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DATA COMPILATION**

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KASAAN ELECTROMAGNETIC AND MAGNETIC AIRBORNE GEOPHYSICAL SURVEY DATA COMPILATION

L.E. Burns¹, G.R.C. Graham¹, J.D. Barefoot¹, 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.

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

AVAILABLE DATA

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

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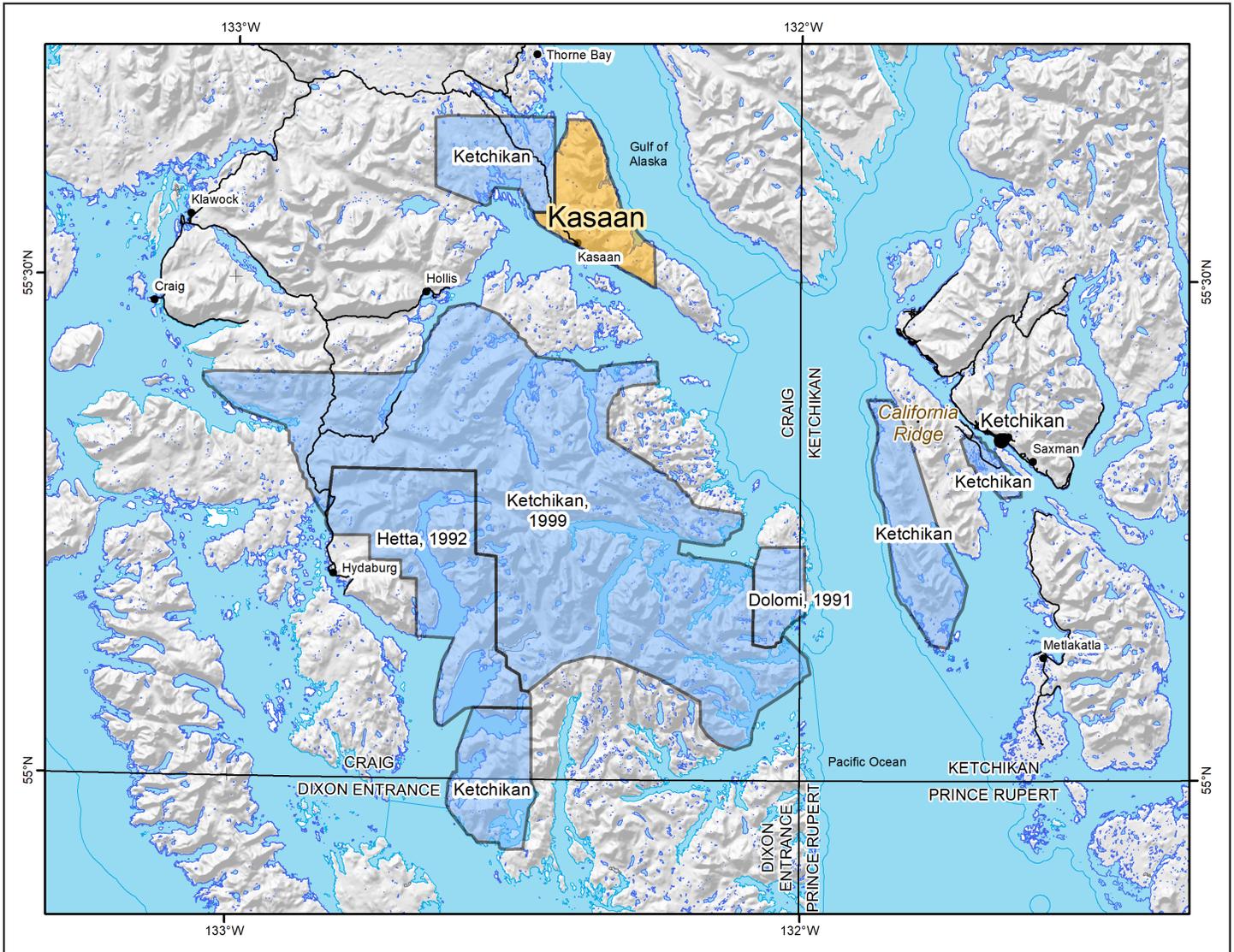


Figure 1. Kasaan electromagnetic and magnetic airborne geophysical survey location shown in interior Alaska (inset). Kasaan survey area shown with adjacent DGGs geophysical surveys, landmarks, relevant 1:250,000-scale quadrangle boundaries, mountain ranges, rivers, glaciers, and elevation hillshade.

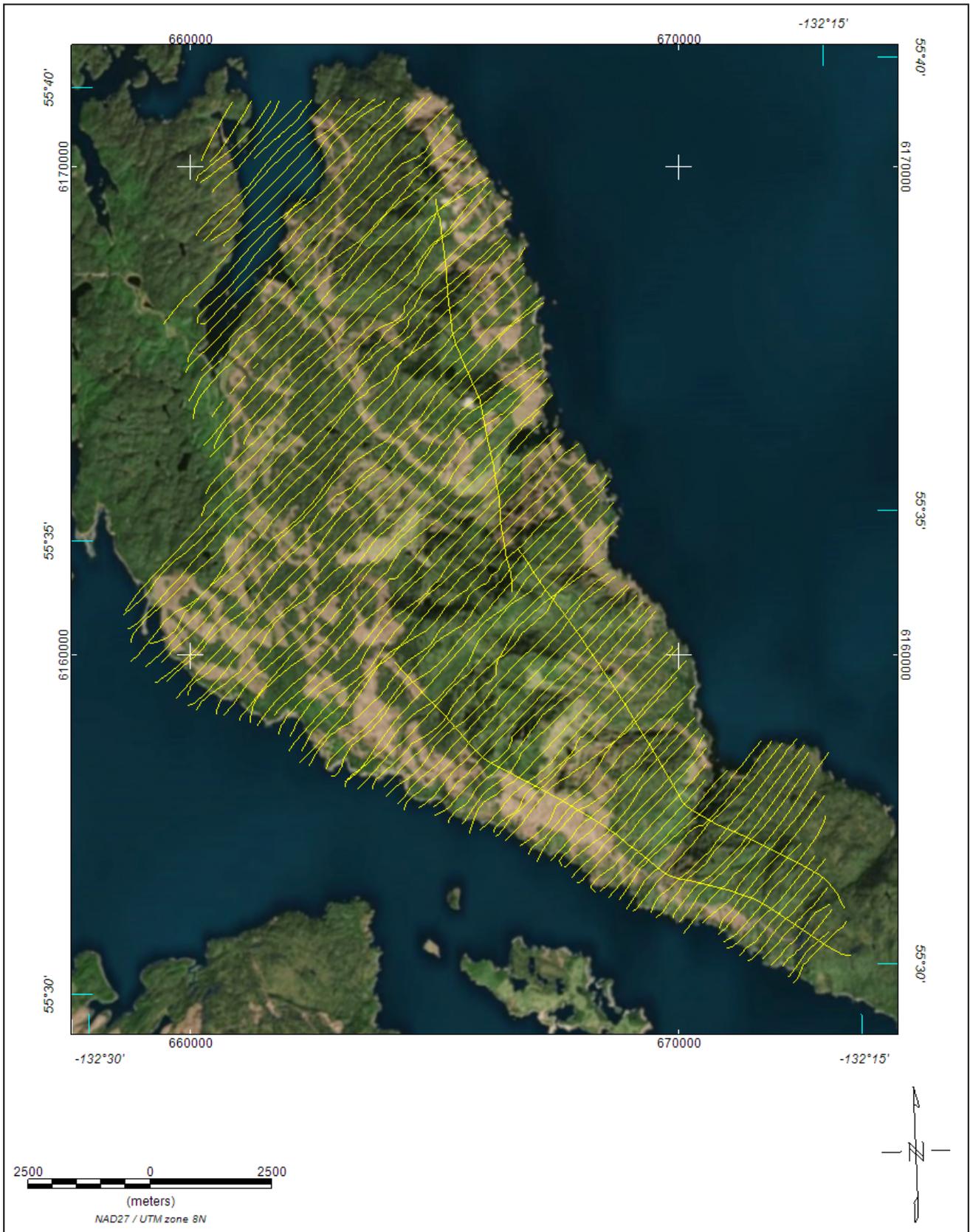


Figure 2. Flight path with orthometric image.

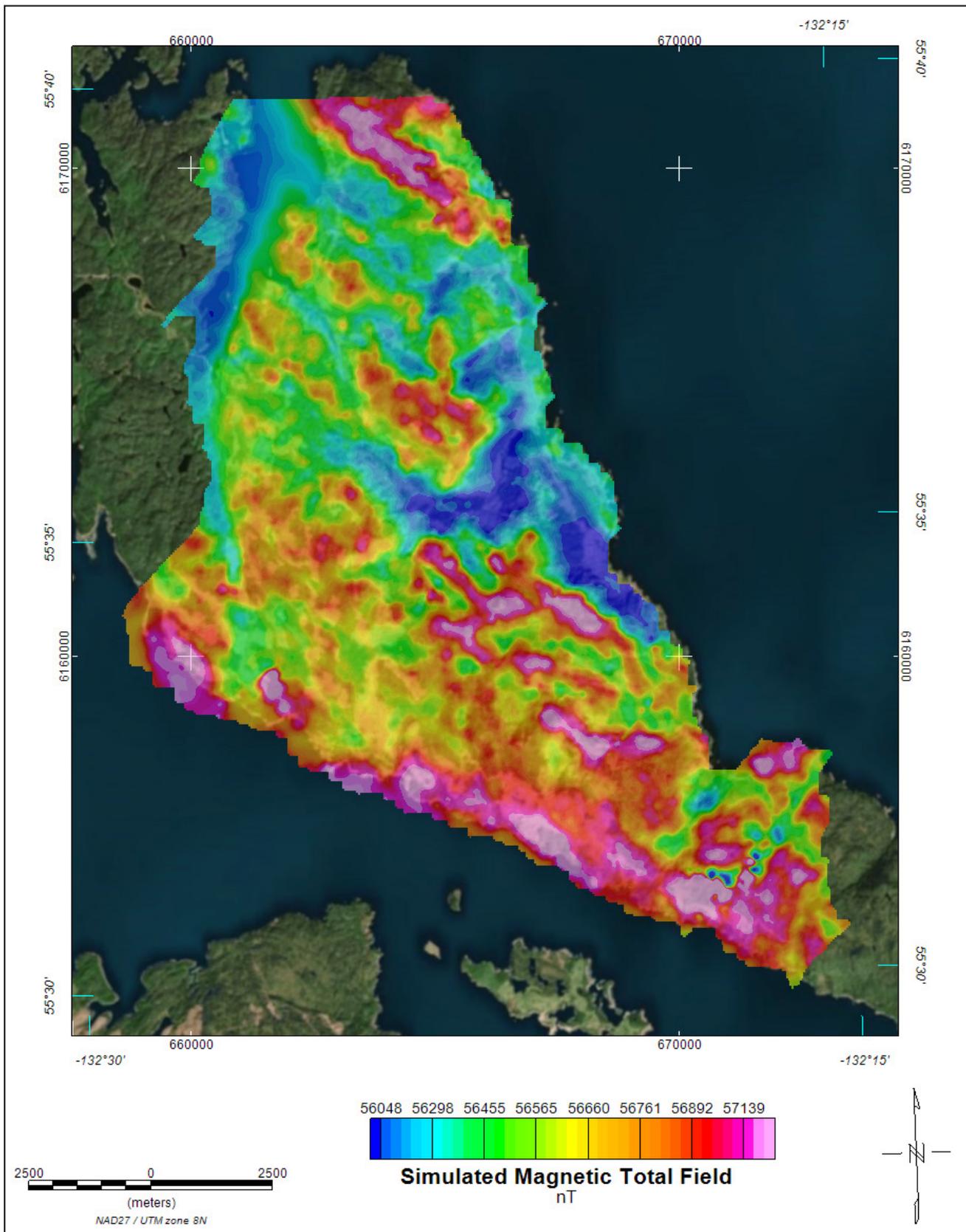


Figure 3. Simulated magnetic total field grid with orthometric image. The magnetic total field data were processed using digitally recorded data from a Scintrex cesium magnetometer. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations 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.

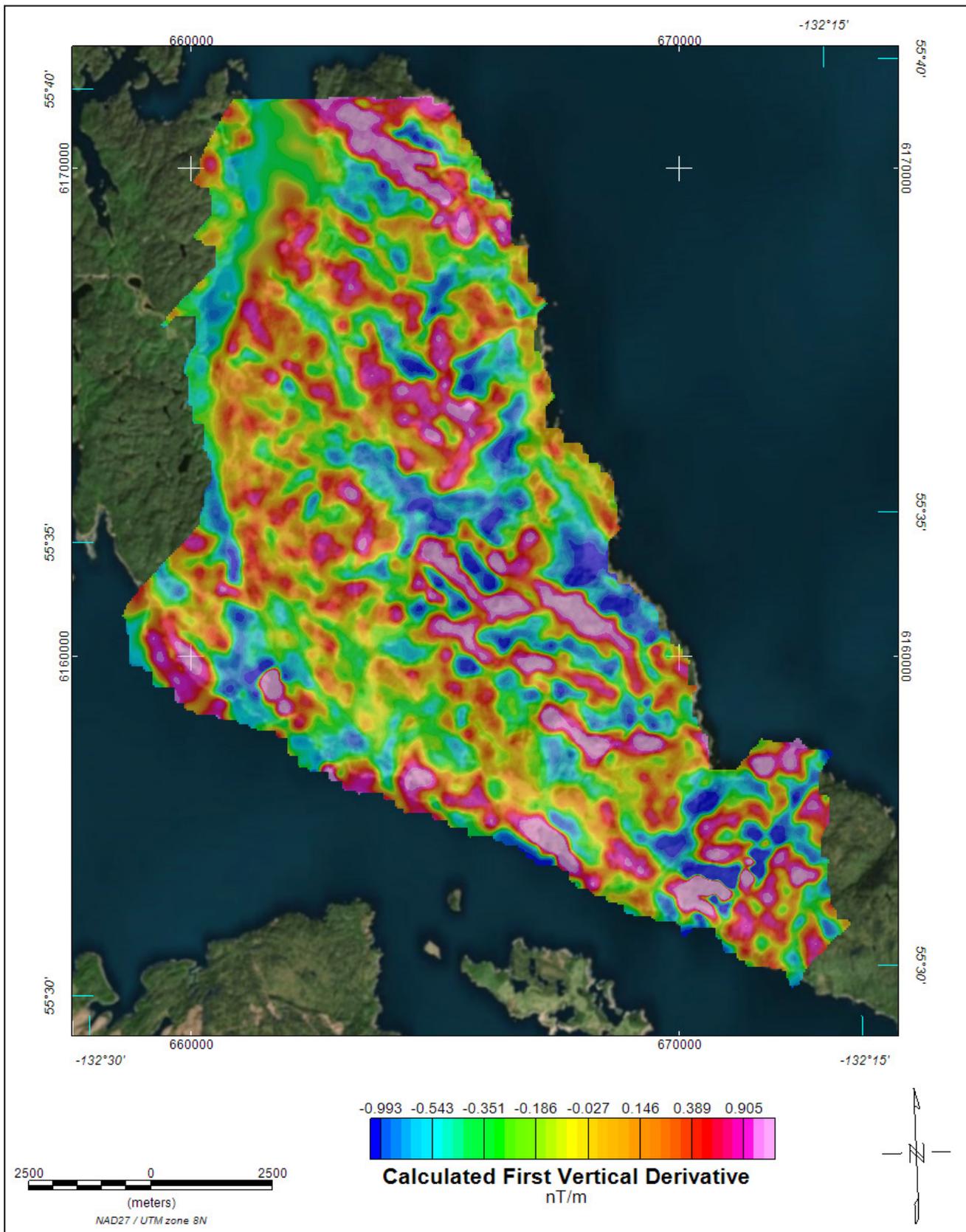


Figure 4. Calculated first vertical derivative grid with orthometric image. The first vertical derivative grid was calculated from the diurnally-corrected, IGRF-corrected total magnetic field grid using a FFT base frequency domain filtering algorithm. The resulting first vertical derivative grid provides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

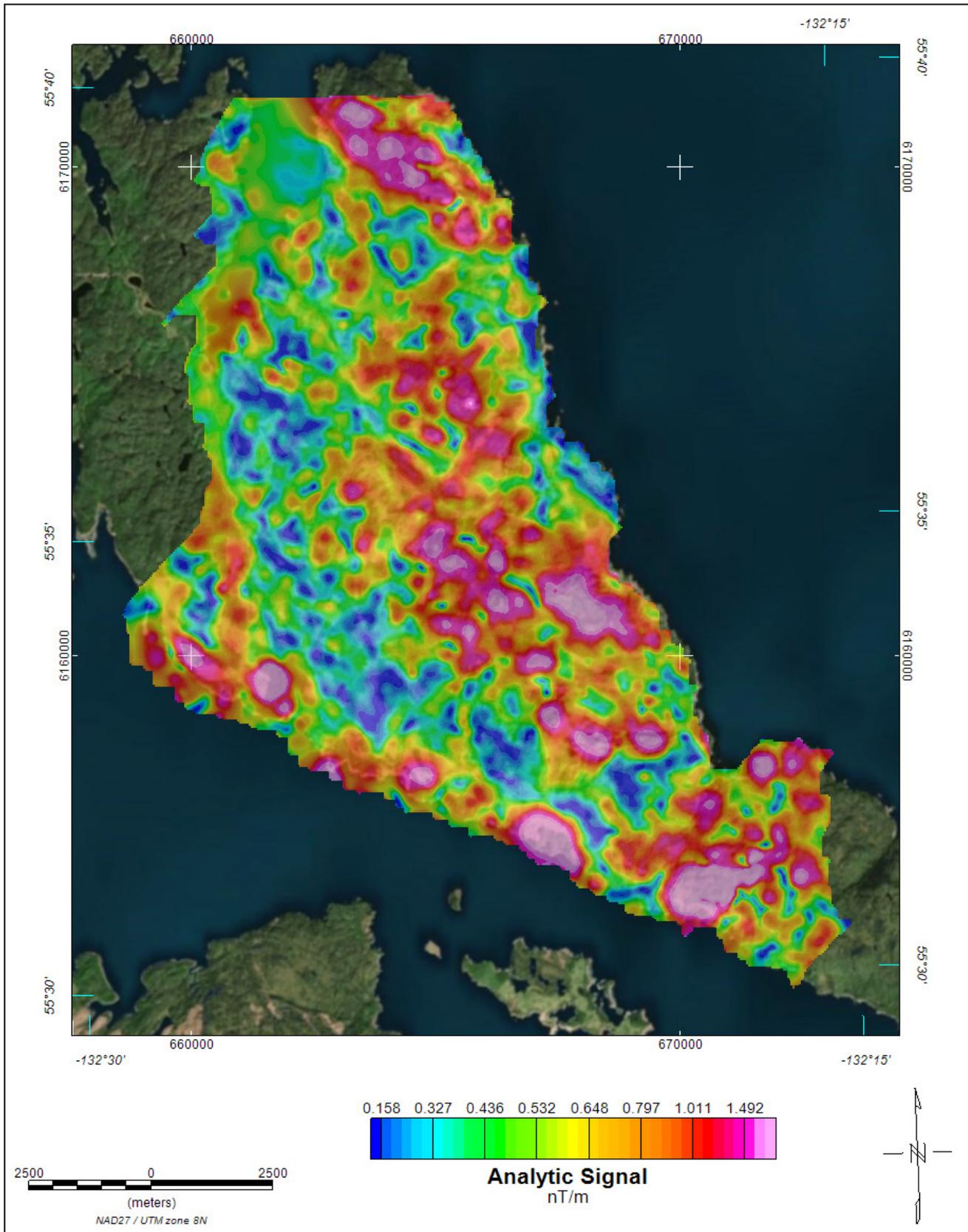


Figure 5. Analytic signal grid with orthometric image. Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source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

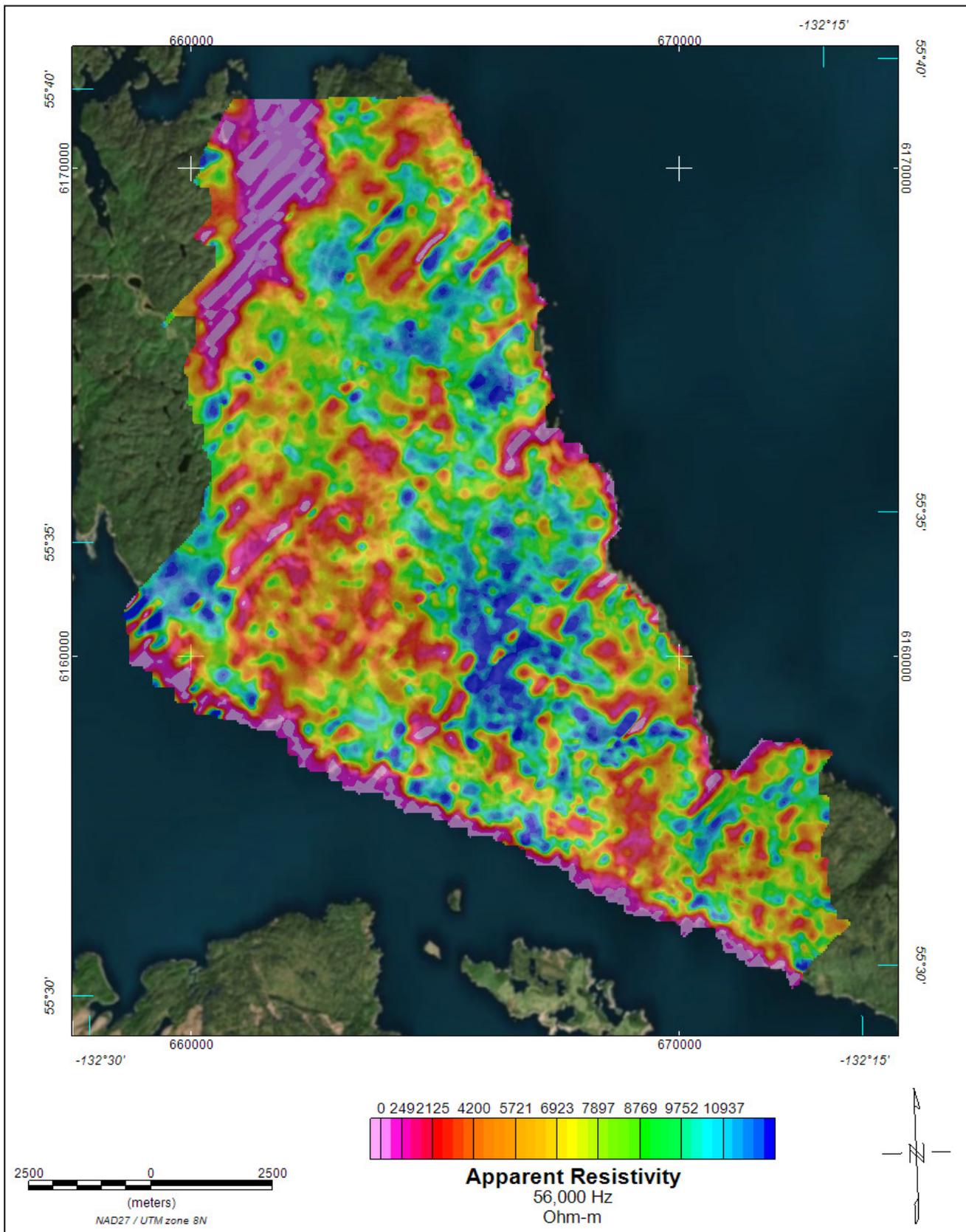


Figure 6. 56,000 Hz coplanar apparent resistivity grid with orthometric image. The DIGHEMI^{IV} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 900 and 7,200 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 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.

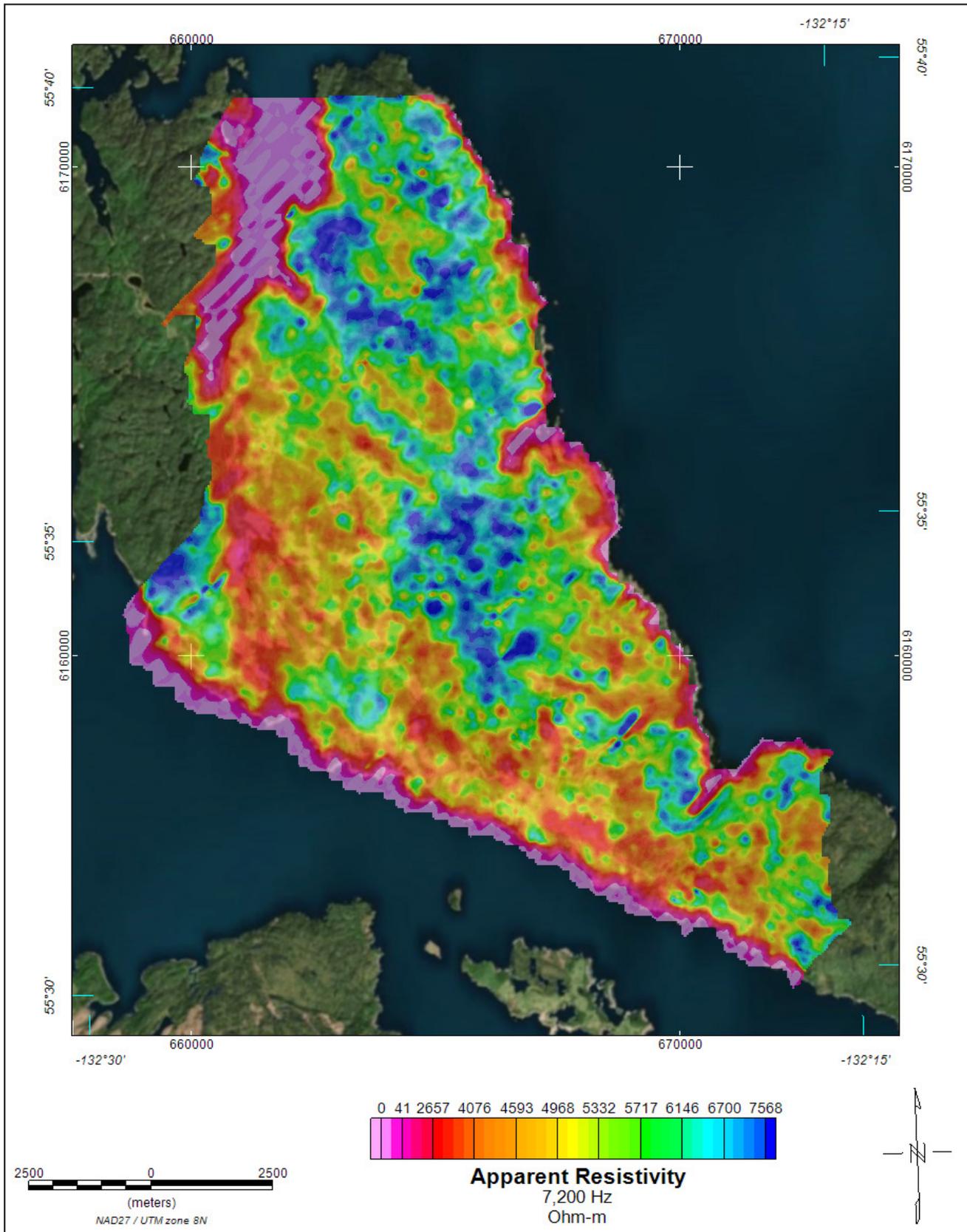


Figure 7. 7,200 Hz coplanar apparent resistivity grid with orthometric image. The DIGHEMI^{IV} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 900 and 7,200 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 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.

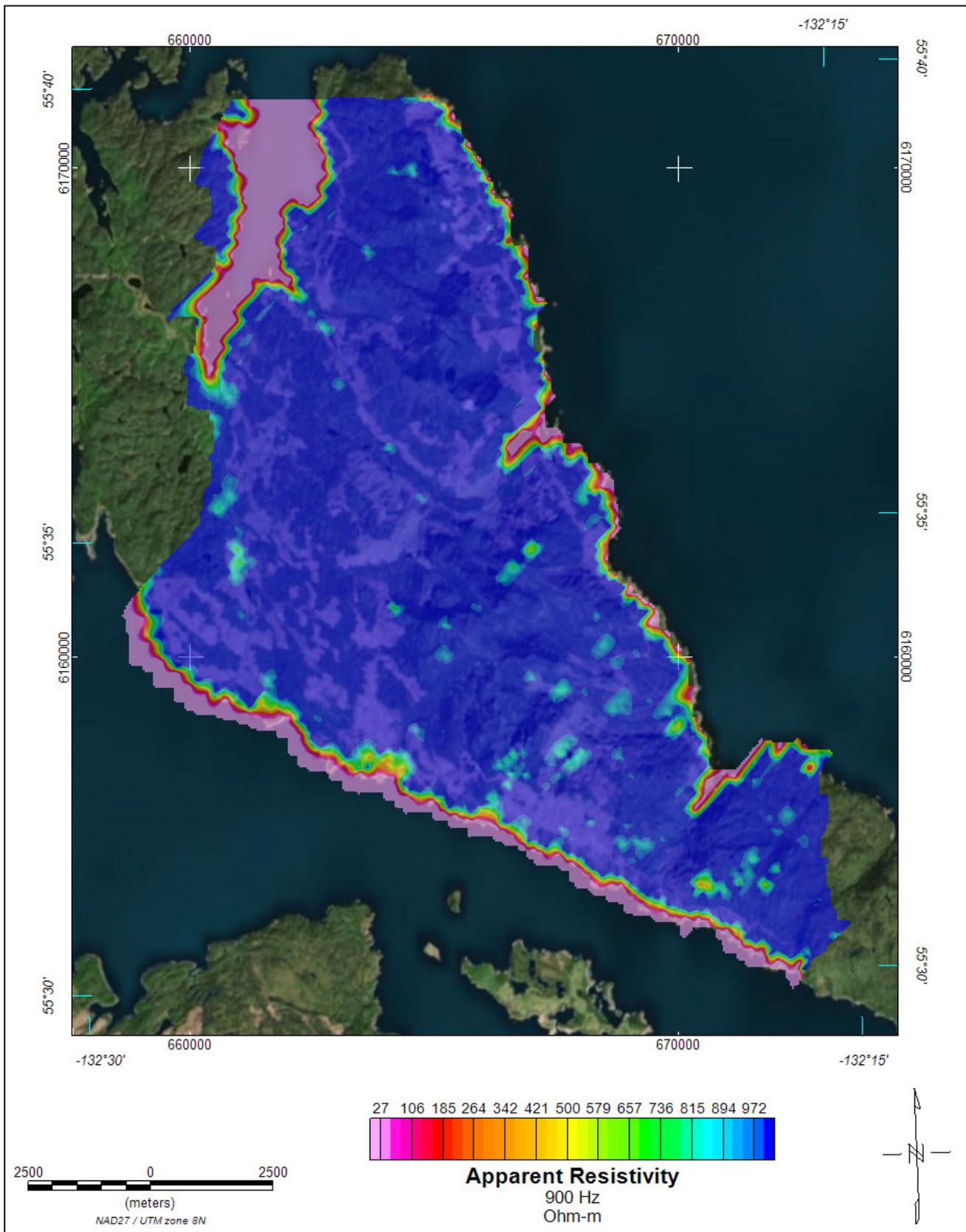


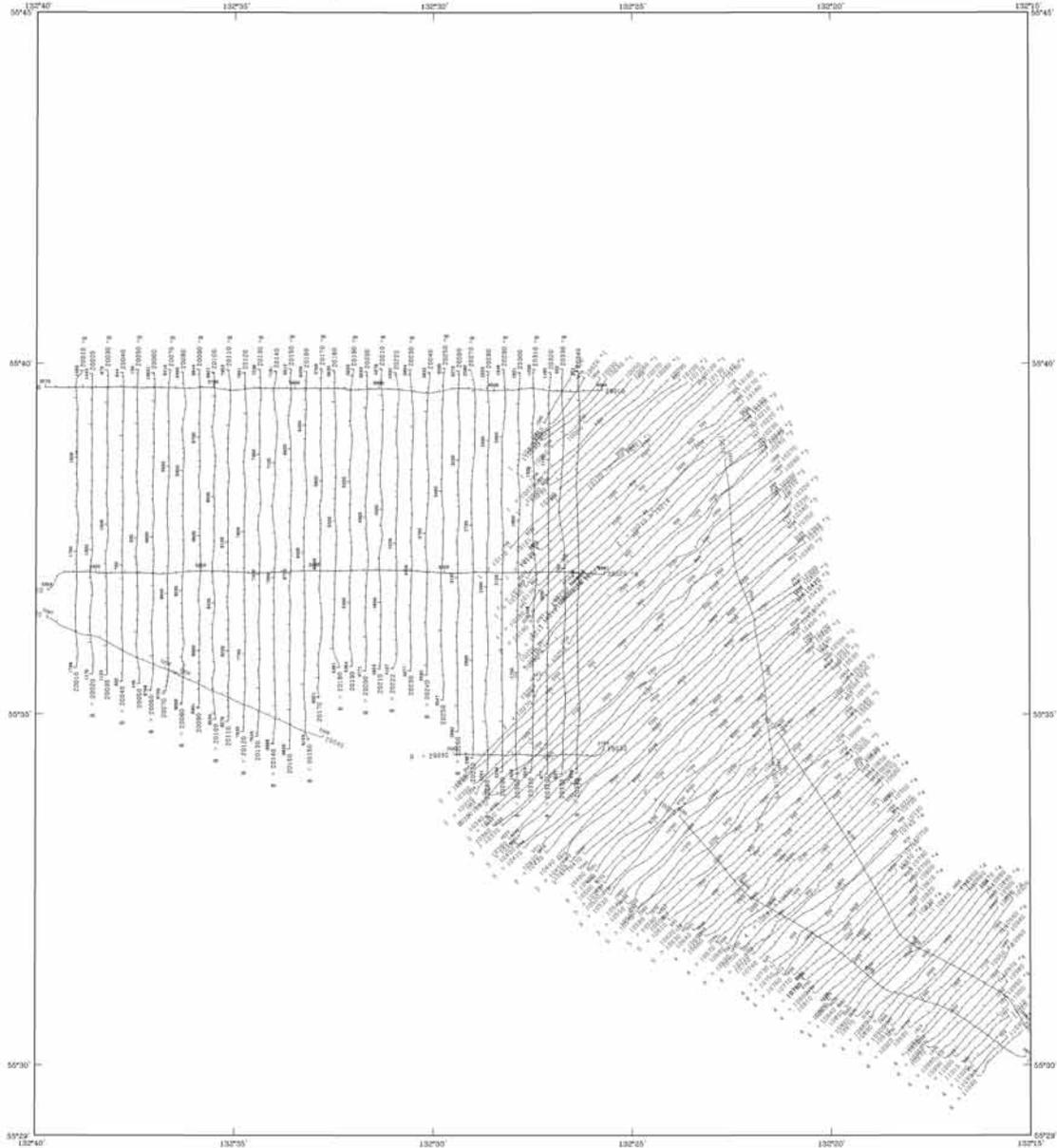
Figure 8. 900 Hz coplanar apparent resistivity grid with orthometric image. The DIGHEMI^{IV} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 900 and 7,200 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 56,000 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



From State U.S. Geological Survey Map No. 1-144, 8-4, 1946.



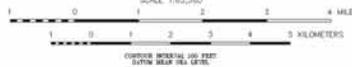
DESCRIPTIVE NOTES

KETCHIKAN SURVEY Area 4¹ - March 1999
 The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system and a Sintera cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/50 Hz monitors and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at minimum terrain clearance of 200 feet along north-south flight lines one-quarter mile apart. The lines were flown perpendicular to the flight lines of intervals of approximately 3 miles.

An Ashtech/Rascal 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 8j spheroid, 1927 North American datum using a central meridian (CM) of 155°, a north constant of 0 and an east constant of 600,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

KASAAH SURVEY Area 2¹ - May 1992
 The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system and a Sintera cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 215 and 184 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/50 Hz monitors, UHF receiver and video camera. The north-south-southwest flight lines were flown one-eighth mile apart with the 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 is considered to be comparable to the accuracy of 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.



**FLIGHT LINES
 OF SELECTED AREAS NEAR
 KETCHIKAN,
 SOUTHEAST ALASKA**

MAP A - SALT CHUCK AND KASAAH
 PENINSULA, PRINCE OF WALES ISLAND
 1999

LOCATION INDEX

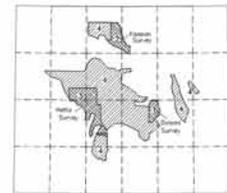
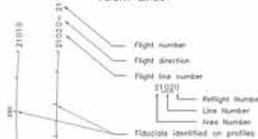


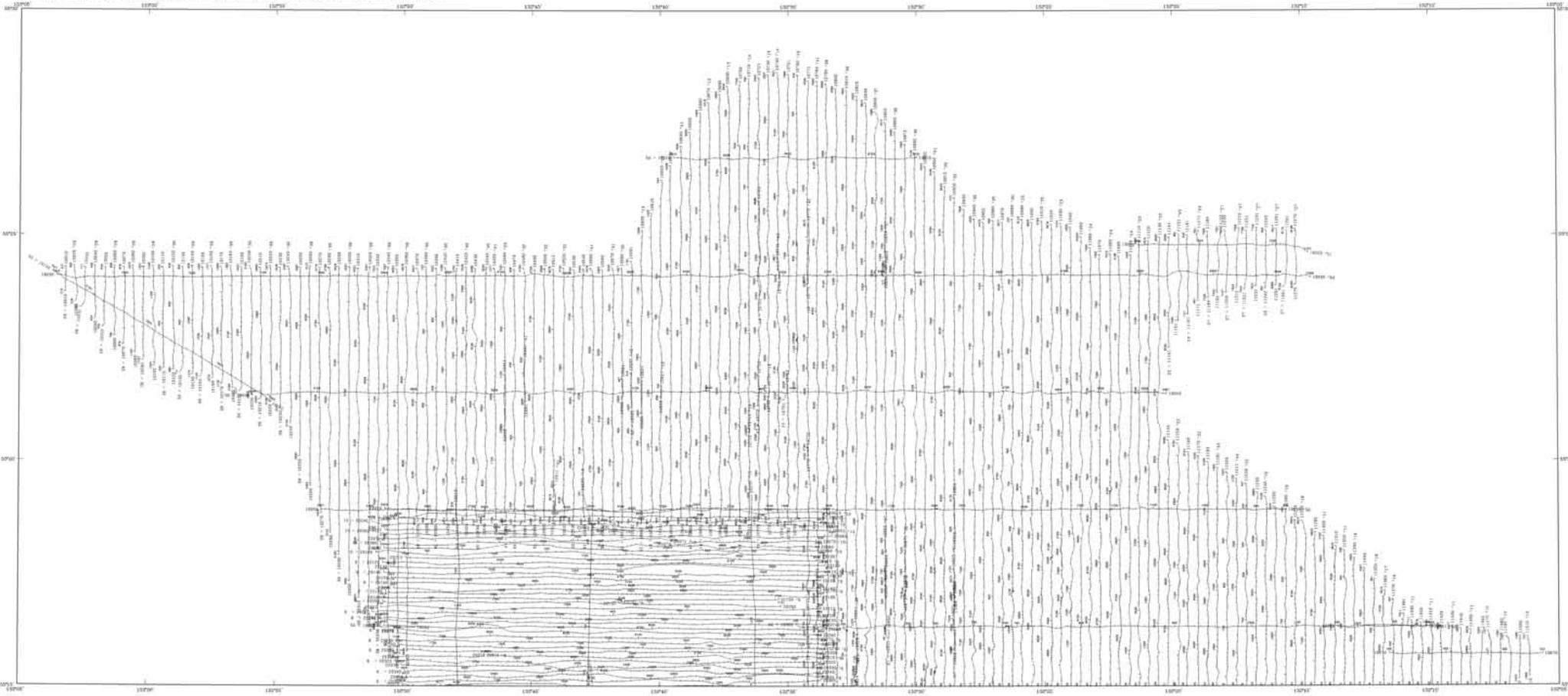
SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGGG), and RGM, Mining & Geological Consultants, Inc. Airborne geophysical data for areas 4 were acquired in 1999 by Geotek-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 DGGG, 784 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are also available, in person only, at the BLM's Juneau Minerals Information Center, McElwain Island, Douglas, AK.

FLIGHT LINES





Map B - Surveyed Area Immediately North of 55°15'



**FLIGHT LINES
 OF SELECTED AREAS NEAR
 KETCHIKAN,
 SOUTHEAST ALASKA**
 MAP B - SURVEYED AREA IMMEDIATELY NORTH OF 55°15',
 PRINCE OF WALES ISLAND
 1999

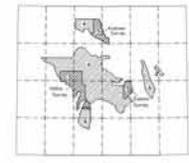
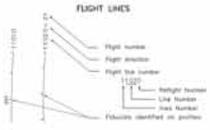
DESCRIPTIVE NOTES

ETOWAN SURVEY "Line 4" - March 1999
 The geophysical data were collected with a DIGHEU[®] magnetometer (200 system) and a Geometrics system magnetometer. Both were flown at a height of 100 feet. In addition, the survey recorded data from a color altimeter, GPS navigation system, DG/AD and heading and case compass. Flights were performed with an AC350B-2 turbine helicopter at a mean terrain clearance of 200 feet along north-south flight lines (see description in the report). The lines were flown approximately 5 miles from flight lines of other geophysical surveys.

An Anitech/Royal 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 locations were plotted onto the Clark 1984 (30N zone 4) Universal Transverse Mercator datum at a mean elevation (M) of 150 ± north constant of 0 and an east constant of 600,000. Position accuracy of the surveyed area is better than 10 m with respect to the UTM grid.

NETA SURVEY "Line 3" - May 1992
 The geophysical data were collected with a DIGHEU[®] magnetometer (200 system) and a Geometrics system magnetometer. Mean terrain clearance for the magnetometer and DG system were approximately 213 and 144 feet, respectively. In addition, the survey recorded data from a color altimeter, DG/AD navigation system, DG/AD heading, DG/AD receiver and case compass. The north-south flight lines were flown over-terrain, and the flight lines were flown approximately 10 miles from the survey area flown with an AC350B-2 helicopter.

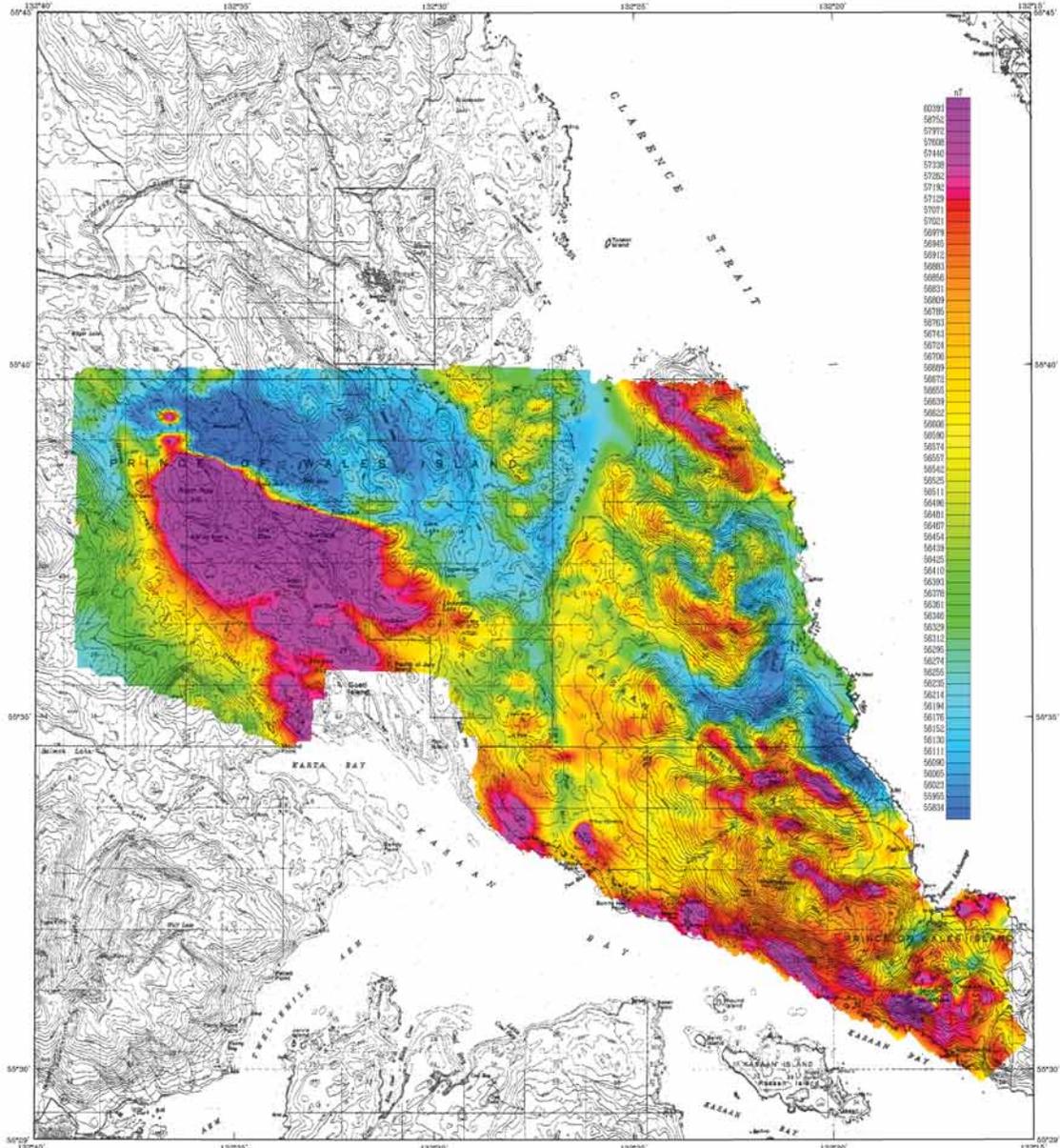
A Del Norte LMF electronic positioning system was used for navigation. Flight path recovery was done with a combination of DG/AD data and visual reference. Position accuracy of the 1992 data should be approximately 10 m.



SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geology & Geophysics Survey (DGG), and NOAA, a Geophysical Consultants, Inc. geophysical data for area A were acquired in 1993 by Geophysical Consultants, a division of CGC-Comtech 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 Aerial Recon Survey Fund Office and the office of Hester Bay and Copper River. The data for areas L, 2 and 3 were flown by Digheu in 1991 and 1992. These data were provided for publication by Sealaska Corporation.

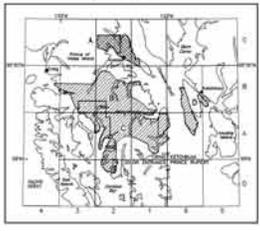
This map and other products from this survey are available by mail order, or in person from 2000, 754 University Ave., Suite 200, Fairbanks, Alaska 99709. Some products are also available in person only at the BLM's primary Resource Information Center, Mail Stop 7000, Douglas, AK.



Base from U.S. Geological Survey Chart 2-1, 1949, 2-4, 1949
 1:500,000 Scale Quadrangle, 1968



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[®] Electromagnetic (EM) system and a Scribner cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 30/50 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 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 centre 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.

KASAAN SURVEY "Area 2" - May 1992
 The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system and a Scribner 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, 50/50 Hz monitors, VLF receiver and video camera. The northeast-southwest flight lines were flown one-eighth mile apart with line 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 1:4 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 Akona (1970) technique. The regional variation (or IIRF) matrix, 1995, updated to March 1999) was removed from the leveled magnetic data.

Wolfe, R. 1970. A new method of interpolation and smooth curve fitting based on the generalization of the operation of Computing Machinery, v. 11, no. 4, p. 589-602.

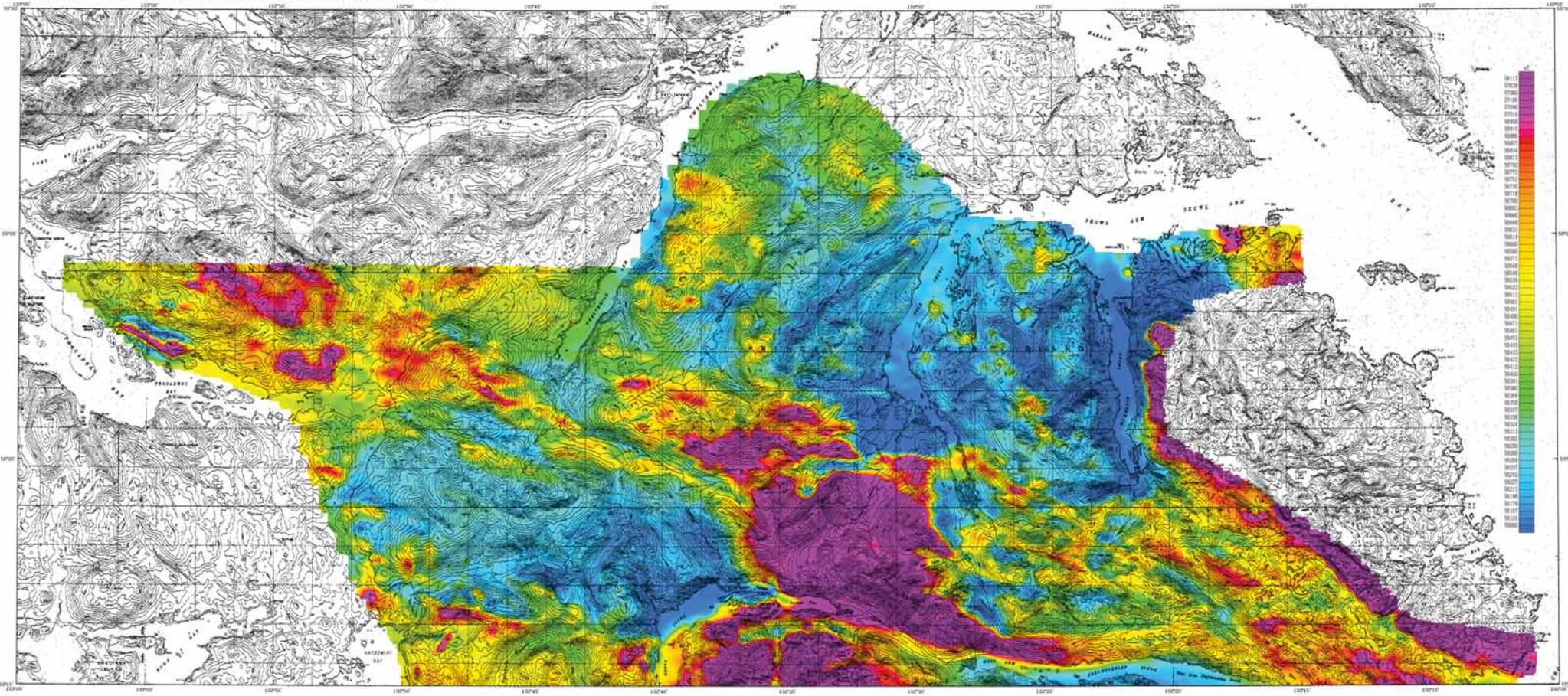
OFFICIAL BLM
 OBSERVATION LOG

SURVEY HISTORY

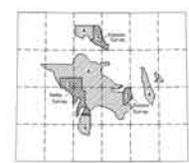
This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGG), and W&M Mining & Geological Consultants, Inc. Airborne geophysical data for areas 4 were acquired in 1999 by Geoterrac-Digheim, a division of DGG 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 Digheim 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 DGG, 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.





Scale: 1:50,000



**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

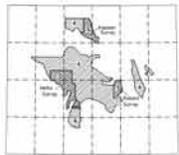
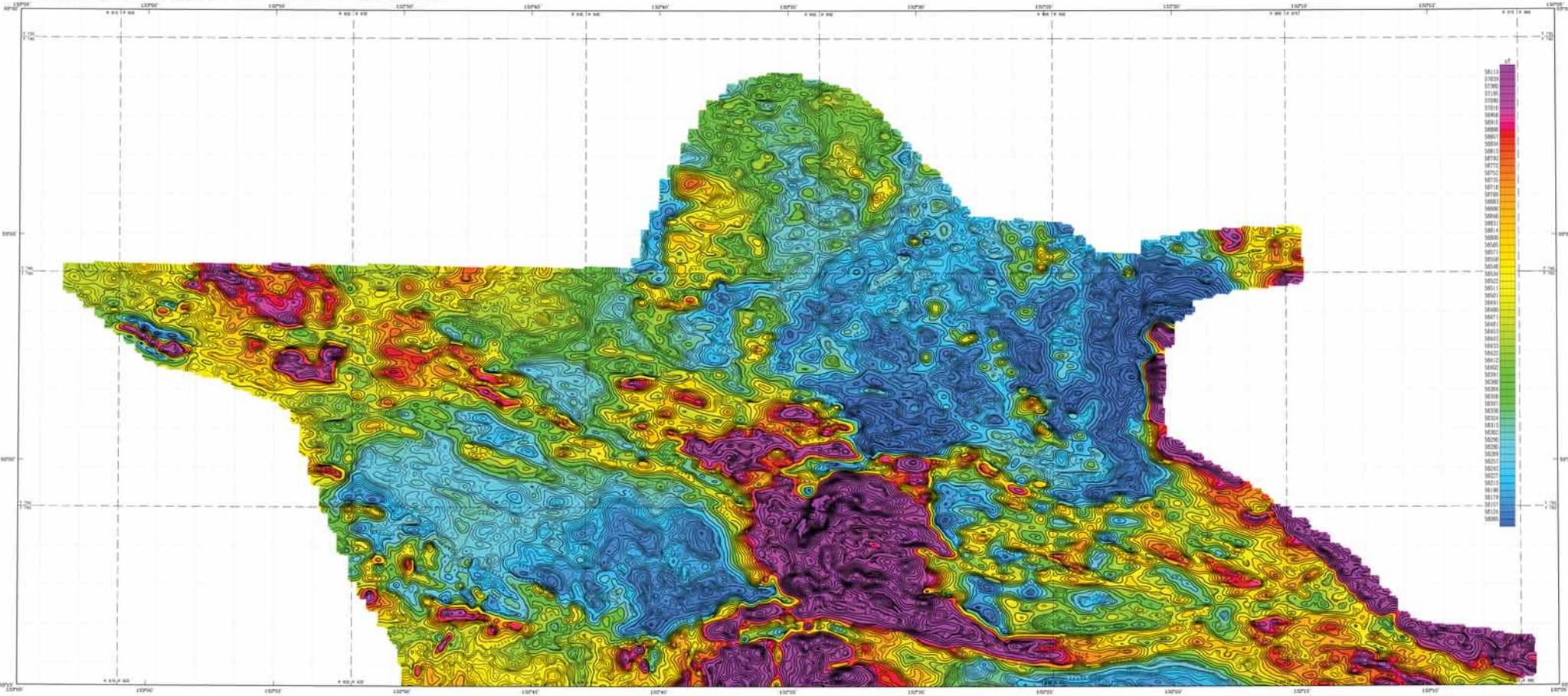
AERIAL SURVEY - June 4 - March 1988
 The geophysical data were acquired with a Dicer®
 magnetometer (20 sensor) in a Cessna 441 Conquest
 aircraft. Both were flown at a height of 100
 feet. In addition, the survey recorded data from a
 color altimeter, GPS navigation system, 50/70 Hz
 magnetometer and compass. Flights were performed with
 an 40,000-2 degree helicopter at a rotor RPM
 clearance of 220 feet above water. Flight
 lines were quarter mile apart. The lines were
 flown approximately 10 to 15 feet above
 the water. A 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
 about 10 cm. Flight lines were flown into
 the Clark 1886 (1986 zone 18) datum, 1973 Azim
 magnetic data to a datum transfer (DT) of 170
 nT north of 55° 00' and an east transfer of 500,000
 mT. The accuracy of the transferred data is better than
 10 nT with respect to the GRS 80.

2011 SURVEY - June 27 - May 1992
 The geophysical data were acquired with a Dicer®
 magnetometer (20 sensor) in a Cessna 441 Conquest
 aircraft. Both were flown at a height of 100
 feet. In addition, the survey recorded data from a
 color altimeter, GPS navigation system, 50/70 Hz
 magnetometer and compass. Flights were performed with
 an 40,000-2 degree helicopter at a rotor RPM
 clearance of 220 feet above water. Flight
 lines were quarter mile apart. The lines were
 flown approximately 10 to 15 feet above
 the water. A Real-Time Differential Global
 Positioning System (RT-DGPS) was used for both
 navigation. Flight path recovery was
 done with a combination of GPS and visual
 recovery. Position accuracy of the 1992 data should
 be approximately 10 cm.

SURVEY HISTORY

This map has been compiled and drawn under contract
 between the State of Alaska, Department of Natural
 Resources (DNR), Division of Geologic & Geophysical
 Survey (DGG), and NOAA, Office of Geologic
 Conservation, Inc. (OGC). The geophysical data for area 4 were acquired
 in 1988 by Dicer/Altimeter/Height, a division of CGC,
 Corvallis, Ore. Funding for the project was provided by
 the U.S. Department of the Interior, Bureau of Land
 Management (BLM), Alaska Coastal Program, Sealaska
 Corporation, Alaska State Mental Health Trust Land
 Office, and the State of Alaska, Dept. of Natural
 Resources. The data for areas 1, 2, and 3 were flown by Dicer/Alt
 in 1973 and 1982. 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 DGG, 54 University Ave.,
 Juneau, Alaska, 99801. Some products are
 also available in person only, at the BLM's general
 mapping information center, 445 West 10th, Juneau, AK.



**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

YEDOWAN SURVEY "Area 2" - March 1999
 The geophysical data were acquired with a GOMAX[®] Earthmation[®] (E) system and a Geometrics[®] magnetometer. Both sets flown at a height of 100 feet. In addition the survey recorded data from a real-time differential GPS navigation system, 50/60 Hz magnetic and clock correct. Flights were performed with an A3300B-2 Survey Navigator at a mean terrain clearance of 200 feet above earth-surface flight from one-quarter mile apart. The lines were flown perpendicular to the flight line of intervals of approximately 2 miles.

An airborne Real-time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight path recovery. The magnetic position was derived every 0.5 seconds using real-time differential provided to a relative accuracy of better than 10 m. Flight path positions were corrected only the once (at the time of survey) from a known datum using a differential (DG) of 120 m north constant of 0 and an east constant of 500.000. Position accuracy of the recorded data is better than 10 m with respect to the UTM grid.

HEITA SURVEY "Area 3" - May 1992
 The geophysical data were collected with a GOMAX[®] Earthmation[®] (E) system and a Geometrics[®] magnetometer. Mean terrain clearance for the magnetometer and EIT system was approximately 213 and 184 feet, respectively. In addition the survey recorded data from a real-time differential GPS navigation system, 50/60 Hz magnetic, RT receiver and clock correct. The north-south flight lines were flown one-quarter mile apart with the lines flown perpendicular to the flight lines. The survey was flown with an A3300B-1 helicopter.

A real-time differential positioning system was used for navigation. Flight path recovery was done with a combination of line data and clock recovery. Position accuracy of the 1992 data should be comparable to the 1999 data.



TOTAL FIELD MAGNETICS

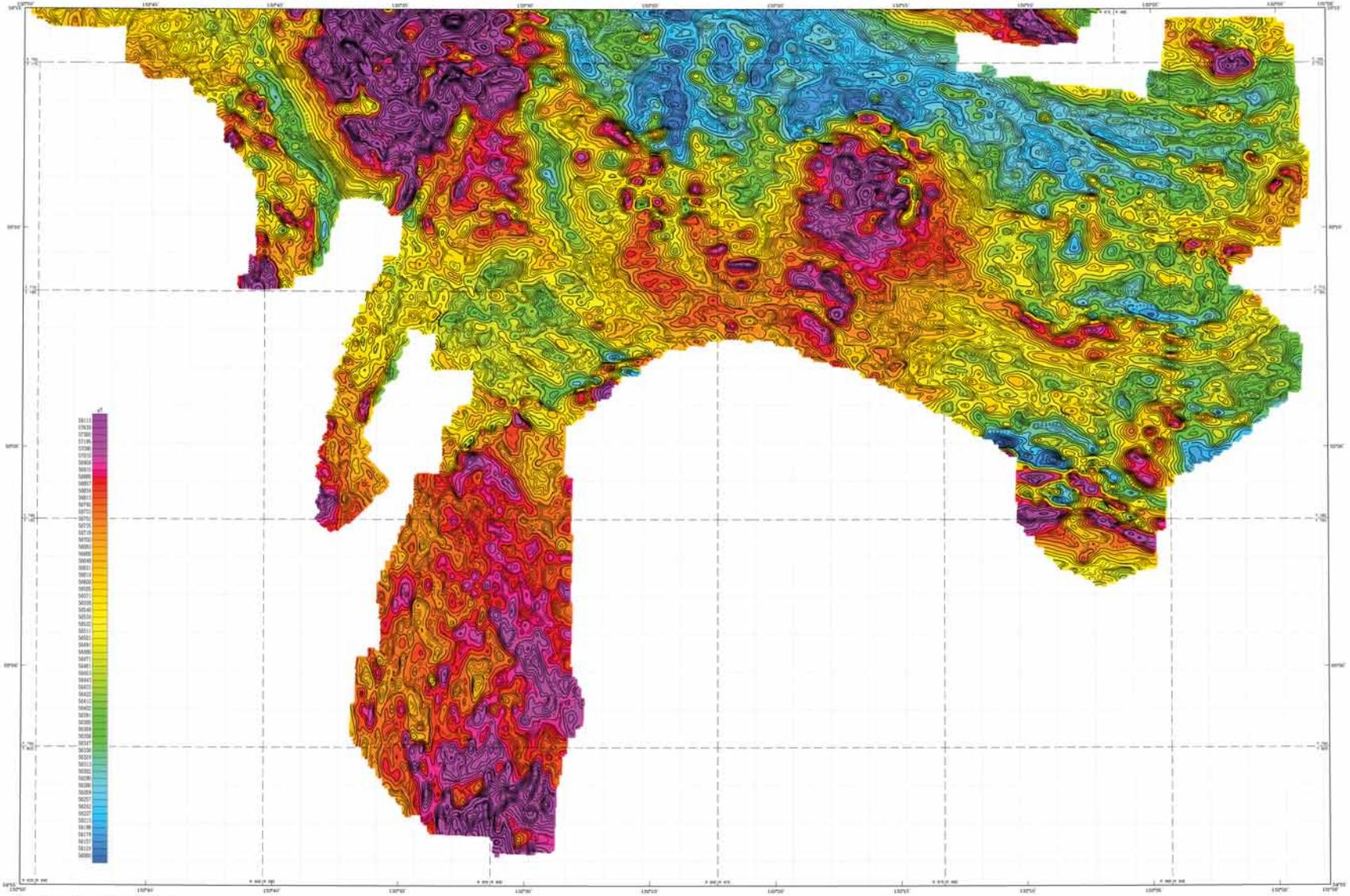
The total field magnetic data were acquired with a sampling interval of 0.1 seconds, and were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data; (2) reduced to the sea level datum; and (3) converted into a regular 100 m grid. The magnetic data for 1992 and 1999 were derived from the Survey Navigator data.

Map B is a composite of the geophysical data from the following surveys: "A", "B", "C", "D", "E", "F", "G", "H", "I", "J", "K", "L", "M", "N", "O", "P", "Q", "R", "S", "T", "U", "V", "W", "X", "Y", "Z", "AA", "AB", "AC", "AD", "AE", "AF", "AG", "AH", "AI", "AJ", "AK", "AL", "AM", "AN", "AO", "AP", "AQ", "AR", "AS", "AT", "AU", "AV", "AW", "AX", "AY", "AZ", "BA", "BB", "BC", "BD", "BE", "BF", "BG", "BH", "BI", "BJ", "BK", "BL", "BM", "BN", "BO", "BP", "BQ", "BR", "BS", "BT", "BU", "BV", "BW", "BX", "BY", "BZ", "CA", "CB", "CC", "CD", "CE", "CF", "CG", "CH", "CI", "CJ", "CK", "CL", "CM", "CN", "CO", "CP", "CQ", "CR", "CS", "CT", "CU", "CV", "CW", "CX", "CY", "CZ", "DA", "DB", "DC", "DD", "DE", "DF", "DG", "DH", "DI", "DJ", "DK", "DL", "DM", "DN", "DO", "DP", "DQ", "DR", "DS", "DT", "DU", "DV", "DW", "DX", "DY", "DZ", "EA", "EB", "EC", "ED", "EE", "EF", "EG", "EH", "EI", "EJ", "EK", "EL", "EM", "EN", "EO", "EP", "EQ", "ER", "ES", "ET", "EU", "EV", "EW", "EX", "EY", "EZ", "FA", "FB", "FC", "FD", "FE", "FF", "FG", "FH", "FI", "FJ", "FK", "FL", "FM", "FN", "FO", "FP", "FQ", "FR", "FS", "FT", "FU", "FV", "FW", "FX", "FY", "FZ", "GA", "GB", "GC", "GD", "GE", "GF", "GG", "GH", "GI", "GJ", "GK", "GL", "GM", "GN", "GO", "GP", "GQ", "GR", "GS", "GT", "GU", "GV", "GW", "GX", "GY", "GZ", "HA", "HB", "HC", "HD", "HE", "HF", "HG", "HH", "HI", "HJ", "HK", "HL", "HM", "HN", "HO", "HP", "HQ", "HR", "HS", "HT", "HU", "HV", "HW", "HX", "HY", "HZ", "IA", "IB", "IC", "ID", "IE", "IF", "IG", "IH", "II", "IJ", "IK", "IL", "IM", "IN", "IO", "IP", "IQ", "IR", "IS", "IT", "IU", "IV", "IW", "IX", "IY", "IZ", "JA", "JB", "JC", "JD", "JE", "JF", "JG", "JH", "JI", "JJ", "JK", "JL", "JM", "JN", "JO", "JP", "JQ", "JR", "JS", "JT", "JU", "JV", "JW", "JX", "JY", "JZ", "KA", "KB", "KC", "KD", "KE", "KF", "KG", "KH", "KI", "KJ", "KL", "KM", "KN", "KO", "KP", "KQ", "KR", "KS", "KT", "KU", "KV", "KW", "KX", "KY", "KZ", "LA", "LB", "LC", "LD", "LE", "LF", "LG", "LH", "LI", "LJ", "LK", "LL", "LM", "LN", "LO", "LP", "LQ", "LR", "LS", "LT", "LU", "LV", "LW", "LX", "LY", "LZ", "MA", "MB", "MC", "MD", "ME", "MF", "MG", "MH", "MI", "MJ", "MK", "ML", "MM", "MN", "MO", "MP", "MQ", "MR", "MS", "MT", "MU", "MV", "MW", "MX", "MY", "MZ", "NA", "NB", "NC", "ND", "NE", "NF", "NG", "NH", "NI", "NJ", "NK", "NL", "NM", "NN", "NO", "NP", "NQ", "NR", "NS", "NT", "NU", "NV", "NW", "NX", "NY", "NZ", "OA", "OB", "OC", "OD", "OE", "OF", "OG", "OH", "OI", "OJ", "OK", "OL", "OM", "ON", "OO", "OP", "OQ", "OR", "OS", "OT", "OU", "OV", "OW", "OX", "OY", "OZ", "PA", "PB", "PC", "PD", "PE", "PF", "PG", "PH", "PI", "PJ", "PK", "PL", "PM", "PN", "PO", "PP", "PQ", "PR", "PS", "PT", "PU", "PV", "PW", "PX", "PY", "PZ", "QA", "QB", "QC", "QD", "QE", "QF", "QG", "QH", "QI", "QJ", "QK", "QL", "QM", "QN", "QO", "QP", "QQ", "QR", "QS", "QT", "QU", "QV", "QW", "QX", "QY", "QZ", "RA", "RB", "RC", "RD", "RE", "RF", "RG", "RH", "RI", "RJ", "RK", "RL", "RM", "RN", "RO", "RP", "RQ", "RR", "RS", "RT", "RU", "RV", "RW", "RX", "RY", "RZ", "SA", "SB", "SC", "SD", "SE", "SF", "SG", "SH", "SI", "SJ", "SK", "SL", "SM", "SN", "SO", "SP", "SQ", "SR", "SS", "ST", "SU", "SV", "SW", "SX", "SY", "SZ", "TA", "TB", "TC", "TD", "TE", "TF", "TG", "TH", "TI", "TJ", "TK", "TL", "TM", "TN", "TO", "TP", "TQ", "TR", "TS", "TT", "TU", "TV", "TW", "TX", "TY", "TZ", "UA", "UB", "UC", "UD", "UE", "UF", "UG", "UH", "UI", "UJ", "UK", "UL", "UM", "UN", "UO", "UP", "UQ", "UR", "US", "UT", "UU", "UV", "UW", "UX", "UY", "UZ", "VA", "VB", "VC", "VD", "VE", "VF", "VG", "VH", "VI", "VJ", "VK", "VL", "VM", "VN", "VO", "VP", "VQ", "VR", "VS", "VT", "VU", "VV", "VW", "VX", "VY", "VZ", "WA", "WB", "WC", "WD", "WE", "WF", "WG", "WH", "WI", "WJ", "WK", "WL", "WM", "WN", "WO", "WP", "WQ", "WR", "WS", "WT", "WU", "WV", "WW", "WX", "WY", "WZ", "XA", "XB", "XC", "XD", "XE", "XF", "XG", "XH", "XI", "XJ", "XK", "XL", "XM", "XN", "XO", "XP", "XQ", "XR", "XS", "XT", "XU", "XV", "XW", "XZ", "YA", "YB", "YC", "YD", "YE", "YF", "YG", "YH", "YI", "YJ", "YK", "YL", "YM", "YN", "YO", "YP", "YQ", "YR", "YS", "YT", "YU", "YV", "YW", "YZ", "ZA", "ZB", "ZC", "ZD", "ZE", "ZF", "ZG", "ZH", "ZI", "ZJ", "ZK", "ZL", "ZM", "ZN", "ZO", "ZP", "ZQ", "ZR", "ZS", "ZT", "ZU", "ZV", "ZW", "ZX", "ZY", "ZZ".

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 Survey (DGG), and KGL, State & Geologic Consultants, Inc. Additional geophysical data for Area 2 were acquired in 1999 by Sealaska Corporation, a division of COG, Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), National Oilfield Development Corporation, Alaska State Health Trust Fund Land Office, and the State of Alaska, Sealaska Corporation. The data for areas 1, 2 and 3 were flown by DGG 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 DGG, 700 University Ave., Suite 200, Fairbanks, Alaska, 99703. Query information is also available, in person only, at the State's Alaska Resource Information Center, 400 West 10th, Douglas, AK.



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Map A" - March 1989
 The geophysical data were collected with a GEOTECH[®] Electromagnetic (EM) system and a Scripps vector magnetometer. Both were flown at a height of 100 feet. In addition, the surface magnetic data from a magnetic survey, GCS, was flown between 500 and 1000 feet. The flight path followed the coastline and an 85,000-ft² square perimeter of a recent terrain elevation of 200 feet along the north-south ridge line for the northern portion and east-west ridge line for the southern portion. The magnetometer was set to a resolution of 0.1 nT. The data were flown approximately to the right-hand of the ridge line of approximately 1/2 mile. The data were flown approximately to the right-hand of the ridge line of approximately 1/2 mile. The data were flown approximately to the right-hand of the ridge line of approximately 1/2 mile.

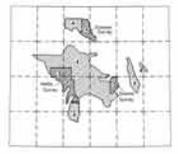
NETA SURVEY "Map C" - May 1993
 The geophysical data were collected with a GEOTECH[®] (Dutton Survey) and GEOTECH[®] (Nette Survey) Electromagnetic (EM) system and a Scripps vector magnetometer. Both were flown at a height of 100 feet. In addition, the surface magnetic data from a magnetic survey, GCS, was flown between 500 and 1000 feet. The flight path followed the coastline and an 85,000-ft² square perimeter of a recent terrain elevation of 200 feet along the north-south ridge line for the northern portion and east-west ridge line for the southern portion. The magnetometer was set to a resolution of 0.1 nT. The data were flown approximately to the right-hand of the ridge line of approximately 1/2 mile. The data were flown approximately to the right-hand of the ridge line of approximately 1/2 mile.



**TOTAL FIELD MAGNETICS
 OF SELECTED AREAS NEAR
 KETCHIKAN,
 SOUTHEAST ALASKA
 MAP C - SURVEYED AREA SOUTH OF 55°15',
 PRINCE OF WALES ISLAND
 1999**

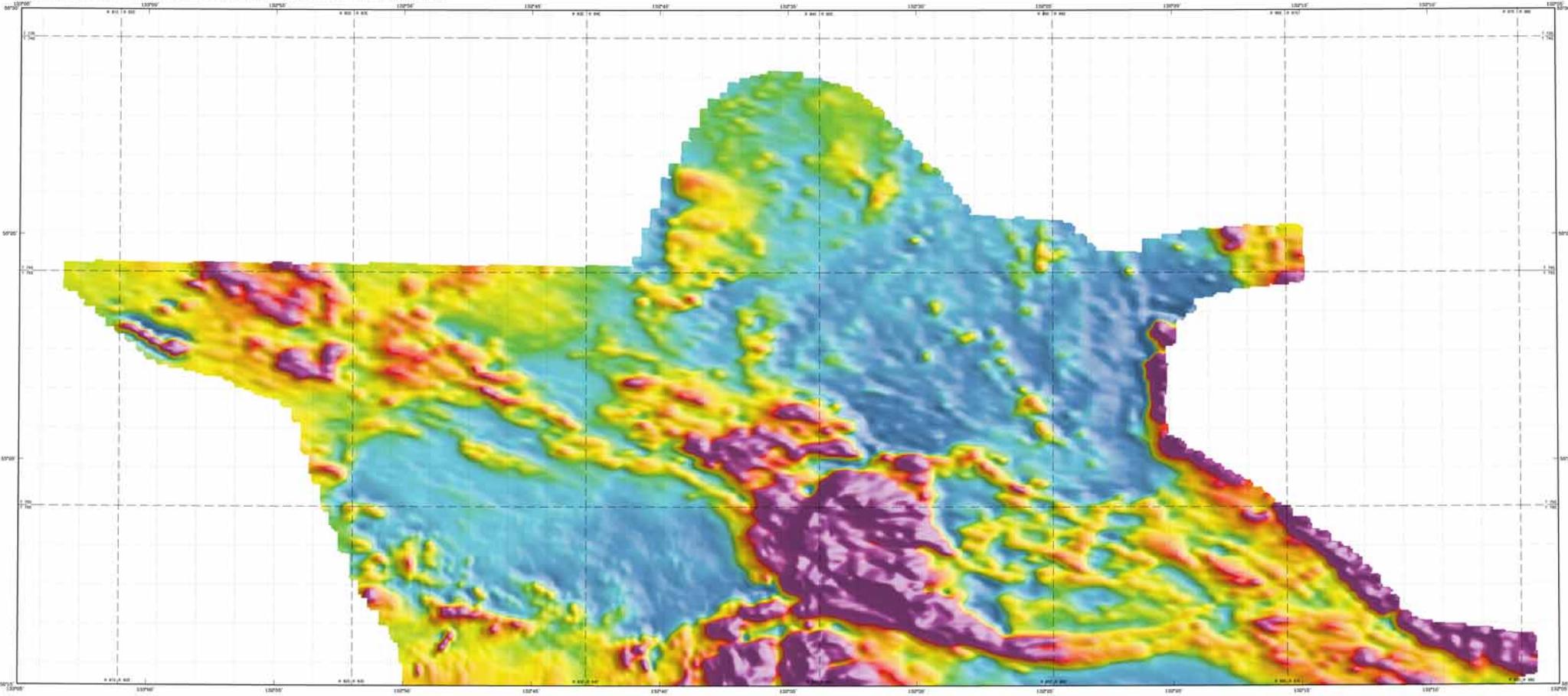
MAGNETIC CONTOUR INTERVAL

..... 20 nT
..... 30 nT
..... 40 nT
..... 50 nT

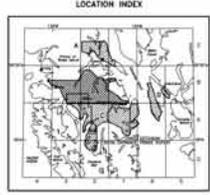


TOTAL FIELD MAGNETICS
 The total field magnetic data were acquired with a Scripps vector magnetometer and a GEOTECH[®] (Dutton Survey) and GEOTECH[®] (Nette Survey) Electromagnetic (EM) system. The data were flown at a height of 100 feet. In addition, the surface magnetic data from a magnetic survey, GCS, was flown between 500 and 1000 feet. The flight path followed the coastline and an 85,000-ft² square perimeter of a recent terrain elevation of 200 feet along the north-south ridge line for the northern portion and east-west ridge line for the southern portion. The magnetometer was set to a resolution of 0.1 nT. The data were flown approximately to the right-hand of the ridge line of approximately 1/2 mile. The data were flown approximately to the right-hand of the ridge line of approximately 1/2 mile.

SURVEY HISTORY
 This map has been compiled and drawn under contract from the State of Alaska Department of Natural Resources (DNR), Division of Geological & Geophysical Survey (DGG), and was flown in 1989. The data were collected by the DGG, in cooperation with the Bureau of Land Management (BLM), Alaska State Mental Health Trust Fund (ASMH), and the State of Alaska Department of Natural Resources (DNR), Division of Geological & Geophysical Survey (DGG). The data were flown at a height of 100 feet. In addition, the surface magnetic data from a magnetic survey, GCS, was flown between 500 and 1000 feet. The flight path followed the coastline and an 85,000-ft² square perimeter of a recent terrain elevation of 200 feet along the north-south ridge line for the northern portion and east-west ridge line for the southern portion. The magnetometer was set to a resolution of 0.1 nT. The data were flown approximately to the right-hand of the ridge line of approximately 1/2 mile. The data were flown approximately to the right-hand of the ridge line of approximately 1/2 mile.



U.S. Geological Survey, Alaska Division, File # 99-10B, P.C. 004



**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

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area A" - April 1999
 The geophysical data were acquired with a DSHW[®] Fluxgate magnetometer (FM) system and a Scintrex vector magnetometer (VM) both were flown at a height of 100 feet. In addition the survey recorded data from a real-time, GPS navigation system, 50/60 Hz magnetic and video camera. Flights were performed with an AS350B-2 helicopter at a major terrain clearance of 200 feet above maximum measured flight lines were flown at a constant altitude of 100 feet above terrain. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.
 An Ashtech/Realtek Real-Time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight path recovery. The helicopter position was recorded every 0.5 seconds using real-time differential processing to a relative accuracy of better than 10 m. Flight path positions were oriented onto the Clarke 1886 (NAD 83) spheroid, 1927 North American datum using a datum translation (DT) of 132.2 north, constant of 0 and an axis rotation of 505,000. Position accuracy of the recovered data is better than 10 m with respect to the ITRF grid.

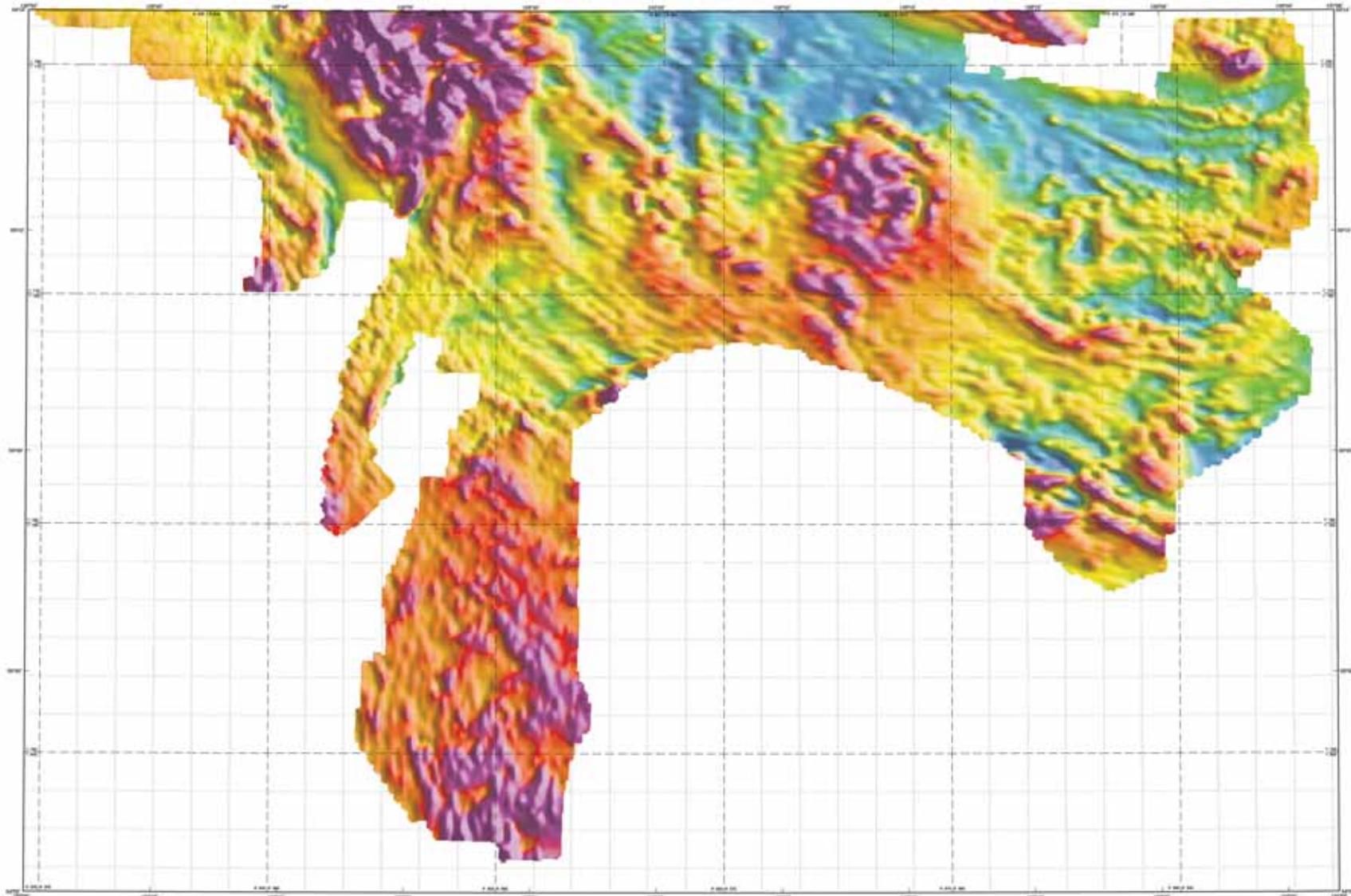
AREA SURVEY "Area B" - May 1999
 The geophysical data were acquired with a DSHW[®] Fluxgate magnetometer (FM) system and a Scintrex vector magnetometer. Mean terrain clearance for the magnetometer and VM system was approximately 215 and 188 feet, respectively. In addition the survey recorded data from a real-time, GPS navigation system, 50/60 Hz magnetic, VLF receiver and video camera. The real-time flight lines were flown at a constant altitude of 100 feet above terrain. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. The survey was flown with an AS350B-2 helicopter.
 A Del Norte GPS electronic positioning system was used for navigation. Flight path recovery was done with a combination of GPS data and video recovery. Positioning accuracy of the 1999 data should be comparable to 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) reduced to the ITRF grid, and (3) interpolated onto a regular grid using the minimum curvature (1970) technique. The regional volcanic (or GVF) gradient, 1995, updated in March 1999) was removed from the treated magnetic data.
 Details of data reduction and processing are available in the report of the Department of Geological Engineering, U.S.G.S., p. 2, 3-4.

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 Survey (DGGG), and BLM, Mining & Geological Consulting, Inc. Additional geophysical data for area A were acquired in 1999 by Geotek-Logan, a division of CGG-Corridor 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 Gustineville. The data for areas 1, 2 and 3 were flown by Dugan in 1991 and 1992. These data were provided for publication by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation.
 This map and other products from the survey are available by mail order, or in person, from DGGG, 394 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are also available, in person only, at the BLM's Ketchikan, Alaska Information Center, Highway 98 West, Dugan, AK.



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
 1000 EAST 10TH AVENUE, SPOKANE, WYOMING 83402-1000

DESCRIPTIVE NOTES

RECONNAISSANCE SURVEY "A" - March 1988
 The reconnaissance survey was conducted with a Geometrics G-800 magnetometer and a Bartington Model 2000 fluxgate gradiometer. The survey was conducted in a north-south direction, with a maximum spacing of 4 miles between stations. The survey was conducted in the southeastern part of the island and was intended to provide a general overview of the magnetic field in the area. The survey was conducted in a north-south direction, with a maximum spacing of 4 miles between stations. The survey was conducted in the southeastern part of the island and was intended to provide a general overview of the magnetic field in the area.

DETAILED SURVEY "B" - May 1988
 The detailed survey was conducted with a Geometrics G-800 magnetometer and a Bartington Model 2000 fluxgate gradiometer. The survey was conducted in a north-south direction, with a maximum spacing of 1 mile between stations. The survey was conducted in the southeastern part of the island and was intended to provide a detailed overview of the magnetic field in the area. The survey was conducted in a north-south direction, with a maximum spacing of 1 mile between stations. The survey was conducted in the southeastern part of the island and was intended to provide a detailed overview of the magnetic field in the area.

RECONNAISSANCE SURVEY "C" - May 1988
 The reconnaissance survey was conducted with a Geometrics G-800 magnetometer and a Bartington Model 2000 fluxgate gradiometer. The survey was conducted in a north-south direction, with a maximum spacing of 4 miles between stations. The survey was conducted in the southeastern part of the island and was intended to provide a general overview of the magnetic field in the area. The survey was conducted in a north-south direction, with a maximum spacing of 4 miles between stations. The survey was conducted in the southeastern part of the island and was intended to provide a general overview of the magnetic field in the area.

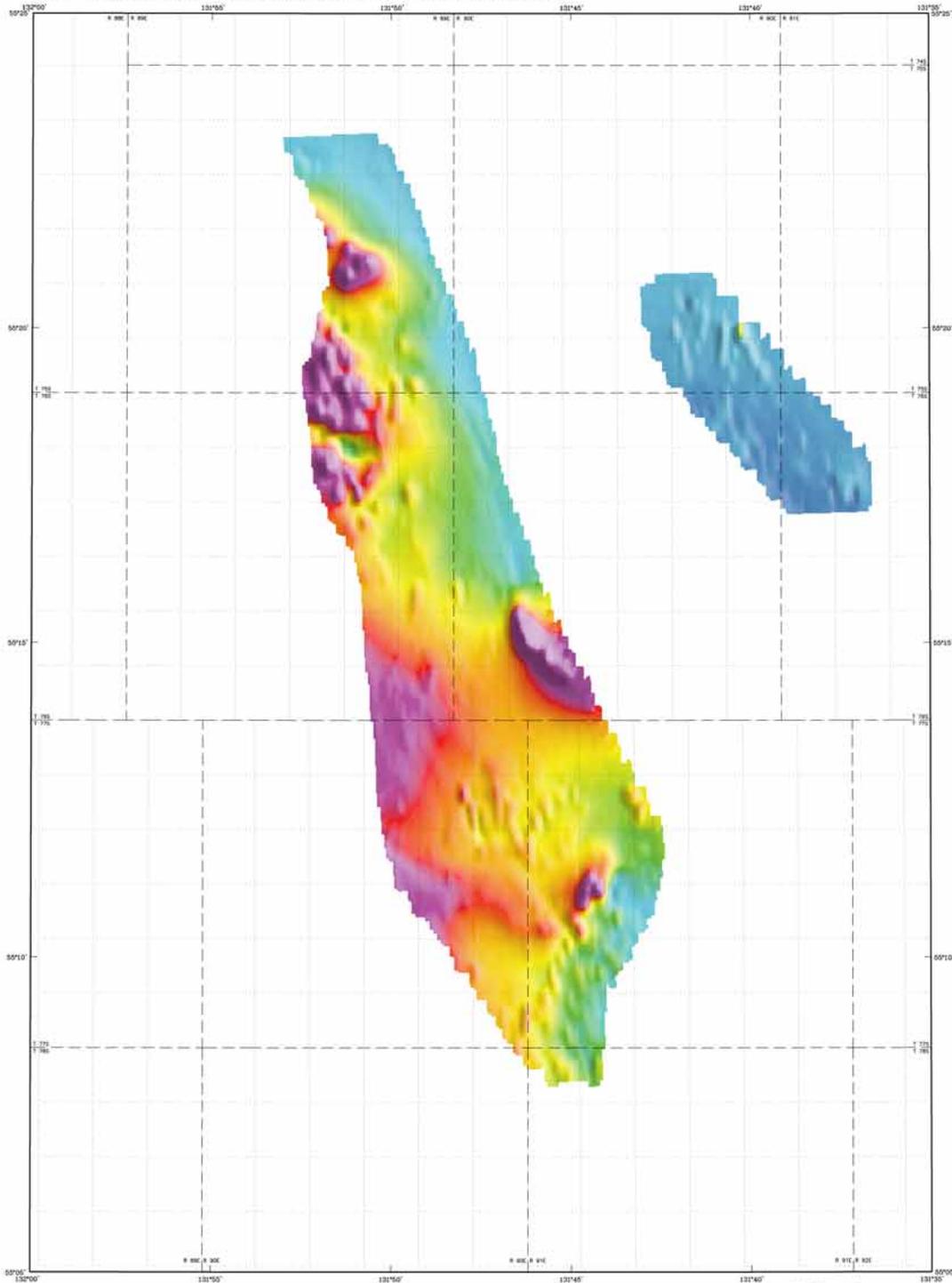


**COLOR SHADOW
 TOTAL FIELD MAGNETICS
 OF SELECTED AREAS NEAR
 KETCHIKAN,
 SOUTHEAST ALASKA**
 MAP C - SURVEYED AREA SOUTH OF 55° 15',
 PRINCE OF WALES ISLAND
 1999
 Sun Azimuth 65 degrees
 Inclination 30 degrees

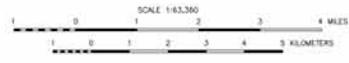
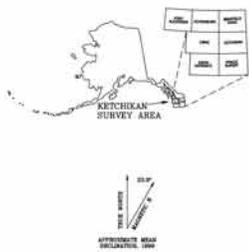


TOTAL FIELD MAGNETICS
 The total field magnetic data were acquired with a Geometrics G-800 magnetometer and were corrected for diurnal variations. The data were corrected for diurnal variations by subtracting the diurnal variation from the total field magnetic data. The data were corrected for diurnal variations by subtracting the diurnal variation from the total field magnetic data. The data were corrected for diurnal variations by subtracting the diurnal variation from the total field magnetic data.

SURVEY HISTORY
 The map was prepared and printed under contract to the Alaska Division of Geological & Geophysical Surveys by the Bureau of Land Management, Ketchikan Gateway Borough, and Sealaska Corporation. The map was prepared and printed under contract to the Alaska Division of Geological & Geophysical Surveys by the Bureau of Land Management, Ketchikan Gateway Borough, and Sealaska Corporation. The map was prepared and printed under contract to the Alaska Division of Geological & Geophysical Surveys by the Bureau of Land Management, Ketchikan Gateway Borough, and Sealaska Corporation.



Shaded outline from U.S. Geological Survey Sketches 4-6, 1886, A-4, 1946, B-4, 1950, B-4, 1951, Geographical, Alaska

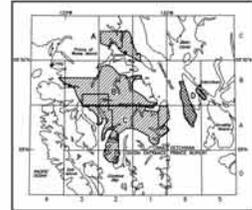


**COLOR SHADOW
 TOTAL FIELD MAGNETICS
 OF SELECTED AREAS NEAR
 KETCHIKAN,
 SOUTHEAST ALASKA**

MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND

1999

Sun Azimuth: 65 degrees
 Inclination: 30 degrees



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 (DGG), and W&M Mining & Geological Consultants, Inc. Airborne geophysical data for the area were acquired in 1999 by Geckert-Dighe, 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 Homer Bay and Cuffman Cove. This map and other products from this survey are available by mail order, or in person, from DGG, 794 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are also available, in person only, at the BLM's Juneau Minerals Information Center, Moyflower Island, Douglas, AK.

TOTAL FIELD MAGNETICS

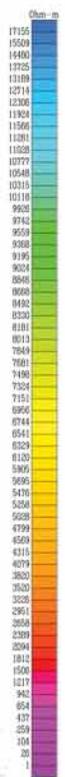
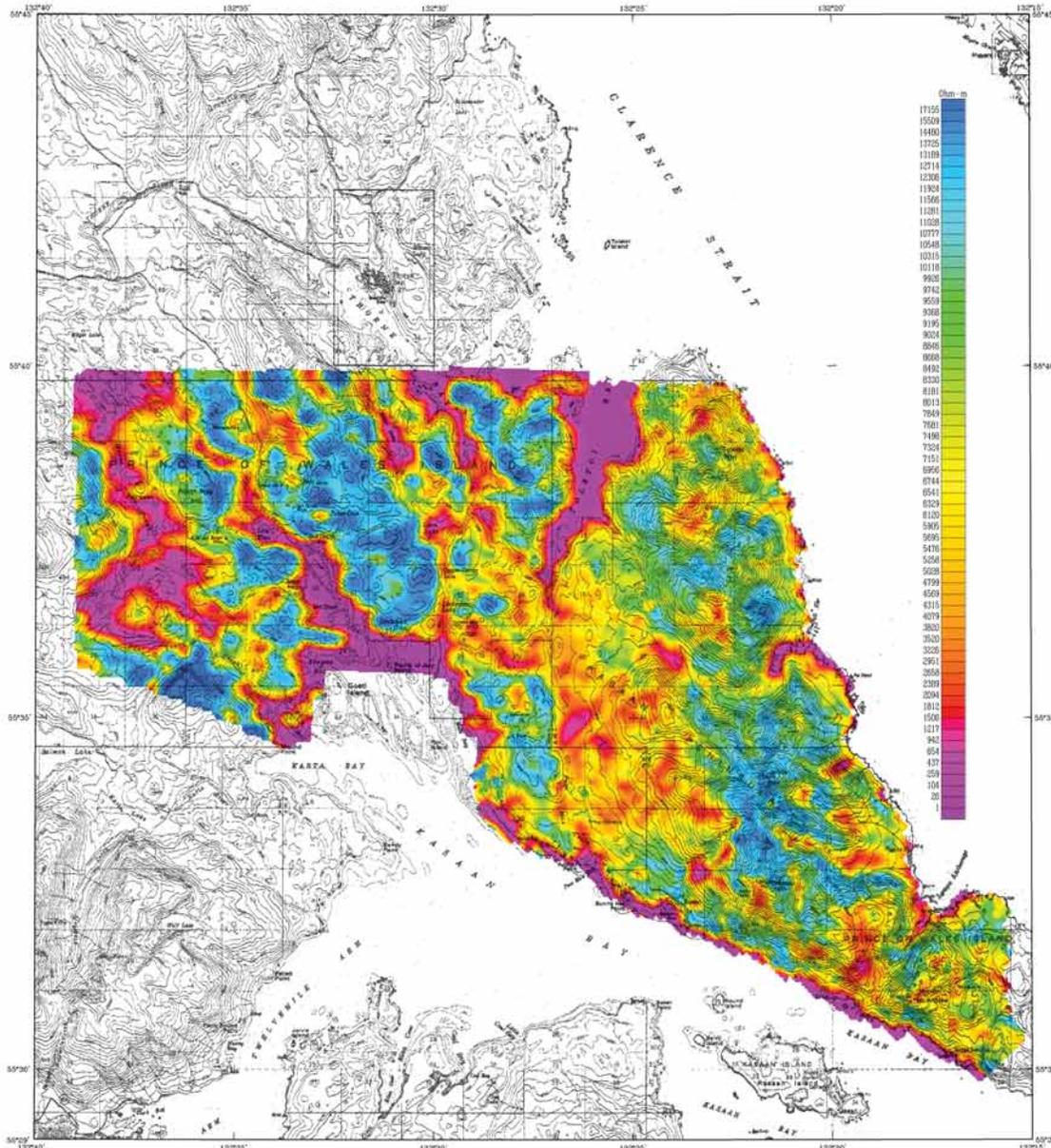
The total field magnetic data were acquired with a sampling interval of 0.1 seconds, and were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) leveled to the tie line data, and (3) interpolated onto a regular 100 m grid using a modified Amund (1970) technique. The regional variation (or IGR gradient, 1995, updated to March 1999) was removed from the leveled magnetic data.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGEM[®] Electromagnetic (EM) system and a Sinterex cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/500 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. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Rocad 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 1886 (UTM zone 9) spheroid, 1927 North American datum using a central meridian (CM) of 139°, 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.

Alaska, 11, 1970, A new method of interpolation and smooth curve fitting based on local polynomials. *Journal of the Association of Computing Machinery*, 17, no. 4, p. 688-691.



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[®] Electromagnetic (EM) system and a Sointrex 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-1 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 Ashtech/Rascal 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 6) spheroid, 1927 North American datum using a central meridian (CM) of 135°, a north constant of 0 and an east constant of 600,000. 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[®] Electromagnetic (EM) system and a Sointrex 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 north-south flight lines were flown one-eighth mile apart with the 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[®] EM system measured in-phase and quadrature components at five frequencies. Two vertical coplanar-coil pairs operated at 300 and 5500 Hz while three horizontal coplanar-coil pairs operated at 900, 2200, 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 in-phase 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.

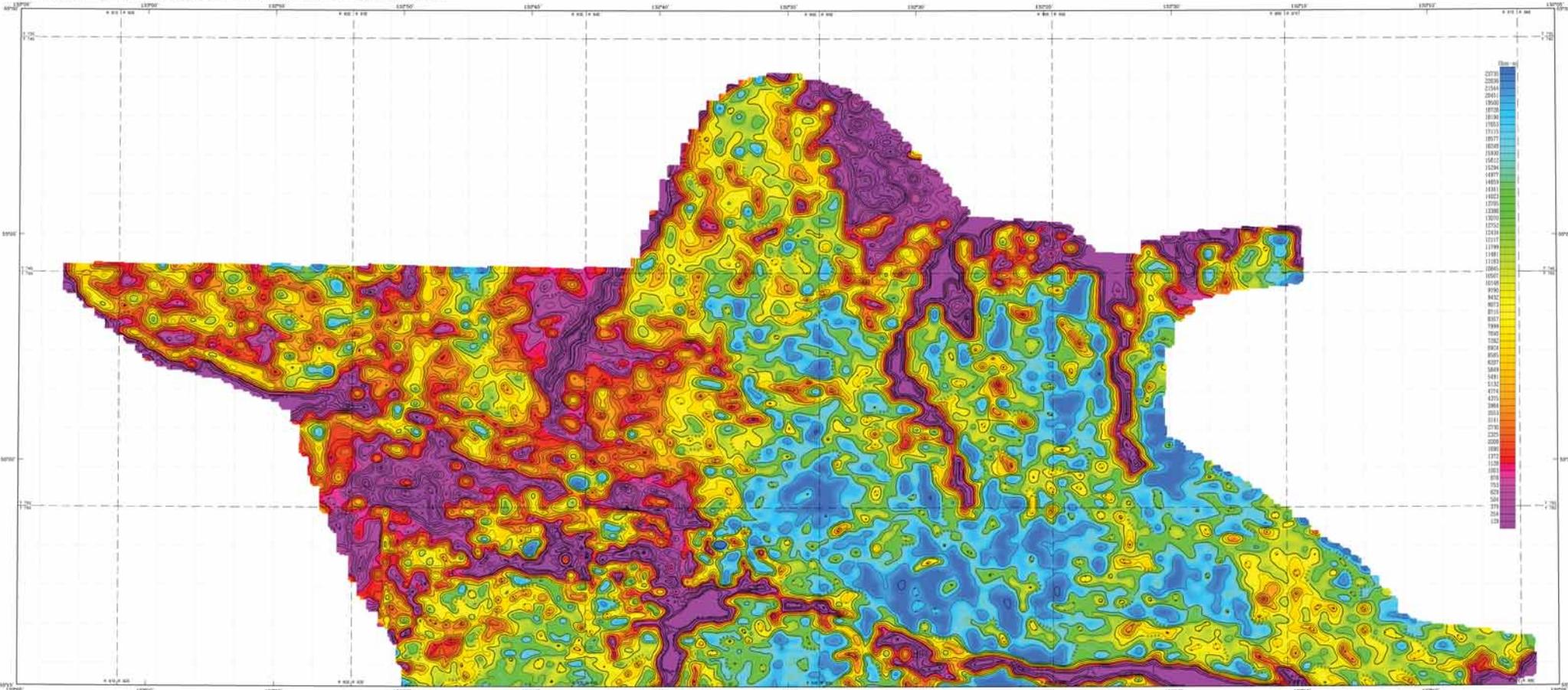
AKIMA, H. 1970. A new method of interpolation and smooth curve fitting based on local procedures. *Journal of the Association of Computing Machinery*, v. 17, no. 4, p. 589-602.

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 (DGGG), and NIM, Mining & Geological Consultants, Inc. Airborne geophysical data for areas 4 were acquired in 1999 by Geoterrac-Digheim, a division of CCG 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 Digheim in 1991 and 1992. These data were provided for publication by Geosistec Corporation.

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

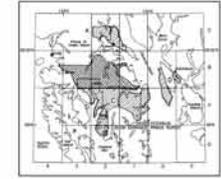




U.S. Geological Survey, Alaska Division, Open-File Report 1999-11B



LOCATION INDEX



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

YEDONAN SURVEY "Area 2" - March 1999
The geophysical data were collected with a GOMEX[®] Earthmagnetic (EM) system and a GOMEX[®] magnetometer. Both sets four of a height of 100 feet. In addition the survey recorded data from a resistivity (EM) system and a GOMEX[®] magnetometer. The EM system was operated at 56,000 Hz with three nominal coil spacings of 200, 500, and 1000 m. EM data were sampled at 0.1 second intervals. The EM system response to bedrock conductors, overburden, and cultural sources. Apparent resistivity is presented from the resistivity and quadrature components of the response. The data were processed using a modified Wenner (1970) technique. The data were interpreted into a regular 100 m grid using a modified Wenner (1970) technique.

HEITA SURVEY "Area 3" - May 1992
The geophysical data were collected with a GOMEX[®] Earthmagnetic (EM) system and a GOMEX[®] magnetometer. Both sets four of a height of 100 feet. In addition the survey recorded data from a resistivity (EM) system and a GOMEX[®] magnetometer. The EM system was operated at 56,000 Hz with three nominal coil spacings of 200, 500, and 1000 m. EM data were sampled at 0.1 second intervals. The EM system response to bedrock conductors, overburden, and cultural sources. Apparent resistivity is presented from the resistivity and quadrature components of the response. The data were processed using a modified Wenner (1970) technique. The data were interpreted into a regular 100 m grid using a modified Wenner (1970) technique.

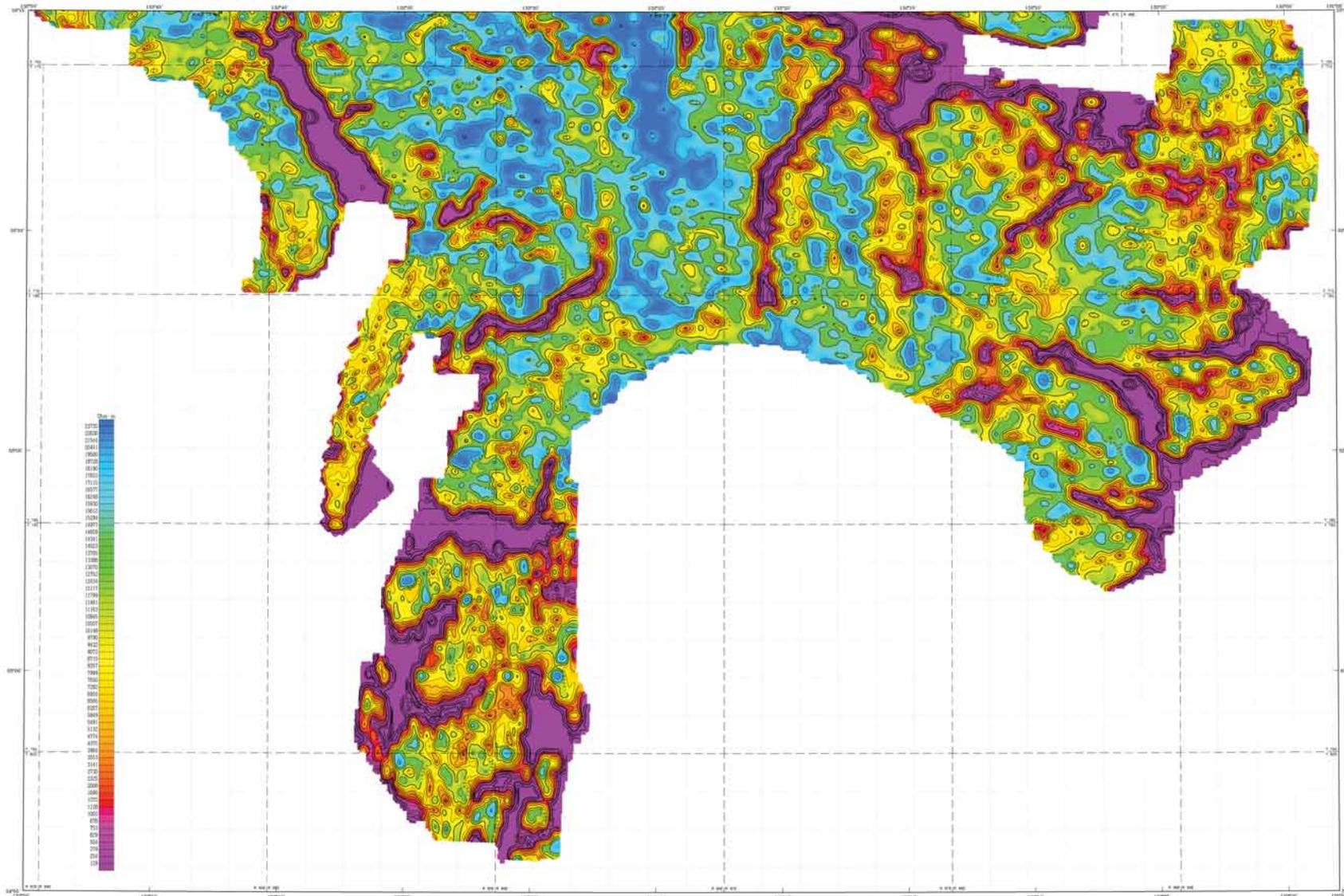
RESISTIVITY

The GOMEX[®] EM system measured in-phase and quadrature components of the response. The in-phase component was operated at 56,000 Hz with three nominal coil spacings of 200, 500, and 1000 m. EM data were sampled at 0.1 second intervals. The EM system response to bedrock conductors, overburden, and cultural sources. Apparent resistivity is presented from the resistivity and quadrature components of the response. The data were processed using a modified Wenner (1970) technique. The data were interpreted into a regular 100 m grid using a modified Wenner (1970) technique.



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 Survey (DGG), and KGL, Mining & Geologic Consultants, Inc. Additional geophysical data for Area 2 were provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Alaska Gateway Borough, Sealaska Corporation, Alaska State Health Service (ASHS) and the State of Alaska, Department of Natural Resources (DNR). The data for areas 1, 2 and 3 were from KJ Diagram in 1991 and 1992. These data were provided for publication by Sealaska Corporation.



DESCRIPTIVE NOTES

KETCHIKAN SURVEY: "Map A" - March 1989
 The geophysical data were collected with a DICKENS[®] Electromagnetic (EM) system and a Scripps earth magnetometer. Both were flown at a height of 100 feet. In addition, the surface resistivity data from a nodular contact, 200 m above the surface, was collected on a 63,500-Ω bipolar resistivity of a near terrain resistance of 200 feet using a resistivity meter. The data were then processed to produce a resistivity map. The data were then processed to produce a resistivity map. The data were then processed to produce a resistivity map.

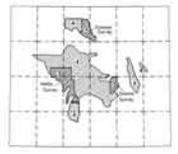
NETA SURVEY: "Map C" - May 1993
 The geophysical data were collected with a DICKENS[®] (Duckhorn Survey) and Scripps earth magnetometer. Both were flown at a height of 100 feet. In addition, the surface resistivity data from a nodular contact, 200 m above the surface, was collected on a 63,500-Ω bipolar resistivity of a near terrain resistance of 200 feet using a resistivity meter. The data were then processed to produce a resistivity map. The data were then processed to produce a resistivity map.



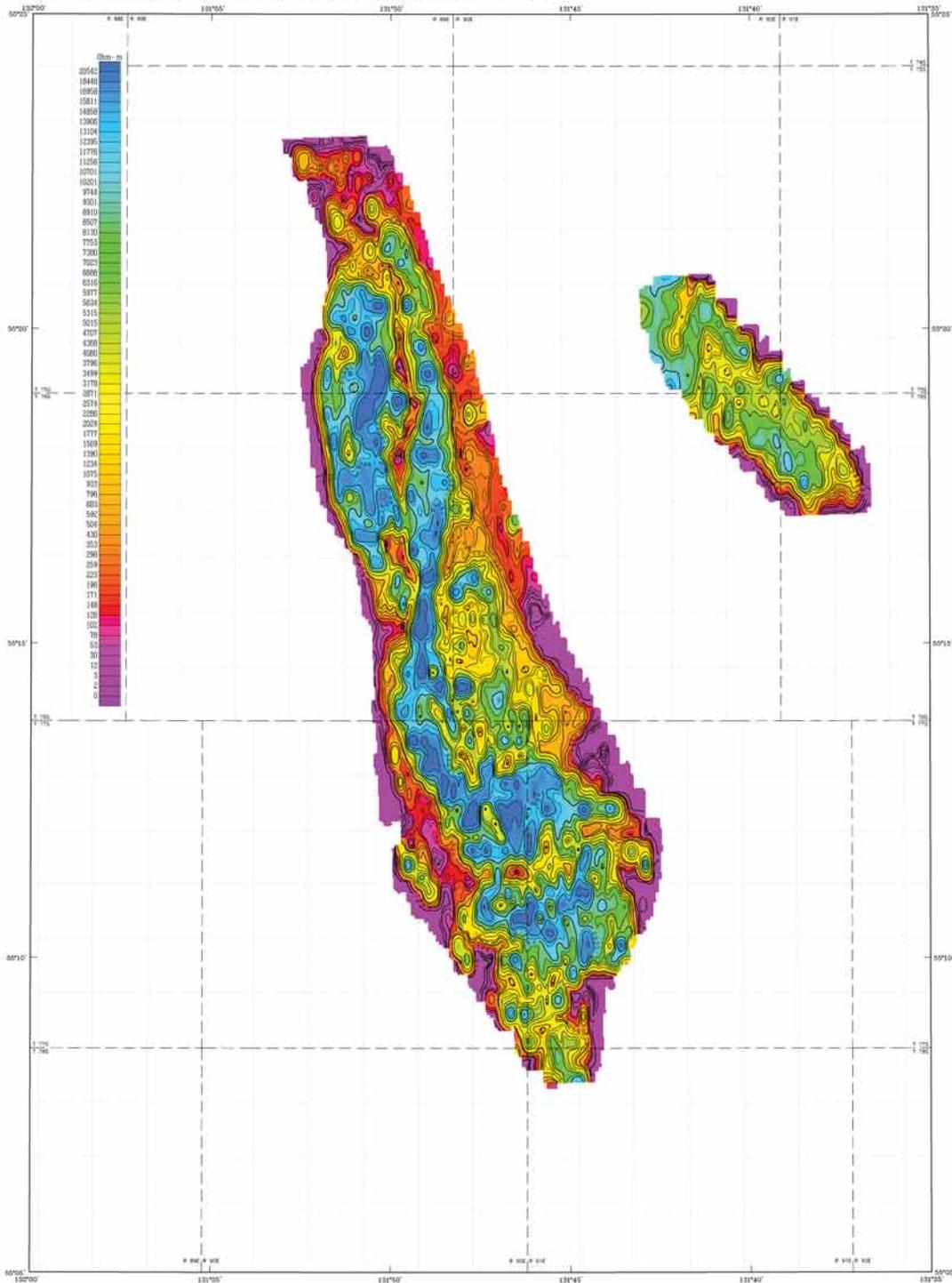
RESISTIVITY
 The DICKENS[®] EM system measured in-phase and quadrature coil pairs operated at 800 and 3500 Hz with three magnetic induction coils spaced at 500, 700, and 1000 m. The data were sampled at 0.1 second intervals. The EM system depends on induced secondary, conductive and cultural currents. Apparent resistivity is generated from the in-phase and quadrature components of the EM system. The data were integrated into a regular 100 m grid using a modified Schlegel (1970) algorithm.



**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**



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 Survey (DGGG), and NOAA, Office of Geophysical Research. The geophysical data for this map were collected in 1989 by Scripps Institution of Oceanography, University of California, San Diego, and the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Mental Health Trust Fund (ASMH), and the State of Alaska, Department of Natural Resources (DNR). The data were then processed to produce a resistivity map. The data were then processed to produce a resistivity map.



Source: Modified from US Geological Survey Ketchikan 4-6, 1860, 1-4, 1846, 3-4, 1920 3-4, 1946. Contouring: GMS



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

MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND
 1999

DESCRIPTIVE NOTES

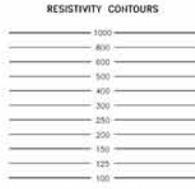
The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system and a Schöberl cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz miniature and video camera. Flights were performed with an A2550B-2 Squire helicopter at a mean terrain clearance of 200 feet along east-west flight lines one-quarter mile apart. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Rascal Real-Time Differential Global Positioning System (RT-DGPS) was used for both acquisition 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 1881 (NAD zone 9) spheroid 1927 North American datum using a central meridian (CM) of 120° 30' 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 ITRF grid.

RESISTIVITY

The DIGHEM[®] EM system measured in-phase and quadrature components at five frequencies. Two vertical coplanar coil pairs operated at 800 and 5500 Hz while three horizontal in-phase coil pairs operated at 300, 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 in-phase 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.

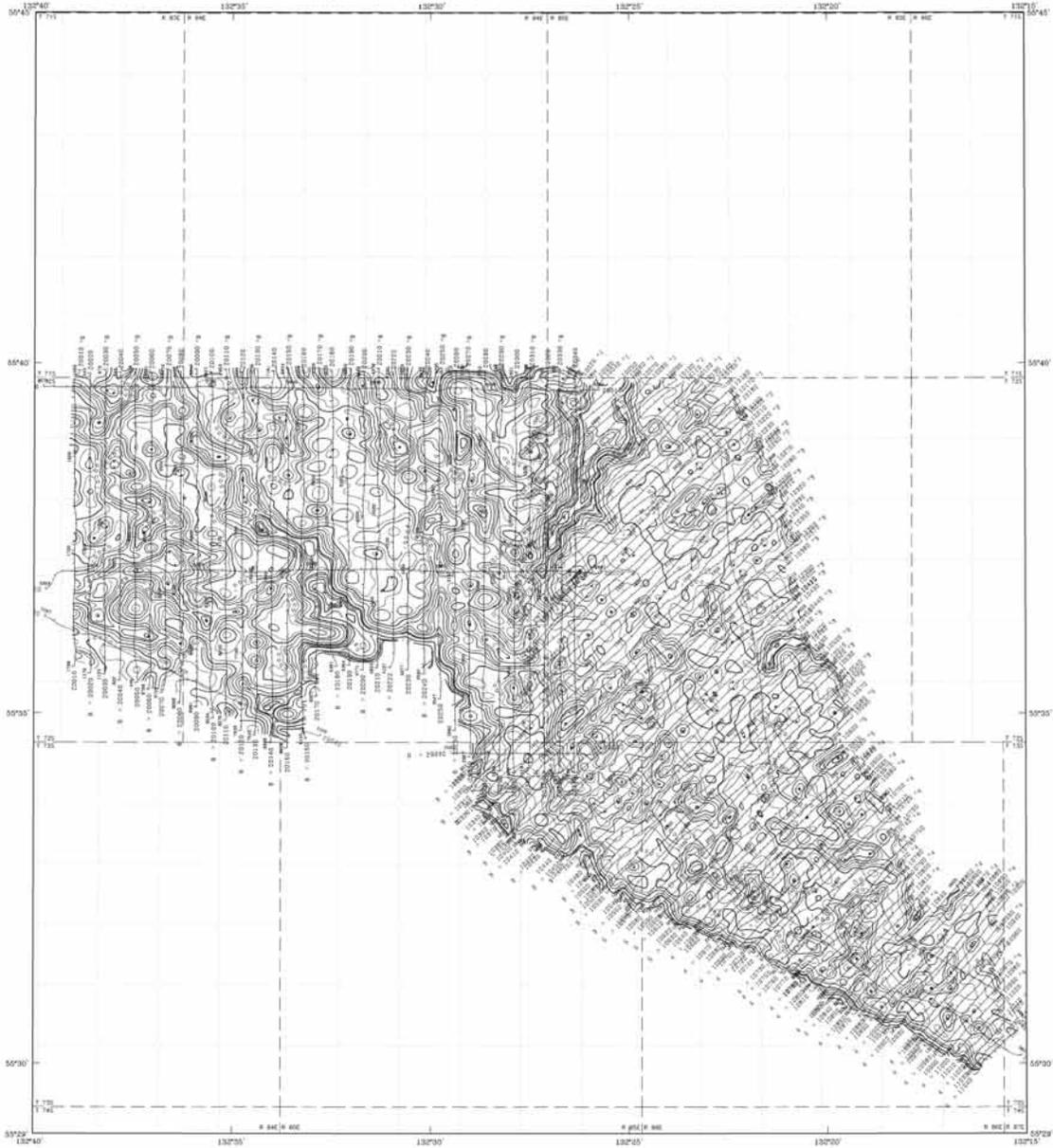
Akima, M. 1970. A new method of interpolation and smooth curve fitting based on processing. In: Proc. of the Symposium of Computing Machinery, p. 171, no. 4, p. 581-582.



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 Survey (DGGG), and NOAA Mining & Geological Consultants, Inc. Airborne geophysical data for the area were acquired in 1999 by Geotek-DigheM, a division of DGC 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.

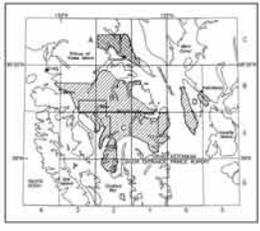
This map and other products from this survey are available by mail order or in person from DGGG, 794 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are also available, in graphic only, at the BLM's Juneau Minerals Information Center, Mt. Iliamna Island, Douglas, AK.



Derives contour lines from U.S. Geological Survey Contour 2-1, 1949; 2-1, 1949; 2-1, 1949.



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

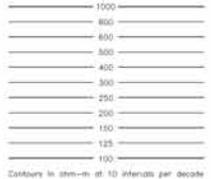
KETCHIKAN SURVEY Area 1st - March 1999
 The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system and a Scintrex cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/100 Hz monitors and video camera. Flights were performed with an AS350B-2 Sikorski helicopter at a minimum 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 Ashtech/Rascal 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 6) spheroid, 1927 North American datum using a central meridian (CM) of 155°, 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 2nd - May 1992
 The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system and a Scintrex cesium magnetometer. Magnetometer clearance for the magnetometer and EM system were approximately 215 and 104 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/100 Hz monitors, UHF receiver and video camera. The north-south-southwest flight lines were flown one-eighth mile apart with the 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. **Caution:** because 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



RESISTIVITY

The DIGHEM[®] EM system measured in-phase and quadrature components at five frequencies. Two vertical coaxial-coil pairs operated at 900 and 5500 Hz with 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 in-phase and quadrature responses 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.

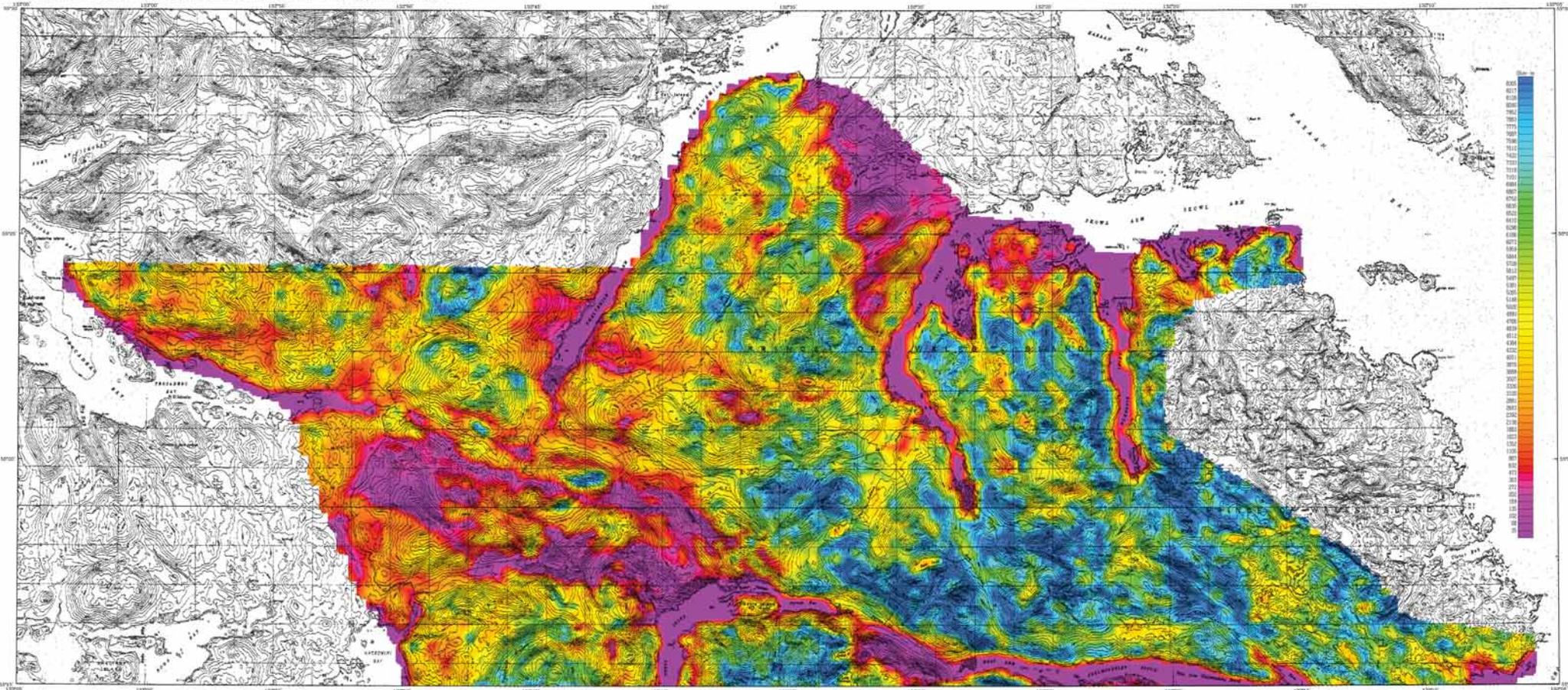
Akima, N. 1970. A new method of interpolation and smooth curve fitting based on local procedures. *Journal of the Association of Computing Machinery*, v. 17, no. 4, p. 589-602.

SURVEY HISTORY

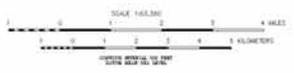
This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGG), and RGM, Mining & Geological Consultants, Inc. Airborne geophysical data for areas 4 were acquired in 1999 by Geotitles-Digheem, 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 Thomas Bay and Coffman Cove. The data for areas 1, 2 and 3 were flown by Digheem 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 DGG, 784 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.





Scale 1:50,000
 UTM Zone 18N, North American Datum 83, UTM 18N 5000



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

MAP B - SURVEYED AREA IMMEDIATELY NORTH OF
 55°15'N,
 PRINCE OF WALES ISLAND
 1999

DESCRIPTIVE NOTES

EXTENSIVE SURVEY - June 4 - March 1999
 The geophysical data were collected with a Dickey® Electromotive (EM) system consisting of a Collins vector magnetometer. Both were flown at a height of 100 feet. In addition, the survey recorded data from a radio altimeter, GPS navigation system, 50/70 Hz monitors and case compass. Flights were performed with an AS3500-2 Gyrover helicopter at a rotor turn rate of 220 feet above mean sea level. Flight lines were spaced 100 feet apart. The lines were flown approximately 10 to 15 miles from shore in an Ashcroft/Prudhoe Rock-Two Differential Global Positioning System (RT-DGPS) mode used for both navigation and flight path recovery. The helicopter position was derived every 0.5 seconds using real-time differential positioning to a station accuracy of 10 centimeters. Flight path recovery was done using the Clarke 1888 (316 zone V) magnetic 1977 Aztec magnetic compass. A control station (CS) was located at a north-south line of 2 and an east-west line of 10000. Horizontal accuracy of the computed data is better than 10 m with respect to the UTM grid.

DATA SURVEY - June 27 - May 1999
 The geophysical data were collected with a Dickey® Electromotive (EM) system consisting of a Collins vector magnetometer. Both were flown at a height of 100 feet. In addition, the survey recorded data from a radio altimeter, GPS navigation system, 50/70 Hz monitors, GPS receiver and video camera. The real-time flight lines were spaced 100 feet apart with the lines flown perpendicular to the flight lines. The survey was flown with an AS3500-2 helicopter.

A Del Norte EMF electronic positioning system was used for navigation. Flight path recovery was done with a combination of GPS data and visual recovery. Position accuracy of the data should be approximately 10 meters.

RESISTIVITY

The Dickey® EM system measured data and quadrature components of the magnetic field. The vertical component was sampled at 500 and 5500 Hz with three nominal resistivity values centered at 20, 200, and 20,000 ft. EM data were sampled at 0.1 second intervals. The EM system response to bedrock conductance, overburden, and cultural sources. Apparent resistivity is generated from the apparent and quadrature component of the apparent 7200 Hz using the pseudo-resistivity technique. The data were interpreted using a regular 100 m grid using a modified Amato (1970) technique.

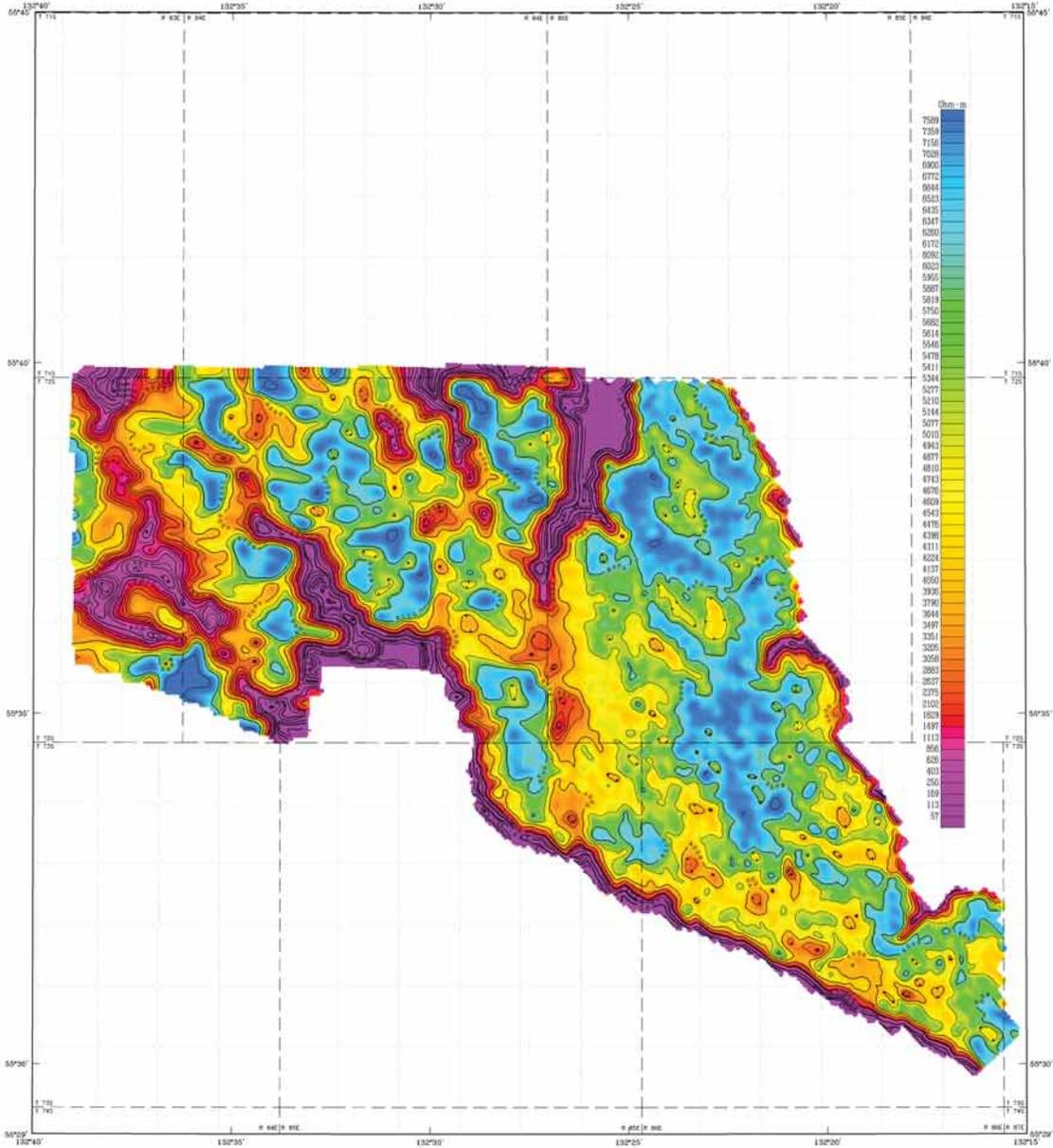
Resistivity values are shown in ohm-meters (Ω·m) on the color scale of the legend. Values are in Ω·m, not Ω·m².



SURVEY HISTORY

This map has been compiled and shown under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geologic & Geophysical Survey (DGS), and NOAA, Office of Geologic Conservation, Inc. Geologic geophysical data for area A were acquired in 1978 by Sinter-Singer, a division of CGC, Corbett Inc. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Alaska Coastal Program, Sealaska Corporation, Alaska State Mental Health Trust Land Office, and the City of Homer, Alaska. Funding for the data for areas 1, 2, and 3 were from the Division of Geologic & Geophysical Survey, DNR, in 1978 and 1982. These data were provided for publication by Sealaska Corporation.

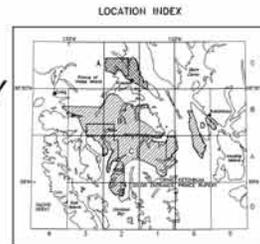
This map and other products from this survey are available by mail order, or in person, from DGS, 154 University Ave., Suite 200, Fairbanks, Alaska 99703. Some products are also available in person only, at the BLM's Fairbanks Science Information Center, 9450 Airport Road, Douglas, AK.



Derives military base U.S. Geological Survey Quad G-4, 1946, 3-4, 1946
 U.S. GEOLOGICAL SURVEY, WASHINGTON, D.C.



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[®] 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-1 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 Ashtech/Rascal 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 6) spheroid, 1927 North American datum using a central meridian (CM) of 135°, a north constant of 0 and an east constant of 600,000. 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[®] Electromagnetic (EM) system and a Scintrex cesium magnetometer. Maps 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, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The north-south flight lines were flown one-eighth mile apart with the 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



Contours in ohm-m at 10 intervals per decade

RESISTIVITY

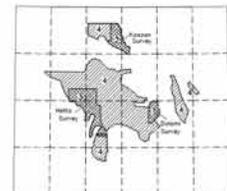
The DIGHEM[®] EM system measured in-phase and quadrature components of five frequencies. Two vertical coplanar-coil pairs operated at 900 and 5500 Hz while three horizontal coplanar-coil pairs operated at 900, 7200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the in-phase and quadrature components of the coplanar 7200 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 100 m grid using a modified Akers (1970) technique.

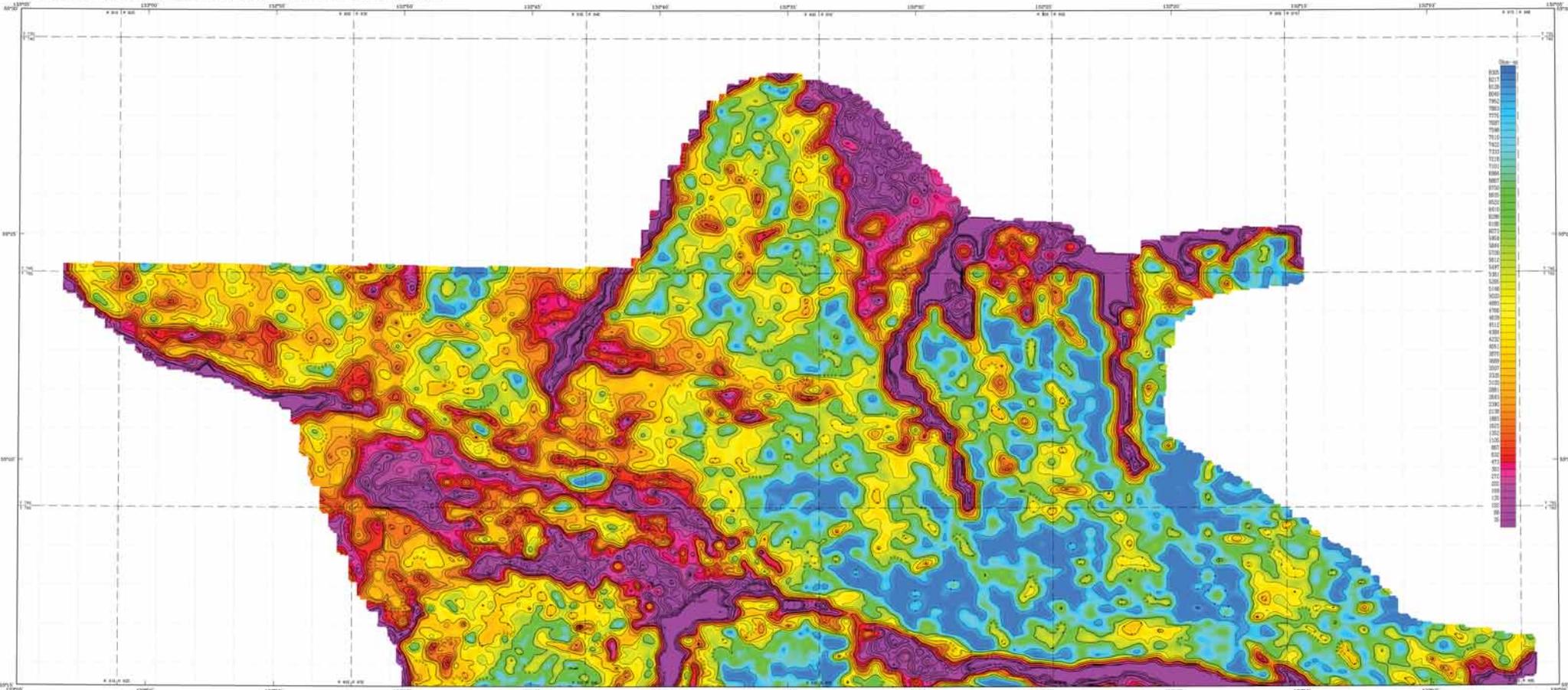
Akers, H. 1970. A new method of interpolation and smooth curve fitting based on local procedures. *Journal of the Association of Computing Machinery*, v. 17, no. 4, p. 589-602.

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 (DGG), and W&M Mining & Geological Consultants, Inc. Airborne geophysical data for areas 4 were acquired in 1999 by Geoterrac-Digheim, a division of CCG 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 Digheim 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 DGG, 794 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are also available, in person only, at the BLM's Bureau Minerals Information Center, Mayflower Island, Douglas, AK.





U.S. GEOLOGICAL SURVEY, ALASKA DIVISION, 420 EAST BRIDGEWAY, ANCHORAGE, ALASKA 99501



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

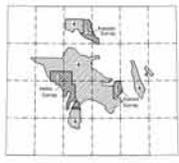
DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Line 4" - March 1999
 The geophysical data were collected with a DIGHEV[®] Electromagnetic (EM) system and a Geotek Geomagneto-meter. Both were flown at a height of 100 feet or higher in addition to the survey aircraft. A real-time GPS navigation system, 50/70 Hz receiver and data logger. Flights were performed with an AS300B-2 Super 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) 5 miles.
 An Ashtech/Trimble Real-Time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight control. The helicopter position was derived every 0.3 seconds using real-time information transmitted to a receiver accuracy of better than 10 cm. Flight path positions were uploaded onto the data logger (100 Hz) using a 19200 baud, RS-485 serial data link. The RT-DGPS had a north constant of 5 and an east constant of 100,000. Position accuracy of the greater data is better than 10 m or less based on the ITRF grid.

HELIUM SURVEY "Line 2" - May 1992
 The geophysical data were collected with a DIGHEV[®] Electromagnetic (EM) system and a Geotek Geomagneto-meter. Both were flown at a height of 100 feet or higher in addition to the survey aircraft. A real-time GPS navigation system, 50/70 Hz receiver and data logger. Flights were performed with an AS300B-2 Super 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) 5 miles.
 An Ashtech/Trimble Real-Time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight control. The helicopter position was derived every 0.3 seconds using real-time information transmitted to a receiver accuracy of better than 10 cm. Flight path positions were uploaded onto the data logger (100 Hz) using a 19200 baud, RS-485 serial data link. The RT-DGPS had a north constant of 5 and an east constant of 100,000. Position accuracy of the greater data is better than 10 m or less based on the ITRF grid.

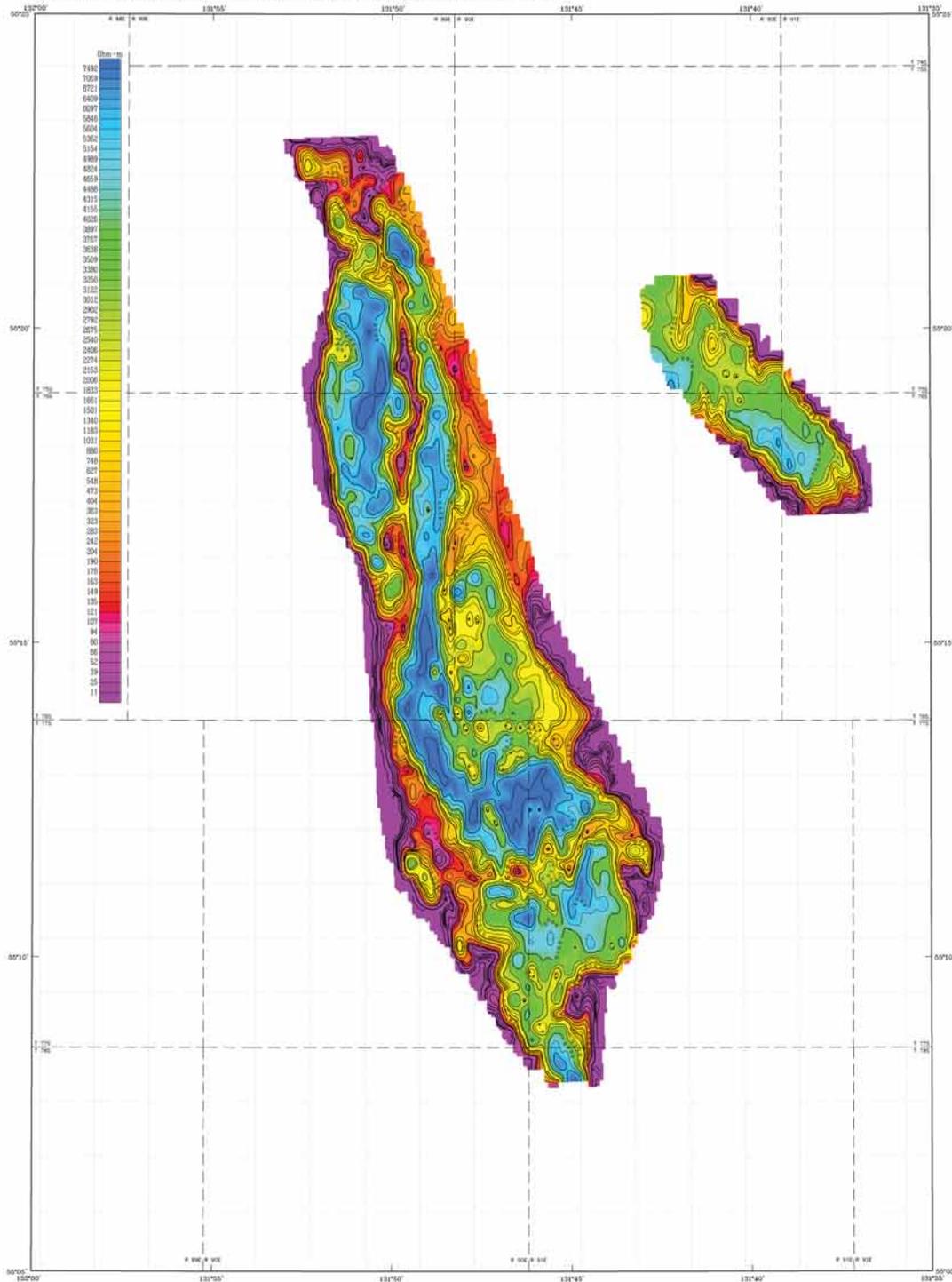
RESISTIVITY

The DIGHEV[®] EM system measured apparent resistivity and quadrature components of the impedance tensor. The apparent resistivity data were collected at 7200 Hz and 150 Hz. The 7200 Hz data were collected at 0.1 second intervals. The EM system response to bedrock conductors (carboniferous, and cultural sources). Apparent resistivity is generated from the apparent resistivity component of the impedance tensor using the pseudo-sound speed method. The data were interpreted using a regular 100 m grid using a modified Alumbaugh (1970) technique.



SURVEY HISTORY

This map and other products from this survey are available by mail order, or in person from 5000, The University Ave., Suite 200, Fairbanks, Alaska 99703. The University Ave. office is also available, in person only, at the BLM's Alaska Resource Information Center, Highway 12, Douglas, AK.



British Columbia Data: US Geological Survey Ketchikan 4-6, 1960, 1-4, 1946, 8-1, 1950 8-1, 1954, Coast Range, 1954



DESCRIPTIVE NOTES

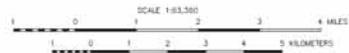
The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system and a Schivel's cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz miniature and video camera. Flights were performed with an A2550E-2 Squire helicopter at a mean terrain clearance of 200 feet along east-west flight lines one-quarter mile apart. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Rascal 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 1881 (NAD zone 9) spheroid 1927 North American datum using a central meridian (CM) of 120° 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 ITRF 95.

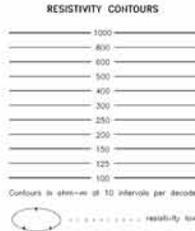
RESISTIVITY

The DIGHEM[®] EM system measured in-phase and quadrature components at five frequencies. Two vertical coplanar coil pairs operated at 800 and 5500 Hz while three horizontal in-phase-coil pairs operated at 300, 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 in-phase 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.

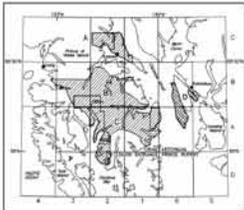
Alton, W. 1975. A new method of interpolation and smooth curve fitting based on processing. In: Proc. 4th International Conference of Computing Geology, p. 171, no. 4, p. 281-282.



**7200 Hz COPLANAR RESISTIVITY
 OF SELECTED AREAS NEAR
 KETCHIKAN,
 SOUTHEAST ALASKA**
 MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND
 1999



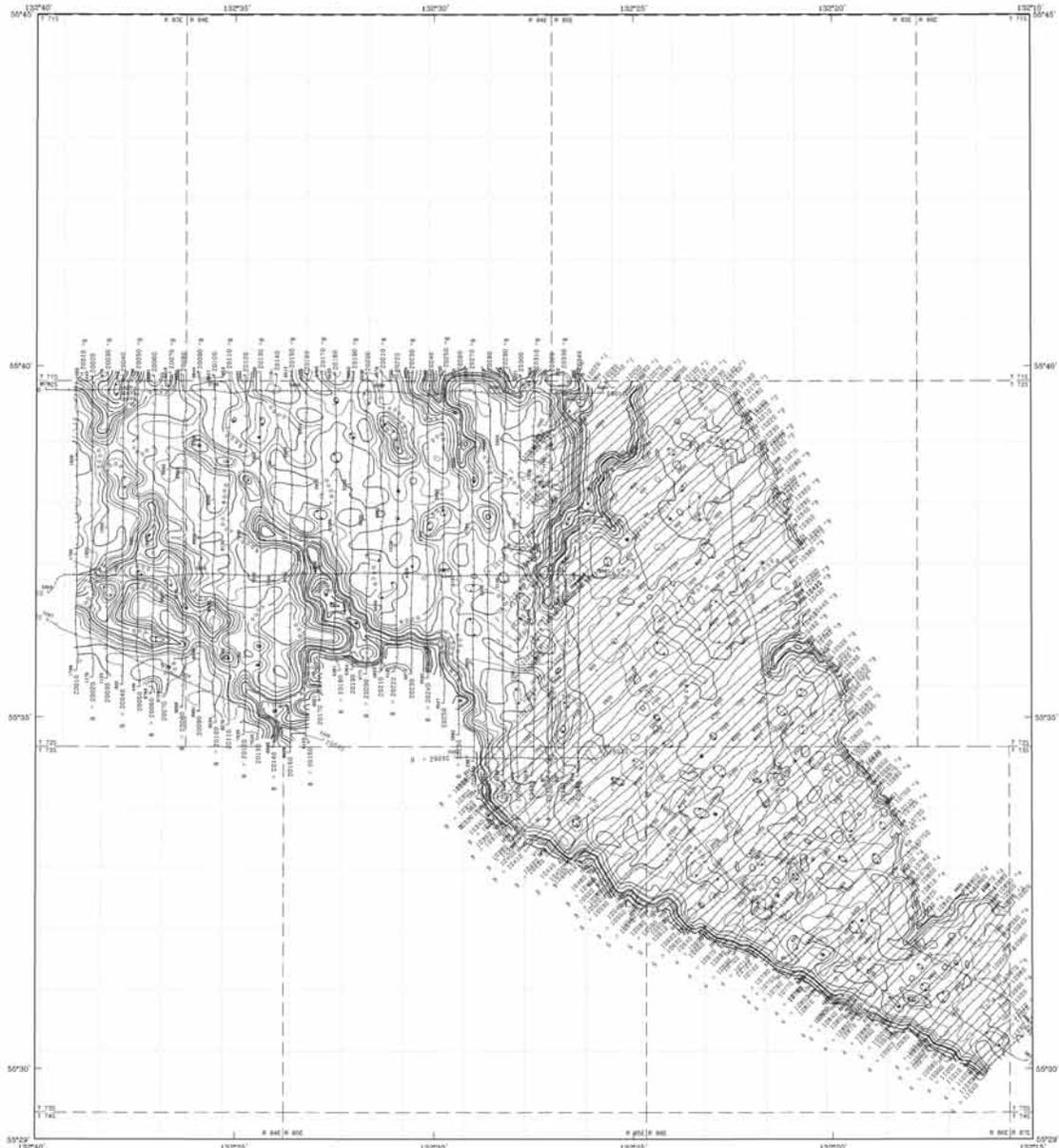
LOCATION INDEX



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 Survey (DGG), and NOAA Mining & Geological Consultants, Inc. Airborne geophysical data for the area were acquired in 1959 by Geotek-Diggins, a division of CGC 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 DGG, 794 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are also available, in parish only, at the BLM's Juneau Minerals Information Center, Uyaknoor Island, Douglas, AK.



Derives contour lines from U.S. Geological Survey Contour 3-1, 1949, 3-1, 1949, 3-1, 1949.



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 1st - 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, 50/50 Hz monitors and video camera. Flights were performed with an AS550B-1 Scintrex 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 Ashtech/Rascal 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 6) spheroid, 1927 North American datum using a central meridian (CM) of 155°, 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 2nd - May 1992
 The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 215 and 104 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/50 Hz monitors, UHF receiver and video camera. The north-south-southwest flight lines were flown one-eighth mile apart with the lines flown parallel to the survey boundaries. The survey was flown with an AS550B-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

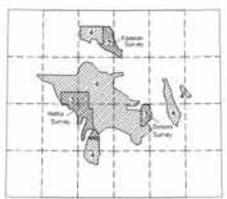
The DIGHEM[®] EM system measured in-phase and quadrature components at five frequencies. Two vertical coaxial-coil pairs operated at 300 and 5500 Hz with three horizontal coplanar-coil pairs operated at 300, 7200, and 26,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the in-phase and quadrature 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.

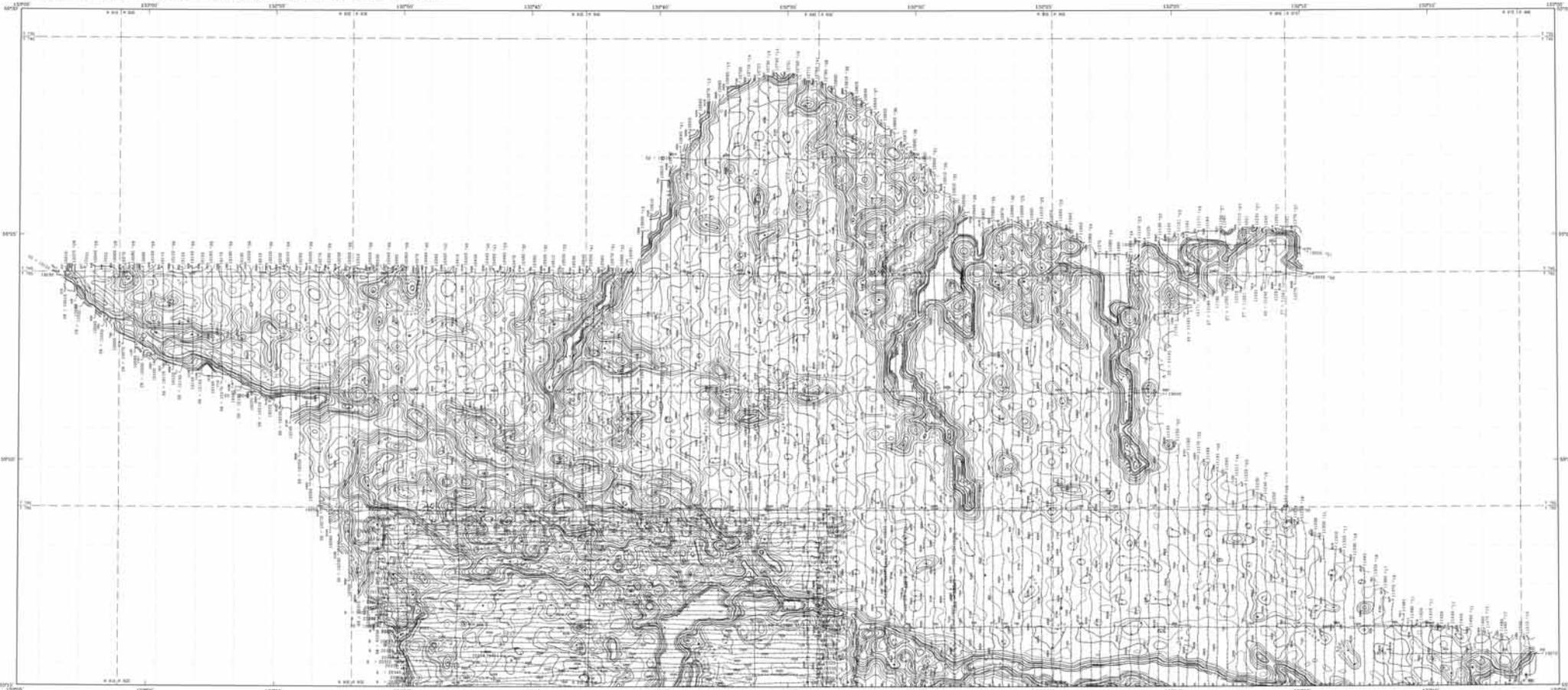
Moore, R. 1970. A new method of interpolation and smooth curve fitting based on local procedures. *Journal of the Association of Computing Machinery*, v. 17, no. 4, p. 589-602.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Surveys (DGG), and RGM, Mining & Geological Consultants, Inc. Airborne geophysical data for areas 4 were acquired in 1999 by Geoterrac-Digheem, 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 Thomas Bay and Coffman Cove. The data for areas 1, 2 and 3 were flown by Digheem 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 DGG, 784 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.





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 A" - March 1999
 The resistivity data were acquired with a GOMEX[®] Electromagnetic (EM) system and a GOMEX[®] magnetometer. Both were flown at a height of 100 feet. In addition, the survey aircraft was fitted with a real-time GPS navigation system, 50/50 Hz magnetic and view camera. Flights were performed with an AS300B-2 Super Helicopter at a mean terrain clearance of 250 feet above maximum flight clearance (one-quarter mile apart). The 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 control. The helicopter position was derived every 0.3 seconds using real-time differential positioning to a relative accuracy of better than 10 m. Real-time position was updated every 100 m (100 ft) using a 1977 North American Datum (NAD) datum with a datum shift of 1.70 m north constant of 0 and an east constant of 100,000. Position accuracy of the processed data is better than 10 m with respect to the 1973 grid.

AREA SURVEY "Area B" - May 1992
 The resistivity data were acquired with a GOMEX[®] Electromagnetic (EM) system and a GOMEX[®] magnetometer. Both were flown at a height of 100 feet. In addition, the survey aircraft was fitted with a real-time GPS navigation system, 50/50 Hz magnetic and view camera. Flights were performed with an AS300B-2 Super Helicopter at a mean terrain clearance of 250 feet above maximum flight clearance (one-quarter mile apart). The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

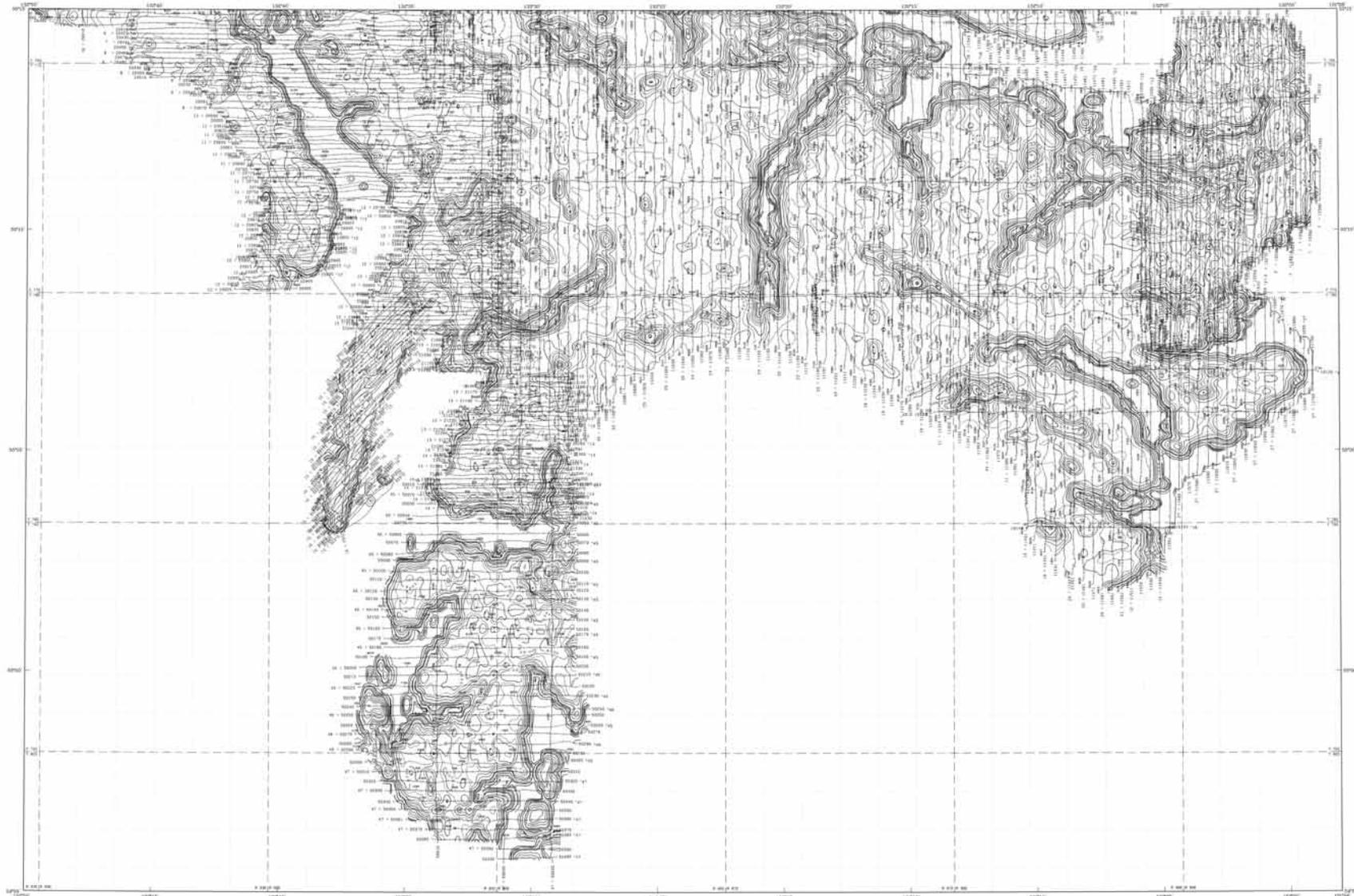
A real-time differential positioning system was used for navigation. Flight path accuracy was done with a combination of real-time and view camera. Position accuracy of the 1992 data should be approximately 10 m.

RESISTIVITY
 The GOMEX[®] EM system measured apparent resistivity and quadrature components of the impedance tensor. The resistivity data were processed at 7200 Hz and 2500 Hz, with three additional channels processed at 500, 1000, and 1500 Hz. EM data were collected at 0.1 second intervals. The EM system responds to both conductive and resistive (permeable) and cultural sources. Apparent resistivity is generated from the primary and quadrature components of the response. The data were interpreted using a regular grid using a modified Alamo (1970) technique.



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 Survey (DGG), and Sealaska Corporation, a subsidiary of Sealaska. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), National Geologic Research and Conservation, Alaska State Geologic Survey, Alaska Department of Natural Resources, and Sealaska Corporation. The data for sheets 1, 2, and 3 were flown by Diggins in 1992 and 1993. These data were provided for publication by Sealaska Corporation. This map and other products from this survey are available to any person or person from DGG, 104 University Ave., Suite 200, Fairbanks, Alaska, 99709. Users of this map are also available, in person only, at the BLM's Alaska Alaska Information Center, 1400 West Douglas, AK.



Scale: 1:62,500
 UTM Zone 18N
 NAD 83
 Vertical Datum: Mean Sea Level

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "See A" - March 1989
 The resistivity data were acquired with a DHDENT[®] (Doherty-Doherty) 7200 Hz system and a Seismic Research magnetometer. Data were taken on a grid of 100 feet. In addition, the survey included data from a magnetic compass, GPS measurements, water depths, and an ALDIS-2 (Alaska Division of Geological & Geophysical Surveys) Survey Magnetometer of a local terrain response at 200 Hz using a water-saturated dipole loop for the northern portion and a coil-wound dipole loop for the southern portion. A water-saturated dipole loop of 200 Hz using a water-saturated dipole loop for the northern portion and a coil-wound dipole loop for the southern portion. A water-saturated dipole loop of 200 Hz using a water-saturated dipole loop for the northern portion and a coil-wound dipole loop for the southern portion.



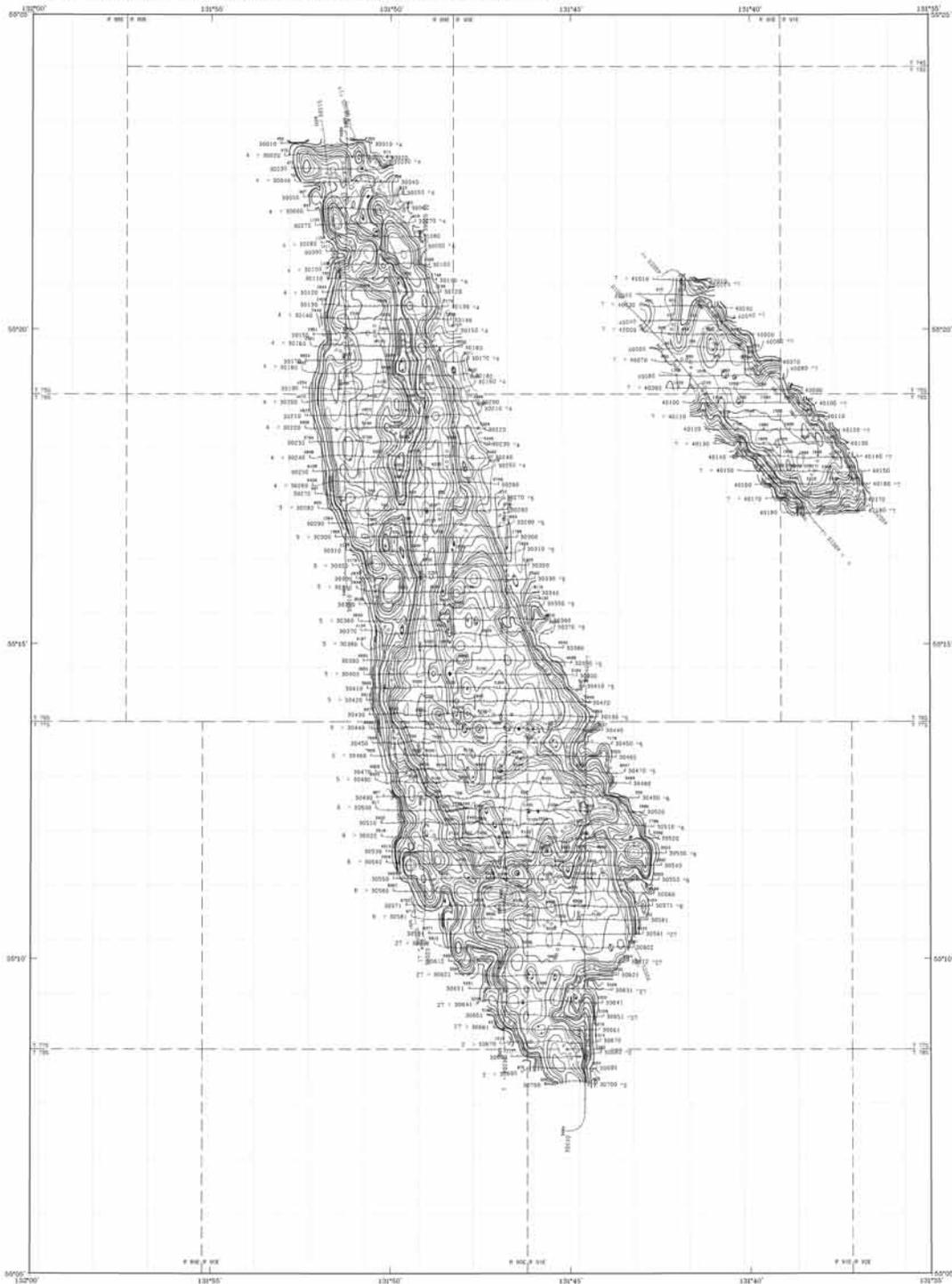
**7200 Hz COPLANAR RESISTIVITY
 OF SELECTED AREAS NEAR
 KETCHIKAN,
 SOUTHEAST ALASKA
 MAP C - SURVEYED AREA SOUTH OF 55°15',
 PRINCE OF WALES ISLAND
 1999**

NETS SURVEY "See D" - May 1992
SEALASKA SURVEY "See E" - March 1991
 The resistivity data were acquired with a DHDENT[®] (Doherty-Doherty) 7200 Hz system and a Seismic Research magnetometer. Data were taken on a grid of 100 feet. In addition, the survey included data from a magnetic compass, GPS measurements, water depths, and an ALDIS-2 (Alaska Division of Geological & Geophysical Surveys) Survey Magnetometer of a local terrain response at 200 Hz using a water-saturated dipole loop for the northern portion and a coil-wound dipole loop for the southern portion. A water-saturated dipole loop of 200 Hz using a water-saturated dipole loop for the northern portion and a coil-wound dipole loop for the southern portion.

RESISTIVITY
 The DHDENT[®] (Doherty-Doherty) 7200 Hz system and a Seismic Research magnetometer were used to acquire resistivity data. The data were acquired on a grid of 100 feet. The resistivity data were acquired with a DHDENT[®] (Doherty-Doherty) 7200 Hz system and a Seismic Research magnetometer. Data were taken on a grid of 100 feet. In addition, the survey included data from a magnetic compass, GPS measurements, water depths, and an ALDIS-2 (Alaska Division of Geological & Geophysical Surveys) Survey Magnetometer of a local terrain response at 200 Hz using a water-saturated dipole loop for the northern portion and a coil-wound dipole loop for the southern portion.



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 Survey (DGGG) and 80% share in Geophysical Consultants, Inc. Airborne geophysical data for area A were acquired in 1988 by Geophysical Consultants, Inc. in cooperation with the U.S. Department of the Interior, Bureau of Land Management (BLM), Eastern District, Wrangell, Sealaska Corporation, Alaska State Mental Health Trust Fund (ASMHF), and the State of Alaska, Dept. of Natural Resources. The data for areas B, C, and D were taken by DGGG in 1991. The data for area E were provided for publication by DGGG.



Derives outline from US Geological Survey bathymetry 1:50,000, 1:250,000, 1:500,000, and 1:1,000,000 scales.



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

MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND
 1999

DESCRIPTIVE NOTES

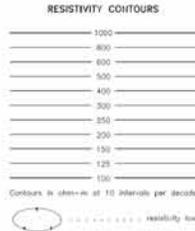
The geophysical data were acquired with a GOMER[®] Electromagnetic (EM) system and a Schlumberger caesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz magnetic and video cameras. Flights were performed with an AS350B-2 Super Puma[®] helicopter at a mean terrain clearance of 200 feet using east-west flight lines, one-quarter mile apart. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An ashtech/Rocal 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 1886 (UTM zone 9) projection, NAD 83 North American datum using a central meridian (CM) of 120°, 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 GOMER EM system measured apparent and quadrature components at five frequencies. Ten vertical coplanar coil pairs operated at 100 and 1500 Hz while three horizontal induction coils operated at 900, 1200, and 50,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the in-phase 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 spline (1970) technique.

ASHTech, Inc. 1970. A new method of interpolation and smooth curve fitting based on local procedures. *Journal of Association of Computing Machinery*, v. 17, no. 4, p. 588-600.



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 Survey (DGGG), and NOAA Mining & Geological Consultants, Inc. Airborne geophysical data for the area were acquired in 1959 by Geotekne-Digheims, a division of CGC 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 Mineral Health Trust, Land Office, and the cities of Thorne Bay and Coffman Cove.

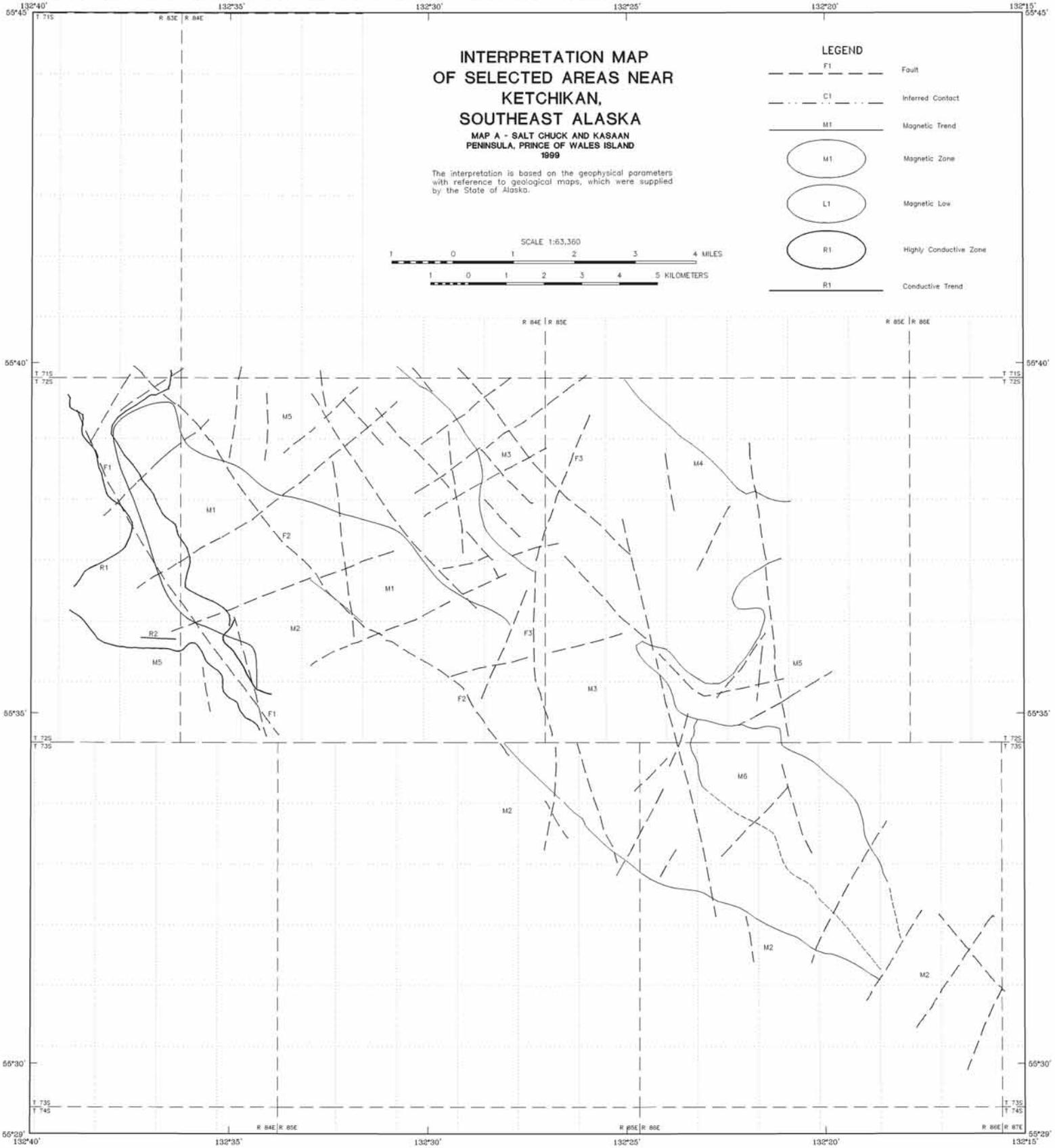
This map and other products from this survey are available by mail order or in person from DGGG, 794 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are also available, in person only, at the BLM's Junction Minerals Information Center, McIvor Island, Douglas, AK.

INTERPRETATION MAP
 OF SELECTED AREAS NEAR
 KETCHIKAN,
 SOUTHEAST ALASKA

MAP A - SALT CHUCK AND KASAAN
 PENINSULA, PRINCE OF WALES ISLAND
 1999

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

LEGEND	
	F1 Fault
	C1 Inferred Contact
	M1 Magnetic Trend
	M1 Magnetic Zone
	L1 Magnetic Low
	R1 Highly Conductive Zone
	R1 Conductive Trend



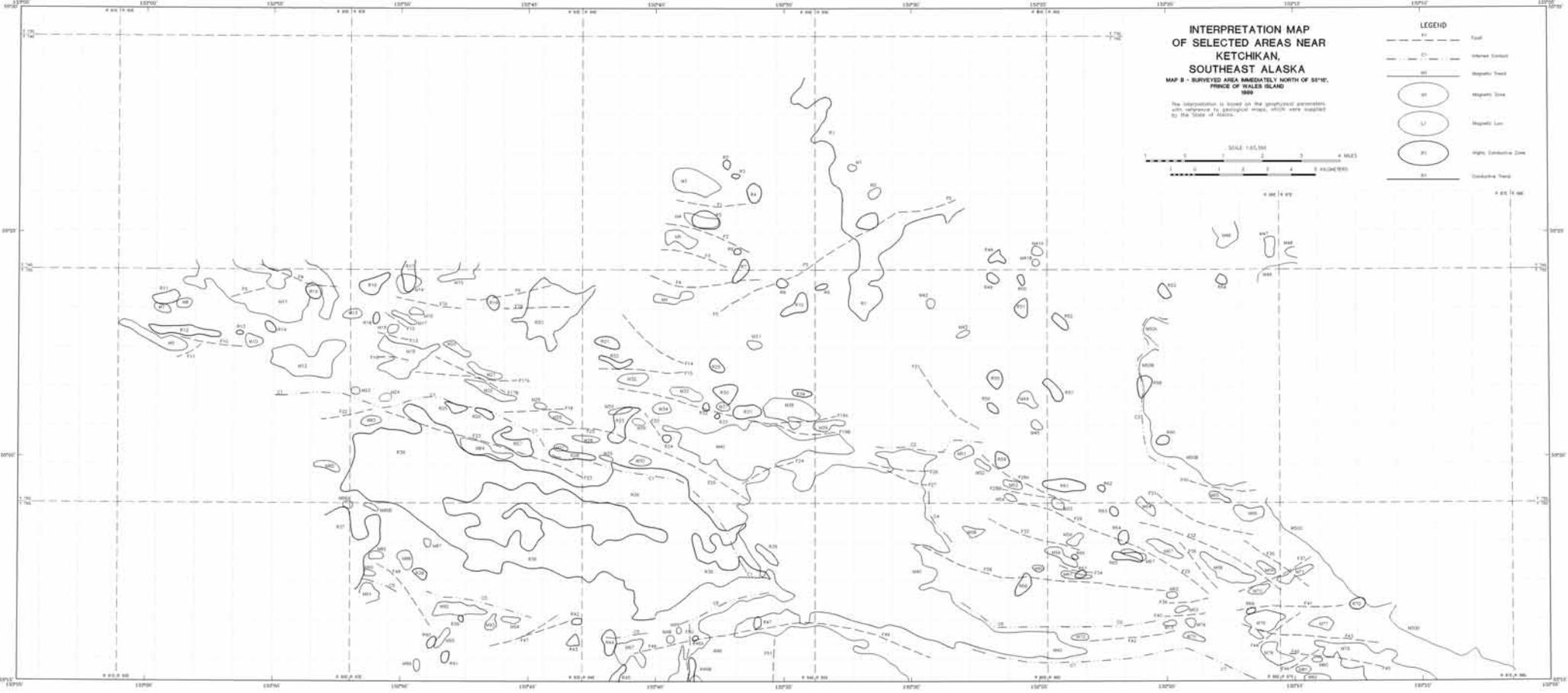
INTERPRETATION MAP
OF SELECTED AREAS NEAR
KETCHIKAN,
SOUTHEAST ALASKA
MAP B - SURVEYED AREA IMMEDIATELY NORTH OF 55°15',
PRINCE OF WALES ISLAND
1999

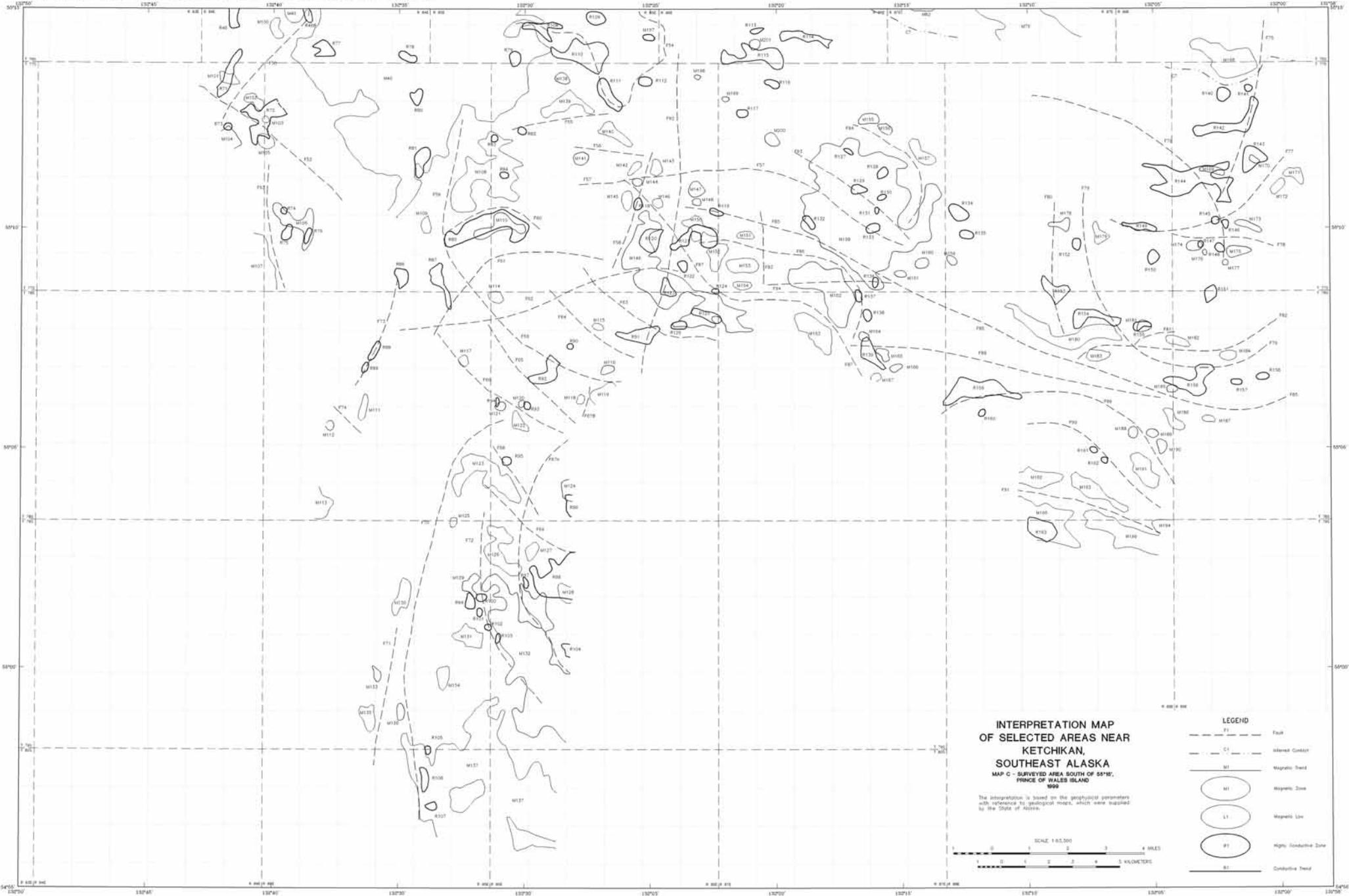
The interpretation is based on the geophysical parameters
with reference to geological maps, which were supplied
by the State of Alaska.

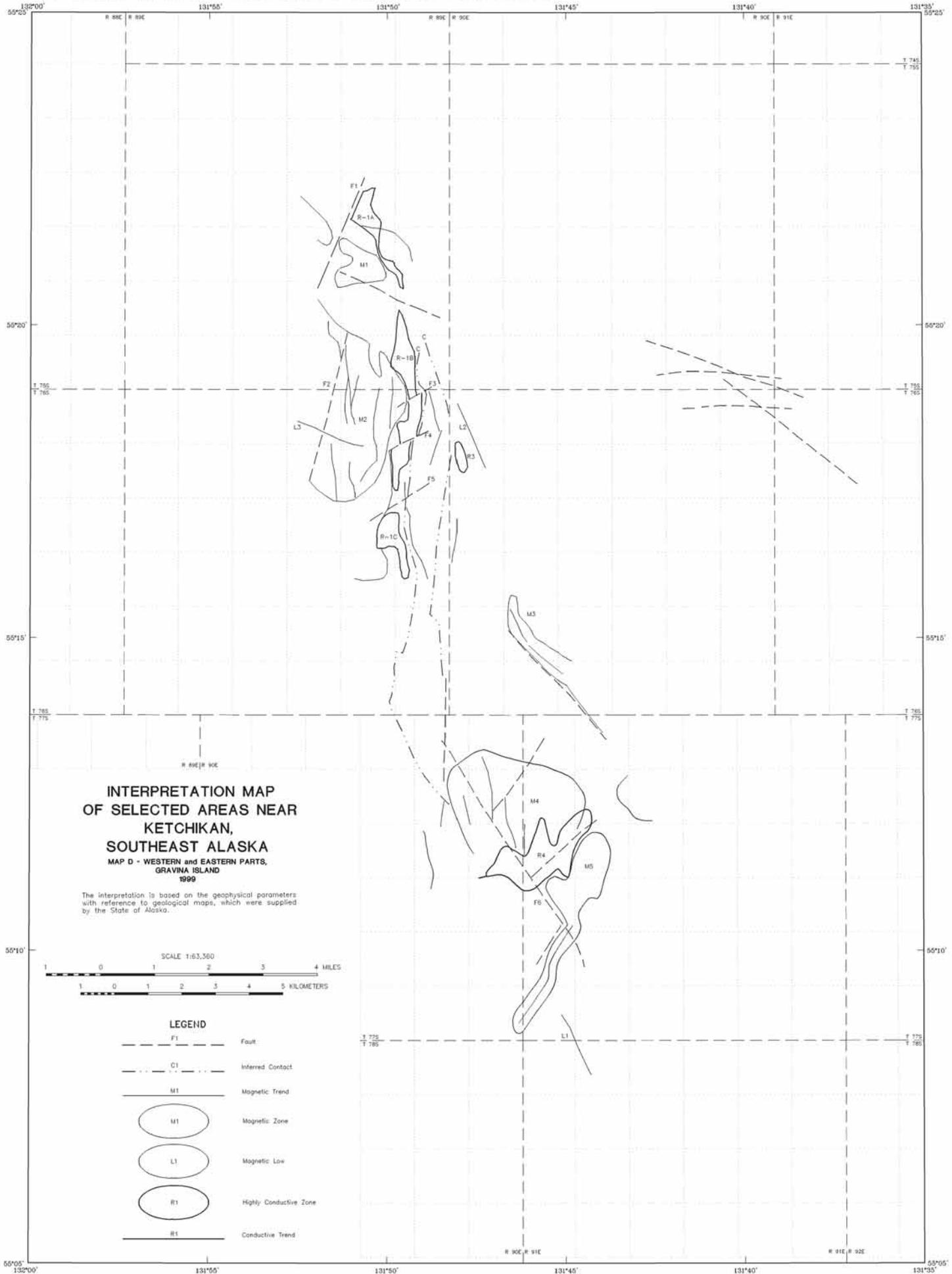


LEGEND

- Fault
- - - - - Mineral Contact
- - - - - Magnetic Fault
- M1 Magnetic Zone
- M2 Magnetic Low
- M3 High Conductivity Zone
- M4 Conductive Zone





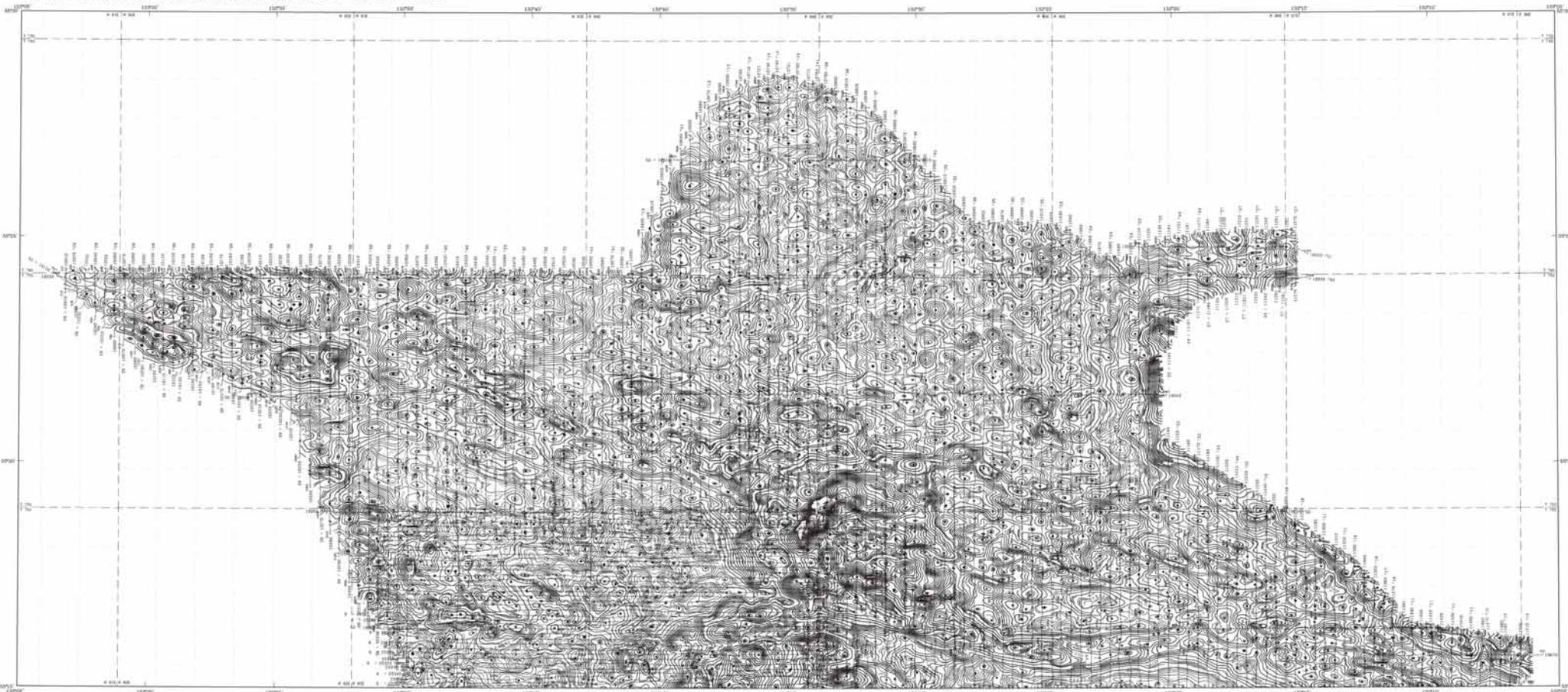


**INTERPRETATION MAP
 OF SELECTED AREAS NEAR
 KETCHIKAN,
 SOUTHEAST ALASKA**
 MAP D - WESTERN and EASTERN PARTS,
 GRAVINA ISLAND
 1999

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

LEGEND

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



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



DESCRIPTIVE NOTES

LETOWAN SURVEY - June 4 - March 1988
The geophysical data were acquired with a DIGHEU¹ Electromagnetic (EM) system and a Collins Geomagnetic magnetometer. Both were flown at a height of 500 feet, in addition the survey recorded data from a color altimeter, GPS navigation system, DGPS and heading and roll sensors. Flights were performed with an AC350B-2 turbine helicopter at a mean terrain clearance of 250 feet above mean-sea-level flight lines (sea-surface to the spot). The lines were flown approximately 5 miles flight lines of intervals of approximately 1 mile.

An Autech/Royal Photo-Term Differential Global Positioning System (RT-DGPS) was used for both navigation and flight path recording. 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 obtained using the Clarke 1884 (NAD 83) spheroid, 1973 North American datum using a datum constant (DM) of 150.0 north constant of 0 and an east constant of 500000. Position accuracy of the surveyed area is better than 10 m with respect to the ITRF grid.

NETS SURVEY - June 3 - May 1992
The geophysical data were acquired with a DIGHEU¹ Electromagnetic (EM) system and a Collins Geomagnetic magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 215 and 194 feet, respectively. In addition the survey recorded data from a color altimeter, GPS navigation system, DGPS, 40 monitors, VLF receiver and video camera. The video-cassette flight lines were flown one-way flight lines with the lines flown perpendicular to the flight lines. The survey was flown with an AC350B-2 helicopter.

A Del Norte SHF electronic altimetry system was used for navigation. Flight path recovery was done with a combination of GPS and visual reference. Position accuracy of the 1992 data should be approximately 10 m.

ELECTROMAGNETICS

To determine the location of EM anomalies on these islands, the DIGHEU EM system, magnetometer and geophysical components at the regional and local-scale profile stations of 500 and 1500 feet above mean-sea-level were used. The EM system consists of a 100 kHz and 30,000 Hz. EM data were acquired at 0.1 second intervals. The EM system responds to ferrous objects, conductive (carboniferous) and cultural features. The power line records and the flight track data were examined to locate cultural features. The EM anomalies that are indicated are circled in red on the map.

ELECTROMAGNETIC ANOMALIES

- -150 gamma
- 00 gamma
- Geomagnetic anomaly
- Local conductivity associated with an EM anomaly

MAGNETIC CONTOUR INTERVAL

- 200 ft
- 50 ft
- 10 ft
- magnetic low
- magnetic high

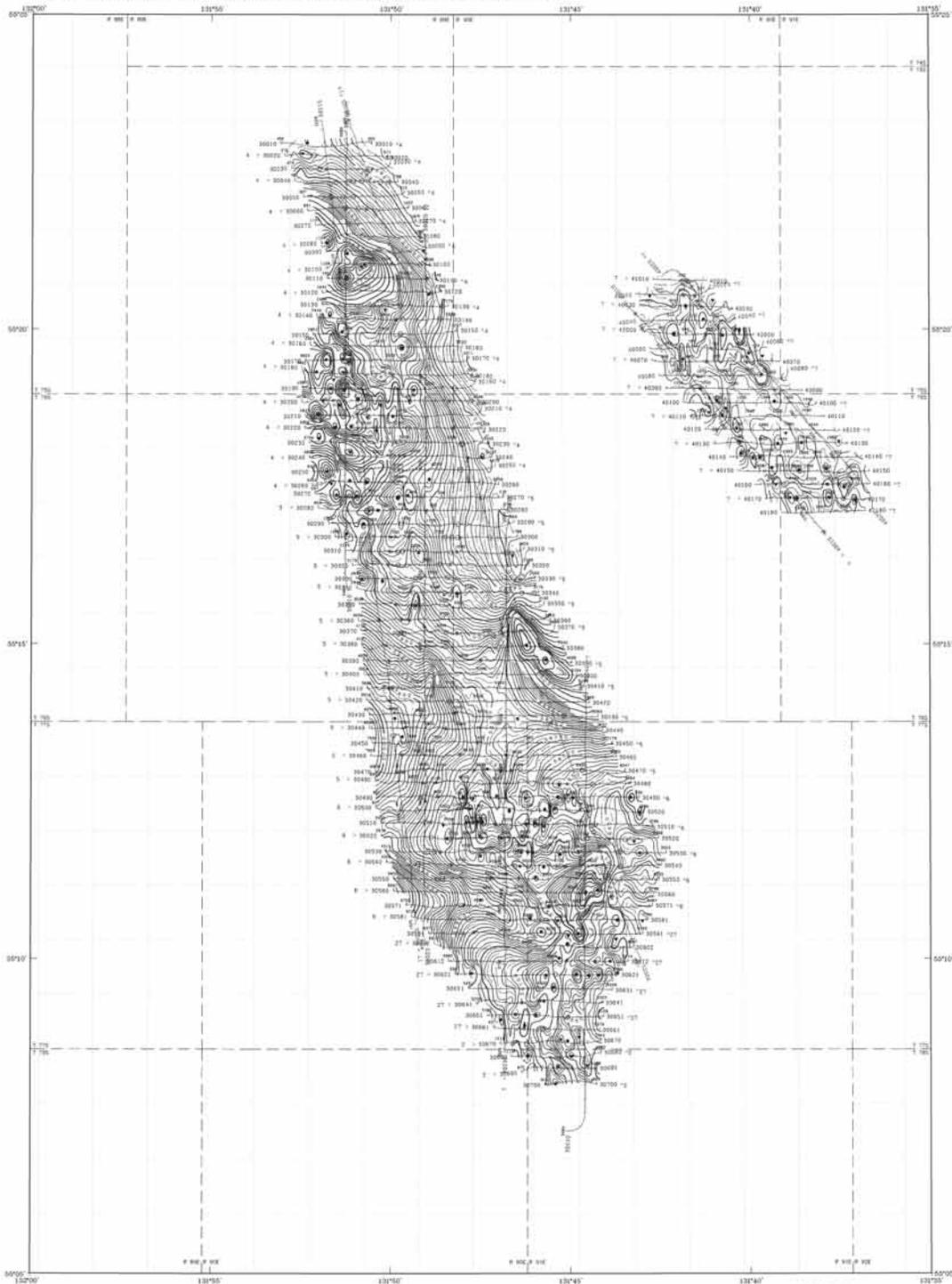
TOTAL FIELD MAGNETICS

The total field magnetic data were acquired with a sampling interval of 0.1 seconds, only were (1) corrected for diurnal variations by subtraction of the diurnal recorded base station magnetic data, (2) reduced to the ITRF datum, and (3) interpolated onto a regular grid. The regional magnetic field (1970) information. The regional magnetic field (1970) information. The regional magnetic field (1970) information. The regional magnetic field (1970) information.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geology & Geophysics Bureau (DGG), and Sealaska Corporation, a subsidiary of Sealaska, Inc. Airborne geophysical data for area A were acquired in 1988 by Sealaska Corporation, a subsidiary of Sealaska, Inc. Letters for the project were provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ketchikan Gateway Borough, Sealaska Corporation, Alaska State Marine Health Trust Land Office and the State of Alaska, Department of Natural Resources. The data to areas L, 2 and 3 were flown by Digheu 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 5500, 754 University Ave., Suite 200, Fairbanks, Alaska 99709. Some products are also available in person only, at the BLM's primary, Sealaska Information Center, Midway House, Douglas, AK.



Inset outline from US Geological Survey Bulletin G-1, 1961, p. 4, 1946.
 U.S. GEO. SURV. Geographical names.



DESCRIPTIVE NOTES

The geophysical data were acquired with a GICHEM[®] 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 meters and video camera. Flights were performed with an AC350B-2 Super helicopter at a mean terrain clearance of 200 feet using east-west flight lines one-quarter mile apart. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Realtek 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 (NAD zone 9) datum, NAD North American datum using a central meridian (CM) of 120°, 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 NAD 83 datum.

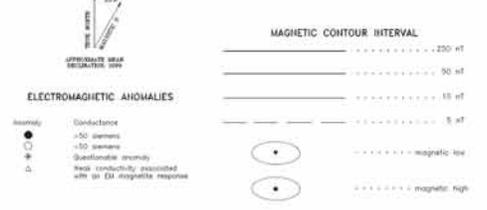
ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the GICHEM[®] EM system measured phase and quadrature components of five frequencies. Two vertical coil-coil pairs operated at 300 and 5500 Hz while three horizontal coil-coil pairs operated at 300, 7200, and 50,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive minerals, and cultural remains. The power line monitor and flight track video were examined to locate cultural sources. The EM anomalies that are indicated are classified by conductance.

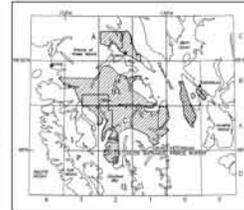
TOTAL FIELD MAGNETICS AND ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA

MAP D - WESTERN and EASTERN PARTS, GRAVINA ISLAND

1999



LOCATION INDEX



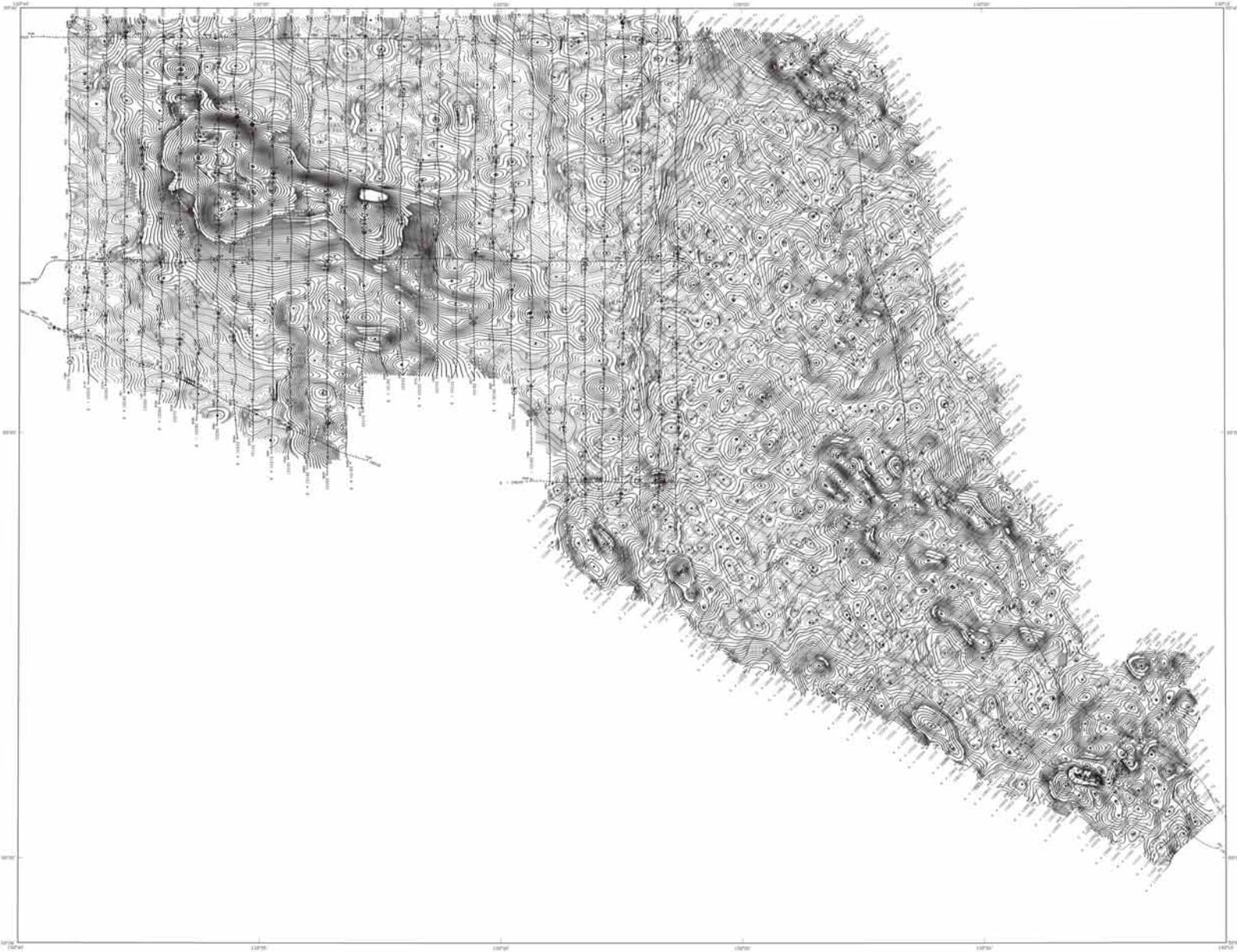
SURVEY HISTORY

This map has been compiled and grown under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geological & Geophysical Survey (DGGG), and NOAA Mining & Geological Consultants, Inc. Airborne geophysical data for the area were acquired in 1959 by Geophysical Systems, a division of CGO 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, Lons Oil, and the cities of Thome Bay and Cuffman Cove.

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 sea level data, and (3) interpolated onto a regular 100 m grid using a modified Along Profile (AP) technique. The regional variation (or GMR) profile, 1995, updated to March 1999) was removed from the leveled magnetic data.

Notes: 0.1970, a new method of observation and single curve fitting based on four frequencies. Journal of the American Geophysical Union, v. 71, no. 4, p. 689-693.

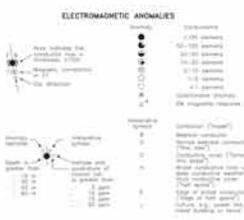


Alaska Division of Geological & Geophysical Surveys, 1999. U.S. Geological Survey, 1999. U.S. Government Printing Office, 1999.

DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" - March 1999
 The Ketchikan Survey "Area 4" was conducted as a 1000m² grid survey using a Geosoft Vector Magnetic System (VMS) with a 1000m² grid. The survey was conducted in a 1000m² grid pattern with a 100m spacing between grid lines. The survey was conducted in a 1000m² grid pattern with a 100m spacing between grid lines. The survey was conducted in a 1000m² grid pattern with a 100m spacing between grid lines.

KASIAK SURVEY "Area 2" - May 1999
 The Kasiak Survey "Area 2" was conducted as a 1000m² grid survey using a Geosoft Vector Magnetic System (VMS) with a 1000m² grid. The survey was conducted in a 1000m² grid pattern with a 100m spacing between grid lines. The survey was conducted in a 1000m² grid pattern with a 100m spacing between grid lines.

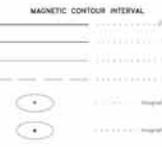
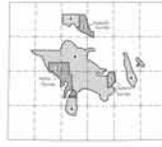


**TOTAL FIELD MAGNETICS AND
 DETAILED ELECTROMAGNETIC ANOMALIES
 OF SELECTED AREAS NEAR
 KETCHIKAN,
 SOUTHEAST ALASKA**
 PARTS OF CRAIG C-1 and
 C-2 QUADRANGLES
 1999

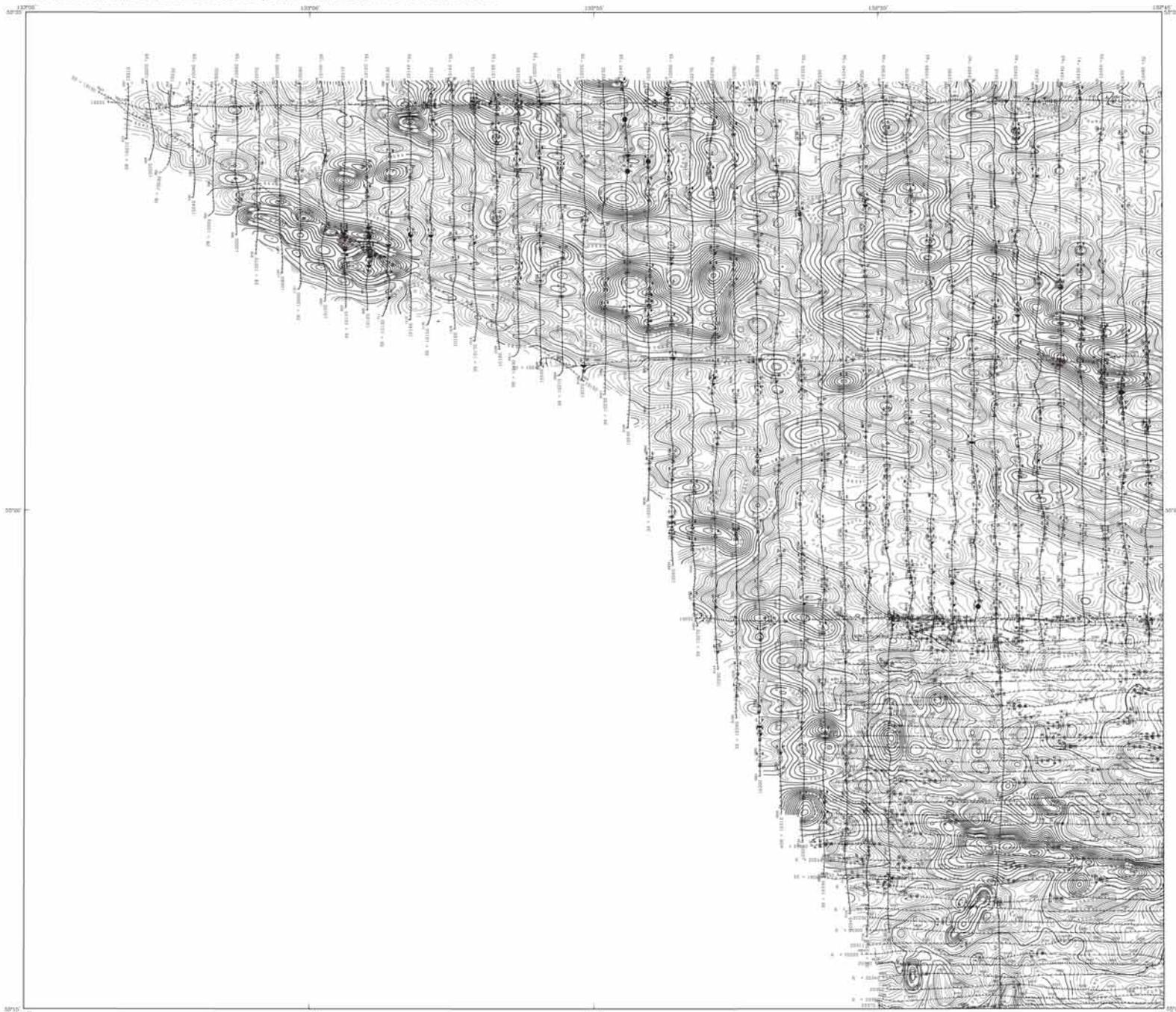


ELECTROMAGNETICS
 To determine the location of EM anomalies in their location, the Geosoft Vector Magnetic System (VMS) was used. The VMS was used to collect magnetic data at 100m intervals. The data was then processed to determine magnetic anomalies. The anomalies were then plotted on a map to show their location.

TOTAL FIELD MAGNETICS
 The total field magnetic data were collected with a Geosoft Vector Magnetic System (VMS) with a 1000m² grid. The survey was conducted in a 1000m² grid pattern with a 100m spacing between grid lines. The survey was conducted in a 1000m² grid pattern with a 100m spacing between grid lines.



SURVEY HISTORY
 This map and data were collected from the Ketchikan Survey "Area 4" and the Kasiak Survey "Area 2". The survey was conducted in 1999. The data was then processed to determine magnetic anomalies. The anomalies were then plotted on a map to show their location.



See also U.S. Geological Survey Data File 1000, R-4, 1998, Ketchikan, Alaska



DESCRIPTIVE NOTES

KETCHIKAN SURVEY "Area 4" - March 1999
 The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system and a Scripps ocean magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a resistivity system, GPS navigation system, 55/60 Hz magnetic and data control. Flights were performed with an AS350B-2 single helicopter at a mean barometric pressure of 250 feet using north-south flight lines one-quarter mile apart. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Aantech/Navstar Real-Time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight path recovery. The helicopter position was determined 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 1886 (NAD 83) datum, 1907 North American Datum using a Clarke meridian (CM) of 132° 30' 00" west of the meridian. The datum constant is 200,000 meters. Accuracy of the measured data is better than 1 m with respect to the flight lines.

NETA SURVEY "Area 3" - May 1992
 The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system and a Scripps ocean magnetometer. Both were flown at a height of approximately 200 feet. In addition the survey recorded data from a resistivity system, GPS navigation system, 55/60 Hz magnetic and data control. Flights were performed with a single helicopter at a mean barometric pressure of 250 feet using north-south flight lines one-quarter mile apart. The lines were flown perpendicular to the flight lines. The survey was flown with an AS350B-2 helicopter.

A Geometrics Ltd. electronic positioning system was used for navigation. Flight path recovery was accomplished with a combination of GPS data and visual survey. The ground contours of the 1992 data should be considered as the primary.



ELECTROMAGNETIC ANOMALIES

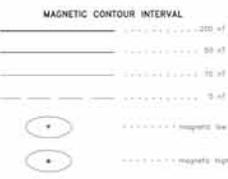
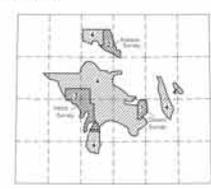
dots indicate the conductor type a conductive zone
 magnetic orientation in N
 dip direction

EM magnetic intensity
 EM magnetic intensity

EM magnetic intensity
 EM magnetic intensity

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

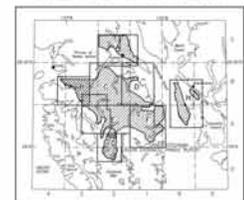
PARTS OF CRAIG B-3 and
 B-4 QUADRANGLES
 1999



ELECTROMAGNETICS

To determine the location of the conductors or their horizontal, the DIGHEM[®] EM system measured resistive and quadrature components of the frequency. Two vertical receiver coils spaced at 500 and 5500 Hz which were horizontal copper-coil pairs oriented at 900, 7000, and 30,000 Hz. EM dots were oriented at 0.1-second intervals. The EM system responds to various conductive, resistive, inductive, and cultural sources. The type of conductor is indicated on the interpretive map by the interpretive symbol attached to each EM intensity. Other symbols of the type of conductor is based on the geometry of the coil—two common-coil responses, together with conductive and magnetic patterns and topographic features. The resistivity and the flight track lines were oriented to locate cultural sources.

LOCATION INDEX FOR SCALE 1:51,600



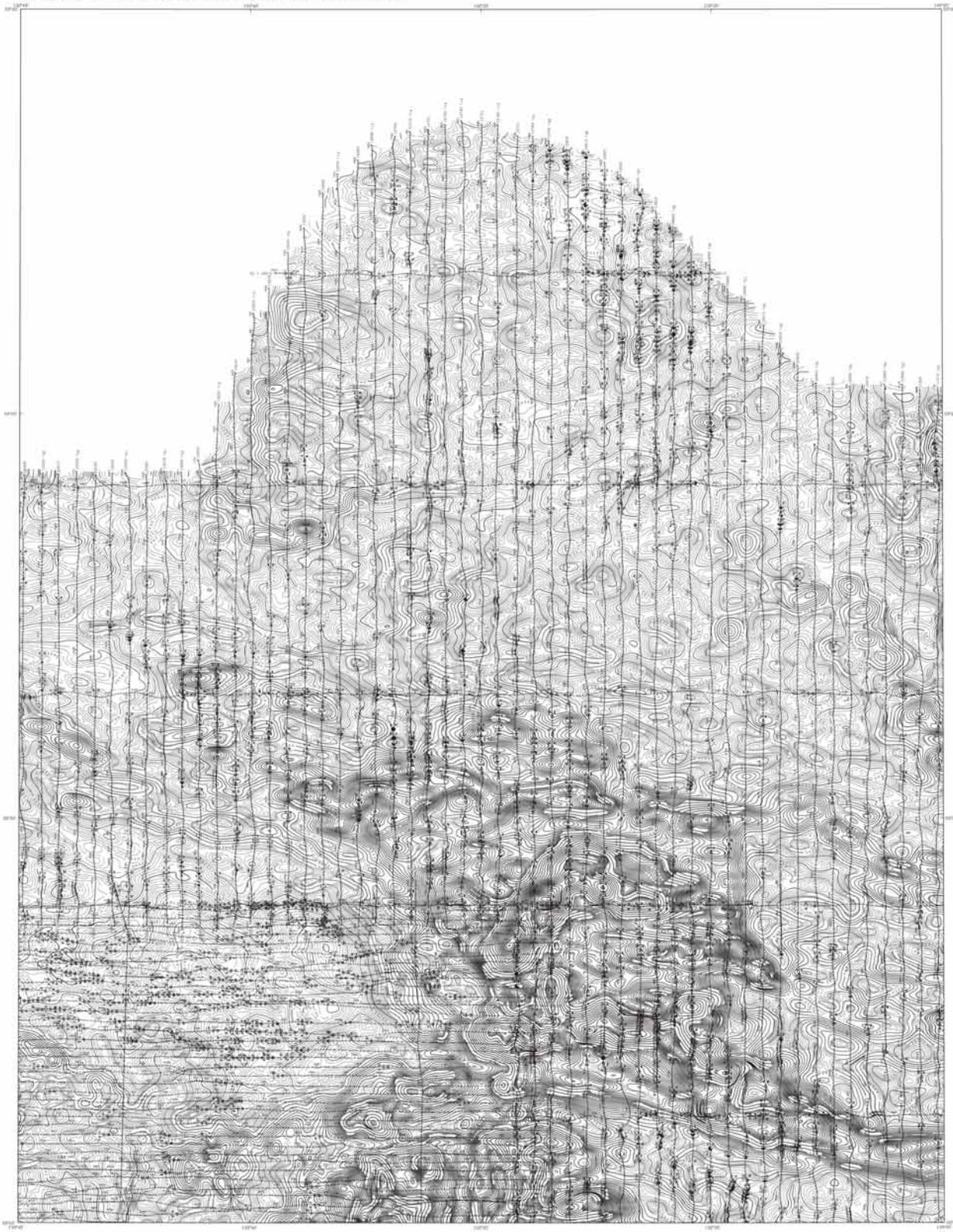
SURVEY HISTORY

This map has been prepared under contract between the State of Alaska, Department of Natural Resources (DNR), Bureau of Geology & Geophysics (BGG), and the U.S. Geological Survey (USGS), and the U.S. Department of the Interior, Bureau of Land Management (BLM), including Sealaska Corporation, Alaska State Marine Health Trust (ASMH), and the State of Alaska, Sealaska Corporation. The data for areas 1, 2, and 3 were flown by D. D. Dyer in 1987 and 1992. These data were provided for publication by Sealaska Corporation.

This map and other products from this survey are available on map order or on paper from 5000, 7th University Ave., Suite 300, Fairbanks, Alaska, 99709. Some products are also available in paper form at the BLM, Alaska State Marine Information Center, Sealaska Center, Douglas, AK.

TOTAL FIELD MAGNETICS

The total field magnetic data were acquired with a Scripps ocean magnetometer and a DIGHEM[®] EM system. The data were acquired on a grid of 100 m spacing. The data were reduced to the 1986 datum using a Clarke meridian (CM) of 132° 30' 00" west of the meridian. The datum constant is 200,000 meters. Accuracy of the measured data is better than 1 m with respect to the flight lines.

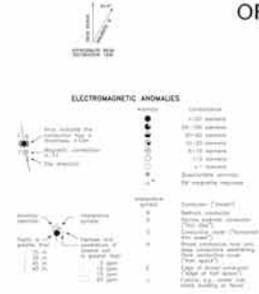


Map Area 1:1,000,000 (North Arrow) 1:1,000,000 (Scale) 1:1,000,000 (Scale)

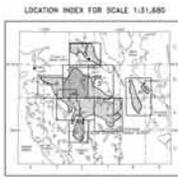
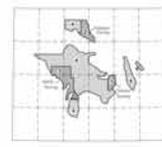


DESCRIPTIVE NOTES
KETCHIKAN SURVEY "New 2" - August 1999
 This project was a continuation of the Ketchikan Survey "New 1" which was completed in 1998. The purpose of this survey was to update the magnetic data and to collect additional electromagnetic data. The survey was conducted using a magnetometer and a fluxgate magnetometer. The magnetic data were collected on a grid with a spacing of 100 meters. The electromagnetic data were collected on a grid with a spacing of 200 meters. The survey was conducted in the Ketchikan Gateway Borough, Alaska. The survey was conducted by the Alaska Division of Geological & Geophysical Surveys in cooperation with the Bureau of Land Management, Ketchikan Gateway Borough, and Sealaska Corporation.

BETA SURVEY "New 2" - May 1992
 This project was a continuation of the Ketchikan Survey "New 1" which was completed in 1991. The purpose of this survey was to update the magnetic data and to collect additional electromagnetic data. The survey was conducted using a magnetometer and a fluxgate magnetometer. The magnetic data were collected on a grid with a spacing of 100 meters. The electromagnetic data were collected on a grid with a spacing of 200 meters. The survey was conducted in the Ketchikan Gateway Borough, Alaska. The survey was conducted by the Alaska Division of Geological & Geophysical Surveys in cooperation with the Bureau of Land Management, Ketchikan Gateway Borough, and Sealaska Corporation.

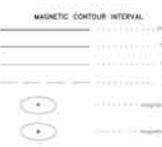


**TOTAL FIELD MAGNETICS AND
 DETAILED ELECTROMAGNETIC ANOMALIES
 OF SELECTED AREAS NEAR
 KETCHIKAN,
 SOUTHEAST ALASKA
 PARTS of CRAIG B-2 and
 B-3 QUADRANGLES
 1999**

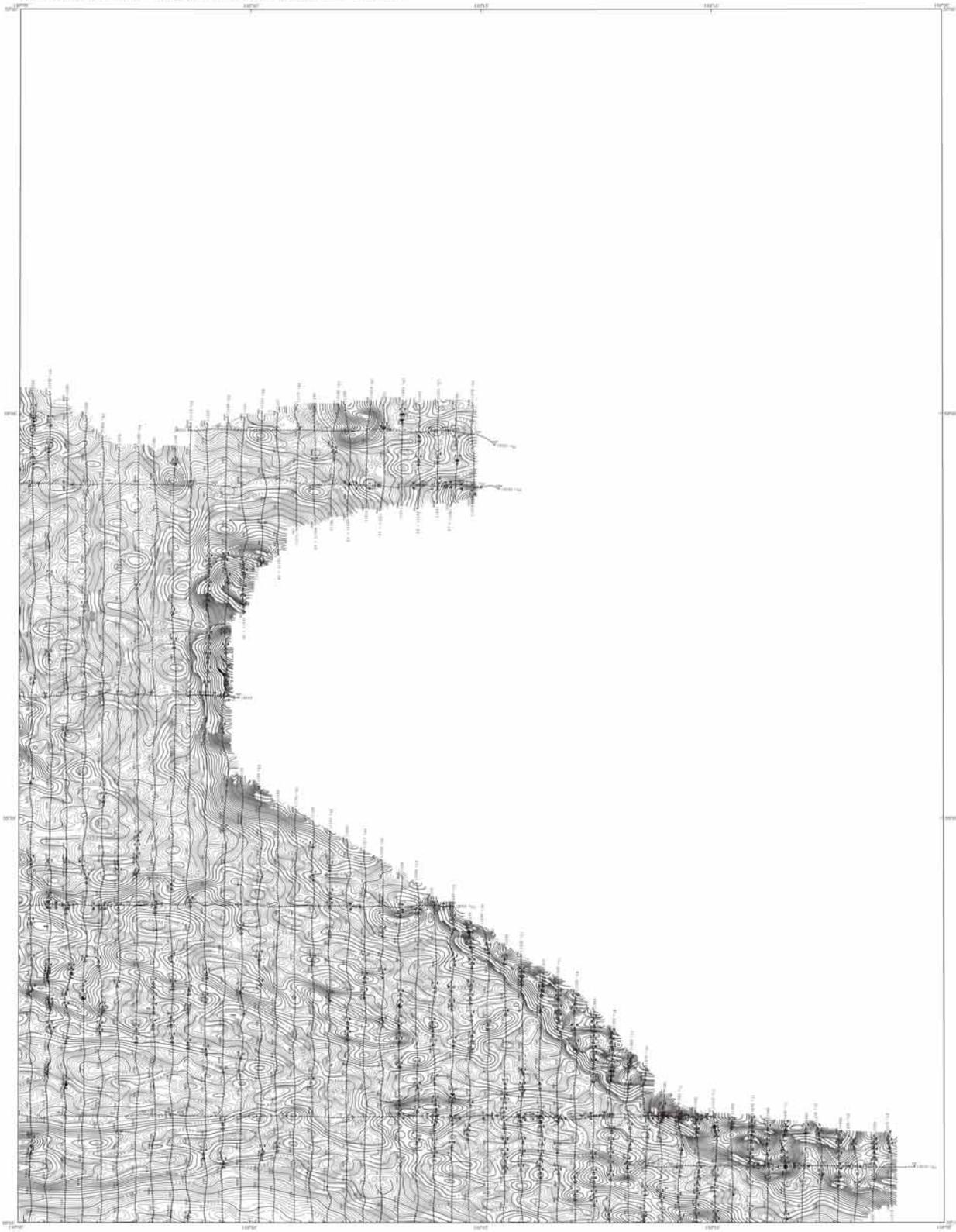


SURVEY HISTORY
 This project was a continuation of the Ketchikan Survey "New 1" which was completed in 1998. The purpose of this survey was to update the magnetic data and to collect additional electromagnetic data. The survey was conducted using a magnetometer and a fluxgate magnetometer. The magnetic data were collected on a grid with a spacing of 100 meters. The electromagnetic data were collected on a grid with a spacing of 200 meters. The survey was conducted in the Ketchikan Gateway Borough, Alaska. The survey was conducted by the Alaska Division of Geological & Geophysical Surveys in cooperation with the Bureau of Land Management, Ketchikan Gateway Borough, and Sealaska Corporation.

TOTAL FIELD MAGNETICS
 The total field magnetic data were collected using a magnetometer. The data were collected on a grid with a spacing of 100 meters. The data were collected in the Ketchikan Gateway Borough, Alaska. The data were collected by the Alaska Division of Geological & Geophysical Surveys in cooperation with the Bureau of Land Management, Ketchikan Gateway Borough, and Sealaska Corporation.



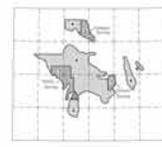
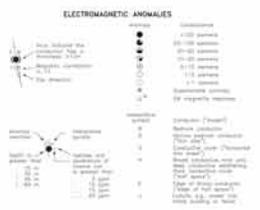
ELECTROMAGNETICS
 The electromagnetic data were collected using a fluxgate magnetometer. The data were collected on a grid with a spacing of 200 meters. The data were collected in the Ketchikan Gateway Borough, Alaska. The data were collected by the Alaska Division of Geological & Geophysical Surveys in cooperation with the Bureau of Land Management, Ketchikan Gateway Borough, and Sealaska Corporation.



DESCRIPTIVE NOTES
 KETCHIKAN SURVEY "Top 4" - August 1988
 The aeromagnetic data were acquired with a GEOMAG 122 magnetometer (1000 gauss) mounted on a Cessna 441 aircraft. The aircraft was flown at an altitude of 10,000 feet above the terrain. The survey was conducted in a grid pattern with a spacing of 1000 feet between lines. The data were collected in a digital format and processed using a computer program. The resulting magnetic field strength is shown in contours on the map. The contours are labeled with values in gauss. The map also shows detailed electromagnetic anomalies, which are represented by shaded areas. The anomalies are labeled with values in gauss. The map includes a grid of latitude and longitude coordinates. The map is titled "TOTAL FIELD MAGNETICS AND DETAILED ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA PARTS of CRAIG B-1 and B-2 QUADRANGLES 1999".



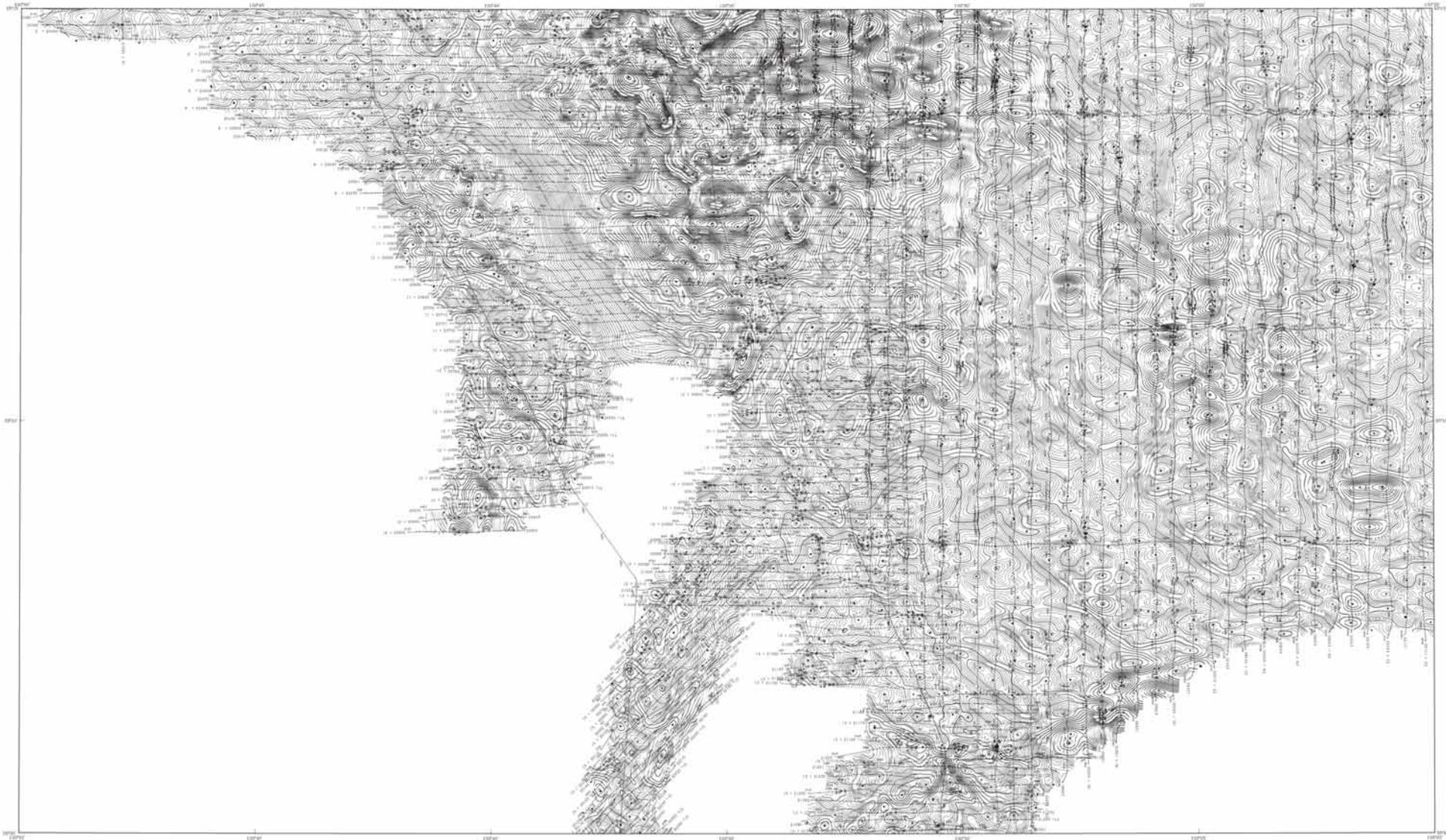
**TOTAL FIELD MAGNETICS AND
 DETAILED ELECTROMAGNETIC ANOMALIES
 OF SELECTED AREAS NEAR
 KETCHIKAN,
 SOUTHEAST ALASKA
 PARTS of CRAIG B-1 and
 B-2 QUADRANGLES
 1999**



MAGNETIC CONTOUR INTERVAL
 1000 GAUSS
 2000 GAUSS
 3000 GAUSS
 4000 GAUSS
 5000 GAUSS
 6000 GAUSS
 7000 GAUSS
 8000 GAUSS
 9000 GAUSS
 10000 GAUSS
 11000 GAUSS
 12000 GAUSS
 13000 GAUSS
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SURVEY HISTORY
 The aeromagnetic data were acquired with a GEOMAG 122 magnetometer (1000 gauss) mounted on a Cessna 441 aircraft. The aircraft was flown at an altitude of 10,000 feet above the terrain. The survey was conducted in a grid pattern with a spacing of 1000 feet between lines. The data were collected in a digital format and processed using a computer program. The resulting magnetic field strength is shown in contours on the map. The contours are labeled with values in gauss. The map also shows detailed electromagnetic anomalies, which are represented by shaded areas. The anomalies are labeled with values in gauss. The map includes a grid of latitude and longitude coordinates. The map is titled "TOTAL FIELD MAGNETICS AND DETAILED ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA PARTS of CRAIG B-1 and B-2 QUADRANGLES 1999".



Map from U.S. Geological Survey Map 1:50,000, 1:250,000, and 1:100,000.

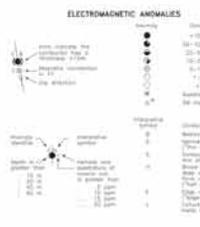


TOTAL FIELD MAGNETICS AND DETAILED ELECTROMAGNETIC ANOMALIES OF SELECTED AREAS NEAR KETCHIKAN, SOUTHEAST ALASKA PARTS OF CRAIG A-2 and A-3 QUADRANGLES 1999

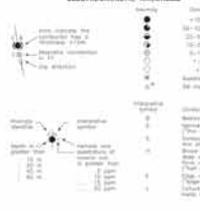
DESCRIPTIVE NOTES

KETCHIKAN SURVEY Area 4¹ - March 1999
 The Ketchikan area was mapped with a Geoscan[®] electromagnetic (EM) system and a Bartington[®] magnetic (M) system. The EM system was a Bartington EM-313R, and the M system was a Bartington M-802. The EM system was used to map the EM anomalies, and the M system was used to map the magnetic anomalies. The EM system was used to map the EM anomalies, and the M system was used to map the magnetic anomalies. The EM system was used to map the EM anomalies, and the M system was used to map the magnetic anomalies.

NETLA SURVEY Area 2¹ - May 1992
 The Netla area was mapped with a Geoscan[®] electromagnetic (EM) system and a Bartington[®] magnetic (M) system. The EM system was a Bartington EM-313R, and the M system was a Bartington M-802. The EM system was used to map the EM anomalies, and the M system was used to map the magnetic anomalies. The EM system was used to map the EM anomalies, and the M system was used to map the magnetic anomalies.

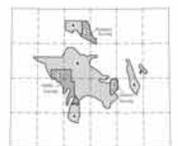


ELECTROMAGNETIC ANOMALIES

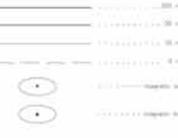


ELECTROMAGNETICS

To determine the location of EM anomalies on this map, the EM system was used to map the EM anomalies. The EM system was used to map the EM anomalies, and the M system was used to map the magnetic anomalies. The EM system was used to map the EM anomalies, and the M system was used to map the magnetic anomalies.



MAGNETIC CONTOUR INTERVAL

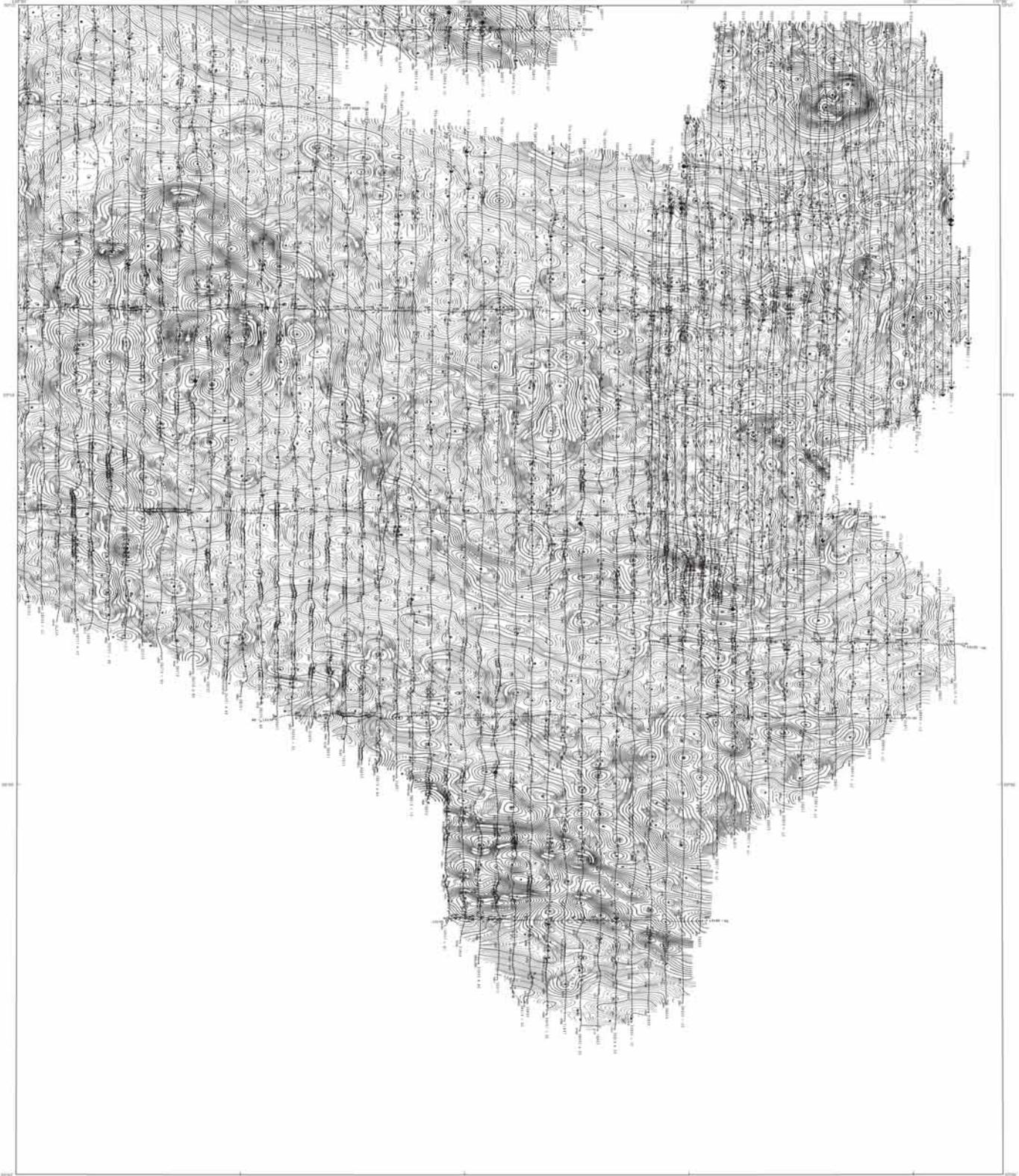


LOCATION INDEX FOR SCALE 1:51,860



SURVEY HISTORY

The map has been compiled and edited from several sources. The data were collected by the U.S. Geological Survey, the Alaska Division of Geological and Geophysical Surveys, and the Sealaska Corporation. The data were collected by the U.S. Geological Survey, the Alaska Division of Geological and Geophysical Surveys, and the Sealaska Corporation.



Map Area 1:100,000 (Scale 1:100,000)



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



SURVEY HISTORY
 This map was prepared by the Alaska Division of Geological and Geophysical Surveys (ADGGS) in cooperation with the Bureau of Land Management (BLM) and the Sealaska Corporation. The survey was conducted in 1999 and is the result of a cooperative effort between ADGGS, BLM, and Sealaska. The survey was conducted in the Ketchikan Gateway Borough and Sealaska Corporation areas. The survey was conducted in the Ketchikan Gateway Borough and Sealaska Corporation areas. The survey was conducted in the Ketchikan Gateway Borough and Sealaska Corporation areas.

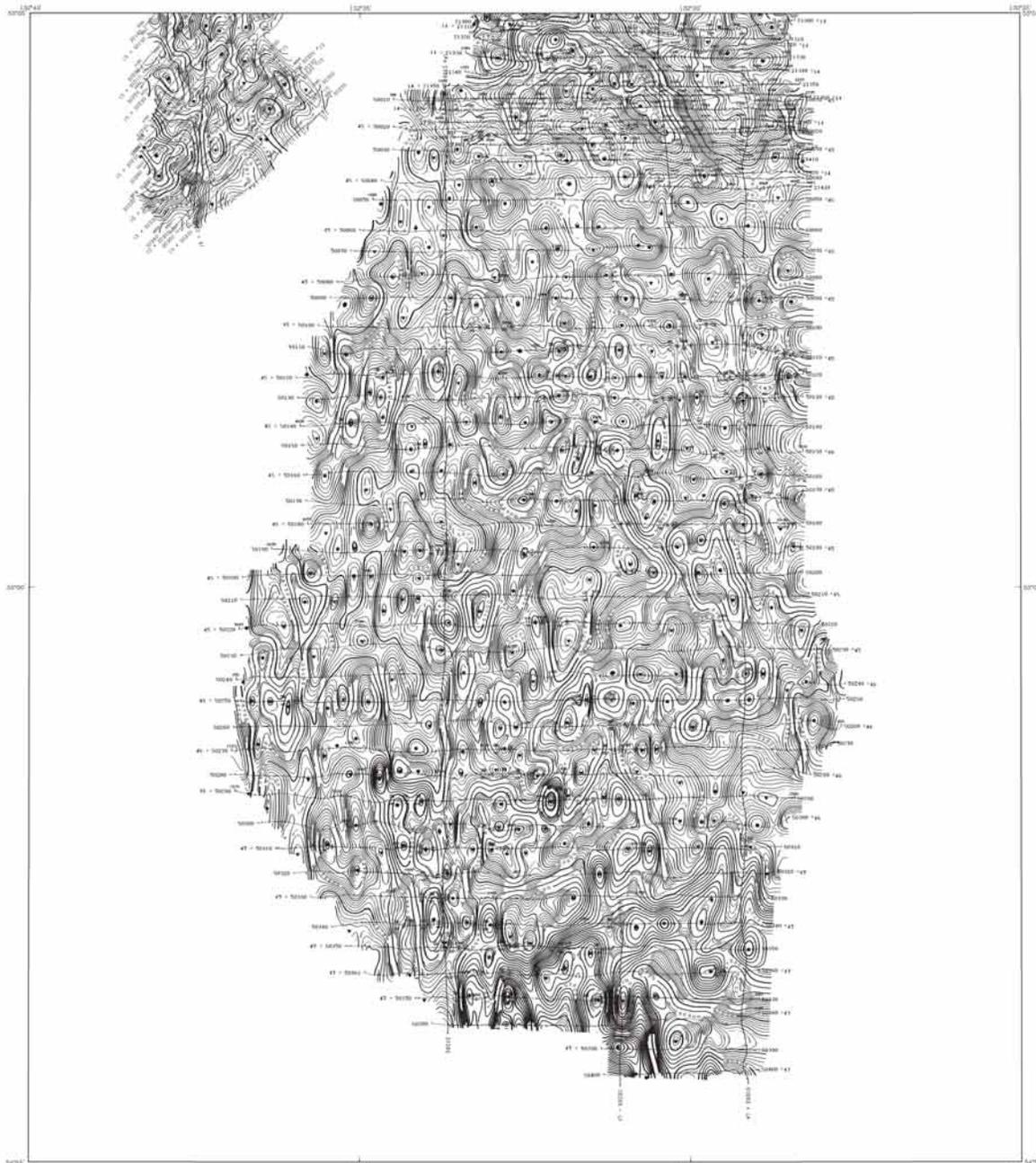
TOTAL FIELD MAGNETICS
 The total field magnetic intensity was measured with a proton precession magnetometer (PPM) and recorded with a digital data logger. The PPM was calibrated against a standard PPM and recorded in Gauss (G) and milligauss (mG). The data were processed and plotted on a grid. The magnetic contour interval is 50 G. The magnetic field strength is shown in Gauss (G) and milligauss (mG). The magnetic field strength is shown in Gauss (G) and milligauss (mG). The magnetic field strength is shown in Gauss (G) and milligauss (mG).

DESCRIPTIVE NOTES
KETCHIKAN SURVEY "Area A" - 1999
 The Ketchikan Survey "Area A" was conducted in 1999. The survey was conducted in the Ketchikan Gateway Borough and Sealaska Corporation areas. The survey was conducted in the Ketchikan Gateway Borough and Sealaska Corporation areas. The survey was conducted in the Ketchikan Gateway Borough and Sealaska Corporation areas.

ELECTROMAGNETIC ANOMALIES
 The electromagnetic anomalies were measured with a magnetic induction system (MIS). The MIS was calibrated against a standard MIS and recorded in millivolt per meter (mV/m). The data were processed and plotted on a grid. The magnetic induction system was used to measure the electromagnetic anomalies. The magnetic induction system was used to measure the electromagnetic anomalies. The magnetic induction system was used to measure the electromagnetic anomalies.

ELECTROMAGNETICS
 The electromagnetic anomalies were measured with a magnetic induction system (MIS). The MIS was calibrated against a standard MIS and recorded in millivolt per meter (mV/m). The data were processed and plotted on a grid. The magnetic induction system was used to measure the electromagnetic anomalies. The magnetic induction system was used to measure the electromagnetic anomalies. The magnetic induction system was used to measure the electromagnetic anomalies.

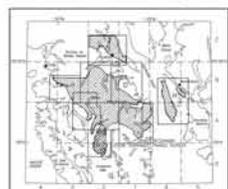




Base: 1:50,000 National Aeronautics and Space Administration (NAD 83) Data: 1:50,000 National Aeronautics and Space Administration (NAD 83)



LOCATION INDEX FOR SCALE 1:31,680



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

DESCRIPTIVE NOTES

KETCHIKAN SURVEY Area 4* - March 1999
 The geophysical data were obtained with a DIGNES[®] Earthmagnetometer (EM) system and a Sippican optical magnetometer. Both were flown at a height of 100 feet. To acquire the data, recorded data from a rotor altimeter, GPS navigation system, 50/60 Hz magnetic and other sensors. Flights were performed with an AS3300-2 turbine helicopter at a mean terrain elevation of 200 feet along east-west flight lines one-quarter mile apart. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Airtech/Novac Real-Time Differential Global Positioning System (RT-DGPS) was used for each registration and flight with accuracy. The helicopter registration was derived from a Sippican optical magnetometer. Mean terrain elevations for the registration and EM system were approximately 217 and 164 feet, respectively. In addition the survey recorded data from a rotor altimeter, GPS navigation system, 50/60 Hz magnetic, and other sensors. The flight lines were flown with one-quarter mile line spacing with the lines flown perpendicular to the flight lines. The flight lines were flown east-west except for the registration between Central Bay and Northwest Inlet which was flown north-south-southwest. The survey area is shown with an AS3300-2 helicopter.

A real-time differential positioning system was used for registration. Flight path recovery was done with a combination of GPS and ground control points. The accuracy of the 1999 data should be comparable to the 1993 data.

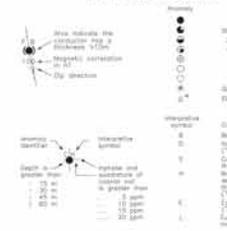
HETA SURVEY Area 3* - May 1999

The geophysical data were obtained with a DIGNES[®] Earthmagnetometer (EM) system and a Sippican optical magnetometer. Mean terrain elevations for the registration and EM system were approximately 217 and 164 feet, respectively. In addition the survey recorded data from a rotor altimeter, GPS navigation system, 50/60 Hz magnetic, and other sensors. The flight lines were flown with one-quarter mile line spacing with the lines flown perpendicular to the flight lines. The flight lines were flown east-west except for the registration between Central Bay and Northwest Inlet which was flown north-south-southwest. The survey area is shown with an AS3300-2 helicopter.

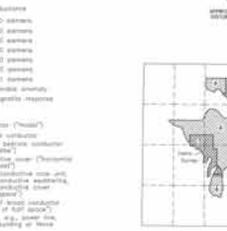
ELECTROMAGNETICS

To determine the location of EM anomalies on their boundaries, the DIGNES[®] EM system measured impulse and waveform components of the magnetic field using a coil-mounted magnetometer. The system was operated at 900, 2000, and 36,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to magnetic induction, conductive inhomogeneities, and cultural sources. The type of conductor is indicated on the topographic map. Interpretive symbols attempt to show EM anomaly. Determination of the type of conductor is based on EM anomaly, shape of the contour, and scatter-plot responses, together with topographic and magnetic patterns and topography. The power line channels and the flight lines were removed to avoid cultural sources.

ELECTROMAGNETIC ANOMALIES



MAGNETIC ANOMALIES



SURVEY HISTORY

This map has been prepared and given under contract between the State of Alaska, Department of Natural Resources (DNR), Division of Geology & Geophysical Survey (DGS), and M&M, Mining & Geological Consultants, Inc. Airborne geophysical data for area 4 were acquired in 1999 by Geoprobe-Digheer, a division of CGC Canada Ltd. Funding for the project was provided by the U.S. Department of the Interior, Bureau of Land Management (BLM), including Central, Eastern, Sealaska Corporation, Alaska State Marine Health Trust and others, and the cities of Thorne Bay and Central Inlet. The data for areas 1, 2 and 3 were flown by Digheer in 1993 and 1992. These data were provided for publication by Sealaska Corporation.

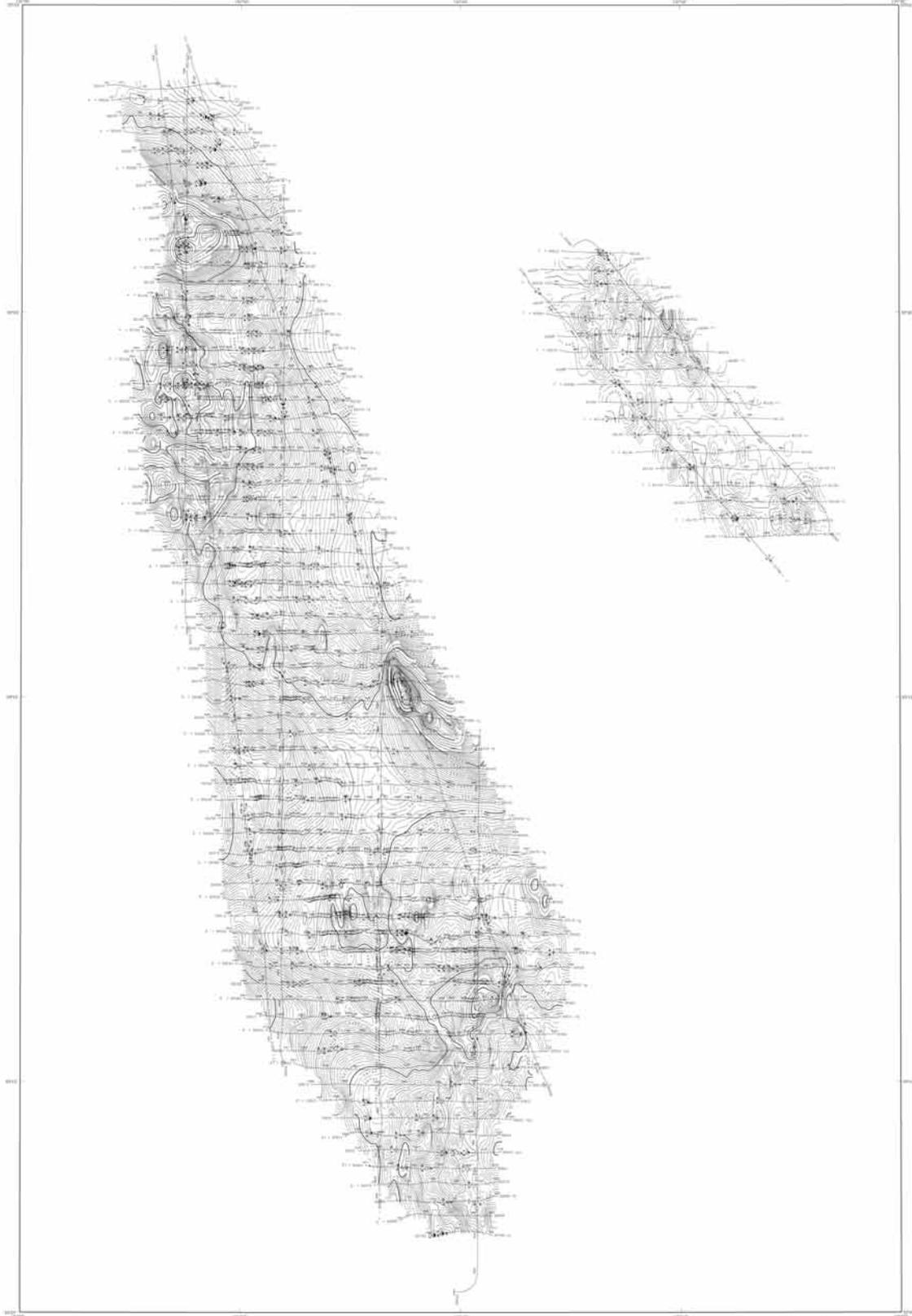
The map and other products from this survey are available to any user, at no charge, from 2000, 794 University Ave., Suite 203, Fairbanks, Alaska, 99703. Some products are not available, in person only, at the BLM's Central Alaska Resource Office, Fairbanks, Alaska, 99701.

TOTAL FIELD MAGNETICS

The total field magnetic data were collected with a sampling interval of 0.1 seconds, and were 1) corrected for diurnal variation by subtraction of the diurnal magnetic base station magnetic data, 2) reduced to the sea level, and 3) interpolated onto a regular 100 m grid using a modified least squares technique. The regional variation for 1999 was subtracted to obtain magnetic anomalies. The regional variation for 1999 was subtracted from the magnetic anomalies.

MAGNETIC CONTOUR INTERVAL





DESCRIPTIVE NOTES
 The geophysical data were collected over a 1000' wide strip of land...
 The magnetic field was measured with a Geometrics G-801 magnetometer...
 The electromagnetic data were collected with a Geometrics EM31-RP...
 The data were collected on a grid with a spacing of 100' between stations...
 The magnetic contours are drawn at 100 gamma intervals...
 The electromagnetic data are plotted as dots with numerical values...
 The data were collected during the summer months of 1999...

ELECTROMAGNETIC ANOMALIES

●	1000
●	900
●	800
●	700
●	600
●	500
●	400
●	300
●	200
●	100
●	0
●	-100
●	-200
●	-300
●	-400
●	-500
●	-600
●	-700
●	-800
●	-900
●	-1000

**TOTAL FIELD MAGNETICS AND
 DETAILED ELECTROMAGNETIC ANOMALIES
 OF SELECTED AREAS NEAR
 KETCHIKAN,
 SOUTHEAST ALASKA
 PARTS OF KETCHIKAN A-5, B-5,
 and B-6 QUADRANGLES
 1999**



SURVEY HISTORY
 The area shown on this map was previously surveyed by the Alaska Division of Geological & Geophysical Surveys in 1981...
 The data were collected during the summer months of 1999...

TOTAL FIELD MAGNETICS
 The total field magnetic intensity was measured with a Geometrics G-801 magnetometer...
 The data were collected on a grid with a spacing of 100' between stations...
 The magnetic contours are drawn at 100 gamma intervals...
 The data were collected during the summer months of 1999...