

Surficial Geology Compilation of Manitoba

Surficial Geology Compilation Map Series (SGCMS)

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The Surficial Geology Compilation Map Series (SGCMS) addresses an increasing demand for consistent surficial geology information for applications such as groundwater protection, industrial mineral management, protected lands, basic research, mineral exploration, engineering, and environmental assessment. In addition, aggregate resources (map units Ls, G, and Gs) applicable to the heavy construction and building industries are easily identified on the map albeit at a small scale. The final compilation at 1:1 000 000 (image at right) has been released as a glossy two-sided hard copy map which supersedes the original Surficial Geological Map of Manitoba released in 1981 (Nielsen et al., 1981). Where applicable, this provincial geological map has been designed to be accessible to a broad audience with specialized terms and concepts being defined on the map.

All paper copies of the most current and detailed surficial geology maps of various scales published by the Geological Survey of Canada and/or the Manitoba Geological Survey (MGS) were digitized. Polygons for several areas, which had been mapped more recently, were derived from digital geological maps. Digital polygons derived from soils mapping were used to fill gaps in the geological mapping. Edge-matching of adjoining map sheets was based on data from the Shuttle Radar Topography Mission Digital Elevation Model (SRTM DEM) (United States Geological Survey, 2002) as interpreted by the MGS. Other polygon gaps and inconsistencies, particularly in the north where no soils' mapping was available, were modified in a similar manner. The surficial geology (coloured) is draped over a shaded topographic relief map (grey tones) derived from the SRTM DEM.

Digital map polygons are linked to a database containing the original map legends compiled from the source publications. These map legend items are parsed into seven lithological and morphological characteristics and one 'derived' legend, producing a standardized legend for the province. The database consists of two tables; a 'legend link' table containing the seven parsed categories and derived legend as well as an 'original mapping' table housing the originally published legend descriptions. These two tables are linked to the polygon attribute table via a 'link' field. The linked polygons can be queried based on any combination of the seven categories, the original map description, or the standardized derived legend

Surficial Geology Data Model

oorly drained parts of the Shield. Fen peat: wet, sedge and moss peat; includes string

intrusions; glacially scoured outcrops form abundant roches moutonnees sand striated or

sandstones and shales; surfaces are commonly pitted and frost shattered, but glacially polished and striated surfaces are preserved locally; occurs as flat-lying outcrops with

coarse clast composition variable and in many places dominated by shale; deposited as glaciofluvial materials in contact with melting ice, as glacial outwash plains and deltas, and

benches well above present stream level, and underlying broad flat to undulating plains; coarse clast composition variable and in many places dominated by shale; deposited as glaciofluvial materials in contact with melting ice, as glacial outwash plains and deltas, and

benches well above present stream level, and underlying broad flat to undulating plains; coarse clast composition variable and in many places dominated by shale; deposited as

glaciofluvial materials in contact with melting ice, as glacial outwash plains and deltas, and

or broad plains. Modern Floodplain Sediments: silt, clay and sand with minor gravel and organic muck and organic-rich silt and clay; poorly sorted and stratified; occurs as gentl

or broad plains. Alluvial Terrace Sediments: sand, silt and clay with minor gravel; generally well sorted and stratified; occurs as low benches up to 5 m above present stream level;

Surficial Geology Compilation Map Series DVD release - 2nd edition

Second edition, 2007

metavolcanics, metasediments, granitic and gneissic lithologies, and some gabbroid BEDROCK

Paleozoic sedimentary rocks: primarily dolomite and dolomitic limestone; and some PRE-QUATERNARY

GLACIOFLUVIAL DEPOSITS: sand and gravel in ridges and hummocks, underlying SURFICIAL MATERIALS:

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ALLUVIAL DEPOSITS: Clayey to sandy materials containing some gravel and organic-rich SURFICIAL MATERIALS:

1:500 000 scale

Paleozoic terrane; carbonate-dominated rocks in areas west of Lake Villnipeg, exposed typically i glacially striated, low-relief surfaces, and along large river valleys in the Hudson Bay Lowland

hublished by Manibibs Science, Technology, Energy and Mines. Manibibs Geological Survey, 2006 Compiled by: G.L.D. Mattle and G.R. Hieller

urficial geology of the Split Lake map sheet

sediments; formed as stream deposits and now underlie modern floodplains, low terraces Quaternary

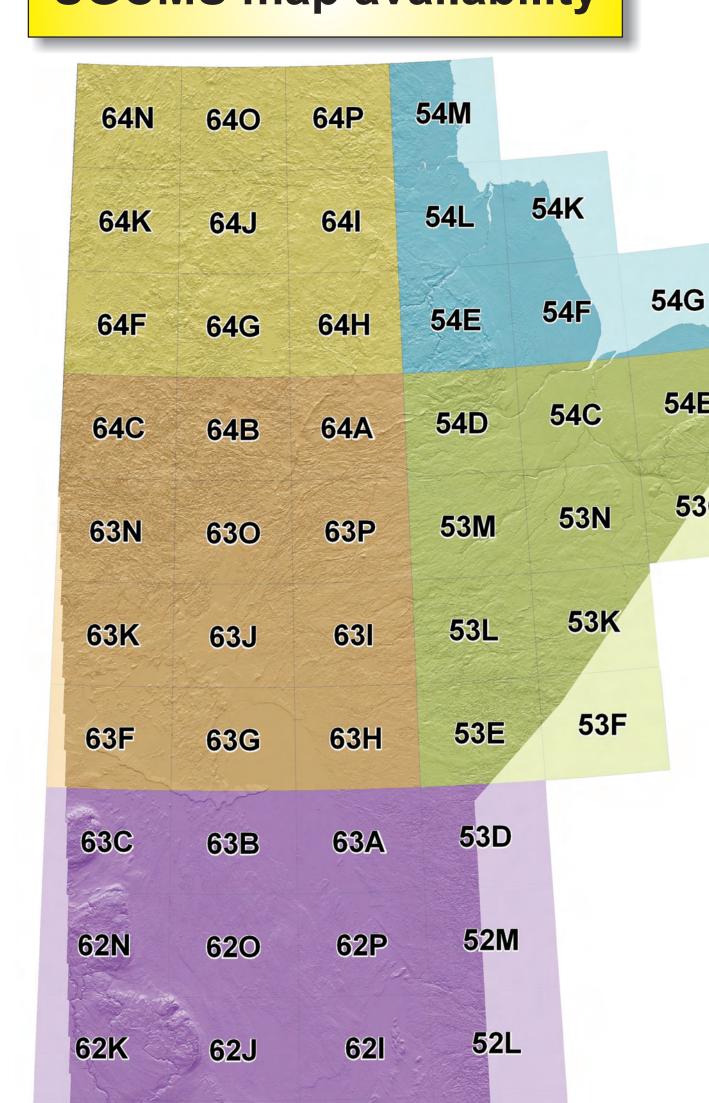
and Queryable Database

Surficial Geology Data Model - Legend Link Database

All maps in the series have been released on DVD in Adobe PDF and ESRI Shapefile formats and on a print-on-demand basis. The SGCMS provides seamless province-wide coverage at scales of 1:250 000, 1:500 000 and 1:1 000 000 including individual and regional map sheets for southern Manitoba (south of 53°N) which were released as the first product of this series in 2004.

- The 1:250 000 scale maps and the regional 1:500 000 scale maps include:
- 1) surficial geology polygons draped on hill shaded topographic relief derived from the SRTM DEM
- 2) a brief description of the Quaternary landscape of northern or southern Manitoba 3) major landforms of Manitoba with specific reference to the glacial ice flow direction
- 4) a paleogeographic reconstruction of late glacial events in Manitoba.
- The two-sided 1:1 000 000 scale map includes all information above as well as:
- 1) a full-colour graphic description of the map units including photographs and diagrams describing unit in lay terms
- 2) an 'Image index map' showing the locations of the areas depicted in the photographs 3) the effect of isostatic rebound on the Tyrrell Sea and Manitoba's Great Lakes region
- 4) a 3-D block diagram showing a cross-sectional view of the geology of southern Manitoba.

SGCMS map availability



1:1 000 000 SGCMS map

1:500 000 SGCMS maps

Provincial coverage at 1:1 million - SG-MB

- Southern Manitoba SG-SMB
- West-central Manitoba SG-WCMB
- East-central Manitoba SG-ECMB
- Northwestern Manitoba SG-NWMB
- Northeastern Manitoba SG-NEMB

1:250 000 SGCMS maps

Full provincial coverage at 250k

(54 NTS* sheets)

Each National Topographic Series (NTS) 1:250 000 scale map sheet is 1°latitude by 2° longitude. Manitoba is comprised of 54 NTS 1:250 000 scale map sheets.

In addition to the DVD, the SGCMS is also available on the web:

http://geoapp2.gov.mb.ca/website/surficialgeo/default.htm - Internet Map Server which allows online viewing and customization of the SGCMS

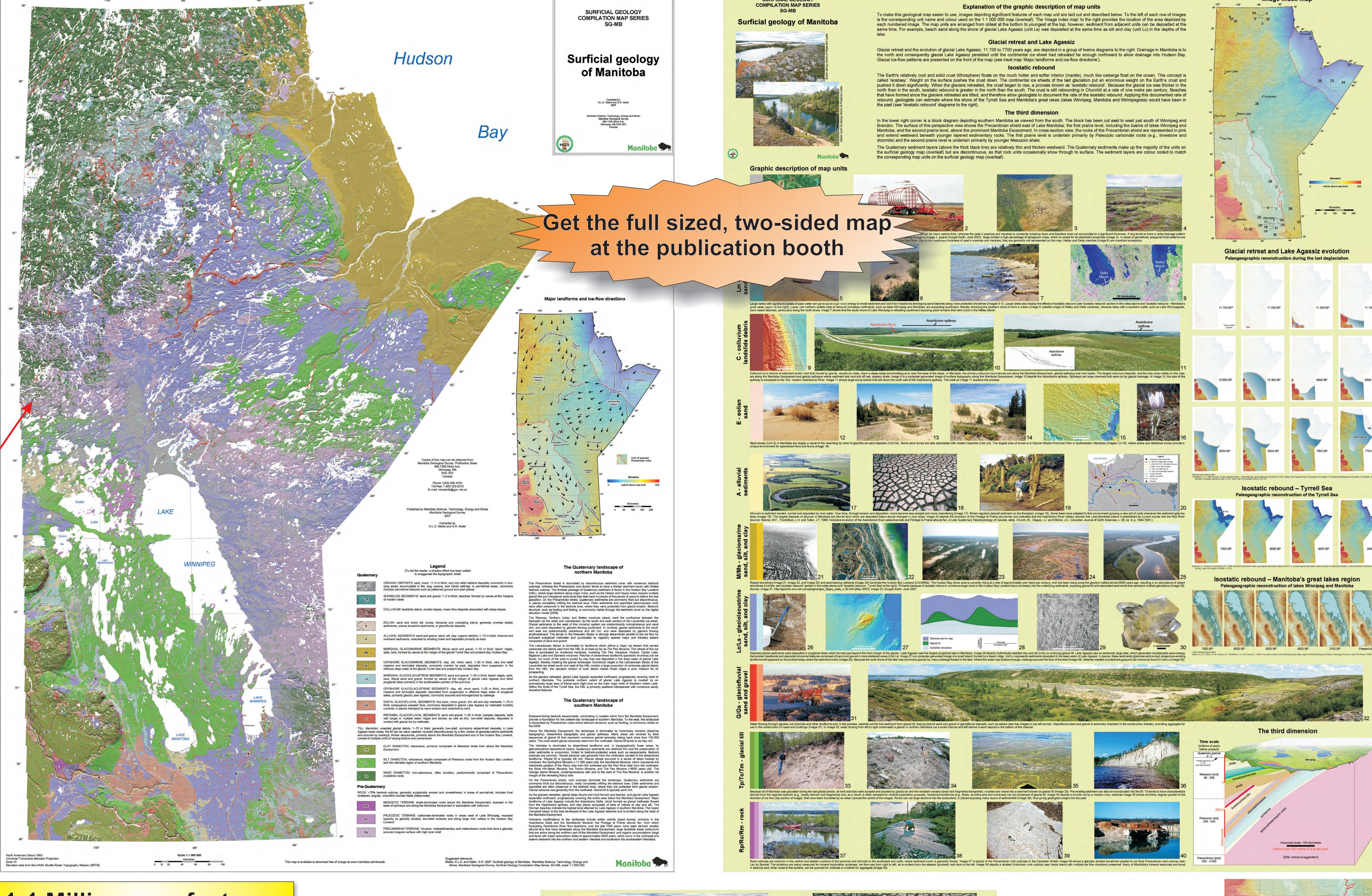
PDF and ESRI Shapefile format via a clickable image map similar to the image above.

http://www.gov.mb.ca/iedm/mrd/geo/gis/surfgeomap.html - This website describes the project and allows download of all SGCMS maps in both



1:1 Million Map - FRONT (reduced to fit poster)

1:1 Million Map - BACK (reduced to fit poster)



ALLUVIAL DEPOSITS: Clayey to sandy materials containing some gravel and organic-rich SURFICIAL MATERIALS: sediments; formed as stream deposits and now underlie modern floodplains, low terraces Quaternary colour maps based on a variety of material characteristics. 1:1 Million map features

ORGANIC DEPOSITS: peat, muck: <1-5 m thick; very low relief wetland deposits: in low-lying areas; accumulated in fen, log, swamp, and marsh settings; in permati commonly includes permators features such as pathered gound and peat palsas

EOLIAN: sand and minor silt, dunes, blowouts and undulating plains; generall sediments, coarse lacustrine sediments, or glaciofluvial deposits

ALLUVIAL SEDIMENTS: sand and gravel, sand, silt, clay, ceganic detritus; 1–20 m thick; and overbank sediments; reworked by existing rivers and deposited primarily as bars

MARGINAL GLACHMARINE SEDIMENTS: litteral sand and gravel; 1–10 m thick; beach ridg spits, bars; formed by waves at the margin of the glacial Tyrrell Sea and present-day Hudson OFFSHORE GLACIOMARINE SEDIMENTS: day, silt, minor sand; 1-20 m thick; very low relief massive and laminated deposits which are commonly overlain by peat, deposited from suspensio in the offshore, deen water of the oracial Turnel Sea and present-day Hudson Burs. MARGINAL GLACICLACUSTRINE SEDIMENTS: sand and gravel; 1–20 m thick; beach ridges, s bars, litoral sand and gravel; formed by waves at the margin of glacial take Agassiz and other sr proglacial lakes in the extreme northwestern portion of the province

OFFSHORE GLACICACUSTRINE SEDMENTS: day, six, minor sand; 1–30 m thick; low relief massive and laminated deposits; deposited from suspension in offshore, deep water of glacial La Agassiz; commonly scoured and homogenized by toetbergs

DISTAL GLACIOFLUVIAL SEDIMENTS: fine sand, minor gravel, thin silt and clay interbeds; 1–7: thick; subaqueous outwash fans; deposited in glacial Lake Agassit by methvater turbidity current commonly reshaped by wave exposin and revoked by wind. PROXIMAL GLACIOFLUVIAL SEDIMERTS: sand and gravet, 1–20 m thick; complex deposits, belts with single or multiple esize ridges and learnes, as well as thin, low-relief deposits; deposited in contact with disciss (see by methysiaer).

silt diamictor: largely derived from Phaneccoic carbonate rocks from the Hudson Bay Lowlar deposited by an ice stream emanating from Hudson Bay

sand diamictor, commonly bouldery, predominantly composed of Precambrian crystalline rool deposited by ice emanating from Nunavut K > 75% bedrock outcrop; generally subglacially eroded and unweathered; in areas of permafrost includes forered, angular, monolithic boulder fields F elsemmen)

Paleozoic terrane: carbonate-dominated rocks in areas west of Lake Winnipeg, exposed typic glacially striated, low-relief surfaces, and along large river valleys in the Hudson Bay Lowland

Precambrian terrane: intrusive, metasedimentary, and metavolcanic rocks having a glacially scoul irregular surface with high local relief

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The Quaternary landscape of northern Manitoba

Surficial geology of northwestern Manito

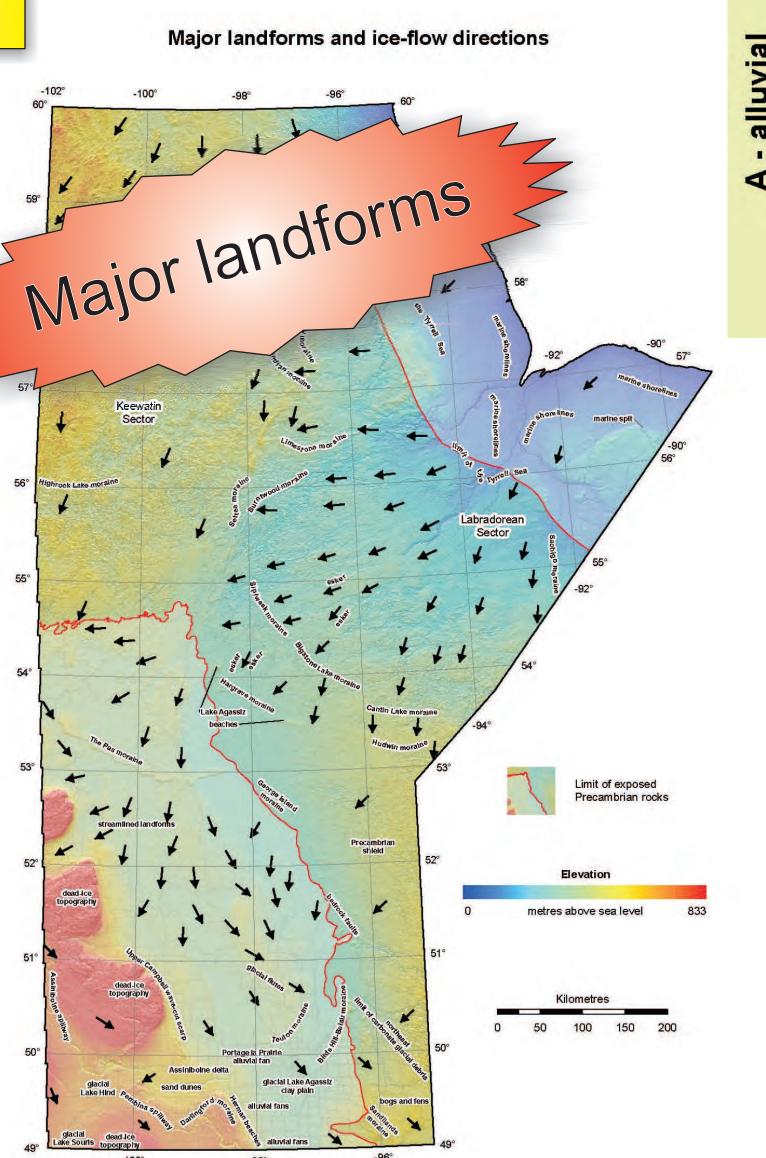
Compiled by: G.L.D. Idatelle and G.R. Keller L. Dredge, Geological Survey of Canada, provided modifications to the Miloving map sheets: 64l, 64l, 64

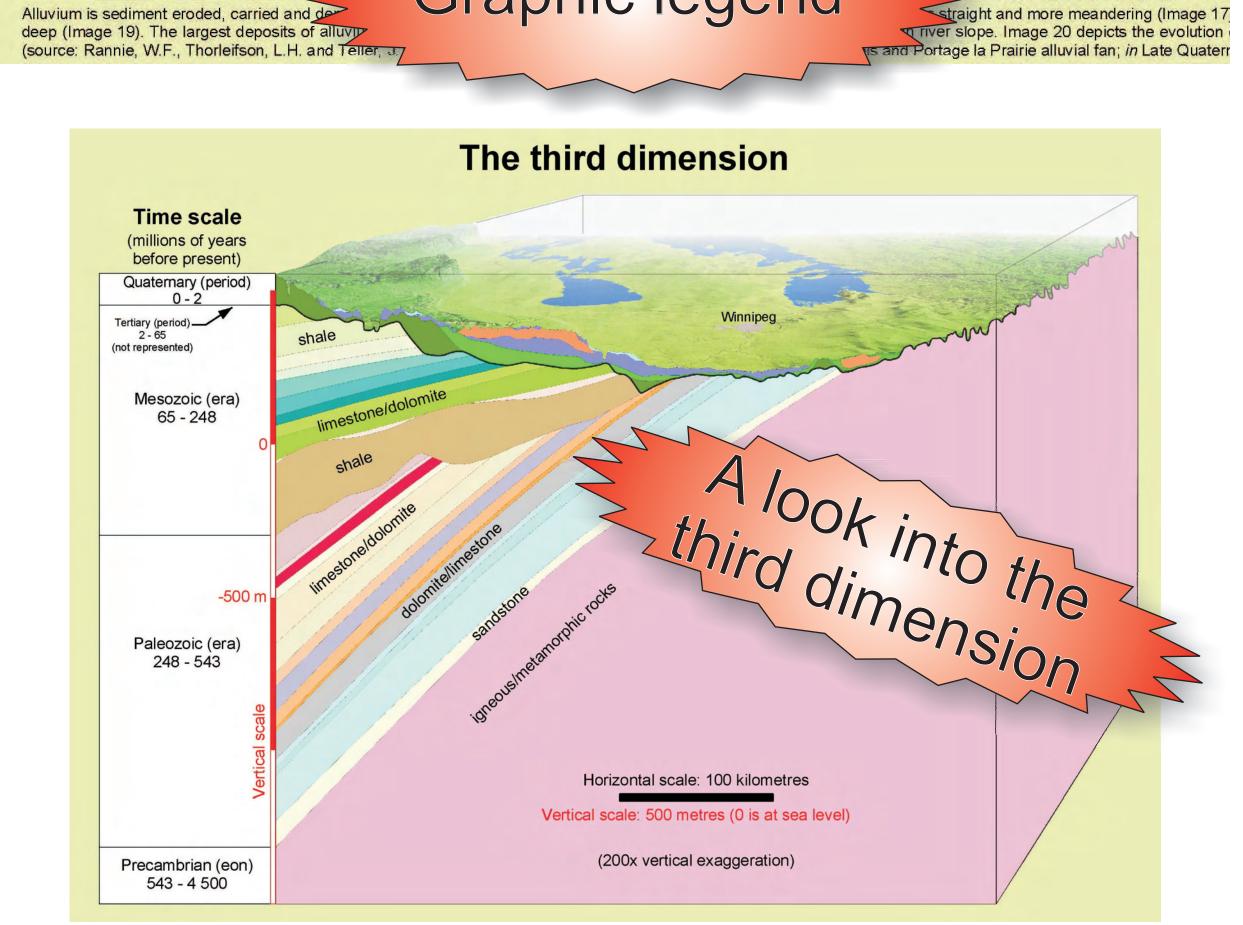
retrieve the original interpretation which can be used

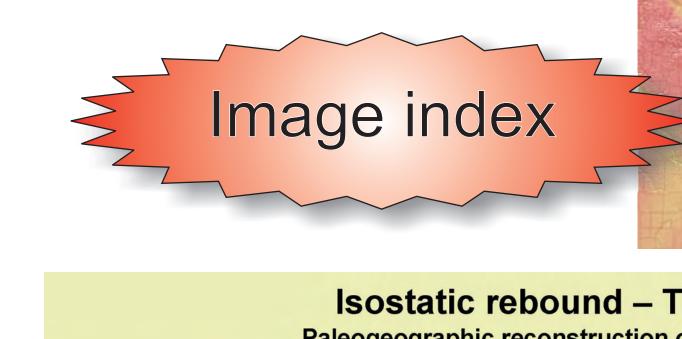
(Note: Maps reduced to fit poster)

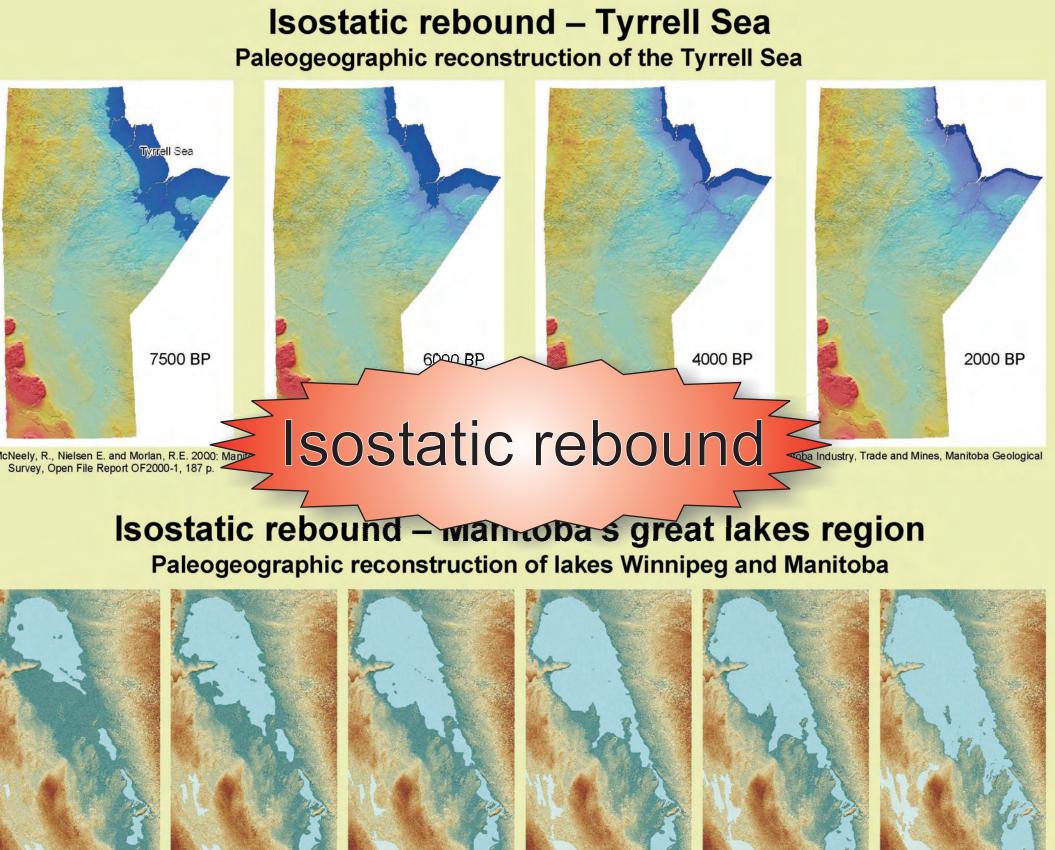
Surficial Geology Polygons - Attribute Table











Lake Winnipeg figures after:
Matile, G.L.D., Lewis, C.F.M., Nielsen, E., Thorleifson, L.H. and Todd, B.J., 1996: Holocene evolution of the Manitoba great lakes region; Manitoba Energy and Mines, Geological Services, Open File Report OF96-8, 1 sheet.