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10

THE "OSHORO MARU" CRUISE 210
TO THE COAST OF SANRIKU

IN DECEMBER 2009

1. Cruise Itinerary

Cruise 210

| | |
|--|----------------|
| Departure from Ofunato | Dec. 23 , 2009 |
| Start hydrographic research (OS09175) | 24 |
| Finish hydrographic research (OS09178) | 25 |
| Return to Ofunato | 26 |
| Departure from Ofunato | 26 |
| Return to Hakodate | 27 |

Total coverage 448.5 miles 5 days at sea

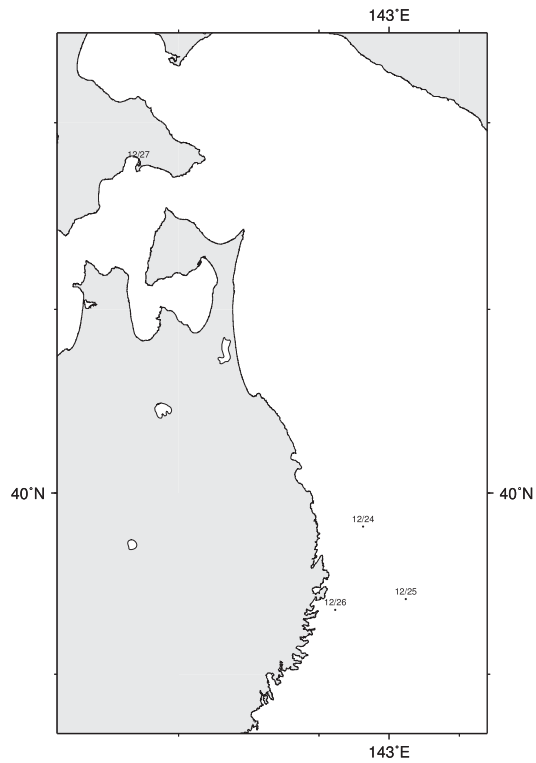


Figure 1: Noon position

2. Vessel Personnel

| | | | |
|----------|----------------|---------------------|-------------------|
| Captain: | | Associate Professor | Shogo Takagi |
| Crew : | Chief Officer | Instructor | Yoshihiko Kamei |
| | First Officer | Instructor | Keiichiro Sakaoka |
| | Second Officer | Technical official | Naoki Hoshi |
| | Third Officer | Technical official | Takuzo Abe |
| | Chief Engineer | Instructor | Jyunichi Kimura |
| | And 24 men | | |

Cruise 210

| | | | |
|----------------------------|--------------------------|---|--------------------|
| Under Graduate instructor: | Professor | (School of Marine Biosciences, Kitasato University) | Ryousuke Kado |
| | Lecturer | (School of Marine Biosciences, Kitasato University) | Yuichiro Yamada |
| | Associate Professor | (Trainig ship Oshoro maru, Hokkaido University) | Yoshiyuki Kajiwara |
| | Teaching Assistant: | | 3 Person |
| | Under Graduate Students: | | 61 Persons |
| | Total | | 97 Persons |

3. Items of Research

Hydrographic observations: Fig. 2 Table 1,2

4. 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 “Oshoro Maru”.

Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19).

Dynamic computations were made using a desk-top computer aboard the “Oshoro Maru”.

Table 1: List of Oceanographic Stations

| Station | Lat.(*) | Long.(*) | Date | S.M.T | T.Z. | Depth | COL. | TR. | S.S.T. | WR. | Remark |
|---------|----------|-----------|-------|-------|------|-------|------|-----|--------|-----|------------|
| OS09175 | 39-59.7N | 143-00.4E | 12/24 | 0357 | 9 | 1306 | - | - | 9.5 | bc | 9Plus-0769 |
| OS09176 | 39-47.2N | 142-19.5E | 12/24 | 1405 | 9 | 506 | - | - | - | bc | 9Plus-0769 |
| OS09177 | 39-31.1N | 142-44.1E | 12/25 | 0832 | 9 | 1370 | 3 | 12 | 12.1 | c | 9Plus-0769 |
| OS09178 | 39-18.0N | 142-26.5E | 12/25 | 1258 | 9 | 995 | 3 | 14 | 11 | c | 9Plus-0769 |

(*):Fixed position by Global Positioning system

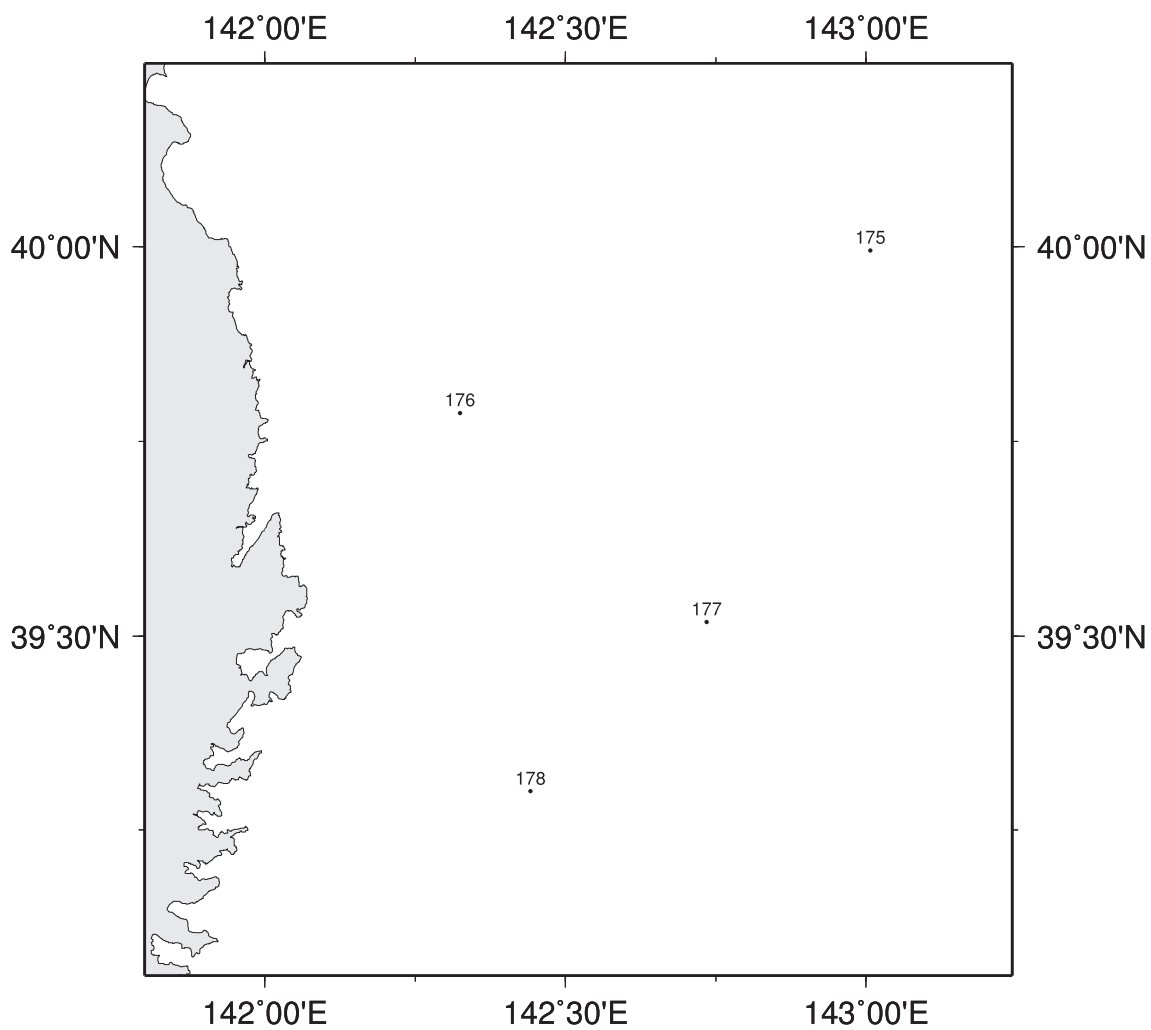


Figure 2: Oceanographic stations

Table 2: Oceanographic data

| Station | | OS09175 | |
|-----------|-------|-----------|--------|
| Longitude | | 39-59.7N | |
| Latitude | | 143-00.4E | |
| Depth(m) | | 1306 | |
| Press. | Temp. | Sal. | SIG-T |
| 5 | 9.849 | 33.704 | 25.966 |
| 10 | 9.186 | 33.637 | 26.022 |
| 20 | 8.723 | 33.587 | 26.056 |
| 30 | 8.200 | 33.534 | 26.093 |
| 40 | 7.838 | 33.495 | 26.116 |
| 50 | 7.508 | 33.456 | 26.132 |
| 75 | 7.070 | 33.490 | 26.220 |
| 100 | 5.154 | 33.503 | 26.471 |
| 125 | 4.583 | 33.525 | 26.552 |
| 150 | 4.185 | 33.536 | 26.603 |
| 200 | 3.328 | 33.564 | 26.709 |
| 250 | 2.935 | 33.589 | 26.764 |
| 300 | 3.051 | 33.687 | 26.833 |
| 400 | 3.278 | 33.846 | 26.939 |
| 500 | 3.389 | 34.029 | 27.074 |

| Station | | OS09176 | |
|-----------|-------|-----------|--------|
| Longitude | | 39-47.2N | |
| Latitude | | 142-19.5E | |
| Depth(m) | | 506 | |
| Press. | Temp. | Sal. | SIG-T |
| 5 | 9.998 | 33.815 | 26.027 |
| 10 | 9.999 | 33.815 | 26.027 |
| 20 | 9.868 | 33.792 | 26.032 |
| 30 | 9.541 | 33.746 | 26.049 |
| 40 | 9.257 | 33.700 | 26.059 |
| 50 | 9.090 | 33.673 | 26.065 |
| 75 | 8.003 | 33.509 | 26.103 |
| 100 | 7.887 | 33.494 | 26.108 |
| 125 | 7.699 | 33.464 | 26.112 |
| 150 | 7.278 | 33.412 | 26.130 |
| 200 | 6.258 | 33.550 | 26.375 |
| 250 | 4.452 | 33.531 | 26.571 |
| 300 | 3.619 | 33.555 | 26.674 |
| 400 | 3.078 | 33.716 | 26.853 |

| Station | | OS09177 | |
|-----------|--------|-----------|--------|
| Longitude | | 39-31.1N | |
| Latitude | | 142-44.1E | |
| Depth(m) | | 1370 | |
| Press. | Temp. | Sal. | SIG-T |
| 5 | 12.556 | 33.964 | 25.679 |
| 10 | 12.569 | 33.964 | 25.676 |
| 20 | 12.579 | 33.964 | 25.674 |
| 30 | 12.580 | 33.964 | 25.674 |
| 40 | 12.576 | 33.964 | 25.674 |
| 50 | 12.570 | 33.962 | 25.674 |
| 75 | 12.554 | 33.961 | 25.676 |
| 100 | 10.957 | 33.809 | 25.856 |
| 125 | 9.540 | 33.841 | 26.124 |
| 150 | 7.587 | 33.764 | 26.364 |
| 200 | 7.231 | 33.961 | 26.569 |
| 250 | 3.567 | 33.580 | 26.699 |
| 300 | 3.313 | 33.631 | 26.764 |
| 400 | 3.222 | 33.788 | 26.897 |
| 500 | 3.430 | 33.942 | 27.001 |

| Station | | OS09178 | |
|-----------|--------|-----------|--------|
| Longitude | | 39-18.0N | |
| Latitude | | 142-26.5E | |
| Depth(m) | | 995 | |
| Press. | Temp. | Sal. | SIG-T |
| 5 | 11.781 | 33.869 | 25.752 |
| 10 | 11.336 | 33.830 | 25.804 |
| 20 | 10.223 | 33.758 | 25.944 |
| 30 | 9.177 | 33.621 | 26.010 |
| 40 | 8.890 | 33.603 | 26.042 |
| 50 | 8.642 | 33.576 | 26.060 |
| 75 | 8.020 | 33.504 | 26.096 |
| 100 | 7.906 | 33.529 | 26.133 |
| 125 | 7.297 | 33.531 | 26.221 |
| 150 | 6.081 | 33.533 | 26.383 |
| 200 | 4.332 | 33.569 | 26.614 |
| 250 | 3.398 | 33.561 | 26.700 |
| 300 | 3.015 | 33.606 | 26.771 |
| 400 | 3.243 | 33.795 | 26.901 |
| 500 | 3.328 | 33.920 | 26.993 |

