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Miscellaneous Release Data—207

Bedrock Topography and Overburden Thickness Mapping, Southern Ontario

C. Gao, J. Shirota, R.I. Kelly, F.R. Brunton and S. van Haaften

This release contains bedrock topography and overburden thickness maps for southern Ontario in ESRI® ArcGIS® (Grid) format. The bedrock topography (elevation) map was created from point data from a variety of sources including water well records, geotechnical borehole records, oil and gas well records, existing geologic maps and field observations. These core data sets are also available in ASCII text format for non-ESRI® users. This release contains files for Google™ Earth users. To use Google™ Earth, at least 128 MB of RAM is required (256 MB or higher recommended). This release also includes a report (*.pdf* format) outlining the protocols and methodology developed by the Ontario Geological Survey (OGS) to generate regional bedrock elevation and overburden thickness maps for southern Ontario. Details of the data sets are provided in a readme *(.pdf*) file and a metadata *(.pdf*) file.

Contents

The contents of this digital data release are organized in the following five main directories.

Directory	Name	Type
ArcGIS	dem	ESRI Grid
	demshade	ESRI Grid
	drift	ESRI Grid
	rock	ESRI Grid
	rockshade	ESRI Grid
	Sample.mxd	ESRI Map Document
	BedrockTopography.lyr	ESRI Layer
	DataPoints.lyr	ESRI Layer
	DriftThickness.lyr	ESRI Layer
	Lakes.lyr	ESRI Layer
	GDB.mdb	ESRI Geodatabase
ASCII	DataPoints.txt	Data points in comma-separated text
	Surfaces.zip	Zipped surfaces in ESRI ASCII format
Google Earth	DataPoints	Folder containing Google Earth KMZ files for data points
	Bedrock Topography Map.kmz	Google Earth KMZ file (zipped KML)
	Drift Thickness Map.kmz	Google Earth KMZ file (zipped KML)
MS Access	Data.mdb	Microsoft Access file containing data points
	map.htm	Supporting HTML document for the KML tool
ArcGIS.avi	AVI video	Video showing how to open ArcMap document
GoogleEarth1.avi	AVI video	Video showing how to open Google Earth file
GoogleEarth2.avi	AVI video	Video showing how to open Google Earth file
BedrockTopMapping.pdf	pdf	Detailed methodology for bedrock interpolation
MRD207_readme.pdf	pdf	This document
MRD207_metadata.pdf	pdf	Description of the digital data

ArcGIS

This directory contains all of the GIS files in ESRI® format. Location information for all of the data sets is stored in geographic coordinates (decimal degree) and in North American Datum 83 (NAD 83).

Three vector feature classes are stored in the *GDB.mdb* file: *DataPoints*, *Lakes* and *Roads*. The *DataPoints* feature class contains all data points used to interpolate the bedrock surface except the artificial points created for the thin-drift areas. The *Lakes* and *Roads* were included to provide base information. The *GDB.mdb* file is an ESRI® geodatabase file, which can be accessed using ArcGIS® 8.3 or higher.

Five raster data sets are also contained in this directory: *dem*, *demshade*, *drift*, *rock* and *rockshade*. All of these raster data sets are in ESRI® Grid format and have the cell size (spatial resolution) of 0.005 decimal degrees.

The *dem* grid was created by combining elevation grids from several sources. Most of the elevation data come from the digital elevation model (DEM) provided by the Ministry of Natural Resources. In some areas, the elevation values were adjusted to the Shuttle Radar Topography Mission (SRTM) grid provided by NASA. The elevation data (bathymetry) under Lake Erie and Lake Saint Clair were provided by National Oceanic and Atmospheric Administration (NOAA). The data sets from these original sources have been combined and smoothed to create a continuous surface. Each cell of this raster contains a numeric value that represents the elevation at a specific location in terms of meters above the sea level.

The *demshade* grid is a shaded relief grid created from the above DEM. It is useful as a backdrop for a map composition, but the cell values retrieved from this raster generally have no meaning.

The *drift* grid contains information about the thickness of the overburden material at a specific location. This was created by simply subtracting the interpolated bedrock surface from the DEM. The cell values are also in meters.

The *rock* grid is the interpolated bedrock surface created from the data points. The interpolation was done using the ordinal Kriging method available in ESRI® ArcGIS®. For the most part, the cell values are a reflection of “Kriged elevation”. However, for the areas known to have thin overburden material, the bedrock elevation was calculated using a more “depth-centric” approach. For the thin-drift areas, a temporary grid was created by interpolating the depth to bedrock, which was subtracted from the DEM to create the derived bedrock elevation grid. The two bedrock elevation grids were combined (and smoothed around the boundaries) to produce the final grid, *rock*.

The *rockshade* grid is a shaded relief grid created from the above bedrock elevation surface. It is useful as a backdrop for a map composition, but the cell values retrieved from this raster generally have no meaning.

ASCII

This directory includes *DataPoints.txt*, which is an ASCII text file containing the longitude, latitude, depth to bedrock and the data source for the points used for bedrock interpolation. Also included in this directory is a zipped folder containing *dem.txt* (DEM), *drift.txt* (drift thickness) and *rock.txt* (bedrock elevation). These are identical to the corresponding grids contained in the ArcGIS directory except these are in ESRI® ASCII format. Most non-ESRI® GIS software should be able to import from this format.

Google Earth

This directory contains a Google™ Earth file for the bedrock topography. Google™ Earth is a free earth visualization tool available at http://earth.google.com/. The bedrock topography was converted to a shaded image; however, the elevation is not accessible from this file. Airborne geophysics (magnetics) data, ground surface topography, drift thickness and surficial geology were also provided in Google™ Earth format.

In addition to the image layers, the data points were also converted to Google™ Earth files and are stored in the *DataPoints* subdirectory. The data points were organized by the regions (counties and regional municipalities). Each file contains the data points for a region, which are further classified based on the original data source such as water wells or oil and gas wells.

MS Access

The data points are also available in Microsoft® Access format in this directory. This database, *Data.mdb*, contains only one table *DataPoints*, which has the same basic structure as the *DataPoints.txt* file.