



HOKKAIDO UNIVERSITY

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THE “OSHORU MARU” CRUISE 198
TO THE NORTHWEST PACIFIC OCEAN

IN FEBRUARY TO MARCH 2009

1. Cruise Itinerary

Cruise 198

Departure from Hakodate	Feb. 27	, 2009
Start hydrographic research (OS09003)	28	
Finish hydrographic research (OS09011)	Mar. 6	
Return to Hakodate	8	

Total coverage 1653.7 miles

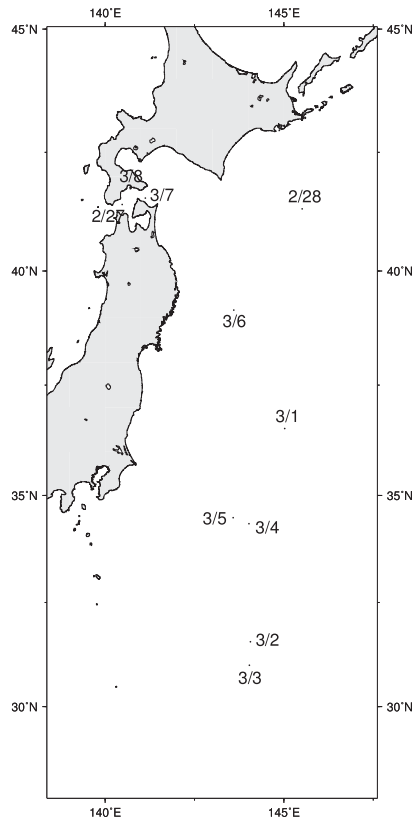


Figure 1: Noon position

2. Vessel Personnel

Captain:		Professor	Toshimi Meguro
Crew :	First Officer	Associate Professor	Shogo Takagi
	Second Officer	Instructor	Yoshihiko Kamei
	Jr. Second Officer	Instructor	Keiichiro Sakaoka
	Chief Engineer	Instructor	Jyunichi Kimura
	And 24 men		

Cruise 198

Research Staff:	Associate Professor	(Laboratory of Marine Biodiversity)	Atsushi Yamaguchi
	Graduate Students		2 persons
	Under Graduate Students		3 persons
	Total		35 persons

3. Items of Research

Hydrographic observations: Fig. 2 Table 1,2

Plankton sampling collected by vertical hauls with a single or twin NORPAC net: Fig. 2 Table 3,4

4. Data on Temperature, Salinity, and Computed Dynamic Depth Anomaly

Hydrographic work on deck and the data processing were made by the deck officers, crews, research staff and cadets of the “Oshoro Maru”.

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

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

Table 1: List of Oceanographic Stations

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS09003	41-30.2N	145-46.9E	2/28	0630	9	6918	5	16.2	2.8	b	9Plus-1588
OS09004	31-00.4N	144-03.1E	3/3	1100	9	5777	4	19	19.4	bc	9Plus-1588
OS09005	31-43.0N	143-57.8E	3/3	1815	9	5726	-	-	18.2	c	9Plus-1588
OS09006	32-29.9N	144-00.0E	3/4	0005	9	5384	-	-	18.1	-	9Plus-1588
OS09007	34-45.1N	144-00.0E	3/4	1301	9	5615	4	20.1	17.9	c	9Plus-1588
OS09008	36-59.8N	144-00.1E	3/5	1444	9	6090	3	21	11.6	bc	9Plus-1588
OS09009	37-47.6N	143-59.4E	3/5	2055	9	7030	-	-	13.3	c	9Plus-1588
OS09010	38-30.0N	143-59.8E	3/6	0500	9	7035	4	31.3	12.6	bc	9Plus-1588
OS09011	39-14.5N	143-60.0E	3/6	1021	9	5100	-	-	12.9	c	9Plus-1588

(*):Fixed position by Global Positioning system

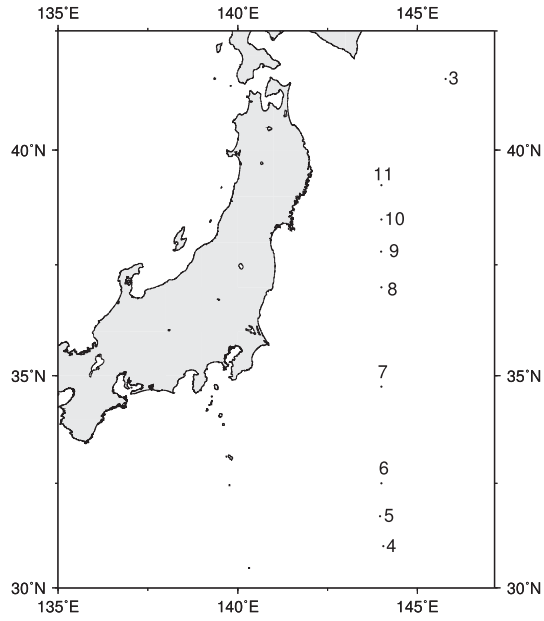


Figure 2: Oceanographic stations

Table 2: Oceanographic data

Station		OS09003	
Longitude		41-30.2N	
Latitude		145-46.9E	
Depth(m)		6918	
Press.	Temp.	Sal.	SIG-T
5	2.725	33.276	26.533
10	2.729	33.276	26.532
20	2.733	33.276	26.532
30	2.735	33.276	26.532
40	2.730	33.275	26.532
50	2.716	33.274	26.532
75	2.685	33.276	26.536
100	3.108	33.349	26.558
125	2.812	33.391	26.617
150	2.280	33.416	26.681
200	2.682	33.539	26.746
250	2.650	33.607	26.803
300	2.880	33.701	26.859
400	3.096	33.855	26.962
500	3.305	33.987	27.048
600	3.076	34.070	27.136
700	2.998	34.154	27.210
800	2.874	34.226	27.279
900	2.842	34.290	27.332
1000	2.834	34.358	27.387
1200	2.624	34.434	27.466
1500	2.335	34.506	27.549
2000	1.996	34.583	27.637
2500	1.755	34.627	27.692
3000	1.611	34.654	27.724

Station		OS09004	
Longitude		31-00.4N	
Latitude		144-03.1E	
Depth(m)		5777	
Press.	Temp.	Sal.	SIG-T
5	19.950	34.694	24.543
10	19.949	34.694	24.543
20	19.952	34.694	24.542
30	19.953	34.694	24.542
40	19.954	34.694	24.542
50	19.952	34.694	24.542
75	19.628	34.706	24.636
100	18.639	34.613	24.818
125	18.594	34.632	24.843
150	18.471	34.640	24.881
200	18.327	34.767	25.014
250	17.440	34.755	25.222
300	16.796	34.719	25.348
400	14.296	34.541	25.771
500	11.437	34.350	26.190
600	7.997	34.091	26.561
700	5.656	34.018	26.819
800	4.818	34.102	26.984
900	4.284	34.187	27.110
1000	3.864	34.268	27.218

Station		OS09005	
Longitude		31-43.0N	
Latitude		143-57.8E	
Depth(m)		5726	
Press.	Temp.	Sal.	SIG-T
5	18.430	34.662	24.908
10	18.433	34.662	24.907
20	18.436	34.662	24.907
30	18.434	34.661	24.906
40	18.438	34.662	24.906
50	18.435	34.662	24.907
75	18.444	34.661	24.904
100	18.427	34.660	24.907
125	18.269	34.658	24.945
150	18.224	34.665	24.961
200	18.190	34.684	24.984
250	17.372	34.754	25.237
300	16.690	34.717	25.371
400	14.637	34.564	25.715
500	11.934	34.385	26.124
600	9.102	34.175	26.456
700	6.288	34.018	26.740
800	5.168	34.062	26.913
900	4.435	34.161	27.073
1000	3.947	34.276	27.216

Station		OS09006	
Longitude		32-29.9N	
Latitude		144-00.0E	
Depth(m)		5384	
Press.	Temp.	Sal.	SIG-T
5	18.472	34.658	24.894
10	18.485	34.658	24.891
20	18.488	34.657	24.889
30	18.486	34.657	24.890
40	18.488	34.657	24.890
50	18.489	34.657	24.889
75	18.496	34.657	24.887
100	18.502	34.657	24.886
125	18.508	34.657	24.885
150	18.503	34.657	24.885
200	18.414	34.649	24.902
250	18.341	34.731	24.983
300	17.446	34.749	25.216
400	15.948	34.653	25.494
500	13.155	34.466	25.948
600	10.553	34.304	26.313
700	8.030	34.190	26.633
800	5.622	34.090	26.881
900	5.073	34.230	27.057
1000	4.293	34.269	27.174

Station		OS09007	
Longitude		34-45.1N	
Latitude		144-00.0E	
Depth(m)		5615	
Press.	Temp.	Sal.	SIG-T
5	18.052	34.641	24.985
10	18.051	34.641	24.985
20	18.042	34.643	24.990
30	18.044	34.653	24.997
40	18.046	34.662	25.003
50	18.042	34.671	25.011
75	18.039	34.675	25.014
100	18.037	34.677	25.017
125	18.021	34.678	25.021
150	18.005	34.677	25.025
200	18.008	34.679	25.025
250	17.940	34.728	25.079
300	17.193	34.743	25.272
400	14.986	34.588	25.658
500	12.392	34.404	26.052
600	9.396	34.183	26.415
700	7.521	34.188	26.706
800	5.992	34.203	26.924
900	4.981	34.239	27.074
1000	4.052	34.254	27.187

Station		OS09008	
Longitude		36-59.8N	
Latitude		144-00.1E	
Depth(m)		6090	
Press.	Temp.	Sal.	SIG-T
5	12.153	34.338	26.047
10	12.156	34.339	26.047
20	12.154	34.339	26.047
30	12.151	34.339	26.048
40	12.144	34.340	26.049
50	12.146	34.339	26.049
75	12.141	34.340	26.050
100	12.140	34.339	26.050
125	12.137	34.338	26.050
150	12.124	34.337	26.051
200	10.316	34.185	26.262
250	8.039	33.970	26.459
300	6.923	33.994	26.637
400	5.347	34.009	26.849
500	4.093	34.002	26.983
600	4.254	34.191	27.117
700	3.911	34.257	27.204
800	3.485	34.294	27.276
900	3.113	34.338	27.346
1000	2.978	34.395	27.404

Station		OS09009	
Longitude		37-47.6N	
Latitude		143-59.4E	
Depth(m)		7030	
Press.	Temp.	Sal.	SIG-T
5	13.457	34.471	25.892
10	13.461	34.471	25.891
20	13.459	34.471	25.891
30	13.455	34.469	25.890
40	13.441	34.467	25.892
50	13.177	34.430	25.917
75	13.053	34.427	25.939
100	13.024	34.428	25.945
125	12.997	34.426	25.950
150	12.512	34.343	25.980
200	12.071	34.308	26.039
250	10.069	34.218	26.330
300	8.035	34.028	26.506
400	6.346	34.060	26.766
500	5.080	34.062	26.922
600	4.052	34.115	27.077
700	3.889	34.233	27.187
800	3.308	34.281	27.283
900	3.325	34.376	27.357
1000	3.126	34.407	27.401

Station		OS09010	
Longitude		38-30.0N	
Latitude		143-59.8E	
Depth(m)		7035	
Press.	Temp.	Sal.	SIG-T
5	12.820	34.385	25.953
10	12.830	34.384	25.950
20	12.832	34.384	25.950
30	12.833	34.384	25.950
40	12.834	34.384	25.949
50	12.832	34.384	25.949
75	12.835	34.384	25.949
100	12.845	34.384	25.947
125	12.851	34.384	25.946
150	12.853	34.383	25.945
200	12.863	34.385	25.944
250	12.867	34.385	25.943
300	11.135	34.233	26.154
400	7.627	34.031	26.568
500	4.701	33.855	26.801
600	3.767	33.889	26.926
700	4.418	34.143	27.060
800	4.369	34.297	27.188
900	3.875	34.345	27.278
1000	3.499	34.367	27.333

Station		OS09011	
Longitude		39-14.5N	
Latitude		143-60.0E	
Depth(m)		5100	
Press.	Temp.	Sal.	SIG-T
5	13.196	34.460	25.936
10	13.199	34.459	25.935
20	13.197	34.460	25.935
30	13.199	34.459	25.935
40	13.167	34.455	25.938
50	13.183	34.458	25.937
75	13.143	34.453	25.941
100	13.072	34.440	25.945
125	13.044	34.440	25.951
150	13.041	34.441	25.952
200	11.166	34.249	26.161
250	9.439	34.099	26.343
300	8.790	34.178	26.508
400	5.963	33.988	26.757
500	3.956	33.861	26.885
600	4.973	34.178	27.027
700	3.929	34.180	27.141
800	3.380	34.218	27.225
900	3.319	34.300	27.297
1000	3.052	34.347	27.359
1200	2.683	34.434	27.461
1500	2.373	34.504	27.544
2000	1.958	34.593	27.649
2500	1.710	34.636	27.702
3000	1.580	34.659	27.730

5. Data on plankton collected by vertical hauls with a single or twin NORPAC net

Vertical hauls with a twin-NORPAC net were made at hydrographic stations. This net was composed of 45 cm mouth diameter and 180 cm long conical one which was made of GG54 and XX13 having 0.33 mm and 0.10 mm mesh, respectively. The net was lowered to the estimated depth of 150 m, 500 m or near the bottom when the bottom depth was shallower than 150 m, and immediately hauled to the surface at a speed about 1 m s⁻¹. A flowmeter was mounted at the center of mouth of the net to estimate the volume water filtered. Sampling was conducted by research staffs and measurement of wet weight of the samples were made by A. Yamaguchi, K. Ishii, K. Matsuno, R. Saito, K. Ohgi, Y. Onishi, T. Homma, R. Ohashi, C. Tsukazaki and K. Mishima (Laboratory of Marine Biology).

Table 3: Data on plankton collected by vertical hauls with a single or twin NORPAC net.

GG54:0.33mm mesh, XX13:0.10mm mesh.

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)	Wet weight (g)		Sample no.
	Lat. (N)	Lon.	Date	Hour					No.	Reading		per haul	per 1000 m ³	
OS09003 (Site H)	41-31	145-48 E	28 Feb.	8:45	151	6	150	GG54	1479	1563	23.02	1.7	72	09001
								XX13	2446	1537	22.63			09002
				8:56	511	12	500	GG54	1479	5218	76.84	19.4	253	09003
								XX13	2446	5078	74.78			09004
OS09004	31-00	144-00 E	3 Mar.	7:46	151	5	150	GG54	1479	1338	19.70	1.6	79	09005
								XX13	2446	1898	27.95			09006
OS09005	31-45	144-00 E	3 Mar.	17:29	157	17	150	GG54	1479	1830	26.95	1.0	37	09007
								XX13	2446	1825	26.88			09008
OS09006	32-30	144-00 E	4 Mar.	0:53	150	0	150	GG54	1479	1830	26.95	1.2	46	09009
								XX13	2446	1855	27.32			09010
OS09007	34-45	144-00 E	4 Mar.	14:10	150	4	150	GG54	1479	1880	27.69	0.6	23	09011
								XX13	2446	2270	33.43			09012
OS09008	37-00	144-00 E	5 Mar.	15:42	151	8	150	GG54	1479	1520	22.38	0.5	23	09013
								XX13	2446	1788	26.33			09014
OS09009	37-47	144-00 E	5 Mar.	22:15	150	4	150	GG54	1479	1781	26.23	10.2	390	09015
								XX13	2446	2138	31.48			09016
OS09010	38-30	144-00 E	6 Mar.	6:21	155	13	151	GG54	1479	1760	25.92	0.5	21	09017
								XX13	2446	1762	25.95			09018

1) Exclusively phytoplankton

2) Including some fragments of medusae.

3) *Neocalanus* abundant.

4) Gelatinous zooplankton abundant.

5) Salpida abundant.

6) Chaetognaths abundant.

6. Data on calibration of flowmeters

Flowmeters used for plankton nets were calibrated once in the cruise.

Table 4. Calibration data on flowmeters used for a twin or single NORPAC net and other kind of nets. 50-m wire out at St. OS09010 in 6 Mar. 2009.

Flowmeter No.	Wire length (m)	Revolution						Mean
		1	2	3	4	5	6	
RG1479	50	830*	718	738	658	610*	650	691
RG2446	50	728*	689	680	642	592*	631	661

*: omitted from calculation