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# Sea Ice Biota and Under-ice Plankton from Southeastern Hudson Bay in 1983

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Le titre exact paraît au haut du résumé de chaque rapport.

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SEA ICE BIOTA AND UNDER-ICE PLANKTON FROM  
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## ABSTRACT

Hsiao, Stephen I. C., Nadia Pinkewycz, A. A. Mohammed and E. H. Grainger. 1984. Sea ice biota and under-ice plankton from southeastern Hudson Bay in 1983. Can. Data Rep. Fish. Aquat. Sci. 494: iv + 49 p.

The sea ice flora overlying a freshwater plume in southeastern Hudson Bay included 112 species of microalgae belonging to 49 genera. The ice flora was typically more densely concentrated than the phytoplankton beneath the ice which consisted of 125 species, mostly pennate diatoms, of 58 genera. The sea ice fauna, of 10 major taxa, was also generally more dense although less diverse than the zooplankton occurring beneath the ice.

Key words: Sea ice flora, microalgae, phytoplankton, quantitative composition, vertical distribution, sea ice fauna, zooplankton, water temperature, salinity

## RESUME

Hsiao, Stephen I. C., Nadia Pinkewycz, A. A. Mohammed and E. H. Grainger. 1984. Sea ice biota and under-ice plankton from southeastern Hudson Bay in 1983. Can. Data Rep. Fish. Aquat. Sci. 494: iv + 49 p.

La flore qui se trouvait dans la couche de glace recouvrant un panache d'eau douce dans le sud-est de la baie d'Hudson comprenait 112 espèces d'algues microscopiques appartenant à 49 genres. En règle générale, sa concentration était plus dense que celle du phytoplancton situé sous la glace qui comprenait 125 espèces (58 genres), surtout des Diatomées pennées. De même, la faune intraglacielle, répartie en 10 grands taxons, était généralement plus dense, bien que moins variée, que le zooplancton observé sous la couche de glace.

## INTRODUCTION

A large freshwater plume develops beneath the winter sea ice cover off the mouth of the Great Whale River in southeastern Hudson Bay. In order to observe the effects of the plume on the plants and animals occupying the ice, a brief collecting project was carried out in April of 1983, supported by a field program conducted by Sciences et Levés Océaniques, Quebec. Samples were taken of the biota occupying the lower 3 centimetres of the ice and of the plankton living beneath the ice, both within and outside the plume.

Collections of flora living within the ice included 112 species of microalgae belonging to 49 genera. Beneath the ice, there were 125 species of phytoplankton representing 58 genera. Concentrations of plants were greater in the ice than in the water immediately below at 8 of the 10 stations sampled. Pennate diatoms, consisting of more than 74 species of 22 genera, were the largest group taken, in terms of numbers of species and of cells in both the ice and the water.

The ice fauna included 10 major taxa, the zooplankton in the under-ice plume 11 taxa (7 of which were found in the ice as well), and the zooplankton outside the plume 19 taxa (only 6 of which were present in the ice samples). Concentrations of all but one of the taxa in the ice were far greater than in the water below. The single exception was the copepod Oithona, most abundant outside the plume. Nematodes, followed by flagellates, rotifers and ciliates dominated numerically in the ice, rotifers, Oithona and mites in the plume, and the copepods Pseudocalanus and Oithona outside the plume.

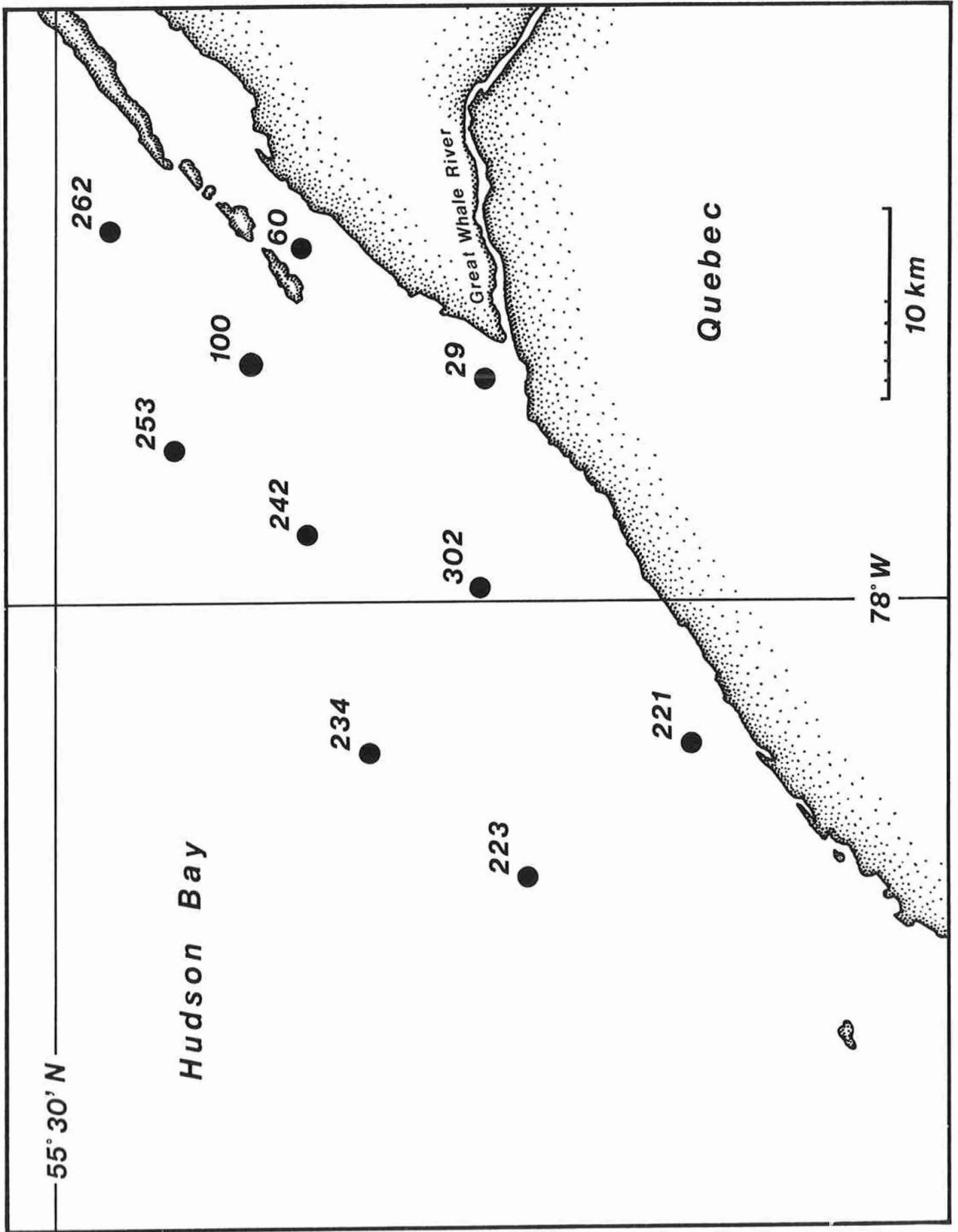


Fig. 1. The region of the Great Whale River plume, showing the locations of collection stations.

Table 1. Station locations.

| <u>Station</u> | <u>North Latitude</u> | <u>West Longitude</u> |
|----------------|-----------------------|-----------------------|
| 29             | 55°16.6'              | 77°48.8'              |
| 60             | 55°21.7'              | 77°42.4'              |
| 100            | 55°23.2'              | 77°48.2'              |
| 221            | 55°10.7'              | 78° 7.2'              |
| 223            | 55°15.5'              | 78°13.5'              |
| 234            | 55°19.8'              | 78° 7.3'              |
| 242            | 55°21.5'              | 77°56.7'              |
| 253            | 55°25.4'              | 77°52.3'              |
| 262            | 55°27.1'              | 77°41.4'              |
| 302            | 55°16.7'              | 77°59.2'              |

Table 2. Genera and species of sea ice microalgae and phytoplankton in the underlying water from southeastern Hudson Bay during April 1983.

| Taxonomic group  | Sea ice microalgae<br>at the bottom of<br>the sea ice | Phytoplankton<br>in the water column<br>beneath the sea ice |
|--|---|---|
| Bacillariophyta  |   |   |
| Centrales  |   |   |
| <u>Chaetoceros borealis</u><br>J. W. Bailey                            | X   |   |
| <u>C. decipiens</u> Cleve  | X   |   |
| <u>C. fragilis</u> Meunier   | X   | X   |
| <u>C. furcellatus</u> J. W. Bailey                                     | X   |   |
| <u>C. holsaticus</u> Schuett   | X   |   |
| <u>C. septentrionalis</u> Oestrup                                      | X   | X   |
| <u>C. teres</u> Cleve  | X   | X   |
| <u>C. wighamii</u> Brightwell  | X   |   |
| <u>Coscinodiscus excentricus</u><br>Ehrenberg                          |   | X   |
| <u>C. lacustris</u> var.<br><u>septentrionalis</u><br>(Grunow) Rattray | X   |   |
| <u>Cyclotella striata</u><br>(Kuetzing) Grunow                         | X   | X   |
| <u>C. striata</u> var. <u>ambigua</u><br>(Grunow) Grunow               |   | X   |
| <u>Eucampia groenlandica</u> Cleve                                     | X   | X   |
| <u>Melosira arctica</u><br>(Ehrenberg) Cleve                           | X   | X   |
| <u>M. distans</u> (Ehrenberg)<br>Kuetzing                              | X   |   |
| <u>M. islandica</u> O. Muller  | X   | X   |
| <u>Skeletonema costatum</u><br>(Greville) Cleve                        |   | X   |
| <u>Thalassiosira decipiens</u><br>(Grunow) E. Joergensen               |   | X   |
| <u>T. nordenskioldii</u> Cleve   | X   | X   |
| <u>T. oestrupii</u> (Ostenfeld)<br>Proschkina-Lavrenko                 |   | X   |
| <u>T. rotula</u> Meunier   |   | X   |
| Pennales   |   |   |
| <u>Achnanthes taeniata</u> Grunow                                      | X   | X   |
| <u>Amphiprora alata</u><br>(Ehrenberg) Kuetzing                        | X   | X   |
| <u>A. concilians</u> Cleve   | X   | X   |
| <u>A. kjellmanii</u> Cleve   | X   | X   |
| <u>A. kjellmanii</u> var. <u>kariana</u><br>(Grunow) Cleve             | X   |   |



Table 2. (Continued)

|   |   |   |
|---|---|---|
| <u>Amphora laevis</u> var.                |   |   |
| <u>laevissima</u>                         | X | X |
| (Gregory) Cleve                           |   |   |
| <u>A. laevis</u> var. <u>minuta</u> Cleve | X |   |
| <u>A. macilenta</u> Gregory               | X |   |
| <u>A. terroris</u> Ehrenberg              | X | X |
| <u>Asterionella formosa</u> Hassall       | X | X |
| <u>A. gracillima</u> (Hantzsch)           | X | X |
| Heiberg                                   |   |   |
| <u>Bacillaria paradoxa</u> Gmelin         | X | X |
| <u>Cocconeis costata</u> Gregory          |   | X |
| <u>Cylindrotheca closterium</u>           | X | X |
| (Ehrenberg)                               |   |   |
| Reimann et Lewin                          |   |   |
| <u>Cymbella ventricosa</u> var.           |   |   |
| <u>semicircularis</u>                     |   | X |
| (Lagerstedt) Oestrup                      |   |   |
| <u>Diploneis litoralis</u>                | X | X |
| (Donkin) Cleve                            |   |   |
| <u>Eunotia arcus</u> Ehrenberg            | X |   |
| <u>E. divisa</u> Héribaud                 |   | X |
| <u>E. lunaris</u> (Ehrenberg)             |   | X |
| Brébisson                                 |   |   |
| <u>E. monodon</u> Ehrenberg               |   | X |
| <u>Fragilaria bicapitata</u> Mayer        | X | X |
| <u>F. islandica</u> Grunow                | X |   |
| <u>F. pinnata</u> Ehrenberg               | X | X |
| <u>F. striatula</u> Lyngbye               | X | X |
| <u>Fragilariopsis nana</u>                | X | X |
| (Stemann-Nielsen)                         |   |   |
| Paasche                                   |   |   |
| <u>Gomphonema acuminatum</u> var.         |   |   |
| <u>coronatum</u> (Ehrenberg)              |   | X |
| Wm. Smith                                 |   |   |
| <u>G. augur</u> Ehrenberg                 | X | X |
| <u>G. exiguum</u> var. <u>pachycladum</u> | X | X |
| (Brébisson) Cleve                         |   |   |
| <u>G. gracile</u> Ehrenberg               | X | X |
| <u>Grammatophora arctica</u>              |   | X |
| Cleve                                     |   |   |
| <u>Hantzschia amphioxys</u>               |   | X |
| (Ehrenberg) Grunow                        |   |   |
| <u>H. vivax</u> (Wm. Smith)               |   | X |
| M. Peragallo                              |   |   |
| <u>Navicula algida</u> Grunow             | X | X |

Table 2. (Continued)

|   |   |   |
|---|---|---|
| <u>N. apiculata</u> Brébisson                             |   | X |
| <u>N. cancellata</u> Donkin                               | X | X |
| <u>N. crassirostris</u> Grunow                            | X | X |
| <u>N. crucigeroides</u> Hustedt                           | X | X |
| <u>N. cryptocephala</u> Kuetzing                          | X | X |
| <u>N. directa</u> (Wm. Smith)<br>Ralfs                    | X | X |
| <u>N. directa</u> var. <u>subtilis</u><br>(Gregory) Cleve | X | X |
| <u>N. forcipata</u> Greville                              | X |   |
| <u>N. gastrum</u> (Ehrenberg)<br>Kuetzing                 | X | X |
| <u>N. gelida</u> Grunow                                   | X | X |
| <u>N. granii</u> (E. Joergensen)<br>Gran                  | X | X |
| <u>N. kariana</u> var. <u>frigida</u><br>(Grunow) Cleve   |   | X |
| <u>N. lanceolata</u> (Agardh)<br>Kuetzing                 | X |   |
| <u>N. latissima</u> Gregory                               | X |   |
| <u>N. lineola</u> Grunow                                  | X | X |
| <u>N. minima</u> Grunow                                   | X | X |
| <u>N. peregrina</u> (Ehrenberg)<br>Kuetzing               | X |   |
| <u>N. perlucens</u> Oestrup                               | X | X |
| <u>N. salinarum</u> Grunow                                |   | X |
| <u>N. transitans</u> Cleve                                | X |   |
| <u>N. transitans</u> var. <u>derasa</u><br>(Grunow) Cleve | X | X |
| <u>N. trigonocephala</u> var.<br><u>depressa</u> Oestrup  | X | X |
| <u>N. vanhoeffenii</u> Gran                               | X | X |
| <u>Nedium affine</u> (Ehrenberg)<br>Pfitzer               | X | X |
| <u>Nitzschia acicularis</u><br>(Kuetzing) Wm. Smith       | X | X |
| <u>N. acuminata</u> (Wm. Smith)<br>Grunow                 |   | X |
| <u>N. angularis</u> var.<br><u>kariana</u> Grunow         | X | X |
| <u>N. cylindrus</u> (Grunow) Hasle                        | X | X |
| <u>N. delicatissima</u> Cleve                             | X | X |
| <u>N. distans</u> Gregory                                 | X | X |
| <u>N. fluminensis</u> Grunow                              | X | X |
| <u>N. frigida</u> Grunow                                  | X | X |

Table 2. (Continued)

|  |   |   |
|--|---|---|
| <u>N. frustulum</u> (Kuetzing)<br>Grunow                             | X | X |
| <u>N. frustulum</u> var. <u>perpusilla</u><br>(Rabenhorst) Grunow    | X | X |
| <u>N. grunowii</u> Hasle   | X | X |
| <u>N. linearis</u> (Agardh)<br>Wm. Smith                             | X | X |
| <u>N. lineata</u> Hasle  | X | X |
| <u>N. marginulata</u> Grunow   | X | X |
| <u>N. recta</u> Hantzsch   |   | X |
| <u>N. seriata</u> Cleve  | X | X |
| <u>N. sigma</u> (Kuetzing)<br>Wm. Smith                              | X |   |
| <u>N. tergestina</u> (Kuetzing)<br>Ralfs                             |   | X |
| <u>Pinnularia borealis</u><br>Ehrenberg                              |   | X |
| <u>P. quadratarea</u> (Schmidt)<br>Cleve                             | X | X |
| <u>P. quadratarea</u> var.<br><u>bicontracta</u> (Oestrup)<br>Heiden | X |   |
| <u>P. quadratarea</u> var.<br><u>bicuneata</u><br>Heiden et Kolbe    | X | X |
| <u>P. quadratarea</u> var.<br><u>capitata</u> Heiden                 |   | X |
| <u>P. quadratarea</u> var.<br><u>densestriata</u> Cleve              | X |   |
| <u>P. quadratarea</u> var.<br><u>leptostauron</u> Cleve              | X |   |
| <u>P. quadratarea</u> var.<br><u>stuxbergii</u> (Cleve)<br>Cleve     |   | X |
| <u>Pleurosigma longum</u> Cleve                                      |   | X |
| <u>P. marinum</u> Donkin   | X |   |
| <u>Pseudonitzschia</u><br><u>delicatissima</u> (Cleve)<br>Heiden     | X |   |
| <u>Stauroneis quadripedis</u><br>(Cleve-Euler) Hendey                | X |   |
| <u>S. septentrionalis</u> Grunow                                     | X | X |
| <u>Surirella ovata</u> Kuetzing                                      |   | X |
| <u>S. striatula</u> Turpin   | X |   |

Table 2. (Continued)

|                                    |   |   |
|------------------------------------|---|---|
| <u>Synedra parasitica</u>          | X | X |
| (Wm. Smith) Hustedt                |   |   |
| <u>S. pulchella</u> (Ralfs)        | X | X |
| Kuetzing                           |   |   |
| <u>Tabellaria fenestrata</u>       |   | X |
| (Lyngbye) Kuetzing                 |   |   |
| <u>T. flocculosa</u> (Roth)        | X | X |
| Kuetzing                           |   |   |
| <u>Thalassionema nitzschioides</u> | X | X |
| (Grunow) Van Heurck                |   |   |
| Chlorophyta                        |   |   |
| <u>Ankistrodesmus falcatus</u>     | X | X |
| (Corda) Ralfs                      |   |   |
| <u>Carteria depressa</u> Butcher   | X | X |
| <u>Chlamydomonas ballenyana</u>    | X |   |
| Kol et Flint                       |   |   |
| <u>C. tetraolaris</u> Wohlenweber  | X | X |
| <u>Closterium</u> Nitzsch          | X | X |
| <u>Cosmarium</u> Corda             |   | X |
| <u>Dunaliella parva</u> Lerche     | X | X |
| <u>D. salina</u> (Dunal)           |   | X |
| Teodoresco                         |   |   |
| <u>Micrasterias</u> Agardh         | X | X |
| <u>Pediastrum</u> Meyen            |   | X |
| <u>Staurostrum</u> Meyen           | X |   |
| <u>Thalassomonas</u> Butcher       | X | X |
| Chrysophyta                        |   |   |
| <u>Coccolithus huxleyi</u>         |   | X |
| (Lohmann) Kamptner                 |   |   |
| <u>Dinobryon balticum</u>          |   | X |
| (Schuett) Lemmermann               |   |   |
| <u>D. belgicae</u> Meunier         |   | X |
| <u>D. cylindricum</u> Imhof        | X | X |
| <u>Distephanus speculum</u>        |   | X |
| (Ehrenberg) Haeckel                |   |   |
| <u>Phaeocystis pouchetii</u>       | X | X |
| (Harriot) Lagerheim                |   |   |
| <u>Synura uvella</u> Ehrenberg     | X |   |
| Cryptophyta                        |   |   |
| <u>Chroomonas placoidea</u>        |   | X |
| Butcher                            |   |   |

Table 2. (Continued)

|  |   |   |
|--|---|---|
| Cyanophyta   |   |   |
| <u>Spirulina</u> Turpin                              |   | X |
| Euglenophyta   |   |   |
| <u>Euglena proxima</u> Dangeard                      | X | X |
| <u>E. schmitzii</u> Gojdics                          | X | X |
| <u>E. viridis</u> Ehrenberg                          | X | X |
| Pyrrophyta   |   |   |
| <u>Coolia monotis</u> Meunier                        | X | X |
| <u>Dinophysis acuminata</u><br>Claparède et Lachmann | X | X |
| <u>D. arctica</u> Mereschkowsky                      | X | X |
| <u>Glenodinium lenticula</u><br>(Bergh) Schiller     |   | X |
| <u>Goniaulax catenata</u> Kofoid                     | X | X |
| <u>G. grindleyi</u> Reinecke                         |   | X |
| <u>G. monilata</u> Howell                            | X | X |
| <u>G. scrippsae</u> Kofoid                           | X | X |
| <u>G. tamarensis</u> Lebour                          |   | X |
| <u>G. turbynei</u><br>Murray et Whitting             |   | X |
| <u>Gymnodinium lohmanni</u><br>Paulsen               | X | X |
| <u>G. rubrum</u> Kofoid et Swezy                     |   | X |
| <u>Gyrodinium spirale</u> (Bergh)<br>Kofoid et Swezy | X | X |
| <u>Ornithocercus</u> Stein                           | X |   |
| <u>Oxytoxum</u> Stein                                | X | X |
| <u>Peridinium minusculum</u><br>Pavillard            |   | X |
| <u>P. punctulatum</u> Paulsen                        | X | X |
| <u>Polykrikos schwartzii</u><br>Buetschlei           |   | X |
| <u>Prorocentrum maximum</u><br>Schiller              | X | X |
| <u>P. micans</u> Ehrenberg                           | X | X |
| <u>P. rampii</u> Sournia                             | X | X |

Table 3. Quantitative composition and vertical distribution of sea ice microalgae and phytoplankton in the underlying water with related environmental parameters in Hudson Bay at station 29, April 28, 1983.

| Station depth (m)  | 27       |      |                |
|--|----------|------|----------------|
| Sea ice thickness (cm)   | 117      |      |                |
| Sample type  | Ice core |      | Water          |
|  | bottom   | 3 cm | 0 m      6 m   |
| Temperature (°C)   | 0        |      | 0.1      -1.4  |
| Salinity (‰)   | 0        |      | 0.0      27.9  |
| Total sea ice microalgae or phytoplankton (cells·L <sup>-1</sup> ) | 1,200    |      | 7,280      613 |
| Bacillariophyta  | 160      |      | 6,240      458 |
| Centrales  | 40       |      | 680      78    |
| <u>Chaetoceros furcellatus</u>                                     | 40       |      | --      --     |
| <u>Coscinodiscus</u> sp.   | --       |      | 80      22     |
| <u>Cyclotella striata</u> var. <u>ambigua</u>                      | --       |      | 120      --    |
| <u>Melosira arctica</u>  | --       |      | 160      --    |
| <u>M. islandica</u>  | --       |      | 120      --    |
| <u>Skeletonema costatum</u>  | --       |      | 120      --    |
| <u>Thalassiosira nordenskiöldii</u>                                | --       |      | 40      22     |
| <u>T. oestrupii</u>  | --       |      | --      34     |
| <u>T. rotula</u>   | --       |      | 40      --     |
| Pennales   | 120      |      | 5,560      380 |
| <u>Achnanthes taeniata</u>   | --       |      | 520      --    |
| <u>Amphora terroris</u>  | --       |      | --      11     |
| <u>Cocconeis costata</u>   | --       |      | 40      --     |
| <u>Cylindrotheca closterium</u>                                    | --       |      | 40      --     |
| <u>Cymbella ventricosa</u> var. <u>semicircularis</u>              | --       |      | 40      --     |
| <u>Diploneis litoralis</u>   | --       |      | 80      --     |
| <u>Eunotia lunaris</u>   | --       |      | 40      --     |
| <u>E. monodon</u>  | --       |      | 80      --     |
| <u>Fragilaria bicapitata</u>                                       | --       |      | 360      --    |
| <u>F. pinnata</u>  | --       |      | 400      --    |
| <u>Fragilariopsis nana</u>   | --       |      | 80      --     |
| <u>Gomphonema</u> sp.  | --       |      | --      11     |
| <u>G. augur</u>  | --       |      | --      11     |
| <u>G. exiguum</u> var. <u>pachycladum</u>                          | --       |      | --      34     |
| <u>G. gracile</u>  | --       |      | 80      --     |
| <u>Grammatophora arctica</u>                                       | --       |      | 80      --     |
| <u>Hantzschia amphioxys</u>  | --       |      | 40      --     |
| <u>Navicula algida</u>   | --       |      | --      11     |
| <u>N. cryptocephala</u>  | --       |      | 40      --     |
| <u>N. directa</u>  | --       |      | --      11     |
| <u>N. minima</u>   | --       |      | 80      --     |
| <u>Nedium affine</u>   | --       |      | 160      --    |
| <u>Nitzschia acicularis</u>  | --       |      | --      22     |
| <u>N. cylindrus</u>  | --       |      | 360      --    |
| <u>N. delicatissima</u>  | --       |      | 400      --    |

Table 3. (Continued)

| Sample type                                | Ice core    | Water |     |
|--|-------------|-------|-----|
|  | bottom 3 cm | 0 m   | 6 m |
| <u>N. distans</u>                          | --          | 40    | 56  |
| <u>N. frigida</u>                          | --          | 40    | 123 |
| <u>N. frustulum</u>                        | --          | 40    | --  |
| <u>N. frustulum</u> var. <u>perpusilla</u> | --          | 40    | --  |
| <u>N. grunowii</u>                         | --          | --    | 34  |
| <u>N. linearis</u>                         | --          | --    | 45  |
| <u>N. lineata</u>                          | --          | 400   | --  |
| <u>N. tergestina</u>                       | --          | --    | 11  |
| <u>N. recta</u>                            | --          | 40    | --  |
| <u>Pinnularia borealis</u>                 | --          | 240   | --  |
| <u>P. quadratarea</u>                      | --          | 120   | --  |
| <u>P. quadratarea</u> var. <u>capitata</u> | --          | 40    | --  |
| <u>Surirella ovata</u>                     | --          | 40    | --  |
| <u>Tabellaria fenestrata</u>               | --          | 440   | --  |
| <u>T. flocculosa</u>                       | --          | 1,160 | --  |
| <u>Thalassionema nitzschioides</u>         | 120         | --    | --  |
| Chlorophyta                                | 520         | 600   | 78  |
| <u>Ankistrodesmus falcatus</u>             | --          | 40    | 11  |
| <u>Chlamydomonas</u> sp.                   | 80          | 240   | 67  |
| <u>C. cysts</u>                            | 80          | --    | --  |
| <u>C. tetraolaris</u>                      | 80          | --    | --  |
| <u>Micrasterias</u> sp.                    | 280         | 200   | --  |
| <u>Thalassomonas</u> sp.                   | --          | 120   | --  |
| Chrysophyta                                | 360         | 200   | 22  |
| <u>Coccolithus huxleyi</u>                 | --          | --    | 22  |
| <u>Dinobryon cylindricum</u>               | --          | 80    | --  |
| <u>Phaeocystis pouchetii</u>               | 360         | 40    | --  |
| Unidentified                               | --          | 80    | --  |
| Cryptophyta                                | --          | 40    | --  |
| <u>Chroomonas placoidea</u>                | --          | 40    | --  |
| Euglenophyta                               | --          | --    | 22  |
| <u>Euglena proxima</u>                     | --          | --    | 11  |
| <u>E. schmitzii</u>                        | --          | --    | 11  |
| Pyrrophyta                                 | 160         | 200   | 33  |
| <u>Dinophysis acuminata</u>                | 40          | --    | --  |
| <u>Glenodinium</u> sp.                     | --          | 40    | 11  |
| <u>G. lenticula</u>                        | --          | 40    | --  |
| <u>Goniaulax</u> sp.                       | --          | 40    | --  |
| <u>G. turbynei</u>                         | --          | --    | 11  |
| <u>Gyrodinium spirale</u>                  | --          | --    | 11  |

Table 3. (Continued)

| Sample type             | Ice core    | Water |     |
|-------------------------|-------------|-------|-----|
|                         | bottom 3 cm | 0 m   | 6 m |
| <u>Prorocentrum</u> sp. | 80          | --    | --  |
| <u>P. micans</u>        | 40          | --    | --  |
| <u>P. rampii</u>        | --          | 80    | --  |



Table 4. Quantitative composition and vertical distribution of sea ice microalgae and phytoplankton in the underlying water with related environmental parameters in Hudson Bay at station 60, April 27, 1983.

| Station depth (m)  | 45          |       |       |
|--|-------------|-------|-------|
| Sea ice thickness (cm)   | 115         |       |       |
| Sample type  | Ice core    | Water |       |
|  | bottom 3 cm | 0 m   | 6 m   |
| Temperature (°C)   | 0           | -0.1  | -1.4  |
| Salinity (‰)   | 3           | 2.6   | 28.2  |
| Total sea ice microalgae or phytoplankton (cells·L <sup>-1</sup> ) | 29,400      | 8,500 | 1,120 |
| Bacillariophyta  | 22,760      | 8,000 | 800   |
| Centrales  | 840         | 1,000 | 150   |
| <u>Chaetoceros decipiens</u>                                       | 120         | --    | --    |
| <u>C. fragilis</u>   | 160         | --    | --    |
| <u>C. septentrionalis</u>  | --          | 20    | --    |
| <u>Coscinodiscus sp.</u>   | 520         | 60    | 20    |
| <u>Eucampia groenlandica</u>                                       | 40          | --    | --    |
| <u>Melosira arctica</u>  | --          | 260   | --    |
| <u>Skeletonema costatum</u>  | --          | --    | 30    |
| <u>Thalassiosira decipiens</u>                                     | --          | 100   | --    |
| <u>T. nordenskiöldii</u>   | --          | 400   | 50    |
| <u>T. oestrupii</u>  | --          | --    | 10    |
| <u>T. rotula</u>   | --          | 160   | 40    |
| Pennales   | 21,920      | 7,000 | 650   |
| <u>Achnanthes taeniata</u>   | 2,720       | --    | --    |
| <u>Amphiprora alata</u>  | 760         | 20    | 40    |
| <u>A. kjellmanii</u>   | 40          | --    | --    |
| <u>Amphora laevis</u> var. <u>laevissima</u>                       | 200         | --    | --    |
| <u>A. macilenta</u>  | 80          | --    | --    |
| <u>Cylindrotheca closterium</u>                                    | 80          | 440   | 10    |
| <u>Diploneis litoralis</u>   | 120         | 160   | --    |
| <u>Eunotia lunaris</u>   | --          | 20    | 10    |
| <u>Fragilaria bicapitata</u>                                       | 480         | --    | 20    |
| <u>F. islandica</u>  | 640         | --    | --    |
| <u>F. striatula</u>  | --          | 100   | --    |
| <u>Fragilariopsis nana</u>   | 920         | 640   | 40    |
| <u>Gomphonema sp.</u>  | --          | --    | 40    |
| <u>G. acuminatum</u> var. <u>coronatum</u>                         | --          | 60    | --    |
| <u>G. augur</u>  | --          | --    | 10    |
| <u>G. gracile</u>  | --          | 40    | --    |
| <u>Grammatophora arctica</u>                                       | --          | 20    | --    |
| <u>Navicula algida</u>   | 40          | --    | --    |
| <u>N. crucigeroides</u>  | --          | 20    | --    |
| <u>N. cryptocephala</u>  | 40          | --    | 10    |
| <u>N. directa</u>  | --          | 40    | 10    |
| <u>N. directa</u> var. <u>subtilis</u>                             | 40          | --    | --    |
| <u>N. gastrum</u>  | --          | 20    | 10    |

Table 4. (Continued)

| Sample type                                    | Ice core    | Water |     |
|--|-------------|-------|-----|
|  | bottom 3 cm | 0 m   | 6 m |
| <u>N. gelida</u>                               | --          | 20    | --  |
| <u>N. granii</u>                               | 280         | 120   | --  |
| <u>N. kariana</u> var. <u>frigida</u>          | --          | 860   | --  |
| <u>N. lineola</u>                              | --          | 120   | 10  |
| <u>N. minima</u>                               | 40          | 140   | 30  |
| <u>N. perlucens</u>                            | 80          | --    | --  |
| <u>N. salinarum</u>                            | --          | 40    | --  |
| <u>N. transitans</u> var. <u>derasa</u>        | --          | 160   | --  |
| <u>N. trigonocephala</u> var. <u>depressa</u>  | 80          | 20    | --  |
| <u>N. vanhoeffenii</u>                         | 760         | 1,180 | --  |
| <u>Nedium affine</u>                           | 40          | 20    | --  |
| <u>Nitzschia acicularis</u>                    | --          | 80    | --  |
| <u>N. acuminata</u>                            | --          | --    | 20  |
| <u>N. angularis</u> var. <u>kariana</u>        | 40          | --    | --  |
| <u>N. cylindrus</u>                            | --          | 240   | 30  |
| <u>N. delicatissima</u>                        | 40          | 260   | --  |
| <u>N. distans</u>                              | --          | 80    | --  |
| <u>N. fluminensis</u>                          | --          | 80    | --  |
| <u>N. frigida</u>                              | 7,720       | 420   | 30  |
| <u>N. frustulum</u>                            | 40          | 420   | 100 |
| <u>N. frustulum</u> var. <u>perpusilla</u>     | 160         | 180   | 10  |
| <u>N. grunowii</u>                             | --          | --    | 70  |
| <u>N. linearis</u>                             | 240         | 80    | 140 |
| <u>N. lineata</u>                              | 1,440       | 180   | --  |
| <u>N. marginulata</u>                          | --          | 20    | --  |
| <u>Pinnularia borealis</u>                     | --          | 400   | --  |
| <u>P. quadratarea</u>                          | 80          | 180   | --  |
| <u>P. quadratarea</u> var. <u>densestriata</u> | 280         | --    | --  |
| <u>P. quadratarea</u> var. <u>teptostauron</u> | 40          | --    | --  |
| <u>P. quadratarea</u> var. <u>stuxbergii</u>   | --          | 120   | --  |
| <u>Pleurosigma longum</u>                      | --          | --    | 10  |
| <u>P. marinum</u>                              | 40          | --    | --  |
| <u>Stauroneis septentrionalis</u>              | 3,840       | --    | --  |
| <u>Synedra pulchella</u>                       | 80          | --    | --  |
| <u>Thalassionema nitzschioides</u>             | 440         | --    | --  |
| Chlorophyta                                    | 3,960       | 140   | 90  |
| <u>Ankistrodesmus falcatus</u>                 | 40          | --    | --  |
| <u>Chlamydomonas</u> sp.                       | 40          | 40    | 70  |
| <u>C. cysts</u>                                | 760         | --    | --  |
| <u>C. tetraolaris</u>                          | 2,240       | --    | --  |
| <u>Closterium</u> sp.                          | --          | --    | 10  |
| <u>Cosmarium</u> sp.                           | --          | 60    | --  |
| <u>Dunaliella parva</u>                        | 360         | --    | --  |
| <u>Micrasterias</u> sp.                        | 320         | --    | --  |

Table 4. (Continued)

| Sample type                  | Ice core    | Water |     |
|------------------------------|-------------|-------|-----|
|                              | bottom 3 cm | 0 m   | 6 m |
| <u>Pediastrum</u> sp.        | --          | 20    | --  |
| <u>Staurastrum</u> sp.       | 40          | --    | --  |
| <u>Thalassomonas</u> sp.     | 160         | --    | --  |
| Unidentified                 | --          | 20    | 10  |
| Chrysophyta                  | 280         | 160   | 130 |
| <u>Coccolithus</u> sp.       | 200         | --    | 110 |
| <u>Dinobryon belgicae</u>    | --          | --    | 10  |
| <u>D. cylindricum</u>        | --          | 120   | 10  |
| <u>Phaeocystis pouchetii</u> | --          | 20    | --  |
| <u>Synura uvella</u>         | 40          | --    | --  |
| Unidentified                 | 40          | 20    | --  |
| Cyanophyta                   | --          | --    | 10  |
| <u>Spirulina</u> sp.         | --          | --    | 10  |
| Euglenophyta                 | 960         | --    | --  |
| <u>Euglena proxima</u>       | 120         | --    | --  |
| <u>E. schmitzii</u>          | 840         | --    | --  |
| Pyrrophyta                   | 1,440       | 200   | 90  |
| <u>Dinophysis acuminata</u>  | 160         | --    | --  |
| <u>D. arctica</u>            | 80          | --    | 10  |
| <u>Glenodinium</u> sp.       | 120         | --    | 20  |
| <u>Goniaulax catenata</u>    | 320         | --    | --  |
| <u>G. grindleyi</u>          | --          | --    | 10  |
| <u>G. tamarensis</u>         | --          | 140   | 10  |
| <u>Gymnodinium lohmanni</u>  | 120         | --    | --  |
| <u>Gyrodinium spirale</u>    | 40          | --    | --  |
| <u>Oxytoxum</u> sp.          | 320         | --    | --  |
| <u>Peridinium</u> sp.        | 80          | 20    | --  |
| <u>P. punctulatum</u>        | 40          | --    | --  |
| <u>Polykrikos schwartzii</u> | --          | --    | 30  |
| <u>Prorocentrum</u> sp.      | 80          | --    | --  |
| <u>P. maximum</u>            | 40          | --    | --  |
| <u>P. micans</u>             | 40          | --    | --  |
| <u>P. rampii</u>             | --          | 40    | 10  |

Table 5. Quantitative composition and vertical distribution of sea ice microalgae and phytoplankton in the underlying water with related environmental parameters in Hudson Bay at station 100, April 28, 1983.

| Station depth (m)  | 74          |        |      |
|--|-------------|--------|------|
|  | 111         |        |      |
| Sea ice thickness (cm)   |             |        |      |
| Sample type  | Ice core    | Water  |      |
|  | bottom 3 cm | 0 m    | 5 m  |
| Temperature (°C)   | 0           | -0.1   | -1.5 |
| Salinity (‰)   | 2           | 2.3    | 26.9 |
| Total sea ice microalgae or phytoplankton (cells·L <sup>-1</sup> ) | 22,200      | 97,647 | 470  |
| Bacillariophyta  | 17,800      | 27,225 | 310  |
| Centrales  | 1,700       | 726    | 30   |
| <u>Chaetoceros fragilis</u>  | 200         | 726    | --   |
| <u>Coscinodiscus</u> sp.   | 200         | --     | --   |
| <u>Thalassiosira nordenskiöldii</u>                                | 1,300       | --     | --   |
| <u>T. oestrupii</u>  | --          | --     | 30   |
| Pennales   | 16,100      | 26,499 | 280  |
| <u>Achnanthes taeniata</u>   | --          | --     | 50   |
| <u>Amphiprora kjellmanii</u>                                       | 300         | --     | --   |
| <u>Amphora macilenta</u>   | 200         | --     | --   |
| <u>Asterionella gracillima</u>                                     | 100         | --     | --   |
| <u>Diploneis litoralis</u>   | 600         | --     | --   |
| <u>Fragilaria pinnata</u>  | 400         | --     | --   |
| <u>Fragilariopsis nana</u>   | 100         | 363    | --   |
| <u>Gomphonema exiguum</u> var. <u>pachycladum</u>                  | 100         | --     | --   |
| <u>G. gracile</u>  | --          | --     | 20   |
| <u>Navicula cancellata</u>   | 700         | --     | --   |
| <u>N. crassirostris</u>  | 100         | --     | --   |
| <u>N. crucigeroides</u>  | 100         | --     | --   |
| <u>N. cryptocephala</u>  | 200         | --     | --   |
| <u>N. granii</u>   | 500         | --     | --   |
| <u>N. lineola</u>  | --          | --     | 10   |
| <u>N. minima</u>   | --          | --     | 20   |
| <u>N. perlucens</u>  | 200         | --     | --   |
| <u>N. transitans</u> var. <u>derasa</u>                            | 300         | --     | --   |
| <u>N. vanhoeffenii</u>   | 1,000       | --     | 10   |
| <u>Nitzschia cylindrus</u>   | 400         | --     | 10   |
| <u>N. delicatissima</u>  | 900         | --     | --   |
| <u>N. frigida</u>  | 800         | --     | 60   |
| <u>N. frustulum</u> var. <u>perpusilla</u>                         | 200         | 363    | 10   |
| <u>N. grunowii</u>   | 900         | 25,773 | 200  |
| <u>N. linearis</u>   | 200         | --     | 40   |
| <u>N. lineata</u>  | 6,500       | --     | --   |
| <u>N. seriata</u>  | 700         | --     | 10   |
| <u>Pinnularia quadratarea</u>                                      | 100         | --     | --   |
| <u>Tabellaria flocculosa</u>                                       | 200         | --     | 20   |

Table 5. (Continued)

| Sample type                        | Ice core    | Water  |     |
|------------------------------------|-------------|--------|-----|
|                                    | bottom 3 cm | 0 m    | 5 m |
| <u>Thalassionema nitzschioides</u> | 200         | --     | --  |
| Unidentified                       | 100         | --     | --  |
| Chlorophyta                        | 1,000       | 31,581 | 70  |
| <u>Carteria depressa</u>           | --          | 3,630  | --  |
| <u>Chlamydomonas</u> sp.           | --          | 1,815  | 70  |
| <u>C. cysts</u>                    | --          | 1,815  | --  |
| <u>C. tetraolaris</u>              | 300         | 6,171  | --  |
| <u>Dunaliella parva</u>            | 400         | 13,431 | --  |
| <u>Thalassomonas</u> sp.           | --          | 4,719  | --  |
| Unidentified                       | 300         | --     | --  |
| Chrysophyta                        | 200         | 7,260  | 10  |
| <u>Coccolithus huxleyi</u>         | --          | 6,897  | --  |
| <u>Dinobryon cylindricum</u>       | 200         | --     | --  |
| <u>Phaeocystis pouchetii</u>       | --          | 363    | --  |
| Unidentified                       | --          | --     | 10  |
| Euglenophyta                       | 600         | 8,349  | 40  |
| <u>Euglena proxima</u>             | 100         | 2,178  | 10  |
| <u>E. schmitzii</u>                | 300         | 1,815  | 30  |
| <u>E. viridis</u>                  | 200         | 4,356  | --  |
| Pyrrophyta                         | 2,600       | 23,232 | 40  |
| <u>Coolia monotis</u>              | 200         | 3,993  | --  |
| <u>Dinophysis acuminata</u>        | 100         | --     | --  |
| <u>Glenodinium</u> sp.             | 1,200       | 5,445  | 10  |
| <u>Goniaulax catenata</u>          | 100         | 6,171  | --  |
| <u>G. monilata</u>                 | --          | 363    | 20  |
| <u>Gymnodinium lohmanni</u>        | --          | 2,904  | --  |
| <u>G. rubrum</u>                   | --          | 1,089  | --  |
| <u>Gyrodinium</u> sp.              | 100         | --     | --  |
| <u>G. spirale</u>                  | --          | 1,089  | --  |
| <u>Oxytoxum</u> sp.                | 400         | --     | --  |
| <u>Peridinium</u> sp.              | 200         | 726    | --  |
| <u>Polykrikos schwartzii</u>       | --          | 726    | 10  |
| <u>Prorocentrum maximum</u>        | 300         | --     | --  |
| <u>P. rampii</u>                   | --          | 726    | --  |

Table 6. Quantitative composition and vertical distribution of sea ice microalgae and phytoplankton in the underlying water with related environmental parameters in Hudson Bay at station 221, April 28, 1983.

| Station depth (m)  | 74          |       |      |
|--|-------------|-------|------|
| Sea ice thickness (cm)   | 112         |       |      |
| Sample type  | Ice core    | Water |      |
|  | bottom 3 cm | 0 m   | 6 m  |
| Temperature (°C)   | 0           | -0.1  | -1.5 |
| Salinity (‰)   | 3           | 3     | 28.1 |
| Total sea ice microalgae or phytoplankton (cells·L <sup>-1</sup> ) | 3,333,213   | 8,870 | 790  |
| Bacillariophyta  | 3,093,831   | 6,590 | 730  |
| Centrales  | 232,128     | 110   | 70   |
| <u>Chaetoceros fragilis</u>  | 79,794      | 70    | --   |
| <u>C. septentrionalis</u>  | 47,151      | 10    | --   |
| <u>C. teres</u>  | 50,778      | --    | --   |
| <u>C. wighami</u>  | 10,881      | --    | --   |
| <u>Coscinodiscus</u> sp.   | 7,254       | --    | --   |
| <u>Melosira arctica</u>  | 14,508      | --    | --   |
| <u>M. islandica</u>  | 14,508      | --    | --   |
| <u>Thalassiosira nordenskiöldii</u>                                | --          | 10    | 60   |
| <u>T. oestrupii</u>  | --          | 20    | 10   |
| Unidentified   | 7,254       | --    | --   |
| Pennales   | 2,861,703   | 6,490 | 660  |
| <u>Achnanthes taeniata</u>   | 192,231     | 1,490 | 80   |
| <u>Amphiprora kjellmanii</u>                                       | 21,762      | --    | --   |
| <u>Amphora laevis</u> var. <u>laevissima</u>                       | 14,508      | --    | 20   |
| <u>A. macilenta</u>  | 7,254       | --    | --   |
| <u>A. terroris</u>   | --          | --    | 10   |
| <u>Asterionella formosa</u>  | 7,254       | --    | --   |
| <u>Cylindrotheca closterium</u>                                    | --          | 10    | --   |
| <u>Diploneis litoralis</u>   | 14,508      | --    | --   |
| <u>Eunotia divisa</u>  | --          | --    | 10   |
| <u>Fragilaria bicapitata</u>                                       | 25,389      | --    | 20   |
| <u>Fragilariopsis nana</u>   | 184,977     | 1,440 | --   |
| <u>Gomphonema</u> sp.  | --          | --    | 30   |
| <u>G. augur</u>  | --          | --    | 20   |
| <u>G. gracile</u>  | 14,508      | --    | 20   |
| <u>Navicula cancellata</u>   | 3,627       | --    | 20   |
| <u>N. crassirostris</u>  | --          | --    | 10   |
| <u>N. cryptocephala</u>  | 21,762      | 20    | 30   |
| <u>N. directa</u>  | 3,627       | --    | --   |
| <u>N. gastrum</u>  | 7,254       | --    | --   |
| <u>N. granii</u>   | 134,199     | 130   | --   |
| <u>N. lineola</u>  | --          | --    | 10   |
| <u>N. peregrina</u>  | 3,627       | --    | --   |
| <u>N. perlucens</u>  | 14,508      | --    | --   |
| <u>N. transitans</u> var. <u>derasa</u>                            | 3,627       | 10    | --   |

Table 6. (Continued)

| Sample type                                   | Ice core<br>bottom 3 cm | Water |     |
|---|-------------------------|-------|-----|
|   |                         | 0 m   | 6 m |
| <u>N. vanhoeffenii</u>                        | 315,549                 | --    | 20  |
| <u>Nitzschia acicularis</u>                   | 43,524                  | 10    | 20  |
| <u>N. cylindrus</u>                           | 36,270                  | 160   | 10  |
| <u>N. delicatissima</u>                       | 61,659                  | 10    | --  |
| <u>N. frigida</u>                             | 123,318                 | 230   | 10  |
| <u>N. frustulum</u>                           | 61,659                  | --    | 50  |
| <u>N. frustulum</u> var. <u>perpusilla</u>    | 21,762                  | 60    | 20  |
| <u>N. grunowii</u>                            | 805,194                 | 2,890 | 150 |
| <u>N. linearis</u>                            | 3,627                   | 10    | 80  |
| <u>N. lineata</u>                             | 145,080                 | --    | --  |
| <u>N. marginulata</u>                         | 7,254                   | --    | --  |
| <u>N. seriata</u>                             | 21,762                  | --    | --  |
| <u>N. tergestina</u>                          | --                      | --    | 10  |
| <u>Pinnularia quadratarea</u>                 | 18,135                  | --    | --  |
| <u>P. quadratarea</u> var. <u>bicontracta</u> | 3,627                   | --    | 10  |
| <u>Stauroneis septentrionalis</u>             | 141,453                 | --    | --  |
| <u>Tabellaria flocculosa</u>                  | --                      | 20    | --  |
| <u>Thalassionema nitzschioides</u>            | 377,208                 | --    | --  |
| Chlorophyta                                   | 181,350                 | 480   | 30  |
| <u>Carteria depressa</u>                      | --                      | 10    | --  |
| <u>Chlamydomonas</u> sp.                      | --                      | 190   | 20  |
| <u>C. cysts</u>                               | 18,135                  | --    | --  |
| <u>C. tetraolaris</u>                         | 36,270                  | 170   | 10  |
| <u>Dunaliella parva</u>                       | 123,318                 | 110   | --  |
| <u>Micrasterias</u> sp.                       | 3,627                   | --    | --  |
| Chrysophyta                                   | 10,881                  | 70    | --  |
| <u>Coccolithus</u> sp.                        | --                      | 40    | --  |
| <u>Dinobryon cylindricum</u>                  | 3,627                   | --    | --  |
| Unidentified                                  | 7,254                   | 30    | --  |
| Euglenophyta                                  | 32,643                  | 40    | --  |
| <u>Euglena proxima</u>                        | 3,627                   | 10    | --  |
| <u>E. schmitzii</u>                           | 25,389                  | 20    | --  |
| <u>E. viridis</u>                             | 3,627                   | 10    | --  |
| Pyrrophyta                                    | 14,508                  | 1,680 | 30  |
| <u>Coolia monotis</u>                         | --                      | 20    | --  |
| <u>Dinophysis arctica</u>                     | --                      | 10    | --  |
| <u>Glenodinium</u> sp.                        | --                      | 130   | 20  |
| <u>Goniaulax</u> sp.                          | --                      | 50    | --  |
| <u>G. catenata</u>                            | 14,508                  | 1,370 | --  |
| <u>Gymnodinium lohmanni</u>                   | --                      | 20    | --  |
| <u>Gyrodinium spirale</u>                     | --                      | 20    | --  |

Table 6. (Continued)

| Sample type                  | Ice core<br>bottom 3 cm | Water |     |
|------------------------------|-------------------------|-------|-----|
|                              |                         | 0 m   | 6 m |
| <u>Oxytoxum</u> sp.          | --                      | 20    | --  |
| <u>Polykrikos schwartzii</u> | --                      | 30    | --  |
| <u>Prorocentrum micans</u>   | --                      | --    | 10  |
| <u>P. rampii</u>             | --                      | 10    | --  |



Table 7. Quantitative composition and vertical distribution of sea ice microalgae and phytoplankton in the underlying water with related environmental parameters in Hudson Bay at station 223, April 28, 1983.

| Station depth (m)  | 86          |       |       |
|--|-------------|-------|-------|
| Sea ice thickness (cm)   | 118         |       |       |
| Sample type  | Ice core    | Water |       |
|  | bottom 3 cm | 0 m   | 4 m   |
| Temperature (°C)   | -1          | -1.0  | -1.5  |
| Salinity (‰)   | 27          | 27.4  | 27.6  |
| Total sea ice microalgae or phytoplankton (cells·L <sup>-1</sup> ) | 27,493,906  | 1,300 | 1,130 |
| <u>Bacillariophyta</u>   | 26,977,346  | 1,200 | 850   |
| Centrales  | 787,754     | 150   | 140   |
| <u>Chaetoceros borealis</u>  | 116,226     | --    | --    |
| <u>C. fragilis</u>   | --          | --    | 20    |
| <u>C. septentrionalis</u>  | 503,646     | --    | --    |
| <u>Coscinodiscus sp.</u>   | 12,914      | --    | --    |
| <u>C. lacustris var. septentrionalis</u>                           | 12,914      | --    | --    |
| <u>Cyclotella striata</u>  | --          | 30    | --    |
| <u>Eucampia groenlandica</u>                                       | 142,054     | --    | 10    |
| <u>Skeletonema costatum</u>  | --          | 110   | 50    |
| <u>Thalassiosira nordenskioeldii</u>                               | --          | --    | 60    |
| <u>T. oestrupii</u>  | --          | 10    | --    |
| Pennales   | 26,189,592  | 1,050 | 710   |
| <u>Amphiprora alata</u>  | 25,828      | --    | 10    |
| <u>A. concilians</u>   | 12,914      | --    | --    |
| <u>A. kjellmanii</u>   | 142,054     | --    | --    |
| <u>Amphora laevis var. laevissima</u>                              | 51,656      | 10    | --    |
| <u>A. laevis var. minuta</u>                                       | 103,312     | --    | --    |
| <u>A. macilenta</u>  | 12,914      | --    | --    |
| <u>A. terroris</u>   | 25,828      | --    | --    |
| <u>Asterionella formosa</u>  | --          | 10    | 20    |
| <u>Bacillaria paradoxa</u>   | 116,226     | --    | --    |
| <u>Cylindrotheca closterium</u>                                    | 77,484      | 10    | --    |
| <u>Diploneis litoralis</u>   | 64,570      | --    | --    |
| <u>Eunotia arcus</u>   | 25,828      | --    | --    |
| <u>Fragilaria pinnata</u>  | --          | 30    | --    |
| <u>Fragilariopsis nana</u>   | 297,022     | --    | --    |
| <u>Gomphonema sp.</u>  | 103,312     | 10    | 40    |
| <u>G. augur</u>  | 64,570      | --    | 30    |
| <u>G. exiguum var. pachycladum</u>                                 | 219,538     | 10    | --    |
| <u>G. gracile</u>  | 555,302     | 20    | --    |
| <u>Navicula crucigeroides</u>                                      | 12,914      | --    | --    |
| <u>N. cryptocephala</u>  | --          | 10    | --    |
| <u>N. directa</u>  | 64,570      | --    | --    |
| <u>N. directa var. subtilis</u>                                    | 12,914      | --    | 20    |
| <u>N. gastrum</u>  | 25,828      | --    | --    |
| <u>N. granii</u>   | 25,828      | --    | --    |

Table 7. (Continued)

| Sample type                                | Ice core<br>bottom 3 cm | Water |     |
|--|-------------------------|-------|-----|
|  |                         | 0 m   | 4 m |
| <u>N. lanceolata</u>                       | 12,914                  | --    | --  |
| <u>N. latissima</u>                        | 25,828                  | --    | --  |
| <u>N. minima</u>                           | --                      | --    | 30  |
| <u>N. perlucens</u>                        | --                      | 30    | 10  |
| <u>N. transitans</u>                       | 38,742                  | --    | --  |
| <u>N. transitans</u> var. <u>derasa</u>    | 51,656                  | --    | --  |
| <u>N. vanhoeffenii</u>                     | 5,888,784               | 40    | 40  |
| <u>Nedium affine</u>                       | 51,656                  | --    | --  |
| <u>Nitzschia acicularis</u>                | 51,656                  | --    | 10  |
| <u>N. angularis</u> var. <u>kariana</u>    | --                      | --    | 30  |
| <u>N. cylindrus</u>                        | --                      | 20    | 20  |
| <u>N. delicatissima</u>                    | --                      | --    | 30  |
| <u>N. fluminensis</u>                      | 38,742                  | --    | --  |
| <u>N. frigida</u>                          | 9,827,554               | 160   | 40  |
| <u>N. frustulum</u>                        | 503,646                 | 20    | 20  |
| <u>N. frustulum</u> var. <u>perpusilla</u> | 787,754                 | 20    | 40  |
| <u>N. grunowii</u>                         | 4,132,480               | 380   | 110 |
| <u>N. linearis</u>                         | 1,291,400               | 170   | 140 |
| <u>N. lineata</u>                          | 193,710                 | --    | --  |
| <u>N. marginulata</u>                      | 25,828                  | --    | --  |
| <u>N. seriata</u>                          | 309,936                 | 90    | 20  |
| <u>N. sigma</u>                            | 51,656                  | --    | --  |
| <u>N. tergestina</u>                       | --                      | --    | 30  |
| <u>Pinnularia quadratarea</u>              | 103,312                 | 10    | 20  |
| <u>Pseudonitzschia delicatissima</u>       | 258,280                 | --    | --  |
| <u>Thalassionema nitzschioides</u>         | 503,646                 | --    | --  |
| Chlorophyta                                | 219,538                 | 50    | 170 |
| <u>Chlamydomonas ballenyana</u>            | 90,398                  | --    | --  |
| <u>C. cysts</u>                            | --                      | 40    | 110 |
| <u>C. sp.</u>                              | --                      | --    | 60  |
| <u>Dunaliella parva</u>                    | 103,312                 | 10    | --  |
| <u>Thalassomonas sp.</u>                   | 25,828                  | --    | --  |
| Chrysophyta                                | --                      | --    | 20  |
| <u>Dinobryon balticum</u>                  | --                      | --    | 10  |
| <u>D. cylindricum</u>                      | --                      | --    | 10  |
| Euglenophyta                               | 25,828                  | --    | --  |
| <u>Euglena proxima</u>                     | 12,914                  | --    | --  |
| <u>E. schmitzii</u>                        | 12,914                  | --    | --  |
| Pyrrophyta                                 | 271,194                 | 50    | 90  |
| <u>Dinophysis acuminata</u>                | --                      | --    | 20  |
| <u>D. arctica</u>                          | --                      | --    | 10  |

Table 7. (Continued)

| Sample type               | Ice core<br>bottom 3 cm | Water |     |
|---------------------------|-------------------------|-------|-----|
|                           |                         | 0 m   | 4 m |
| <u>Glenodinium</u> sp.    | 25,828                  | 30    | 20  |
| <u>Goniaulax monilata</u> | 38,742                  | 10    | --  |
| <u>G. scrippsae</u>       | --                      | 10    | --  |
| <u>Gymnodinium</u> sp.    | 25,828                  | --    | --  |
| <u>G. lohmanni</u>        | --                      | --    | 10  |
| <u>Gyrodinium spirale</u> | 12,914                  | --    | --  |
| <u>Oxytoxum</u> sp.       | 12,914                  | --    | 10  |
| <u>Peridinium</u> sp.     | --                      | --    | 10  |
| <u>Prorocentrum</u> sp.   | 12,914                  | --    | --  |
| <u>P. maximum</u>         | 64,570                  | --    | --  |
| <u>P. micans</u>          | --                      | --    | 10  |
| <u>P. rampii</u>          | 77,484                  | --    | --  |

Table 8. Quantitative composition and vertical distribution of sea ice microalgae and phytoplankton in the underlying water with related environmental parameters in Hudson Bay at station 234, April 28, 1983.

| Station depth (m)  | 125         |       |       |
|--|-------------|-------|-------|
| Sea ice thickness (cm)   | 84          |       |       |
| Sample type  | Ice core    | Water |       |
|  | bottom 3 cm | 0 m   | 4 m   |
| Temperature (°C)   | -1          | -1.0  | -1.5  |
| Salinity (‰)   | 27          | 27.2  | 27.3  |
| Total sea ice microalgae or phytoplankton (cells·L <sup>-1</sup> ) | 7,393,265   | 1,420 | 1,060 |
| Bacillariophyta  | 7,270,582   | 1,330 | 960   |
| Centrales  | 6,457       | 50    | 10    |
| <u>Cyclotella striata</u>  | 6,457       | --    | 10    |
| <u>Eucampia groenlandica</u>                                       | --          | 10    | --    |
| <u>Thalassiosira nordenskiöldii</u>                                | --          | 40    | --    |
| Pennales   | 7,264,125   | 1,280 | 950   |
| <u>Achnanthes taeniata</u>   | 225,995     | --    | 10    |
| <u>Amphiprora alata</u>  | --          | --    | 10    |
| <u>A. kjellmanii</u>   | 12,914      | 20    | 20    |
| <u>A. kjellmanii</u> var. <u>kariana</u>                           | 6,457       | --    | --    |
| <u>Amphora laevis</u> var. <u>laevissima</u>                       | 12,914      | 10    | --    |
| <u>Asterionella formosa</u>  | --          | --    | 10    |
| <u>Bacillaria paradoxa</u>   | 38,742      | 10    | --    |
| <u>Cylindrotheca closterium</u>                                    | 523,017     | 10    | 10    |
| <u>Diploneis litoralis</u>   | 6,457       | --    | --    |
| <u>Eunotia divisa</u>  | --          | 20    | 20    |
| <u>Fragilaria bicapitata</u>                                       | 19,371      | --    | --    |
| <u>Fragilariopsis nana</u>   | --          | 210   | --    |
| <u>Gomphonema</u> sp.  | --          | 10    | 40    |
| <u>G. augur</u>  | 6,457       | --    | 10    |
| <u>G. exiguum</u> var. <u>pachycladum</u>                          | --          | 10    | --    |
| <u>Navicula cancellata</u>   | 6,457       | --    | 10    |
| <u>N. crassirostris</u>  | --          | --    | 10    |
| <u>N. crucigeroides</u>  | --          | --    | 10    |
| <u>N. cryptocephala</u>  | 64,570      | 40    | --    |
| <u>N. directa</u>  | 6,457       | 20    | --    |
| <u>N. gastrum</u>  | 12,914      | --    | --    |
| <u>N. granii</u>   | 19,371      | 80    | --    |
| <u>N. lineola</u>  | 32,285      | --    | --    |
| <u>N. perlucens</u>  | --          | 20    | --    |
| <u>N. transitans</u>   | 32,285      | --    | --    |
| <u>N. transitans</u> var. <u>derasa</u>                            | 6,457       | --    | --    |
| <u>N. vanhoeffenii</u>   | 6,457       | 20    | --    |
| <u>Nitzschia acicularis</u>  | 45,199      | 20    | --    |
| <u>N. angularis</u> var. <u>kariana</u>                            | --          | 20    | --    |
| <u>N. cylindrus</u>  | 368,049     | --    | --    |
| <u>N. delicatissima</u>  | 129,140     | --    | --    |

Table 8. (Continued)

| Sample type                                | Ice core<br>bottom 3 cm | Water |     |
|--|-------------------------|-------|-----|
|  |                         | 0 m   | 4 m |
| <u>N. frigida</u>                          | 1,117,061               | 350   | 370 |
| <u>N. frustulum</u>                        | 12,914                  | 70    | 40  |
| <u>N. frustulum</u> var. <u>perpusilla</u> | 6,457                   | 50    | 70  |
| <u>N. grunowii</u>                         | 3,803,173               | --    | 190 |
| <u>N. linearis</u>                         | 284,108                 | 250   | 120 |
| <u>N. marginulata</u>                      | 6,457                   | --    | --  |
| <u>N. seriata</u>                          | 19,371                  | --    | --  |
| <u>N. tergestina</u>                       | --                      | 40    | --  |
| <u>Pinnularia quadratarea</u>              | 6,457                   | --    | --  |
| <u>Stauroneis quadripedis</u>              | 245,366                 | --    | --  |
| <u>Surirella striatula</u>                 | 116,226                 | --    | --  |
| <u>Synedra parasitica</u>                  | 64,570                  | --    | --  |
| Chlorophyta                                | 45,199                  | 10    | 60  |
| <u>Chlamydomonas</u> sp.                   | 12,914                  | 10    | 50  |
| <u>C. cysts</u>                            | --                      | --    | 10  |
| <u>C. ballenyana</u>                       | --                      | --    | --  |
| <u>C. tetraolaris</u>                      | 6,457                   | --    | --  |
| <u>Dunaliella parva</u>                    | 25,828                  | --    | --  |
| Chrysophyta                                | --                      | --    | 10  |
| <u>Distephanus speculum</u>                | --                      | --    | 10  |
| Euglenophyta                               | 12,914                  | --    | --  |
| <u>Euglena schmitzii</u>                   | 12,914                  | --    | --  |
| Pyrrophyta                                 | 64,570                  | 80    | 30  |
| <u>Dinophysis acuminata</u>                | --                      | 10    | --  |
| <u>Glenodinium</u> sp.                     | 32,285                  | 30    | 10  |
| <u>Goniaulax</u> sp.                       | --                      | 20    | --  |
| <u>G. scrippsae</u>                        | 6,457                   | --    | --  |
| <u>Gymnodinium lohmanni</u>                | --                      | 10    | --  |
| <u>Gyrodinium spirale</u>                  | 6,457                   | --    | 10  |
| <u>Peridinium punctulatum</u>              | 6,457                   | --    | 10  |
| <u>Prorocentrum</u> sp.                    | 6,457                   | --    | --  |
| <u>P. micans</u>                           | --                      | 10    | --  |
| <u>P. rampii</u>                           | 6,457                   | --    | --  |

Table 9. Quantitative composition and vertical distribution of sea ice microalgae and phytoplankton in the underlying water with related environmental parameters in Hudson Bay at station 242, April 28, 1983.

| Station depth (m)  | 67       |      |                |
|--|----------|------|----------------|
| Sea ice thickness (cm)   | 130      |      |                |
| Sample type  | Ice core |      | Water          |
|  | bottom   | 3 cm | 0 m      5 m   |
| Temperature (°C)   | 2        |      | -0.1      -1.5 |
| Salinity (‰)   | 2        |      | 1.9      26.6  |
| Total sea ice microalgae or phytoplankton (cells·L <sup>-1</sup> ) | 19,600   |      | 1,510      600 |
| <hr/>  |          |      |                |
| Bacillariophyta  | 10,080   |      | 290      440   |
| Centrales  | 160      |      | 30      30     |
| <u>Chaetoceros septentrionalis</u>                                 | --       |      | --      10     |
| <u>Thalassiosira nordenskiöldii</u>                                | 40       |      | --      20     |
| <u>T. oestrupii</u>  | --       |      | 30      --     |
| <u>T. sp.</u>  | 120      |      | --      --     |
| Pennales   | 9,920    |      | 260      410   |
| <u>Asterionella formosa</u>  | --       |      | --      20     |
| <u>A. gracillima</u>   | 6,360    |      | 30      --     |
| <u>Cylindrotheca closterium</u>                                    | 40       |      | --      --     |
| <u>Diploneis litoralis</u>   | 40       |      | --      10     |
| <u>Eunotia arcus</u>   | 440      |      | --      --     |
| <u>E. divisa</u>   | --       |      | 10      --     |
| <u>Fragilaria bicapitata</u>                                       | 120      |      | --      10     |
| <u>F. striatula</u>  | 1,240    |      | --      --     |
| <u>Navicula apiculata</u>  | --       |      | 10      --     |
| <u>N. granii</u>   | 80       |      | --      --     |
| <u>N. lineola</u>  | --       |      | --      20     |
| <u>N. perlucens</u>  | --       |      | --      10     |
| <u>N. vanhoeffenii</u>   | 120      |      | --      50     |
| <u>Nedium affine</u>   | --       |      | 10      --     |
| <u>Nitzschia acicularis</u>  | --       |      | --      10     |
| <u>N. cylindrus</u>  | 360      |      | 50      30     |
| <u>N. frigida</u>  | --       |      | --      110    |
| <u>N. frustulum</u>  | --       |      | --      80     |
| <u>N. frustulum var. perpusilla</u>                                | --       |      | 20      10     |
| <u>N. grunowii</u>   | 160      |      | 110      10    |
| <u>N. linearis</u>   | --       |      | --      30     |
| <u>Pinnularia quadratarea</u>                                      | --       |      | --      10     |
| <u>Stauroneis septentrionalis</u>                                  | 960      |      | --      --     |
| <u>Thalassionema nitzschioides</u>                                 | --       |      | 20      --     |
| <hr/>  |          |      |                |
| Chlorophyta  | 8,520    |      | 490      40    |
| <u>Carteria depressa</u>   | 320      |      | --      --     |
| <u>Chlamydomonas ballenyana</u>                                    | 240      |      | --      --     |
| <u>C. sp.</u>  | --       |      | 120      10    |
| <u>C. cysts</u>  | 1,400    |      | --      --     |

Table 9. (Continued)

| Sample type                  | Ice core<br>bottom 3 cm | Water |     |
|------------------------------|-------------------------|-------|-----|
|                              |                         | 0 m   | 5 m |
| <u>C. tetraolaris</u>        | 5,480                   | 270   | 30  |
| <u>Closterium</u> sp.        | 40                      | --    | --  |
| <u>Dunaliella parva</u>      | 1,040                   | 90    | --  |
| <u>Thalassomonas</u> sp.     | --                      | 10    | --  |
| Chrysophyta                  | 80                      | 90    | 30  |
| <u>Coccolithus huxleyi</u>   | --                      | --    | 10  |
| <u>Dinobryon cylindricum</u> | --                      | 10    | 20  |
| <u>Phaeocystis pouchetii</u> | 40                      | --    | --  |
| Unidentified                 | 40                      | 80    | --  |
| Euglenophyta                 | 320                     | --    | 10  |
| <u>Euglena proxima</u>       | 240                     | --    | --  |
| <u>E. schmitzii</u>          | 80                      | --    | 10  |
| Pyrrophyta                   | 600                     | 640   | 80  |
| <u>Coolia monotis</u>        | 40                      | --    | --  |
| <u>Dinophysis acuminata</u>  | 40                      | --    | 30  |
| <u>Glenodinium</u> sp.       | 200                     | 170   | 30  |
| <u>Goniaulax</u> sp.         | --                      | 10    | --  |
| <u>G. catenata</u>           | --                      | 340   | --  |
| <u>G. monilata</u>           | 80                      | 20    | --  |
| <u>G. tamarensis</u>         | --                      | 20    | --  |
| <u>Gyrodinium spirale</u>    | 40                      | --    | --  |
| <u>Ornithocercus</u> sp.     | 40                      | --    | --  |
| <u>Oxytoxum</u> sp.          | --                      | 30    | --  |
| <u>Peridinium</u> sp.        | --                      | 40    | --  |
| <u>P. punctulatum</u>        | --                      | --    | 10  |
| <u>Prorocentrum</u> sp.      | 160                     | --    | --  |
| <u>P. micans</u>             | --                      | --    | 10  |
| <u>P. rampii</u>             | --                      | 10    | --  |

Table 10. Quantitative composition and vertical distribution of sea ice microalgae and phytoplankton in the underlying water with related environmental parameters in Hudson Bay at station 253, April 28, 1983.

| Station depth (m)  | 100         |       |
|--|-------------|-------|
| Sea ice thickness (cm)   | 120         |       |
| Sample type  | Ice core    | Water |
|  | bottom 3 cm | 0 m   |
| Temperature (°C)   | -1          | -1.5  |
| Salinity (‰)   | 27          | 26.9  |
| Total sea ice microalgae or phytoplankton (cells·L <sup>-1</sup> ) | 72,661,648  | 1,583 |
| <u>Bacillariophyta</u>   | 72,080,527  | 1,535 |
| Centrales  | 602,644     | 36    |
| <u>Chaetoceros decipiens</u>                                       | 64,569      | --    |
| <u>C. holsaticus</u>   | 43,046      | --    |
| <u>C. septentrionalis</u>  | 344,368     | 12    |
| <u>Cyclotella striata</u>  | 129,138     | --    |
| <u>Melosira arctica</u>  | 21,523      | --    |
| <u>Thalassiosira nordenskiöldii</u>                                | --          | 12    |
| <u>T. oestrupii</u>  | --          | 12    |
| Pennales   | 71,477,883  | 1,499 |
| <u>Achnanthes taeniata</u>   | 2,475,145   | --    |
| <u>Amphiprora alata</u>  | 86,092      | --    |
| <u>A. concilians</u>   | 64,569      | 12    |
| <u>A. kjellmanii</u>   | 301,322     | 35    |
| <u>A. kjellmanii</u> var. <u>kariana</u>                           | 516,552     | --    |
| <u>Amphora laevis</u> var. <u>laevissima</u>                       | --          | 47    |
| <u>A. laevis</u> var. <u>minuta</u>                                | 86,092      | --    |
| <u>Cylindrotheca closterium</u>                                    | 258,276     | --    |
| <u>Diploneis litoralis</u>   | 86,092      | --    |
| <u>Fragilaria islandica</u>  | 172,184     | --    |
| <u>Gomphonema</u> sp.  | 193,707     | 59    |
| <u>G. augur</u>  | 688,736     | 24    |
| <u>G. exiguum</u> var. <u>pachycladum</u>                          | 581,121     | 24    |
| <u>G. gracile</u>  | 21,523      | --    |
| <u>Hantzschia vivax</u>  | --          | 12    |
| <u>Navicula algida</u>   | 21,523      | 12    |
| <u>N. crassirostris</u>  | --          | 12    |
| <u>N. crucigeroides</u>  | 21,523      | --    |
| <u>N. cryptocephala</u>  | --          | 12    |
| <u>N. directa</u>  | 86,092      | 35    |
| <u>N. forcipata</u>  | 21,523      | --    |
| <u>N. gelida</u>   | 21,523      | --    |
| <u>N. kariana</u> var. <u>frigida</u>                              | --          | 35    |
| <u>N. minima</u>   | --          | 12    |
| <u>N. peregrina</u>  | 64,569      | --    |
| <u>N. transitans</u>   | 21,523      | --    |
| <u>N. transitans</u> var. <u>derasa</u>                            | 43,046      | --    |



Table 10. (Continued)

| Sample type                                   | Ice core<br>bottom 3 cm | Water<br>0 m |
|---|-------------------------|--------------|
| <u>N. trigonocephala</u> var. <u>depressa</u> | 21,523                  | --           |
| <u>N. vanhoeffenii</u>                        | 796,351                 | 12           |
| <u>Nitzschia acicularis</u>                   | 21,523                  | 35           |
| <u>N. angularis</u> var. <u>kariana</u>       | 301,322                 | --           |
| <u>N. cylindrus</u>                           | 473,506                 | --           |
| <u>N. delicatissima</u>                       | 258,276                 | 12           |
| <u>N. distans</u>                             | 21,523                  | --           |
| <u>N. frigida</u>                             | 38,160,279              | 295          |
| <u>N. frustulum</u>                           | --                      | 59           |
| <u>N. frustulum</u> var. <u>perpusilla</u>    | 129,138                 | 153          |
| <u>N. grunowii</u>                            | 19,585,930              | 35           |
| <u>N. linearis</u>                            | 4,842,675               | 118          |
| <u>N. lineata</u>                             | --                      | 401          |
| <u>N. seriata</u>                             | 387,414                 | --           |
| <u>N. sigma</u>                               | 43,046                  | --           |
| <u>Pinnularia borealis</u>                    | --                      | 12           |
| <u>P. quadratarea</u>                         | 86,092                  | 12           |
| <u>P. quadratarea</u> var. <u>bicontracta</u> | 21,523                  | --           |
| <u>P. quadratarea</u> var. <u>bicuneata</u>   | 258,276                 | --           |
| <u>Pleurosigma marinum</u>                    | 43,046                  | --           |
| <u>Synedra parasitica</u>                     | 193,707                 | --           |
| <u>S. pulchella</u>                           | --                      | 12           |
| <u>Thalassionema nitzschioides</u>            | --                      | 12           |
| Chlorophyta                                   | 451,983                 | 24           |
| <u>Chlamydomonas</u> sp.                      | --                      | 12           |
| <u>C. ballenyana</u>                          | 86,092                  | --           |
| <u>C. cysts</u>                               | 21,523                  | --           |
| <u>C. tetraolaris</u>                         | 21,523                  | 12           |
| <u>Dunaliella parva</u>                       | 322,845                 | --           |
| Chrysophyta                                   | 43,046                  | --           |
| <u>Phaeocystis pouchetii</u>                  | 21,523                  | --           |
| Unidentified                                  | 21,523                  | --           |
| Euglenophyta                                  | 21,523                  | --           |
| <u>Euglena schmitzii</u>                      | 21,523                  | --           |
| Pyrrophyta                                    | 64,569                  | 24           |
| <u>Coolia monotis</u>                         | 21,523                  | --           |
| <u>Goniaulax catenata</u>                     | --                      | 12           |
| <u>Gyrodinium spirale</u>                     | --                      | 12           |
| <u>Peridinium</u> sp.                         | 21,523                  | --           |
| <u>Prorocentrum micans</u>                    | 21,523                  | --           |

Table 11. Quantitative composition and vertical distribution of sea ice microalgae and phytoplankton in the underlying water with related environmental parameters in Hudson Bay at station 262, April 28, 1983.

| Station depth (m)  | 70          |        |       |
|--|-------------|--------|-------|
|  | 112         |        |       |
| Sea ice thickness (cm)   |             |        |       |
| Sample type  | Ice core    | Water  |       |
|  | bottom 3 cm | 0 m    | 3 m   |
| Temperature (°C)   | -1          | -1.0   | -1.4  |
| Salinity (‰)   | 18          | 18.0   | 25.9  |
| Total sea ice microalgae or phytoplankton (cells·L <sup>-1</sup> ) | 26,719,066  | 18,720 | 2,340 |
| Bacillariophyta  | 26,383,302  | 8,220  | 750   |
| Centrales  | 2,750,682   | 150    | 60    |
| <u>Chaetoceros decipiens</u>                                       | 38,742      | --     | --    |
| <u>C. septentrionalis</u>  | 787,754     | 40     | --    |
| <u>C. teres</u>  | --          | 10     | --    |
| <u>Coscinodiscus excentricus</u>                                   | --          | 10     | --    |
| <u>Cyclotella striata</u>  | 12,914      | --     | --    |
| <u>Eucampia groenlandica</u>                                       | --          | 10     | --    |
| <u>Melosira arctica</u>  | --          | 50     | 40    |
| <u>M. distans</u>  | 1,911,272   | --     | --    |
| <u>Thalassiosira decipiens</u>                                     | --          | 30     | 20    |
| Pennales   | 23,632,620  | 8,070  | 690   |
| <u>Achnanthes taeniata</u>   | 322,850     | --     | 40    |
| <u>Amphiprora alata</u>  | 103,312     | --     | 10    |
| <u>A. concilians</u>   | --          | 10     | --    |
| <u>A. kjellmanii</u>   | 154,968     | 70     | --    |
| <u>A. kjellmanii</u> var. <u>kariana</u>                           | 1,071,862   | --     | --    |
| <u>Amphora laevis</u> var. <u>laevissima</u>                       | --          | 20     | --    |
| <u>A. laevis</u> var. <u>minuta</u>                                | 25,828      | --     | --    |
| <u>Asterionella formosa</u>  | --          | --     | 30    |
| <u>Bacillaria paradoxa</u>   | --          | 10     | --    |
| <u>Cylindrotheca closterium</u>                                    | 38,742      | 10     | 10    |
| <u>Diploneis litoralis</u>   | 38,742      | 10     | 10    |
| <u>Fragilaria islandica</u>  | 1,149,346   | --     | --    |
| <u>Fragilariopsis nana</u>   | 697,356     | 870    | --    |
| <u>Gomphonema</u> sp.  | 38,742      | 110    | --    |
| <u>G. augur</u>  | 245,366     | 10     | 10    |
| <u>G. exiguum</u> var. <u>pachycladum</u>                          | 142,054     | 10     | 10    |
| <u>G. gracile</u>  | 232,452     | 10     | --    |
| <u>Navicula crucigeroides</u>                                      | --          | 10     | --    |
| <u>N. cryptocephala</u>  | 90,398      | 10     | 10    |
| <u>N. directa</u>  | 90,398      | 30     | --    |
| <u>N. gastrum</u>  | --          | 20     | --    |
| <u>N. peregrina</u>  | 25,828      | --     | --    |
| <u>N. perlucens</u>  | 12,914      | --     | --    |
| <u>N. transitans</u> var. <u>derasa</u>                            | 12,914      | 30     | --    |
| <u>N. vanhoeffenii</u>   | 5,578,848   | 150    | 170   |

Table 11. (Continued)

| Sample type                                   | Ice core<br>bottom 3 cm | Water |       |
|---|-------------------------|-------|-------|
|   |                         | 0 m   | 3 m   |
| <u>Nitzschia</u> sp.                          | 426,162                 | --    | --    |
| <u>N. acicularis</u>                          | 12,914                  | 180   | 20    |
| <u>N. angularis</u> var. <u>kariana</u>       | 38,742                  | --    | --    |
| <u>N. cylindrus</u>                           | 116,226                 | --    | 10    |
| <u>N. delicatissima</u>                       | 348,678                 | --    | --    |
| <u>N. frigida</u>                             | 3,861,286               | 1,440 | 130   |
| <u>N. frustulum</u>                           | 348,678                 | 250   | 20    |
| <u>N. frustulum</u> var. <u>perpusilla</u>    | 594,044                 | 250   | 60    |
| <u>N. grunowii</u>                            | 2,879,822               | 3,900 | 50    |
| <u>N. linearis</u>                            | 4,171,222               | 340   | 30    |
| <u>N. lineata</u>                             | 464,904                 | --    | --    |
| <u>N. marginulata</u>                         | --                      | 20    | --    |
| <u>Pinnularia quadratarea</u>                 | 180,796                 | --    | --    |
| <u>P. quadratarea</u> var. <u>bicontracta</u> | 64,570                  | --    | --    |
| <u>P. quadratarea</u> var. <u>capitata</u>    | --                      | --    | 10    |
| <u>Stauroneis septentrionalis</u>             | --                      | 300   | --    |
| <u>Synedra parasitica</u>                     | 51,656                  | --    | --    |
| Chlorophyta                                   | 154,968                 | 220   | --    |
| <u>Chlamydomonas</u> sp.                      | --                      | 220   | 30    |
| <u>C. ballenyana</u>                          | 38,742                  | --    | --    |
| <u>C. cysts</u>                               | --                      | --    | 10    |
| <u>C. tetraolaris</u>                         | 38,742                  | --    | --    |
| <u>Dunaliella parva</u>                       | 77,484                  | --    | 10    |
| <u>D. salina</u>                              | --                      | --    | 10    |
| Chrysophyta                                   | 12,914                  | 340   | 50    |
| <u>Phaeocystis pouchetii</u>                  | 12,914                  | 190   | 30    |
| Unidentified                                  | --                      | 150   | 20    |
| Euglenophyta                                  | 12,914                  | 10    | --    |
| <u>Euglena proxima</u>                        | --                      | 10    | --    |
| <u>E. schmitzii</u>                           | 12,914                  | --    | --    |
| Pyrrophyta                                    | 154,968                 | 9,930 | 1,540 |
| <u>Dinophysis arctica</u>                     | 38,742                  | 20    | 10    |
| <u>Glenodinium</u> sp.                        | 64,570                  | 20    | 10    |
| <u>Goniaulax catenata</u>                     | 12,914                  | 9,510 | 1,450 |
| <u>G. scrippsae</u>                           | 25,828                  | 40    | 10    |
| <u>Gymnodinium lohmanni</u>                   | --                      | 80    | --    |
| <u>Gyrodinium spirale</u>                     | --                      | 10    | --    |
| <u>Oxytoxum</u> sp.                           | --                      | 40    | --    |
| <u>Peridinium minusculum</u>                  | --                      | 150   | 30    |
| <u>P. punctulatum</u>                         | --                      | 60    | 10    |
| <u>Polykrikos schwartzii</u>                  | --                      | --    | 10    |

Table 11. (Continued)

| Sample type                 | Ice core    | Water |     |
|-----------------------------|-------------|-------|-----|
|                             | bottom 3 cm | 0 m   | 3 m |
| <u>Prorocentrum maximum</u> | --          | --    | 10  |
| <u>P. rampii</u>            | 12,914      | --    | --  |

Table 12. Quantitative composition and vertical distribution of sea ice microalgae and phytoplankton in the underlying water with related environmental parameters in Hudson Bay at station 302, April 28, 1983.

| Station depth (m)  | 93          |       |      |
|--|-------------|-------|------|
|  | 114         |       |      |
| Sea ice thickness (cm)   |             |       |      |
| Sample type  | Ice core    | Water |      |
|  | bottom 1 cm | 0 m   | 6 m  |
| Temperature (°C)   | 0           | 0.0   | -1.5 |
| Salinity (‰)   | 1           | 1.0   | 27.4 |
| Total sea ice microalgae or phytoplankton (cells·L <sup>-1</sup> ) | 85,600      | 3,704 | 200  |
| Bacillariophyta  | 23,800      | 242   | 170  |
| Centrales  | 600         | 10    | 20   |
| <u>Chaetoceros decipiens</u>                                       | 200         | --    | --   |
| <u>Coscinodiscus sp.</u>   | 400         | --    | --   |
| <u>Thalassiosira decipiens</u>                                     | --          | --    | 20   |
| <u>T. oestrupii</u>  | --          | 10    | --   |
| Pennales   | 23,200      | 232   | 150  |
| <u>Achnanthes taeniata</u>   | 400         | --    | 50   |
| <u>Asterionella formosa</u>  | 1,400       | 212   | --   |
| <u>A. gracillima</u>   | 3,600       | --    | --   |
| <u>Cylindrotheca closterium</u>                                    | 400         | --    | --   |
| <u>Diploneis litoralis</u>   | 200         | --    | --   |
| <u>Fragilaria bicapitata</u>                                       | 400         | 20    | --   |
| <u>F. islandica</u>  | 3,800       | --    | --   |
| <u>Gomphonema sp.</u>  | 200         | --    | --   |
| <u>G. exiguum</u> var. <u>pachycladum</u>                          | --          | --    | 10   |
| <u>G. gracile</u>  | 800         | --    | --   |
| <u>Navicula directa</u>  | 400         | --    | --   |
| <u>N. granii</u>   | 600         | --    | --   |
| <u>N. perlucens</u>  | 200         | --    | --   |
| <u>N. transitans</u>   | 200         | --    | --   |
| <u>N. vanhoeffenii</u>   | 4,200       | --    | --   |
| <u>Nitzschia acicularis</u>  | 800         | --    | --   |
| <u>N. angularis</u> var. <u>kariana</u>                            | 800         | --    | --   |
| <u>N. cylindrus</u>  | 1,400       | --    | 10   |
| <u>N. delicatissima</u>  | 1,000       | --    | --   |
| <u>N. frigida</u>  | --          | --    | 20   |
| <u>N. frustulum</u>  | 1,200       | --    | 10   |
| <u>N. frustulum</u> var. <u>perpusilla</u>                         | --          | --    | 10   |
| <u>Pinnularia sp.</u>  | 400         | --    | --   |
| <u>P. quadrata</u> area  | 200         | --    | --   |
| <u>Synedra parasitica</u>  | 600         | --    | 20   |
| <u>Tabellaria flocculosa</u>                                       | --          | --    | 20   |
| Chlorophyta  | 42,600      | 2,141 | 10   |
| <u>Carteria depressa</u>   | 2,000       | 283   | --   |
| <u>Chlamydomonas sp.</u>   | --          | 434   | 10   |

Table 12. (Continued)

| Sample type                  | Ice core    | Water |     |
|------------------------------|-------------|-------|-----|
|                              | bottom 3 cm | 0 m   | 6 m |
| <u>C. ballenyana</u>         | 200         | --    | --  |
| <u>C. cysts</u>              | 8,200       | --    | --  |
| <u>C. tetraolaris</u>        | 25,600      | 838   | --  |
| <u>Dunaliella parva</u>      | 5,600       | 495   | --  |
| <u>Micrasterias</u> sp.      | 400         | --    | --  |
| <u>Thalassomonas</u> sp.     | 600         | 91    | --  |
| Chrysophyta                  | 2,400       | 424   | 10  |
| <u>Dinobryon cylindricum</u> | 200         | --    | 10  |
| <u>Phaeocystis pouchetii</u> | 1,800       | --    | --  |
| Unidentified                 | 400         | 424   | --  |
| Euglenophyta                 | 5,600       | 81    | --  |
| <u>Euglena proxima</u>       | 1,000       | --    | --  |
| <u>E. schmitzii</u>          | 4,600       | 10    | --  |
| <u>E. viridis</u>            | --          | 71    | --  |
| Pyrrophyta                   | 11,200      | 816   | 10  |
| <u>Coolia monotis</u>        | --          | 30    | --  |
| <u>Dinophysis</u> sp.        | 200         | --    | --  |
| <u>D. arctica</u>            | --          | 10    | --  |
| <u>Glenodinium</u> sp.       | 4,200       | 414   | --  |
| <u>Goniaulax</u> sp.         | 400         | 20    | --  |
| <u>G. catenata</u>           | --          | 30    | 10  |
| <u>G. monilata</u>           | 200         | --    | --  |
| <u>G. scrippsae</u>          | 1,400       | --    | --  |
| <u>G. tamarensis</u>         | --          | 51    | --  |
| <u>Gymnodinium</u> sp.       | 200         | --    | --  |
| <u>G. lohmanni</u>           | --          | 50    | --  |
| <u>Oxytoxum</u> sp.          | --          | 40    | --  |
| <u>Peridinium</u> sp.        | --          | 111   | --  |
| <u>P. punctulatum</u>        | 400         | 20    | --  |
| <u>Prorocentrum</u> sp.      | 3,200       | --    | --  |
| <u>P. micans</u>             | 400         | --    | --  |
| <u>P. rampii</u>             | 600         | 40    | --  |

Table 13. Components of the sea ice fauna and the under-ice zooplankton taken in southeastern Hudson Bay in April of 1983.

|   | In the ice | Below the ice |               |
|---|------------|---------------|---------------|
|   |            | In plume      | Outside plume |
| Hydrozoa: larvae                                    | +          | +             |               |
| Rotifera  | +          | +             |               |
| Copepoda: <u>Tisbe furcata</u> (Baird)              | +          | +             |               |
| Ectinosomidae                                       | +          | +             |               |
| Ciliata   | +          |               | +             |
| Flagellata  | +          |               | +             |
| Copepoda: <u>Harpacticus superflexus</u> Willey     | +          |               | +             |
| Nematoda  | +          | +             | +             |
| Copepoda: <u>Oithona similis</u> Claus              | +          | +             | +             |
| Acarina   | +          | +             | +             |
| Gastropoda: <u>Spiratella helicina</u> (Phipps)     |            | +             |               |
| Ostracoda: <u>Philomedes globosa</u> (Lilljeborg)   |            | +             |               |
| Gastropoda: larvae                                  |            | +             | +             |
| Copepoda: <u>Pseudocalanus</u> sp.                  |            | +             | +             |
| Hydrozoa: <u>Aeginopsis laurenti</u> Brandt         |            |               | +             |
| Polychaeta: larvae                                  |            |               | +             |
| Copepoda: <u>Microcalanus pygmaeus</u> (G. O. Sars) |            |               | +             |
| <u>Acartia longiremis</u> (Lilljeborg)              |            |               | +             |
| <u>Oncaea borealis</u> G. O. Sars                   |            |               | +             |
| Isopoda: larvae                                     |            |               | +             |
| Mysidacea: <u>Mysis oculata</u> (Fabricius)         |            |               | +             |
| Echinodermata: larvae                               |            |               | +             |
| Chaetognatha: <u>Sagitta elegans</u> Verrill        |            |               | +             |
| Larvacea: <u>Fritillaria borealis</u> Lohmann       |            |               | +             |
| <u>Oikopleura labradoriensis</u> Lohmann            |            |               | +             |
|   | 10         | 11            | 19            |

Table 14. Ice and under-ice fauna at Station 29, 28 April 1983.

| Station depth 27 m                     | Ice thickness 117 cm.    |                     |                     |
|--|--------------------------|---------------------|---------------------|
|  | <u>Ice</u><br>lower 3 cm | <u>Water</u><br>0 m | <u>Water</u><br>6 m |
| Temperature (°C)                       | 0                        | 0.1                 | -1.4                |
| Salinity (‰)                           | 0                        | 0.0                 | 27.9                |
| <hr/>                                  |                          |                     |                     |
| Ciliata                                |                          |                     | 53/m <sup>3</sup>   |
| Hydrozoa: <u>Aeginopsis laurenti</u>   |                          |                     | 13                  |
| Nematoda                               |                          | 13/m <sup>3</sup>   |                     |
| Rotifera                               |                          | 145                 |                     |
| Polychaeta: larvae                     |                          |                     | 26                  |
| Gastropoda: <u>Spiratella helicina</u> |                          |                     | 211                 |
| Copepoda: <u>Pseudocalanus</u> sp. V   |                          |                     | 132                 |
|  |                          |                     | IV 238              |
|  |                          |                     | III 13              |
|  |                          |                     | II 13               |
| <u>Microcalanus pygmaeus</u> III       |                          |                     | 40                  |
|  |                          |                     | II 13               |
|  |                          |                     | I 13                |
| <u>Oithona similis</u> VI M            |                          |                     | 106                 |
|  |                          |                     | VI F 185            |
|  |                          |                     | V 13 1135           |
|  |                          |                     | IV 26 898           |
|  |                          |                     | III 686             |
|  |                          |                     | II 238              |
|  |                          |                     | I 13                |
| exoskeletons                           |                          |                     | 40                  |
| nauplii                                |                          | 13                  | 1637                |
| Acarina                                | 2.5/100 cm <sup>2</sup>  |                     | 26                  |
| Chaetognatha: <u>Sagitta elegans</u>   |                          |                     | 26                  |
| Larvacea: <u>Fritillaria borealis</u>  |                          |                     | 13                  |
| Eggs                                   |                          |                     | 106                 |
|  | <hr/>                    | <hr/>               | <hr/>               |
|  | 2.5/100 cm <sup>2</sup>  | 210/m <sup>3</sup>  | 5874/m <sup>3</sup> |



Table 15. Ice and under-ice fauna at Station 60, 27 April 1983.

| Station depth 45 m                         | Ice thickness 115 cm.    |                     |                     |
|--|--------------------------|---------------------|---------------------|
|  | <u>Ice</u><br>lower 3 cm | <u>Water</u><br>0 m | <u>Water</u><br>6 m |
| Temperature (°C)                           | 0                        | -0.1                | -1.4                |
| Salinity (‰)                               | 3                        | 2.6                 | 28.2                |
| <hr/>                                      |                          |                     |                     |
| Rotifera                                   | 2.5/100 cm <sup>2</sup>  | 594/m <sup>3</sup>  |                     |
| Gastropoda: larvae                         |                          |                     | 172/m <sup>3</sup>  |
| Copepoda: <u>Pseudocalanus</u> sp.         |                          |                     | 172                 |
|  | V                        |                     | 119                 |
|  | IV                       |                     | 66                  |
|  | III                      |                     | 106                 |
|  | II                       |                     | 40                  |
|  | I                        |                     | 26                  |
| <u>Oithona similis</u>                     | VI M                     |                     | 79                  |
|  | VI F                     |                     | 568                 |
|  | V                        |                     | 185                 |
|  | IV                       |                     | 185                 |
|  | III                      |                     | 53                  |
|  | II                       |                     | 13                  |
| <u>Oncaea borealis</u>                     | VI F                     |                     | 13                  |
|  | V                        |                     | 13                  |
| <u>Tisbe furcata</u>                       | IV                       | 13                  |                     |
| Ectinosomidae                              | V                        | 13                  |                     |
| nauplii                                    |                          |                     | 304                 |
| Acarina                                    |                          |                     | 26                  |
| Larvacea: <u>Oikopleura labradoriensis</u> |                          |                     | 13                  |
| <u>Fritillaria borealis</u>                |                          |                     | 13                  |
| Eggs                                       |                          | 92                  |                     |
|  | <hr/>                    | <hr/>               | <hr/>               |
|  | 2.5/100 cm <sup>2</sup>  | 712/m <sup>3</sup>  | 2153/m <sup>3</sup> |

Table 16. Ice and under-ice fauna at Station 100, 28 April 1983.

| Station depth 74 m                      | Ice thickness 111 cm.    |                      |                                 |
|---|--------------------------|----------------------|---------------------------------|
|   | <u>Ice</u><br>lower 3 cm | <u>Water</u><br>0 m  | <u>Water</u><br>5 m             |
| Temperature (°C)                        | 0                        | -0.1                 | -1.5                            |
| Salinity (‰)                            | 2                        | 2.3                  | 26.9                            |
| <hr/>                                   |                          |                      |                                 |
| Ciliata                                 | 1.1/100 cm <sup>2</sup>  |                      | 13/m <sup>3</sup>               |
| Hydrozoa: larvae                        |                          | 13/m <sup>3</sup>    |                                 |
| Nematoda                                | 2.2                      |                      |                                 |
| Rotifera                                | 7.7                      | 13715                | 396                             |
| Gastropoda: larvae                      |                          |                      | 79                              |
| Ostracoda: <u>Philomedes globosa</u>    |                          | 13                   |                                 |
| Copepoda: <u>Pseudocalanus</u> sp. VI M |                          |                      | 13                              |
|   |                          |                      | VI F                            |
|   |                          |                      | V                               |
|   |                          |                      | IV                              |
|   |                          |                      | III                             |
|   |                          |                      | II                              |
|   |                          |                      | <u>Microcalanus pygmaeus</u> IV |
|   |                          |                      | <u>Oithona similis</u> VI M     |
|   |                          |                      | VI F                            |
|   |                          |                      | V                               |
|   |                          |                      | IV                              |
|   |                          |                      | III                             |
|   |                          |                      | II                              |
|   |                          |                      | I                               |
|   |                          |                      | Ectinosomidae                   |
|   |                          |                      | nauplii                         |
| Mysidacea: <u>Mysis oculata</u>         |                          |                      | 40                              |
| Acarina                                 | 9.9                      | 251                  | 119                             |
| Echinodermata: larvae                   |                          |                      | 26                              |
| Larvacea: <u>Fritillaria borealis</u>   |                          |                      | 26                              |
|   | <hr/>                    | <hr/>                | <hr/>                           |
|   | 20.9/100 cm <sup>2</sup> | 13992/m <sup>3</sup> | 4367/m <sup>3</sup>             |

Table 17. Ice and under-ice fauna at Station 221, 28 April 1983.

| Station depth 74 m                      | Ice thickness 112 cm.     |                     |
|---|---------------------------|---------------------|
|   | <u>Ice</u><br>lower 3 cm  | <u>Water</u><br>0 m |
| Temperature (°C)                        | 0                         | -0.1                |
| Salinity (‰)                            | 3                         | 3.0                 |
| <hr/>                                   |                           |                     |
| Ciliata                                 | 14.8/100 cm <sup>2</sup>  |                     |
| Nematoda                                | 472.3                     | 330/m <sup>3</sup>  |
| Rotifera                                | 110.7                     | 1848                |
| Copepoda: <u>Pseudocalanus</u> sp. VI M |                           | 13                  |
| <u>Oithona similis</u> VI F             |                           | 13                  |
| Acarina                                 | 7.4                       | 13                  |
| Eggs                                    | 88.6                      | 13                  |
|   | <hr/>                     | <hr/>               |
|   | 693.8/100 cm <sup>2</sup> | 2230/m <sup>3</sup> |

Table 18. Ice and under-ice fauna at Station 223, 28 April 1983.

| Station depth 86 m                 | Ice thickness 118 cm.    |                   |                     |
|------------------------------------|--------------------------|-------------------|---------------------|
|                                    | <u>Ice</u><br>lower 3 cm | 0 m               | <u>Water</u><br>4 m |
| Temperature (°C)                   | -1                       | -1.0              | -1.5                |
| Salinity (‰)                       | 27                       | 27.4              | 27.6                |
| <hr/>                              |                          |                   |                     |
| Ciliata                            | 45.9/100 cm <sup>2</sup> |                   | 26/m <sup>3</sup>   |
| Flagellata                         | 2581.2                   | 40/m <sup>3</sup> |                     |
| Nematoda                           | 2493.7                   | 26                | 13                  |
| Rotifera                           | 262.7                    | 158               | 66                  |
| Gastropoda: larvae                 |                          |                   | 13                  |
| Polychaeta: larvae                 |                          |                   | 13                  |
| Copepoda: <u>Pseudocalanus</u> sp. | VI M                     |                   | 79                  |
|                                    | VI F                     | 26                | 198                 |
|                                    | V                        | 185               | 1360                |
|                                    | IV                       | 66                |                     |
|                                    | III                      | 26                | 264                 |
|                                    | II                       |                   | 26                  |
| <u>Acartia longiremis</u>          | VI M                     | 13                |                     |
|                                    | VI F                     | 13                | 13                  |
|                                    | V                        | 39                | 53                  |
| <u>Oithona similis</u>             | VI M                     | 26                | 53                  |
|                                    | VI F                     | 1016              | 343                 |
|                                    | V                        | 2099              | 1637                |
|                                    | IV                       | 1030              | 1307                |
|                                    | III                      | 409               | 541                 |
|                                    | II                       |                   | 277                 |
|                                    | I                        |                   | 13                  |
|                                    | exoskeletons             |                   | 106                 |
| <u>Harpacticus superflexus</u>     | VI M                     | 12.5              |                     |
|                                    | VI F                     |                   | 13                  |
|                                    | V                        | 12.5              |                     |
|                                    | III                      | 4.2               |                     |
|                                    | II                       | 4.2               |                     |
|                                    | exoskeletons             | 12.5              | 13                  |
| Ectinosomidae                      | IV                       | 4.2               |                     |
|                                    | II                       | 12.5              |                     |
|                                    | exoskeletons             | 12.5              |                     |

Table 18. (Continued)

| Station depth 86 m | Ice thickness 118 cm.      |                     |                     |
|--------------------|----------------------------|---------------------|---------------------|
|                    | <u>Ice</u><br>lower 3 cm   | <u>Water</u><br>0 m | <u>Water</u><br>4 m |
| Temperature (°C)   | -1                         | -1.0                | -1.5                |
| Salinity (‰)       | 27                         | 27.4                | 27.6                |
| <hr/>              |                            |                     |                     |
| nauplii            |                            | 713                 | 1597                |
| Isopoda: larvae    |                            |                     | 13                  |
| Acarina            | 20.9                       | 26                  | 119                 |
| Eggs               | 116.8                      |                     |                     |
|                    | <hr/>                      | <hr/>               | <hr/>               |
|                    | 5596.3/100 cm <sup>2</sup> | 5937/m <sup>3</sup> | 8130/m <sup>3</sup> |

Table 19. Ice and under-ice fauna at Station 242, 28 April 1983.

| Station depth 67 m                    | Ice thickness 130 cm.    |                     |
|---------------------------------------|--------------------------|---------------------|
|                                       | <u>Ice</u><br>lower 3 cm | <u>Water</u><br>0 m |
| Temperature (°C)                      | 0                        | -0.1                |
| Salinity (‰)                          | 2                        | 1.9                 |
| <hr/>                                 |                          |                     |
| Rotifera                              | 9.8/100 cm <sup>2</sup>  | 2429/m <sup>3</sup> |
| Gastropoda: larvae                    |                          | 13                  |
| Copepoda: <u>Pseudocalanus</u> sp. II |                          | 13                  |
| <u>Oithona similis</u> V              | 2.5                      | 26                  |
| exoskeletons                          |                          | 13                  |
| nauplii                               |                          | 119                 |
| Acarina                               | 19.7                     | 40                  |
| Eggs                                  | 41.8                     |                     |
|                                       | <hr/>                    | <hr/>               |
|                                       | 73.8/100 cm <sup>2</sup> | 2653/m <sup>3</sup> |

Table 20. Ice and under-ice fauna at Station 253, 28 April 1983.

| Station depth 100 m                  | Ice thickness 120 cm.     |                     |
|--------------------------------------|---------------------------|---------------------|
|                                      | <u>Ice</u><br>lower 3 cm  | <u>Water</u><br>0 m |
| Temperature (°C)                     | -1                        | -1.5                |
| Salinity (‰)                         | 27                        | 26.9                |
| <hr/>                                |                           |                     |
| Ciliata                              | 194.3/100 cm <sup>2</sup> | 40/m <sup>3</sup>   |
| Flagellata                           | 125.5                     |                     |
| Hydrozoa: larvae                     | 4.9                       |                     |
| Nematoda                             | 1926.2                    | 53                  |
| Rotifera                             | 263.2                     | 119                 |
| Gastropoda: larvae                   |                           | 40                  |
| Ostracoda: <u>Philomedes globosa</u> |                           | 13                  |
| Copepoda: <u>Pseudocalanus</u> sp.   | V                         | 79                  |
|                                      | IV                        | 80                  |
|                                      | III                       | 53                  |
|                                      | II                        | 26                  |
| <u>Acartia longiremis</u>            | V                         | 66                  |
|                                      | IV                        | 92                  |
|                                      | III                       | 13                  |
| <u>Oithona similis</u>               | VI M                      | 13                  |
|                                      | VI F                      | 264                 |
|                                      | V                         | 1346                |
|                                      | IV                        | 502                 |
|                                      | III                       | 53                  |
|                                      | II                        | 13                  |
|                                      | I                         | 26                  |
|                                      | exoskeletons              | 145                 |
| <u>Harpacticus superflexus</u>       | V                         | 4.9                 |
|                                      | IV                        | 4.9                 |
|                                      | III                       | 2.5                 |
|                                      | exoskeletons              | 41.8                |
| Ectinosomidae                        | V                         | 2.5                 |
|                                      | III                       | 2.5                 |
|                                      | I                         | 4.9                 |
|                                      | exoskeletons              | 4.9                 |

Table 20. (Continued)

| Station depth 100 m | Ice thickness 120 cm.      |                     |
|---------------------|----------------------------|---------------------|
|                     | <u>Ice</u>                 | <u>Water</u>        |
|                     | lower 3 cm                 | 0 m                 |
| Temperature (°C)    | -1                         | -1.5                |
| Salinity (‰)        | 27                         | 26.9                |
| <hr/>               |                            |                     |
| nauplii             | 7.4                        | 502                 |
| exoskeletons        | 32.0                       |                     |
| Isopoda: larvae     |                            | 13                  |
| Acarina             |                            | 13                  |
| Eggs                | 4.9                        |                     |
|                     | <hr/>                      | <hr/>               |
|                     | 2627.3/100 cm <sup>2</sup> | 3564/m <sup>3</sup> |



Table 21. Ice and under-ice fauna at Station 262, 28 April 1983.

| Station depth 70 m                             | Ice thickness 112 cm.     |                     |                     |
|--|---------------------------|---------------------|---------------------|
|  | <u>Ice</u><br>lower 3 cm  | <u>Water</u><br>0 m | <u>Water</u><br>3 m |
| Temperature (°C)                               | -1                        | -1.0                | -1.4                |
| Salinity (‰)                                   | 18                        | 18.0                | 25.9                |
| <hr/>  |                           |                     |                     |
| Ciliata  | 191.9/100 cm <sup>2</sup> | 53/m <sup>3</sup>   | 13/m <sup>3</sup>   |
| Flagellata                                     | 24.6                      |                     |                     |
| Hydrozoa: <u>Aeginopsis laurenti</u><br>larvae | 83.6                      | 13                  |                     |
| Nematoda                                       | 391.1                     | 132                 |                     |
| Rotifera                                       | 71.3                      | 937                 | 264                 |
| Polychaeta: larvae                             |                           | 26                  |                     |
| Gastropoda: larvae                             |                           |                     | 40                  |
| Copepoda: <u>Pseudocalanus</u> sp. VI M        |                           |                     | 26                  |
| VI F   |                           |                     | 53                  |
| V  |                           |                     | 396                 |
| IV   |                           | 13                  | 608                 |
| III  |                           |                     | 172                 |
| II   |                           |                     | 79                  |
| I  |                           |                     | 26                  |
| <u>Microcalanus pygmaeus</u> IV                |                           | 13                  |                     |
| <u>Acartia longiremis</u> V                    |                           |                     | 52                  |
| IV   |                           |                     | 52                  |
| calanoid exoskeletons                          | 4.9                       |                     |                     |
| <u>Oithona similis</u> VI M                    |                           |                     | 66                  |
| VI F   |                           | 13                  | 264                 |
| V  |                           | 40                  | 1148                |
| IV   |                           | 13                  | 1003                |
| III  |                           |                     | 436                 |
| II   |                           | 26                  | 92                  |
| exoskeletons                                   |                           |                     | 13                  |
| <u>Harpacticus superflexus</u> VI F            |                           |                     | 13                  |
| I  |                           | 13                  |                     |
| <u>Tisbe furcata</u> exoskeletons              | 4.9                       |                     |                     |
| nauplii  |                           | 251                 | 818                 |
| exoskeletons                                   | 2.5                       |                     |                     |

Table 21. (Continued)

| Station depth 70 m                    | Ice thickness 112 cm.     |                     |                     |
|---------------------------------------|---------------------------|---------------------|---------------------|
|                                       | <u>Ice</u><br>lower 3 cm  | 0 m                 | <u>Water</u><br>3 m |
| Temperature (°C)                      | -1                        | -1.0                | -1.4                |
| Salinity (‰)                          | 18                        | 18.0                | 25.9                |
| <hr/>                                 |                           |                     |                     |
| Acarina                               | 2.5                       | 79                  | 53                  |
| Larvacea: <u>Fritillaria borealis</u> |                           |                     | 40                  |
| Eggs                                  |                           | 409                 | 26                  |
|                                       | <hr/>                     | <hr/>               | <hr/>               |
|                                       | 777.3/100 cm <sup>2</sup> | 2031/m <sup>3</sup> | 5753/m <sup>3</sup> |

Table 22. Ice and under-ice fauna at Station 302, 28 April 1983.

| Station depth 93 m                      | Ice thickness 114 cm.    |                      |                     |
|---|--------------------------|----------------------|---------------------|
|   | <u>Ice</u><br>lower 3 cm | 0 m                  | <u>Water</u><br>6 m |
| Temperature (°C)                        | 0                        | 0.0                  | -1.5                |
| Salinity (‰)                            | 1                        | 1.0                  | 27.4                |
| <hr/>                                   |                          |                      |                     |
| Ciliata                                 | 2.8/100 cm <sup>2</sup>  |                      | 26/m <sup>3</sup>   |
| Nematoda                                |                          | 119/m <sup>3</sup>   | 40                  |
| Rotifera                                | 7.0                      | 10798                | 581                 |
| Gastropoda: <u>Spiratella helicina</u>  |                          | 13                   |                     |
| larvae                                  |                          | 26                   | 185                 |
| Copepoda: <u>Pseudocalanus</u> sp. VI M |                          |                      | 13                  |
| VI F                                    |                          |                      | 13                  |
| V                                       |                          |                      | 106                 |
| IV                                      |                          | 26                   | 92                  |
| III                                     |                          |                      | 26                  |
| II                                      |                          |                      | 40                  |
| I                                       |                          |                      | 26                  |
| exoskeletons                            |                          |                      | 26                  |
| <u>Acartia longiremis</u> V             |                          |                      | 53                  |
| III                                     |                          |                      | 26                  |
| <u>Oithona similis</u> VI M             |                          |                      | 211                 |
| VI F                                    |                          |                      | 317                 |
| V                                       |                          | 158                  | 1954                |
| IV                                      |                          | 53                   | 1888                |
| III                                     |                          | 53                   | 1030                |
| II                                      |                          | 40                   | 317                 |
| I                                       |                          |                      | 53                  |
| exoskeletons                            |                          |                      | 66                  |
| nauplii                                 |                          | 79                   | 1531                |
| Acarina                                 |                          |                      | 13                  |
| Larvacea: <u>Fritillaria borealis</u>   |                          |                      | 13                  |
| Eggs                                    | 11.1                     |                      |                     |
|   | <hr/>                    | <hr/>                | <hr/>               |
|   | 20.9/100 cm <sup>2</sup> | 11365/m <sup>3</sup> | 8646/m <sup>3</sup> |