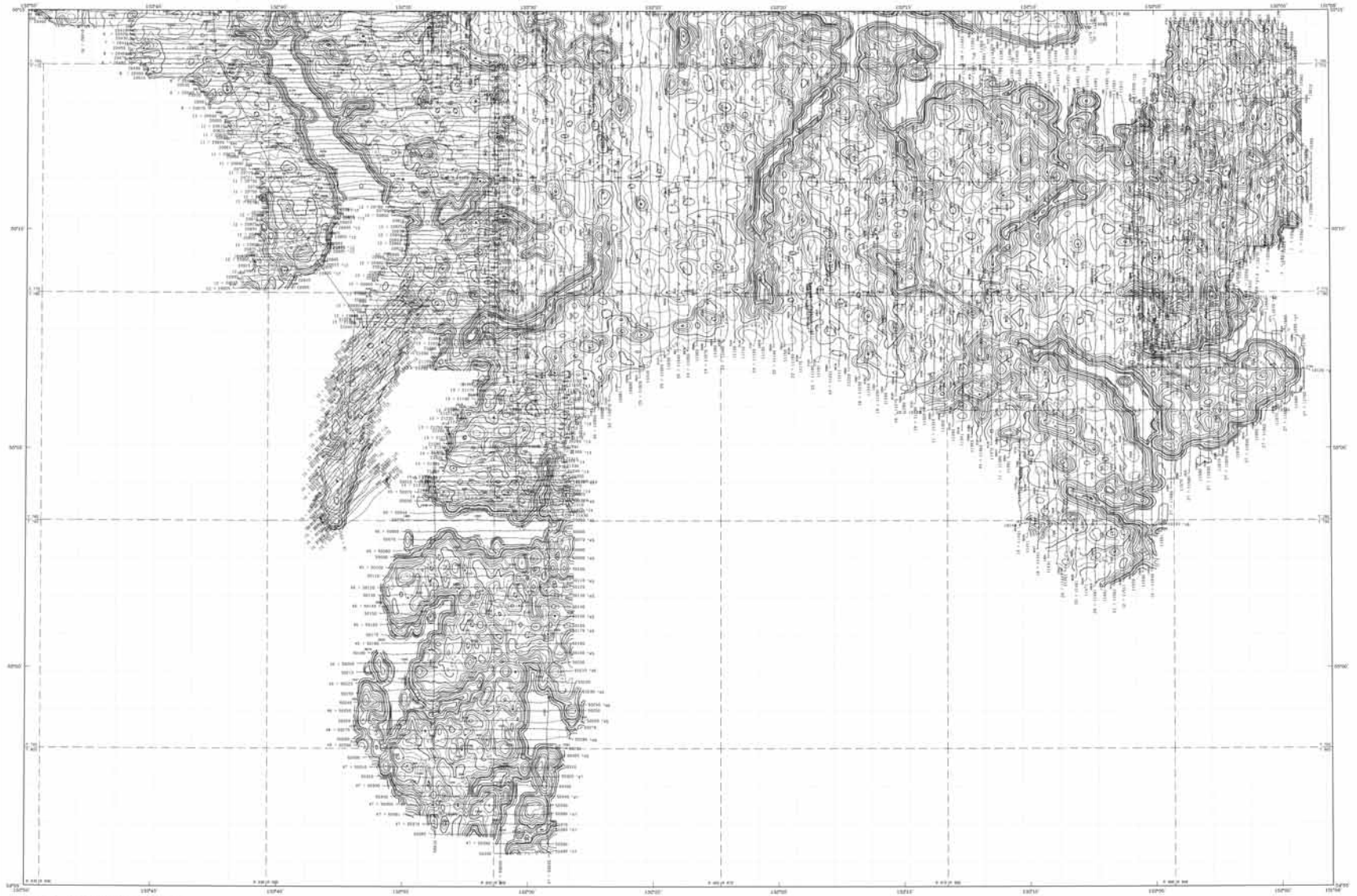
GEOPHYSICAL REPORT 1999-7C
Map C - Surveyed Area South of
55°15', Prince of Wales Island



56,000 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP C - SURVEYED AREA SOUTH OF 55°15',
PRINCE OF WALES ISLAND
1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

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 required 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 north–south flight lines for the northern portion and east–west flight lines for the southern portion one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 2 miles.

An Ashtech/Magnavox Real-Time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight path recovery. The helicopter position was derived every 0.2 seconds using real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (27# zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 132° 0' west, 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.

METTA SURVEY "Area 3" – May 1998 / DOLOMI SURVEY "Area 1" – March 1999

The geophysical data were acquired with DIGHEM^{V} (Ocean Survey) and DIGHEM^{V} (Metta Survey) Electromagnetic (EM) systems and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were (approximately) 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, VHF navigation system, 50/60 Hz monitors, GLF receiver and video camera. The flight lines were flown with one-eighth mile line spacing with tie lines flown perpendicular to the flight lines. The Dolomi Survey was flown north–south with an AS350B helicopter. The Metta Survey was flown with an AS350B-1 helicopter. The flight lines for Metta Survey were flown east–west except for the peninsula between Cordova Bay and Hotham Inlet which was flown northeast–southwest.

A Sea Horse UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1991/92 data should be considered as fair/poor.

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 vertical coplanar coil pairs operated at 1800, 7200, and 56,000 Hz. All data were sampled at 0.1 second intervals. The EM system was used to map 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.

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.

SCALE 1:63,360

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

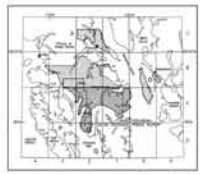
RESISTIVITY CONTOURS

1100
800
600
500
400
300
250
200
150
125
100

Contours in intervals of 10 ohm-m 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 (DNR), Division of Geological & Geophysical Surveys (DGGS), and Kim Kenny & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1998 by Geotech Ltd., a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management, Alaska, Ketchikan Gateway Borough, Sealaska Corporation, Alaska Mental Health Trust Land Office, and the State of Alaska, DNR, DGGS (STATEMAP). The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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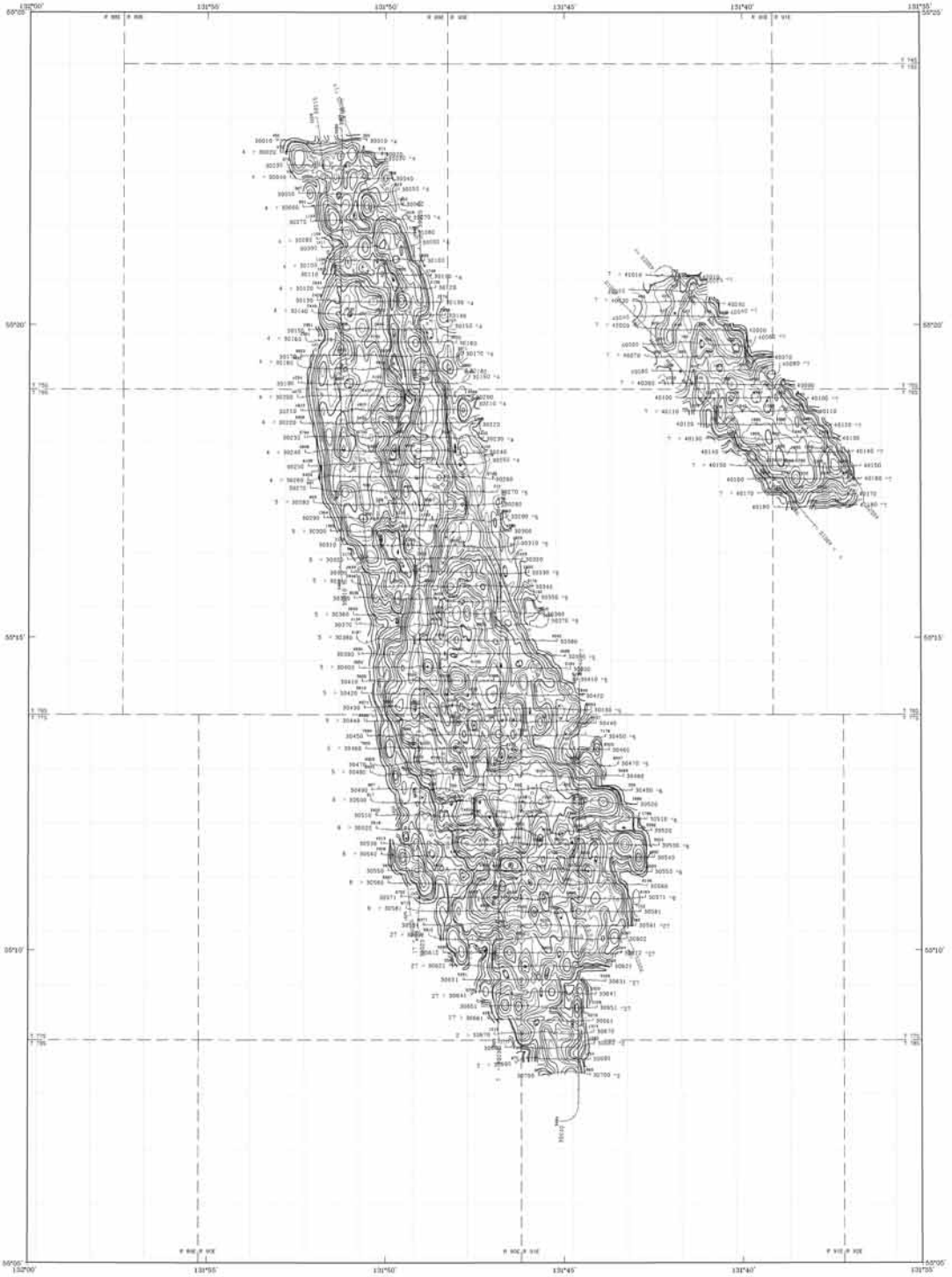
GEOPHYSICAL REPORT 1999-7D
Map D - Western and Eastern Parts, Gravina Island



Section outlines from U.S. Geological Survey Ketchikan A-5, 1955, A-6, 1948, B-5, 1955, B-6, 1954, Quadrangles, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

APPROXIMATE MEAN DECLINATION, 1999

56,000 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND

1999

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 east–west flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 129°, 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 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.

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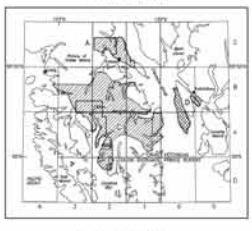
RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

resistivity low

LOCATION INDEX



SURVEY HISTORY

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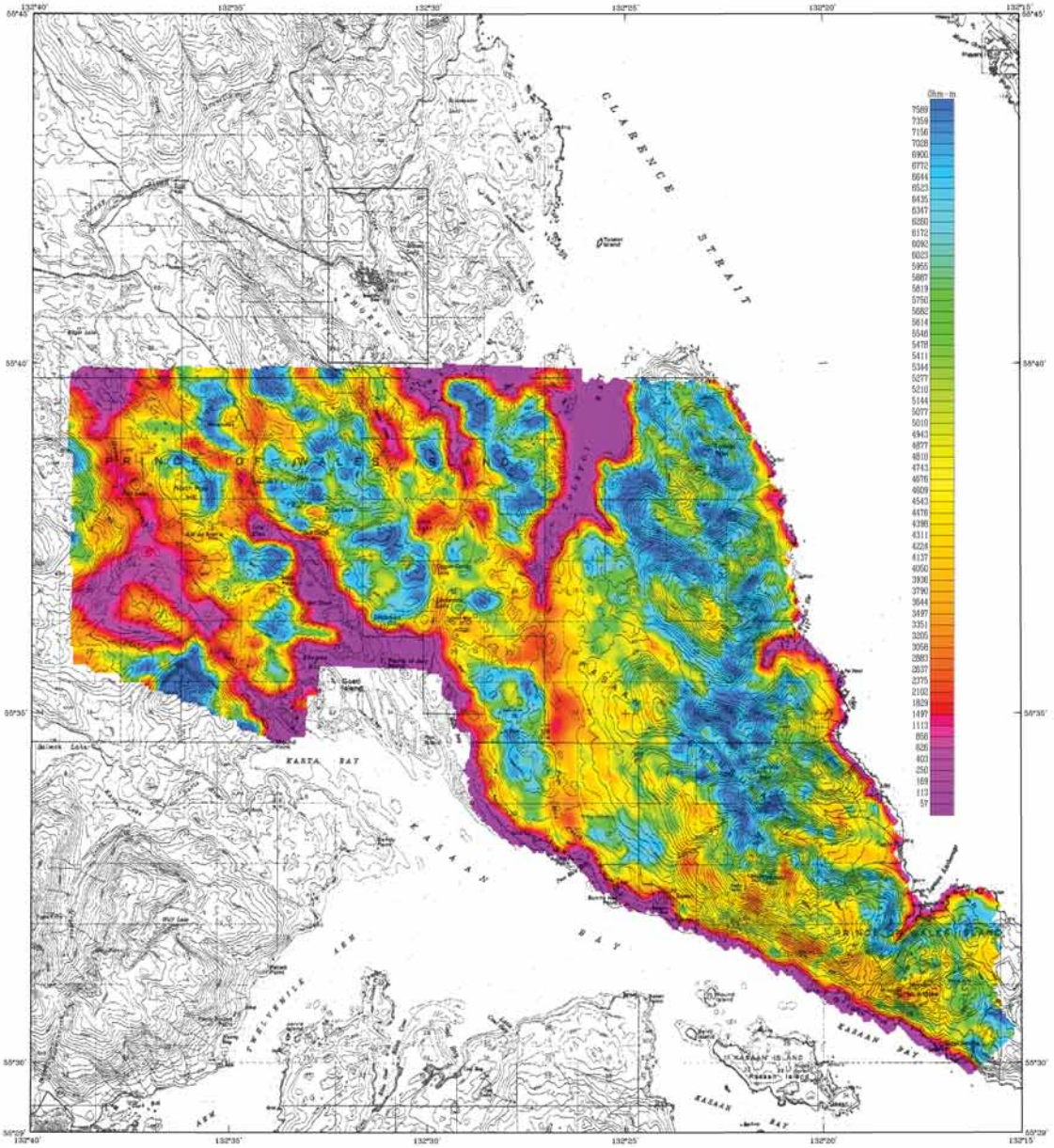
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

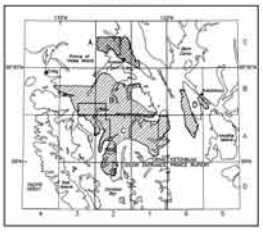
GEOPHYSICAL REPORT 1999-3A
Map A - Salt Chuck and Kasaan
Peninsula, Prince of Wales Island



Base from U.S. Geological Survey Craig B-1, 1948 B-2, 1948
C-1, 1951 C-2, 1949 Quadrangles, Alaska

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

LOCATION INDEX



7200 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP A - SALT CHUCK AND KASAAN PENINSULA, PRINCE OF WALES ISLAND

1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999
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 north–south flight lines, one–quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real–time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

KASAAN SURVEY "Area 2" – May 1992
The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The northeast–southwest flight lines were flown one–eighth mile apart with tie lines flown parallel to the survey boundaries. The survey was flown with an AS350B–1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability. An error on the Craig C–2 topographic map sheet caused distortion of the positioning in the original 1992 data. The data were re–positioned in 1999 using a rubber sheet stretching technique to better match the topography and fit with the 1999 data.

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 component 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.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGGS), and WGM, Mining & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geoterrex–Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Coffman Cove. The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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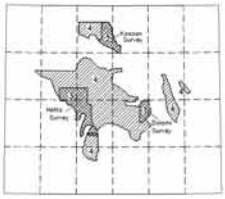

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
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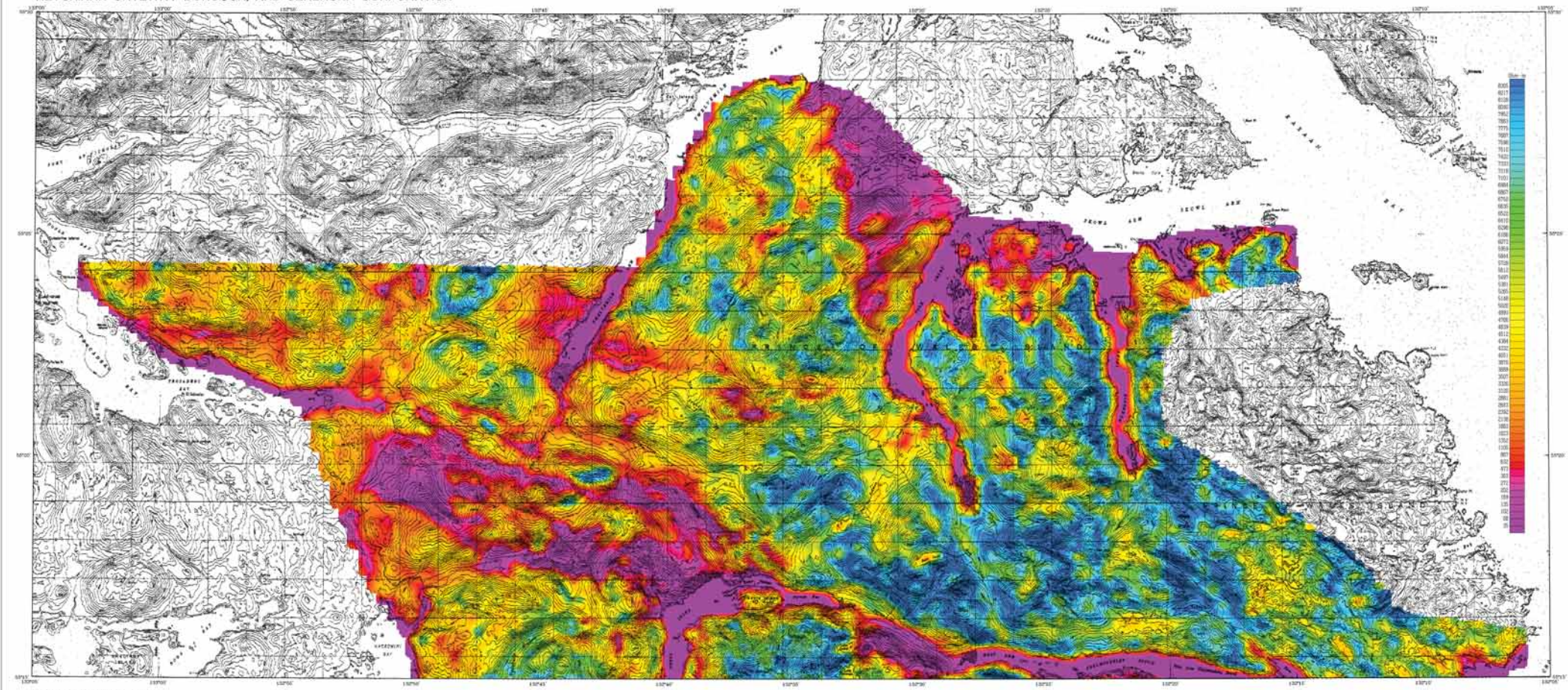
GEOPHYSICAL REPORT 1999-3B
Map B - Surveyed Area Immediately North of 55°15', Prince of Wales Island



7200 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP B - SURVEYED AREA IMMEDIATELY NORTH OF 55°15', PRINCE OF WALES ISLAND

1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

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 north–south flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

METTA SURVEY "Area 3" – May 1992

The geophysical data were acquired with a DIGHEM^{V} Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors, VLF receiver and video camera. The east–west flight lines were flown one-eighth mile apart with tie lines flown perpendicular to the flight lines. The survey was flown with an AS350B-1 helicopter.

A Del Norte GPS electronic positioning system was used for navigation. Flight path recovery was done with a combination of GPS data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability.

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 component 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

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGGS), and RGM, Mining & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geoterrex–Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Craftman Cove. The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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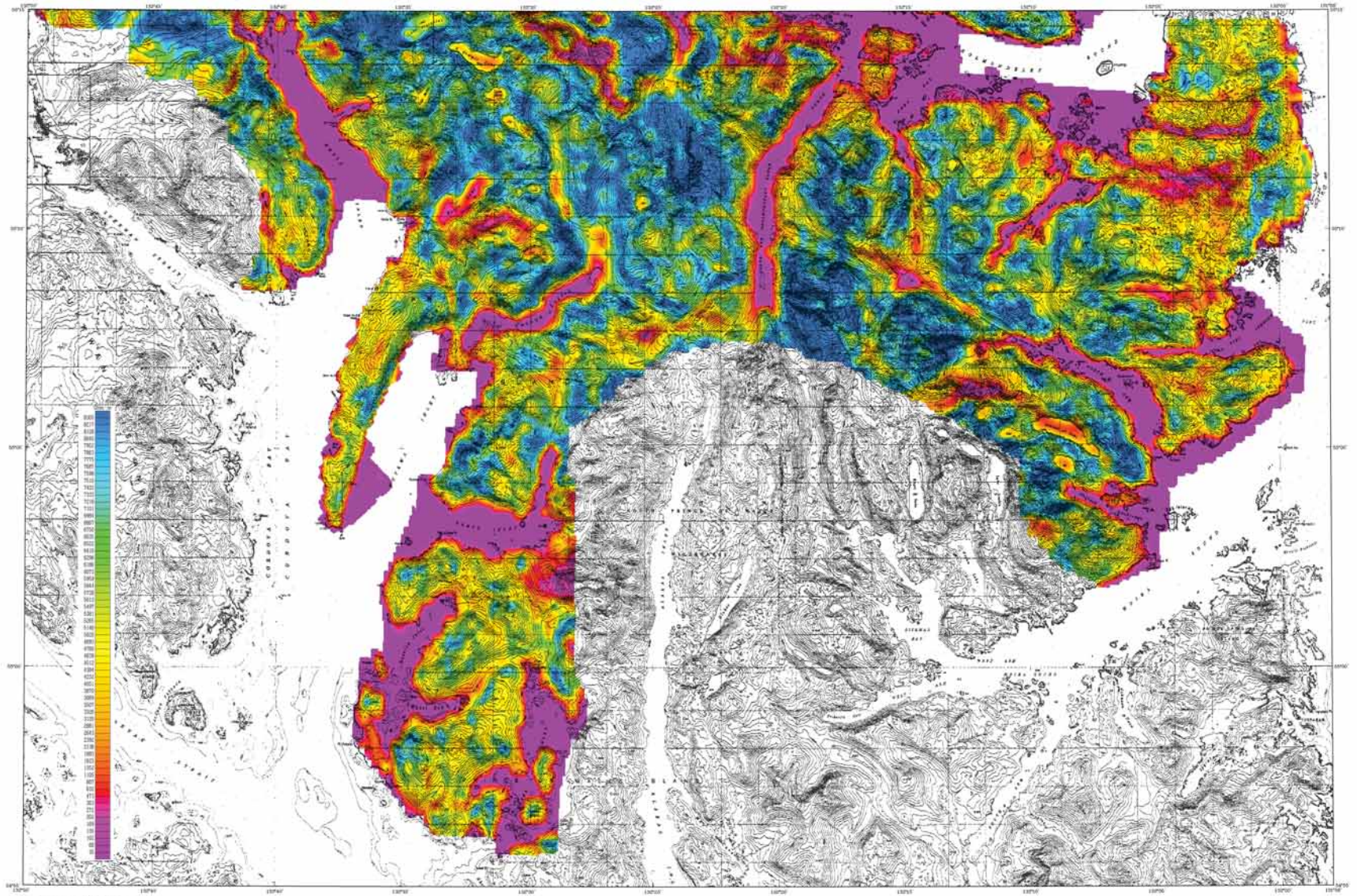
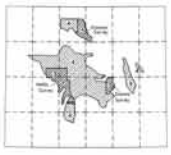
GEOPHYSICAL REPORT 1999-3C
Map C - Surveyed Area South of
55°15', Prince of Wales Island





7200 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP C - SURVEYED AREA SOUTH OF 55°15',
PRINCE OF WALES ISLAND
1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1998

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 north–south flight lines for the northern portion and east–west flight lines for the southern portion one-quarter mile apart. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Picodi 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

HETTA SURVEY "Area 3" – May 1992
DOLOMI SURVEY "Area 1" – March 1991

The geophysical data were acquired with DIGHEM^{V} (Dolomi Survey) and DIGHEM^{V} (Hetta Survey) Electromagnetic (EM) systems and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 215 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, VHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The flight lines were flown with man-eighth mile line spacing with tie lines flown perpendicular to the flight lines. The Dolomi Survey was flown north–south with an AS350B helicopter. The Hetta Survey was flown with an AS350B-1 helicopter. The flight lines for Hetta Survey were flown east–west except for the peninsula between Cordova Bay and Hetta Inlet which was flown northeast–southwest.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1991/92 data should be considered at the resolution

RESISTIVITY

The DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coplanar coil pairs operated at 900 and 5000 Hz while three horizontal coplanar coil pairs operated at 900, 5000 and 56,000 Hz. The system was operated at 0.1 second intervals. The EM system responds to resistive conductors, conductive overburden and bedrock sources. Apparent resistivity is generated from the inphase and quadrature component 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.

SCALE 1:63,360

1 0 1 2 3 4 MILES
1 0 1 2 3 4 5 6 KILOMETERS

TOPOGRAPHIC MATERIAL AND GRID SUPPLIED BY USGS, DENVER.

TRUE NORTH

APPROXIMATE MEAN DECLINATION, 1999

LOCATION INDEX

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGGS), and Kirk Hinkley & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1998 by Geotervey–Digheam, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management, Alaska State Office, through the Challenge Cost Share program, Alaska Mental Health Trust Land Office, and the State of Alaska General Fund (CIP). The data for areas 1, 2 and 3 were flown by Digheam in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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. These products are also available, in person only, at the BLM's Juneau Minerals Information Center, Mayflower Island, Douglas, AK.

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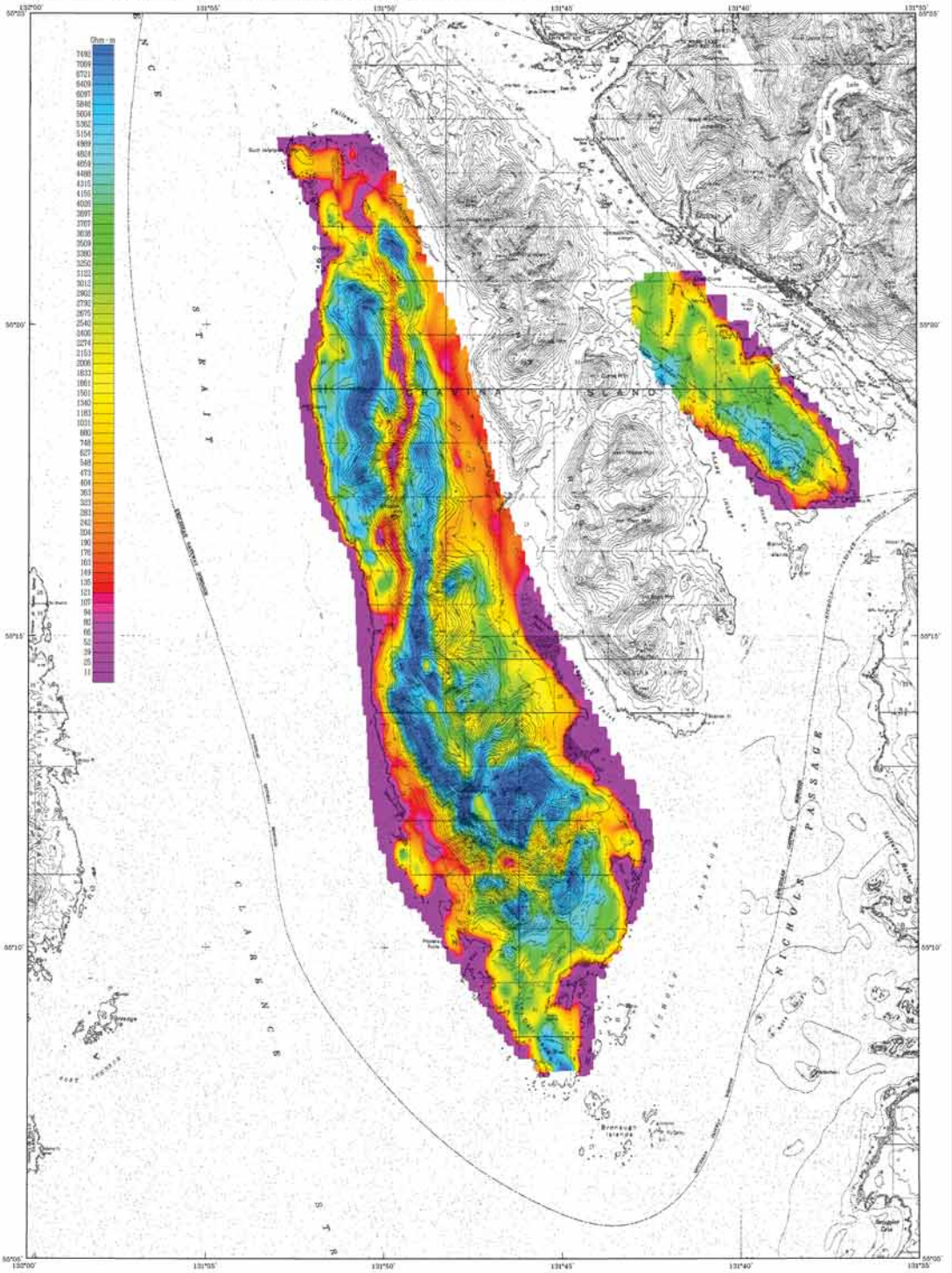
GEOPHYSICAL REPORT 1999-3D
Map D - Western and Eastern Parts, Gravina Island



Base from U.S. Geological Survey Ketchikan A-5, 1950, A-6, 1949;
B-5, 1951, B-6, 1954; Quadrangles, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 200 FEET
DATUM MEAN SEA LEVEL

APPROXIMATE MEAN DECLINATION, 1999

7200 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND

1999

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 east–west flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

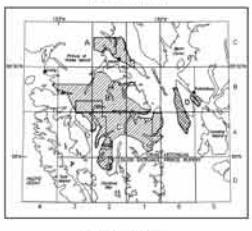
An Ashtech/Racal Real-Time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight path recovery. The helicopter position was derived every 0.5 seconds using real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 129°, 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 component 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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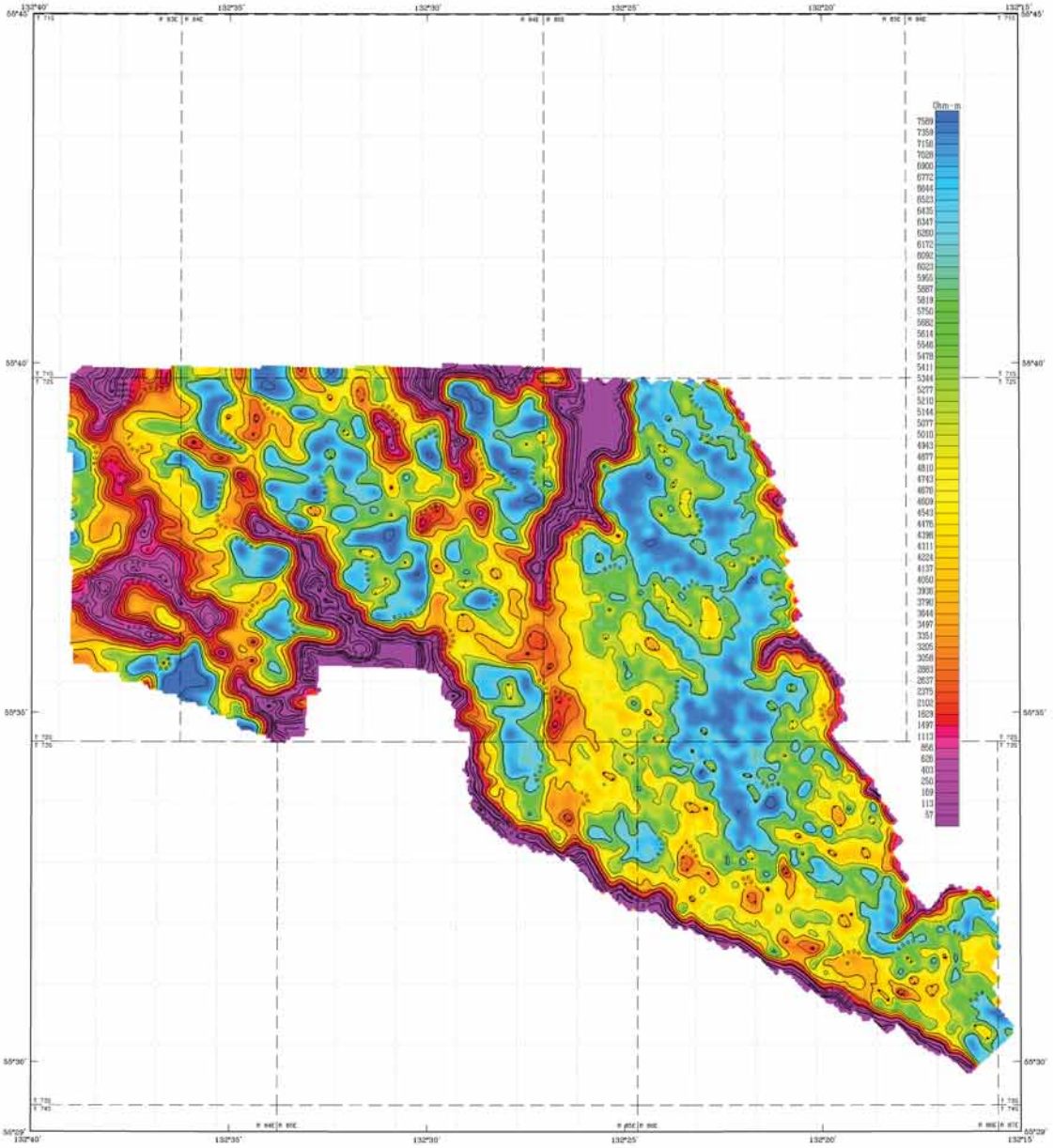
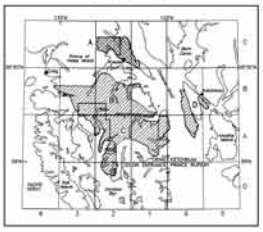
GEOPHYSICAL REPORT 1999-12A
Map A - Salt Chuck and Kasaan
Peninsula, Prince of Wales Island



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

LOCATION INDEX



7200 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP A - SALT CHUCK AND KASAAN PENINSULA, PRINCE OF WALES ISLAND

1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999
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 north-south flight lines, one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

KASAAN SURVEY "Area 2" – May 1992
The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The northeast-southwest flight lines were flown one-eighth mile apart with tie lines flown parallel to the survey boundaries. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability. An error on the Craig C-2 topographic map sheet caused distortion of the positioning in the original 1992 data. The data were re-positioned in 1999 using a rubber sheet stretching technique to better match the topography and fit with the 1999 data.

RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

resistivity low

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 component 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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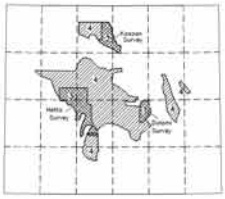

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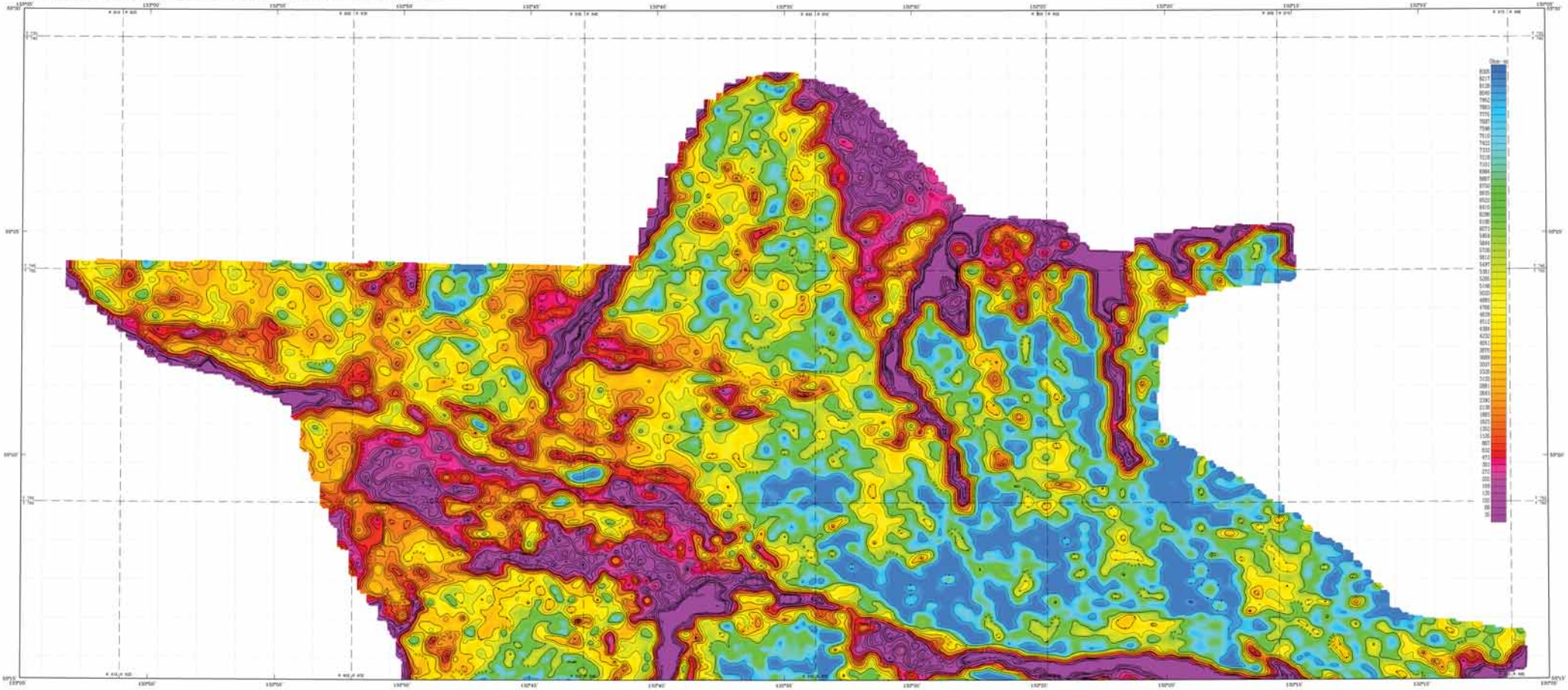
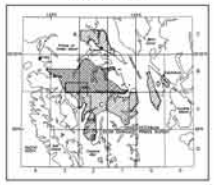
GEOPHYSICAL REPORT 1999-12B
Map B - Surveyed Area Immediately North of 55°15', Prince of Wales Island



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

LOCATION INDEX



7200 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP B - SURVEYED AREA IMMEDIATELY NORTH OF 55°15', PRINCE OF WALES ISLAND

1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

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 north-south flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 5 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

METTA SURVEY "Area 3" – May 1892

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The west-east flight lines were flown one-eighth mile apart with tie lines flown perpendicular to the flight lines. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1892 data should be considered of low reliability.

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 component 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.

RESISTIVITY CONTOURS

1700
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 (DNR), Division of Geological & Geophysical Surveys (DGGS), and RGM Mining & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geoterrex–Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Coffman Cove. The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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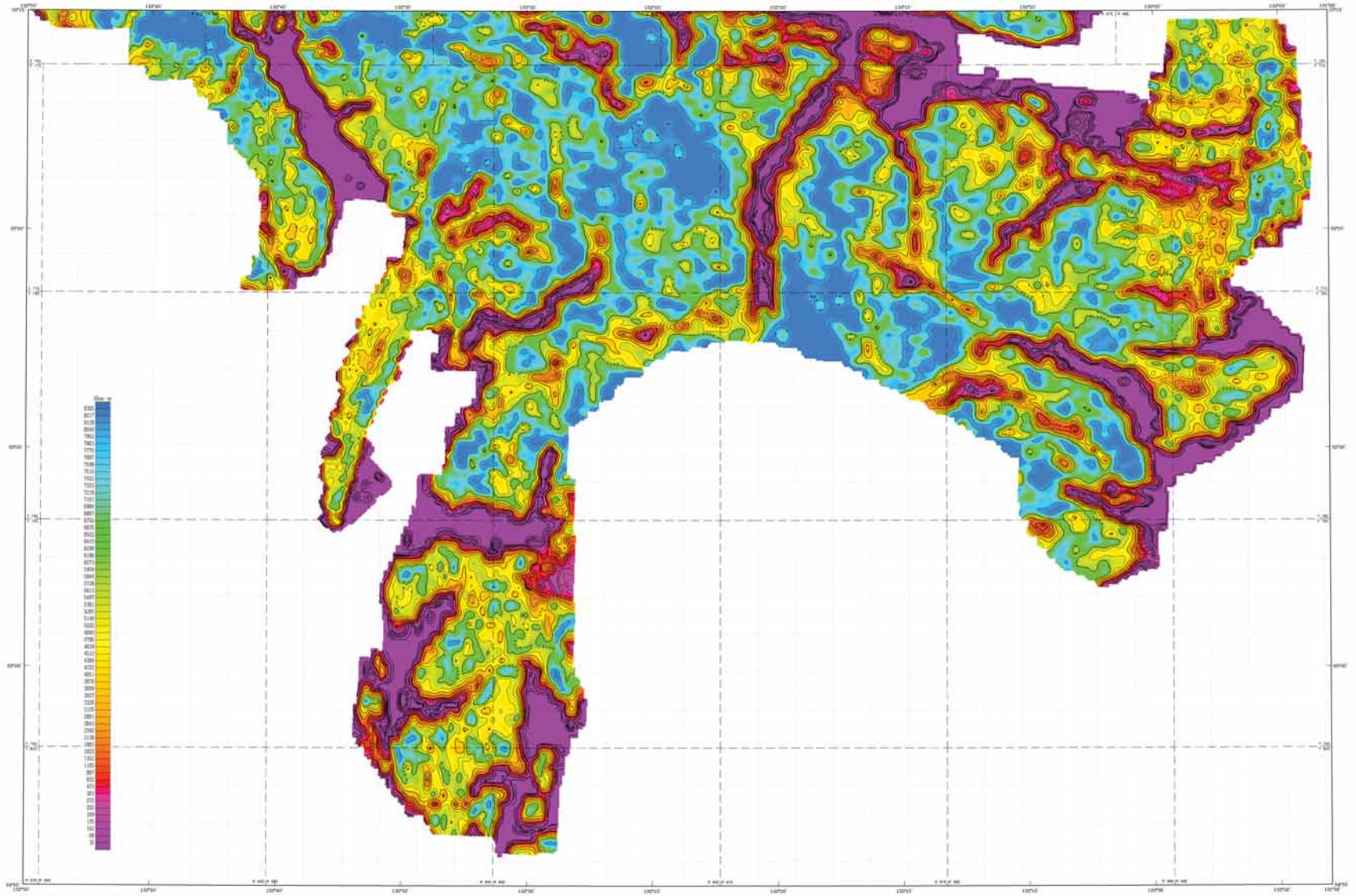
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-12C
Map C - Surveyed Area South of
55°15', Prince of Wales Island



7200 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP C - SURVEYED AREA SOUTH OF 55°15',
PRINCE OF WALES ISLAND
1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area A" – March 1999

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 north–south flight lines for the northern portion and east–west flight lines for the southern portion one-quarter mile apart. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

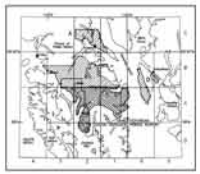
An Ashtech/Picos Real-Time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight path recovery. The helicopter position was derived every 0.5 seconds using real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

HATTA SURVEY "Area B" – May 1992
DOLOMI SURVEY "Area C" – March 1991

The geophysical data were acquired with DIGHEM^{V} (Dolomi Survey) and DIGHEM^{I} (Hatta Survey) Electromagnetic (EM) systems and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors, VLF receiver and video camera. The flight lines were flown with one-eighth mile line spacing with tie lines flown perpendicular to the flight lines. The Dolomi Survey was flown north–south on an AS350B helicopter. The Hatta Survey was flown with an AS350B-1 helicopter. The flight lines for Hatta Survey were flown east–west except for the peninsula between Cordova Bay and Hunter Inlet which was flown northeast–southwest.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1991/92 data should be considered at the resolution.

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



LOCATION INDEX

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 1,800, 7,200 and 56,000 Hz. Data were recorded at 0.1 second intervals. The EM system responds to resistive conductors, conductive overburden, and bedrock sources. Apparent resistivity is generated from the inphase and quadrature component 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.

RESISTIVITY CONTOURS

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 (DNR), Division of Geological & Geophysical Surveys (DGGS), and Kirk Hinkley & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1998 by Geotech/eu-Digheam, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska Mental Health Trust Land Office, and the Counties of Prince of Wales and Ketchikan. The data for areas 1, 2 and 3 were flown by Digheam in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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 Minerals Information Center, Mayflower Island, Douglas, AK.

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
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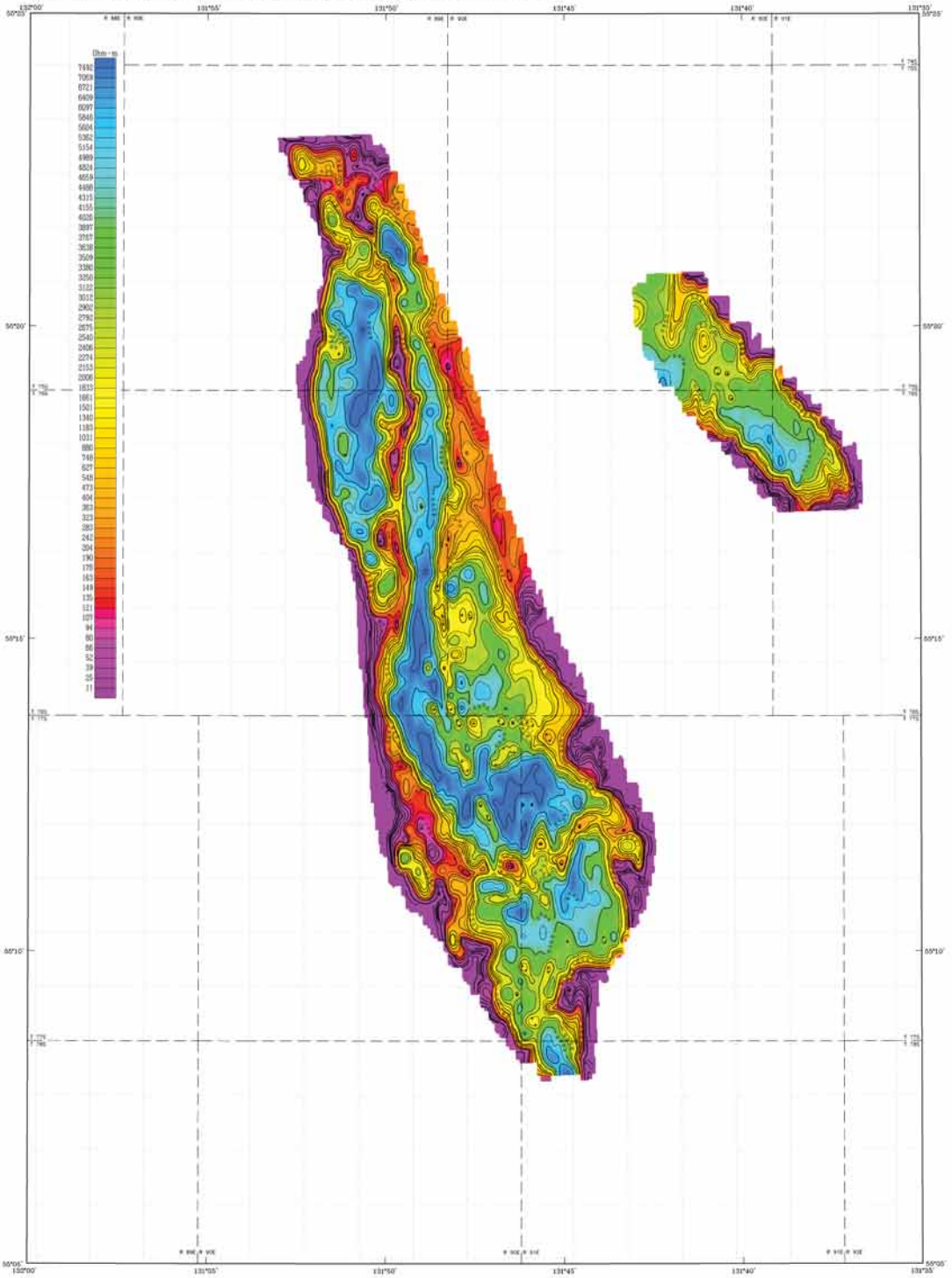
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-12D
Map D - Western and Eastern Parts, Gravina Island



SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

7200 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND

1999

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 east–west flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 129°, 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 component 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.

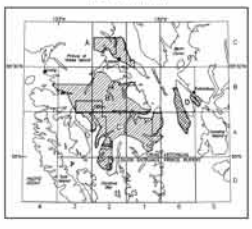
RESISTIVITY CONTOURS

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 (DNR), Division of Geological & Geophysical Surveys (DGGS), and RGM, Mining & Geological Consultants, Inc.. Airborne geophysical data for the area were acquired in 1999 by Geoterrex–Dighem, a division of CGG Canada Ltd.. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Coffman Cove.

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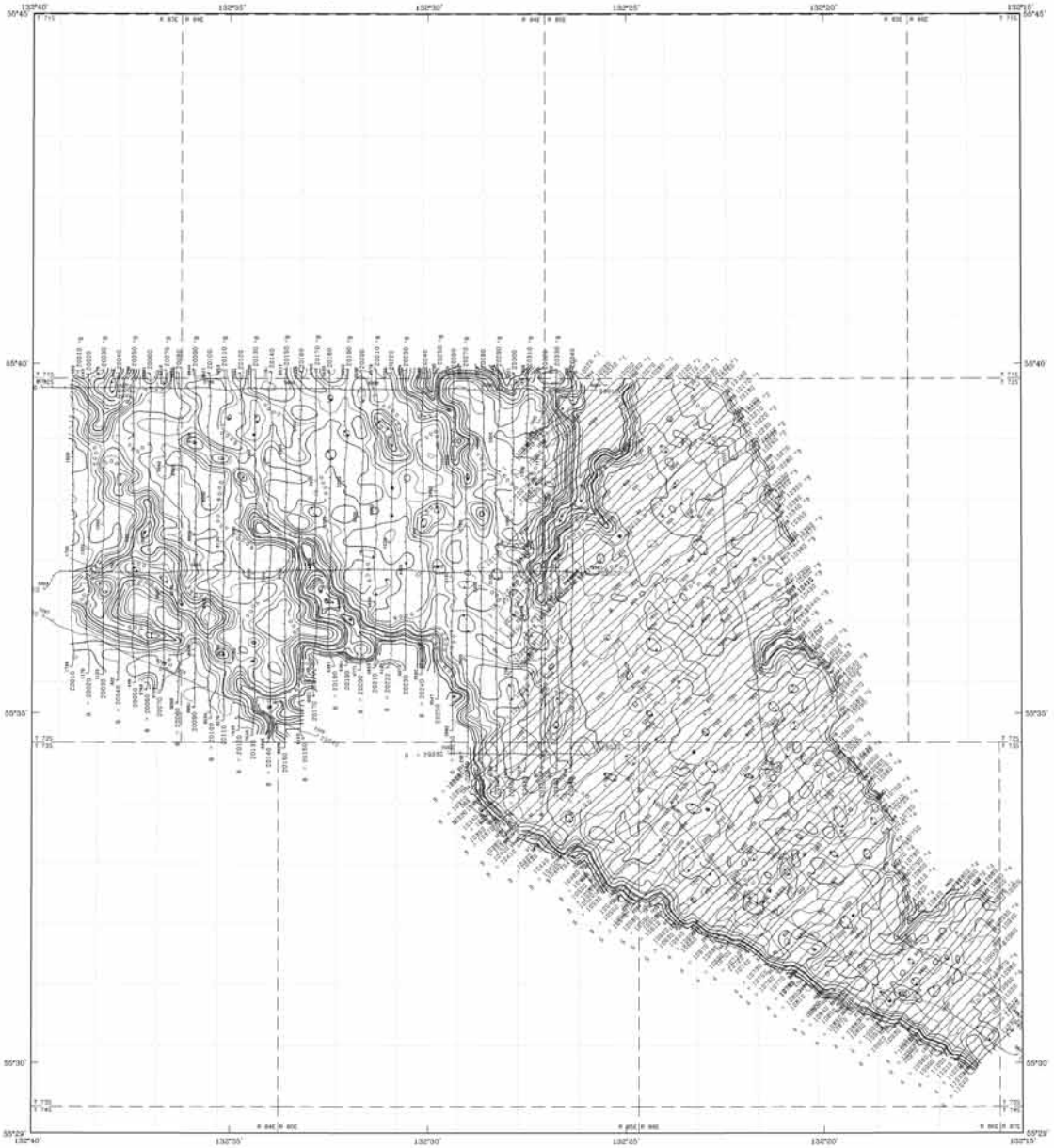
GEOPHYSICAL REPORT 1999-8A
Map A - Salt Chuck and Kasaan
Peninsula, Prince of Wales Island



Section outlines from U.S. Geological Survey Craig D-1, 1948; D-2, 1948; D-3, 1950; D-5, 1948; Ketchikan, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

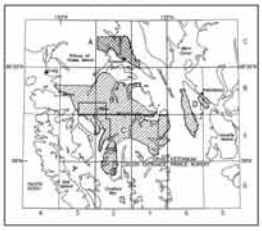
1 0 1 2 3 4 5 KILOMETERS

7200 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP A - SALT CHUCK AND KASAAN PENINSULA, PRINCE OF WALES ISLAND

1999

LOCATION INDEX



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

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 north–south flight lines one–quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real–time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

KASAAN SURVEY "Area 2" – May 1992

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The northeast–southwest flight lines were flown one–eighth mile apart with tie lines flown parallel to the survey boundaries. The survey was flown with an AS350B–1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability. An error on the Craig C–2 topographic map sheet caused distortion of the positioning in the original 1992 data. The data were re–positioned in 1999 using a rubber sheet stretching technique to better match the topography and fit with the 1999 data.

RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm–m at 10 intervals per decade

resistivity low

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 component 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.

SURVEY HISTORY

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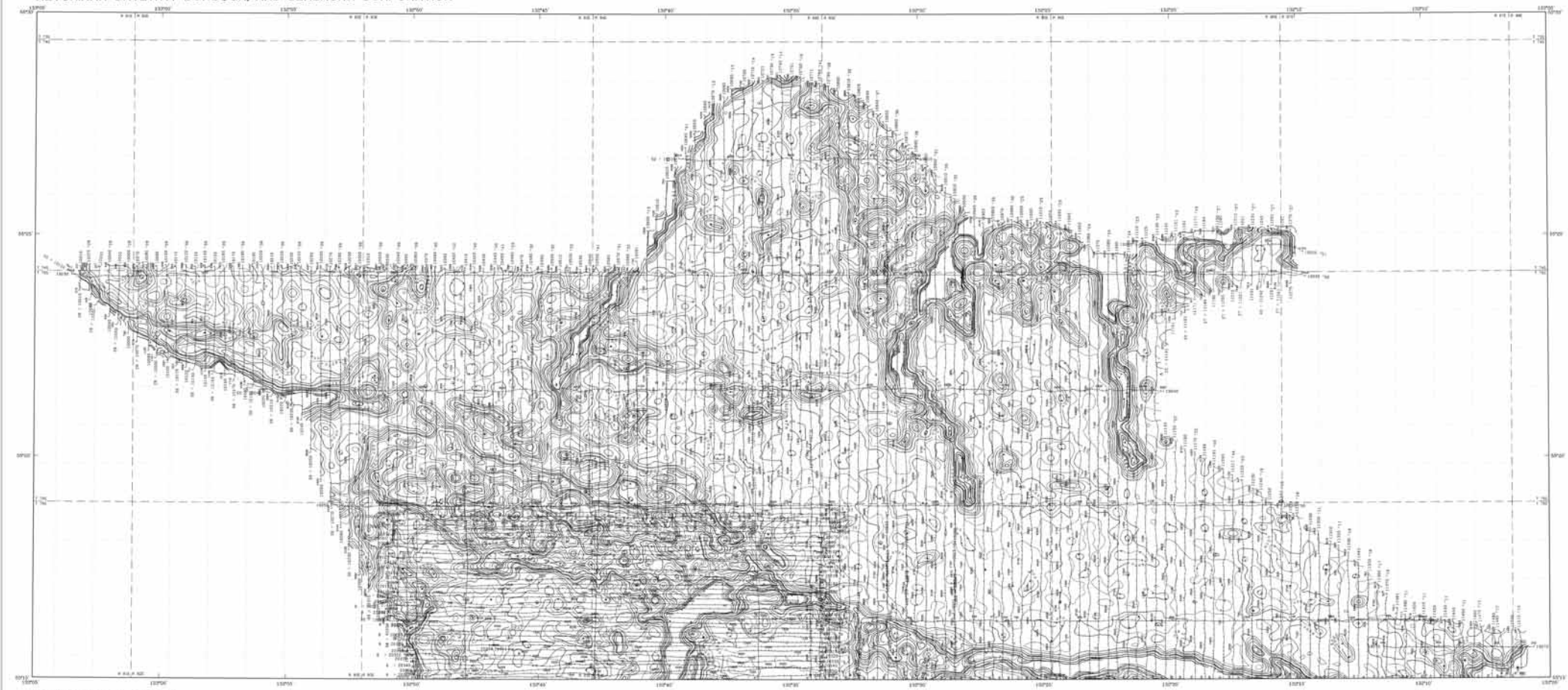
GEOPHYSICAL REPORT 1999-8B
Map B - Surveyed Area Immediately North of 55°15', Prince of Wales Island



SCALE 1:63,360

LOCATION INDEX

7200 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP B - SURVEYED AREA IMMEDIATELY NORTH OF 55°15', PRINCE OF WALES ISLAND

1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999
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 north–south flight lines one-quarter mile apart. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Aashtech/Trisol 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 real–time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

METTA SURVEY "Area 3" – May 1992
The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 212 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The east–west flight lines were flown one–eighth mile apart with tie lines flown perpendicular to the flight lines. The survey was flown with an AS350B–1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low resolution.

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 806, 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 component 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.

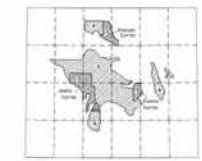
Akima, H. 1970, a new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

RESISTIVITY CONTOURS

1100
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

Resistivity low



SURVEY HISTORY

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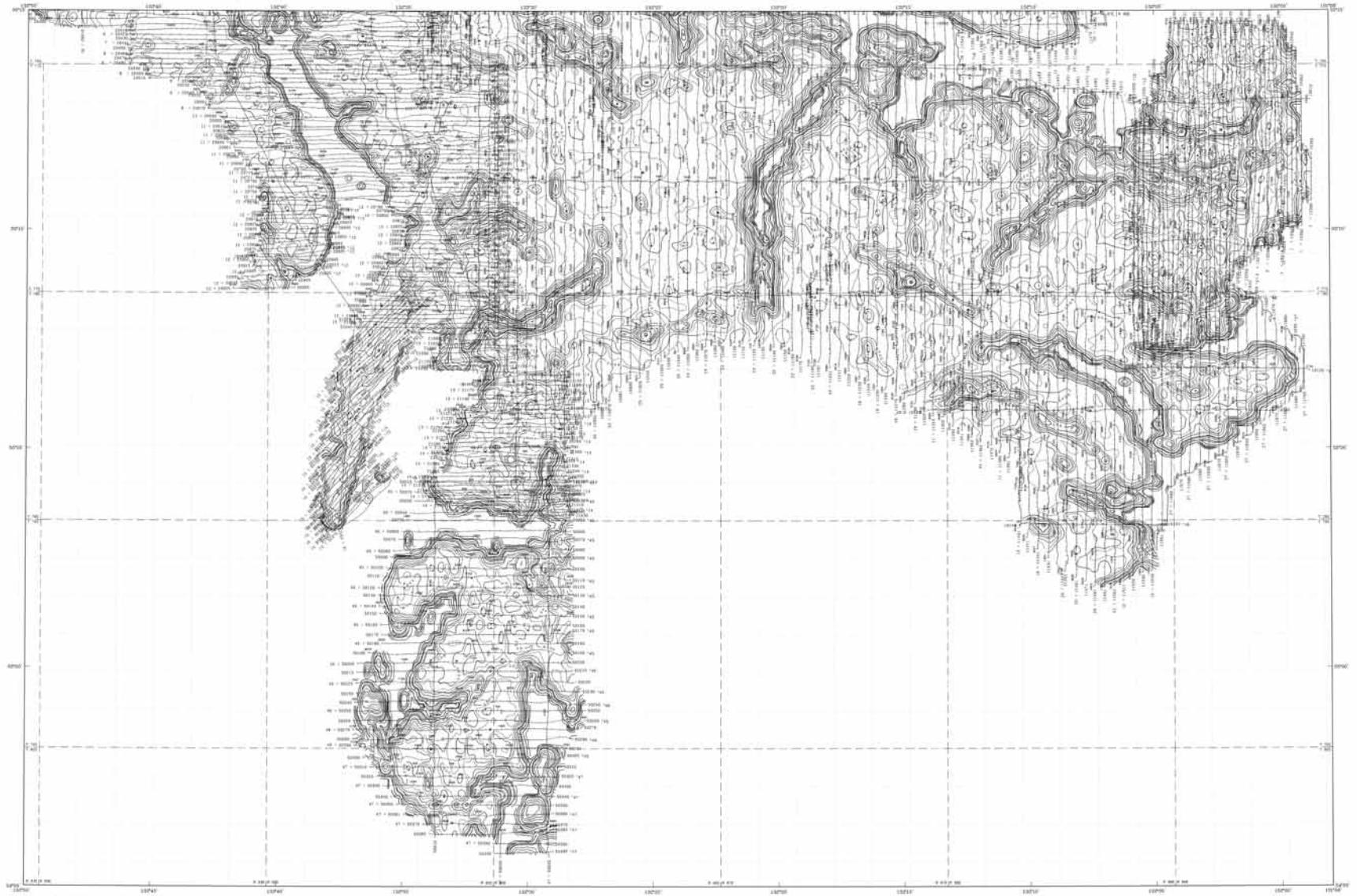
GEOPHYSICAL REPORT 1999-8C
Map C - Surveyed Area South of
55°15', Prince of Wales Island



7200 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP C - SURVEYED AREA SOUTH OF 55°15',
PRINCE OF WALES ISLAND
1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

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 HUGHES-2 Skyline helicopter at a mean terrain clearance of 200 feet along north–south flight lines for the northern portion and east–west flight lines for the southern portion one-quarter mile apart. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Trivial Rapp–Time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight path recovery. The helicopter position was derived every 0.2 seconds using real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected into the Clarke 1866 (27# zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 132° 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.

METTA SURVEY "Area 3" – May 1998 / DOLOMI SURVEY "Area 1" – March 1999

The geophysical data were acquired with DIGHEM^{V} (Dolomi Survey) and DIGHEM^{2} (Metta Survey) Electromagnetic (EM) systems and a Scintrex cesium magnetometer. Sleen terrain clearance for the magnetometer and EM system were (approximately) 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, VHF navigation system, 50/60 Hz monitors, GPS receiver and video camera. The flight lines were flown with one-eighth mile line spacing with tie lines flown perpendicular to the flight lines. The Dolomi Survey was flown north–south with an AS350B helicopter. The Metta Survey was flown with an AS350B–1 helicopter. The flight lines for Metta Survey were flown east–west except for the peninsula between Cordova Bay and Hotham Inlet which was flown northeast–southwest.

A Sie Horta UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1991/92 data should be considered at the meter(s).

RESISTIVITY

The DIGHEM^{V} EM system measured inphase and quadrature components of five frequencies. Two vertical coaxial coil pairs operated at 900 and 5000 Hz, while three horizontal coplanar coil pairs operated at 900, 5000, and 56,000 Hz. All data were recorded at 0.1 second intervals. The EM system was used to detect conductive overburden, bedrock conductors, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component 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.

SCALE 1:63,360

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

RESISTIVITY CONTOURS

1100
800
600
500
400
300
250
200
150
100
50

Contours in intervals of 10 ohm-m per decade

resistivity low

LOCATION INDEX

SURVEY HISTORY

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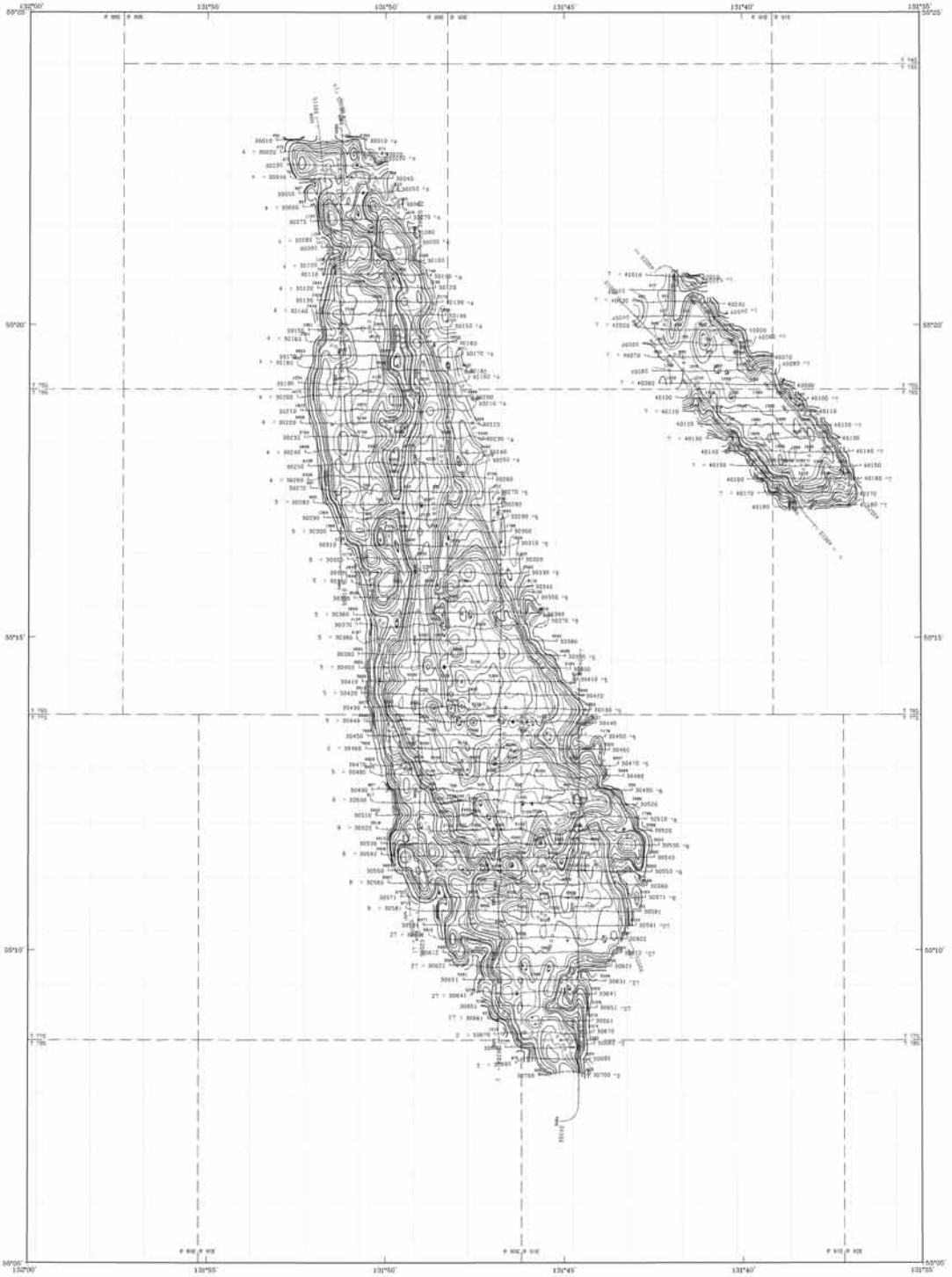
GEOPHYSICAL REPORT 1999-8D
Map D - Western and Eastern Parts, Gravina Island



Section outlines from U.S. Geological Survey Ketchikan A-5, 1955, A-6, 1948, B-5, 1955, B-6, 1954, Quadrangles, Alaska

SCALE 1:63,300

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

APPROXIMATE MEAN DECLINATION, 1999

7200 Hz COPLANAR RESISTIVITY OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND

1999

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 east–west flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

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RESISTIVITY

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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

LOCATION INDEX

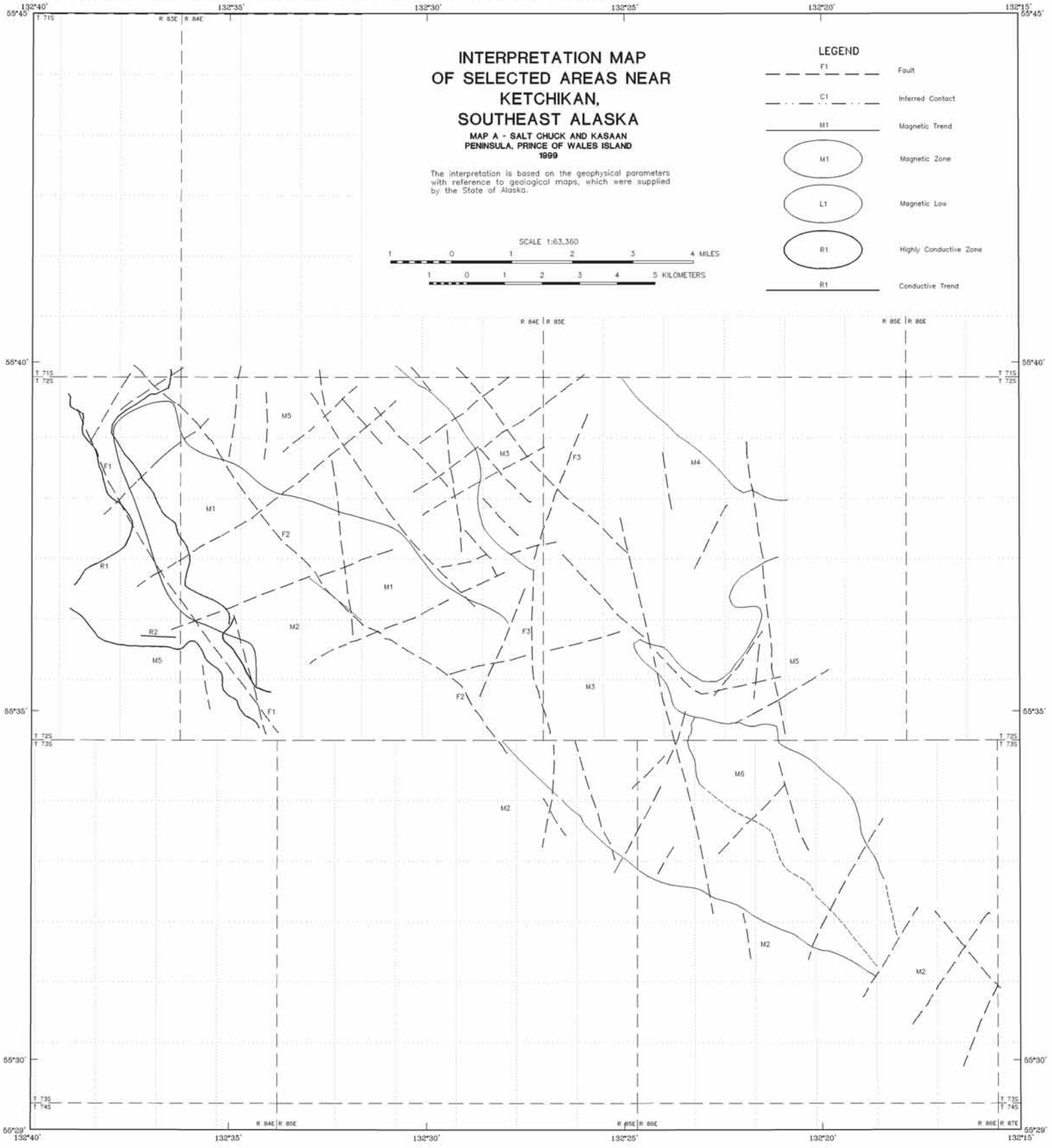
SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGGS), and RGM, Mining & Geological Consultants, Inc.. Airborne geophysical data for the area were acquired in 1999 by Geoterrex–Dighem, a division of CGG Canada Ltd.. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Coffman Cove.

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 Minerals Information Center, Mayflower Island, Douglas, AK.

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-17A
Map A - Salt Chuck and Kasaan
Peninsula, Prince of Wales Island



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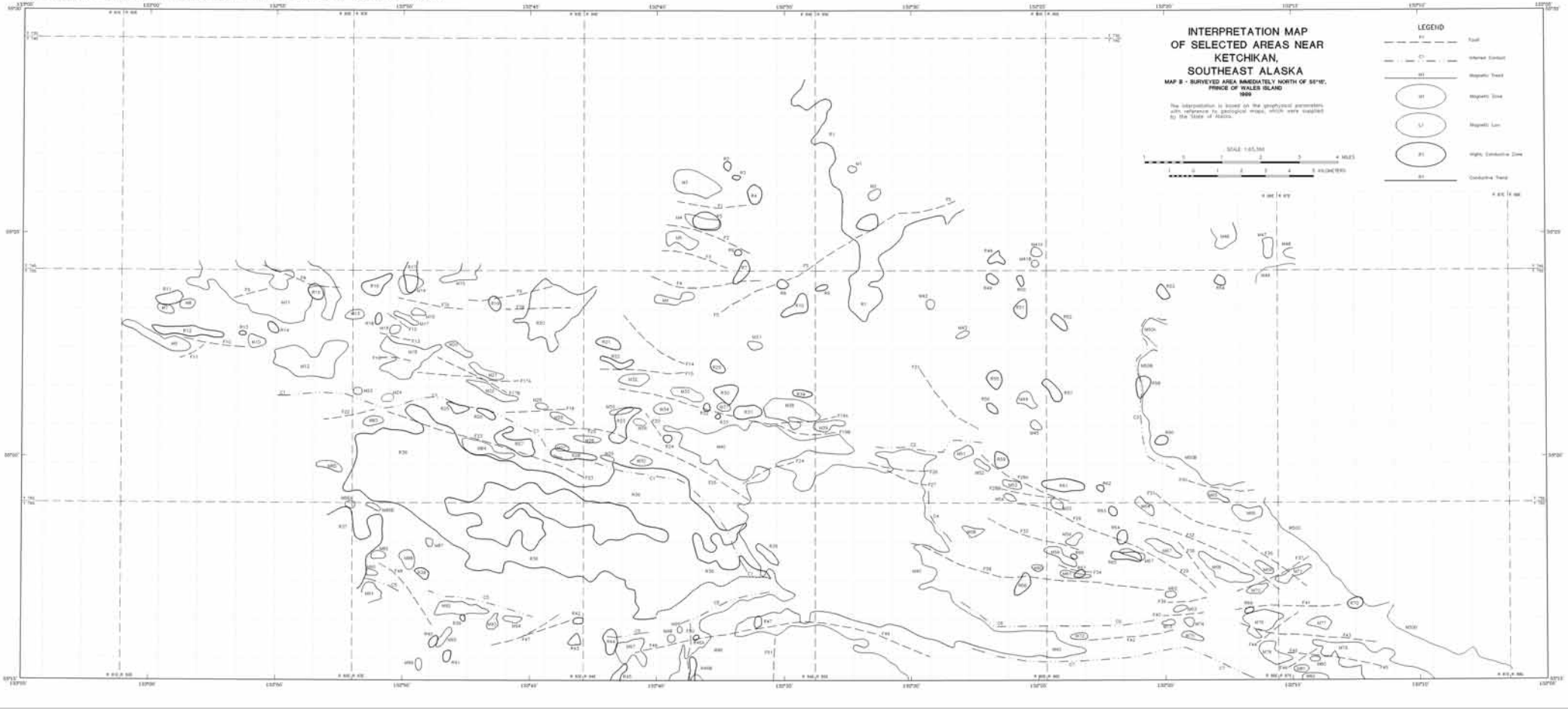
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-17B
Map B - Surveyed Area Immediately North of
55°15', Prince of Wales Island



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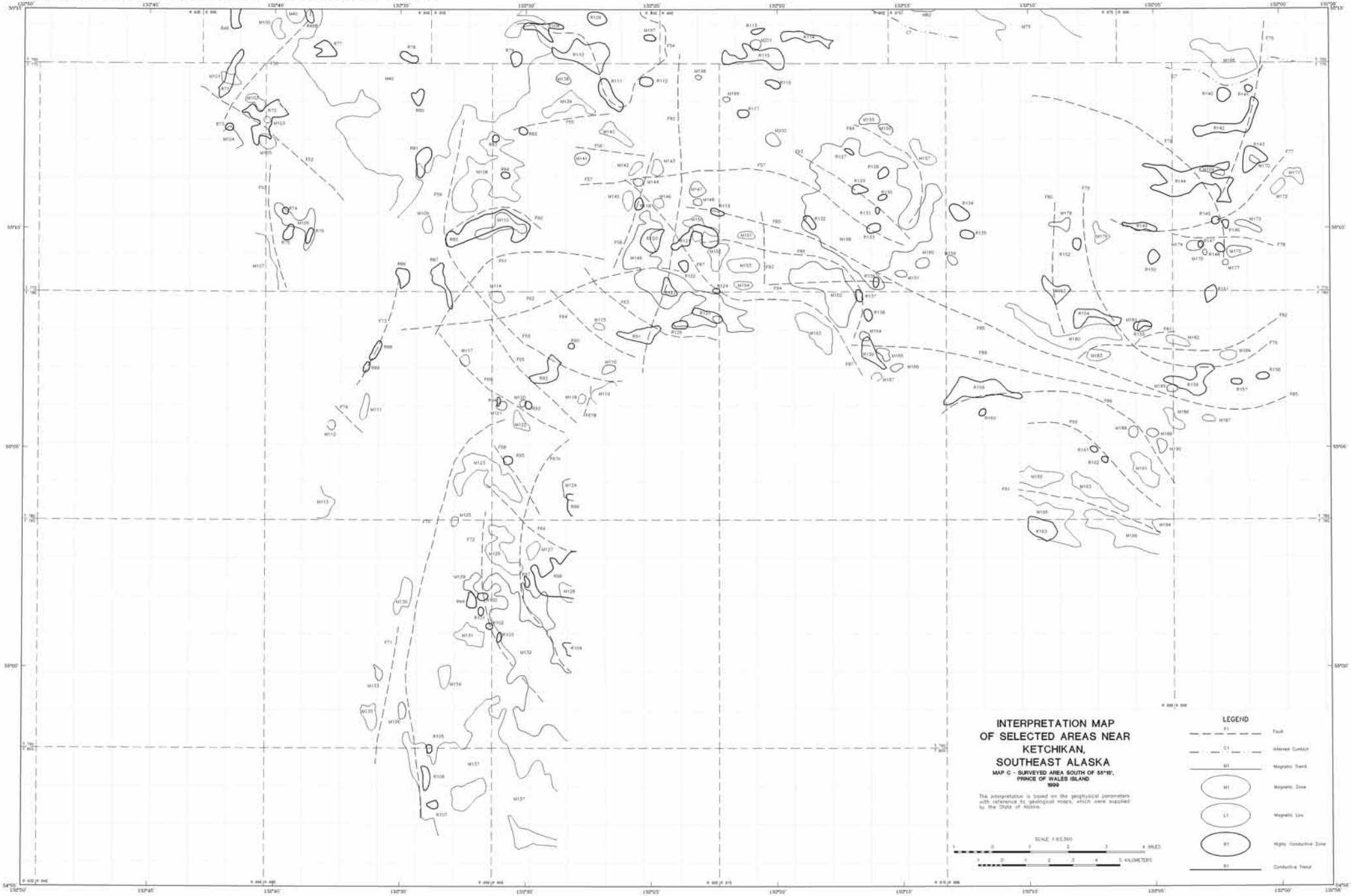
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-17C
Map C - Surveyed Area South of
55°15', Prince of Wales Island



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
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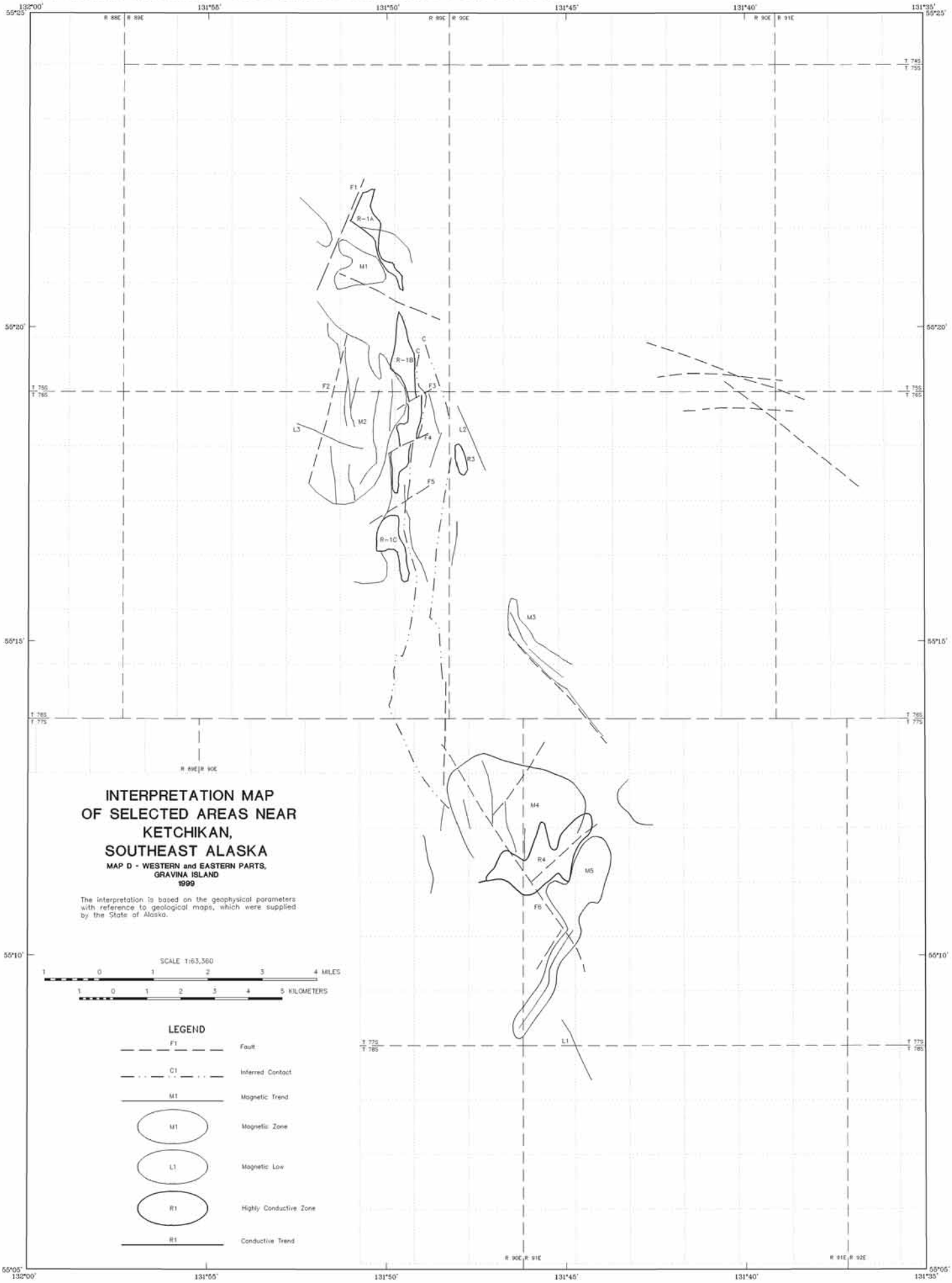
GEOPHYSICAL REPORT 1999-17D
Map D - Western and Eastern Parts, Gravina Island



INTERPRETATION MAP OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND
1999

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 Trend
- M1 — Magnetic Zone
- L1 — Magnetic Low
- R1 — Highly Conductive Zone
- R1 — Conductive Trend

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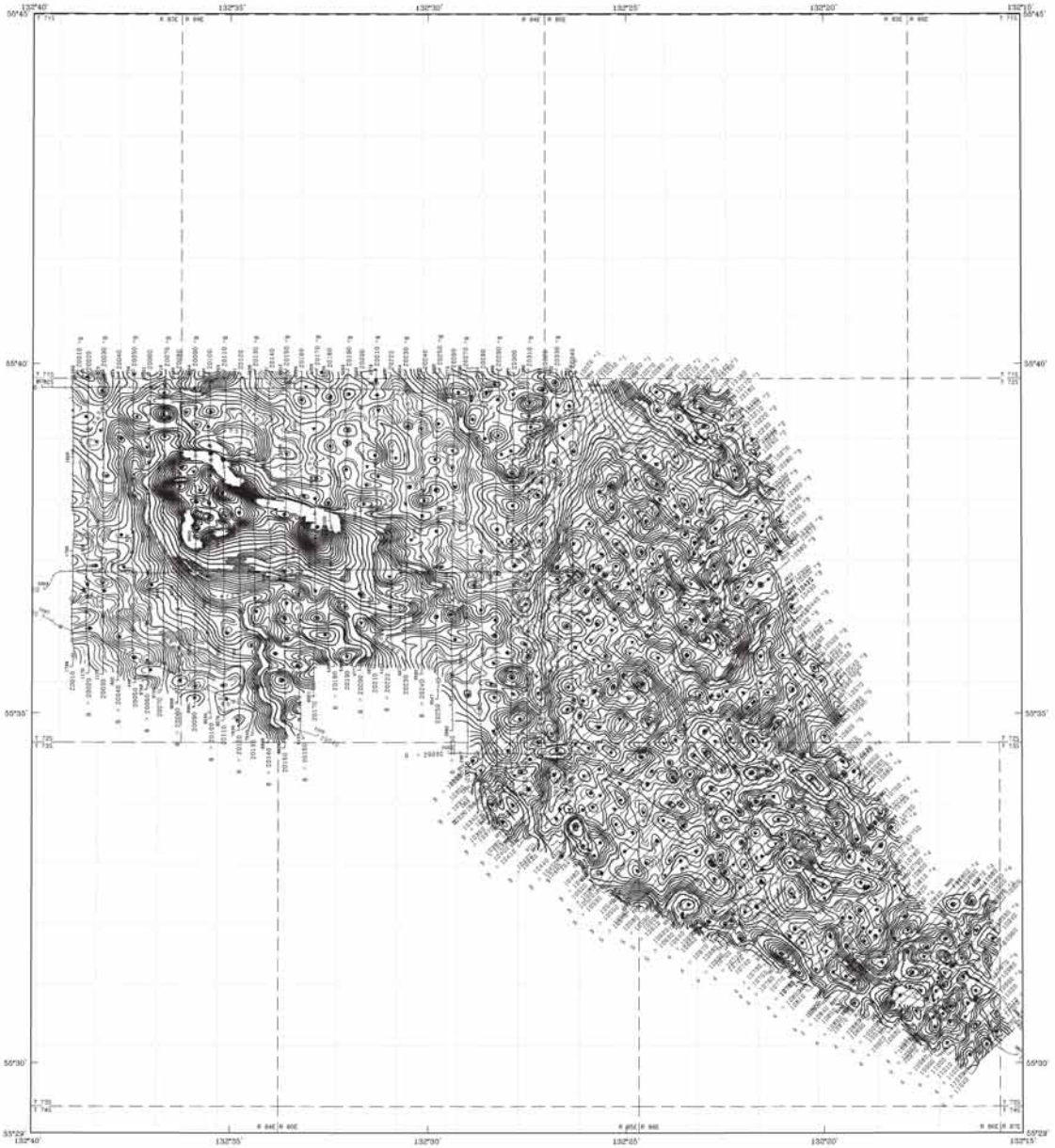
GEOPHYSICAL REPORT 1999-5A
Map A - Salt Chuck and Kasaan
Peninsula, Prince of Wales Island



Section outlines from U.S. Geological Survey Craig D-1, 1948; D-2, 1948; D-3, 1950; D-5, 1948; Ketchikan, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

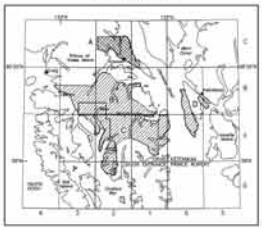
1 0 1 2 3 4 5 KILOMETERS

TOTAL FIELD MAGNETICS AND ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP A - SALT CHUCK AND KASAAN PENINSULA, PRINCE OF WALES ISLAND

1999

LOCATION INDEX



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999
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 north-south flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

KASAAN SURVEY "Area 2" – May 1992
The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The northeast-southwest flight lines were flown one-eighth mile apart with tie lines flown parallel to the survey boundaries. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability. An error on the Craig C-2 topographic map sheet caused distortion of the positioning in the original 1992 data. The data were re-positioned in 1999 using a rubber sheet stretching technique to better match the topography and fit with the 1999 data.

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEM^V EM system measured in-phase 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 power line monitor and the flight track video were examined to locate cultural sources. The EM anomalies that are indicated are classified by conductance.

MAGNETIC CONTOUR INTERVAL

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

ELECTROMAGNETIC ANOMALIES

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

TOTAL FIELD MAGNETICS

The total field magnetic 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, 1995, updated to March 1999) 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 (DNR), Division of Geological & Geophysical Surveys (DGGS), and RGM, Mining & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geoterrex-Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Coffman Cove. The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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 Minerals Information Center, Mayflower Island, Douglas, AK.

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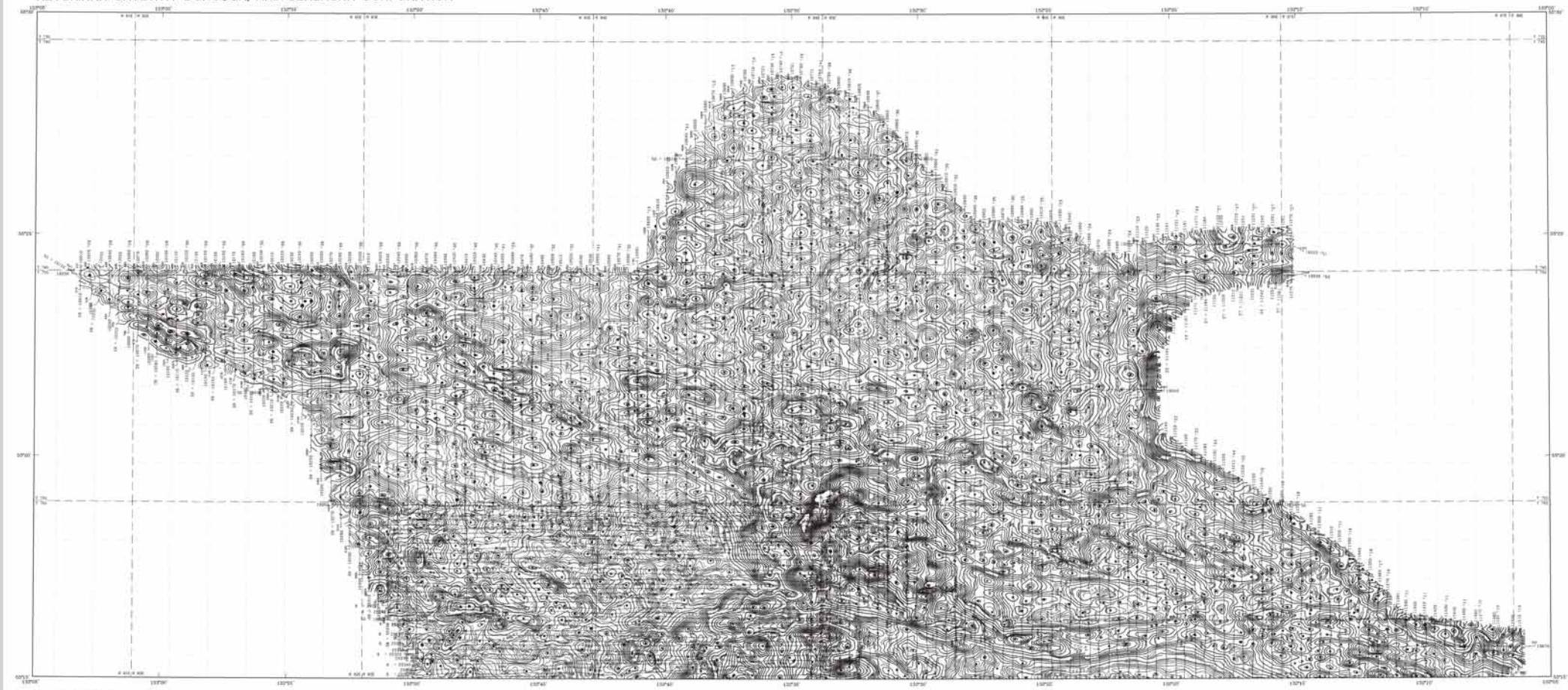
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

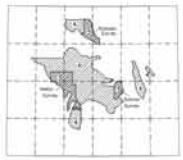
GEOPHYSICAL REPORT 1999-5B
Map B - Surveyed Area Immediately North of 55°15', Prince of Wales Island



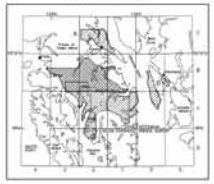
TOTAL FIELD MAGNETICS AND ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP B - SURVEYED AREA IMMEDIATELY NORTH OF 55°15', PRINCE OF WALES ISLAND

1999



LOCATION INDEX



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999
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 north–south flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Magnavox 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (7M zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 135°, 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.

HETTA SURVEY "Areas 3" – May 1992
The geophysical data were acquired with a DIGHEM^{I} Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The east–west flight lines were flown one-eighth mile apart with tie lines flown perpendicular to the flight lines. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual reviews. Positional accuracy of the 1992 data should be considered as low reliability.

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEM^{I} EM system measured in-phase and quadrature components of the 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 recorded at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. The power line monitor and the flight track video were examined to locate cultural sources. The EM anomalies that are indicated are classified by conductance.

ELECTROMAGNETIC ANOMALIES

Anomaly — Conductance

- >50 siemens
- >30 siemens
- Questionable anomaly
- Weak conductivity associated with an EM magnetite response

MAGNETIC CONTOUR INTERVAL

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

TOTAL FIELD MAGNETICS

The total field magnetic 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 correction (1st IGRF gradient, 1995, updated to March 1999) 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 (DNR), Division of Geological & Geophysical Surveys (DGGS), and Rice, Inning & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geoterrex–Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Coffman Cove. The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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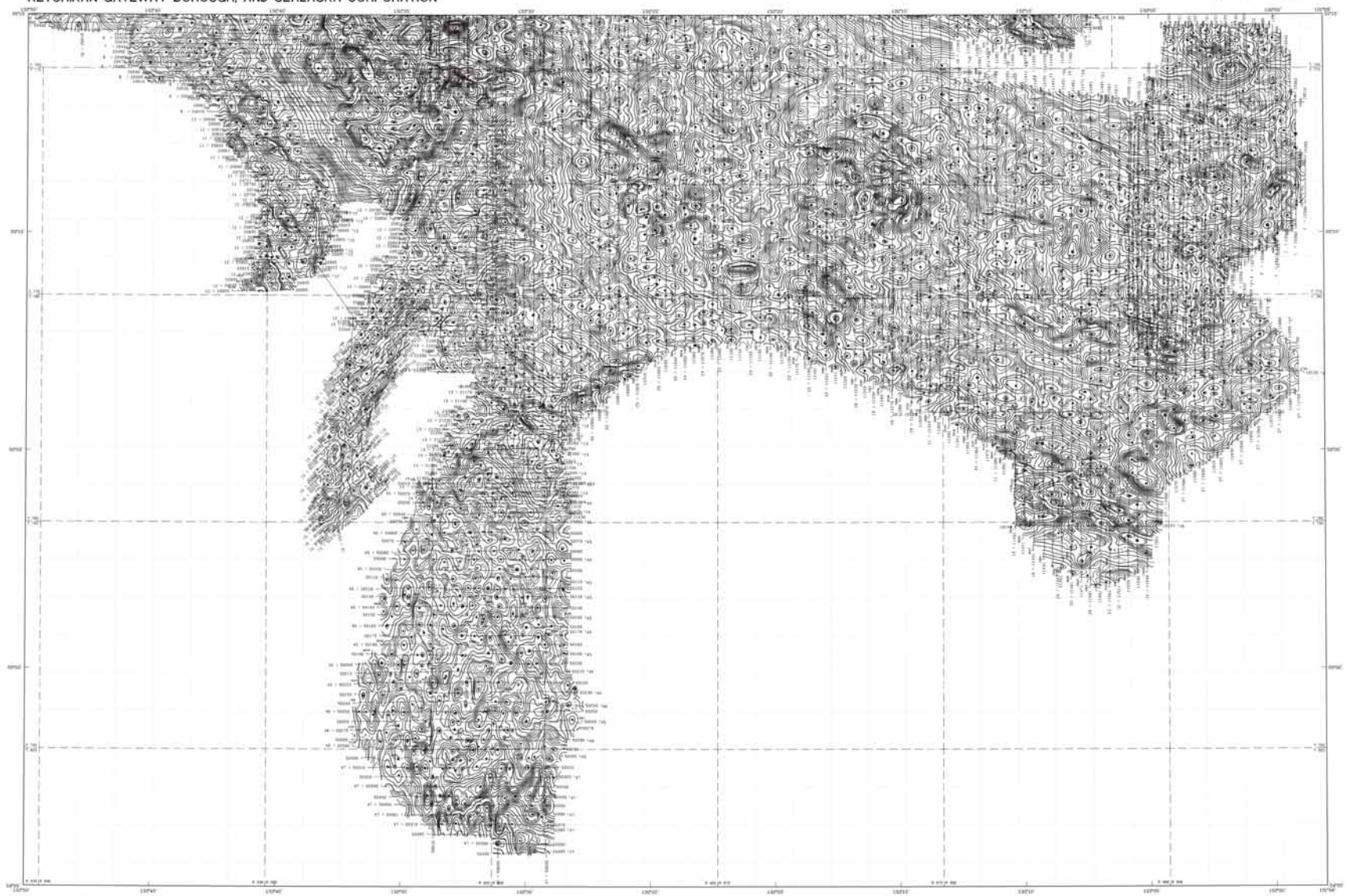
GEOPHYSICAL REPORT 1999-5C
Map C - Surveyed Area South of
55°15', Prince of Wales Island



TOTAL FIELD MAGNETICS AND ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP C - SURVEYED AREA SOUTH OF 55°15',
PRINCE OF WALES ISLAND
1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

The geophysical data were acquired with a SIGHEM (Electromagnetic (EM) system and a Scintrex cesium magnetometer. Both were flown at a height of 100 feet. In addition, the survey required data from a radar altimeter, GPS navigation system, 50/60 Hz monitor, and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along north–south flight lines for the northern portion and east–west flight lines for the southern portion one-quarter mile apart. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Magnavox 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (the pre 91 spheroid, 1927 North American datum using a central meridian (CM) of 132° 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.

METTA SURVEY "Area 3" – May 1998
DOLOMI SURVEY "Area 1" – March 1999

The geophysical data were acquired with SIGHEM (Dolomi Survey) and DIGHEM (Metta Survey) Electromagnetic (EM) systems and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were (approximately) 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitor, VLF receiver and video camera. The flight lines were flown with one-eighth mile line spacing, with tie lines flown perpendicular to the flight lines. The Dolomi Survey was flown north–south with an AS350B helicopter. The Metta Survey was flown with an AS350B-1 helicopter. The flight lines for Metta Survey were flown east–west except for the peninsula between Cordova Bay and Hotham Inlet which was flown northeast–southwest.

A Sie Motte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1997/98 data should be considered at the meter(s).

ELECTROMAGNETICS

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

ELECTROMAGNETIC ANOMALIES

Intensity	Conductance
●	>54 mhos/m
▽	>54 mhos/m
★	Questionable anomaly;
△	Weak conductivity associated with an EM magnetite response

SCALE 1:63,360

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

TOTAL FIELD MAGNETICS

The total field magnetic 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 correction (or IGRF gridded, 1995, updated to March 1998) was removed from the leveled magnetic data.

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

MAGNETIC CONTOUR INTERVAL

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

LOCATION INDEX

SURVEY HISTORY

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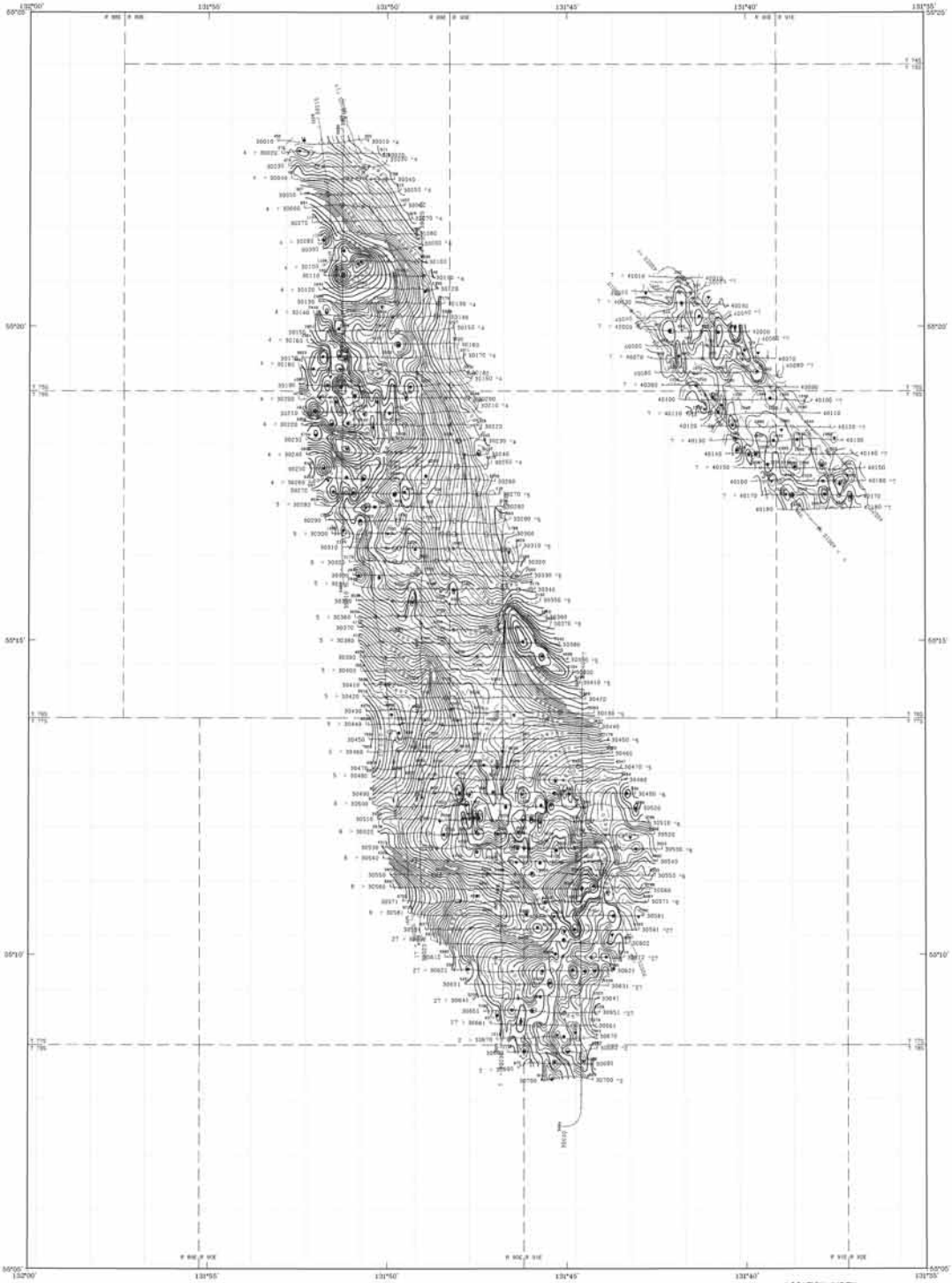
GEOPHYSICAL REPORT 1999-5D
Map D - Western and Eastern Parts, Gravina Island



Section outlines from U.S. Geological Survey Ketchikan A-5, 1955, A-6, 1948, B-5, 1955, B-6, 1954, Quadrangles, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

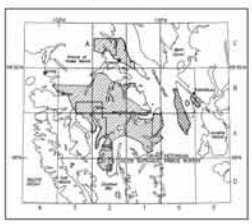
1 0 1 2 3 4 5 KILOMETERS

TOTAL FIELD MAGNETICS AND ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND

1999

LOCATION INDEX



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ELECTROMAGNETICS

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ELECTROMAGNETIC ANOMALIES

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

MAGNETIC CONTOUR INTERVAL

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

SURVEY HISTORY

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TOTAL FIELD MAGNETICS

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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.

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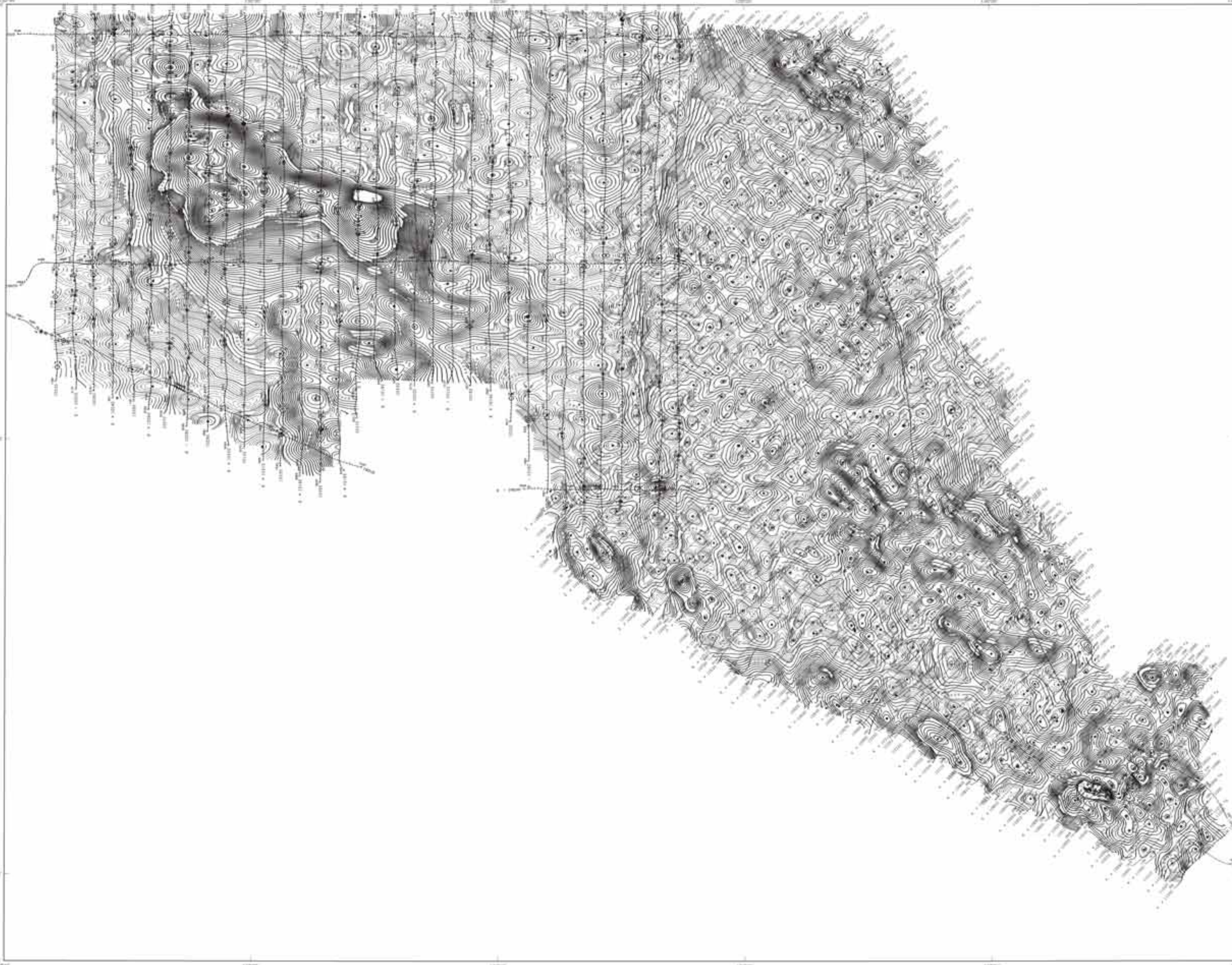
GEOPHYSICAL REPORT 1999-16A
PARTS of CRAIG C-1 and
C-2 QUADRANGLES



TOTAL FIELD MAGNETICS AND DETAILED ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

PARTS of CRAIG C-1 and
C-2 QUADRANGLES
1999

DESCRIPTIVE NOTES

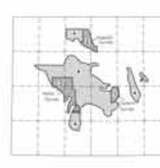
KETCHIKAN SURVEY "Area 4" – March 1999

HASAAN SURVEY "Area 2" – May 1992

ELECTROMAGNETIC ANOMALIES

ELECTROMAGNETICS

TOTAL FIELD MAGNETICS



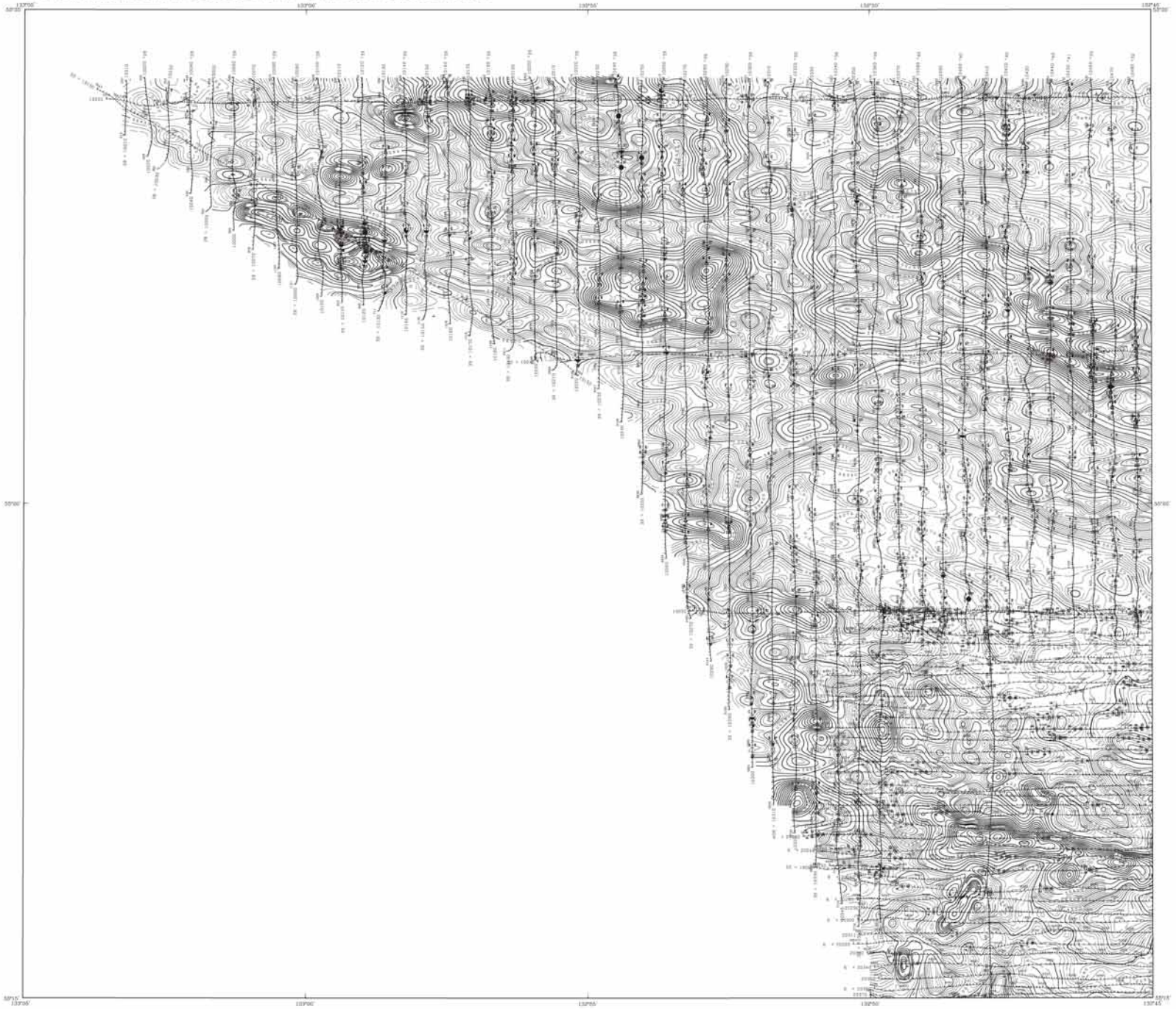
MAGNETIC CONTOUR INTERVAL

LOCATION INDEX FOR SCALE 1:31,680

SURVEY HISTORY

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-16B
PARTS of CRAIG B-3 and
B-4 QUADRANGLES



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 FIELD MAGNETICS AND DETAILED ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

PARTS of CRAIG B-3 and
B-4 QUADRANGLES
1999

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

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 north–south flight lines one-quarter mile apart. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Aerotech/Novatel 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 real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 133°, 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.

HETTA SURVEY "Area 3" – May 1992

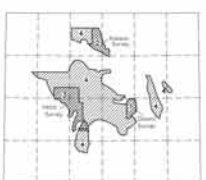
The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The east–west flight lines were flown one-eighth mile apart with tie lines flown perpendicular to the flight lines. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1992 data should be considered of low reliability.

ELECTROMAGNETIC ANOMALIES

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 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 conductive and magnetic patterns and topography. The power line monitor and the flight track video were examined to locate cultural sources.



MAGNETIC CONTOUR INTERVAL

200 nT
50 nT
10 nT
5 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 (DNR), Division of Geological & Geophysical Surveys (DGGS), and BGM, Mining & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geoterrex-Dighem, a division of CGG Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the cities of Thorne Bay and Coffman Cove. The data for areas 1, 2 and 3 were flown by Dighem in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

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 Minerals Information Center, Mezzanine Island, Douglas, AK.

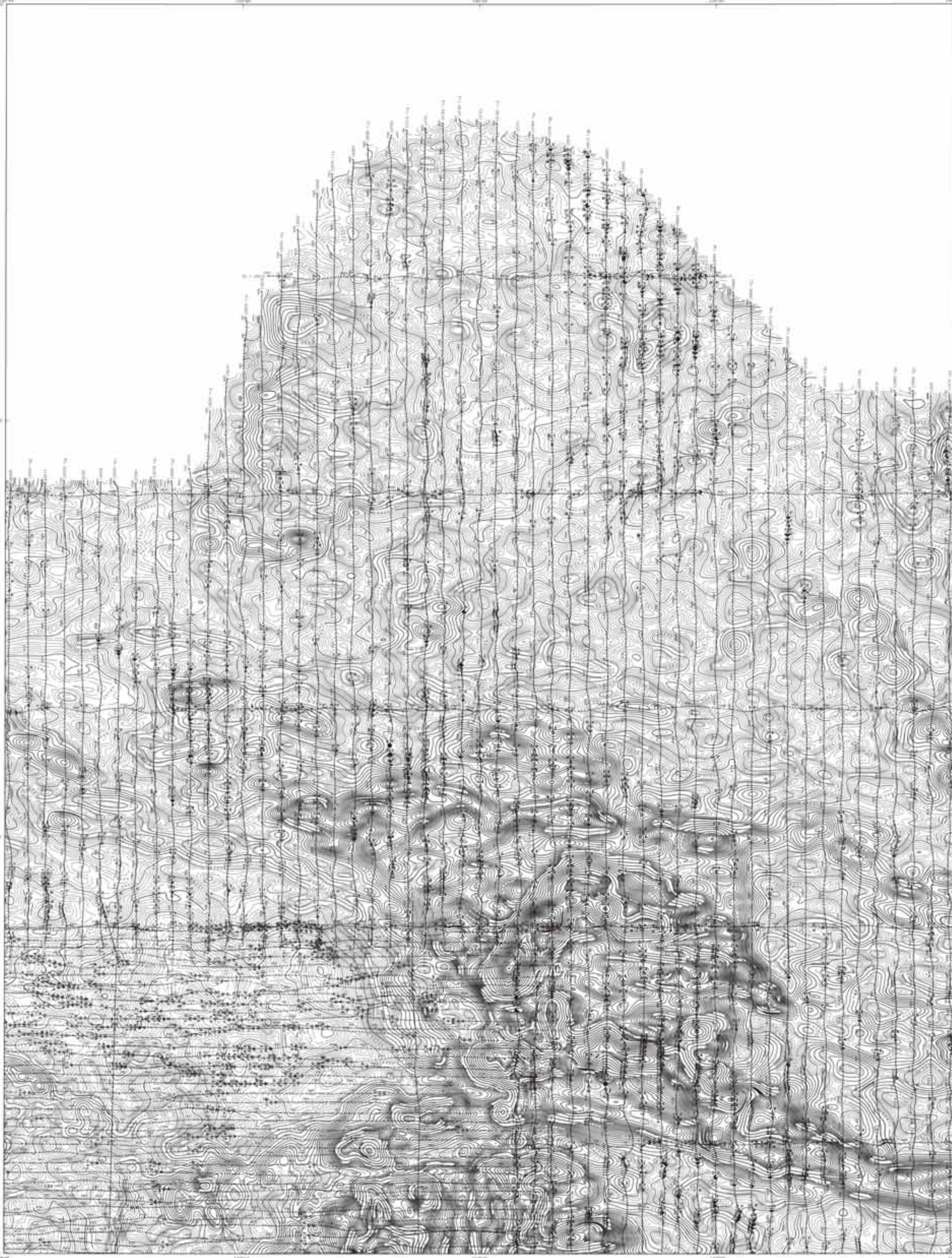
TOTAL FIELD MAGNETICS

The total field magnetic 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, 1995, updated to March 1999) 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.

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

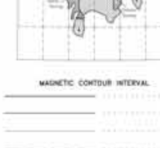
GEOPHYSICAL REPORT 1999-16C
PARTS of CRAIG B-2 and
B-3 QUADRANGLES



LOCATION INDEX FOR SCALE 1:31,680

TOTAL FIELD MAGNETICS AND DETAILED ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

PARTS of CRAIG B-2 and
B-3 QUADRANGLES
1999



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" — March 1999

HETTA SURVEY "Area 3" – May 1992

ELECTROMAGNETIC ANOMALIES

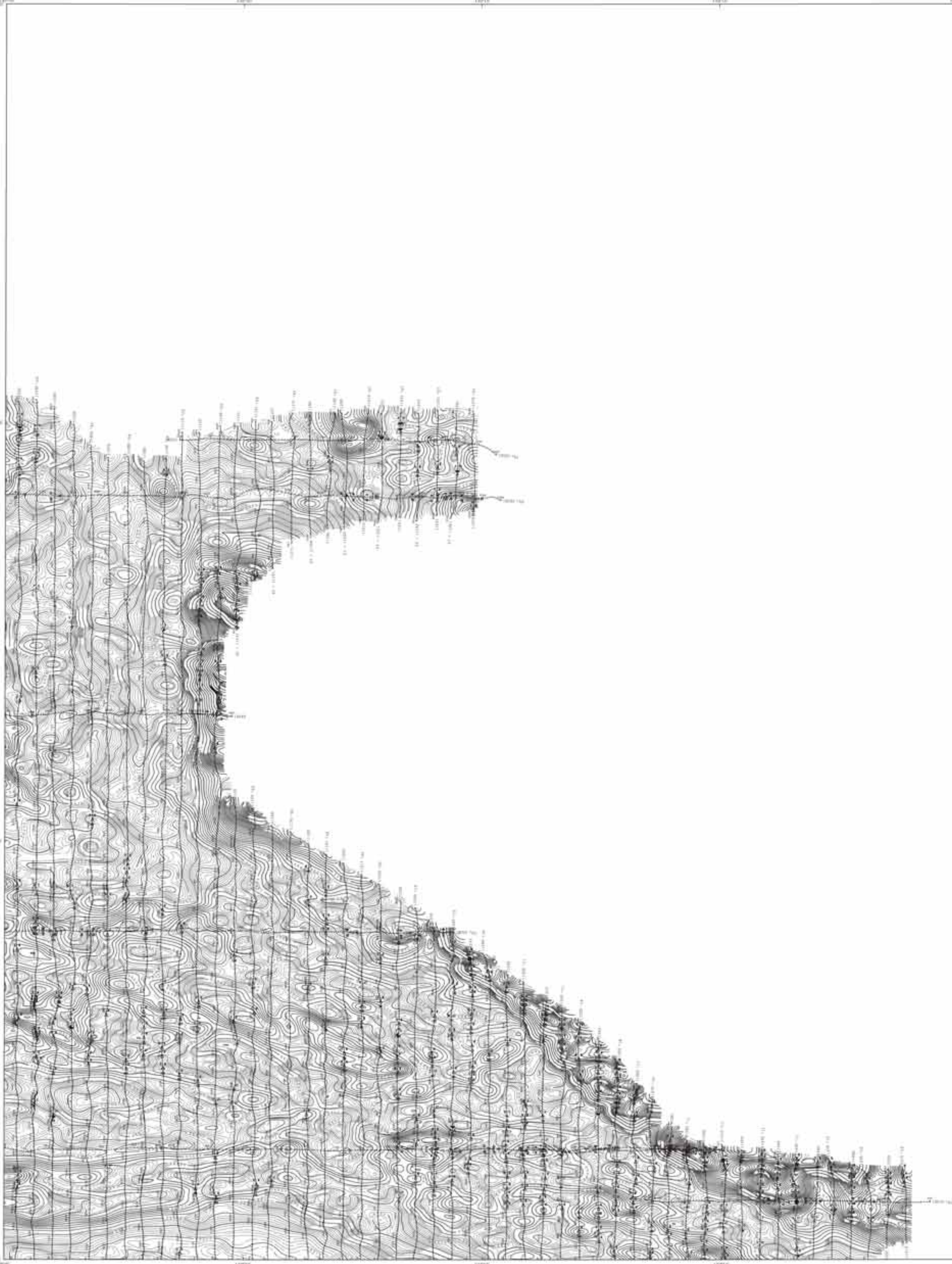
ELECTROMAGNETICS

MAGNETIC CONTOUR INTERVAL

SURVEY HISTORY

TOTAL FIELD MAGNETICS

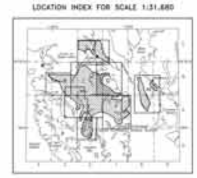
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION



TOTAL FIELD MAGNETICS AND DETAILED ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

PARTS of CRAIG B-1 and
B-2 QUADRANGLES
1999

LOCATION INDEX FOR SCALE 1:31,680



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" — March 1998

ELECTROMAGNETICS

ELECTROMAGNETIC ANOMALIES

MAGNETIC CONTOUR INTERVAL

SURVEY HISTORY

TOTAL FIELD MAGNETICS

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

GEOPHYSICAL REPORT 1999-16E
PARTS of CRAIG A-2 and
A-3 QUADRANGLES

TOTAL FIELD MAGNETICS AND DETAILED ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

PARTS of CRAIG A-2 and
A-3 QUADRANGLES
1999

DESCRIPTIVE NOTES

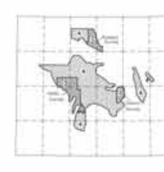
KETCHIKAN SURVEY "Area 4" – March 1999

HETTA SURVEY "Area 2" – May 1993

ELECTROMAGNETIC ANOMALIES

ELECTROMAGNETICS

TOTAL FIELD MAGNETICS



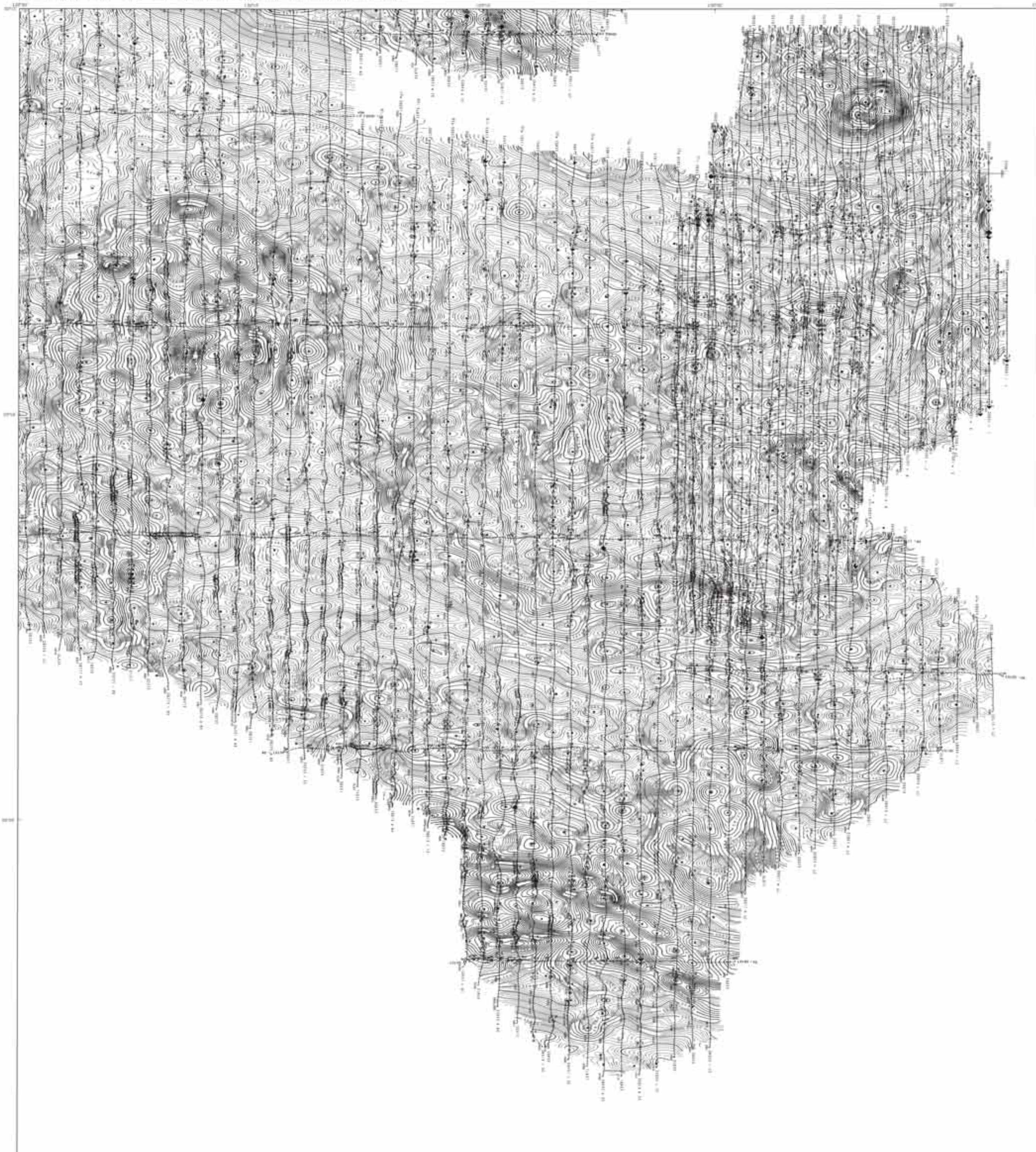
MAGNETIC CONTOUR INTERVAL

LOCATION INDEX FOR SCALE 1:31,680

SURVEY HISTORY

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION

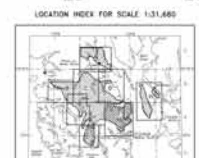
GEOPHYSICAL REPORT 1999-16F
PARTS of CRAIG A-1 and
KETCHIKAN A-6 QUADRANGLES



TOTAL FIELD MAGNETICS AND DETAILED ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

PARTS of CRAIG A-1 and
KETCHIKAN A-6 QUADRANGLES
1999

LOCATION INDEX FOR SCALE 1:31,680



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

DOLOMI SURVEY "Area 1" – March 1981

ELECTROMAGNETIC ANOMALIES

ELECTROMAGNETICS

MAGNETIC CONTOUR INTERVAL

SURVEY HISTORY

TOTAL FIELD MAGNETICS

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
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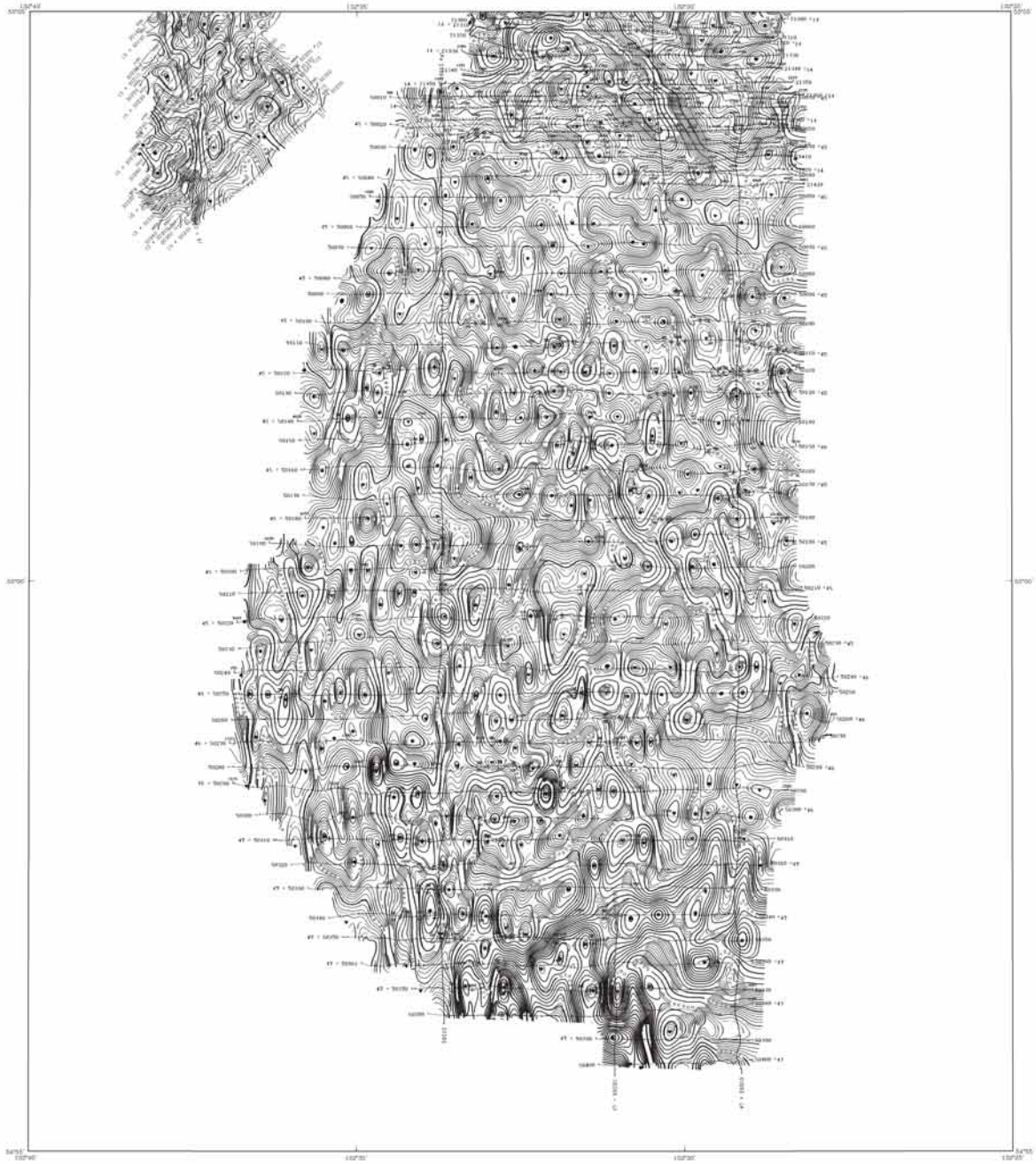
GEOPHYSICAL REPORT 1999-16G
PARTS of CRAIG A-2 and
DIXON ENTRANCE D-2 QUADRANGLES



TOTAL FIELD MAGNETICS AND DETAILED ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

PARTS of CRAIG A-2 and
DIXON ENTRANCE D-2 QUADRANGLES
1999

LOCATION INDEX FOR SCALE 1:31,680

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" – March 1999

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An Ashtech/Magnavox Real-Time Differential Global Positioning System (WT-GDPS) was used for both navigation and flight path recovery. The helicopter position was derived every 0.5 seconds using real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central Meridian (CM) of 135°, 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.

HETTA SURVEY "Area 3" – May 1993

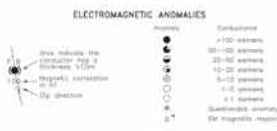
The geophysical data were acquired with a DIGHEM^{V} Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The flight lines were flown with one-eighth mile line spacing with the lines flown perpendicular to the flight lines. The flight lines were flown east–west except for the peninsula between Carolova Bay and Nutwell Island which was flown northeast–southeast. The survey was flown with an AS350B-1 helicopter.

A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1993 data should be considered of low reliability.

ELECTROMAGNETICS

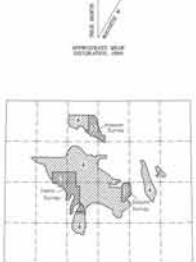
To determine the position of EM anomalies on their boundaries, the DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies, two vertical coaxial-coil pairs operated at 900 and 5500 Hz while three horizontal coplanar-coil pairs operated at 900, 7200, and 56,000 Hz. EM data 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 geophysical 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



Anomaly symbol	Conductance
●	>100 siemens
●	50–100 siemens
●	20–50 siemens
◎	10–20 siemens
○	5–10 siemens
○	1–5 siemens
✱	0–1 siemens
	Questionable anomaly
	Edi magnetic response

Interpretive symbol	Conductor ("model")
B	Bedrock conductor
O	Narrow bedrock conductor ("thin sheet")
T	Conductive cover ("horizontal thin sheet")
H	Broad conductive rock unit; steep conductive sedimentary rock; conductive cover ("half space")
C	Edge of broad conductor ("edge of half space")
L	Culture, e.g., power line, metal building or fence



SURVEY HISTORY

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TOTAL FIELD MAGNETICS

The total field magnetic 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, 1995, updated to March 1999) 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

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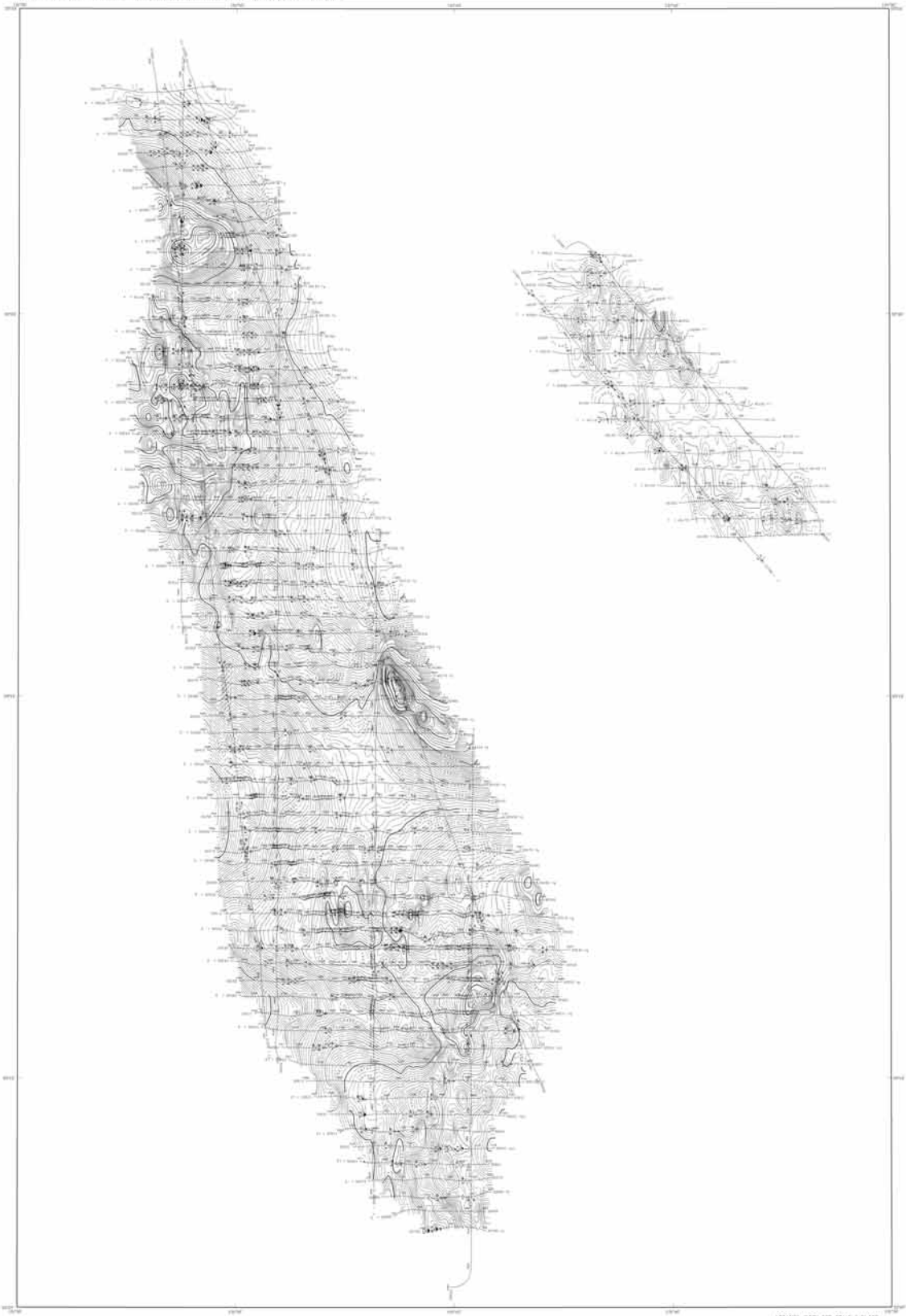
GEOPHYSICAL REPORT 1999-16H
PARTS of KETCHIKAN A-6, B-5,
and B-6 QUADRANGLES



TOTAL FIELD MAGNETICS AND DETAILED ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

PARTS of KETCHIKAN A-6, B-5,
and B-6 QUADRANGLES

1999

LOCATION INDEX FOR SCALE 1:31,680

KETCHIKAN SURVEY AREA

DESCRIPTIVE NOTES

ELECTROMAGNETIC ANOMALIES

ELECTROMAGNETICS

MAGNETIC CONTOUR INTERVAL

SURVEY HISTORY

TOTAL FIELD MAGNETICS