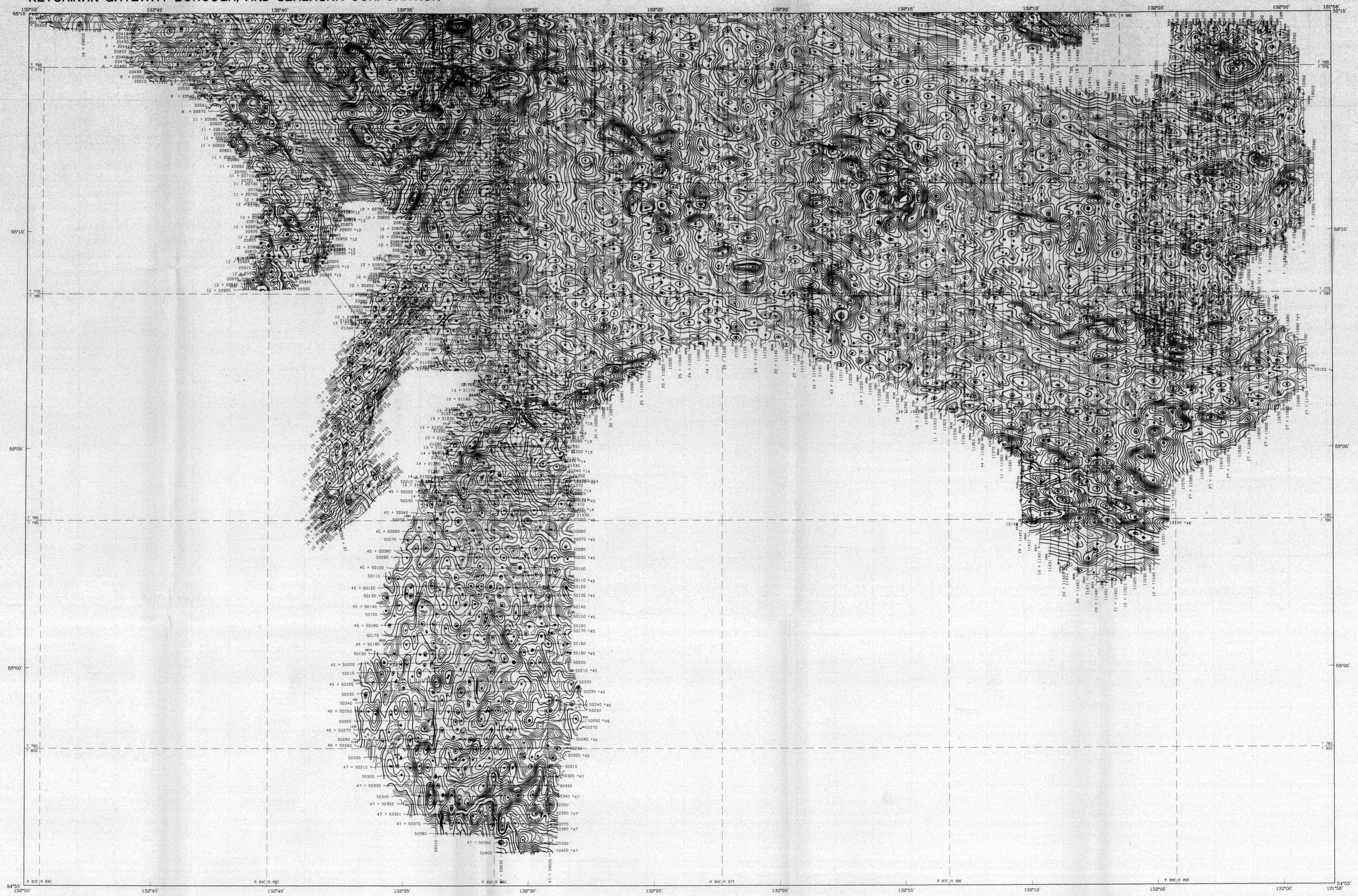
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH BUREAU OF LAND MANAGEMENT,
KETCHIKAN GATEWAY BOROUGH, AND SEALASKA CORPORATION



Section outlines from U.S. Geological Survey Craig A-1, 1946; A-2, 1951; A-3, 1951; Dixon Entrance D-1, 1944; D-2, 1951; D-3, 1951; Ketchikan A-6, 1948; Prince Rupert D-6, 1951; Quadrangles, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

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

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

1999

DESCRIPTIVE NOTES

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

An Ashtech/Racal Real-Time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight path recovery. The helicopter position was derived every 0.5 seconds using real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 135°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

HETTA SURVEY "Area 3" – May 1992
DOLOMI SURVEY "Area 1" – March 1991
The geophysical data were acquired with DIGHEM^{IV} (Dolomi Survey), and DIGHEM^{V} (Hetta Survey) Electromagnetic (EM) systems and a Scintrex cesium magnetometer. Mean terrain clearance for the magnetometer and EM system were approximately 213 and 164 feet, respectively. In addition the survey recorded data from a radar altimeter, UHF navigation system, 50/60 Hz monitors, VLF receiver and video camera. The flight lines were flown with one-eighth mile line spacing with tie lines flown perpendicular to the flight lines. The Dolomi Survey was flown north–south with an AS350B helicopter. The Hetta Survey was flown with an AS350B-1 helicopter. The flight lines for Hetta Survey were flown east–west except for the peninsula between Cordova Bay and Nutkwa Inlet which was flown northeast–southwest.

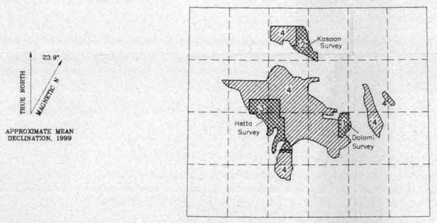
A Del Norte UHF electronic positioning system was used for navigation. Flight path recovery was done with a combination of UHF data and visual recovery. Positional accuracy of the 1991/92 data should be considered of low reliability.

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial-coil pairs operated at 900 and 5500 Hz while three horizontal coplanar-coil pairs operated at 900, 7200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. The power line monitor and the flight track video were examined to locate cultural sources. The EM anomalies that are indicated are classified by conductance.

ELECTROMAGNETIC ANOMALIES

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



TOTAL FIELD MAGNETICS

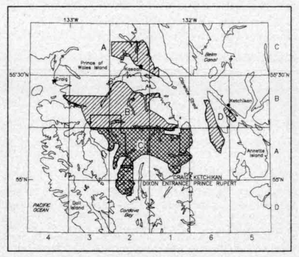
The total field magnetic data were acquired with a sampling interval of 0.1 seconds, and were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) leveled to the tie line data, and (3) interpolated onto a regular 100 m grid using a modified Akima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

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

MAGNETIC CONTOUR INTERVAL

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

LOCATION INDEX



SURVEY HISTORY

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

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