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Abstract

In 2000, the Geological Survey of Canada supervised four aeromagnetic survey contracts totaling 260 385 line kilometres. These surveys were flown in the Northwest Territories, Nunavut, British Columbia, and Quebec. In addition, private-sector airborne geophysical survey data sets were recompiled for areas in northern Ontario and Newfoundland.

Résumé

En 2000, la Commission géologique du Canada a supervisé l'exécution de quatre levés aéromagnétiques totalisant 260 385 kilomètres de lignes de vol. Ces levés ont été réalisés dans les Territoires du Nord-Ouest, au Nunavut, en Colombie-Britannique et au Québec. En outre, des ensembles de données de levés géophysiques aériens acquis par le secteur privé dans le nord de l'Ontario et à Terre-Neuve ont été recompilés.

INTRODUCTION

In 2000–2001, the GSC aeromagnetic program included four new surveys and two data reprocessing projects. A survey over the Mackenzie Corridor in the Northwest Territories continues a multiyear acquisition project that commenced in 1998. Three other surveys were conducted in British Columbia, Quebec, and Nunavut under the Targeted Geoscience Initiative, a federal program to promote mining investment within Canada. Reprocessing of older industry data, acquired over the James Bay Lowlands area of northern Ontario, was undertaken under a collaborative agreement with the Ontario Geological Survey. A Targeted Geoscience Initiative project to examine the Red Indian Line, through the Buchans mining district in Newfoundland, initiated the second reprocessing project. Locations of these projects are shown in **Figure 1**, with accompanying details summarized in **Table 1**.

NORTHWEST TERRITORIES

The 2000–2001 survey over the Mackenzie Corridor region of the Northwest Territories is the third phase of this multiyear program. It was conducted over the Mackenzie Delta area and covered parts of NTS 107 B and 107 C. The Department of Indian and Northern Affairs annually auctions exploration permits, thus encouraging private-sector exploration, which in turn provides potential cost-sharing partners for these surveys. Four companies helped fund the 2000–2001 phase; they receive exclusive use of the data for a limited period, prior to release to the public. The survey results will be published in 2002 to support ongoing geological mapping and hydrocarbon exploration.

BRITISH COLUMBIA

The GSC is conducting a regional aeromagnetic survey over the Atlin, British Columbia, map sheet (NTS 104 N), immediately south of the Yukon Territory border. No publicly available data exist for this area and the new aeromagnetic survey will be used to identify mineral prospective anomalies and help focus mapping and related studies planned by the Province of British Columbia and the GSC for 2001. Mineral exploration in the region will be aided through the mapping of prospective environments for mineral deposits, primarily volcanic massive sulfide (VMS) and various gold-rich deposit types. The aeromagnetic results will be published in the spring of 2001, with the data released in both map and digital forms.

QUEBEC

The GSC has undertaken a detailed aeromagnetic survey over the Lake Vernon area of Quebec (NTS 34 J and part of 34 G). This survey complements and expands the extensive geological mapping and geochemistry program that the Quebec Ministry of Natural Resources (MRNQ) currently has in the area. The MRNQ is examining the mineral potential of this northeast sector of the Superior Province, with interest focused on the Cu-Zn-Au content of several volcanic-sedimentary belts and the potential for diamondiferous kimberlite. The data will be published in 2001.

NUNAVUT

Identified by Nunavut as its highest priority for geoscience studies in support of sustainable development, the Committee Bay greenstone belt in central Nunavut (NTS 56 J, 56 K, 56-O, and 56 P) is being surveyed using airborne magnetics. The survey data represent the first stage of a three-year integrated geoscience project to produce aeromagnetic, bedrock, and surficial maps. This project is intended to stimulate mineral exploration by addressing such questions as the origin and age of polydeformed gold mineralization and the potential for paleoplacer gold, Ni-PGE mineralization. This detailed survey will replace 30 year old regional data with double the line density, lower altitude and optimally directed (across strike) coverage. The survey results will be published as 1:100 000 maps and digital archive data.

NORTHERN ONTARIO

In collaboration with the Ontario Geological Survey, the GSC is recompiling, under contract, a private-sector data set for northern Ontario. This is one component of a broader project to improve the usefulness of older aeromagnetic data in support of field mapping programs in northern Ontario. The original survey was flown in 1980 over the James Bay Lowlands (parts of NTS 42 J and 42 K). Flight-path uncertainties require the repositioning of picked fiducial points through the use of orthorectified airphotos. The data will be released in the spring of 2001.

NEWFOUNDLAND

The Geological Survey of Newfoundland and Labrador and the GSC have a joint project to improve the understanding of the tectonic setting and stratigraphy associated with major ore bodies (Buchans camp, Victoria mine, and Hope Brook, among others) and give impetus to renewed exploration in this highly prospective region. As part of this three-year project, data from 14 multiparameter magnetic-electromagnetic-VLF airborne surveys are being recompiled and merged with the older, regional coverage. The more recent multiparameter survey data were acquired by the private sector between 1988 and 1998. A partial data release will be made in the spring of 2001 with a full release to follow one year later, upon the expiry of certain confidentiality agreements.

Geological Survey of Canada Projects 980008, 303011, 000017, 000014, 980007, 000018

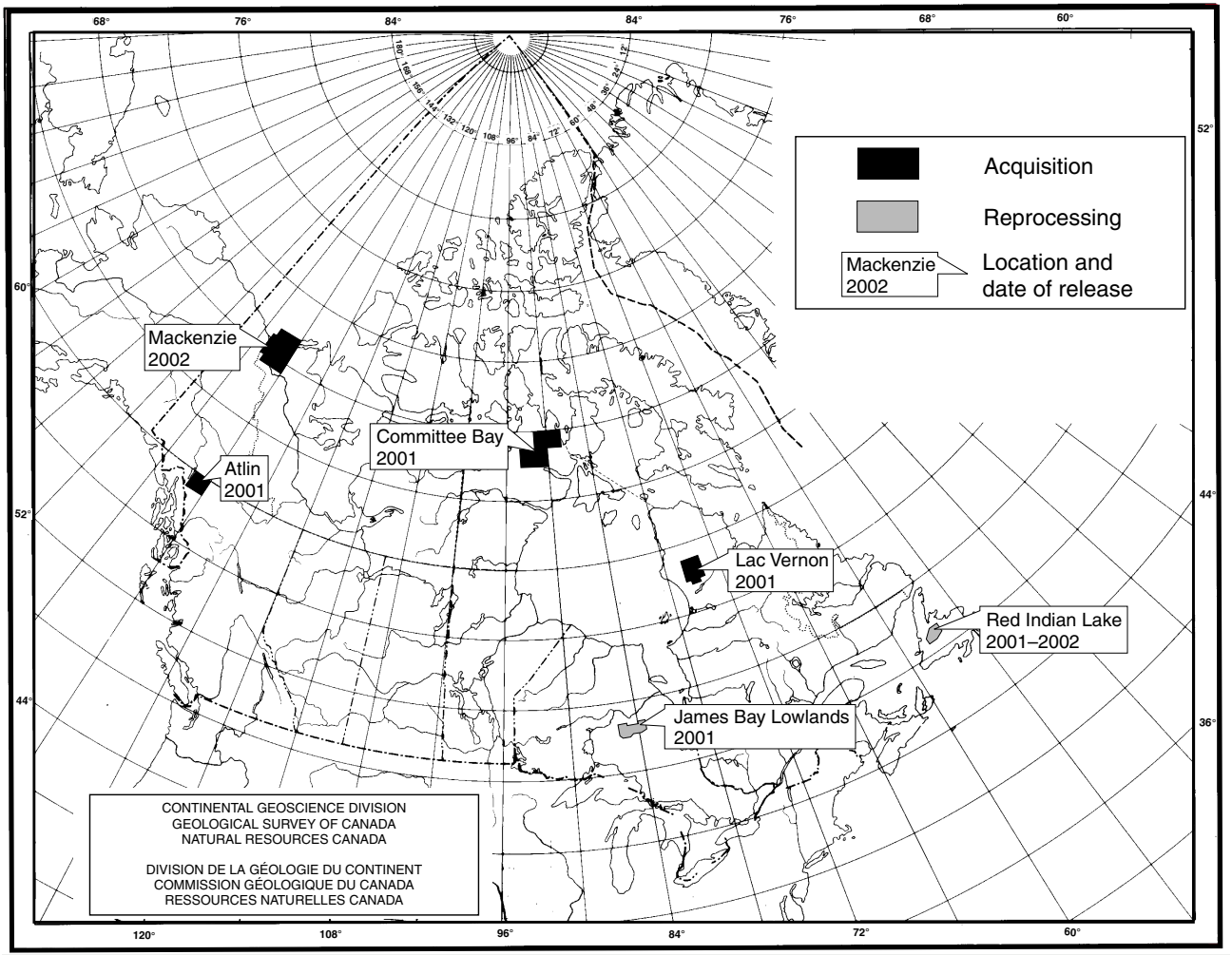

Figure 1. Aeromagnetic survey and reprocessing projects in 2000–2001.

Table 1a. Aeromagnetic survey activity in 2000–2001.

Total field aeromagnetic surveys	Line km	Line spacing	Elevation of draped surface	Year of publication
Atlin, British Columbia	30 735	500 m	200 m	2001
Committee Bay, Nunavut	85 300	400 m	150 m	2001
Lake Vernon, Quebec	69 410	300 m	150 m	2001
Mackenzie Delta, Northwest Territories	74 940	800 m	200 m	2002

Table 1b.

Data reprocessing projects	
	Line km
James Bay Lowlands, Ontario	36 375
Red Indian Lake, Newfoundland	9479