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Miscellaneous Release–Data 126 - Revision 1
1:250 000 Scale Bedrock Geology of Ontario

by Ontario Geological Survey

Users of OGS products are encouraged to contact those Aboriginal communities whose traditional territories may be located in the mineral exploration area to discuss their project.

Introduction

The Precambrian Geoscience Section, Ontario Geological Survey, has compiled a 1:250 000 scale map of the bedrock geology of Ontario. The map has recently been revised and updated and replaces the map previously released on Miscellaneous Release–Data 126—Revised. This seamless GIS data set includes such themes as bedrock units, major faults, dike swarms, iron formations and kimberlites, and also includes an interpretation of the Precambrian bedrock geology underlying the Hudson Bay and James Bay lowlands Phanerozoic cover.

The Precambrian Bedrock Geology themes are suitable for small scale (i.e., 1:250 000) applications, but users should be cautioned that the depth and accuracy is not intended for integration into large scale (i.e., 1:5000) maps or GIS environments. On previous versions of this MRD the position of any feature on these themes is accurately located to within 5000 m.

The second geology theme, composed of GeopolyLOWLANDS.shp and GeolineLOWLANDS.shp, shows an interpretation of the Precambrian bedrock geology underlying the Hudson Bay and James Bay lowlands Phanerozoic cover, a broad area of Paleozoic to Mesozoic cover that extends over a significant portion of the Precambrian rocks in northern Ontario and which has impeded our knowledge of the Precambrian geology and tectonic framework in this part of the province. The interpretation is based mainly on an analysis of available re-processed aeromagnetic data and limited diamond-drill hole information. Much of the interpretation is anchored by comparing similar aeromagnetic features in the exposed portions of the Archean Superior Province and the Paleoproterozoic Trans-Hudson Orogen in Ontario, Manitoba and Quebec. The results provide a general framework of interpreted supracrustal belts, plutonic subdivisions, major faults, locations of iron formation, Proterozoic dike swarms, and kimberlite pipes.

Users should be aware that the OGS is continually collecting, synthesizing and compiling new data throughout the province. The interpretation of the ages of the dikes and the geology in this GIS product should be verified before proceeding with any exploration project.

The bedrock geology of Southern Ontario was not considered for compilation in this project due to time constraints.

Data are provided in the North American Datum geographic coordinate system of 1983 (NAD83). The data is provided in ESRI® shape file format.

Changes to this MRD from Previous Versions

Both the dikes and iron formations are now available in a complete polyline shapefile. Dike and iron formation polygons have been removed from the Bedrock Geology shape file and represented as polylines. The dike and iron formation polylines are a complete set of all dikes and iron formation for the province. Some dike and iron formation polygons that were too large to be converted to polylines have been left in the Bedrock Geology polygon shape file, but these units will also be represented in the polyline shape files.

Map Projections

All spatial data on the CD is projected in decimal degrees (**G**eographic **C**oordinate **S**ystem, **N**orth **A**merican **D**atum of 19**83**).

The project file (**MRD126rev1.mxd**) is projected in Lambert Conic Conformal for display and printing purposes, but the shape files in this project file are still projected to **GCS NAD83**.

Using the Data with ArcGIS® Software

The data is provided in ESRI® shape file format.

The data may be accessed with ESRI® ArcGIS® 9.3 (or newer versions) for the project file (MRD126rev1.mxd). The shape files can be accessed using ArcGIS® 8.3 (or newer versions).

- Copy the **MRD126rev1** folder to your hard drive from the CD. Alternately, make a new folder on your hard drive and copy all folders within the **MRD126rev1** directory to your new folder.

- If you would like to edit or alter the data you will have to right-click the **MRD126rev1** folder, choose 'properties' and uncheck the 'Read-only' option. Click 'Apply' and then make sure to 'Apply changes to this folder, subfolders and files'.

- The 'MRD\Fonts' folder provided on the CD contains font files required by ArcGIS® for symbolizing some of the features on the map. The fonts must be installed prior to viewing the data sets properly in ArcMap. These can be installed by simply copying them to your \\Windows\Font directory.

- ESRI® ArcGIS® 9.3 must be used to open the project file MRD126rev1.mxd. Please note that at full map extent, regeneration time for some layers may be slow. For earlier versions of ESRI® ArcGIS®, the project will have to be recreated. This can be done by adding the shape files you would like to view to your empty map and importing the symbology from the *.lyr files.

Sources of Information

The geology is mainly derived from MRD 126 (Miscellaneous Release–Data 126-Revised, 1:250 000 Scale Bedrock Geology of Ontario, 2006) and MRD 265 (Miscellaneous Release–Data 265, Regional Geology and Mineral Deposits of Northern Ontario, North of Latitude 49°30', 2009), with additional, updated geology from more recently published OGS maps.

Diabase dike swarms and related units in Canada and adjacent regions are from: Buchan, K.L. and Ernst, R.E., Geological Survey of Canada, "A" Series Map 2022A, 2004; 39 pages.

Digital base map information is derived from the Ontario Land Information Warehouse, Land Information Ontario, Ontario Ministry of Natural Resources.

Compilation geology is derived from published maps and geophysical data of the Ontario Geological Survey.

Credits

S.D. Josey is acknowledged for the innumerable hours spent in the construction of the GIS product for this digital data release.

To enable the rapid dissemination of information, this product has not received a technical edit. Discrepancies may occur for which the Ontario Ministry of Northern Development, Mines and Forestry does not assume liability. Users should verify critical information.

Issued 2011.

Information from this publication may be quoted if credit is given. It is recommended that reference to this product be made in the following form:

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Contents of the CD

TOP FOLDER	FOLDER	CONTENTS	DESCRIPTION
\\MRD126rev1		MRD126rev1.mxd	ArcMap version 9.3 project file containing shape files.
		MRD 126 Revision 1_GeologyRGBvalues2010.txt	Text file with the RGB values used to symbolize/colour the Geopoly and GeopolyLOWLANDS shape files.
		MRD 126 Revision 1_Lookup Table of Lithologies.xls	Excel spreadsheet of the legend used as a look up table to populate fields in the Geopoly and GeopolyLOWLANDS shape files. The **UNITNAME_P, ROCKTYPE_P, STRAT_P, SUPEREON_P, EON_P, ERA_P, PERIOD_P, EPOCH_P, PROVINCE_P, and TECTZONE_P** fields were populated using this table.
		MRD 126 Revision 1_LEGEND.doc, MRD 126 Revision 1_LEGEND.pdf	Text file containing the legend for the digital map.
		MRD 126 - Revision 1_Readme.doc and MRD 126 - Revision 1_Readme.pdf	Text file containing introduction, instructions, legend, attribute information and other information related to the MRD.
	\Fonts	OGSFaults.TTF	Font used for symbolizing features in ArcMap.
		OGSFolds.TTF	Font used for symbolizing features in ArcMap.
	\LayerFiles\Base	INDIANRESERVE.lyr	This folder contains layer files that can be used to symbolize associated shape files.
		MAJORLAKES.lyr	
		MAJORRIVERS.lyr	
		NATIONALPARK.lyr	
		PROVINCE.lyr	
		PROVINCIALPARK.lyr	
		RAILWAY.lyr	
		ROADS600K.lyr	
		SETTLEMENTS.lyr	
		TOWNSHIP.lyr	
		UTILITY.lyr	
	\LayerFiles\Geology	Geolines.lyr	
		GeolinesLOWLANDS.lyr	
		Geopoly.lyr	
		GeopolyLOWLANDS.lyr	
		Clines.lyr	
		Kimberlite.lyr	

	\ShapeFiles\Base	INDIANRESERVE.shp	This folder contains shape file versions of all Base data.
		MAJORLAKES.shp	
		MAJORRIVERS.shp	
		NATIONALPARK.shp	
		PROVINCE.shp	
		PROVINCIALPARK.shp	
		RAILWAY.shp	
		ROADS600K.shp	
		SETTLEMENTS.shp	
		TOWNSHIP.shp	
		UTILITY.ship	
	\ShapeFiles\Geology	Geolines.shp	This folder contains shape file versions of the Precambrian Bedrock Geology of Ontario (without lowlands interpretation).
		Geopoly.shp	
		IronFormation.shp	
		Dikes.shp	
		Clines.shp	
		Kimberlite.shp	
	\ShapeFiles\Geology \LowlandsGEO	GeolinesLOWLAND.shp	This folder contains shape file versions of the Precambrian bedrock geology interpreted under the Hudson and James Bay lowlands Phanerozoic rocks.
		GeopolyLOWLAND.shp	

Data Layers and Attributes

Only fields from geological attribute tables are described. As well, no default fields will be described.

Historically, the accuracy of any feature on the geology themes is accurate to within 5000 m.

FEATURE CLASS	FEATURE CLASS DESCRIPTION	FIELD	ATTRIBUTE DESCRIPTION
Geopoly and GeopolyLOWLANDS	The **Geopoly** polygon feature class shows the distribution of bedrock units underlying Ontario. The geology of the province consists of Precambrian rocks of the Canadian Shield and Phanerozoic sedimentary rocks that overlie the Canadian Shield. The **GeopolyLOWLANDS** polygon feature class shows an interpretation of the Precambrian bedrock underlying the Hudson Bay and James Bay lowlands Phanerozoic cover. This cover is a broad area of Paleozoic to Mesozoic cover that extends over a significant portion of the Precambrian rocks in northern Ontario.	FEATURE	All features coded as **'GEOLOGICAL UNIT'.** Indicates that all features in this feature class are geological units.
		TYPE_ALL	The geological unit number(s) or code(s) for all rock types present in an individual polygon.
		TYPE_P	The primary geological unit number or code for the primary rock type in an individual polygon
		TYPE_S	The secondary geological unit number or code for the secondary rock type, if present, in an individual polygon
		TYPE_T	The tertiary geological unit number or code for the tertiary rock type, if present, in an individual polygon
		UNITNAME_P	Generalized geological unit classification
		ROCKTYPE_P	Rock type or sub-unit description
		STRAT_P	The Stratigraphic unit. Divided into **Supergroup (two or more groups and lone formations); Group (two or more formations); Formation (primary unit of lithostratigraphy); Member (named lithologic subdivision of a formation); and Bed (named distinctive layer in a member or formation).**
		SUPEREON_P	A name given to the largest defined unit of geological time, divided into Eons. Unique values which this field may contain (Domains) are **'PRECAMBRIAN (0.542 Ga to <3.85 Ga)'.**
		EON_P	A name given to a defined unit of geological time, divided into Eras. Unique values which this field may contain (Domains) are: **'ARCHEAN (2.5 Ga to <3.85 Ga)'; 'PROTEROZOIC (0.542 Ga to 2.50 Ga)'; and 'PHANEROZOIC (Present to 542.0 Ma)'.**

		ERA_P	A name given to a defined unit of geological time, divided into Periods. Each era on the scale is separated from the next by a major event or change. Unique values which this field may contain (Domains) are: **'MESOARCHEAN (2.8 Ga to 3.2 Ga)'; 'NEO-TO MESOARCHEAN (2.5 Ga to 3.2 Ga)'; 'NEOARCHEAN (2.5 Ga to 2.8 Ga)'; 'PALEOPROTEROZOIC (1.6 Ga to 2.5 Ga)'; 'MESO-TO PALEOPROTEROZOIC (1.0 Ga to 2.5 Ga)'; 'MESOPROTEROZOIC (1.0 Ga to 1.6 Ga)'; 'EARLY PALEOZOIC TO NEOPROTEROZOIC (443.7 Ma to 1.0 Ga)'; 'NEO-TO MESOPROTEROZOIC (0.542 Ga to 1.6 Ga)'; 'PALEOZOIC (251.0 Ma to 542.0 Ma)'; and 'MESOZOIC (65.5 Ma to 251.0 Ma)'.**
		PERIOD_P	A name given to a defined unit of geological time, divided into Epochs. Unique values which this field may contain (Domains) are: **'CAMBRIAN (488.3 Ma to 542.0 Ma)'; 'ORDOVICIAN (443.7 Ma to 488.3 Ma)'; 'SILURIAN (416.0 Ma to 443.7 Ma)'; 'DEVONIAN (359.2 Ma to 416.0 Ma)'; 'MISSISSIPPIAN TO DEVONIAN (318.1 Ma to 416.0 Ma)'; 'JURASSIC (145.5 Ma to 199.6 Ma)'; and 'CRETACEOUS AND JURASSIC (65.5 Ma to 199.6 Ma)'.**
		EPOCH_P	A name given to a defined unit of geological time. Unique values which this field may contain (Domains) are: **'LOWER ORDOVICIAN'; 'MIDDLE ORDOVICIAN'; 'UPPER ORDOVICIAN'; 'MIDDLE AND LOWER SILURIAN'; 'UPPER SILURIAN TO LOWER DEVONIAN'; 'UPPER SILURIAN'; 'LOWER DEVONIAN'; 'MIDDLE DEVONIAN'; 'UPPER DEVONIAN'; and 'LOWER CRETACEOUS AND MIDDLE JURASSIC'.**
		PROVINCE_P	The Geological Province the geological unit is in. Unique values which this field may contain (Domains) are: **'SUPERIOR'; 'SOUTHERN and SUPERIOR'; and 'GRENVILLE'.**
		TECTZONE_P	The Tectonic Zone the geological unit is in. Unique values which this field may contain (Domains) are: **'CENTRAL GNEISS BELT' or 'CENTRAL METASEDIMENTARY BELT'.**
		OROGEN_P	This field is used to define the **'AREA OF INFERRED TRANS-HUDSON OROGEN OVERPRINT ON ARCHEAN CRUST'.** Interpreted as an area of Archean granitoid rock overprinted by the Trans-Hudson Orogen. The Trans-Hudson Orogen is the largest Paleoproterozoic orogenic belt in the world. It consists of a network of belts that were formed by Proterozoic crustal accretion and the collision of pre-existing Archean continents. The event occurred 2.0-1.8 billion years ago. The Trans-Hudson orogen sutured together the Hearne-Rae, Superior, and Wyoming cratons to form the cratonic core of North America in a network of Paleoproterozoic orogenic belts.
		SUT_GAB_P	This field is used to define the **'INTERPRETED AEROMAGNETIC EXTENT OF GABBROIC INTRUSIONS OF THE SUTTON INLIERS'**.
<u>Dikes</u>		FEATURE	All features coded as **'DIKE'**. Indicates that all features in this feature class are dikes.
		TYPE	All features coded as **'DIKE'**. Used to symbolize the line style. A standard dike linestyle and linestyle code will replace this code, once developed.
		AGE	Age of dike in millions of years.
		DIKE_TYPE	Generalized geological dike unit classification or description.

		DIKE_CODE	The geological unit number or code used to distinguish the type of dike polyline. Also used to symbolize various dike colours.
		LABEL	Any name or label associated with the polyline feature or dike.
Geolines and GeolinesLOWLAND	Line features consisting of geological contacts, faults, neatlines and terrane boundaries (terrane boundaries are incomplete).	FEATURE	Descriptive attributes defined as either: **'CONTACT, SHARP, TREND, INTERPRETED'; 'CONTACT, SHARP, TREND, OBSERVED'; 'CONTACT, GEOPHYSICAL, TREND, INTERPRETED'; 'CONTACT, OUTCROP/DRIFT, INTERPRETED'; 'FAULT, DEXTRAL HORIZONTAL COMPONENT, TREND, INTERPRETED, UNKNOWN GENERATION'; 'FAULT, PROJECTED FAULT, INTERPRETED, UNKNOWN GENERATION'; 'FAULT, SINISTRAL HORIZONTAL COMPONENT, TREND, INTERPRETED, UNKNOWN GENERATION'; 'FAULT, SINISTRAL HORIZONTAL COMPONENT, TREND, OBSERVED, UNKNOWN GENERATION'; 'FAULT, UNKNOWN HORIZONTAL COMPONENT, INCLINED-REVERSE, INTERPRETED, UNKNOWN GENERATION'; 'FAULT, UNKNOWN HORIZONTAL COMPONENT, INCLINED-REVERSE, OBSERVED, UNKNOWN GENERATION'; FAULT, UNKNOWN HORIZONTAL COMPONENT, TREND, INTERPRETED, UNKNOWN GENERATION'; 'NEATLINE'; and 'ONTARIO BORDER'.** Descriptive field to describe the TYPE field codes.
		TYPE	Coding used to symbolize map. Attributes are defined as either: **'MCTGLSTI'; 'MCTGLSTO'; 'MCTGPTI'; 'MCTOCDR'; 'MFTDXTI'; 'MFTPJT'; 'MFTSXTI'; 'MFTSXTO'; 'MFTUXIRI'; 'MFTUXIRO'; 'MFTUXTI'; 'MFTUXTO'; 'NEATLINE'; and 'ONTARIO BORDER'.**
		LABEL	Any name associated with the line feature.
		SUTTON_GABBRO	This field indicates any line features that are defined as the **'INTERPRETED AEROMAGNETIC EXTENT OF GABBROIC INTRUSIONS OF THE SUTTON INLIERS'.**
IronFormation.shp	Unit 7c in legend, consisting of Precambrian metasedimentary rocks made up of marble, chert, iron formation and minor metavolcanic rocks. Iron formations consist of beds of quartz or carbonate alternating with iron-rich beds consisting of iron-rich minerals such as magnetite, pyrite, iron carbonate or iron silicates.	FEATURE	All attributes are coded as **'Marble, chert, iron formation, minor metavolcanic rocks'.** Descriptive field to define the TYPE field.
		TYPE	Unique value attributed as **'IRON FORMATION'.** Used to symbolize the iron formation.
		IF_CODE	The geological unit number or code used to distinguish the iron formation polyline. Unique values which this field contain (Domains) are: **'7c'; 'G7c'.**
Kimberlite.shp	Kimberlite locations. Intrusive rocks with high contents of magnesium, iron and alkali elements. Commonly porphyritic with phenocrysts of olivine, phlogopite and garnet. Generally has a brecciated or fragmental texture.	FEATURE	All attributes are coded as **'KIMBERLITE'.** Descriptive field to define the TYPE field.

		TYPE	All attributes are coded as **'62'**, the geological code corresponding to the legend.
		LABEL	Common name of the Kimberlite.
		AGE	Age of the Kimberlite, if present.
		AKA_NAME	Alternate name of Kimberlite.
Clines.shp		FEATURE	Descriptive attributes defined as either: **'FOLD, ANTICLINE, INTERPRETED, UNKNOWN GENERATION'; 'FOLD, ANTICLINE, OBSERVED, UNKNOWN GENERATION'; 'FOLD, ANTIFORM, INTERPRETED, UNKNOWN GENERATION'; 'FOLD, ANTICLINE, SYNFORMAL, INTERPRETED, SECOND GENERATION'; 'FOLD, SYNCLINE, INTERPRETED, UNKNOWN GENERATION'; 'FOLD, SYNCLINE, OBSERVED, UNKNOWN GENERATION'; and 'FOLD SYNCLINE, INTERPRETED, UNKNOWN GENERATION'.** Descriptive field to describe the TYPE field codes.
		TYPE	Coding used to symbolize map. Attributes are defined as either: **'MFDACXTOI'; 'MFDACXTOO'; 'MFDAFXTOI'; 'MFDAS2IOI'; 'MFDSCXTOI'; 'MFDSCXTOO'; or 'MFDSFXTOI'.**