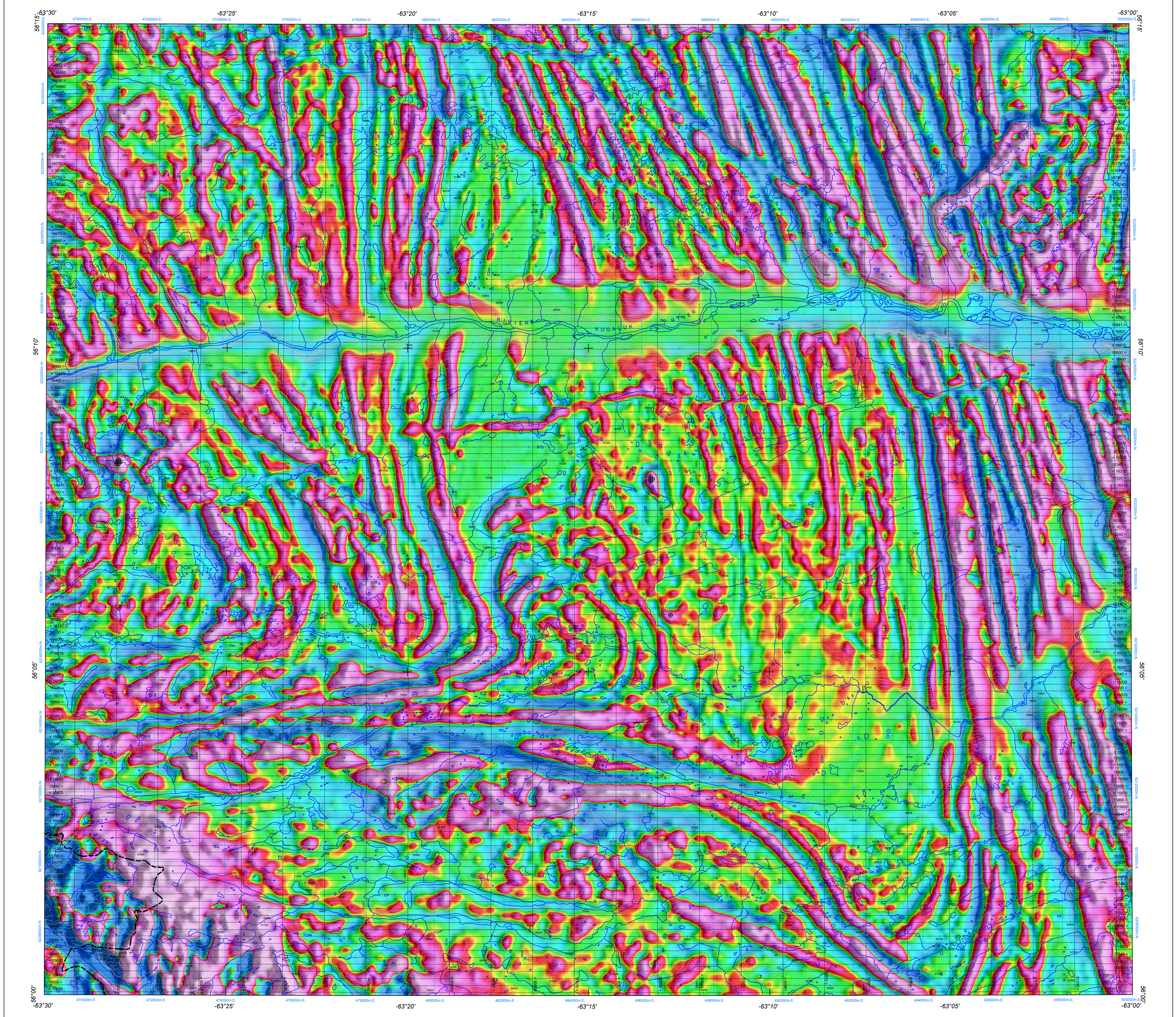


FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

DÉRIVÉE PREMIÈRE VERTICALE DU CHAMP MAGNÉTIQUE



First Vertical Derivative of the Magnetic Field

This map of the first vertical derivative of the magnetic field was compiled from data acquired during an aeromagnetic survey carried out by Geo Data Solutions GDS Inc. and Orsis Geoscience International during the period from February 16 to April 16, 2012. The data were recorded using a split-beam cesium vapour magnetometer (sensitivity = 0.005 nT) mounted in the tail boom of each of three Piper Navajo aircraft. The nominal traverse and control line spacing were respectively 200 m and 1 200 m, and the aircraft flew at a nominal terrain clearance of 80 m. Traverse lines were oriented E-W with orthogonal control lines. The flight path was recovered following post-flight differential corrections to the raw Global Positioning System data and inspection of ground images recorded by a vertically-mounted video camera. The survey was flown on a pre-determined flight surface to minimize differences in magnetic values at the intersections of control and traverse lines. These differences were computer-analyzed to obtain a mutually leveled set of high-line magnetic data. The leveled values were then interpolated to a 50 m grid. The International Geomagnetic Reference Field (IGRF) defined at an altitude of 616 m for the year 2012.202 was then removed. Removal of the IGRF, representing the magnetic field of the Earth's core, produces a residual component related essentially to the magnetizations within the Earth's crust.

The first vertical derivative of the magnetic field is the rate of change of the magnetic field in the vertical direction. Computation of the first vertical derivative removes long-wavelength features of the magnetic field and significantly improves the resolution of closely spaced and superposed anomalies. A property of first vertical derivative maps is the coincidence of the zero-value contour with vertical contacts at high magnetic latitudes (Hood, 1965).

Keating Correlation Coefficients

This pattern recognition technique (Keating, 1995) for identifying roughly circular anomalies consists of computing the correlation coefficient, over a moving window, between a vertical cylinder model anomaly and the gridded magnetic data. Results above a correlation coefficient threshold of 80% were depicted as circular symbols, scaled to reflect the correlation value. The most favourable targets are those that exhibit a cluster of high correlation coefficients. The cylinder model parameters for this survey are as follows: diameter: 200 m; infinite length; depth: 120 m; magnetic inclination: 76° N; magnetic declination: 23° W; window size: 1000 m x 1000 m.

Digital versions of this map can be downloaded, at no charge, from Natural Resources Canada's Geoscience Data Repository (MIRAGE) at <http://www.mirage.ca>. Corresponding digital profile and gridded data as well as similar data for adjacent airborne geophysical surveys are available from Natural Resources Canada's Geoscience Data Repository for Aeromagnetic Data at <http://gdr.nrcan.gc.ca/aeromag/>. The same products are also available, for a fee, from the Geophysical Data Centre, Geological Survey of Canada, 615 Booth Street, Ottawa, Ontario K1A 0E9. Telephone: (613) 995-5326; email: enr@gsc.nrcan.gc.ca.

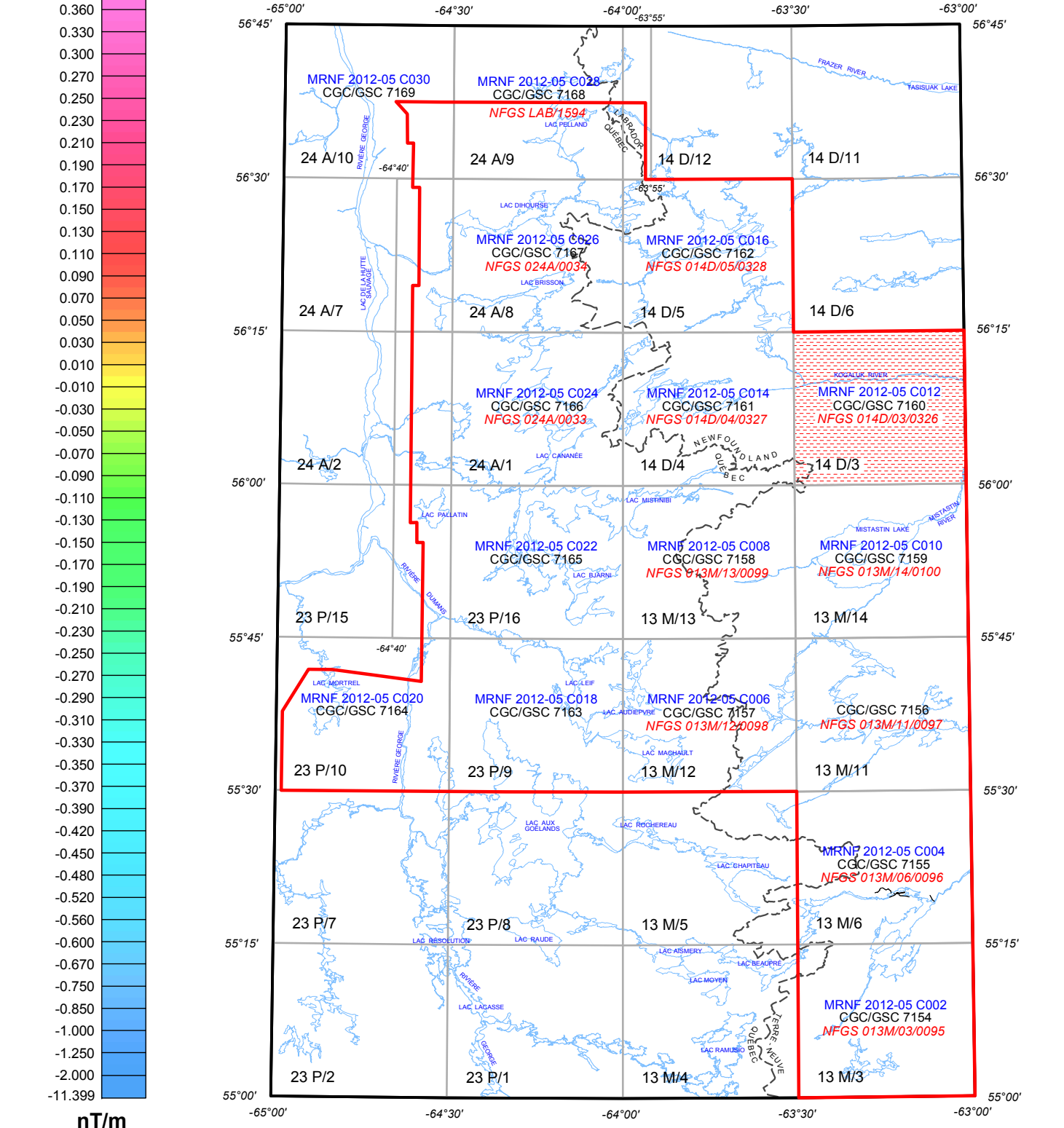
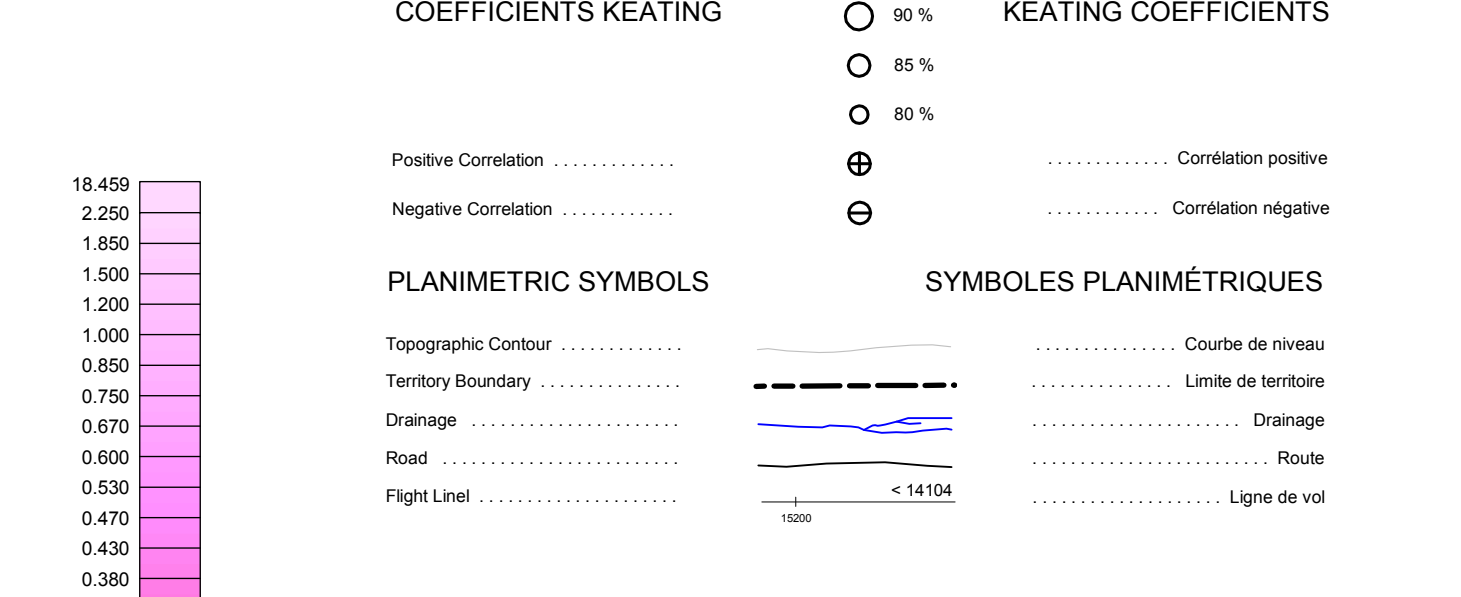
This map and the corresponding digital geophysical data may also be obtained from the Ministère des Ressources naturelles et de la Faune du Québec Web site's "Online Products and Services" page at <http://www.mrn.gov.qc.ca/produits-et-services/produits-et-services-geophysiques/>.

A digital version of this map can also be downloaded, at no charge, from the Web site of the Department of Natural Resources, Newfoundland and Labrador, either on its Open File page at http://www.nrl.gov.nl.ca/mineres/geomagnetonline/latest_public.html or on its Geoscience Online page at <http://gis.govonline.gov.nl.ca/>.

References / Références

Hood, P. J., 1965. Gradient measurements in aeromagnetic surveying. *Geophysics*, v. 30, p. 891-902.

Keating, P., 1995. A simple technique to identify magnetic anomalies due to kimberlite pipes. *Exploration and mining geology*, v. 4, no. 2, p. 121-125.



AEROMAGNETIC SURVEY MISTASTIN BATHOLITH / LEVÉ AÉROMAGNÉTIQUE DE LA RÉGION DU BATHOLITE DE MISTASTIN

OPEN FILE / DOSSIER PUBLIC

7160

GÉOLOGICAL SURVEY OF CANADA / COMMISSION GÉOLOGIQUE DU QUÉBEC

2012

Newfoundland and Labrador Department of Natural Resources, Geological Survey Open File 014D/03/0326

Ministère des Ressources naturelles et de la Faune du Québec

DP 2012-05 C012

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 MINISTÈRE DES RESSOURCES NATURELLES ET DE LA FAUNE DU QUÉBEC, DP 2012-05 C012

Authors: R. Dumont and A. Jones

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AEROMAGNETIC SURVEY MISTASTIN BATHOLITH / LEVÉ AÉROMAGNÉTIQUE DE LA RÉGION DU BATHOLITE DE MISTASTIN

NTS 14 D/3 / SNRC 14 D/3
 QUÉBEC AND NEWFOUNDLAND AND LABRADOR / QUÉBEC ET TERRE-NEUVE-ET-LABRADOR

FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD / DÉRIVÉE PREMIÈRE VERTICALE DU CHAMP MAGNÉTIQUE

Scale 1: 50 000 - Échelle 1/50 000

MAP LOCATION - LOCALISATION DE LA CARTE

MAP SHEET SUMMARY / SOMMAIRE DES FEUILLETS

Sheet / Feuillelet

MAP / CARTE

- Residual Total Magnetic Field / Composante résiduelle du champ magnétique total
- First Vertical Derivative of the Magnetic Field / Dérivée première verticale du champ magnétique