




 GEOLOGICAL SURVEY OF CANADA
 DEPARTMENT OF ENERGY, MINES AND RESOURCES
 125A
 THIRD EDITION
MAGNETIC ANOMALY MAP OF CANADA
 Scale 1:5,000,000
 Miles 0 100 200 300
 Kilometers 0 100 200 300
 JANUARY COMPASS CONIC PROJECTION STANDARD MERIDIAN 95°W AND 77°W, MODIFIED POLYCONIC PROJECTION NORTH OF LATITUDE 50°
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 1977 12 3077

This magnetic anomaly map is derived from approximately 8200 standard total field aeromagnetic maps published at a scale of one inch equals one mile (1:63360) under the Federal/Provincial Aeromagnetic Survey Program. The standard flight line spacing for these surveys was 1/2 mile (0.8 kilometers) at an average terrain clearance of 1000 feet (305 metres). Sea map magnetometer data has also been included in the map. The first and second editions of this map were collated from a total of 1000 maps of one inch equals four miles (1:25344) in which the original total field aeromagnetic maps were reduced in scale and colored at 200 gamma intervals. A distinctive banding was apparent on the resultant colored maps caused by the dominating effect of the main geomagnetic field which has its origin in the earth's core. The bands corresponded approximately with the contours found on the total field (F) map for 1965.0 published by the Dominion Observatories Branch (now the Earth Physics Branch). The magnetic anomaly pattern due to crustal geology was as a consequence obscured. In order to remove the undesirable effects it was decided to produce a 200 gamma magnetic anomaly map of Canada by subtracting the core generated component of the geomagnetic field from the aeromagnetic data using values derived from the Dominion Observatories total field (F) map for 1965.0. The values were first corrected for secular variation to the year in which the particular survey comprising the map was flown. For a more complete description of the compilation of the map see McGrath et al., Geological Survey of Canada Paper 78-1A. Magnetic features less than 5 miles (8 kilometers) regardless of their intensity are too narrow to be portrayed at the scale of this map. As the narrow anomalies are known to be caused by relatively small scale near surface features, the map can be regarded as many

reflecting larger scale near surface and major deep-seated geological features. As a result no change is evident in the magnetic pattern at the boundary of the Canadian Shield as there is on the one-mile maps. This map presents an overview of a massive amount of magnetic data and will assist both in interpreting regional geological structure in the basement rocks and help in the planning of more detailed investigations. One of the more striking characteristics of the map is the occurrence of pervasive magnetic patterns over large regions which reflect the various geological provinces and their boundaries. Contained within these large subdivisions are a number of major magnetic features and their boundaries. Contained within these are not as readily apparent on the four-mile maps. The linear features probably reflect major fault zones or crustal sutures. The large scale pattern variations probably reflect differences in lithology and/or metamorphic history within the crustal rocks or variations in the thickness of the upper sialic layer of the earth. When the anomaly map is compared to a geological map the correspondence is obvious between granitoid belts and their metamorphic equivalents with areas of broad magnetic low. The magnetic high areas correlate well with more extensively granitized areas. The various surveys that comprise the map were not tied to a common reference magnetic base level. It is not known whether regional changes in base level over large areas are geologically significant; for example the regional high area over central Canada as compared with the regional low over the Maritime Provinces of eastern Canada may have geologic significance. Aeromagnetic data used in this map are derived from the Federal/Provincial Aeromagnetic Survey from maps published previously by the Geological Survey and by Provincial Governments; the sea magnetic

former data was obtained by the Hydrographic and Marine Geophysics Sections of the Bedford Institute of Oceanography. Data was also contributed by Atlantic Richfield Company, Shell Canada Company, Dominion Gulf Company, Imperial Oil Ltd., Mobil Oil Ltd. and the Newmont Mining Company. The work involved in the approximately 9 million kilometres of aeromagnetic surveying and compilation of the data by Aero Photo Inc., Canadian Aero Services Ltd., Geomatics Ltd., Hunting Earth Science and Survey Ltd., has made a significant contribution to geological mapping and mineral exploration programs in Canada. P.H. McGrath, P.J. Hood, A.G. Darney
 Geophysical compilation by E.L. Halsey
 Base-map cartography by R. Saffin
 Geographical cartography by E. Maish
 Computer assisted and traditional cartographic techniques were used to produce the topographical and geophysical information portrayed on this map.
 Base-map has been revised for this edition.
 Bathymetry in metres
 1 gamma = 1 nanotesla in S.I. units
LEGEND
 > 200 gamma
 0 to +200 gamma
 0 to -200 gamma
 < -200 gamma