



HOKKAIDO UNIVERSITY

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PART I

OSHORO MARU CRUISES
FROM FEBRUARY 2014 TO DECEMBER 2014

**THE "OSHOROMARU" CRUISE 266
TO TSUGARU STRAIT, IBURI and HIDAKA OFF, and IWATE OFF**

IN FEBRUARY 2014

1. Cruise Itinerary

Cruise 266

Departure from Hakodate		
and start hydrographic research (OS14001)	February	12 2014
Finish hydrographic research (OS14007)		14
Return to Hakodate		15
Departure from Hakodate		17
Start hydrographic research (OS14008)		18
Finish hydrographic research (OS14015)		19
Return to Hakodate		20
Departure from Hakodate and start hydrographic research (OS14016)		21
Finish hydrographic research (OS14048)		26
Return to Hakodate		27

Total coverage 719.8 miles

2. Vessel Personnel

Crew:	Captain:	Associate Professor	Shogo Takagi
			And 28 persons
Research Staff:	Leg1		
		Graduate Students:	2 persons
		Undergraduate Students:	5 persons
	Leg2		
		Technical Specialist (Tokyo University of Marine Science and Technology)	
			Yukari Ito
	Leg3		
		Specially Appointed Associate Professor	
		(School of Fisheries Sciences, Hokkaido University)	
			Mituhiko Nakaya
		Graduate Students:	2 persons
		Undergraduate Students:	9 persons
			Total 20 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.

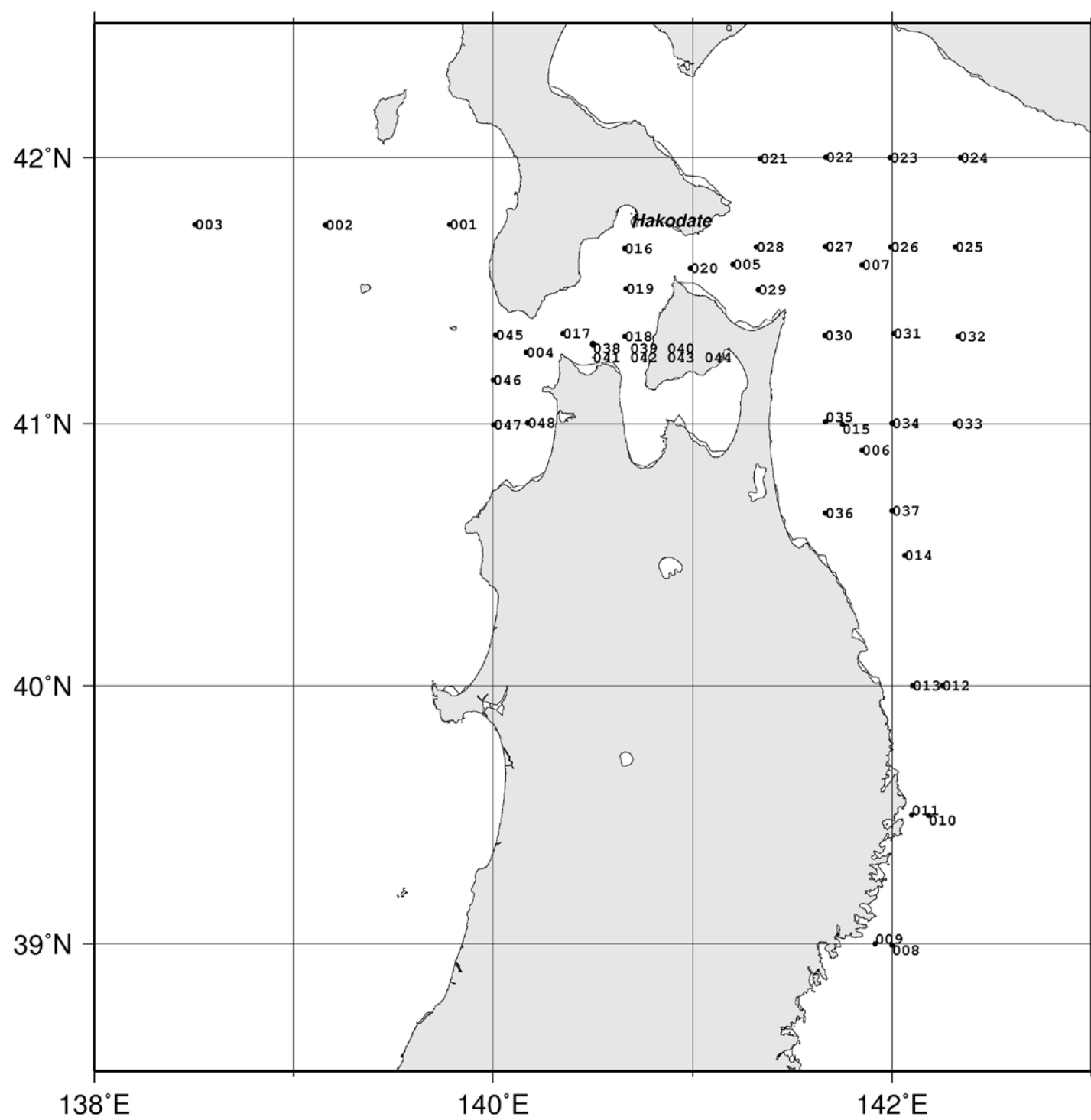


Fig. 1 Oceanographic stations

Table 1. List of Oceanographic station

Station	Lat.	Long.	Date (MGT)	Hour (GMT)	T.Z.	Depth	Col.	Tr.	SST	Wr.	Gear
OS14001	41 45.02 N	139 46.93 E	2/12	7:38	9	1432	-	-	8.6	bc	19p-4636
OS14002	41 44.93 N	139 09.52 E	2/12	12:41	9	2054	-	-	8.5	bc	19p-4636
OS14003	41 45.06 N	138 30.36 E	2/12	17:11	9	3716	-	-	6.8	bc	19p-4636
OS14004	41 16.16 N	140 09.97 E	2/13	0:47	9	151	-	-	8.6	s	19p-4636
OS14005	41 36.03 N	141 12.18 E	2/13	5:42	9	232	-	-	6.3	bc	19p-4636
OS14006	40 54.01 N	141 51.04 E	2/13	22:56	9	384	-	-	5.8	c	19p-4636
OS14007	41 35.90 N	141 50.93 E	2/14	3:41	9	985	-	-	3.0	c	19p-4636
OS14008	38 59.65 N	142 00.03 E	2/18	8:39	9	206	-	-	8.6	bc	19p-4636
OS14009	38 59.96 N	141 54.95 E	2/18	9:28	9	140	-	-	8.4	bc	19p-4636
OS14010	39 29.85 N	142 11.08 E	2/18	12:56	9	238	-	-	8.3	b	19p-4636
OS14011	39 30.02 N	142 05.94 E	2/18	13:55	9	148	-	-	6.9	b	19p-4636
OS14012	39 59.92 N	142 15.07 E	2/18	17:32	9	238	-	-	5.4	bc	19p-4636
OS14013	39 59.95 N	142 06.20 E	2/18	18:59	9	130	-	-	5.6	bc	19p-4636
OS14014	40 29.93 N	142 03.87 E	2/18	22:29	9	253	-	-	6.2	c	XCTD
OS14015	40 59.88 N	141 45.10 E	2/19	2:17	9	495	-	-	5.2	bc	XCTD
OS14016	41 39.61 N	140 39.60 E	2/21	2:21	9	119	-	-	5.5	bc	19p-4636
OS14017	41 20.48 N	140 20.96 E	2/21	5:04	9	185	-	-	7.2	bc	19p-4636
OS14018	41 19.84 N	140 39.62 E	2/21	6:49	9	187	-	-	6.1	bc	19p-4636
OS14019	41 30.52 N	140 40.04 E	2/21	21:17	9	222	-	-	3.6	bc	19p-4636
OS14020	41 35.20 N	140 59.37 E	2/21	23:25	9	299	-	-	1.9	bc	19p-4636
OS14021	41 59.78 N	141 20.31 E	2/22	3:11	9	320	-	-	2.2	b	19p-4636
OS14022	42 00.13 N	141 40.18 E	2/22	5:06	9	844	-	-	1.6	b	19p-4636
OS14023	42 00.05 N	141 59.50 E	2/22	6:54	9	987	-	-	0.6	bc	19p-4636
OS14024	42 00.05 N	142 20.67 E	2/22	8:57	9	980	-	-	0.4	b	19p-4636
OS14025	41 39.98 N	142 19.13 E	2/22	21:15	9	1194	-	-	0.8	c	19p-4636
OS14026	41 39.96 N	141 59.61 E	2/22	22:59	9	1058	-	-	0.5	bc	19p-4636
OS14027	41 40.04 N	141 40.03 E	2/23	0:51	9	579	-	-	1.0	bc	19p-4636
OS14028	41 39.98 N	141 19.29 E	2/23	2:46	9	230	-	-	1.5	b	19p-4636
OS14029	41 30.35 N	141 19.87 E	2/23	4:12	9	249	-	-	1.3	bc	19p-4636
OS14030	41 20.03 N	141 39.85 E	2/23	6:31	9	764	-	-	1.2	bc	19p-4636
OS14031	41 20.42 N	142 00.43 E	2/23	8:23	9	1090	-	-	0.6	c	19p-4636
OS14032	41 19.80 N	142 19.92 E	2/23	21:09	9	1320	-	-	1.0	b	19p-4636
OS14033	40 59.91 N	142 19.00 E	2/23	23:22	9	1338	-	-	1.2	b	19p-4636
OS14034	41 00.10 N	142 00.03 E	2/24	1:11	9	873	-	-	1.8	b	19p-4636
OS14035	41 00.35 N	141 40.05 E	2/24	3:11	9	468	-	-	3.2	b	19p-4636
OS14036	40 39.58 N	141 40.04 E	2/24	5:34	9	79	-	-	4.0	b	19p-4636
OS14037	40 40.15 N	142 00.09 E	2/24	7:19	9	215	-	-	2.7	bc	19p-4636
OS14038	41 18.17 N	140 29.95 E	2/24	23:06	9	148	-	-	6.1	c	19p-4636
OS14039	41 17.86 N	140 29.97 E	2/24	3:03	9	160	-	-	6.1	c	19p-4636
OS14040	41 17.97 N	140 29.99 E	2/25	7:02	9	157	-	-	5.8	bc	19p-4636
OS14041	41 17.98 N	140 29.99 E	2/25	11:02	9	155	-	-	5.9	bc	19p-4636
OS14042	41 17.99 N	140 30.25 E	2/25	15:00	9	161	-	-	6.4	bc	19p-4636
OS14043	41 17.99 N	140 30.01 E	2/25	18:57	9	157	-	-	6.2	bc	19p-4636
OS14044	41 18.02 N	140 29.82 E	2/25	23:01	9	154	-	-	6.1	b	19p-4636
OS14045	41 20.12 N	140 00.86 E	2/26	3:08	9	255	-	-	7.3	bc	19p-4636
OS14046	41 09.85 N	140 00.11 E	2/26	4:45	9	96	-	-	8.7	b	19p-4636
OS14047	40 59.77 N	140 00.20 E	2/26	6:11	9	502	-	-	9.0	b	19p-4636
OS14048	41 00.18 N	140 10.33 E	2/26	7:30	9	107	-	-	9.1	b	19p-4636

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

Table 2. Oceanographic data

Station	OS14001		
Latitude	41-45.02N		
Longitude	139-09.52E		
Depth(m)	1432		
Press.	Temp.	Sal.	SIG-T
10	7.817	33.937	26.466
20	7.802	33.935	26.466
30	7.753	33.932	26.471
50	7.730	33.932	26.475
75	6.279	34.003	26.729
100	4.422	34.003	26.949
150	2.632	34.010	27.127
200	1.465	34.028	27.233
300	0.975	34.051	27.284
400	0.822	34.060	27.301
500	0.701	34.068	27.314
600	0.599	34.070	27.323
700	0.527	34.070	27.327

Station	OS14002		
Latitude	41-44.93N		
Longitude	139-09.52E		
Depth(m)	2054		
Press.	Temp.	Sal.	SIG-T
10	5.926	33.993	26.767
20	5.763	33.995	26.788
30	4.312	33.987	26.948
50	3.209	34.012	27.078
75	2.930	34.011	27.101
100	2.628	34.010	27.127
150	1.538	34.027	27.226
200	1.150	34.038	27.262
300	0.849	34.054	27.294
400	0.768	34.063	27.307
500	0.703	34.069	27.315
600	0.600	34.072	27.324
700	0.511	34.072	27.329

Station	OS14003		
Latitude	41-45.06N		
Longitude	138-30.36E		
Depth(m)	3716		
Press.	Temp.	Sal.	SIG-T
10	5.963	34.005	26.771
20	5.849	34.003	26.784
30	2.816	33.974	27.082
50	2.472	34.006	27.137
75	2.350	34.013	27.153
100	2.158	34.017	27.172
150	1.197	34.047	27.266
200	1.034	34.050	27.280
300	0.860	34.060	27.299
400	0.755	34.067	27.311
500	0.668	34.071	27.319
600	0.570	34.072	27.326
700	0.496	34.072	27.330

Station	OS14004		
Latitude	41-16.16N		
Longitude	140-09.97E		
Depth(m)	151		
Press.	Temp.	Sal.	SIG-T
10	7.779	33.924	26.461
20	7.693	33.929	26.477
30	7.516	33.940	26.511
50	5.931	33.994	26.766
75	5.304	34.010	26.855
100	4.467	34.010	26.950
125	3.594	34.010	27.047

Station	OS14005		
Latitude	41-36.03N		
Longitude	141-12.18E		
Depth(m)	232		
Press.	Temp.	Sal.	SIG-T
10	7.779	33.924	26.461
20	7.693	33.929	26.477
30	7.516	33.940	26.511
50	5.931	33.994	26.766
75	5.304	34.010	26.855
100	4.467	34.010	26.950
125	3.594	34.019	27.047

Station	OS14006		
Latitude	40-54.01N		
Longitude	141-51.04E		
Depth(m)	384		
Press.	Temp.	Sal.	SIG-T
10	4.977	33.171	26.228
20	5.440	33.261	26.247
30	6.239	33.400	26.258
50	6.707	33.483	26.263
75	7.275	33.603	26.281
100	7.833	33.735	26.305
150	7.816	33.759	26.327
200	7.763	33.778	26.349
300	5.822	33.583	26.455

Station	OS14007		
Latitude	41-35.90N		
Longitude	141-50.93E		
Depth(m)	985		
Press.	Temp.	Sal.	SIG-T
10	1.945	32.535	26.002
20	1.947	32.538	26.003
30	2.495	32.635	26.039
50	3.249	32.767	26.081
75	5.615	33.239	26.208
100	6.398	33.388	26.229
150	6.284	33.450	26.292
200	5.476	33.518	26.445
300	3.497	33.484	26.629
400	3.014	33.624	26.785
500	3.337	33.837	26.926
600	3.733	34.011	27.027
700	3.534	34.138	27.147

Station	OS14008		
Latitude	38-59.65N		
Longitude	142-00.03E		
Depth(m)	206		
Press.	Temp.	Sal.	SIG-T
10	7.859	33.599	26.194
20	7.860	33.597	26.193
30	7.854	33.595	26.192
50	7.847	33.594	26.192
75	7.839	33.593	26.192
100	7.785	33.591	26.199
150	7.285	33.591	26.270

Station	OS14009		
Latitude	38-59.96N		
Longitude	141-54.95E		
Depth(m)	140		
Press.	Temp.	Sal.	SIG-T
10	7.607	33.602	26.233
20	7.615	33.604	26.233
30	7.613	33.600	26.231
50	7.549	33.594	26.235
75	7.460	33.590	26.244
100	7.471	33.596	26.247

Station	OS14010		
Latitude	39-29.85N		
Longitude	142-11.08E		
Depth(m)	238		
Press.	Temp.	Sal.	SIG-T
10	7.518	33.575	26.224
20	7.513	33.575	26.225
30	7.514	33.575	26.225
50	7.510	33.574	26.225
75	7.491	33.575	26.228
100	7.184	33.544	26.247
150	6.515	33.460	26.270
200	7.037	33.598	26.309

Station	OS14011		
Latitude	39-30.02N		
Longitude	142-05.94E		
Depth(m)	148		
Press.	Temp.	Sal.	SIG-T
10	5.966	33.365	26.265
20	5.993	33.367	26.263
30	5.985	33.365	26.263
50	6.099	33.391	26.269
75	6.081	33.410	26.286
100	6.107	33.422	26.292

Station	OS14012		
Latitude	39-59.92N		
Longitude	142-15.07E		
Depth(m)	238		
Press.	Temp.	Sal.	SIG-T
10	4.391	33.099	26.234
20	4.579	33.135	26.243
30	4.801	33.167	26.244
50	5.294	33.253	26.257
75	5.516	33.294	26.263
100	5.811	33.352	26.274
150	5.893	33.369	26.277
200	5.984	33.388	26.281

Station	OS14013		
Latitude	39-59.95N		
Longitude	142-06.20E		
Depth(m)	130		
Press.	Temp.	Sal.	SIG-T
10	3.714	32.944	26.179
20	3.713	32.944	26.179
30	3.724	32.944	26.178
50	3.756	32.949	26.179
75	4.984	33.207	26.255
100	6.395	33.494	26.312

Station	OS14014		
Latitude	40-29.93N		
Longitude	142-03.87E		
Depth(m)	253		
Depth	Temp.	Sal.	SIG-T
5	5.168	33.210	-
10	5.178	33.217	-
20	5.326	33.255	-
30	5.519	33.293	-
40	5.605	33.319	-
50	5.635	33.331	-
75	6.067	33.416	-
100	6.288	33.453	-
125	6.319	33.459	-
150	6.339	33.463	-
175	6.358	33.472	-
200	6.532	33.524	-

Station	OS14015		
Latitude	40-59.88N		
Longitude	141-45.10E		
Depth(m)	495		
Depth	Temp.	Sal.	SIG-T
5	3.674	32.915	-
10	3.658	32.917	-
20	3.669	32.923	-
30	3.679	32.934	-
40	3.679	32.940	-
50	3.837	32.989	-
75	4.977	33.254	-
100	5.445	33.346	-
125	6.013	33.478	-
150	6.324	33.543	-
175	7.020	33.683	-
200	7.033	33.687	-
250	6.550	33.626	-
300	4.803	33.599	-
400	3.557	33.684	-

Station	OS14016		
Latitude	41-39.61N		
Longitude	140-39.60E		
Depth(m)	119		
Press.	Temp.	Sal.	SIG-T
5	5.414	33.702	26.598
10	5.516	33.910	26.750
20	5.089	33.985	26.860
30	4.928	33.992	26.884
50	4.310	33.982	26.944
75	2.697	34.000	27.113
100	2.122	34.014	27.172

Station	OS14017		
Latitude	41-20.48N		
Longitude	140-20.96E		
Depth(m)	185		
Press.	Temp.	Sal.	SIG-T
10	7.918	33.952	26.463
20	7.917	33.952	26.463
30	6.751	33.952	26.627
50	5.238	33.991	26.847
75	4.743	33.997	26.909
100	3.320	34.005	27.061
150	2.687	34.020	27.130

Station	OS14018		
Latitude	41-19.84N		
Longitude	140-39.62E		
Depth(m)	187		
Press.	Temp.	Sal.	SIG-T
10	6.644	33.945	26.636
20	6.637	33.946	26.638
30	6.610	33.948	26.643
50	6.512	33.953	26.659
75	6.131	33.965	26.718
100	5.056	33.978	26.859
150	3.839	33.994	27.002

Station	OS14019		
Latitude	41-30.52N		
Longitude	140-40.04E		
Depth(m)	223		
Press.	Temp.	Sal.	SIG-T
10	3.441	33.907	26.972
20	3.525	33.936	26.987
30	3.488	33.965	27.013
50	3.102	34.006	27.082
75	2.639	34.018	27.133
100	2.307	34.024	27.166
150	2.029	34.029	27.192

Station	OS14020		
Latitude	41-35.20N		
Longitude	140-59.37E		
Depth(m)	299		
Press.	Temp.	Sal.	SIG-T
10	1.953	32.598	26.051
20	2.322	32.767	26.159
30	2.462	32.834	26.201
50	2.670	32.955	26.281
75	3.101	33.374	26.578
100	3.145	33.413	26.605

Station	OS14021		
Latitude	41-59.78N		
Longitude	140-20.31E		
Depth(m)	320		
Press.	Temp.	Sal.	SIG-T
10	2.143	32.606	26.043
20	2.465	32.690	26.086
30	2.733	32.735	26.100
50	3.303	32.833	26.128
75	6.410	33.427	26.258
100	6.316	33.507	26.333
150	4.558	33.457	26.500

Station	OS14022		
Latitude	42-00.13N		
Longitude	141-40.18E		
Depth(m)	844		
Press.	Temp.	Sal.	SIG-T
10	1.894	32.562	26.026
20	2.231	32.626	26.053
30	2.302	32.634	26.054
50	2.391	32.648	26.058
75	2.486	32.667	26.066
100	3.293	32.854	26.146
150	5.670	33.407	26.334

Station	OS14023		
Latitude	42-00.05N		
Longitude	141-59.50E		
Depth(m)	987		
Press.	Temp.	Sal.	SIG-T
10	0.579	32.197	25.815
20	0.560	32.196	25.816
30	0.524	32.205	25.825
50	0.564	32.252	25.861
75	0.644	32.345	25.931
100	1.217	32.513	26.033
150	2.198	32.924	26.294

Station	OS14024		
Latitude	42-00.05N		
Longitude	142-20.67E		
Depth(m)	980		
Press.	Temp.	Sal.	SIG-T
10	0.495	32.177	25.803
20	0.528	32.185	25.809
30	0.562	32.196	25.815
50	0.729	32.253	25.852
75	0.759	32.287	25.878
100	0.756	32.363	25.940
150	1.489	32.597	26.082
200	3.469	33.035	26.275
300	3.886	33.464	26.576
400	2.906	33.554	26.739
500	3.149	33.724	26.853
600	3.577	33.939	26.984
700	3.691	34.084	27.089
800	3.423	34.190	27.199
900	3.215	34.271	27.284

Station	OS14025		
Latitude	41-39.98N		
Longitude	142-19.13E		
Depth(m)	1194		
Press.	Temp.	Sal.	SIG-T
10	0.582	32.360	25.947
20	1.578	32.633	26.105
30	1.883	32.710	26.146
50	2.150	32.825	26.218
75	3.004	33.052	26.330
100	3.186	33.135	26.380
150	2.992	33.171	26.426

Station	OS14026		
Latitude	41-39.96N		
Longitude	141-59.61E		
Depth(m)	1058		
Press.	Temp.	Sal.	SIG-T
10	0.809	32.409	25.973
20	1.243	32.509	26.028
30	1.804	32.636	26.092
50	2.205	32.770	26.170
75	2.099	32.886	26.271
100	2.739	33.025	26.331
150	2.729	33.135	26.419

Station	OS14027		
Latitude	41-40.04N		
Longitude	141-40.03E		
Depth(m)	579		
Press.	Temp.	Sal.	SIG-T
10	0.862	32.326	25.903
20	1.178	32.400	25.944
30	1.318	32.429	25.959
50	1.799	32.531	26.009
75	3.474	32.864	26.138
100	5.552	33.383	26.330
150	4.395	33.473	26.531

Station	OS14028		
Latitude	41-39.98N		
Longitude	141-19.29E		
Depth(m)	230		
Press.	Temp.	Sal.	SIG-T
10	1.340	32.373	25.913
20	1.262	32.375	25.919
30	1.386	32.398	25.929
50	1.650	32.453	25.956
75	2.901	32.724	26.077
100	3.930	32.918	26.137
150	4.572	33.235	26.323

Station	OS14029		
Latitude	41-30.35N		
Longitude	141-19.87E		
Depth(m)	249		
Press.	Temp.	Sal.	SIG-T
10	1.198	32.376	25.924
20	4.073	33.048	26.226
30	5.276	33.327	26.317
50	3.828	33.545	26.646
75	4.018	33.687	26.740
100	4.045	33.816	26.840
150	3.474	33.941	26.996

Station	OS14030		
Latitude	41-20.03N		
Longitude	141-39.85E		
Depth(m)	764		
Press.	Temp.	Sal.	SIG-T
10	1.063	32.379	25.934
20	1.111	32.397	25.946
30	1.770	32.536	26.014
50	4.713	33.201	26.281
75	5.045	33.291	26.315
100	5.002	33.344	26.362
150	3.950	33.385	26.507

Station	OS14031		
Latitude	41-20.42N		
Longitude	142-00.43E		
Depth(m)	1090		
Press.	Temp.	Sal.	SIG-T
10	0.468	32.239	25.855
20	0.478	32.243	25.857
30	0.442	32.246	25.862
50	0.422	32.253	25.869
75	1.342	32.570	26.070
100	2.067	32.785	26.193
150	2.547	33.145	26.443

Station	OS14032		
Latitude	41-19.80N		
Longitude	142-19.92E		
Depth(m)	1320		
Press.	Temp.	Sal.	SIG-T
10	1.038	32.400	25.953
20	1.079	32.406	25.955
30	1.220	32.433	25.968
50	2.417	32.713	26.108
75	4.738	33.208	26.284
100	5.220	33.348	26.341
150	3.567	33.331	26.501

Station	OS14033		
Latitude	40-59.91N		
Longitude	142-19.00E		
Depth(m)	1338		
Press.	Temp.	Sal.	SIG-T
10	2.016	32.862	26.258
20	2.866	33.115	26.392
30	3.025	33.161	26.415
50	3.037	33.172	26.422
75	3.028	33.176	26.427
100	3.149	33.205	26.439
150	2.860	33.257	26.506

Station	OS14034		
Latitude	41-00.10N		
Longitude	142-00.03E		
Depth(m)	873		
Press.	Temp.	Sal.	SIG-T
10	1.565	32.508	26.006
20	1.637	32.519	26.010
30	1.634	32.519	26.010
50	3.233	32.832	26.134
75	4.942	33.155	26.219
100	7.647	33.678	26.287
150	6.153	33.514	26.359

Station	OS14035		
Latitude	41-00.35N		
Longitude	141-40.05E		
Depth(m)	468		
Press.	Temp.	Sal.	SIG-T
10	3.017	32.814	26.139
20	3.019	32.821	26.145
30	3.060	32.838	26.155
50	3.763	33.007	26.224
75	4.299	33.150	26.285
100	4.494	33.206	26.309
150	7.169	33.749	26.410

Station	OS14036		
Latitude	40-39.58N		
Longitude	141-40.04E		
Depth(m)	79		
Press.	Temp.	Sal.	SIG-T
10	4.015	33.067	26.247
20	4.457	33.188	26.298
30	5.222	33.339	26.334
50	5.308	33.355	26.336

Station	OS14037		
Latitude	40-40.15N		
Longitude	141-00.10E		
Depth(m)	215		
Press.	Temp.	Sal.	SIG-T
10	2.472	32.680	26.077
20	2.884	32.841	26.172
30	3.347	32.975	26.238
50	3.856	33.102	26.290
75	4.410	33.212	26.322
100	4.992	33.347	26.366
150	5.491	33.527	26.451

Station	OS14038		
Latitude	41-18.17N		
Longitude	140-29.95E		
Depth(m)	148		
Press.	Temp.	Sal.	SIG-T
10	6.083	33.960	26.720
20	6.076	33.959	26.721
30	6.082	33.959	26.720
50	6.064	33.958	26.721
75	5.916	33.954	26.736
100	5.284	33.975	26.829

Station	OS14039		
Latitude	41-17.86N		
Longitude	140-29.97E		
Depth(m)	160		
Press.	Temp.	Sal.	SIG-T
10	6.006	33.886	26.672
20	6.007	33.887	26.672
30	6.009	33.909	26.690
50	5.958	33.923	26.707
75	5.951	33.929	26.713
100	5.904	33.956	26.739

Station	OS14040		
Latitude	41-17.97N		
Longitude	140-29.99E		
Depth(m)	157		
Press.	Temp.	Sal.	SIG-T
10	5.657	33.693	26.562
20	5.655	33.698	26.567
30	5.780	33.787	26.621
50	6.096	33.946	26.707
75	6.062	33.959	26.722
100	5.953	33.958	26.735

Station	OS14041		
Latitude	41-17.98N		
Longitude	140-29.99E		
Depth(m)	155		
Press.	Temp.	Sal.	SIG-T
10	5.987	33.860	26.653
20	6.091	33.945	26.708
30	6.107	33.960	26.717
50	5.957	33.965	26.740
75	5.768	33.966	26.765
100	5.515	33.978	26.805

Station	OS14042		
Latitude	41-17.99N		
Longitude	140-30.25E		
Depth(m)	161		
Press.	Temp.	Sal.	SIG-T
10	6.427	33.894	26.624
20	5.967	33.947	26.724
30	5.848	33.962	26.751
50	5.717	33.972	26.775
75	5.485	33.979	26.809
100	5.392	33.989	26.828

Station	OS14043		
Latitude	41-17.99N		
Longitude	140-30.01E		
Depth(m)	157		
Press.	Temp.	Sal.	SIG-T
10	6.474	33.942	26.655
20	6.369	33.946	26.672
30	6.172	33.955	26.705
50	6.183	33.955	26.704
75	6.108	33.958	26.715
100	5.923	33.968	26.747

Station	OS14044		
Latitude	41-18.02N		
Longitude	140-29.82E		
Depth(m)	154		
Press.	Temp.	Sal.	SIG-T
10	6.107	33.931	26.694
20	6.061	33.927	26.697
30	5.982	33.929	26.709
50	5.946	33.936	26.718
75	5.873	33.944	26.734
100	5.819	33.962	26.755

Station	OS14045			
Latitude	41-20.12E			
Longitude	140-00.86E			
Depth(m)	255			
Press.	Temp.	Sal.	SIG-T	
10	6.314	33.952	26.684	
20	3.667	33.932	26.969	
30	4.493	33.969	26.914	
50	2.978	33.995	27.084	
75	3.267	33.994	27.057	
100	2.253	34.017	27.164	

Station	OS14046		
Latitude	41-09.85N		
Longitude	140-00.11E		
Depth(m)	96		
Press.	Temp.	Sal.	SIG-T
10	8.668	33.918	26.323
20	8.511	33.911	26.342
30	8.480	33.912	26.347
50	8.438	33.919	26.359
75	8.351	33.948	26.395

Station	OS14047		
Latitude	40-59.77N		
Longitude	140-00.20E		
Depth(m)	502		
Press.	Temp.	Sal.	SIG-T
10	8.927	33.903	26.271
20	8.888	33.905	26.278
30	8.792	33.911	26.298
50	8.744	33.914	26.308
75	8.700	33.914	26.315
100	8.553	33.910	26.335
150	5.270	34.020	26.867

Station	OS14048			
Latitude	41-00.18N			
Longitude	140-10.33E			
Depth(m)	107			
Press.	Temp.	Sal.	SIG-T	
10	9.074	33.902	26.246	
20	8.978	33.900	26.260	
30	8.967	33.901	26.263	
50	8.957	33.901	26.265	
75	8.842	33.905	26.286	

**THE "OSHORO 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, Hokkaido University)	Kenshi Kuma
Associate Professor	(Laboratory of Marine Environmental Science, Hokkaido University)	Yutaka Isoda
Graduate Students:		5 persons
Undergraduate Students:		1 person

Leg1

Professor	(Center for Global Environmental Research, 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 (GMT)	Hour (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

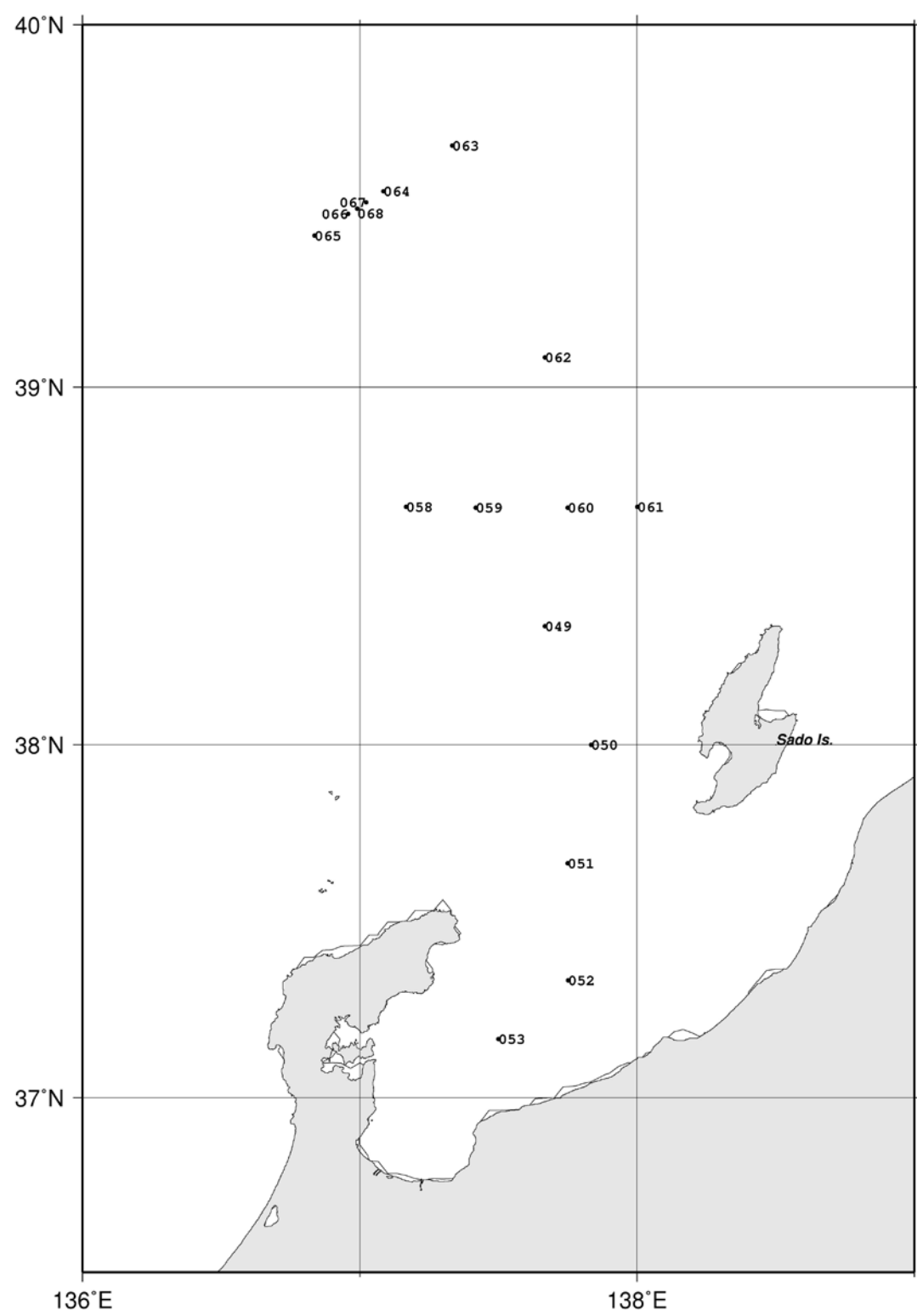


Fig.-1 Oceanographic stations

Table 2. Oceanographic data

Station OS14049 Latitude 38-19.97N Longitude 137-40.07E Depth(m) 1998				Station OS14050 Latitude 38-0.01N Longitude 137-50.06E Depth(m) 2015				Station OS14051 Latitude 37-39.95N Longitude 137-44.96E 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 Latitude 37-20.05N Longitude 137-45.04E Depth(m) 1205				Station OS14053 Latitude 37-10.04N Longitude 137-29.96E 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 Latitude 38-40.05N Longitude 137-10.05E Depth(m) 1510				Station OS14059 Latitude 38-39.9N Longitude 137-25.09E Depth(m) 1380				Station OS14060 Latitude 38-39.92N Longitude 137-44.98E 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 Latitude 38-40.02N Longitude 138-0.02E Depth(m) 1860				Station OS14062 Latitude 39-4.99N Longitude 137-40.06E Depth(m) 2326				Station OS14063 Latitude 39-40.06N Longitude 137-20.05E 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

**THE "OSHOROMARU" CRUISE 268
TO IWATE OFF**

IN APRIL 2014

1. Cruise Itinerary

Cruise 268

Departure from Hakodate	April	20	2014
Arrival at Kamaishi		21	
Departure from Kamaishi and start hydrographic research (OS14069)		22	
Finish hydrographic research (OS14075)		24	
Arrival at and departure from Miyako, and start hydrographic research (OS14076, 77)		25	
Return to Hakodate		26	
Total coverage 571.2 miles			

2. Vessel Personnel

Crew:	Captain:	Associate Professor	Shogo Takagi
			And 28 persons
Supervising teacher:	High school teacher (Iwate prefectural Miyako Fisherise High School)		
	Takuya Shiota		
	High school teacher (Iwate prefectural Miyako Fisherise High School)		
	Yukimasa Hatakekawa		
	High school teacher (Iwate prefectural Takada High School)		
	Katumi Yoshida		
	Teaching Assistant:		2 persons
	Senior High School Students:		
	(Iwate prefectural Miyako Fisherise High School)		30 persons
	(Iwate prefectural Takada High School)		7 persons
			Total 42 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. List of Oceanographic station

Station	Lat.	Long.	Date (GMT)	Hour (GMT)	T.Z.	Depth	Col.	Tr.	SST	Wr.	Gear
OS14069	39 30.07 N	142 05.80 E	Apr 22 2014	9:09	9	145	-	-	5.3	bc	9p-0769
OS14070	39 29.83 N	142 11.18 E	Apr 22 2014	10:06	9	238	-	-	3.6	bc	9p-0769
OS14071	38 58.23 N	142 07.30 E	Apr 23 2014	4:04	9	376	-	5	5.4	bc	9p-0769
OS14072	38 41.89 N	142 04.98 E	Apr 24 2014	0:01	9	440	-	4	5.7	b	9p-0769
OS14073	38 50.23 N	142 05.92 E	Apr 24 2014	6:04	9	390	-	5	4.4	b	9p-0769
OS14074	39 00.16 N	142 00.03 E	Apr 24 2014	9:08	9	199	-	-	5.5	bc	9p-0769
OS14075	38 59.86 N	141 54.89 E	Apr 24 2014	11:05	9	139	-	-	6.3	bc	9p-0769
OS14076	39 59.89 N	142 06.29 E	Apr 25 2014	3:06	9	127	-	-	7.1	b	9p-0769
OS14077	39 59.94 N	142 15.12 E	Apr 25 2014	4:12	9	238	-	-	6.8	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

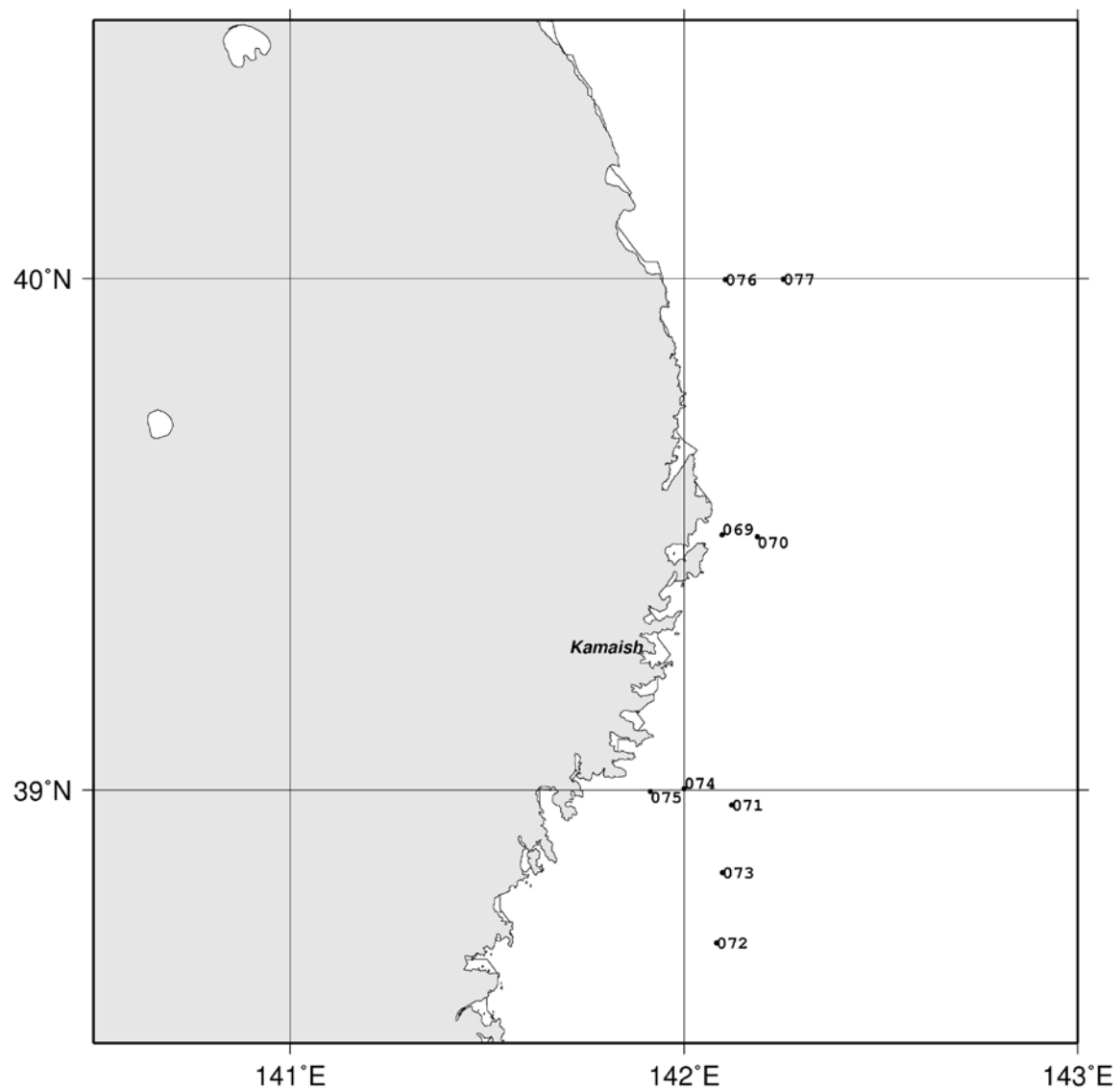


Fig.-1 Oceanographic stations

Table 2. Oceanographic data

Station OS14069				
Latitude 39-30.07N				
Longitude 142-5.8E				
Depth(m) 145				
Press.	Temp.	Sal.	SIG-T	
5	4.231	32.605	25.858	
10	3.762	32.607	25.906	
20	3.233	32.628	25.971	
30	2.957	32.720	26.069	
40	3.793	32.930	26.160	
50	3.983	32.981	26.182	
75	4.394	33.178	26.297	
100	4.691	33.323	26.380	
125	5.120	33.440	26.425	

Station OS14070				
Latitude 39-29.83N				
Longitude 142-11.18E				
Depth(m) 238				
Press.	Temp.	Sal.	SIG-T	
5	2.551	32.433	25.874	
10	2.126	32.433	25.906	
20	1.688	32.456	25.956	
30	1.460	32.498	26.005	
40	1.472	32.535	26.034	
50	1.524	32.549	26.041	
75	2.433	32.764	26.147	
100	5.888	33.552	26.422	
125	6.515	33.702	26.461	
150	6.485	33.720	26.479	
175	6.482	33.720	26.480	
200	6.527	33.728	26.480	

Station OS14071				
Latitude 38-58.23N				
Longitude 142-7.3E				
Depth(m) 376				
Press.	Temp.	Sal.	SIG-T	
5	3.692	32.569	25.883	
10	3.709	32.571	25.882	
20	3.135	32.602	25.959	
30	2.929	32.684	26.043	
40	1.412	32.623	26.108	
50	2.310	32.872	26.244	
75	4.901	33.329	26.361	
100	4.532	33.332	26.405	
125	4.685	33.364	26.412	
150	4.371	33.409	26.483	
175	4.389	33.415	26.485	
200	4.781	33.493	26.505	

Station OS14072				
Latitude 38-41.89N				
Longitude 142-4.98E				
Depth(m) 440				
Press.	Temp.	Sal.	SIG-T	
5	5.101	32.556	25.727	
10	4.416	32.595	25.831	
20	3.727	32.751	26.024	
30	3.423	32.841	26.124	
40	3.554	32.980	26.222	
50	3.450	33.024	26.267	
75	3.818	33.218	26.386	
100	4.757	33.427	26.456	
125	5.086	33.497	26.474	
150	5.350	33.562	26.495	
175	5.419	33.591	26.510	
200	5.636	33.651	26.531	

Station OS14073				
Latitude 38-50.23N				
Longitude 142-5.92E				
Depth(m) 390				
Press.	Temp.	Sal.	SIG-T	
5	2.480	32.375	25.833	
10	2.015	32.370	25.864	
20	0.887	32.386	25.950	
30	0.684	32.413	25.983	
40	0.562	32.483	26.047	
50	0.684	32.578	26.116	
75	0.703	32.782	26.279	
100	5.935	33.599	26.454	
125	6.386	33.693	26.471	
150	5.690	33.591	26.478	
175	5.460	33.574	26.491	
200	5.309	33.556	26.495	

Station OS14074				
Latitude 39-0.16N				
Longitude 142-0.03E				
Depth(m) 199				
Press.	Temp.	Sal.	SIG-T	
5	3.289	32.499	25.864	
10	2.461	32.403	25.856	
20	1.173	32.510	26.033	
30	1.014	32.524	26.054	
40	0.872	32.571	26.100	
50	0.941	32.578	26.101	
75	0.975	32.673	26.176	
100	4.087	33.257	26.390	
125	4.853	33.386	26.413	
150	4.858	33.440	26.454	
175	5.629	33.582	26.477	

Station OS14075				
Latitude 38-59.86N				
Longitude 141-54.89E				
Depth(m) 139				
Press.	Temp.	Sal.	SIG-T	
5	4.693	32.668	25.860	
10	4.725	32.665	25.854	
20	2.156	32.600	26.037	
30	2.381	32.657	26.066	
40	3.444	32.901	26.170	
50	3.876	33.010	26.216	
75	4.077	33.118	26.281	
100	4.016	33.159	26.320	
125	3.919	33.160	26.331	

Station OS14076				
Latitude 39-59.89N				
Longitude 142-6.3E				
Depth(m) 127				
Press.	Temp.	Sal.	SIG-T	
5	5.482	32.687	25.787	
10	4.666	32.671	25.866	
20	3.174	32.742	26.068	
30	3.174	32.884	26.181	
40	3.534	33.077	26.302	
50	4.862	33.294	26.338	
75	6.644	33.610	26.372	
100	7.248	33.743	26.395	

Station OS14077				
Latitude 39-59.93N				
Longitude 142-15.11E				
Depth(m) 238				
Press.	Temp.	Sal.	SIG-T	
5	5.920	32.410	25.516	
10	5.783	32.456	25.569	
20	4.901	32.802	25.944	
30	4.956	33.018	26.109	
40	5.246	33.168	26.195	
50	6.191	33.472	26.322	
75	6.722	33.615	26.365	
100	7.165	33.729	26.395	
125	6.793	33.686	26.412	
150	6.637	33.692	26.437	
175	5.855	33.591	26.457	
200	4.530	33.405	26.463	

**THE "OSHO RO MARU" CRUISE 269
TO THE WESTERN NORTH PACIFIC OCEAN**

IN MAY 2014

1. Cruise Itinerary

Cruise 269

Departure from Hakodate	May	8	2014
Start hydrographic research (OS14078)		9	
Start surface long-line research (OSSL1401)		11	
Start Gill-net research (OSG1401)		12	
Finish Gill-net research (OSG1401)			
and surface long-line research (OSSL1403)		13	
Finish hydrographic research (OS14090)		16	
Return to Hakodate		15	
Total coverage 1758.1 miles			

2. Vessel Personnel

Crew:	Captain:	Associate Professor	Shogo Takagi
			And 28 persons

Research Staff:

Associate Professor (Laboratory of Marine Biodiversity, Hokkaido University)	Atsushi Yamaguchi
Teaching Assistant:	4 persons
Undergraduate Students:	49 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. List of Oceanographic station

Station	Lat.	Long.	Date (GMT)	Hour (GMT)	T.Z.	Depth	Col.	Tr.	SST	Wr.	Gear
OS14078	41-59.29 N	145-29.52 E	5/9	5:08	9	4724	-	-	5.8	r	9p-0769
OS14079	44-00.05 N	154-59.98 E	5/10	23:07	10	5300	-	-	5.4	o	9p-0769
OS14082	43-30.12 N	154-59.68 E	5/11	10:54	10	5466	-	-	5.7	o	9p-0769
OS14083	43-14.91 N	154-59.95 E	5/11	22:07	10	5486	-	-	5.5	o	9p-0769
OS14084	42-30.14 N	155-00.26 E	5/12	3:53	10	5150	-	-	5.8	o	9p-0769
OS14085	41-52.58 N	154-59.52 E	5/12	9:31	10	5465	-	-	9.2	o	9p-0769
OS14086	41-44.95 N	155-00.01 E	5/12	22:36	10	5553	-	-	10.6	o	9p-0769
OS14087	41-00.61 N	154-59.37 E	5/13	4:24	10	5522	-	-	10.0	o	9p-0769
OS14088	40-15.17 N	154-59.91 E	5/13	11:21	10	5541	-	-	8.9	o	9p-0769
OS14089	39-29.97 N	155-00.09 E	5/13	17:02	10	5615	-	-	13.8	o	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

Table 2. Oceanographic data

Station OS14078 Latitude 41-59.29N Longitude 145-29.52E Depth(m) 4724				Station OS14079 Latitude 44-0.05N Longitude 154-59.98E Depth(m) 5300				Station OS14082 Latitude 43-30.12N Longitude 154-59.68E Depth(m) 5466			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	4.701	32.882	26.029	5	4.351	32.999	26.159	5	4.670	32.977	26.108
10	4.621	32.892	26.046	10	4.344	33.000	26.160	10	4.663	32.976	26.108
20	4.431	32.929	26.095	20	4.220	32.994	26.169	20	3.715	32.981	26.208
30	3.412	32.900	26.172	30	3.742	32.999	26.219	30	3.471	33.020	26.262
40	2.698	33.001	26.315	40	3.622	33.025	26.252	40	3.113	33.046	26.316
50	2.228	33.005	26.356	50	3.457	33.040	26.279	50	2.806	33.042	26.339
75	1.728	33.027	26.410	75	2.930	33.085	26.363	75	3.112	33.171	26.416
100	1.304	33.018	26.432	100	3.475	33.206	26.410	100	5.139	33.515	26.482
125	1.516	33.169	26.539	125	3.632	33.330	26.494	125	3.121	33.357	26.563
150	2.113	33.407	26.687	150	3.767	33.485	26.604	150	3.258	33.542	26.698
175	2.220	33.499	26.752	175	3.349	33.548	26.694	175	3.675	33.608	26.711
200	2.326	33.560	26.792	200	3.303	33.603	26.742	200	3.794	33.660	26.741
250	2.641	33.675	26.859	250	3.866	33.780	26.829	250	3.716	33.752	26.822
300	2.821	33.761	26.912	300	4.051	33.899	26.905	300	2.784	33.705	26.871
400	3.082	33.945	27.036	400	3.504	33.979	27.023	400	3.552	33.973	27.014
500	3.151	34.086	27.142	500	3.441	34.091	27.119	500	3.566	34.090	27.105
600	3.042	34.183	27.229	600	3.442	34.207	27.211				
700	2.920	34.268	27.308	700	3.274	34.268	27.276				
800	2.721	34.308	27.357	800	3.104	34.314	27.328				
900	2.693	34.358	27.400	900	2.812	34.347	27.380				
1000	2.579	34.397	27.441	1000	2.693	34.382	27.419				
1200	2.377	34.447	27.498	1200	2.512	34.453	27.491				
1500	2.166	34.512	27.568	1500	2.231	34.509	27.560				

Station OS14083 Latitude 43-14.91N Longitude 154-59.95E Depth(m) 5486				Station OS14084 Latitude 42-30.14N Longitude 155-0.26E Depth(m) 5150				Station OS14085 Latitude 41-52.58N Longitude 154-59.52E Depth(m) 5465			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	4.477	32.952	26.109	5	4.688	32.975	26.104	5	7.921	33.647	26.223
10	4.465	32.951	26.109	10	4.679	32.977	26.106	10	8.304	33.778	26.269
20	3.129	32.962	26.247	20	4.704	33.016	26.135	20	9.111	34.061	26.365
30	2.614	32.993	26.316	30	3.346	33.118	26.352	30	9.101	34.068	26.372
40	2.440	32.999	26.335	40	3.050	33.142	26.398	40	9.046	34.073	26.385
50	2.266	33.009	26.357	50	4.226	33.325	26.431	50	9.046	34.072	26.384
75	2.411	33.081	26.403	75	4.861	33.459	26.469	75	8.035	33.961	26.452
100	3.215	33.302	26.510	100	5.764	33.621	26.492	100	8.191	34.006	26.465
125	3.387	33.390	26.565	125	5.167	33.574	26.525	125	7.954	33.968	26.470
150	2.754	33.397	26.627	150	2.433	33.303	26.578	150	8.110	34.010	26.480
175	2.029	33.411	26.696	175	2.428	33.383	26.643	175	7.991	33.997	26.487
200	2.893	33.551	26.738	200	3.682	33.615	26.716	200	7.657	33.949	26.499
250	2.257	33.555	26.794	250	2.957	33.626	26.792	250	6.281	33.828	26.591
300	2.569	33.661	26.853	300	2.553	33.632	26.832	300	3.790	33.590	26.685
400	4.236	34.031	26.991	400	4.252	34.011	26.973	400	3.127	33.704	26.839
500	3.531	34.056	27.082	500	4.316	34.144	27.073	500	2.984	33.842	26.962
600	3.449	34.162	27.175	600	3.197	34.110	27.156	600	3.164	34.000	27.072
700	3.105	34.225	27.257	700	3.612	34.271	27.246	700	3.532	34.167	27.170
800	3.239	34.317	27.317	800	3.375	34.320	27.308	800	3.375	34.260	27.259
900	2.883	34.325	27.357	900	3.118	34.359	27.362	900	3.236	34.321	27.321
1000	2.829	34.387	27.411	1000	2.827	34.377	27.403	1000	3.011	34.357	27.370
1200	2.495	34.441	27.483	1200	2.581	34.435	27.471	1200	2.743	34.422	27.447
1500	2.291	34.512	27.557	1500	2.314	34.501	27.547	1500	2.392	34.492	27.533

Station OS14086
Latitude 41-44.95N
Longitude 155-0.01E
Depth(m) 5553

Press.	Temp.	Sal.	SIG-T
5	9.902	34.149	26.304
10	9.898	34.149	26.304
20	9.895	34.149	26.305
30	9.821	34.138	26.309
40	9.503	34.109	26.339
50	9.335	34.087	26.349
75	8.743	34.007	26.381
100	8.467	34.004	26.422
125	7.984	33.942	26.446
150	7.762	33.923	26.463
175	7.725	33.930	26.473
200	7.743	33.943	26.481
250	7.252	33.874	26.497
300	6.523	33.821	26.554
400	4.178	33.748	26.772
500	4.190	33.918	26.905
600	4.140	34.089	27.047
700	3.234	34.101	27.146
800	3.295	34.237	27.248
900	3.301	34.318	27.312
1000	3.013	34.334	27.353
1200	2.767	34.415	27.439
1500	2.396	34.481	27.524

Station OS14087
Latitude 41-0.61N
Longitude 154-59.37E
Depth(m) 5522

Press.	Temp.	Sal.	SIG-T
5	9.044	33.964	26.300
10	9.024	33.966	26.305
20	8.973	33.969	26.315
30	9.006	33.985	26.322
40	9.037	33.997	26.327
50	9.066	34.009	26.331
75	8.805	34.081	26.429
100	8.647	34.082	26.455
125	8.606	34.081	26.460
150	8.302	34.033	26.469
175	8.194	34.021	26.476
200	8.098	34.014	26.485
250	7.701	33.958	26.500
300	6.639	33.818	26.536
400	4.813	33.816	26.758
500	4.486	33.934	26.887
600	3.826	33.997	27.006
700	4.056	34.146	27.101
800	3.806	34.222	27.187
900	3.474	34.285	27.270
1000	3.277	34.329	27.324
1200	2.875	34.408	27.423
1500	2.480	34.479	27.515

Station OS14088
Latitude 40-15.17N
Longitude 154-59.91E
Depth(m) 5541

Press.	Temp.	Sal.	SIG-T
5	8.903	33.723	26.134
10	8.979	33.788	26.172
20	8.949	33.889	26.256
30	8.889	33.889	26.266
40	8.505	33.904	26.337
50	8.664	34.025	26.407
75	8.119	33.982	26.457
100	7.937	33.967	26.472
125	8.035	34.003	26.486
150	8.082	34.013	26.487
175	8.061	34.010	26.487
200	8.080	34.013	26.487
250	7.382	33.910	26.507
300	6.318	33.766	26.537
400	4.264	33.707	26.731
500	4.831	33.980	26.886
600	4.406	34.100	27.027
700	3.989	34.157	27.116
800	3.712	34.232	27.204
900	3.417	34.286	27.276
1000	3.149	34.336	27.342
1200	2.828	34.402	27.423
1500	2.386	34.484	27.527

Station OS14089
Latitude 39-29.97N
Longitude 155-0.09E
Depth(m) 5615

Press.	Temp.	Sal.	SIG-T
5	12.989	34.402	25.932
10	12.986	34.402	25.932
20	12.911	34.398	25.944
30	12.470	34.342	25.988
40	11.048	34.254	26.186
50	10.680	34.234	26.236
75	10.158	34.179	26.284
100	9.896	34.172	26.323
125	9.406	34.122	26.365
150	8.845	34.062	26.408
175	8.169	33.988	26.454
200	7.754	33.927	26.467
250	7.416	33.892	26.488
300	6.777	33.892	26.576
400	5.237	33.922	26.793
500	4.532	34.001	26.936
600	4.245	34.105	27.049
700	3.985	34.202	27.153
800	3.637	34.267	27.240
900	3.426	34.317	27.300
1000	3.122	34.358	27.362
1200	2.777	34.414	27.437
1500	2.381	34.493	27.535

Drift Gillnet Research

Three gillnet researches were performed during this cruise.

The captain supervised the operations, and were conducted by deck officers, crews, research staff.

One set of drift gillnet was used to collect salmonids and other epipelagic fishes in Figs.2 Details about each operation are shown in Table 3. The gillnet configuration is as follows:

Drift Gillnet Sampling

One set of drift gillnet was used to collect salmonids and other epipelagic fishes [Figs.1 and Table 1.]

Details about each operation are shown in Table 2.The gillnet configuration is as follows:

Stations	net	A-Gear		C-gear										Total
	Mesh size (mm)	112	115	48	55	63	72	82	93	106	121	138	157	
OSG1401	Number of tan	6	6	3	3	3	5	6	5	3	3	3	3	49

The net comprised of total 49 tans of C-Gear gillnet (non-selective varied research mesh, Takagi, 1975), and A-Gear gillnet (commercial mesh). Each tan was 50m long. Gillnet gear was set in the evening, allowed to soak overnight, and retrieved in the following morning. The number of organisms caught was counted by species for mesh size. Catch per unit effort (CPUE) values were calculated as the number of fish caught by C-gear gillnet per tan.

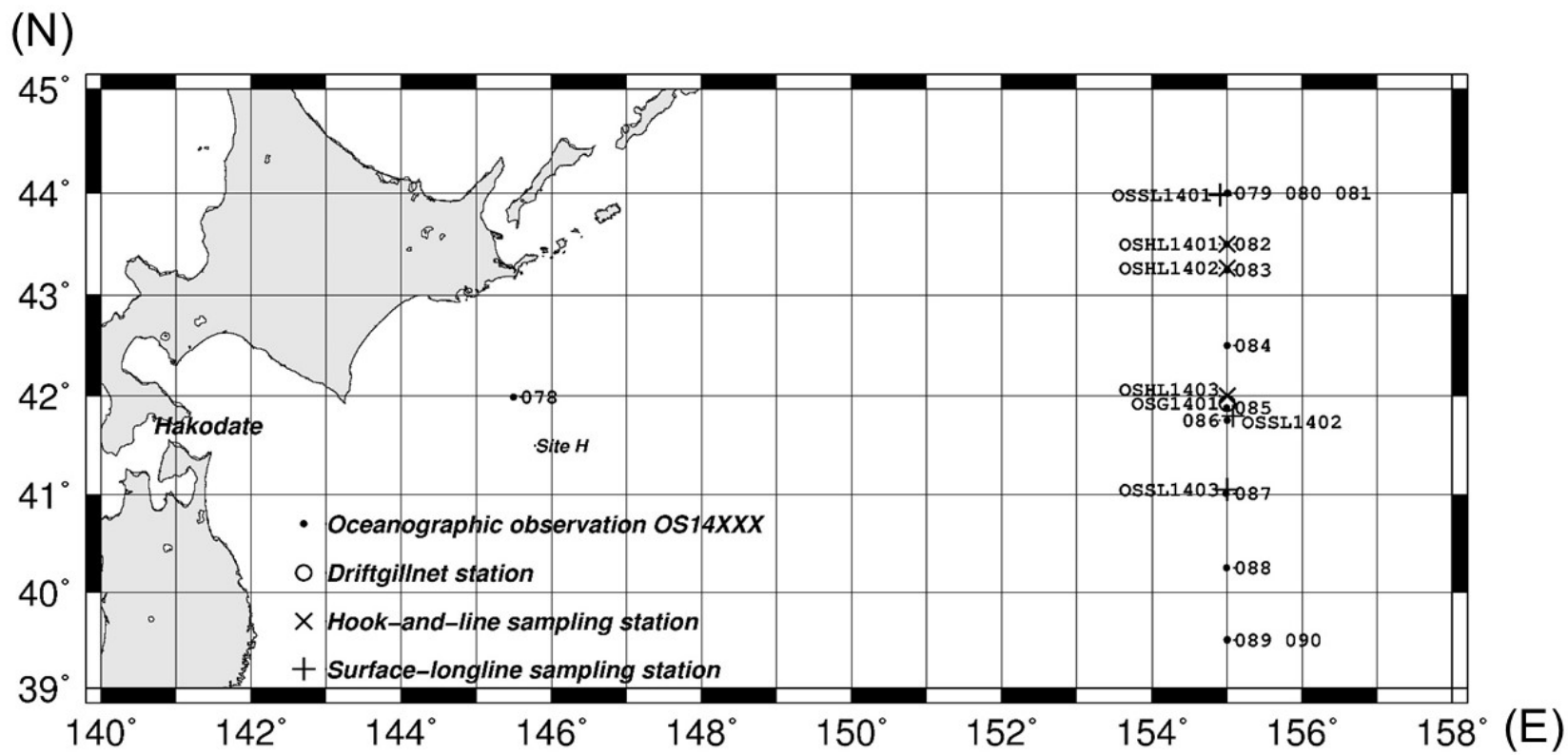


Fig.-2

Table 3. Position and research conditions of surface drift gillnet sampling at each station during the Oshoro maru Cruise #269, 2014.

Station	Date and Time (S.M.T.)		T.D.	Set Position		D.S.*	bottom depth(m)	Wr	Wind (Force)	S.T. (°C)
	Net set	Net haul		Lat.	Long.					
OSG 1401	May 12 1827-1850	May 13 0524-0635	+10h	41-55.4N	155-00.3 E	210	5455	o	NNW-4	6.9

Salmon Hook-and-Line and surface longline Research:

To collect salmons, hook-and-line gears and surface longline were used in Cruise #269. These samplings were mainly conducted with observations when ship was under drifting.

Table 4. Position and research conditions of surface longline and hook-and-line sampling at each station during the Oshoro maru Cruise #269, 2014.

Station	Date and Time (S.M.T.)		T.D.	Set Position		D.S. *	Number of baskets	bottom depth(m)	Wr	Wind (Force)	S.T. (°C)		
	Line set	Line haul		Lat.	Long.								
C269													
OSSL1401	May 11	0757-08-25	May 11	1455-1550	+10h	43-58.9N	154-54.5N	080	20	5337	f	ENE-4	4.8
OSSL1402	May 13	0453-0503	May 13	0715-0750	+10h	41-47.9N	155-04.5E	108	10	5480	o	Calm	8.5
OSSL1403	May 13	1340-1353	May 13	1627-1648	+10h	41-03.1N	154-59.8E	215	10	5584	c	SW-4	9.5
OSHL1401	May 11	2130	May 11	2340	+10h	43-30.1N	154-59.7E	-	-	5472	f	NW-4	5.0
OSHL1402	May 12	0100	May 12	0400	+10h	43-16.2N	155-00.3E	-	-	5500	o	NNW-4	5.1
OSHL1403	July 12	2110	July 12	0330	+10h	42-00.2N	155-00.0E	-	-	5465	o	North-2	6.0

D.S.* : Direction of line set.

Table 5. List of oceanographic station during the Oshoro maru Cruise #269, 2014.

Station	Date and Time (S.M.T.)		T.D.	Set Position		Remark CTD	CTD depth(db)
				Lat.	Long.		
C269							
OS 14078	May 09	1508	+10h	41-59.3N	145-29.5E	Sea-Bird SBE 9	1500
OS 14079	May 11	0907	+10h	44-00.1N	155-00.0E	Sea-Bird SBE 9	5000
OS 14080	May 11	1624	+10h	44-00.0N	155-00.1E	Sea-Bird SBE 9	800
OS 14081	May 11	1743	+10h	44-00.0N	155-00.5E	Sea-Bird SBE 9	200
OS 14082	May 11	2054	+10h	43-30.1N	154-59.7E	Sea-Bird SBE 9	500
OS 14083	May 12	0807	+10h	43-14.9N	155-00.0E	Sea-Bird SBE 9	1500
OS 14084	May 12	1353	+10h	42-30.1N	155-00.3E	Sea-Bird SBE 9	1500
OS 14085	May 12	1931	+10h	41-52.6N	154-59.5E	Sea-Bird SBE 9	1500
OS 14086	May 13	0836	+10h	41-45.0N	155-00.0E	Sea-Bird SBE 9	1500
OS 14087	May 13	1424	+10h	41-00.6N	154-59.4E	Sea-Bird SBE 9	1500
OS 14088	May 13	2121	+10h	40-15.2N	154-59.9E	Sea-Bird SBE 9	1500
OS 14089	May 13	0302	+10h	39-30.0N	155-00.1E	Sea-Bird SBE 9	1500
OS 14090	May 13	0500	+10h	39-30.2N	155-00.2E	Sea-Bird SBE 9	200

Table 6. The number of organisms caught by drift gillnet during the Oshoro maru Cruise # 269, in May, 2014. CPUE and (%) indicate numerical catch per tan and percentage of total catch by C-gear gillnet at the station, respectively.

		Station	OSG 1401			
Common name	Scientific name	Gear	C		A	Total
			CPUE	(%)		
Sockeye salmon	<i>Oncorhynchus nerka</i>		0	0.0 (0.0)	0	0
Chum salmon	<i>Oncorhynchus keta</i>		10	0.3 (2.0)	17	27
Pink salmon	<i>Oncorhynchus gorbuscha</i>		481	16.0 (97.2)	7	488
Coho salmon	<i>Oncorhynchus kisutch</i>		0	0.0 (0.0)	0	0
Chinook salmon	<i>Oncorhynchus tshawytscha</i>		0	0.0 (0.0)	0	0
Steelhead	<i>Oncorhynchus mykiss</i>		0	0.0 (0.0)	0	0
						0
Tufted Puffin	<i>Fratercula cirrhata</i>		1	0.0 (0.2)	0	1
Boreal clubhook squid	<i>Onychoteuthis borealijaponicus</i>		3	0.1 (0.6)	1	4

Table 7. The catch number of each salmonid at each station where salmonids were collected by hook-and-line gear, surface longline in the Oshoro maru Cruise # 269, 2014.

Station Name	Sampling gear	Species name						Total
		Sockeye	Chum	Pink	Coho	Chinook	Stellhead	
C269								
OSSL 1401	Surface longline	1	12	3	0	0	0	16
OSSL 1402	Surface longline	0	0	14	0	0	0	14
OSSL 1403	Surface longline	0	0	5	0	0	0	5
OSHL 1401	Hook-and-line	0	0	0	0	0	0	0
OSHL 1402	Hook-and-line	0	0	0	0	0	0	0
OSHL 1403	Hook-and-line	0	2	26	0	0	0	28
Total		1	14	48	0	0	0	63

Table. 8 Data on plankton collected by vertical hauls with a twin NORPAC net.

Station no.	Position		S.M.T.		Length of wire (m)	Angle of wire (°)	Depth estimated by wire angle (m)	Kind of cloth	Flowmeter		Estimated volume of water filtered (m ³)	Sample no.
	Lat. (N)	Lon.	Date	Hour					No.	Reading		
OS 14078 (Site H)	41-59	145-29 E	9 May	15:58	152	10	150	GG54	3691	1538	24.46	14001
OS 14079 (Site H)	44-00	154-59 E	11 May	8:54	150	0	150	GG54	3691	1138	18.10	14002
OS 14084 (42-30)	42-30	155-00 E	12 May	13:31	155	15	150	GG54	3691	1377	21.90	14003
OS 14085 (Gill-net 1)	41-52	155-00 E	12 May	19:06	150	0	150	GG54	3691	1420	22.58	14004
OS 14086 (41-45)	41-45	155-00 E	13 May	8:23	160	20	150	GG54	3691	1432	22.77	14005
OS 14087 (41-00)	41-00	155-00 E	13 May	14:10	150	0	150	GG54	3691	1298	20.64	14006

**THE "OSHOROMARU" CRUISE 270
TO WEST OF HOKKAIDO**

IN JUNE 2014

1. Cruise Itinerary

Cruise 270

Departure from Hakodate and start hydrographic research (OS14091)	June	10	2014
Finish hydrographic research (OS14094)		14	
Return to Hakodate		15	
Total coverage 804.6 miles			

2. Vessel Personnel

Crew:			
Captain:	Associate Professor	Shogo Takagi	And 28 persons

Research Staff:	Professor	(Laboratory of Bioresources chemistry, Hokkaido University)	Ryuichi Sakai
	Specially Appointed Associate Professor	(Laboratory of Bioresources chemistry, Hokkaido University)	Masaki Fujita
	Researcher Fellow	(Marine Life Monitoring Grope, Field Science Center for Northern Biosphere)	Yuichi Tsuda
	Technical Staff:		5 persons
	Graduate Students:		11 persons
	Undergraduate Students:		14 persons
	Total 33 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.

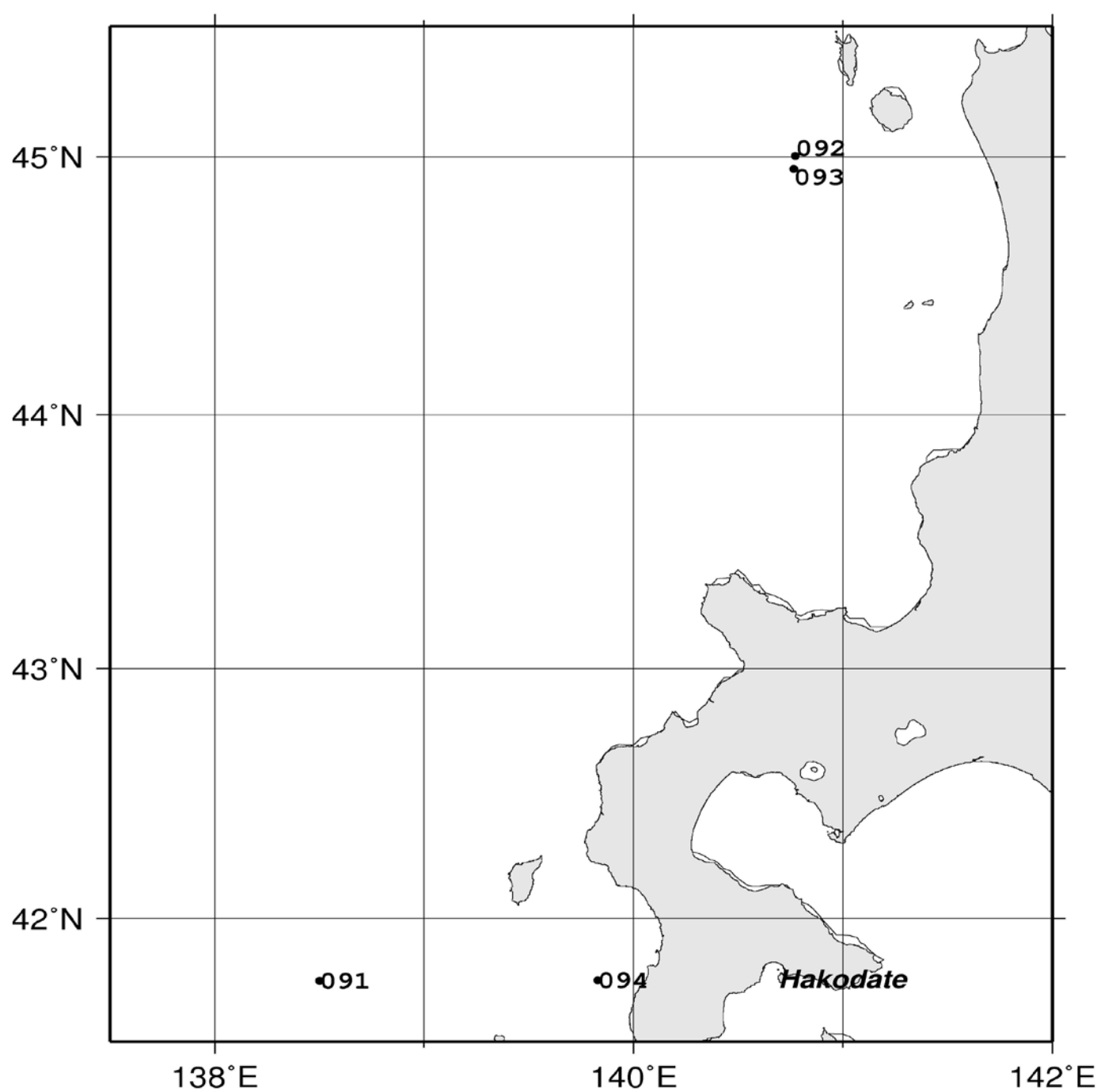


Fig.-10 Oceanographic stations

Table 1. List of Oceanographic station

Station	Lat.	Long.	Date (GMT)	Hour (GMT)	T.Z	Depth	Col.	Tr.	SST	Wr.	Gear
OS14091	41 44.87 N	138 30.17 E	6/10	14:17	9	3700	-	-	16.0	bc	9p-0769
OS14092	45 00.21 N	140 46.50 E	6/12	8:21	9	171	-	-	13.6	o	XCTD-2
OS14093	44 57.25 N	140 45.91 E	6/12	8:44	9	183	-	-	13.6	o	XCTD-1
OS14094	41 44.98 N	139 49.76 E	6/14	13:36	9	1415	-	-	17.5	bc	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

Table 2. Oceanographic data

Station OS14091			
Latitude 41-44.87N			
Longitude 138-30.17E			
Depth(m) 3700			
Press.	Temp.	Sal.	SIG-T
5	15.298	33.980	25.121
10	14.756	33.981	25.239
20	9.864	33.962	26.164
30	8.763	34.005	26.376
40	7.532	34.055	26.600
50	6.643	34.051	26.720
75	4.736	34.014	26.923
100	3.468	34.013	27.053
125	2.590	34.015	27.135
150	1.935	34.014	27.187
175	1.474	34.015	27.222
200	1.280	34.014	27.234
250	1.046	34.022	27.256
300	0.942	34.039	27.276
400	0.800	34.048	27.293
500	0.709	34.056	27.304
600	0.618	34.060	27.313
700	0.524	34.060	27.319

Station OS14092			
Latitude 45-00.21N			
Longitude 140-46.50E			
Depth(m) 171			
Depth	Temp.	Sal.	SIG-T
5	12.735	33.793	-
10	12.729	33.800	-
20	11.722	33.792	-
30	9.924	33.916	-
40	8.025	33.870	-
50	6.892	33.929	-
75	5.247	33.941	-
100	4.099	34.003	-
125	3.639	34.012	-
150	3.097	34.015	-

Station OS14093			
Latitude 44-57.25N			
Longitude 140-45.91E			
Depth(m) 183			
Depth	Temp.	Sal.	SIG-T
5	12.722	33.787	-
10	12.722	33.801	-
20	12.703	33.812	-
30	10.517	33.940	-
40	9.384	33.952	-
50	7.734	33.951	-
75	5.703	33.954	-
100	4.116	34.009	-
125	3.737	34.011	-
150	3.105	34.033	-
175	2.792	34.044	-

Station OS14094			
Latitude 41-44.98N			
Longitude 139-49.76E			
Depth(m) 1415			
Press.	Temp.	Sal.	SIG-T
5	17.264	33.945	24.642
10	17.274	33.946	24.640
20	16.062	34.203	25.121
30	13.977	34.254	25.615
40	12.148	34.118	25.876
50	10.925	34.248	26.204
75	9.154	34.142	26.421
100	7.892	34.106	26.587
125	6.164	34.052	26.783
150	5.301	34.036	26.876
175	3.886	34.009	27.009
200	2.629	34.019	27.135
250	1.667	34.025	27.216
300	1.254	34.031	27.249
400	0.916	34.043	27.282
500	0.751	34.052	27.299
600	0.627	34.057	27.310
700	0.537	34.058	27.316

**THE "OSHOROMARU" CRUISE 271
TO IWATE OFF AND IBARAKI OFF**

IN JUNE 2014

1. Cruise Itinerary

Cruise 271		
Departure from Hakodate	June	16 2014
Start hydrographic research (OS14095)		17
Finish hydrographic research (OS14101)		18
Arrival at Tamano		21
Total coverage 906.2 miles		

2. Vessel Personnel

Crew:	Captain:	
	Associate Professor	Shogo Takagi
And 28 persons		

Research Staff:

Assistant Professor (Laboratory of Marine Environmental Science, Hokkaido University)		
		Hiroji Onishi
Technical Staff:		1 person
Undergraduate Students:		1 Person
Total 3 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. List of Oceanographic station

Station	Lat.	Long.	Date (GMT)	Hour (GMT)	T.Z	Depth	Col.	Tr.	SST	Wr.	Gear
OS14095	40 00.21 N	142 14.92 E	6/16	18:23	9	230	-	-	13.4	bc	XCTD-1
OS14096	39 30.07 N	142 10.98 E	6/16	20:48	9	230	-	-	16.7	bc	XCTD-1
OS14097	39 00.13 N	142 00.00 E	6/16	23:12	9	196	-	-	14.6	bc	XCTD-1

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

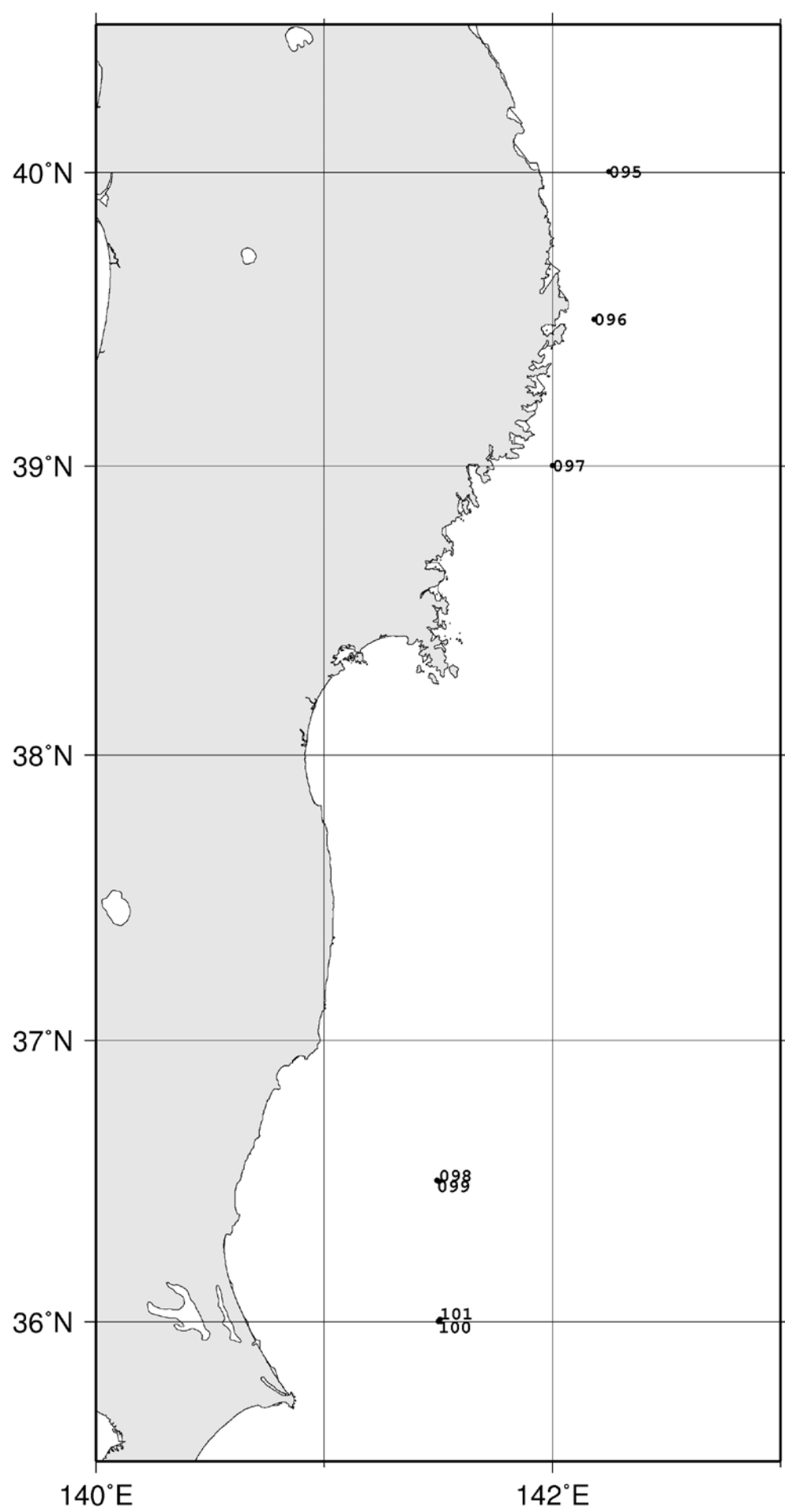


Fig.-1. Oceanographic stations

Table 2. Oceanographic data

Station OS14095				Station OS14096				Station OS14097			
Latitude 40-00.21N				Latitude 39-30.07N				Latitude 39-00.13N			
Longitude 142-14.92E				Longitude 142-10.98E				Longitude 142-00.00E			
Depth(m) 230				Depth(m) 230				Depth(m) 196			
Depth	Temp.	Sal.	SIG-T	Depth	Temp.	Sal.	SIG-T	Depth	Temp.	Sal.	SIG-T
5	12.296	33.001	-	5	15.819	33.136	-	5	12.930	33.235	-
10	11.939	33.090	-	10	14.256	33.059	-	10	12.564	33.263	-
20	11.241	33.529	-	20	14.056	33.802	-	20	11.122	33.330	-
30	11.056	33.651	-	30	13.228	33.814	-	30	9.956	33.682	-
40	10.515	33.741	-	40	13.757	34.262	-	40	9.700	33.767	-
50	10.493	33.758	-	50	13.651	34.277	-	50	9.624	33.783	-
75	9.715	33.745	-	75	10.997	33.946	-	75	9.330	33.834	-
100	9.573	33.779	-	100	9.819	33.925	-	100	9.264	33.838	-
125	8.973	33.852	-	125	8.583	33.798	-	125	9.226	33.839	-
150	8.664	33.863	-	150	6.219	33.492	-	150	9.121	33.825	-
175	8.345	33.864	-	175	5.108	33.476	-	175	9.007	33.815	-
200	8.148	33.841	-	200	4.768	33.448	-				

**THE "OSHOROMARU" CRUISE 004
TO IBURI OFF**

IN SEPTEMBER - OCTOBER 2014

1. Cruise Itinerary

Cruise 004

Departure from Hakodate	September	30	2014
Surface-trawl research (OSST1401-1402)	October	1	
Return at Hakodate		2	
Departure from Hakodate		3	
Mid-trawl research (OSMT1401)		4	
Return to Hakodate		5	
Departure from Hakodate		6	
Start hydrographic research (OS14122)		7	
Bottom-trawl (OST1401-1402)		8	
Finish hydrographic research (OS14123)		9	
Return to Hakodate		10	
Total coverage 582.0 miles			

2. Vessel Personnel

Crew:	Captain:	Associate Professor	Shogo Takagi
			And 30 persons

Research Staff: Leg1

Professor (Laboratory of Fishing Production Engineering, Hokkaido University)	Tsutomu Takagi
Professor (Laboratory of Marine Environment and Resource Sensing, Hokkaido University)	Yasuzumi Fujimori
Associate Professor (Field Science Center for Northern Biosphere, Hokkaido University)	Yoko Mitani
Technical Staff:	22 persons
Graduate Students:	3 persons

Leg2

Professor (Laboratory of Marine Environment and Resource Sensing, Hokkaido University)	Yasuzumi Fujimori
Associate Professor (Laboratory of Marine Environment and Resource Sensing, Hokkaido University)	Toru Mukai
Associate Professor (Laboratory of Marine Bioresources Ecology, Hokkaido University)	Takashi Matsuishi
Specially Appointed Associate Professor (School of Fisheries Sciences, Hokkaido University)	Mituhiko Nakaya
Technical Staff:	24 persons
Graduate Students:	6 persons

Leg3

Professor (Department of Marine and Earth Science, Tokai University)	Hisashi Narita
Professor (Laboratory of Marine Environmental and Resource Sensing, Hokkaido University)	Koji Iida
Professor (Laboratory of Marine Biodiversity, Hokkaido University)	Mamoru Yabe
Associate Professor (Laboratory of Marine Biodiversity, Hokkaido University)	Hisashi Imamura

Associate Professor (Laboratory of Marine Environment and Resource Sensing, Hokkaido University)

Toru Mukai

Technical Staff:

23 persons

graduate Students:

6 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.

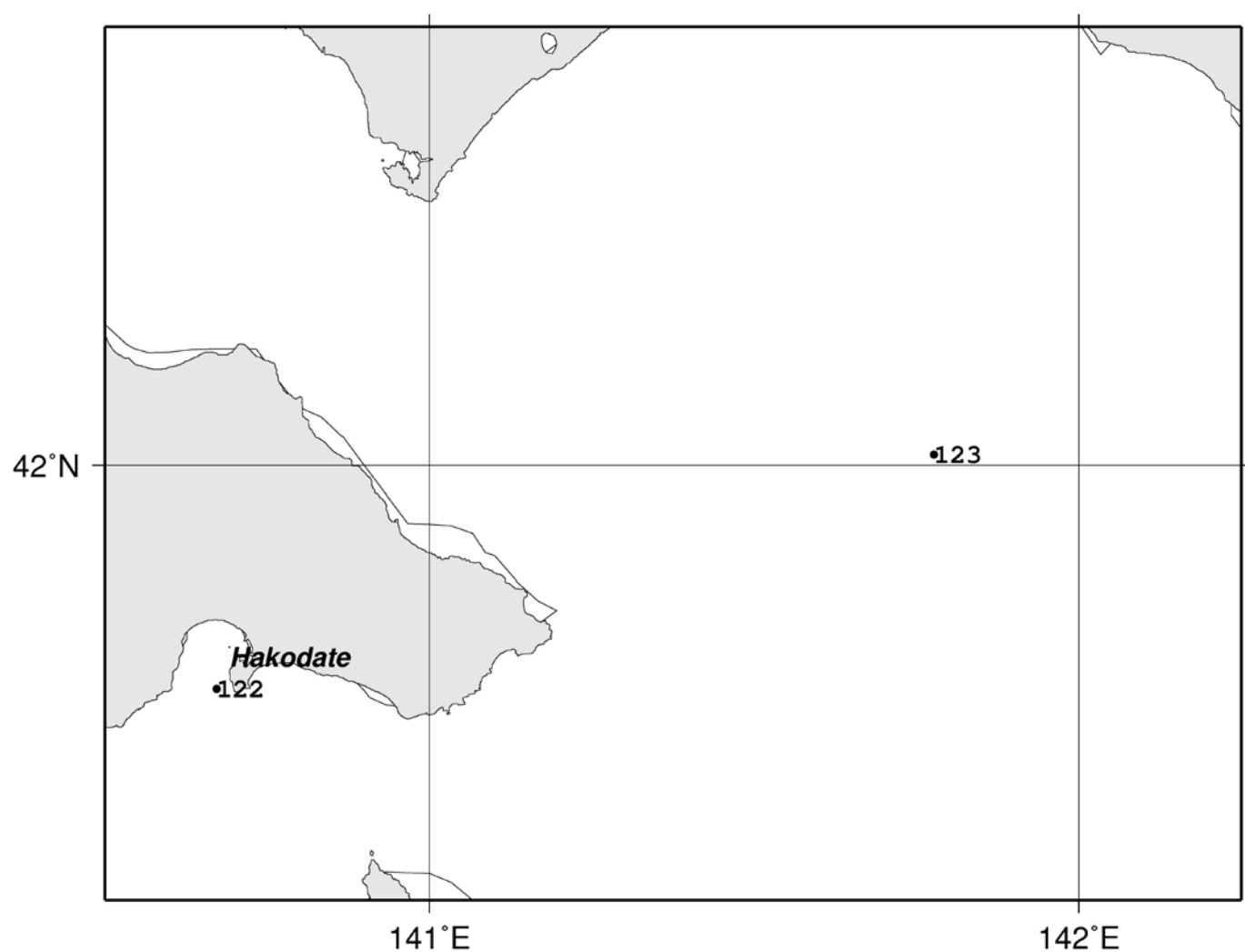


Table 1. List of Oceanographic station

Station	Lat.	Long.	Date (GMT)	Hour (GMT)	T.Z.	Depth	Col.	Tr.	SST	Wr.	Gear
OS14122	41 44.60 N	140 40.32 E	10/6	23:05	9	57	-	-	-	bc	19p-4636
OS14123	42 00.72 N	141 46.59 E	10/9	5:29	9	901	-	-	17.7	b	9p-1171

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

Table 2. Oceanographic data

Station	OS14122			Station	OS14123		
Latitude	41-44.60N			Latitude	42-0.72N		
Longitude	140-40.31E			Longitude	141-46.59E		
Depth(m)	57			Depth(m)	901		
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
10	19.922	33.691	23.784	5	17.269	33.798	24.528
20	19.123	33.842	24.105	10	17.127	33.781	24.549
30	18.889	33.874	24.189	20	17.052	33.839	24.611
				30	16.716	33.961	24.784
				40	15.683	34.087	25.117
				50	13.963	34.152	25.539
				75	12.728	34.241	25.859
				100	11.114	34.087	26.044
				125	9.687	34.006	26.228
				150	7.102	33.730	26.404
				175	4.237	33.425	26.509
				200	3.503	33.436	26.590
				250	2.947	33.523	26.711
				300	2.866	33.644	26.815
				400	3.087	33.781	26.904
				500	3.336	33.964	27.027
				600	3.464	34.126	27.144
				700	3.302	34.236	27.247
				800	3.147	34.299	27.312

Bottom Trawl Research

2 operations of the stern otter bottom trawl were carried out.

These operations were supervised by the captain, Deck officer, Science officer, crew and research staff were engaged in the work.

Table 3: Data on Bottom trawl research during the Oshoromaru Cruise#004

No. of research	Date and time of net tow (S.M.T.*1)		Position		T.D.*2	D.S.*3	Speed of tow (K't)	Bottom depth (m)	Wr.*4	Wind	S.T.*5 (°C)
			Lat. (N)	Long. (E)							
OST1401	Oct. 8	0937-1010	41-56.0	141-42.1	+9h	310	3.5	880-900	c	WSW-4	17.5
OST1402	Oct. 8	1409-1440	42-03.5	141-36.8	+9h	350	3.5	740-755	c	WSW-3	17.1

*1 S.M.T. : Ship's Mean Time.

*2 T.D. : Time Difference between Greenwich Mean Time (G.M.T.) and Ship's Mean Time (S.M.T.).

*3 D.S. : Direction of tow.

*4 Wr. : Weather (bc: 25-75% clouded, c: over 75-99% clouded).

*5 S.T. : Surface temperature

Japanese name	Scientific Name	OST1401		OST1402	
		Number	Weight (kg)	Number	Weight (kg)
Gangiei rui	Rajidae sp.	-	1.35	-	-
Shigunagi	<i>Nemichthys scolopaceus</i>	-	-	1	0.08
Irakoanago	<i>Synaphobranchus kaupii</i>	-	2.45	2	0.25
Togariichimonjiwashi	<i>Leuroglossus schmidtii</i>	-	-	-	0.01
Sokoiwashi rui	Bathylagidae	-	0.65	-	0.97
Houraieso rui	<i>Chauliodus</i> sp.	-	-	2	0.08
Hadakaiwashi rui	Myctophidae	17	0.45	-	0.83
Karasudara	<i>Halargyreus johnsonii</i>	-	1.8	2	0.33
Kanadadara	<i>Antimora microlepis</i>	-	10.1	1	0.55
Itohikidara	<i>Laemonema longipes</i>	-	6.7	2	1.15
Karafutosokodara	<i>Coryphaenoides cinereus</i>	-	37.2	-	-
Munedara	<i>Coryphaenoides pectoralis</i>	-	2.35	-	-
Ibarahige	<i>Coryphaenoides acrolepis</i>	-	7.7	-	-
Futasuzinamehadaka	<i>Lestrolepis intermedia</i>	-	-	2	0.2
Nezumiginpo	<i>Lumpenella longirostris</i>	-	3.95	-	0.53
Shirogenge	<i>Bothrocara zestum</i>	-	7.7	-	8.9
Kichiji	<i>Sebastolobus macrochir</i>	-	6.7	12	1.45
Nyuudoukajika	<i>Psychrolutes phrictus</i>	-	0.3	-	-
Ganko	<i>Dasycottus setiger</i>	-	-	2	0.3
Kabutouo	<i>Poromitra crassiceps</i>	-	0.1	-	-
Ezobai spp.	Buccinidae spp.	-	2.45	-	-
Benizuwaigani	<i>Chionoecetes japonicus</i>	-	2.25	-	-
Ika-rui	Squids	-	-	-	0.1
Dosuika	<i>Berrytenthis magister</i>	-	1.25	-	0.95
Yanagidako		-	5.15	-	6.05
Mendako	<i>Opishoteuthis depressa</i>	-	0.1	1	0.55
Uncategorized		8baskets		1basket	

Drift Gillnet Research

Three gillnet researches were performed during this cruise.

The captain supervised the operations, and were conducted by deck officers, crews, research staff.

Table 4 Data on floating gill net research during the "Oshoro Maru" Cruise #004

No. of research		OSG1402	OSG1403	OSG1404	OSG1405
Date		30-Oct	30-Oct	31-Oct	31-Oct
position of net set	Lat. (N)	41-29.0	41-29.7	41-27.9	41-30.0
	Long. (E)	142-47.8	142-26.4	143-49.8	144-44.2
Time(S.M.T.)	net set	0940-0945	1305-1308	0652-0656	1332-1335
	net haul	1015-1025	1415-1422	0800-0810	1445-1455
Surface temp. (°C)		17.3	17.5	12.8	11.1
Weather		b	bc	bc	bc
Wind (force)		WNW-3	WNW-4	WNW-3	West-4
Pacific saury		90	12	55	10
Japanese sardine		-	25	1	-
Mackerels		-	-	1	-

S.T. : Surface temperature

Wr.: Weather (r: rain, o: 100% clouded, c:75-99%clouded, bc: 25-75% clouded)

Table 5 Composition of drift Gillnet

Mesh size(mm)	29	33	37	42	48	Total
Number of tan	half	2	2	half	2	7

**THE "OSHOROMARU" CRUISE 005
TO IBURI OFF and HACHINOHE-KUSHIRO OFF**

IN OCTOBER 2014

1. Cruise Itinerary

Cruise 005

Departure from Hakodate and start hydrographic research (OS14124)	October 18	2014
Start bottom-trawl research (OST1403)	19	
Finish Bottom-trawl (OST1406) and hydrographic research (OS14129)	20	
Arrival at Hachinohe	21	
Departure from Hachinohe and start hydrographic research (OS14130)	22	
Finish hydrographic research (OS14131)	23	
Return to Hakodate	25	
Total coverage 708.7 miles		

2. Vessel Personnel

Crew:	Captain:	Associate Professor	Shogo Takagi
			And 30 persons
(Hakodate-Hachinohe)			
Research Staff:	Professor (Laboratory of Marine Bioresources Ecology, Hokkaido University)		
			Tetsuya Takatsu
	Associate Professor (Laboratory of Marine Biodiversity, Hokkaido University)		
			Hisashi Imamura
	Associate Professor (Laboratory of Marine Biodiversity, Hokkaido University)		
			Atsushi Yamaguchi
	Teaching Assistant:		10 persons
(Hakodate-Hakodate)			
Research Staff:	Associate Professor (Laboratory of Marine Bioresources Ecology, Hokkaido University)		
			Takashi Matsuishi
	Associate Professor (Laboratory of Marine Environmental Science, Hokkaido University)		
			Atsushi Ooki
	Undergraduate Students:		47 persons
(Hachinohe-Hakodate)			
	Technical Staff:		2 persons
	Teaching Assistant:		9 persons
			Total 67 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.

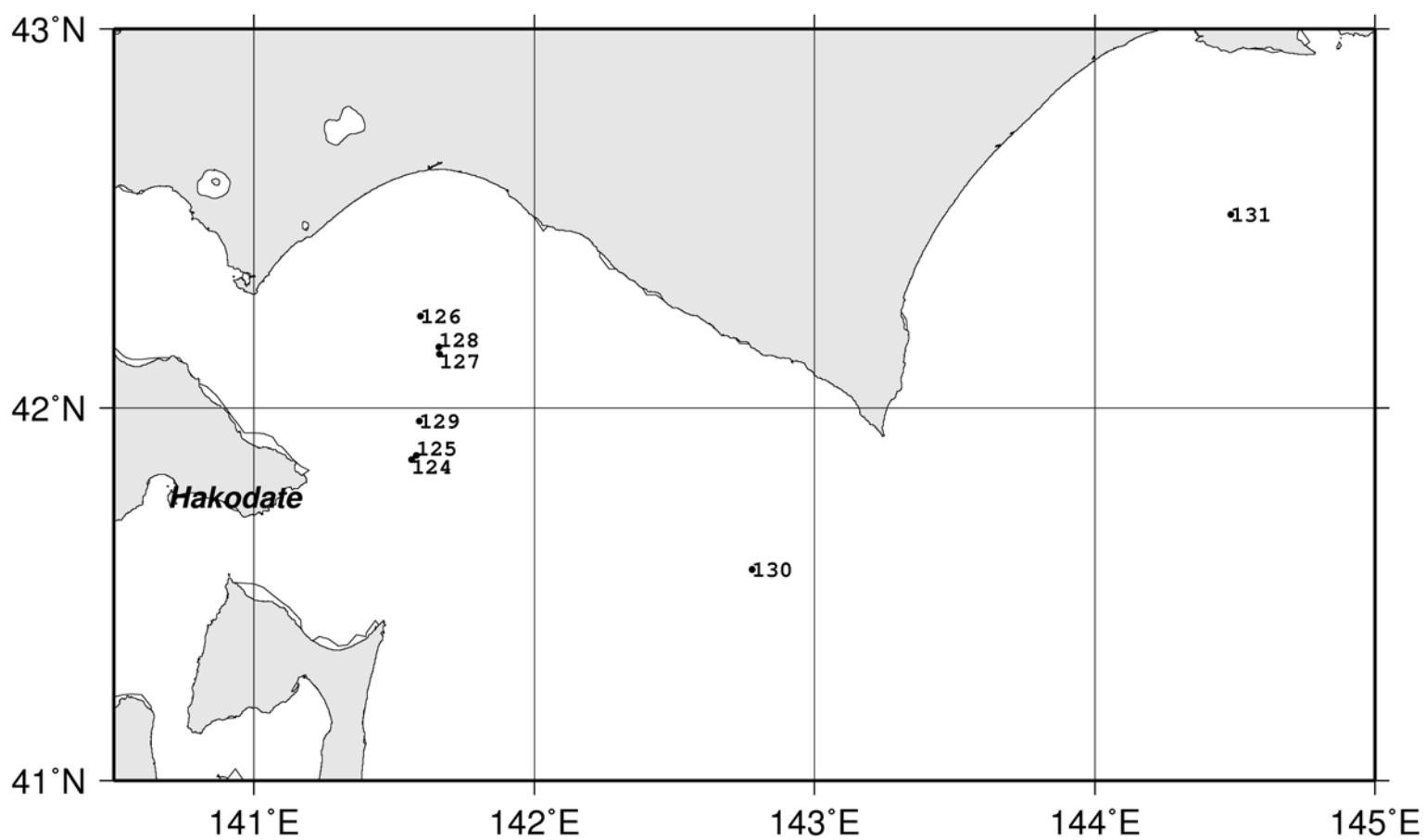


Fig.-1 Oceanographic stations

Table 1. List of Oceanographic station

Station	Lat.	Long.	Date (GMT)	Hour (GMT)	T.Z.	Depth	Col.	Tr.	SST	Wr.	Gear
OS14124	41 51.69 N	141 33.73 E	10/18	10:20	9	595	-	-	16.6	bc	9p-1171
OS14125	41 52.35 N	141 34.82 E	10/18	12:45	9	655	-	-	18.0	bc	9p-1171
OS14126	42 14.64 N	141 35.72 E	10/18	21:08	9	600	-	-	17.9	b	9p-1171
OS14127	42 08.56 N	141 39.68 E	10/19	8:34	9	762	-	-	18.4	bc	9p-1171
OS14128	42 09.71 N	141 39.57 E	10/19	11:04	9	745	-	-	18.3	b	9p-1171
OS14129	41 57.85 N	141 35.40 E	10/19	21:05	9	727	-	-	17.7	c	9p-1171
OS14130	41 34.09 N	142 46.69 E	10/22	7:37	9	1020	-	-	17.1	c	9p-1171
OS14131	42 30.75 N	144 29.17 E	10/23	9:08	9	1479	-	-	11.5	bc	9p-1171

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

Table 2. Oceanographic data

Station OS14124				Station OS14125				Station OS14126			
Latitude 41-51.68N				Latitude 41-52.36N				Latitude 42-14.64N			
Longitude 141-33.74E				Longitude 141-34.81E				Longitude 141-35.72E			
Depth(m) 595				Depth(m) 655				Depth(m) 600			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	16.411	33.906	24.812	5	17.883	33.936	24.486	5	17.792	33.945	24.515
10	16.428	33.906	24.808	10	17.890	33.935	24.483	10	17.791	33.945	24.515
20	16.424	33.905	24.809	20	16.689	33.889	24.735	20	17.792	33.945	24.515
30	16.424	33.905	24.809	30	16.285	33.883	24.823	30	17.797	33.945	24.514
40	16.420	33.906	24.810	40	16.250	33.880	24.829	40	17.799	33.945	24.513
50	15.060	34.131	25.289	50	15.931	33.970	24.971	50	17.267	34.060	24.730
75	13.382	34.158	25.664	75	13.871	34.169	25.571	75	15.032	34.150	25.310
100	12.088	34.116	25.886	100	12.521	34.143	25.823	100	12.978	34.146	25.736
125	10.150	33.976	26.126	125	11.306	34.063	25.991	125	9.758	33.949	26.172
150	8.103	33.787	26.306	150	9.112	33.904	26.243	150	3.969	33.185	26.345
175	6.935	33.710	26.411	175	7.786	33.789	26.354	175	3.581	33.257	26.441
200	4.526	33.457	26.504	200	4.725	33.450	26.477	200	3.608	33.351	26.513
250	2.773	33.421	26.645	250	2.905	33.429	26.639	250	2.886	33.470	26.674
300	2.900	33.545	26.732	300	2.904	33.565	26.748	300	2.862	33.568	26.754
400	3.097	33.775	26.899	400	3.143	33.801	26.915	400	3.066	33.747	26.879
500	3.265	33.908	26.989	500	3.340	33.956	27.021	500	3.359	33.949	27.013
				600	3.405	34.071	27.106				

Station OS14127				Station OS14128				Station OS14129			
Latitude 42-8.57N				Latitude 42-9.71N				Latitude 41-57.85N			
Longitude 141-39.67E				Longitude 141-39.57E				Longitude 141-35.39E			
Depth(m) 762				Depth(m) 745				Depth(m) 727			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	18.131	33.904	24.400	5	18.129	33.912	24.407	5	17.515	33.834	24.497
10	18.132	33.903	24.400	10	18.135	33.915	24.408	10	17.516	33.834	24.497
20	18.132	33.903	24.400	20	18.142	33.915	24.407	20	17.293	33.870	24.578
30	18.014	33.880	24.411	30	18.142	33.915	24.406	30	16.481	33.869	24.767
40	17.933	33.862	24.417	40	18.142	33.915	24.406	40	16.258	33.878	24.826
50	17.872	33.849	24.422	50	18.145	33.914	24.405	50	16.266	33.889	24.833
75	15.854	34.070	25.065	75	16.290	34.053	24.953	75	14.220	34.102	25.447
100	12.661	34.078	25.746	100	13.176	34.131	25.684	100	12.368	34.123	25.837
125	11.444	34.070	25.971	125	11.435	34.062	25.966	125	10.499	34.000	26.085
150	7.762	33.628	26.231	150	5.713	33.306	26.250	150	8.599	33.836	26.269
175	6.061	33.523	26.378	175	6.047	33.541	26.394	175	6.301	33.599	26.407
200	6.098	33.654	26.476	200	6.077	33.670	26.492	200	3.847	33.381	26.514
250	2.842	33.439	26.653	250	2.991	33.448	26.647	250	2.576	33.400	26.645
300	2.872	33.561	26.748	300	3.118	33.585	26.745	300	2.887	33.547	26.735
400	3.091	33.752	26.881	400	3.096	33.756	26.883	400	3.033	33.739	26.876
500	3.287	33.925	27.001	500	3.284	33.917	26.994	500	3.458	33.982	27.030
600	3.400	34.057	27.096	600	3.421	34.044	27.083	600	3.483	34.104	27.125
700	3.380	34.167	27.185	700	3.394	34.149	27.169				

Station OS14130				Station OS14131			
Latitude 41-34.09N				Latitude 42-30.74N			
Longitude 142-46.7E				Longitude 144-29.16E			
Depth(m) 1020				Depth(m) 1479			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	16.945	33.855	24.649	5	11.217	33.104	25.261
10	16.951	33.855	24.647	10	11.221	33.103	25.259
20	16.961	33.864	24.651	20	11.123	33.080	25.258
30	16.955	33.894	24.676	30	11.108	33.083	25.263
40	16.902	33.902	24.695	40	10.892	33.118	25.330
50	16.700	33.923	24.758	50	9.042	32.972	25.524
75	15.018	34.087	25.264	75	6.322	33.092	26.005
100	11.899	34.117	25.922	100	6.650	33.590	26.355
125	11.632	34.141	25.991	125	3.795	33.287	26.444
150	9.763	33.931	26.157	150	3.049	33.250	26.484
175	6.812	33.617	26.355	175	3.285	33.342	26.536
200	4.716	33.450	26.478	200	3.265	33.392	26.578
250	3.531	33.483	26.625	250	2.981	33.505	26.694
300	3.229	33.534	26.694	300	2.986	33.577	26.750
400	2.911	33.647	26.813	400	3.216	33.755	26.872
500	3.232	33.840	26.938	500	3.329	33.921	26.993
600	3.396	34.075	27.110	600	3.595	34.070	27.087
700	3.411	34.147	27.166	700	3.332	34.154	27.179
800	3.288	34.245	27.256	800	3.317	34.255	27.261
900	3.117	34.307	27.321	900	3.030	34.285	27.311
1000	2.898	34.362	27.385	1000	2.870	34.341	27.371
				1200	2.589	34.434	27.469

Bottom Trawl Research

4 operations of the stern otter bottom trawl were carried out.

These operations were supervised by the captain, Deck officer, Science officer, crew and research staff were engaged in the work.

Table 3: Data on Bottom trawl research during the Oshoromaru Cruise#005

No. of research	Date and time of net tow (S.M.T.*1)		Position		T.D.*2	D.S.*3	Speed of tow (K't)	Bottom depth (m)	Wr.*4	Wind	S.T.*5 (°C)
			Lat. (N)	Long. (E)							
OST1403	Oct. 19	0925-1015	42-08.5	141-35.6	+9h	183	3.5	656	bc	West-2	17.8
OST1404	Oct. 19	1408-1510	42-09.1	141-35.7	+9h	006	3.5	710	bc	South-3	17.9
OST1405	Oct. 20	0920-0950	42-05.6	141-35.6	+9h	010	2.0	713	o	SSW-4	17.3
OST1406	Oct. 20	1255-1355	42-14.9	141-43.2	+9h	095	3.0	645	o	SSW-4	17.5

*1 S.M.T. : Ship's Mean Time.

*2 T.D. : Time Difference between Greenwich Mean Time (G.M.T.) and Ship's Mean Time (S.M.T.).

*3 D.S. : Direction of tow.

*4 Wr. : Weather (bc: 25-75% clouded, c: over 75-99% clouded).

*5 S.T. : Surface temperature

Japanese name	Scientific Name	OST1403		OST1404		OST1405		OST1406	
		Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)
Shigiunagi	<i>Nemichthys scolopaceus</i>	-	-	-		1	0.02	1	0.07
Irakoanago	<i>Synaphobranchus kaupii</i>	24	15.58	25	13.4	7	1.96	35	28
Yukihoraanago	<i>Ilyophis nigeli</i>	-	-	2	0.02	2	0.02	1	0.09
Onihige	<i>Caelorinchus gilberti</i>	-	-	-	-	-	-	5	3.9
Onagakasube	<i>Rhinoraja longicauda</i>	7	0.79	2	0.06	-	-	5	1.12
Gangiei-rui	<i>Bathyraja</i> sp.	1	0.61	1	0.39	-	-	-	-
Togariichimonjiuwashi	<i>Leuroglossus schmidtii</i>	1	0.01	-	-	4	0.055	-	-
Ginsokoiwashi	<i>Dolicholagus longirostris</i>	-	-	-	-	-	-	2	0.005
Sokoiwashi	<i>Lipolagus ochotensis</i>	-	-	-	-	4	TR	2	0.005
Sokoiwashi rui	<i>Lipolagus</i> spp.	7	0.24	7	0.33	11	0.5	7	0.435
Hadakahoteieso	<i>Tactostoma macropus</i>	-	-	-	-	3	0.16	2	0.35
Demeiso	<i>Benthalbella linguidentis</i>			1	0.05	-	-	-	-
Yokoeso	<i>Gonostoma gracile</i>	-	-	-	-	14	0.03	1	0.01
Houraieso	<i>Chauliodus sloani</i>			1	0.03	3	0.02	2	0.12
Isaribihadaka	<i>Notoscopelus resplendens</i>	-	-	-	-	1	0.01		
Kohirehadaka	<i>Stenobranchius leucosparsus</i>	-	-	-	-	-	-	2	0.02
Todohadaka	<i>Diabhus theta</i>	-	-	-	-	4	0.02		
Mamehadaka	<i>Lampanyctus jordani</i>	9	0.2	11	0.24	32	0.75	9	0.34
Mikadohadaka	<i>Nannobranchium regale</i>	-	-	1	0.07	-	-	-	-
Nagahadaka	<i>Symbolophorus californiensis</i>	1	0.02	2	0.02	-	-	-	-
Sekkihadaka	<i>Symbolophorus californiensis</i>	1	0.02	-	-	8	0.0815	4	0.02
Futasuzinamehadaka	<i>Lestrolepis intermedia</i>	-	-	-	-	1	0.07	-	-
Karasudara	<i>Halargyreus johnsonii</i>	3	0.57	18	5	6	1.62	5	1.57
Kanadadara	<i>Antimora microlepis</i>	24	4.35	46	11.25	1	0.05	15	2.69
Itohikidara	<i>Laemonema longipes</i>	21	12	58	31.1	8	3.07	38	21
Munedara	<i>Coryphaenoides pectoralis</i>	-	-	1	2.65	-	-	-	-
Ibarahige	<i>Coryphaenoides acrolepis</i>	1	0.96	-	-	-	-	-	-
Karafutosokodara	<i>Coryphaenoides cinereus</i>	28	7.1			2	0.51	10	3.2
Yumeankou	<i>Oneirodes bullbosus</i>	1	0.17	-	-	-	-	-	-
Ogurokonnyakuuo	<i>Careproctus furcellus</i>	-	-	-	-	-	-	1	0.28
Kantennoo	<i>Nectoliparis pelagicus</i>	-	-	-	-	1	0.001	-	-
Hirainkioo	<i>Paraliparis grandis Schmidt</i>	-	-	-	-	-	-	12	4.1
Kantenngenge	<i>Bothrocara tanakae</i>	15	8	15	8.6	-	-	7	4.4
Kamuchakkagenge	<i>Bothrocarina microcephala</i>	2	0.85	-	-	-	-	-	-
Shirogenge	<i>Bothrocara molle</i>	119	69.7	167	101.4	15	7.106	114	54.9
Kichiji	<i>Sebastolobus macrochir</i>	121	19.5	93	19.7	14	2.32	94	14.2
Ganko	<i>Dasycottus setiger</i>	13	0.9	2	0.7	-	-	4	1.23
Nezumiginpo	<i>Lumpenella longirostris</i>	37	3.1	33	2.67	6	0.33	9	0.95
Akadonko	<i>Ebinania vermiculata</i>	-	-	1	2	-	-	-	-
Kobushikazika	<i>Malacocottus zonurus</i>	6	0.59	2	0.29	-	-	-	-
Aburagarei	<i>Atheresthes evermanni</i>	1	0.825	-	-	-	-	2	2.35
Samegarei	<i>Clidoderma asperrimum</i>	-	-	2	2.45	-	-	1	2.6
Namako	<i>Holothurian</i>	55	3.61	-	1.29	1	0.02	21	2.49
Mendako spp.	<i>Opisthoteuthis</i> spp.	27	15.5	21	9.14	-	-	18	10.3
Kokaku rui	<i>Crustacean</i>	-	-	-	-	-	-	14	0.19
Ebi rui	<i>shrimps</i>			3	0.58	-	-	-	-
Benizuwaigani	<i>Chionoecetes japonicus</i>	44	22.85	-	-	-	-	7	2.7
Dosuika	<i>Berrytenthis magister</i>	-	-	-	-	6	1.29	115	24
Ika-rui	<i>Squids</i>	35	8.05	-	-	-	-	7	0.49
Tako-rui	<i>Octopuses</i>	130	46	22	4.9	4	0.43	65	31
Ezobai spp.	<i>Buccinidae</i> spp.	57	5.15	73	3.25	1	0.07	66	4.45
Kokonohoshiginzame	<i>Hydrolagus barbouri</i>	-	-	-	-	-	-	1	2.15
Kassumizame	<i>Centroscyllium ritteri</i>	1	0.5	-	-	-	-	-	-

**THE "OSHO RO MARU" CRUISE 006
TO IBURI OFF and SANRIKU OFF**

IN OCTOBER-NOVEMBER 2014

1. Cruise Itinerary

Cruise 006

Departure from Hakodate	October 28	2014
Start hydrographic research (OS14132) and gill net research (OSG1402)	30	
Finish gill net research (OSG1405)	31	
Finish hydrographic research (OS14149)	November 2	
Arrival at Shiogama	4	
Departure from Shiogama and start hydrographic research (OS14150)	7	
Start Bottom-trawl (OST1407)	9	
Finish Bottom-trawl (OST1409)	11	
Finish hydrographic research (OS14157) and return to Hakodate	12	
Total coverage 1122.5 miles		

2. Vessel Personnel

Crew:	Captain:	Associate Professor	Shogo Takagi
			And 30 persons
(Hakodate-Shiogama)			
Research Staff:	Assistant Professor (Laboratory of Marine Environmental Science, Hokkaido University)		
			Hiroji Onishi
	(Kasetsart University)		Khwan Kong and 6 students
(Shiogama-Hakodate)			
Research Staff:	Professor (Laboratory of Marine Environment and Resource Sensing, Hokkaido University)		
			Yasuzumi Fujimori
	Associate Professor (Laboratory of Marine Environment and Resource Sensing, Hokkaido University)		
			Toru Mukai
	Assistant Professor (Field Science Center for Northern Biosphere, Hokkaido University)		
			Jun Yamamoto
	Technical assistant		10 persons
(Hakodate-Hakodate)			
	Teaching Assistant:		4 persons
	Undergraduate Students:		42 persons
			Total 67 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.

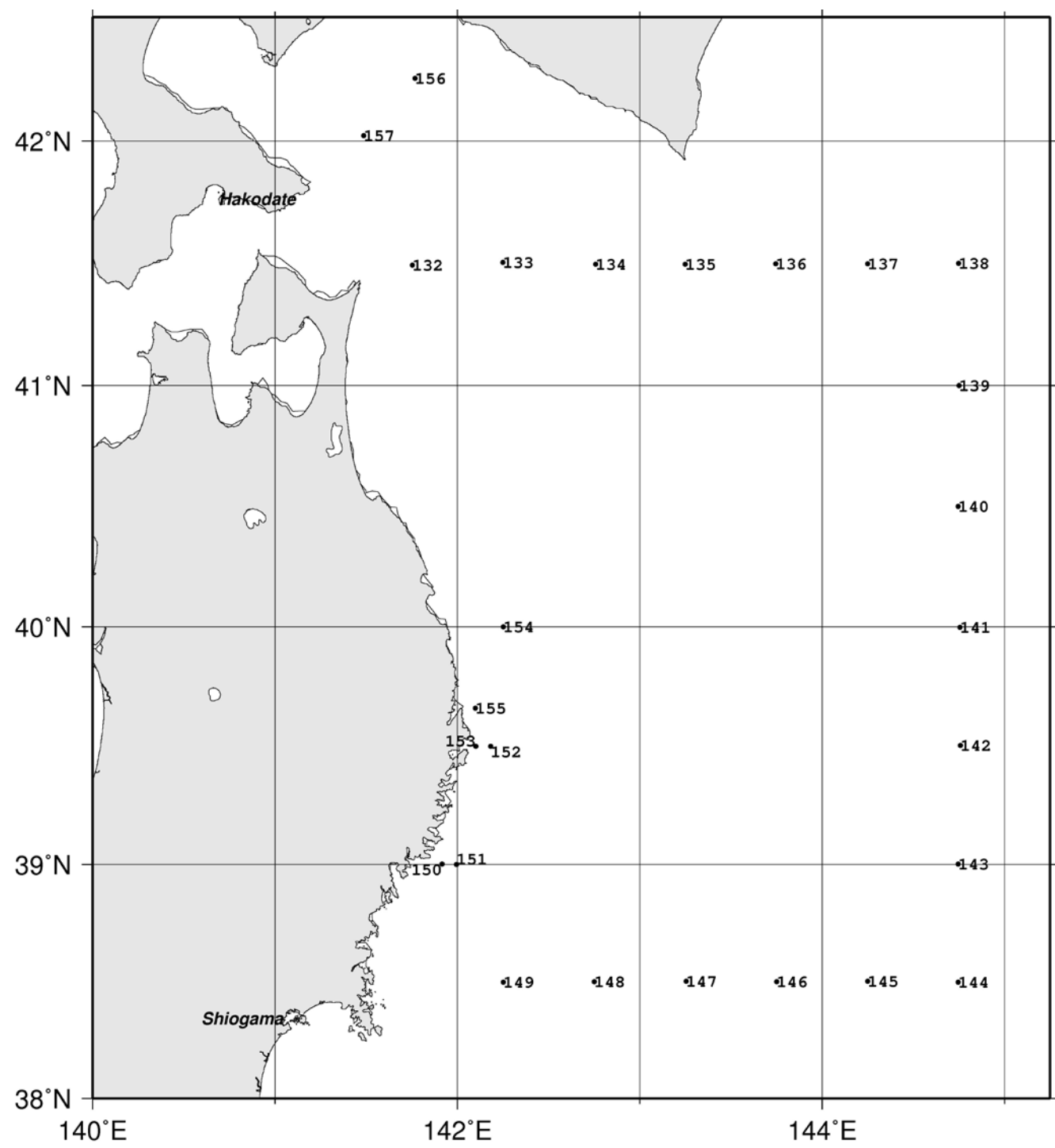


Fig.-1 Oceanographic stations

Table 1. List of Oceanographic station

Station	Lat.	Long.	Date (GMT)	Hour (GMT)	T.Z.	Depth	Col.	Tr.	SST	Wr.	Gear
OS14132	41 29.67 N	141 45.23 E	10/29	15:21	9	872	-	-	15.1	bc	9p-1171
OS14133	41 30.37 N	142 14.93 E	10/29	19:00	9	1196	-	-	16.9	bc	9p-1171
OS14134	41 29.94 N	142 45.51 E	10/29	23:04	9	1160	3	19.4	17.3	b	9p-1171
OS14135	41 29.91 N	143 15.05 E	10/30	7:30	9	1328	3	12.8	15.4	b	9p-1171
OS14136	41 29.98 N	143 44 79 E	10/30	11:32	9	1530	-	-	10.6	b	9p-1171
OS14137	41 30.04 N	144 14.95 E	10/31	1:05	9	2881	4	16.2	11.1	bc	9p-1171
OS14138	41 30.15 N	144 44.92 E	10/31	7:10	9	4565	4	11.1	10.9	b	9p-1171
OS14139	41 00.00 N	144 45.07 E	10/31	12:24	9	6578	-	-	14.1	r	9p-1171
OS14140	40 30.12 N	144 44.76 E	10/31	17:31	9	6575	-	-	13.0	bc	9p-1171
OS14141	39 59.92 N	144 45.39 E	10/31	23:10	9	5979	4	16.5	19.9	bc	9p-1171
OS14142	39 30.09 N	144 45.51 E	11/1	4:31	9	5849	4	9.4	18.4	c	9p-1171
OS14143	39 00.04 N	144 44.75 E	11/1	9:46	9	5851	-	-	18.6	r	9p-1171
OS14144	38 29.91 N	144 44.82 E	11/1	15:02	9	5583	-	-	16.1	r	9p-1171
OS14145	38 30.16 N	144 15.00 E	11/1	19:23	9	6700	-	-	17.8	r	9p-1171
OS14146	38 30.06 N	143 45.01 E	11/1	23:57	9	5390	4	12.5	17.9	c	9p-1171
OS14147	38 30.15 N	143 15.28 E	11/2	5:06	9	2341	3	13.5	19.8	c	9p-1171
OS14148	38 30.03 N	142 45.01 E	11/2	9:38	9	1484	-	-	13.3	c	9p-1171
OS14149	38 29.87 N	142 15.06 E	11/2	13:54	9	707	-	-	15.9	c	9p-1171
OS14150	39 00.12 N	141 54.99 E	11/7	14:48	9	137	-	-	15.8	bc	19p-4636
OS14151	38 59.98 N	141 59.76 E	11/7	15:38	9	196	-	-	15.9	bc	19p-4636
OS14152	39 29.89 N	142 10.98 E	11/7	19:42	9	234	-	-	15.5	bc	19p-4636
OS14153	39 29.96 N	142 06.03 E	11/7	20:35	9	146	-	-	16.4	bc	19p-4636
OS14154	39 59.99 N	142 15.10 E	11/8	0:32	9	239	-	-	14.0	bc	19p-4636
OS14155	39.59.99 N	142 05.91 E	11/8	1:52	9	126	-	-	16.0	bc	19p-4636
OS14156	42 15.25 N	141 46.05 E	11/9	6:40	9	697	-	-	13.7	bc	19p-4636
OS14157	42 01.34 N	141 29.16 E	11/11	21:54	9	458	-	-	14.3	c	25p-1053

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

Table 2. Oceanographic data

Station OS14132				Station OS14133				Station OS14134			
Latitude 41-29.65N				Latitude 41-30.39N				Latitude 41-29.92N			
Longitude 141-45.24E				Longitude 142-14.95E				Longitude 142-45.54E			
Depth(m) 872				Depth(m) 1196				Depth(m) 1160			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	15.083	34.028	25.204	5	17.480	33.953	24.597	10	17.374	33.962	24.629
10	15.090	34.027	25.202	10	17.484	33.953	24.596	20	17.368	33.963	24.631
20	15.095	34.027	25.201	20	17.487	33.953	24.595	30	17.373	33.962	24.629
30	15.094	34.028	25.202	30	17.487	33.953	24.595	40	17.373	33.963	24.629
40	15.074	34.029	25.207	40	17.487	33.953	24.594	50	17.374	33.963	24.629
50	15.059	34.030	25.211	50	17.491	33.953	24.594	75	17.318	33.958	24.639
75	14.916	34.032	25.244	75	16.372	33.946	24.852	100	15.373	34.028	25.141
100	14.230	34.047	25.402	100	14.121	34.146	25.502	125	13.478	34.081	25.584
125	13.068	34.113	25.692	125	12.324	34.149	25.866	150	12.110	34.102	25.871
150	11.730	34.063	25.912	150	10.409	34.028	26.123	175	11.212	34.084	26.024
175	4.956	33.200	26.254	175	9.852	33.998	26.194	200	10.008	33.974	26.149
200	2.981	33.143	26.405	200	7.840	33.748	26.314	250	6.244	33.531	26.361
250	2.080	33.275	26.584	250	5.108	33.515	26.486	300	3.568	33.350	26.516
300	2.784	33.520	26.722	300	2.743	33.362	26.600	400	2.747	33.503	26.712
400	2.946	33.734	26.879	400	2.613	33.544	26.756	500	2.993	33.695	26.844
500	3.393	33.930	26.995	500	2.922	33.744	26.890	600	3.328	33.919	26.992
600	3.479	34.093	27.116	600	3.348	33.941	27.008	700	3.425	34.106	27.132
700	3.386	34.174	27.190	700	3.600	34.107	27.116	800	3.354	34.204	27.217
800	3.246	34.261	27.272	800	3.559	34.203	27.197	900	3.119	34.307	27.321
				900	3.253	34.262	27.273	1000	2.873	34.377	27.399
				1000	3.028	34.336	27.352				

Station OS14135				Station OS14136				Station OS14137			
Latitude 41-29.87N				Latitude 41-29.92N				Latitude 41-30.04N			
Longitude 143-15.04E				Longitude 143-44.8E				Longitude 144-14.96E			
Depth(m) 1328				Depth(m) 1530				Depth(m) 2881			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	15.556	33.917	25.014	5	10.640	33.208	25.444	10	10.677	32.721	25.058
10	15.562	33.917	25.013	10	10.641	33.208	25.444	20	10.665	32.721	25.060
20	15.557	33.917	25.014	20	10.628	33.214	25.450	30	10.627	32.719	25.065
30	15.564	33.917	25.013	30	9.890	33.231	25.589	40	9.916	32.731	25.194
40	15.526	33.914	25.019	40	6.495	33.317	26.160	50	5.785	32.871	25.897
50	15.118	33.940	25.129	50	6.136	33.343	26.227	75	2.417	33.081	26.403
75	13.916	34.079	25.493	75	5.323	33.372	26.348	100	2.006	33.151	26.490
100	12.668	34.124	25.780	100	4.137	33.340	26.452	125	1.849	33.244	26.576
125	10.544	34.014	26.088	125	3.546	33.338	26.509	150	1.893	33.306	26.623
150	9.045	33.895	26.246	150	3.411	33.402	26.573	175	1.933	33.365	26.667
175	7.671	33.778	26.362	175	3.131	33.433	26.622	200	2.058	33.452	26.727
200	4.510	33.457	26.506	200	3.002	33.463	26.658	250	2.295	33.578	26.810
250	3.182	33.414	26.603	250	3.068	33.543	26.716	300	2.966	33.749	26.889
300	2.948	33.513	26.703	300	3.039	33.614	26.775	400	3.011	33.895	27.002
400	3.046	33.727	26.865	400	3.190	33.789	26.901	500	3.196	34.057	27.115
500	3.304	33.909	26.986	500	3.354	33.952	27.016	600	3.231	34.153	27.188
600	3.410	34.040	27.081	600	3.433	34.069	27.102	700	3.246	34.257	27.269
700	3.390	34.161	27.179	700	3.377	34.132	27.157	800	3.097	34.312	27.327
800	3.306	34.236	27.247	800	3.341	34.240	27.247	900	2.777	34.343	27.380
900	3.155	34.295	27.308	900	3.141	34.296	27.310	1000	2.773	34.405	27.431
1000	2.961	34.340	27.361	1000	2.945	34.351	27.372	1200	2.506	34.459	27.497
1200	2.623	34.430	27.464	1200	2.609	34.433	27.467	1500	2.215	34.522	27.571
				1500	2.301	34.508	27.553	2000	1.922	34.597	27.655

Station	OS14138		
Latitude	41-30.15N		
Longitude	144-44.92E		
Depth(m)	4565		
Press.	Temp.	Sal.	SIG-T
5	10.849	32.607	24.939
10	10.862	32.607	24.937
20	10.658	32.595	24.963
30	10.580	32.593	24.975
40	10.376	32.597	25.013
50	5.856	32.933	25.936
75	2.651	33.101	26.399
100	3.110	33.231	26.463
125	3.059	33.301	26.524
150	2.744	33.371	26.607
175	2.788	33.491	26.699
200	2.788	33.556	26.751
250	2.953	33.681	26.836
300	3.202	33.804	26.912
400	3.404	33.986	27.038
500	3.392	34.101	27.131
600	3.243	34.207	27.230
700	3.113	34.278	27.299
800	2.934	34.342	27.366
900	2.791	34.384	27.412
1000	2.645	34.417	27.452
1200	2.425	34.474	27.516
1500	2.210	34.543	27.588
2000	1.883	34.604	27.663

Station	OS14139		
Latitude	41-0.01N		
Longitude	144-45.09E		
Depth(m)	6578		
Press.	Temp.	Sal.	SIG-T
5	14.038	32.786	24.469
10	14.036	32.787	24.470
20	13.978	32.785	24.480
30	13.962	32.786	24.485
40	13.929	32.787	24.492
50	13.025	32.788	24.675
75	5.346	32.902	25.973
100	2.434	33.056	26.381
125	2.261	33.108	26.436
150	2.180	33.180	26.500
175	2.239	33.284	26.578
200	2.137	33.355	26.643
250	2.259	33.504	26.753
300	2.462	33.615	26.825
400	2.887	33.808	26.944
500	3.091	33.970	27.055
600	3.117	34.142	27.189
700	3.144	34.284	27.300
800	2.823	34.395	27.418
900	2.528	34.452	27.489
1000	2.364	34.489	27.533
1200	2.051	34.562	27.616
1500	1.881	34.597	27.658
2000	1.679	34.635	27.704

Station	OS14140		
Latitude	40-30.12N		
Longitude	144-44.75E		
Depth(m)	6575		
Press.	Temp.	Sal.	SIG-T
5	12.896	32.793	24.704
10	12.889	32.793	24.705
20	12.717	32.817	24.758
30	12.672	32.861	24.800
40	12.541	32.925	24.875
50	4.903	32.887	26.011
75	2.618	33.101	26.402
100	2.788	33.224	26.486
125	2.708	33.306	26.558
150	2.336	33.368	26.638
175	2.480	33.468	26.706
200	2.792	33.561	26.755
250	2.955	33.679	26.834
300	3.228	33.789	26.898
400	3.334	33.945	27.013
500	3.469	34.112	27.132
600	3.345	34.205	27.219
700	3.171	34.282	27.296
800	3.020	34.335	27.352
900	2.837	34.377	27.402
1000	2.655	34.415	27.449
1200	2.455	34.473	27.513
1500	2.220	34.529	27.577
2000	1.896	34.602	27.661

Station	OS14141		
Latitude	39-59.92N		
Longitude	144-45.41E		
Depth(m)	5979		
Press.	Temp.	Sal.	SIG-T
5	18.939	34.101	24.350
10	18.922	34.096	24.350
20	18.776	34.056	24.356
30	18.115	33.919	24.416
40	17.338	34.045	24.701
50	17.156	34.242	24.895
75	15.461	34.295	25.327
100	13.632	34.308	25.729
125	10.076	33.785	25.991
150	5.978	33.351	26.252
175	6.464	33.658	26.433
200	3.699	33.352	26.505
250	2.551	33.344	26.602
300	2.732	33.489	26.702
400	2.855	33.677	26.842
500	3.263	33.894	26.978
600	3.299	34.031	27.084
700	3.334	34.160	27.184
800	3.163	34.237	27.261
900	3.117	34.309	27.323
1000	2.962	34.364	27.381
1200	2.681	34.427	27.456
1500	2.345	34.500	27.543
2000	1.982	34.587	27.642

Station	OS14142		
Latitude	39-30.09N		
Longitude	144-45.53E		
Depth(m)	5849		
Press.	Temp.	Sal.	SIG-T
5	18.329	34.062	24.472
10	18.325	34.062	24.473
20	17.509	34.138	24.731
30	17.212	34.181	24.835
40	16.875	34.212	24.939
50	16.703	34.220	24.986
75	14.065	34.267	25.607
100	11.461	34.164	26.040
125	9.813	34.064	26.252
150	9.163	33.989	26.300
175	8.237	33.865	26.347
200	5.901	33.586	26.448
250	3.855	33.387	26.518
300	2.848	33.320	26.558
400	1.625	33.326	26.658
500	1.780	33.425	26.726
600	2.242	33.578	26.813
700	2.870	33.776	26.919
800	3.388	33.988	27.041
900	3.539	34.166	27.169
1000	3.312	34.256	27.262
1200	2.931	34.363	27.382
1500	2.563	34.473	27.503
2000	2.078	34.572	27.622

Station	OS14143		
Latitude	39-0.01N		
Longitude	144-44.71E		
Depth(m)	5851		
Press.	Temp.	Sal.	SIG-T
5	18.540	34.058	24.417
10	18.532	34.055	24.417
20	18.599	34.098	24.433
30	18.554	34.104	24.449
40	18.023	34.055	24.543
50	17.924	34.095	24.598
75	15.863	34.323	25.258
100	14.248	34.413	25.681
125	12.150	34.243	25.972
150	10.837	34.146	26.139
175	9.989	34.075	26.232
200	9.449	34.027	26.284
250	7.071	33.765	26.436
300	4.695	33.532	26.546
400	3.524	33.573	26.698
500	3.322	33.706	26.823
600	3.759	33.899	26.934
700	4.146	34.095	27.051
800	4.131	34.225	27.156
900	3.638	34.280	27.250
1000	3.378	34.336	27.320
1200	2.879	34.407	27.423
1500	2.496	34.487	27.520
2000	2.046	34.578	27.630

Station	OS14144		
Latitude	38-29.83N		
Longitude	144-44.77E		
Depth(m)	5583		
Press.	Temp.	Sal.	SIG-T
5	16.018	33.528	24.612
10	15.999	33.522	24.611
20	17.069	33.931	24.678
30	17.074	33.933	24.678
40	17.077	33.934	24.678
50	17.079	33.935	24.678
75	13.073	34.063	25.653
100	8.899	33.739	26.146
125	6.408	33.506	26.321
150	5.567	33.470	26.396
175	6.397	33.711	26.483
200	3.813	33.366	26.505
250	2.978	33.407	26.615
300	2.941	33.511	26.702
400	3.577	33.787	26.863
500	3.344	33.910	26.984
600	3.837	34.109	27.094
700	3.853	34.219	27.180
800	3.414	34.267	27.261
900	3.126	34.312	27.324
1000	2.990	34.364	27.378
1200	2.660	34.436	27.466
1500	2.341	34.519	27.559
2000	1.967	34.591	27.647

Station	OS14145		
Latitude	38-30.17N		
Longitude	144-14.98E		
Depth(m)	6700		
Press.	Temp.	Sal.	SIG-T
5	17.724	34.063	24.621
10	17.725	34.063	24.622
20	17.691	34.056	24.625
30	17.617	34.041	24.631
40	17.623	34.044	24.631
50	17.625	34.044	24.631
75	15.495	34.365	25.373
100	13.351	34.370	25.834
125	12.347	34.295	25.975
150	10.747	34.171	26.175
175	9.834	34.083	26.264
200	8.609	33.968	26.371
250	7.203	33.909	26.531
300	6.935	33.956	26.606
400	5.194	33.945	26.816
500	4.649	34.047	26.959
600	4.148	34.115	27.067
700	4.050	34.242	27.178
800	3.591	34.277	27.252
900	3.405	34.342	27.322
1000	3.047	34.374	27.381
1200	2.754	34.446	27.465
1500	2.407	34.507	27.543
2000	2.028	34.582	27.635

Station	OS14146		
Latitude	38-30.07N		
Longitude	143-45.01E		
Depth(m)	5390		
Press.	Temp.	Sal.	SIG-T
10	17.803	34.229	24.730
20	17.620	34.230	24.775
30	17.398	34.221	24.821
40	17.362	34.226	24.834
50	17.321	34.228	24.845
75	15.373	34.459	25.473
100	12.752	34.302	25.901
125	11.982	34.287	26.039
150	10.948	34.196	26.159
175	10.219	34.130	26.235
200	9.470	34.044	26.294
250	6.826	33.781	26.482
300	5.181	33.689	26.616
400	4.116	33.774	26.799
500	4.558	34.085	26.999
600	3.791	34.101	27.092
700	3.653	34.195	27.181
800	3.501	34.313	27.289
900	3.115	34.379	27.379
1000	2.905	34.416	27.427
1200	2.639	34.452	27.480
1500	2.427	34.496	27.533
2000	2.154	34.561	27.607

Station	OS14147		
Latitude	38-30.15N		
Longitude	143-15.28E		
Depth(m)	2341		
Press.	Temp.	Sal.	SIG-T
5	19.684	34.116	24.170
10	19.739	34.191	24.213
20	19.636	34.186	24.236
30	19.213	34.089	24.271
40	19.201	34.102	24.284
50	18.485	34.192	24.533
75	13.656	34.005	25.489
100	12.094	34.188	25.940
125	9.544	33.840	26.122
150	9.923	34.142	26.295
175	9.051	34.117	26.418
200	7.233	33.893	26.515
250	7.887	34.176	26.643
300	7.083	34.142	26.731
400	5.367	34.104	26.922
500	4.706	34.172	27.052
600	4.166	34.240	27.164
700	3.844	34.295	27.241
800	3.587	34.352	27.312
900	3.217	34.366	27.359
1000	2.921	34.390	27.405
1200	2.660	34.456	27.481
1500	2.334	34.519	27.559
2000	1.946	34.595	27.651

Station	OS14148		
Latitude	38-30.03N		
Longitude	142-45.02E		
Depth(m)	1484		
Press.	Temp.	Sal.	SIG-T
5	13.165	32.677	24.561
10	12.753	32.660	24.629
20	13.478	33.252	24.944
30	11.973	33.727	25.606
40	11.512	33.800	25.749
50	10.754	33.790	25.877
75	9.075	33.841	26.199
100	6.064	33.475	26.340
125	3.520	33.308	26.487
150	5.176	33.603	26.548
175	3.297	33.430	26.605
200	4.479	33.614	26.634
250	5.276	33.842	26.726
300	5.301	33.935	26.796
400	4.796	34.069	26.960
500	4.322	34.160	27.084
600	3.862	34.223	27.182
700	3.594	34.277	27.252
800	3.370	34.329	27.315
900	3.080	34.371	27.375
1000	2.903	34.403	27.418
1200	2.550	34.456	27.490

Station	OS14149		
Latitude	38-29.74N		
Longitude	142-15.0E		
Depth(m)	707		
Press.	Temp.	Sal.	SIG-T
5	15.789	33.806	24.877
10	15.781	33.861	24.921
20	15.695	33.876	24.952
30	15.130	33.823	25.036
40	14.997	33.820	25.063
50	14.889	33.823	25.089
75	8.839	33.199	25.733
100	7.205	33.578	26.271
125	6.278	33.558	26.378
150	4.424	33.385	26.458
175	3.148	33.281	26.500
200	3.201	33.354	26.554
250	2.576	33.405	26.648
300	2.599	33.506	26.727
400	3.198	33.789	26.901
500	3.909	34.063	27.050
600	3.445	34.134	27.153

Station	OS14150		
Latitude	39-00.12N		
Longitude	141-54.99E		
Depth(m)	137		
Press.	Temp.	Sal.	SIG-T
10	15.576	33.591	24.759
20	15.604	33.648	24.797
30	15.631	33.721	24.847
50	15.627	33.739	24.862
75	15.661	33.756	24.867
100	15.581	33.809	24.926

Station	OS14151		
Latitude	38-59.98N		
Longitude	141-59.76E		
Depth(m)	196		
Press.	Temp.	Sal.	SIG-T
10	15.592	33.041	24.332
20	15.564	33.109	24.391
30	15.605	33.220	24.467
50	15.728	33.404	24.581
75	15.810	33.568	24.689
100	15.727	33.771	24.864
150	15.269	34.037	25.171

Station	OS14152		
Latitude	39-29.89N		
Longitude	142-10.98E		
Depth(m)	234		
Press.	Temp.	Sal.	SIG-T
10	15.275	33.990	25.133
20	15.183	33.988	25.151
30	15.116	33.985	25.164
50	14.941	33.973	25.193
75	14.340	33.916	25.278
100	12.943	33.935	25.579
150	12.024	34.063	25.857
200	8.373	33.802	26.277

Station	OS14153		
Latitude	39-29.96N		
Longitude	142-06.03E		
Depth(m)	146		
Press.	Temp.	Sal.	SIG-T
10	16.202	33.941	24.887
20	16.187	33.939	24.889
30	16.155	33.938	24.896
50	15.494	33.969	25.068
75	15.258	33.977	25.127
100	14.745	33.966	25.230

Station	OS14154		
Latitude	39-59.99N		
Longitude	142-15.10E		
Depth(m)	239		
Press.	Temp.	Sal.	SIG-T
10	13.995	33.856	25.304
20	13.997	33.858	25.305
30	14.001	33.862	25.307
50	13.945	33.891	25.342
75	13.584	34.016	25.512
100	12.571	34.000	25.703
150	8.512	33.731	26.200
200	4.487	33.407	26.469

Station	OS14155		
Latitude	39-59.99N		
Longitude	142-05.91E		
Depth(m)	126		
Press.	Temp.	Sal.	SIG-T
10	15.295	33.986	25.126
20	14.883	33.997	25.224
30	14.717	33.999	25.262
50	14.475	33.987	25.305
75	14.299	33.993	25.347
100	14.151	34.003	25.385

Station	OS14156		
Latitude	42-15.25N		
Longitude	141-46.05E		
Depth(m)	697		
Press.	Temp.	Sal.	SIG-T
10	13.195	33.983	25.566
20	13.072	34.011	25.613
30	13.066	34.024	25.624
50	13.019	34.037	25.643
75	12.781	34.057	25.706
100	11.404	34.087	25.991
150	6.045	33.554	26.404
200	4.819	33.530	26.530
300	2.721	33.463	26.682

Station	OS14157		
Latitude	42-1.34N		
Longitude	141-29.16E		
Depth(m)	458		
Press.	Temp.	Sal.	SIG-T
10	14.027	33.993	25.403
20	13.683	33.976	25.461
30	13.622	33.971	25.470
40	13.609	33.971	25.473
50	13.611	33.972	25.473
75	13.301	34.069	25.611
100	11.702	34.073	25.925
125	11.140	34.095	26.045
150	10.328	34.044	26.149
175	5.381	33.475	26.422
200	4.965	33.545	26.525
250	3.839	33.558	26.655
300	3.118	33.597	26.755
400	2.974	33.648	26.808

Bottom Trawl Research

4 operations of the stern otter bottom trawl were carried out.

These operations were supervised by the captain, Deck officer, Science officer, crew and research staff were engaged in the work.

Table 3: Data on Bottom trawl research during the Oshoromaru Cruise#006

No. of research	Date and time of net tow (S.M.T.*1)		Position		T.D.*2	D.S.*3	Speed of tow (K't)	Bottom depth (m)	Wr.*4	Wind	S.T.*5 (°C)
			Lat. (N)	Long. (E)							
OST1407	Nov. 9	0920-1020	42-11.0	141-48.5	+9h	110	3.0	664-823	bc	West-5	13.7
OST1408	Nov. 10	0855-0955	42-09.5	141-37.0	+9h	194	3.0	613	c	SSW-5	13.5
OST1409	Nov. 11	0740-0810	42-11.5	141-44.2	+9h	115	3.3	620-749	b	NE-3	13.2

*1 S.M.T. : Ship's Mean Time.

*2 T.D. : Time Difference between Greenwich Mean Time (G.M.T.) and Ship's Mean Time (S.M.T.).

*3 D.S. : Direction of tow.

*4 Wr. : Weather (bc: 25-75% clouded, c: over 75-99% clouded).

*5 S.T. : Surface temperature

Japanese name	Scientific Name	OST1407		OST1408		OST1409	
		Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)
Gangiei sp.	Bathyraja sp.	4	4.6	4	1.1	2	0.7
Irakoanago	<i>Synaphobranchus kaupii</i>	26	20.7	19	18.6	13	9.6
Hadakahoteieso	<i>Tactostoma macropus</i>	4	0.7	-	-	2	0.1
Eso rui	Synodontidae	-	-	-	-	1	0.1
Houraieso	<i>Chauliodus sloani</i>	1	0.1	-	-	1	0.1
Mamehadaka	<i>Lampanyctus jordani</i>	-	-	-	-	4	0.1
Sekkihadaka	<i>Symbolophorus californiensis</i>	-	-	-	-	4	0.1
Mizuuodamashi	<i>Anotopterus nikparini</i>	1	4.3	-	-	-	-
Hadakaiwashi	<i>Diaphus watasei</i>	1	0.1	-	-	-	-
Karasudara	<i>Halargyreus johnsonii</i>	1	1.7	-	-	-	-
Kanadadara	<i>Antimora microlepis</i>	36	11.5	12	4.7	16	6.7
Itohikidara	<i>Laemonema longipes</i>	200	55.9	2	0.1	4	0.2
Ibarahige	<i>Coryphaenoides acrolepis</i>	-	-	1	0.3	-	-
Karafutosokodara	<i>Coryphaenoides cinereus</i>	-	-	9	3.6	119	34.6
Touzin	<i>Coelorinchus</i>	-	-	1	0.9	-	-
Suketoudara	<i>Theragra chalcogramma</i> (Pa)	3	2.8	-	-	-	-
Onikinme	<i>Anoplogaster cornuta</i>	-	-	-	-	1	0.1
Arasukabikunin	<i>Careproctus colletti</i>	1	1.5	-	-	-	-
Genge rui	Zoarcidae	153	69.9	101	48	89	38.1
Kichiji	<i>Sebastolobus macrochir</i>	111	22.3	139	25.5	74	15.6
Ganko	<i>Dasycottus setiger</i>	-	-	8	0.9	1	0.1
Nezumiginpo	<i>Lumpenella longirostris</i>	2	0.3	10	0.9	2	0.1
Kazika rui	Cottoidea	3	1.4	-	-	1	0.1
Aburagarei	<i>Atheresthes evermanni</i>	-	-	1	1.2	1	0.7
Samegarei	<i>Clidoderma asperrimum</i>	-	-	2	1.8	1	1.9
Dosuika	<i>Berrytenthis magister</i>	118	26.6	37	8.9	22	3.7
Tako-rui	<i>Octopuses</i>	44	15.4	14	15.1	4	1.6
Ezobai spp.	<i>Buccinidae spp.</i>	-	-	52	6.6	25	2.1
Kokonohoshiginza	<i>Hydrolagus barbouri</i>	-	-	1	1.4	-	-
Kani sp.	Bracyyura	2	2.7	31	16.6	2	0.3

**THE "OSHO RO MARU" CRUISE 009
TO THE OGASAWARA ISLANDS**

IN DECEMBER 2014

1. Cruise Itinerary

Cruise 009

Departure from Hakodate	December 3	2014
Arrival at Yokohama	6	
Departure from Yokohama	9	
Start hydrographic research (OS14168)	10	
Start vertical long-line research (OSVL1401)	11	
Finish hydrographic research (OS14174)	12	
Finish vertical long-line research (OSVL141406) and arrival at Futami	13	
Departure from Futami	14	
Arriveal at Tokyo	17	

Total coverage 1771.9 miles

2. Vessel Personnel

Crew:	Captain:	Associate Professor	Shogo Takagi
			And 29 persons

(Hakodate – Yokohama)

Technical staff:	4 persons
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(Yokohama –Tokyo)

Guest Scientist:	Assistant Professor (Hokkaido University Museum)	Yoshiharu Fujita
	Program-Specific Assistant Professor (Kyoto University)	Shunsuke Yamashita
	Postdoctoral Fellow (Department of Marine Science and Resources, Nihon University)	Shun Watanabe
	Postdoctoral Fellow (Department of Marine Science and Resources, Nihon University)	Ryotaro Manabe

Undergraduate instructor:	Professor (Department of Marine Science and Resources, Nihon University)	Takahito Kojima
	Assistant Professor (Department of Marine Science and Resources, Nihon University)	Yuya Makiguchi
	Associate Professor (Department of Animal Science, Teikyo University of Science and Technology)	Kyoichi Mori
Teaching Assistant:		3 persons
Undergraduate Students:		
	(Nihon University)	31 persons
	(Teikyo University of Science Technology)	14 persons
		Total 58 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.

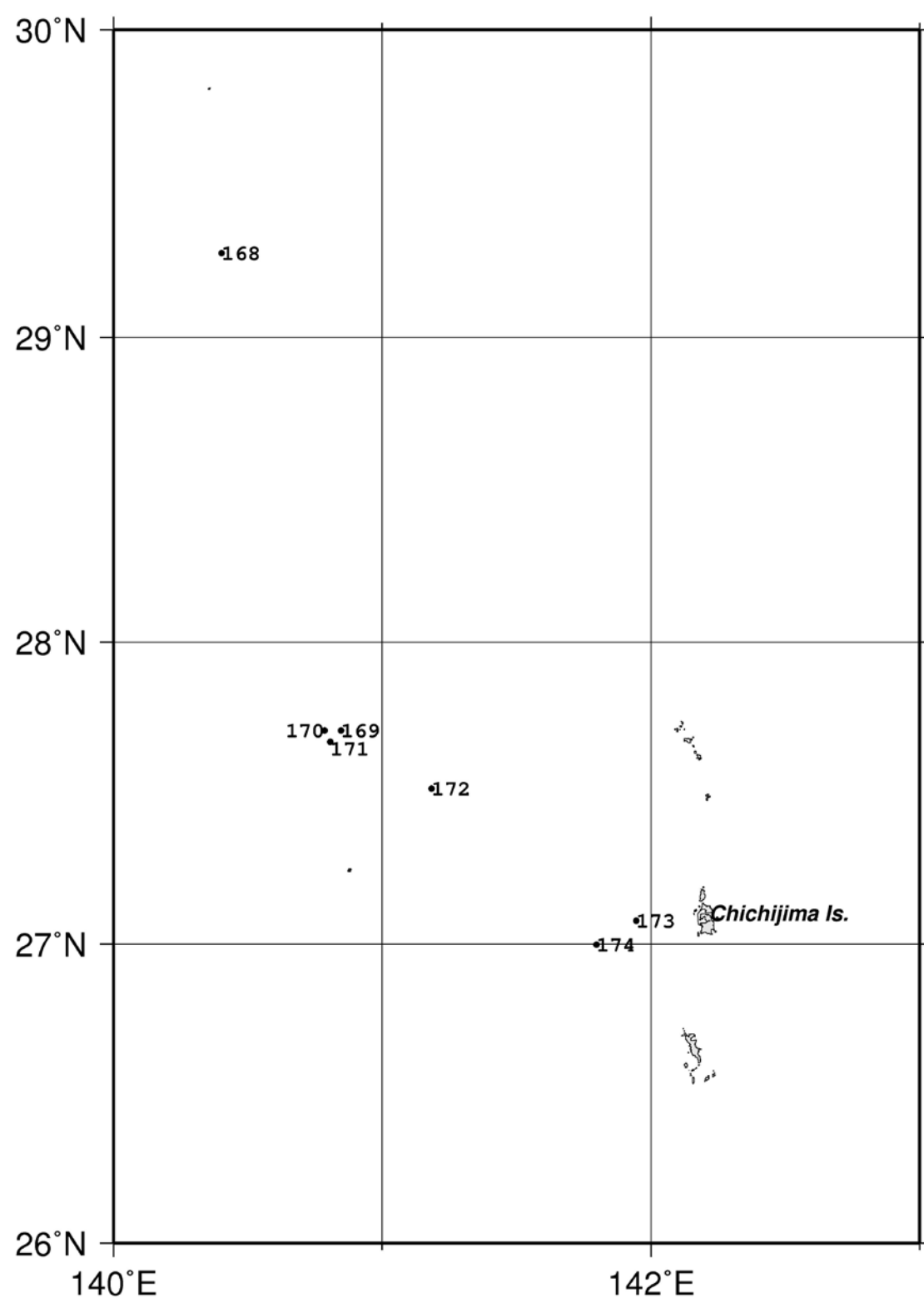


Fig.-1 Oceanographic stations

Table 1. List of Oceanographic station

Station	Lat.	Long.	Date (GMT)	Hour (GMT)	T.Z	Depth	Col.	Tr.	SST	Wr.	Gear
OS14168	29 16.49 N	140 24.13 E	12/10	10:01	9	2504	-	-	23.2	bc	XCTD-1
OS14169	27 42.56 N	140 50.81 E	12/10	20:54	p	1863	-	-	23.4	c	XCTD-2
OS14170	27 42.51 N	140 47.18 E	12/10	21:55	9	1405	28.2	-	23.3	c	9p-1171
OS14171	27 40.24 N	140 48.40 E	12/11	1:39	9	635	-	-	23.3	c	9p-1171
OS14172	27 31.02 N	141 10.97 E	12/11	10:51	9	4110	-	-	23.5	bc	XCTD-1
OS14173	27 04.70 N	141 56.67 E	12/12	1:52	9	1458	-	-	22.6	bc	XCTD-2
OS14174	26 59.87 N	141 47.78 E	12/12	12:00	9	3810	-	-	22.5	bc	XCTD-2

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

Table 2. Oceanographic data

Station OS14168				Station OS14169				Station OS14170			
Latitude 29-16.49N				Latitude 27-42.56N				Latitude 27-42.51N			
Longitude 140-24.13E				Longitude 140-50.81E				Longitude 140-47.18E			
Depth(m) 2504				Depth(m) 1863				Depth(m) 1405			
Depth	Temp.	Sal.	SIG-T	Depth	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
12	23.061	31.552	-	5	23.320	34.664	-	5	23.222	34.698	23.641
20	23.069	34.635	-	10	23.320	34.677	-	10	23.218	34.698	23.642
30	23.069	34.642	-	20	23.320	34.686	-	20	23.225	34.698	23.639
40	23.069	34.643	-	30	23.320	34.692	-	30	23.223	34.698	23.640
50	23.069	34.650	-	40	23.300	34.686	-	40	23.225	34.698	23.639
75	22.783	34.666	-	50	23.301	34.690	-	50	23.228	34.698	23.639
100	20.377	34.772	-	75	23.194	34.679	-	75	22.087	34.732	23.990
125	19.015	34.764	-	100	22.273	34.654	-	100	20.269	34.779	24.522
150	18.505	34.747	-	125	18.746	34.760	-	125	18.268	34.754	25.017
175	18.176	34.733	-	150	17.840	34.725	-	150	17.508	34.732	25.187
200	17.386	34.710	-	175	17.386	34.714	-	175	17.202	34.722	25.253
250	16.776	34.683	-	200	17.115	34.705	-	200	17.005	34.715	25.295
300	15.988	34.616	-	250	16.862	34.693	-	250	16.868	34.707	25.321
400	13.713	34.453	-	300	16.646	34.679	-	300	16.773	34.701	25.339
500	11.278	34.284	-	400	15.671	34.603	-	400	15.997	34.633	25.466
600	9.049	34.153	-	500	13.612	34.451	-	500	14.162	34.497	25.764
700	6.268	34.033	-	600	10.513	34.237	-				
800	5.330	34.066	-	700	8.018	34.114	-				
900	4.671	34.131	-	800	6.163	34.100	-				
1000	4.144	34.213	-	900	4.819	34.178	-				
1100	3.586	34.312	-	1000	4.105	34.279	-				
				1200	3.435	34.395	-				
				1500	2.464	34.533	-				

Vertical long-line Research

Four operations using a vertical long-line were performed.

The gear comprised by three types of main line (400,500,600m) with a weight attached to one end, a buoy attached to the other end, and six branch lines (18m-for tuna and 4m-for squid) attached to the main line.

These operations were supervised by the captain, Deck officers, Science officer, crews, and under graduate instructor were engaged in the work

Table 3 Data on vertical long line research

No. of research		OSVL 1401-01	OSVL 1401-02	OSVL 1401-03	OSVL 1401-04
Date		11-Dec			
position of	Lat. (N)	27-42.3	27-42.4	27-42.4	27-42.5
line set	Long. (E)	140-49.3	140-48.8	140-48.3	140-47.9
Time	Line set	0619	0625	0630	0635
(S.M.T.)	Line haul	0814-0951			
Length of main line(m)		600	600	500	500
Depth(m)		1051-1380			
Surface temp. (°C)		23.2			
Wether		c			
Wind		East-4			
Flying squid		1			
Diamondback squid		1			
Swordfish		1			

No. of research		OSVL 1402-01	OSVL 1402-02	OSVL 1402-03
Date		11-Dec		
position of	Lat. (N)	27-40.4	27-40.4	27-40.4
line set	Long. (E)	140-49.9	140-49.6	140-49.2
Time	Line set	1005	1011	1018
(S.M.T.)	Line haul	1140-1235		
Length of main line(m)		600	600	500
Depth(m)		1160		
Surface temp. (°C)		23.2		
Wether		bc		
Wind		East-5		
		nothing		

No. of research		OSVL 1403-01	OSVL 1403-02	OSVL 1403-03	OSVL 1403-04
Date		11-Dec			
position of	Lat. (N)	27-40.5	27-40.4	27-40.2	27-40.1
line set	Long. (E)	140-52.0	140-52.4	140-52.9	140-53.2
Time	Line set	1253	1259	1304	1309
(S.M.T.)	Line haul	1457-1621			
Length of main line(m)		600	600	500	500
Depth(m)		2711			
Surface temp. (°C)		23.3			
Wether		c			
Wind		SSE-5			
Flying squid		1			
Diamondback squid		1			
Sickle pomfret		1			
Blue shark		1			

Continued

No. of research		OSVL 1404-01	OSVL 1404-02	OSVL 1404-03	OSVL 1404-04	OSVL 1404-05	OSVL 1404-06
Date		12-Dec					
position of	Lat. (N)	27-06.7	27-06.5	27-06.5	27-06.4	27-06.3	27-06.2
line set	Long. (E)	141-56.5	141-57.1	141-57.7	141-58.1	141-58.5	141-58.9
Time	Line set	0619	0625	0631	0636	0642	0646
(S.M.T.)	Line haul	0832-1048					
Length of main line(m)		600	500	600	500	600	500
Depth(m)		1352-1734					
Surface temp. (°C)		22.5					
Wether		bc					
Wind		NW-3					
Bigeye tuna		1			1		
Blue shark					1		
No. of research		OSVL 1405-01	OSVL 1405-02	OSVL 1405-03	OSVL 1405-04	OSVL 1405-05	OSVL 1405-06
Date		12-Dec					
position of	Lat. (N)	27-05.5	27-05.6	27-05.8	27-05.9	27-06.0	27-06.1
line set	Long. (E)	141-50.8	141-51.1	141-51.5	141-51.9	141-52.2	141-52.5
Time	Line set	1204	1209	1215	1221	1226	1231
(S.M.T.)	Line haul	1351-1558					
Length of main line(m)		600	600	500	500	500	500
Depth(m)		-					
Surface temp. (°C)		22.4					
Wether		b					
Wind		WSW-3					
Diamondback squid				1			
Bigeye tuna		1	1				
Thresher shark							1
No. of research		OSVL 1406-01	OSVL 1406-02	OSVL 1406-03	OSVL 1406-04	OSVL 1406-05	OSVL 1406-06
Date		13-Dec					
position of	Lat. (N)	27-10.0	27-09.7	27-09.4	27-09.2	27-08.9	27-08.7
line set	Long. (E)	141-54.4	141-54.9	141-54.9	141-55.2	141-55.4	141-55.7
Time	Line set	0611	0617	0622	0627	0632	0637
(S.M.T.)	Line haul	0828-1018					
Length of main line(m)		600	600	600	500	500	500
Depth(m)		2080					
Surface temp. (°C)		22.5					
Wether		c					
Wind		NW-4					
Flying squid		1					

S.T. : Surface temperature

Wr.: Weather (r: rain, o: 100% clouded, c: 75-99% clouded, d: drizzling rain, bc: 25-75% clouded)

**THE "OSHORO MARU" CRUISE 010
TO SAGAMI-WAN, TATEYAMA-WAN, and TOHOKU OFF**

IN DECEMBER 2014

1. Cruise Itinerary

Cruise 010

Departure from Tokyo	December 18	2014
Hydrographic research (OS14175-OS14177)	19	
Return to Tokyo	20	
Departure from Tokyo	21	
Hydrographic research (OS14178, OS14179)	22	
Return to Hakodate	24	
Total coverage 786.2 miles		

2. Vessel Personnel

Crew:	Captain:	Associate Professor	Shogo Takagi
			And 29 persons

Undergraduate instructor: Leg1

Professor (Laboratory of Coastal Marine Biology and ecology, Kitasato University)	Ryusuke Kado
Junior Associate Professor (Department of Marine Biochemical Resources, Kitasato University)	Ko Yasumoto
Specially Appointed Associate Professor (School of Fisheries Sciences, Hokkaido University)	Mituhiko Nakaya
PR manager:	1 person
Teaching Assistant:	3 persons
Undergraduate Students:	58 persons

Undergraduate instructor: Leg2

Professor (Laboratory of Coastal Marine Biology and ecology, Kitasato University)	Ryusuke Kado
Junior Associate Professor (Laboratory of Coastal Marine Biology and ecology, Kitasato University)	Yuichiro Yamada
Teaching Assistant:	2 persons
Undergraduate Students:	39 persons
Technical staff:	2 persons
Total 106 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.

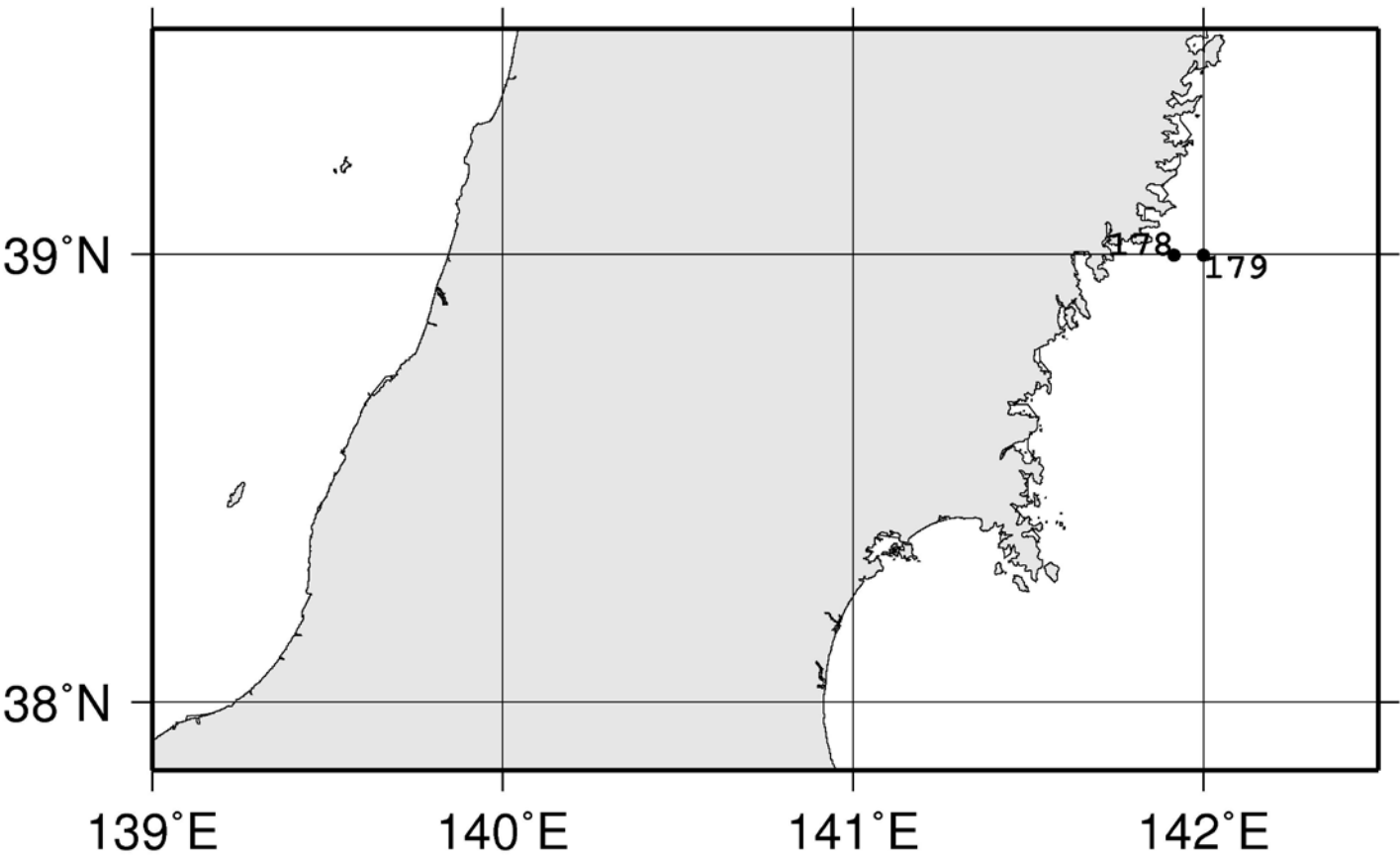


Fig.-1 Oceanographic stations

Table 1. List of Oceanographic station

Station	Lat.	Long.	Date (GMT)	Hour (GMT)	T.Z.	Depth	Col.	Tr.	SST	Wr.	Gear
OS14178	38 59.96 N	141 54.99 E	12/22	21:40	9	139			11.9	s	19p-4636
OS14179	38 59.91 N	141 59.96 E	12/22	22:25	9	201			11.8	s	19p-4636

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

Table 2. Oceanographic data

Latitude 38-59.96N				Station OS14179			
Longitude 141-54.99E				Latitude 38-59.91N			
Depth(m) 139.1				Longitude 141-59.96E			
				Depth(m) 200.5			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
10	11.733	33.962	25.833	10	11.589	33.972	25.867
20	11.735	33.962	25.832	20	11.576	33.971	25.869
30	11.736	33.962	25.832	30	11.571	33.971	25.870
50	11.749	33.962	25.830	50	11.539	33.969	25.875
75	11.764	33.963	25.828	75	11.354	33.974	25.913
100	11.757	33.962	25.829	100	11.247	33.969	25.928
				150	11.212	33.961	25.928