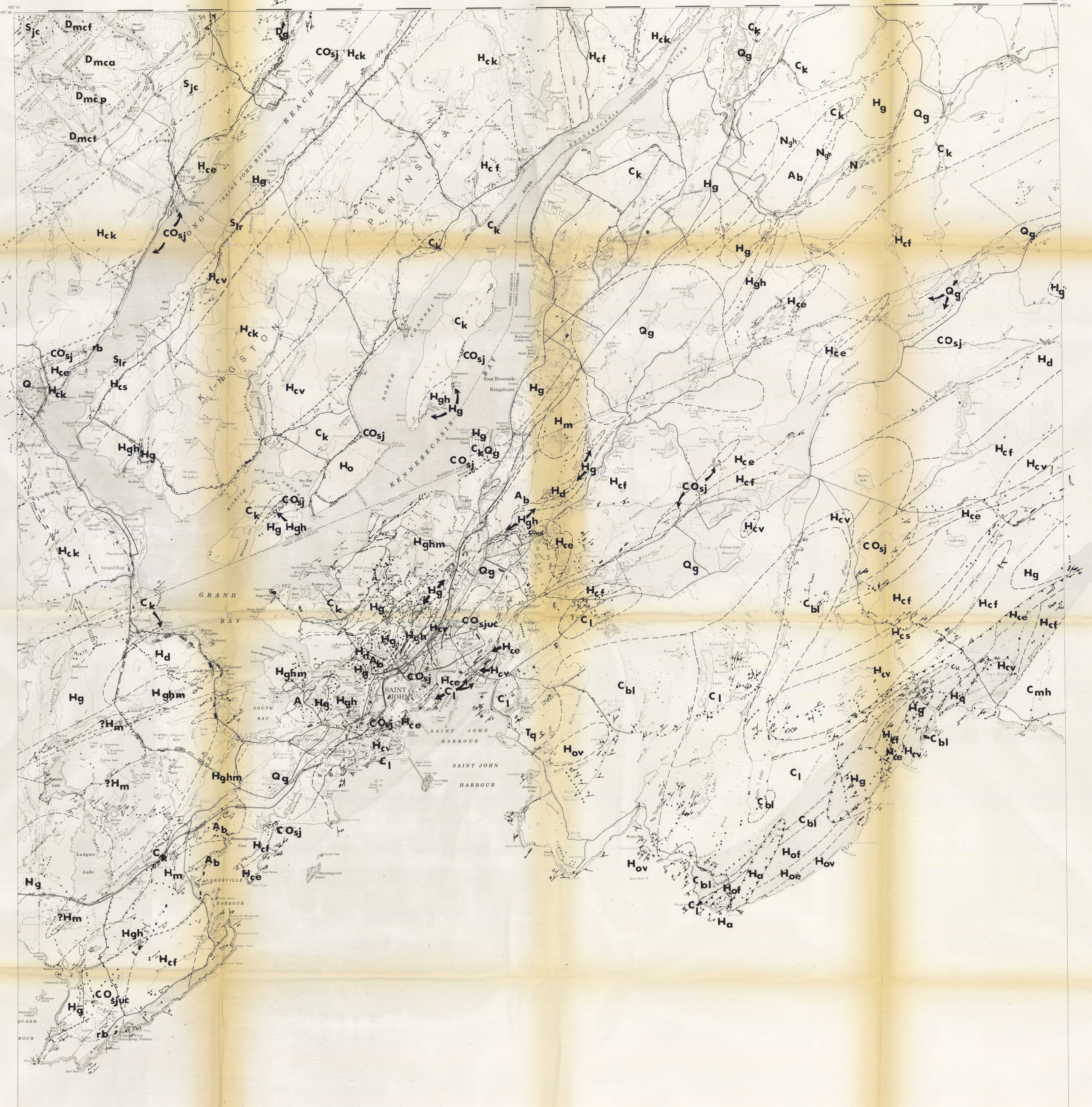
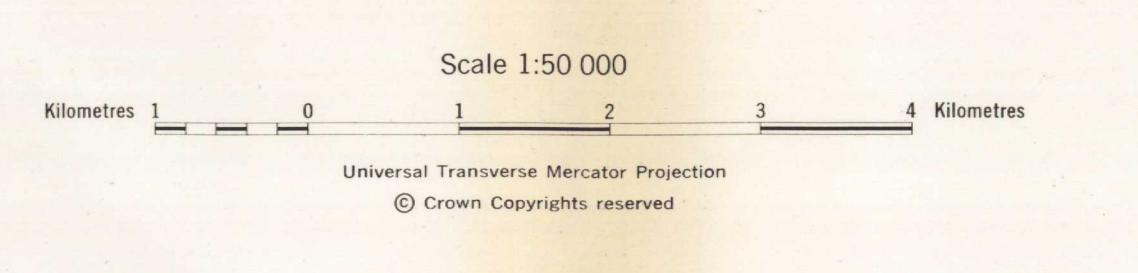


- QUATERNARY
Q1 Glacial drift, boulder till, stratified (fluviolacustrine sand and gravel)
TRIASSIC
T1 QUACO FORMATION: crumbly red to brown conglomerate, minor sandstone
CARBONIFEROUS
C1 MCCOY HEAD FORMATION: grey to reddish conglomerate, sandstone, minor shale
C2 LANCASTER FORMATION: grey lithic arenite, fossiliferous rusty siltstone, minor pebbly beds, rare tuffaceous beds
C3 BALLS LAKE FORMATION: red shale and siltstone with conglomerate and sandstone lenses
C4 KENNEBECAS FORMATION: red to brown conglomerate, (c) interbedded red sandstone and siltstone, (d) flaggy grey limestone, black siltstone
DEVONIAN
D100 MOUNT CHAMPLAIN PLUTON: (a) grey alkali granite, (f) red microgranite and felsites (p) porphyritic granite
D4 medium-grained biotite granite and granodiorite, hornblende syenodiorite, both slightly epidotized
SLURIAN OR YOUNGER
SD1 gabbro, diabase and augite porphyrite dykes
SLURIAN
S100 JONES CREEK FORMATION: grey-green to black thin-bedded shale and siltstone, hornfelsed near D100 and D200
S101 LONG REACH FORMATION: basalt flows and dykes, commonly feldspathic; minor interbedded siltstone and limy shale
CAMBRIAN AND ORDOVICIAN
CO1 SAINT JOHN GROUP: (rb) Ratcliffe Brook Formation, red sandstone, pebble conglomerate, white to grey arenites; (gf) Glen Falls Formation, white quartz pebble conglomerate; (uc) Upper Cambrian Hartford Brook, Hastings Cove, Agnostus Cove and related formations, grey to grey-green siltstone, sandstone and minor shale; (sa) black shale and siltstone, mainly of Ordovician age
EOCAMBRIAN
H100 pink to purple feldspathic sandstone, volcanogenic conglomerate, blood-red tuff
HADRYNIAN
H10 COLDOBROOK GROUP: (f) mainly tuff, agglomerate, (la) mainly salic and mafic flows; (l) mainly banded siltstone and chert
H101 KINGSTON COMPLEX: dyke complex of rhyolite, diorite, and rare altered basalt dykes; rare fault slices of H101 and H102
GOLDEN GROVE SUITE (H101, H102, H103)
H101 hornblende granodiorite, hornblende-biotite granite, epidote alkalis; all phases locally megacrystic
H102 diorite, minor granodiorite and gabbro, abundant basaltic dykes and fragments
H103 gabbro, hornblende, perthite; all strongly altered and metasomatized
HELIKIAN
H104 MARTINON FORMATION: purplish-black, graded sandstone and siltstone, commonly hornfelsed; (c) carbonate conglomerate or breccia
H105 GREEN HEAD GROUP: (m) grey blue to buff marbles; (f) white to lilac quartzite; (p) siliceous black siltstone and pelitic schist
APHEBIAN
A10 BROOKVILLE GNEISS: fine-banded quartz-plagioclase-hornblende-biotite gneiss, locally chloritized, and minor porphyroblastic biotite granite gneiss
S106 STROMATOLITE LOCALITY



GEOLOGY OF SAINT JOHN REGION, NEW BRUNSWICK



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Geology by K.L. Currie, 1980, 1982, 1983, R.D. Nance 1980, 1982, G.E. Pajeri, Jr., 1985, and R.K. Pickersill 1980. Geologic compilation and interpretation by K.L. Currie.

DESCRIPTIVE NOTES

After 150 years of investigation the geology of the Saint John region remains poorly understood, despite good natural exposures along the sea coast and an increasing number of artificial exposures created by construction.

The rocks of the Saint John Group fall into five major divisions, namely the Green Head Group, a platform carbonate-quartzite-shale assemblage of probable Helikian age, probably deposited on older basement; the Golden Grove suite of igneous and metamorphic rocks, the Coldbrook Group and related Hadrynian volcanogenic assemblages, the Saint John Group, a Cambro-Ordovician sedimentary succession, and an extensive, mainly clastic Carboniferous succession.

The Brookville gneiss (unit H101) comprises a mesocratic quartz-plagioclase-hornblende ± biotite gneiss locally containing schlieren, patches and neoblastic enclaves of biotite granite gneiss and muscovite tourmaline pegmatite.

The Green Head Group (unit H105) comprises major grey to buff marble, white to lilac quartzite, and minor black siltstone and pelitic schist.

The Martinon Formation (unit H104) includes grey to purple-brown siltstone, sandstone and pebble sandstone with a distinctive basal marble conglomerate or breccia, which contains fragments of chert, siltstone and marble.

The Golden Grove suite (units H101, H102 and H103) comprises many small plutons which together form a central crystalline core to the map area.

According to convention grown up over the past 50 years, the Coldbrook Group (unit H100) comprises not only late Precambrian volcanogenic sequences in the region of Saint John, but also presumed equivalent hypabyssal rocks.

New roadcuts from Saint John to Westfield provide virtually complete exposure across the Kingston complex (unit H101), which consists of essentially vertical salic and mafic dykes 5 to 50 m in width alternating in fairly regular fashion.

Volcanogenic rocks of the Coldbrook Group (units H100, H101 and H102) consist of mafic to salic flows (H100), extensive tuff and fragmental units (H101) and a significant amount of intercalated sedimentary rocks (H102).

The Saint John Group and older rocks contain a distinctive suite of fine-grained, relatively fresh basaltic dykes (unit SD1), which generally trend north-northeast parallel to tectonic grain.

characteristic hackly, "chipped" weathered surface. Red crystal tuffs, agglomerate and greenish lapilli tuffs with lapilli up to 5 cm, occur commonly but cannot be separated mapwise at this scale.

Rose to brown, highly feldspathic cross-bedded coarse sandstone, blood-red, virtually massive tuff up to 3 m thick, and pebble to cobble conglomerates containing abundant volcanic clasts and rare quartz clasts.

The Long Reach Formation (unit S101) forms a narrow belt of feldspathic basaltic lavas, locally amygdaloidal. Minor intercalated grey-green feldspathic arenite and limy shale contain fossils including a Landsvey to Wenlock age.

The Jones Creek Formation (unit S100), which outcrops only northwest of the Bellefleur Fault, consists of grey-green siltstone and pelitic siltstone which yields an abundant fauna of Pristionella.

The Mount Champlain pluton (unit D100) forms a mass of batholithic dimensions stretching off the map area to the west. The central parts of the pluton, as on Mount Champlain itself, consist of pale grey-green igneous granite with distinctive blue alkaline amphibole.

The older granitic rocks (unit D100) consist of medium-grained hornblende-biotite granite, granodiorite and syenodiorite, all with saucer-weathered feldspar, and minor fine epidote veining.

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Following tradition, the Carboniferous section is divided into the Kennebecas Formation to the northwest, and other units to the southeast.

The Carboniferous section along the Bay of Fundy falls into a grey, fossiliferous lithic arenite division (Lancaster Formation) and a red siltstone-shale division with conglomerate lenses (Balls Lake Formation).

The McCoy Head Formation, separated from outcrop of the Lancaster and Balls Lake Formations by a major fault along Emerson Creek, appears to rest on Lancaster-like lithic arenite, and consists of upward-trending cycles 5-10 m thick grading from brownish pebble conglomerate, with limestone cobbles bearing a Windsor fauna, through cross-bedded sandstone to red siltstone.

Following Alcock (1938), an area of coarse, poorly indurated, unclaved conglomerate and sandstone on the east side of Saint John harbour is here mapped as correlative to the Triassic Quaco Formation.

The map area falls into three structural zones. The northwestern zone exhibits a thick Silurian sedimentary section and extensive Devonian magmatism.

The central zone has been polydeformed (Wardle and O'Brien, 1975, Currie et al., 1981; Nance, 1982). Structures of Precambrian age have been generally obscured by subsequent deformation, possibly during the Taconic and Acadian orogenies.

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