

**FIRST VERTICAL DERIVATIVE OF THE  
RESIDUAL MAGNETIC FIELD**  
Shag Island - Serpentine Map Area

12B/15 (east) and 12B/16 (west)

MAP 2009-60  
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 1<sup>st</sup>, 2008 to May 16<sup>th</sup>, 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 NS07W 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 schedule 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 survey 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/nr/>  
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](mailto:pub@gov.nl.ca)

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**References**

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

**Recommended Citation**

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

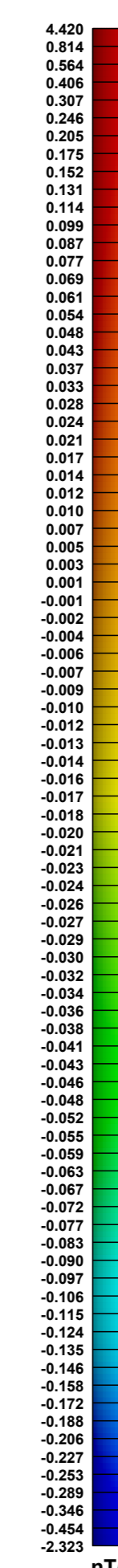
Map Area (NTS)	Residual Magnetic Field	First Vertical Derivative of the Resid. Mag. Field
Flat Bay - Main Gut (12B/07 east, 12B/08 west)	Map 2009-55	Map 2009-56
Harry's River - Stophenville (12B/09 west, 12B/10 east)	Map 2009-57	Map 2009-58
Shag Island - Serpentine (12B/15 east, 12B/16 west)	Map 2009-59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

**Note**

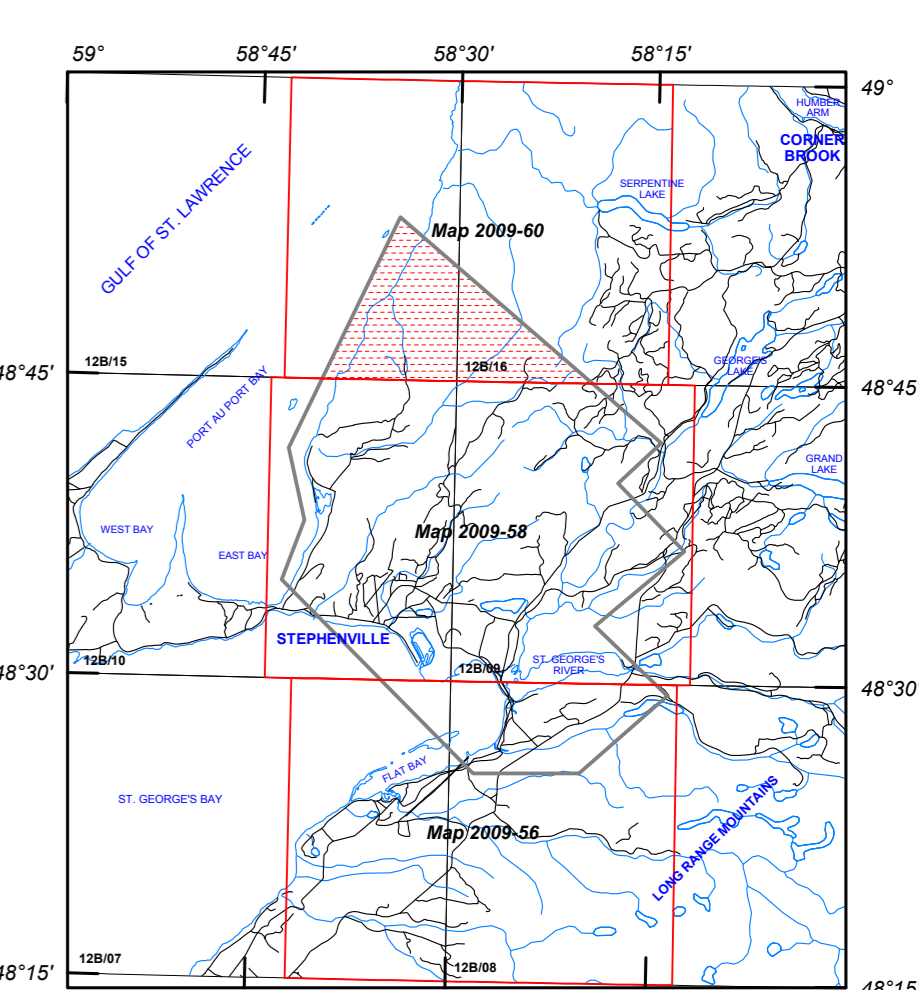
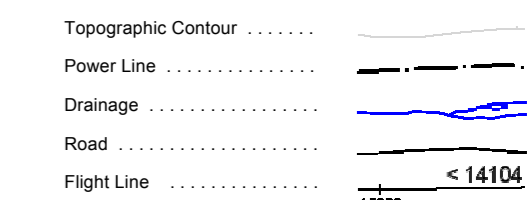
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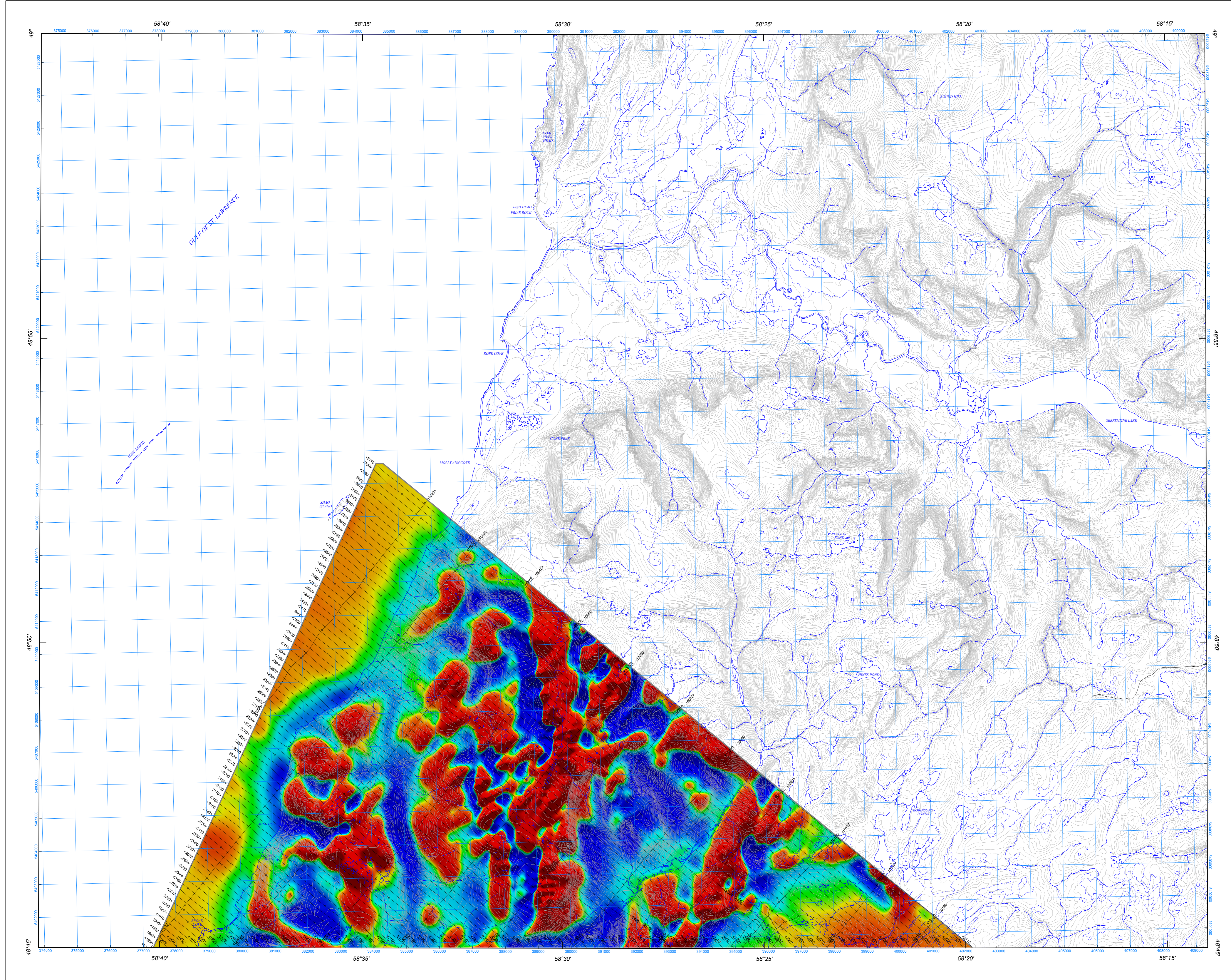


**PLANIMETRIC SYMBOLS**



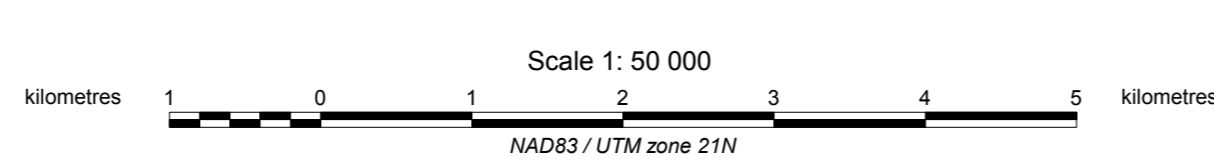
NATIONAL TOPOGRAPHICAL SYSTEM REFERENCE AND GEOPHYSICAL MAP INDEX

**AEROMAGNETIC SURVEY - INDIAN HEAD AREA**



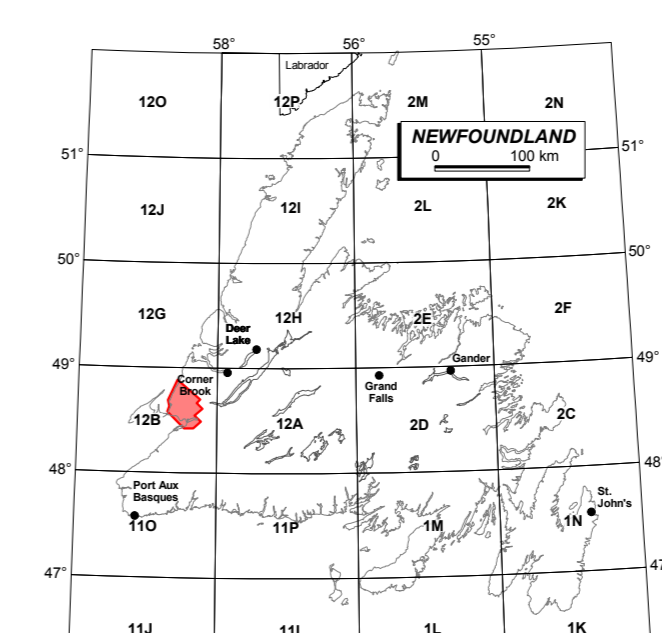
**MAP 2009-60**

SHAG ISLAND / SERPENTINE - NTS 12B/15 (east) & 12B/16 (west)



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