

# Benthonic Foraminiferal Depth-Assemblages of the Continental Shelf off Eastern Canada

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Benthonic Foraminiferal Depth-Assemblages of the  
Continental Shelf off Eastern Canada\*

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Factor-vector analysis of 40 bottom sediment samples from stations ranging from English Point, P. Q. to the Flemish Cap off Newfoundland, is interpreted as indicating seven benthonic foraminiferal depth-assemblages. These are correlated with the main water mass layers of the region. Locations are given in Figure 1.

Raw data was processed by a Control Data G. 20 computer according to a program described by Hooper (1967) for the production of data matrices. The data of the benthonic foraminiferal percentage matrix was processed by the IBM 7094 computer in a program of factor-vector analysis, essentially as described by Manson & Imbrie (1964), but with some modifications in the QQ mode.

Particle size analysis of the sediments indicated only a weak correlation of mean grain diameter with depth of occurrence. However, there is a general trend of decreasing grain size with depth. Also, values of the average mean grain size and its range tend to be characteristics of the depth-assemblages.

In all, 318 species and varieties of foraminifera were recognized. Many of these were probably only variant specimens which did not merit the distinction of separation from the species population. However, in order not to miss the possibility of their being of ecological significance, they were given a number and hence treated as species by the computer program.

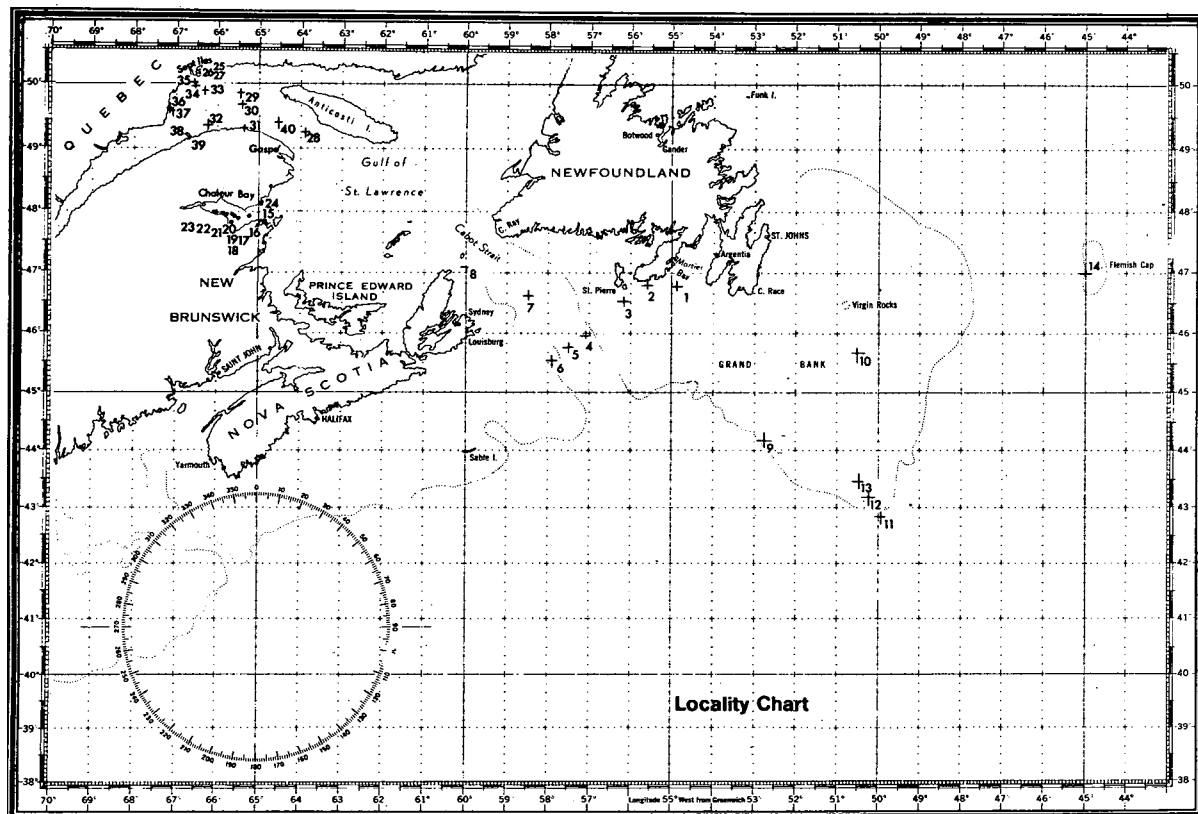


Fig. 1 - Location of sampling stations

\*Manuscript received July 5, 1968.

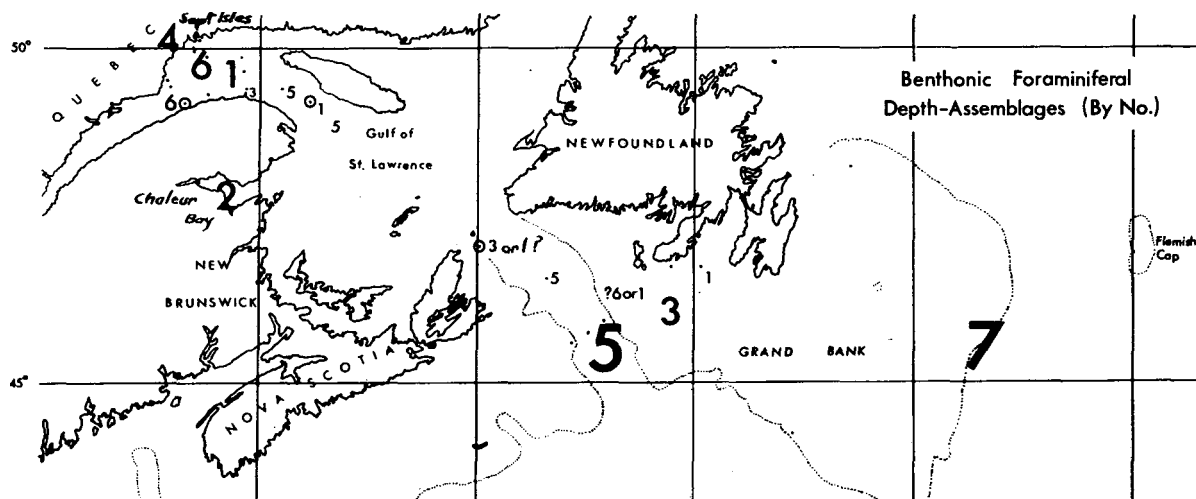


Fig. 2 - Map showing location of depth assemblages

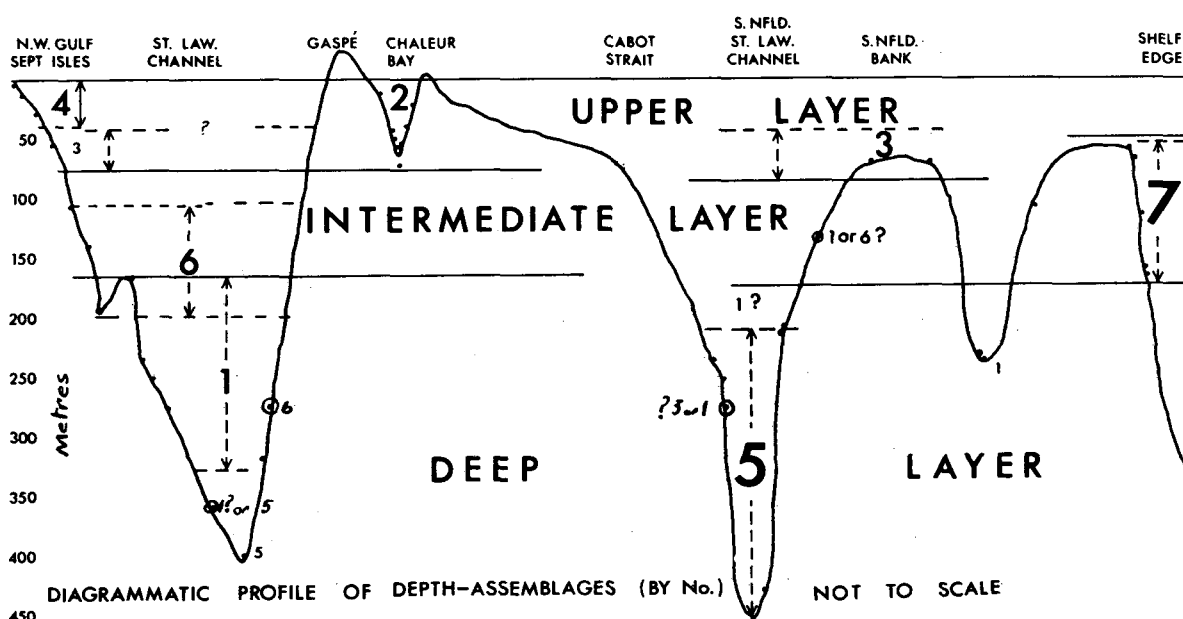


Fig. 3 - Submarine topographic profile showing location of depth assemblages

Depth-assemblages

The re-ordered oblique projection matrix is interpreted as indicating seven assemblages which are related to depth. The depth-assemblages are shown in Figures 2 and 3, and are listed below:

- Depth-assemblage no. 1. The Laurentian channel slope in the N. W. Gulf and south of Newfoundland; deep water; depth range, approximately 166 to 317 metres.
- Depth-assemblage no. 2. Chaleur Bay; shallow water; depth range, approximately 12.5 to 64 metres (or possibly to 82 metres).
- Depth-assemblage no. 3. N. W. Gulf of St. Lawrence and the Bank south of Newfoundland; shallow water; depth range, approximately 56 to 74 metres.
- Depth-assemblage no. 4. Sept Isles Bay; shallow water; depth range, approximately 7 to 36 metres.
- Depth-assemblage no. 5. St. Lawrence Channel; deep water; depth range, approximately 218 to 457 metres.
- Depth-assemblage no. 6. N. W. Gulf of St. Lawrence; intermediate depth; depth range, approximately 106 to 191 metres.
- Depth-assemblage no. 7. S. E. Grand Bank (Tail) and edge of shelf; intermediate depth; depth range, approximately 58 to 165 metres.

Assemblage-ubiquitous Species

Some species occur in each and every sample present in a depth-assemblage. The assemblage-ubiquitous species are listed.

Assemblage No. 1. Depth range, 166 to 317 metres.

Angulogerina fluens TODD, 1947  
Buccella inusitata ANDERSEN, 1952  
Cassidulina islandica NORVANG, 1945

Assemblage No. 2. Depth range, 12.5 to 64 (or 82) metres.

Eggerella scabra (WILLIAMSON), 1858

Assemblage No. 3. Depth range, 56 to 74 metres.

Angulogerina fluens TODD, 1947  
Buccella inusitata ANDERSEN, 1952  
Buccella frigida (CUSHMAN), 1922  
Cassidulina islandica NORVANG, 1945  
Cassidulina teretis TAPPAN, 1951 = Islandiella  
Cibicides lobatulus (WALKER & JACOB), 1798  
Elphidium bartletti CUSHMAN, 1933  
Elphidium clavatum CUSHMAN, 1930  
Elphidium subarcticum CUSHMAN, 1944  
Elphidiella arctica (PARKER & JONES), 1864  
Fissurina marginata (MONTAGU), 1803  
Lagena apiopleura LOEBLICH & TAPPAN, 1953  
Oolina melo D'ORBIGNY, 1839

Assemblage No. 4. Depth range, 7 to 36 metres.

Eggerella advena (CUSHMAN), 1922  
Psammosphaera sp.

Assemblage No. 5. Depth range, 218 to 457 metres.

Bulimina exilis BRADY, 1884  
Buccella inusitata ANDERSEN, 1952  
Nonion labradoricum (DAWSON), 1860  
Bulimina marginata D'ORBIGNY, 1826  
Virgulina complanata EGGER, 1893

Assemblage No. 6. Depth range, 106 to 191 metres.

Adercotryma glomerata (BRADY), 1878  
Alveolophragmium jeffreysi (WILLIAMSON), 1858

Assemblage No. 7. Depth range, 58 to 165 metres.

Buccella inusitata ANDERSEN, 1952  
Cassidulina islandica NORVANG, 1945  
Cibicides lobatulus (WALKER & JACOB), 1798  
Elphidium clavatum CUSHMAN, 1930

Assemblage-indicator Species

Some forms are restricted to one assemblage. They are assemblage-indicator species. The most important of these forms are listed.

Assemblage No. 1. Depth range, 166 to 317 metres.

Trochammina lobata CUSHMAN, 1944  
Trochammina squamata JONES & PARKER, 1860  
Lagena parri LOEBLICH & TAPPAN, 1953  
Dentalina pauperata D'ORBIGNY, 1846  
Rectoglandulina rotundata (REUSS), 1850

Assemblage No. 2. Depth range 12.5 to 64 (or 82) metres.

Reophax fusiformis WILLIAMSON, 1858  
Gyroidina quinqueloba UCHIO, 1960

Assemblage No. 3. Depth range, 56 to 74 metres.

Astacolus hyalacrulus LOEBLICH & TAPPAN, 1953  
Dentalina baggi GALLOWAY & WISSLER, 1927  
Glabratella wrightii (BRADY), 1881  
Guttulina lactea (WALKER & JACOB), 1798  
Guttulina earlandi CUSHMAN & OZAWA, 1930

- Laryngosigma hyalascidia LOEBLICH & TAPPAN, 1953  
Lamarckina haliotidea HERON-ALLEN & EARLAND, 1911  
Nonion scaphum (TICHTEL & MOLL), 1798  
Quinqueloculina arctica CUSHMAN, 1933  
Quinqueloculina agglutinata CUSHMAN, 1917  
Quinqueloculina nitida NORVANG, 1945  
Triloculina trihedra LOEBLICH & TAPPAN, 1953  
Trochammina nana (BRADY), 1881  
Oolina striatopunctata (PARKER & JONES), 1865  
Planorbulina mediterraneensis D'ORBIGNY, 1826  
Robertinoides charlottensis (CUSHMAN), 1925  
Quinqueloculina akneriana D'ORBIGNY, 1846  
Tholosina bulla (BRADY), 1881  
Turrispirillina arctica (CUSHMAN), 1933  
Oolina squamosa (MONTAGU), 1893
- Assemblage No. 4. Depth range, 7 to 36 metres.
- Miliammina fusca (BRADY), 1870
- Assemblage No. 5. Depth range, 218 to 457 metres.
- Discorbis chasteri (HERON-ALLEN & EARLAND), 1913  
Discorbis obtusa CUSHMAN, 1931  
Lagena gracilis (WILLIAMSON), 1848  
Lagena hispida REUSS, 1863  
Oolina hexagona (WILLIAMSON), 1848  
Parafissurina tectulostoma LOEBLICH & TAPPAN, 1953  
Parafissurina follicula LOEBLICH & TAPPAN, 1953  
Pninaella pulchella PARKER, 1952  
Siphogenerina annulata BRADY, 1884  
Fissurina lucida (WILLIAMSON), 1848  
Globobulimina turgida (BAILEY), 1851  
Buliminella convoluta (WILLIAMSON), 1858  
Gyroidina umbonata (SILVESTRI), 1898  
Cyclammina cancellata BRADY, 1879  
Trochammina quadriloba HOGLUND, 1948
- Assemblage No. 6. Depth range, 106 to 191 metres.
- Hyperammina subnodosa BRADY, 1884  
Marsipella elongata RHUMBLER, 1913  
Nonion pompilioides (FICHTEL & MOLL), 1798  
Robertina arctica D'ORBIGNY, 1846  
Reophax subfusiformis EARLAND, 1933
- Assemblage No. 7. Depth range, 58 to 165 metres.
- Guttulina dawsoni CUSHMAN & OZAWA, 1930  
Psammosphaera fusca SCHULZE, 1875  
Virgulina fusiformis WILLIAMSON, 1858  
Trochammina globigeriniformis (PARKER & JONES), 1865  
Scutuloris tegminis LOEBLICH & TAPPAN, 1953  
Rosalina columbiensis (CUSHMAN), 1925  
Trochammina conica EARLAND, 1934  
Quinqueloculina seminula (LINNAEUS), 1767  
Dentalina melvillensis LOEBLICH & TAPPAN, 1953

#### Acknowledgements

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