
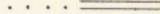

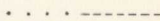
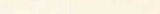




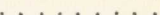
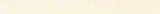



BEDROCK

Rb Chiefly limestone

Rs Chiefly granite and granitic gneisses

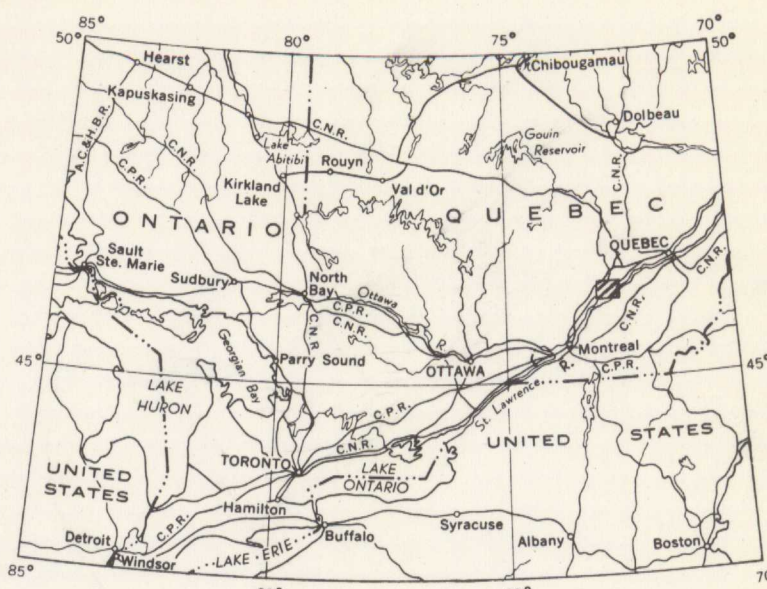
Geology by N. R. Gadd and P. F. Karrow, 1954.

Main highway	
Other roads	
Trail	
Railway	
Power transmission line	
Post Office	
County boundary	
Township boundary	
Concession and lot numbers	
Marsh	
Foreshore flats	
Contours (interval 50 feet)	

Approximate magnetic declination, 16° 55' West

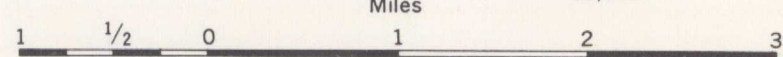
Air photographs covering this area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa, Ontario

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.



MAP 54-1959
SURFICIAL GEOLOGY
TROIS-RIVIÈRES
T-Maurice, Champlain, Maskinongie
AND Nicolet Counties
QUEBEC

Scale: One Inch to One Mile = $\frac{1}{63,360}$



DESCRIPTIVE NOTES

The oldest glaciation of the area is represented by two small outcrops of Bécancour till (map-unit I) on the south shore of the St. Lawrence River in the vicinity of St. Grégoire. This sandy till has a brick-red colour derived from local red shale bedrock. In adjoining areas it is overlain unconformably by interglacial sediments whose age may be as great as 60,000 C₁₄ years; the Bécancour till is therefore assigned a pre-Wisconsinan age.

The interglacial sediments (map-unit 2) exposed along the banks of the St. Pierre River are correlated with the St. Pierre sediment of the adjoining Wisconsin. The St. Pierre is a sequence of sand, silt and radiocarbon age of contained wood and peat. Samples of wood and peat from exposures on the east bank of the St. Maurice River at Les Veilleux-Forges have been given C₁₄ ages beyond the limit of method (Y₁₉₄) (Y₁₉₄ = 19400 years). The St. Pierre is composed of silty, cherty sands with minor silt and some peat beds, lie in deep valleys, and occur during a relatively long interglacial time. They represent a freshwater environment in a cool, moist climate. In places they are overlain unconsolidated Wisconsin glacial till and sand. These tills are easily separated from the St. Pierre sediments and are shown as a separate map-unit in Wisconsin in age but on this map scale they are not separated from underlying sands and shown as a separate map-unit.

Glaciation of Wisconsin area was first represented in the St. Lawrence River valley by a glacial drift belt composed of till superseded by calcareous, grey sandy till (map-unit 3), the Gentilly till, deposited by an ice-sheet advancing southward from the Laurentian shield. The calcareous till is composed of glacial till and of carbonate material in the till is derived from these Palaeozoic rocks (Rt.).

Later, the distal margin of the Wisconsin ice-sheet retreated and for a short time the Laurentian ice-sheet occupied the northern limits of the map-area. As the ice-margin again withdrew towards the Three Rivers area, an ice-dam on the St. Lawrence - a dam of ice and moraine material - was built up. The Laurentian waters engulfed the St. Lawrence Lowland. This incursion of the Champlain Sea probably accelerated the removal of glacial ice from the Champlain Sea area. The Laurentian ice-sheet and the Laurentian Highland. The shorelines were high on Precambrian bedrock in the Laurentian Highland, only small amounts of shore sediments

Lag gravels and boulder concentrations produced by wave action among the Laurentian Highlands. The Laurentian Highland. Occupation of the valley by the Champlain Sea, therefore, is represented in the map-area by thick deposits of bottom sediments in the form of clay and silt, and by thin, light-colored, silty sand and clay bands of fine sand alternating with silt and clay layers. In most outcrops these sediments contain foraminifera and/or pelecypods of a

While the Champlain Sea still occupied the St. Lawrence Lowlands, glacial activity was renewed and the ice-margin advanced from the highland into the marine basin to form the St. Narcisse moraine². Glacial till (4) that forms the core of the moraine is very sandy and is typically non-calcareous, because it is composed essentially of material derived from areas of Precambrian granitic rocks. A small carbonate content is found in the till where the glacier for short distances passed over Palaeozoic rocks or where fossiliferous marine sediments have been incorporated in the till. Such an occurrence of calcareous, fossiliferous till was found in a large sand-and-gravel pit just outside

The northern limit of the map-area is in the vicinity of Valmont. The map-area sands and gravels of unit 5 comprise ice-contact material deposited at the ice-front during the retreat of the St. Narcisse moraine, and outwash channel deposits laid down by the meltwater from the ice-sheet during and after the northward retreat of the ice-margin from its position at the moraine. At places along the northern flank of the moraine, east of Charette, the coarse sands and gravels are overlain by thin layers of unfossiliferous varved clay and silty clay. The unfossiliferous nature of these layers is evidence of glacial and marine events.

In the period immediately following the second, and last, recession of the margin of the Wisconsin ice-sheet into the Laurentian Highland, marine waters modified the landscape by erosion and deposition. The resulting deltaic deposits are well exposed in the rounded and much fine material was washed out of the sediments there. The ridge northeast of Valmont is a modified remnant of the moraine, and in places has thick deposits of sand and gravel in steeply dipping ridges. The capped moraine extends to slightly inclined ridges of the same material. The glacial origin of these deposits has been the basis of this hypothesis requires an explanation for the total disappearance of the stream that may have formed the delta. It seems more likely that the deposits formed as a spit on the west end of a truncated moraine sub-

Truncation of the St. Narcisse moraine was effected by early meanders of the channels of the St. Maurice River when it existed as a major distributary of the Saguenay River. The meandering sediment accumulated as a delta that became prominent in this area, when marine or estuarine levels had dropped to about 400 feet above present level. The meandering process continued until the river approached present levels (the "Three Rivers Delta" advanced by accretion towards the present position of the St. Lawrence. New fans developed and southward accretion continued. The volume of material decreased in volume as glacial activity came to an end and as the channel of the St. Maurice was incised into earlier parts of the delta. The St. Maurice River was incised into the delta of the St. Maurice and St. Lawrence Rivers; the three channels of the St. Maurice at this point gave rise to the name Three Rivers (Trois Rivières). The Three Rivers Delta is composed of silty sand and sands, but in places there are thick deposits of sand interbedded alternately with silty sands in nearly horizontal thin beds. Presumably the silty sands were deposited in the lower reaches of the delta, the bottom-sets of the same delta are the horizontally stratified, coarse and fine silts and sandy silts of map-unit 6a. These constitute a facies change from the silty sands to the silty sands and silts. The major mass of the delta and they are shown separately on the map for map-unit 6b. Silty laminated clays may be included in map-unit 6 in other parts of the area.

Some chaelcs cut in the top of the delta by distributaries have filled with peat (9). On the basis of pollen spectra from the channel bogs, Terasmae (personal communication, 1959) has classified some of the bogs of the Three Rivers area as to relative age. The oldest bog in the area is the Estrie Bog, which is the oldest of the map-area bogs, followed in order of decreasing age by bogs in the vicinities of St-Boniface-de-Shawinigan, St-Etienne-des-Grès, and Marchand Station. The last three are on progressively lower stages of the "Three Rivers Delta". Pollen diagrams of these four bogs, collectively, are similar to that of the Ste. Adelphe bog in the Grouindes area (Map 41-1959) whose minimum age is 8,480±80, C₁₄ years (GRO-1922).

At the same time as the formation of the delta, stream currents were redepositing glacial and marine sands in beach deposits, terraces, and bars (7) that are more or less parallel with the present course of the St. Lawrence River.

Within recent time the St. Lawrence River has produced broad, flat terraces, limited by river-trimmed scarps, in which are deposited alluvial sands and silty sands (8) containing some disseminated organic matter and minor thin deposits of peat. Some parts of these terraces are subject to flooding, often the result of damming of tributaries by break-up ice carried by the St. Lawrence River.

The Pleistocene stratigraphy of the Three Rivers area is similar to that of the adjoining Bécancour map-area discussed in Paper 59-8, Geol. Surv., Canada, Map 42-1959.

¹ Preston, R.S., Person, E., and Deevey, E.S.: Yale Natural Radio-carbon Measurements II; Science, Vol. 122, No. 3177, pp. 954-960, Nov. 18, 1955

² Osborne, F.F.: Parc des Laurentides Ice Cap and the Quebec Sea; *Naturaliste Canadien*, 78, 221-251, p. 225, (1951)

MAP 54-1959

TROIS-RIVIÈRES
QUEBEC

SHEET 317