Atlantic Geology

A Continuous Seismic Profile from Halifax Harbour, Nova Scotia

A. C. Grant

Volume 3, numéro 2-3, april 1967

URI : https://id.erudit.org/iderudit/ageo03_2_3rep03

Aller au sommaire du numéro

Éditeur(s)

Maritime Sediments Editorial Board

ISSN

0843-5561 (imprimé)
1718-7885 (numérique)

Découvrir la revue

Citer cet article

Grant, A. C. (1967). A Continuous Seismic Profile from Halifax Harbour, Nova Scotia. *Atlantic Geology*, *3*(2-3), 64–64.

A Continuous Seismic Profile from Halifax Harbour, Nova Scotia*

A. C. GRANT
Bedford Institute of Oceanography, Dartmouth, N. S.

Progress Report on Halifax Harbour Survey

In October, 1966, a number of continuous seismic profiles were run across Halifax Harbour, Nova Scotia, immediately to the north of George Island (Figure 1). This work was done in conjunction with a hydrographic survey by Mr. A. L. Adams and Mr. E. J. Comeau of the Canadian Hydrographic Service. A Huntec Mark II A Hydrosonde (160 joule out-put) was used for the continuous seismic profiling, and regular water-depth measurements were obtained with a Kelvin Hughes 26B echo-sounder. Fifteen traverses of the Harbour were completed within the area stippled on figure 1.

Figure 2 is a cross-section of the harbour prepared from a representative continuous seismic profile. Thicknesses of sub-bottom formations shown on this cross-section are based upon a velocity of sound in water of 4800 feet/second, and consequently they are minimal values.

Four sub-bottom units are indicated on the cross-section; soft mud, sand and silt, till, and bedrock. The soft mud that blankets the harbour bottom was resolved in excellent detail with the use of the Kelvin Hughes 26B echo-sounder. Accumulations of soft mud in excess of 15 feet in thickness (apparent) were encountered within the area surveyed, and thicknesses of only one or two feet could be detected with the sounder. Beneath the soft mud the surface of the sand and silt was generally quite smooth, especially as compared to the rough surface of the till. In addition, stratification within the sand and silt was shown by regular and continuous reflectors on the profiler recordings, as opposed to the complete absence of coherent reflections in the till. Boulders scattered through the till probably account for the numerous "point" reflecting sources characterizing that medium. In general, a strong bedrock reflection was recorded beneath the areas of sand and silt, while in areas of till-cover the same event was usually much weaker. Presumably this is related in part to the higher velocity of sound through the till. No definite reflectors were noted within the bedrock. Apart from local irregularities on the bedrock surface, its cross-sectional aspect is that of a broad, symmetrical, and fairly flat-bottomed channel.

If the lithology of the sub-bottom media has been interpreted correctly, then the sequence of events would appear to be as follows: the bedrock channel was glacially cut, or at least scoured, and was partially filled with till; the till was channeled by a stream, and that channel was subsequently infilled with stream-borne sand and silt; the soft mud blanketing the harbour bottom is of modern accumulation.

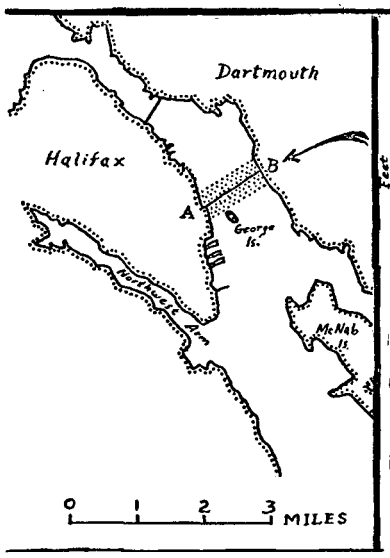

Figure 1 (left) Index map showing location of the survey area and cross-section (A-B) in Halifax Harbour.

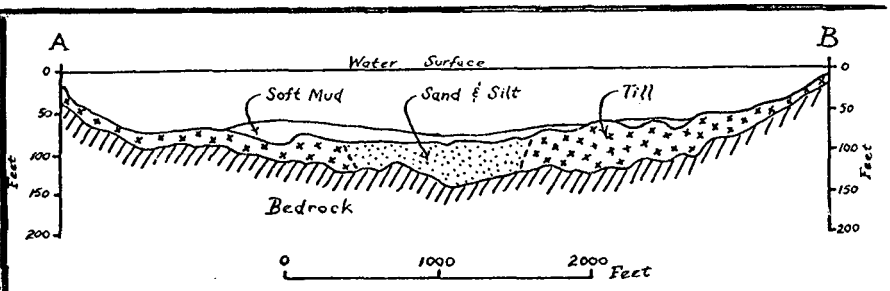

Figure 2 (right) Cross-section of Halifax Harbour based on continuous seismic profiler recording.

* Manuscript received September 29, 1967; BIO Contribution No. 101