LEGEND

SURFICIAL DEPOSITS

QUATERNARY

HOLOCENE - LATE WISCONSINAN

MA / OW — **MARINE - ALLUVIAL AND OUTWASH DEPOSITS (MA ,OW):** MA; silty clay, sand and gravel; forms estuarine deposits, alluvial floodplains and alluvial channel deposits. OW; silt, sand and gravel; massive to horizontally bedded; channel sequences common; forms flat plains and terraced deposits.

IC — **ICE-CONTACT DEPOSITS (IC):** silty sand, gravel and boulders, abrupt grain size transition from shallow- to steeply-dipping beds; faulting is common; clasts reflect provenance of surrounding till; may be interstratified with till; forms kames, kame terraces, ice contact deltas and eskers; thickness 1-15 m.

LATE - MIDDLE WISCONSINAN

GSRT / MSRT — **SHELBURNE RIVER TILL*:** Occurs as granite (GSRT) and greywacke/slate (MSRT)+ lithological facies; loose, texture varies from a sandy matrix-rich to a stony, clast supported till; colour varies from white (10YR8/1)** to very pale brown (10YR7/3); nonweathered appearance; occurs as hummocks, ridges and a rolling ground moraine; deposits are crudely stratified; spatially associated with kames and eskers; exhibits extensive onlap of clasts down-ice onto adjacent bedrock units; renewal distances*** vary from 0.1 km to >5 km; matrix may be derived from up-ice lithologies and may not reflect the composition of the pebble fraction; thickness varies from 1-3 m in areas of ground moraine to 10-15 m on hummocks and ridges; the major transport direction is toward the southeast with lesser transport toward the south and west.

BEAVER RIVER TILL: Divided into ablation, ground moraine and drumlin-derived units.

GTC / GWC / SLC — **Ablation moraine:** May occur as granite (GTC), greywacke (GWC) and/or slate (SLC) lithological facies; loose, matrix supported till containing intrabeds of silt, sand and gravel; colour varies from very pale brown (10YR7/4) to yellowish-brown (10YR5/4); forms hummocks and ridges with associated ice-contact deposits; locally derived or may exhibit extensive onlap of clasts and matrix down-ice onto adjacent rock types; renewal distances vary from 0.1 to 6 km; thickness 1-10 m; glacial transport is toward the southeast and south.

GTB / GWB-SLB — **Ground moraine:** Subdivided into granite (GTB) and greywacke-slate (GWB-SLB) lithological facies; structureless stony matrix, though sandier varieties with minor washed zones around boulders are common; colour varies from light yellowish-brown (10YR6/4) to dark yellowish-brown (10YR4/4) in the granitic facies, light olive-brown (2.5Y5/4) in the greywacke and slate facies; generally forms a featureless ground moraine; exhibits rapid lithological change down-ice of bedrock contacts, >90% of clasts are transported less than 1 km; renewal distances vary from tens to hundreds of metres; thickness 1-6 m; glacial transport directions are difficult to determine due to short renewal distance, it is southeastward across most of the South Mountain Batholith (SMB); however, northward, northwestward and westward dispersal was mapped in the northern and western margins of the SMB.

GTB (D) — **Drumlin-derived moraine (GTB(D)):** Loose, medium- to coarse-grained, sandy matrix, moderately stony, minor washing; colour is brown (10YR5/3) to dark yellowish-brown (10YR4/4); till mantles and forms a ground moraine between drumlins; nongranitic lithologies are incorporated from straigraphically older tills; matrix composition is in part dependent on composition of reworked older till; thickness 1-4 m; actual glacial transport directions are the same as those of the ground moraine unit; however, a strong southeast transport was inherited from older, reworked southeast-transported till(s).

LT — **LAWRENCETOWN TILL (LT):** Muddy to sandy till, moderately compact, jointed, greenish mottling in the weathered zone; colour varies from dark reddish-brown (2.5YR3/4) to strong brown (7.5YR4/6); occurs as a ground moraine and drumlins; clast lithologies vary from 10-90% local bedrock to 10-90% non-granitic clasts derived from as far as 90 km; distal sources are the metasedimentery/volcanic mass complex of the Cobequid Highlands, Meguma Group, metasedimentary and volcanic rocks of the White Rock, New Canaan, Kentville and Torbrook formations, and North Mountain basalt; renewal distances vary from hundreds of metres to tens of kilometres; thickness is 1-2 m as a ground moraine and 4-30 m as drumlins; dispersal direction varies from southward to southeastward.

EARLY WISCONSINAN (?)

HT — **HARTLEN TILL (HT)*:** Occurs as granite (GTA) and slate (STA) lithological facies; sandy, compact till, clast-rich, fissile; colour varies from strong brown (7.5YR4/6) in granite facies to olive (5Y5/3) in slate facies; generally forms or cores drumlins; clast lithology dominated by local bedrock lithologies; 10-35% of clasts transported 20-25 km; thickness 1-10 m; glacial transport is toward the southeast with lesser transport toward the east-southeast(?).

PRE-WISCONSINAN

R — **RESIDUUM (R)*:** Chemically-weathered bedrock; commonly develops a soil-like consistency due to *in situ* weathering followed by glacial mixing; may retain hypidiomorphic granular texture of parent granite, preservation of K-feldspar megacrysts and hydrothermally altered fracture zones; restricted to the topographically highest regions of the Southern Uplands; thickness varies from a veneer to >3 m.

D — **BEDROCK (D)*:** Glacially-scoured bedrock; areas of discontinuous till veneer and B-horizon soil developed to bedrock; bedrock structure and large scale features of glacial erosion are easily discernible on aerial photographs.

* Indicates units not mapped on this map sheet.
** All colours from Munsell Soil Colour Chart.
*** Renewal distance is the distance required by a given rock type (measured from the proximal contact of the up-ice lithology) to increase its proportion in till from 0% to 50% (Peltoniemi, 1985).

TILL CLAST LEGEND

1 — **SCRAG LAKE GRANODIORITE/ MONZOGRANITE:** light- to medium-grey, medium- to coarse-grained, may be megacrystic; biotite (9 - 20%), muscovite (trace - 1%); may contain metasedimentary xenoliths.

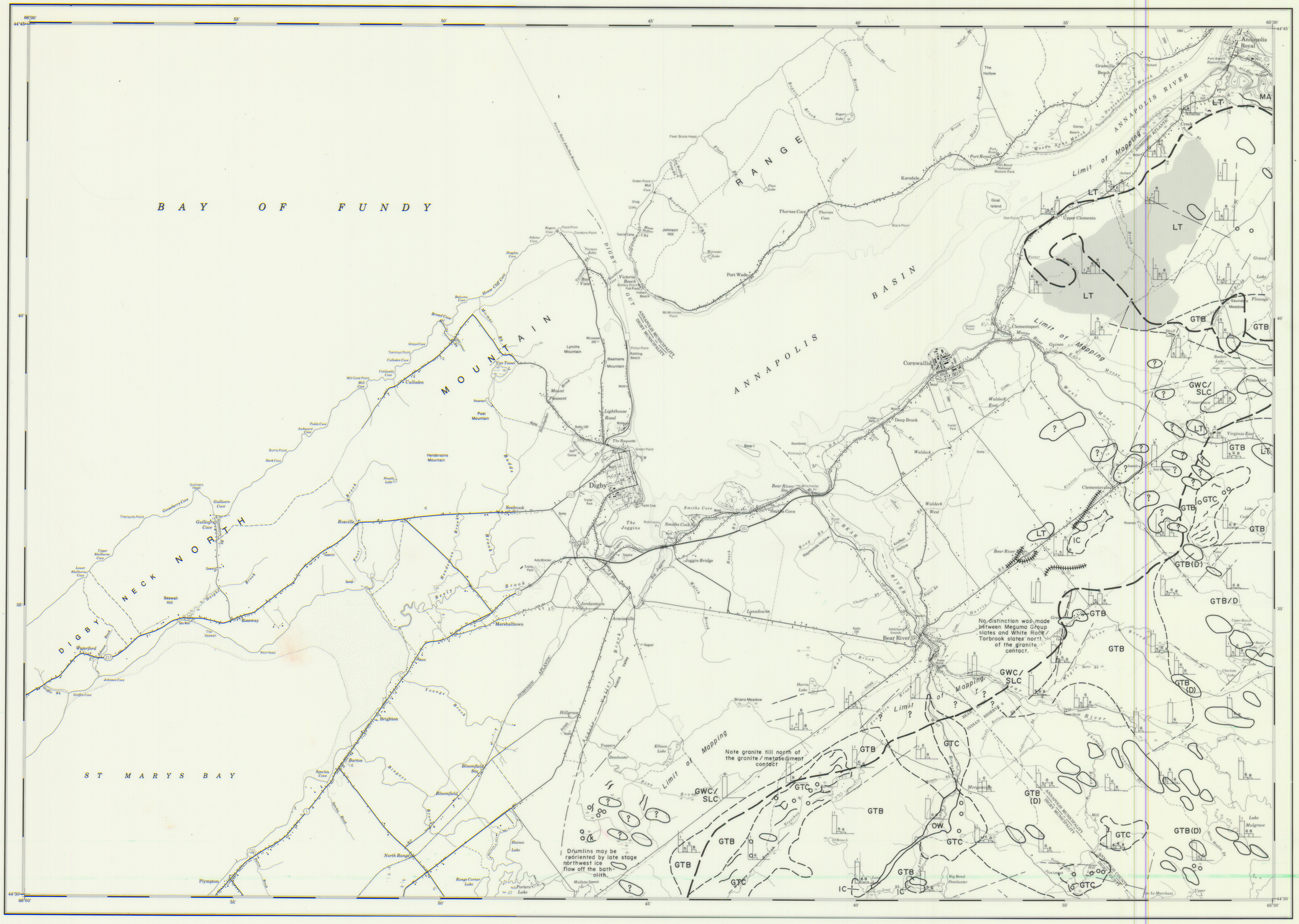
5 — **LEUCOGRANITE:** white, grey to buff, fine- to medium grained; biotite (2-8%), muscovite (1-5%).

6 — **MEGUMA GROUP, WHITE ROCK AND TORBROOK FORMATION:** variably coloured slate.

7 — **FORIGN:** quartzites (red, grey, light green), fossiliferous sandstone, basalt, rhyolite, tuff, mafic porphyry.

Rock units are in part simplified after Ham, 1989. Numbers in boxes correspond with numbers on bars of the till clast histograms and also to the rock units on the simplified bedrock geology map (Fig. 1) after Ham et al., 1990.

This map is based on information taken from the National Topographic System map sheet number 21 A/12 © 1993. Her Majesty the Queen in Right of Canada with permission of Energy, Mines and Resources Canada.



SYMBOLS

- Surficial contact (abrupt, gradational, assumed)
- Bedrock contact from Ham, 1989
- Drumlin
- Moraine (minor)
- Ablation hummock
- Kettle
- Lineaments (based on airphotograph interpretation)
- Meltwater channel, flow direction (known, unknown)
- Till veneer; till thickness generally <1 m (based on field mapping and/or airphotograph interpretation)
- Composition and/or genesis of material uncertain or unknown

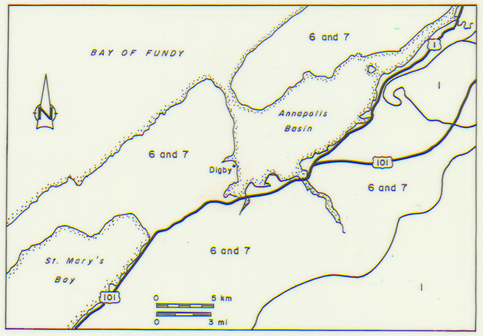


Fig. 1 Simplified bedrock geology of the Digby map sheet (NTS 21 A/12) modified after Ham (1990). Bedrock units are keyed to the till clast legend and histograms on the glacial map.

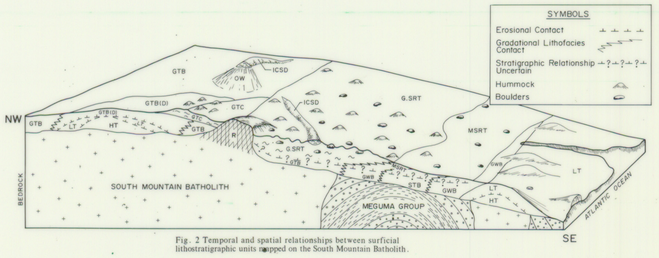
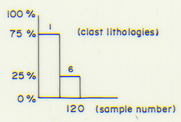
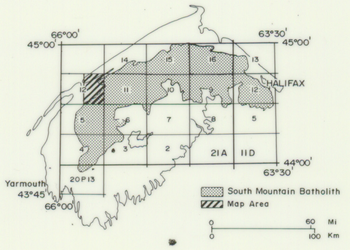
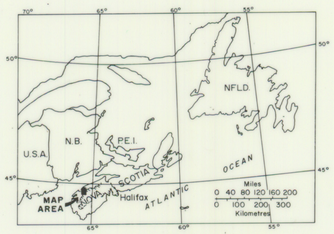


Fig. 2 Temporal and spatial relationships between surficial lithostratigraphic units mapped on the South Mountain Batholith.



This illustration shows the system of lithological representation used on the map. Each bar represents a clast type. The bar height denotes the percentage of that clast type in the pebble fraction of the till. Clast lithologies on histograms are keyed to the till clast legend. Axis of histogram defines sample location.





Location Map

REFERENCES

Ham, L. J., Corey, M. C., Horne, R. J. and MacDonald, M. A. 1990: Lithogeochemistry of the Western Portion of the South Mountain Batholith, Nova Scotia; Nova Scotia Department of Mines and Energy, Open File Report 90-007, 31 p.

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Nova Scotia Department of Natural Resources
Mines and Energy Branches

OPEN FILE MAP 93-013

Glacial and Till Clast Geology of DIGBY NOVA SCOTIA

P.W. Finck, R.M. Graves and F.J. Boner

Scale 1:50,000
0 1 2 3 4
kilometres

Nova Scotia Department of Natural Resources
Honourable Don Downe, Minister

Halifax, Nova Scotia
1993

Nova Scotia Department of Natural Resources

Canada-Nova Scotia Cooperation Agreement on Mineral Development 1993