Surficial Geology of Southern Ontario – Getting Started

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Introduction:

This digital map data product of the Ontario Geological Survey comprises two CD-ROM disks containing surficial geology map data for southern Ontario, Canada. It is a geographic information system (GIS) – based map of the surface and near-surface geological materials, mapped at a nominal depth of 1 m. The data are useful for many purposes, including ground and surface water studies, other environmental studies, geotechnical investigations and mineral exploration.

This “getting started” document is intended to help clients begin to use the data. The CDs also contain a more comprehensive “user document” in the documentation folder, and a license agreement document in the top or “root” folder. Most of the documentation is in “pdf” format, which may be read using Adobe ® Reader ® software available for download from Adobe’s site at http://www.adobe.com/products/acrobat/readermain.html.

Using the data with ArcGIS ® software:

The data may be accessed with ESRI ® ArcGIS ® 8.x software, including ArcView ® 8.x, as follows.

- Copy the contents of the first CD to a new directory on your hard drive. The data will occupy about about 650 MB of space.

- For each newly copied folder right-click and uncheck the Read-only option check box.

- The 'Fonts' folder provided on this CD contains a font file required by ArcGIS for symbolizing point features on the map. The font must be installed as follows, prior to viewing the data sets in ArcMap. In Windows ® 2000 ®, open the 'fonts' subdirectory in your 'winnt' directory, or click start, select Settings, then select 'Control Panel'. In the 'Control Panel' open the 'Fonts' folder, under 'File', click 'Install New Font' and map to the ‘fonts’ folder copied from the CD or simply copy the ‘QUAT.TTF’ file located in the ‘fonts’ folder and paste it into the

'fonts' subdirectory in your 'winnt' directory. For Windows ® XP ®, the font folder is located in c:\WINDOWS\Fonts. Click start, select Settings then select 'Control Panel'. In the 'Control Panel' open the 'Fonts' folder, under 'File' click 'Install New Font' and map to the 'fonts' folder copied from the CD.

- Optional step, which may be omitted if desired. For ESRI ® ArcGIS ® 8.x and ArcView ® 8.x users, we recommend that the user build pyramids for the hillshade image provided on the CD found in the hillshade folder. In ArcCatalog, right-click the raster dataset (shadedd.jpg) located in the hillshade folder, then click build pyramids. 'Building pyramids' allows the computer to open and process the hillshade relatively quickly. Please note building pyramids may take up to 30 minutes.

- Use ArcGIS to open the project file "map.mxd", found in the new directory. Open ArcMap and under file click 'open' and select map.mxd and the index map should appear. The displayed index layer is called "index polygon" in the legend on the left side of the screen. The user can simply click on or off whatever layers he/she chooses. The legends for each layer can be viewed by clicking the plus sign next to each layer. Please note that at full map extent, regeneration time for some layers may be slow.

The data can also be opened directly from the CD without copying it to the hard disk, but it will take several minutes for the map to display on screen. To do this, use ArcGIS to open the project file "map.mxd". The project files are found in the top or root folder of the first CD, and in the folders "Zone17" and "Zone18" of the second CD.

Using the data without ArcGIS software:

In the "map.pdf" folder of the first CD there is a "pdf" file, which is the digital equivalent of a conventional printed geology map. This digital map may be viewed using Adobe Reader software. The visual quality of the pdf map is blocky when zoomed in close, and cannot equal the visual quality that may be obtained with GIS software.

For clients who have non-ESRI GIS software, the first CD also contains "e00" ArcInfo export files, which they may import.

ESRI offers the free ArcExplorer ® version 2 software for download from their site at http://www.esri.com/software/arcexplorer/index.html. This GIS viewing software can be used to view the surficial geology map data. The newer ArcExplorer version 4.0.1 requires "shape files", and it will not work with the surficial geology map data which is in "coverage" format.

Contents of the CD-ROMs, map projections, scale and base map information:

There are two CD-ROM disks in the Surficial geology of southern Ontario data release. Disk 1 contains a complete set of data in geographic projection (decimal degrees, NAD 83 datum).

Disk 2 contains the same data, but in the Universal Transverse Mercator (UTM) co-ordinate system, NAD 83 datum. Many clients may prefer to use the UTM data because their other data may already be in this projection. In UTM there are zone 17 and zone 18 datasets, representing the west and east portions of the map. UTM data may be processed relatively quickly because they are smaller than the full southern Ontario dataset.

Tables 1 and 2 detail the contents of the CDs.

The scale of the geology data is nominally 1:50,000. Most of the individual maps assembled for the Surficial geology of southern Ontario are of this scale, but some smaller-scale data was also used.

The base map, which was used in assembling the data, is the Ministry of Natural Resources' Land Information Ontario/ Natural Resource Values Information System base map.

Data layers and attributes:

As can be seen in the ArcMap legend, there are many layers in the Surficial Geology GIS map. Also, individual layers may have many attribute columns which can be used for visualizing or querying the data. The layers and attributes are fully described in the comprehensive user document, but some significant information is provided in Table 3 for convenience. The "layers" are ArcInfo "coverages", the data format traditionally used by ArcInfo.

Table 1: Contents of CD-ROM 1 (decimal degrees data)

Top Folder	Folder	Sub-Folder	Contents
	av3_legends		Arcview 3.x "avl" legend files
	coverages		All ArcInfo coverages.
	Documentation		
		User document	Project report (Geological and technical)
		Licence	Data licence agreement
		metadata	Detailed metadata
	e00_files		ArcInfo export files for all vector coverages
	fonts		Font file required for point symbology. Must be loaded by user.

	hillshade	Shaded relief (JPEG)
	layerfiles	Layer files used to display proper symbology in creating the mxd.
map.mxd		ArcMap project file (mxd) found at the root directory of the cd.
dd.prj		Projection file.
readme		How to use the data, and basic metadata

Table 2: Contents of CD-ROM 2 (UTM co-ordinate system data)

Top Folder	Folder	Sub-Folder	Contents
	av3_legends		Arcview 3.x "avl" legend files
	Documentation		
		User document	Project report (Geological and technical)
		Licence	Data licence agreement
		metadata	Detailed metadata
	fonts		Font file required for point symbology. Must be loaded by user.
	layerfiles		Layer files used to display proper symbology when creating the mxd.
	map_pdf		Surficial geology map of S. Ontario as a pdf document
	Zone17		ArcMap project file (mxd). Projection file.
		coverages	All ArcInfo coverages for UTM grid zone 17.
		hillshade	Shaded relief (JPEG) for UTM grid zone 17.
	Zone18		ArcMap project file (mxd). Projection file.
		coverages	All ArcInfo coverages for UTM grid zone 18.
		hillshade	Shaded relief (JPEG) for UTM grid zone 18.
readme			How to use the data, and basic metadata

Table 3: Map layers and selected attributes

Layer	Attribute	Description
SGU_POLY		Surficial geology unit polygons, which classify the earth's surface by the surface or near-surface geological material.
	SINGLE_NEW_ID	The geological unit number assigned to the polygon from the provincial legend, for example 1, 2, 5, 5a, 5b.
	SINGLE_PRIM_MAT	Single primary material. A single word providing information regarding the most prevalent material present within a given area, for example "sand".
	SINGLE_PMAT_MOD	Single primary material modifier. Provides a more refined, single-word description of the lithological classification of the primary material, for example "sandy".
	PRIM_MAT	Primary material. Provides information regarding the most prevalent material present within a given area, for example "silt, sand". Multiple words are allowed.
	PRIM_MAT_MOD	Primary material modifier. Provides a more refined description of the lithological classification of the primary material, for example "organic-bearing". Multiple words are allowed.
	SINGLE_PRIM_GEN	Single primary genesis. Provides an interpretation of the depositional environment within which the primary material was deposited, using single words, for example "glaciofluvial".
	FORMATION	Provides information regarding the formal geological formation to which a primary material belongs, for example "Tavistock Till".
	PERMIABILITY	Provides information about the permeability of the sediments in a rank from high, medium to low.
SGU_POINT		Captures oriented point information such as drumlins and striae.
	FEATURE_CODE	A character field containing a feature code such as drumlin or flute.
	ORIENTATION	A numeric field containing each feature's orientation. For example, for feature codes "strd", glacial striae, direction of ice movement known, this field contains a number from 0 to 360 degrees.
SGU_LINE		Captures oriented lines such as eskers and beaches.
	FEATURE_CODE	A character field containing a feature code such as "eskern", esker, direction of flow known or "bluff".
SGU_MOR		Displays areas of hummocky topography as well as areas mapped as moraines.
SGU_MISC		Captures polygonal geology features not otherwise captured, for example areas of dunes (fdune).
SGU_ANNO		Captures geological annotation.
OGS_PITS		Captures gravel pit and quarry locations.
SHADED RELIEF		An image of the shaded relief derived from Ministry of Natural Resources' digital elevation model.
INDEX		Provides information about the individual map tiles used to generate the seamless coverage.
BASE MAP LAYERS (water, roads, municipal boundaries)		From Land Information Ontario and the Ministry of Municipal Affairs and Housing.

Layers in the ArcMap ® project (mxd file):

The ArcMap project file (mxd) provided for this dataset was created so that the user can simply double click and open a completed map displaying all the layers and information captured in this dataset. Table 4 lists the layers found in the ArcMap legend, the GIS layers or coverages used to create that ArcMap layer, the attribute displayed and the layerfile used.

Table 4: Layers in ArcMap project (mxd).

ArcMap Layer	coverage	attribute	layerfile
index polygon	index	ORG	index polygon.lyr
annotation.geol	sgu_anno		
lakes polygon	lakes		
roads arc	roads		
municipal arc	municipal		
ogs_pits point	ogs_pits	FEATURE_CODE	ogs_pits point.lyr
sgu_point point	sgu_point	FEATURE_CODE	sgu_point point.lyr
sgu_line arc	sgu_line	FEATURE_CODE	sgu_line arc.lyr
sgu_misc polygon	sgu_misc	FEATURE_CODE	sgu_misc polygon.lyr
sgu_mor polygon	sgu_mor	FEATURE_CODE	sgu_mor polygon.lyr
sgu_poly arc	sgu_poly.aat	FEATURE_CODE	sgu_poly arc.lyr
sgu_poly polygon	sgu_poly.pat	SINGLE_NEW_ID	sgu_poly polygon.lyr
sgu_polybedrock polygon	sgu_poly.pat	SINGLE_NEW_ID	sgu_polybedrock polygon.lyr
material	sgu_poly.pat	SINGLE_PRIM_MAT	material.lyr
permeability	sgu_poly.pat	PERMEABILITY	permeability.lyr
formation	sgu_poly.pat	FORMATION	formation.lyr
genesis	sgu_poly.pat	SINGLE_PRIM_GEN	genesis.lyr
shadedd.jpg			