



# HOKKAIDO UNIVERSITY

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| Title            | 2 THE "OSHO RO MARU" CRUISE 267 TO NORTHWEST OF THE JAPAN SEA and TOYAMA BAY, and WAKASA BAY IN APRIL 2014 |
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**THE "OSHORU MARU" CRUISE 267  
TO NORTHWEST OF THE JAPAN SEA and TOYAMA BAY, and WAKASA BAY**

**IN APRIL 2014**

1. Cruise Itinerary

Cruise 267

|                                                                  |       |    |      |
|------------------------------------------------------------------|-------|----|------|
| Departure from Hakodate                                          | April | 8  | 2014 |
| Start hydrographic research (OS14049)                            |       | 9  |      |
| Finish hydrographic research (OS14053)                           |       | 10 |      |
| Arrive at Tsuruga                                                |       | 11 |      |
| Departure from Tsuruga and start hydrographic research (OS14054) |       | 12 |      |
| Finish hydrographic research (OS14057) and return to Tsuruga     |       | 13 |      |
| Departure from Tsuruga                                           |       | 14 |      |
| Start hydrographic research (OS14058)                            |       | 15 |      |
| Finish hydrographic research (OS14068)                           |       | 16 |      |
| Return to Hakodate                                               |       | 17 |      |
| Total coverage 1207.0 miles                                      |       |    |      |

2. Vessel Personnel

|       |          |                     |                |
|-------|----------|---------------------|----------------|
| Crew: | Captain: | Associate Professor | Shogo Takagi   |
|       |          |                     | And 29 persons |

Research Staff: Leg1, Leg3

|                         |                                                                      |              |
|-------------------------|----------------------------------------------------------------------|--------------|
| Professor               | (Laboratory of Marine Environmental Science,<br>Hokkaido University) | Kenshi Kuma  |
| Associate Professor     | (Laboratory of Marine Environmental Science,<br>Hokkaido University) | Yutaka Isoda |
| Graduate Students:      |                                                                      | 5 persons    |
| Undergraduate Students: |                                                                      | 1 person     |

Leg1

|                    |                                                                                             |                                |
|--------------------|---------------------------------------------------------------------------------------------|--------------------------------|
| Professor          | (Center for Global Environmental Research,<br>National Institute for Environmental studies) | Takafumi Aramaki               |
| Graduate Students: |                                                                                             | 1 person (Kanazawa University) |

Undergraduate instructor: Leg2

|                         |                                                                 |                    |
|-------------------------|-----------------------------------------------------------------|--------------------|
| Professor               | (Department of Marine Bioscience, Fukui Prefectural University) | Tatsuo Kato        |
| Professor               | (Department of Marine Bioscience, Fukui Prefectural University) | Ryuji Kondo        |
| Associate Professor     | (Department of Marine Bioscience, Fukui Prefectural University) | Masahito Matsukawa |
| Associate Professor     | (Department of Marine Bioscience, Fukui Prefectural University) | Atsushi Kaneda     |
| Associate Professor     | (Department of Marine Bioscience, Fukui Prefectural University) | Yoshitake Takao    |
| Teaching Assistant:     |                                                                 | 6 persons          |
| Undergraduate Students: |                                                                 | 53 persons         |

Total 74 persons

### 3. Items of Research

Hydrographic observations: (Observation of Temperature, Salinity, and Computed Dynamic Depth Anomaly)

Hydrographic work on deck and the data processing were made by the Science officer, the deck officers, crews, research staff and cadets of the “Oshoro maru”. Temperature and salinity were measured by CTD (Seabird SBE-9Plus) and XCTD.

Table 1. Oceanographic station

| Station | Lat.       | Long.       | Date<br>(GMT) | Hour<br>(GMT) | T.Z. | Depth | Col. | Tr. | SST  | Wr. | Gear    |
|---------|------------|-------------|---------------|---------------|------|-------|------|-----|------|-----|---------|
| OS14049 | 38 19.97 N | 137 40.07 E | 4/9           | 3:37          | 9    | 1998  | -    | -   | 9.8  | b   | 9p-0769 |
| OS14050 | 38 00.01 N | 137 50.06 E | 4/9           | 7:16          | 9    | 2015  | -    | -   | 10.1 | b   | 9p-0769 |
| OS14051 | 37 39.95 N | 137 44.96 E | 4/9           | 10:52         | 9    | 1637  | -    | -   | 11.4 | b   | 9p-0769 |
| OS14052 | 37 20.05 N | 137 45.04 E | 4/9           | 14:39         | 9    | 1205  | -    | -   | 11.1 | b   | 9p-0769 |
| OS14053 | 37 10.04 N | 137 29.96 E | 4/9           | 17:30         | 9    | 1205  | -    | -   | 11.7 | b   | 9p-0769 |
| OS14058 | 38 40.05 N | 137 10.05 E | 4/14          | 16:36         | 9    | 1510  | -    | -   | 11   | bc  | 9p-0769 |
| OS14059 | 38 39.90 N | 137 25.09 E | 4/14          | 19:06         | 9    | 1380  | -    | -   | 10.3 | bc  | 9p-0769 |
| OS14060 | 38 39.92 N | 137 44.98 E | 4/14          | 21:45         | 9    | 1857  | -    | -   | 10.5 | b   | 9p-0769 |
| OS14061 | 38 40.02 N | 138 00.02 E | 4/15          | 0:33          | 9    | 1860  | -    | -   | 10.4 | b   | 9p-0769 |
| OS14062 | 39 04.99 N | 137 40.06 E | 4/15          | 4:49          | 9    | 2326  | -    | -   | 10.5 | b   | 9p-0769 |
| OS14063 | 39 40.06 N | 137 20.05 E | 4/15          | 10:34         | 9    | 2569  | -    | -   | 10.0 | b   | 9p-0769 |
| OS14064 | 39 32.51 N | 137 05.08 E | 4/15          | 14:30         | 9    | 2545  | -    | -   | 10.3 | b   | 9p-0769 |
| OS14065 | 39 25.17 N | 136 50.22 E | 4/15          | 18:05         | 9    | 2580  | -    | -   | 10.8 | b   | 9p-0769 |
| OS14066 | 39 28.79 N | 136 57.52 E | 4/15          | 21:10         | 9    | 2580  | -    | -   | 10.8 | b   | 9p-0769 |
| OS14067 | 39 30.67 N | 137 01.42 E | 4/15          | 23:44         | 9    | 2574  | -    | -   | 11.0 | b   | 9p-0769 |
| OS14068 | 39 29.68 N | 136 59.47 E | 4/16          | 2:08          | 9    | 2570  | -    | -   | 11.1 | b   | 9p-0769 |

T.Z.: Time Difference between G.M.T and S.M.T.

Col.: Water color in Forel-Ule scale

Tr.: Transparency in meters with Secchi disc

SST: Surface temperature

Wr.: Weather in WMO Code 4501

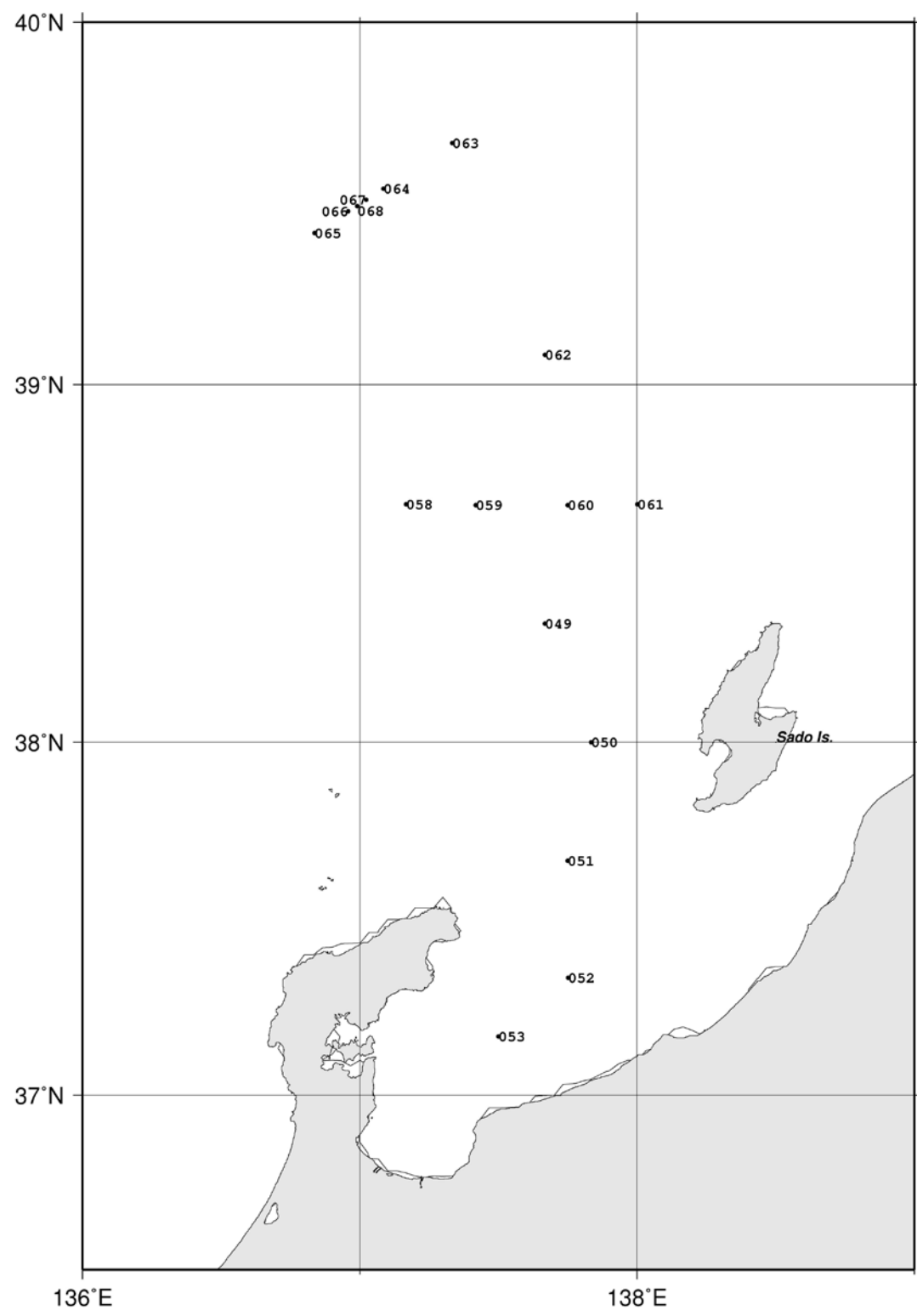


Fig.-1 Oceanographic stations

Table 2. Oceanographic data

| Station OS14049<br>Latitude 38-19.97N<br>Longitude 137-40.07E<br>Depth(m) 1998 |       |        |        | Station OS14050<br>Latitude 38-0.01N<br>Longitude 137-50.06E<br>Depth(m) 2015 |       |        |        | Station OS14051<br>Latitude 37-39.95N<br>Longitude 137-44.96E<br>Depth(m) 1637 |        |        |        |
|--------------------------------------------------------------------------------|-------|--------|--------|-------------------------------------------------------------------------------|-------|--------|--------|--------------------------------------------------------------------------------|--------|--------|--------|
| Press.                                                                         | Temp. | Sal.   | SIG-T  | Press.                                                                        | Temp. | Sal.   | SIG-T  | Press.                                                                         | Temp.  | Sal.   | SIG-T  |
| 5                                                                              | 8.809 | 33.999 | 26.364 | 5                                                                             | 8.762 | 34.009 | 26.380 | 5                                                                              | 10.392 | 34.048 | 26.141 |
| 10                                                                             | 8.690 | 34.003 | 26.386 | 10                                                                            | 8.718 | 34.005 | 26.383 | 10                                                                             | 10.185 | 34.075 | 26.198 |
| 20                                                                             | 8.546 | 34.006 | 26.411 | 20                                                                            | 8.285 | 33.996 | 26.443 | 20                                                                             | 10.160 | 34.079 | 26.206 |
| 30                                                                             | 8.509 | 34.007 | 26.417 | 30                                                                            | 8.208 | 34.000 | 26.457 | 30                                                                             | 10.052 | 34.077 | 26.222 |
| 40                                                                             | 7.062 | 34.040 | 26.654 | 40                                                                            | 8.156 | 33.995 | 26.461 | 40                                                                             | 9.973  | 34.075 | 26.234 |
| 50                                                                             | 6.471 | 34.031 | 26.726 | 50                                                                            | 8.141 | 33.994 | 26.463 | 50                                                                             | 9.926  | 34.078 | 26.245 |
| 75                                                                             | 5.368 | 34.017 | 26.853 | 75                                                                            | 7.118 | 34.015 | 26.626 | 75                                                                             | 9.803  | 34.081 | 26.267 |
| 100                                                                            | 3.712 | 34.012 | 27.029 | 100                                                                           | 6.078 | 34.030 | 26.777 | 100                                                                            | 9.656  | 34.110 | 26.315 |
| 125                                                                            | 3.004 | 34.017 | 27.100 | 125                                                                           | 4.945 | 34.019 | 26.904 | 125                                                                            | 9.337  | 34.106 | 26.364 |
| 150                                                                            | 2.574 | 34.029 | 27.147 | 150                                                                           | 3.909 | 34.026 | 27.021 | 150                                                                            | 8.532  | 34.088 | 26.477 |
| 175                                                                            | 1.895 | 34.028 | 27.201 | 175                                                                           | 2.675 | 34.020 | 27.132 | 175                                                                            | 7.386  | 34.030 | 26.601 |
| 200                                                                            | 1.662 | 34.038 | 27.226 | 200                                                                           | 2.033 | 34.028 | 27.191 | 200                                                                            | 6.770  | 34.040 | 26.694 |
| 250                                                                            | 1.226 | 34.047 | 27.264 | 250                                                                           | 1.411 | 34.042 | 27.248 | 250                                                                            | 2.601  | 34.027 | 27.143 |
| 300                                                                            | 1.020 | 34.052 | 27.281 | 300                                                                           | 1.047 | 34.050 | 27.278 | 300                                                                            | 1.656  | 34.037 | 27.226 |
| 400                                                                            | 0.751 | 34.058 | 27.303 | 400                                                                           | 0.772 | 34.056 | 27.300 | 400                                                                            | 1.142  | 34.045 | 27.268 |
| 500                                                                            | 0.598 | 34.060 | 27.314 | 500                                                                           | 0.634 | 34.059 | 27.311 | 500                                                                            | 0.906  | 34.055 | 27.291 |
| 600                                                                            | 0.478 | 34.061 | 27.322 | 600                                                                           | 0.513 | 34.060 | 27.320 | 600                                                                            | 0.679  | 34.058 | 27.308 |
| 700                                                                            | 0.424 | 34.061 | 27.325 | 700                                                                           | 0.439 | 34.060 | 27.324 | 700                                                                            | 0.509  | 34.060 | 27.320 |
| 800                                                                            | 0.375 | 34.060 | 27.328 | 800                                                                           | 0.387 | 34.060 | 27.327 | 800                                                                            | 0.414  | 34.060 | 27.325 |
| 900                                                                            | 0.341 | 34.060 | 27.329 | 900                                                                           | 0.341 | 34.060 | 27.329 | 900                                                                            | 0.341  | 34.060 | 27.329 |
| 1000                                                                           | 0.311 | 34.060 | 27.331 | 1000                                                                          | 0.312 | 34.060 | 27.331 | 1000                                                                           | 0.322  | 34.060 | 27.330 |
| 1200                                                                           | 0.278 | 34.059 | 27.332 | 1200                                                                          | 0.273 | 34.059 | 27.332 | 1200                                                                           | 0.284  | 34.059 | 27.332 |
| 1500                                                                           | 0.241 | 34.059 | 27.334 | 1500                                                                          | 0.240 | 34.059 | 27.334 | 1500                                                                           | 0.239  | 34.058 | 27.334 |

| Station OS14052<br>Latitude 37-20.05N<br>Longitude 137-45.04E<br>Depth(m) 1205 |       |        |        | Station OS14053<br>Latitude 37-10.04N<br>Longitude 137-29.96E<br>Depth(m) 1205 |        |        |        |
|--------------------------------------------------------------------------------|-------|--------|--------|--------------------------------------------------------------------------------|--------|--------|--------|
| Press.                                                                         | Temp. | Sal.   | SIG-T  | Press.                                                                         | Temp.  | Sal.   | SIG-T  |
| 5                                                                              | 9.974 | 33.279 | 25.612 | 5                                                                              | 10.503 | 33.852 | 25.969 |
| 10                                                                             | 9.857 | 33.430 | 25.750 | 10                                                                             | 10.448 | 33.891 | 26.009 |
| 20                                                                             | 9.612 | 33.742 | 26.034 | 20                                                                             | 10.286 | 33.896 | 26.041 |
| 30                                                                             | 9.521 | 33.796 | 26.092 | 30                                                                             | 10.152 | 33.972 | 26.123 |
| 40                                                                             | 9.333 | 33.800 | 26.125 | 40                                                                             | 9.578  | 33.904 | 26.167 |
| 50                                                                             | 9.363 | 33.849 | 26.159 | 50                                                                             | 9.336  | 33.882 | 26.189 |
| 75                                                                             | 9.308 | 33.927 | 26.229 | 75                                                                             | 9.534  | 33.984 | 26.236 |
| 100                                                                            | 9.581 | 34.036 | 26.269 | 100                                                                            | 9.182  | 33.960 | 26.275 |
| 125                                                                            | 9.487 | 34.091 | 26.328 | 125                                                                            | 9.033  | 33.993 | 26.325 |
| 150                                                                            | 9.226 | 34.090 | 26.369 | 150                                                                            | 8.750  | 34.014 | 26.386 |
| 175                                                                            | 8.727 | 34.114 | 26.467 | 175                                                                            | 7.969  | 34.026 | 26.513 |
| 200                                                                            | 7.925 | 34.085 | 26.566 | 200                                                                            | 6.661  | 34.039 | 26.708 |
| 250                                                                            | 3.971 | 34.006 | 26.999 | 250                                                                            | 3.267  | 34.031 | 27.087 |
| 300                                                                            | 2.181 | 34.030 | 27.180 | 300                                                                            | 1.728  | 34.039 | 27.222 |
| 400                                                                            | 0.875 | 34.052 | 27.291 | 400                                                                            | 1.068  | 34.050 | 27.277 |
| 500                                                                            | 0.577 | 34.057 | 27.314 | 500                                                                            | 0.798  | 34.055 | 27.298 |
| 600                                                                            | 0.467 | 34.059 | 27.321 | 600                                                                            | 0.651  | 34.058 | 27.310 |
| 700                                                                            | 0.409 | 34.059 | 27.325 | 700                                                                            | 0.551  | 34.059 | 27.316 |
| 800                                                                            | 0.359 | 34.060 | 27.328 | 800                                                                            | 0.440  | 34.060 | 27.323 |
| 900                                                                            | 0.329 | 34.060 | 27.330 | 900                                                                            | 0.379  | 34.060 | 27.327 |
| 1000                                                                           | 0.296 | 34.059 | 27.331 | 1000                                                                           | 0.336  | 34.060 | 27.329 |

Table 2. Oceanographic data

| Station OS14058<br>Latitude 38-40.05N<br>Longitude 137-10.05E<br>Depth(m) 1510 |       |        |        | Station OS14059<br>Latitude 38-39.9N<br>Longitude 137-25.09E<br>Depth(m) 1380 |       |        |        | Station OS14060<br>Latitude 38-39.92N<br>Longitude 137-44.98E<br>Depth(m) 1857 |       |        |        |
|--------------------------------------------------------------------------------|-------|--------|--------|-------------------------------------------------------------------------------|-------|--------|--------|--------------------------------------------------------------------------------|-------|--------|--------|
| Press.                                                                         | Temp. | Sal.   | SIG-T  | Press.                                                                        | Temp. | Sal.   | SIG-T  | Press.                                                                         | Temp. | Sal.   | SIG-T  |
| 5                                                                              | 9.281 | 34.020 | 26.306 | 5                                                                             | 9.296 | 34.011 | 26.296 | 5                                                                              | 9.413 | 34.013 | 26.279 |
| 10                                                                             | 9.192 | 34.023 | 26.323 | 10                                                                            | 9.048 | 33.997 | 26.325 | 10                                                                             | 9.023 | 34.000 | 26.332 |
| 20                                                                             | 9.030 | 34.085 | 26.397 | 20                                                                            | 8.693 | 33.996 | 26.380 | 20                                                                             | 8.702 | 34.003 | 26.384 |
| 30                                                                             | 8.782 | 34.063 | 26.419 | 30                                                                            | 8.421 | 33.990 | 26.417 | 30                                                                             | 8.580 | 34.000 | 26.400 |
| 40                                                                             | 8.310 | 34.043 | 26.475 | 40                                                                            | 8.303 | 33.993 | 26.438 | 40                                                                             | 8.147 | 33.992 | 26.460 |
| 50                                                                             | 7.953 | 34.025 | 26.515 | 50                                                                            | 7.866 | 33.998 | 26.507 | 50                                                                             | 7.097 | 34.011 | 26.627 |
| 75                                                                             | 6.627 | 34.031 | 26.706 | 75                                                                            | 6.110 | 34.035 | 26.776 | 75                                                                             | 5.456 | 34.013 | 26.840 |
| 100                                                                            | 5.489 | 34.021 | 26.842 | 100                                                                           | 4.912 | 34.012 | 26.902 | 100                                                                            | 4.075 | 34.023 | 27.002 |
| 125                                                                            | 4.289 | 34.018 | 26.975 | 125                                                                           | 3.757 | 34.020 | 27.031 | 125                                                                            | 2.866 | 34.022 | 27.116 |
| 150                                                                            | 3.280 | 34.020 | 27.077 | 150                                                                           | 2.854 | 34.011 | 27.109 | 150                                                                            | 2.245 | 34.030 | 27.175 |
| 175                                                                            | 2.344 | 34.018 | 27.158 | 175                                                                           | 1.882 | 34.024 | 27.199 | 175                                                                            | 1.777 | 34.038 | 27.218 |
| 200                                                                            | 1.866 | 34.025 | 27.201 | 200                                                                           | 1.487 | 34.034 | 27.236 | 200                                                                            | 1.446 | 34.043 | 27.246 |
| 250                                                                            | 1.277 | 34.042 | 27.257 | 250                                                                           | 1.092 | 34.047 | 27.273 | 250                                                                            | 1.103 | 34.050 | 27.275 |
| 300                                                                            | 1.020 | 34.049 | 27.279 | 300                                                                           | 0.879 | 34.052 | 27.291 | 300                                                                            | 0.935 | 34.053 | 27.288 |
| 400                                                                            | 0.708 | 34.056 | 27.305 | 400                                                                           | 0.710 | 34.056 | 27.305 | 400                                                                            | 0.689 | 34.056 | 27.306 |
| 500                                                                            | 0.588 | 34.058 | 27.314 | 500                                                                           | 0.600 | 34.058 | 27.312 | 500                                                                            | 0.553 | 34.058 | 27.316 |
| 600                                                                            | 0.467 | 34.059 | 27.321 | 600                                                                           | 0.529 | 34.059 | 27.317 | 600                                                                            | 0.462 | 34.059 | 27.321 |
| 700                                                                            | 0.393 | 34.059 | 27.325 | 700                                                                           | 0.452 | 34.059 | 27.322 | 700                                                                            | 0.392 | 34.059 | 27.325 |
| 800                                                                            | 0.367 | 34.059 | 27.327 | 800                                                                           | 0.406 | 34.059 | 27.325 | 800                                                                            | 0.338 | 34.059 | 27.328 |
| 900                                                                            | 0.354 | 34.059 | 27.328 | 900                                                                           | 0.363 | 34.058 | 27.327 | 900                                                                            | 0.304 | 34.058 | 27.330 |
| 1000                                                                           | 0.327 | 34.059 | 27.329 | 1000                                                                          | 0.326 | 34.058 | 27.329 | 1000                                                                           | 0.285 | 34.058 | 27.331 |
| 1200                                                                           | 0.276 | 34.058 | 27.331 | 1200                                                                          | 0.291 | 34.058 | 27.330 | 1200                                                                           | 0.252 | 34.058 | 27.332 |
|                                                                                |       |        |        |                                                                               |       |        |        | 1500                                                                           | 0.225 | 34.057 | 27.333 |

| Station OS14061<br>Latitude 38-40.02N<br>Longitude 138-0.02E<br>Depth(m) 1860 |       |        |        | Station OS14062<br>Latitude 39-4.99N<br>Longitude 137-40.06E<br>Depth(m) 2326 |       |        |        | Station OS14063<br>Latitude 39-40.06N<br>Longitude 137-20.05E<br>Depth(m) 2569 |       |        |        |
|-------------------------------------------------------------------------------|-------|--------|--------|-------------------------------------------------------------------------------|-------|--------|--------|--------------------------------------------------------------------------------|-------|--------|--------|
| Press.                                                                        | Temp. | Sal.   | SIG-T  | Press.                                                                        | Temp. | Sal.   | SIG-T  | Press.                                                                         | Temp. | Sal.   | SIG-T  |
| 5                                                                             | 9.427 | 34.014 | 26.277 | 10                                                                            | 9.382 | 34.031 | 26.298 | 10                                                                             | 9.062 | 34.010 | 26.333 |
| 10                                                                            | 8.970 | 34.008 | 26.346 | 20                                                                            | 9.176 | 34.065 | 26.358 | 20                                                                             | 9.051 | 34.011 | 26.336 |
| 20                                                                            | 8.930 | 34.011 | 26.355 | 30                                                                            | 8.749 | 34.032 | 26.400 | 30                                                                             | 8.399 | 34.016 | 26.441 |
| 30                                                                            | 8.879 | 34.011 | 26.363 | 40                                                                            | 8.604 | 34.044 | 26.432 | 40                                                                             | 8.017 | 34.008 | 26.493 |
| 40                                                                            | 8.617 | 34.004 | 26.398 | 50                                                                            | 8.196 | 34.026 | 26.480 | 50                                                                             | 7.251 | 34.017 | 26.610 |
| 50                                                                            | 7.837 | 33.990 | 26.505 | 75                                                                            | 7.199 | 34.052 | 26.644 | 75                                                                             | 6.229 | 34.053 | 26.775 |
| 75                                                                            | 5.836 | 34.008 | 26.789 | 100                                                                           | 6.353 | 34.030 | 26.741 | 100                                                                            | 4.613 | 34.003 | 26.928 |
| 100                                                                           | 4.499 | 34.015 | 26.950 | 125                                                                           | 5.108 | 34.017 | 26.884 | 125                                                                            | 3.545 | 34.012 | 27.045 |
| 125                                                                           | 3.475 | 34.017 | 27.056 | 150                                                                           | 3.453 | 34.016 | 27.058 | 150                                                                            | 2.693 | 34.015 | 27.126 |
| 150                                                                           | 2.613 | 34.020 | 27.136 | 175                                                                           | 2.625 | 34.019 | 27.135 | 175                                                                            | 2.082 | 34.017 | 27.178 |
| 175                                                                           | 2.055 | 34.033 | 27.193 | 200                                                                           | 2.037 | 34.035 | 27.196 | 200                                                                            | 1.624 | 34.024 | 27.218 |
| 200                                                                           | 1.850 | 34.039 | 27.213 | 250                                                                           | 1.198 | 34.045 | 27.265 | 250                                                                            | 1.226 | 34.036 | 27.255 |
| 250                                                                           | 1.458 | 34.046 | 27.248 | 300                                                                           | 0.950 | 34.051 | 27.286 | 300                                                                            | 0.955 | 34.044 | 27.279 |
| 300                                                                           | 1.260 | 34.049 | 27.264 | 400                                                                           | 0.727 | 34.057 | 27.305 | 400                                                                            | 0.788 | 34.052 | 27.297 |
| 400                                                                           | 0.987 | 34.053 | 27.285 | 500                                                                           | 0.597 | 34.059 | 27.314 | 500                                                                            | 0.648 | 34.059 | 27.310 |
| 500                                                                           | 0.702 | 34.057 | 27.306 | 600                                                                           | 0.487 | 34.059 | 27.321 | 600                                                                            | 0.549 | 34.060 | 27.317 |
| 600                                                                           | 0.545 | 34.058 | 27.316 | 700                                                                           | 0.421 | 34.059 | 27.324 | 700                                                                            | 0.449 | 34.060 | 27.323 |
| 700                                                                           | 0.451 | 34.059 | 27.322 | 800                                                                           | 0.362 | 34.059 | 27.327 | 800                                                                            | 0.383 | 34.059 | 27.326 |
| 800                                                                           | 0.391 | 34.059 | 27.325 | 900                                                                           | 0.313 | 34.059 | 27.330 | 900                                                                            | 0.331 | 34.059 | 27.329 |
| 900                                                                           | 0.350 | 34.058 | 27.327 | 1000                                                                          | 0.285 | 34.058 | 27.331 | 1000                                                                           | 0.301 | 34.058 | 27.330 |
| 1000                                                                          | 0.313 | 34.058 | 27.329 | 1200                                                                          | 0.255 | 34.058 | 27.332 | 1200                                                                           | 0.263 | 34.058 | 27.332 |
| 1200                                                                          | 0.263 | 34.058 | 27.332 | 1500                                                                          | 0.224 | 34.057 | 27.333 | 1500                                                                           | 0.232 | 34.057 | 27.333 |
| 1500                                                                          | 0.234 | 34.057 | 27.333 | 2000                                                                          | 0.222 | 34.056 | 27.333 | 2000                                                                           | 0.221 | 34.056 | 27.333 |
|                                                                               |       |        |        |                                                                               |       |        |        | 2500                                                                           | 0.241 | 34.056 | 27.331 |

Station OS14064  
Latitude 39-32.51N  
Longitude 137-5.08E  
Depth(m) 2545

| Press. | Temp. | Sal.   | SIG-T  |
|--------|-------|--------|--------|
| 10     | 9.373 | 33.939 | 26.228 |
| 20     | 9.376 | 33.939 | 26.227 |
| 30     | 9.333 | 33.939 | 26.234 |
| 40     | 9.050 | 33.947 | 26.286 |
| 50     | 8.495 | 34.014 | 26.425 |
| 75     | 7.175 | 34.025 | 26.626 |
| 100    | 6.338 | 34.028 | 26.742 |
| 125    | 4.502 | 34.018 | 26.952 |
| 150    | 3.356 | 34.014 | 27.065 |
| 175    | 2.584 | 34.028 | 27.146 |
| 200    | 2.045 | 34.027 | 27.188 |
| 250    | 1.446 | 34.036 | 27.240 |
| 300    | 1.045 | 34.044 | 27.274 |
| 400    | 0.810 | 34.053 | 27.296 |
| 500    | 0.675 | 34.058 | 27.308 |
| 600    | 0.562 | 34.059 | 27.316 |
| 700    | 0.471 | 34.060 | 27.322 |
| 800    | 0.405 | 34.059 | 27.325 |
| 900    | 0.357 | 34.059 | 27.327 |
| 1000   | 0.315 | 34.058 | 27.329 |
| 1200   | 0.266 | 34.057 | 27.331 |
| 1500   | 0.234 | 34.057 | 27.333 |
| 2000   | 0.225 | 34.056 | 27.333 |
| 2500   | 0.242 | 34.056 | 27.331 |

Station OS14065  
Latitude 39-25.17N  
Longitude 136-50.22E  
Depth(m) 2580

| Press. | Temp. | Sal.   | SIG-T  |
|--------|-------|--------|--------|
| 20     | 9.860 | 34.136 | 26.300 |
| 30     | 9.180 | 34.075 | 26.365 |
| 40     | 9.010 | 34.072 | 26.390 |
| 50     | 8.764 | 34.070 | 26.427 |
| 75     | 7.523 | 34.018 | 26.572 |
| 100    | 7.071 | 34.052 | 26.662 |
| 125    | 6.653 | 34.050 | 26.717 |
| 150    | 5.607 | 34.031 | 26.835 |
| 175    | 4.172 | 34.012 | 26.983 |
| 200    | 3.025 | 34.014 | 27.096 |
| 250    | 1.828 | 34.024 | 27.203 |
| 300    | 1.222 | 34.035 | 27.255 |
| 400    | 0.873 | 34.052 | 27.291 |
| 500    | 0.695 | 34.057 | 27.307 |
| 600    | 0.555 | 34.059 | 27.316 |
| 700    | 0.455 | 34.059 | 27.322 |
| 800    | 0.392 | 34.059 | 27.326 |
| 900    | 0.349 | 34.059 | 27.328 |
| 1000   | 0.314 | 34.058 | 27.329 |
| 1200   | 0.261 | 34.057 | 27.332 |
| 1500   | 0.233 | 34.057 | 27.333 |
| 2000   | 0.229 | 34.056 | 27.332 |
| 2500   | 0.256 | 34.056 | 27.331 |

Station OS14066  
Latitude 39-28.79N  
Longitude 136-57.52E  
Depth(m) 2580

| Press. | Temp. | Sal.   | SIG-T  |
|--------|-------|--------|--------|
| 10     | 9.953 | 34.147 | 26.294 |
| 20     | 9.947 | 34.146 | 26.294 |
| 30     | 9.554 | 34.129 | 26.347 |
| 40     | 9.378 | 34.125 | 26.372 |
| 50     | 9.240 | 34.117 | 26.388 |
| 75     | 7.549 | 34.069 | 26.609 |
| 100    | 7.055 | 34.078 | 26.685 |
| 125    | 6.057 | 34.029 | 26.778 |
| 150    | 4.601 | 34.015 | 26.939 |
| 175    | 3.573 | 34.018 | 27.048 |
| 200    | 2.444 | 34.015 | 27.147 |
| 250    | 1.498 | 34.023 | 27.226 |
| 300    | 1.205 | 34.041 | 27.261 |
| 400    | 0.789 | 34.053 | 27.297 |
| 500    | 0.665 | 34.057 | 27.308 |
| 600    | 0.592 | 34.058 | 27.313 |
| 700    | 0.530 | 34.059 | 27.318 |
| 800    | 0.459 | 34.059 | 27.322 |
| 900    | 0.394 | 34.059 | 27.325 |
| 1000   | 0.347 | 34.058 | 27.327 |
| 1200   | 0.289 | 34.058 | 27.330 |
| 1500   | 0.243 | 34.057 | 27.332 |
| 2000   | 0.234 | 34.056 | 27.332 |
| 2500   | 0.255 | 34.056 | 27.330 |

Station OS14067  
Latitude 39-30.67N  
Longitude 137-1.42E  
Depth(m) 2574

| Press. | Temp.  | Sal.   | SIG-T  |
|--------|--------|--------|--------|
| 5      | 10.168 | 34.160 | 26.267 |
| 10     | 10.118 | 34.158 | 26.274 |
| 20     | 10.101 | 34.157 | 26.276 |
| 30     | 9.925  | 34.139 | 26.292 |
| 40     | 9.167  | 34.110 | 26.395 |
| 50     | 8.999  | 34.106 | 26.418 |
| 75     | 8.175  | 34.096 | 26.537 |
| 100    | 7.321  | 34.096 | 26.662 |
| 125    | 5.273  | 34.022 | 26.868 |
| 150    | 3.920  | 34.011 | 27.008 |
| 175    | 3.044  | 34.010 | 27.091 |
| 200    | 2.301  | 34.018 | 27.161 |
| 250    | 1.505  | 34.033 | 27.233 |
| 300    | 1.112  | 34.041 | 27.267 |
| 400    | 0.833  | 34.053 | 27.295 |
| 500    | 0.677  | 34.057 | 27.307 |
| 600    | 0.558  | 34.059 | 27.316 |
| 700    | 0.470  | 34.059 | 27.321 |
| 800    | 0.400  | 34.059 | 27.325 |
| 900    | 0.354  | 34.059 | 27.327 |
| 1000   | 0.326  | 34.058 | 27.329 |
| 1200   | 0.273  | 34.057 | 27.331 |
| 1500   | 0.234  | 34.057 | 27.332 |
| 2000   | 0.224  | 34.056 | 27.332 |
| 2500   | 0.242  | 34.056 | 27.331 |

Station OS14068  
Latitude 39-29.68N  
Longitude 136-59.47E  
Depth(m) 2570

| Press. | Temp.  | Sal.   | SIG-T  |
|--------|--------|--------|--------|
| 5      | 10.100 | 34.145 | 26.268 |
| 10     | 10.037 | 34.146 | 26.279 |
| 20     | 10.005 | 34.147 | 26.285 |
| 30     | 9.973  | 34.144 | 26.288 |
| 40     | 9.350  | 34.111 | 26.366 |
| 50     | 9.294  | 34.112 | 26.376 |
| 75     | 7.732  | 34.082 | 26.592 |
| 100    | 7.096  | 34.071 | 26.673 |
| 125    | 5.959  | 34.036 | 26.796 |
| 150    | 4.284  | 34.015 | 26.973 |
| 175    | 3.268  | 34.017 | 27.076 |
| 200    | 2.425  | 34.009 | 27.144 |
| 250    | 1.562  | 34.028 | 27.225 |
| 300    | 1.173  | 34.042 | 27.264 |
| 400    | 0.851  | 34.054 | 27.294 |
| 500    | 0.684  | 34.058 | 27.308 |
| 600    | 0.559  | 34.059 | 27.316 |
| 700    | 0.481  | 34.059 | 27.321 |
| 800    | 0.420  | 34.059 | 27.324 |
| 900    | 0.377  | 34.059 | 27.326 |
| 1000   | 0.340  | 34.058 | 27.328 |
| 1200   | 0.274  | 34.057 | 27.331 |
| 1500   | 0.236  | 34.057 | 27.332 |
| 2000   | 0.230  | 34.056 | 27.332 |
| 2500   | 0.257  | 34.056 | 27.330 |