

**FIRST VERTICAL DERIVATIVE OF  
THE RESIDUAL MAGNETIC FIELD**

Little Grand Lake Map Area

(NTS 12A/12)

MAP 2009-31

OPEN FILE NFLD/3058

G.J. Kilfoil and L.A. Cook

**First Vertical Derivative of the Residual Magnetic Field**

This map was derived from data acquired during an aeromagnetic survey carried out by Geo Data Solutions GDS Inc. The survey was flown during the period November 25, 2008 to March 30, 2009, using a Piper PA-31 Navajo aircraft, C-2000. The aircraft was equipped with three Geometrics cesium vapour magnetometers with a sensitivity of 0.005 nT, installed in the tail boom and wingtip pods. Total field data were sampled at 10 Hz. The nominal traverse and control-line spacings were, respectively, 200 m and 2000 m, and the aircraft flew at a nominal terrain clearance of 90 m. Traverse lines were oriented N50°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 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.geosurvey.gov.nl.ca/>), and from the Geological Survey of Newfoundland and Labrador On-Line Open File page (<http://www.nr.gov.nl.ca/mines/geo/survey/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.

Printed copies of this map may be obtained from the Geoscience Publication and Information Section, Geological Survey, Department of Natural Resources, Government of Newfoundland and Labrador, P.O. Box 8700, St. John's, NL, Canada, A1B 4J6.

Department: <http://www.nr.gov.nl.ca/nr/>  
Geological Survey: <http://www.nr.gov.nl.ca/mines/geo/survey/>  
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.

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Maps released as part of Open File NFLD/3058 are (refer to index map below):

Map Area (NTS)	Residual Magnetic Field	First Vertical Derivative of the Resid. Mag. Field
Little Grand Lake (12A/12)	Map 2009-30	Map 2009-31
Corner Brook (12A/13)	Map 2009-32	Map 2009-33
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Pasadena (12H/04)	Map 2009-40	Map 2009-41
Lomond (12H/05)	Map 2009-42	Map 2009-43

**Note**

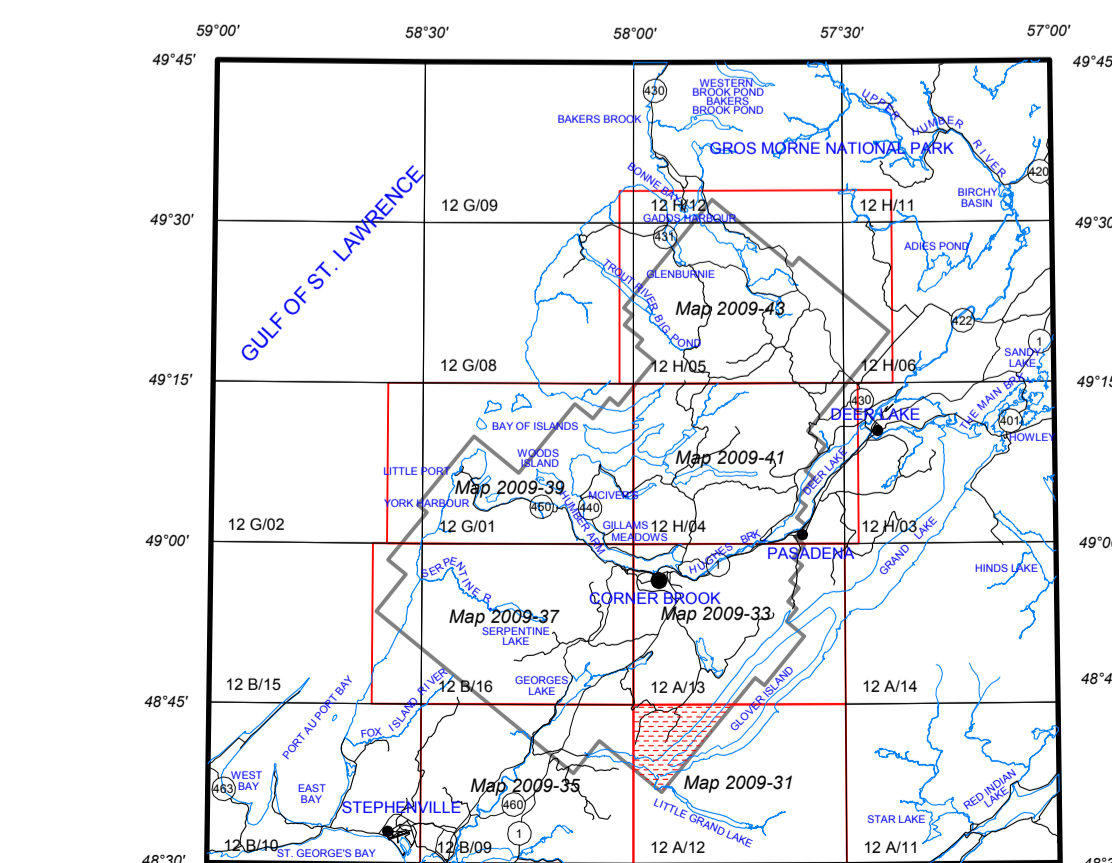
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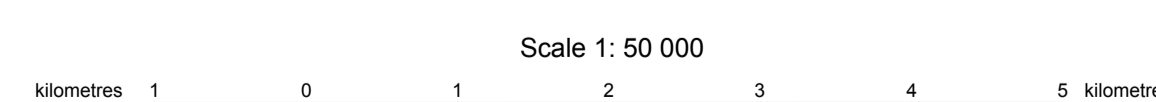
**PLANIMETRIC SYMBOLS**

Topographic Contour	
Power Line	
Drainage	
Road	
Flight Line	

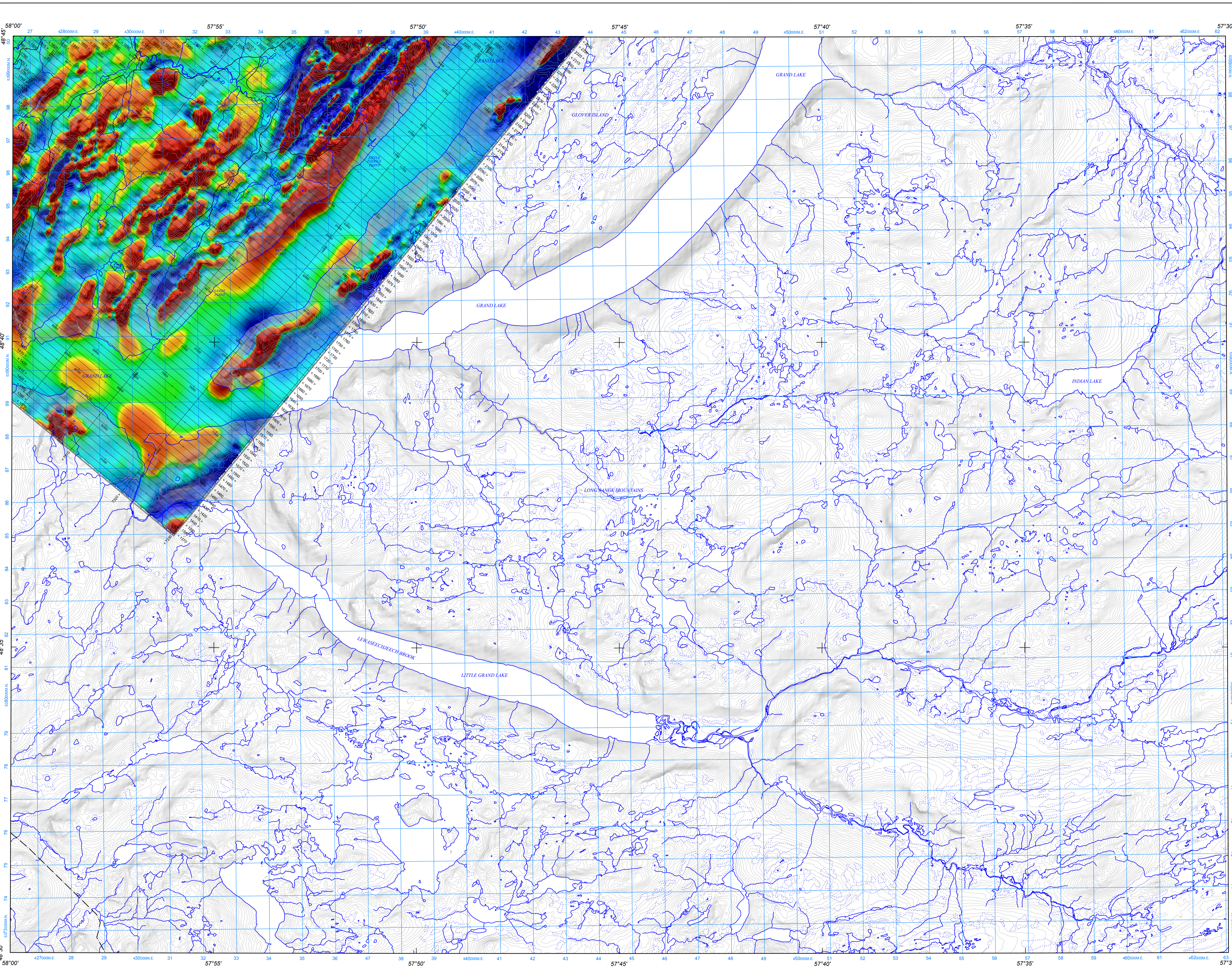


NATIONAL TOPOGRAPHICAL SYSTEM REFERENCE AND GEOPHYSICAL MAP INDEX  
**AEROMAGNETIC SURVEY - CORNER BROOK AREA**

**MAP 2009-31**  
LITTLE GRAND LAKE - NTS 12A/12



Scale 1: 50 000  
NAD83 / UTM zone 21N  
Digital Topographic Data provided by Geomatics Canada, Natural Resources Canada



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