AEROMAGNETIC PROFILES NORTHEAST OF ORPHAN BASIN

Geological Survey of Canada Open File Number 1907

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In 1985, the Geological Survey of Canada joined with five oil companies in sponsoring a detailed aeromagnetic survey of the Northeast Newfoundland Shelf and Orphan Basin. Flight lines in this operation were spaced 3 km apart, and were oriented in a NNE-SSW direction for optimum delineation of sedimentary basin structures in the area. Flight altitude was 305 metres above sea level.

Concurrent with this operation, the GSC arranged and paid to have every tenth flight line extended for a distance of 300 nautical miles, in order to obtain regional coverage northeast of the main survey area (see Figure). The data collected in this outer survey area were compiled in 1985-86 by the prime contractor Geoterrex Limited, who produced the map featured in this Open File; it shows profiles along flight lines at a scale of 1:1,000,000. (Field and subsequent compilation procedures are described briefly in marginal notes appended to the map.)

Taken together, the profiles outline sea floor spreading anomalies with much greater clarity than previously possible, permitting the delineation of numerous tectonic features in considerable detail. These new data and their analysis have been described by Srivastava et al (1988a, 1988b).

The digital observations collected during the regional aeromagnetic survey have been gridded and merged with other magnetic data off the east coast of Canada for inclusion in a new magnetic anomaly map of the eastern continental margin of Canada (Geological Survey of Canada, 1988); they have also been released to the public as part of GSC Open File 1504 (Verhoef and Macnab, 1988).

The 1985 regional aeromagnetic survey and the subsequent data analysis were carried out under the auspices of the East Coast Task of the Frontier Geoscience Program of the Geological Survey of Canada. Wim Knappers of the Contract Surveys Group, GSC Geophysics Division, was Technical Authority for the survey.

This document was produced by scanning the original publication.

Ce document est le produit d'une numérisation par balayage de la publication originale.

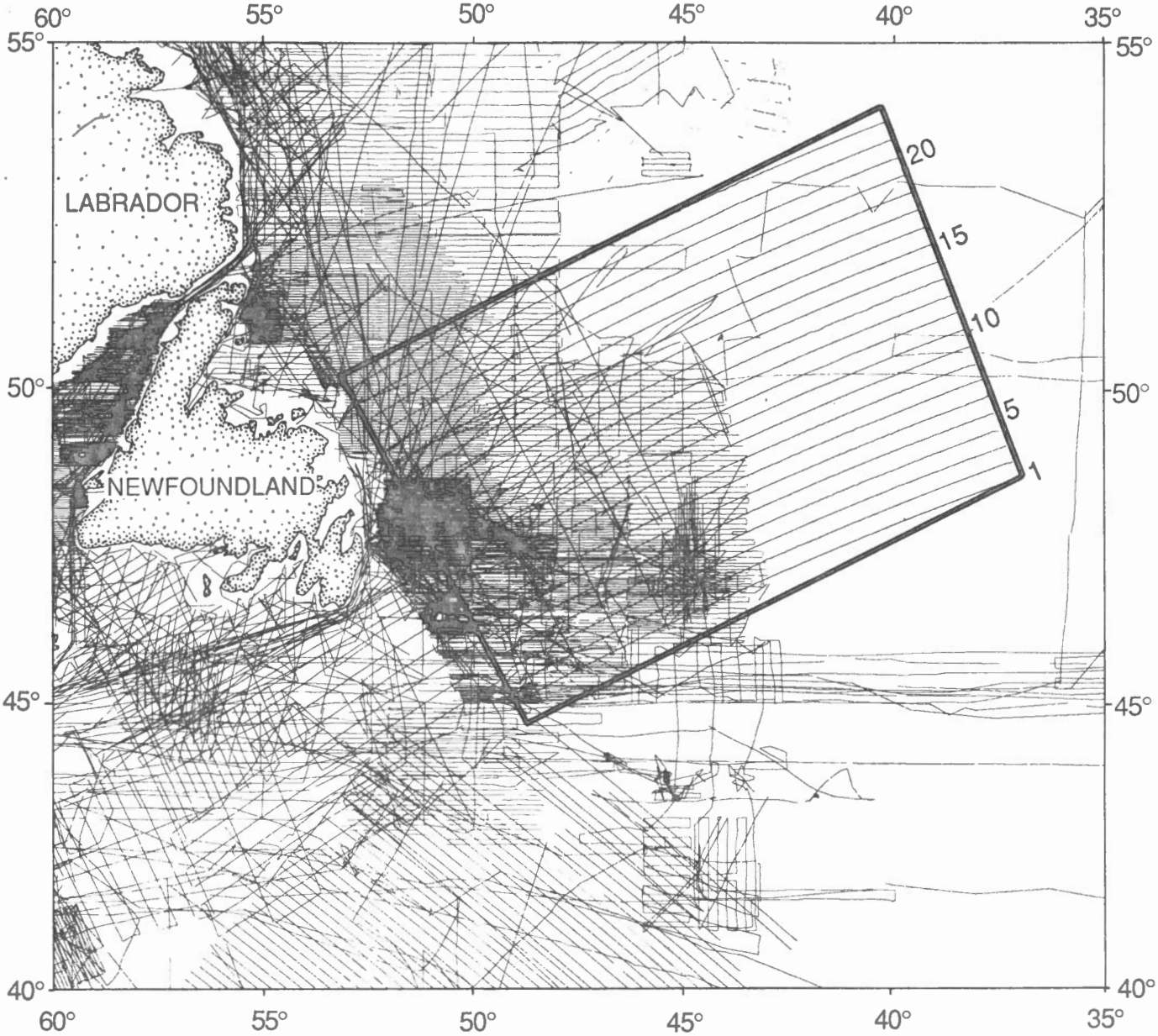
BIBLIOGRAPHY

Geological Survey of Canada, 1988, Magnetic Anomaly Map of the Continental Margin of Eastern Canada, Geological Survey of Canada Map 1709A, 1:5,000,000.

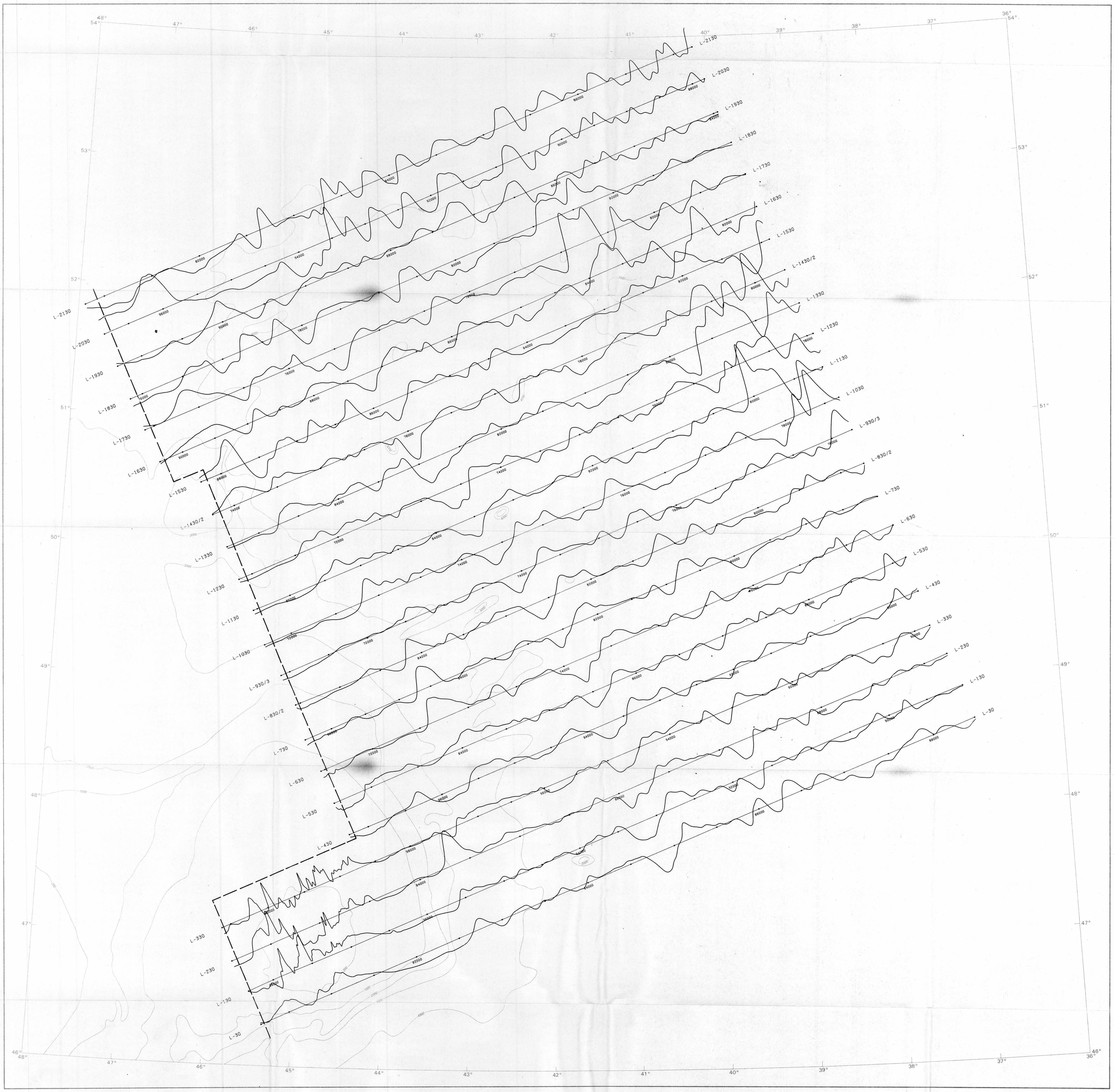
Srivastava, S.P., J. Verhoef and R. Macnab, 1988a, Results from a detailed aeromagnetic survey across the northeast Newfoundland margin, Part I: Spreading anomalies and the relationship between magnetic anomalies and the ocean continent boundary: Marine and Petroleum Geology, v. 5.

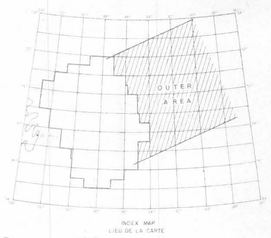
Srivastava, S.P., J. Verhoef and R. Macnab, 1988b, Results from a detailed aeromagnetic survey across the northeast Newfoundland margin, Part II: Early opening of the North Atlantic between the British Isles and Newfoundland: Marine and Petroleum Geology, v. 5.

Verhoef, J. and R. Macnab, 1988, Magnetic data over the continental margin of eastern Canada: preparation of a data base and construction of a 1:5 million magnetic anomaly map: Open File 1504, Geological Survey of Canada.



Compilation of ships' tracks and flight lines, showing where magnetic data have been collected by the Geological Survey of Canada and other agencies. The heavy box outlines the area of aeromagnetic operations in 1985; the magnetic profiles in this Open File are located along the flight lines in the NE half of the box.





INDEX MAP
LIEU DE LA CARTE

OPEN FILE
DOSSIER PUBLIC
1907
GEOLOGICAL SURVEY
COMMISSION GÉOLOGIQUE
OTTAWA

Canada

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Flight line direction: NE - SW
Flight altitude: 305 metre above sea level
1 gamma = 10^{-9} tesla in SI units
Bathymetric contours in metres

Direction des lignes de vol: NE - SO
Altitude de vol: 305 mètres au-dessus du niveau de la mer.
1 gamma = 10^{-9} tesla (système international)
courbes de bathymétrie en mètres.

EAST NEWFOUNDLAND SHELF - ORPHAN KNOLL

MAGNETIC PROFILES:

500 gamma/inch

Scale 1:1,000,000 Échelle

20 0 20 40 60 80 Kilometres

The data used in compiling this map are available in digital form from the Federal Department of Energy, Mines and Resources for the cost of retrieval and copying.

Les données utilisées dans la compilation de cette carte peuvent être obtenues du ministère de l'Énergie, des mines et des Ressources, sous forme numérique, moyennant le coût de récupération et de reproduction.

This map was compiled from digitally recorded aeromagnetic survey data obtained by cesium vapour magnetometers which measured the total field with a resolution (sensitivity) of 0.01 nanotesla. Combined Loran-C and Global Positioning System data were used for navigation and flight path recovery. Flight path recovery was also assisted by digitally recorded IRS data. After editing the survey data the IGRF was subtracted from the magnetic values. Then the mean magnetic value of each line was subtracted from the data in challenging. The flight path was smoothed by interpolating a straight line between real positions 1000 seconds apart. The magnetic values were then plotted with respect to this smoothed flight path with the flight path being used as a base level of zero.

The survey was flown in 1985 by Geotervra Limited and Keating Earth Sciences Limited with Loran-C and GPS Navigation provided by Nortech Surveys Limited.

The data was compiled in 1985-1986 by Geotervra Limited.

The bathymetric contours were supplied by The Canadian Hydrographic Service, Department of Fisheries and Oceans.

Cette carte fut produite à partir de données aéromagnétiques enregistrées numériquement à l'aide d'un magnétomètre à vapeur de césium mesurant le champ magnétique total avec une sensibilité de 0.01 nanotesla. La navigation et la restitution du plan de vol fut effectuées à partir des données de radio-navigation (Loran-C) et d'un système de positionnement global (GPS). La restitution du plan de vol fut aussi assistée de données numériques provenant d'un système de navigation à inertie (IRS). Après vérification et correction des données magnétiques, le champ magnétique de référence terrestre (IGRF) fut soustrait des valeurs enregistrées. La valeur magnétique moyenne de chaque ligne fut ensuite soustraite de chaque profile magnétique. Le plan de vol fut lissé en interpolant une ligne droite entre les positions réelle à 1000 secondes d'écart. Les profiles magnétiques furent ensuite tracés avec les lignes de vol en abscisses, prenant zéro comme niveau de base.

Le levé fut volé en 1985 par Geotervra Inée et Keating Earth Sciences Ltd. La navigation au Loran-C et GPS fut la responsabilité de Nortech Surveys Ltd.

La compilation des données fut effectuée par Geotervra Ltée en 1985-1986.

Les courbes de bathymétrie furent obtenues du Service hydrographique du Canada, ministère des Pêches et Océans.