THESE TERMS GOVERN YOUR USE OF THIS DOCUMENT

Your use of this Ontario Geological Survey document (the "Content") is governed by the terms set out on this page ("Terms of Use"). By downloading this Content, you (the "User") have accepted, and have agreed to be bound by, the Terms of Use.

Content: This Content is offered by the Province of Ontario's *Ministry of Northern Development and Mines* (MNDM) as a public service, on an "as-is" basis. Recommendations and statements of opinion expressed in the Content are those of the author or authors and are not to be construed as statement of government policy. You are solely responsible for your use of the Content. You should not rely on the Content for legal advice nor as authoritative in your particular circumstances. Users should verify the accuracy and applicability of any Content before acting on it. MNDM does not guarantee, or make any warranty express or implied, that the Content is current, accurate, complete or reliable. MNDM is not responsible for any damage however caused, which results, directly or indirectly, from your use of the Content. MNDM assumes no legal liability or responsibility for the Content whatsoever.

Links to Other Web Sites: This Content may contain links, to Web sites that are not operated by MNDM. Linked Web sites may not be available in French. MNDM neither endorses nor assumes any responsibility for the safety, accuracy or availability of linked Web sites or the information contained on them. The linked Web sites, their operation and content are the responsibility of the person or entity for which they were created or maintained (the "Owner"). Both your use of a linked Web site, and your right to use or reproduce information or materials from a linked Web site, are subject to the terms of use governing that particular Web site. Any comments or inquiries regarding a linked Web site must be directed to its Owner.

Copyright: Canadian and international intellectual property laws protect the Content. Unless otherwise indicated, copyright is held by the Queen's Printer for Ontario.

It is recommended that reference to the Content be made in the following form:

Easton, R.M. 2014. Proterozoic and Phanerozoic geologic history of the Cobden area, Grenville Orogen, Ontario, based on new geological and geophysical data; poster, Geological Society of America 2014 Annual Meeting, Vancouver, British Columbia, Canada, October 19–22.

Use and Reproduction of Content: The Content may be used and reproduced only in accordance with applicable intellectual property laws. *Non-commercial* use of unsubstantial excerpts of the Content is permitted provided that appropriate credit is given and Crown copyright is acknowledged. Any substantial reproduction of the Content or any *commercial* use of all or part of the Content is prohibited without the prior written permission of MNDM. Substantial reproduction includes the reproduction of any illustration or figure, such as, but not limited to graphs, charts and maps. Commercial use includes commercial distribution of the Content, the reproduction of multiple copies of the Content for any purpose whether or not commercial, use of the Content in commercial publications, and the creation of value-added products using the Content.

Contact:

FOR FURTHER INFORMATION ON	PLEASE CONTACT:	BY TELEPHONE:	BY E-MAIL:
The Reproduction of the EIP or Content	MNDM Publication Services	Local: (705) 670-5691 Toll-Free: 1-888-415-9845, ext. 5691 (inside Canada, United States)	Pubsales.ndm@ontario.ca
The Purchase of MNDM Publications	MNDM Publication Sales	Local: (705) 670-5691 Toll-Free: 1-888-415-9845, ext. 5691 (inside Canada, United States)	Pubsales.ndm@ontario.ca
Crown Copyright	Queen's Printer	Local: (416) 326-2678 Toll-Free: 1-800-668-9938 (inside Canada, United States)	Copyright@gov.on.ca

PRECAMBRIAN GEOLOGY OF THE GRENVILLE OROGEN IN EASTERN ONTARIO FROM AEROMAGNETIC AND COMPILED GEOLOGICAL DATA

R.M. Easton and S.J. Magnus, Earth Resources and Geoscience Mapping Section, Ontario Geological Survey, Sudbury, Ontario P3E 6B5, mike.easton@ontario.ca, 705-670-5995.

Abstract

The Grenville Orogen in eastern Ontario is almost entirely overlain by Paleozoic strata, consequently its geology was poorly known because of low-resolution aeromagnetic coverage (800 m line spacing) and limited diamond drilling that penetrated to basement. To improve our knowledge of this area, in late 2013, 34 724 line-kilometres of aeromagnetic data were collected at 400 m line spacing over a 12 515 km² area from east of longitude 76°30'30"W to the Quebec border. These data were released in June 2014 as Ontario Geological Survey Geophysical Data Set 1075 and a series of hard-copy aeromagnetic maps.

We present an example of one of 3 new 100 000 scale geological compilation maps for the Precambrian geology of eastern Ontario utilizing the detailed aeromagnetic data and existing geological data. This is possible as the Paleozoic strata are magnetically transparent, especially where thin (<400m thick). The geology polygons on the map are underlain by a greyscale shaded-relief image of the first vertical derivative of the aeromagnetic survey in order to illustrate the geophysical expression of the geological units. Sun angle is from the northwest (315°) with an elevation of 45°. Paleozoic rock units are not indicated directly on the map, although the Precambrian–Paleozoic unconformity is shown. Marginal notes and a table summarizing the tectonic history of the area are also provided. Two main lithotectonic subdivisions of the Central Metasedimentary Belt are present, with Highway 7 approximately coincident with the boundary between the 2 subdivisions. To the south and southeast are medium-pressure granulite-facies rocks of the Frontenac terrane, whereas to the north and northeast are upper greenschist- to lower amphibolite-facies rocks of the Sharbot Lake domain. They are separated by the Maberly shear zone that formed at circa 1160 Ma.

Highlights include 1) the Maberly shear zone is not readily evident, but a 10 to 20 km zone in Frontenac terrane immediately to the south characterized by strong linear magnetic trends is likely a high strain zone in the hanging wall of the Maberly shear zone; 2) few faults and lineaments identified in the basement propagate into the overlying Paleozoic strata; 3) several large mafic dikes are present beneath the Paleozoic; and 4) 2 possible Monteregian (Mesozoic) intrusions occur near the Ontario-Quebec border.

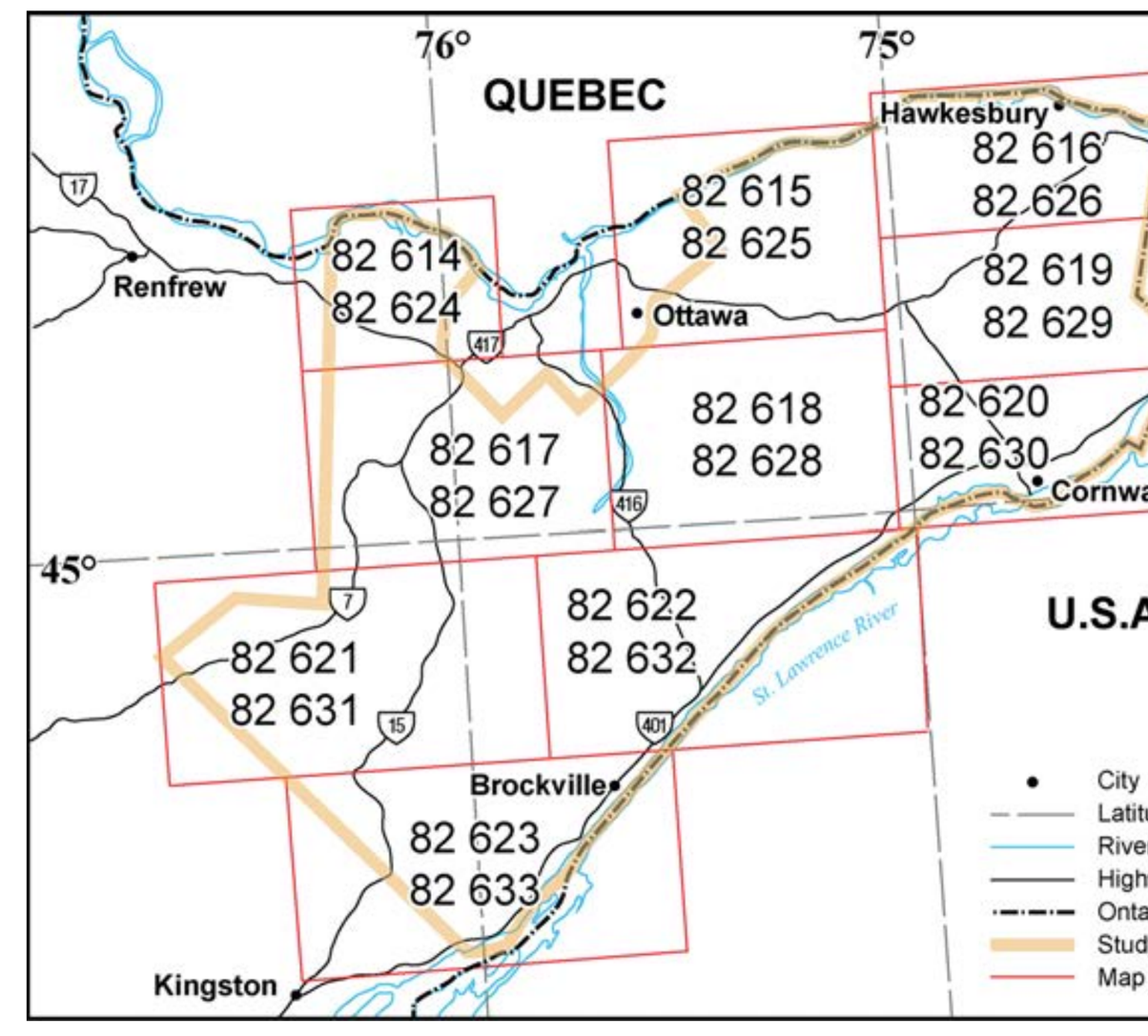

Figure 1. Map of eastern Ontario showing the area covered by the aeromagnetic survey and hard-copy geophysical maps released in June 2014.

Example: Map P3793 is one of 3 compilation maps. Not to scale on poster.