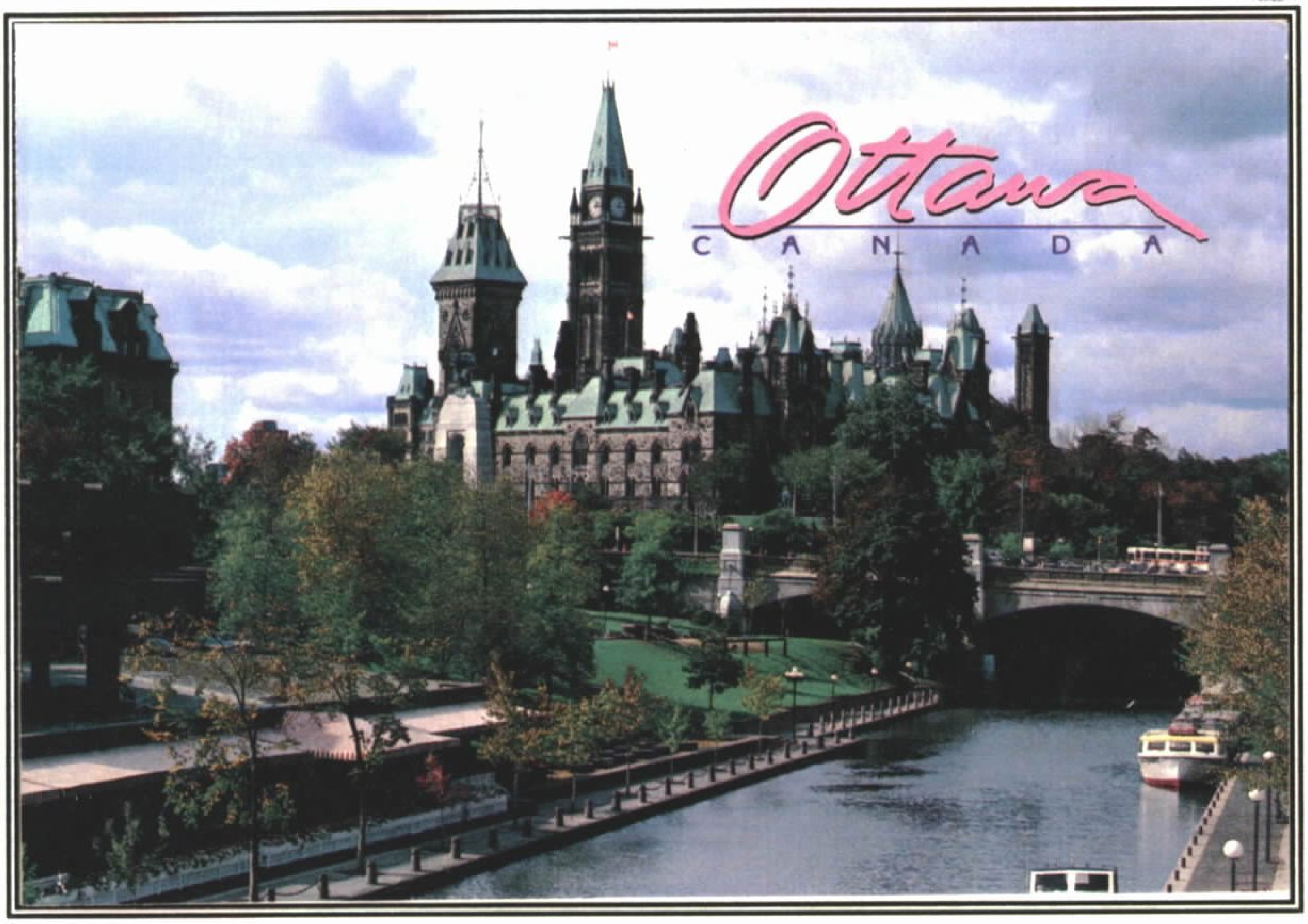
MINISTÉRIO DAS MINAS E ENERGIA

COMPANHIA DE PESQUISA DE RECURSOS MINERAIS
SERVIÇO GEOLÓGICO DO BRASIL



RELATÓRIO DE VIAGEM AO CANADÁ

OUTUBRO/1995

GERSON MANOEL MUNIZ DE MATOS
DEPES/DIPROE

Foto da Capa : Vista parcial do Centro Histórico da Cidade de Ottawa. Edifício do Parlamento e o Canal Rideau, Cartão Postal da Cidade.

SUMÁRIO

RELATÓRIO DE VIAGEM AO EXTERIOR

Geólogo: Gerson Manoel Muniz de Matos

I - INTRODUÇÃO

O presente relatório tem como objetivo apresentar de maneira resumida os objetivos, programa, contatos pessoais e descrição e análise dos assuntos tratados na viagem realizada pelo relator geólogo da Companhia de Recursos Minerais - Serviço Geológico do Brasil - ao Canadá no período de 17 a 23 de setembro de 1995, como integrante da equipe técnica da CPRM. A autorização da viagem e afastamento do país foi emitida pelo Ministério das Minas e Energia em 11.09.95, estando fundamentada no Decreto n° 1.387 de 07.02.95, sendo publicada no Diário Oficial da União n° 175 de 12.09.95, página 6884 - seção 2.

A visita do relator deste documento ao Serviço Geológico do Canadá - SGC fundamentou-se na linha de ação de um projeto de cooperação técnica entre a CPRM e o SGC, objetivando a prospecção de platinóides no estado de Rondônia - Brasil. Os trabalhos deste projeto de ação conjunta deverão realizar-se como um sistema geral de apoio ao Programa Nacional de Prospecção de Metais do Grupo da Platina, desenvolvido pelo Departamento de Projetos Especiais - Diretoria de Recursos Minerais da CPRM, através do aprimoramento de metodologias de investigação.

II - OBJETIVOS DA VIAGEM

Os objetivos da viagem e visita ao SGC foram apresentar aos técnicos daquela instituição, a metodologia desenvolvida e empregada pela CPRM no Programa Nacional de Prospecção de Metais do Grupo da Platina - PNPP; os dados para conhecimento e avaliação dos resultados pelos consultores que participam do referido projeto de ação conjunta; e , finalmente, discutir a programação das atividades do Projeto Platina-Rondônia dentro do contexto de cooperação técnica entre a CPRM e o SGC.

III - PROGRAMA DE VIAGEM

A viagem para a cidade de Toronto no Canadá deveria ter sido realizada a partir do Rio de Janeiro, no dia 16.09.95 no vôo 814 da VARIG até a cidade de Miami nos EUA, e a partir daí em conexão com o vôo 6241 da American Airlines do dia 17.09.95 continuação até Toronto. A primeira parte da viagem transcorreu sem problemas, porém para a conexão em Miami com o vôo da American Airlines tivemos vários problemas. Os problemas enfrentados nesta conexão foram gerados, exclusivamente, devido a inexistência em nossos passaportes de visto de trânsito nos Estados Unidos. A burocracia exigida pelas autoridades americanas, a qual nos impediu de livre trânsito no terminal aeroviário de Miami para resolver os trâmites necessários a uma conexão de vôo internacional, justamente pela falta de visto consular, e a súbita transferência dos passageiros da companhia aérea Canadian Pacific, vôo 6241, para a American Airlines, vôo 450, impediu que o tempo disponível para a conexão fosse suficiente para as modificações nas passagens e emissão de cartões de embarque no novo vôo de n^0 450.. Com isso perdemos o vôo de conexão para Toronto e tivemos de esperar para embarcar num próximo vôo da empresa aérea Air Canadá, chegando a Toronto com um atraso considerável. Toda esta situação, gerada pela falta de visto consular de trânsito nos EUA, provocou o desencontro da missão da CPRM com o representante do SGC, Dr.. Yvon Maurice, no aeroporto internacional de Toronto, além de promover, ainda no aeroporto de Miami o extravio e violação da bagagem dos técnicos da CPRM, seguido de roubo e destruição de pertences pessoais e de material técnico (relatórios, mapas, etc.) levados para apresentação ao corpo técnico do SGC.

Pelo fato de termos chegado à Toronto em um domingo, dia 17.09.95, e com um atraso considerável, somente no dia seguinte logramos localizar nossas bagagens e, finalmente, encontrarmo-nos com o Dr. Yvon Maurice. Em Toronto ficamos hospedados no Hotel "Best Western Inn".

No dia 18.09.95 embarcamos para a cidade de Ottawa, nos sendo reservado acomodações no "Quality Hotel" onde ficamos hospedados por todo o período de nossa estadia no Canadá, até o dia 24.09.95 data de nosso regresso ao Brasil via New York. A fim de evitarmos dificuldades semelhantes às encontradas na ida para Toronto, providenciamos em Ottawa um visto consular de trânsito para os EUA.

Durante a estadia no Canadá não foram encontradas quaisquer dificuldades com o idioma, moeda ou câmbio, tendo em vista o alto padrão de organização do povo canadense e o apoio incondicional prestado pelo Dr. Yvon Maurice aos técnicos da CPRM.

IV - CONTATOS PESSOAIS

Durante a nossa estadia no Canadá travamos conhecimentos com técnicos de várias instituições, as quais visitamos. Abaixo relacionamos aqueles com quem mantivemos contatos freqüentes além de outros técnicos que nos forneceram cartões de visitas cujas cópias encontram-se no Anexo I deste relatório.

- Yvon T. Maurice - Diretor do projeto cooperativo Brasil-Canadá. Serviço Geológico do Canadá.
- James M. Franklin - Cientista chefe do Serviço Geológico do Canadá.
- O. Roger Eckstrand - Gitólogo da Divisão de Recursos Minerais. Serviço Geológico do Canadá.
- D. James Misener - Geofísico. Presidente da empresa "Paterson, Grant & Watson Limited".
- Robert H. Sinclair - Geofísico. Geofísico consultor da empresa "Paterson, Grant & Watson Limited".
- Quentin Gall - Geólogo consultor autônomo.
- Laurence W. Cumtis - Consultor da empresa "Curtis & Associates INC.".

- Jeff R. Harris - Departamento de Recursos Naturais do Canadá. Serviço Geológico do Canadá.

- Kenneth L. Ford - Geólogo/geofísico. Departamento de Recursos Naturais do Canadá. Serviço Geológico do Canadá.

- Allan Miller - Metallogenista - Serviço Geológico do Canadá.

- Pavel J. Kurfurst - Gerente de Pesquisa. Serviço Geológico do Canadá.

- Gary Labelle - Chefe do Setor de Cartografia Digital. Serviço Geológico do Canadá.

- Jocelyne Caloz - Relações Internacionais da CANMET.

- Gwendy E. M. Hall - Chefe do Departamento de Desenvolvimento de Métodos Analíticos. Serviço Geológico do Canadá.

- Pierre Keating - Geofísico. Serviço Geológico do Canadá.

- J. M. Duke - Diretor da Divisão de Recursos Naturais do Serviço Geológico do Canadá.

- Willian B. Coker - Chefe da Divisão de Geoquímica Aplicada. Serviço Geológico do Canadá.

- David A. Walker - Chefe do Laboratório de Microscopia Eletrônica e Análise de Imagens. Serviço Geológico do Canadá.

V - DESCRIÇÃO E ANÁLISE DOS ASSUNTOS TRATADOS

O primeiro dia de nossa estada no Canadá, na cidade de Toronto (18.09.95) foi despendido com a visita à empresa de consultoria em levantamentos geofísicos PATERSON, GRANT & WATSON LTD." para conhecer as instalações e discutir sobre projetos em andamentos realizados pela PGW's no Brasil e na América do Sul em geral e sobre o programa proposto de cooperação SGC-CPRM.

Desta reunião participaram todos os integrantes da missão da CPRM; o diretor do projeto cooperativo Brasil-Canadá, Dr. Yvon Maurice, o presidente da PGW's, Dr. James Misener e o geofísico Robert H. Sinclair. Foram apresentados as diretrizes do Convênio de Cooperação Técnico-Científica que fazem entre si a PGW's e a CPRM para o desenvolvimento do Projeto Mapa Magnético da América do Sul. Este Convênio tem por objetivo e inserção de dados aeromagnéticos, coligidos pela CPRM, num arquivo digital único que possibilitará a confecção do MAPA AEROMAGNÉTICO DA AMÉRICA DO SUL, que a PGW's, em colaboração com Geophysical Exploration Technology (GETECH) está desenvolvendo, bem como a transferência de tecnologia para a CPRM interessada em possuir os equipamentos e informática e os programas mais adequados ao processamento de dados aerogeofísicos.

Em especial foi apresentada a compilação e interpretação de dados gerando o mapa de cobertura aeromagnética da região do Tapajós no Estado do Pará.

O embarque para Ottawa aconteceu neste mesmo dia às 17:30 h chegando aquela cidade por volta das 18:30 h.

A programação do dia 19 de setembro esteve limitada às instalações do Serviço Geológico do Canadá. Após a apresentação de ambas as partes, comitiva da CPRM e integrantes do "staff" do SGC, CAMMET e CIDA, deu-se início a uma apresentação informal das atividades do Serviço Geológico do Canadá conduzida pelo Cientista Chefe Dr. James M. Franklin. Logo após a comitiva da CPRM, liderada pelo chefe do DEPEX e membro do "Steering Committe of the Canada-Brasil Cooperative Project", geólogo Samir Nahass, iniciou uma apresentação sintética do organograma da CPRM, suas principais atividades desenvolvidas no território brasileiro e missões no exterior, e dando-se ênfase a postura e objetivos da empresa no que se refere a sua nova missão como Serviço Geológico do Brasil.

Em seguida a apresentação do Chefe do DEPEX, o relator deste documento, Chefe da Divisão de Prospecção do Departamento de Projetos Especiais, iniciou a apresentação das principais atividades desse Departamento da CPRM, fazendo menção aos projetos de prospecção e geologia econômica de minerais estratégicos, principalmente metais preciosos. Além dos importantes programas de Prospecção de Ouro (PNPO) e de Metais do Grupo da Platina (PNPP) citou-se os programas de Integração Mineral em Municípios da Amazônia - PRIMAZ, Programa de Interesse Geológico-Social - PRGS (Pegmatitos do Nordeste Oriental, Rochas Ornamentais, Avaliação de Depósitos Minerais para Construção Civil - PI/MA), Programa Nacional de Prospecção de Metais de Alta Tecnologia - PNAT, Programa de Avaliação Geológica-Econômica das Pedras Preciosas - PGPP e o Programa de Avaliação Geológico-Econô ica de Insumos Minerais para Agricultura - PIMA.

O Programa Nacional de Prospecção de Metais do Grupo da Platina - PNPP foi apresentado desta feita, em linhas gerais explicitando-se apenas os seus objetivos de descortinar-se a potencialidade geológica do Brasil para Metais do Grupo da Platina (MGP), indicando-se zonas e locais propícios a conter concentrações de valor econômico e as justificativas para execução deste programa baseadas principalmente na:

1) existência de vários corpos máfico-ultramáficos com caracterização geológica favorável a abrigar mineralizações de platinóides;

2) nos trabalhos já realizados pela CPRM, os quais detectaram diversas anomalias geoquímicas especialmente de cobre e níquel e MGP, confirmadas por testes de microscopia eletrônica em concentrados de bateia; e

3) na posição do Brasil como país que não produz platina apesar do contexto geológico altamente favorável.

Logo após a exposição sobre as atividades do DEPES, foi iniciada a apresentação do Chefe do Grupo de Geologia Ambiental e Engenharia para a Amazônia e Centro-Oeste do Brasil, geólogo Valter José Marques, o qual discorreu sucintamente sobre as atividades e objetivos do programa de caracterização metalogenética da província aurífera do Tapajós e sobre os objetivos do programa de geologia ambiental.

Encerrada a apresentação da comissão técnica da CPRM foram apresentados pelo Diretor da Divisão de Recursos Naturais do Serviço Geológico do Canadá, geólogo J. M. Duke, os objetivos do programa cooperativo Brasil-Canadá, visando a transferência de tecnologia de prospecção e proteção ambiental, por parte dos geólogos canadenses através de treinamento no campo, no laboratório e na interpretação de dados dos técnicos brasileiros envolvidos nos projetos em execução no Brasil.

Na parte da tarde do dia 19.09.95 visitamos as dependências do Serviço Geológico conforme segue:

➤ Visita à Divisão de Informações e Comunicações Geocientíficas, conduzida pelo geólogo Gary Labelle e J. Glynn, sendo-nos mostrado os trabalhos de elaboração de cartografia computadorizada e produção de mapas.

➤ Visita ao Laboratório de Geocronologia, conduzida pelo técnico R. Parrish.

➤ Visita ao Laboratório Mineralógico, conduzida por David A. Walker, sendo-nos apresentados os trabalhos de microscopia eletrônica de varredura e do Laboratório de Análise de Imagens.

➤ Visita à Biblioteca Central e Setor de Documentação Cartográfica do SGC, conduzida pelo geólogo Yvon Maurice, assessorado por vários funcionários do setor de documentação técnica.

As atividades desenvolvidas pela manhã do dia 20.09.95 restringiram-se às discussões sobre os aspectos metalogenéticos da região aurífera do Tapajós, conduzidas pelos geólogos François Robert (SGC), Valter José Marques (CPRM) e Allan R. Miller (SGC), e discussões sobre os projetos de geologia urbana (meio ambiente) da qual participaram os geólogos R. Bélanger, P. J. Kurfurst, D. Sharp e L. Dyke, todos do Serviço Geológico do Canadá e a comissão técnica da CPRM.

Uma visita ao "Geophysical Data Centre" do Serviço Geológico do Canadá foi organizada e conduzida na tarde do dia 20.09.95. Pelos técnicos J. Tod, P. Keating e K. Ford fomos introduzidos para conhecimento dos trabalhos do Programa de Dados Aeromagnéticos e de Dados Gravimétricos (Data Storage), desenvolvidos por este importante centro de informações geofísicas. Nos foram apresentados sistemas de integração de dados geofísicos.

Através do GDCINFO (Sistema "on line" de informações de dados magnéticos e gravimétricos), o usuário poderá efetuar pesquisas interativas para informações nos consórcios do "National Aeromagnetic and Gravity Anomaly Data Bases". O acesso ao GDCINFO está disponível via:

MODEM ACCESS
Modem Line: (613) 947.7940
Modem Settings: 8 data bits, no parity, 1 stop bit
Band Rates: to 28,800 bps
Login: gdcinfo
Password: info4me

TELNETACCESS
Telnet gdcinfo: agg.cmr.ca
Username: gdcinfo
Password: info4me

WWW ACESS

http://www.cmr.ca/~ tod/gophys
Online catalogue and link to GDCINFO

As atividades relativas à manhã do dia 21.09.95 restringiram-se a apresentação de discussões sobre o Programa Nacional de Prospecção de Metais do Grupo da Platina (PNPP). A mesa redonda sobre o PNPP contou com a participação dos técnicos do SGC O. Roger Eckstrand, Gwendy E. M. Hall, B. Ballantyme; o consultor autônomo geólogo Quentin Gall, e a comissão técnica da CPRM.

O relator deste documento fez uma apresentação detalhada das justificativas e objetivos do Programa Nacional de Prospecção de Metais do Grupo da Platina e passou a discorrer sobre a metodologia aplicada e sistemática desenvolvida pela equipe técnica da CPRM.

A situação atual do programa como um todo para o território nacional foi apresentada, seguida das explanações sobre o Projeto Platina no estado de Rondônia. Foram apresentados os resultados obtidos até o presente estágio do projeto, seguido de discussões sobre: a avaliação das informações (relatórios, mapas, resultados analíticos, etc., com captura de dados; o detalhamento da programação a ser implantada com estabelecimento de métodos de trabalho; o levantamento e interpretação aerogeofísica existente; o apoio laboratorial, especialmente em análises químicas de platinóides, com treinamento de pessoal, a visita de geólogos canadenses ao Brasil e de geólogos brasileiros ao Canadá, objetivando especialmente métodos de prospecção; e finalmente acertado as bases e datas dos trabalhos conjuntos, em campo e gabinete de geólogos canadenses e brasileiros. Os geólogos R. Eckstrand, L. Hulbert e o consultor privado Q. Gall deverão visitar, ainda no ano corrente, a área do Projeto Rondônia.

Na parte da tarde realizou-se uma mesa redonda sobre proteção ambiental na região do Projeto Tapajós. Esta reunião contou com a presença dos geólogos canadenses L. Curtis, A. Miller, B. Ballantyme, W. Coker e T. Hynes e a comissão técnica da CPRM.

Na manhã do dia 22.09.95 foi realizada uma mesa redonda para discutir-se a respeito de treinamento de pessoal técnico do Departamento Geofísico da CPRM e sobre a realização de "Workshops" de geofísica e/ou cursos rápidos (short curse) em técnicas de interpretação de dados aeromagnetométricos e aerogamaespectrométicos a serem montados no Brasil usando dados existentes disponíveis sobre a região da província aurífera do Tapajós. Os dados existentes deverão ser integrados num sistema de informação utilizando (armazenando e recuperando) todos os dados da base de dados AERO e outros da CPRM (SIGA).

Desta reunião participaram pelo Serviço Geológico do Canadá os geólogos K. Ford, J. Harris, P. Keating. D. Graham e Yvon Maurice.

VI - CONCLUSÕES

Os objetivos dos trabalhos levados a efeito através de mesas redondas de discussões técnicas com a apresentação das metodologias empregadas pela CPRM e resultados obtidos, podem ser considerados como plenamente alcançados.

Sem dúvida, o programa de ação conjunta CPRM-SGC, apresenta-se como um marco no fomento ao intercâmbio de conhecimentos e experiências entre técnicos canadenses e brasileiros. Particularmente no que se refere aos projetos incluídos no programa é promissora a perspectiva de aprimoramento das metodologias de investigação de prospecção contendo com o apoio da experiência técnica e infra-estrutura de um país detentor de tecnologia e experiência de prospecção e mineração como é o caso do Canadá.

VII - RECOMENDAÇÃO

Tendo em vista as novas atribuições da CPRM como Serviço Geológico do Brasil, torna-se imprescindível o intercâmbio de conhecimentos e experiências entre técnicos da empresa e instituições do gênero, de alto gabarito tecnológico e organizacional como é o caso do Serviço Geológico do Canadá. É altamente recomendável o fomento a intercâmbios e convênios com outras instituições como o já realizado com o SGC.

Em vista das dificuldades burocráticas encontradas por brasileiros em trânsito nos Estados Unidos, recomenda-se que seja sempre providenciado visto consular para aquele país quando houver necessidade de conexão aérea em território americano.

VIII - AGRADECIMENTOS

Pela indicação de meu nome e conseqüente confiança depositada em minha pessoa para, fazendo parte da comissão técnica da CPRM, apresentar e discutir a metodologia, sistemática e resultados obtidos do Projeto Platina-RO com especialistas canadenses do SGC, agradeço ao Diretor de Recursos Minerais, Dr. Antônio Juarez Milmann Martins e ao chefe do Departamento de Projetos Especiais, Dr. Mário Farina, esperando ter cumprido o papel a mim delegado de maneira satisfatória para a empresa.

Pelo bom relacionamento, incentivo, companheirismo e amizade expontânea agradeço ao meus colegas de trabalho e viagem Dr. Samir Nahass, chefe do Departamento de Relações Exteriores e Dr. Valter José Marques, e, em especial, ao meu amigo François Robert por todo o apoio incondicionalmente prestado quando necessário.

GERSON MANOEL MUNIZ DE MATOS
Chefe da DIPROE

ANEXO I

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To my good friend Gerson!

GEOLOGICAL SURVEY OF CANADA

OPEN FILE 2850

Structural analysis of lode gold deposits in deformed terranes

F. Robert, K.H. Poulsen, and B. Dubé

1994

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Canada

STRUCTURAL ANALYSIS OF LODE GOLD DEPOSITS IN DEFORMED TERRANES

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Ottawa, April 1994

NOTE

This document contains notes used for a short course on Structural Analysis of Ore Deposits. It represents the first, *unedited* draft of a manuscript to be submitted for publication as a GSC Bulletin. The document is relased as an Open File in its unedited form in order to make it readily available to anyone interested.

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Natural Resources Canada

GEOLOGICAL SURVEY OF CANADA

GEOPHYSICAL DATA CENTRE

CATALOGUE OF PRODUCTS AND SERVICES

AEROMAGNETIC and GRAVITY

DATA BASES

March 1995

GEOPHYSICAL DATA CENTRE
1 Observatory Crescent
Ottawa, Ontario K1A 0Y3

Tel: (613) 995-5326
Fax: (613) 992-2787
Internet: infogdc@agg.emr.ca
WWW Site: http://www.emr.ca/~jtod/geophys

Version Francaise
Disponible sur demande

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MAP INDEX

The Geophysical Data Centre (GDC) of the Geological Survey of Canada provides access to the National Aeromagnetic and Gravity Data Bases. Acquisition and archiving of these potential field data has taken place over the past 45 years. A description of the source and detail of these data sets is itemized under the two headings of **Aeromagnetic Data** and **Gravity Data**.

Orders may be placed by telephone, letter, or fax. Telephone orders should be confirmed in writing (fax or mail).

Geophysical Data Centre
Geological Survey of Canada
1 Observatory Crescent
Ottawa, Ont. K1A 0Y3

Tel: (613) 995-5326
Fax: (613) 992-2787
Internet: infogdc@agg.emr.ca

Allow five (5) to seven (7) working days plus delivery time for standard digital data and plotting orders. For custom orders a minimum of four (4) weeks may be required.

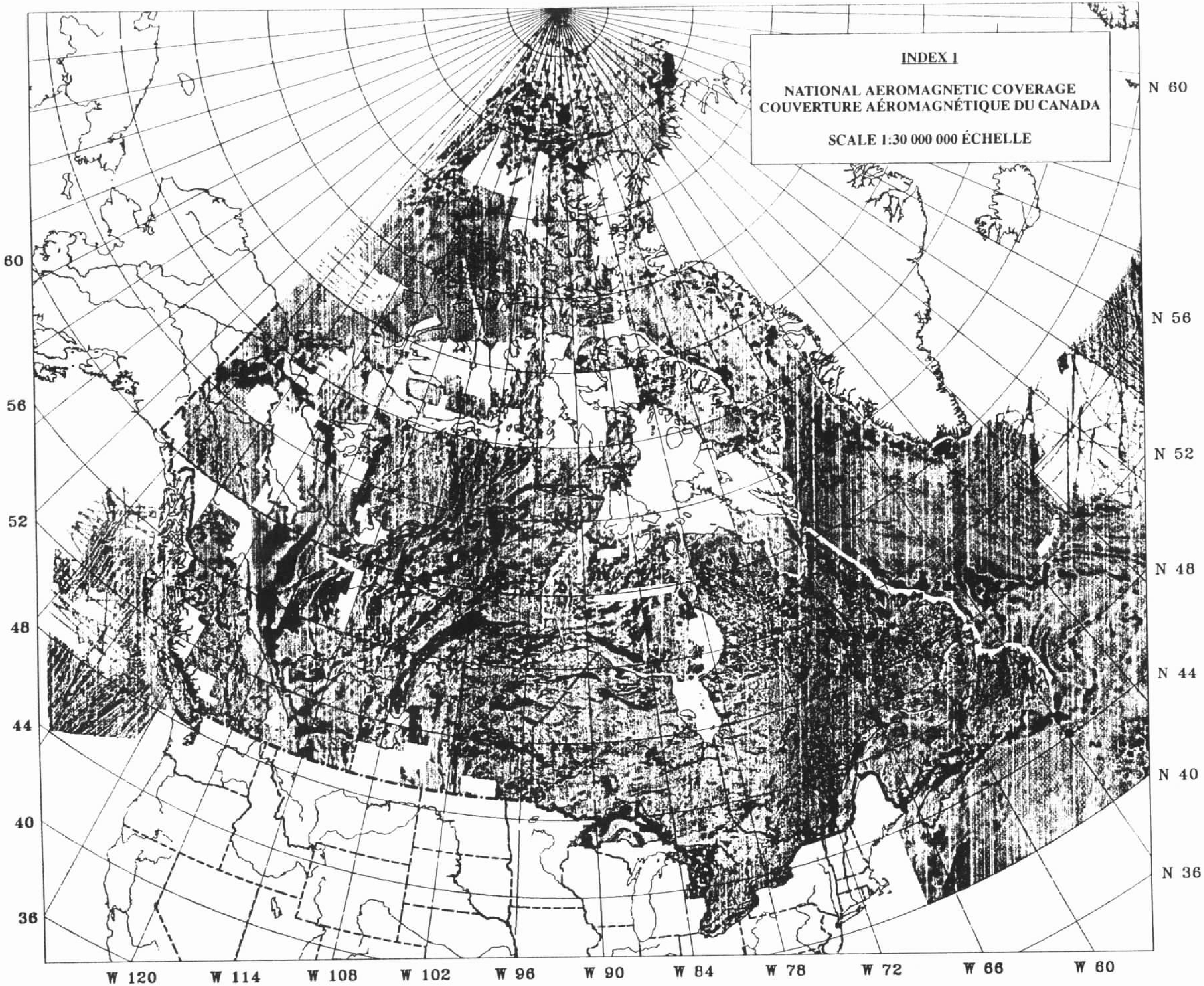
Prepayment of all purchases is required and can be made by cheque, MasterCard or Visa. Before paying by cheque please contact the Data Centre for the exact cost of purchase. Cheques must be made payable to the RECEIVER GENERAL FOR CANADA and mailed to the Data Centre.

If purchases in excess of $750 annually are anticipated, a credit account can be established.

All orders are subject to a $25 handling charge, plus applicable federal and provincial taxes. Shipping charges are extra and billed to the client. For more information on prices and charges see Schedule of Charges.

New data releases or map compilations are announced monthly in the **GSC Information Circular** (see Sources of Related Information).

Printed versions of Open File maps and reports are available through the GSC Bookstore, (see Sources of Related Information).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NATIONAL COVERAGE — OVERVIEW

The adjacent map (Map Index 1) indicates the current (1994) aeromagnetic coverage of Canada, regardless of source or type of survey.

The entire data set is available as a 2 km grid which is updated annually to reflect recent data acquisition. Projection is Lambert Conformal (central meridian 92W, standard parallels 49N and 77N). This is suitable for plotting scales of 1:1 000 000 or coarser.

Digital data	**$100**
Plot at 1:5 000 000	**$ 50**

The **National Aeromagnetic Data Base** consists of data from the following sources:

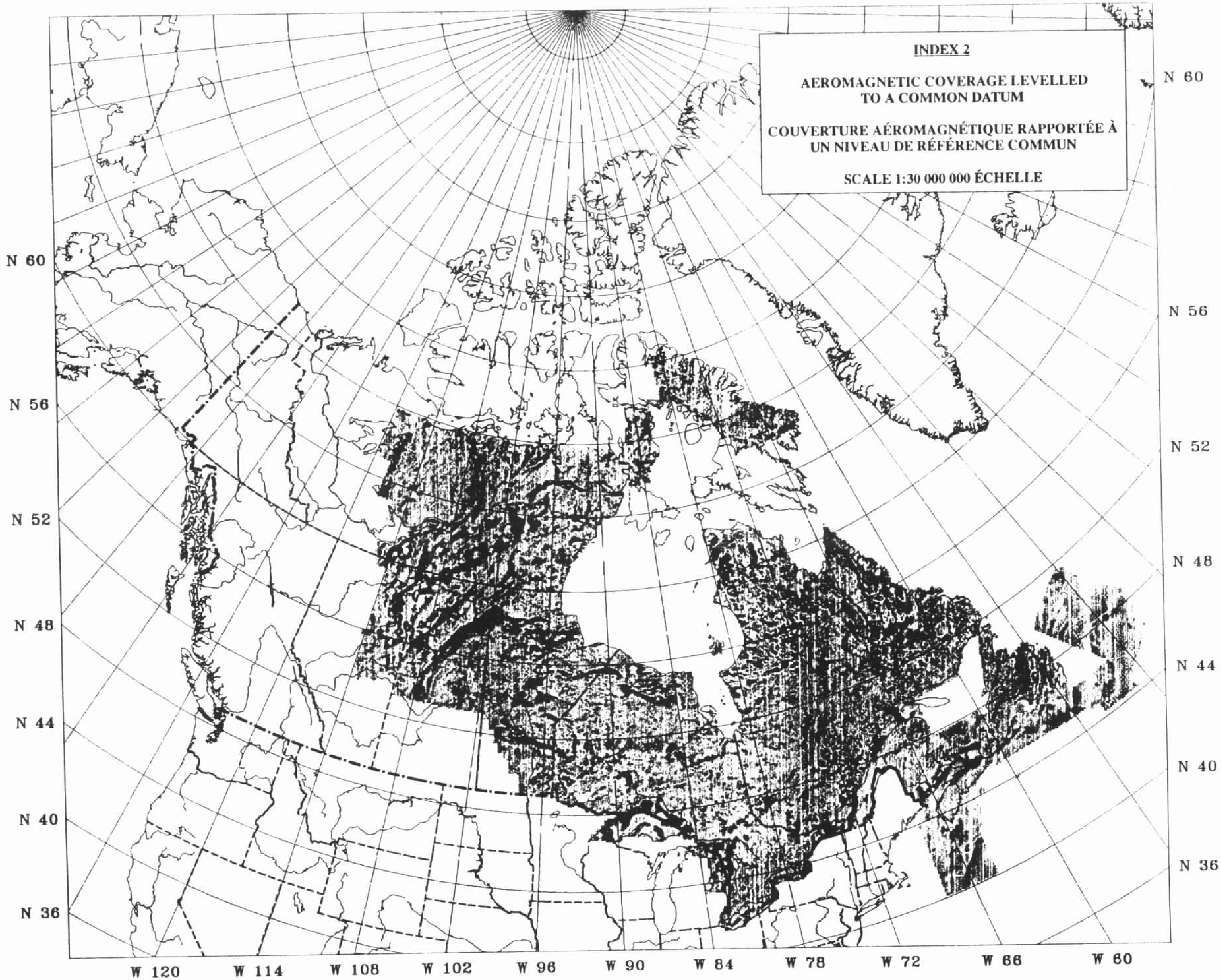
Digitized from Contour Maps

These data were collected before the advent of digital recording. The original 1:63 360 or 1:50 000 contour maps have been digitized. Typical line spacing was half mile (805m) and altitude, 1000 feet (305m) above ground.

These data were acquired between 1947 and the late 1970's and recorded in analogue form. Originally, the magnetic readings from analogue surveys were manually transcribed onto flight path maps and hand contoured at a scale of 1:63 360 and 1:50 000. Digital profile records were later created by locating the intercept of each contour interval (typically 10 nT intervals) along flight path lines. Typical line spacing was half mile (805 m) and altitude 1000 feet (305 m) above ground.

The profile records contain:

- line header indicating the year of the survey and the flight altitude
- data records consisting of **latitude, longitude, magnetic value** for each digitized point.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Prices for Digitized Data

(based on a 1:50 000 map sheet)

Profile data: Latitude, longitude, magnetic value

$8 per sheet

Grid data: Magnetic values

Grid cell size	Price per sheet
800 m	**$0.50**
400 m	**$2.00**
200 m	**$8.00**

plus gridding charge

Digitally acquired data (Map Index 3)

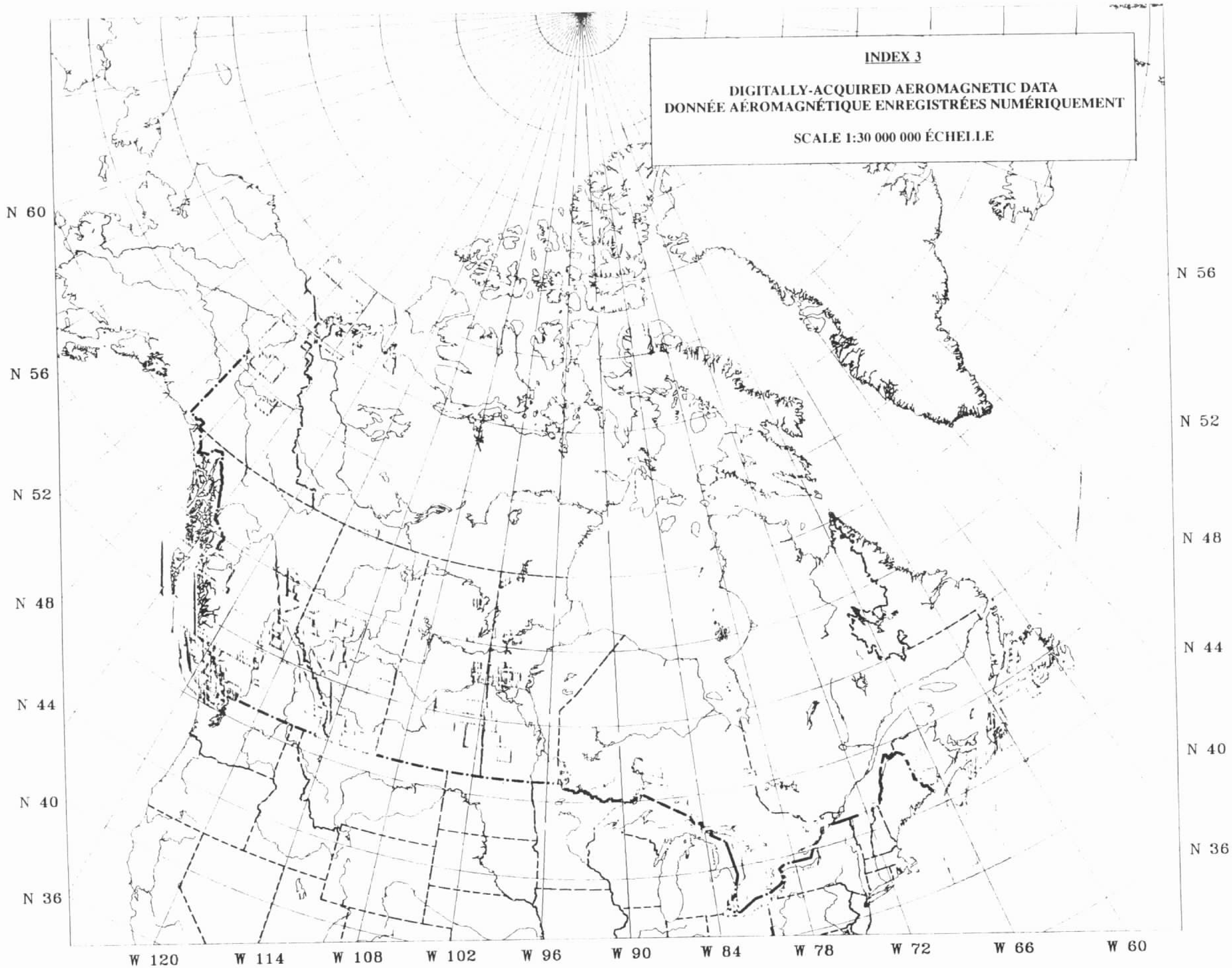
Regional surveys
Line spacing typically 800m but can range up to 2, 4, and 6 km; flying was done at either constant barometric altitude (BAR) or mean terrain clearance (MTC).

Detail surveys
Typical line spacing of 300m and flight altitude of 150m mean terrain clearance (MTC).

The entire aeromagnetic coverage of Canada is being levelled to one common datum. This will result in a "seamless" grid of contiguous aeromagnetic surveys from coast to coast, irrespective of the year flown, altitude, or type of survey. Levelling started with Ontario and the Atlantic provinces and that initial grid is being extended west and north. (Map Index 2 shows the national aeromagnetic coverage, levelled to one common datum.)

Regional surveys

These data encompass reconnaissance surveys that have been flown from the 1970's to present. Line spacing ranges from 800m to 2, 4, and 6 km, and the surveys were flown at a constant barometric altitude or in some instances, mean terrain clearance. Recorded parameters typically include: total field magnetics, radar and barometric altimetry, navigation information.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Detail surveys

These are target specific surveys with 300m being the typical line spacing and 150m mean terrain clearance (MTC) the flying height. Recorded parameters include some or all of the following: total field magnetics, radar and barometric altimetry, navigation information, vertical gradient magnetics, VLF-EM, several EM channels.

Survey parameters and location of individual projects are listed in Appendix A.

Prices for Digital Data

(based on line kilometres)

Profile data:

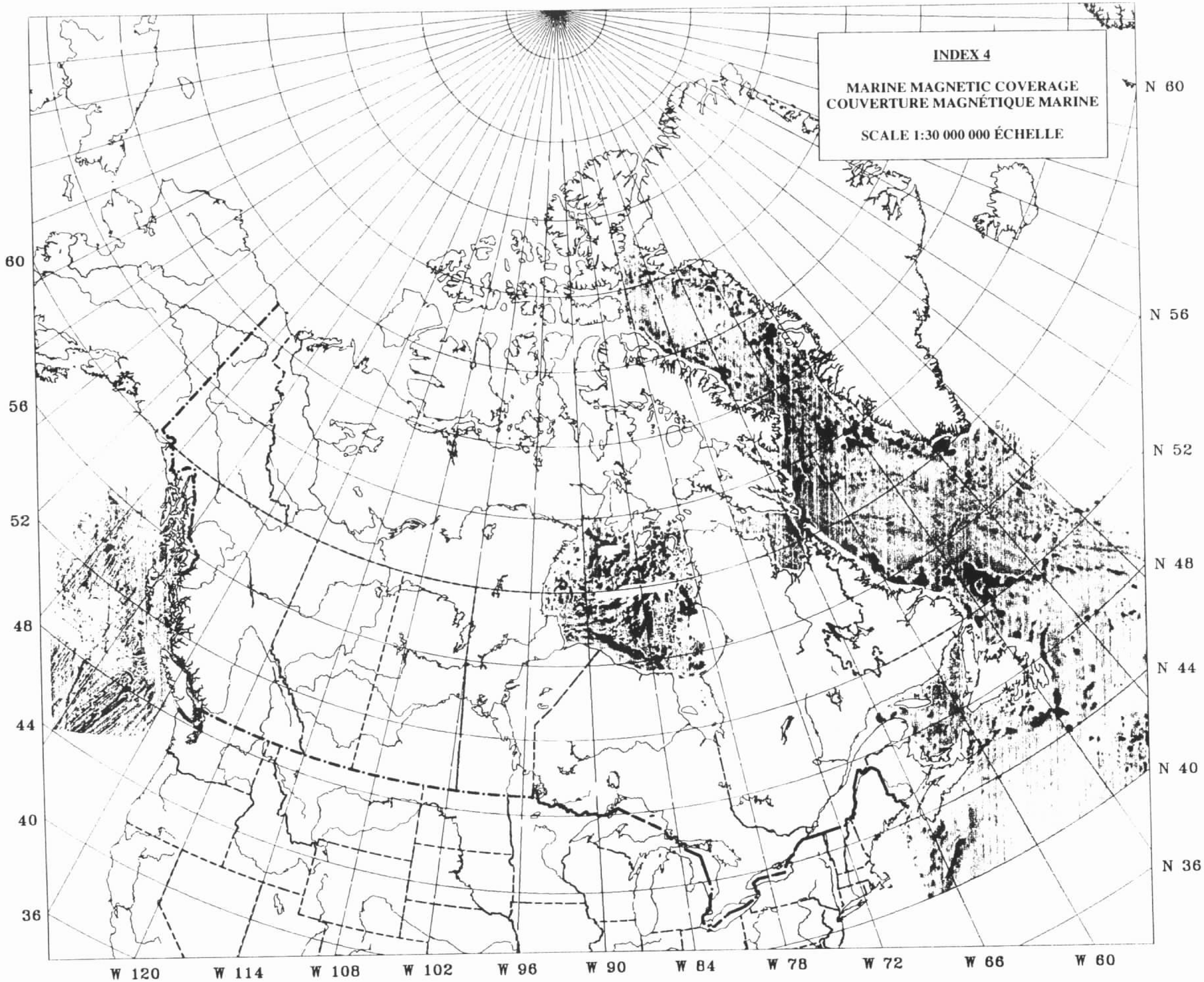
1. Latitude, longitude, magnetic value — **$0.01/line km**

2. Latitude, longitude, magnetic values, radar, barometric altitude, plus where recorded: electronic navigation, VLF-EM, vertical gradient magnetics — **$0.03/line km**

Grid data: Magnetic values

Grid cell size	Price per 100 km
800 m	**$0.0625**
400 m	**$0.25**
200 m	**$1.00**

plus gridding charge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OFFSHORE AND MARINE COVERAGE (Map Index 4)

Continental Margin of Eastern Canada

This data set was compiled by the Atlantic Geoscience Centre under GSC Open File 1504. The original shipborne track records are available as well as grid values derived from edited and levelled data.

Shipborne track records **$100**

Hudson Bay

Data from shipborne surveys (1975 to 1978) were compiled as one data set and released in 1982. The sensor was towed 200 m behind the ship; corrections were applied to compensate for geomagnetic field disturbances.

Combined marine and aeromagnetic observations are available as part of the national 2 km grid.

$0.01/line km

West coast

Shipborne data (1972-1985) extending from the Strait of Juan de Fuca to Queen Charlotte Islands and westward 200 nautical miles are available as track records.

The national 2 km grid incorporates other data and extends further westward, as indicated on Map Index 4.

$0.01/line km

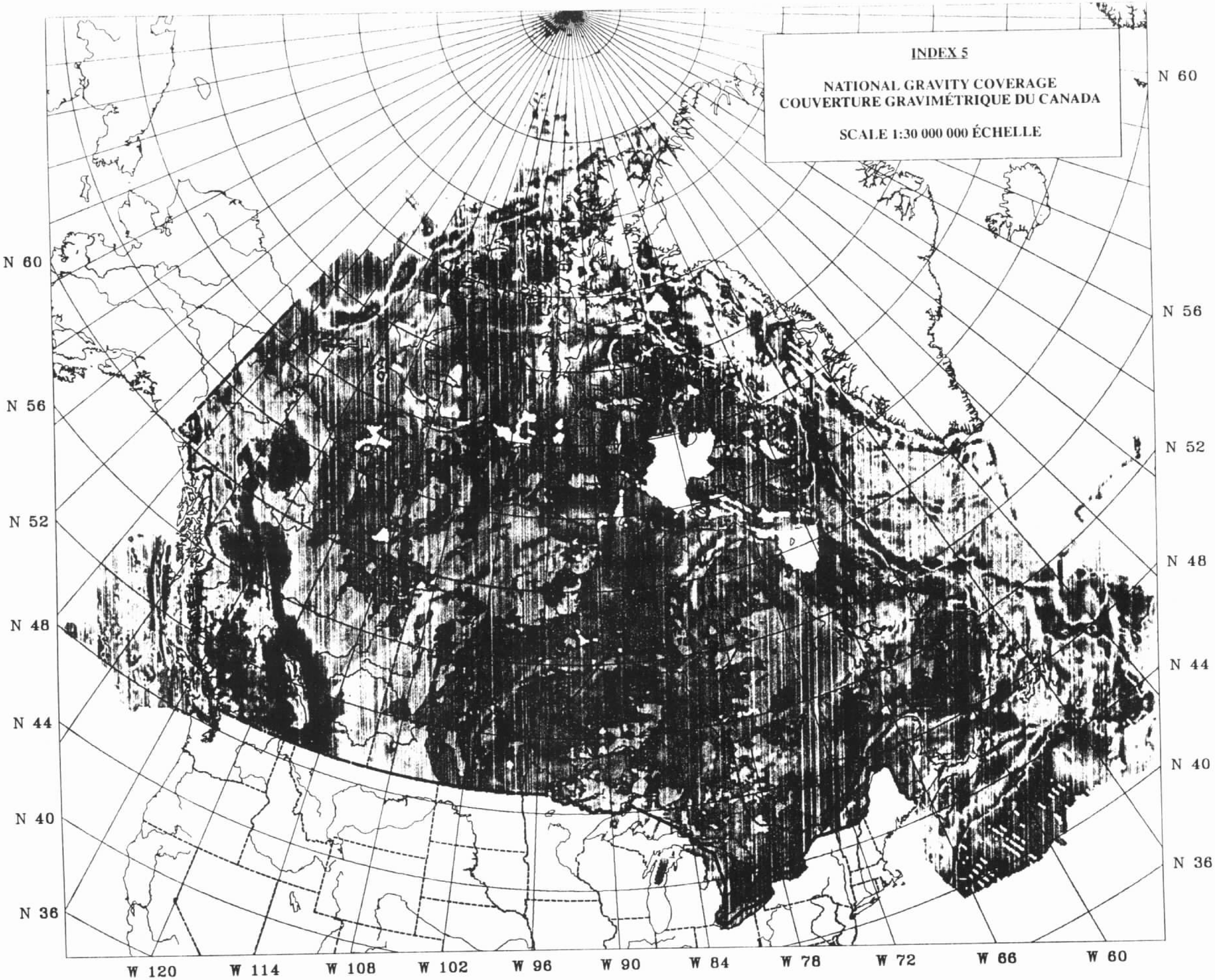
INTERNATIONAL COVERAGE

The Canadian International Development Agency (**CIDA**) has sponsored analogue and digital aeromagnetic surveys in several countries. In certain cases the digital data are stored at the GDC, while in other instances the host country holds these records. Often the permission of the host country is required before the data can be released.

The following table provides basic information about each survey, and whether or not the digital data are available from the Geophysical Data Centre.

LIST OF CIDA AEROMAGNETIC SURVEYS

Country	Type of Survey	Year Flown	Line Km	Digital
Brazil	Aeromagnetic/ Radiometric	1974-81	284,117	-
Cameroon	Aeromagnetic	1970-71	239,732	Yes
Guyana	Aeromagnetic	1971-72	121,600	-
Ivory Coast	Aeromagnetic/ Radiometric	1973-76	473,000	Yes
Kenya	Aeromagnetic/ Radiometric	1977-78	39,000	-
	Aeromagnetic/ Airborne EM (INPUT)	1978	>5,000	-
Mali	Aeromagnetic	1976-80	30,780	-
Niger	Aeromagnetic/ Radiometric	1970-74	162,135	-
Pakistan	Aeromagnetic	1976-78	123,840	Yes
Rwanda	Aeromagnetic/ Radiometric	1981-83	25,039	Yes
Thailand	Aeromagnetic/ Radiometric/ Helicopter EM	1984-88	444,000	-
Upper Volta	Aeromagnetic/ Radiometric	1972-73	111,500	-
	Aeromagnetic	1976-80	170,800	Yes
Zimbabwe	Aeromagnetic	1983-84	103,192	Yes
	Aeromagnetic/ Airborne EM (INPUT)	1983	19,295	Yes
	Aeromagnetic	1988-90	158,006	Yes
	Aeromagnetic	1990-91	149,745	Yes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NATIONAL COVERAGE (Map Index 5)

The adjacent map indicates the current (1994) gravity coverage of Canada.

The entire data set is available as a 5 km grid which is updated annually to reflect recent data acquisition. Data types available include:

observed gravity
free air anomaly
Bouguer anomaly
isostatic anomaly
horizontal gradient of Bouguer anomaly
vertical gradient of Bouguer anomaly.

Digital data	**$50**
Plot at 1:5 000 000	**$50**

The **National Gravity Data Base** contains:

Point measurements

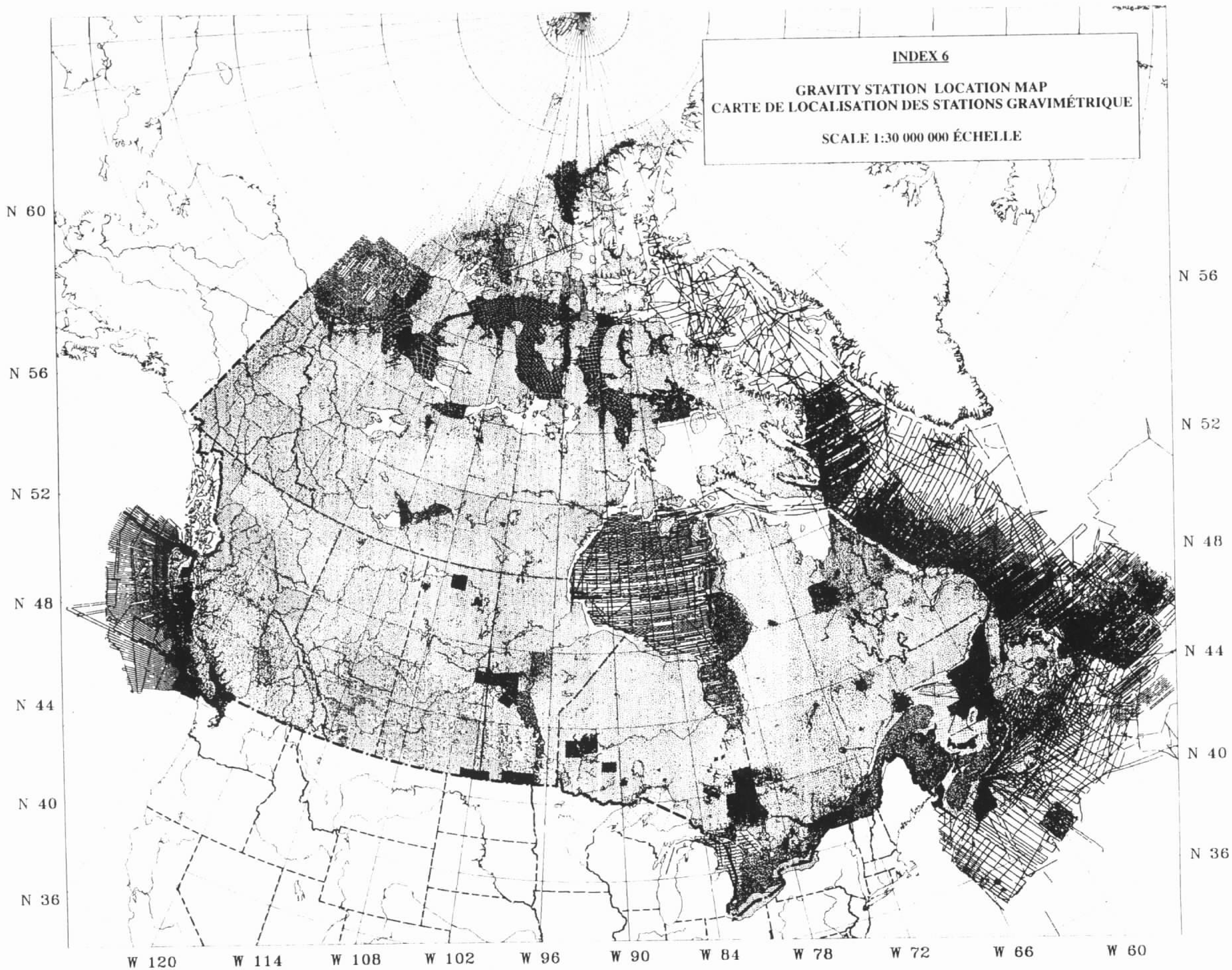
- more than 665,000 systematically distributed

Anomalies

- computed free air and Bouguer, as well as principal facts used for those computations

Control stations

- information about 5500 gravity reference locations.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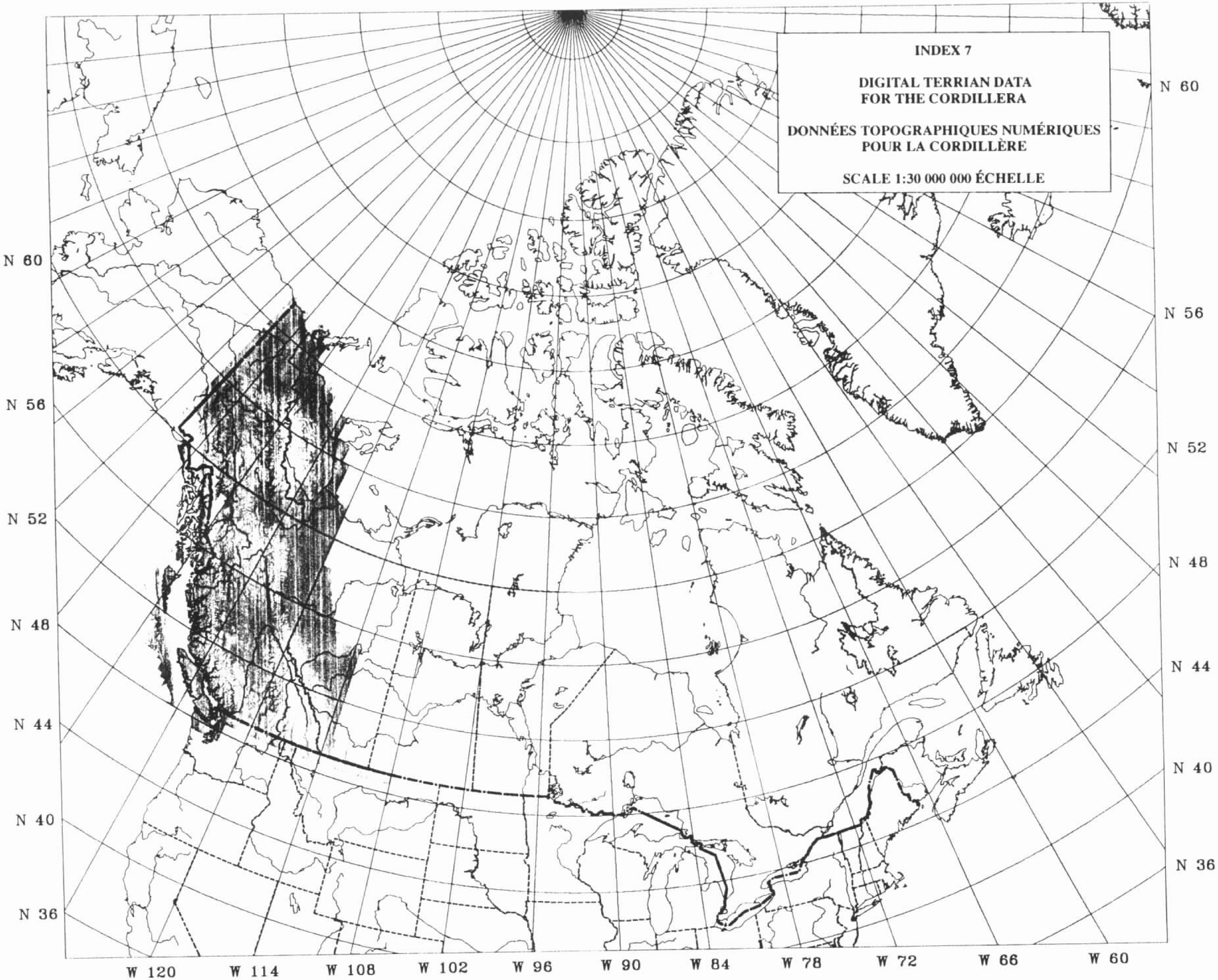
Gravity Point Measurements

Data are stored by degree square and are usually retrieved in rectangular areas, defined by latitude and longitude boundaries. Other methods of retrieval such as user-defined polygons, are also available. Options include data selectivity and user-specified reductions. The **Station Location Map** (Map Index 6) shows the distribution of gravity readings across Canada.

$0.01/point

The existing gravity Coverage of Canada is available as a two-part data set that is updated annually. It comprises:

> **Eastern wholefile** which covers the east coast offshore regions. These data correspond to the dynamic gravity surveys conducted by and in collaboration with the Atlantic Geoscience Centre.
>
> **$150**
>
> **Western wholefile** which covers the Canadian landmass, the Arctic islands and channels, Hudson Bay, the Great Lakes, and the west coast offshore. It contains all land, underwater, ice and remaining dynamic gravity surveys.
>
> **$150**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Gravity Anomalies - Gridded Data

Custom grids are generated to user specifications to fit a particular map base, map projection, or ellipsoid model. All the options itemized under Customized Plots, are available.

Gravity Control Stations

Principal facts are available for approximately 5500 control stations. These can be accessed by latitude/longitude coordinates or city name, and listed alphabetically or by station number. A printed summary is available for approximately 1700 relocatable stations in Canada; it includes a written description, a sketch and two photographs.

$0.10/station
$2.50/description

Related Gravity Information

Computed Gravity Values can be interpolated for specific locations where sufficient anomaly data are available in the immediate vicinity. The accuracy of the computed value varies depending on the latitude correction, the vertical correction and the surrounding geology.

$10/g-value

Earth Tide Corrections calculated according to Longman's formulae (1959), at 10 minute intervals, are available. Users must specify a central latitude and longitude for the survey area, and a date range.

$0.10/day

Digital Terrain Data for the Cordillera and adjacent offshore areas consist of elevations and water depths at approximately 1 km intervals (Map Index 7 shows coverage). Data are disseminated by quadrangle, as defined by the NTS 1:50 000 map sheet boundaries. Approximately 1000 elevations/depths are available per quadrangle; there are some 2800 quadrangles in the complete file.

$0.50/quadrangle
$150/complete file

A number of standard, colour map products have been prepared and are plotted upon request. These are generic rather than custom maps; scale and presentation of the maps are fixed, not optional. Below is a list of the current products; notice of new releases will be given in the GSC Information Circular.

Aeromagnetic

BC and Yukon	Residual Magnetics + Shaded Relief of Topography	1:2 000 000
Canada	Shaded Relief of Residual Magnetics	1:5 000 000
Eastern Canada	Shaded Relief of Residual Magnetics	1:2 000 000
Labrador	Shaded Relief of Residual Magnetics	1:1 000 000
Manitoba	Shaded Relief of Residual Magnetics	1:1 000 000
Manitoba	As above	1:2 000 000
NWT	Shaded Relief of Residual Magnetics	1:2 000 000
Ontario	Shaded Relief of Residual Magnetics	1:2 000 000
Quebec	Shaded Relief of Residual Magnetics	1:2 000 000
Saskatchewan	Shaded Relief of Residual Magnetics	1:1 000 000
Saskatchewan	As above	1:2 000 000
Western Basin	Shaded Relief of Residual Magnetics	1:2 000 000

Gravity

BC and Yukon	Vertical Gradient of Bouguer	1:2 000 000
Canada	Bouguer on land, free air offshore	1:5 000 000
Eastern Canada	Bouguer on land, free air offshore	1:2 000 000
Labrador	Bouguer on land, free air offshore	1:1 000 000
Labrador	Vertical Gradient of Bouguer	1:1 000 000
Manitoba	Bouguer anomaly	1:1 000 000
Manitoba	As above	1:2 000 000
NWT	Bouguer anomaly	1:2 000 000
Ontario	Bouguer anomaly	1:2 000 000
Ontario	Vertical Gradient of Bouguer	1:2 000 000
Quebec	Bouguer anomaly	1:2 000 000
Quebec	Vertical Gradient of Bouguer	1:2 000 000
Saskatchewan	Bouguer anomaly	1:1 000 000
Saskatchewan	As above	1:2 000 000
Western Basin	Vertical Gradient of Bouguer	1:2 000 000

$50 each

DIGITAL DATA

Data services include preparation of digital data in various formats to accommodate commercial software packages, data processing to user specifications, monochrome and colour plots.

Digital data are available in:

* ASCII	* UNIX binary	* DOS binary

and in a **format** suitable for input to:

* GEOSOFT	* GEOPAK	* VISION
* ARCINFO	* SPANS	* CorelDraw
* PCI EASI\PACE		

Media types include:

* 8 mm cassette	* 9 track tape	* 5.25" floppy
* CD - ROM	* 3.5" diskette	* ¼" 150Mb cartridge
* INTERNET	*Trakker 250 Mb tape	

All digital data disseminated through the Geophysical Data Centre are for the SOLE USE of the client and not for redistribution in any form.

CUSTOMIZED PLOTS

Maps are customized to user specifications, including scale, base map and projection. A maximum plot width of 44" (size E) can be accommodated on either paper or mylar. User options include:

- line contours (intervals, labels, line widths)
- latitude/longitude grids
- topographic/hydrographic features
- posted data locations and values
- colour and/or shaded relief

Several map projections are available, including these standards:
- UTM
- Lambert Conformal
- Mercator
- polar stereographic
- polyconic

Prices for digital data are described under the pertinent sections of this catalogue. The following is a list of charges for related products and services.

Custom gridding	Price on request
Merging	Price on request
Datum (level) adjustments	Price on request

Digital media

9-track tapes	$ 30 each
CD-ROM	$ 30 each
8 mm cassette	$ 30 each
150 Mb cartridge	$ 30 each
Trakker 250 Mb	$ 30 each
3.5" diskettes	$ 5 each
5.25" floppy	$ 5 each

Handling	$ 25/request
Shipping	Billed directly

Custom Plots (exclusive of data costs)

Black & white		Colour or shaded relief	
Posted data	$ 50	36"	$200
Line contours		- additional copies	$ 50
36"	$100	44"	$300
44"	$150	- additional copies	$ 75
- additional copies	$ 50		

Pricing Example

Requested: 30 map sheets (1:50 000) of digitized data gridded at 800 m. Colour plots and digital data are final products.

Data: 30 sheets @ $0.50	$ 15.00
Gridding	$ 75.00
Colour plot (36")	$200.00
- second copy	$ 50.00
Exabyte tape	$ 30.00
Handling	$ 25.00
Taxes and shipping as applicable	

SOURCES OF RELATED INFORMATION

GSC Bookstore 601 Booth Street Ottawa, Ontario K1A 0E8 Tel: (613) 995-4342 Fax: (163) 943-0646	Printed maps Geological reports Information Circular
D.J. Teskey 1 Observatory Crescent Ottawa, Ontario K1A 0Y3 (613) 992-9763	Aeromagnetic Surveys
D.B. Hearty 1 Observatory Crescent Ottawa, Ontario K1A 0Y3 (613) 995-5536	Gravity Surveys
R.L. Coles 1 Observatory Crescent Ottawa, Ontario K1A 0Y3 (613) 837-4561	Geomagnetic Field
Geomatics Canada 130 Bentley Avenue Ottawa, Ontario K1A 0E9 (613) 952-7000	Topographic Maps

APPENDIX A
DIGITALLY FLOWN AEROMAGNETIC SURVEYS
PARAMETERS AND LOCATION

Project No.	Project Name Sub-Area Name	Year Flown	Survey Type	Altitude	Line Spacing	Line Direction	Survey Km	General Location			
								South Lat.	North Lat.	East Long.	West Long.
ALBERTA											
19700	SOUTHERN BC/ALBERTA	1987-88	TF				53 548				
19707	Area 3A	1987-88	TF	3200 mBAR	1500 m	E, W	12 681	49°00'	50°30'	113°40'	116°30'
19708	Area 3B	1987-88	TF	305 mMTC	1500 m	E, W	14 184	49°00'	50°30'	112°00'	114°25'
21300	SOUTHERN ALBERTA (I)*	1990	TF				86 400				
21301	6000 ft block	1990	TF	1830 mBAR	1600 m	E, W	16 900	53°00'	54°00'	116°00'	119°30'
21302	4500 ft block	1990	TF	1372 mBAR	1600 m	E, W	28 500	52°00'	54°00'	113°00'	117°30'
21303	3300 ft block	1990	TF	1006 mBAR	1600 m	E, W	41 000	52°00'	54°00'	110°00'	115°00'
21800	SOUTHERN ALBERTA (II)*	1991	TF				73202				
21801	8500 ft block 1	1991	TF	2591 mBAR	1600 m	NE, SW	10 571	54°07'	55°33'	120°30'	122°40'
21802	10 500 ft block 2	1991	TF	3201 mBAR	1600 m	NE, SW	16 634	54°00'	55°00'	118°00'	122°00'
21803	3700 ft block 3	1991	TF	1128 mBAR	1600 m	E, W	12 975	54°30'	55°15'	116°45'	119°45'
21804	4800 ft block 4	1991	TF	1463 mBAR	1600 m	E, W	16 569	54°00'	55°07'	115°00'	118°45'
21805	3800 ft block 5	1991	TF	1159 mBAR	1600 m	E, W	16 453	54°00'	55°40'	114°00'	116°00'
22500	CYPRESS HILLS	1992	TF	150 mMTC	800 m	E, W	33 940	49°00'	50°00'	110°00'	113°00'

*Data may be subject to release restrictions.

Project No.	Project Name Sub-Area Name	Year Flown	Survey Type	Altitude	Line Spacing	Line Direction	Survey Km	General Location			
								South Lat.	North Lat.	East Long.	West Long.
22700	SOUTHERN ALBERTA (III)*	1992	TF				85 118				
22701	Block 1 - 3813 mBAR	1992	TF	3813 mBAR	1609 m	NE/SW	68 307	50°30'	54°00'	114°30'	121°45'
22702	Block 2 - 1830 mBAR	1992	TF	1830 mBAR	1609 m	E, W	9 380	50°30'	52°00'	114°00'	115°15'
22703	Block 3 - 2135 mBAR	1992	TF	2135 mBAR	1609 m	NE/SW	7 431	55°30'	56°43'	121°30'	123°08'
BRITISH COLUMBIA											
10100	ALBERNI	1984	TF	1524 mBAR	1000 m	E, W	5 740	49°00'	49°30'	124°02'	126°13'
15000	SOUTHERN VANCOUVER IS.	1976	TF				15 198				
15001	Vancouver Island	1976	TF	1370 mBAR	1200 m	N, S	5 736	48°21'	49°00'	123°42'	125°39'
15002	Cowichan Lake	1976	TF	1675 mBAR	1200 m	E, W	1 379	48°51'	49°00'	123°42'	124°30'
15003	Strait Juan de Fuca	1976	TF	300 mBAR	1200 m	N, S	2 907	48°06'	48°37'	123°17'	124°44'
15004	Nanaimo Gulf Islands	1976	TF	760 mBAR	1200 m	N, S	2 743	48°20'	49°14'	123°15'	124°00'
15005	San Juan Islands	1976	TF	300 mBAR	1200 m	N, S	1 579	48°25'	48°51'	122°45'	123°15'
19000	PRINCE RUPERT	1988	TF	2896 mBAR	2000 m	E, W	5 162	53°45'	54°00'	127°00'	130°30'
19100	QUEEN CHARLOTTE IS.	1985	TF	610 mMTC	2000 m	E, W	35 730	51°45'	54°45'	130°30'	134°30'

*Data may be subject to release restrictions.

Project No.	Project Name Sub-Area Name	Year Flown	Survey Type	Altitude	Line Spacing	Line Direction	Survey Km	General Location			
								South Lat.	North Lat.	East Long.	West Long.
19700	SOUTHERN BC/ALBERTA	1987-88	TF				53 548				
19701	Area 1A	1987-88	TF	2286 mBAR	1000 m	E, W	4 641	53°15'	53°45'	121°00'	122°00'
19702	Area 1B	1987-88	TF	2743 mBAR	1000 m	E, W	2 466	53°00'	53°15'	121°00'	122°00'
19703	Area 1C	1987-88	TF	3048 mBAR	1000 m	E, W	4 688	52°30'	53°00'	120°30'	121°30'
19704	Area 2A	1987-88	TF	305 mMTC	1000 m	E, W	5 646	51°20'	52°00'	121°30'	122°30'
19705	Area 2B	1987-88	TF	2439 mBAR	1000 m	E, W	6 263	51°00'	51°30'	121°30'	123°30'
19706	Area 2C	1987-88	TF	3566 mBAR	1000 m	E, W	2 979	51°00'	51°15'	122°20'	123°30'
19707	Area 3A	1987-88	TF	3200 mBAR	1500 m	E, W	12 681	49°00'	50°30'	113°40'	116°30'
19900	TERRACE	1989	TF	2895 mBAR	2000 m	E, W	18 360	54°00'	55°15'	127°30'	130°39'
20100	VANCOUVER IS./BC	1986	TF				37 678				
20101	Area A	1986	TF	2440 mBAR	1500 m	E, W	5 226	50°40'	51°15'	125°30'	127°45'
20102	Area B	1986	TF	2440 mBAR	1500 m	E, W	6 094	49°26'	50°00'	125°20'	127°20'
20103	Area C	1986	TF	1830 mBAR	1500 m	E, W	1 379	49°15'	49°26'	125°30'	126°35'
20104	Area D	1986	TF	2590 mBAR	1500 m	E, W	4 089	49°25'	49°45'	122°00'	123°45'
20105	Area E	1986	TF	760 mBAR	1500 m	E, W	20 890	48°45'	51°00'	122°00'	128°00'
22700	SOUTHERN ALBERTA (III)*	1992	TF				85 118				
22701	Block 1 - 3813 mBAR	1992	TF	3813 mBAR	1609 m	NE/SW	68 307	50°30'	54°00'	114°30'	121°45'

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Project No.	Project Name Sub-Area Name	Year Flown	Survey Type	Altitude	Line Spacing	Line Direction	Survey Km	General Location			
								South Lat.	North Lat.	East Long.	West Long.
25300	BC 1993/94*	1993-94	TF				110 200				
25301	Area A: Williams Lake	1993-94	TF	305 mMTC	800 m	E, W	82 700	51°00'	53°15'	122°00'	126°00'
25302	Area B: Ft. Nelson North	1993	TF	1370 mBAR	1609 m	NE, SW	3 600	59°00'	60°00'	124°00'	125°30'
25303	Area B: Ft. Nelson South	1993	TF	1830 mBAR	1609 m	NE, SW	4 800	57°30'	59°05'	122°30'	124°30'
25304	Area C: Cranbrook	1993-94	TF	305 mMTC	800 m	NE, SW	19 100	50°00'	51°45'	116°30'	118°00'
MANITOBA											
10500	BARRINGTON LAKE	1983	TF VG VLF	150 mMTC	300 m	N, S	5 716	56°45'	57°00'	100°00'	100°45'
11700	CORMORANT	1981	TF VG VLF	150 mMTC	300 m	N, S	7 892	54°22'	54°45'	100°30'	101°15'
12300	FLIN FLON	1980	TF VG VLF	150 mMTC	300 m	N, S	9 096	54°22'	55°00'	101°15'	101°45'
13300	KASMERE LAKE	1977	TF VG	152 mMTC	300 m	SE, NW	5 964	59°11'	59°47'	100°40'	101°55'
13800	LYNN LAKE	1982	VG VLF	150 mMTC	300 m	N, S	3 852	56°37'	57°00'	100°45'	101°08'
14000	MCCLARTY LAKE	1982	VG VLF	150 mMTC	300 m	E, W	11 737	54°22'	54°45'	99°30'	100°45'
14500	PINAWA (RA-3)	1980	TF VG	150 mMTC	100 m	N, S	300	50°13'	50°17'	95°50'	95°54'
14800	SHERRIDON/HEMING LAKE	1981	TF VG VLF	150 mMTC	300 m	N, S	3 863	54°45'	55°15'	101°00'	101°15'
16100	WHITESHELL	1978	TF VG	152 mMTC	300 m	N, S	2 325	50°09'	50°24'	95°40'	96°03'

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Project No.	Project Name Sub-Area Name	Year Flown	Survey Type	Altitude	Line Spacing	Line Direction	Survey Km	General Location			
								South Lat.	North Lat.	East Long.	West Long.
16200	W.N.R.E.	1978	TF VG	152 mMTC	150 m	N, S	766	50°09'	50°12'	95°58'	96°05'
17000	FLIN FLON/SHERRIDON	1985-86	TF VG VLF				35 847				
17001	Area 100	1985-86	TF VG VLF	150 mMTC	300 m	E, W	26 581	54°00'	55°00'	101°15'	103°00'
17002	Area 200	1985-86	TF VG VLF	150 mMTC	300 m	E, W	5 510	54°57'	55°15'	100°15'	101°00'
17003	Area 201	1985-86	TF VG VLF	150 mMTC	300 m	E, W	1 378	54°45'	55°00'	100°45'	101°00'
17004	Area 300	1985-86	TF VG VLF	150 mMTC	300 m	E, W	2 378	54°15'	54°23'	100°00'	100°45'
17900	LYNN LAKE (TIME-DOMAIN)	1988	TF TD-EM	120 mMTC	200 m	NW, SE	4 907	56°45'	57°00'	101°12'	102°00'
18100	MANITOBA (FLIN FLON)	1986	TF VG VLF				19 129				
18101	Area 100-Moose Lake	1986	TF VG VLF	150 mMTC	300 m	E, W	5 654	54°00'	54°15'	100°00'	100°45'
18102	Area 200-Hargrave R.	1986	TF VG VLF	150 mMTC	300 m	E, W	8 200	54°22'	54°45'	98°45'	99°30'
18103	Area 300-Bissett	1986	TF VG VLF	150 mMTC	300 m	N, S	5 275	50°52'	51°15'	95°30'	96°00'

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Project No.	Project Name Sub-Area Name	Year Flown	Survey Type	Altitude	Line Spacing	Line Direction	Survey Km	General Location			
								South Lat.	North Lat.	East Long.	West Long.
18200	MAN/SASK LYNN LAKE	1985	TF VG VLF				15 285				
18201	Lynn Lake Area 100	1985	TF VG VLF	150 mMTC	300 m	N, S	5 267	56°30'	56°52'	101°07'	102°00'
18202	Leaf Rapids Area 200	1985	TF VG VLF	150 mMTC	300 m	N, S	5 239	56°15'	56°38'	99°00'	99°45'
19600	SNOW LAKE	1988	TF VG VLF	150 mMTC	300 m	E, W	8 180	54°45'	55°00'	99°30'	100°45'
22000	SASK/MAN (I)	1991	TF				51 250				
22002	DUCK MOUNTAIN, MAN.	1991	TF	150 mMTC	800 m	E, W	13 780	51°30'	53°00'	100°30'	101°40'
23100	SASK/MAN (II): DAUPHIN	1992	TF	150 mMTC	800 m	E, W	15 260	50°45'	51°30'	99°30'	101°30'
23300	TALBOT L./CLEARWATER L.	1991-92	TF VG VLF				13 800				
23301	Talbot Lake	1991-92	TF VG VLF	150 mMTC	300 m	NW, SE	10 975	54°00'	54°23'	99°00'	100°00'
23302	Clearwater Lake	1991-92	TF VG VLF	150 mMTC	300 m	E, W	2 825	54°11'	54°23'	100°45'	101°15'
25200	SASK/MAN (III)	1993	TF				36 796				
25202	SASK/MAN III: Riding Mt.	1993	TF	150 mMTC	800 m	E, W	13 799	50°00'	50°45'	99°00'	101°30'
25400	SASK/MAN (IV)*	1994	TF				116 837				
25402	SASK/MAN IV: Virden	1994	TF	150 mMTC	800 m	E, W	36,225	49°00'	50°00'	98°00'	101°00'

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Project No.	Project Name Sub-Area Name	Year Flown	Survey Type	Altitude	Line Spacing	Line Direction	Survey Km	General Location South Lat.	North Lat.	East Long.	West Long.
NEW BRUNSWICK											
11800	DALHOUSIE (BATHURST)	1972-73	TF				18 780				
11801	Area 1 (457 mBAR)	1972-73	TF	457 mBAR	300 m	N, S	3 828	47°00'	47°45'	65°45'	66°00'
11802	Area 2 (762 mBAR)	1972-73	TF	762 mBAR	300 m	N, S	7 476	46°45'	47°45'	66°00'	66°23'
11803	Area 3 (914 mBAR)	1972-73	TF	914 mBAR	300 m	N, S	7 476	46°45'	47°45'	66°22'	66°45'
16900	DALHOUSIE/HEATH STEELE	1985	TF VG VLF	150 mMTC	300 m	N, S	14 300	47°15'	48°08'	65°45'	66°30'
17100	FLORENCEVILLE	1988	TF VG VLF	150 mMTC	300 m	E, W	10 322	46°07'	46°45'	67°00'	67°38'
18500	NEW BRUNSWICK BATHURST	1986-87	TF VG VLF	150 mMTC	300 m	N, S	17 985	47°00'	47°45'	66°15'	67°00'
19300	SAINT JOHN	1987	TF VG VLF	150 mMTC	300 m	NW, SE	13 524	45°03'	45°48'	65°45'	66°30'
20000	TOBIQUE RIVER	1985	TF VG VLF	150 mMTC	300 m	E, W	13 202	46°45'	47°15'	66°45'	67°348'
22300	MAGAGUADAVIC LAKE	1991	TF VG VLF	150 mMTC	300 m	NE, SW	10 600	45°30'	46°00'	66°45'	67°30'
NEWFOUNDLAND											
10900	BUCHANS	1983	TF VG VLF	150 mMTC	300 m	E, W	8 071	48°45'	49°00'	56°00'	57°00'
17500	GRAND BANKS	1987	TF	395 mMTC	4000 m	E, W	37 304	44°15'	46°30'	48°30'	55°00'

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Project No.	Project Name Sub-Area Name	Year Flown	Survey Type	Altitude	Line Spacing	Line Direction	Survey Km	General Location			
								South Lat.	North Lat.	East Long.	West Long.
20300	YARMOUTH 1989/90	1989	TF VG VLF	150 mMTC	300 m	NW, SE	30 000	43°22'	44°15'	65°00'	66°15'
22100	CAPE BRETON ISLAND	1991	TF VG VLF	150 mMTC	300 m	SE, NW	7 170	46°15'	46°41'	60°24'	61°18'
NORTHWEST TERRITORIES											
11900	DARNLEY BAY	1973	TF	610 mBAR	2000 m	N, S	4 023	68°40'	69°47'	122°45'	124°37'
15400	TATHLINA LAKE	1969-71	TF				18 830				
15401	762 mBAR Area	1969-71	TF	762 mBAR	300 m	N, S	12 552	60°00'	60°30'	116°00'	117°00'
15402	1219 mBAR Area	1969-71	TF	1219 mBAR	300 m	N, S	6 278	60°00'	60°15'	117°00'	118°00'
16600	BAFFIN ISLAND	1984	TF				64 048				
16601	305m MTC Block	1984	TF	305 mMTC	1000 m	N, S	56 404	72°00'	73°54'	80°00'	90°06'
16602	1524 mBAR Block	1984	TF	1524 mBAR	1500 m	N, S	5 746	73°00'	73°46'	80°52'	83°30'
16603	1828 mBAR Block	1984	TF	1829 mBAR	1500 m	N, S	1 898	73°00'	73°46'	80°00'	80°53'
16800	BEAUFORT SEA AND YUKON	1985	TF				82 000				
16801	Yukon (2km N-S)	1985	TF	1829 mBAR	2000 m	N, S	15 238	68°00'	69°40'	135°00'	141°00'
16802	Beaufort (6km NE-SW)	1985	TF	305 mBAR	6000 m	NE, SW	9 753	71°00'	72°00'	132°00'	142°00'
16803	Beaufort (2km NE-SW)	1985	TF	305 mBAR	2000 m	NE, SW	31 902	68°45'	71°00'	132°00'	142°00'
16804	Beaufort (2km NW-SE)	1985	TF	305 mBAR	2000 m	NW, SE	25 127	69°15'	72°00'	126°00'	135°00'
20200	WHITEHILLS	1988	TF VG VLF	150 mMTC	300 m	NW, SE	6 855	64°30'	65°05'	95°45'	96°30'

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								South Lat.	North Lat.	East Long.	West Long.
21000	LINCOLN SEA (1988/91)	1988-91	TF	305 mBAR	4000 m	N, S	24 000	81°48'	84°25'	43°20'	72°00'
ONTARIO											
10800	BOWMANVILLE	1978	TF VG				1029				
10801	Bowmanville	1978	TF VG	150 mMTC	200 m	NW, SE	917	43°51'	43°58'	78°37'	78°47'
10802	Bowmanville profiles	1978	TF VG	150 mMTC	PROF.	E, W	112	43°51'	43°58'	78°37'	78°47'
11100	CAMP BORDEN	1986	TF	300 mMTC	762 m	E, W	546	44°13'	44°21'	79°50'	80°01'
11300	CARLETON PLACE	1975	TF VG	150 mMTC	300 m	E, W	3 880	45°00'	45°15'	76°00'	76°30'
11400	CAVIAR LAKE (RA-8)	1981	TF VG VLF	150 mMTC	300 m	N, S	3 858	49°15'	49°30'	93°25'	93°50'
11500	CHALK RIVER	1979	TF VG	150 mMTC	150 m	N, S	821	46°00'	46°05'	77°22'	77°29'
11600	CHATS FALLS	1977	TF VG	150 mMTC	150 m	N, S	1 995	45°22'	45°36'	76°07'	76°19'
12100	EAST BULL LAKE (RA-7)	1981	TF VG VLF	150 mMTC	300 m	N, S	1 831	46°20'	46°30'	82°05'	82°20'
12200	ERIE, LAKE	1984-85	TF	300 mMTC	1860 m	E, W	18 993	41°22'	42°52'	78°50'	83°30'
12500	GEORGIAN BAY	1985	TF	300 mMTC	1200 m	N, S	21 842	44°30'	46°00'	80°00'	82°00'
12600	GRIMSTHORPE	1976	TF VG	150 mMTC	300 m	E, W	1 190	44°39'	44°45'	77°22'	77°45'
12900	HURON, LAKE	1986	TF	300 mMTC	1900 m	E, W	37 500	42°59'	46°11'	81°15'	85°00'
13100	JELLICOE	1971	TF	305 mMTC	305 m	N, S	16 328	49°07'	50°00'	86°30'	88°08'
13500	KILLALA LAKE	1978	TF VG	152 mMTC	300 m	N, S	611	49°07'	49°13'	86°23'	86°33'
13600	KIRKLAND LAKE	1972	TF	305 mMTC	305 m	N, S	11 268	48°00'	48°45'	79°30'	80°15'

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								South Lat.	North Lat.	East Long.	West Long.
17700	LAURENTIAN CHANNEL	1985	TF				85 853				
17701	Area 100	1985	TF	305 mBAR	1000 m	N, S	15 921				
17702	Area 200	1985	TF	305 mBAR	1000 m	E, W	34 647	46°30'	47°40'	53°00'	60°00'
17703	Area 300	1985	TF	305 mBAR	2000 m	E, W	21 267	46°00'	47°15'	55°00'	60°00'
17704	Area 400	1985	TF	305 mBAR	4000 m	N, S	14 018	45°00'	46°00'	55°00'	60°00'
18700	ORPHAN KNOLL	1985	TF				28 119				
18701	Inner Area:	1985	TF	305 mBAR	3000 m	NE, SW	16 087	45°10'	51°55'	44°20'	52°53'
18702	Outer area:	1985	TF	305 mBAR	30 km	NE, SW	12 032	46°55'	54°40'	37°20'	47°20'
19200	RED INDIAN LAKE	1984-85	TF VG VLF	150 mMTC	300 m	E, W	14 000	48°15'	48°45'	56°00'	57°30'
19800	SPRINGDALE	1986-87	TF VG VLF	150 mMTC	300 m	E, W	18 686	49°00'	49°45'	55°30'	56°30'
NOVA SCOTIA											
10200	ANTIGONISH	1977-78	TF VG	152 mMTC	300 m	N, S	8 973	45°22'	45°54'	61°52'	62°38'
11200	CAPE BRETON ISLAND	1980	TF VG	609 mBAR	400 m	E, W	1 626	46°30'	46°38'	60°20'	60°45'
12700	GUYSBOROUGH	1982-83	TF VG VLF	150 mMTC	300 m	N, S	15 150	44°48'	45°23'	61°30'	62°30'
12800	HALIFAX	1976	TF VG				7 103				
12801	Halifax	1976	TF VG	150 mMTC	300 m	N, S	6 741	44°45'	45°08'	63°15'	63°50'
12802	Truro profiles	1976	TF VG	150 mMTC	1000 m	N, S	362	45°18'	45°46'	63°13'	63°32'

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15200	ST. MARY'S RIVER	1970	TF	458 mBAR	457 m	N, S	9 085	45°15'	45°30'	61°30'	63°15'
16500	YARMOUTH	1976	TF VG	150 mMTC	300 m	SE, NW	2 727	43°45'	44°08'	65°47'	66°09'
17400	GEORGES BANK	1982	TF				80 595				
17401	Area A (N-S)	1982	TF	300 mBAR	2000 m	N, S	54 785	40°30'	44°40'	63°15'	68°00'
17402	Area B (N-S)	1982	TF	300 mBAR	6000 m	N, S	11 650	40°00'	42°30'	64°00'	68°00'
17403	Area C (E-W)	1982	TF	300 mBAR	2000 m	E, W	14 160	43°00'	44°40'	65°00'	67°00'
17700	LAURENTIAN CHANNEL	1985	TF				85 853				
17701	Area 100	1985	TF	305 mBAR	1000 m	N, S	15 921	45°00'	47°00'	59°30'	61°00'
17702	Area 200	1985	TF	305 mBAR	1000 m	E, W	34 647	46°30'	47°40'	53°00'	60°00'
17703	Area 300	1985	TF	305 mBAR	2000 m	E, W	21 267	46°00'	47°15'	55°00'	60°00'
17704	Area 400	1985	TF	305 mBAR	4000 m	N, S	14 018	45°00'	46°00'	55°00'	60°00'
17800	LIVERPOOL	1985	TF VG VLF	150 mMTC	300 m	N, S	14 342	43°45'	44°45'	64°19'	65°00'
18000	MAHONE BAY	1983	TF VG VLF	150 mMTC	300 m	N, S	5 392	44°15'	44°53'	64°15'	64°30'
18400	MUSQUODOBOIT	1985-86	TF VG VLF	150 mMTC	300 m	N, S	16 233	44°37'	45°23'	62°30'	63°23'
18900	PARRSBORO	1986-87	TF VG VLF	150 mMTC	300 m	N, S	17 150	45°17'	45°41'	62°52'	64°57'
19400	SEABRIGHT (CANSO AREA)	1987	TF VG VLF	150 mMTC	200 m	N, S	4 129	45°08'	45°23'	60°57'	61°30'

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18800	PABOS FAULT	1987	TF VG VLF HEM				2 858				
18801	PABOS FAULT	1987	TF VG VLF	150 mMTC	200 m	N, S	2 858	48°11'	48°25'	64°50'	65°05'
18802	PABOS FAULT	1987	FDEM	150 mMTC	200 m	N, S	2 858	48°11'	48°25'	64°50'	65°05'
19500	SHERBROOKE	1984-85	TF VG VLF				5 772				
19501	Sherbrooke	1984-85	TF VG VLF	150 mMTC	300 m	E, W	5 662	45°30'	45°53'	71°00'	71°30'
19502	Sherbrooke Profiles	1984-85	TF VG VLF	150 mMTC	2000 m	E, W	110	45°00'	45°15'	71°45'	72°15'
SASKATCHEWAN											
13000	JAN LAKE	1979	TF VG	150 mMTC	300 m	E, W	5 736	54°45'	55°02'	102°30'	103°10'
13400	KEY LAKE	1977	TF VG	152 mMTC	300 m	SE, NW	860	57°07'	57°17'	105°28'	105°49'
14700	RABBIT LAKE	1977	TF VG	152 mMTC	300 m	SE, NW	756	58°09'	58°20'	103°38'	104°06'
16300	WOLLASTON LAKE 1977	1977	TF VG	152 mMTC	300 m	SE, NW	576	57°58'	58°04'	103°49'	104°10'
16400	WOLLASTON LAKE 1979	1979	TF VG	152 mMTC	300 m	E, W	5 280	58°07'	58°23'	103°30'	104°15'
17000	FLIN FLON/SHERRIDON	1985-86	TF VG VLF				35 847				
17001	Area 100	1985-86	TF VG VLF	150 mMTC	300 m	E, W	26 581	54°00'	55°00'	101°15'	103°00'

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Project No.	Project Name Sub-Area Name	Year Flown	Survey Type	Altitude	Line Spacing	Line Direction	Survey Km	General Location			
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18200	MAN/SASK LYNN LAKE	1985	TF VG VLF				1 528				
18203	Waddy Lake- Area 300	1985	TF VG VLF	150 mMTC	300 m	SE, NW	4 779	56°00'	56°23'	103°22'	104°15'
22000	SASK/MAN (I)*	1991	TF				51 250				
22001	Humboldt, Sask	1991	TF	150 mMTC	800 m	E, W	37 470	52°15'	53°00'	101°37'	106°00'
22600	SHELLBROOK	1991	TF	75 mBAR	250 m	E, W	11 446	52°43'	53°16'	105°56'	106°52'
23000	SASK/MAN (II): QUILL L.*	1992	TF	150 mMTC	800 m	E, W	38 300	51°15'	52°15'	101°30'	106°00'
23200	GRASSBERRY RIVER	1992	TF VG VLF	150 mMTC	300 m	E, W	11 223	54°00'	54°45'	102°30'	103°15'
25200	SASK/MAN (III)	1993	TF				22 997				
25201	SASK/MAN (III): Yorkton	1993	TF	150 mMTC	800 m	E, W	22 997	50°30'	51°45'	101°30'	103°00'
25400	SASK/MAN (IV)*	1994	TF				116 837				
25401	SASK/MAN (IV): Regina	1994	TF	150 mMTC	800 m	E, W	80 612	50°00'	51°45'	103°00'	106°00'
25500	SASK/MAN (V): Saskatoon	1994	TF	150 mMTC	800 m	E, W	22, 834	52°00'	53°00'	106°00'	108°00'

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								South Lat.	North Lat.	East Long.	West Long.
13700	LAKE OF THE WOODS	1984	TF	300 mMTC	926 m	NE, SW	3 194	48°47'	49°23'	94°36'	95°21'
14100	ONTARIO, LAKE	1981-84	TF	300 mMTC	927 m	E, W	26 718	43°10'	44°08'	76°05'	80°00'
14600	PRESCOTT (MORRISBURG)	1979	TF	305 mMTC	805 m	N, S	1 382	44°45'	45°00'	75°00'	75°30'
14900	SIMCOE, LAKE	1985	TF	300 mMTC	643 m	N, S	2 273	44°10'	45°35'	79°08'	79°34'
15100	ST.CLAIR, LAKE	1987	TF	300 mMTC	926 m	E, W	3 734	42°15'	42°45'	82°23'	83°00'
15300	SUPERIOR, LAKE	1987	TF	300 mMTC	1900 m	N, S	56 916	46°25'	48°47'	84°30'	92°07'
15500	THUNDER BAY (ATIKOKAN)	1979	TF VG	150 mMTC	300 m	N, S	3 104	48°45'	49°00'	91°35'	91°55'
15600	TIMMINS	1968-69	TF	305 mMTC	305 m	N, S	8 047	48°22'	48°45'	81°00'	81°45'
15900	WATERLOO	1986	TF	300 mMTC	926 m	E, W	13 237	43°15'	44°30'	80°00'	81°30'
16000	WHITE LAKE	1975					3 460				
16001	152 m, N-S/E-W Grid	1975	TF VG	152 mMTC	300 m	NSEW	1 730	45°15'	45°24'	76°30'	76°39'
16002	305 m, N-S, E-W Grid	1975	TF VG	305 mMTC	300 m	NSEW	1 730	45°15'	45°24'	76°30'	76°39'
16700	BEARDMORE/GERALDTON	1987					16 725				
16701	Beardmore/Geraldton	1987	TF VG VLF	150 mMTC	200 m	N, S	16 615	49°34'	49°51'	86°30'	88°06'
16702	Exploratory Profiles	1987	TF VG VLF	150 mMTC	2000 m	E, W	110	49°07'	49°15'	89°32'	89°41'
17600	KENORA/FORT FRANCES	1987	TF VG VLF	150 mMTC	300 m	N, S	21 288	49°00'	49°47'	93°00'	95°10'

*Data may be subject to release restrictions.

Project No.	Project Name Sub-Area Name	Year Flown	Survey Type	Altitude	Line Spacing	Line Direction	Survey Km	General Location South Lat.	North Lat.	East Long.	West Long.
22400	BLAKE RIVER SYNCLINE	1992	TF TDEM	120 mMTC	200 m	N, S	7 093	48°11'	48°22'	79°31'	80°17'
QUEBEC											
10000	ABITIBI	1971	TF	300 mMTC	300 m	N, S	8 104	49°00'	49°45'	78°07'	78°38'
10400	BARRAUTE	1971	TF	300 mMTC	300 m	N, S	9 298	48°15'	48°45'	77°30'	78°15'
15800	VAL D'OR	1980	TF VG VLF	150 mMTC	300 m	N, S	4 482	48°00'	48°15'	77°30'	78°00'
17200	GASPE	1985	TF VG VLF				11 700				
17201	Gaspe: Area A	1985	TF VG VLF	150 mMTC	300 m	N, S	7 823	48°22'	48°53'	66°30'	67°00'
17202	Gaspe: Area B	1985	TF VG VLF	150 mMTC	300 m	N, S	3 877	49°00'	49°15'	65°30'	66°00'
17300	GASPE BAY	1984	TF VG VLF	150 mMTC	300 m	N, S	10 386	48°37'	49°00'	65°30'	66°30'
18300	MONTS STOKE	1986	TF VG VLF FDEM				2 100				
18301	MONTS STOKE	1986	TF VG VLF	75 mMTC	100 m	SW, NE	2 100	45°29'	45°40'	71°35'	71°50'
18302	MONTS STOKE	1986	FDEM	75 mMTC	100 m	SW, NE	2 100	45°29'	45°40'	71°35'	71°50'

*Data may be subject to release restrictions.

Project No.	Project Name Sub-Area Name	Year Flown	Survey Type	Altitude	Line Spacing	Line Direction	Survey Km	General Location			
								South Lat.	North Lat.	East Long.	West Long.
YUKON											
16800	BEAUFORT SEA AND YUKON	1985	TF				82 000				
16801	Yukon (2 km N-S)	1985	TF	1829 mBAR	2000 m	N, S	15 238	68°00'	69°40'	135°00'	141°00'
16802	Beaufort (6 km NE-SW)	1985	TF	305 mBAR	6000 m	NE, SW	9 753	71°00'	72°00'	132°00'	142°00'
16803	Beaufort (2 km NE-SW)	1985	TF	305 mBAR	2000 m	NE, SW	31 902	68°45'	71°00'	132°00'	142°00'
16804	Beaufort (2 km NW-SE)	1985	TF	305 mBAR	2000 m	NW, SE	25 127	69°15'	72°00'	126°00'	135°00'
18600	NORTHERN YUKON	1988-89	TF				24 840				
18601	Area 1	1988-89	TF	2743 mBAR	2000 m	N, S	15 114	64°30'	65°45'	136°00'	140°00'
18602	Area 2A	1988-89	TF	2134 mBAR	3000 m	E, W	2 418	65°00'	65°30'	138°30'	141°00'
18603	Area 2F	1988-89	TF	2134 mBAR	3000 m	E, W	7 308	67°30'	68°00'	135°00'	141°00'
22200	PORCUPINE RIVER	1990	TF				35 550				
22201	Porcupine R. Area 1	1990	TF	2134 mBAR	3000 m	E, W	29 295	65°30'	67°30'	134°00'	141°00'
22202	Mayo Area 2	1990	TF	305 mMTC	2000 m	N, S	6 255	63°00'	64°00'	134°00'	136°00'

TF	Magnetic Total Field
VG	Measured Vertical Gradient of the Total Field
EM	Electromagnetic
VLF	Very Low Frequency EM
TDEM	Time Domain EM
FDEM	Frequency Domain EM
MTC	Mean Terrain Clearance
BAR	Barometric

*Data may be subject to release restrictions.

APPENDIX A:

Paterson, Grant & Watson Limited

Publications

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GIPSI™
UNIX/VMS Software Applications for Geophysical Interpretation

Specification Sheet

GRAPHICS

General Purpose Graphics

GIPSI System 1000 works with original data and creates grid files and neutral plot files. Grid files are used to represent two-dimensional images, which is the reason grid data processing is commonly referred to as image processing. Neutral plot files contain only vector line data, the type which are plotted on a typical pen plotter. In order to work with these types of data, we provide a number of viewing and plotting utilities.

VIEWPLOT (1301) - *Plot File Viewing* (UNIX only-Sunview environment)
VIEWPLOT is a graphics tool that simply displays a plot file in a window on the workstation screen. Up to 10 plot files may be displayed in the same window; the user may define line weights and colours for each logical pen number in the plot files. Sub-areas of complex plots may be zoomed to fill the window, and a history of all plots is maintained in small sub-windows for instant retrieval at any time.

VIEWGRID (1302) - *Grid File Viewing* (UNIX-Sunview environment; VMS)
When working with gridded data, the most common requirement is for the user to 'see' the grid. VIEWGRID is a fast graphics tool that displays any gridded data set as a colour image on the colour workstation. The user has the option of providing both the colour table as well as the colour distribution. For user convenience, however, default colour tables are provided, and the data is automatically zoned to produce 'equal-area' colour images that equalize the area distribution of colour. Once displayed, a number of basic operations are available to modify the colour table, switch to monochrome image, transpose the image, mirror-image the grid, zoom the grid, extract profiles by defining the points, request the coordinates of any given point on the image, and overlay coincident plot files. A further simplified version of VIEWGRID is also available for colour raster terminals, of which Tektronics, Hirez and IBM-PC terminals are currently supported.

VIEWSHAD (1303) - *Interactive False Shaded Relief* (UNIX only-Sunview and Openlook)
Shaded relief maps are a powerful way to present gridded data. In a shaded relief presentation the gridded data value (Z value) is converted to a false elevation by some scaling factor, which results in a conceptual 3-D surface. This surface is then illuminated by a light source which is located at some 3D azimuth relative to the surface. The resulting reflectance is then mapped onto a grey scale that varies between white, for surfaces that face the light, to black for surfaces that face away from the light source. The resulting image is readily interpreted by human perception into highs and

lows in which textural information is particularly well rendered.
One difficulty with preparing shaded relief maps is in selecting an appropriate scaling factor and locating the position of the light. VIEWSHAD provides a tool to interactively change vertical scaling, light intensity and move the light source on an image. These operations are all performed with the use of the mouse, and the image is changed instantly with each change of a parameter. This allows the users to very quickly decide on the optimum settings for the various parameters before plotting. Once chosen, the GRIDSHAD tool may be run to process the entire grid image before plotting.

IMAGEVIEW (**1307**) - *Grid File and Plot File Viewing*
(UNIX-OpenLook environment)
IMAGEVIEW is a graphics tool that quickly displays grids and plot files separately or simultaneously in the same workstation screen. The user has all the options of VIEWGRID and VIEWPLOT but combined for more convenience and more comprehension of your working data.

PLOT UTILITIES (**1203**) - *General Purpose Plot Utilities*
PLMERGE merges multiple plot files into a single plot file for plotting with CPLOT.
PLTRNS translates a plot file through shifting the origin, rescaling and/or rotation.
PLDUMP displays the contents of a plot file in ASCII format.

CPLOT (**1304**) - *Plot and Image Raster Plotting*
CPLOT is a device independent plotting program that combines plot files and up to 4 grid files for plotting on any raster device. A typical application would be to plot a contour plot together with the original grid displayed colour in- fill, or to simply plot three ban[ds of] LANDSAT data together as a false-colour image, or any three grids of related data (geochem-radiometric). CPLOT may also [be] used to plot a colour intensity image togeth[er] with a grey-scale overlay from GRIDSH[AD to] produce a 3-D shaded colour image.
Some additional features of CPLOT are:

- each image may define its own colou[r] of up to 256 entries selected from a c[...] palette of more than 16 million colours.
- colour zones may be calculated autor[...] cally by histogram equalization, assign[ed] linear ranges or be completely user defi[...]
- regardless of the device, a full colou[r] grey-scale range may be used at a maximum resolution of a single dot or pix[el] the device.
- device independence allows CPLOT to c[re]ate plots on everything from the office l[...] printer, 9-pin printers, 24-pin printers large scale electrostatic, ink-jet and lase[r] plotters.

SORTPLOT (**1306**)
The vector files created by the GIPSI sof[tware] are stored in the neutral plot format. SORTPLOT is a tool that in addition to converti[ng] neutral plot file to selected plotter format[...] the plotting, improves its efficiency by optim[iz]ing the pen movements. Sortplot outputs tor file in one of three different formats:

- The neutral plot file format,
- The CALCOMP 907 format, and
- The HPGL format.

A file in the CALCOMP 907 format, in addition to the CALCOMP plotters can be in[ter]preted by a number of other plotters, throug[h] their CALCOMP emulation option. The HP[GL] format is also a generic format that in ad[...] to the HP plotters is interpreted by a large nu[m]ber of other plotters. Please refer to your plott[er] documentation for supported formats.

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Specification Sheet

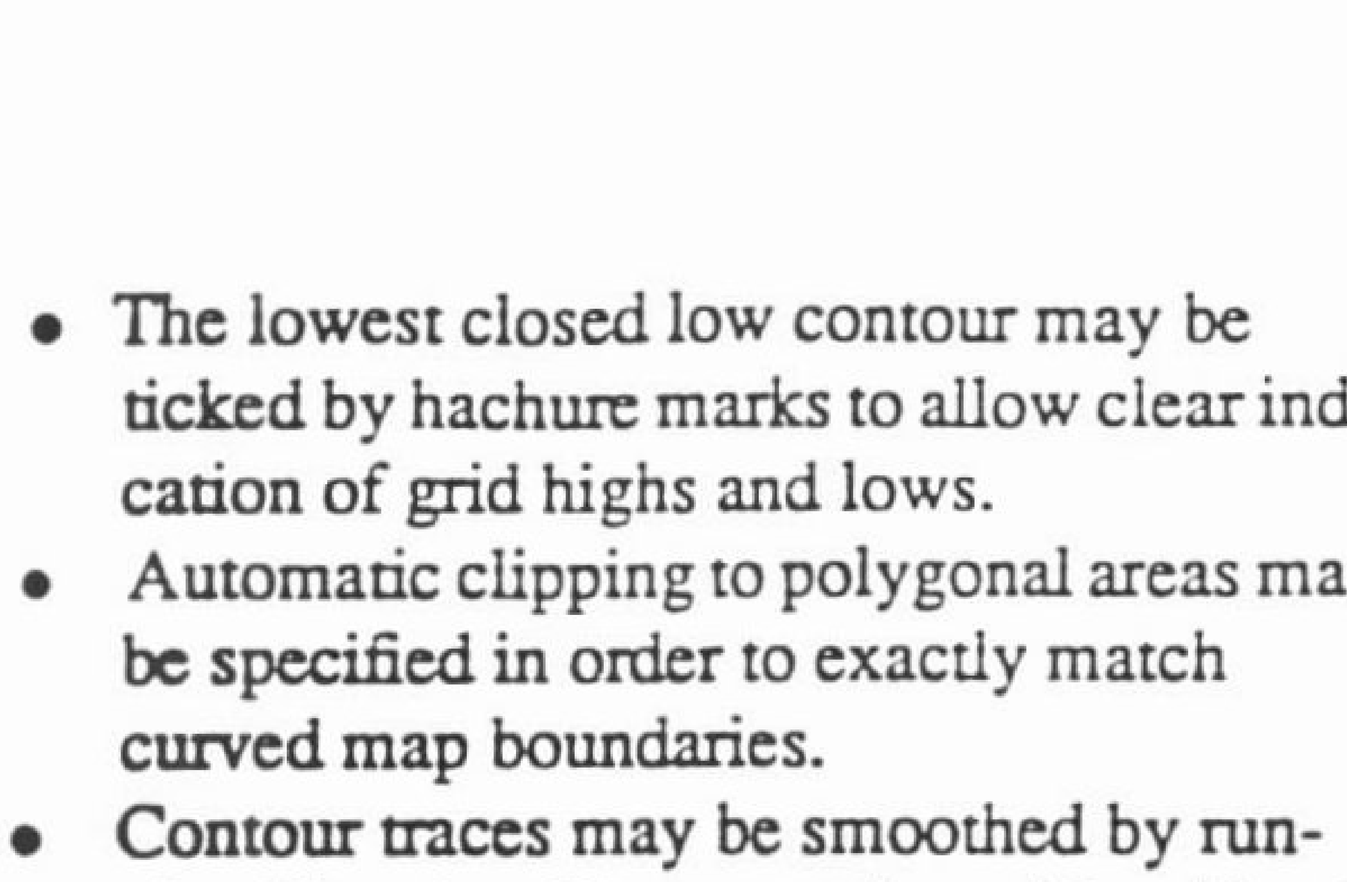
CONTUR (1103)

Contouring of High Dynamic Range Data

Geophysical data, and in particular magnetic data, often contain very large dynamic ranges, in which anomalies of many thousand nT are as significant as anomalies of 10 to 100 nT in the same map. These type of data must be contoured so that both large and small amplitude anomalies are clearly resolved. CONTUR makes no compromises in producing cartographic quality plots of any high dynamic range data.

The most significant features of CONTUR are tabulated here:

- Up to 32 hierarchical levels may be specified, each with separate line style, pen number, data ranges, gradient suppression limit and labeling option.
- Contours in high gradients are suppressed such that lower level contours are removed while allowing higher level contours to pass and thus produce a feathered appearance.
- Grids of up to 4096 by 4096 cells may be contoured, which is sufficient for maps up to 9 square meters.
- Cartographic features include annotation of high and low peaks, annotating selective contours along the contour traces and annotating at the edges of the grid.
- The lowest closed low contour may be ticked by hachure marks to allow clear indication of grid highs and lows.
- Automatic clipping to polygonal areas may be specified in order to exactly match curved map boundaries.
- Contour traces may be smoothed by running Hanning filters together with grid-cell doubling. This results in esthetically acceptable contours even from grids with cell sizes as large as 0.5 cm.
- Output from CONTUR is a neutral plot file which may be input to any graphics system or plotted on a number of devices using GIPSI plotting software.



Total Magnetic Field contours

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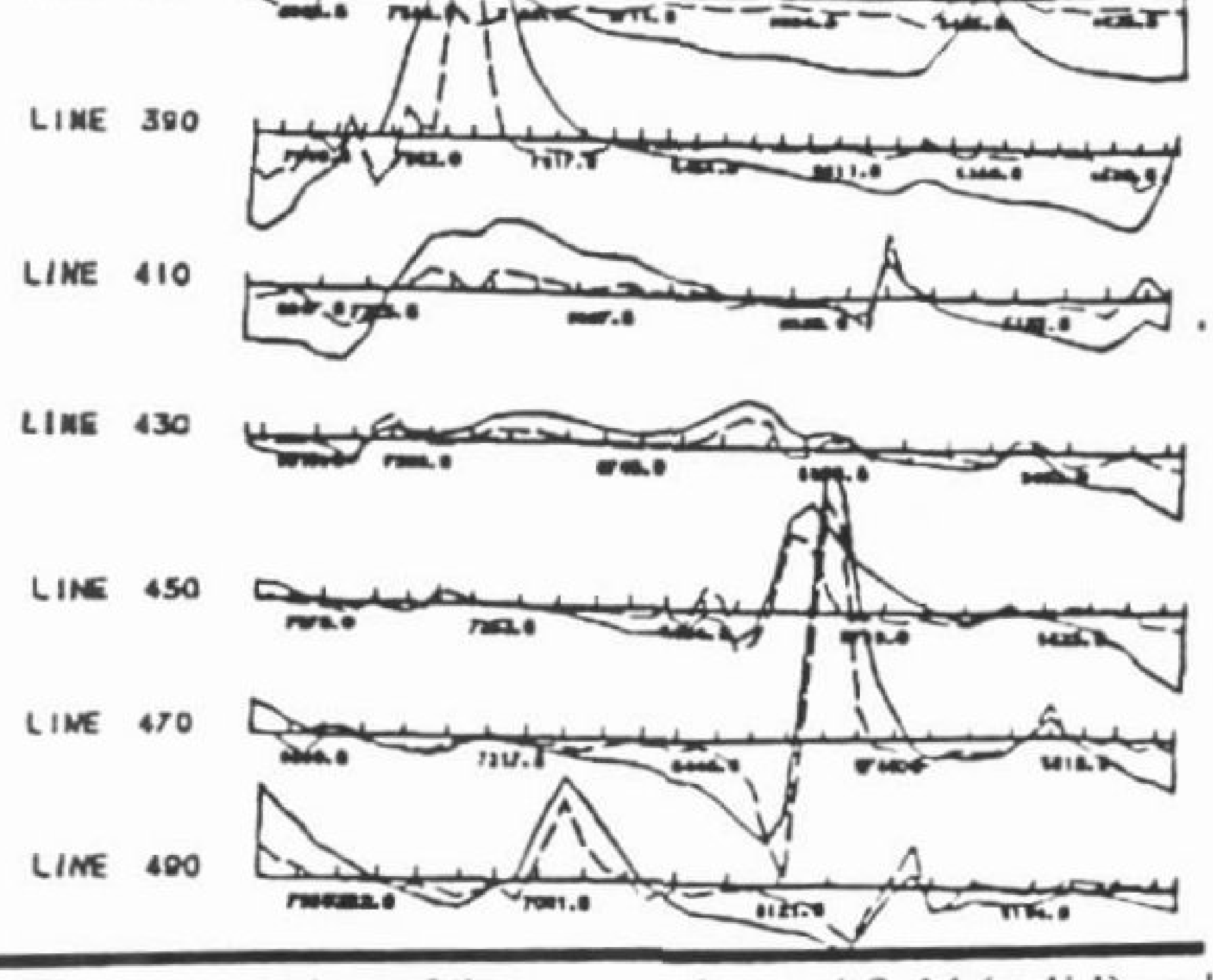
PSTACK (1104)

Profile Plotting of Line Data

PSTACK is utilized for creating station, traverse and/or profile maps of survey data or stacked profiles from a single line of data. Some of its features are:

- Survey lines or flight path may be annotated by line number and have the position or fiducials marked at specified intervals along each line, or have a profile value posted.
- Four posting position and user-defined posting direction and character size.
- As many as 16 profiles per line may be plotted, with the option to offset them for a stacked profile presentation.
- Each profile may be scaled individually to take full advantage of the dynamic range in the data.
- Profiles may be differentiated by varying the line thickness or colour, line style (six combinations of solid, dots and dashes are supported) and line pitch.
- Profiles on adjacent lines may be differentiated by alternating the line thickness or colour from line to line.
- Stations can be posted and shown with a symbol chosen from the symbol table.
- Profile truncation
- Default setting to facilitate use.
- The program supports up to 16834 points per line, an unlimited number of survey lines and a maximum plot area of 3m x 3m.



Profile presentation of the magnetic total field (solid) and vertical gradient (dashed line) data.

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Specification Sheet

XYZ UTILITIES

General Purpose XYZ Processing Utilities

In the current release of the GIPSI System 1000 processing system, line data is stored in what are called XYZ files. These are flat files (they consist of simple rows and columns of either ASCII or binary data) that contain the X and Y position of every data point together with any number of Z data values. A particularly important characteristic of these data is that they are broken up into sets of sorted points for individual survey lines. The XYZ file may contain up to 16384 records (points) per line. There is no limit for the number of lines in a file.
The XYZ utilities are divided into two sets; the XYZ utilities 1 that allow the application of routine operations on the XYZ data files, and the XYZ utilities 2 that consist of more complex operations such as filtering, projection, etc...

XYZ Utilities 1 (1201)

XYZATOB converts an ASCII XYZ file to a binary XYZ file.
XYZBTOA converts a binary XYZ file to an ASCII XYZ file.
XYZIMP a data import utility that allows the user to specify the format specifications of an input data archive and automatically extract all required information to create a standard XYZ file.
XYZLIST lists the contents of an XYZ file with options to thin the listing and provide some summary information including data ranges.
XYZPLOT a fast line plot of the line locations of XYZ data files. XYZPLOT produces a Geosoft plot file which may be displayed or plotted to confirm the integrity of an XYZ dataset.
XYZSTAT statistically summarizes the contents of an XYZ file, and produces a histogram of the distribution of data within a single channel.
XYZTRNS translates the co-ordinates of an XYZ file using simple plane scaling, offset and rotation.
XYZWIND windows out sub-set XYZ files from larger XYZ files. Windowing may be performed based on X, Y or a specified Z column. XYZWIND may also swap X and Y columns and apply base-shift and scaling to any of the X, Y or Z columns.
XYZADD adds together two specified columns of an XYZ file with a scale factor for each.
XYZCONV converts from/to Geosoft PC XYZ format to/from PGW Mainframe XYZ format.
XYZSORT sorts an XYZ file by X, Y or any of the Z columns. An XYZ file can also optionally be sorted by line numbers.

XYZ Utilities 2 (1002)

XYZFILT will apply any convolution filter together with an optional non-linear filter to a selected Z data column. XYZFILT can optionally re-sample the data at an even increment using either linear, cubic or Akima splines. Lines are extended using Burg's[1] maximum entropy prediction to allow any length filter to be applied to the data. A companion program FDESIGN may be used to design high- low- and band-pass convolution filters.

XYZPROJ performs normal transformations to and from a number of different map projections including longitude/latitude, U.T.M. and Lambert Conformal.

IGRF calculates the International Geomagnetic Reference Field at specified latitude and longitude pairs and specified year.

FDESIGN designs a convolution filter for XYZ data given the spacing, and the cutoff frequencies.

XYZXTRC extracts from a grid profiles along paths specified in an XYZ file and saves the results in the PGW XYZ format. This utility offers different interpolation options.

---

1. Burg, J.P., 1975, Maximum Entropy Special Analysis: Unpublished doctoral dissertation. Stanford University. p.168.

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Specification Sheet

COMPU-DRAPE ® (3001)

Continuation of potential field data between arbitrary surfaces.

SUMMARY

From a set of potential field line or gridded data, measured at a constant altitude, or on any other smooth surface, COMPU-DRAPE ® produces a dataset as it would have been measured on another specified surface.
A COMPU-DRAPE dataset can be submitted to the usual GIPSI enhancement processes such as pole-reduction, susceptibility mapping, derivative calculation etc., with the advantage of improved spatial data coherence.

APPLICATIONS

1. Computation of a draped grid from a constant barometric survey (or vice versa).
2. Rectification of a loosely draped survey to a tight pseudo-drape.
3. Computation of a magnetic or gravity grid draped over a known or calculated buried basement.

ADVANTAGES

Drape-flown surveys have the advantage that minor variations in the magnetic susceptibility of the ground (i.e. geology/ore environments) cause stronger and sharper anomalies than on surveys flown at higher elevations (Paterson et al., 1990). Unfortunately, an ideal drape survey is impossible to achieve either with fixed-wing and between points on adjacent lines, and changes in ground speed of the aircraft, can lead to a serious degradation of the magnetic grids and contoured data. COMPU-DRAPE data is corrected for changes in height both along and across lines, and, because the original data is either flown at a constant elevation or a loose drape, a nearly constant ground speed can be maintained, normally resulting in very accurate horizontal positioning. The resulting total field and horizontal positioning. The resulting total field and enhanced magnetic maps show none of the "herringbone" effect that is normally present in drape surveys flown in rough terrain.

- Constant barometric surveys can be flown by fixed wing aircraft at a much lower cost than comparable drape-flown helicopter surveys; and the added cost of COMPU-DRAPE processing is negligible.
- Constant barometric surveys can take advantage of new navigation technology (both ground-based and satellite) to reduce the dependance on visual navigation and flight-path information. Surveys can be conducted under weather conditions unsuitable for drape surveys and, where circumstances favour this approach, even on a 24hour basis. Cost saving factors of 2 or more can be gained in areas of poor ground visibility.
- COMPU-DRAPE can be used to link adjacent blocks of data flown at different survey altitudes into a single, coherent pseudo-drape at any height above ground. This can be a highly effective exploration approach in areas where the

METHODOLOGY

COMPU-DRAPE is based on a technique developed by Cordell (1985) of the USGS for preparing composite aeromagnetic maps in the southwest United States. Unlike techniques that require the calculation of equivalent sources or susceptibility surfaces, most of which are computer intensive and unforgiving of very steep terrain, shallow magnetic sources of very steep terrain, shallow magnetic sources etc., COMPU-DRAPE is exceedingly simple. A series of potential field grids or profiles are calculated at various heights above (and possibly below) the measured surface, and the field at the desired surface is obtained by cubic spline interpolation.

Continuation into valleys between basement ridges proved a problem with Cordell's (1985) earlier "chessboard" technique. COMPU-DRAPE solves this (in default mode) by introducing an intermediate surface that is everywhere above the highest basement level, using real numbers and no filtering, in order to preserve the full resolution of the measured data. A single downward continuation, with only white noise removal, produces the final COMPU-DRAPE surface at any arbitrary height above ground.

COMPU-DRAPE contains two options.

1-D The 1-D version operates on profile data, employing a 1-D Fourier continuation filter. It is used mainly to rectify loosely draped data (e.g. fixed-wing surveys in rough terrain) to a tight pseudo-drape. Continuation distances are relatively small, usually 20 -5 m, so that the assumptions inherent in 1-D continuation have an insignificant effect on the continued data. Input consists of the XYZ file, containing both magnetic (preferably unlevelled) and terrain clearance (e.g. radar altimeter) data, from which a new XYZ file is generated at the prescribed height above ground. Levelling performed on the COMPU-DRAPE file has the advantage that all flightline and tie-line crossings are at the same elevation, thus removing major source of error inherent in surveys in rough terrain. Line-to-line incoherence, com... mon in most drape surveys in steep topograph is also removed.

2-D Typically, a block of gridded data, m... sured at a constant barometric altitude, is required to be continued downward to a surf at a constant height above ground. Sometim... (as in most petroleum surveys), the ground s face is non-magnetic and the desired surfac at a constant height above a known or calculated "basement"- usually the Precambrian. Input is the gridded data file consisting of l elled magnetic and terrain clearance data at regular grid interval. It is important that the gr interval is not much more than the final con ued height above ground (basement).

If the ground (basement) surface is relative smooth, downward continuation surfaces a calculated using Butterworth filters of specifi (or default) control wavelength and power remove noise due to Gibb's effect from ma netic sources above the continuation surface. most cases, however, an intermediate surfac calculated whose minimum elevation exce the maximum elevation of the ground (basement) in the area. A single downward cont ation is then performed, using a default filte remove the effects of any theoretical sources above the known ground (basement) surfa

REFERENCES

Cordell, L., 1985, Techniques, applications an problems of analytical continuation of New Mexico aeromagnetic data between arbitra surfaces of very high relief: Institute de Géophysique, Université de Lausanne, Switzerland, Bulletin No. 7, p.96-99.

Paterson, Norman R., Reford, Stephen W. an Kwan, Karl C. H., Continuation of Magnetic Data Between Arbitrary Surfaces: Advanc and Applications, Expanded Abstracts of the Society of Exploration Geophysicists, p.66 669.

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Specification Sheet

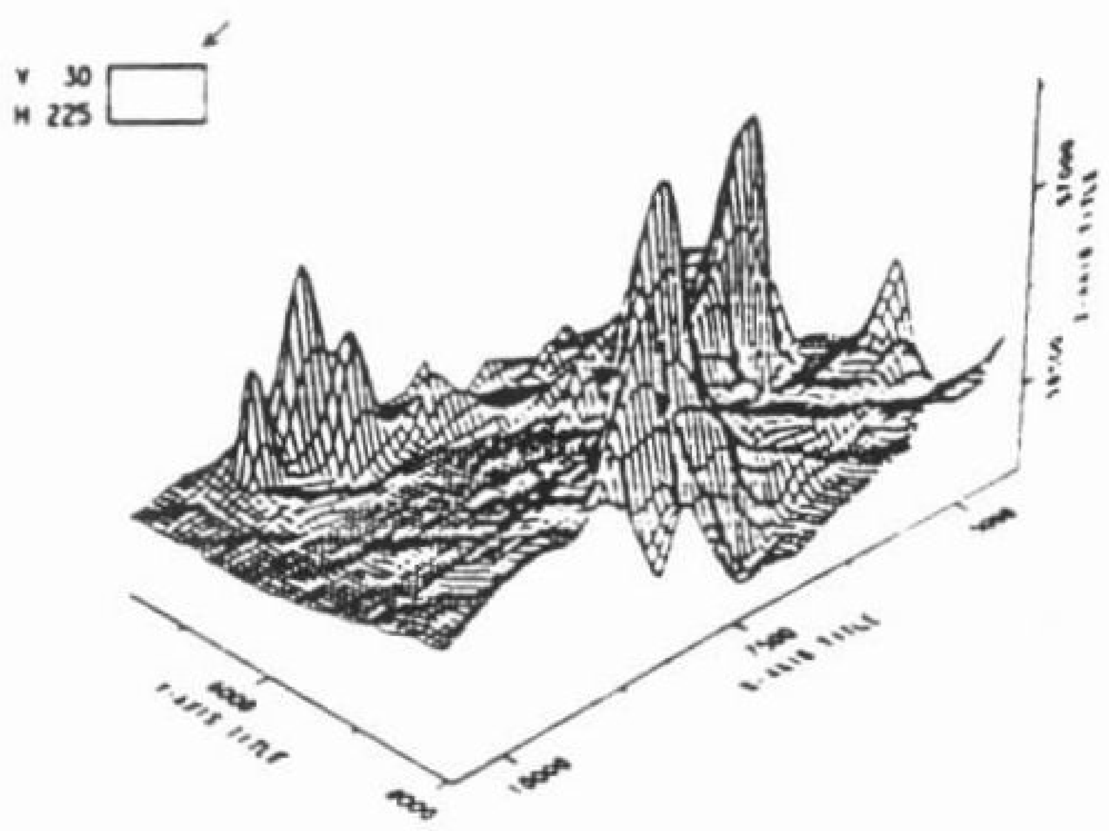
NETVIEW (1308)

3-D Perspective View in Colour

Netview is a program for creating a 3-Dimensional perspective plot of gridded topographical, geophysical or geochemical data. The view may be shown as a fishnet of intersecting lines, or alternatively, as a solid drape in colour. By changing the horizontal and the vertical viewing angles, and the distance between the eyepoint and the centre of the grid, the relief in the data may be visualized in a more realistic and illustrative manner. A 3-D view complements a traditional contour or a colour map and is ideal as an attractive presentation piece.

Netview offers many advanced features and user options which include:

- Full colour capability for both pen plotters and raster plotters. Line net in colour or solid filled polygons in colour are both user selectable options. The grid can be displayed using a gradation of up to 255 colours or grey scales.
- In addition to the visible part of the surface as viewed from top, it is possible to create an underside view of the surface for the part of the grid which is visible from the bottom.
- Contour lines may be superimposed (with the hidden part removed) on top of the net. The addition of contours leads to easier identification of the vertical levels of the grid.
- As an important option, Netview will accept a second grid as input. A net created from the base grid may be draped with colour from an alternate grid. For example, Netview can draw the net itself from a grid of topography and the colour infill from a grid of VLF readings.
- Netview is so easy to run that it will in fact create an automatic default view of a grid even if not a single control parameter has been specified.
- The program allows to selectively plot the net using lines in either the X direction or Y direction or both. This applies to line net only (no colourfill).
- Because Netview takes into account the distortion caused by the closeness of the eyepoint to the object, a fish-eye view in perspective may be created for added effect.ce
- Output from Netview is a neutral plot file which may be viewed on the screen ar plotted on a wide range of hardcopy devices using GIPSI plotting software.



Total Magnetic Field perspective view, observed from an azimuth angle of 35 W.

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MAPPLOT (1305)

Graphical Map Annotation

MAPPLOT is a graphics interpreter that is used to prepare custom map details, such as title blocks, colour scale bars, surrounds, north arrows, horizontal scale bars, coordinate system annotation, etc. Full text and line-drawing capabilities allow for preparation of marginal notes, importation of planimetry, display of filter responses, etc. Thirteen fonts are supported, which may be varied within one plot file. Specialized graphics objects may be created on a one-time basis and imported to MAPPLOT whenever needed.
The following graphics commands are available through MAPPLOT:

ANNX	Annotate X axis.
ANNY	Annotate Y axis.
CBAR	Colour scale bar.
CIRC	Draw a circle, arc or wedge.
CMNT	User comment.
FONT	Set a font.
INCL	Include another MAPPLOT control file.
LINA	Absolute line draw with symbols.
LIND	Directional line draw with symbols.
LINR	Relative line draw with symbols.
MAPR	Set map edge reference points.
NARR	Draw a north arrow.
PLTR	Set plot file reference point.
RECT	Draw a rectangle.
REFP	Set user reference point.
SURR	Draw a surround.
SYMB	Draw a symbol.
TEXT	Plot text.
TITL	Draw a title box.

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GIPSI™
UNIX/VMS Software Applications for Geophysical Interpretation

Specification Sheet

MAGMAP-3 (1001)

Potential Field Data Processing System

MAGMAP is the GIPSI System 1000 potential field processing system for manipulating 2-D (gridded/image) magnetic and gravity data. Although MAGMAP contains many features and filters which are unique to geophysical potential field data, it may also be applied to any image data for FFT based processing applications.

This mature system is the result of more than 15 accumulated years of development and more than 10 million line kilometres of processing experience in all magnetic latitudes of the world. It is an excellent tool for the application of standard FFT based processes to potential field data, as well as providing a number of innovative and proven special purpose filters that address 'real- world' problems in FFT processing.

MAGMAP-3 will cleanly and efficiently process very large grids (currently up to 4096x4096 points) without edge effects, strong anomaly ringing, noise blow-up, Gibb's phenomena and other nasty side-effects of conventional FFT based processes.

Standard Capabilities

As with any good FFT processing system, MAGMAP includes all standard processes as separate filters:

- Reduction to the magnetic pole or equator.
- First/second/nth vertical derivatives.
- Upward/downward continuations to any surface.
- De-corrugation and directional filters.
- Apparent magnetic susceptibility maps from total field.
- Apparent density maps from residual gravity field.
- Optimum Weiner depth filter.
- Cosine power high/low pass filters.
- Butterworth regional/residual separation.
- User defined general filtering option.
- Radial power spectrums.

Powerful Features

MAGMAP employs a number of powerful techniques to minimize or eliminate problems common to conventional FFT filtering systems:

- Ability to process grids of any shape (including holes) or orientation.
- Data conditioning to eliminate the side-effects of high-power and high-frequency signal in the data.
- The employment of a 2-D maximum entropy prediction algorithm to extrapolate the real data to a periodic function.
- Clean reduction to the pole, even from the equator, by the separate control of the phase and amplitude components of the reduction operator.
- Very effective directional filter functions that can be tuned to reduce or eliminate flight-line leveling errors in any type of processed map, and in any direction.

- Complete 1-D and 2-D spectral functions, including optional pre- whitening, for regional/residual/noise analysis.
- Naive user option to automatically apply appropriate optimum filters to match the user specified processes.

Straight Forward Use

All MAGMAP operations are defined by parameters entered into a self- documented control file. By the consistent and logical design of built-in default parameter settings, the system is straightforward to use. There is also a special option, designed for the inexperienced user, which will set all default parameters automatically based on the minimum primary filter options requested by the user. Of course, more advanced users have total control over all filter parameters to allow fine-tuning to provide the best result possible.

Comprehensive Reports

MAGMAP always produces a comprehensive report that itemizes all selected filters and default parameters so the user is never in doubt about what has been done to the grid. The report can also optionally include plots of radially averaged or directional power spectrums, with depth-to-source estimates based on normal statistical source assumptions (after Spector and Grant[1]). 2-D power spectrums may also be saved as grids to be viewed on graphics terminals or image processors for 2-D spectral analysis.

MAGMAP Parameters - **A Summary**

BPAS	Apply a simple band-pass filter.
BTWR	Apply a variable order Butterwor regional/residual filter.
CNUP	Upward continuation to a new su face.
CNDN	Downward continuation to a n surface.
COSN	Cosine power roll-off, high- or lo pass.
DCOS	Apply directional power cosine f ter (pass or reject).
DENS	Calculate apparent density grid from residual Bouguer grid.
DPAS	Apply directional (band) powe cosine filter (pass or reject).
DRV1	Calculate the first vertical deriva tive.
DRV2	Calculate the second vertical d ative.
DRVN	Calculate the nth vertical deriv tive.
GAUS	Apply a normal Gausian filter, hig or low-pass.
GNRL	Apply a user defined filter func...
HPAS	Apply a high pass filter.
INTG	Integrate the grid.
LPAS	Apply a low-pass filter.
NAIV	Set naive user defaults based on other filters requested.
OPTM	Apply an optimum Weiner depth noise filter.
REDE	Reduce the magnetic field to th equator.
REDP	Reduce the magnetic field to the pole.
SUSC	Calculate an apparent magnetic s ceptibility grid from a total ma netic field grid.

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Specification Sheet

RANGRID (1102)

Random Gridding of Point Data

The first step in working with 2-D data sets is the creation of the grid image from a set of spatially non-uniform observations — a process commonly referred to as gridding. If the spatial data is distributed randomly, which is often the case with gravity anomaly, geochemical data, drill hole information etc., the program RANGRID is used. It also works well with line-based survey data in more than one orientation.

RANGRID proceeds by fitting through multiple iterations, a minimum curvature[1] surface to the original data points. The minimum curvature algorithm minimizes the second horizontal derivative of a surface that passes through the given data points.

Some of the capabilities of RANGRID are summarized here:

- Processes up to 100 million total data points, to produce a regular grid of maximum dimensions of 4096 x 4096.
- RANGRID is extremely fast because it makes maximum use of a 2-D blocked mass storage together with linearized coding technique.
- Dummy values are used to represent areas of the grid which lie outside of the surveyed area or are within holes in the coverage.
- An internal tension mechanism permits the user to control the generation of false anomalies in areas where the sampling is poor or non-existent. This situation arises with spatial data that is clustered or irregularly sampled.
- A de-aliasing filter is incorporated in RANGRID and can be activated in order to remove high frequency noise in the data prior to gridding.

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Specification Sheet

GRID UTILITIES

General Purpose Grid Processing Utilities

Grid (or image) files are two-dimensional representations of a single geophysical (or other) parameter. The actual data consists of the values of the parameter defined at each point of a rectangular mesh (a grid) which is stored consecutively by row, then column, in a grid file.

Grid files represent a fundamental class of data which can be manipulated by a number of programs in GIPSI System 1000.

The GRID UTILITIES are a collection of programs which permit the routine application of general purpose grid processes.

The utilities are divided into two categories – Grid Utilities1 that consist of basic utilities allowing the application of routine operations and Grid Utilities 2 that consist of a set of more advanced operations.

Grid Utilities 1 (1202)

GRID2XYZ converts a Geosoft grid to a Geosoft XYZ file, with optional decimation and direction.

GRIDADD adds two grids, with multiplying factors for each, and produces a resultant grid. GRIDADD may also be used to subtract the one grid from another.

GRIDBOOL masks one grid against another allowing AND, OR, XOR operations.

GRIDFILL replaces all dummies in a grid using either the Maximum Entropy or Linear Interpolation methods. The interpolation maintains the periodicity on opposite edges.

GRIDHEAD allows direct user modification of the grid header without changing the contents of the grid itself.

GRIDLINK will link any two grids together into a single grid that encompasses the area of both grids. A cosine roll-off algorithm is used to average the data within overlapping valid areas.

GRIDMASK given a polygonal area defined by X,Y coordinates, GRIDMASK will either dummy the grid area within or outside the defined area.

GRIDMULT multiplies one grid by another with a single multiplying factor to yield a resultant product grid.

GRIDPROF extracts a linear profile between two specified points at a requested resolution.

GRIDRTIO divides one grid by another to yield a grid which is a ratio of the two originals.

GRIDSTAT reports the contents of the grid-header and optionally calculates grid statistics and presents a histogram of the grid distribution.

GRIDTRND removes a first order trend from a grid, using either all points in the grid or only the points along the edge of the valid area to define the trend.

GRIDTRNS transposes a grid by swapping the grid rows and columns. A blocking method which minimizes linear memory requirements (and therefore minimizes paging) is used.

GRIDWIND windows a sub-set grid from a larger grid. The sub-area may be referenced in by grid indices or in reference system units.
GRIDXPND expands a grid with dummies to either user specified dimensions, or by default to the next Winograd permissible dimension (see MAGMAP-3).
REGRID regrids an existing grid to a new grid cell size and/or grid origin. REGRID will also fill holes in the grid that are larger than a specified minimum size. The interpolation algorithm may be chosen as a linear, cubic or an Akima spline.

Grid Utilities 2 (1003)

GRIDFILT filters a grid in the space domain, by convolving it with a given two dimensional (3x3 or 5x5) filter.
GRIDHDRV calculates the amplitude of the horizontal derivative in a specified direction, or the total amplitude regardless of direction.
GRIDIGRF given the projection parameters, grid cell in metres, latitude/longitude limits and an altitude datum, calculates an IGRF grid.
GRIDPROJ reprojects a grid from its specified projection to a different one, while preserving the grid cell size. This utility facilitates the reprojection of grids for presentation purposes.
GRIDSHAD applies a diffuse shading algorithm to a grid. GRIDSHAD is used in conjunction with VIEWSHAD on a Unix platform.

NORMAN R. PATERSON

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APPENDIX B: GIPSI Software Users

Table 1: GIPSI CLIENTS

	Client	Country
1	University of Leeds	United Kingdom
2	ITC	The Netherlands
3	GSC	Canada
4	GSC	Canada
5	SIAL	Canada
6	Anglovaal	South Africa
7	BP	Canada
8	KIER	Korea
9	RTZ-Newbury	United Kingdom
10	H&H	U.S.A.
11	Anglo American	South Africa
12	Goldfields	South Africa
13	BMR/AGSO	Australia
14	STATOIL	Norway
15	MNR	Canada
16	Amarok	Norway
17	GSM	Malaysia
18	DMR	Thailand
19	UBC	Canada
20	RTZ-Chile	Chile
21	Western University	Canada
22	KORDI	Korea
23	Kennecott	U.S.A.
24	Univ of Saskatchewan	Canada
25	Geodatos	Chile
26	RTZ-Bristol	United Kingdom
27	GEOPEKO Ltd.	Australia

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Specification Sheet

BIGRID (1101)

Bi-Directional Gridding of Line Data

The first step in working with 2-D data sets is the creation of the grid image from a set of located observations — a process commonly referred to as gridding. In geophysical applications, and with many other kinds of earth science related data, the original data is often collected along roughly parallel survey lines, which results in a data set that is densely sampled in one direction (down the line) and more coarsely sampled in the orthogonal direction (across the lines). This is referred to as line data.

In geological applications, line based surveys are particularly effective because the lines can be oriented to take advantage of geologic strike. When gridding such data, it is important to use a method that will also be able to take advantage of geologic strike when interpolating between the lines.

BIGRID is specifically designed for line data and has many capabilities which make it particularly powerful for geophysical data. With BIGRID, it is not necessary to degrade the high frequency content of the line data in order to match the wide line separation. For example, conventional random gridding techniques would not allow a grid cell size to be much less than half the nominal line separation; otherwise narrow anomalies on the survey lines break down into "bulls-eyes". In bi-directional gridding, it is not uncommon to use cell sizes of 1/4 to1/8 the line separation.

Some of the other capabilities of BIGRID are summarized here:

- Processes up to 67 million total data points, up to 16348 points per survey line and up to 4096 survey lines.
- *SPEED* - BIGRID is extremely fast because it makes maximum use of 2- D blocked mass storage together with linearized coding techniques.
- The geologic strike may be independently defined so that interpolations between lines work in the direction of strike.
- Interpolations may be chosen independently for the down-strike and across-strike directions. Linear, cubic and Akima spline options are supported.
- Convolution band-pass filters together with powerful non-linear filters may be applied by BIGRID to each data line before gridding.
- BIGRID will accept as input both line XYZ data and existing grid files. Re-gridding a grid is an effective way to apply linear and non-linear directional filters to already gridded data. In particular, this provides a method to apply tuned directional filters to perform operations such as de-corrugation on existing gridded data. BIGRID also provides a mechanism to rotate and re- sample gridded data.
- Dummy values are used to represent areas of the grid which lie outside of the surveyed area or are within holes in the coverage.
- A mechanism is provided for the user to add manual trend lines that can be used to enforce individual anomaly trends that do not run in the direction of the predominant geologic strike.

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APPENDIX C: GIPSI Specification Sheets

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GIPSI™ UNIX/VMS Software Applications for Geophysical Interpretation

Specification Sheet

GRIDEPTH® (3002)

Euler Deconvolution Application

GRIDEPTH is an automatic depth determination method for gridded potential field data. GRIDEPTH solves Euler's homogeneity equation for source position, depth and nature of any sources present. GRIDEPTH may be applied to magnetic or gravity field grids.

Various structural geometries can be solved for, including dipping contacts, dikes, pipe intrusions and sills. The most significant features of GRIDEPTH are:

- its ability to quickly and reliably analyze large amounts of data,
- that the geologic model(s) does not need to be known prior to its application,

The acceptance and rejection of solutions take place at the data presentation stage using EULMAP, an efficient data filter.

GRIDEPTH was developed jointly by Paterson, Grant & Watson Ltd., Simon-Robertson and the University of Leeds.

BASIN EXAMPLE: Basement faults and contacts are clearly delineated; depth is denoted by the size of the circle.

® GRIDEPTH is a registered trademark of Simon-Robertson.

7.

GRIDEPTH OPTIONS

OPT-01 EULMAP OPTION:

GRIDEPTH is most effectively used with EULMAP, the GRIDEPTH XYZ Utility for sorting Euler solutions and preparing data for presentation. EULMAP allows the following flexibility:

- splitting solutions into a series of depth levels that are of specific interest to the user,
- setting vertical and horizontal uncertainties, and depth limits, as accept/reject criteria,
- "binning" - the ability to collect solutions that fall within specific location and tolerance ranges, and plot them as one circle,
- speed - EULMAP is *FAST*, which encourages the user to investigate different approaches to representing the Euler solutions.

OPT-02 EULMAP + MAPPLOT OPTION:

EULMAP creates a GIPSI mapping output file that can immediately be formatted into a vector plot file using MAPPLOT. MAPPLOT has many more useful features. It allows for the creation of custom map details such as title blocks, colour scale bars, legends, surrounds, annotation, etc.

COMPLEMENTARY MODULES:

MAGMAP is used to compute the vertical derivative grid required by GRIDEPTH.

GRIDHDRV (GRID Utilities I) is used to com pute the horizontal derivative grids required b GRIDEPTH.

IMAGEVIEW incorporates an interactive graphical interface to GRIDEPTH.