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SURFICIAL AND GLACIAL MAPPING - PETER SNOUT (11P/13) AND KING GEORGE IV LAKE (12A/4) MAP AREAS, SOUTHWESTERN NEWFOUNDLAND

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ABSTRACT

Mapping was conducted during 1985 in the King George IV Lake (12A/4) and Peter Snout (11P/13) map areas of southwestern Newfoundland. A till sampling program was completed on a 2 x 2 km grid spacing. Samples were collected from the C soil horizon from lodgement and meltout till facies. Pebble lithologies were determined and referenced to bedrock map units. These data will be used to determine till geology and to aid in the interpretation of ice flow directions and transport distances. Grain size analyses will be used to aid in the interpretation of the till geochemistry and to provide information on textural variations between till types and landforms. A ground verified landform classification map was completed using 1:50,000 black and white airphotos. Ice flow over both map areas is predominantly to the south, although a westward flow of ice in the northwest corner of the King George IV Lake map area may represent a response to the east-west structural grain and regional topographic slope.

INTRODUCTION

During the 1985 field season, Quaternary mapping was conducted in the Peter Snout (11P/13) and King George IV Lake (12A/4) map areas (Figure 1). This project is a continuation of the provincially funded Surficial and Glacial Mapping Program, designed to provide information on glacial geology and till geochemistry as an aid to exploration in areas of mineral potential and/or exploration activity. The area has limited access, except for the Burgeo road (Route 480) which crosses the eastern part of both map areas. Field work started in early June and continued until late August.

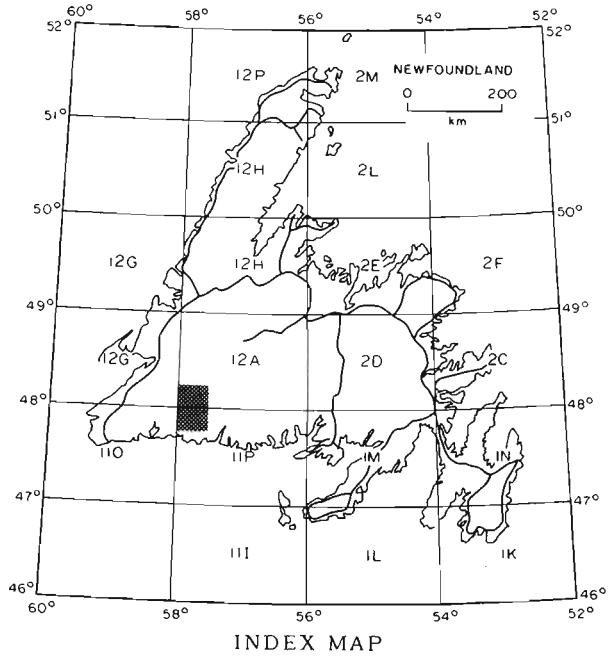

Figure 1: *Location of study area.*

The only published surficial geology map for the Peter Snout area (Grant, 1974) outlines the major depositional features (drumlins, ramps, etc.) and indicates a ubiquitous southward ice flow. There is no previously published map or report on the surficial geology of the King George IV map area.

PHYSIOGRAPHY

King George IV Lake

Most of the King George IV Lake map area is a barren, hummocky upland with an elevation of 350 to 400 m. High hills stand above this level to a maximum height of 552 m. Three major river systems, the Lloyds, Victoria, and Burnt Pond rivers, drain toward the northwest. The topographic morphology and main drainage pattern predominantly reflect the bedrock structures, although many of the smaller lakes and ponds show no discernible geological control. Some ponds, particularly in the area east of Rocky Ridge Pond (Figure 2), seem to reflect southward ice flow.

Peter Snout

The Peter Snout map area is characterized by large areas of barren plateau with an average elevation of 350 m. Numerous peaks over 500 m constitute part of the Blue Hills of Couteau in the northwestern part of the map area. Drainage is toward the south via the Grandy Brook system, and an unnamed brook which flows into Connaire Bay east of Burgeo. This drainage pattern is transverse to the regional geologic structure and may be controlled by cross-faults.

GEOLOGICAL SETTING

The King George IV Lake (12A/4) and Peter Snout (11P/13) map areas lie within the southern end of the Paleozoic Central Mobile Belt (Kean, 1983). Both areas contain elements of the Dunnage Zone, and the Peter Snout area also

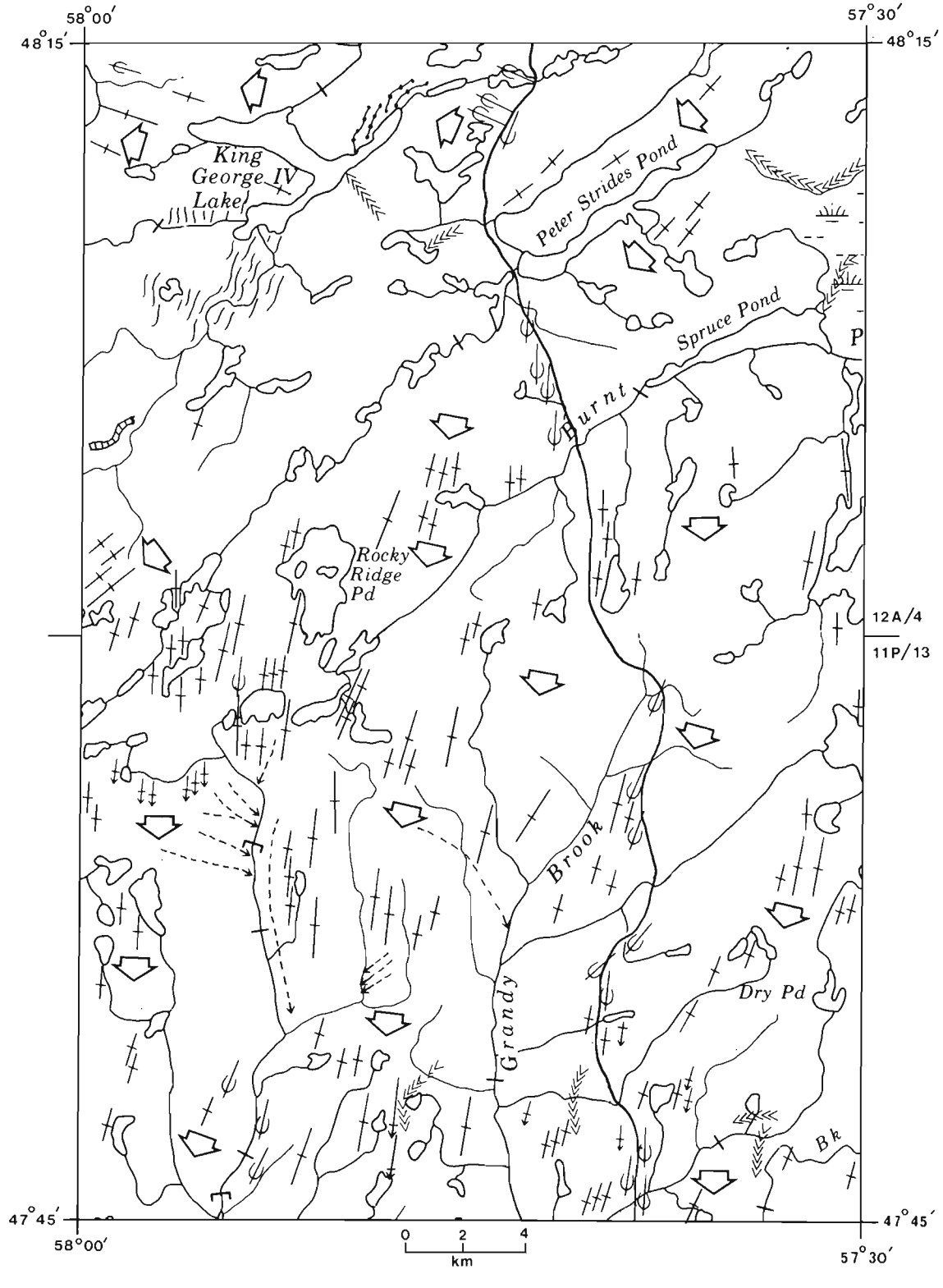

Figure 2: *Regional ice flow features in the Peter Snout (11P/13) and King George IV Lake (12A/4) map areas.*

SYMBOLS

Esker, crevasse filling.

Abandoned channel of former meltwater stream.

Direction of regional ice flows.

Longitudinal ice-flow features

Drumlin, drumlinoid, fluting.

Crag-and-tail hill.

Till ramp.

Striation.

Transverse ice-flow features

Crestline of prominent moraine.

Ribbed moraine, DeGeer moraine, minor moraine.

has elements of the Gander Zone. The oldest units consist of ophiolitic rocks overlain by an island-arc sequence. These are unconformably overlain by fluviatile sedimentary and subaerial volcanic rocks that have a northeast-southwest trend in the northern area and an east-west trend in the south. Intrusive rocks range from Silurian to Carboniferous in age. The older intrusives are concordant with the structural trends, and the younger ones cross-cut them. The faults trend northeast-southwest in the north and east-west in the south. The rocks vary from undeformed to polydeformed and the grade of metamorphism varies from subgreenschist facies to amphibolite facies (Kean, 1983; O'Brien, 1983).

FIELD PROGRAM

Six hundred and six samples were collected from shallow (50 to 75 cm) hand-dug pits, on an approximate 2 x 2 km grid spacing. Ninty percent of these samples were taken from the C soil horizon, and the remainder were from either the B horizon or the B-C transitional zone. Three hundred and six samples were taken from the lodgement till facies, two hundred and forty-six were taken from the sub-glacial meltout facies, and the remainder were taken from esker or glaciofluvial deposits. A representative pebble fraction (16 to 32 mm) was obtained at approximately 400 sites, and the pebble lithologies were determined and referenced to a bedrock map unit where possible. A landform classification map has been completed for both map areas using 1:50,000 scale black and white airphotos. This landform interpretation was extensively ground verified during the course of field work and was used for determining ice flow directions, possible ice margins, and the distribution of surficial sediments.

DATA ANALYSES

The silt to clay size fraction (minus 64 micron) of all till samples will be analysed for Cu, Pb, Zn, Co, Ni, Ag, Mn, Fe, Mo, U, W and Au. The pebble lithology data will be used to produce a map of till geology, and used as an aid in the interpretation of ice flow directions, transport distance, and the pattern of glacial dispersal as determined from till geochemistry. Grain size analyses of the till matrix, employing a wet-sieving technique and a fine particle analyser (Coulter Counter), will be conducted to determine textural differences that occur both regionally and locally. This data will also be used as a variable to interpret the till geochemistry data.

GLACIAL FLOW

Ice flow in the Peter Snout map area (Figure 2) was generally to the south (180 to 210). Numerous drumlins, till ramps, striae, and crag and tail hills, scattered across the whole map area, are good indicators of this ice movement. Ice flow appears to have been controlled by the underlying bedrock topography, e.g., flow generally parallels Grandy's Brook. The orientation of eskers indicates that retreat of the ice was parallel to ice flow. Meltwater channels appear to indicate that glaciers retreated into some of the highland areas in the north-central part of the map area.

In the King George IV Lake map area, ice flow is more varied (Figure 2), having moved: (a) to the southwest, parallel to Peter Strides Pond in the northeast corner of the map area, (b) south in the central part of the area between Spruce Pond and Rocky Ridge Pond, and (c) west in the northwest corner near King George IV Lake. These divergent flows may be attributed to relatively thin ice conditions, which resulted in ice flow being controlled by topography and the direction of regional slope. The north/south orientation of possible recessional moraines to the east and south of King George IV Lake indicates that retreat of ice in this area was eastward. The highlands in the central and north-central part of the map area were the last areas to be deglaciated.

DISCUSSION

The primary objective of surficial mapping is to provide information on the nature, distribution, and texture of glacial sediments. To properly interpret geochemical anomalies, resulting from either detailed or regional soil geochemistry, it is necessary to recognize and understand the factors that have influenced them. The effect upon geochemical values by variations in the till matrix, till geology, and the type of till being sampled, e.g., lodgement, meltout, should be considered. The data generated by this project will be used to assess the importance of these variables and to establish some guidelines for the interpretation of soil and till anomalies, particularly as it pertains to gold exploration in this area of southwestern Newfoundland.

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