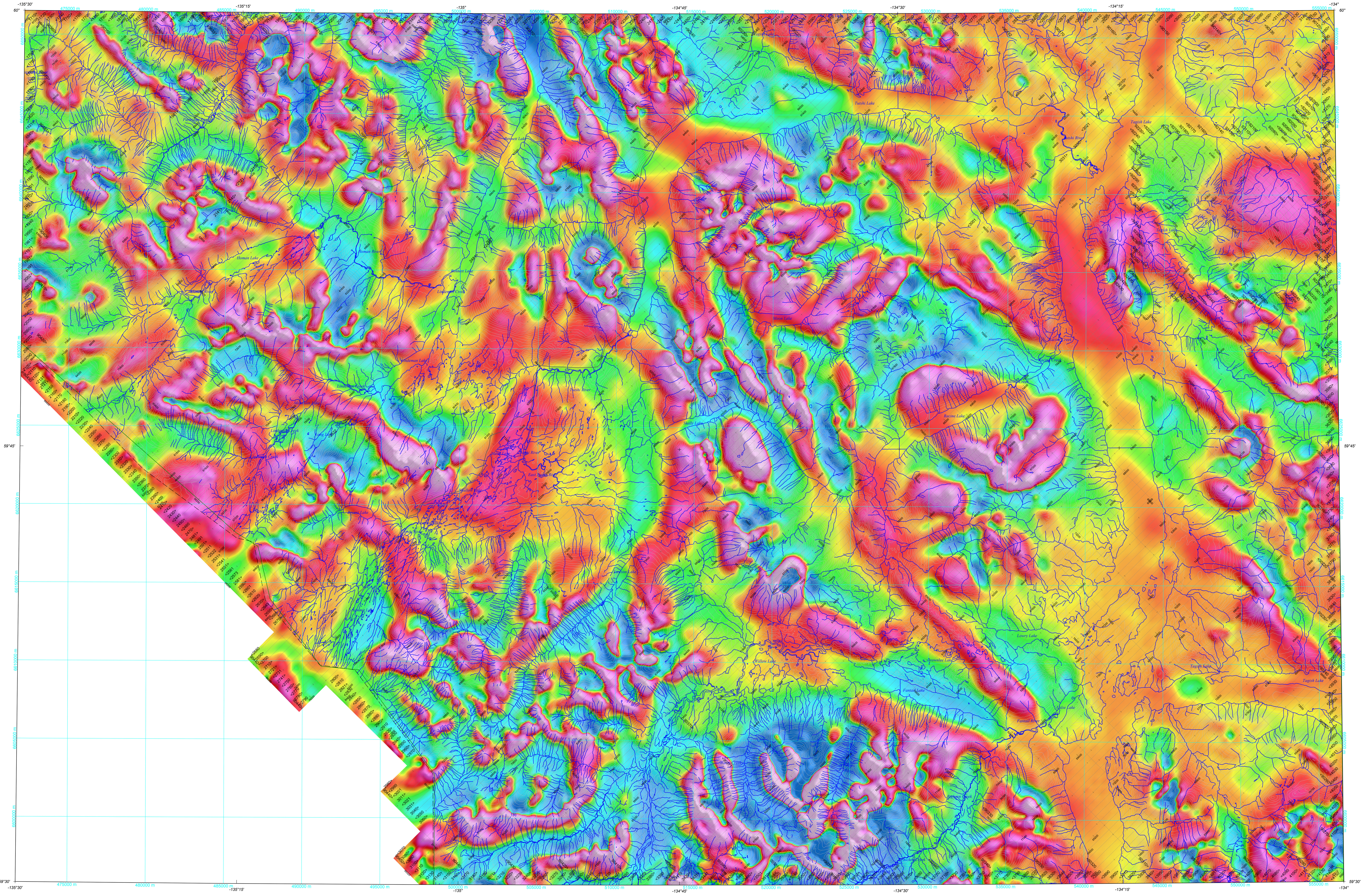
Natural Resources Canada | Ressources naturelles Canada

Celebrating 175 yrs

FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD



This aeromagnetic survey and the production of this map were funded by Phase 2 of the Geo-Mapping for Energy and Minerals program (GEM-2 Cordillera Project) of the Lands and Minerals Sector, Natural Resources Canada.

TOPOGRAPHIC CONTOUR INTERVAL: 30 METRES

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 Goldak Airborne Surveys from March 10, 2017 to July 6, 2017. The nominal traverse and control line spacings were, respectively, 400 m and 2400 m, and the airplane flew at a nominal terrain clearance of 150 m. Traverse lines were oriented 45°E 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 1950 m for the current mid-survey date of 2017/06/08 was removed. Removal of the IGRF, representing the magnetic field of 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).

This publication is available for free download through GEOSCAN (http://geoscan.nrcan.gc.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 Geophysical 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, 601 Booth Street, Ottawa, Ontario K1A 0E8. Telephone: (613) 947-3337, email: NRCan.infogdc-infogdc.RNCan@canada.ca.

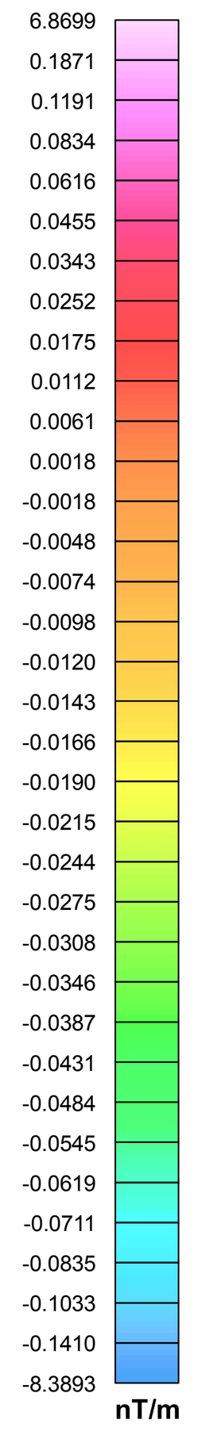
These data are also available for free download from the British Columbia Geological Survey, http://www.empr.gov.bc.ca/mining/Geoscience/Pages/default.aspx. PO Box 9333 Stn Prov Gov't, Victoria, BC,V8W 9N3. Telephone: (250) 952-0372, email: Geological.Survey@gov.bc.ca.

References

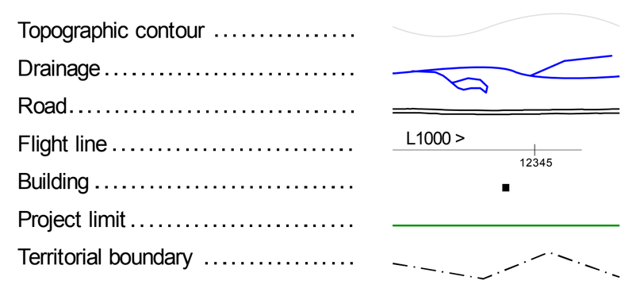
Hood, P.J., 1965. Gradient measurements in aeromagnetic surveying; Geophysics, v. 30, p. 891-902.

Acknowledgements

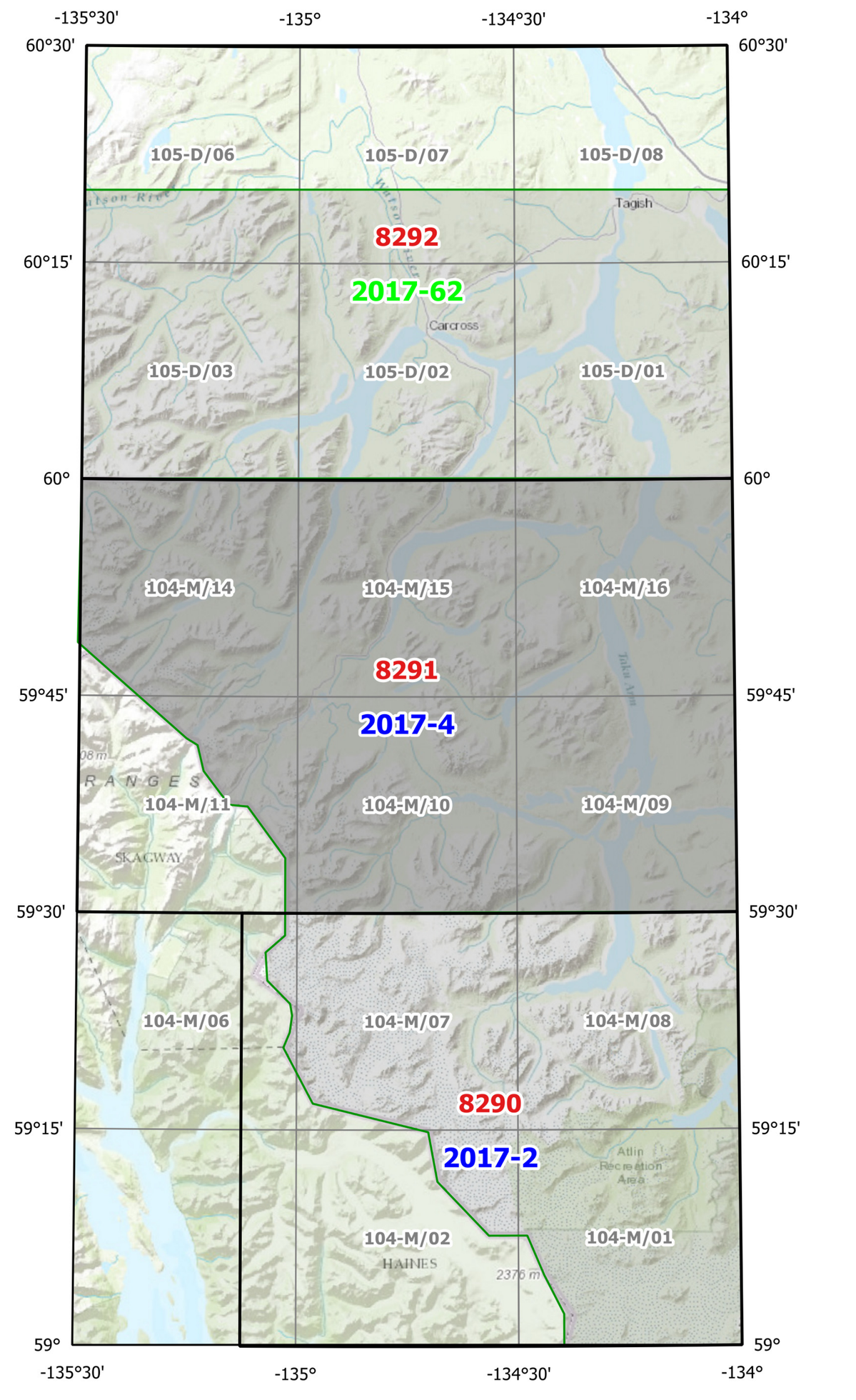
The authors thank Bill Heath and Glen Carson at Goldak Airborne Surveys for their cooperation during the survey. The authors thank Maurice Coyle and Richard Fortin for their participation in the project, and Mark Pilkington and Natalie Morisset for editing and helpful suggestions to improve the maps.



PLANIMETRIC SYMBOLS



GSC Open File Numbers in Red
BCGS Geoscience Map Numbers in Blue
YGS Open File Numbers in Green



NATIONAL TOPOGRAPHIC SYSTEM REFERENCE AND GEOPHYSICAL INDEX MAP

GEOLOGICAL SURVEY OF CANADA OPEN FILE 8291
BRITISH COLUMBIA GEOLOGICAL SURVEY GEOSCIENCE MAP 2017-4, SHEET 2 OF 2

FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

AEROMAGNETIC SURVEY OF THE LLEWELLYN AREA

NTS 104-M/9, 10, 15, 16 and parts of 104-M/11, 14
BRITISH COLUMBIA

Authors: O. Boulanger and F. Kiss

Data acquisition, data compilation and map production by Goldak Airborne Surveys, Saskatoon, Saskatchewan.
Contract and project management by the Geological Survey of Canada, Ottawa, Ontario.

Permanent link: https://doi.org/10.4095/305326

Scale 1:100 000

2000 0 2000 4000 6000
(metres)
NAD83 / UTM zone 8N

Universal Transverse Mercator Projection
North American Datum 1983

Digital topographic data from Natural Resources Canada

MAP LOCATION

OPEN FILE
DOSSIER PUBLIC
8291
GEOLOGICAL SURVEY OF CANADA
COMMISSION GÉOLOGIQUE DU CANADA
2017

Publications in this series have not been edited; they are released as submitted by the author.

Les publications de cette série ne sont pas révisées; elles sont publiées telles que soumises par l'auteur.

GEOSCIENCE MAP
2017-4
BRITISH COLUMBIA GEOLOGICAL SURVEY
2017
Sheet 2 of 2

MAP SHEET SUMMARY

SHEET	MAP
1.	Residual Total Magnetic Field
2.	First Vertical Derivative of the Magnetic Field

AEROMAGNETIC SURVEY OF THE LLEWELLYN AREA

Recommended Citation for BCGS Publication

Boulanger, O., and Kiss, F., 2017.
Aeromagnetic Survey of the Llewellyn Area,
NTS 104-M/9, 10, 15, 16 and parts of 104-M/11, 14, British Columbia.
British Columbia Ministry of Energy and Mines,
British Columbia Geological Survey Geoscience Map 2017-4 (Scale 1:100 000).
Sheet 2 of 2: First Vertical Derivative of the Magnetic Field

Recommended Citation for GSC Publication

Boulanger, O., and Kiss, F., 2017.
First Vertical Derivative of the Magnetic Field,
Aeromagnetic Survey of the Llewellyn Area,
NTS 104-M/9, 10, 15, 16 and parts of 104-M/11, 14, British Columbia;
Geological Survey of Canada, Open File 8291;
scale 1:100 000. https://doi.org/10.4095/305326

Canada

BRITISH COLUMBIA | Ministry of Energy and Mines