

SURFICIAL AND GLACIAL MAPPING OF THE
BUCHANS MAP AREA (12A/15), NEWFOUNDLAND

by

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INTRODUCTION

Mapping was conducted in the Buchans map area during 1982 as a continuation of the Surficial and Glacial Mapping Program in central Newfoundland (Sparkes, 1982). The aim of the project is to provide information on the nature and distribution of surficial landforms and the glacial dispersal of rock materials as an aid to mineral exploration. The Buchans map area has limited road access, relatively few glacial till exposures, and only scattered unweathered bedrock exposures exhibiting glacial flow indicators.

FIELD PROGRAM

Mapping was started late in June and continued until September. Information was obtained along existing roads, lake shorelines, and streams as well as from hand-dug or backhoe-dug pits. Forty-three till fabrics were obtained, 200 sites were noted, and approximately 300 samples of the till were collected for particle size analyses and geochemistry. A representative pebble (+8 mm to -16 mm) fraction was obtained at each site to determine the lithologic composition of the sampled till(s). The lithologic study also included silt/clay coating, weathering, staining, sphericity, fracturing, mineralogy and texture for each lithology present. Additional information was obtained from the 330 overburden drill logs made available from Asarco drill records at Buchans.

PHYSIOGRAPHY

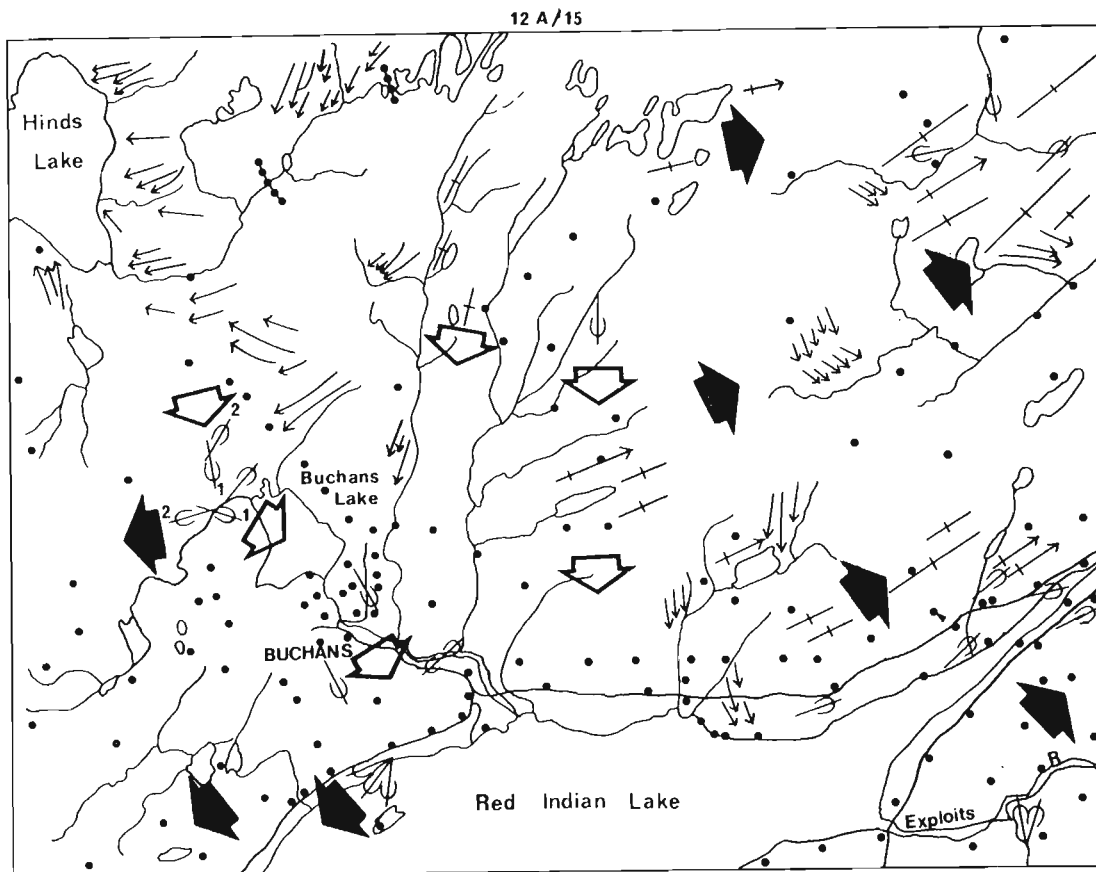
The terrain in the north-central part of the area is characterized by bog

underlain by thin till or rock. This part of the area also has many elongate till ridges (*i.e.* drumlinoid). In the northwestern part of the area, where the relief is much higher, there is considerably less bog cover, and a thicker cover of till. Abundant glacial melt-water channels and several large moraines are also located there. The area southwest of Buchans is characterized by moderate to low relief, scattered bogs and many isolated till hummocks. In the shoreline areas of Red Indian Lake, the till cover is more extensive and generally thicker than in the area of the till hummocks.

GLACIAL FLOW FEATURES

Due to an extensive overburden mantle, few striae were observed within the map area (Figure 1). Striae in the Millertown area (southeast corner of map) record an ice flow to the northeast (030) approximately parallel to Red Indian Lake. In the area of the town of Buchans, the striae record a flow to the southeast (160); in the area west of Buchans Lake, flows to the northeast, southeast and west have been recorded. On the shoreline of Red Indian Lake, south of Buchans, striae record a flow to the south and a possibly later flow to the southwest (220-250).

Geomorphic features, such as crag and tail hills and drumlinoid forms north of Red Indian Lake, in the eastern part of the map area, are indicative of ice flow to the northeast. Elsewhere in the map area, there are few apparent geomorphic landform features (other than striae) to indicate the latest direction of glacial transport.



LEGEND

- Major transverse moraine
- Drumlinoid features.
- Crag and tail hills.
- Glacial meltwater channels
- Glacial striae (direction known)
- Glacial striae (direction unknown)
- Striae - 1 oldest.
- Sample location
- Early glacial flow.
- Later glacial flows

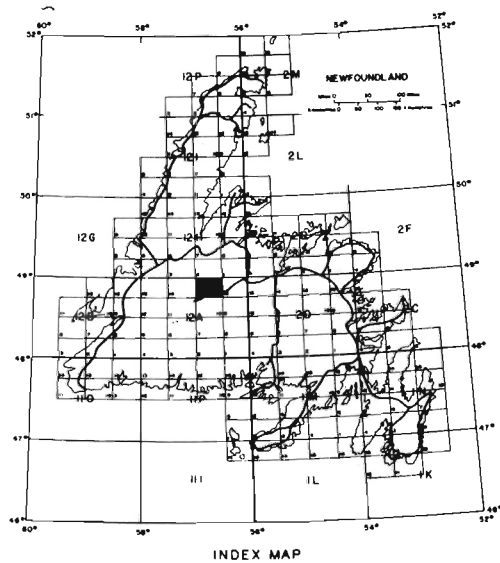


FIG. 1

STRATIGRAPHY AND TILL FABRICS

There are two distinct tills within the map area. The stratigraphically lowest till observed is gray, with a silty matrix and usually lacking in fissility; it is commonly of local provenance. The fabrics in this lower unit are inconclusive. This unit is everywhere overlain (where observed) by a red till which generally has a more sandy matrix and contains clasts of more distant provenance. The measured till fabrics in the latter are extremely varied, possibly because of post-depositional reorientation of the clasts resulting in a fabric parallel to the slope at the site.

In the open pit of the Oriental Mine, the gray till contains ore float and sits atop mineralized bedrock. The overlying red till (mainly granitic) is overlain by a third unit, possibly an ablation till. This upper till unit is thin (1-2 m), distinctively lacking in fines or striated stones, and generally composed of clasts of distal provenance (*i.e.* granitic clasts). At the eastern edge of the pit, this upper unit is separated from the red till by a thin wedge of sand which is very compact and oxidized.

At the sandfill pit northeast of Buchans for the Asarco mining operation, 1-2 m of moderately compact, stony till overlies up to 50 m of sand (Asarco drill records). This till is similar to the red till unit in the Oriental pit and is composed mostly of granitic clasts probably derived from sources in the north and northwest.

GLACIAL INTERPRETATION

The Buchans map area was affected by three distinct pulses of ice movement. A flow to the southeast was possibly the earliest event; it probably emplaced the gray till unit. This was followed by ice

flows to the northeast and southwest, possibly after or during a period of glacial retreat. These two flows may not have been contemporaneous, as indicated by the presence of considerable sand beneath the red till unit, and may indicate different source areas. The distribution patterns of 'Buchans type' ore float and the orientation of geochemical dispersion trains from Buchans (James and Perkins, 1981) appear to confirm the three directions of ice movement. We hope that the textural, geochemical and lithological analysis of the till samples from the area will provide better understanding of the glacial events.

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