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Barnett, P.J., and Yeung, K.H. 2014. Surficial geology of the Wunnummin Lake area southeast, northern Ontario; Ontario Geological Survey, Preliminary Map P.3708, scale 1:100 000

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Marginal Notes

In 2008, the Ontario government announced plans to permanently protect half of the Far North region of Ontario and launched a planning process to support this goal (Far North Information Knowledge Management Program). During the initial stages of planning, the need for primary landscape data became apparent. A terrain mapping project to remotely predict surficial materials was initiated by the Ontario Geological Survey in response to this information need.

SPOT imagery (4 colour bands and the panchromatic band), a digital elevation model and its derivatives and the Ontario Hydro Network vector drainage shape files (Ontario Ministry of Natural Resources 2010) are the primary data sources for this remote predictive mapping exercise. A multiresolution segmentation algorithm, using different image layer weights, scale parameters and homogeneity criterion, within an object-based image analysis software is used to achieve meaningful objects representing various surficial material types. Objects are then classified based on digital signature, internal variability of signature and proximity to certain vector layers and certain adjacent material types.

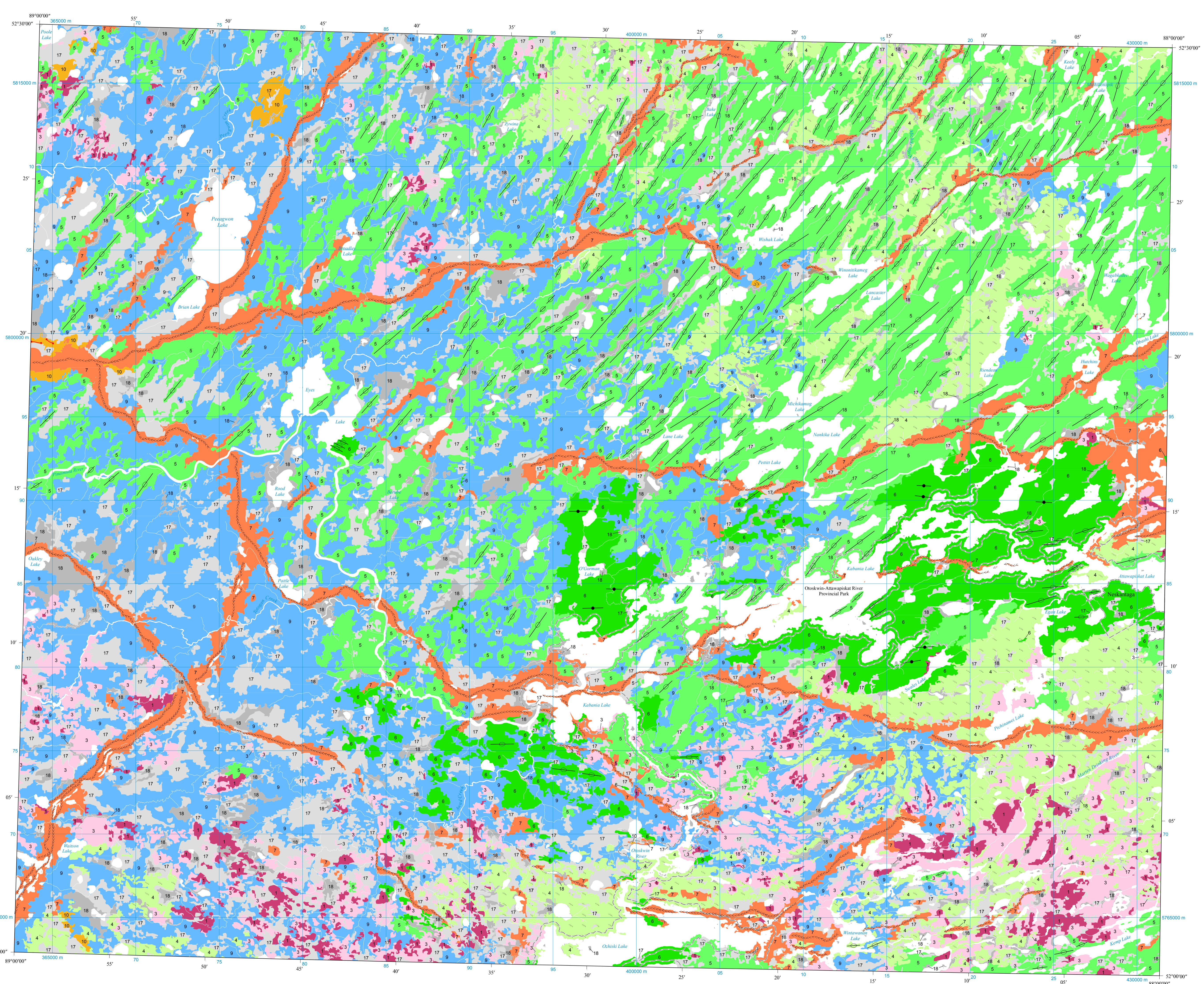
Limited helicopter-supported field work combined with the examination of archival information (Riley and Boissonneau unpublished field notes and photographs), Geological Survey of Canada, Operation Wink, unpublished field notes; Skinner 1973; Sanford, Norris and Bostock 1968; Sanford and Norris 1975; and Thorleifson, Wyatt and Warman 1993, and their unpublished field notes) provided the ground control on the classification of objects. In addition, information from the various other Far North Information Knowledge Management Program projects, such as base data and land cover information (Ontario Ministry of Natural Resources, in progress), has been used in the interpretation and classification of the surficial materials.

The maps show only the surface material distribution. For better definition of wetland types please refer to the Ontario Ministry of Natural Resources Far North Land Cover 2005-2009 digital series of maps. Older deposits that occur along many of the deep-seated river valleys are not depicted. However, the reader is encouraged to review books by Skinner (1973) and Thorleifson, Wyatt and Warman (1993) for further information and details on the older sediments exposed along rivers within the Hudson Bay Lowland.

This project is funded by the Far North Branch, Ontario Ministry of Natural Resources, and the Ontario Geological Survey, Ontario Ministry of Northern Development and Mines. Interaction with the First Nation community members greatly enhanced the map products of the Far North Information Knowledge Management Program Terrain Mapping Project.

REFERENCES

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Sanford, B.V. and Norris, A.W. 1975. Devonian stratigraphy of the Hudson Bay Platform. Geological Survey of Canada, Memoir 379, 124p.
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Skinner, R.G. 1973. Quaternary stratigraphy of the Moose River Basin, Ontario. Geological Survey of Canada, Bulletin 225, 77p.
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LEGEND\*

PHANEROZOIC

CENOZOIC

QUATERNARY

- 20 Marine Mud-Flat Deposits: Sand, silt and clay; deposited in mud flats and offshore bars within the tidal zone.
19 Marine Salt-Marsh Deposits: Silt and clay with organic matter; minor sand; deposited in salt marshes along present-day coast.
18 Organic Deposits: Peat, muck and/or marl; deposited in fen wetlands.
17 Organic Deposits: Peat, muck and/or marl; deposited in bog wetlands.
16 Fluvial Deposits (recent): Stratified sand and gravel; may include silt, minor clay. Deposited in bars and channels of present-day rivers and creeks.
15 Fluvial Deposits (abandoned): Stratified sand and gravel; may include silt, minor clay. Deposited in bars and channels along abandoned terraces of rivers and creeks.
14 Marine Deltaic Deposits: Stratified sand and gravel; silt, minor clay. Deposited at the mouths of rivers and creeks entering a postglacial sea.
13 Marine Beach and Nearshore Deposits: Stratified sand and gravel; minor silt. Deposited primarily in the shore zone and nearshore zone of a postglacial sea.
12 Marine Basin Deposits: Massive to stratified silt and clay; minor sand. Deposited in basinal areas of a postglacial sea.
11 Glaciolacustrine Deltaic Deposits: Stratified sand and gravel; may include minor silt and clay. Deposited at the mouths of rivers and creeks entering a proglacial lake.
10 Glaciolacustrine Beach and Nearshore Deposits: Stratified sand and gravel; minor silt. Deposited primarily in the shore zone and nearshore zone of a proglacial lake.
9 Glaciolacustrine Basin Deposits: Stratified silt and clay; minor sand. Deposited in basinal areas of a proglacial lake.
8 Glaciolacustrine Outwash Deposits: Stratified sand and gravel; including minor silt, clay. Deposited in bars and channels in rivers flowing from a glacier.
7 Glaciolacustrine Ice-Contact Deposits: Stratified sand and gravel; including minor silt, clay, till and flow till. Deposited in eskers, kames, deltas and subaqueous fans and in end and recessional moraines along a glacier margin.
6 Till: Massive to bedded diamictic; clayey silt to clay matrix, clast content low to moderate, moderate to high matrix carbonate content, may contain discontinuous layers or lenses of stratified gravel, sand, silt and/or clay, or flow till. Deposited at the base or along the margins of a glacier.
5 Till: Massive to bedded diamictic; sandy silt to silt matrix, clast content moderate to high, low to high matrix carbonate content, rare discontinuous layers or lenses of stratified gravel, sand, silt and/or clay, or flow till. Deposited at the base or along the margins of a glacier.
4 Till: Massive to bedded diamictic; silty sand to sand matrix, clast content moderate to high, low to moderate matrix carbonate content, rare discontinuous layers or lenses of stratified gravel, sand, silt and/or clay, or flow till. Deposited at the base or along the margins of a glacier.
3 Thin Sediment over Bedrock: Thin, near-continuous cover of Quaternary sediments overlying undifferentiated bedrock. Quaternary sediments are commonly less than 1 m thick; however, areas of outcrop indicated on the map may contain small areas where the cover exceeds 1 m in thickness, but are too small to delineate at this map scale.

PALEOZOIC, MESOZOIC AND CENOZOIC (TERTIARY)

- 2 Bedrock: Undifferentiated bedrock with a thin, discontinuous cover of Quaternary sediments. Quaternary sediments rarely exceed 0.5 m in thickness; however, areas of outcrop indicated on the map may contain small areas where the cover exceeds 1 m in thickness, but are too small to delineate at this map scale.

PRECAMBRIAN

- 1 Bedrock: Undifferentiated bedrock with a thin, discontinuous cover of Quaternary sediments. Quaternary sediments rarely exceed 0.5 m in thickness; however, areas of outcrop indicated on the map may contain small areas where the cover exceeds 1 m in thickness, but are too small to delineate at this map scale.

\* The map legend applies to Preliminary Maps P.3625 to P.3758, and P.3767. Deposits on this sheet are mapped primarily where they reach 1 m or more in thickness. Thinner deposits are not generally shown. All legend units or deposit types may not be present on this map.
Refer to Ontario Ministry of Natural Resources Far North Land Cover 2005-2009 series of digital maps for better definition of wetland types and distribution.

SOURCES OF INFORMATION

The digital base map is derived from the Ontario Land Information Warehouse, Land Information Ontario, Ontario Ministry of Natural Resources, scale 1:50 000, with modifications by staff of the Ministry of Northern Development and Mines. The digital base data is current to January 2012. The map co-ordinates are in UTM zone 16, North American Datum 1983 (NAD83).

Magnetic declination at the centre of the map area was approximately 5°49'W in 2014. Mean annual change is 2.9'W.

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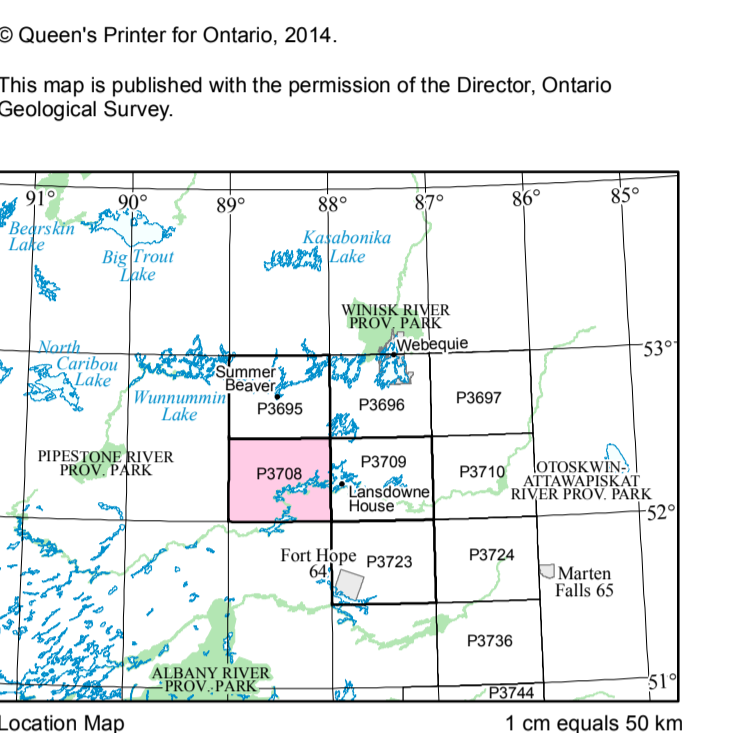
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Ontario Geological Survey
MAP P.3708
SURFICIAL GEOLOGY
WUNNUMMIN LAKE AREA
SOUTHEAST,
NORTHERN ONTARIO
Scale 1:100 000
NTS References: 53 A/1, 2, 7, 8
Queen's Printer for Ontario, 2014.
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SYMBOLS\*

- Bedrock outcrop
Lineament observed on remotely sensed imagery
Brow of large landslide or failure scar
Base of terraced escarpment (abandoned glaciolacustrine or marine shoreflat)
Base of terraced escarpment (margin of abandoned or modern fluvial or glaciolacustrine terrace)
Trend or crest of abandoned or modern beach bar or spit
Base of large ice-contact slope
Trend of large moraine or moraine crest
Trend of minor moraine or moraine crest, includes De Geer (or washboard) moraines
Area of hummocky moraine
Area of palimpsest moraine
Area of ribbed landforms, includes Rogen (or ribbed) moraine, scabland-type erosional features and/or megaripples
Trend of esker or esker crest
Glacial erosion features carved into the bedrock surface (includes streamlines, drumlins, drumminoid ridges and crag-and-tail features)
Streamline form with positive relief, includes drumlins, drumminoid ridges and crag-and-tail features
Streamline form with negative relief, includes flutes
Large iceberg keel mark
Large sand dune (aeolian)
Area of extensive peatland
Area of suspected karst features
Indian Reserve, park boundary, township
Utility
Road, railroad

\* The symbols list applies to Preliminary Maps P.3625 to P.3758, and P.3767. All symbols may not be present on this map.
As presented on published and unpublished maps.

CREDITS

Geology by P.J. Barnett and K.H. Yeung, 2014.
Preparation of GIS product by K.H. Yeung, J.D. McCallum, L.A. Handley. Cartographic production by R. Corcoran.
To enable the rapid dissemination of information, this map has not received a technical edit. Discrepancies may occur for which the Ontario Ministry of Northern Development and Mines does not assume liability. Users should verify critical information. Sources include both the references listed here, and information on file at the Resident Geologist's office nearest the map area.
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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.