

Oceanographic Data in Lützow-Holm Bay from July 1998 to December 1998
(JARE-39)

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1. Introduction

To investigate characteristics of intraseasonal to interannual variations in Lützow-Holm Bay, oceanographic observations were conducted from winter to early summer in 1998 under the auspices of the 39th Japanese Antarctic Research Expedition (JARE-39). Vertical profiles of temperature, salinity, and current velocity field were observed, and continuous moorings with sensors for those variables were conducted.

In this report, we present the vertical profiles of temperature and salinity obtained with a Conductivity-Temperature-Depth (CTD) profiler and expendable CTD (XCTD) system. The profiles of current velocity obtained with a current meter are also given. We also present information on observational sites and sea ice conditions.

2. Study Area

In Lützow-Holm Bay, observations were conducted mainly in three regions: Ongul Strait, the eastern boundary region of Lützow-Holm Bay, and Hovdebukta (Fig. 1). The sea ice condition in Lützow-Holm Bay was fairly unstable. Around the Ongul Islands, open water surface prevailed in the summer of 1997-1998, and growth of fast ice was delayed. South and west of the Ongul Islands, fast ice began to grow from April, but it became detached again in June. Hence, operations were started in late July. Details on the sea ice condition are described in National Institute of Polar Research (1999).

Observational sites and the depths there are listed in Table 1. In Ongul Strait, an observation point OS5 was placed at almost the center of the strait, and another point OS2 on the western slope of the strait. Observations were conducted almost once a month from July 22 to December 8 at OS5 and from July 23 to September 11 at OS2. Ice thickness and snow depth at the points are listed in Table 2. At the eastern boundary of Lützow-Holm Bay, west of the Ongul Islands, two

points (OW8 and OW28) were placed with a 10 km distance on the same latitudinal line. The fast ice in the center of the Bay became detached again in July, so the operations were restricted on the eastern side. Observations were conducted four times from August 20 to November 24. In Hovdebukta, CTD (XCTD) observation was conducted in October (September) at a point about 75m off from the edge of Langhovde Glacier.

3. Methods

Vertical profiles of temperature and salinity were obtained with a CTD profiler (Seabird SBE-19). Accuracy given by the manufacturer is 0.01 °C in temperature and 0.01 mmho/cm in conductivity. Salinity observations have significant uncertainty due to logistic difficulties. Results of salinity calibration suggest that the CTD output indicated a value 0.018 psu lower on average than that obtained with bottles. However, water used for calibration was obtained under severe field conditions and the values obtained have significant randomness, so it is ambiguous whether we can apply this simple correction for the CTD data. Thus, the raw data obtained are presented in Table 3.

Vertical profiles of temperature and salinity were also obtained with a XCTD system (Tsurumi-Seiki T.S.K. XCTD system). Accuracy in temperature is 0.02 °C, and that in conductivity is 0.03 mmho/cm. Depth accuracy is 5 m or 2% of the value indicated. The data are listed in Table 4.

Current profiles were measured with an electromagnetic current meter (ALEC Electronics ACM8M). Accuracy in current speed is 1 cm/s or 2% of the value obtained, and that in direction is 2°. An attached thermistor sensor provides the temperature to 0.05°C accuracy. Observations were usually conducted at 25 m depth intervals. The results are listed in Table 5.

Acknowledgments

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Reference

National Institute of Polar Research (1999): Nihon Nankyoku Chiiki Kansokutai Dai -39-ji-tai Hôkoku 1997-1999 (Report of the 39th Japanese Antarctic Research Expedition 1997-1999). Tokyo, 326p. (in Japanese).

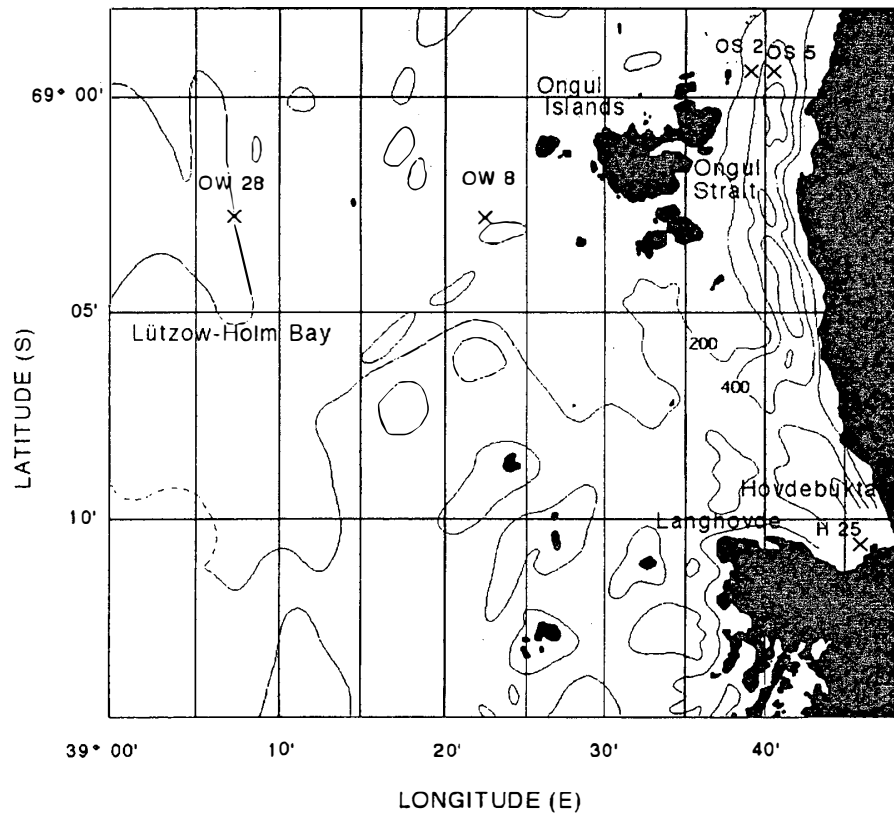


Fig. 1. Locations of oceanographic stations.

Table 1. Locations of oceanographic stations.

| Station | Position | | Depth (m) |
|-----------------|---------------|----------------|--------------|
| | Latitude (°S) | Longitude (°E) | |
| Ongul Strait | | | |
| OS5 | 68° 59.43'S | 39° 39.72'E | 549 |
| OS2 | 68° 59.52'S | 39° 37.87'E | 317 |
| Lützow-Holm Bay | | | |
| OW8 | 69° 02.33'S | 39° 22.28'E | 197 |
| OW28 | 69° 02.27'S | 39° 06.92'E | 147 |
| Hovdebukta | | | |
| H25 | 69° 10.97'S | 39° 47.43'E | 602 |
| NPO | 69° 07.02'S | 39° 35.15'E | 150 |

Table 2. Ice thickness and snow depth at the observational sites.

| Station | Date | | ice thickness (cm) | snow depth (cm) | freeboard (cm) |
|---------|-------|-----|-----------------------|--------------------|-------------------|
| | Month | Day | | | |
| OS5 | 7 | 20 | 60 | 29 | - |
| | 8 | 11 | 69 | 23 | - |
| | 10 | 12 | 84 | 25 | -3 |
| | 11 | 20 | 109 | - | - |
| | 12 | 8 | 90 | 20 | 5 |
| OS2 | 7 | 23 | - | - | - |
| | 8 | 12 | 75 | 25 | - |
| | 9 | 11 | 90 | 32 | - |
| | 11 | 20 | 121 | 27 | 0 |
| OW8 | 8 | 21 | 72 | 27 | 0 |
| | 10 | 7 | 102 | 24 | 2 |
| | 10 | 23 | 93.5 | 39 | -6.5 |
| | 11 | 24 | 105 | 27 | -2 |
| OW28 | 8 | 20 | 70 | 26 | - |
| | 10 | 6 | 96 | 36 | -4 |
| | 10 | 22 | 108 | 37 | -6 |
| | 11 | 23 | 103 | 47 | -7 |
| | 11 | 30 | 103 | 31 | - |
| H25 | 9 | 2 | 110 | 5 | 8 |
| | 10 | 5 | 126 | 1.5 | 11 |

Table 3. CTD observation data.

Stn. OS5

Date: Jul. 22,1998 Time: 14:07 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.855 | 33.852 |
| 10 | -1.854 | 33.860 |
| 20 | -1.851 | 33.867 |
| 30 | -1.847 | 33.874 |
| 50 | -1.828 | 33.908 |
| 75 | -1.831 | 33.915 |
| 100 | -1.805 | 33.936 |
| 125 | -1.687 | 33.994 |
| 150 | -1.618 | 34.052 |
| 200 | -1.558 | 34.093 |
| 250 | -1.472 | 34.167 |
| 300 | -1.456 | 34.179 |
| 400 | -1.445 | 34.197 |
| 500 | -1.460 | 34.249 |
| 521 | -1.456 | 34.302 |

Stn. OS5

Date: Aug. 11,1998 Time: 13:33 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.840 | 33.985 |
| 10 | -1.841 | 33.984 |
| 20 | -1.837 | 33.980 |
| 30 | -1.826 | 33.986 |
| 50 | -1.798 | 33.994 |
| 75 | -1.766 | 34.010 |
| 100 | -1.666 | 34.060 |
| 125 | -1.615 | 34.099 |
| 150 | -1.536 | 34.157 |
| 200 | -1.493 | 34.186 |
| 250 | -1.475 | 34.209 |
| 300 | -1.444 | 34.225 |
| 400 | -1.431 | 34.238 |
| 500 | -1.441 | 34.281 |
| 514 | -1.437 | 34.295 |

Stn. OS5

Date: Sep. 12,1998 Time: 10:17 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.824 | 33.963 |
| 10 | -1.828 | 33.966 |
| 20 | -1.808 | 33.975 |
| 30 | -1.799 | 33.979 |
| 50 | -1.768 | 33.994 |
| 75 | -1.778 | 34.003 |
| 100 | -1.706 | 34.033 |
| 125 | -1.625 | 34.086 |
| 150 | -1.568 | 34.127 |
| 200 | -1.475 | 34.204 |
| 250 | -1.440 | 34.236 |
| 300 | -1.422 | 34.250 |
| 400 | -1.388 | 34.267 |
| 500 | -1.380 | 34.275 |
| 506 | -1.381 | 34.275 |

Stn. OS5

Date: Oct. 12,1998 Time: 10:03 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.846 | 34.019 |
| 10 | -1.847 | 34.018 |
| 20 | -1.843 | 34.015 |
| 30 | -1.842 | 34.015 |
| 50 | -1.813 | 34.024 |
| 75 | -1.744 | 34.039 |
| 100 | -1.633 | 34.093 |
| 125 | -1.527 | 34.152 |
| 150 | -1.518 | 34.178 |
| 200 | -1.430 | 34.240 |
| 250 | -1.391 | 34.268 |
| 300 | -1.354 | 34.281 |
| 400 | -1.412 | 34.281 |
| 492 | -1.458 | 34.284 |

Table 3. CTD observation data.

Stn. OS5

Date: Nov. 14,1998 Time: 09:53 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.815 | 34.049 |
| 10 | -1.812 | 34.045 |
| 20 | -1.809 | 34.041 |
| 30 | -1.802 | 34.038 |
| 50 | -1.767 | 34.044 |
| 75 | -1.648 | 34.095 |
| 100 | -1.566 | 34.150 |
| 125 | -1.490 | 34.192 |
| 150 | -1.460 | 34.224 |
| 200 | -1.461 | 34.260 |
| 250 | -1.437 | 34.292 |
| 300 | -1.427 | 34.305 |
| 400 | -1.459 | 34.310 |
| 491 | -1.461 | 34.317 |

Stn. OS5

Date: Dec. 08,1998 Time: 09:45 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.622 | 34.000 |
| 10 | -1.649 | 34.002 |
| 20 | -1.676 | 34.004 |
| 30 | -1.702 | 34.028 |
| 50 | -1.612 | 34.079 |
| 75 | -1.592 | 34.135 |
| 100 | -1.520 | 34.187 |
| 125 | -1.490 | 34.197 |
| 150 | -1.406 | 34.246 |
| 200 | -1.322 | 34.288 |
| 250 | -1.324 | 34.301 |
| 300 | -1.319 | 34.314 |
| 400 | -1.466 | 34.313 |
| 500 | -1.458 | 34.319 |
| 505 | -1.459 | 34.319 |

Stn. OS2

Date: Jul. 23,1998 Time: 11:32 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.834 | 33.945 |
| 10 | -1.833 | 33.946 |
| 20 | -1.820 | 33.949 |
| 30 | -1.820 | 33.948 |
| 50 | -1.819 | 33.949 |
| 75 | -1.765 | 33.979 |
| 100 | -1.707 | 34.002 |
| 125 | -1.699 | 34.006 |
| 150 | -1.605 | 34.059 |
| 200 | -1.523 | 34.115 |
| 250 | -1.486 | 34.146 |
| 296 | -1.467 | 34.162 |

Stn. OS2

Date: Aug. 13,1998 Time: 11:10 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.817 | 33.962 |
| 10 | -1.816 | 33.960 |
| 20 | -1.820 | 33.963 |
| 30 | -1.818 | 33.963 |
| 50 | -1.803 | 33.972 |
| 75 | -1.753 | 33.995 |
| 100 | -1.653 | 34.059 |
| 125 | -1.617 | 34.078 |
| 150 | -1.542 | 34.138 |
| 200 | -1.511 | 34.163 |
| 250 | -1.483 | 34.201 |
| 300 | -1.467 | 34.209 |
| 301 | -1.467 | 34.210 |

Table 3. CTD observation data.

Stn. OS2

Date: Sep. 11, 1998 Time: 11:08 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.813 | 33.990 |
| 10 | -1.820 | 33.990 |
| 20 | -1.800 | 33.992 |
| 30 | -1.794 | 33.995 |
| 50 | -1.781 | 33.999 |
| 75 | -1.763 | 34.007 |
| 100 | -1.734 | 34.024 |
| 125 | -1.650 | 34.056 |
| 150 | -1.581 | 34.114 |
| 200 | -1.462 | 34.219 |
| 250 | -1.424 | 34.249 |
| 288 | -1.408 | 34.262 |

Stn. OS2

Date: Nov. 14, 1998 Time: 09:53 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.815 | 34.049 |
| 10 | -1.812 | 34.045 |
| 20 | -1.809 | 34.041 |
| 30 | -1.802 | 34.038 |
| 50 | -1.767 | 34.044 |
| 75 | -1.648 | 34.095 |
| 100 | -1.566 | 34.150 |
| 125 | -1.490 | 34.192 |
| 150 | -1.460 | 34.224 |
| 200 | -1.461 | 34.260 |
| 250 | -1.437 | 34.292 |
| 300 | -1.427 | 34.305 |
| 400 | -1.459 | 34.310 |
| 491 | -1.461 | 34.317 |

Stn. OW8

Date: Aug. 21, 1998 Time: 11:00 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.837 | 7.833 |
| 10 | -1.837 | 8.732 |
| 20 | -1.836 | 11.738 |
| 30 | -1.835 | 13.086 |
| 50 | -1.834 | 15.877 |
| 75 | -1.828 | 16.579 |
| 100 | -1.742 | 17.492 |
| 125 | -1.724 | 19.429 |
| 150 | -1.717 | 32.868 |
| 189 | -1.710 | 30.692 |

Stn. OW8

Date: Oct. 07, 1998 Time: 11:52 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | — | — |
| 10 | — | — |
| 20 | — | — |
| 30 | — | — |
| 50 | -1.819 | 33.968 |
| 75 | -1.751 | 33.997 |
| 100 | -1.704 | 34.032 |
| 125 | -1.693 | 34.044 |
| 150 | -1.686 | 34.053 |
| 175 | -1.681 | 34.063 |

Table 3. CTD observation data.

Stn. OW8

Date: Nov. 24, 1998 Time: 09:42 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.794 | 34.043 |
| 10 | -1.793 | 34.044 |
| 20 | -1.778 | 34.051 |
| 30 | -1.732 | 34.056 |
| 50 | -1.694 | 34.074 |
| 75 | -1.663 | 34.101 |
| 100 | -1.605 | 34.127 |
| 125 | -1.599 | 34.131 |
| 150 | -1.591 | 34.135 |
| 188 | -1.582 | 34.138 |

Stn. OW28

Date: Aug. 20, 1998 Time: 14:51 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.829 | 33.865 |
| 10 | -1.824 | 33.878 |
| 20 | -1.824 | 33.897 |
| 30 | -1.821 | 33.907 |
| 50 | -1.820 | 33.923 |
| 75 | -1.822 | 33.946 |
| 100 | -1.747 | 33.991 |
| 125 | -1.688 | 34.049 |
| 135 | -1.682 | 34.057 |

Stn. OW28

Date: Oct. 06, 1998 Time: 13:57 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.843 | — |
| 10 | -1.844 | — |
| 20 | -1.862 | 7.062 |
| 30 | -1.852 | 7.776 |
| 50 | -1.807 | 21.987 |
| 75 | -1.736 | 27.330 |
| 100 | -1.626 | 34.062 |
| 116 | -1.584 | 34.124 |

Stn. OW28

Date: Oct. 22, 1998 Time: 13:19 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.830 | 33.990 |
| 10 | -1.832 | 33.992 |
| 20 | -1.826 | 34.003 |
| 30 | -1.824 | 34.008 |
| 50 | -1.810 | 34.011 |
| 75 | -1.699 | 34.071 |
| 100 | -1.625 | 34.121 |
| 125 | -1.560 | 34.154 |

Table 3. CTD observation data.

Stn. OW28

Date: Nov. 23,1998 Time: 11:29 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.852 | 34.077 |
| 10 | -1.851 | 34.076 |
| 20 | -1.814 | 34.074 |
| 30 | -1.819 | 34.078 |
| 50 | -1.802 | 34.071 |
| 75 | -1.654 | 34.128 |
| 100 | -1.611 | 34.168 |
| 125 | -1.549 | 34.211 |
| 138 | -1.531 | 34.216 |

Stn. H25

Date: Oct. 05,1998 Time: 15:30 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 5 | -1.840 | 34.035 |
| 10 | -1.839 | 34.035 |
| 20 | -1.841 | 34.029 |
| 30 | -1.840 | 34.026 |
| 50 | -1.838 | 34.023 |
| 75 | -1.829 | 34.027 |
| 100 | -1.623 | 34.105 |
| 125 | -1.549 | 34.169 |
| 150 | -1.555 | 34.196 |
| 200 | -1.480 | 34.234 |
| 250 | -1.418 | 34.257 |
| 300 | -1.400 | 34.273 |
| 400 | -1.362 | 34.286 |
| 500 | -1.316 | 34.335 |
| 573 | -1.253 | 34.352 |

Table 4. XCTD observation data.

Strn. H25

Date: Sep. 02,1998 Time: 15:00 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) | PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|---------------|--------------|--------------|
| 2 | -1.865 | 32.498 | 310 | -1.440 | 34.366 |
| 10 | -1.854 | 33.798 | 320 | -1.440 | 34.379 |
| 20 | -1.854 | 34.022 | 330 | -1.429 | 34.375 |
| 30 | -1.854 | 34.092 | 340 | -1.429 | 34.376 |
| 40 | -1.854 | 34.115 | 350 | -1.429 | 34.381 |
| 50 | -1.854 | 34.123 | 360 | -1.429 | 34.381 |
| 60 | -1.854 | 34.132 | 370 | -1.429 | 34.377 |
| 70 | -1.854 | 34.134 | 380 | -1.419 | 34.378 |
| 80 | -1.854 | 34.145 | 390 | -1.419 | 34.389 |
| 90 | -1.854 | 34.149 | 400 | -1.419 | 34.386 |
| 100 | -1.734 | 34.180 | 410 | -1.419 | 34.386 |
| 110 | -1.668 | 34.220 | 420 | -1.408 | 34.383 |
| 120 | -1.625 | 34.234 | 430 | -1.429 | 34.389 |
| 130 | -1.625 | 34.251 | 440 | -1.419 | 34.392 |
| 140 | -1.592 | 34.267 | 450 | -1.419 | 34.397 |
| 150 | -1.538 | 34.282 | 460 | -1.386 | 34.418 |
| 160 | -1.538 | 34.291 | 470 | -1.365 | 34.429 |
| 170 | -1.582 | 34.299 | 480 | -1.343 | 34.443 |
| 180 | -1.560 | 34.315 | 490 | -1.321 | 34.448 |
| 190 | -1.549 | 34.314 | 500 | -1.311 | 34.447 |
| 200 | -1.538 | 34.316 | 510 | -1.300 | 34.448 |
| 210 | -1.549 | 34.326 | 520 | -1.289 | 34.454 |
| 220 | -1.527 | 34.334 | 530 | -1.278 | 34.458 |
| 230 | -1.495 | 34.336 | 540 | -1.267 | 34.458 |
| 240 | -1.506 | 34.343 | 550 | -1.256 | 34.461 |
| 250 | -1.462 | 34.347 | 560 | -1.246 | 34.465 |
| 260 | -1.451 | 34.348 | 570 | -1.235 | 34.469 |
| 270 | -1.451 | 34.361 | 580 | -1.224 | 34.471 |
| 280 | -1.451 | 34.362 | 590 | -1.224 | 34.474 |
| 290 | -1.451 | 34.365 | 600 | -1.213 | 34.476 |
| 300 | -1.440 | 34.364 | | | |

Table 4. XCTD observation data.

Stn. NPO

Date: Oct. 27, 1998 Time: 12:00 (LT)

| PRESS (dB) | TEMP (°C) | SAL (PSU) |
|---------------|--------------|--------------|
| 2 | -1.819 | 32.375 |
| 10 | -1.830 | 33.025 |
| 20 | -1.808 | 33.609 |
| 30 | -1.819 | 33.729 |
| 40 | -1.819 | 33.817 |
| 50 | -1.786 | 34.190 |
| 60 | -1.819 | 34.199 |
| 70 | -1.764 | 34.204 |
| 80 | -1.634 | 34.245 |
| 90 | -1.612 | 34.273 |
| 100 | -1.558 | 34.309 |
| 110 | -1.526 | 34.321 |
| 120 | -1.515 | 34.333 |
| 130 | -1.482 | 34.348 |
| 140 | -1.471 | 34.362 |
| 150 | -1.471 | 34.392 |

Table 5. Vertical current profile data.

Stn. OS5

Date: Jul. 22, 1998 Time: 14:50-15:20 (LT)

| DEPTH | N-COMP | E-COMP | TEMP |
|-------|--------|--------|-------|
| (m) | (cm/s) | (cm/s) | (°C) |
| 2 | 0.98 | -1.17 | -1.87 |
| 25 | 18.25 | -2.23 | -1.86 |
| 50 | 11.92 | -8.02 | -1.85 |
| 75 | -1.18 | -0.60 | -1.85 |
| 100 | 9.12 | -10.30 | -1.86 |
| 125 | 7.21 | -4.84 | -1.78 |
| 150 | 2.20 | 8.10 | -1.66 |
| 175 | 3.24 | -3.66 | -1.60 |
| 200 | 1.77 | 0.98 | -1.58 |
| 250 | -4.31 | -2.15 | -1.49 |
| 300 | -1.77 | -3.70 | -1.46 |
| 350 | -4.33 | 0.13 | -1.45 |
| 400 | -0.30 | -2.21 | -1.45 |
| 450 | -1.12 | -0.55 | -1.46 |
| 500 | -4.97 | -0.54 | -1.46 |

Stn. OS5

Date: Aug. 12, 1998 Time: 10:25-11:10 (LT)

| DEPTH | N-COMP | E-COMP | TEMP |
|-------|--------|--------|------|
| (m) | (cm/s) | (cm/s) | (°C) |
| 2 | -12.09 | 2.53 | |
| 25 | -7.22 | 12.54 | |
| 50 | 6.69 | -1.32 | |
| 75 | -6.62 | 12.91 | |
| 100 | -6.03 | 12.59 | |
| 125 | 2.93 | 1.58 | |
| 150 | 2.22 | 0.36 | |
| 175 | 1.40 | 1.41 | |
| 200 | 1.57 | 0.97 | |
| 225 | 1.59 | -0.03 | |
| 250 | 0.38 | -0.32 | |
| 275 | 0.61 | 0.23 | |
| 300 | 0.30 | 0.52 | |
| 325 | -0.38 | 0.51 | |
| 350 | -0.30 | 0.86 | |
| 375 | 0.77 | 0.03 | |
| 400 | -0.12 | 0.11 | |
| 425 | 0.56 | 0.21 | |
| 450 | 0.80 | 0.34 | |
| 475 | 1.63 | 0.43 | |
| 500 | 0.89 | 0.14 | |

Table 5. Vertical current profile data.

Stn. OS5

Date: Sep. 12, 1998 Time: 11:15–12:10 (LT)

| DEPTH (m) | N-COMP (cm/s) | E-COMP (cm/s) | TEMP (°C) |
|--------------|------------------|------------------|--------------|
| 2 | -0.80 | 0.88 | -1.87 |
| 20 | 11.50 | 6.46 | -1.85 |
| 40 | 0.21 | 4.30 | -1.80 |
| 60 | -1.75 | -10.75 | -1.82 |
| 80 | -2.75 | 1.68 | -1.80 |
| 100 | 6.71 | 4.10 | -1.72 |
| 120 | -4.91 | -0.69 | -1.65 |
| 140 | -4.45 | -0.23 | -1.60 |
| 160 | 2.09 | -2.33 | -1.58 |
| 180 | -2.71 | -4.51 | -1.52 |
| 200 | 0.19 | 2.16 | -1.48 |
| 220 | -4.56 | -1.67 | -1.46 |
| 240 | 0.50 | -0.47 | -1.46 |
| 260 | 1.45 | -0.99 | -1.45 |
| 280 | 1.11 | 2.26 | -1.44 |
| 300 | -2.53 | 0.29 | -1.43 |
| 320 | -0.73 | -1.18 | -1.42 |
| 340 | 2.22 | -1.33 | -1.40 |
| 360 | 0.37 | -2.19 | -1.40 |
| 380 | -0.84 | 2.14 | -1.40 |
| 400 | 2.15 | 1.40 | -1.40 |
| 420 | -1.35 | -0.90 | -1.41 |
| 440 | 0.21 | -2.15 | -1.40 |
| 460 | 0.70 | 1.77 | -1.40 |
| 480 | 3.18 | 0.96 | -1.40 |
| 500 | -0.01 | -0.65 | -1.39 |

Stn. OS5

Date: Oct. 12, 1998 Time: 10:40–11:20 (LT)

| DEPTH (m) | N-COMP (cm/s) | E-COMP (cm/s) | TEMP (°C) |
|--------------|------------------|------------------|--------------|
| 2 | -5.90 | -0.62 | -1.81 |
| 25 | 15.77 | -0.10 | -1.85 |
| 50 | 14.90 | 1.74 | -1.82 |
| 75 | 13.31 | 3.33 | -1.78 |
| 100 | 4.10 | -0.76 | -1.65 |
| 125 | -1.97 | -1.89 | -1.53 |
| 150 | -0.45 | 1.30 | -1.51 |
| 175 | 1.96 | 1.68 | -1.46 |
| 200 | -0.35 | 1.68 | -1.44 |
| 225 | 2.65 | 3.29 | -1.42 |
| 250 | 1.62 | 3.26 | -1.41 |
| 275 | 3.43 | -1.41 | -1.39 |
| 300 | 1.04 | -1.83 | -1.35 |
| 325 | -2.22 | 2.41 | -1.35 |
| 350 | -0.61 | -0.29 | -1.35 |
| 375 | -2.04 | -1.14 | -1.37 |
| 400 | 5.67 | -2.32 | -1.45 |
| 425 | -1.77 | 0.54 | -1.46 |
| 450 | 2.49 | 0.55 | -1.47 |
| 475 | -2.20 | 3.06 | -1.46 |
| 500 | 0.86 | -0.95 | -1.43 |

Table 5. Vertical current profile data.

Stn. OS5

Date: Nov. 14,1998 Time: 10:35-11:35 (LT)

| DEPTH (m) | N-COMP (cm/s) | E-COMP (cm/s) | TEMP (°C) |
|--------------|------------------|------------------|--------------|
| 2 | 8.56 | 3.87 | -1.82 |
| 25 | 3.69 | -3.61 | -1.81 |
| 50 | -1.75 | 1.61 | -1.79 |
| 75 | 0.83 | 0.72 | -1.66 |
| 100 | 0.60 | -0.37 | -1.60 |
| 125 | 1.33 | 1.13 | -1.52 |
| 150 | -0.73 | 0.22 | -1.47 |
| 175 | 0.19 | -0.64 | -1.45 |
| 200 | 0.44 | -1.27 | -1.47 |
| 225 | 0.74 | -1.19 | -1.47 |
| 250 | 0.06 | -0.09 | -1.45 |
| 275 | -0.13 | 0.33 | -1.42 |
| 300 | 0.46 | 0.25 | -1.36 |
| 325 | 0.74 | -0.48 | -1.45 |
| 350 | -0.24 | -0.19 | -1.46 |
| 375 | 0.09 | -0.04 | -1.44 |
| 400 | 0.39 | 0.10 | -1.45 |
| 425 | 0.53 | -0.03 | -1.46 |
| 450 | 0.13 | -0.25 | -1.47 |
| 475 | 0.15 | -0.03 | -1.46 |
| 500 | 0.44 | -0.24 | -1.46 |

Stn. OS5

Date: Dec. 08,1998 Time: 10:20-11:05 (LT)

| DEPTH (m) | N-COMP (cm/s) | E-COMP (cm/s) | TEMP (°C) |
|--------------|------------------|------------------|--------------|
| 0 | -4.53 | 4.93 | -1.30 |
| 25 | 2.44 | -0.90 | -1.66 |
| 50 | 4.54 | -7.66 | -1.61 |
| 75 | -6.12 | 6.28 | -1.60 |
| 100 | 3.77 | 2.23 | -1.52 |
| 125 | 2.72 | -2.55 | -1.48 |
| 150 | -1.82 | 2.21 | -1.40 |
| 175 | -0.03 | 1.77 | -1.34 |
| 200 | 0.92 | -1.58 | -1.32 |
| 225 | -2.97 | 0.05 | -1.31 |
| 250 | 2.08 | 6.69 | -1.33 |
| 275 | 1.13 | -1.43 | -1.37 |
| 300 | 2.85 | -0.68 | -1.33 |
| 325 | 1.80 | -1.99 | -1.32 |
| 350 | -0.30 | 4.34 | -1.44 |
| 375 | -0.08 | -0.84 | -1.46 |
| 400 | 8.98 | 4.03 | -1.46 |
| 425 | -3.29 | 2.66 | -1.45 |
| 450 | -2.54 | 3.17 | -1.46 |
| 475 | -2.20 | 3.70 | -1.46 |
| 500 | -0.55 | -0.54 | -1.46 |

Table 5. Vertical current profile data.

Stn. OS2

Date: Jul. 23, 1998 Time: 12:50-13:15 (LT)

| DEPTH | N-COMP | E-COMP | TEMP |
|-------|--------|--------|-------|
| (m) | (cm/s) | (cm/s) | (°C) |
| 2 | -5.72 | 6.66 | -1.85 |
| 25 | -0.15 | -4.40 | -1.84 |
| 50 | 3.03 | 6.47 | -1.84 |
| 75 | -1.25 | -8.35 | -1.79 |
| 100 | -4.50 | -1.51 | -1.75 |
| 125 | -1.82 | -2.36 | -1.69 |
| 150 | 1.46 | -1.63 | -1.63 |
| 175 | 0.27 | -3.49 | -1.59 |
| 200 | -2.38 | 3.72 | -1.54 |
| 225 | 3.96 | -0.06 | -1.52 |
| 250 | 3.96 | -0.06 | -1.50 |
| 275 | -1.28 | 2.24 | -1.49 |
| 300 | -0.25 | -1.68 | -1.48 |

Stn. OS2

Date: Aug. 13, 1998 Time: 11:50-12:15 (LT)

| DEPTH | N-COMP | E-COMP | TEMP |
|-------|--------|--------|------|
| (m) | (cm/s) | (cm/s) | (°C) |
| 2 | -5.22 | -1.78 | |
| 25 | 7.16 | -0.26 | |
| 50 | 2.28 | 2.44 | |
| 75 | 3.11 | -3.30 | |
| 100 | -0.07 | -0.68 | |
| 125 | -1.69 | -0.36 | |
| 150 | 2.64 | -1.22 | |
| 175 | -0.62 | -0.65 | |
| 200 | -0.61 | -0.90 | |
| 225 | -1.92 | 1.49 | |
| 250 | -2.50 | -2.97 | |
| 275 | -1.29 | -0.66 | |
| 300 | -1.54 | -0.97 | |

Stn. OS2

Date: Sep. 11, 1998 Time: 13:20-13:55 (LT)

| DEPTH | N-COMP | E-COMP | TEMP |
|-------|--------|--------|-------|
| (m) | (cm/s) | (cm/s) | (°C) |
| 2 | 6.31 | -1.09 | -1.88 |
| 20 | 4.33 | -7.34 | -1.83 |
| 40 | -1.21 | -1.66 | -1.80 |
| 60 | -2.99 | -6.09 | -1.80 |
| 80 | 3.89 | -7.35 | -1.78 |
| 100 | 1.00 | -6.59 | -1.77 |
| 120 | 1.53 | 5.61 | -1.72 |
| 140 | 5.93 | -2.41 | -1.63 |
| 160 | 1.78 | -2.79 | -1.58 |
| 180 | 0.88 | -2.20 | -1.52 |
| 200 | -2.67 | -1.26 | -1.49 |
| 220 | 2.04 | 1.23 | -1.47 |
| 240 | 2.45 | 0.92 | -1.45 |
| 260 | -1.29 | -0.54 | -1.44 |
| 280 | -1.76 | -0.92 | -1.43 |

Stn. OS2

Date: Nov. 20, 1998 Time: 13:55-14:25 (LT)

| DEPTH | N-COMP | E-COMP | TEMP |
|-------|--------|--------|-------|
| (m) | (cm/s) | (cm/s) | (°C) |
| 2 | -5.13 | -2.05 | -1.41 |
| 25 | -6.72 | 1.80 | -1.76 |
| 50 | -0.48 | 7.70 | -1.68 |
| 75 | -3.56 | -2.09 | -1.61 |
| 100 | 7.36 | -6.12 | -1.54 |
| 125 | 3.05 | 5.16 | -1.51 |
| 150 | 6.52 | 0.70 | -1.48 |
| 175 | -1.92 | 10.03 | -1.45 |
| 200 | 2.93 | -4.80 | -1.39 |
| 225 | -1.80 | 6.39 | -1.38 |
| 250 | 3.32 | -4.86 | -1.36 |
| 275 | 0.89 | -6.73 | -1.38 |
| 300 | 0.80 | 5.16 | -1.38 |

Table 5. Vertical current profile data.

Stn. OW8

Date: Aug. 21, 1998 Time: 11:30–11:50 (LT)

| DEPTH (m) | N-COMP (cm/s) | E-COMP (cm/s) | TEMP (°C) |
|--------------|------------------|------------------|--------------|
| 2 | -5.55 | -0.03 | |
| 2 | -5.74 | 0.00 | |
| 2 | -5.57 | 0.63 | |
| 25 | 2.95 | -8.98 | |
| 50 | -4.27 | -6.68 | |
| 75 | -2.63 | 6.40 | |
| 100 | -3.31 | -3.62 | |
| 125 | 1.05 | 4.53 | |
| 150 | -0.59 | -4.19 | |
| 175 | -4.65 | 2.38 | |

Stn. OW8

Date: Oct. 07, 1998 Time: 13:40–14:00 (LT)

| DEPTH (m) | N-COMP (cm/s) | E-COMP (cm/s) | TEMP (°C) |
|--------------|------------------|------------------|--------------|
| 2 | 5.49 | -1.35 | -1.88 |
| 25 | 2.34 | 0.46 | -1.85 |
| 50 | -2.48 | -7.62 | -1.85 |
| 75 | -0.15 | -7.56 | -1.84 |
| 100 | 3.37 | -5.45 | -1.75 |
| 125 | 1.36 | -6.27 | -1.72 |
| 150 | -0.92 | -1.38 | -1.71 |
| 175 | -2.50 | -1.83 | -1.70 |

Stn. OW8

Date: Oct. 23, 1998 Time: 13:20–13:35 (LT)

| DEPTH (m) | N-COMP (cm/s) | E-COMP (cm/s) | TEMP (°C) |
|--------------|------------------|------------------|--------------|
| 2 | -3.54 | 1.34 | -1.82 |
| 25 | -2.73 | -2.22 | -1.82 |
| 50 | -0.07 | -1.31 | -1.80 |
| 75 | -1.41 | -0.92 | -1.73 |
| 100 | 2.52 | -0.93 | -1.66 |
| 125 | 1.55 | -0.30 | -1.64 |
| 150 | 0.79 | 0.36 | -1.64 |
| 175 | 0.87 | -0.66 | -1.62 |

Stn. OW8

Date: Nov. 24, 1998 Time: 10:00–10:15 (LT)

| DEPTH (m) | N-COMP (cm/s) | E-COMP (cm/s) | TEMP (°C) |
|--------------|------------------|------------------|--------------|
| 2 | 6.65 | -0.64 | -1.39 |
| 25 | -5.22 | -1.23 | -1.73 |
| 50 | 6.95 | -0.73 | -1.68 |
| 75 | 0.91 | -0.96 | -1.66 |
| 100 | -1.28 | 1.32 | -1.60 |
| 125 | 1.52 | -1.13 | -1.60 |
| 150 | 0.34 | -1.94 | -1.59 |
| 175 | -0.57 | 1.28 | -1.59 |

Table 5. Vertical current profile data.

Stn. OW28

Date: Aug. 20, 1998 Time: 15:10-15:30 (LT)

| DEPTH | N-COMP | E-COMP | TEMP |
|-------|--------|--------|------|
| (m) | (cm/s) | (cm/s) | (°C) |
| 2 | 2.57 | -4.79 | |
| 2 | 2.71 | -5.01 | |
| 2 | 2.74 | -5.00 | |
| 25 | -6.24 | 0.43 | |
| 50 | 9.70 | -2.45 | |
| 75 | 8.83 | -4.37 | |
| 100 | 0.52 | -7.95 | |
| 125 | -2.00 | 1.28 | |

Stn. OW28

Date: Oct. 06, 1998 Time: 14:15-14:25 (LT)

| DEPTH | N-COMP | E-COMP | TEMP |
|-------|--------|--------|-------|
| (m) | (cm/s) | (cm/s) | (°C) |
| 2 | -3.15 | -4.03 | -1.86 |
| 25 | -4.24 | -4.44 | -1.85 |
| 50 | -0.13 | -7.49 | -1.82 |
| 75 | -2.46 | 2.31 | -1.75 |
| 100 | 1.49 | 0.54 | -1.64 |
| 125 | -1.77 | 2.48 | -1.55 |

Stn. OW28

Date: Oct. 22, 1998 Time: 13:35-13:50 (LT)

| DEPTH | N-COMP | E-COMP | TEMP |
|-------|--------|--------|-------|
| (m) | (cm/s) | (cm/s) | (°C) |
| 2 | -2.43 | 5.49 | -1.78 |
| 25 | -9.70 | 0.93 | -1.83 |
| 25 | -10.02 | 0.92 | -1.84 |
| 50 | 1.16 | -13.33 | -1.84 |
| 75 | -1.42 | 3.29 | -1.74 |
| 100 | -3.88 | -2.75 | -1.64 |
| 125 | -0.63 | 0.79 | -1.57 |

Stn. OW28

Date: Nov. 23, 1998 Time: 11:40-11:55 (LT)

| DEPTH | N-COMP | E-COMP | TEMP |
|-------|--------|--------|-------|
| (m) | (cm/s) | (cm/s) | (°C) |
| 2 | 11.36 | 3.68 | -1.82 |
| 25 | -3.70 | 1.42 | -1.78 |
| 50 | -3.82 | -0.27 | -1.77 |
| 75 | -0.96 | 1.16 | -1.65 |
| 100 | 2.62 | 0.21 | -1.60 |
| 125 | 3.10 | 0.72 | -1.54 |