



Title	8. The "Ushio Maru" Cruise 206, 207 and 208 in October 2010
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THE " USHIO MARU "

CRUISE 206

CRUISE 207

CRUISE 208

IN OCTOBER 2010

1. Cruise Itinerary

Cruise 206

Departure from Hakodate	Oct.	4 ,	2010
Start hydrographic research (US10490)		5	
Arrival at and departure from Kushiro		6	
Finish hydrographic research (US10498)		7	
Return to Hakodate		8	

Total coverage 455.6 miles

Cruise 207

Departure from Hakodate	Oct.	12 ,	2010
Start hydrographic research (US10499)		13	
Start tuna long-line research		13	
Finish tuna long-line research		14	
Finish hydrographic research (US10503)		14	
Return to Hakodate		15	

Total coverage 251.6 miles

Cruise 208

Departure from Hakodate	Oct.	20 ,	2010
Retrieval Sediment trap system		20	
Start hydrographic research (US10504)		20	
Arrival at Mori		20	
Departure from Mori		21	
Set mooring ADCP system		21	
Arrival at Mori		21	
Departure from Mori		22	
Arrival at Usujiri		22	
Departure from Usujiri		23	
Arrival at and departure from Usujiri		23	
Finish hydrographic research (US10544)		23	
Return to Hakodate		24	

Total coverage 324.7 miles

2. Vessel Personnel

Captain:		Professor	Toshimi Meguro
Crew:	Chief Officer	Assistant Professor	Osamu Kimura
	Second Officer	Assistant Professor	Naoto Kobayashi
	And 13 men		

Cruise 206

Under Graduate Students:	Department of Marine Biology:	1 person
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Cruise 207

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Susumu Shimizu
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Graduate Students:	Chair of Marine Bioresource and Environment Sensing:	1 person
Under Graduate Students:	Department of Applied Marine Science:	1 person
	Department of Marine Production System Science:	1 person

Cruise 208

Research Staff:	Professor	(Laboratory of Marine Environmental Science)	Kenshi Kuma
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Tohru Hirawake
	Postdoctoral fellow	(Faculty of Fisheries Sciences)	Tomonori Isada

Guest Scientist (Domestic):	(Ehime University)	Michinobu Kuwae
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Research Students:	Faculty of Fisheries Sciences:	1 person
Graduate Students:	Chair of Marine Environmental Science:	2 persons
	Chair of Marine Bioresource and Environment Sensing	1 person
	Graduate School of Environmental Science:	1 person
Under Graduate Students:	Department of Marine Biology:	6 persons
	Department of Applied Marine Science:	2 persons

3. 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 “Ushio Maru”. Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19). Dynamic computations were made using a desk-top computer aboard the “Ushio Maru”.

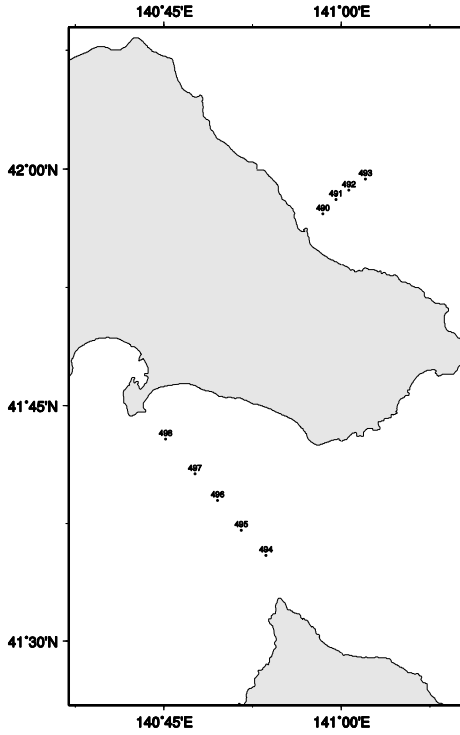


Figure 1: Oceanographic stations (Cruise 206)

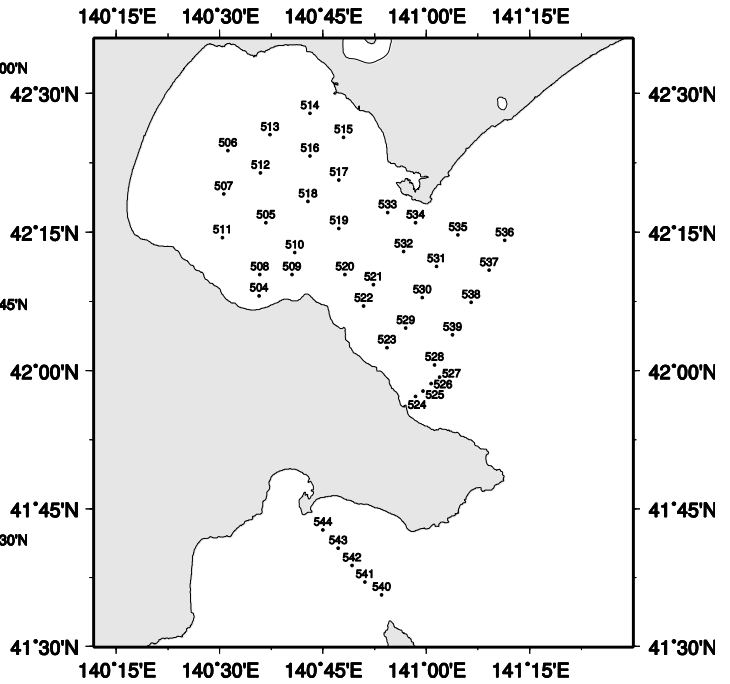


Figure 3: Oceanographic stations (Cruise 208)

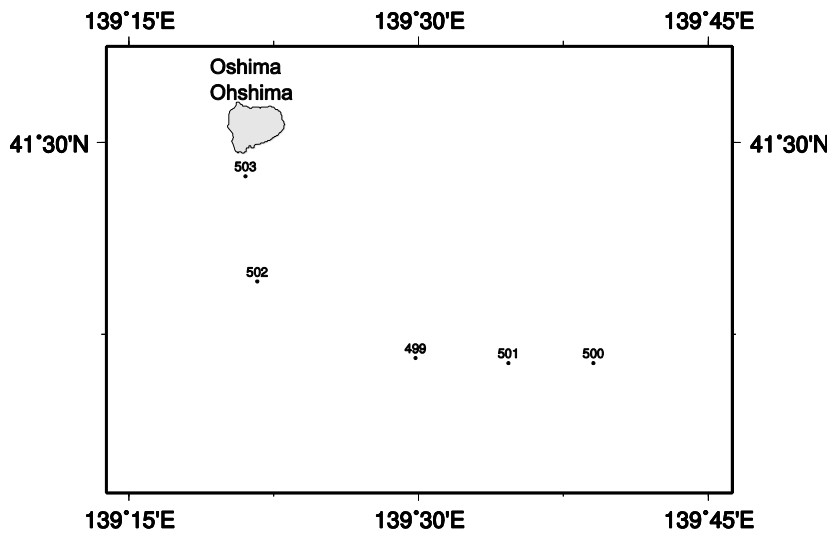


Figure 2: Oceanographic stations (Cruise 207)

Table 1: List of oceanographic stations

Cruise 206												
Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10490	41-57.2	140-58.4	40456	1030-1034	79	NNW-3	East-1	NNW-5	18.5	17.2	bc	1007.5
US10491	41-58.1	140-59.5	40456	1042-1046	86	NNW-3	East-1	NNW-5	19.2	17.4	bc	1007.3
US10492	41-58.7	141-00.6	40456	1054-1058	94	NNW-3	East-1	NNW-5	19.5	17.5	bc	1007.5
US10493	41-59.4	141-02.0	40456	1106-1110	101	NNW-2	East-1	NNW-4	19.4	17.2	bc	1007.4
US10494	41-35.5	140-53.6	40458	0938-0941	54	East-2	East-1	East-4	19.8	22.4	bc	1024.6
US10495	41-37.1	140-51.5	40458	1000-1005	140	East-2	East-1	East-4	18.9	21.9	bc	1024.6
US10496	41-39.0	140-49.5	40458	1022-1033	285	East-2	East-1	East-4	18.6	21.5	bc	1024.6
US10497	41-40.7	140-47.6	40458	1051-1058	233	East-2	East-1	East-4	18.8	21.7	bc	1024.6
US10498	41-42.9	140-45.1	40458	1117-1120	83	East-2	East-1	East-4	18.8	20.1	bc	1024.6

Cruise 207												
Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10500	41-21.4	139-39.0	10/13	0205-0212	1586	North-2	SW -1	North-4	18.9	20.9	bc	1012.6
US10500	41-21.4	139-39.0	10/13	0403-0412	255	North-2	North-1	North-4	18.9	21.2	bc	1012.7
US10501	41-21.4	139-34.6	10/13	1040-1049	359	North-3	North-1	North-5	19.3	20.8	bc	1013.1
US10502	41-24.6	139-21.6	10/14	0813-0819	2058	North-3	North-2	North-5	15.9	20.4	bc	1015.6
US10503	41-28.7	139-21.0	10/14	1055-1100	725	NE -2	NE -1	NE -4	15.8	20.4	bc	1014.6

Cruise 208												
Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10504	42-08.2	140-35.6	10/20	1548-1550	58	ENE-1	East-1	ENE-3	13.4	16.3	c	1022.7
US10505	42-16.1	140-36.6	10/21	0727-0732	89	North-1	NW -1	North-4	12.9	16.3	bc	1020.1
US10506	42-23.9	140-31.1	10/21	0858-0904	94	NW -2	NW -1	NW -4	13.0	16.7	bc	1020.6
US10507	42-19.2	140-30.5	10/21	1008-1014	92	North-1	NW -1	North-2	14.7	16.8	bc	1020.6
US10508	42-10.5	140-35.7	10/22	0647-0650	76	SSW-1	East-1	SSW-2	9.6	16.0	bc	1024.3
US10509	42-10.5	140-40.4	10/22	0711-0714	84	SSW-1	East-1	SSW-2	11.3	16.1	bc	1024.2
US10510	42-12.9	140-40.8	10/22	0731-0735	89	SW -1	East-1	SW -3	12.4	16.3	bc	1024.6
US10511	42-14.5	140-30.3	10/22	0916-0919	81	NW -1	East-1	NW -2	12.3	16.6	bc	1025.1
US10512	42-21.5	140-35.8	10/22	1055-1059	89	Calm	ESE-1	Calm	14.2	16.6	bc	1025.1
US10513	42-25.6	140-37.2	10/22	1126-1130	83	SSE-1	ESE-1	SSE-2	14.1	16.8	bc	1025.1
US10514	42-27.9	140-43.0	10/22	1158-1202	61	Calm	ESE-1	Calm	14.6	16.7	bc	1024.8
US10515	42-25.3	140-47.9	10/22	1229-1232	46	Calm	ESE-1	Calm	15.1	16.7	bc	1024.5
US10516	42-23.3	140-43.0	10/22	1258-1301	59	Calm	ESE-1	Calm	15.4	16.9	bc	1024.1
US10517	42-20.7	140-47.2	10/22	1327-1330	56	ESE-1	ESE-1	ESE-2	15.3	16.8	bc	1023.7
US10518	42-18.4	140-42.7	10/22	1355-1358	62	SE -1	ESE-1	SE -3	15.9	16.6	bc	1023.7
US10519	42-15.5	140-47.2	10/22	1428-1432	72	ESE-2	ESE-1	ESE-3	15.0	16.4	bc	1023.6
US10520	42-10.5	140-48.1	10/22	1503-1507	93	ESE-2	ESE-1	ESE-3	15.7	16.5	bc	1023.6
US10521	42-09.4	140-52.2	10/22	1528-1532	76	ESE-2	ESE-1	ESE-3	15.6	16.7	bc	1023.7
US10522	42-07.1	140-50.8	10/22	1548-1552	76	SE -1	ESE-1	SE -3	15.7	16.5	bc	1023.7
US10523	42-02.6	140-54.2	10/22	1623-1626	75	South-1	ESE-1	South-3	14.6	16.8	bc	1023.8
US10524	41-57.3	140-58.3	10/23	0602-0605	78	Calm	East-1	Calm	10.4	16.0	bc	1024.5
US10525	41-57.9	140-59.4	10/23	0611-0615	85	Calm	East-1	Calm	12.1	15.9	bc	1024.5
US10526	41-58.7	141-00.6	10/23	0624-0627	92	West-1	East-1	West-2	12.5	16.1	bc	1024.6
US10527	41-59.4	141-01.8	10/23	0636-0640	99	West-1	East-1	West-2	12.7	17.0	bc	1024.7
US10528	42-00.7	141-01.1	10/23	0650-0652	92	WNW-1	East-1	WNW-3	13.3	17.0	bc	1024.7
US10529	42-04.7	140-56.9	10/23	0751-0759	83	West-1	East-1	West-3	13.1	17.2	bc	1024.8
US10530	42-08.0	140-59.3	10/23	0841-0845	82	NW -1	East-1	NW -3	14.9	16.8	bc	1025.1
US10531	42-11.4	141-01.4	10/23	0910-0914	78	NW -1	ESE-1	NW -3	14.9	16.6	bc	1025.1
US10532	42-13.0	140-56.6	10/23	0939-0942	69	NW -1	ESE-1	NW -3	14.2	16.8	bc	1025.1
US10533	42-17.2	140-54.3	10/23	1010-1013	56	NW -1	ESE-1	NW -3	13.9	16.6	bc	1025.1
US10534	42-16.1	140-58.3	10/23	1032-1035	62	NW -1	ESE-1	NW -2	15.6	16.6	bc	1025.1
US10535	42-14.8	141-04.5	10/23	1103-1107	78	NW -1	ESE-1	NW -3	16.3	16.4	bc	1024.7
US10536	42-14.2	141-11.3	10/23	1136-1141	111	West-1	ESE-1	West-3	17.2	16.5	bc	1024.5
US10537	42-11.0	141-09.0	10/23	1203-1207	108	WNW-1	ESE-1	WNW-3	15.4	16.5	bc	1024.1
US10538	42-07.5	141-06.4	10/23	1233-1238	105	NW -1	ESE-1	NW -2	16.8	15.5	bc	1024.0
US10539	42-04.0	141-03.7	10/23	1301-1305	99	Calm	ESE-1	Calm	15.4	16.9	bc	1023.2
US10540	41-35.7	140-53.4	10/23	1733-1735	58	SW -2	East-1	SW -4	17.7	20.4	bc	1023.0
US10541	41-37.1	140-51.0	10/23	1751-1754	94	WSW-2	East-1	WSW-4	17.8	20.7	bc	1023.1
US10542	41-38.9	140-49.1	10/23	1809-1821	343	NW -2	East-1	NW -4	16.9	20.4	bc	1023.1
US10543	41-40.8	140-47.1	10/23	1836-1843	219	NW -1	East-1	NW -3	16.6	19.9	bc	1023.1
US10544	41-42.8	140-44.9	10/23	1900-1905	84	NW -1	East-1	NW -3	16.2	19.9	bc	1023.2

(*) Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US10490				STATION US10491				STATION US10492			
LATITUDE	41-57.2	N		LATITUDE	41-58.1	N		LATITUDE	41-58.7	N	
LONGITUDE	140-58.4	E		LONGITUDE	140-59.5	E		LONGITUDE	141-00.6	E	
DEPTH (m)	79			DEPTH (m)	86			DEPTH (m)	94		
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	17.417	33.223	24.052	5	17.674	33.256	24.016	5	17.657	33.225	23.996
10	17.270	33.227	24.090	10	17.661	33.259	24.021	10	17.635	33.223	24.000
20	15.797	33.342	24.518	20	17.511	33.481	24.227	20	17.354	33.291	24.120
30	14.534	33.444	24.873	30	15.072	33.687	24.944	30	15.510	33.831	24.958
40	12.928	33.171	24.991	40	14.511	33.659	25.044	40	13.736	33.788	25.305
50	11.557	33.051	25.157	50	13.341	33.707	25.323	50	13.045	33.773	25.433
75	8.829	33.079	25.641	75	7.606	33.015	25.772	75	7.542	33.181	25.911

STATION		US10493	
LATITUDE	41-59.4	N	
LONGITUDE	141-02.0	E	
DEPTH (m)	101		
Press.	Temp.	Salinity	Sigma-T
5	17.413	33.296	24.109
10	17.393	33.296	24.114
20	16.853	33.352	24.284
30	13.999	33.644	25.140
40	13.001	33.732	25.411
50	12.620	33.827	25.559
75	10.289	33.717	25.901

STATION		US10494	
LATITUDE	41-35.5	N	
LONGITUDE	140-53.6	E	
DEPTH (m)	54		
Press.	Temp.	Salinity	Sigma-T
5	22.097	33.104	22.751
10	22.135	33.104	22.740
20	21.729	33.205	22.929
30	21.680	33.223	22.956
40	21.519	33.259	23.028
50	21.495	33.266	23.040

STATION		US10495	
LATITUDE	41-37.1	N	
LONGITUDE	140-51.5	E	
DEPTH (m)	140		
Press.	Temp.	Salinity	Sigma-T
5	21.980	33.181	22.842
10	21.648	33.262	22.995
20	21.474	33.308	23.078
30	21.356	33.333	23.129
40	20.027	33.555	23.653
50	17.866	33.903	24.465
75	15.250	34.211	25.309
100	14.929	34.216	25.383

STATION		US10496	
LATITUDE	41-39.0	N	
LONGITUDE	140-49.5	E	
DEPTH (m)	285		
Press.	Temp.	Salinity	Sigma-T
5	21.441	33.388	23.148
10	20.776	33.545	23.447
20	19.854	33.671	23.786
30	19.735	33.679	23.823
40	18.620	33.922	24.293
50	17.881	34.047	24.571
75	15.288	34.138	25.244
100	12.565	34.189	25.850
125	11.833	34.201	26.000
150	11.311	34.202	26.098
175	11.003	34.195	26.148
200	10.528	34.176	26.218
250	10.262	34.178	26.266

STATION		US10497	
LATITUDE	41-40.7	N	
LONGITUDE	140-47.6	E	
DEPTH (m)	233		
Press.	Temp.	Salinity	Sigma-T
5	21.801	33.239	22.936
10	21.624	33.255	22.996
20	20.608	33.457	23.425
30	20.308	33.525	23.556
40	19.653	33.623	23.802
50	18.246	33.780	24.277
75	14.330	34.097	25.419
100	13.288	34.137	25.665
125	11.642	34.155	26.000
150	10.466	34.169	26.223
175	9.925	34.162	26.310
200	9.572	34.164	26.371

STATION		US10498	
LATITUDE	41-42.9	N	
LONGITUDE	140-45.1	E	
DEPTH (m)	83		
Press.	Temp.	Salinity	Sigma-T
5	20.114	33.492	23.582
10	19.968	33.490	23.619
20	19.878	33.496	23.647
30	19.624	33.534	23.741
40	18.935	33.631	23.992
50	16.816	33.843	24.670
75	14.317	34.068	25.401

STATION		US10499	
LATITUDE	41-21.6	N	
LONGITUDE	139-29.8	E	
DEPTH (m)	1586		
Press.	Temp.	Salinity	Sigma-T
5	20.991	33.136	23.078
10	21.012	33.145	23.079
20	21.004	33.144	23.081
30	20.837	33.244	23.202
40	16.559	33.898	24.771
50	15.781	34.308	25.265
75	12.075	34.246	25.989
100	9.478	34.150	26.375
125	7.592	34.096	26.624
150	5.435	34.056	26.876
175	3.862	34.059	27.051
200	2.983	34.066	27.141

STATION		US10500	
LATITUDE	41-21.4	N	
LONGITUDE	139-39.0	E	
DEPTH (m)	255		
Press.	Temp.	Salinity	Sigma-T
5	21.364	32.870	22.775
10	21.389	32.885	22.779
20	21.280	32.961	22.867
30	18.932	33.706	24.050
40	16.855	34.093	24.852
50	14.939	34.267	25.420
75	11.563	34.195	26.046
100	9.142	34.150	26.430
125	7.232	34.098	26.676
150	5.652	34.084	26.872
175	4.273	34.067	27.016
200	2.489	34.066	27.184

STATION		US10501	
LATITUDE	41-21.4	N	
LONGITUDE	139-34.6	E	
DEPTH (m)	359		
Press.	Temp.	Salinity	Sigma-T
5	20.972	33.105	23.059
10	20.971	33.105	23.060
20	20.923	33.134	23.095
30	19.204	33.654	23.941
40	16.144	34.227	25.120
50	14.291	34.255	25.550
75	10.719	34.181	26.188
100	8.586	34.129	26.501
125	6.352	34.084	26.783
150	4.478	34.074	26.999
175	3.467	34.068	27.098

STATION		US10502	
LATITUDE	41-24.6	N	
LONGITUDE	139-21.6	E	
DEPTH (m)	2058		
Press.	Temp.	Salinity	Sigma-T
5	20.527	33.111	23.183
10	20.533	33.114	23.184
20	20.552	33.151	23.207
30	18.195	33.836	24.333
40	16.060	34.238	25.148
50	14.431	34.297	25.553
75	10.884	34.185	26.161
100	8.749	34.135	26.481
125	6.552	34.076	26.751
150	5.359	34.081	26.905

STATION		US10503	
LATITUDE	41-28.7	N	
LONGITUDE	139-21.0	E	
DEPTH (m)	725		
Press.	Temp.	Salinity	Sigma-T
5	20.555	33.067	23.142
10	20.482	33.077	23.169
20	20.413	33.109	23.212
30	20.388	33.187	23.277
40	16.171	34.213	25.103
50	13.358	34.248	25.738
75	10.277	34.165	26.253
100	8.879	34.141	26.465
125	6.720	34.103	26.750

STATION		US10504	
LATITUDE	42-08.2	N	
LONGITUDE	140-35.6	E	
DEPTH (m)	58		
Press.	Temp.	Salinity	Sigma-T
5	16.449	32.392	23.641
10	16.544	32.483	23.689
20	16.833	32.770	23.842
30	16.433	33.188	24.255
40	15.618	33.263	24.497
50	13.952	33.162	24.777

STATION		US10505	
LATITUDE	42-16.1	N	
LONGITUDE	140-36.6	E	
DEPTH (m)	89		
Press.	Temp.	Salinity	Sigma-T
5	16.573	32.897	24.000
10	16.570	32.901	24.004
20	16.557	32.921	24.022
30	15.837	33.218	24.414
40	13.628	33.155	24.838
50	11.677	33.141	25.206
75	7.063	32.889	25.748

STATION		US10506	
LATITUDE	42-23.9	N	
LONGITUDE	140-31.1	E	
DEPTH (m)	94		
Press.	Temp.	Salinity	Sigma-T
5	16.867	33.106	24.092
10	16.881	33.101	24.085
20	16.882	33.096	24.081
30	16.882	33.094	24.080
40	16.951	33.153	24.109
50	15.119	33.190	24.551
75	6.868	32.875	25.762

STATION		US10507	
LATITUDE	42-19.2	N	
LONGITUDE	140-30.5	E	
DEPTH (m)	92		
Press.	Temp.	Salinity	Sigma-T
5	16.940	33.088	24.061
10	16.928	33.089	24.065
20	16.921	33.088	24.066
30	16.932	33.093	24.067
40	16.955	33.371	24.274
50	14.792	33.240	24.660
75	8.289	32.849	25.542

STATION		US10508	
LATITUDE	42-10.5	N	
LONGITUDE	140-35.7	E	
DEPTH (m)	76		
Press.	Temp.	Salinity	Sigma-T
5	16.540	32.951	24.050
10	16.553	32.957	24.051
20	16.549	32.954	24.050
30	16.580	32.987	24.067
40	14.728	33.090	24.558
50	12.372	33.094	25.039

STATION		US10509	
LATITUDE	42-10.5	N	
LONGITUDE	140-40.4	E	
DEPTH (m)	84		
Press.	Temp.	Salinity	Sigma-T
5	16.326	32.589	23.820
10	16.528	32.902	24.014
20	16.619	32.981	24.054
30	16.789	33.073	24.085
40	14.871	33.247	24.648
50	12.198	33.183	25.141
75	6.569	32.821	25.760

STATION		US10510	
LATITUDE	42-12.9	N	
LONGITUDE	140-40.8	E	
DEPTH (m)	89		
Press.	Temp.	Salinity	Sigma-T
5	16.520	32.912	24.023
10	16.526	32.913	24.023
20	16.530	32.913	24.022
30	16.129	33.227	24.355
40	13.416	33.147	24.874
50	11.906	33.172	25.187
75	6.170	32.900	25.872

STATION		US10511	
LATITUDE	42-14.5	N	
LONGITUDE	140-30.3	E	
DEPTH (m)	81		
Press.	Temp.	Salinity	Sigma-T
5	16.108	32.639	23.907
10	16.790	33.074	24.086
20	16.782	33.067	24.082
30	16.824	33.084	24.085
40	16.000	33.310	24.448
50	13.728	33.163	24.824
75	8.667	32.875	25.506

STATION		US10512	
LATITUDE	42-21.5	N	
LONGITUDE	140-35.8	E	
DEPTH (m)	89		
Press.	Temp.	Salinity	Sigma-T
5	16.849	33.013	24.025
10	16.713	33.008	24.053
20	16.684	33.016	24.066
30	16.927	33.158	24.118
40	16.469	33.364	24.382
50	13.317	33.156	24.901
75	6.341	32.792	25.765

STATION		US10513	
LATITUDE	42-25.6	N	
LONGITUDE	140-37.2	E	
DEPTH (m)	83		
Press.	Temp.	Salinity	Sigma-T
5	16.699	33.004	24.053
10	16.637	33.001	24.065
20	16.633	33.008	24.072
30	17.043	33.222	24.140
40	16.225	33.385	24.455
50	12.727	33.184	25.040
75	6.794	32.827	25.735

STATION		US10514	
LATITUDE	42-27.9	N	
LONGITUDE	140-43.0	E	
DEPTH (m)	61		
Press.	Temp.	Salinity	Sigma-T
5	16.550	32.963	24.056
10	16.523	32.967	24.066
20	16.504	32.969	24.071
30	16.354	33.235	24.310
40	13.876	33.152	24.785
50	13.021	33.293	25.067

STATION		US10515	
LATITUDE	42-25.3	N	
LONGITUDE	140-47.9	E	
DEPTH (m)	46		
Press.	Temp.	Salinity	Sigma-T
5	16.648	32.950	24.024
10	16.551	32.946	24.043
20	16.494	32.947	24.057
30	16.483	32.953	24.064
40	15.355	33.165	24.480

STATION		US10516	
LATITUDE	42-23.3	N	
LONGITUDE	140-43.0	E	
DEPTH (m)	59		
Press.	Temp.	Salinity	Sigma-T
5	16.883	33.162	24.132
10	16.844	33.171	24.147
20	16.821	33.179	24.159
30	16.834	33.192	24.166
40	16.981	33.250	24.176
50	14.424	33.166	24.681

STATION		US10517	
LATITUDE	42-20.7	N	
LONGITUDE	140-47.2	E	
DEPTH (m)	56		
Press.	Temp.	Salinity	Sigma-T
5	16.917	33.077	24.058
10	16.838	33.086	24.084
20	16.814	33.106	24.105
30	17.250	33.332	24.176
40	17.196	33.352	24.203
50	14.160	33.248	24.800

STATION		US10518	
LATITUDE	42-18.4	N	
LONGITUDE	140-42.7	E	
DEPTH (m)	62		
Press.	Temp.	Salinity	Sigma-T
5	16.821	32.879	23.929
10	16.675	32.914	23.990
20	17.072	33.211	24.125
30	16.817	33.248	24.213
40	15.969	33.258	24.415
50	12.271	33.460	25.341

STATION		US10519	
LATITUDE	42-15.5	N	
LONGITUDE	140-47.2	E	
DEPTH (m)	72		
Press.	Temp.	Salinity	Sigma-T
5	16.603	32.916	24.007
10	16.616	32.978	24.052
20	17.095	33.290	24.180
30	17.142	33.483	24.317
40	16.687	33.461	24.407
50	13.734	33.155	24.816

STATION		US10520	
LATITUDE	42-10.5	N	
LONGITUDE	140-48.1	E	
DEPTH (m)	93		
Press.	Temp.	Salinity	Sigma-T
5	16.589	32.793	23.916
10	16.561	32.821	23.944
20	17.185	33.290	24.159
30	17.070	33.434	24.296
40	17.039	33.508	24.361
50	15.376	33.253	24.543
75	9.833	33.754	26.007

STATION		US10521	
LATITUDE	42-09.4	N	
LONGITUDE	140-52.2	E	
DEPTH (m)	76		
Press.	Temp.	Salinity	Sigma-T
5	17.074	33.298	24.191
10	17.235	33.494	24.303
20	17.089	33.491	24.335
30	17.039	33.492	24.348
40	17.064	33.522	24.365
50	17.020	33.569	24.411
75	9.165	33.781	26.137

STATION		US10522	
LATITUDE	42-07.1	N	
LONGITUDE	140-50.8	E	
DEPTH (m)	76		
Press.	Temp.	Salinity	Sigma-T
5	16.632	32.868	23.964
10	16.747	32.994	24.034
20	16.945	33.190	24.138
30	17.080	33.348	24.228
40	16.867	33.498	24.393
50	14.037	33.187	24.779

STATION		US10523	
LATITUDE	42-02.6	N	
LONGITUDE	140-54.2	E	
DEPTH (m)	75		
Press.	Temp.	Salinity	Sigma-T
5	17.051	33.557	24.395
10	17.001	33.570	24.417
20	16.929	33.576	24.438
30	16.903	33.575	24.444
40	16.888	33.581	24.451
50	15.670	33.636	24.773

STATION		US10524	
LATITUDE	41-57.3	N	
LONGITUDE	140-58.3	E	
DEPTH (m)	78		
Press.	Temp.	Salinity	Sigma-T
5	16.301	32.687	23.901
10	16.621	32.843	23.948
20	17.126	33.203	24.106
30	16.910	33.410	24.315
40	16.909	33.483	24.371
50	16.752	33.511	24.430
75	9.945	33.337	25.663

STATION		US10525	
LATITUDE	41-57.9	N	
LONGITUDE	140-59.4	E	
DEPTH (m)	85		
Press.	Temp.	Salinity	Sigma-T
5	16.673	32.972	24.035
10	16.802	33.065	24.076
20	17.140	33.372	24.232
30	16.961	33.499	24.372
40	16.854	33.536	24.426
50	16.873	33.567	24.444
75	13.094	33.835	25.472

STATION		US10526	
LATITUDE	41-58.7	N	
LONGITUDE	141-00.6	E	
DEPTH (m)	92		
Press.	Temp.	Salinity	Sigma-T
5	17.139	33.449	24.291
10	17.193	33.522	24.334
20	17.137	33.537	24.359
30	17.096	33.548	24.377
40	16.965	33.560	24.417
50	16.855	33.572	24.453
75	12.361	33.886	25.655

STATION		US10527	
LATITUDE	41-59.4	N	
LONGITUDE	141-01.8	E	
DEPTH (m)	99		
Press.	Temp.	Salinity	Sigma-T
5	17.173	33.519	24.337
10	17.161	33.515	24.336
20	17.123	33.519	24.348
30	17.091	33.523	24.360
40	17.040	33.539	24.383
50	15.762	33.757	24.846
75	12.322	33.889	25.665
100	9.791	33.830	26.074

STATION		US10528	
LATITUDE	42-00.7	N	
LONGITUDE	141-01.1	E	
DEPTH (m)	92		
Press.	Temp.	Salinity	Sigma-T
5	17.152	33.528	24.349
10	17.166	33.526	24.344
20	17.176	33.528	24.343
30	17.178	33.527	24.342
40	17.181	33.528	24.342
50	16.782	33.596	24.488
75	12.400	33.850	25.620

STATION		US10529	
LATITUDE	42-04.7	N	
LONGITUDE	140-56.9	E	
DEPTH (m)	83		
Press.	Temp.	Salinity	Sigma-T
5	17.429	33.553	24.302
10	17.429	33.550	24.300
20	17.439	33.552	24.299
30	17.404	33.543	24.301
40	17.210	33.510	24.321
50	16.707	33.616	24.520
75	9.265	33.646	26.016

STATION		US10530	
LATITUDE	42-08.0	N	
LONGITUDE	140-59.3	E	
DEPTH (m)	82		
Press.	Temp.	Salinity	Sigma-T
5	17.080	33.362	24.238
10	17.093	33.367	24.239
20	17.168	33.441	24.279
30	17.211	33.481	24.299
40	17.158	33.500	24.326
50	16.404	33.571	24.556
75	11.314	33.860	25.831

STATION		US10531	
LATITUDE	42-11.4	N	
LONGITUDE	141-01.4	E	
DEPTH (m)	78		
Press.	Temp.	Salinity	Sigma-T
5	16.838	33.069	24.071
10	16.837	33.080	24.079
20	16.876	33.100	24.085
30	17.268	33.320	24.162
40	16.823	33.508	24.411
50	14.388	33.490	24.939

STATION		US10532	
LATITUDE	42-13.0	N	
LONGITUDE	140-56.6	E	
DEPTH (m)	69		
Press.	Temp.	Salinity	Sigma-T
5	17.102	33.440	24.293
10	17.163	33.481	24.310
20	17.097	33.498	24.339
30	17.077	33.501	24.346
40	17.064	33.511	24.357
50	15.719	33.506	24.661

STATION		US10533	
LATITUDE	42-17.2	N	
LONGITUDE	140-54.3	E	
DEPTH (m)	56		
Press.	Temp.	Salinity	Sigma-T
5	16.817	33.082	24.085
10	16.766	33.078	24.094
20	16.777	33.088	24.099
30	17.129	33.318	24.193
40	17.047	33.493	24.347
50	16.391	33.516	24.518

STATION		US10534	
LATITUDE	42-16.1	N	
LONGITUDE	140-58.3	E	
DEPTH (m)	62		
Press.	Temp.	Salinity	Sigma-T
5	16.798	33.063	24.076
10	16.764	33.061	24.082
20	16.828	33.103	24.099
30	16.712	33.319	24.292
40	15.227	33.389	24.680
50	14.331	33.527	24.980

STATION		US10535	
LATITUDE	42-14.8	N	
LONGITUDE	141-04.5	E	
DEPTH (m)	78		
Press.	Temp.	Salinity	Sigma-T
5	16.545	33.092	24.156
10	16.544	33.145	24.197
20	16.261	33.254	24.346
30	15.800	33.487	24.629
40	14.908	33.650	24.951
50	13.615	33.718	25.275

STATION		US10536	
LATITUDE	42-14.2	N	
LONGITUDE	141-11.3	E	
DEPTH (m)	111		
Press.	Temp.	Salinity	Sigma-T
5	16.650	33.003	24.064
10	16.656	33.003	24.062
20	16.631	33.137	24.171
30	17.220	33.460	24.281
40	17.173	33.498	24.321
50	15.429	33.677	24.858
75	12.327	33.926	25.692
100	9.393	33.801	26.116

STATION		US10537	
LATITUDE	42-11.0	N	
LONGITUDE	141-09.0	E	
DEPTH (m)	108		
Press.	Temp.	Salinity	Sigma-T
5	16.771	33.041	24.064
10	16.745	33.040	24.070
20	16.668	33.054	24.098
30	17.108	33.324	24.202
40	17.205	33.461	24.285
50	15.897	33.567	24.669
75	11.959	33.889	25.734
100	9.342	33.815	26.135

STATION		US10538	
LATITUDE	42-07.5	N	
LONGITUDE	141-06.4	E	
DEPTH (m)	105		
Press.	Temp.	Salinity	Sigma-T
5	16.897	33.097	24.079
10	16.821	33.108	24.105
20	17.285	33.408	24.226
30	17.472	33.524	24.269
40	17.110	33.485	24.326
50	15.676	33.517	24.680
75	11.767	33.879	25.762
100	9.486	33.825	26.120

STATION		US10539	
LATITUDE	42-04.0	N	
LONGITUDE	141-03.7	E	
DEPTH (m)	99		
Press.	Temp.	Salinity	Sigma-T
5	17.350	33.471	24.259
10	17.344	33.521	24.298
20	17.273	33.509	24.305
30	17.230	33.502	24.310
40	17.203	33.497	24.313
50	16.961	33.598	24.448
75	11.269	33.849	25.831

STATION		US10540	
LATITUDE	41-35.7	N	
LONGITUDE	140-53.4	E	
DEPTH (m)	58		
Press.	Temp.	Salinity	Sigma-T
5	20.822	32.907	22.949
10	20.889	33.018	23.015
20	20.282	33.198	23.314
30	18.433	33.654	24.135
40	18.020	33.754	24.313
50	17.504	33.858	24.518

STATION		US10541	
LATITUDE	41-37.1	N	
LONGITUDE	140-51.0	E	
DEPTH (m)	94		
Press.	Temp.	Salinity	Sigma-T
5	20.746	32.919	22.979
10	20.742	32.925	22.984
20	20.749	32.949	23.000
30	20.479	33.096	23.184
40	18.168	33.534	24.108
50	17.205	33.634	24.418
75	15.975	34.026	25.004

STATION		US10542	
LATITUDE	41-38.9	N	
LONGITUDE	140-49.1	E	
DEPTH (m)	343		
Press.	Temp.	Salinity	Sigma-T
5	20.529	32.930	23.045
10	20.508	32.930	23.050
20	20.496	32.931	23.054
30	20.260	32.974	23.149
40	18.180	33.354	23.967
50	17.154	33.579	24.388
75	15.294	34.143	25.247
100	13.812	34.192	25.602
125	12.063	34.192	25.950
150	11.542	34.192	26.047
175	11.076	34.185	26.127
200	10.897	34.180	26.156
250	10.560	34.171	26.208
300	10.323	34.172	26.250

STATION		US10543	
LATITUDE	41-40.8	N	
LONGITUDE	140-47.1	E	
DEPTH (m)	219		
Press.	Temp.	Salinity	Sigma-T
5	20.295	32.866	23.057
10	20.017	33.012	23.242
20	19.945	33.043	23.284
30	19.770	33.091	23.366
40	19.054	33.266	23.683
50	16.893	33.929	24.718
75	14.763	34.072	25.308
100	12.524	34.196	25.864
125	12.398	34.208	25.898
150	11.071	34.169	26.116
175	10.622	34.167	26.194
200	10.479	34.167	26.219

STATION		US10544	
LATITUDE	41-42.8	N	
LONGITUDE	140-44.9	E	
DEPTH (m)	84		
Press.	Temp.	Salinity	Sigma-T
5	19.846	33.053	23.318
10	19.851	33.054	23.316
20	19.777	33.072	23.349
30	19.098	33.226	23.641
40	17.465	33.497	24.250
50	17.123	33.549	24.372
75	12.633	34.147	25.804