

**FIRST VERTICAL DERIVATIVE OF THE
RESIDUAL MAGNETIC FIELD**
Harry's River - Stephenville Map Area

12B/09 (west) and 12B/10 (east)

MAP 2009-58
OPEN FILE 012B/0581

L.A. Cook and G.J. Kilfoil

First Vertical Derivative of the Residual Magnetic Field

This map was derived from data acquired during an aeromagnetic survey carried out by NOVATEM Inc. The survey was flown during the period October 1st, 2008 to May 16th, 2009, using a Cessna-185 aircraft C-FARU. The aircraft was equipped with two Geometrics cesium vapour magnetometers with a sensitivity of 0.005 nT, installed in wingtip pods. Total field data were sampled at 10 Hz. The nominal traverse and control-line spacing were, respectively, 200 m and 2000 m, and the aircraft flew at a nominal terrain clearance of 90 m. Traverse lines were oriented NS0W 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 levelled set of flight-line magnetic data. The levelled values were then interpolated to a 50 m grid.

The first vertical derivative of the residual 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 superimposed anomalies. A property of the first vertical derivative maps is the coincidence of the zero-value contour with vertical contacts at high magnetic latitudes (Hood, 1965).

Digital versions of this map can be downloaded, at no charge, from the Newfoundland and Labrador Resource Atlas (<http://gis.geosurv.gov.nl.ca/>), and from the Geological Survey of Newfoundland and Labrador On-Line Open File page: <http://www.nr.gov.nl.ca/mines&en/geosurvey/publications/openfiles/>. Corresponding digital profile and gridded data for this survey, as well as for airborne surveys flown over adjacent areas, are also available from the Newfoundland and Labrador Resource Atlas.

Nalcor: <http://www.nalcorenergy.com/>
Department of Natural Resources: <http://www.nr.gov.nl.ca/>
Energy Branch: <http://www.nr.gov.nl.ca/mines&en/energy/>
Geological Survey: <http://www.nr.gov.nl.ca/mines&en/geosurvey/>
E-mail: pub@gov.nl.ca

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References

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

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Maps released as part of Open File Open File 012B/0581 are (refer to index map below):

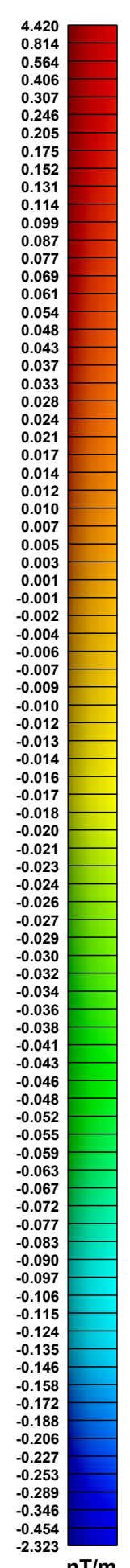
| Map Area (NTS) | Residual Magnetic Field | First Vertical Derivative of the Resid. Mag. Field |
|---|-------------------------|--|
| Flat Bay - Main Gut (12B/07 east, 12B/08 west) | Map 2009-55 | Map 2009-56 |
| Harry's River - Stephenville (12B/09 west, 12B/10 east) | Map 2009-57 | Map 2009-58 |
| Shag Island - Serpentine (12B/15 east, 12B/16 west) | Map 2009-59 | Map 2009-60 |

Note

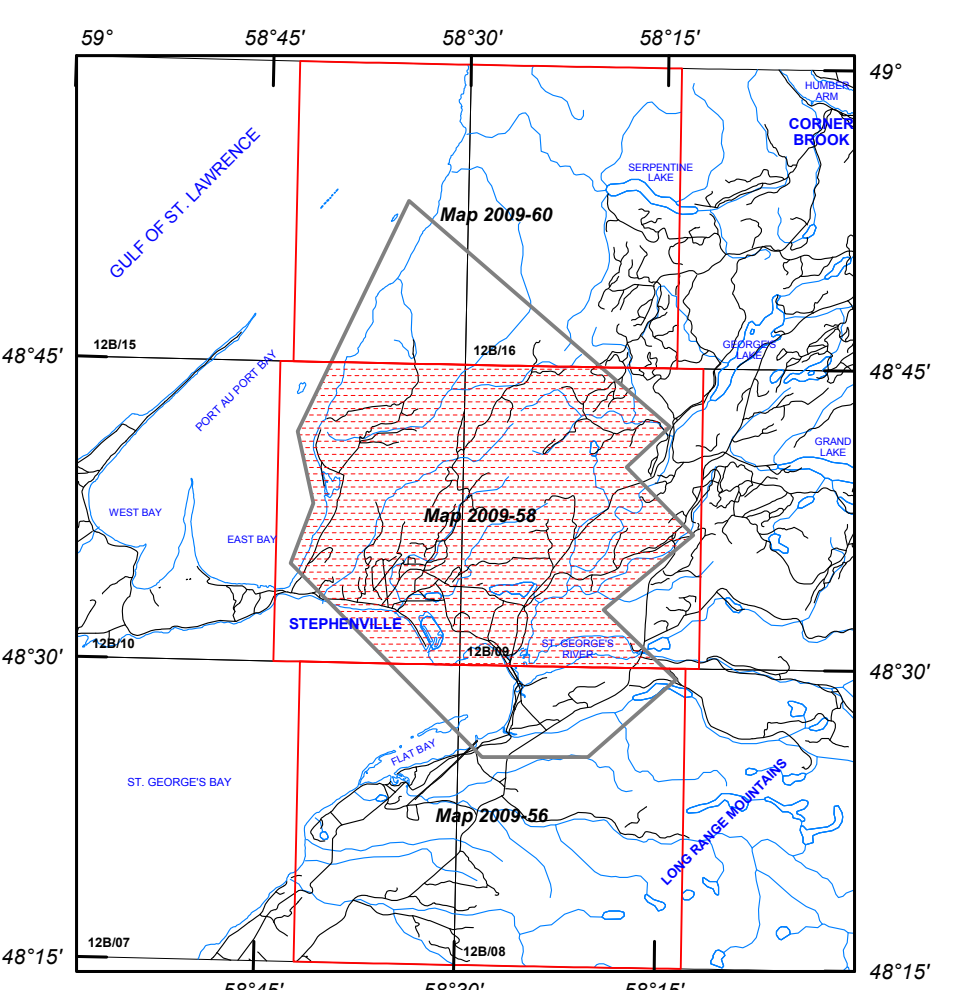
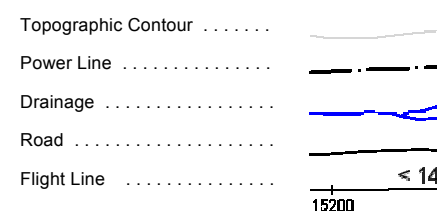
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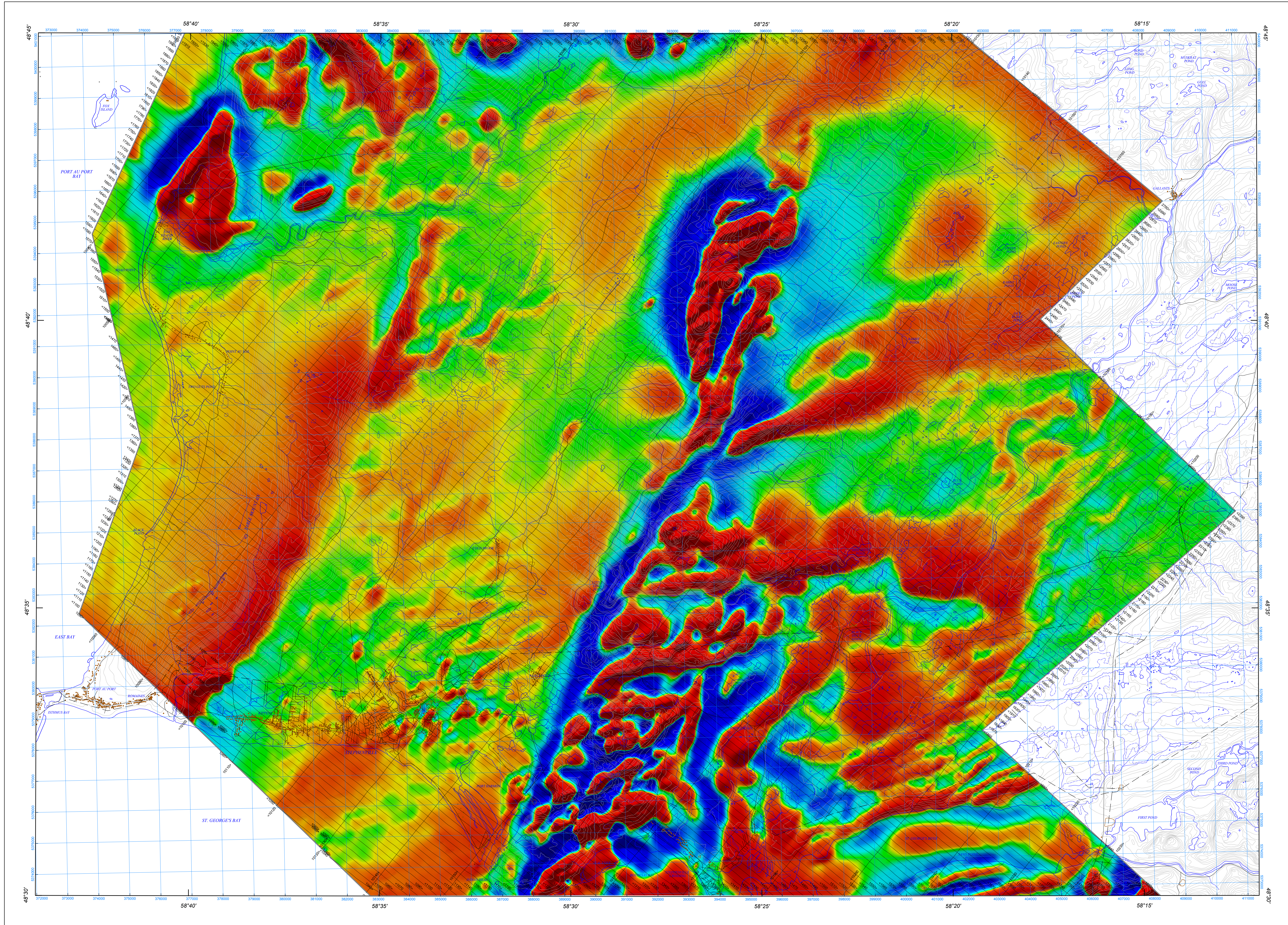
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PLANIMETRIC SYMBOLS



NATIONAL TOPOGRAPHICAL SYSTEM REFERENCE AND GEOPHYSICAL MAP INDEX
AEROMAGNETIC SURVEY - INDIAN HEAD AREA



MAP 2009-58
HARRY'S RIVER / STEPHENVILLE - NTS 12B/09 (west) & 12B/10 (east)

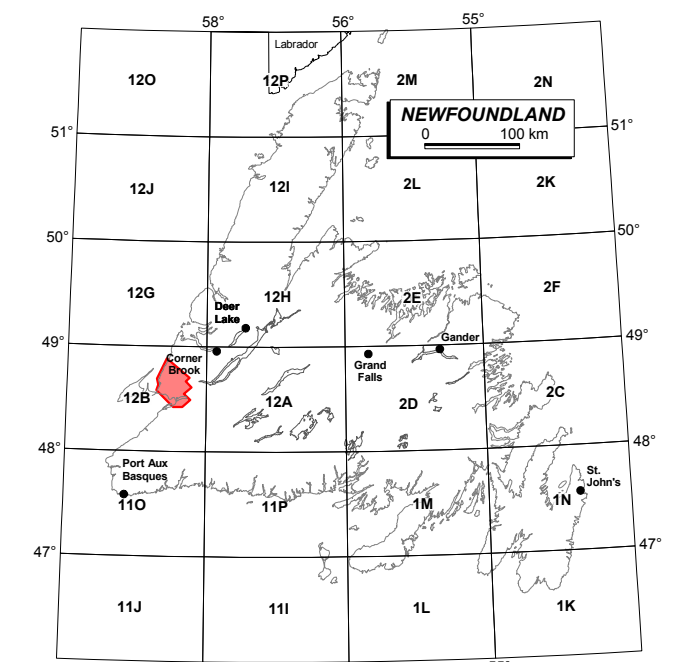
Scale 1: 50 000

1 0 1 2 3 4 5
kilometres

NAD83 / UTM zone 21N

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