

Bedrock Topography of the Greater Toronto & Oak Ridges Moraine Areas, southern Ontario

Canada
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NATMAP
 Canada's National Geospatial Information Program
 Le Programme national de renseignements géospatiaux du Canada

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Scale 1:200 000

Map Index

Figure 1. Location and index map for Oak Ridges Moraine NATMAP Area

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Past Work

The configuration of the bedrock surface in the GTA has been of interest since the early reports of Spencer (e.g. 1981) who drew attention to the location of a former channel network connecting Georgian Bay and Lake Ontario. More recently the location of bedrock valleys has been of interest due to their hydrogeological significance and possible control on regional groundwater flow (e.g. Haeffel, 1970). A series of bedrock topography maps have been produced as part of geological mapping in the area (e.g. Karrow, 1967) and these data were used to re-assess the location of the Laurentian channel (e.g. White and Karrow, 1971). The regional Ministry of Environment (MOE) water well records were used to map the bedrock surface (Eyles et al., 1993).

Current Data Assembly

The present map is a synthesis of a wider range of subsurface records from government agencies (e.g. MOE), geotechnical consulting firms, utilities, local government, most geological mapping records and new and archival geophysical data (Table 1). The original point data have been verified for location errors (e.g. Kenny et al., 1996; Kenny et al., 1997), standardized coding of subsurface lithologies (e.g. Brennan et al., 1997; Russell et al., 1998), and error trapping procedures (Logan, unpublished). The final data sets used to produce the map are shown (Figs.2&3) as is a contoured version of the map (Fig.4) and selected cross-sections (Fig.5). These data sets were processed using a TIN model in ArcView 3.0 to derive the most reasonable interpolation of the bedrock surface (e.g. Skinner and Moore, 1997; Moore et al., 1997). Map production and layout were completed in MapInfo and Vertical Mapper. Preliminary versions of the bedrock surface are shown as thematic maps on a new series of surficial geology maps released as open files (cf. Fig.1).

Preliminary Results

The bedrock surface map of the GTA and surrounding area is shown with little data interpretation as this will be published in a separate paper. Briefly, however, there are several points to note. (1) The bedrock surface has a regional southward slope from the mapped Paleozoic outcrop north of the study area. (2) There is sparse data coverage (Figs.2&3) in the thickly covered areas of the Oak Ridges Moraine and Laurentian Channel, a bedrock-surface low extending from Georgian Bay to Lake Ontario (Fig.4). Despite this, it seems reasonable to conclude that: (i) no east-west bedrock ridge exists beneath the Oak Ridges Moraine, contrary to Eyles et al. (1993), and (ii) the Laurentian Channel coincides with a broad area of erodible shale bedrock (Fig.4&5). (3) Whereas in some areas there is general correspondence between bedrock valleys and modern rivers (e.g. lower Humber and Holland rivers) this does not always follow (e.g. Caltawa Creek, Brennan in press); the pattern of modern stream courses needs more rigorous assessment (Cheng et al., 1997). (4) The Niagara Escarpment is well delineated in the west (Fig.4).

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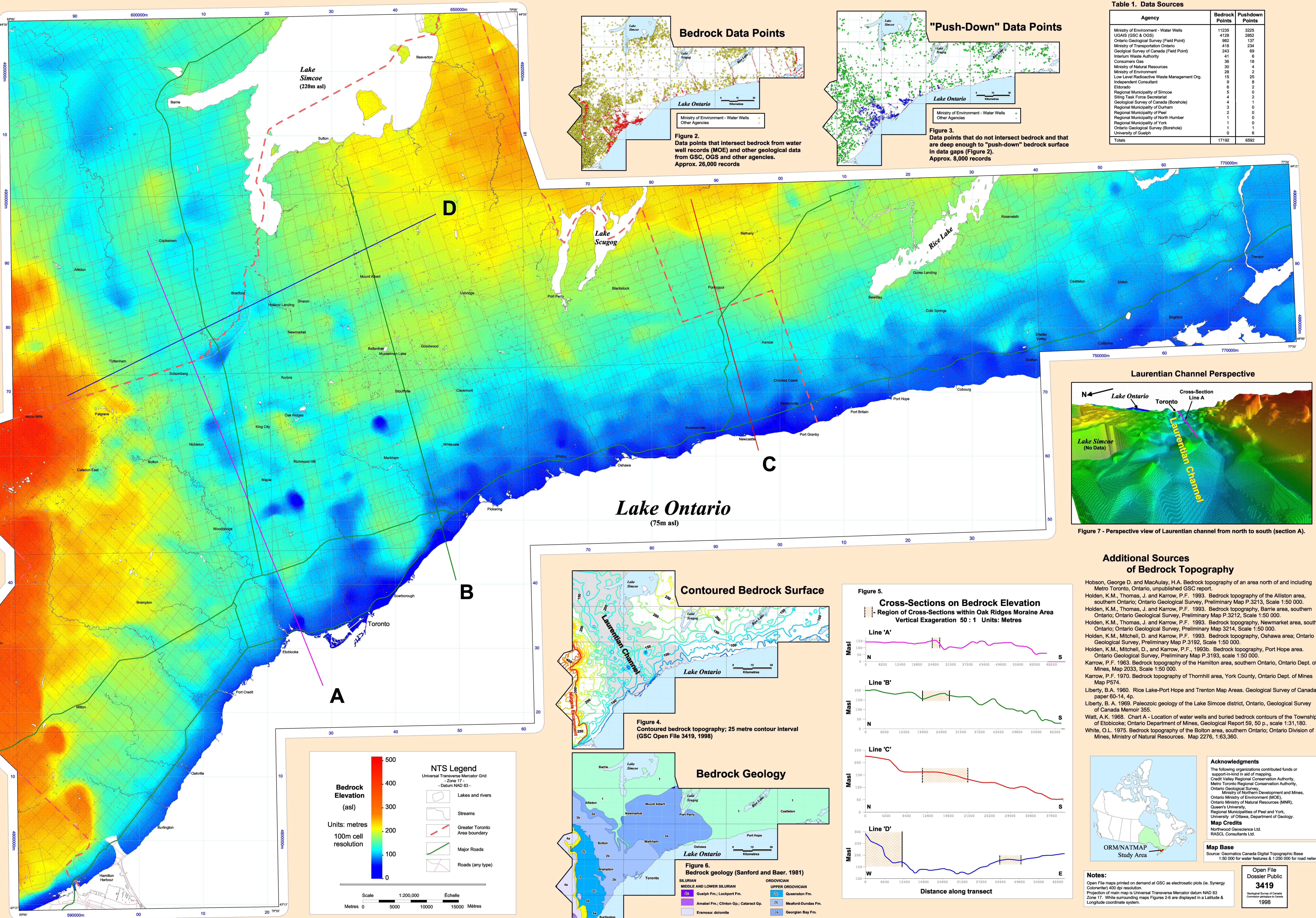
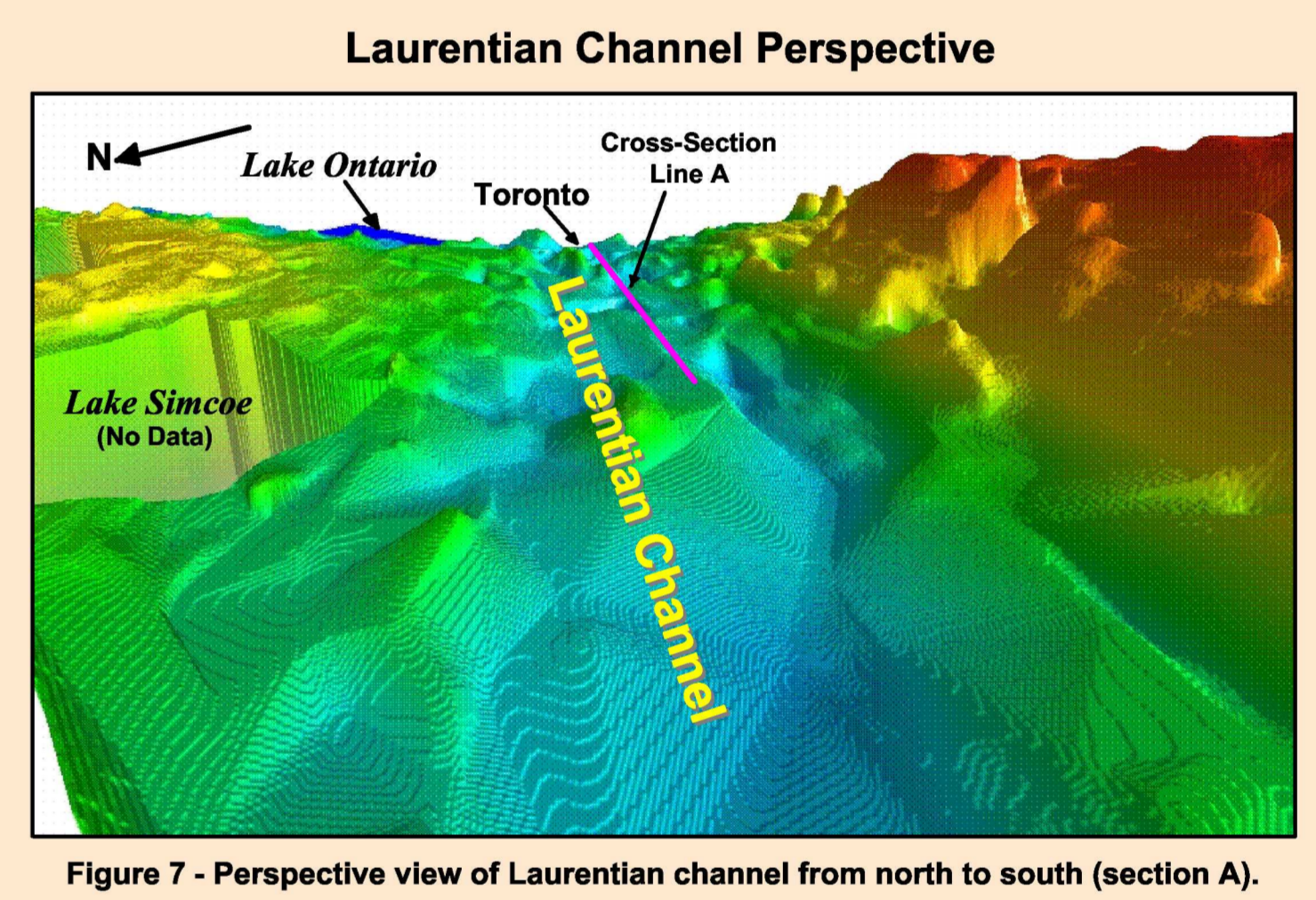


Table 1. Data Sources

Agency	Bedrock Points	Pushdown Points
Ministry of Environment - Water Wells (GSC & OGS)	11236	3225
Ontario Geological Survey (Field Point)	4128	2852
Ministry of Transportation Ontario	882	137
Geological Survey of Canada (Field Point)	418	234
Interim Waste Authority	243	89
Consumers Gas	30	4
Ministry of Natural Resources	36	18
Ministry of Environment	28	2
Low Level Radioactive Waste Management Org.	15	28
Independent Consultant	9	8
Elcadoro	5	0
Regional Municipality of Simcoe	4	2
Sling Task Force Secretariat	4	1
Geological Survey of Canada (Borehole)	4	1
Regional Municipality of Durham	3	0
Regional Municipality of Peel	2	0
Regional Municipality of North Humber	1	0
Regional Municipality of York	1	0
Ontario Geological Survey (Borehole)	1	1
University of Guelph	0	6
Totals	17192	6992



Additional Sources of Bedrock Topography

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Map Credits

Horizontal Geospatial Data
 RASCIS, Consultants Ltd.

Map Base

Source: Geomatics Canada Digital Topographic Base
 1:50 000 for water features & 1:250 000 for road network

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Notes:
 Open File maps printed on demand at GSC as electronic plots (ie. Syntray Colorletter 400 dpi resolution).
 Projection of maps is Universal Transverse Mercator datum NAD 83 Zone 17. While surrounding maps Figures 2-6 are displayed in a Latitude & Longitude coordinate system.