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## REGIONAL GEOCHEMICAL SURVEYS IN THE FORTUNE BAY AREA AND ON THE AVALON PENINSULA, NEWFOUNDLAND

by A.J. Butler

Regional lake sediment surveys were conducted with helicopter assistance in two areas on the Avalon Platform of southeastern Newfoundland during the 1978 field season. An area of approximately 7400 km<sup>2</sup> was surveyed north of Fortune Bay joining two areas previously surveyed, the Burin Peninsula area (Open File 1M/166) and the Meelpaeg Lake area of Central Newfoundland (Open File Nfld. 986). The other area of 4100 km<sup>2</sup> is located on the Avalon Peninsula and connects two areas surveyed in 1975 (Open File Nfld. 879 and Nfld. 894). A total of 1900 sites were sampled and 2011 samples collected (including replicate samples), with a sample density of one per 6 km<sup>2</sup>. The sampling and analytical methods have been described elsewhere (Hornbrook and Davenport, 1975).

### FORTUNE BAY AREA

#### Geology

The Fortune Bay area is underlain by Hadrynian volcanic and sedimentary rocks which have been intruded by granite (mainly the Ackley City Batholith) of probable Upper Devonian to Lower Carboniferous age. The Precambrian rocks in the western part of the area are correlative with the Precambrian rocks in the east (Williams, 1967). They consist of clastic and tuffaceous sedimentary rocks and acidic to mafic volcanic rocks and associated volcanogenic sedimentary rocks. The Precambrian rocks in the east are underlain by siltstone, slate, graywacke, sandstone and argillite, whereas in the west the underlying formations are probably older and consist of metamorphosed felsic and mafic volcanic rocks and

graywacke. Cambrian shale, limestone, sandstone, conglomerate and minor volcanic rocks overlie the Precambrian rocks locally (Bradley, 1963; Williams, 1971). The northwest corner of the area is underlain by intermediate to mafic volcanic rocks and sedimentary rocks of Ordovician age (Williams, 1967).

#### Mineral Potential

The base metal potential of the Hadrynian rocks of the Fortune Bay area is not well known. Some showings of lead, in places with zinc, occur as veins in volcanic rocks (10, 11, Figure 1) and copper occurs associated with fault zones in metaconglomerates (6, 7) and with andesite (54) (Douglas, 1976). A number of base metal showings, containing several combinations of metals, occur within the Ordovician age rocks in the northwest corner of the survey area (47-53).

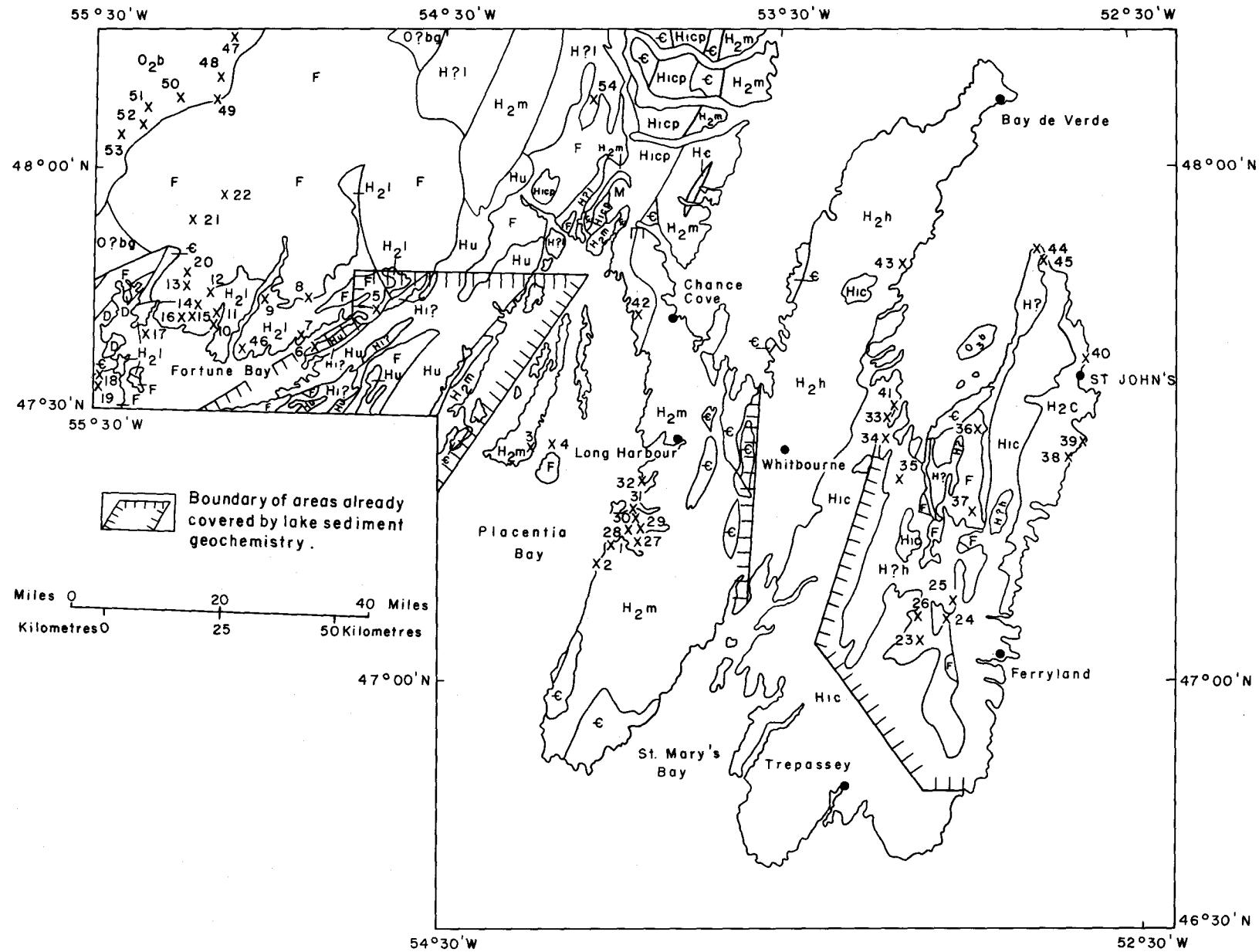
A number of molybdenum showings (Douglas, 1976) are associated with granitic intrusions in the western part of the area (8, 9, 12-22), some of which are accompanied by other metals.

Knowledge of the uranium potential of the area is limited; however, Whalen (1975) reports pitchblende in the Wylie Hill Showing (12), located near the southern edge of the Ackley City Batholith.

### CENTRAL AVALON PENINSULA

#### Geology

The central Avalon Peninsula area is underlain almost entirely by thick sequences of Hadrynian red, green and gray arkose, siltstone and slate (McCartney, 1967) which are equivalent to, but lithologically different from, the Hadrynian rocks of the Fortune Bay area



## LEGEND

### CARBONIFEROUS OR EARLIER

**F** Granite, granodiorite, syenite, monzonite, quartz diorite and related rocks.

**M** Gabbro, diorite.

### DEVONIAN

**D** Great Bay de l'Eau, Pool's Cove and Cinq Isles Formations: Conglomerate, arkose.

### ORDOVICIAN

**O 3b** Bell Island Group: Shale, siltstone, sandstone, hematite beds.

**O 2b** Baie d'Espoir Group: Intermediate to mafic volcanic rocks, slate, graywacke, siltstone, chert, conglomerate.

### ORDOVICIAN OR EARLIER

**O ?gb** Mainly granitic gneiss.

### CAMBRIAN

**C** Dominantly shales with limestone, conglomerate, siltstone, sandstone, minor volcanic rocks and manganese beds.

### HADRYNIAN

**H 2** Musgravetown Group ( $H_2m$ ), Hodgewater Group ( $H_2h$ ), Long Harbour Group ( $H_2l$ ), Cabot Group ( $H_2c$ ): Siltstone, arkose, conglomerate, slate, and acidic to mafic volcanic rocks.

**H 1** Conception Group ( $H_1c$ ), Connecting Point Group ( $H_1cp$ ): Slate, siltstone, graywacke, conglomerate, minor volcanic rocks; cut by basic dikes and sills possibly related to subsequent Hadrynian volcanism.

### HADRYNIAN OR EARLIER

**H u** Acidic to mafic volcanic rocks, slate, siltstone, graywacke, and conglomerate.

**H ?** Harbour Main Group ( $H?h$ ), Love Cove Group ( $H?l$ ): Acidic to mafic volcanic rocks.

(Williams, 1967). These rocks are underlain by an older sequence of gray-green slate and red and green siltstone. Locally, this area is overlain by Cambrian slate and limestone (McCartney, 1967).

The base metal showings (Douglas, 1966) are limited to isolated lead (43) and copper (41). No uranium occurrences are known.

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## MINERAL OCCURRENCES

Cu			Mo		Pb		Zn	F	Sb
4	25	38	8	17(+Cu)	1	31	3	46	51
5	26	39	9(+F)	18	2	32			
6	30	40	12(+U)	19	10(+Zn)	42			
7	33	41	13	20	11	43			
23	34	44	14(+Pb)	21(+Bi)	27	47(+Zn)			
24(+Ag,Pb)	35	45	15	22	28	50(+Cu)			
25	36	48	16	37	29	52(+Zn,Cu)			
		49(+Pb,As)							
		53							
		54							