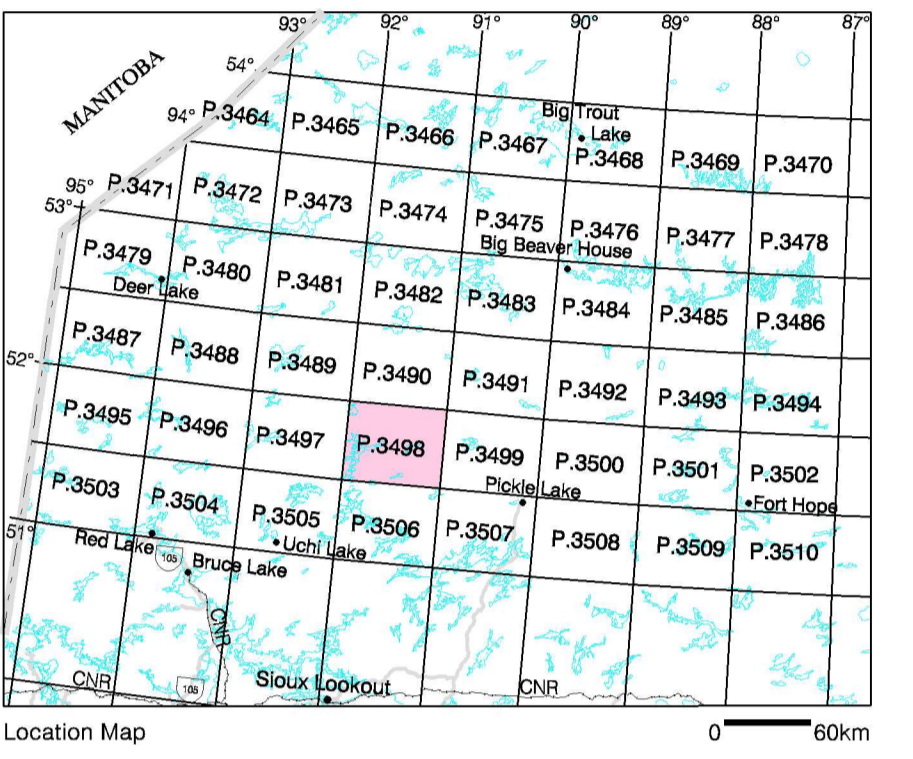


Ontario Geological Survey
 MAP P.3498
 SATELLITE IMAGE MAP
LAKE ST. JOSEPH AREA NORTHWEST
 NORTHWESTERN ONTARIO

Scale 1:100 000
 2000 m 0 2 4 km

NTS Reference: 52 O
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MARGINAL NOTES

This Satellite Image Map is one of a series of 47, 1:100 000 scale image maps produced as a result of co-operative research done by the Ontario Geological Survey, Ministry of Northern Development and Mines, and the Canada Centre for Remote Sensing, Natural Resources Canada. The overall goal of the joint research is to develop a process for terrain analysis that will produce maps similar to the Northern Ontario Engineering Geology Terrain Studies (NOEGTS) of the 1990s (Gartner et al. 1981). Digital Elevation Models (DEMs), their derivatives and remotely sensed imagery are used to delineate areas with different terrain conditions. The process to do terrain analysis uses a Geographic Information System (GIS) to analyze the DEM and remotely sensed data, and is particularly useful for terrain analysis of large areas or areas with limited access and/or financial resources.

The NOEGTS terrain maps produced previously have been quite useful in providing regional information on geological conditions of the landscape. These conditions affect or determine resource capability of an area as well as identify and outline possible constraints (Gartner et al. 1981). They have been used extensively for regional planning purposes in forest management, oil exploration and in ecological land classification studies completed by both private and public organizations. The area north of 51°N latitude is in need of such terrain information. It is a part of Ontario's new frontier for the mineral and forest industries.

The series of Satellite Image Maps portray enhanced terrain conditions as viewed from space. They are a useful visualization by-product of the terrain analysis process and provide a quasi-three-dimensional overview of the terrain and its conditions. Image maps are useful for orienting and planning various types of ground survey operations. The series of Satellite Image Maps covers a large part of the northern boreal forest region of northwestern Ontario between latitudes 51° and 54°N and between longitude 87°W and the Manitoba-Ontario provincial boundary.

The Satellite Image Maps are products of the fusion of a shaded Digital Elevation Model (Hillshade) and Landsat Extended Thematic Mapper (Landsat ETM) or Landsat Thematic Mapper (Landsat TM) image. The Geomatics Service Centre (Ontario Ministry of Natural Resources) created the DEMs and hillshades with a 25 m grid size for this project. Each DEM tile used in the fused product was generated using the ANUDEM process (Hutchinson 1989) from digital contour and stream lines from a 1:50 000 scale National Topographic System (NTS) maps that cover an individual image map area. This process creates a higher quality representation of the land surface as a result of incorporating drainage enforcement into the DEM algorithm. An adaptive enhancement was then applied to the derived shaded DEM to augment terrain features. The Landsat ETM or TM image was georectored and the infrared bands 4, 5, and 7 of the Landsat imagery enhanced using a linear stretch prior to an arithmetic fusion with the hillshade (Singhroy et al. 2000). On images where there were significant areas of cloud cover and/or cloud shadows, a mosaic of 2 images was created. No attempt has been made to match the colour balance between adjacent image maps.

In general, water appears black on the images; tree-covered areas, in various shades of brown, depending, in part, on forest composition; and wetlands, as light red to pale red areas. Areas that have been disturbed by natural processes or human activity, such as forest fires, roads or clear-cut areas, appear white, in shades of blue or very pale brown in colour. The lighter shades of yellow and brown are either areas where forest fire or logging has previously occurred and new forest growth (regeneration) has begun.

SOURCES OF INFORMATION

- Digital National Topographic System maps 52 O/11, 12, 13, and 14 in UTM zone 15, NAD 83 projection.
- Landsat ETM image 27/24, September 4, 2000; LANDSAT data #NOAA. Received by the Canada Centre for Remote Sensing (CCRS). Processed and distributed by RADARSAT International under license from CCRS. Acknowledgements: EROS Data Centre.
- Gartner, J.F., Mollard, J.D. and Rood, M.A. 1981. Ontario engineering geology terrain study users' manual; Ontario Geological Survey, Northern Ontario Engineering Geology Terrain Study 1, 51p.
- Hutchinson, M.F. 1989. A new procedure for gridding elevation and stream line data with automatic removal of pits; Journal of Hydrogeology, v.106, p.211-232.
- Singhroy, V.N., Barnett, P.J., Yatabe, S. and Saint-Jean, R. 2000. Satellite-based engineering terrain mapping of Canada's boreal forest region; in Proceedings, 14th International ERIM Applied Geologic Remote Sensing Conference, Las Vegas, Nevada, p.131-140.

CREDITS

- Technical supervision and design by V.H. Singhroy, Canada Centre for Remote Sensing, and P.J. Barnett, Ontario Geological Survey.
- Georectored Landsat ETM/TM enhancements and data fusion by P. Assouad and K. Molch, Canada Centre for Remote Sensing.
- Digital Elevation Model and Hillshade created by S.J. Leney, Geomatics Service Centre, Ontario Ministry of Natural Resources.
- Ontario's Far-North, Engineering Geology Terrain Study Project leaders: P.J. Barnett and V.H. Singhroy.
- 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 and the Canada Centre for Remote Sensing do not assume liability. Users should verify critical information.
- Issued 2002.
- Information from this publication may be quoted if credit is given. It is recommended that reference to this map be made in the following form:
 Singhroy, V.H., Barnett, P.J., Assouad, P., Molch, K. and Leney, S.J. 2002. Satellite Image Map, Lake St. Joseph area northwest, northwestern Ontario; Ontario Geological Survey, Preliminary Map P.3498, scale 1:100 000.

