



GEOLOGICAL SURVEY OF CANADA  
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

SHEET 31 1/2

- LEGEND
- PLEISTOCENE AND RECENT
- WISCONSIN AND YOUNGER
- 6 LOW TERRACE SANDS: grey to brown alluvial sands of all grades, some gravel, includes some marshy areas
- 5 HIGH TERRACE SANDS: medium to coarse grey sand, some gravel, in beach ridge and terrace deposits
- 4 CHAMPLAIN SEA SEDIMENTS: chiefly massive grey silty clay, stratified and sandy near base in many places; includes some glacio-fluvial and glacio-lacustrine sediment younger than 3 that grades upward into 4
- 3 GENTILLY TILL: typically calcareous, sandy grey till, in some places coloured reddish where bedrock or lower till has been eroded; in most upland exposures covered by a lag concentrate of coarse sandy gravel and boulders
- EARLY AND PRE-WISCONSIN
- 2 INTRAGLACIAL SEDIMENTS: includes pro-Wisconsin Deschailions varved sediments and pre-Wisconsin St. Pierre sediments, the latter comprising fine to medium sands at places with peat beds
- 1 GLACIAL SEDIMENTS: chiefly Bécancour till, sandy till and sandy silt till, calcareous, brick red; includes subjacent red varves and superjacent grey varved silts with some red winter layers

Geological boundary (approximate), . . . . .

Geology by N.R. Gadd, 1954

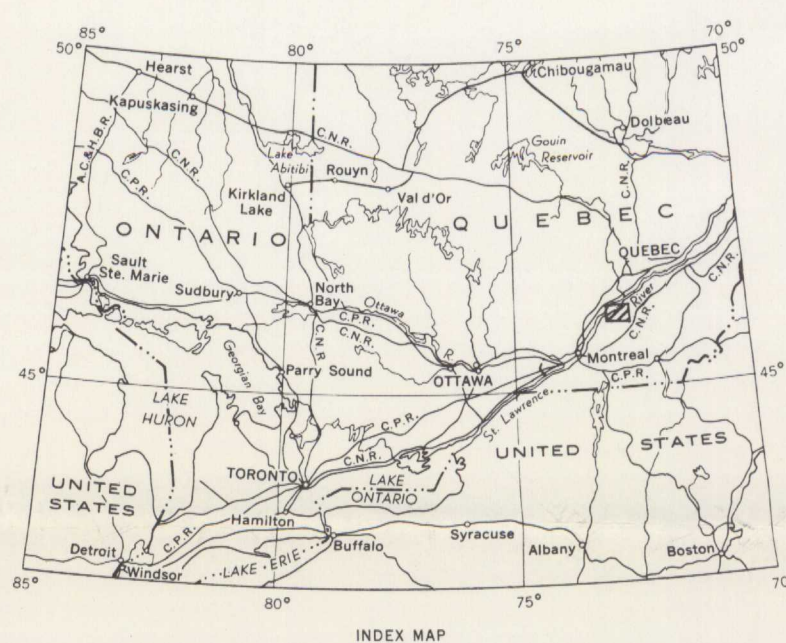
- Main highway, . . . . .
- Other roads, . . . . .
- Trail, . . . . .
- Railway, . . . . .
- Abandoned railway, . . . . .
- Post Office, . . . . . P
- County boundary, . . . . .
- Township boundary, . . . . .
- Ditch, . . . . .
- Marsh, . . . . .
- Foreshore flats, . . . . .
- Contours (interval 50 feet), . . . . .

Cartography by the Geological Survey of Canada, 1959

Approximate magnetic declination, 16° 46' West

Air photographs covering this area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa, Ontario

In response to public demand for earlier publication, Preliminary Series maps are now being issued in this simplified form, thereby effecting a substantial saving in time. There is no loss of information, but the maps will be clearer to read if all or some of the map-units are hand-coloured.



INDEX MAP



DESCRIPTIVE NOTES

Within the map-area there is a clear record of two Pleistocene glaciations, the older being represented by three lithological units which are considered to be Pre-Wisconsin in age. These units, included in map-unit 1, comprise the following: Bécancour till which is brick-red in colour and from sandy till to sandy silt till in composition; typically red varves (proglacial varves overridden by red till); and grey varves with some red winter layers (post-glacial varves that overlie the till). Outcrops are restricted to the basal parts of sections along the banks of the St. Francis, Nicolet, and Southwest Nicolet Rivers.

Intraglacial sediments (map-unit 2) include the St. Pierre sediments that are dominantly medium- to fine-grained fluvial sand containing, in some outcrops, layers of compressed peat and disseminated organic matter. In the map-area, peat and wood from freshwater bogs are most abundant in a section of the east bank of Nicolet River, about a mile upstream from Ste. Monique-de-Nicolet, and in the Pierreville section on the east bank of St. Francis River 1 3/4 miles upstream from Pierreville. The Pierreville section contains the source bed for Y-256, a sample of organic matter dated at greater than 29,630 C14 years. St. Pierre sediments in other outcrops along St. Francis and Nicolet Rivers are mainly sand, but in some sections the horizon of peat accumulation is marked by the presence of brilliant blue vivianite (Fe3P2O8.8H2O).

Also included in map-unit 2 are the Deschailions varved silts that are pro-Wisconsin grey varves deposited in the St. Lawrence and tributary valleys during the advance of the Wisconsin glacier. They overlie St. Pierre sediments and are overridden by Gently till.

Gently till (map-unit 3), of Wisconsin age, includes lag gravels derived from the till and concentrated on its surface by wave and current action. The glaciation represented by this unit, and by the proglacial Deschailions varved silts, terminated the St. Pierre interglacial. Contact relations of these sediments with those below and above them suggest that a continental glacier occupied the St. Lawrence valley through most of Wisconsin time and that the retreat of the glacier in late Wisconsin was contemporaneous with flooding of low-lying areas by the Champlain Sea. Outcrops of Gently till between Nicolet and St. Francis Rivers in the southeast corner of the area are in ridges that form part of the Drummondville moraine—a recessional moraine of the Wisconsin glaciation. Other outcrops to the north and west of these are exposures of ground moraine.

Most of the surface of the map-area is underlain by Champlain Sea clay (map-unit 4), commonly called "lede" or "ue" clay. Exposed thicknesses of more than 100 feet of clay are common along streams of the area, and a thickness of nearly 200 feet is recorded at the Department of National Defence establishment at the mouth of Nicolet River. In these thick clay deposits, retrogressive flow-type landslides are common and their scars, shaped like amphitheatres, occur along most of the streams of the area. The scar of one slide that occurred in October 1955 causing great damage and some loss of life in the village of Nicolet, remains at the east end of the highway bridge over the Nicolet River.

The soft grey clay was laid in the bottom of Champlain Sea when it occupied the St. Lawrence Valley in late-glacial time. The clay has a laminated facies with sand partings in some outcrops and commonly is spotted with black organic matter near the base of thick sections. In a number of sections, notably one at the mouth of Rivière aux Vaches, varved non-fossiliferous clays and silts overlying Gently till grade upward into laminated fossiliferous marine clay, indicating a rapid transition from glacial to marine conditions and a very short interval between glacial recession and marine invasion.

Sands (map-unit 5), laid on the marine clay over most of the area, are medium to fine sands with some gravel. They are estuarine or fluvial sands laid down as shoreline features such as bars and spits, and as channel deposits on broad flat terraces cut in marine clay and underlying sediments. These so-called High Terrace sands were deposited by the estuarine or fluvial system that was the high-level predecessor of the present St. Lawrence drainage system and whose development bridges the time between Champlain Sea occupation and modern drainage of the region.

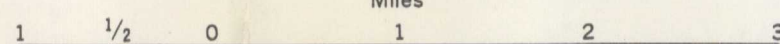
Low Terrace sands (map-unit 6) are fine to medium alluvial sands, with some gravel, containing some disseminated organic matter. These were deposited in recent times by the St. Lawrence River. They occur in terraces that are only a little above the mean water-levels and are, at least in part, subject to seasonal or occasional flooding by waters of the St. Lawrence and its tributaries. Spring floods brought about by ice barricades across tributaries during break-up on the St. Lawrence are the most common on these low terraces.

The Pleistocene stratigraphy of Yamaska map-area is similar to that of the adjacent Bécancour map-area, described in detail in Geol. Surv., Canada, Paper 59-8, Map 42-1959

MAP 43-1959  
SURFICIAL GEOLOGY  
YAMASKA

YAMASKA, NICOLET, MASKINONGE, RICHELIEU,  
BERTHIER AND ST. MAURICE COUNTIES  
QUEBEC

Scale: One Inch to One Mile = 1/63,360  
Miles



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3401  
1956  
G4  
omvsc  
43-1959  
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MAP 43-1959  
YAMASKA  
QUEBEC  
SHEET 31 1/2