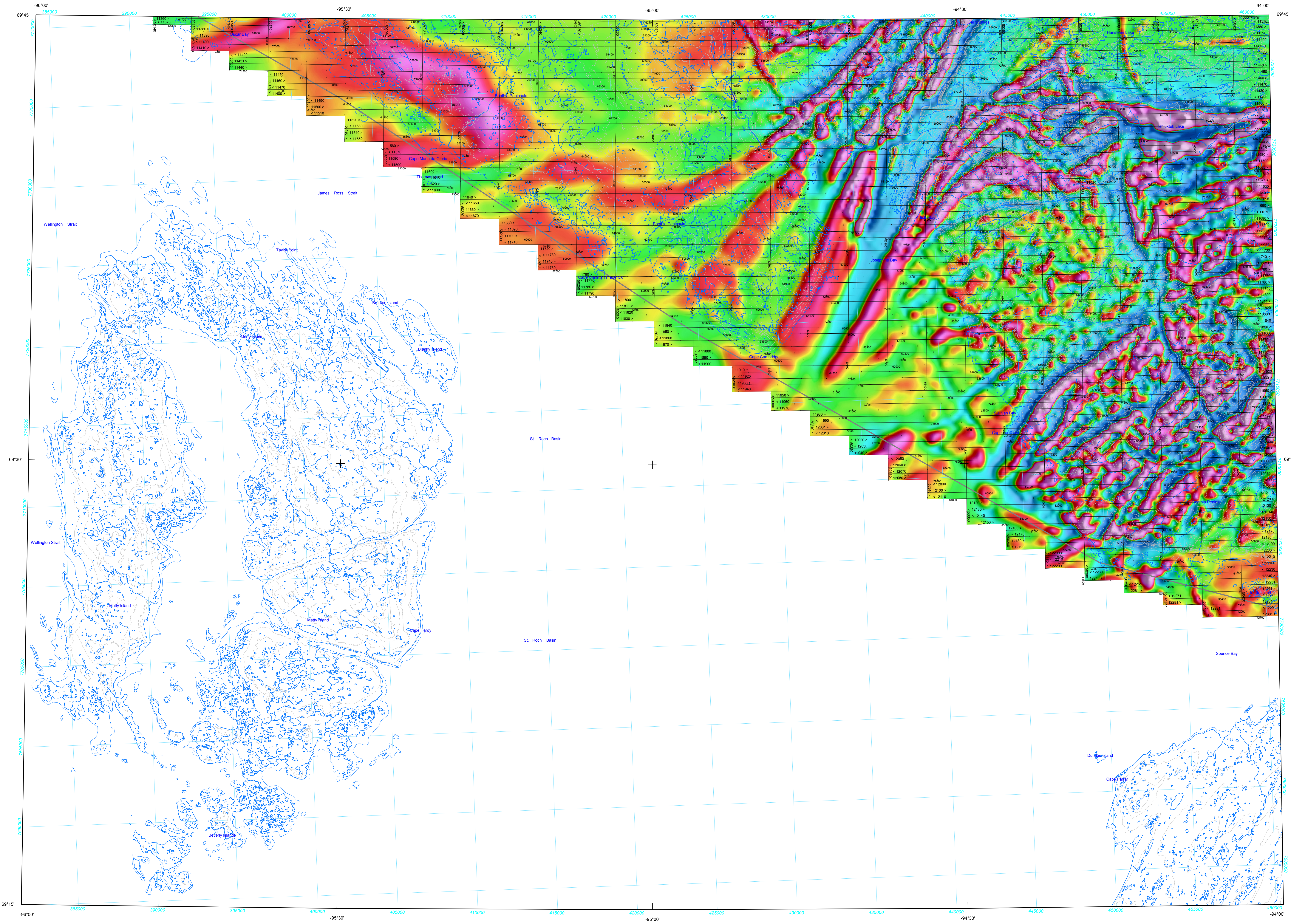
FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD



TOPOGRAPHIC CONTOUR INTERVAL: 30 METRES

This aeromagnetic survey and the production of this map were funded by the Geomapping for Energy and Minerals (GEM) program of the Earth Sciences Sector, Natural Resources Canada.

First Vertical Derivative of the Magnetic Field

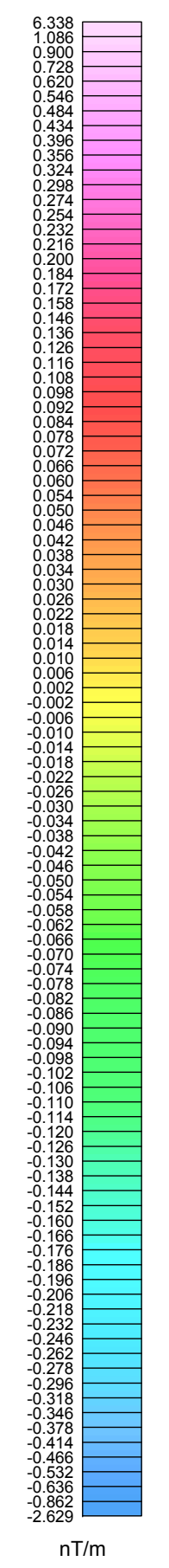
This map of the first vertical derivative of the magnetic field was derived from data acquired during an aeromagnetic survey carried out by Geo Data Solutions GDS Inc. and Oracle Geoscience International from September 7, 2013 to October 4, 2013. The data were recorded using split-beam cesium vapour magnetometer (sensitivity = 0.005 nT) mounted in each of the tail booms of two Piper Navajo aircraft (C-FVTL and C-GSVM). The nominal traverse and control line spacings were, respectively, 400 m and 2400 m, and the aircraft flew at a nominal terrain clearance of 150 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 (GPS) data. 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-analysed to obtain a mutually levelled set of flight-line magnetic data. The levelled values were then interpolated to a 100 m grid. The International Geomagnetic Reference Field (IGRF) defined at the average GPS altitude of 282.8 m for the year 2013.721 was then removed. Removal of the IGRF, representing the magnetic field of the Earth's core, produces a residual component related almost entirely to 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).

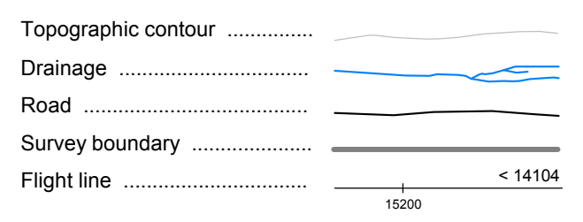
A digital version of this map can be downloaded, at no charge, from Natural Resources Canada's Geoscience Data Repository (MIRAGE) at http://apps1.gdr.nrcan.gc.ca/mirage/mirage_index_e.php. Corresponding digital profile and gridded data as well as similar data for adjacent airborne geophysical surveys are available from Natural Resources Canada's Geoscience Data Repository for Aeromagnetic data at http://gdr.agg.nrcan.gc.ca/index_e.html. 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: infogdc@agg.nrcan.gc.ca.

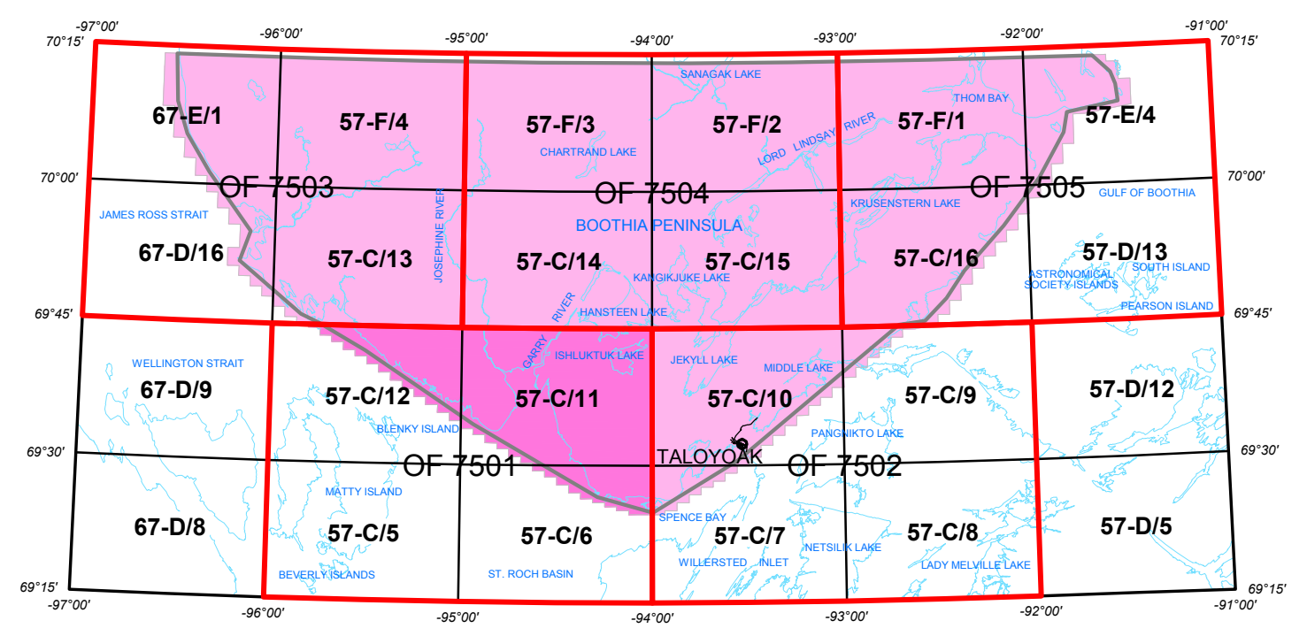
Reference

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



PLANIMETRIC SYMBOLS





NATIONAL TOPOGRAPHIC SYSTEM REFERENCE AND GEOPHYSICAL MAP INDEX

AEROMAGNETIC SURVEY OF NORTHERN BOOTHIA PENINSULA, NUNAVUT

OPEN FILE
DOSSIER PUBLIC
7501
GEOLOGICAL SURVEY OF CANADA
COMMISSION GÉOLOGIQUE DU CANADA
2014

GSC OPEN FILE 7501

FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

AEROMAGNETIC SURVEY OF NORTHERN BOOTHIA PENINSULA

NTS 57-C/6, 57-C/11 and 57-C/12

NUNAVUT

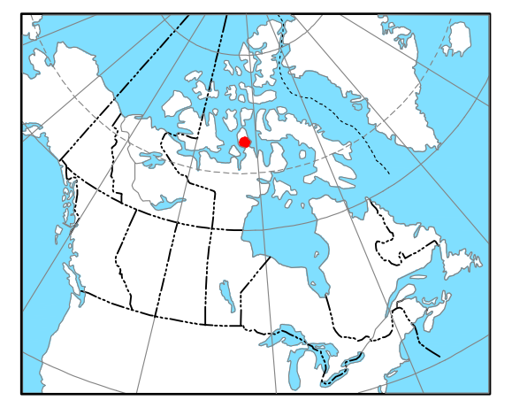
Scale 1:100 000

2 0 2 4 6 kilometres

NAD83 / UTM zone 15N

Universal Transverse Mercator Projection
North American Datum,1983

Digital Topographic Data provided by Geomatics Canada, Natural Resources Canada



MAP LOCATION

Author: R. Dumont

Data acquisition, data compilation and map production by
Geo Data Solutions GDS Inc., Laval, Quebec.
Contract and project management by
the Geological Survey of Canada, Ottawa, Ontario.

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First Vertical derivative of the magnetic field,
Aeromagnetic Survey of Northern Boothia Peninsula,
NTS 57-C/6, 57-C/11 and 57-C/12, Nunavut;
Geological Survey of Canada, Open File 7501,
scale 1:100 000.

GEM

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