

Tilt Angle of the Magnetic Field

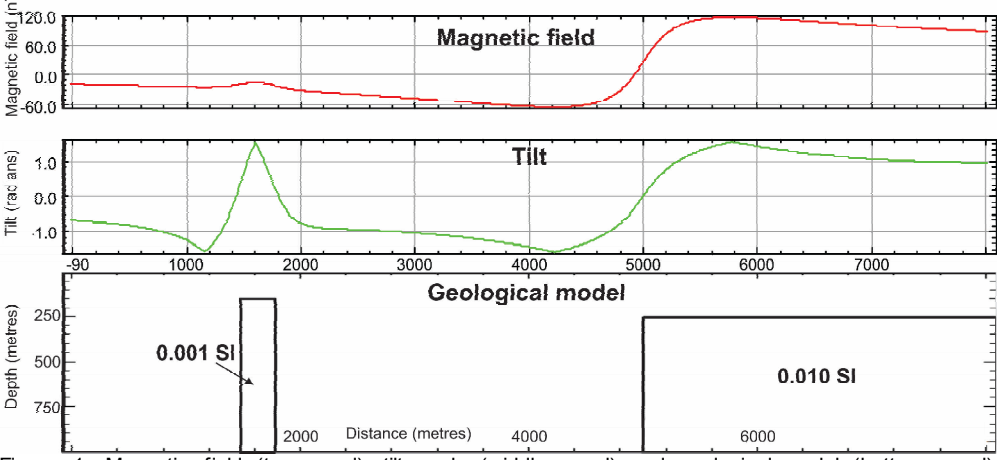
This map of the tilt angle of the magnetic field was derived from data acquired during an aeromagnetic survey carried out by Geo Data Solutions (GDS) Inc. from March 1, 2017 to April 2, 2017. The survey area consists of three adjoining survey blocks, A, B and C. Rubenized data (Bucke et al., 2009) originating from a survey flown by Fugro Airborne Surveys Corp. supplements the new survey data in Block C. Data from all survey blocks were recorded using split-beam cesium vapour magnetometers (precision = ±0.05 nT) mounted in each of the tail booms of two GDS Super Hawk and a Gemini Titan 400 aircraft operated by Fugro Airborne Surveys Corp.

Survey project specifications				
	Block A	Block B	Block C	Block C (re-fit)
Survey year	2017	2017	2009	2017
Aircraft registration	C-PT028	C-PT028	C-PT028	C-PT028
Crew	C-PT028	C-PT028	C-PT028	C-PT028
Flight height	Drone, 100 m	Drone, 100 m	Drone, 100 m	Drone, 100 m
Line spacing	200 m	200 m	400 m	400 m
Line direction	45° / 225°	100° / 280°	100° / 280°	100° / 280°
Line line spacing	1200 m	1200 m	2400 m	2400 m
The line direction	130° / 310°	100° / 280°	100° / 280°	100° / 280°

In Block C, the left flight line and line for the current 2017 survey were offset to provide the desired coverage of 200 m line and 1200 m line spacing when combined with the 2009 survey.

The flight path was recovered following post-flight differential corrections to the raw Global Positioning System (GPS) data. The survey blocks were flown on a pre-determined flight draped surface to minimize differences in magnetic values at the intersections of the lines and traverse lines. The draped surface for the 2009 survey in Block C was lowered and the magnetic data were down-weighted and combined to the new surface level of the 2017 survey draped surface before these intersection differences were computed. The 2017 survey data were then used to produce the magnetic data. The leveled values were then interpolated to a 0.25 m grid. The International Geomagnetic Reference Field (IGRF) defined at the average IGRF altitude of 0.25 m for the current survey date of 2017/03/17 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 tilt angle of the magnetic field (Muller and Singh, 1994) is the arctangent of the ratio of the vertical derivative of the magnetic field over the horizontal derivative of the magnetic field. The amplitude is restricted to -90° to 90° radians, is generally positive over a magnetic source, negative where the source is at zero or to near the source edge for vertical contacts (Figure 1). The tilt effectively equalizes amplitudes of the magnetic field so weak and strong magnetic anomalies have a similar appearance (Figure 1 – 500 m grid).



This publication is available for free download through GEOCAN (<http://geocan.nrc.ca/geocan>). Corresponding digital profile and gridded data as well as aerial data for adjacent aeromagnetic surveys are available from Natural Resources Canada's Geoscience Data Repository at <http://open.canada.ca/data/geoscience>. The same products are also available, for a fee, from the Geophysical Data Centre, Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario K1A 0K8, email: [geocan@nrc.ca](mailto:geocan@nrc.ca).

Digital versions of this map, as well as corresponding digital profile and gridded data, may also be downloaded free of charge from the Alberta Geological Survey website: <http://www.agr.alberta.ca>.

Acknowledgements

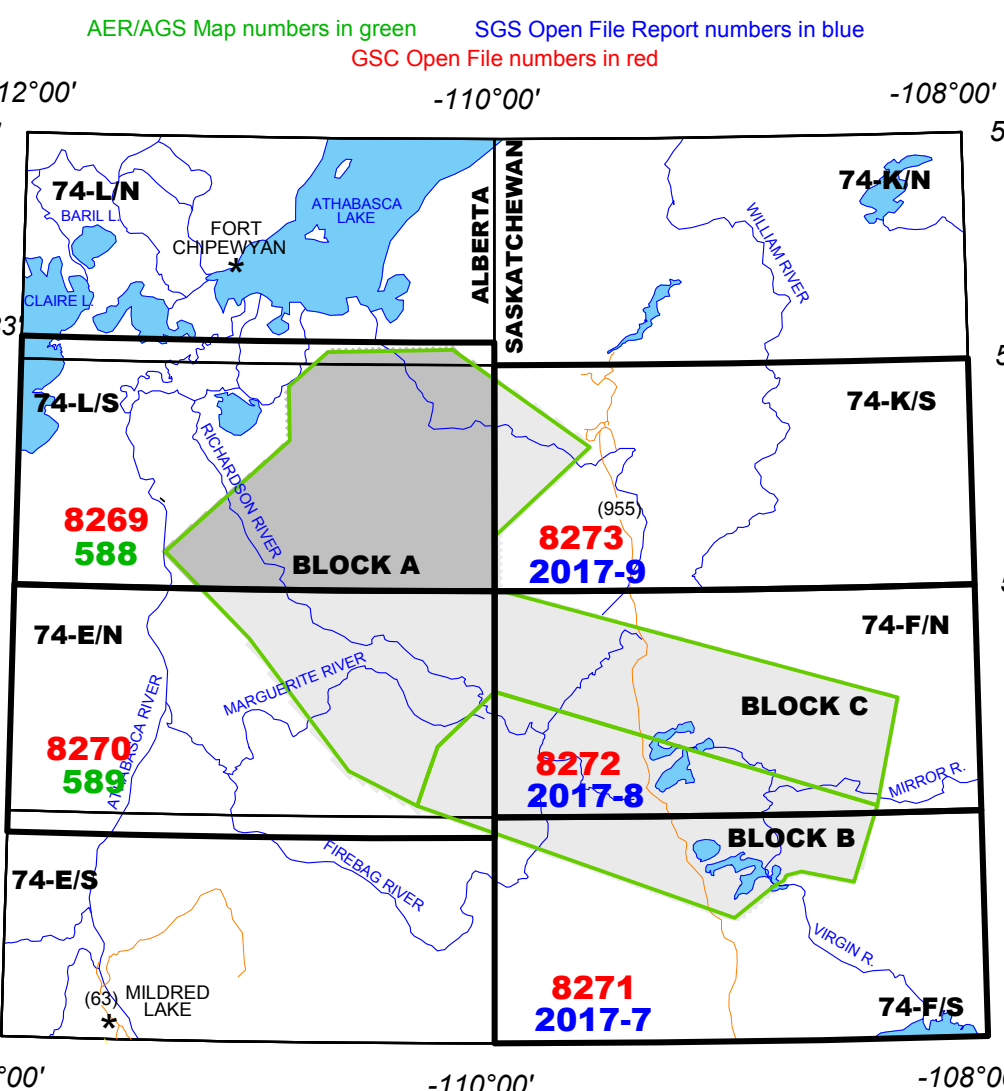
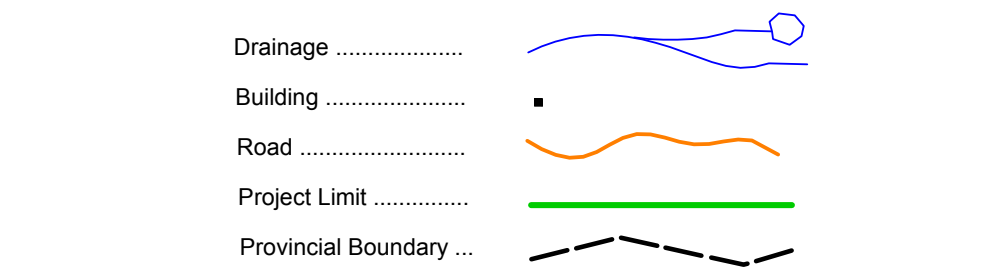
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References

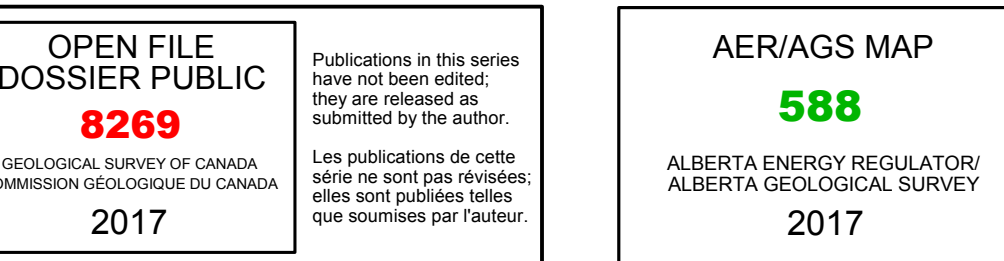
Bucke, J. L., Coyle, M., Carson, J. M., Harvey, B. J. A. and Delaney, G., 2009. Geophysical Setting, Southern Saskatchewan Survey, Saskatchewan, parts of NTS 74-F and 74-E. Geological Survey of Canada, Open File 6917. Saskatchewan Ministry of the Economy, Open File 2009-1, scale 1:250 000. (<http://openfile.cdn.gc.ca/openfile/6917>)

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PLANIMETRIC SYMBOLS



AEROMAGNETIC SURVEY OF THE MARGUERITE RIVER AREA



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