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THE "OSHORO 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

Press.	Temp.	Sal.	SIG-T
5	4.701	32.882	26.029
10	4.621	32.892	26.046
20	4.431	32.929	26.095
30	3.412	32.900	26.172
40	2.698	33.001	26.315
50	2.228	33.005	26.356
75	1.728	33.027	26.410
100	1.304	33.018	26.432
125	1.516	33.169	26.539
150	2.113	33.407	26.687
175	2.220	33.499	26.752
200	2.326	33.560	26.792
250	2.641	33.675	26.859
300	2.821	33.761	26.912
400	3.082	33.945	27.036
500	3.151	34.086	27.142
600	3.042	34.183	27.229
700	2.920	34.268	27.308
800	2.721	34.308	27.357
900	2.693	34.358	27.400
1000	2.579	34.397	27.441
1200	2.377	34.447	27.498
1500	2.166	34.512	27.568

Station OS14079
Latitude 44-0.05N
Longitude 154-59.98E
Depth(m) 5300

Press.	Temp.	Sal.	SIG-T
5	4.351	32.999	26.159
10	4.344	33.000	26.160
20	4.220	32.994	26.169
30	3.742	32.999	26.219
40	3.622	33.025	26.252
50	3.457	33.040	26.279
75	2.930	33.085	26.363
100	3.475	33.206	26.410
125	3.632	33.330	26.494
150	3.767	33.485	26.604
175	3.349	33.548	26.694
200	3.303	33.603	26.742
250	3.866	33.780	26.829
300	4.051	33.899	26.905
400	3.504	33.979	27.023
500	3.441	34.091	27.119
600	3.442	34.207	27.211
700	3.274	34.268	27.276
800	3.104	34.314	27.328
900	2.812	34.347	27.380
1000	2.693	34.382	27.419
1200	2.512	34.453	27.491
1500	2.231	34.509	27.560

Station OS14082
Latitude 43-30.12N
Longitude 154-59.68E
Depth(m) 5466

Press.	Temp.	Sal.	SIG-T
5	4.670	32.977	26.108
10	4.663	32.976	26.108
20	3.715	32.981	26.208
30	3.471	33.020	26.262
40	3.113	33.046	26.316
50	2.806	33.042	26.339
75	3.112	33.171	26.416
100	5.139	33.515	26.482
125	3.121	33.357	26.563
150	3.258	33.542	26.698
175	3.675	33.608	26.711
200	3.794	33.660	26.741
250	3.716	33.752	26.822
300	2.784	33.705	26.871
400	3.552	33.973	27.014
500	3.566	34.090	27.105

Station OS14083
Latitude 43-14.91N
Longitude 154-59.95E
Depth(m) 5486

Press.	Temp.	Sal.	SIG-T
5	4.477	32.952	26.109
10	4.465	32.951	26.109
20	3.129	32.962	26.247
30	2.614	32.993	26.316
40	2.440	32.999	26.335
50	2.266	33.009	26.357
75	2.411	33.081	26.403
100	3.215	33.302	26.510
125	3.387	33.390	26.565
150	2.754	33.397	26.627
175	2.029	33.411	26.696
200	2.893	33.551	26.738
250	2.257	33.555	26.794
300	2.569	33.661	26.853
400	4.236	34.031	26.991
500	3.531	34.056	27.082
600	3.449	34.162	27.175
700	3.105	34.225	27.257
800	3.239	34.317	27.317
900	2.883	34.325	27.357
1000	2.829	34.387	27.411
1200	2.495	34.441	27.483
1500	2.291	34.512	27.557

Station OS14084
Latitude 42-30.14N
Longitude 155-0.26E
Depth(m) 5150

Press.	Temp.	Sal.	SIG-T
5	4.688	32.975	26.104
10	4.679	32.977	26.106
20	4.704	33.016	26.135
30	3.346	33.118	26.352
40	3.050	33.142	26.398
50	4.226	33.325	26.431
75	4.861	33.459	26.469
100	5.764	33.621	26.492
125	5.167	33.574	26.525
150	2.433	33.303	26.578
175	2.428	33.383	26.643
200	3.682	33.615	26.716
250	2.957	33.626	26.792
300	2.553	33.632	26.832
400	4.252	34.011	26.973
500	4.316	34.144	27.073
600	3.197	34.110	27.156
700	3.612	34.271	27.246
800	3.375	34.320	27.308
900	3.118	34.359	27.362
1000	2.827	34.377	27.403
1200	2.581	34.435	27.471
1500	2.314	34.501	27.547

Station OS14085
Latitude 41-52.58N
Longitude 154-59.52E
Depth(m) 5465

Press.	Temp.	Sal.	SIG-T
5	7.921	33.647	26.223
10	8.304	33.778	26.269
20	9.111	34.061	26.365
30	9.101	34.068	26.372
40	9.046	34.073	26.385
50	9.046	34.072	26.384
75	8.035	33.961	26.452
100	8.191	34.006	26.465
125	7.954	33.968	26.470
150	8.110	34.010	26.480
175	7.991	33.997	26.487
200	7.657	33.949	26.499
250	6.281	33.828	26.591
300	3.790	33.590	26.685
400	3.127	33.704	26.839
500	2.984	33.842	26.962
600	3.164	34.000	27.072
700	3.532	34.167	27.170
800	3.375	34.260	27.259
900	3.236	34.321	27.321
1000	3.011	34.357	27.370
1200	2.743	34.422	27.447
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.

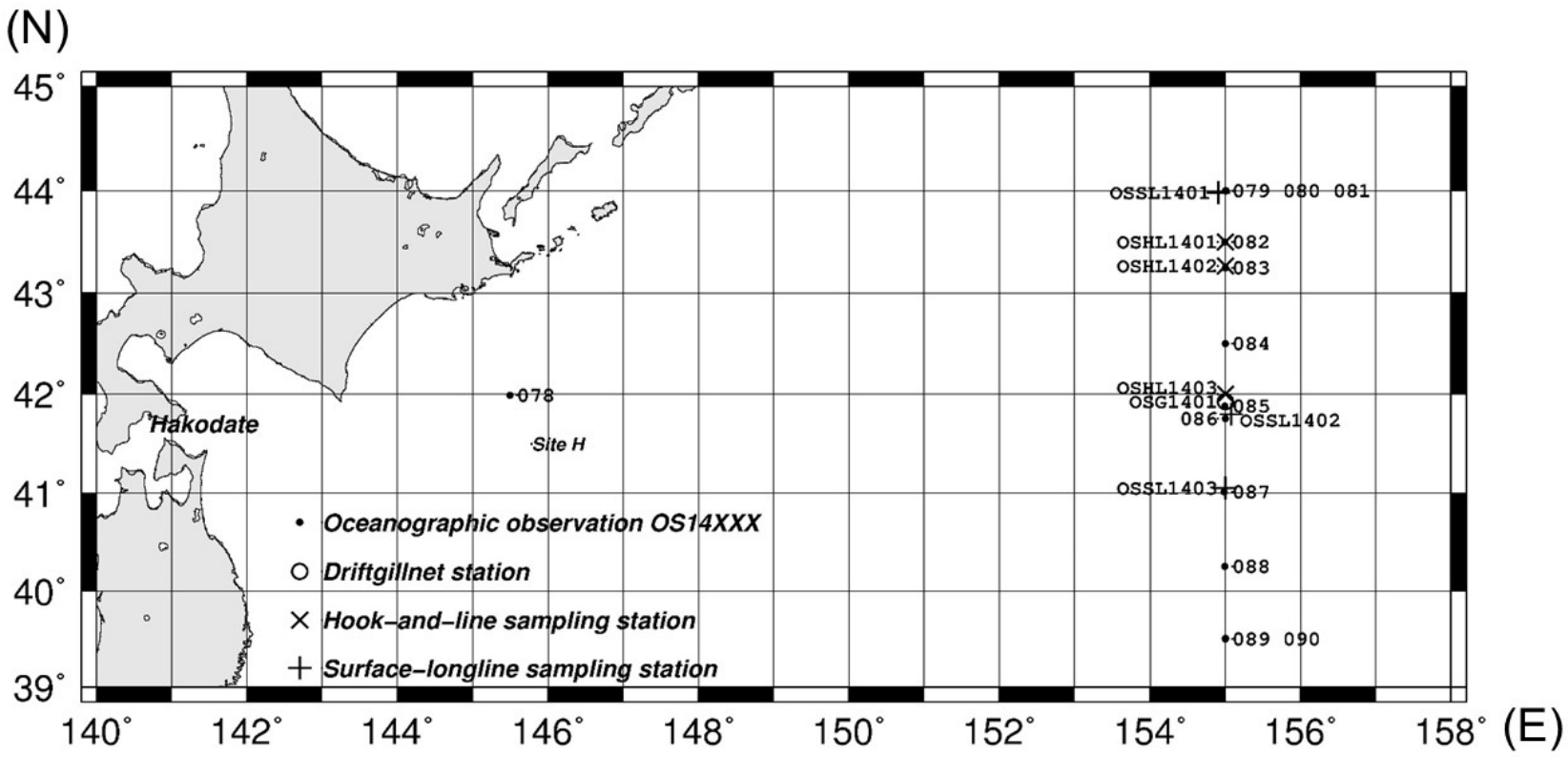

Fig.-2

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. (℃)
	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. (℃)
	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 mumerical catch per tan and percentage of total catch by C-gear gillnet at the station, respectively.

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