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Ödsmål, Kville sn, Bohuslän

Hällristning  
Fiskare från  
bronsåldern

Rock carving  
Bronze age  
fishermen

ANKOM

1973 -09 -24

FISKERIINTENDENTEN I  
VÄSTERHAVETS DISTRIKT

Dnr -



**MEDDELANDE från**  
**HAVSFISKELABORATORIET · LYSEKIL**

nr  
**151**

Hydrografiska avdelningen, Göteborg.

Observations along the Swedish coast and  
in the Deep Basins in the Baltic, 1972.

Hydrography of the Kattegatt and the  
Skagerrak Area, Swedish Observations, 1972.

(Contribution to ICES "Annales Biologiques")

by Stig Fonselius and Artur Svansson

September 1973

Observations along the Swedish coast and in the Deep Basins in the Baltic, 1972.

All Swedish lightships have now been replaced by unmanned light towers built on caissons. Therefore the long series of salinity, temperature and current measurements have ceased. Instead measurements of temperature and salinity are now performed by patrol boats of the Swedish coast guard at fixed stations. The measurements are carried out weekly at stations close to the coast and monthly on some outsea stations. At some stations oxygen and total phosphorus measurements are also carried out. The sampling program and coordinates of the stations have been given in Medd. Havsfiskelab. Lysekil, no 136 and the data for 1972 in no. 135 and 137, for the stations operated by the Fishery Board and in "SMHI, HBO, Rapport angående oceanografiska observationer i Östersjön 1972 med Kustbevakningens båtar (stenc. 1-73)" and "Månadsöversikt över väderlek och vattentillgång (SMHI)" for the stations operated by the Meteorological and Hydrological Institute.

Here only some results of the observations will be discussed. It is not possible to compare these measurements with the old lightships measurements and no deviations can be computed until more data have been obtained. Fig. 1 and fig. 2 show variations in surface salinity at the 14 observation points during 1972. It can be seen that there is a summer minimum along the Swedish coast. This minimum is much less pronounced east of Gotland during the summer and there is instead an autumn minimum. The summer minimum is obviously caused by the spring flood in the rivers discharging into the Baltic and especially into the Gulf of Bothnia. It can also be seen that the surface salinity increased up to 10 ‰ at the Arkona Deep in November. The increase can also be observed at Ystad, Hanö and Karlshamn. It was probably caused by an inflow of high saline water through the Danish sounds. Table 1 shows the deviations from the long time means at the "Falsterborev". The salinity deviation was positive.

During 1972 a beginning renewal of the deep water in the Baltic was observed. Already in December 1971 the hydrogen sulfide disappeared from the Bornholm Basin but the oxygen values below 80 m remained low until March. In April the values in the deep water increased to above 1 ml O<sub>2</sub>/l and in May values above 6 ml/l were observed.

In June a slow decreasing of the oxygen values begun and the values were below 2 ml/l in October. (Fig. 3).

The inflow continued into the Central Basin renewing the water in the Gotland Deep in June (fig. 4). In the Landsort Deep hydrogen sulfide was observed in the beginning of the year below 400 m. The amount increased during the year (fig. 5). The inflow of new water had not reached the Landsort Deep at the end of the year. The water in the Landsort Deep will probably be renewed during 1973. Table II shows hydrographic values at the main Deep Stations in the Baltic in 1972.

Stig H. Fonselius

Table II

Arkona Deep  
55°00'N 14°05'E

| Depth<br>m  | Temp.<br>°C | S<br>‰ | O <sub>2</sub><br>ml/l | pH   | PO <sub>4</sub> -P<br>µgat/l | Tot.P<br>µgat/l | Alkal.<br>Mval/l | Si<br>µgat/l | NO <sub>3</sub> -N<br>µgat/l | NO <sub>2</sub> -N<br>µgat/l | NH <sub>4</sub> -N<br>µgat/l | Tot.N<br>µgat/l |
|-------------|-------------|--------|------------------------|------|------------------------------|-----------------|------------------|--------------|------------------------------|------------------------------|------------------------------|-----------------|
| February 29 |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |
| 000         | 1.28        | 8.129  | 9.67                   | 8.19 | 0.43                         | 0.74            | 1.568            | 20.0         | 2.1                          | 0.28                         | 1.2                          | 6.0             |
| 010         | 1.25        | 8.137  | 9.64                   | 8.21 | 0.48                         | 0.68            | 1.599            | 20.5         | 3.2                          | 0.28                         | 0.5                          | 11.0            |
| 030         | 0.63        | 9.340  | 9.48                   | 8.19 | 0.52                         | 0.74            | 1.638            | 19.5         | 2.4                          |                              | 0.6                          |                 |
| 048         | 1.25        | 14.947 | 8.28                   | 8.14 | 1.11                         | 1.41            | 1.830            | 24.0         | 4.2                          | 0.36                         | 1.9                          | 14.0            |
| May 24      |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |
| 000         | 7.92        | 8.092  | 8.80                   | 8.34 | 0.15                         | 0.39            | 1.505            | 15.0         | <0.1                         | 0.03                         | 0.60                         | 7.6             |
| 010         | 6.50        | 8.086  | 8.85                   | 8.37 | 0.14                         | 0.47            | 1.502            | 12.5         | <0.1                         |                              | 0.39                         |                 |
| 030         | 6.29        | 8.100  | 8.65                   | 8.34 | 0.18                         | 0.45            | 1.542            | 14.5         | <0.1                         | 0.02                         | 0.45                         | 13.8            |
| 048         | 4.02        | 14.950 | 5.44                   | 7.88 | 0.45                         | 1.781           | 1.781            | 23.0         | 0.30                         | 0.08                         | 0.97                         | 18.7            |
| August 15   |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |
| 000         | 17.06       | 7.873  | 7.16                   | 8.31 | 0.08                         | 0.46            | 1.509            | 11.0         | 0.05                         | 0.02                         | 0.36                         | 19.78           |
| 010         | 15.98       | 7.866  | 6.93                   | 8.30 | 0.12                         | 0.51            | 1.499            | 10.5         | 0                            | 0.02                         | 0.33                         | 14.92           |
| 030         | 8.42        | 9.241  | 6.03                   | 7.93 | 0.41                         | 0.66            | 1.557            | 17.0         | 0.16                         | 0.13                         | 0.44                         | 13.11           |
| 048         | 9.30        | 18.348 | 2.92                   | 7.65 | 8.20                         | 14.40           | 1.838            | 45.5         | 2.35                         | 0.37                         | 1.13                         |                 |
| October 26  |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |
| 000         | 11.21       | 8.207  | 7.30                   | 8.22 | 0.12                         | 0.45            | 1.620            | 11.0         | 0.3                          | 0.03                         | 1.01                         |                 |
| 010         | 11.17       | 8.193  | 7.33                   | 8.27 | 0.10                         | 0.40            | 1.632            | 11.0         | 0.3                          |                              | 0.79                         |                 |
| 030         | 10.80       | 8.637  | 7.29                   | 8.30 | 0.14                         | 0.38            | 1.624            | 11.0         | 0.1                          |                              | 6.74                         |                 |
| 048         | 12.66       | 16.972 | 2.53                   | 7.62 | 1.29                         | 1.71            | 1.967            | 46.1         | 3.0                          | 0.35                         | 4.99                         | 9.78            |

## Bornholm Deep

55°15'N 15°59'E

| Depth<br>m | Temp.<br>°C | S<br>‰ | O <sub>2</sub><br>ml/l | pH   | PO <sub>4</sub> -P<br>µgat/l | Tot.P<br>µgat/l | Alkal.<br>Mval/l | Si<br>µgat/l | NO <sub>3</sub> -N<br>µgat/l | NO <sub>2</sub> -N<br>µgat/l | NH <sub>4</sub> -N<br>µgat/l | Tot.N<br>µgat/l |
|------------|-------------|--------|------------------------|------|------------------------------|-----------------|------------------|--------------|------------------------------|------------------------------|------------------------------|-----------------|
| March 1    |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |
| 000        | 1.72        | 7.710  | 9.44                   | 8.11 | 0.52                         | 0.71            | 1.565            | 22.5         | 1.3                          | 0.15                         | 0.4                          | 7.4             |
| 010        | 1.78        | 7.753  | 9.27                   | 8.16 | 0.50                         | 0.70            | 1.562            | 19.5         | 2.3                          |                              | 0.5                          |                 |
| 030        | 1.95        | 7.962  | 9.33                   | 8.17 | 0.50                         | 0.73            | 1.562            | 18.5         | 2.3                          |                              | 1.0                          |                 |
| 050        | 1.20        | 8.729  | 9.31                   | 8.17 | 0.52                         | 0.69            | 1.615            | 19.0         | 3.1                          | 0.28                         | 0.4                          | 7.3             |
| 070        | 8.66        | 14.479 | 1.36                   | 7.50 | 2.42                         | 2.64            | 1.855            | 69.0         | 3.9                          | 0.01                         | 0.8                          | 7.5             |
| 090        | 7.72        | 15.336 | 0.12                   | 7.44 | 4.09                         | 5.15            | 1.916            | 92.0         | 4.8                          | 0.27                         | 1.4                          | 10.0            |
| May 25     |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |
| 000        | 7.23        | 7.713  | 9.12                   | 8.36 | 0.20                         | 0.66            | 1.502            | 19.5         | <0.1                         | 0.04                         | 0.10                         | 15.2            |
| 010        | 6.91        | 7.722  | 9.20                   | 8.37 | 0.20                         | 0.62            | 1.502            | 19.5         | <0.1                         |                              | 0.53                         |                 |
| 030        | 5.79        | 7.791  | 9.10                   | 8.39 | 0.19                         | 0.65            | 1.512            | 19.0         | <0.1                         |                              | 1.13                         |                 |
| 050        | 3.95        | 11.762 | 6.91                   | 8.03 | 0.37                         | 0.84            | 1.679            | 17.5         | <0.1                         | 0.04                         | 0.26                         | 15.6            |
| 070        | 3.76        | 16.047 | 6.67                   | 8.04 | 0.64                         | 0.93            | 1.798            | 18.0         | 1.8                          |                              | 0.64                         |                 |
| 089        | 3.79        | 17.654 | 6.06                   | 8.01 | 0.79                         | 1.31            | 1.838            | 17.5         | 1.9                          | 0.24                         | 1.47                         | 18.7            |
| August 18  |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |
| 000        | 17.97       | 7.669  | 6.47                   | 8.40 | 0.04                         | 0.40            | 1.494            | 10.5         | 0.04                         | 0                            | 0.35                         | 23.20           |
| 010        | 17.98       | 7.667  | 6.46                   | 8.43 | 0.07                         | 0.41            | 1.489            | 10.0         | 0.23                         | 0                            | 0.35                         |                 |
| 030        | 5.46        | 7.920  | 7.72                   | 8.12 | 0.29                         | 0.48            | 1.517            | 13.0         | 0                            | 0.01                         | 0.33                         | 14.71           |
| 050        | 4.75        | 9.830  | 6.34                   | 7.93 | 0.55                         | 0.74            | 1.579            | 16.5         | 0.26                         | 0.18                         | 0.24                         | 15.59           |
| 070        | 4.74        | 15.139 | 4.06                   | 7.77 | 1.11                         | 1.39            | 1.760            | 30.5         | 1.08                         | 0.03                         | 0.18                         | 19.50           |
| 093        | 4.08        | 17.807 | 3.65                   | 7.76 | 1.15                         | 1.69            | 1.818            | 30.5         | 3.43                         | 0.02                         | 0.58                         | 22.52           |

## Bornholm Deep

55°15'N 15°59'E

| Depth<br>m | Temp.<br>°C | S<br>‰ | O <sub>2</sub><br>ml/l | pH   | PO <sub>4</sub> -P<br>µgat/l | Tot.P<br>µgat/l | Alkal.<br>Mval/l | Si<br>µgat/l | NO <sub>3</sub> -N<br>µgat/l | NO <sub>2</sub> -N<br>µgat/l | NH <sub>4</sub> -N<br>µgat/l | Tot.N<br>µgat/l |
|------------|-------------|--------|------------------------|------|------------------------------|-----------------|------------------|--------------|------------------------------|------------------------------|------------------------------|-----------------|
| October 26 |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |
| 000        | 10.91       | 7.447  | 7.43                   | 8.18 | 0.09                         | 0.33            | 1.555            | 8.5          | 0.3                          | <0.01                        | 1.05                         |                 |
| 010        | 10.88       | 7.442  | 7.45                   | 8.26 | 0.10                         | 0.40            | 1.569            | 7.5          | 0.1                          |                              | 0.94                         |                 |
| 030        | 10.90       | 7.442  | 7.36                   | 8.27 | 0.08                         | 0.36            | 1.549            | 7.0          | 0.1                          |                              | 0.51                         |                 |
| 050        | 6.05        | 8.837  | 5.97                   | 7.86 | 0.48                         | 0.75            | 1.616            | 17.0         | 1.8                          | <0.01                        | 0.67                         |                 |
| 070        | 6.05        | 15.399 | 3.58                   | 7.71 | 0.92                         | 1.19            | 1.868            | 32.5         | 4.8                          |                              | 0.73                         |                 |
| 090        | 4.50        | 17.770 | 2.51                   | 7.66 | 0.93                         | 1.26            | 1.921            | 33.5         | 7.6                          |                              | 0.50                         |                 |

Gotland Deep

57°20'N 20°03'E

| Depth<br>m | Temp.<br>°C | S<br>‰ | O <sub>2</sub><br>ml/l | pH   | PO <sub>4</sub> -P<br>µgat/l | Tot.P<br>µgat/l | Alkal.<br>Mval/l | Si<br>µgat/l | NO <sub>3</sub> -N<br>µgat/l | NO <sub>2</sub> -N<br>µgat/l | NH <sub>4</sub> -N<br>µgat/l | Tot.N<br>µgat/l | H <sub>2</sub> S<br>µgat/l |
|------------|-------------|--------|------------------------|------|------------------------------|-----------------|------------------|--------------|------------------------------|------------------------------|------------------------------|-----------------|----------------------------|
| March 2    |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |                            |
| 000        | 1.45        | 7.631  | 9.55                   | 8.17 | 0.36                         | 0.56            | 1.546            | 11.5         | 1.6                          | 0.14                         | 0.6                          | 7.0             |                            |
| 070        | 2.11        | 7.734  | 9.23                   | 8.08 | 0.45                         | 0.62            | 1.596            | 12.0         | 1.5                          | 0.23                         | 0.4                          | 7.9             |                            |
| 100        | 4.63        | 10.648 | 0.47                   | 7.40 | 2.42                         | 2.51            | 1.716            | 66.5         | 3.0                          | 0.01                         | 1.4                          |                 |                            |
| 150        | 5.25        | 12.059 | 0                      | 7.36 | 2.62                         | 2.80            | 1.771            | 77.5         | 0.7                          | 0.01                         | 0.8                          |                 | 0.1                        |
| 200        | 5.51        | 12.559 |                        | 7.41 | 4.49                         | 5.03            | 1.833            | 92.5         | 0.2                          | 0.00                         | 4.2                          |                 | 13.6                       |
| 240        | 5.63        | 12.679 |                        | 7.47 | 5.91                         | 7.14            | 1.858            | 107.0        | 0.0                          | 0.03                         | 7.3                          | 13.0            | 30.6                       |
| May 26     |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |                            |
| 000        | 4.95        | 7.653  | 9.73                   | 8.41 | 0.13                         | 0.65            | 1.525            | 14.5         | 0.3                          | 0.02                         | 2.02                         | 10.8            |                            |
| 070        | 3.44        | 9.098  | 4.38                   | 7.63 | 1.14                         | 1.67            | 1.594            | 40.0         | 0.5                          |                              | 0.54                         |                 |                            |
| 100        | 5.35        | 10.973 | 0.67                   | 7.36 | 2.75                         | 3.09            | 1.657            | 64.5         | 6.3                          |                              | 0.17                         |                 |                            |
| 150        | 5.55        | 12.180 | 0                      | 7.38 | 4.61                         | 5.26            | 1.741            | 77.5         | 0.5                          |                              | 2.75                         |                 | 3.05                       |
| 200        | 5.52        | 12.539 | 0                      | 7.41 | 4.37                         | 5.63            | 1.761            | 85.0         | <0.1                         | 0.05                         | 4.34                         | 15.1            | 20.60                      |
| 240        | 5.58        | 12.654 | 0                      | 7.47 | 5.34                         | 7.33            | 1.816            | 99.0         | <0.1                         |                              | 7.37                         |                 | 36.70                      |
| August 20  |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |                            |
| 000        | 18.29       | 7.232  | 6.49                   | 8.40 | 0.05                         | 0.44            | 1.527            | 10.0         | 0.11                         | 0.03                         | 0.40                         | 16.77           |                            |
| 070        | 3.53        | 9.154  | 3.05                   | 7.64 | 1.02                         | 1.66            | 1.584            | 37.0         | 0.83                         | 0.09                         | 0.33                         | 17.01           |                            |
| 100        | 5.43        | 11.072 | 0.46                   | 7.37 | 2.58                         | 2.90            | 1.642            | 61.0         | 5.33                         | 0.04                         | 0.06                         | 21.22           |                            |
| 150        | 5.28        | 12.341 | 0.57                   | 7.41 | 3.01                         | 3.22            | 1.702            | 67.0         | 2.87                         | 0.07                         | 0.22                         | 22.34           |                            |
| 200        | 4.94        | 12.627 | 1.77                   | 7.47 | 2.09                         | 2.43            | 1.692            | 54.5         | 3.17                         | 0.06                         | 0.64                         |                 |                            |
| 240        | 5.03        | 12.842 | 0.04                   | 7.53 | 5.91                         | 8.95            | 1.888            | 73.5         |                              |                              |                              |                 |                            |



Gotland Deep

57°20'N 20°03'E

| Depth<br>m | Temp.<br>°C | S<br>‰ | O <sub>2</sub><br>ml/l | pH   | PO <sub>4</sub> -P<br>µgat/l | Tot.P<br>µgat/l | Alkal.<br>Mval/l | Si<br>µgat/l | NO <sub>3</sub> -N<br>µgat/l | NO <sub>2</sub> -N<br>µgat/l | NH <sub>4</sub> -N<br>µgat/l | Tot.N<br>µgat/l | H <sub>2</sub> S<br>µgat/l |
|------------|-------------|--------|------------------------|------|------------------------------|-----------------|------------------|--------------|------------------------------|------------------------------|------------------------------|-----------------|----------------------------|
| March 2    |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |                            |
| 000        | 1.45        | 7.631  | 9.55                   | 8.17 | 0.36                         | 0.56            | 1.546            | 11.5         | 1.6                          | 0.14                         | 0.6                          | 7.0             |                            |
| 070        | 2.11        | 7.734  | 9.23                   | 8.08 | 0.45                         | 0.62            | 1.596            | 12.0         | 1.5                          | 0.23                         | 0.4                          | 7.9             |                            |
| 100        | 4.63        | 10.648 | 0.47                   | 7.40 | 2.42                         | 2.51            | 1.716            | 66.5         | 3.0                          | 0.01                         | 1.4                          |                 |                            |
| 150        | 5.25        | 12.059 | 0                      | 7.36 | 2.62                         | 2.80            | 1.771            | 77.5         | 0.7                          | 0.01                         | 0.8                          |                 | 0.1                        |
| 200        | 5.51        | 12.559 |                        | 7.41 | 4.49                         | 5.03            | 1.833            | 92.5         | 0.2                          | 0.00                         | 4.2                          |                 | 13.6                       |
| 240        | 5.63        | 12.679 |                        | 7.47 | 5.91                         | 7.14            | 1.858            | 107.0        | 0.0                          | 0.03                         | 7.3                          | 13.0            | 30.6                       |
| May 26     |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |                            |
| 000        | 4.95        | 7.653  | 9.73                   | 8.41 | 0.13                         | 0.65            | 1.525            | 14.5         | 0.3                          | 0.02                         | 2.02                         | 10.8            |                            |
| 070        | 3.44        | 9.098  | 4.38                   | 7.63 | 1.14                         | 1.67            | 1.594            | 40.0         | 0.5                          |                              | 0.54                         |                 |                            |
| 100        | 5.35        | 10.973 | 0.67                   | 7.36 | 2.75                         | 3.09            | 1.657            | 64.5         | 6.3                          |                              | 0.17                         |                 |                            |
| 150        | 5.55        | 12.180 | 0                      | 7.38 | 4.61                         | 5.26            | 1.741            | 77.5         | 0.5                          |                              | 2.75                         |                 | 3.05                       |
| 200        | 5.52        | 12.539 | 0                      | 7.41 | 4.37                         | 5.63            | 1.761            | 85.0         | <0.1                         | 0.05                         | 4.34                         | 15.1            | 20.60                      |
| 240        | 5.58        | 12.654 | 0                      | 7.47 | 5.34                         | 7.33            | 1.816            | 99.0         | <0.1                         |                              | 7.37                         |                 | 36.70                      |
| August 20  |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |                            |
| 000        | 18.29       | 7.232  | 6.49                   | 8.40 | 0.05                         | 0.44            | 1.527            | 10.0         | 0.11                         | 0.03                         | 0.40                         | 16.77           |                            |
| 070        | 3.53        | 9.154  | 3.05                   | 7.64 | 1.02                         | 1.66            | 1.584            | 37.0         | 0.83                         | 0.09                         | 0.33                         | 17.01           |                            |
| 100        | 5.43        | 11.072 | 0.46                   | 7.37 | 2.58                         | 2.90            | 1.642            | 61.0         | 5.33                         | 0.04                         | 0.06                         | 21.22           |                            |
| 150        | 5.28        | 12.341 | 0.57                   | 7.41 | 3.01                         | 3.22            | 1.702            | 67.0         | 2.87                         | 0.07                         | 0.22                         | 22.34           |                            |
| 200        | 4.94        | 12.627 | 1.77                   | 7.47 | 2.09                         | 2.43            | 1.692            | 54.5         | 3.17                         | 0.06                         | 0.64                         |                 |                            |
| 240        | 5.03        | 12.842 | 0.04                   | 7.53 | 5.91                         | 8.95            | 1.888            | 73.5         |                              |                              |                              |                 |                            |



Landsort Deep

58°35'N 18°14'E

| Depth<br>m | Temp.<br>°C | S<br>‰ | O <sub>2</sub><br>ml/l | pH   | PO <sub>4</sub> -P<br>µgat/l | Tot.P<br>µgat/l | Alkal.<br>Mval/l | SI<br>µgat/l | NO <sub>3</sub> -N<br>µgat/l | NO <sub>2</sub> -N<br>µgat/l | NH <sub>4</sub> -N<br>µgat/l | Tot.N<br>µgat/l | H <sub>2</sub> S<br>µgat/l |
|------------|-------------|--------|------------------------|------|------------------------------|-----------------|------------------|--------------|------------------------------|------------------------------|------------------------------|-----------------|----------------------------|
| March 3    |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |                            |
| 000        | 0.78        | 7.164  | 9.78                   | 8.17 | 0.42                         | 0.70            | 1.502            | 23.5         | 1.6                          | 0.23                         | 1.3                          | 4.2             |                            |
| 070        | 3.11        | 8.060  | 6.88                   | 7.86 | 0.85                         | 1.12            | 1.574            | 32.5         | 1.8                          | 0.15                         | 0.9                          | 7.5             |                            |
| 100        | 4.46        | 10.303 | 0.52                   | 7.37 | 2.60                         | 3.07            | 1.710            | 72.5         | 2.3                          | 0.03                         | 0.7                          |                 |                            |
| 150        | 4.60        | 10.647 | 0.33                   | 7.36 | 2.65                         | 2.94            | 1.724            | 75.0         | 1.8                          | 0.05                         | 0.5                          |                 |                            |
| 200        | 4.72        | 10.917 | 0.21                   | 7.36 | 2.79                         | 3.13            | 1.733            | 74.5         | 1.7                          | 0.37                         | 0.4                          |                 |                            |
| 440        | 4.83        | 11.060 | 0                      | 7.38 | 3.32                         | 3.90            | 1.752            | 78.0         | 0.2                          | 0.08                         | 1.5                          | 8.9             | 0.9                        |
| May 30     |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |                            |
| 000        | 6.25        | 6.566  | 9.06                   | 8.34 | 0.12                         | 0.53            | 1.386            | 20.0         | <0.1                         | 0.02                         | 0.62                         | 6.0             |                            |
| 070        | 3.91        | 9.457  | 2.00                   | 7.44 | 2.01                         | 2.32            | 1.607            | 53.0         | 2.6                          |                              | 0.60                         |                 |                            |
| 100        | 4.46        | 10.352 | 0.44                   | 7.36 | 2.71                         | 3.06            | 1.632            | 62.5         | 2.7                          |                              | 0.58                         |                 |                            |
| 150        | 4.56        | 10.639 | 0.20                   | 7.33 | 2.66                         | 2.62            | 1.657            | 63.5         | 2.4                          |                              | 0.53                         |                 |                            |
| 200        | 4.66        | 10.857 | 0.10                   | 7.33 | 2.88                         | 3.09            | 1.659            | 64.0         | 1.3                          | 0.02                         | 0.55                         | 11.0            |                            |
| 440        | 4.80        | 11.020 | 0                      | 7.40 | 3.63                         | 4.25            | 1.714            | 67.0         | 0.3                          |                              | 3.16                         |                 | 1.5                        |
| August 21  |             |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |                            |
| 000        | 18.21       | 6.558  | 6.65                   | 8.38 | 0.03                         | 0.44            | 1.396            | 13.5         | 0.04                         | 0.03                         |                              |                 |                            |
| 070        | 4.26        | 10.059 | 0.40                   | 7.38 | 2.35                         | 2.88            | 1.637            | 60.5         | 2.28                         | 0.06                         |                              | 15.12           |                            |
| 100        | 4.64        | 10.622 | 0.10                   | 7.34 | 2.50                         | 3.07            | 1.667            | 64.5         | 0.07                         | 0.17                         |                              | 12.16           | 0                          |
| 150        | 4.77        | 10.934 |                        | 7.36 | 2.43                         | 3.29            | 1.687            | 67.0         | 0.06                         | 0.01                         |                              |                 | 3.4                        |
| 200        | 4.92        | 11.023 |                        | 7.36 | 2.53                         | 3.46            | 1.680            | 70.0         | 0                            | 0.02                         |                              | 21.64           | 4.4                        |
| 440        | 5.01        | 11.091 |                        | 7.36 | 2.51                         | 3.27            | 1.712            | 66.5         | 0                            | 0.02                         |                              | 14.56           | 3.7                        |

## Landsort Deep

58°35'N 18°14'E

| Depth<br>m | Temp.<br>°C | S<br>‰ | O <sub>2</sub><br>ml/l | pH   | PO <sub>4</sub> -P<br>µgat/l | Tot.P<br>µgat/l | Alkal.<br>Mval/l | Si<br>µgat/l | NO <sub>3</sub> -N<br>µgat/l | NO <sub>2</sub> -N<br>µgat/l | NH <sub>4</sub> -N<br>µgat/l | Tot.N<br>µgat/l | H <sub>2</sub> S<br>µgat/l |
|------------|-------------|--------|------------------------|------|------------------------------|-----------------|------------------|--------------|------------------------------|------------------------------|------------------------------|-----------------|----------------------------|
|            | October 30  |        |                        |      |                              |                 |                  |              |                              |                              |                              |                 |                            |
| 000        | 9.02        | 6.701  | 7.80                   | 8.09 | 0.12                         | 0.37            | 1.472            | 13.0         | 0.3                          | 0.12                         | 0.89                         |                 |                            |
| 070        | 4.33        | 10.106 | 0.82                   | 7.40 | 2.34                         | 2.78            | 1.563            | 56.0         | 2.1                          |                              | <0.1                         |                 |                            |
| 100        | 4.53        | 10.444 | 0.30                   | 7.35 | 2.38                         | 2.77            | 1.599            | 59.5         | 0.9                          | 0.02                         | 0.83                         |                 | 0                          |
| 150        | 4.74        | 10.779 | 0                      | 7.36 | 2.82                         | 3.10            | 1.620            | 64.0         | <0.1                         |                              | 1.06                         |                 | 2.1                        |
| 200        | 4.84        | 10.937 | 0                      | 7.37 | 2.96                         | 3.17            | 1.648            | 66.0         | <0.1                         | <0.01                        | 1.76                         |                 | 5.3                        |
| 440        | 4.93        | 11.030 | 0                      | 7.38 | 3.06                         | 3.55            | 1.607            | 65.5         | <0.1                         |                              | 2.35                         |                 | 8.4                        |

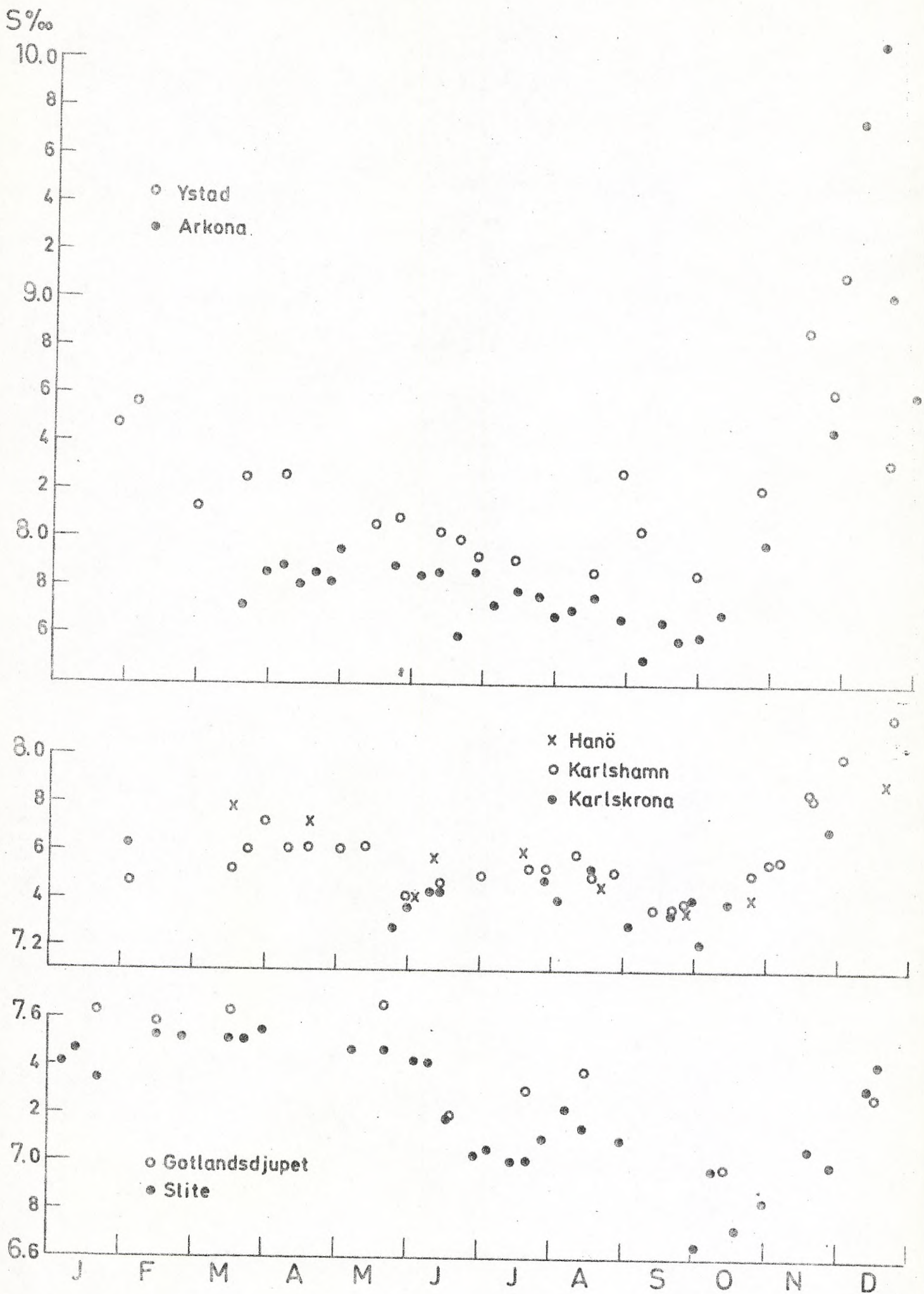


Fig. 1

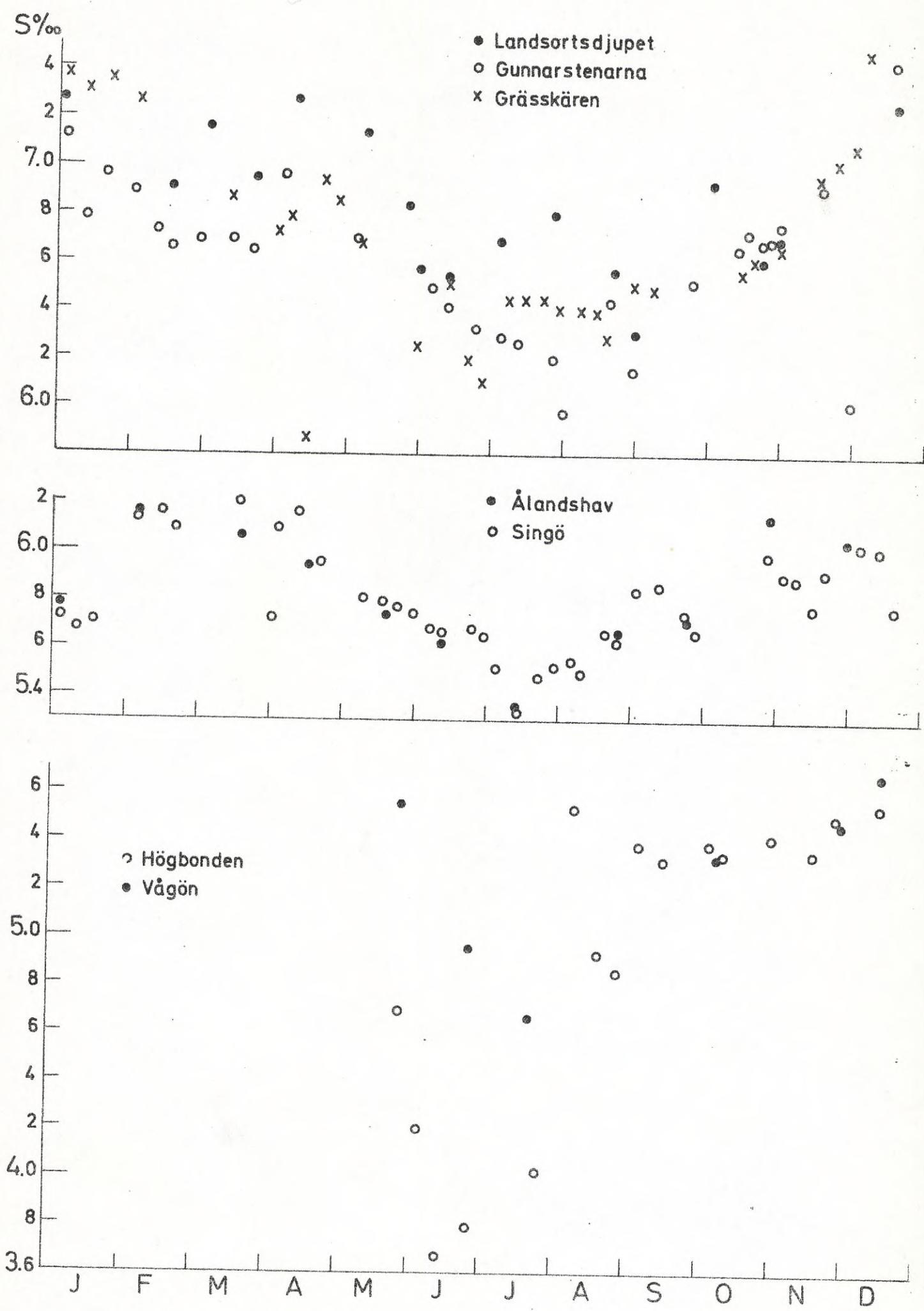
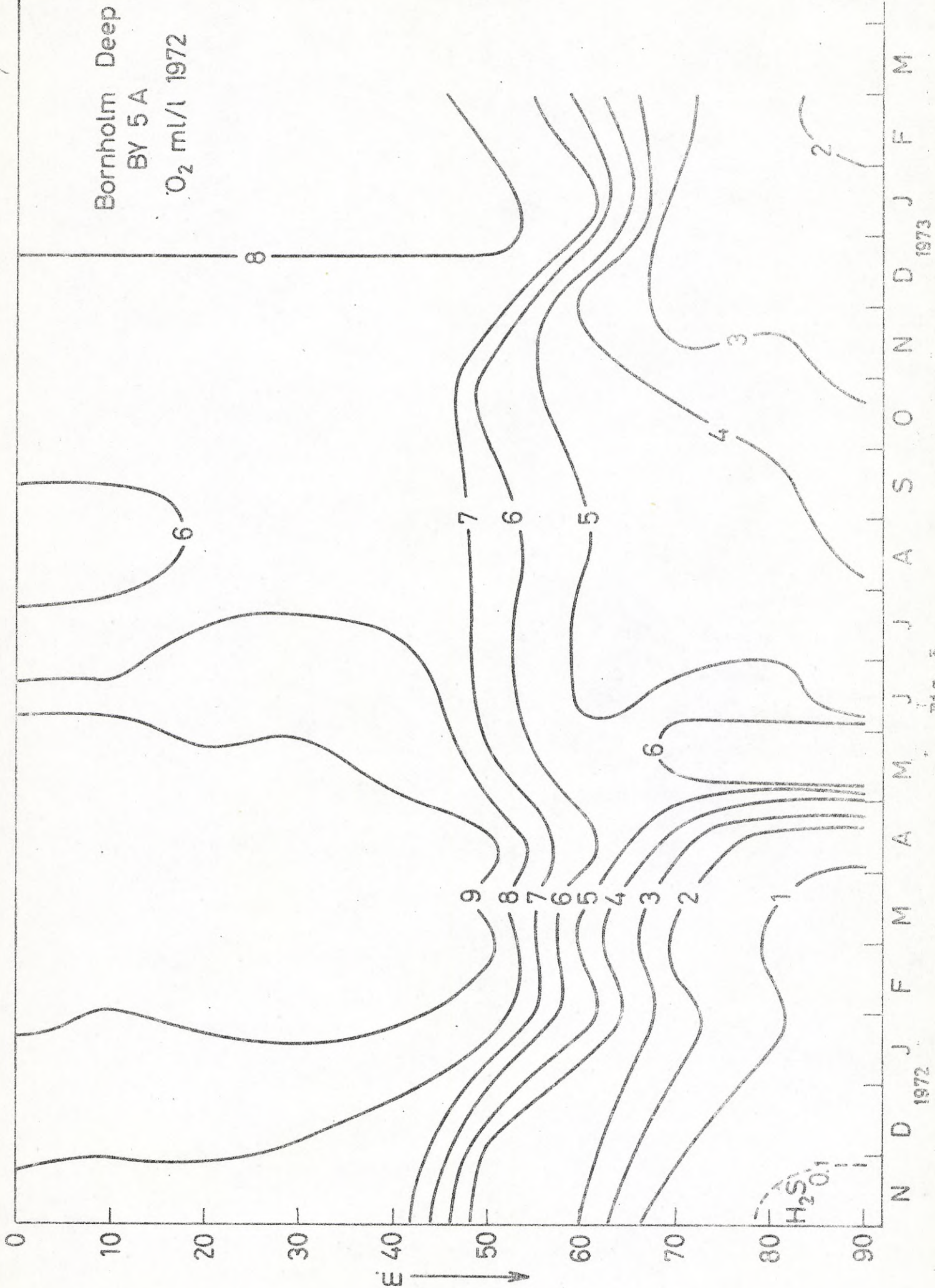


Fig. 2

Bornholm Deep  
BY 5 A  
O<sub>2</sub> ml/l 1972



Gotland Deep  
BY 15 A  
O<sub>2</sub> ml/l 1972

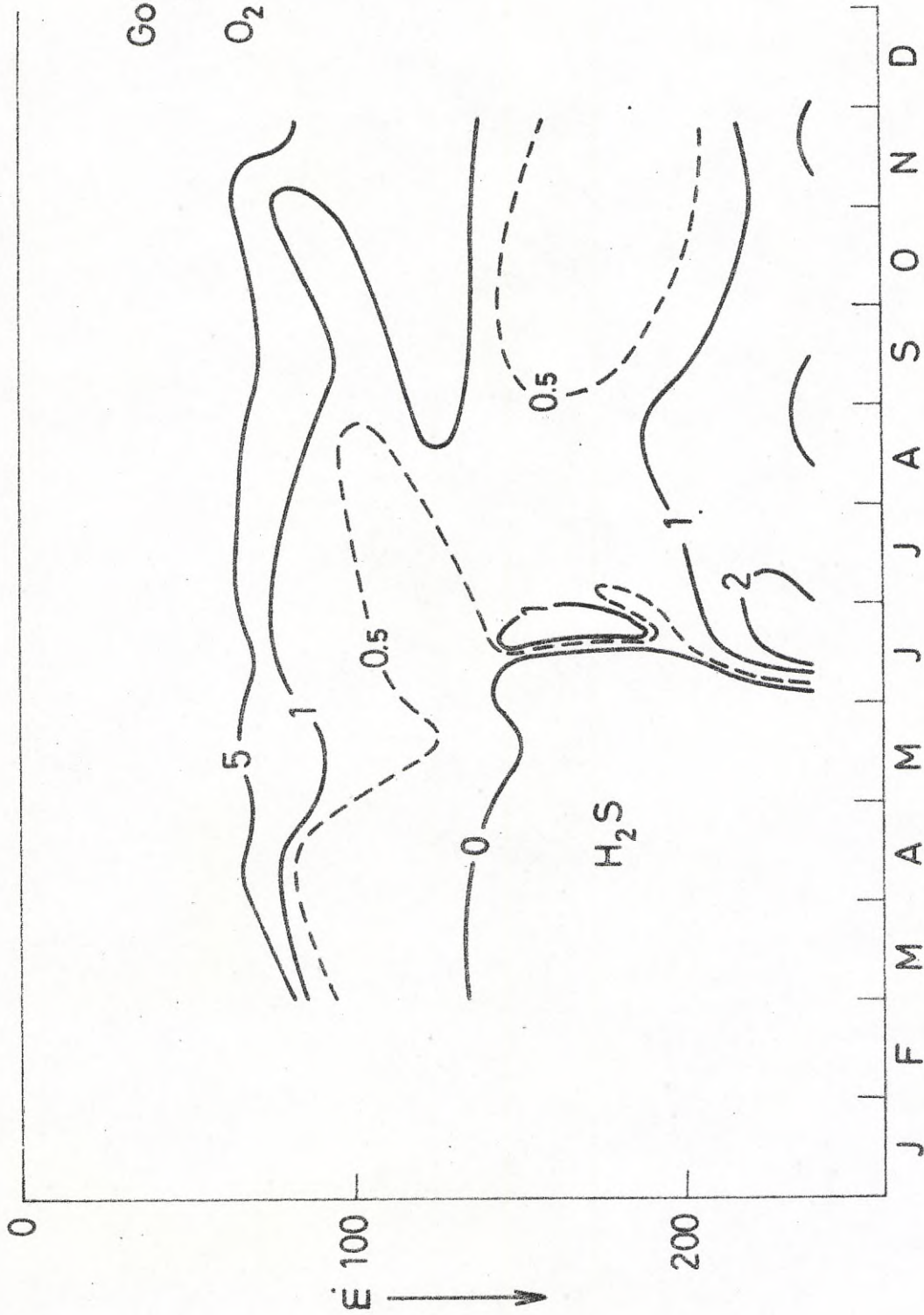


FIG. 4



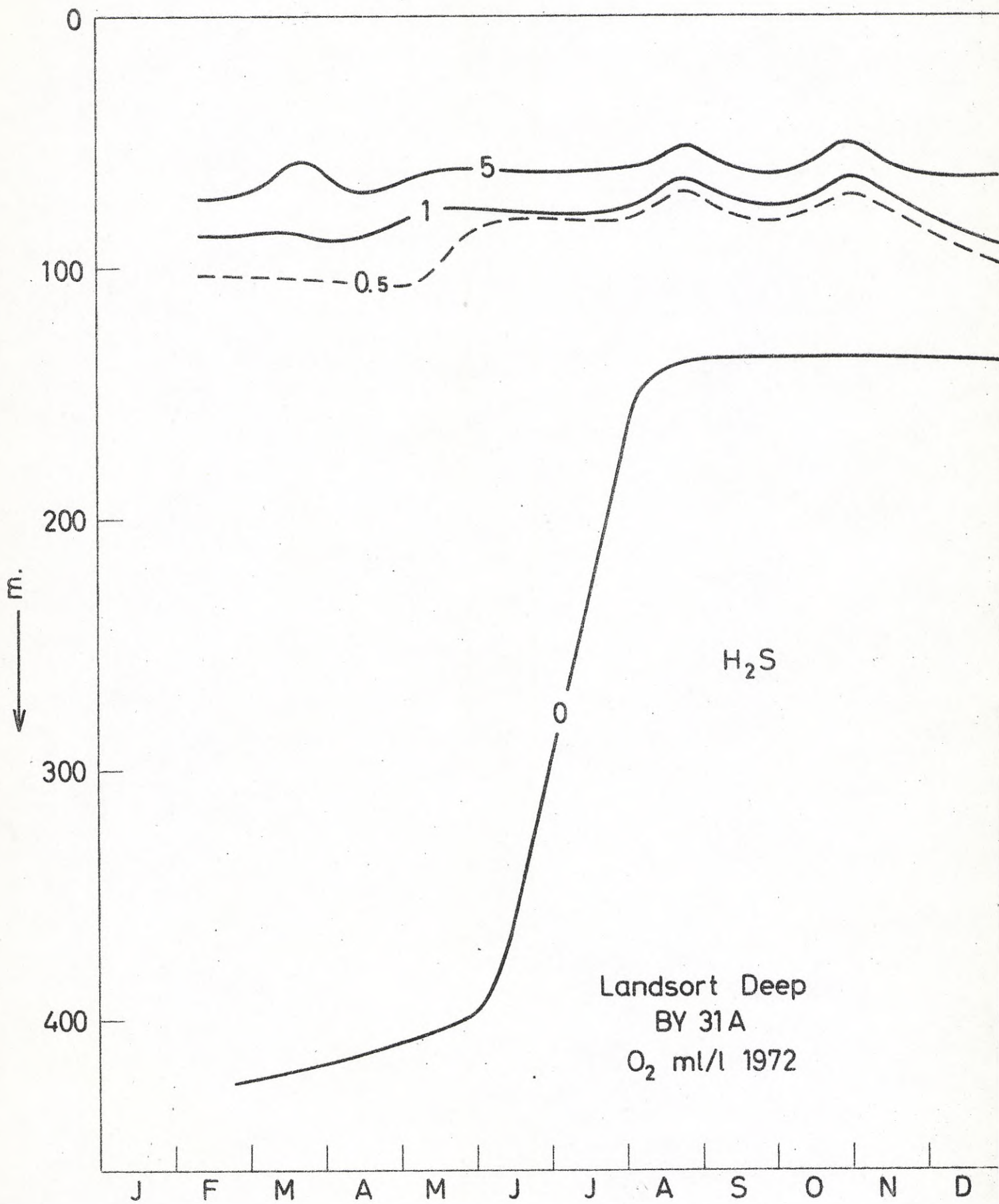


Fig. 5

## Hydrography of the Kattegat and the Skagerrak Area

1972

In Figures 1 and 2 results of daily measurements at Bornö station ( $58^{\circ} 22.85' N$   $11^{\circ} 35.05' E$ ) in the Gullmar fiord are presented as deviations in temperature and salinity from the mean values 1939 - 1963, similar to last year's report. The mean annual deviations at 5 m depth were  $+ 0.1 \text{ ‰ S}$  and  $- 0.3^{\circ} C$ .

Table 1 presents the oxygen saturation values at a station in the Northern Kattegat. This year the water renewal came later than Oct. 25 and thereby as low values as 63 % were found.

Table 2 shows that only very small changes occurred in the Skagerrak Deep.

For positions see Fig. 3.

Artur Svansson

Table 1

Percentage Oxygen Saturation at 57°11.5'N 11°40'E (Fladen).

| Depth m | Feb. 6 | Feb. 28 | Mar. 14 | Apr. 28 | May 10 | May 23 | June 17 | July 16 |
|---------|--------|---------|---------|---------|--------|--------|---------|---------|
| 30      | 92.9   | 91.8    | 91.0    | 87.1    | 95.5   | 92.9   | 93.2    | 83.5    |
| 40      | 95.4   | 91.4    | 89.6    | 82.0    | 91.4   | 94.1   | 92.8    | 79.1    |
| 50      | 95.2   | 90.6    | 88.6    | 81.5    | 95.2   | 95.5   | 92.3    | 77.6    |
| 60      | 98.1   | 88.8    | 88.7    | 80.8    | 95.6   | 93.4   | 92.6    | 78.3    |
| 70      | 97.0   |         | 89.0    | 80.0    | 90.4   |        | 96.6    | 78.4    |

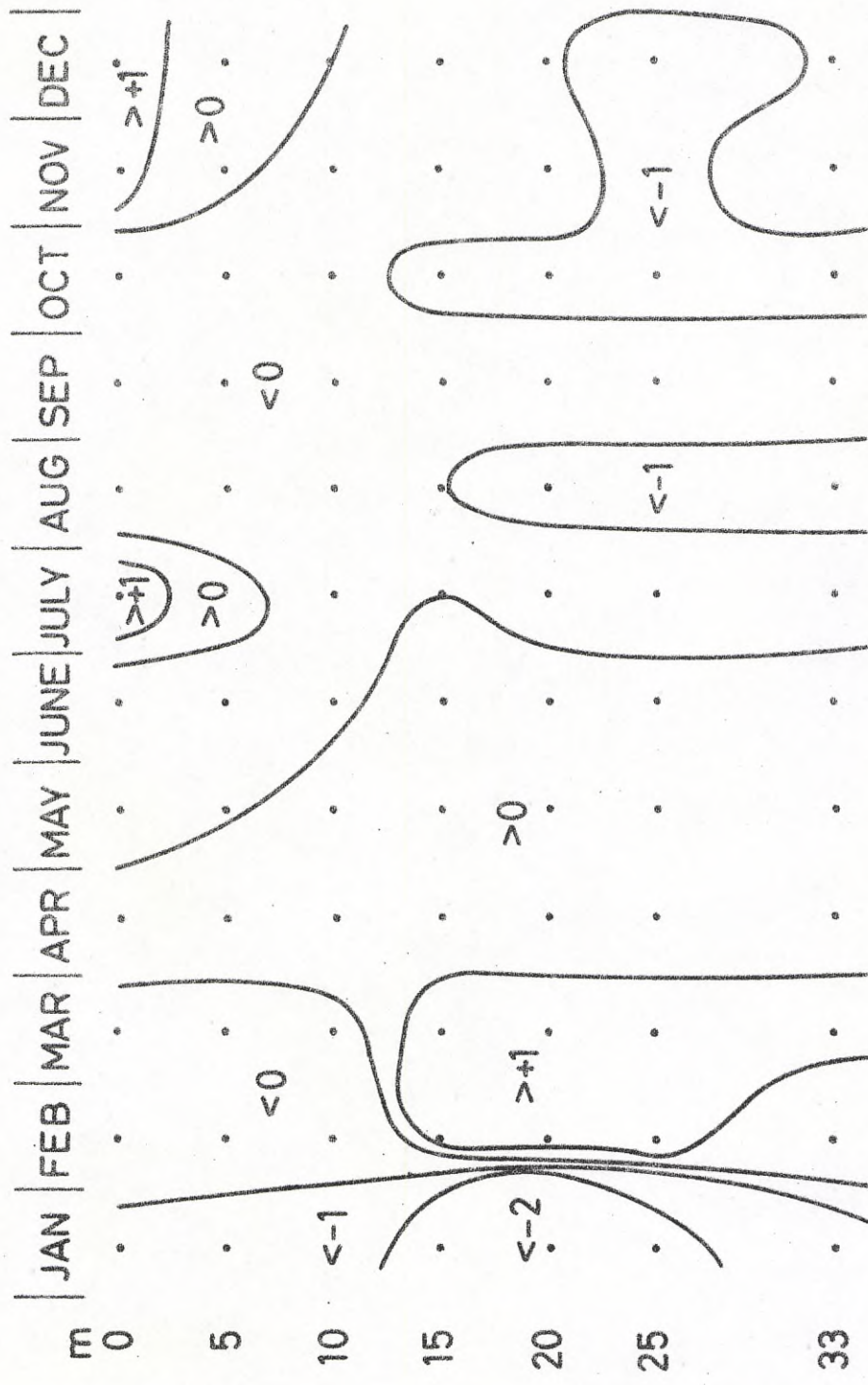
| Depth m | Aug. 14 | Aug. 16 | Aug. 28 | Sep. 18 | Oct. 13 | Oct. 25 | Dec. 16 |
|---------|---------|---------|---------|---------|---------|---------|---------|
| 30      | 90.6    | 88.6    | 85.4    | 75.7    | 88.3    | 97.0    | 96.0    |
| 40      | 81.4    | 80.4    | 81.8    | 68.3    | 70.5    | 75.6    | 97.4    |
| 50      | 81.6    | 77.5    | 74.8    | 67.7    | 67.3    | 63.1    | 91.3    |
| 60      | 78.1    | 76.2    | 73.6    | 67.9    | 60.8    | 63.6    | 93.0    |
| 70      |         | 76.0    | 72.7    | 67.0    | 60.2    |         | 98.7    |

Table 2

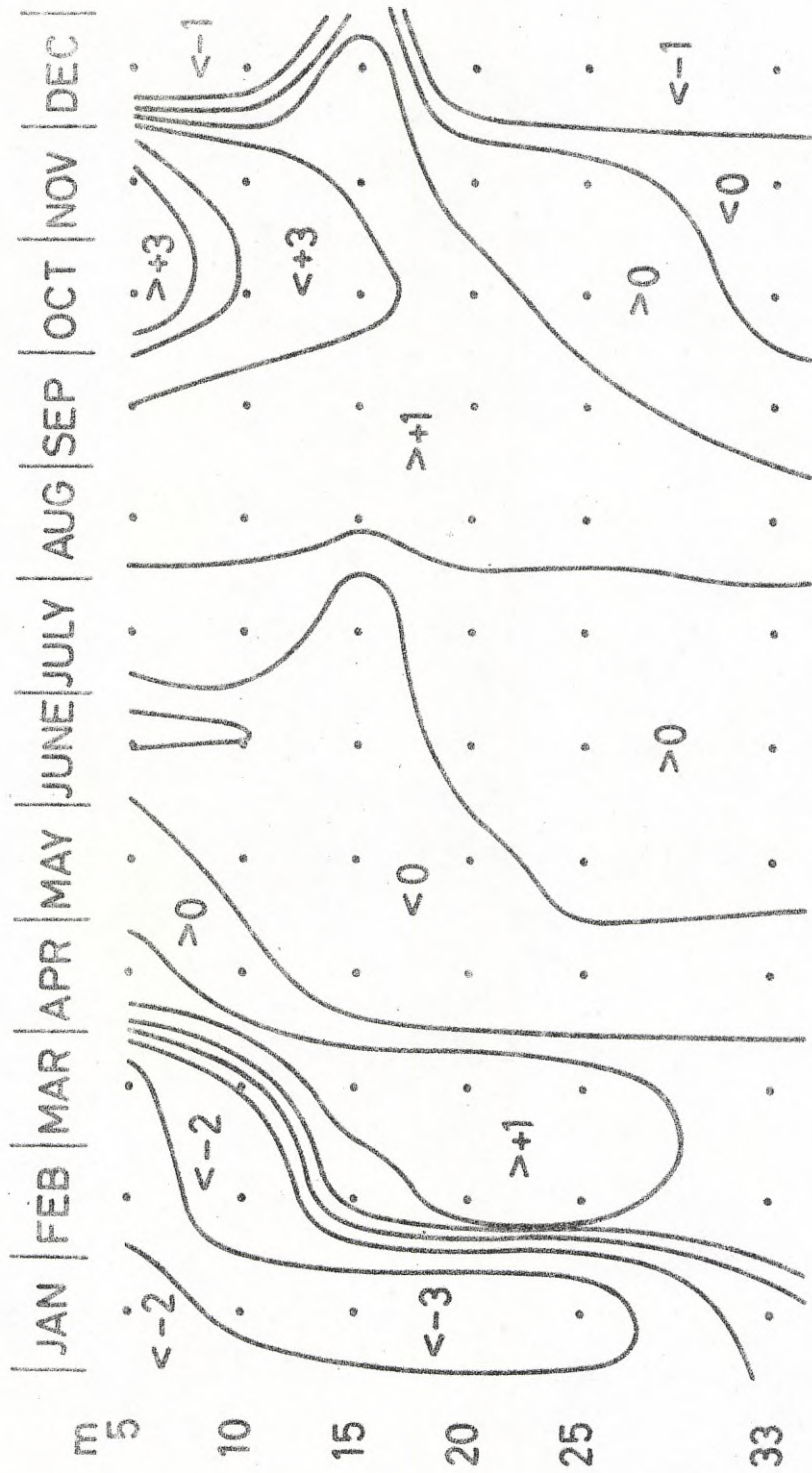
M 6

58°10'N 09°30'E

| Depth<br>m   | Temp.<br>°C | S<br>‰ | O <sub>2</sub><br>ml/l |
|--------------|-------------|--------|------------------------|
| January 20   |             |        |                        |
| 200          | 8.10        | 35.202 | 5.84                   |
| 300          | 7.16        | 35.186 | 5.73                   |
| 400          | 6.32        | 35.149 | 5.98                   |
| 500          | 5.69        | 35.109 | 6.03                   |
| 600          | 5.20        | 35.084 | 6.06                   |
| April 17     |             |        |                        |
| 200          | 6.69        | 35.104 | 6.33                   |
| 300          | 6.07        | 35.074 | 6.53                   |
| 400          | 6.02        | 35.123 | 6.55                   |
| 500          | 5.52        | 35.099 | 6.07                   |
| 600          | 5.20        | 35.085 | 6.06                   |
| September 14 |             |        |                        |
| 200          | 5.83        | 35.054 | 6.42                   |
| 300          | 5.80        | 35.008 | 6.32                   |
| 400          | 6.08        | 35.020 | 6.40                   |
| 500          | 6.06        | 35.131 | 6.25                   |
| 600          | 5.57        | 35.109 | 6.29                   |



Bornö 1972  
Temperature Deviations °C



Bornö 1972  
Salinity Deviations ‰



