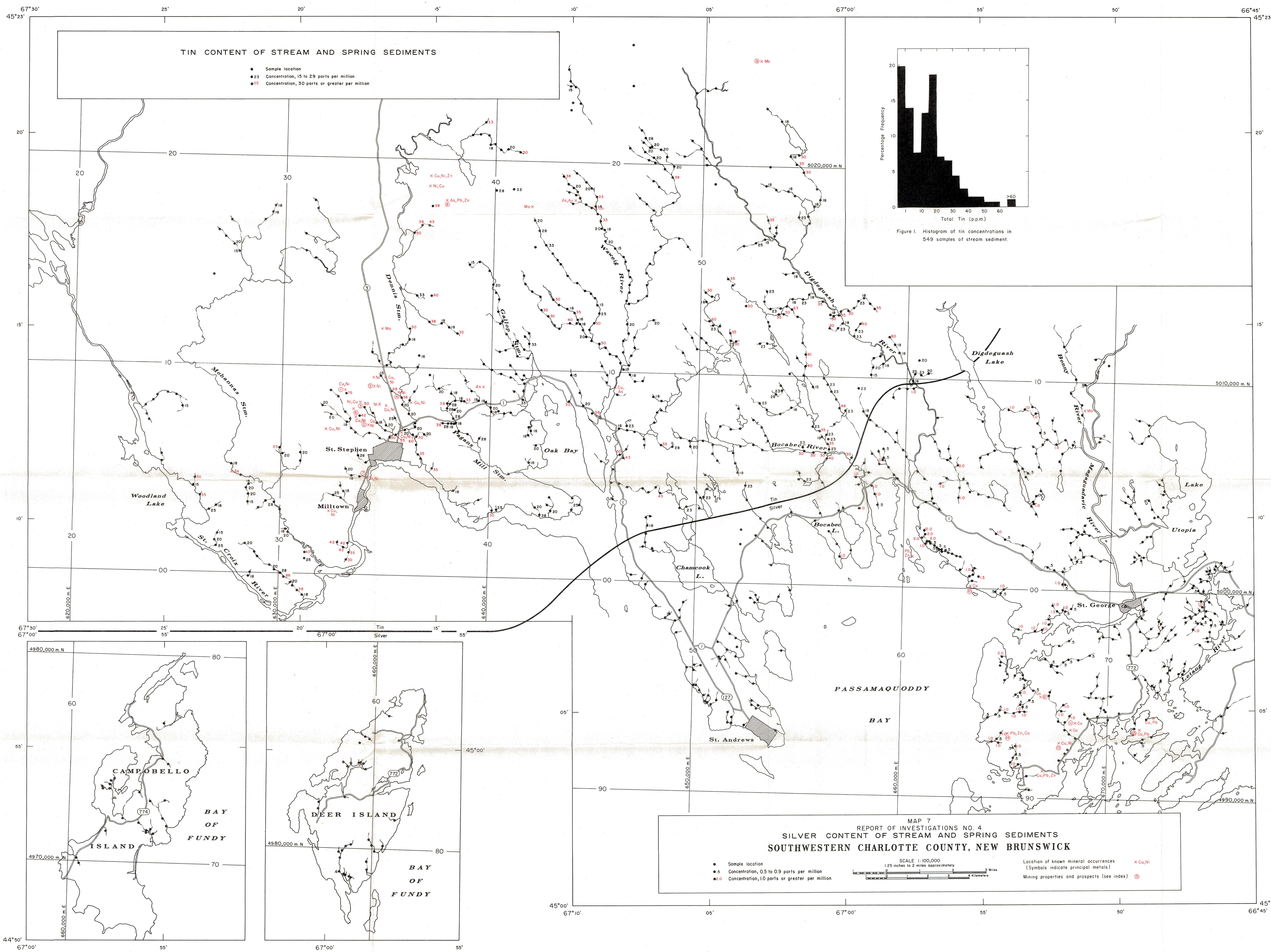


Figure 1. Histogram of tin concentrations in 549 samples of stream sediment.

NEW BRUNSWICK
MINES DIVISION
DEPARTMENT OF NATURAL RESOURCES

DESCRIPTIVE NOTES

Geological

Almost all of the map-area is underlain by Palaeozoic rocks that range in age from Early Ordovician to Late Devonian. Volcanic rocks in the extreme southeastern part of the map-area are tentatively correlated with Coldbrook Group rocks of probable Proterozoic age. The northwestern third of the map-area is underlain by a widespread sequence of undifferentiated Lower Palaeozoic light to dark slates, argillites and impure quartzites of the Charlotte Group.

In the Oak Bay region, the base of the Silurian is marked by a belt of conglomerate that grades upward into an assemblage of greywacke, quartzite, siltstone and argillite. Andesite, rhyolite, dacite and basalt flows, breccias and tuffs predominate in the upper part of the Silurian section between Bocabec Bay and Lake Utopia. Volcanic and sedimentary units on the Mascarene-Letite Peninsula are highly deformed and intensely sheared, in contrast to generally less deformed unmetamorphosed rocks of similar lithology in the area northwest of the Magaguadavic River.

Eastport-type sedimentary rocks of possible Lower Devonian age are intruded by rhyolite and andesite volcanic necks near Chamcook Lake. The Upper Devonian Perry Formation consists of extensive terrestrial deposits of red conglomerate and sandstone, and minor intercalated basalt flows. Conglomerates containing granitic boulders and clasts of Silurian and pre-Silurian rocks are in most cases undeformed and rest unconformably on older rocks or in fault contact with them.

Lower Palaeozoic volcanic and sedimentary units are intruded by Ordovician gabbro-norite bodies, and Middle Devonian granitic batholiths and stocks. The large St. George batholith underlies the northeastern part of the map-area and is composed mainly of granite, quartz monzonite and adamellite. Three smaller stocks of similar composition intrude the Lower Palaeozoic sedimentary rocks of the Charlotte Group. Granitic rocks immediately east of Oak Bay are intimately associated with gabbro, diorite and diabase that are similar to, but may significantly post-date the gabbro intrusives at St. Stephen. Silurian and Lower Devonian sedimentary and volcanic rocks are locally intruded by gabbro and diabase dykes, sills and stocks.

The region has been heavily glaciated. Eskers, glacial striae, and stoss and lee slopes indicate a general southeasterly direction of ice movement. Double sets of striae in the area south of St. George reflect at least two ice advances. An older set bearing 145 degrees is combined with a younger set that averages 110 degrees. Thick deposits of glacial till and fluvioglacial sands and gravels cover most of the area and have markedly altered the pre-Pleistocene drainage pattern on the lower parts of the Magaguadavic River.

The principal mineral deposits in the district are massive, vein and disseminated copper-nickel deposits associated with the gabbroic intrusions, and copper-lead-zinc disseminated and vein-type deposits in the Silurian volcanic rocks. Molybdenum, tin and gold occurrences appear to be associated with some of the granitic bodies.

Map 1 should be consulted for further details on the geology and economic geology of the district.

Geochemical

The data recorded on this map are based on the analyses of 1,056 samples of fine-grained sediment collected from the channels of rivers and streams, and from rivulets flowing from springs and seeps. Where possible the active channels were sampled, but in a few cases bank material or residual sediment of dried up streams was used. Tin has been determined in 549 samples from the northwest half of the map-area. Silver has been determined in 507 samples collected from the area to the southeast, including Deer and Campobello Islands. Sediment samples from poorly drained areas of muskeg and beaver workings contained abundant decomposed organic matter. All samples were collected during the 1966 field season. An attempt was made to maintain a uniform sample density, but this was frequently not achieved because of irregularities in the drainage network and the absence of an actively deposited silt-sized fraction in streams draining areas underlain by coarse glacial till. Streams were traversed on foot, and samples were collected, where possible, at intervals of 1,000 to 1,500 feet.

Sediment samples were air dried prior to shipment to Bondar-Clegg & Company Limited, Ottawa, Ontario for laboratory analysis. Silver was determined by atomic absorption analysis after extraction from the -80 mesh sieve fraction by hot HNO_3 - HCl digestion. Tin was colorimetrically determined following extraction by ammonium iodide fusion and an HCl leach. Values shown on this map are expressed in parts per million. The subdivisions used on the map are arbitrary, and the lowest subdivisions approximate the regional background values for tin and silver.

The tin content of the stream sediments ranges from non-detectable (less than 3 ppm) to 88 ppm. The average background value is about 15 ppm, but this is variable, being as low as 10 ppm in some areas and as high as 20 ppm in others. The frequency distribution of tin data shows that 45.0 per cent of all analyses exceed 15 ppm, and 12.5 per cent of the analyses exceed 30 ppm. Higher than average amounts of tin in stream sediments are broadly related to the western margins of the St. George batholith in the general area drained by tributaries of the Bocabec and Digdeguash Rivers. The significance of other tin anomalies (particularly those in the vicinity of basic intrusions) is difficult to assess. A few higher than average values to the north and east of the town of St. Stephen may reflect contamination from nearby settlements and roads.

The silver content of the stream sediments ranges from non-detectable (less than 0.2 ppm) to 2.0 ppm. The background value for the district is probably about 0.2 ppm, and the distribution of silver data indicates that 11.5 per cent of all analyses equal or exceed 1.0 ppm. Silver values of 1.0 ppm or more are generally correlative with higher than average contents of Cu, Pb and Zn.

The tin and silver contents of stream and spring sediments shown on this map should be interpreted with respect to the geological environment (Map 1) and compared with the contents of individual elements in stream sediments on Maps 2 to 8 inclusive.

Metal and Mineral Symbols

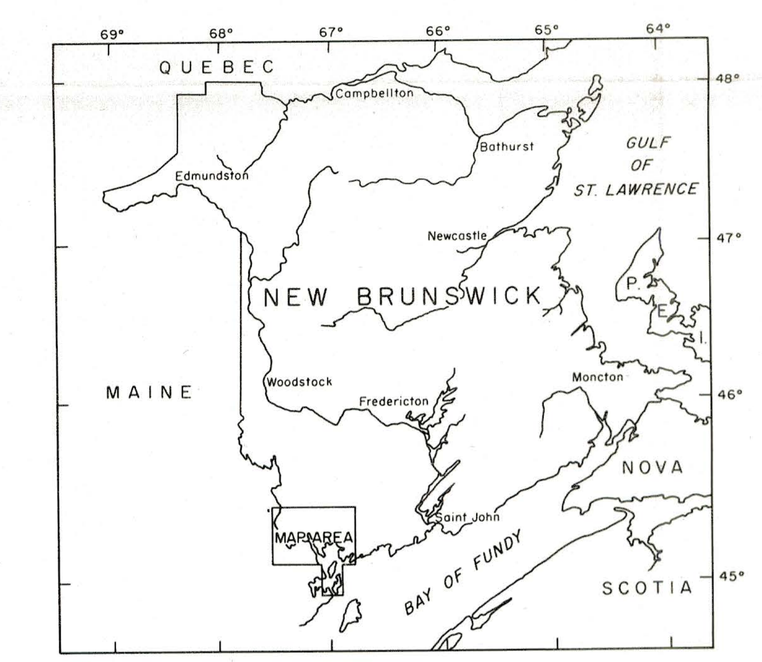
Arsenic	As	Silver	Ag	Hematite	hem
Bismuth	Bi	Zinc	Zn	Malachite	mal
Copper	Cu			Pentlandite	pn
Gold	Au	Arsenopyrite	asp	Pyrite	py
Lead	Pb	Chalcopyrite	cp	Pyrrhotite	po
Molybdenum	Mo	Fluorite	fl	Quartz	qtz
Nickel	Ni	Galena	gn	Sphalerite	sp

INDEX TO MINING PROPERTIES AND PROSPECTS

1. Atlantic Nickel (Rodgers Farm): cp, po, pn.
2. Clark Farm ('A' Zone): cp, po.
3. Hall Carroll: po, cp.
4. Dennis Stream ('N' Zone): cp, po.
5. Grant Farm: cp, po.
6. 'C' Zone: cp, po.
7. Union Bridge - St. Croix River: cp, po.
8. Moores Mills - qtz, asp, gn, sp.
9. Rollingdam Molybdenite: Mo, fl.
10. Mt. Blair: cp, fl, mal, hem.
11. Oliver - Cameron: qtz, cp, Bi, Au, Ag, mal.
12. T. Dick: qtz, py, cp, po, gn.
13. Letite: qtz, cp, gn.
14. Simpson: sp, gn, py.
15. Daniel Hatt Farm: qtz, cp, po, gn.

Field work by W. J. Wolfe, M. Mason, G. J. Mazerolle, J. M. Robbins, R. G. Garnett and D. K. J. MacKinnon

Analyses by Bondar-Clegg & Company, Limited, Ottawa, Ontario



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Copies of this map may be obtained from the Mines Division, Department of Natural Resources, Fredericton, New Brunswick