



# HOKKAIDO UNIVERSITY

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| Title            | 8. The "Ushio Maru" Cruise 206, 207 and 208 in October 2010                       |
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**THE " USHIO MARU "**

**CRUISE 206**

**CRUISE 207**

**CRUISE 208**

**IN OCTOBER 2010**

## 1. Cruise Itinerary

### Cruise 206

|                                        |      |          |
|----------------------------------------|------|----------|
| Departure from Hakodate                | Oct. | 4 , 2010 |
| Start hydrographic research (US10490)  |      | 5        |
| Arrival at and departure from Kushiro  |      | 6        |
| Finish hydrographic research (US10498) |      | 7        |
| Return to Hakodate                     |      | 8        |

Total coverage 455.6 miles

### Cruise 207

|                                        |      |           |
|----------------------------------------|------|-----------|
| Departure from Hakodate                | Oct. | 12 , 2010 |
| Start hydrographic research (US10499)  |      | 13        |
| Start tuna long-line research          |      | 13        |
| Finish tuna long-line research         |      | 14        |
| Finish hydrographic research (US10503) |      | 14        |
| Return to Hakodate                     |      | 15        |

Total coverage 251.6 miles

### Cruise 208

|                                        |      |           |
|----------------------------------------|------|-----------|
| Departure from Hakodate                | Oct. | 20 , 2010 |
| Retrieval Sediment trap system         |      | 20        |
| Start hydrographic research (US10504)  |      | 20        |
| Arrival at Mori                        |      | 20        |
| Departure from Mori                    |      | 21        |
| Set mooring ADCP system                |      | 21        |
| Arrival at Mori                        |      | 21        |
| Departure from Mori                    |      | 22        |
| Arrival at Usujiri                     |      | 22        |
| Departure from Usujiri                 |      | 23        |
| Arrival at and departure from Usujiri  |      | 23        |
| Finish hydrographic research (US10544) |      | 23        |
| Return to Hakodate                     |      | 24        |

Total coverage 324.7 miles

## 2. Vessel Personnel

|          |                |                     |                 |
|----------|----------------|---------------------|-----------------|
| Captain: |                | Professor           | Toshimi Meguro  |
| Crew:    | Chief Officer  | Assistant Professor | Osamu Kimura    |
|          | Second Officer | Assistant Professor | Naoto Kobayashi |
|          | And 13 men     |                     |                 |

|                          |  |                               |          |
|--------------------------|--|-------------------------------|----------|
|                          |  | Cruise 206                    |          |
| Under Graduate Students: |  | Department of Marine Biology: | 1 person |

|                 |                     |                                                            |                |
|-----------------|---------------------|------------------------------------------------------------|----------------|
|                 |                     | Cruise 207                                                 |                |
| Research Staff: | Associate Professor | (Laboratory of Marine Bioresource and Environment Sensing) |                |
|                 |                     |                                                            | Susumu Shimizu |

|                          |                                                      |          |
|--------------------------|------------------------------------------------------|----------|
| Graduate Students:       | Chair of Marine Bioresource and Environment Sensing: | 1 person |
| Under Graduate Students: | Department of Applied Marine Science:                | 1 person |
|                          | Department of Marine Production System Science:      | 1 person |

|                             |                     |                                                            |                 |
|-----------------------------|---------------------|------------------------------------------------------------|-----------------|
|                             |                     | Cruise 208                                                 |                 |
| Research Staff:             | Professor           | (Laboratory of Marine Environmental Science)               |                 |
|                             |                     |                                                            | Kenshi Kuma     |
|                             | Associate Professor | (Laboratory of Marine Bioresource and Environment Sensing) |                 |
|                             |                     |                                                            | Tohru Hirawake  |
|                             | Postdoctoral fellow | (Faculty of Fisheries Sciences)                            |                 |
|                             |                     |                                                            | Tomonori Isada  |
| Guest Scientist (Domestic): |                     | (Ehime University)                                         | Michinobu Kuwae |

|                          |                                                     |           |
|--------------------------|-----------------------------------------------------|-----------|
| Research Students:       | Faculty of Fisheries Sciences:                      | 1 person  |
| Graduate Students:       | Chair of Marine Environmental Science:              | 2 persons |
|                          | Chair of Marine Bioresource and Environment Sensing | 1 person  |
|                          | Graduate School of Environmental Science:           | 1 person  |
| Under Graduate Students: | Department of Marine Biology:                       | 6 persons |
|                          | Department of Applied Marine Science:               | 2 persons |

### 3. Data on Temperature, Salinity and Computed Dynamic Depth Anomaly

Hydrographic work on deck and the data processing were made by the deck officers, crews, research staff and cadets of the “Ushio Maru”. Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19). Dynamic computations were made using a desk-top computer aboard the “Ushio Maru”.

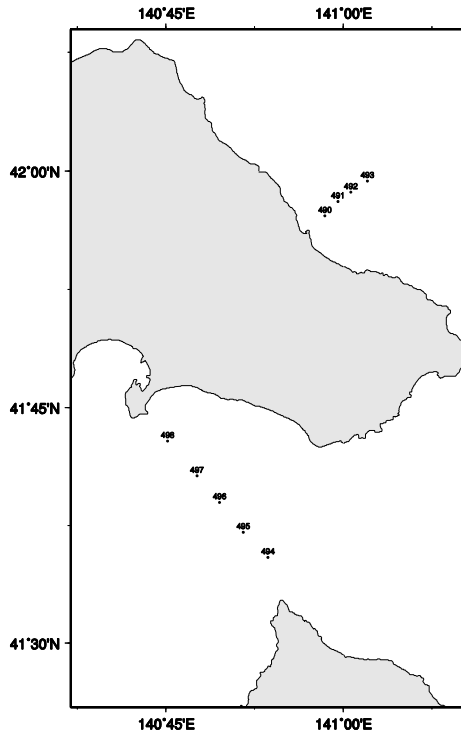


Figure 1: Oceanographic stations (Cruise 206)

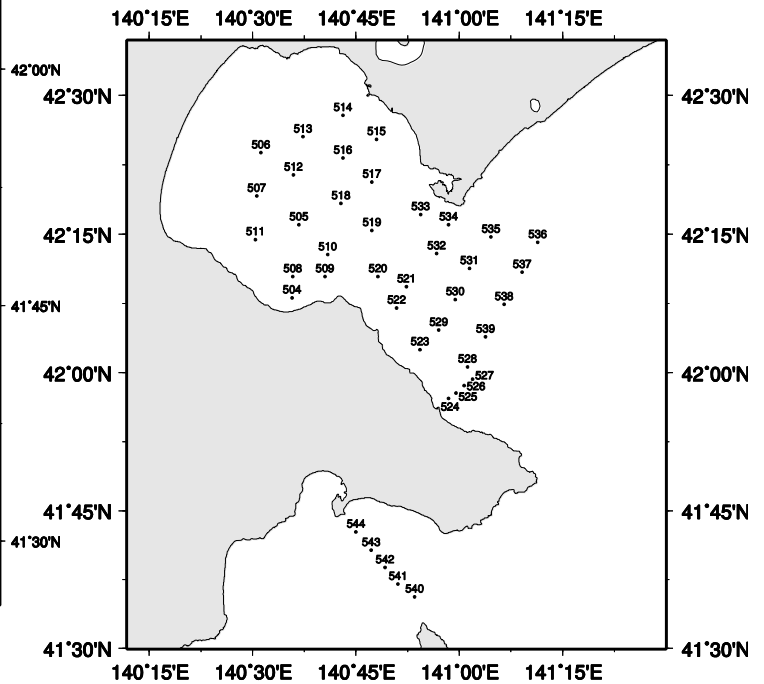


Figure 3: Oceanographic stations (Cruise 208)

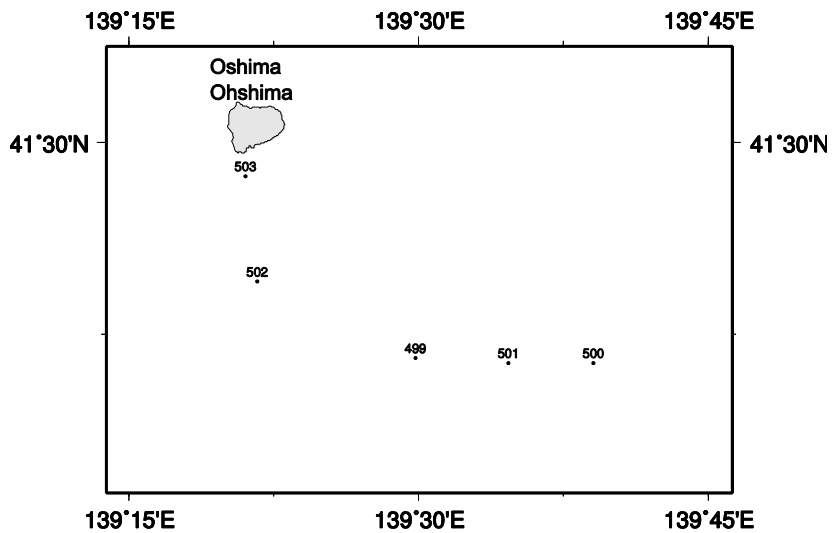


Figure 2: Oceanographic stations (Cruise 207)

Table 1: List of oceanographic stations

| Cruise 206 |           |           |       |           |       |         |         |         |           |           |     |            |
|------------|-----------|-----------|-------|-----------|-------|---------|---------|---------|-----------|-----------|-----|------------|
| Station    | Lat. (N)* | Long (E)* | Date  | S.M.T     | Depth | Wave    | Swell   | Wind    | Air Temp. | Sea Temp. | Wr. | Bar. (hPa) |
| US10490    | 41-57.2   | 140-58.4  | 40456 | 1030-1034 | 79    | NNW-3   | East-1  | NNW-5   | 18.5      | 17.2      | bc  | 1007.5     |
| US10491    | 41-58.1   | 140-59.5  | 40456 | 1042-1046 | 86    | NNW-3   | East-1  | NNW-5   | 19.2      | 17.4      | bc  | 1007.3     |
| US10492    | 41-58.7   | 141-00.6  | 40456 | 1054-1058 | 94    | NNW-3   | East-1  | NNW-5   | 19.5      | 17.5      | bc  | 1007.5     |
| US10493    | 41-59.4   | 141-02.0  | 40456 | 1106-1110 | 101   | NNW-2   | East-1  | NNW-4   | 19.4      | 17.2      | bc  | 1007.4     |
| US10494    | 41-35.5   | 140-53.6  | 40458 | 0938-0941 | 54    | East-2  | East-1  | East-4  | 19.8      | 22.4      | bc  | 1024.6     |
| US10495    | 41-37.1   | 140-51.5  | 40458 | 1000-1005 | 140   | East-2  | East-1  | East-4  | 18.9      | 21.9      | bc  | 1024.6     |
| US10496    | 41-39.0   | 140-49.5  | 40458 | 1022-1033 | 285   | East-2  | East-1  | East-4  | 18.6      | 21.5      | bc  | 1024.6     |
| US10497    | 41-40.7   | 140-47.6  | 40458 | 1051-1058 | 233   | East-2  | East-1  | East-4  | 18.8      | 21.7      | bc  | 1024.6     |
| US10498    | 41-42.9   | 140-45.1  | 40458 | 1117-1120 | 83    | East-2  | East-1  | East-4  | 18.8      | 20.1      | bc  | 1024.6     |
| Cruise 207 |           |           |       |           |       |         |         |         |           |           |     |            |
| Station    | Lat. (N)* | Long (E)* | Date  | S.M.T     | Depth | Wave    | Swell   | Wind    | Air Temp. | Sea Temp. | Wr. | Bar. (hPa) |
| US10499    | 41-21.6   | 139-29.8  | 10/13 | 0205-0212 | 1586  | North-2 | SW -1   | North-4 | 18.9      | 20.9      | bc  | 1012.6     |
| US10500    | 41-21.4   | 139-39.0  | 10/13 | 0403-0412 | 255   | North-2 | North-1 | North-4 | 18.9      | 21.2      | bc  | 1012.7     |
| US10501    | 41-21.4   | 139-34.6  | 10/13 | 1040-1049 | 359   | North-3 | North-1 | North-5 | 19.3      | 20.8      | bc  | 1013.1     |
| US10502    | 41-24.6   | 139-21.6  | 10/14 | 0813-0819 | 2058  | North-3 | North-2 | North-5 | 15.9      | 20.4      | bc  | 1015.6     |
| US10503    | 41-28.7   | 139-21.0  | 10/14 | 1055-1100 | 725   | NE -2   | NE -1   | NE -4   | 15.8      | 20.4      | bc  | 1014.6     |
| Cruise 208 |           |           |       |           |       |         |         |         |           |           |     |            |
| Station    | Lat. (N)* | Long (E)* | Date  | S.M.T     | Depth | Wave    | Swell   | Wind    | Air Temp. | Sea Temp. | Wr. | Bar. (hPa) |
| US10504    | 42-08.2   | 140-35.6  | 10/20 | 1548-1550 | 58    | ENE-1   | East-1  | ENE-3   | 13.4      | 16.3      | c   | 1022.7     |
| US10505    | 42-16.1   | 140-36.6  | 10/21 | 0727-0732 | 89    | North-1 | NW -1   | North-4 | 12.9      | 16.3      | bc  | 1020.1     |
| US10506    | 42-23.9   | 140-31.1  | 10/21 | 0858-0904 | 94    | NW -2   | NW -1   | NW -4   | 13.0      | 16.7      | bc  | 1020.6     |
| US10507    | 42-19.2   | 140-30.5  | 10/21 | 1008-1014 | 92    | North-1 | NW -1   | North-2 | 14.7      | 16.8      | bc  | 1020.6     |
| US10508    | 42-10.5   | 140-35.7  | 10/22 | 0647-0650 | 76    | SSW-1   | East-1  | SSW-2   | 9.6       | 16.0      | bc  | 1024.3     |
| US10509    | 42-10.5   | 140-40.4  | 10/22 | 0711-0714 | 84    | SSW-1   | East-1  | SSW-2   | 11.3      | 16.1      | bc  | 1024.2     |
| US10510    | 42-12.9   | 140-40.8  | 10/22 | 0731-0735 | 89    | SW -1   | East-1  | SW -3   | 12.4      | 16.3      | bc  | 1024.6     |
| US10511    | 42-14.5   | 140-30.3  | 10/22 | 0916-0919 | 81    | NW -1   | East-1  | NW -2   | 12.3      | 16.6      | bc  | 1025.1     |
| US10512    | 42-21.5   | 140-35.8  | 10/22 | 1055-1059 | 89    | Calm    | ESE-1   | Calm    | 14.2      | 16.6      | bc  | 1025.1     |
| US10513    | 42-25.6   | 140-37.2  | 10/22 | 1126-1130 | 83    | SSE-1   | ESE-1   | SSE-2   | 14.1      | 16.8      | bc  | 1025.1     |
| US10514    | 42-27.9   | 140-43.0  | 10/22 | 1158-1202 | 61    | Calm    | ESE-1   | Calm    | 14.6      | 16.7      | bc  | 1024.8     |
| US10515    | 42-25.3   | 140-47.9  | 10/22 | 1229-1232 | 46    | Calm    | ESE-1   | Calm    | 15.1      | 16.7      | bc  | 1024.5     |
| US10516    | 42-23.3   | 140-43.0  | 10/22 | 1258-1301 | 59    | Calm    | ESE-1   | Calm    | 15.4      | 16.9      | bc  | 1024.1     |
| US10517    | 42-20.7   | 140-47.2  | 10/22 | 1327-1330 | 56    | ESE-1   | ESE-1   | ESE-2   | 15.3      | 16.8      | bc  | 1023.7     |
| US10518    | 42-18.4   | 140-42.7  | 10/22 | 1355-1358 | 62    | SE -1   | ESE-1   | SE -3   | 15.9      | 16.6      | bc  | 1023.7     |
| US10519    | 42-15.5   | 140-47.2  | 10/22 | 1428-1432 | 72    | ESE-2   | ESE-1   | ESE-3   | 15.0      | 16.4      | bc  | 1023.6     |
| US10520    | 42-10.5   | 140-48.1  | 10/22 | 1503-1507 | 93    | ESE-2   | ESE-1   | ESE-3   | 15.7      | 16.5      | bc  | 1023.6     |
| US10521    | 42-09.4   | 140-52.2  | 10/22 | 1528-1532 | 76    | ESE-2   | ESE-1   | ESE-3   | 15.6      | 16.7      | bc  | 1023.7     |
| US10522    | 42-07.1   | 140-50.8  | 10/22 | 1548-1552 | 76    | SE -1   | ESE-1   | SE -3   | 15.7      | 16.5      | bc  | 1023.7     |
| US10523    | 42-02.6   | 140-54.2  | 10/22 | 1623-1626 | 75    | South-1 | ESE-1   | South-3 | 14.6      | 16.8      | bc  | 1023.8     |
| US10524    | 41-57.3   | 140-58.3  | 10/23 | 0602-0605 | 78    | Calm    | East-1  | Calm    | 10.4      | 16.0      | bc  | 1024.5     |
| US10525    | 41-57.9   | 140-59.4  | 10/23 | 0611-0615 | 85    | Calm    | East-1  | Calm    | 12.1      | 15.9      | bc  | 1024.5     |
| US10526    | 41-58.7   | 141-00.6  | 10/23 | 0624-0627 | 92    | West-1  | East-1  | West-2  | 12.5      | 16.1      | bc  | 1024.6     |
| US10527    | 41-59.4   | 141-01.8  | 10/23 | 0636-0640 | 99    | West-1  | East-1  | West-2  | 12.7      | 17.0      | bc  | 1024.7     |
| US10528    | 42-00.7   | 141-01.1  | 10/23 | 0650-0652 | 92    | WNW-1   | East-1  | WNW-3   | 13.3      | 17.0      | bc  | 1024.7     |
| US10529    | 42-04.7   | 140-56.9  | 10/23 | 0751-0759 | 83    | West-1  | East-1  | West-3  | 13.1      | 17.2      | bc  | 1024.8     |
| US10530    | 42-08.0   | 140-59.3  | 10/23 | 0841-0845 | 82    | NW -1   | East-1  | NW -3   | 14.9      | 16.8      | bc  | 1025.1     |
| US10531    | 42-11.4   | 141-01.4  | 10/23 | 0910-0914 | 78    | NW -1   | ESE-1   | NW -3   | 14.9      | 16.6      | bc  | 1025.1     |
| US10532    | 42-13.0   | 140-56.6  | 10/23 | 0939-0942 | 69    | NW -1   | ESE-1   | NW -3   | 14.2      | 16.8      | bc  | 1025.1     |
| US10533    | 42-17.2   | 140-54.3  | 10/23 | 1010-1013 | 56    | NW -1   | ESE-1   | NW -3   | 13.9      | 16.6      | bc  | 1025.1     |
| US10534    | 42-16.1   | 140-58.3  | 10/23 | 1032-1035 | 62    | NW -1   | ESE-1   | NW -2   | 15.6      | 16.6      | bc  | 1025.1     |
| US10535    | 42-14.8   | 141-04.5  | 10/23 | 1103-1107 | 78    | NW -1   | ESE-1   | NW -3   | 16.3      | 16.4      | bc  | 1024.7     |
| US10536    | 42-14.2   | 141-11.3  | 10/23 | 1136-1141 | 111   | West-1  | ESE-1   | West-3  | 17.2      | 16.5      | bc  | 1024.5     |
| US10537    | 42-11.0   | 141-09.0  | 10/23 | 1203-1207 | 108   | WNW-1   | ESE-1   | WNW-3   | 15.4      | 16.5      | bc  | 1024.1     |
| US10538    | 42-07.5   | 141-06.4  | 10/23 | 1233-1238 | 105   | NW -1   | ESE-1   | NW -2   | 16.8      | 15.5      | bc  | 1024.0     |
| US10539    | 42-04.0   | 141-03.7  | 10/23 | 1301-1305 | 99    | Calm    | ESE-1   | Calm    | 15.4      | 16.9      | bc  | 1023.2     |
| US10540    | 41-35.7   | 140-53.4  | 10/23 | 1733-1735 | 58    | SW -2   | East-1  | SW -4   | 17.7      | 20.4      | bc  | 1023.0     |
| US10541    | 41-37.1   | 140-51.0  | 10/23 | 1751-1754 | 94    | WSW-2   | East-1  | WSW-4   | 17.8      | 20.7      | bc  | 1023.1     |
| US10542    | 41-38.9   | 140-49.1  | 10/23 | 1809-1821 | 343   | NW -2   | East-1  | NW -4   | 16.9      | 20.4      | bc  | 1023.1     |
| US10543    | 41-40.8   | 140-47.1  | 10/23 | 1836-1843 | 219   | NW -1   | East-1  | NW -3   | 16.6      | 19.9      | bc  | 1023.1     |
| US10544    | 41-42.8   | 140-44.9  | 10/23 | 1900-1905 | 84    | NW -1   | East-1  | NW -3   | 16.2      | 19.9      | bc  | 1023.2     |

(\*) : Fixed position by Global Positioning System

Table 2: Oceanographic data

| STATION US10490       |         |          |         | STATION US10491       |         |          |         | STATION US10492       |         |          |         |
|-----------------------|---------|----------|---------|-----------------------|---------|----------|---------|-----------------------|---------|----------|---------|
| LATITUDE 41-57. 2 N   |         |          |         | LATITUDE 41-58. 1 N   |         |          |         | LATITUDE 41-58. 7 N   |         |          |         |
| LONGITUDE 140-58. 4 E |         |          |         | LONGITUDE 140-59. 5 E |         |          |         | LONGITUDE 141-00. 6 E |         |          |         |
| DEPTH (m) 79          |         |          |         | DEPTH (m) 86          |         |          |         | DEPTH (m) 94          |         |          |         |
| Press.                | Temp.   | Salinity | Sigma-T | Press.                | Temp.   | Salinity | Sigma-T | Press.                | Temp.   | Salinity | Sigma-T |
| 5                     | 17. 417 | 33. 223  | 24. 052 | 5                     | 17. 674 | 33. 256  | 24. 016 | 5                     | 17. 657 | 33. 225  | 23. 996 |
| 10                    | 17. 270 | 33. 227  | 24. 090 | 10                    | 17. 661 | 33. 259  | 24. 021 | 10                    | 17. 635 | 33. 223  | 24. 000 |
| 20                    | 15. 797 | 33. 342  | 24. 518 | 20                    | 17. 511 | 33. 481  | 24. 227 | 20                    | 17. 354 | 33. 291  | 24. 120 |
| 30                    | 14. 534 | 33. 444  | 24. 873 | 30                    | 15. 072 | 33. 687  | 24. 944 | 30                    | 15. 510 | 33. 831  | 24. 958 |
| 40                    | 12. 928 | 33. 171  | 24. 991 | 40                    | 14. 511 | 33. 659  | 25. 044 | 40                    | 13. 736 | 33. 788  | 25. 305 |
| 50                    | 11. 557 | 33. 051  | 25. 157 | 50                    | 13. 341 | 33. 707  | 25. 323 | 50                    | 13. 045 | 33. 773  | 25. 433 |
| 75                    | 8. 829  | 33. 079  | 25. 641 | 75                    | 7. 606  | 33. 015  | 25. 772 | 75                    | 7. 542  | 33. 181  | 25. 911 |

|                      |        |          |         |
|----------------------|--------|----------|---------|
| STATION US10493      |        |          |         |
| LATITUDE 41-59.4 N   |        |          |         |
| LONGITUDE 141-02.0 E |        |          |         |
| DEPTH (m) 101        |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 17.413 | 33.296   | 24.109  |
| 10                   | 17.393 | 33.296   | 24.114  |
| 20                   | 16.853 | 33.352   | 24.284  |
| 30                   | 13.999 | 33.644   | 25.140  |
| 40                   | 13.001 | 33.732   | 25.411  |
| 50                   | 12.620 | 33.827   | 25.559  |
| 75                   | 10.289 | 33.717   | 25.901  |

|                      |        |          |         |
|----------------------|--------|----------|---------|
| STATION US10496      |        |          |         |
| LATITUDE 41-39.0 N   |        |          |         |
| LONGITUDE 140-49.5 E |        |          |         |
| DEPTH (m) 285        |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 21.441 | 33.388   | 23.148  |
| 10                   | 20.776 | 33.545   | 23.447  |
| 20                   | 19.854 | 33.671   | 23.786  |
| 30                   | 19.735 | 33.679   | 23.823  |
| 40                   | 18.620 | 33.922   | 24.293  |
| 50                   | 17.881 | 34.047   | 24.571  |
| 75                   | 15.288 | 34.138   | 25.244  |
| 100                  | 12.565 | 34.189   | 25.850  |
| 125                  | 11.833 | 34.201   | 26.000  |
| 150                  | 11.311 | 34.202   | 26.098  |
| 175                  | 11.003 | 34.195   | 26.148  |
| 200                  | 10.528 | 34.176   | 26.218  |
| 250                  | 10.262 | 34.178   | 26.266  |

|                      |        |          |         |
|----------------------|--------|----------|---------|
| STATION US10499      |        |          |         |
| LATITUDE 41-21.6 N   |        |          |         |
| LONGITUDE 139-29.8 E |        |          |         |
| DEPTH (m) 1586       |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 20.991 | 33.136   | 23.078  |
| 10                   | 21.012 | 33.145   | 23.079  |
| 20                   | 21.004 | 33.144   | 23.081  |
| 30                   | 20.837 | 33.244   | 23.202  |
| 40                   | 16.559 | 33.898   | 24.771  |
| 50                   | 15.781 | 34.308   | 25.265  |
| 75                   | 12.075 | 34.246   | 25.989  |
| 100                  | 9.478  | 34.150   | 26.375  |
| 125                  | 7.592  | 34.096   | 26.624  |
| 150                  | 5.435  | 34.056   | 26.876  |
| 175                  | 3.862  | 34.059   | 27.051  |
| 200                  | 2.983  | 34.066   | 27.141  |

|                      |        |          |         |
|----------------------|--------|----------|---------|
| STATION US10502      |        |          |         |
| LATITUDE 41-24.6 N   |        |          |         |
| LONGITUDE 139-21.6 E |        |          |         |
| DEPTH (m) 2058       |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 20.527 | 33.111   | 23.183  |
| 10                   | 20.533 | 33.114   | 23.184  |
| 20                   | 20.552 | 33.151   | 23.207  |
| 30                   | 18.195 | 33.836   | 24.333  |
| 40                   | 16.060 | 34.238   | 25.148  |
| 50                   | 14.431 | 34.297   | 25.553  |
| 75                   | 10.884 | 34.185   | 26.161  |
| 100                  | 8.749  | 34.135   | 26.481  |
| 125                  | 6.552  | 34.076   | 26.751  |
| 150                  | 5.359  | 34.081   | 26.905  |

|                      |        |          |         |
|----------------------|--------|----------|---------|
| STATION US10505      |        |          |         |
| LATITUDE 42-16.1 N   |        |          |         |
| LONGITUDE 140-36.6 E |        |          |         |
| DEPTH (m) 89         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.573 | 32.897   | 24.000  |
| 10                   | 16.570 | 32.901   | 24.004  |
| 20                   | 16.557 | 32.921   | 24.022  |
| 30                   | 15.837 | 33.218   | 24.414  |
| 40                   | 13.628 | 33.155   | 24.838  |
| 50                   | 11.677 | 33.141   | 25.206  |
| 75                   | 7.063  | 32.889   | 25.748  |

|                      |        |          |         |
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| STATION US10494      |        |          |         |
| LATITUDE 41-35.5 N   |        |          |         |
| LONGITUDE 140-53.6 E |        |          |         |
| DEPTH (m) 54         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 22.097 | 33.104   | 22.751  |
| 10                   | 22.135 | 33.104   | 22.740  |
| 20                   | 21.729 | 33.205   | 22.929  |
| 30                   | 21.680 | 33.223   | 22.956  |
| 40                   | 21.519 | 33.259   | 23.028  |
| 50                   | 21.495 | 33.266   | 23.040  |

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| STATION US10497      |        |          |         |
| LATITUDE 41-40.7 N   |        |          |         |
| LONGITUDE 140-47.6 E |        |          |         |
| DEPTH (m) 233        |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 21.801 | 33.239   | 22.936  |
| 10                   | 21.624 | 33.255   | 22.996  |
| 20                   | 20.608 | 33.457   | 23.425  |
| 30                   | 20.308 | 33.525   | 23.556  |
| 40                   | 19.653 | 33.623   | 23.802  |
| 50                   | 18.246 | 33.780   | 24.277  |
| 75                   | 14.330 | 34.097   | 25.419  |
| 100                  | 13.288 | 34.135   | 25.665  |
| 125                  | 11.642 | 34.155   | 26.000  |
| 150                  | 10.466 | 34.169   | 26.223  |
| 175                  | 9.925  | 34.162   | 26.310  |
| 200                  | 9.572  | 34.164   | 26.371  |

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| STATION US10500      |        |          |         |
| LATITUDE 41-21.4 N   |        |          |         |
| LONGITUDE 139-39.0 E |        |          |         |
| DEPTH (m) 255        |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 21.364 | 32.870   | 22.775  |
| 10                   | 21.389 | 32.885   | 22.779  |
| 20                   | 21.280 | 32.961   | 22.867  |
| 30                   | 18.932 | 33.706   | 24.050  |
| 40                   | 16.855 | 34.093   | 24.852  |
| 50                   | 14.939 | 34.267   | 25.420  |
| 75                   | 11.563 | 34.195   | 26.046  |
| 100                  | 9.142  | 34.150   | 26.430  |
| 125                  | 7.232  | 34.098   | 26.676  |
| 150                  | 5.652  | 34.084   | 26.872  |
| 175                  | 4.273  | 34.067   | 27.016  |
| 200                  | 2.489  | 34.066   | 27.184  |

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| STATION US10503      |        |          |         |
| LATITUDE 41-28.7 N   |        |          |         |
| LONGITUDE 139-21.0 E |        |          |         |
| DEPTH (m) 725        |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 20.555 | 33.067   | 23.142  |
| 10                   | 20.482 | 33.077   | 23.169  |
| 20                   | 20.413 | 33.109   | 23.212  |
| 30                   | 20.388 | 33.187   | 23.277  |
| 40                   | 16.171 | 34.213   | 25.103  |
| 50                   | 13.358 | 34.248   | 25.738  |
| 75                   | 10.277 | 34.165   | 26.253  |
| 100                  | 8.879  | 34.141   | 26.465  |
| 125                  | 6.720  | 34.103   | 26.750  |

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| STATION US10506      |        |          |         |
| LATITUDE 42-23.9 N   |        |          |         |
| LONGITUDE 140-31.1 E |        |          |         |
| DEPTH (m) 94         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.867 | 33.106   | 24.092  |
| 10                   | 16.881 | 33.101   | 24.085  |
| 20                   | 16.882 | 33.096   | 24.081  |
| 30                   | 16.882 | 33.094   | 24.080  |
| 40                   | 16.951 | 33.153   | 24.109  |
| 50                   | 15.119 | 33.190   | 24.551  |
| 75                   | 6.868  | 32.875   | 25.762  |

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| STATION US10495      |        |          |         |
| LATITUDE 41-37.1 N   |        |          |         |
| LONGITUDE 140-51.5 E |        |          |         |
| DEPTH (m) 140        |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 21.980 | 33.181   | 22.842  |
| 10                   | 21.648 | 33.262   | 22.995  |
| 20                   | 21.474 | 33.308   | 23.078  |
| 30                   | 21.356 | 33.333   | 23.129  |
| 40                   | 20.027 | 33.555   | 23.653  |
| 50                   | 17.866 | 33.903   | 24.465  |
| 75                   | 15.250 | 34.211   | 25.309  |
| 100                  | 14.929 | 34.216   | 25.383  |

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| STATION US10498      |        |          |         |
| LATITUDE 41-42.9 N   |        |          |         |
| LONGITUDE 140-45.1 E |        |          |         |
| DEPTH (m) 83         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 20.114 | 33.492   | 23.582  |
| 10                   | 19.968 | 33.490   | 23.619  |
| 20                   | 19.878 | 33.496   | 23.647  |
| 30                   | 19.624 | 33.534   | 23.741  |
| 40                   | 18.935 | 33.631   | 23.992  |
| 50                   | 16.816 | 33.843   | 24.670  |
| 75                   | 14.317 | 34.068   | 25.401  |

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| STATION US10501      |        |          |         |
| LATITUDE 41-21.4 N   |        |          |         |
| LONGITUDE 139-34.6 E |        |          |         |
| DEPTH (m) 359        |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 20.972 | 33.105   | 23.059  |
| 10                   | 20.971 | 33.105   | 23.060  |
| 20                   | 20.923 | 33.134   | 23.095  |
| 30                   | 19.204 | 33.654   | 23.941  |
| 40                   | 16.144 | 34.227   | 25.120  |
| 50                   | 14.291 | 34.255   | 25.550  |
| 75                   | 10.719 | 34.181   | 26.188  |
| 100                  | 8.586  | 34.129   | 26.501  |
| 125                  | 6.352  | 34.084   | 26.783  |
| 150                  | 4.478  | 34.074   | 26.999  |
| 175                  | 3.467  | 34.068   | 27.098  |

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| STATION US10504      |        |          |         |
| LATITUDE 42-08.2 N   |        |          |         |
| LONGITUDE 140-35.6 E |        |          |         |
| DEPTH (m) 58         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.449 | 32.392   | 23.641  |
| 10                   | 16.544 | 32.483   | 23.689  |
| 20                   | 16.833 | 32.770   | 23.842  |
| 30                   | 16.433 | 33.188   | 24.255  |
| 40                   | 15.618 | 33.263   | 24.497  |
| 50                   | 13.952 | 33.162   | 24.777  |

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| STATION US10507      |        |          |         |
| LATITUDE 42-19.2 N   |        |          |         |
| LONGITUDE 140-30.5 E |        |          |         |
| DEPTH (m) 92         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.940 | 33.088   | 24.061  |
| 10                   | 16.928 | 33.089   | 24.065  |
| 20                   | 16.921 | 33.088   | 24.066  |
| 30                   | 16.932 | 33.093   | 24.067  |
| 40                   | 16.955 | 33.371   | 24.274  |
| 50                   | 14.792 | 33.240   | 24.660  |
| 75                   | 8.289  | 32.849   | 25.542  |

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| STATION US10508      |        |          |         |
| LATITUDE 42-10.5 N   |        |          |         |
| LONGITUDE 140-35.7 E |        |          |         |
| DEPTH (m) 76         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.540 | 32.951   | 24.050  |
| 10                   | 16.553 | 32.957   | 24.051  |
| 20                   | 16.549 | 32.954   | 24.050  |
| 30                   | 16.580 | 32.987   | 24.067  |
| 40                   | 14.728 | 33.090   | 24.558  |
| 50                   | 12.372 | 33.094   | 25.039  |

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| STATION US10511      |        |          |         |
| LATITUDE 42-14.5 N   |        |          |         |
| LONGITUDE 140-30.3 E |        |          |         |
| DEPTH (m) 81         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.108 | 32.639   | 23.907  |
| 10                   | 16.790 | 33.074   | 24.086  |
| 20                   | 16.782 | 33.067   | 24.082  |
| 30                   | 16.824 | 33.084   | 24.085  |
| 40                   | 16.000 | 33.310   | 24.448  |
| 50                   | 13.728 | 33.163   | 24.824  |
| 75                   | 8.667  | 32.875   | 25.506  |

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| STATION US10514      |        |          |         |
| LATITUDE 42-27.9 N   |        |          |         |
| LONGITUDE 140-43.0 E |        |          |         |
| DEPTH (m) 61         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.550 | 32.963   | 24.056  |
| 10                   | 16.523 | 32.967   | 24.066  |
| 20                   | 16.504 | 32.969   | 24.071  |
| 30                   | 16.354 | 33.235   | 24.310  |
| 40                   | 13.876 | 33.152   | 24.785  |
| 50                   | 13.021 | 33.293   | 25.067  |

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| STATION US10517      |        |          |         |
| LATITUDE 42-20.7 N   |        |          |         |
| LONGITUDE 140-47.2 E |        |          |         |
| DEPTH (m) 56         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.917 | 33.077   | 24.058  |
| 10                   | 16.838 | 33.086   | 24.084  |
| 20                   | 16.814 | 33.106   | 24.105  |
| 30                   | 17.250 | 33.332   | 24.176  |
| 40                   | 17.196 | 33.352   | 24.203  |
| 50                   | 14.160 | 33.248   | 24.800  |

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| STATION US10520      |        |          |         |
| LATITUDE 42-10.5 N   |        |          |         |
| LONGITUDE 140-48.1 E |        |          |         |
| DEPTH (m) 93         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.589 | 32.793   | 23.916  |
| 10                   | 16.561 | 32.821   | 23.944  |
| 20                   | 17.185 | 33.290   | 24.159  |
| 30                   | 17.070 | 33.434   | 24.296  |
| 40                   | 17.039 | 33.508   | 24.361  |
| 50                   | 15.376 | 33.253   | 24.543  |
| 75                   | 9.833  | 33.754   | 26.007  |

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| STATION US10523      |        |          |         |
| LATITUDE 42-02.6 N   |        |          |         |
| LONGITUDE 140-54.2 E |        |          |         |
| DEPTH (m) 75         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 17.051 | 33.557   | 24.395  |
| 10                   | 17.001 | 33.570   | 24.417  |
| 20                   | 16.929 | 33.576   | 24.438  |
| 30                   | 16.903 | 33.575   | 24.444  |
| 40                   | 16.888 | 33.581   | 24.451  |
| 50                   | 15.670 | 33.636   | 24.773  |

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| STATION US10526      |        |          |         |
| LATITUDE 41-58.7 N   |        |          |         |
| LONGITUDE 141-00.6 E |        |          |         |
| DEPTH (m) 92         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 17.139 | 33.449   | 24.291  |
| 10                   | 17.193 | 33.522   | 24.334  |
| 20                   | 17.137 | 33.537   | 24.359  |
| 30                   | 17.096 | 33.548   | 24.377  |
| 40                   | 16.965 | 33.560   | 24.417  |
| 50                   | 16.855 | 33.572   | 24.453  |
| 75                   | 12.361 | 33.886   | 25.655  |

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| STATION US10509      |        |          |         |
| LATITUDE 42-10.5 N   |        |          |         |
| LONGITUDE 140-40.4 E |        |          |         |
| DEPTH (m) 84         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.326 | 32.589   | 23.820  |
| 10                   | 16.528 | 32.902   | 24.014  |
| 20                   | 16.619 | 32.981   | 24.054  |
| 30                   | 16.789 | 33.073   | 24.085  |
| 40                   | 14.871 | 33.247   | 24.648  |
| 50                   | 12.198 | 33.183   | 25.141  |
| 75                   | 6.569  | 32.821   | 25.760  |

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| STATION US10512      |        |          |         |
| LATITUDE 42-21.5 N   |        |          |         |
| LONGITUDE 140-35.8 E |        |          |         |
| DEPTH (m) 89         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.849 | 33.013   | 24.025  |
| 10                   | 16.713 | 33.008   | 24.053  |
| 20                   | 16.684 | 33.016   | 24.066  |
| 30                   | 16.927 | 33.158   | 24.118  |
| 40                   | 16.469 | 33.364   | 24.382  |
| 50                   | 13.317 | 33.156   | 24.901  |
| 75                   | 6.341  | 32.792   | 25.765  |

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| STATION US10515      |        |          |         |
| LATITUDE 42-25.3 N   |        |          |         |
| LONGITUDE 140-47.9 E |        |          |         |
| DEPTH (m) 46         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.648 | 32.950   | 24.024  |
| 10                   | 16.551 | 32.946   | 24.043  |
| 20                   | 16.494 | 32.947   | 24.057  |
| 30                   | 16.483 | 32.953   | 24.064  |
| 40                   | 15.355 | 33.165   | 24.480  |

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| STATION US10518      |        |          |         |
| LATITUDE 42-18.4 N   |        |          |         |
| LONGITUDE 140-42.7 E |        |          |         |
| DEPTH (m) 62         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.821 | 32.879   | 23.929  |
| 10                   | 16.675 | 32.914   | 23.990  |
| 20                   | 17.072 | 33.211   | 24.125  |
| 30                   | 16.817 | 33.248   | 24.213  |
| 40                   | 15.969 | 33.258   | 24.415  |
| 50                   | 12.271 | 33.460   | 25.341  |

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| STATION US10521      |        |          |         |
| LATITUDE 42-09.4 N   |        |          |         |
| LONGITUDE 140-52.2 E |        |          |         |
| DEPTH (m) 76         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 17.074 | 33.298   | 24.191  |
| 10                   | 17.235 | 33.494   | 24.303  |
| 20                   | 17.089 | 33.491   | 24.335  |
| 30                   | 17.039 | 33.492   | 24.348  |
| 40                   | 17.064 | 33.522   | 24.365  |
| 50                   | 17.020 | 33.569   | 24.411  |
| 75                   | 9.165  | 33.781   | 26.137  |

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| STATION US10524      |        |          |         |
| LATITUDE 41-57.3 N   |        |          |         |
| LONGITUDE 140-58.3 E |        |          |         |
| DEPTH (m) 78         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.301 | 32.687   | 23.901  |
| 10                   | 16.621 | 32.843   | 23.948  |
| 20                   | 17.126 | 33.203   | 24.106  |
| 30                   | 16.910 | 33.410   | 24.315  |
| 40                   | 16.909 | 33.483   | 24.371  |
| 50                   | 16.752 | 33.511   | 24.430  |
| 75                   | 9.945  | 33.337   | 25.663  |

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| STATION US10527      |        |          |         |
| LATITUDE 41-59.4 N   |        |          |         |
| LONGITUDE 141-01.8 E |        |          |         |
| DEPTH (m) 99         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 17.173 | 33.519   | 24.337  |
| 10                   | 17.161 | 33.515   | 24.336  |
| 20                   | 17.123 | 33.519   | 24.348  |
| 30                   | 17.091 | 33.523   | 24.360  |
| 40                   | 17.040 | 33.539   | 24.383  |
| 50                   | 15.762 | 33.757   | 24.846  |
| 75                   | 12.322 | 33.889   | 25.665  |
| 100                  | 9.791  | 33.830   | 26.074  |

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| STATION US10510      |        |          |         |
| LATITUDE 42-12.9 N   |        |          |         |
| LONGITUDE 140-40.8 E |        |          |         |
| DEPTH (m) 89         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.520 | 32.912   | 24.023  |
| 10                   | 16.526 | 32.913   | 24.023  |
| 20                   | 16.530 | 32.913   | 24.022  |
| 30                   | 16.129 | 33.227   | 24.355  |
| 40                   | 13.416 | 33.147   | 24.874  |
| 50                   | 11.906 | 33.172   | 25.187  |
| 75                   | 6.170  | 32.900   | 25.872  |

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| STATION US10513      |        |          |         |
| LATITUDE 42-25.6 N   |        |          |         |
| LONGITUDE 140-37.2 E |        |          |         |
| DEPTH (m) 83         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.699 | 33.004   | 24.053  |
| 10                   | 16.637 | 33.001   | 24.065  |
| 20                   | 16.633 | 33.008   | 24.072  |
| 30                   | 17.043 | 33.222   | 24.140  |
| 40                   | 16.225 | 33.385   | 24.455  |
| 50                   | 12.727 | 33.184   | 25.040  |
| 75                   | 6.794  | 32.827   | 25.735  |

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| STATION US10516      |        |          |         |
| LATITUDE 42-23.3 N   |        |          |         |
| LONGITUDE 140-43.0 E |        |          |         |
| DEPTH (m) 59         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.883 | 33.162   | 24.132  |
| 10                   | 16.844 | 33.171   | 24.147  |
| 20                   | 16.821 | 33.179   | 24.159  |
| 30                   | 16.834 | 33.192   | 24.166  |
| 40                   | 16.981 | 33.250   | 24.176  |
| 50                   | 14.424 | 33.166   | 24.681  |

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| STATION US10519      |        |          |         |
| LATITUDE 42-15.5 N   |        |          |         |
| LONGITUDE 140-47.2 E |        |          |         |
| DEPTH (m) 72         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.603 | 32.916   | 24.007  |
| 10                   | 16.616 | 32.978   | 24.052  |
| 20                   | 17.095 | 33.290   | 24.180  |
| 30                   | 17.142 | 33.483   | 24.317  |
| 40                   | 16.687 | 33.461   | 24.407  |
| 50                   | 13.734 | 33.155   | 24.816  |

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| STATION US10522      |        |          |         |
| LATITUDE 42-07.1 N   |        |          |         |
| LONGITUDE 140-50.8 E |        |          |         |
| DEPTH (m) 76         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.632 | 32.868   | 23.964  |
| 10                   | 16.747 | 32.994   | 24.034  |
| 20                   | 16.945 | 33.190   | 24.138  |
| 30                   | 17.080 | 33.348   | 24.228  |
| 40                   | 16.867 | 33.498   | 24.393  |
| 50                   | 14.037 | 33.187   | 24.779  |

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| STATION US10525      |        |          |         |
| LATITUDE 41-57.9 N   |        |          |         |
| LONGITUDE 140-59.4 E |        |          |         |
| DEPTH (m) 85         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.673 | 32.972   | 24.035  |
| 10                   | 16.802 | 33.065   | 24.076  |
| 20                   | 17.140 | 33.372   | 24.232  |
| 30                   | 16.961 | 33.499   | 24.372  |
| 40                   | 16.854 | 33.536   | 24.426  |
| 50                   | 16.873 | 33.567   | 24.444  |
| 75                   | 13.094 | 33.835   | 25.472  |

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| STATION US10528      |        |          |         |
| LATITUDE 42-00.7 N   |        |          |         |
| LONGITUDE 141-01.1 E |        |          |         |
| DEPTH (m) 92         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 17.152 | 33.528   | 24.349  |
| 10                   | 17.166 | 33.526   | 24.344  |
| 20                   | 17.176 | 33.528   | 24.343  |
| 30                   | 17.178 | 33.527   | 24.342  |
| 40                   | 17.181 | 33.528   | 24.342  |
| 50                   | 16.782 | 33.596   | 24.488  |
| 75                   | 12.400 | 33.850   | 25.620  |

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| STATION US10529      |        |          |         |
| LATITUDE 42-04.7 N   |        |          |         |
| LONGITUDE 140-56.9 E |        |          |         |
| DEPTH (m) 83         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 17.429 | 33.553   | 24.302  |
| 10                   | 17.429 | 33.550   | 24.300  |
| 20                   | 17.439 | 33.552   | 24.299  |
| 30                   | 17.404 | 33.543   | 24.301  |
| 40                   | 17.210 | 33.510   | 24.321  |
| 50                   | 16.707 | 33.616   | 24.520  |
| 75                   | 9.265  | 33.646   | 26.016  |

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| STATION US10532      |        |          |         |
| LATITUDE 42-13.0 N   |        |          |         |
| LONGITUDE 140-56.6 E |        |          |         |
| DEPTH (m) 69         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 17.102 | 33.440   | 24.293  |
| 10                   | 17.163 | 33.481   | 24.310  |
| 20                   | 17.097 | 33.498   | 24.339  |
| 30                   | 17.077 | 33.501   | 24.346  |
| 40                   | 17.064 | 33.511   | 24.357  |
| 50                   | 15.719 | 33.506   | 24.661  |

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| STATION US10535      |        |          |         |
| LATITUDE 42-14.8 N   |        |          |         |
| LONGITUDE 141-04.5 E |        |          |         |
| DEPTH (m) 78         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.545 | 33.092   | 24.156  |
| 10                   | 16.544 | 33.145   | 24.197  |
| 20                   | 16.261 | 33.254   | 24.346  |
| 30                   | 15.800 | 33.487   | 24.629  |
| 40                   | 14.908 | 33.650   | 24.951  |
| 50                   | 13.615 | 33.718   | 25.275  |

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| STATION US10538      |        |          |         |
| LATITUDE 42-07.5 N   |        |          |         |
| LONGITUDE 141-06.4 E |        |          |         |
| DEPTH (m) 105        |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.897 | 33.097   | 24.079  |
| 10                   | 16.821 | 33.108   | 24.105  |
| 20                   | 17.285 | 33.408   | 24.226  |
| 30                   | 17.472 | 33.524   | 24.269  |
| 40                   | 17.110 | 33.485   | 24.326  |
| 50                   | 15.676 | 33.517   | 24.680  |
| 75                   | 11.767 | 33.879   | 25.762  |
| 100                  | 9.486  | 33.825   | 26.120  |

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| STATION US10541      |        |          |         |
| LATITUDE 41-37.1 N   |        |          |         |
| LONGITUDE 140-51.0 E |        |          |         |
| DEPTH (m) 94         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 20.746 | 32.919   | 22.979  |
| 10                   | 20.742 | 32.925   | 22.984  |
| 20                   | 20.749 | 32.949   | 23.000  |
| 30                   | 20.479 | 33.096   | 23.184  |
| 40                   | 18.168 | 33.534   | 24.108  |
| 50                   | 17.205 | 33.634   | 24.418  |
| 75                   | 15.975 | 34.026   | 25.004  |

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| STATION US10544      |        |          |         |
| LATITUDE 41-42.8 N   |        |          |         |
| LONGITUDE 140-44.9 E |        |          |         |
| DEPTH (m) 84         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 19.846 | 33.053   | 23.318  |
| 10                   | 19.851 | 33.054   | 23.316  |
| 20                   | 19.777 | 33.072   | 23.349  |
| 30                   | 19.098 | 33.226   | 23.641  |
| 40                   | 17.465 | 33.497   | 24.250  |
| 50                   | 17.123 | 33.549   | 24.372  |
| 75                   | 12.633 | 34.147   | 25.804  |

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| STATION US10530      |        |          |         |
| LATITUDE 42-08.0 N   |        |          |         |
| LONGITUDE 140-59.3 E |        |          |         |
| DEPTH (m) 82         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 17.080 | 33.362   | 24.238  |
| 10                   | 17.093 | 33.367   | 24.239  |
| 20                   | 17.168 | 33.441   | 24.279  |
| 30                   | 17.211 | 33.481   | 24.299  |
| 40                   | 17.158 | 33.500   | 24.326  |
| 50                   | 16.404 | 33.571   | 24.556  |
| 75                   | 11.314 | 33.860   | 25.831  |

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| STATION US10533      |        |          |         |
| LATITUDE 42-17.2 N   |        |          |         |
| LONGITUDE 140-54.3 E |        |          |         |
| DEPTH (m) 56         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.817 | 33.082   | 24.085  |
| 10                   | 16.766 | 33.078   | 24.094  |
| 20                   | 16.777 | 33.088   | 24.099  |
| 30                   | 17.129 | 33.318   | 24.193  |
| 40                   | 17.047 | 33.493   | 24.347  |
| 50                   | 16.391 | 33.516   | 24.518  |

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| STATION US10536      |        |          |         |
| LATITUDE 42-14.2 N   |        |          |         |
| LONGITUDE 141-11.3 E |        |          |         |
| DEPTH (m) 111        |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.650 | 33.003   | 24.064  |
| 10                   | 16.656 | 33.003   | 24.062  |
| 20                   | 16.631 | 33.137   | 24.171  |
| 30                   | 17.220 | 33.460   | 24.281  |
| 40                   | 17.173 | 33.498   | 24.321  |
| 50                   | 15.429 | 33.677   | 24.858  |
| 75                   | 12.327 | 33.926   | 25.692  |
| 100                  | 9.393  | 33.801   | 26.116  |

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| STATION US10539      |        |          |         |
| LATITUDE 42-04.0 N   |        |          |         |
| LONGITUDE 141-03.7 E |        |          |         |
| DEPTH (m) 99         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 17.350 | 33.471   | 24.259  |
| 10                   | 17.344 | 33.521   | 24.298  |
| 20                   | 17.273 | 33.509   | 24.305  |
| 30                   | 17.230 | 33.502   | 24.310  |
| 40                   | 17.203 | 33.497   | 24.313  |
| 50                   | 16.961 | 33.598   | 24.448  |
| 75                   | 11.269 | 33.849   | 25.831  |

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| STATION US10542      |        |          |         |
| LATITUDE 41-38.9 N   |        |          |         |
| LONGITUDE 140-49.1 E |        |          |         |
| DEPTH (m) 343        |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 20.529 | 32.930   | 23.045  |
| 10                   | 20.508 | 32.930   | 23.050  |
| 20                   | 20.496 | 32.931   | 23.054  |
| 30                   | 20.260 | 32.974   | 23.149  |
| 40                   | 18.180 | 33.354   | 23.967  |
| 50                   | 17.154 | 33.579   | 24.388  |
| 75                   | 15.294 | 34.143   | 25.247  |
| 100                  | 13.812 | 34.192   | 25.602  |
| 125                  | 12.063 | 34.192   | 25.950  |
| 150                  | 11.542 | 34.192   | 26.047  |
| 175                  | 11.076 | 34.185   | 26.127  |
| 200                  | 10.897 | 34.180   | 26.156  |
| 250                  | 10.560 | 34.171   | 26.208  |
| 300                  | 10.323 | 34.172   | 26.250  |

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| STATION US10531      |        |          |         |
| LATITUDE 42-11.4 N   |        |          |         |
| LONGITUDE 141-01.4 E |        |          |         |
| DEPTH (m) 78         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.838 | 33.069   | 24.071  |
| 10                   | 16.837 | 33.080   | 24.079  |
| 20                   | 16.876 | 33.100   | 24.085  |
| 30                   | 17.268 | 33.320   | 24.162  |
| 40                   | 16.823 | 33.508   | 24.411  |
| 50                   | 14.388 | 33.490   | 24.939  |

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| STATION US10534      |        |          |         |
| LATITUDE 42-16.1 N   |        |          |         |
| LONGITUDE 140-58.3 E |        |          |         |
| DEPTH (m) 62         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.798 | 33.063   | 24.076  |
| 10                   | 16.764 | 33.061   | 24.082  |
| 20                   | 16.828 | 33.103   | 24.099  |
| 30                   | 16.712 | 33.319   | 24.292  |
| 40                   | 15.227 | 33.389   | 24.680  |
| 50                   | 14.331 | 33.527   | 24.980  |

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| STATION US10537      |        |          |         |
| LATITUDE 42-11.0 N   |        |          |         |
| LONGITUDE 141-09.0 E |        |          |         |
| DEPTH (m) 108        |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 16.771 | 33.041   | 24.064  |
| 10                   | 16.745 | 33.040   | 24.070  |
| 20                   | 16.668 | 33.054   | 24.098  |
| 30                   | 17.108 | 33.324   | 24.202  |
| 40                   | 17.205 | 33.461   | 24.285  |
| 50                   | 15.897 | 33.567   | 24.669  |
| 75                   | 11.959 | 33.889   | 25.734  |
| 100                  | 9.342  | 33.815   | 26.135  |

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| STATION US10540      |        |          |         |
| LATITUDE 41-35.7 N   |        |          |         |
| LONGITUDE 140-53.4 E |        |          |         |
| DEPTH (m) 58         |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 20.822 | 32.907   | 22.949  |
| 10                   | 20.889 | 33.018   | 23.015  |
| 20                   | 20.282 | 33.198   | 23.314  |
| 30                   | 18.433 | 33.654   | 24.135  |
| 40                   | 18.020 | 33.754   | 24.313  |
| 50                   | 17.504 | 33.858   | 24.518  |

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| STATION US10543      |        |          |         |
| LATITUDE 41-40.8 N   |        |          |         |
| LONGITUDE 140-47.1 E |        |          |         |
| DEPTH (m) 219        |        |          |         |
| Press.               | Temp.  | Salinity | Sigma-T |
| 5                    | 20.295 | 32.866   | 23.057  |
| 10                   | 20.017 | 33.012   | 23.242  |
| 20                   | 19.945 | 33.043   | 23.284  |
| 30                   | 19.770 | 33.091   | 23.366  |
| 40                   | 19.054 | 33.266   | 23.683  |
| 50                   | 16.893 | 33.929   | 24.718  |
| 75                   | 14.763 | 34.072   | 25.308  |
| 100                  | 12.524 | 34.196   | 25.864  |
| 125                  | 12.398 | 34.208   | 25.898  |
| 150                  | 11.071 | 34.169   | 26.116  |
| 175                  | 10.622 | 34.167   | 26.194  |
| 200                  | 10.479 | 34.167   | 26.219  |