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2

THE "OSHORO MARU" CRUISE 253 TO TSURUGA-WAN

IN APRIL 2013

1. Cruise Itinerary

Departure from Hakodate	Apr.	15	2013
Start hydrographic research (OS13014)		16	
Arrival at Tsuruga		19	
Departure from Tsuruga		20	
Return to Tsuruga		21	
Departure from Tsuruga		22	
Finish hydrographic research (OS13026)		24	
Return to Hakodate		25	

Total coverage 1158.7 miles

2. Vessel Personnel

Crew: Captain: Associate Professor Shogo Takagi

And 28 men

Research Staff: Professor (Laboratory of Marine Environmental Science, Hokkaido University)

Kenshi Kuma

Associatet Professor (Laboratory of Marine Environmental Science, Hokkaido University)

Yutaka Isoda

Under Graduate instructor:

Professor・Vice-President（Faculty of Marine Bioscience, Fukui Prefectural University）

Tadahisa Seikai

Professor （Faculty of Marine Bioscience, Fukui Prefectural University）

Ryuji Kondo

Associate Professor （Faculty of Marine Bioscience, Fukui Prefectural University）

Atsushi Kaneda

Associate Professor （Faculty of Marine Bioscience, Fukui Prefectural University）

Takao Yoshitake

Teaching assistant: 4 persons

Graduate Students: 4 persons

Under Graduate Students: 56 persons

Total 99 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 Science officer, the deck officers, crews, research staff and cadets of the “Oshoro maru”. Temperature and salinity were measured by CTD (Seabird SBE-9Plus, SBE-19Plus). Water and Plankton sampling were also carried out at almost hydrographic stations.

Fig.-1 Table-1, 2

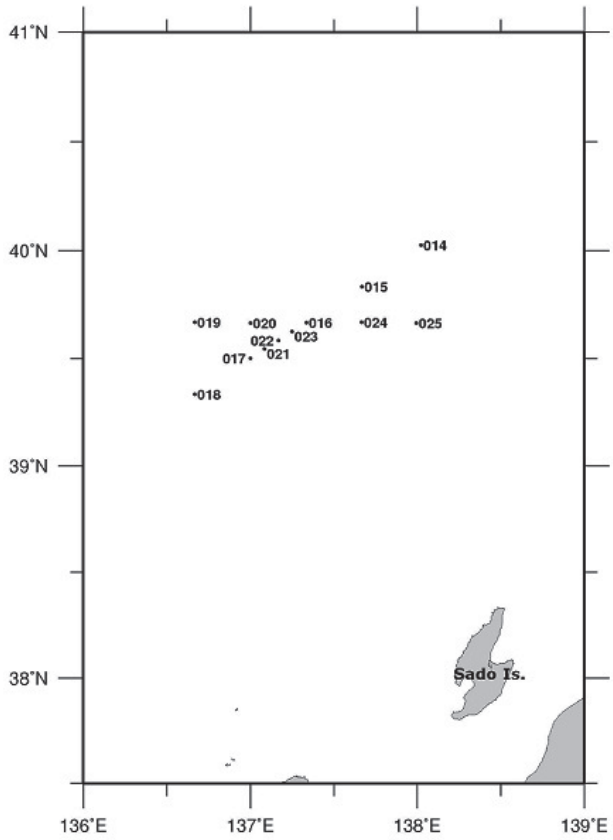

Fig. 1. Oceanographic stations

Table 1. List of Oceanographic station

Station	Lat.	Long.	Date (GMT)	Hour (GMT)	T.Z.	Depth	Col.	Tr.	SST	Wr.	Gear
OS13014	40-01.50N	138-01.30E	4/16	1:04	9	2561	-	-	8.4	o	9plus-0769
OS13015	39-50.03N	137-40.12E	4/16	5:35	9	2757	-	-	9.1	o	9plus-0769
OS13016	39-40.00N	137-20.09E	4/16	10:07	9	2580	-	-	9.6	o	9plus-0769
OS13017	39-30.07N	137-00.01E	4/16	14:23	9	2562	-	-	7.5	o	9plus-0769
OS13018	39-20.06N	136-40.08E	4/16	18:29	9	2640	-	-	6.9	o	9plus-0769
OS13019	39-40.08N	136-40.05E	4/16	23:00	9	2415	-	-	6.3	o	9plus-0769
OS13020	39-39.90N	136-59.97E	4/17	3:00	9	2600	-	-	7.8	bc	9plus-0769
OS13021	39-32.66N	137-05.07E	4/17	6:03	9	2557	-	-	8.1	o	9plus-0769
OS13022	39-35.02N	137-10.06E	4/17	8:19	9	2595	-	-	9.6	o	9plus-0769
OS13023	39-37.50N	137-15.04E	4/17	10:40	9	2536	-	-	10.3	o	9plus-0769
OS13024	39-40.14N	137-39.96E	4/17	14:32	9	2599	-	-	9.8	o	9plus-0769
OS13025	39-39.93N	137-59.56E	4/17	18:10	9	2580	-	-	10.0	o	9plus-0769
OS13026	39-37.32N	132-15.10E	4/23	4:00	9	2530	-	-	10.5	o	9plus-0769

Table 2. Oceanographic data

Station OS13014
Latitude 40-01.83N
Longitude 138-01.58E
Depth(m) 2561

Press.	Temp.	Sal.	SIG-T
5	8.222	34.067	26.508
10	8.152	34.066	26.518
20	6.836	34.049	26.692
30	6.286	34.049	26.765
40	5.758	34.042	26.826
50	5.213	34.041	26.891
75	4.957	34.046	26.924
100	4.049	34.041	27.018
125	2.737	34.045	27.146
150	2.355	34.043	27.176
175	1.933	34.050	27.216
200	1.724	34.049	27.231
250	1.227	34.063	27.277
300	0.943	34.068	27.300
400	0.732	34.071	27.315
500	0.564	34.072	27.326
600	0.468	34.073	27.332
700	0.387	34.072	27.336
800	0.348	34.072	27.338
900	0.310	34.071	27.340
1000	0.277	34.071	27.341
1200	0.239	34.070	27.343
1500	0.213	34.070	27.344
2000	0.211	34.070	27.344
2500	0.238	34.071	27.343

Station OS13015
Latitude 39-50.05N
Longitude 137-40.14E
Depth(m) 2757

Press.	Temp.	Sal.	SIG-T
5	9.007	34.078	26.395
10	9.002	34.078	26.396
20	8.698	34.071	26.438
30	8.276	34.066	26.499
40	8.234	34.068	26.507
50	7.262	34.067	26.648
75	4.885	34.071	26.951
100	3.384	34.041	27.084
125	2.742	34.037	27.139
150	1.948	34.045	27.210
175	1.592	34.045	27.237
200	1.352	34.044	27.253
250	1.055	34.046	27.275
300	0.944	34.047	27.283
400	0.800	34.068	27.309
500	0.645	34.072	27.321
600	0.546	34.073	27.328
700	0.462	34.073	27.333
800	0.399	34.073	27.336
900	0.355	34.072	27.338
1000	0.324	34.072	27.340
1200	0.271	34.071	27.342
1500	0.235	34.071	27.343
2000	0.221	34.07	27.344
2500	0.238	34.071	27.343

Station OS13016
Latitude 39-39.99N
Longitude 137-20.08E
Depth(m) 2580

Press.	Temp.	Sal.	SIG-T
5	9.569	34.043	26.277
10	9.560	34.042	26.278
20	9.562	34.044	26.278
30	9.558	34.050	26.284
40	9.026	34.089	26.401
50	8.744	34.108	26.460
75	7.265	34.074	26.652
100	5.641	34.074	26.865
125	4.187	34.064	27.022
150	3.221	34.057	27.112
175	2.456	34.048	27.172
200	1.964	34.051	27.214
250	1.284	34.051	27.263
300	1.105	34.056	27.279
400	0.816	34.068	27.307
500	0.664	34.072	27.320
600	0.569	34.073	27.327
700	0.469	34.073	27.332
800	0.400	34.073	27.336
900	0.354	34.072	27.338
1000	0.316	34.072	27.34
1200	0.265	34.071	27.342
1500	0.227	34.07	27.344
2000	0.221	34.071	27.344
2500	0.240	34.071	27.343

Station OS13017
Latitude 39-30.07N
Longitude 137-00.19E
Depth(m) 2562

Press.	Temp.	Sal.	SIG-T
5	6.764	34.064	26.713
10	6.765	34.064	26.713
20	6.627	34.064	26.732
30	6.451	34.065	26.756
40	6.333	34.063	26.770
50	5.735	34.054	26.838
75	3.445	34.056	27.091
100	2.508	34.041	27.162
125	2.008	34.048	27.208
150	1.631	34.050	27.238
175	1.488	34.052	27.250
200	1.253	34.056	27.270
250	0.988	34.062	27.292
300	0.866	34.068	27.305
400	0.673	34.072	27.320
500	0.544	34.073	27.328
600	0.439	34.072	27.334
700	0.377	34.072	27.337
800	0.332	34.072	27.339
900	0.297	34.071	27.341
1000	0.273	34.071	27.342
1200	0.238	34.071	27.343
1500	0.217	34.070	27.344
2000	0.219	34.070	27.344
2500	0.251	34.071	27.343

Station OS13018
Latitude 39-20.06N
Longitude 136-40.12E
Depth(m) 2640.000

Press.	Temp.	Sal.	SIG-T
10	6.583	34.061	26.735
20	6.564	34.060	26.737
30	6.357	34.058	26.762
40	6.206	34.063	26.786
50	5.878	34.061	26.826
75	3.943	34.042	27.030
100	3.281	34.050	27.101
125	2.710	34.043	27.147
150	2.198	34.041	27.188
175	1.773	34.044	27.223
200	1.494	34.048	27.247
250	1.101	34.06	27.283
300	0.911	34.067	27.301
400	0.719	34.072	27.317
500	0.574	34.073	27.326
600	0.487	34.073	27.331
700	0.417	34.072	27.335
800	0.360	34.072	27.338
900	0.318	34.072	27.340
1000	0.288	34.071	27.341
1200	0.252	34.071	27.343
1500	0.218	34.071	27.344
2000	0.221	34.070	27.344
2500	0.249	34.071	27.343

Station OS13019
Latitude 39-40.09N
Longitude 136-40.06E
Depth(m) 2415.000

Press.	Temp.	Sal.	SIG-T
10	6.127	34.052	26.787
20	6.119	34.051	26.788
30	5.230	34.049	26.894
40	4.623	34.055	26.968
50	4.215	34.056	27.013
75	3.274	34.053	27.104
100	2.448	34.048	27.173
125	1.986	34.046	27.209
150	1.620	34.048	27.238
175	1.431	34.055	27.256
200	1.215	34.061	27.277
250	0.988	34.067	27.296
300	0.838	34.07	27.308
400	0.647	34.072	27.321
500	0.524	34.073	27.329
600	0.449	34.073	27.334
700	0.386	34.072	27.337
800	0.335	34.072	27.339
900	0.312	34.072	27.34
1000	0.285	34.071	27.341
1200	0.242	34.071	27.343
1500	0.217	34.07	27.344
2000	0.216	34.07	27.345

Station OS13020
Latitude 39-39.89N
Longitude 136-59.97E
Depth(m) 2600

Press.	Temp.	Sal.	SIG-T
5	7.735	34.051	26.568
10	7.546	34.049	26.593
20	7.398	34.052	26.616
30	6.021	34.053	26.801
40	5.456	34.062	26.878
50	4.948	34.066	26.941
75	3.897	34.061	27.050
100	3.094	34.058	27.125
125	2.424	34.048	27.175
150	1.742	34.050	27.230
175	1.464	34.053	27.253
200	1.302	34.057	27.267
250	1.071	34.063	27.288
300	0.921	34.067	27.300
400	0.733	34.071	27.315
500	0.598	34.072	27.324
600	0.491	34.072	27.330
700	0.400	34.072	27.336
800	0.360	34.072	27.338
900	0.327	34.072	27.340
1000	0.301	34.071	27.341
1200	0.252	34.071	27.343
1500	0.223	34.071	27.344
2000	0.219	34.070	27.344
2500	0.245	34.071	27.343

Station OS13021
Latitude 39-32.68N
Longitude 137-05.08E
Depth(m) 2557

Press.	Temp.	Sal.	SIG-T
5	7.129	34.065	26.664
10	7.106	34.064	26.667
20	6.943	34.062	26.687
30	6.861	34.060	26.697
40	6.780	34.059	26.707
50	6.082	34.048	26.790
75	3.339	34.043	27.090
100	2.742	34.052	27.151
125	1.958	34.048	27.212
150	1.650	34.051	27.237
175	1.408	34.056	27.259
200	1.279	34.059	27.270
250	1.051	34.065	27.290
300	0.874	34.069	27.305
400	0.684	34.072	27.319
500	0.524	34.072	27.329
600	0.456	34.073	27.333
700	0.401	34.072	27.336
800	0.351	34.072	27.338
900	0.309	34.072	27.340
1000	0.280	34.071	27.342
1200	0.249	34.071	27.343
1500	0.222	34.070	27.344
2000	0.224	34.071	27.344
2500	0.252	34.071	27.343

Station OS13022
Latitude 39-35.12N
Longitude 137-10.09E
Depth(m) 2595

Press.	Temp.	Sal.	SIG-T
5	9.216	34.082	26.365
10	9.181	34.078	26.367
20	7.371	34.062	26.629
30	7.130	34.064	26.664
40	6.814	34.055	26.700
50	6.419	34.052	26.750
75	5.502	34.056	26.868
100	3.789	34.061	27.061
125	2.883	34.053	27.139
150	2.236	34.054	27.195
175	1.828	34.054	27.227
200	1.545	34.055	27.248
250	1.186	34.061	27.278
300	1.003	34.067	27.295
400	0.748	34.071	27.314
500	0.597	34.072	27.324
600	0.498	34.072	27.330
700	0.411	34.072	27.335
800	0.369	34.072	27.337
900	0.322	34.072	27.340
1000	0.289	34.071	27.341
1200	0.246	34.071	27.343
1500	0.215	34.070	27.344
2000	0.219	34.070	27.344
2500	0.251	34.071	27.343

Station OS13023
Latitude 39-37.52N
Longitude 137-15.05E
Depth(m) 2536

Press.	Temp.	Sal.	SIG-T
5	9.513	34.073	26.309
10	9.516	34.073	26.309
20	9.516	34.073	26.309
30	9.512	34.073	26.309
40	8.878	34.073	26.411
50	8.219	34.086	26.523
75	6.377	34.066	26.766
100	4.952	34.060	26.936
125	3.628	34.059	27.075
150	2.882	34.054	27.140
175	2.135	34.054	27.203
200	1.783	34.055	27.231
250	1.253	34.061	27.274
300	1.051	34.065	27.290
400	0.780	34.071	27.312
500	0.603	34.072	27.324
600	0.494	34.073	27.331
700	0.425	34.073	27.335
800	0.360	34.072	27.338
900	0.327	34.072	27.340
1000	0.293	34.071	27.341
1200	0.255	34.071	27.343
1500	0.221	34.070	27.344
2000	0.218	34.070	27.344
2500	0.239	34.071	27.343

Station OS13024
Latitude 39-40.12N
Longitude 137-39.98E
Depth(m) 2599

Press.	Temp.	Sal.	SIG-T
5	9.758	34.031	26.236
10	9.671	34.039	26.257
20	9.415	34.053	26.310
30	9.272	34.068	26.345
40	8.982	34.076	26.398
50	8.814	34.081	26.428
75	7.649	34.070	26.595
100	6.187	34.066	26.791
125	5.389	34.058	26.883
150	4.445	34.061	26.992
175	3.598	34.062	27.080
200	2.472	34.053	27.175
250	1.705	34.057	27.238
300	1.288	34.064	27.273
400	0.865	34.070	27.306
500	0.681	34.072	27.319
600	0.548	34.073	27.328
700	0.456	34.073	27.333
800	0.394	34.072	27.336
900	0.341	34.072	27.339
1000	0.306	34.071	27.340
1200	0.264	34.071	27.342
1500	0.223	34.070	27.344
2000	0.216	34.070	27.344
2500	0.237	34.071	27.343

Station OS13025
Latitude 39-40.10N
Longitude 137-59.69E
Depth(m) 2580

Press.	Temp.	Sal.	SIG-T
5	9.907	34.025	26.206
10	9.903	34.025	26.207
20	9.905	34.025	26.207
30	9.910	34.026	26.207
40	9.887	34.033	26.216
50	9.848	34.058	26.242
75	9.645	34.055	26.273
100	9.325	34.085	26.350
125	8.480	34.081	26.480
150	7.429	34.073	26.629
175	6.208	34.068	26.790
200	5.363	34.073	26.898
250	3.554	34.059	27.082
300	1.872	34.051	27.221
400	1.021	34.067	27.294
500	0.773	34.071	27.313
600	0.602	34.072	27.324
700	0.503	34.072	27.330
800	0.415	34.072	27.335
900	0.369	34.072	27.337
1000	0.338	34.072	27.339
1200	0.276	34.071	27.342
1500	0.233	34.070	27.344
2000	0.224	34.070	27.344
2500	0.238	34.071	27.343

	Station	OS13026	
	Latitude	39-37.43N	
	Longitude	137-14.98E	
	Depth(m)	2530	
Press.	Temp.	Sal.	SIG-T
5	9.881	33.988	26.182
10	9.872	33.987	26.183
20	8.95	34.065	26.394
30	8.461	34.073	26.476
40	8.062	34.061	26.527
50	6.923	34.062	26.69
75	5.652	34.064	26.856
100	4.708	34.061	26.964
125	3.8	34.057	27.056
150	2.91	34.055	27.139
175	2.226	34.055	27.197
200	1.736	34.051	27.231
250	1.314	34.058	27.267
300	1.072	34.066	27.29
400	0.761	34.071	27.314
500	0.61	34.072	27.324
600	0.518	34.073	27.33
700	0.447	34.073	27.334
800	0.383	34.072	27.337
900	0.341	34.072	27.339
1000	0.3	34.071	27.34
1200	0.26	34.071	27.342
1500	0.226	34.07	27.344
2000	0.218	34.07	27.344
2500	0.237	34.07	27.343