



HOKKAIDO UNIVERSITY

Title	Part II. USHIO MARU CRUISES FROM JANUARY TO DECOMBER IN 2010
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PART II

USHIO MARU CRUISE FROM JANUARY TO DECEMBER IN 2010

I . Crew's List

Captain :

Crew :

Chief Officer

Second Officer

Chief Engineer

First Engineer

Second Engineer

Toshimi Meguro

Osamu Kimura

Naoto Kobayashi

Hideo Ito

Senetsu Nakai

Kenichi Shindo

(Cruise 193 – 200)

Junpei Shimura

(Cruise 201 -)

Nagahide Yamane

Yoshitaka Yoshida

Yukio Tabata

Yutaka Takeda

(Cruise 193 – 200)

Naoyuki Eda

(Cruise 201 -)

Takahiro Kanazawa

Nobuyuki Sawada

Konichi Tomosugi

Akira Sugihara

Tsutomu Takahashi

Hajime Morihiro

(Cruise 185 - 192)

Kazuo Ishikawa

(Cruise 193 -)

Chief Radio Officer

Boatswain

Jr. Boatswain

Quartermaster

Sailor

No.1 Oiler

No.2 Oiler

Oiler

Chief Steward

Head Steward

II . Particulars

Length (R.L.)

33.74 m

Length (O.L.)

39.39 m

Breadth (mid)

6.50 m

Depth (mid)

3.00 m

Gross Tonnage (Domestic)

179 tons

International Gross Tonnage

286 tons

Main engine

735 kw

Call Sign

JD2672

THE " USHIO MARU "

CRUISE 185

CRUISE 186

CRUISE 187

IN JANUARY 2010

1. Cruise Itinerary

Cruise 185

Departure from Hakodate	Jan. 6 , 2010
Start hydrographic research (US10001)	7
Arrival at Hakodate	7
Departure from Hakodate	8
Finish hydrographic research (US10015)	8
Return to Hakodate	9

Total coverage 190.9 miles

Cruise 186

Departure from Hakodate	Jan. 20 , 2010
Return to Hakodate	21

Total coverage 0.5 miles

Cruise 187

Departure from Hakodate	Jan. 26 , 2010
Start hydrographic research (US10016)	26
Arrival at Hakodate	26
Departure from Hakodate	27
Finish hydrographic research (US10027)	27
Return to Hakodate	27

Total coverage 86.4 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 185			
Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	
			Tetsuya Takatsu
Graduate Students:	Chair of Marine Bioresource Science:		2 persons
Under Graduate Students:	Department of Marine Biological Science:		2 persons

Cruise 186			
Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	
			Toshikuni Nakatani
Graduate Students:	Chair of Marine Bioresource Science:		4 persons
Under Graduate Students:	Department of Marine Biological Science:		1 person

Cruise 187			
Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	
			Tetsuya Takatsu
Graduate Students:	Chair of Marine Bioresource Science:		4 persons
Under Graduate Students:	Department of Marine Biological Science (Third grade):		1 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 185)

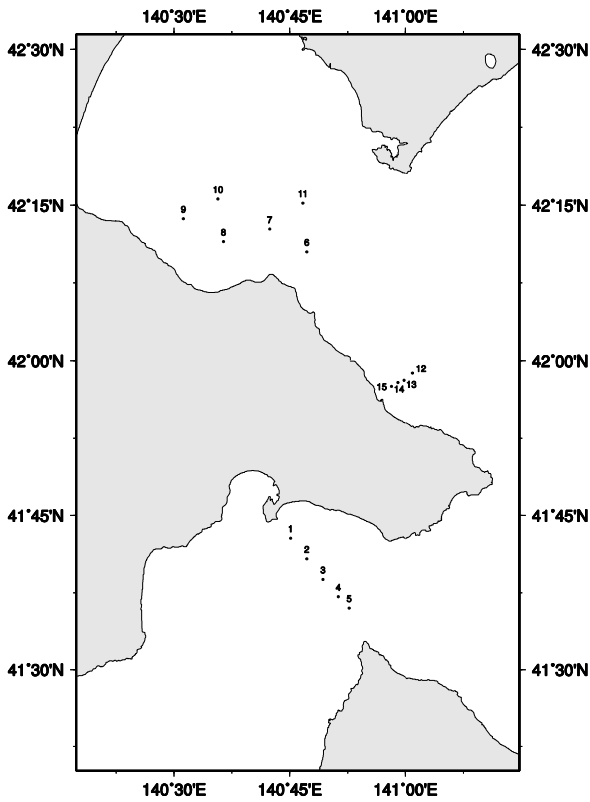


Figure 2: Oceanographic stations (Cruise 187)

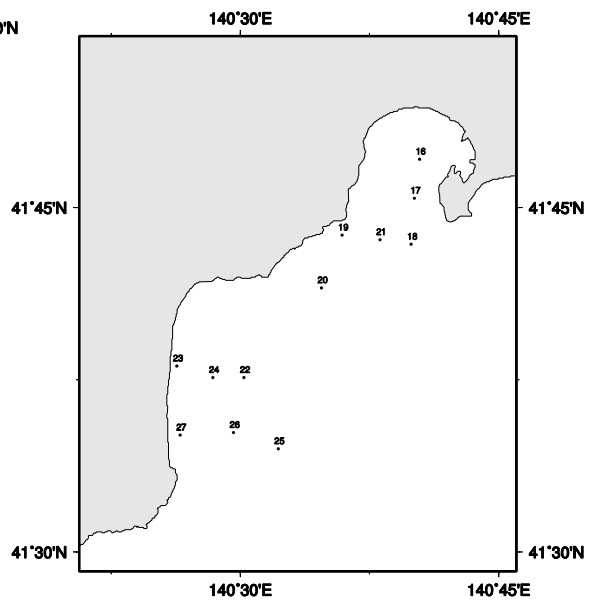


Table 1: List of oceanographic stations

Cruise 185

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10001	41-42.8	140-45.1	1/7	0700-0703	86	NNW-2	East-1	NNW-4	4.3	10.9	c	1006.5
US10002	41-40.8	140-47.2	1/7	0720-0730	225	North-2	East-1	North-4	4.2	11.0	c	1006.6
US10003	41-38.8	140-49.3	1/7	0748-0800	336	North-3	East-1	North-5	4.6	10.9	bc	1006.7
US10004	41-37.1	140-51.3	1/7	0815-0820	101	NNE-3	East-1	NNE-5	4.6	11.4	bc	1007.3
US10005	41-36.0	140-52.7	1/7	0831-0834	47	NNE-3	East-1	NNE-5	4.9	11.4	bc	1007.3
US10006	42-10.5	140-47.2	1/8	1157-1201	93	NNW-1	ESE-1	NNW-3	1.3	5.9	bc	1012.4
US10007	42-12.7	140-42.4	1/8	1243-1247	92	NW-1	ESE-1	NW-2	1.7	6.0	bc	1012.1
US10008	42-11.5	140-36.4	1/8	1336-1340	83	SW-1	East-1	SW-2	2.5	6.1	bc	1012.2
US10009	42-13.7	140-31.2	1/8	1427-1431	83	West-2	East-1	West-4	1.0	6.2	s	1012.2
US10010	42-15.6	140-35.7	1/8	1516-1520	92	West-3	East-1	West-5	1.0	6.2	s	1012.6
US10011	42-15.2	140-46.7	1/8	1618-1622	75	NW-3	East-1	NW-5	2.3	5.7	c	1012.6
US10012	41-58.8	141-00.9	1/8	1818-1823	96	NW-3	East-1	NW-5	2.1	5.8	c	1013.1
US10013	41-58.1	140-59.8	1/8	1830-1834	90	West-3	East-1	West-5	1.9	6.1	s	1012.7
US10014	41-57.9	140-59.0	1/8	1839-1843	86	West-3	East-1	West-5	1.8	6.0	s	1013.0
US10015	41-57.5	140-58.2	1/8	1849-1853	80	WNW-3	East-1	WNW-5	1.4	6.0	c	1013.1

Cruise 186

No data

Cruise 187

Station	Lat. (N)	Long (E)	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10016	41-47.1	140-40.4	1/26	0853-0855	21	NW-3	SW-1	NW-5	-4.7	6.9	s	1015.6
US10017	41-45.4	140-40.1	1/26	0921-0923	40	West-3	SW-1	West-5	-5.0	7.1	s	1016.1
US10018	41-43.4	140-39.9	1/26	0955-0959	68	West-3	SW-1	West-5	-4.1	8.9	s	1016.1
US10019	41-43.8	140-35.9	1/26	1125-1127	17	West-3	SW-1	West-5	-3.8	9.0	s	1016.2
US10020	41-41.5	140-34.7	1/26	1205-1207	42	WNW-4	SW-1	WNW-6	-4.2	9.7	s	1016.1
US10021	41-43.6	140-38.1	1/26	1238-1243	58	West-4	SW-1	West-6	-2.2	9.7	c	1016.1
US10022	41-37.6	140-30.2	1/27	0901-0903	31	West-1	SW-1	West-3	2.4	8.7	bc	1021.1
US10023	41-38.1	140-26.3	1/27	0923-0925	13	SW-1	South-1	SW-2	2.8	8.6	bc	1020.7
US10024	41-37.6	140-28.4	1/27	0953-0955	24	SW-1	South-1	SW-2	3.4	8.6	bc	1020.5
US10025	41-34.5	140-32.2	1/27	1030-1033	62	WSW-3	SSW-1	WSW-5	5.3	9.5	bc	1019.6
US10026	41-35.2	140-29.6	1/27	1057-1100	42	SW-2	SSW-1	SW-4	6.3	9.4	bc	1019.0
US10027	41-35.1	140-26.5	1/27	1136-1138	13	SW-2	South-1	SW-4	6.0	8.6	c	1018.0

(*) : Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US10001				STATION US10002				STATION US10003			
LATITUDE 41-42.8 N				LATITUDE 41-40.8 N				LATITUDE 41-38.8 N			
LONGITUDE 140-45.1 E				LONGITUDE 140-47.2 E				LONGITUDE 140-49.3 E			
DEPTH (m) 86				DEPTH (m) 225				DEPTH (m) 336			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	11.184	34.019	25.978	5	11.243	34.044	25.987	5	11.578	34.044	25.926
10	11.191	33.998	25.961	10	11.230	34.043	25.989	10	11.576	34.042	25.925
20	11.189	33.999	25.962	20	11.120	34.032	26.000	20	11.474	34.032	25.936
30	11.183	33.996	25.961	30	11.045	34.039	26.019	30	11.416	34.026	25.941
40	11.189	33.997	25.961	40	10.990	34.041	26.030	40	11.396	34.027	25.946
50	11.194	34.005	25.966	50	10.954	34.041	26.037	50	11.332	34.032	25.962
75	11.037	34.033	26.016	75	10.742	34.042	26.075	75	11.257	34.037	25.979
				100	10.555	34.046	26.111	100	11.239	34.040	25.985
				125	10.449	34.049	26.133	125	10.980	34.040	26.032
				150	10.319	34.046	26.152	150	10.961	34.044	26.038
				175	10.182	34.046	26.176	175	10.828	34.045	26.062
								200	10.610	34.037	26.095
								250	9.900	34.061	26.235
								300	9.888	34.062	26.238

STATION US10004				STATION US10005				STATION US10006			
LATITUDE 41-37.1 N				LATITUDE 41-36.0 N				LATITUDE 42-10.5 N			
LONGITUDE 140-51.3 E				LONGITUDE 140-52.7 E				LONGITUDE 140-47.2 E			
DEPTH (m) 101				DEPTH (m) 47				DEPTH (m) 93			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	11.747	34.035	25.887	5	11.667	33.993	25.870	5	6.232	33.300	26.180
10	11.757	34.034	25.884	10	11.636	34.005	25.885	10	6.234	33.312	26.190
20	11.743	34.034	25.888	20	11.619	34.006	25.888	20	6.199	33.304	26.188
30	11.710	34.037	25.896	30	11.610	34.009	25.892	30	6.193	33.303	26.187
40	11.656	34.033	25.903	40	11.610	34.008	25.892	40	6.197	33.304	26.188
50	11.591	34.025	25.908					50	6.215	33.311	26.191
75	11.576	34.025	25.911					75	6.087	33.327	26.220

STATION US10007				STATION US10008				STATION US10009			
LATITUDE 42-12.7 N				LATITUDE 42-11.5 N				LATITUDE 42-13.7 N			
LONGITUDE 140-42.4 E				LONGITUDE 140-36.4 E				LONGITUDE 140-31.2 E			
DEPTH (m) 92				DEPTH (m) 83				DEPTH (m) 83			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.498	33.263	26.117	5	6.424	33.281	26.141	5	6.527	33.264	26.114
10	6.455	33.306	26.156	10	6.412	33.290	26.150	10	6.494	33.292	26.141
20	6.312	33.304	26.173	20	6.386	33.289	26.152	20	6.484	33.294	26.144
30	6.263	33.313	26.187	30	6.365	33.288	26.154	30	6.479	33.294	26.144
40	6.251	33.315	26.190	40	6.359	33.288	26.155	40	6.471	33.295	26.146
50	6.243	33.315	26.191	50	6.360	33.289	26.155	50	6.471	33.295	26.146
75	6.233	33.319	26.195	75	6.366	33.290	26.155	75	6.452	33.306	26.157

STATION US10010			
LATITUDE 42-15.6 N			
LONGITUDE 140-35.7 E			
DEPTH (m) 92			
Press.	Temp.	Salinity	Sigma-T
5	6.473	33.299	26.148
10	6.448	33.304	26.156
20	6.324	33.309	26.175
30	6.279	33.312	26.184
40	6.273	33.315	26.187
50	6.262	33.315	26.189
75	6.285	33.322	26.191

STATION US10011			
LATITUDE 42-15.2 N			
LONGITUDE 140-46.7 E			
DEPTH (m) 75			
Press.	Temp.	Salinity	Sigma-T
5	6.072	33.281	26.186
10	6.139	33.302	26.193
20	6.164	33.310	26.197
30	6.188	33.312	26.195
40	6.149	33.306	26.195
50	6.043	33.294	26.199

STATION US10012			
LATITUDE 41-58.8 N			
LONGITUDE 141-00.9 E			
DEPTH (m) 96			
Press.	Temp.	Salinity	Sigma-T
5	6.253	33.343	26.212
10	6.252	33.344	26.212
20	6.207	33.351	26.224
30	6.202	33.355	26.227
40	6.195	33.355	26.229
50	6.192	33.356	26.230
75	6.191	33.356	26.230

STATION US10013			
LATITUDE 41-58.1 N			
LONGITUDE 140-59.8 E			
DEPTH (m) 90			
Press.	Temp.	Salinity	Sigma-T
5	6.410	33.300	26.158
10	6.417	33.312	26.166
20	6.392	33.307	26.165
30	6.316	33.323	26.188
40	6.298	33.329	26.195
50	6.304	33.330	26.195
75	6.192	33.353	26.227

STATION US10014			
LATITUDE 41-57.9 N			
LONGITUDE 140-59.0 E			
DEPTH (m) 86			
Press.	Temp.	Salinity	Sigma-T
5	6.379	33.302	26.163
10	6.385	33.300	26.161
20	6.385	33.304	26.164
30	6.379	33.310	26.170
40	6.368	33.313	26.173
50	6.367	33.313	26.174

STATION US10015			
LATITUDE 41-57.5 N			
LONGITUDE 140-58.2 E			
DEPTH (m) 80			
Press.	Temp.	Salinity	Sigma-T
5	6.429	33.299	26.154
10	6.440	33.302	26.156
20	6.436	33.299	26.154
30	6.356	33.288	26.155
40	6.350	33.288	26.155

STATION US10016			
LATITUDE 41-47.1 N			
LONGITUDE 140-40.4 E			
DEPTH (m) 21			
Press.	Temp.	Salinity	Sigma-T
5	7.761	32.992	25.731
10	8.418	33.555	26.077

STATION US10017			
LATITUDE 41-45.4 N			
LONGITUDE 140-40.1 E			
DEPTH (m) 40			
Press.	Temp.	Salinity	Sigma-T
5	8.763	33.400	25.902
10	9.449	33.910	26.192
20	9.639	33.925	26.173
30	9.603	33.914	26.170

STATION US10018			
LATITUDE 41-43.4 N			
LONGITUDE 140-39.9 E			
DEPTH (m) 68			
Press.	Temp.	Salinity	Sigma-T
5	9.969	33.981	26.162
10	9.991	33.993	26.168
20	10.000	34.013	26.181
30	9.995	34.010	26.179
40	9.999	34.013	26.182
50	10.006	34.015	26.182

STATION US10019			
LATITUDE 41-43.8 N			
LONGITUDE 140-35.9 E			
DEPTH (m) 17			
Press.	Temp.	Salinity	Sigma-T
5	9.254	33.873	26.195
10	9.250	33.902	26.218

STATION US10020			
LATITUDE 41-41.5 N			
LONGITUDE 140-34.7 E			
DEPTH (m) 42			
Press.	Temp.	Salinity	Sigma-T
5	9.880	34.013	26.201
10	9.875	34.017	26.205
20	9.890	34.014	26.200
30	9.853	34.010	26.204
40	9.820	34.005	26.205

STATION US10021			
LATITUDE 41-43.6 N			
LONGITUDE 140-38.1 E			
DEPTH (m) 58			
Press.	Temp.	Salinity	Sigma-T
5	9.923	33.795	26.024
10	9.942	34.011	26.189
20	9.947	34.012	26.190
30	9.954	34.004	26.182
40	9.953	34.007	26.185
50	9.964	34.011	26.186

STATION US10022			
LATITUDE 41-37.6 N			
LONGITUDE 140-30.2 E			
DEPTH (m) 31			
Press.	Temp.	Salinity	Sigma-T
5	8.867	33.959	26.324
10	8.851	33.958	26.326
20	8.847	33.946	26.317

STATION US10023			
LATITUDE 41-38.1 N			
LONGITUDE 140-26.3 E			
DEPTH (m) 13			
Press.	Temp.	Salinity	Sigma-T
5	8.851	33.830	26.226

STATION US10024			
LATITUDE 41-37.6 N			
LONGITUDE 140-28.4 E			
DEPTH (m) 24			
Press.	Temp.	Salinity	Sigma-T
5	8.945	33.956	26.309
10	8.945	33.957	26.310
20	8.949	33.959	26.311

STATION US10025			
LATITUDE 41-34.5 N			
LONGITUDE 140-32.2 E			
DEPTH (m) 62			
Press.	Temp.	Salinity	Sigma-T
5	9.843	34.001	26.198
10	9.848	34.021	26.213
20	9.846	34.019	26.212
30	9.808	34.020	26.219
40	9.777	34.023	26.226
50	9.776	34.023	26.226

STATION US10026			
LATITUDE 41-35.2 N			
LONGITUDE 140-29.6 E			
DEPTH (m) 42			
Press.	Temp.	Salinity	Sigma-T
5	9.191	33.996	26.301
10	9.179	33.998	26.305
20	9.208	34.010	26.310
30	9.237	34.009	26.304
40	9.255	34.013	26.304

STATION US10027			
LATITUDE 41-35.1 N			
LONGITUDE 140-26.5 E			
DEPTH (m) 13			
Press.	Temp.	Salinity	Sigma-T
5	8.888	33.902	26.276
10	8.885	33.919	26.290

THE " USHIO MARU "

CRUISE 188

CRUISE 189

CRUISE 190

IN FEBRUARY - MARCH 2010

1. Cruise Itinerary

Cruise 188

Departure from Hakodate	Feb.	2 , 2010
Start hydrographic research (US10028)		2
Arrival at Usujiri		2
Departure from Usujiri		3
Arrival at Usujiri		3
Departure from Usujiri		4
Finish hydrographic research (US10046)		4
Arrival at and departure from Usujiri		4
Return to Hakodate		5

Total coverage 188.5 miles

Cruise 189

Departure from Hakodate	Feb.	15 , 2010
Start hydrographic research (US10047)		15
Arrival at Hakodate		17
Departure from Hakodate		18
Arrival at Fukushima		18
Departure from Fukushima		19
Finish hydrographic research (US10092)		19
Return to Hakodate		20

Total coverage 439.9 miles

Cruise 190

Departure from Hakodate	Feb.	26, 2010
Start hydrographic research (US10093)		26
Arrival at Usujiri		26
Departure from Usujiri		27
Retrieval Sediment trap system		27
Arrival at Mori		27
Departure from Mori		28
Set Sediment trap system		28
Arrival at and departure from Usujiri		28
Finish hydrographic research (US10115)		28
Return to Hakodate	Mar.	1

Total coverage 234.0 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 188

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
Graduate Students:	Chair of Marine Bioresource Science:		4 persons
Under Graduate Students:	Department of Marine Biological Science:		1 person

Cruise 189

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
Guest Scientist (Domestic):		(JAMSTEC)	Yasushi Yoshikawa
		(Marine Works Japan.LTD)	Kenichi Katayama
Graduate Students:	Chair of Marine Bioresource Science:		3 persons
Under Graduate Students:	Department of Marine Biological Science:		1 person

Cruise 190

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
	Assistant Professor	(Laboratory of Marine Environmental Science)	Hiroji Onishi
Guest Scientist (Domestic):		(Ehime University)	Michinobu Kuwae
Graduate Students:	Chair of Marine Bioresource Science:		3 persons
	Chair of Marine Environmental Science:		4 persons
Under Graduate Students:	Department of Marine Biological Science:		1 person
	Department of Applied Marine Science:		1 person

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”.

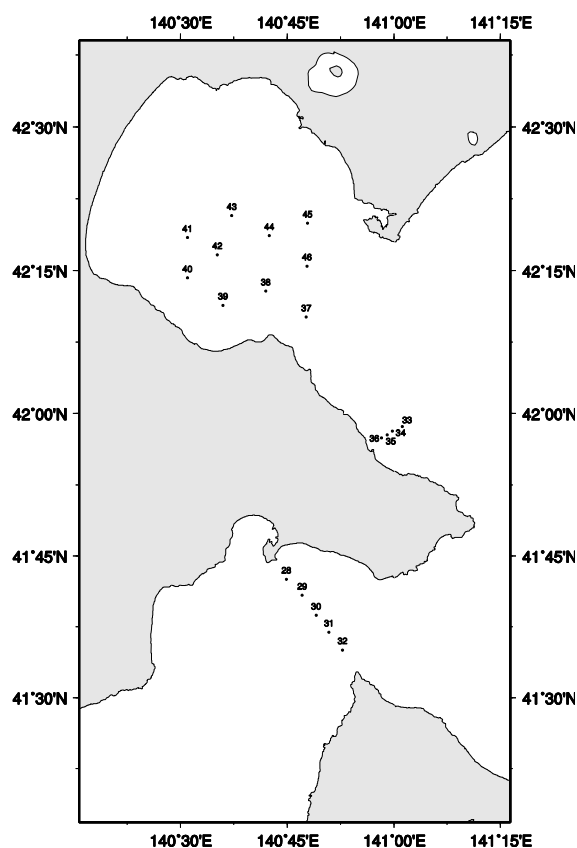


Figure 1: Oceanographic stations (Cruise 188)

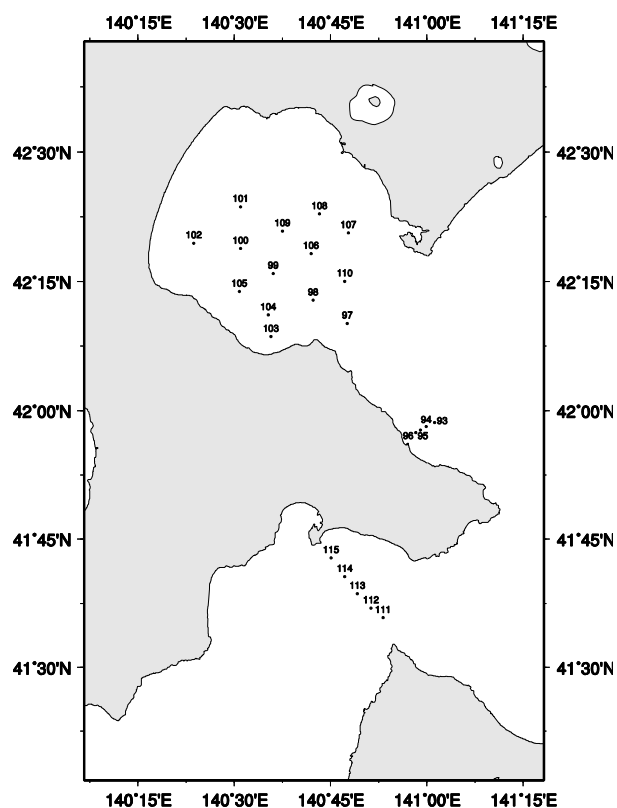


Figure 3: Oceanographic stations (Cruise 190)

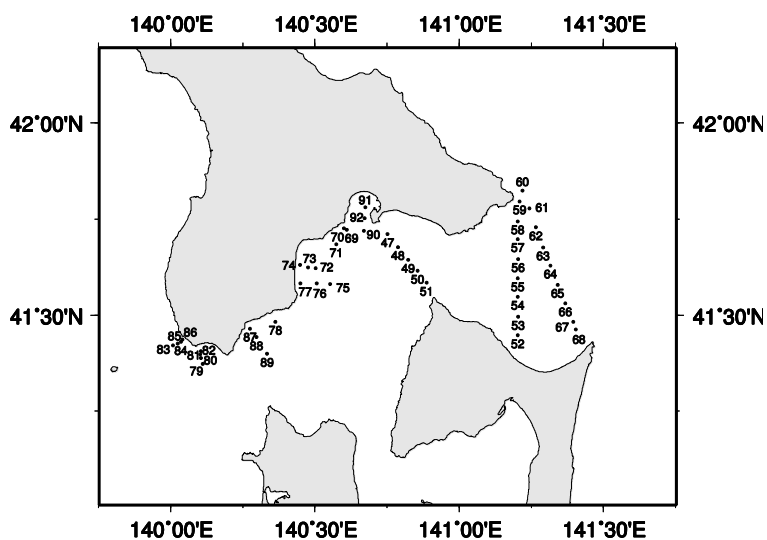


Figure 2: Oceanographic stations (Cruise 189)

Table 1: List of oceanographic stations

Cruise 188

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10028	41-42.6	140-44.8	2/2	0942-0945	90	NNW-1	NW -1	NNW-3	-3.6	10.0	bc	1014.1
US10029	41-40.9	140-47.0	2/2	1002-1010	218	NW -1	NW -1	NW -3	-3.2	10.0	bc	1014.1
US10030	41-38.8	140-49.0	2/2	1028-1041	356	NW -1	NW -1	NW -3	-3.5	10.2	bc	1014.1
US10031	41-37.0	140-50.8	2/2	1056-1100	86	NW -2	NW -1	NW -4	-2.6	10.2	bc	1013.8
US10032	41-35.1	140-52.7	2/2	1116-1118	34	NW -2	NW -1	NW -4	-2.9	10.2	bc	1013.6
US10033	41-58.7	141-01.1	2/2	1423-1428	99	NW -2	NW -1	NW -4	-4.6	3.1	bc	1011.1
US10034	41-58.2	140-59.7	2/2	1436-1440	90	NW -2	NW -1	NW -4	-4.4	3.2	bc	1011.0
US10035	41-57.8	140-59.0	2/2	1445-1448	86	NW -2	NW -1	NW -4	-4.6	3.2	bc	1011.1
US10036	41-57.5	140-58.2	2/2	1453-1456	81	NW -2	NW -1	NW -4	-4.6	3.1	bc	1011.1
US10037	42-10.2	140-47.6	2/4	0708-0713	94	West-3	WNW-1	West-5	-6.9	3.0	bc	1015.8
US10038	42-12.9	140-41.9	2/4	0817-0822	92	West-3	WNW-1	West-5	-7.4	3.1	bc	1016.2
US10039	42-11.4	140-35.9	2/4	0913-0918	84	West-3	WNW-1	West-5	-7.0	3.4	bc	1016.6
US10040	42-14.3	140-30.9	2/4	1001-1006	85	West-3	WNW-1	West-5	-7.2	3.5	s	1016.5
US10041	42-18.5	140-30.9	2/4	1051-1056	94	West-3	WNW-1	West-5	-6.1	3.6	s	1016.6
US10042	42-16.7	140-35.1	2/4	1129-1133	93	West-3	WNW-1	West-5	-6.5	3.6	s	1016.6
US10043	42-20.8	140-37.1	2/4	1215-1219	87	West-3	West-1	West-5	-6.2	3.7	bc	1016.2
US10044	42-18.7	140-42.4	2/4	1302-1306	67	West-2	West-1	West-4	-5.4	3.2	bc	1016.0
US10045	42-20.0	140-47.8	2/4	1340-1344	58	West-3	West-1	West-6	-4.6	3.3	bc	1015.5
US10046	42-15.5	140-47.7	2/4	1417-1420	72	West-3	West-1	West-5	-5.0	3.1	bc	1015.2

Cruise 189

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10047	41-42.8	140-44.9	2/15	0950-0954	86	NW -1	NW -1	NW -2	-0.3	8.8	c	1025.0
US10048	41-40.8	140-47.1	2/15	1012-1020	222	NW -1	NW -1	NW -3	-0.6	8.8	c	1025.1
US10049	41-38.8	140-49.2	2/15	1038-1049	349	NW -1	NW -1	NW -3	-0.2	8.7	c	1025.0
US10050	41-37.1	140-51.2	2/15	1104-1108	101	NW -1	NW -1	NW -3	-0.1	8.7	c	1024.6
US10051	41-35.2	140-53.1	2/15	1126-1128	39	NW -1	NW -1	NW -2	-0.1	8.9	c	1024.6
US10052	41-27.0	141-12.0	2/15	1306-1310	79	WNW-1	NW -1	WNW-3	1.5	8.9	c	1023.0
US10053	41-29.9	141-12.1	2/15	1331-1341	267	WNW-2	NW -1	WNW-4	1.5	8.9	c	1022.4
US10054	41-33.0	141-12.0	2/15	1403-1415	310	WNW-3	NW -1	WNW-5	1.1	8.9	c	1022.0
US10055	41-35.9	141-12.0	2/15	1432-1440	233	WNW-3	NW -1	WNW-5	0.8	8.8	c	1021.6
US10056	41-38.9	141-12.1	2/15	1500-1510	209	WNW-3	NW -1	WNW-5	0.4	1.5	bc	1021.9
US10057	41-42.0	141-12.0	2/15	1530-1540	211	WNW-1	NW -1	WNW-2	0.5	2.0	bc	1022.1
US10058	41-44.8	141-12.0	2/15	1600-1607	174	NNW-2	NW -1	NNW-4	-0.1	1.9	bc	1022.1
US10059	41-47.9	141-12.4	2/15	1630-1634	117	NNW-3	NW -1	NNW-5	-1.0	1.5	bc	1021.8
US10060	41-49.6	141-13.0	2/15	1650-1656	174	NNW-3	NW -1	NNW-5	-0.7	1.8	bc	1021.6
US10061	41-46.8	141-14.4	2/15	1715-1723	201	NW -3	NW -1	NW -5	-1.2	1.7	bc	1022.0
US10062	41-43.9	141-15.8	2/15	1741-1750	231	NNW-3	NW -1	NNW-5	-1.2	2.4	bc	1022.1
US10063	41-40.7	141-17.3	2/15	1810-1819	232	NW -3	NW -1	NW -5	-1.3	1.3	bc	1022.4
US10064	41-37.9	141-18.8	2/15	1838-1846	217	NNW-3	NW -2	NNW-5	-1.3	1.7	bc	1022.5
US10065	41-34.9	141-20.3	2/15	1907-1918	316	NNW-3	NW -2	NNW-5	-1.3	2.8	bc	1022.5
US10066	41-32.0	141-21.9	2/15	1940-1950	260	NNW-3	NW -1	NNW-5	-0.7	8.9	bc	1022.6
US10067	41-29.1	141-23.6	2/15	2010-2014	96	NNW-3	NW -1	NNW-4	-0.5	9.0	bc	1022.6
US10068	41-27.9	141-24.1	2/15	2023-2027	59	NNW-3	NW -1	NNW-4	-1.0	8.9	bc	1022.6
US10069	41-43.5	140-36.5	2/18	0747-0750	39	East-1	East-1	East-3	-0.9	8.1	bc	1020.0
US10070	41-43.7	140-35.9	2/18	0805-0807	21	ESE-1	East-1	ESE-3	-0.2	8.1	bc	1020.0
US10071	41-41.2	140-34.3	2/18	0836-0839	41	ESE-1	East-1	ESE-2	-0.8	8.1	bc	1019.6
US10072	41-37.5	140-30.0	2/18	0919-0921	31	WSW-1	East-1	WSW-2	0.9	8.2	bc	1018.8
US10073	41-37.6	140-28.4	2/18	0938-0940	24	WSW-1	East-1	WSW-2	1.2	7.2	bc	1018.4
US10074	41-38.0	140-26.7	2/18	0958-1000	16	Calm	East-1	Calm	2.0	6.9	bc	1018.0
US10075	41-35.0	140-33.0	2/18	1044-1047	59	SE -1	ESE-1	SE -3	2.0	8.5	bc	1017.2
US10076	41-35.1	140-30.2	2/18	1110-1113	47	SE -1	ESE-1	SE -2	4.0	8.5	bc	1017.2
US10077	41-35.1	140-26.8	2/18	1149-1150	14	ESE-1	ESE-1	ESE-2	4.4	7.7	bc	1016.0
US10078	41-29.1	140-21.6	2/18	1250-1253	70	East-1	SE -1	East-3	4.4	8.3	bc	1014.4
US10079	41-22.5	140-06.5	2/18	1425-1430	114	ENE-3	East-1	ENE-5	3.4	7.3	bc	1012.4
US10080	41-23.4	140-06.1	2/18	1446-1450	98	ENE-3	East-1	ENE-5	3.2	8.0	bc	1011.9
US10081	41-24.0	140-06.0	2/18	1503-1508	85	ENE-3	East-1	ENE-5	3.4	7.8	bc	1011.8
US10082	41-24.5	140-06.1	2/18	1522-1525	54	ENE-3	East-1	ENE-5	3.3	8.2	bc	1011.6
US10083	41-25.4	140-00.3	2/18	1601-1605	105	ENE-3	East-1	ENE-5	3.1	7.0	c	1010.8
US10084	41-25.7	140-01.3	2/18	1621-1624	86	East-3	East-1	East-5	3.3	7.3	o	1010.4
US10085	41-26.0	140-02.0	2/18	1639-1642	54	East-3	East-1	East-5	3.3	6.7	o	1010.1
US10086	41-26.3	140-02.3	2/18	1655-1657	35	East-3	East-1	East-5	3.1	7.1	o	1009.9
US10087	41-28.0	140-16.3	2/19	1206-1208	28	WNW-2	SSW-1	WNW-4	2.6	7.7	o	1011.8
US10088	41-26.7	140-17.7	2/19	1229-1232	66	West-3	SSW-1	West-5	2.2	8.2	s	1011.6
US10089	41-24.1	140-19.9	2/19	1309-1313	95	West-3	SW -1	West-5	1.9	8.1	o	1011.2
US10090	41-43.3	140-40.0	2/19	1536-1539	71	West-3	SSW-1	West-5	2.4	8.2	c	1010.6
US10091	41-47.0	140-40.3	2/19	1612-1614	21	West-3	SSW-1	West-5	1.9	7.1	c	1011.0
US10092	41-45.3	140-40.2	2/19	1634-1637	43	West-3	SSW-1	West-5	1.5	7.2	c	1011.3

Cruise 190

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10093	41-58.7	141-01.1	2/26	1519-1523	99	NW -3	NW -1	NW -5	3.6	1.2	bc	1011.8
US10094	41-58.2	140-59.8	2/26	1530-1534	91	NW -3	NW -1	NW -5	3.1	1.2	bc	1011.7
US10095	41-57.8	140-58.9	2/26	1540-1544	86	NW -3	NW -1	NW -5	3.2	1.4	bc	1012.0
US10096	41-57.5	140-58.2	2/26	1549-1553	81	NW -3	NW -1	NW -5	3.2	1.5	bc	1012.0
US10097	42-10.2	140-47.5	2/27	0810-0815	94	NW -3	NW -1	NW -5	-1.9	1.2	bc	1019.2
US10098	42-12.9	140-42.2	2/27	0901-0906	92	NW -2	NW -1	NW -4	-1.5	1.3	bc	1019.5
US10099	42-16.0	140-36.0	2/27	1036-1041	93	NW -1	NW -1	NW -3	-0.1	1.5	bc	1019.5
US10100	42-18.9	140-30.9	2/27	1211-1216	95	NNW-2	NW -1	NNW-4	-0.9	1.7	bc	1018.6
US10101	42-23.7	140-30.9	2/27	1340-1344	97	North-3	NNW-1	North-5	-0.8	2.9	bc	1018.1
US10102	42-19.5	140-23.6	2/27	1455-1458	89	West-2	West-1	West-4	-0.5	2.5	bc	1018.0
US10103	42-08.7	140-35.6	2/27	1642-1646	65	NW -1	NW -1	NW -3	0.0	2.7	bc	1018.6

Cruise 190 (continued)

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10104	42-11.2	140-35.2	2/28	0634-0638	82	NW -1	NW -1	NW -2	-1.9	2.1	o	1019.1
US10105	42-13.9	140-30.7	2/28	0744-0748	83	NNE-1	NW -1	NNE-2	-1.8	2.4	o	1019.2
US10106	42-18.3	140-41.9	2/28	0914-0919	68	Calm	NW -1	Calm	-1.3	1.1	o	1019.1
US10107	42-20.7	140-47.7	2/28	0955-0959	54	Calm	SE -1	Calm	-0.8	1.3	o	1018.7
US10108	42-22.9	140-43.2	2/28	1031-1035	59	Calm	SE -1	Calm	-1.7	1.5	s	1019.0
US10109	42-20.9	140-37.4	2/28	1113-1117	87	Calm	SE -1	Calm	0.7	1.5	c	1018.6
US10110	42-15.1	140-47.1	2/28	1339-1343	75	NNW-1	SE -1	NNW-2	-0.5	1.1	bc	1016.8
US10111	41-35.9	140-53.1	2/28	1937-1940	56	West-3	West-1	West-5	2.7	8.3	c	1015.7
US10112	41-37.0	140-51.2	2/28	1954-1958	98	West-3	West-1	West-5	2.8	7.6	c	1016.0
US10113	41-38.7	140-49.1	2/28	2015-2028	350	West-3	West-1	West-5	2.7	7.0	c	1016.1
US10114	41-40.7	140-47.1	2/28	2046-2054	229	West-3	West-1	West-5	2.6	7.7	c	1016.0
US10115	41-42.9	140-45.0	2/28	2113-2118	84	WSW-3	WSW-1	WSW-5	2.9	3.1	c	1015.6

(*) : Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US10028				STATION US10029				STATION US10030			
LATITUDE		41-42. 6	N	LATITUDE		41-40. 9	N	LATITUDE		41-38. 8	N
LONGITUDE		140-44. 8	E	LONGITUDE		140-47. 0	E	LONGITUDE		140-49. 0	E
DEPTH (m)		90		DEPTH (m)		218		DEPTH (m)		356	
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	10. 327	34. 012	26. 124	5	10. 047	34. 007	26. 169	5	10. 585	33. 978	26. 053
10	10. 332	34. 014	26. 126	10	10. 047	34. 007	26. 169	10	10. 587	33. 979	26. 053
20	10. 334	34. 016	26. 127	20	10. 040	34. 006	26. 169	20	10. 591	33. 979	26. 053
30	10. 316	34. 020	26. 133	30	10. 036	34. 004	26. 168	30	10. 594	33. 982	26. 055
40	10. 238	34. 022	26. 148	40	10. 020	34. 004	26. 171	40	10. 550	33. 995	26. 072
50	10. 203	34. 022	26. 154	50	10. 017	34. 003	26. 171	50	10. 524	33. 996	26. 078
75	10. 132	34. 015	26. 160	75	9. 977	34. 003	26. 177	75	10. 478	34. 002	26. 090
				100	9. 913	34. 000	26. 185	100	10. 370	33. 993	26. 102
				125	9. 764	34. 001	26. 211	125	10. 214	33. 976	26. 116
				150	9. 663	34. 005	26. 231	150	10. 168	33. 975	26. 123
				175	9. 504	34. 008	26. 260	175	10. 165	33. 975	26. 124
				200	9. 454	34. 033	26. 288	200	10. 081	33. 996	26. 154
								250	10. 112	33. 985	26. 140
								300	9. 930	34. 016	26. 195

STATION US10031				STATION US10032				STATION US10033			
LATITUDE		41-37. 0	N	LATITUDE		41-35. 1	N	LATITUDE		41-58. 7	N
LONGITUDE		140-50. 8	E	LONGITUDE		140-52. 7	E	LONGITUDE		141-01. 1	E
DEPTH (m)		86		DEPTH (m)		34		DEPTH (m)		99	
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	10. 562	33. 986	26. 063	5	10. 510	33. 957	26. 050	5	3. 554	33. 023	26. 257
10	10. 571	33. 986	26. 062	10	10. 509	33. 972	26. 062	10	3. 554	33. 025	26. 258
20	10. 567	33. 989	26. 065	20	10. 495	33. 982	26. 072	20	3. 554	33. 023	26. 257
30	10. 564	33. 989	26. 065	30	10. 467	33. 985	26. 079	30	3. 549	33. 023	26. 257
40	10. 534	33. 990	26. 072					40	3. 549	33. 022	26. 256
50	10. 537	33. 991	26. 072					50	3. 551	33. 020	26. 255
75	10. 479	33. 991	26. 082					75	3. 568	33. 023	26. 255

STATION US10034				STATION US10035				STATION US10036			
LATITUDE		41-58. 2	N	LATITUDE		41-57. 8	N	LATITUDE		41-57. 5	N
LONGITUDE		140-59. 7	E	LONGITUDE		140-59. 0	E	LONGITUDE		140-58. 2	E
DEPTH (m)		90		DEPTH (m)		86		DEPTH (m)		81	
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3. 559	33. 013	26. 248	5	3. 548	33. 022	26. 257	5	3. 385	33. 001	26. 255
10	3. 563	33. 025	26. 258	10	3. 548	33. 024	26. 258	10	3. 408	33. 004	26. 255
20	3. 563	33. 025	26. 258	20	3. 554	33. 024	26. 258	20	3. 414	33. 002	26. 253
30	3. 560	33. 024	26. 257	30	3. 554	33. 024	26. 257	30	3. 408	33. 003	26. 254
40	3. 560	33. 024	26. 257	40	3. 552	33. 023	26. 257	40	3. 424	33. 009	26. 258
50	3. 559	33. 023	26. 257	50	3. 545	33. 021	26. 256	50	3. 446	33. 009	26. 255
75	3. 567	33. 023	26. 256	75	3. 519	33. 020	26. 258	75	3. 883	33. 184	26. 353

STATION US10037				STATION US10038				STATION US10039			
LATITUDE		42-10. 2	N	LATITUDE		42-12. 9	N	LATITUDE		42-11. 4	N
LONGITUDE		140-47. 6	E	LONGITUDE		140-41. 9	E	LONGITUDE		140-35. 9	E
DEPTH (m)		94		DEPTH (m)		92		DEPTH (m)		84	
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3. 389	33. 084	26. 321	5	3. 548	33. 132	26. 344	5	3. 792	33. 193	26. 370
10	3. 400	33. 077	26. 314	10	3. 534	33. 130	26. 344	10	3. 798	33. 217	26. 388
20	3. 405	33. 068	26. 307	20	3. 555	33. 133	26. 345	20	3. 801	33. 216	26. 387
30	3. 407	33. 065	26. 304	30	3. 569	33. 133	26. 343	30	3. 816	33. 219	26. 388
40	3. 406	33. 064	26. 303	40	3. 552	33. 130	26. 342	40	3. 830	33. 215	26. 383
50	3. 407	33. 065	26. 304	50	3. 552	33. 130	26. 342	50	3. 836	33. 214	26. 382
75	3. 407	33. 066	26. 305	75	3. 612	33. 145	26. 348	75	4. 072	33. 249	26. 386

STATION US10040			
LATITUDE 42-14.3 N			
LONGITUDE 140-30.9 E			
DEPTH (m) 85			
Press.	Temp.	Salinity	Sigma-T
5	3.882	33.064	26.258
10	3.889	33.209	26.373
20	3.887	33.221	26.383
30	3.892	33.221	26.381
40	3.890	33.222	26.383
50	3.881	33.222	26.384
75	3.901	33.224	26.383

STATION US10043			
LATITUDE 42-20.8 N			
LONGITUDE 140-37.1 E			
DEPTH (m) 87			
Press.	Temp.	Salinity	Sigma-T
5	4.073	33.228	26.369
10	4.074	33.249	26.386
20	4.072	33.261	26.396
30	4.074	33.261	26.395
40	4.074	33.260	26.395
50	4.079	33.260	26.394
75	4.080	33.257	26.392

STATION US10046			
LATITUDE 42-15.5 N			
LONGITUDE 140-47.7 E			
DEPTH (m) 72			
Press.	Temp.	Salinity	Sigma-T
5	3.491	33.110	26.332
10	3.510	33.124	26.342
20	3.515	33.140	26.354
30	3.514	33.140	26.354
40	3.523	33.143	26.355
50	3.529	33.142	26.354

STATION US10049			
LATITUDE 41-38.8 N			
LONGITUDE 140-49.2 E			
DEPTH (m) 349			
Press.	Temp.	Salinity	Sigma-T
5	9.001	34.049	26.373
10	9.006	34.048	26.372
20	9.004	34.048	26.372
30	8.935	34.053	26.387
40	8.878	34.049	26.393
50	8.837	34.058	26.406
75	8.805	34.061	26.414
100	8.785	34.059	26.416
125	8.760	34.061	26.421
150	8.752	34.061	26.422
175	8.749	34.061	26.423
200	8.747	34.061	26.423
250	8.750	34.061	26.422
300	8.739	34.063	26.426

STATION US10052			
LATITUDE 41-27.0 N			
LONGITUDE 141-12.0 E			
DEPTH (m) 79			
Press.	Temp.	Salinity	Sigma-T
5	9.241	34.010	26.304
10	9.248	34.010	26.303
20	9.248	34.008	26.302
30	9.248	34.008	26.302
40	9.247	34.008	26.302
50	9.249	34.008	26.302
75	9.251	34.007	26.300

STATION US10041			
LATITUDE 42-18.5 N			
LONGITUDE 140-30.9 E			
DEPTH (m) 94			
Press.	Temp.	Salinity	Sigma-T
5	4.002	33.193	26.349
10	4.009	33.229	26.377
20	4.008	33.229	26.377
30	4.006	33.229	26.377
40	3.995	33.227	26.377
50	3.994	33.230	26.379
75	4.038	33.238	26.381

STATION US10044			
LATITUDE 42-18.7 N			
LONGITUDE 140-42.4 E			
DEPTH (m) 67			
Press.	Temp.	Salinity	Sigma-T
5	3.477	33.099	26.324
10	3.479	33.125	26.345
20	3.474	33.125	26.345
30	3.474	33.124	26.345
40	3.476	33.123	26.344
50	3.480	33.124	26.344

STATION US10047			
LATITUDE 41-42.8 N			
LONGITUDE 140-44.9 E			
DEPTH (m) 86			
Press.	Temp.	Salinity	Sigma-T
5	9.164	34.050	26.348
10	9.167	34.049	26.347
20	9.171	34.049	26.346
30	9.159	34.050	26.349
40	9.146	34.048	26.350
50	9.088	34.055	26.364
75	8.938	34.062	26.394

STATION US10050			
LATITUDE 41-37.1 N			
LONGITUDE 140-51.2 E			
DEPTH (m) 101			
Press.	Temp.	Salinity	Sigma-T
5	9.118	34.039	26.347
10	9.121	34.041	26.348
20	9.121	34.042	26.349
30	9.118	34.043	26.350
40	9.119	34.043	26.350
50	9.095	34.046	26.356
75	9.093	34.042	26.353
100	9.082	34.046	26.358

STATION US10053			
LATITUDE 41-29.9 N			
LONGITUDE 141-12.1 E			
DEPTH (m) 267			
Press.	Temp.	Salinity	Sigma-T
5	9.206	34.010	26.310
10	9.208	34.010	26.310
20	9.212	34.010	26.309
30	9.207	34.010	26.310
40	9.208	34.010	26.310
50	9.208	34.009	26.309
75	9.215	34.009	26.307
100	9.224	34.008	26.306
125	9.226	34.008	26.305
150	9.232	34.007	26.304
175	9.237	34.008	26.303
200	9.237	34.007	26.303
250	9.243	34.007	26.302

STATION US10042			
LATITUDE 42-16.7 N			
LONGITUDE 140-35.1 E			
DEPTH (m) 93			
Press.	Temp.	Salinity	Sigma-T
5	3.972	33.207	26.362
10	3.977	33.231	26.381
20	3.977	33.231	26.382
30	3.978	33.231	26.382
40	3.979	33.232	26.382
50	3.982	33.230	26.380
75	3.996	33.235	26.383

STATION US10045			
LATITUDE 42-20.0 N			
LONGITUDE 140-47.8 E			
DEPTH (m) 58			
Press.	Temp.	Salinity	Sigma-T
5	3.686	33.178	26.368
10	3.689	33.186	26.374
20	3.695	33.193	26.379
30	3.743	33.206	26.384
40	3.747	33.206	26.384
50	3.733	33.204	26.384

STATION US10048			
LATITUDE 41-40.8 N			
LONGITUDE 140-47.1 E			
DEPTH (m) 222			
Press.	Temp.	Salinity	Sigma-T
5	9.132	34.053	26.355
10	9.133	34.054	26.356
20	9.132	34.054	26.356
30	9.130	34.053	26.356
40	9.128	34.054	26.357
50	9.123	34.052	26.356
75	9.042	34.060	26.375
100	8.992	34.060	26.383
125	8.936	34.061	26.393
150	8.722	34.062	26.427
175	8.522	34.065	26.461
200	8.326	34.071	26.495

STATION US10051			
LATITUDE 41-35.2 N			
LONGITUDE 140-53.1 E			
DEPTH (m) 39			
Press.	Temp.	Salinity	Sigma-T
5	9.301	33.987	26.276
10	9.302	34.032	26.311
20	9.229	34.029	26.321
30	9.213	34.035	26.328

STATION US10054			
LATITUDE 41-33.0 N			
LONGITUDE 141-12.0 E			
DEPTH (m) 310			
Press.	Temp.	Salinity	Sigma-T
5	9.240	33.971	26.274
10	9.245	34.021	26.312
20	9.249	34.023	26.313
30	9.252	34.021	26.311
40	9.238	34.019	26.312
50	9.251	34.021	26.311
75	9.250	34.020	26.311
100	9.229	34.017	26.312
125	9.228	34.016	26.311
150	9.218	34.015	26.312
175	9.004	33.987	26.324
200	8.999	33.989	26.327
250	8.951	33.982	26.328
300	8.917	33.977	26.331

		STATION	US10055		
		LATITUDE	41-35.9	N	
		LONGITUDE	141-12.0	E	
		DEPTH (m)	233		
Press.	Temp.	Salinity	Sigma-T		
5	9.139	33.966	26.286		
10	9.154	33.969	26.286		
20	9.153	34.004	26.314		
30	9.152	34.002	26.312		
40	9.151	34.002	26.312		
50	9.158	34.002	26.311		
75	8.608	33.918	26.332		
100	6.834	33.618	26.353		
125	6.070	33.712	26.526		
150	6.394	33.593	26.391		
175	5.334	33.399	26.368		
200	5.472	33.443	26.386		

		STATION	US10058		
		LATITUDE	41-44.8	N	
		LONGITUDE	141-12.0	E	
		DEPTH (m)	174		
Press.	Temp.	Salinity	Sigma-T		
5	2.323	32.958	26.311		
10	2.788	33.061	26.356		
20	3.186	33.088	26.343		
30	3.147	33.069	26.331		
40	3.095	33.080	26.344		
50	3.184	33.105	26.356		
75	3.063	33.089	26.354		
100	2.965	33.092	26.365		
125	2.933	33.089	26.366		
150	2.899	33.091	26.371		

		STATION	US10061		
		LATITUDE	41-46.8	N	
		LONGITUDE	141-14.4	E	
		DEPTH (m)	201		
Press.	Temp.	Salinity	Sigma-T		
5	2.261	32.913	26.280		
10	2.253	32.913	26.281		
20	2.332	32.929	26.287		
30	3.150	33.100	26.355		
40	3.172	33.087	26.343		
50	3.151	33.091	26.348		
75	3.198	33.108	26.358		
100	3.185	33.107	26.358		
125	3.181	33.109	26.360		
150	3.049	33.127	26.386		
175	2.995	33.120	26.385		

		STATION	US10064		
		LATITUDE	41-37.9	N	
		LONGITUDE	141-18.8	E	
		DEPTH (m)	217		
Press.	Temp.	Salinity	Sigma-T		
5	2.164	32.902	26.279		
10	2.119	32.897	26.278		
20	2.293	32.943	26.301		
30	2.330	32.939	26.295		
40	2.364	32.941	26.295		
50	2.925	33.098	26.373		
75	3.019	33.085	26.355		
100	3.069	33.106	26.367		
125	3.104	33.111	26.368		
150	3.082	33.104	26.365		
175	3.157	33.157	26.400		
200	3.556	33.229	26.421		

		STATION	US10067		
		LATITUDE	41-29.1	N	
		LONGITUDE	141-23.6	E	
		DEPTH (m)	96		
Press.	Temp.	Salinity	Sigma-T		
5	9.346	34.020	26.295		
10	9.353	34.023	26.296		
20	9.347	34.022	26.297		
30	9.346	34.022	26.297		
40	9.356	34.018	26.292		
50	9.361	34.021	26.293		
75	9.263	34.010	26.301		

		STATION	US10056		
		LATITUDE	41-38.9	N	
		LONGITUDE	141-12.1	E	
		DEPTH (m)	209		
Press.	Temp.	Salinity	Sigma-T		
5	1.880	32.852	26.259		
10	2.037	32.883	26.273		
20	2.453	32.978	26.317		
30	2.945	33.039	26.325		
40	2.981	33.041	26.323		
50	3.184	33.093	26.346		
75	3.166	33.085	26.342		
100	3.146	33.090	26.347		
125	3.252	33.110	26.354		
150	3.109	33.124	26.378		
175	3.088	33.124	26.380		
200	3.087	33.125	26.381		

		STATION	US10059		
		LATITUDE	41-47.9	N	
		LONGITUDE	141-12.4	E	
		DEPTH (m)	117		
Press.	Temp.	Salinity	Sigma-T		
5	1.876	32.846	26.255		
10	1.894	32.854	26.260		
20	2.315	32.987	26.335		
30	2.531	33.025	26.348		
40	2.874	33.082	26.365		
50	2.958	33.087	26.361		
75	2.928	33.088	26.365		
100	2.900	33.091	26.370		

		STATION	US10062		
		LATITUDE	41-43.9	N	
		LONGITUDE	141-15.8	E	
		DEPTH (m)	231		
Press.	Temp.	Salinity	Sigma-T		
5	2.709	33.000	26.314		
10	2.705	33.031	26.339		
20	2.892	33.087	26.368		
30	3.005	33.082	26.353		
40	3.104	33.096	26.356		
50	3.084	33.091	26.354		
75	3.113	33.100	26.359		
100	3.227	33.133	26.374		
125	3.236	33.133	26.374		
150	3.167	33.133	26.380		
175	3.246	33.160	26.395		
200	3.245	33.159	26.394		

		STATION	US10065		
		LATITUDE	41-34.9	N	
		LONGITUDE	141-20.3	E	
		DEPTH (m)	316		
Press.	Temp.	Salinity	Sigma-T		
5	3.277	33.108	26.350		
10	3.497	33.171	26.380		
20	3.453	33.159	26.375		
30	4.499	33.343	26.417		
40	4.693	33.323	26.380		
50	5.268	33.429	26.399		
75	5.193	33.397	26.383		
100	5.188	33.408	26.391		
125	5.257	33.408	26.384		
150	5.154	33.387	26.379		
175	5.022	33.369	26.380		
200	5.094	33.387	26.386		
250	6.256	33.616	26.427		
300	5.610	33.559	26.461		

		STATION	US10068		
		LATITUDE	41-27.9	N	
		LONGITUDE	141-24.1	E	
		DEPTH (m)	59		
Press.	Temp.	Salinity	Sigma-T		
5	9.077	34.006	26.328		
10	9.101	34.007	26.324		
20	9.102	34.006	26.324		
30	9.109	34.007	26.323		
40	9.112	34.006	26.322		
50	9.112	34.007	26.323		

		STATION	US10057		
		LATITUDE	41-42.0	N	
		LONGITUDE	141-12.0	E	
		DEPTH (m)	211		
Press.	Temp.	Salinity	Sigma-T		
5	2.499	32.906	26.255		
10	2.999	33.047	26.326		
20	2.935	33.064	26.345		
30	2.974	33.066	26.344		
40	3.015	33.073	26.345		
50	3.026	33.076	26.347		
75	3.053	33.083	26.350		
100	3.031	33.080	26.350		
125	3.024	33.084	26.354		
150	3.004	33.085	26.356		
175	2.976	33.084	26.357		
200	3.013	33.105	26.371		

		STATION	US10060		
		LATITUDE	41-49.6	N	
		LONGITUDE	141-13.0	E	
		DEPTH (m)	174		
Press.	Temp.	Salinity	Sigma-T		
5	2.184	32.922	26.293		
10	2.199	32.926	26.295		
20	2.289	32.948	26.306		
30	3.033	33.089	26.357		
40	3.028	33.085	26.354		
50	3.073	33.091	26.355		
75	3.153	33.107	26.361		
100	3.117	33.122	26.376		
125	3.014	33.119	26.382		
150	3.003	33.121	26.385		

		STATION	US10063		
		LATITUDE	41-40.7	N	
		LONGITUDE	141-17.3	E	
		DEPTH (m)	232		
Press.	Temp.	Salinity	Sigma-T		
5	1.735	32.783	26.215		
10	1.736	32.830	26.253		
20	2.011	32.909	26.296		
30	2.415	32.965	26.310		
40	2.619	32.994	26.316		
50	3.009	33.061	26.337		
75	3.192	33.093	26.346		
100	3.181	33.105	26.356		
125	3.253	33.129	26.369		
150	3.288	33.141	26.376		
175	3.302	33.162	26.391		
200	3.223	33.175	26.408		

		STATION	US10066		
		LATITUDE	41-32.0	N	
		LONGITUDE	141-21.9	E	
		DEPTH (m)	260		
Press.	Temp.	Salinity	Sigma-T		
5	9.252	34.023	26.313		
10	9.257	34.019	26.308		
20	9.267	34.015	26.304		
30	9.271	34.018	26.306		
40	9.274	34.017	26.305		
50	9.274	34.018	26.305		
75	9.273	34.017	26.305		
100	9.274	34.017	26.304		
125	9.269	34.016	26.304		
150	9.264	34.015	26.305		
175	9.266	34.015	26.304		
200	9.244	34.012	26.306		
250	9.195	34.003	26.307		

		STATION	US10069		
		LATITUDE	41-43.5	N	
		LONGITUDE	140-36.5	E	
		DEPTH (m)	39		
Press.	Temp.	Salinity	Sigma-T		
5	8.299	34.005	26.447		
10	8.305	34.014	26.454		
20	8.220	34.006	26.460		
30	8.110	33.967	26.446		

STATION	US10070
LATITUDE	41-43.7 N
LONGITUDE	140-35.9 E
DEPTH (m)	21

Press.	Temp.	Salinity	Sigma-T
5	7.450	33.846	26.447
10	7.451	33.850	26.450

STATION	US10073
LATITUDE	41-37.6 N
LONGITUDE	140-28.4 E
DEPTH (m)	24

Press.	Temp.	Salinity	Sigma-T
5	7.563	33.953	26.515
10	7.562	33.986	26.541
20	7.571	33.992	26.544

STATION	US10076
LATITUDE	41-35.1 N
LONGITUDE	140-30.2 E
DEPTH (m)	47

Press.	Temp.	Salinity	Sigma-T
5	8.770	34.037	26.400
10	8.753	34.046	26.410
20	8.747	34.046	26.411
30	8.738	34.045	26.412
40	8.248	34.027	26.473

STATION	US10079
LATITUDE	41-22.5 N
LONGITUDE	140-06.5 E
DEPTH (m)	114

Press.	Temp.	Salinity	Sigma-T
5	7.607	34.053	26.588
10	7.587	34.069	26.602
20	7.090	34.062	26.668
30	7.070	34.069	26.676
40	6.889	34.065	26.697
50	6.493	34.066	26.751
75	5.884	34.069	26.831
100	4.568	34.068	26.984

STATION	US10082
LATITUDE	41-24.5 N
LONGITUDE	140-06.1 E
DEPTH (m)	54

Press.	Temp.	Salinity	Sigma-T
5	8.506	34.056	26.456
10	8.506	34.058	26.458
20	8.108	34.045	26.507
30	7.889	34.030	26.529
40	7.388	34.045	26.612
50	7.253	34.055	26.639

STATION	US10085
LATITUDE	41-26.0 N
LONGITUDE	140-02.0 E
DEPTH (m)	54

Press.	Temp.	Salinity	Sigma-T
5	7.056	34.040	26.655
10	7.045	34.068	26.679
20	6.990	34.068	26.686
30	6.988	34.067	26.686
40	6.992	34.071	26.688
50	6.997	34.070	26.687

STATION	US10088
LATITUDE	41-26.7 N
LONGITUDE	140-17.7 E
DEPTH (m)	66

Press.	Temp.	Salinity	Sigma-T
5	8.518	34.060	26.457
10	8.515	34.059	26.457
20	8.431	34.052	26.464
30	8.347	34.045	26.472
40	8.277	34.044	26.481
50	8.205	34.048	26.496

STATION	US10071
LATITUDE	41-41.2 N
LONGITUDE	140-34.3 E
DEPTH (m)	41

Press.	Temp.	Salinity	Sigma-T
5	8.441	34.046	26.458
10	8.433	34.046	26.460
20	8.412	34.046	26.462
30	8.352	34.034	26.462

STATION	US10074
LATITUDE	41-38.0 N
LONGITUDE	140-26.7 E
DEPTH (m)	16

Press.	Temp.	Salinity	Sigma-T
5	7.199	33.909	26.532
10	7.197	33.925	26.544

STATION	US10077
LATITUDE	41-35.1 N
LONGITUDE	140-26.8 E
DEPTH (m)	14

Press.	Temp.	Salinity	Sigma-T
5	8.023	33.964	26.457
10	8.018	33.979	26.470

STATION	US10080
LATITUDE	41-23.4 N
LONGITUDE	140-06.1 E
DEPTH (m)	98

Press.	Temp.	Salinity	Sigma-T
5	8.331	34.057	26.484
10	8.270	34.051	26.489
20	7.472	34.008	26.571
30	6.925	34.046	26.678
40	6.783	34.073	26.718
50	6.757	34.078	26.726
75	5.678	34.075	26.862

STATION	US10083
LATITUDE	41-25.4 N
LONGITUDE	140-00.3 E
DEPTH (m)	105

Press.	Temp.	Salinity	Sigma-T
5	7.272	34.065	26.645
10	7.209	34.087	26.671
20	7.113	34.083	26.681
30	6.903	34.089	26.715
40	6.747	34.080	26.729
50	6.271	34.073	26.785
75	4.538	34.076	26.994

STATION	US10086
LATITUDE	41-26.3 N
LONGITUDE	140-02.3 E
DEPTH (m)	35

Press.	Temp.	Salinity	Sigma-T
5	7.446	34.037	26.598
10	7.442	34.064	26.620
20	7.321	34.059	26.633
30	7.249	34.062	26.646

STATION	US10089
LATITUDE	41-24.1 N
LONGITUDE	140-19.9 E
DEPTH (m)	95

Press.	Temp.	Salinity	Sigma-T
5	8.470	34.049	26.456
10	8.468	34.050	26.457
20	8.468	34.049	26.456
30	8.441	34.044	26.457
40	8.322	34.022	26.458
50	7.745	34.050	26.565
75	6.212	34.048	26.773

STATION	US10072
LATITUDE	41-37.5 N
LONGITUDE	140-30.0 E
DEPTH (m)	31

Press.	Temp.	Salinity	Sigma-T
5	8.482	33.974	26.396
10	8.360	34.021	26.451
20	7.961	34.017	26.508

STATION	US10075
LATITUDE	41-35.0 N
LONGITUDE	140-33.0 E
DEPTH (m)	59

Press.	Temp.	Salinity	Sigma-T
5	8.778	34.056	26.414
10	8.776	34.057	26.415
20	8.760	34.056	26.417
30	8.761	34.056	26.416
40	8.674	34.059	26.432
50	8.583	34.054	26.443

STATION	US10078
LATITUDE	41-29.1 N
LONGITUDE	140-21.6 E
DEPTH (m)	70

Press.	Temp.	Salinity	Sigma-T
5	8.586	34.018	26.414
10	8.551	34.041	26.438
20	8.493	34.039	26.444
30	8.482	34.040	26.447
40	8.464	34.037	26.448
50	8.432	34.037	26.453

STATION	US10081
LATITUDE	41-24.0 N
LONGITUDE	140-06.0 E
DEPTH (m)	85

Press.	Temp.	Salinity	Sigma-T
5	8.079	34.064	26.527
10	8.010	34.058	26.533
20	7.632	34.053	26.584
30	7.486	34.051	26.603
40	7.364	34.065	26.632
50	7.280	34.070	26.647
75	7.222	34.067	26.653

STATION	US10084
LATITUDE	41-25.7 N
LONGITUDE	140-01.3 E
DEPTH (m)	86

Press.	Temp.	Salinity	Sigma-T
5	7.583	34.060	26.597
10	7.317	34.065	26.638
20	7.317	34.072	26.643
30	7.289	34.074	26.649
40	7.224	34.080	26.663
50	7.091	34.074	26.677
75	4.695	34.028	26.939

STATION	US10087
LATITUDE	41-28.0 N
LONGITUDE	140-16.3 E
DEPTH (m)	28

Press.	Temp.	Salinity	Sigma-T
5	8.111	34.045	26.507
10	8.126	34.045	26.506
20	8.128	34.044	26.504

STATION	US10090
LATITUDE	41-43.3 N
LONGITUDE	140-40.0 E
DEPTH (m)	71

Press.	Temp.	Salinity	Sigma-T
5	8.519	34.046	26.446
10	8.523	34.046	26.446
20	8.526	34.048	26.446
30	8.529	34.049	26.447
40	8.537	34.057	26.452
50	8.152	34.053	26.508

STATION		US10091	
LATITUDE		41-47.0 N	
LONGITUDE		140-40.3 E	
DEPTH (m)		21	
Press.	Temp.	Salinity	Sigma-T
5	7.505	33.711	26.333
10	8.216	34.042	26.489

STATION		US10094	
LATITUDE		41-58.2 N	
LONGITUDE		140-59.8 E	
DEPTH (m)		91	
Press.	Temp.	Salinity	Sigma-T
5	1.772	32.769	26.201
10	1.746	32.789	26.219
20	1.726	32.802	26.231
30	1.727	32.807	26.235
40	1.701	32.830	26.255
50	1.757	32.866	26.280
75	3.070	33.196	26.439

STATION		US10097	
LATITUDE		42-10.2 N	
LONGITUDE		140-47.5 E	
DEPTH (m)		94	
Press.	Temp.	Salinity	Sigma-T
5	1.599	32.792	26.231
10	1.597	32.806	26.243
20	1.966	32.997	26.370
30	3.121	33.226	26.458
40	3.111	33.220	26.454
50	3.075	33.211	26.451
75	3.005	33.215	26.460

STATION		US10100	
LATITUDE		42-18.9 N	
LONGITUDE		140-30.9 E	
DEPTH (m)		95	
Press.	Temp.	Salinity	Sigma-T
5	2.051	32.890	26.277
10	2.011	32.927	26.310
20	3.143	33.206	26.440
30	3.143	33.204	26.439
40	3.134	33.203	26.439
50	3.117	33.207	26.444
75	3.130	33.215	26.449

STATION		US10103	
LATITUDE		42-08.7 N	
LONGITUDE		140-35.6 E	
DEPTH (m)		65	
Press.	Temp.	Salinity	Sigma-T
5	3.122	33.192	26.431
10	3.133	33.200	26.436
20	3.130	33.197	26.434
30	3.135	33.198	26.434
40	3.138	33.196	26.433
50	3.119	33.197	26.435

STATION		US10106	
LATITUDE		42-18.3 N	
LONGITUDE		140-41.9 E	
DEPTH (m)		68	
Press.	Temp.	Salinity	Sigma-T
5	1.482	32.768	26.220
10	1.480	32.772	26.223
20	1.484	32.771	26.222
30	1.527	32.790	26.235
40	2.824	33.174	26.443
50	3.209	33.230	26.454

STATION		US10092	
LATITUDE		41-45.3 N	
LONGITUDE		140-40.2 E	
DEPTH (m)		43	
Press.	Temp.	Salinity	Sigma-T
5	7.650	33.772	26.360
10	8.309	34.046	26.478
20	8.484	34.039	26.446
30	8.430	34.041	26.456

STATION		US10095	
LATITUDE		41-57.8 N	
LONGITUDE		140-58.9 E	
DEPTH (m)		86	
Press.	Temp.	Salinity	Sigma-T
5	1.847	32.810	26.228
10	1.844	32.808	26.227
20	1.839	32.809	26.228
30	1.775	32.825	26.246
40	1.897	32.902	26.299
50	2.461	33.053	26.376
75	3.020	33.189	26.438

STATION		US10098	
LATITUDE		42-12.9 N	
LONGITUDE		140-42.2 E	
DEPTH (m)		92	
Press.	Temp.	Salinity	Sigma-T
5	1.744	32.842	26.261
10	1.743	32.848	26.266
20	2.108	33.055	26.405
30	3.044	33.223	26.463
40	3.056	33.208	26.450
50	3.028	33.205	26.450
75	2.815	33.193	26.459

STATION		US10101	
LATITUDE		42-23.7 N	
LONGITUDE		140-30.9 E	
DEPTH (m)		97	
Press.	Temp.	Salinity	Sigma-T
5	3.254	33.219	26.441
10	3.249	33.220	26.442
20	3.228	33.219	26.443
30	3.218	33.221	26.446
40	3.216	33.224	26.448
50	3.219	33.225	26.449
75	3.225	33.229	26.452

STATION		US10104	
LATITUDE		42-11.2 N	
LONGITUDE		140-35.2 E	
DEPTH (m)		82	
Press.	Temp.	Salinity	Sigma-T
5	2.851	33.187	26.451
10	2.921	33.199	26.454
20	2.988	33.208	26.456
30	3.021	33.211	26.455
40	3.027	33.209	26.453
50	3.045	33.209	26.451
75	2.949	33.219	26.468

STATION		US10107	
LATITUDE		42-20.7 N	
LONGITUDE		140-47.7 E	
DEPTH (m)		54	
Press.	Temp.	Salinity	Sigma-T
5	1.668	32.811	26.242
10	1.658	32.814	26.245
20	1.664	32.815	26.246
30	1.882	32.869	26.274
40	1.942	32.893	26.288
50	2.123	32.978	26.343

STATION		US10093	
LATITUDE		41-58.7 N	
LONGITUDE		141-01.1 E	
DEPTH (m)		99	
Press.	Temp.	Salinity	Sigma-T
5	1.599	32.787	26.227
10	1.596	32.771	26.215
20	1.605	32.786	26.227
30	1.628	32.823	26.254
40	1.658	32.836	26.263
50	1.747	32.861	26.276
75	2.936	33.186	26.442

STATION		US10096	
LATITUDE		41-57.5 N	
LONGITUDE		140-58.2 E	
DEPTH (m)		81	
Press.	Temp.	Salinity	Sigma-T
5	1.945	32.815	26.225
10	1.949	32.816	26.226
20	1.932	32.823	26.233
30	1.976	32.902	26.293
40	2.541	33.076	26.388
50	2.742	33.140	26.422
75	2.944	33.173	26.432

STATION		US10099	
LATITUDE		42-16.0 N	
LONGITUDE		140-36.0 E	
DEPTH (m)		93	
Press.	Temp.	Salinity	Sigma-T
5	1.943	32.887	26.283
10	1.921	32.887	26.285
20	2.143	32.979	26.342
30	3.062	33.213	26.454
40	3.073	33.205	26.446
50	3.071	33.203	26.445
75	3.110	33.215	26.451

STATION		US10102	
LATITUDE		42-19.5 N	
LONGITUDE		140-23.6 E	
DEPTH (m)		89	
Press.	Temp.	Salinity	Sigma-T
5	2.865	33.084	26.367
10	2.769	33.124	26.407
20	2.780	33.135	26.416
30	2.792	33.143	26.421
40	2.839	33.167	26.436
50	2.980	33.177	26.432

STATION		US10105	
LATITUDE		42-13.9 N	
LONGITUDE		140-30.7 E	
DEPTH (m)		83	
Press.	Temp.	Salinity	Sigma-T
5	2.778	33.140	26.420
10	2.889	33.156	26.423
20	3.057	33.204	26.446
30	3.051	33.200	26.444
40	3.050	33.202	26.445
50	3.057	33.206	26.448
75	3.000	33.206	26.453

STATION		US10108	
LATITUDE		42-22.9 N	
LONGITUDE		140-43.2 E	
DEPTH (m)		59	
Press.	Temp.	Salinity	Sigma-T
5	1.889	32.823	26.236
10	1.862	32.864	26.270
20	1.852	32.864	26.272
30	1.856	32.865	26.272
40	1.866	32.867	26.273
50	2.516	33.094	26.405

STATION US10109			
LATITUDE 42-20.9 N			
LONGITUDE 140-37.4 E			
DEPTH (m) 87			
Press.	Temp.	Salinity	Sigma-T
5	1.506	32.789	26.235
10	1.530	32.788	26.233
20	1.484	32.792	26.239
30	1.915	32.894	26.291
40	2.611	33.092	26.395
50	2.761	33.137	26.419
75	3.043	33.210	26.452

STATION US10112			
LATITUDE 41-37.0 N			
LONGITUDE 140-51.2 E			
DEPTH (m) 98			
Press.	Temp.	Salinity	Sigma-T
5	8.007	33.937	26.438
10	8.005	33.937	26.438
20	7.918	33.925	26.441
30	7.870	33.918	26.443
40	7.709	33.900	26.452
50	7.581	33.898	26.469
75	7.526	33.897	26.476

STATION US10115			
LATITUDE 41-42.9 N			
LONGITUDE 140-45.0 E			
DEPTH (m) 84			
Press.	Temp.	Salinity	Sigma-T
5	3.254	33.068	26.320
10	3.560	33.161	26.367
20	5.815	33.569	26.445
30	6.003	33.580	26.430
40	5.839	33.553	26.429
50	6.272	33.658	26.458
75	8.087	34.025	26.495

STATION US10110			
LATITUDE 42-15.1 N			
LONGITUDE 140-47.1 E			
DEPTH (m) 75			
Press.	Temp.	Salinity	Sigma-T
5	1.402	32.704	26.174
10	1.289	32.712	26.188
20	1.321	32.724	26.196
30	1.325	32.725	26.196
40	1.445	32.765	26.220
50	2.050	32.982	26.351

STATION US10113			
LATITUDE 41-38.7 N			
LONGITUDE 140-49.1 E			
DEPTH (m) 350			
Press.	Temp.	Salinity	Sigma-T
5	7.125	33.834	26.483
10	7.213	33.862	26.493
20	7.474	33.923	26.504
30	7.702	33.991	26.525
40	7.753	34.000	26.524
50	7.868	34.030	26.532
75	7.865	34.023	26.526
100	7.913	34.029	26.524
125	7.905	34.028	26.525
150	7.899	34.027	26.525
175	7.878	34.026	26.527
200	7.877	34.029	26.529
250	7.884	34.032	26.531
300	7.753	34.038	26.555

STATION US10111			
LATITUDE 41-35.9 N			
LONGITUDE 140-53.1 E			
DEPTH (m) 56			
Press.	Temp.	Salinity	Sigma-T
5	8.551	34.028	26.427
10	8.549	34.027	26.427
20	8.558	34.027	26.425
30	8.553	34.025	26.425
40	8.430	34.010	26.432
50	8.319	33.996	26.437

STATION US10114			
LATITUDE 41-40.7 N			
LONGITUDE 140-47.1 E			
DEPTH (m) 229			
Press.	Temp.	Salinity	Sigma-T
5	8.087	34.009	26.483
10	8.099	34.010	26.482
20	8.108	34.015	26.484
30	8.095	34.028	26.496
40	8.042	34.024	26.501
50	7.990	34.018	26.504
75	7.797	34.032	26.543
100	7.777	34.032	26.547
125	7.733	34.030	26.551
150	7.705	34.031	26.556
175	7.693	34.031	26.558
200	7.676	34.030	26.560

THE " USHIO MARU "

CRUISE 191

CRUISE 192

CRUISE 193

IN MARCH - APRIL 2010

1. Cruise Itinerary

Cruise 191

Departure from Hakodate	Mar.	8 , 2010
Arrival at Usujiri		8
Departure from Usujiri		9
Hydrographic research (US10116)		9
Sampling by Frame trawl net		9
Arrival at Usujiri		9
Departure from Usujiri		14
Return to Hakodate		14

Total coverage 149.2 miles

Cruise 192

Departure from Hakodate	Mar.	23 , 2010
Start hydrographic research (US10117)		23
Anchorage at Muroran		23
Departure from Muroran		24
Finish hydrographic research (US10139)		25
Return to Hakodate		25

Total coverage 224.4 miles

Cruise 193

Departure from Hakodate	Apr.	5 , 2010
Arrival at Esashi		5
Departure from Esashi		6
Start hydrographic research (US10140)		6
Arrival at Okushiri		6
Departure from Okushiri		8
Arrival at Fukushima		8
Departure from Fukushima		9
Arrival at Fukushima		9
Departure from Fukushima		10
Finish hydrographic research (US10155)		10
Return to Hakodate		11

Total coverage 400.7 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 191

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	
			Tohru Mukai
	Associate Professor	(Laboratory of Marine Bioresource Science)	
			Tetsuya Takatsu

Graduate Students:	Chair of Marine Bioresource and environment Sensing:	6 persons
	Chair of Marine Bioresource Science:	3 persons
Under Graduate Students:	Department of Applied Marine Science:	1 person
	Department of Marine Biological Science:	1 person
	Department of Applied Marine Science (Third grade):	1 person

Cruise 192

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	
			Tetsuya Takatsu
Graduate Students:	Chair of Marine Bioresource Science:		3 persons
Under Graduate Students:	Department of Marine Biological Science:		2 persons

Cruise 193

Graduate Students:	Chair of Marine Bioresource Science:	1 person
	Chair of Marine Bioresource and Environment Sensing:	1 person
	Graduate School of Environmental Science:	2 persons
Under Graduate Students:	Department of Marine Biology:	1 person
	Department of Applied Marine Science:	3 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”.

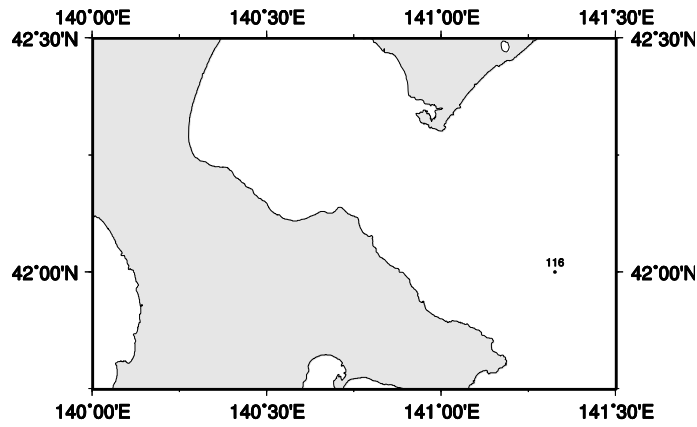


Figure 1: Oceanographic stations (Cruise 191)

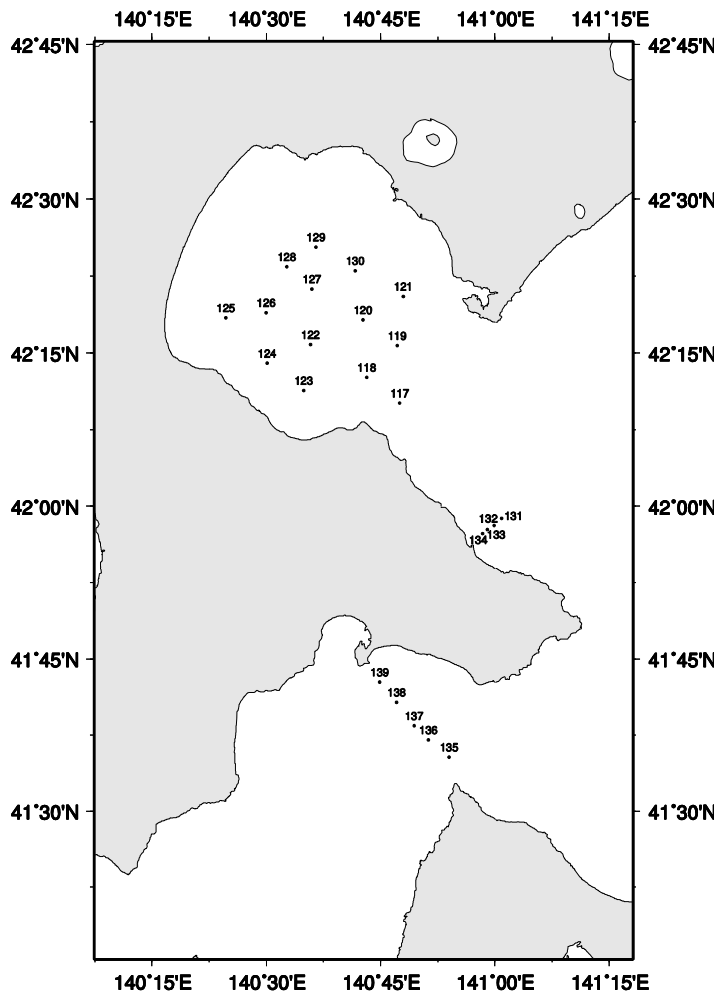


Figure 2: Oceanographic stations (Cruise 192)

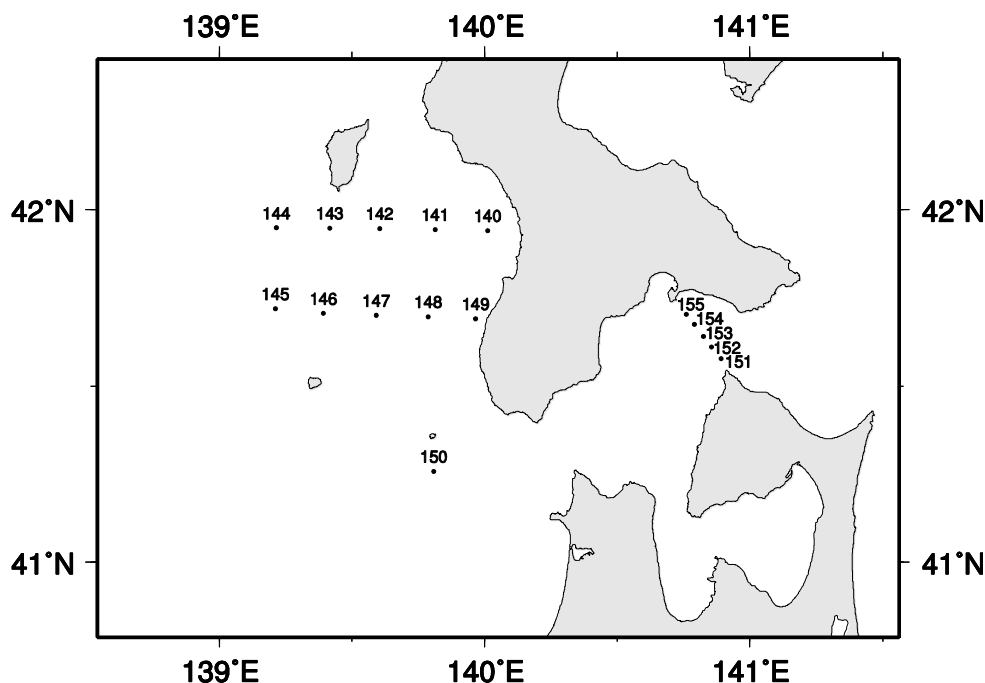


Figure 3: Oceanographic stations (Cruise 193)

Table 1: List of oceanographic stations

Cruise 191													
Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)	
US10116	42-00.1	141-19.5	3/9	0406-0419	309	NW -2	NW -1	NW -3	-3.4	0.3	bc	1030.5	
Cruise 192													
Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)	
US10117	42-10.2	140-47.4	3/23	1310-1314	94	NNE-2	NNW-1	NNE-4	1.8	1.9	o	1012.1	
US10118	42-12.7	140-43.1	3/23	1404-1410	92	NNE-1	NNE-1	NNE-3	1.6	1.4	s	1012.0	
US10119	42-15.8	140-47.1	3/23	1508-1512	72	NNE-1	NNE-1	NNE-3	1.2	1.7	s	1011.7	
US10120	42-18.3	140-42.6	3/23	1545-1549	64	NE -1	NNW-1	NE -3	0.8	1.5	s	1011.9	
US10121	42-20.6	140-47.9	3/23	1653-1656	55	Calm	East-1	Calm	1.1	1.5	s	1011.7	
US10122	42-15.9	140-35.7	3/24	0816-0820	94	West-2	East-1	West-4	1.7	1.5	bc	1012.3	
US10123	42-11.4	140-34.8	3/24	1001-1005	84	WNW-1	East-1	WNW-3	2.5	1.4	bc	1022.6	
US10124	42-14.1	140-30.0	3/24	1112-1116	81	Calm	East-1	Calm	4.3	1.7	bc	1022.6	
US10125	42-18.5	140-24.6	3/24	1234-1238	63	Calm	West-1	Calm	4.9	2.0	bc	1022.5	
US10126	42-19.0	140-29.9	3/24	1342-1346	93	SE -1	West-1	SE -2	4.3	2.4	bc	1021.6	
US10127	42-21.3	140-35.9	3/24	1500-1504	90	Calm	West-1	Calm	5.3	2.7	bc	1021.6	
US10128	42-23.5	140-32.6	3/24	1357-1602	97	West-2	West-1	West-4	4.4	2.0	c	1021.0	
US10129	42-25.4	140-36.4	3/24	1656-1701	88	WNW-1	West-1	WNW-3	4.1	1.7	o	1021.1	
US10130	42-23.1	140-41.6	3/24	1734-1738	68	WNW-1	West-1	WNW-2	3.3	2.1	o	1021.1	
US10131	41-58.9	141-00.8	3/24	2035-2040	96	Calm	East-1	Calm	2.3	1.1	o	1021.6	
US10132	41-58.2	140-59.8	3/24	2047-2051	90	Calm	East-1	Calm	2.7	1.2	o	1021.6	
US10133	41-57.8	140-58.9	3/24	2057-2101	85	Calm	East-1	Calm	2.4	1.3	o	1021.6	
US10134	41-57.4	140-58.3	3/24	2106-2110	80	Calm	East-1	Calm	2.4	1.5	o	1021.6	
US10135	41-35.4	140-53.9	3/25	0027-0030	59	ENE-1	WSW-1	ENE-2	4.7	7.9	c	1020.1	
US10136	41-37.1	140-51.2	3/25	0055-0059	100	NE -1	WSW-1	NE -2	4.8	8.3	c	1020.1	
US10137	41-38.5	140-49.3	3/25	0116-0127	340	NE -1	WSW-1	NE -2	4.8	8.0	c	1019.7	
US10138	41-40.8	140-47.0	3/25	0149-0157	223	North-1	WSW-1	North-3	4.3	7.9	c	1019.1	
US10139	41-42.8	140-44.8	3/25	0215-0219	88	North-1	WSW-1	North-3	3.4	8.2	c	1018.6	

Cruise 193

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10140	41-56.6	140-00.5	4/6	0720-0732	771	East-1	West-1	East-3	5.4	7.0	o	1013.7
US10141	41-56.8	139-48.6	4/6	0828-0838	1294	East-1	West-1	East-3	7.7	7.5	o	1013.1
US10142	41-56.9	139-36.1	4/6	0938-0948	592	SE -1	West-1	SE -3	9.1	7.7	o	1012.8
US10143	41-57.0	139-24.8	4/6	1041-1050	1194	South-1	WSW-1	South-2	8.5	8.0	o	1012.5
US10144	41-57.1	139-12.7	4/9	1149-1158	2794	South-1	WSW-1	South-3	9.3	8.3	o	1011.6
US10145	41-43.4	139-12.5	4/8	0848-0859	607	NW -1	NNW-1	NW -3	4.5	7.3	bc	1026.1
US10146	41-42.6	139-23.3	4/8	0954-1003	785	NW -1	NNW-1	NW -2	6.0	7.4	bc	1026.2
US10147	41-42.3	139-35.3	4/8	1103-1112	742	NW -1	NNW-1	NW -2	5.8	7.6	bc	1026.2
US10148	41-42.0	139-47.0	4/8	1208-1217	1431	West-1	NNW-1	West-1	6.9	7.6	bc	1026.2
US10149	41-41.7	139-57.7	4/8	1307-1311	123	NW -1	NW -1	NW -2	6.4	8.0	bc	1026.2
US10150	41-15.7	139-48.3	4/9	0825-0835	1190	SSE-2	South-1	SSE-4	7.7	7.1	bc	1025.5
US10151	41-34.9	140-53.2	4/10	0934-0936	35	SSW-3	East-1	SSW-5	9.4	8.5	r	1018.1
US10152	41-36.9	140-51.1	4/10	0955-0958	85	SSW-3	East-1	SSW-5	9.6	8.5	r	1017.6
US10153	41-38.7	140-49.2	4/10	1015-1028	353	SW -3	SW -1	SW -5	9.8	8.4	r	1017.6
US10154	41-40.7	140-47.2	4/10	1046-1054	230	SW -3	SW -1	SW -5	9.5	8.6	o	1017.2
US10155	41-42.4	140-45.4	4/10	1110-1115	91	SW -3	SW -1	SW -5	9.6	8.1	o	1016.6

(*): Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION		US10116	
LATITUDE		42-00.1	N
LONGITUDE		141-19.5	E
DEPTH (m)		309	
Press.	Temp.	Salinity	Sigma-T
5	0.725	32.571	26.109
10	0.728	32.564	26.103
20	0.731	32.559	26.098
30	0.760	32.560	26.098
40	0.781	32.559	26.096
50	0.993	32.663	26.167
75	1.763	32.926	26.327
100	2.295	33.041	26.380
125	3.044	33.188	26.435
150	4.075	33.407	26.511
175	4.041	33.453	26.552
200	3.926	33.463	26.571
250	3.524	33.470	26.616

STATION		US10117	
LATITUDE		42-10.2	N
LONGITUDE		140-47.4	E
DEPTH (m)		94	
Press.	Temp.	Salinity	Sigma-T
5	2.209	32.849	26.233
10	2.157	32.865	26.250
20	2.190	32.884	26.262
30	2.202	32.889	26.266
40	2.221	32.894	26.268
50	2.427	32.953	26.299
75	3.839	33.451	26.570

STATION		US10118	
LATITUDE		42-12.7	N
LONGITUDE		140-43.1	E
DEPTH (m)		92	
Press.	Temp.	Salinity	Sigma-T
5	1.863	32.743	26.174
10	1.871	32.800	26.219
20	2.230	32.903	26.274
30	2.266	32.908	26.275
40	2.309	32.917	26.280
50	2.442	32.953	26.298

STATION		US10119	
LATITUDE		42-15.8	N
LONGITUDE		140-47.1	E
DEPTH (m)		72	
Press.	Temp.	Salinity	Sigma-T
5	2.113	32.753	26.163
10	2.293	32.885	26.255
20	2.562	32.968	26.300
30	2.663	32.990	26.310
40	2.735	33.007	26.317
50	3.006	33.081	26.353

STATION		US10120	
LATITUDE		42-18.3	N
LONGITUDE		140-42.6	E
DEPTH (m)		64	
Press.	Temp.	Salinity	Sigma-T
5	1.862	32.373	25.877
10	1.783	32.497	25.982
20	1.791	32.632	26.089
30	1.923	32.784	26.202
40	2.184	32.877	26.257
50	2.722	33.043	26.347

STATION		US10121	
LATITUDE		42-20.6	N
LONGITUDE		140-47.9	E
DEPTH (m)		55	
Press.	Temp.	Salinity	Sigma-T
5	1.900	32.760	26.185
10	1.809	32.790	26.215
20	1.813	32.744	26.178
30	1.847	32.759	26.188
40	1.916	32.800	26.216
50	2.409	33.015	26.350

STATION		US10122	
LATITUDE		42-15.9	N
LONGITUDE		140-35.7	E
DEPTH (m)		94	
Press.	Temp.	Salinity	Sigma-T
5	1.853	32.805	26.224
10	1.851	32.808	26.227
20	1.904	32.836	26.245
30	1.952	32.851	26.254

STATION		US10123	
LATITUDE		42-11.4	N
LONGITUDE		140-34.8	E
DEPTH (m)		84	
Press.	Temp.	Salinity	Sigma-T
5	1.898	32.753	26.179
10	1.819	32.754	26.185
20	1.856	32.792	26.213
30	1.869	32.801	26.220
40	1.908	32.828	26.239
50	1.920	32.845	26.251
75	3.771	33.351	26.497

STATION		US10124	
LATITUDE		42-14.1	N
LONGITUDE		140-30.0	E
DEPTH (m)		81	
Press.	Temp.	Salinity	Sigma-T
5	1.890	32.736	26.166
10	1.781	32.738	26.176
20	1.711	32.746	26.186
30	1.729	32.758	26.195
40	1.765	32.773	26.204
50	1.850	32.795	26.216
75	3.952	33.417	26.532

STATION		US10125	
LATITUDE		42-18.5	N
LONGITUDE		140-24.6	E
DEPTH (m)		63	
Press.	Temp.	Salinity	Sigma-T
5	1.988	32.612	26.060
10	1.800	32.692	26.137
20	1.749	32.747	26.185
30	1.776	32.758	26.192
40	1.817	32.773	26.201
50	2.591	33.044	26.358

STATION		US10126	
LATITUDE		42-19.0	N
LONGITUDE		140-29.9	E
DEPTH (m)		93	
Press.	Temp.	Salinity	Sigma-T
5	2.022	32.708	26.134
10	1.896	32.719	26.152
20	1.713	32.731	26.175
30	1.715	32.737	26.179
40	1.749	32.744	26.182
50	2.169	32.893	26.271
75	2.923	33.163	26.426

STATION		US10127	
LATITUDE		42-21.3	N
LONGITUDE		140-35.9	E
DEPTH (m)		90	
Press.	Temp.	Salinity	Sigma-T
5	2.516	32.787	26.159
10	1.921	32.761	26.184
20	1.922	32.797	26.213
30	1.983	32.826	26.232
40	1.992	32.830	26.234
50	2.107	32.877	26.263
75	3.888	33.465	26.577

STATION		US10128	
LATITUDE		42-23.5	N
LONGITUDE		140-32.6	E
DEPTH (m)		97	
Press.	Temp.	Salinity	Sigma-T
5	2.060	32.790	26.197
10	1.906	32.803	26.219
20	1.929	32.829	26.238
30	1.956	32.855	26.256
40	1.979	32.867	26.265
50	2.164	32.927	26.299
75	3.482	33.316	26.497

STATION		US10131	
LATITUDE		41-58.9	N
LONGITUDE		141-00.8	E
DEPTH (m)		96	
Press.	Temp.	Salinity	Sigma-T
5	1.535	32.617	26.096
10	1.334	32.614	26.106
20	1.613	32.729	26.180
30	1.714	32.753	26.192
40	2.492	32.954	26.294
50	3.631	33.232	26.416
75	4.973	33.569	26.544

STATION		US10134	
LATITUDE		41-57.4	N
LONGITUDE		140-58.3	E
DEPTH (m)		80	
Press.	Temp.	Salinity	Sigma-T
5	1.662	32.647	26.111
10	1.663	32.656	26.118
20	1.843	32.696	26.137
30	1.796	32.729	26.167
40	2.176	32.860	26.244
50	3.798	33.313	26.464
75	3.588	33.515	26.646

STATION		US10137	
LATITUDE		41-38.5	N
LONGITUDE		140-49.3	E
DEPTH (m)		340	
Press.	Temp.	Salinity	Sigma-T
5	8.266	34.069	26.503
10	8.271	34.066	26.500
20	8.270	34.065	26.499
30	8.277	34.064	26.497
40	8.288	34.063	26.495
50	8.283	34.063	26.495
75	8.290	34.063	26.495
100	8.043	34.070	26.537
125	8.057	34.073	26.537
150	7.990	34.076	26.550
175	8.050	34.075	26.540
200	7.964	34.077	26.554
250	8.037	34.075	26.542
300	7.954	34.077	26.556

STATION		US10140	
LATITUDE		41-56.6	N
LONGITUDE		140-00.5	E
DEPTH (m)		771	
Press.	Temp.	Salinity	Sigma-T
5	7.469	33.860	26.456
10	7.372	33.901	26.502
20	7.008	33.988	26.621
30	6.361	34.031	26.741
40	5.973	34.050	26.806
50	5.858	34.058	26.826
75	5.301	34.071	26.904
100	4.522	34.072	26.993
125	3.886	34.063	27.052
150	3.367	34.072	27.111
175	2.943	34.072	27.149
200	2.583	34.072	27.181

STATION		US10129	
LATITUDE		42-25.4	N
LONGITUDE		140-36.4	E
DEPTH (m)		88	
Press.	Temp.	Salinity	Sigma-T
5	2.076	32.651	26.084
10	1.591	32.643	26.112
20	1.900	32.805	26.221
30	1.932	32.822	26.232
40	1.936	32.829	26.237
50	1.973	32.858	26.258
75	4.269	33.512	26.575

STATION		US10132	
LATITUDE		41-58.2	N
LONGITUDE		140-59.8	E
DEPTH (m)		90	
Press.	Temp.	Salinity	Sigma-T
5	1.501	32.615	26.096
10	1.373	32.615	26.104
20	1.486	32.684	26.152
30	1.906	32.803	26.219
40	2.307	32.902	26.268
50	3.743	33.282	26.445
75	4.639	33.571	26.583

STATION		US10135	
LATITUDE		41-35.4	N
LONGITUDE		140-53.9	E
DEPTH (m)		59	
Press.	Temp.	Salinity	Sigma-T
5	8.259	34.069	26.504
10	8.269	34.069	26.502
20	8.279	34.068	26.500
30	8.272	34.069	26.502
40	8.270	34.068	26.502
50	8.265	34.068	26.503

STATION		US10138	
LATITUDE		41-40.8	N
LONGITUDE		140-47.0	E
DEPTH (m)		223	
Press.	Temp.	Salinity	Sigma-T
5	8.232	34.071	26.510
10	8.202	34.066	26.511
20	8.146	34.065	26.518
30	8.109	34.065	26.524
40	8.084	34.065	26.527
50	8.091	34.066	26.527
75	7.810	34.064	26.567
100	7.678	34.064	26.586
125	7.698	34.065	26.584
150	7.660	34.063	26.588
175	7.667	34.063	26.587
200	7.606	34.062	26.595

STATION		US10141	
LATITUDE		41-56.8	N
LONGITUDE		139-48.6	E
DEPTH (m)		1294	
Press.	Temp.	Salinity	Sigma-T
5	7.861	34.081	26.573
10	7.843	34.080	26.575
20	7.844	34.081	26.575
30	7.702	34.080	26.595
40	7.609	34.084	26.612
50	7.546	34.087	26.623
75	7.333	34.088	26.654
100	6.986	34.090	26.704
125	6.782	34.089	26.731
150	5.075	34.061	26.923
175	3.050	34.072	27.139
200	2.583	34.076	27.184

STATION		US10130	
LATITUDE		42-23.1	N
LONGITUDE		140-41.6	E
DEPTH (m)		68	
Press.	Temp.	Salinity	Sigma-T
5	2.112	32.703	26.123
10	2.020	32.707	26.133
20	1.847	32.706	26.145
30	1.818	32.725	26.162
40	1.877	32.803	26.221
50	2.027	32.874	26.267

STATION		US10133	
LATITUDE		41-57.8	N
LONGITUDE		140-58.9	E
DEPTH (m)		85	
Press.	Temp.	Salinity	Sigma-T
5	1.581	32.614	26.090
10	1.514	32.626	26.104
20	1.590	32.686	26.147
30	1.793	32.777	26.206
40	2.154	32.863	26.248
50	3.977	33.316	26.449
75	4.136	33.545	26.618

STATION		US10136	
LATITUDE		41-37.1	N
LONGITUDE		140-51.2	E
DEPTH (m)		100	
Press.	Temp.	Salinity	Sigma-T
5	8.592	34.010	26.407
10	8.580	34.020	26.416
20	8.489	34.042	26.448
30	8.473	34.054	26.459
40	8.159	34.070	26.520
50	8.071	34.075	26.537
75	8.004	34.080	26.550

STATION		US10139	
LATITUDE		41-42.8	N
LONGITUDE		140-44.8	E
DEPTH (m)		88	
Press.	Temp.	Salinity	Sigma-T
5	8.313	34.025	26.461
10	8.280	34.050	26.486
20	8.139	34.040	26.500
30	8.077	34.045	26.512
40	8.070	34.049	26.516
50	8.039	34.051	26.523
75	7.532	34.042	26.590

STATION		US10142	
LATITUDE		41-56.9	N
LONGITUDE		139-36.1	E
DEPTH (m)		592	
Press.	Temp.	Salinity	Sigma-T
5	8.039	34.075	26.542
10	7.877	34.071	26.562
20	7.865	34.074	26.566
30	7.865	34.075	26.567
40	7.860	34.076	26.568
50	7.819	34.076	26.575
75	7.648	34.075	26.599
100	7.448	34.070	26.624
125	6.878	34.068	26.702
150	5.513	34.068	26.876
175	4.413	34.076	27.008
200	3.347	34.074	27.114

STATION		US10143	
LATITUDE		41-57.0	N
LONGITUDE		139-24.8	E
DEPTH (m)		1194	
Press.	Temp.	Salinity	Sigma-T
5	8.113	34.068	26.525
10	8.066	34.069	26.533
20	8.040	34.071	26.538
30	8.009	34.070	26.542
40	7.972	34.070	26.548
50	7.950	34.071	26.552
75	7.786	34.073	26.577
100	7.594	34.074	26.606
125	7.310	34.074	26.646
150	6.647	34.076	26.739
175	5.998	34.084	26.829
200	3.848	34.076	27.066

STATION		US10146	
LATITUDE		41-42.6	N
LONGITUDE		139-23.3	E
DEPTH (m)		785	
Press.	Temp.	Salinity	Sigma-T
5	7.650	34.065	26.591
10	7.396	34.055	26.619
20	7.308	34.059	26.635
30	7.293	34.061	26.638
40	7.283	34.060	26.639
50	6.708	34.068	26.724
75	6.453	34.075	26.763
100	5.252	34.071	26.909
125	4.274	34.074	27.021
150	3.545	34.074	27.095
175	3.202	34.075	27.128
200	2.670	34.069	27.171

STATION		US10149	
LATITUDE		41-41.7	N
LONGITUDE		139-57.7	E
DEPTH (m)		123	
Press.	Temp.	Salinity	Sigma-T
5	7.491	33.894	26.479
10	7.307	33.962	26.559
20	7.140	34.012	26.621
30	7.029	34.022	26.644
40	6.875	34.050	26.687
50	6.444	34.066	26.757
75	5.121	34.067	26.922
100	2.204	34.056	27.199

STATION		US10152	
LATITUDE		41-36.9	N
LONGITUDE		140-51.1	E
DEPTH (m)		85	
Press.	Temp.	Salinity	Sigma-T
5	8.780	33.912	26.301
10	8.658	33.956	26.354
20	8.445	33.972	26.400
30	8.154	33.984	26.453
40	8.148	33.986	26.456
50	8.144	33.986	26.456
75	8.141	33.986	26.457

STATION		US10155	
LATITUDE		41-42.4	N
LONGITUDE		140-45.4	E
DEPTH (m)		91	
Press.	Temp.	Salinity	Sigma-T
5	8.315	34.012	26.451
10	8.310	34.013	26.452
20	8.198	34.012	26.468
30	8.100	34.015	26.486
40	7.940	34.023	26.516
50	7.806	34.029	26.540
75	7.253	34.056	26.640

STATION		US10144	
LATITUDE		41-57.1	N
LONGITUDE		139-12.7	E
DEPTH (m)		2794	
Press.	Temp.	Salinity	Sigma-T
5	8.393	34.063	26.479
10	8.329	34.063	26.488
20	8.180	34.062	26.511
30	8.125	34.063	26.520
40	8.107	34.065	26.523
50	8.101	34.065	26.525
75	7.935	34.071	26.554
100	7.915	34.074	26.559
125	7.907	34.075	26.561
150	7.781	34.069	26.575
175	6.889	34.075	26.705
200	5.593	34.075	26.872

STATION		US10147	
LATITUDE		41-42.3	N
LONGITUDE		139-35.3	E
DEPTH (m)		742	
Press.	Temp.	Salinity	Sigma-T
5	7.625	34.035	26.571
10	7.578	34.044	26.584
20	7.564	34.049	26.591
30	7.581	34.060	26.597
40	7.565	34.060	26.599
50	7.572	34.063	26.600
75	7.332	34.065	26.636
100	6.704	34.081	26.735
125	5.746	34.073	26.852
150	4.689	34.073	26.976
175	4.217	34.077	27.029
200	3.102	34.069	27.132

STATION		US10150	
LATITUDE		41-15.7	N
LONGITUDE		139-48.3	E
DEPTH (m)		1190	
Press.	Temp.	Salinity	Sigma-T
5	7.394	34.076	26.636
10	7.359	34.077	26.641
20	6.996	34.072	26.688
30	6.745	34.075	26.725
40	5.872	34.067	26.831
50	5.415	34.082	26.899
75	5.096	34.084	26.938
100	4.205	34.078	27.032
125	3.520	34.070	27.094
150	2.966	34.070	27.146
175	2.171	34.067	27.211
200	1.875	34.070	27.236

STATION		US10153	
LATITUDE		41-38.7	N
LONGITUDE		140-49.2	E
DEPTH (m)		353	
Press.	Temp.	Salinity	Sigma-T
5	8.750	33.950	26.335
10	8.736	33.950	26.337
20	8.592	33.947	26.357
30	8.393	33.984	26.417
40	8.385	34.001	26.431
50	8.389	34.021	26.446
75	8.128	34.018	26.483
100	7.867	34.030	26.532
125	7.626	34.048	26.581
150	7.479	34.058	26.610
175	7.404	34.063	26.625
200	7.413	34.063	26.623
250	6.949	34.070	26.693
300	6.746	34.075	26.725

STATION		US10145	
LATITUDE		41-43.4	N
LONGITUDE		139-12.5	E
DEPTH (m)		607	
Press.	Temp.	Salinity	Sigma-T
5	7.691	34.052	26.575
10	7.651	34.060	26.587
20	7.637	34.064	26.592
30	7.636	34.065	26.593
40	7.636	34.066	26.594
50	7.421	34.082	26.636
75	6.472	34.060	26.749
100	5.815	34.080	26.849
125	5.127	34.080	26.931
150	4.102	34.077	27.041
175	3.453	34.073	27.103
200	2.509	34.068	27.184

STATION		US10148	
LATITUDE		41-42.0	N
LONGITUDE		139-47.0	E
DEPTH (m)		1431	
Press.	Temp.	Salinity	Sigma-T
5	7.333	34.018	26.599
10	7.199	34.032	26.628
20	7.065	34.047	26.659
30	6.970	34.054	26.678
40	6.456	34.058	26.750
50	5.825	34.054	26.827
75	4.989	34.069	26.939
100	4.072	34.073	27.041
125	3.375	34.071	27.109
150	3.083	34.074	27.138
175	2.496	34.064	27.182
200	1.696	34.070	27.249

STATION		US10151	
LATITUDE		41-34.9	N
LONGITUDE		140-53.2	E
DEPTH (m)		35	
Press.	Temp.	Salinity	Sigma-T
5	8.810	33.913	26.296
10	8.723	33.927	26.322
20	8.454	33.960	26.388
30	8.458	33.963	26.390

STATION		US10154	
LATITUDE		41-40.7	N
LONGITUDE		140-47.2	E
DEPTH (m)		230	
Press.	Temp.	Salinity	Sigma-T
5	8.744	34.009	26.383
10	8.733	34.010	26.385
20	8.561	34.016	26.416
30	8.543	34.021	26.423
40	8.417	34.030	26.450
50	8.299	34.032	26.469
75	8.183	34.025	26.481
100	8.063	34.026	26.499
125	7.605	34.038	26.576
150	7.542	34.047	26.592
175	7.464	34.066	26.618
200	6.961	34.070	26.692

THE " USHIO MARU "

CRUISE 194

CRUISE 195

CRUISE 196

IN APRIL - MAY 2010

1. Cruise Itinerary

Cruise 194		
Departure from Hakodate	Apr.	15 , 2010
Arrival at Usujiri		15
Departure from Usujiri		16
Start hydrographic research (US10156)		16
Sampling by Frame trawl net		16
Arrival at and departure from Usujiri		17
Arrival at Usujiri		17
Departure from Usujiri		19
Arrival at Usujiri		20
Departure from Usujiri		22
Retrieval Sediment trap system		22
Arrival at Mori		22
Departure from Mori		23
Set Sediment trap system		23
Arrival at Muroran		23
Departure from Muroran		24
Finish hydrographic research (US10195)		24
Return to Hakodate		25

Total coverage 554.0 miles

Cruise 195		
Departure from Hakodate	May	7 , 2010
Arrival at Usujiri		7
Departure from Usujiri		8
Research by bottom long line		8
Start hydrographic research (US10196)		8
Arrival at Usujiri		8
Departure from Usujiri		9
Start Frame trawl net sampling		9
Finish Frame trawl net sampling		10
Arrival at Usujiri		11
Departure from Usujiri		13
Start Trawl net research		13
Finish Trawl net research		14
Arrival at Usujiri		14
Departure from Usujiri		15
Finish hydrographic research (US10235)		15
Arrival at Usujiri		15
Departure from Usujiri		16
Return to Hakodate		16

Total coverage 451.3 miles

Cruise 196		
Departure from Hakodate	May	21 , 2010
Start hydrographic research (US10236)		21
Finish hydrographic research (US10246)		23
Return to Hakodate		23

Total coverage 336.8 miles

2. Vessel Personnel

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

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Research Staff:	Associate Professor	(Laboratory of Marine Environmental Science)	Isao Kudo
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Tohru Mukai
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Tohru Hirawake
	Associate Professor	(Laboratory of Marine Bioresource Science)	Toshikuni Nakatani
	Assistant Professor	(Laboratory of Marine Environmental Science)	Hiroji Onishi
	Assistant Professor	(Field Science Center for Northern Biosphere)	Jun Yamamoto
	Postdoctoral fellow	(Faculty of Fisheries Sciences)	Tomonori Isada

Guest Scientist (Domestic):	(Ehime University)	Michinobu Kuwae
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Graduate Students:	Chair of Marine Bioresource and Environment Sensing:	8 persons
	Chair of Marine Bioresource Science:	3 persons
	Chair of Marine Environmental Science:	1 person
	Graduate School of Environmental Science:	2 persons
Under Graduate Students:	Department of Marine Biology:	5 persons
	Department of Applied Marine Science:	9 persons
	Ehime University:	1 person

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Research Staff:	Professor	(Laboratory of Marine Biology and Biodiversity)	Ichiro Imai
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Susumu Shimizu
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Tohru Mukai
	Associate Professor	(Laboratory of Marine Bioresource Science)	Toshikuni Nakatani
	Assistant Professor	(Field Science Center for Northern Biosphere)	Jun Yamamoto

Graduate Students:	Chair of Marine Bioresource and Environment Sensing:	6 persons
	Chair of Marine Industrial Science and Technology:	1 person
	Chair of Marine Bioresource Science:	4 persons

	Chair of Marine Biology and Biodiversity:	2 persons
Under Graduate Students:	Department of Marine Biology:	5 persons
	Department of Applied Marine Science:	6 persons
	Department of Marine Production System Science:	1 person
	Department of Applied Marine Science (Third grade):	8 persons

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Research Staff:	Postdoctoral fellow	(Faculty of Fisheries Sciences)	Tomonori Isada
Guest Scientist (Domestic)		(JAMSTEC)	Kenichi Sasaki
		(JAMSTEC)	Hajime Kawakami
		(JAMSTEC)	Hideki Yamamoto
Graduate Students:	Chair of Marine Bioresource and Environment Sensing:	2 persons	
Under Graduate Students:	Department of Applied Marine Science:	1 person	

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”.

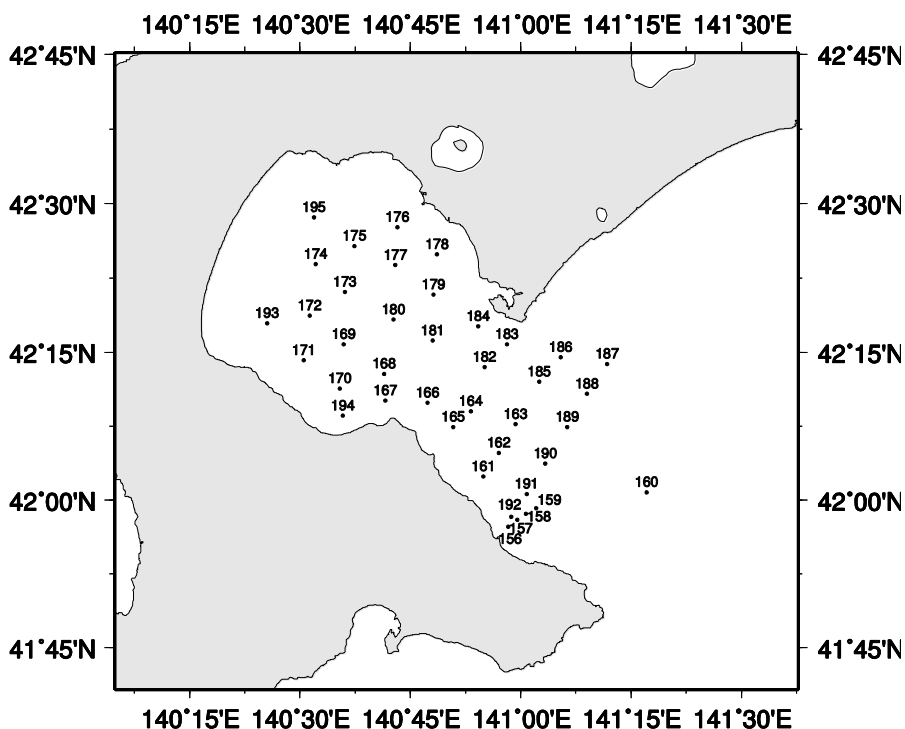


Figure 1: Oceanographic stations (Cruise 194)

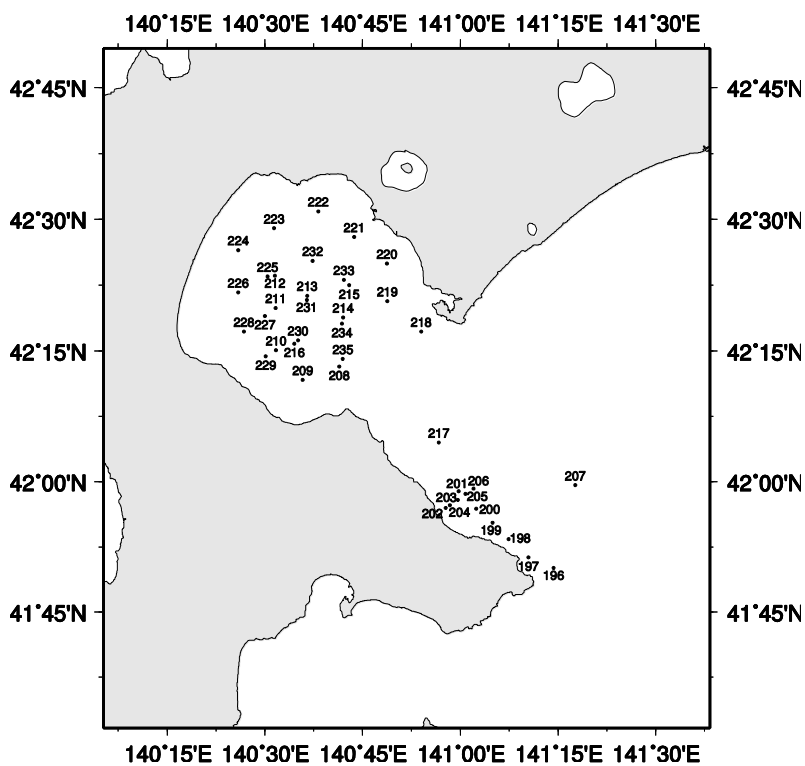


Figure 2: Oceanographic stations (Cruise 195)

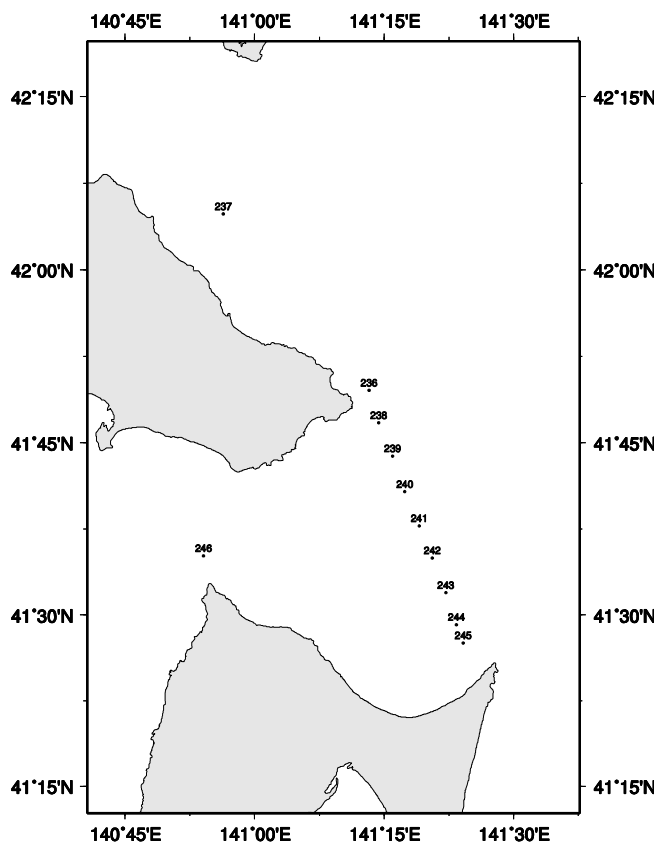


Figure 3: Oceanographic stations (Cruise 196)

Table 1: List of oceanographic stations

Cruise 194												
Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10156	41-57.4	140-58.2	4/16	1202-1205	79	SE -1	NW -1	SE -3	5.3	3.4	bc	1027.2
US10157	41-58.1	140-59.4	4/16	1214-1217	86	ESE-1	NW -1	ESE-3	4.8	3.3	bc	1027.2
US10158	41-58.7	141-00.6	4/16	1225-1229	94	ESE-1	NW -1	ESE-3	4.8	3.3	bc	1027.2
US10159	41-59.3	141-02.0	4/16	1238-1242	102	ESE-1	NW -1	ESE-3	4.9	3.4	bc	1027.2
US10160	42-00.9	141-17.0	4/16	1754-1804	256	SSE-1	NW -1	SSE-2	5.4	4.0	bc	1027.3
US10161	42-02.5	140-54.8	4/19	0635-0640	78	Calm	ESE-1	Calm	3.6	3.2	o	1027.6
US10162	42-04.9	140-56.9	4/19	0720-0730	86	WSW-1	ESE-1	WSW-1	3.6	2.9	o	1027.7
US10163	42-07.8	140-59.2	4/19	0824-0828	84	Calm	ESE-1	Calm	4.8	3.3	o	1027.6
US10164	42-09.1	140-53.1	4/19	0858-0903	78	SE -1	ESE-1	SE -2	5.3	3.2	o	1027.6
US10165	42-07.5	140-50.7	4/19	0918-0923	82	SE -1	ESE-1	SE -2	5.1	3.6	o	1027.6
US10166	42-10.0	140-47.2	4/19	0947-0954	94	East-1	ESE-1	East-2	4.9	3.6	o	1027.1
US10167	42-10.2	140-41.5	4/19	1018-1022	86	East-1	ESE-1	East-2	5.9	3.4	c	1027.1
US10168	42-12.9	140-41.3	4/19	1040-1044	91	East-1	ESE-1	East-3	4.8	3.6	c	1027.1
US10169	42-15.9	140-35.8	4/19	1117-1123	92	ENE-1	ESE-1	ENE-3	4.7	3.3	c	1027.1
US10170	42-11.4	140-35.3	4/19	1223-1227	82	East-1	East-1	East-2	5.6	3.6	c	1026.7
US10171	42-14.3	140-30.4	4/19	1256-1259	82	Calm	East-1	Calm	5.6	3.6	o	1026.8
US10172	42-18.8	140-31.2	4/19	1327-1331	95	ESE-1	East-1	ESE-2	5.3	3.9	c	1026.6
US10173	42-21.2	140-36.0	4/19	1358-1402	90	SE -1	East-1	SE -3	5.5	4.1	c	1026.1
US10174	42-24.0	140-32.0	4/19	1428-1432	97	SE -1	ESE-1	SE -3	7.5	4.0	c	1025.7
US10175	42-25.8	140-37.3	4/19	1510-1515	85	SE -1	ESE-1	SE -3	5.1	4.0	bc	1025.4
US10176	42-27.7	140-43.1	4/19	1544-1547	62	SSE-2	SE -1	SSE-4	5.2	4.2	c	1025.4
US10177	42-23.9	140-42.8	4/19	1612-1615	62	SE -2	SE -1	SE -4	5.5	4.0	c	1025.2
US10178	42-25.0	140-48.5	4/19	1644-1647	45	SE -1	SE -1	SE -3	5.5	5.7	c	1025.1
US10179	42-20.9	140-48.0	4/19	1713-1716	54	ESE-1	SE -1	ESE-3	5.4	4.5	c	1025.2
US10180	42-18.4	140-42.6	4/19	1745-1748	64	SE -1	SE -1	SE -3	5.3	3.8	o	1024.8
US10181	42-16.3	140-47.9	4/19	1816-1820	70	ESE-1	SE -1	ESE-3	5.2	4.0	c	1024.6
US10182	42-13.6	140-55.0	4/19	1857-1900	66	ESE-1	SE -1	ESE-3	4.8	3.2	o	1024.6
US10183	42-15.9	140-58.0	4/19	1923-1926	65	SE -2	SE -1	SE -4	4.9	3.1	o	1024.6
US10184	42-17.7	140-54.1	4/20	0713-0719	58	East-3	SE -1	East-5	4.6	3.3	o	1021.2
US10185	42-12.1	141-02.4	4/20	0827-0831	81	ENE-3	East-1	ENE-5	4.1	2.9	r	1021.6
US10186	42-14.6	141-05.3	4/20	0851-0855	82	ENE-3	East-1	ENE-5	4.0	3.1	r	1021.6
US10187	42-13.9	141-11.6	4/20	0925-0930	122	East-2	ESE-1	East-4	4.1	2.9	r	1021.6
US10188	42-10.9	141-08.9	4/20	0959-1004	110	East-2	ESE-1	East-4	4.4	3.2	r	1020.6
US10189	42-07.5	141-06.2	4/20	1030-1034	106	East-2	ESE-1	East-4	4.4	2.9	o	1020.5
US10190	42-03.8	141-03.2	4/20	1105-1109	99	ESE-3	ESE-1	ESE-5	4.6	3.3	o	1020.1
US10191	42-00.7	141-00.7	4/20	1133-1136	91	ESE-3	ESE-1	ESE-5	4.4	3.2	r	1019.1
US10192	41-58.4	140-58.6	4/20	1155-1159	84	ESE-3	ESE-1	ESE-5	4.4	3.4	r	1019.0
US10193	42-18.0	140-25.4	4/22	1112-1115	67	East-1	ESE-1	East-2	6.9	3.8	c	1019.7
US10194	42-08.7	140-35.7	4/22	1557-1600	64	East-2	East-1	East-4	5.8	3.5	c	1017.6
US10195	42-28.7	140-31.8	4/23	1041-1045	79	SE -3	ESE-1	SE -5	3.3	3.2	o	1013.2

Cruise 195												
Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10196	41-50.2	141-14.2	5/8	0730-0740	218	West-1	SE -1	West-3	8.7	5.0	c	1003.6
US10197	41-51.4	141-10.3	5/8	0804-0809	112	South-1	SE -1	South-2	9.9	4.9	c	1003.6
US10198	41-53.5	141-07.3	5/8	0832-0836	97	Calm	SE -1	Calm	8.3	4.9	c	1003.6
US10199	41-55.4	141-04.8	5/8	1157-1202	114	Calm	East-1	Calm	7.7	4.5	c	1004.1
US10200	41-57.0	141-02.3	5/8	1221-1225	107	NNE-1	East-1	NNE-3	7.4	5.3	c	1004.2
US10201	41-59.0	140-59.6	5/8	1243-1248	88	NNE-1	East-1	NNE-3	7.3	5.8	c	1004.1
US10202	41-57.1	140-57.6	5/9	0744-0747	64	NNW-1	East-1	NNW-3	7.9	4.7	bc	1010.6
US10203	41-57.4	140-58.3	5/9	1140-1144	80	North-1	East-1	North-3	10.7	6.0	bc	1012.1
US10204	41-58.0	140-59.5	5/9	1151-1155	88	Calm	East-1	Calm	9.8	6.2	bc	1012.2
US10205	41-58.7	141-00.7	5/9	1203-1207	96	NW -1	East-1	NW -2	9.4	6.3	bc	1012.2
US10206	41-59.3	141-01.9	5/9	1214-1218	103	Calm	East-1	Calm	9.6	6.0	bc	1012.2
US10207	41-59.7	141-17.5	5/9	1435-1445	266	NW -2	ESE-2	NW -4	10.5	6.8	bc	1012.2
US10208	42-13.3	140-41.3	5/13	0855-0859	90	West-2	ESE-1	West-3	6.4	4.8	r	1007.3
US10209	42-11.8	140-35.7	5/13	1023-1027	84	NW -1	ESE-1	NW -2	7.1	5.6	o	1007.6
US10210	42-15.2	140-31.6	5/13	1147-1151	89	NNW-2	ESE-1	NNW-4	8.2	5.7	o	1007.8
US10211	42-20.0	140-31.5	5/13	1313-1318	96	NNW-3	ESE-1	NNW-5	7.3	5.5	c	1007.9
US10212	42-23.7	140-31.4	5/13	1436-1441	98	NNW-3	NW -1	NNW-5	7.7	5.7	c	1008.1
US10213	42-21.4	140-36.4	5/13	1530-1535	90	NNW-3	NW -1	NNW-5	7.0	5.9	r	1008.5
US10214	42-18.9	140-41.9	5/13	1625-1629	72	NNW-3	NW -1	NNW-5	7.1	5.9	r	1008.6
US10215	42-22.6	140-42.8	5/13	1711-1714	62	NW -2	NW -1	NW -4	7.1	6.4	r	1008.8
US10216	42-15.9	140-34.4	5/14	0849-0853	92	NW -2	ESE-1	NW -3	7.8	5.4	bc	1015.6
US10217	42-04.6	140-56.6	5/15	0648-0654	86	Calm	ESE-1	Calm	7.2	6.4	bc	1021.2
US10218	42-17.3	140-53.9	5/15	0819-0823	57	Calm	ESE-1	Calm	7.9	6.6	bc	1021.6
US10219	42-20.8	140-48.7	5/15	0904-0907	52	Calm	SE -1	Calm	8.3	6.7	bc	1021.5
US10220	42-25.1	140-48.6	5/15	0935-0938	43	Calm	SE -1	Calm	8.3	7.1	bc	1021.5
US10221	42-28.1	140-43.6	5/15	1010-1014	59	Calm	SSE-1	Calm	9.6	6.7	bc	1021.5
US10222	42-31.0	140-38.1	5/15	1046-1049	62	Calm	SE -1	Calm	10.7	7.0	bc	1021.2
US10223	42-29.1	140-31.3	5/15	1123-1127	74	Calm	ESE-1	Calm	10.1	7.8	bc	1021.1
US10224	42-26.6	140-25.8	5/15	1156-1200	66	Calm	ESE-1	Calm	10.3	7.7	bc	1021.0
US10225	42-23.6	140-30.3	5/15	1230-1234	95	SE -1	ESE-1	SE -2	10.1	7.7	bc	1020.7
US10226	42-21.8	140-25.8	5/15	1258-1302	76	SSE-1	ESE-1	SSE-2	9.5	8.1	bc	1020.7
US10227	42-19.1	140-29.9	5/15	1333-1337	93	SE -1	ESE-1	SE -2	10.8	7.0	bc	1020.5
US10228	42-17.3	140-26.7	5/15	1400-1403	72	Calm	ESE-1	Calm	9.9	8.0	bc	1020.2
US10229	42-14.5	140-30.0	5/15	1427-1430	82	Calm	ESE-1	Calm	10.0	7.9	bc	1020.1
US10230	42-16.3	140-35.0	5/15	1456-1500	93	SE -1	ESE-1	SE -2	9.1	7.7	bc	1020.0
US10231	42-20.9	140-36.3	5/15	1537-1542	90	SSE-1	ESE-1	SSE-2	11.1	8.4	bc	1020.1
US10232	42-25.4	140-37.2	5/15	1623-1627	86	ESE-1	ESE-1	ESE-2	8.8	8.5	bc	1020.1
US10233	42-23.2	140-42.0	5/15	1654-1657	65	SE -1	ESE-1	SE -3	9.0	7.6	bc	1020.1
US10234	42-18.2	140-41.7	5/15	1730-1734	70	SE -1	ESE-1	SE -3	8.4	7.6	bc	1020.1
US10235	42-14.2	140-41.8	5/15	1801-1805	88	SE -1	ESE-1	SE -3	8.1	7.2	bc	1020.1

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Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10236	41-49.6	141-13.2	5/21	1156-1205	179	North-1	East-1	North-1	9.9	6.6	bc	1009.3
US10237	42-04.9	140-56.3	5/21	1451-1457	86	Calm	East-1	Calm	14.5	8.2	m	1009.5
US10238	41-46.8	141-14.3	5/21	1744-1755	196	SW-3	South-1	SW-5	9.4	5.9	bc	1008.4
US10239	41-43.9	141-15.9	5/21	1816-1829	230	SW-3	SSW-1	SW-5	8.8	5.5	f	1009.0
US10240	41-40.8	141-17.3	5/21	1850-1905	232	WSW-3	SSW-1	WSW-5	8.6	5.5	f	1009.3
US10241	41-37.8	141-19.0	5/21	1927-1938	218	WSW-3	SW-1	WSW-5	9.1	7.5	f	1009.7
US10242	41-35.0	141-20.5	5/21	1957-2014	311	West-3	WSW-1	West-5	9.0	6.9	bc	1010.1
US10243	41-32.0	141-22.1	5/21	2035-2050	247	West-2	WSW-1	West-4	10.2	9.8	bc	1010.2
US10244	41-29.2	141-23.3	5/21	2110-2124	109	West-1	WSW-1	West-3	10.7	10.0	bc	1010.8
US10245	41-27.6	141-24.1	5/21	2136-2143	55	NW-1	WSW-1	NW-3	10.5	9.4	bc	1011.0
US10246	41-35.2	140-54.0	5/23	0010-0013	57	ENE-3	East-1	ENE-5	10.9	10.8	bc	1016.7

(*) : Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US10156				STATION US10157				STATION US10158			
LATITUDE 41-57.4 N				LATITUDE 41-58.1 N				LATITUDE 41-58.7 N			
LONGITUDE 140-58.2 E				LONGITUDE 140-59.4 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	3.073	32.687	26.032	5	3.103	32.778	26.102	5	2.898	32.789	26.129
10	2.779	32.708	26.075	10	2.698	32.782	26.140	10	2.673	32.793	26.151
20	3.036	32.866	26.179	20	2.715	32.800	26.154	20	2.845	32.844	26.177
30	4.765	33.562	26.561	30	3.560	33.145	26.353	30	3.648	33.215	26.400
40	4.927	33.592	26.567	40	4.661	33.537	26.553	40	4.359	33.435	26.504
50	4.978	33.608	26.574	50	5.022	33.639	26.594	50	4.522	33.479	26.522
75	4.882	33.676	26.639	75	5.040	33.696	26.637	75	5.408	33.709	26.604
STATION US10159				STATION US10160				STATION US10161			
LATITUDE 41-59.3 N				LATITUDE 42-00.9 N				LATITUDE 42-02.5 N			
LONGITUDE 141-02.0 E				LONGITUDE 141-17.0 E				LONGITUDE 140-54.8 E			
DEPTH (m) 102				DEPTH (m) 256				DEPTH (m) 78			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	2.826	32.773	26.123	5	3.650	32.900	26.150	5	3.406	32.533	25.880
10	2.659	32.787	26.148	10	3.425	32.910	26.179	10	3.302	32.655	25.987
20	2.623	32.798	26.159	20	3.160	32.913	26.206	20	3.010	32.812	26.138
30	3.069	33.053	26.325	30	3.188	32.924	26.211	30	2.946	32.846	26.171
40	4.545	33.422	26.474	40	3.326	32.954	26.223	40	3.440	33.028	26.271
50	5.233	33.546	26.496	50	3.290	32.968	26.238	50	4.193	33.393	26.488
75	5.512	33.674	26.564	75	5.151	33.523	26.487	75	4.837	33.674	26.642
STATION US10162				STATION US10163				STATION US10164			
LATITUDE 42-04.9 N				LATITUDE 42-07.8 N				LATITUDE 42-09.1 N			
LONGITUDE 140-56.9 E				LONGITUDE 140-59.2 E				LONGITUDE 140-53.1 E			
DEPTH (m) 86				DEPTH (m) 84				DEPTH (m) 78			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.372	32.715	26.028	5	3.530	32.696	25.999	5	3.426	32.675	25.992
10	3.199	32.788	26.102	10	3.413	32.754	26.056	10	3.368	32.713	26.027
20	2.818	32.834	26.172	20	3.377	32.966	26.228	20	3.302	32.980	26.246
30	3.551	33.136	26.347	30	3.788	33.242	26.409	30	4.555	33.515	26.547
40	4.276	33.364	26.457	40	4.576	33.446	26.490	40	5.006	33.636	26.593
50	5.026	33.548	26.522	50	4.996	33.530	26.510	50	5.020	33.642	26.596
75	5.366	33.668	26.577	75	5.431	33.660	26.563	75	4.869	33.644	26.615
STATION US10165				STATION US10166				STATION US10167			
LATITUDE 42-07.5 N				LATITUDE 42-10.0 N				LATITUDE 42-10.2 N			
LONGITUDE 140-50.7 E				LONGITUDE 140-47.2 E				LONGITUDE 140-41.5 E			
DEPTH (m) 82				DEPTH (m) 94				DEPTH (m) 86			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.619	32.617	25.928	5	3.871	32.610	25.898	5	3.511	32.608	25.930
10	3.315	32.637	25.971	10	3.744	32.649	25.941	10	3.487	32.642	25.959
20	2.977	32.769	26.107	20	3.196	32.652	25.994	20	3.071	32.749	26.082
30	2.898	32.795	26.134	30	2.731	32.751	26.113	30	3.257	32.823	26.124
40	3.199	32.973	26.250	40	3.247	32.993	26.261	40	3.393	32.876	26.155
50	4.714	33.555	26.562	50	5.096	33.659	26.602	50	3.247	32.930	26.211
75	5.018	33.636	26.592	75	5.151	33.653	26.590	75	4.282	33.463	26.535
STATION US10168				STATION US10169				STATION US10170			
LATITUDE 42-12.9 N				LATITUDE 42-15.9 N				LATITUDE 42-11.4 N			
LONGITUDE 140-41.3 E				LONGITUDE 140-35.8 E				LONGITUDE 140-35.3 E			
DEPTH (m) 91				DEPTH (m) 92				DEPTH (m) 82			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.592	32.569	25.892	5	3.642	32.588	25.902	5	3.810	32.662	25.945
10	3.553	32.590	25.912	10	3.572	32.700	25.998	10	3.440	32.668	25.985
20	3.284	32.596	25.942	20	3.060	32.690	26.036	20	2.853	32.727	26.084
30	2.871	32.629	26.004	30	3.393	32.802	26.096	30	2.800	32.751	26.107
40	2.611	32.726	26.102	40	2.745	32.758	26.117	40	2.854	32.788	26.132
50	3.267	33.072	26.322	50	2.762	32.773	26.128	50	3.223	32.856	26.154
75	4.443	33.473	26.525	75	4.300	33.446	26.520	75	4.221	33.457	26.536

STATION		US10171	
LATITUDE		42-14.3	N
LONGITUDE		140-30.4	E
DEPTH (m)		82	
Press.	Temp.	Salinity	Sigma-T
5	3.498	32.634	25.953
10	3.361	32.676	25.999
20	3.009	32.796	26.125
30	2.939	32.801	26.135
40	2.960	32.826	26.154
50	3.118	32.890	26.190
75	4.245	33.460	26.536

STATION		US10174	
LATITUDE		42-24.0	N
LONGITUDE		140-32.0	E
DEPTH (m)		97	
Press.	Temp.	Salinity	Sigma-T
5	3.588	32.648	25.955
10	3.121	32.665	26.011
20	2.874	32.668	26.035
30	3.036	32.733	26.072
40	2.714	32.715	26.086
50	2.666	32.737	26.107
75	3.830	33.351	26.492

STATION		US10177	
LATITUDE		42-23.9	N
LONGITUDE		140-42.8	E
DEPTH (m)		62	
Press.	Temp.	Salinity	Sigma-T
5	3.976	32.504	25.804
10	3.507	32.516	25.857
20	2.858	32.658	26.028
30	2.816	32.697	26.062
40	2.609	32.730	26.106
50	2.569	32.897	26.243

STATION		US10180	
LATITUDE		42-18.4	N
LONGITUDE		140-42.6	E
DEPTH (m)		64	
Press.	Temp.	Salinity	Sigma-T
5	4.172	32.493	25.775
10	4.000	32.520	25.814
20	3.116	32.520	25.896
30	2.892	32.580	25.963
40	2.798	32.699	26.066
50	2.683	32.953	26.278

STATION		US10183	
LATITUDE		42-15.9	N
LONGITUDE		140-58.0	E
DEPTH (m)		65	
Press.	Temp.	Salinity	Sigma-T
5	3.637	32.830	26.096
10	3.539	32.826	26.101
20	3.711	33.118	26.317
30	3.998	33.321	26.451
40	4.115	33.390	26.494
50	4.123	33.390	26.493

STATION		US10186	
LATITUDE		42-14.6	N
LONGITUDE		141-05.3	E
DEPTH (m)		82	
Press.	Temp.	Salinity	Sigma-T
5	3.431	32.755	26.055
10	3.429	32.757	26.056
20	3.260	32.863	26.156
30	3.768	33.152	26.339
40	4.661	33.440	26.476
50	4.967	33.513	26.500
75	5.442	33.658	26.561

STATION		US10172	
LATITUDE		42-18.8	N
LONGITUDE		140-31.2	E
DEPTH (m)		95	
Press.	Temp.	Salinity	Sigma-T
5	3.803	32.768	26.030
10	3.202	32.764	26.083
20	3.038	32.795	26.122
30	3.075	32.820	26.138
40	3.044	32.819	26.140
50	3.035	32.830	26.150
75	3.738	33.336	26.488

STATION		US10175	
LATITUDE		42-25.8	N
LONGITUDE		140-37.3	E
DEPTH (m)		85	
Press.	Temp.	Salinity	Sigma-T
5	3.540	32.609	25.928
10	2.882	32.671	26.036
20	2.827	32.695	26.060
30	2.792	32.707	26.073
40	2.614	32.722	26.099
50	2.850	32.894	26.217
75	4.163	33.476	26.557

STATION		US10178	
LATITUDE		42-25.0	N
LONGITUDE		140-48.5	E
DEPTH (m)		45	
Press.	Temp.	Salinity	Sigma-T
5	4.279	32.479	25.753
10	3.716	32.723	26.002
20	3.388	33.204	26.417
30	3.422	33.244	26.446
40	3.915	33.407	26.528

STATION		US10181	
LATITUDE		42-16.3	N
LONGITUDE		140-47.9	E
DEPTH (m)		70	
Press.	Temp.	Salinity	Sigma-T
5	4.298	32.507	25.773
10	3.451	32.540	25.882
20	3.095	32.654	26.004
30	3.057	32.998	26.282
40	4.758	33.555	26.557
50	4.978	33.593	26.562

STATION		US10184	
LATITUDE		42-17.7	N
LONGITUDE		140-54.1	E
DEPTH (m)		58	
Press.	Temp.	Salinity	Sigma-T
5	3.353	32.714	26.029
10	3.094	32.752	26.082
20	3.286	33.038	26.294
30	4.076	33.377	26.487
40	4.124	33.391	26.494
50	4.415	33.460	26.519

STATION		US10187	
LATITUDE		42-13.9	N
LONGITUDE		141-11.6	E
DEPTH (m)		122	
Press.	Temp.	Salinity	Sigma-T
5	3.214	32.736	26.059
10	3.192	32.760	26.080
20	3.134	32.764	26.089
30	2.643	32.763	26.130
40	2.617	32.829	26.185
50	3.091	32.967	26.255
75	3.782	33.297	26.453
100	4.508	33.498	26.539

STATION		US10173	
LATITUDE		42-21.2	N
LONGITUDE		140-36.0	E
DEPTH (m)		90	
Press.	Temp.	Salinity	Sigma-T
5	3.637	32.599	25.911
10	3.211	32.604	25.954
20	2.894	32.626	26.000
30	2.813	32.686	26.054
40	2.786	32.719	26.083
50	2.759	32.734	26.097
75	3.075	33.116	26.375

STATION		US10176	
LATITUDE		42-27.7	N
LONGITUDE		140-43.1	E
DEPTH (m)		62	
Press.	Temp.	Salinity	Sigma-T
5	4.311	32.460	25.735
10	3.460	32.525	25.869
20	2.965	32.753	26.095
30	2.876	32.905	26.224
40	3.087	33.135	26.389
50	3.884	33.402	26.527

STATION		US10179	
LATITUDE		42-20.9	N
LONGITUDE		140-48.0	E
DEPTH (m)		54	
Press.	Temp.	Salinity	Sigma-T
5	3.887	32.461	25.778
10	3.365	32.485	25.846
20	3.104	32.731	26.065
30	2.555	32.851	26.207
40	3.354	33.227	26.438
50	4.268	33.457	26.531

STATION		US10182	
LATITUDE		42-13.6	N
LONGITUDE		140-55.0	E
DEPTH (m)		66	
Press.	Temp.	Salinity	Sigma-T
5	3.544	32.678	25.983
10	3.334	32.787	26.089
20	3.151	32.844	26.151
30	3.851	33.258	26.415
40	5.256	33.691	26.608
50	5.287	33.685	26.599

STATION		US10185	
LATITUDE		42-12.1	N
LONGITUDE		141-02.4	E
DEPTH (m)		81	
Press.	Temp.	Salinity	Sigma-T
5	3.269	32.680	26.010
10	3.190	32.689	26.024
20	2.971	32.830	26.156
30	4.641	33.465	26.498
40	5.626	33.681	26.556
50	5.446	33.653	26.556
75	5.452	33.656	26.557

STATION		US10188	
LATITUDE		42-10.9	N
LONGITUDE		141-08.9	E
DEPTH (m)		110	
Press.	Temp.	Salinity	Sigma-T
5	3.512	32.819	26.098
10	3.324	32.825	26.120
20	3.115	32.824	26.138
30	2.824	32.822	26.161
40	2.840	32.847	26.180
50	2.797	32.871	26.203
75	4.024	33.356	26.476
100	4.690	33.524	26.540

STATION US10189			
LATITUDE 42-07.5 N			
LONGITUDE 141-06.2 E			
DEPTH (m) 106			
Press.	Temp.	Salinity	Sigma-T
5	3.303	32.759	26.069
10	3.300	32.761	26.071
20	2.921	32.752	26.098
30	3.246	32.833	26.134
40	3.205	32.842	26.145
50	2.913	32.845	26.172
75	4.168	33.358	26.463
100	5.498	33.649	26.546

STATION US10192			
LATITUDE 41-58.4 N			
LONGITUDE 140-58.6 E			
DEPTH (m) 84			
Press.	Temp.	Salinity	Sigma-T
5	3.593	32.744	26.031
10	3.233	32.923	26.207
20	3.107	32.938	26.230
30	3.243	33.072	26.325
40	3.677	33.189	26.377
50	4.753	33.472	26.491
75	5.745	33.709	26.564

STATION US10195			
LATITUDE 42-28.7 N			
LONGITUDE 140-31.8 E			
DEPTH (m) 79			
Press.	Temp.	Salinity	Sigma-T
5	3.569	32.567	25.892
10	3.425	32.566	25.905
20	2.740	32.682	26.057
30	2.800	32.775	26.127
40	3.271	32.881	26.170
50	2.878	33.084	26.367
75	3.901	33.416	26.536

STATION US10198			
LATITUDE 41-53.5 N			
LONGITUDE 141-07.3 E			
DEPTH (m) 97			
Press.	Temp.	Salinity	Sigma-T
5	5.148	32.307	25.524
10	5.138	32.314	25.531
20	4.184	32.536	25.808
30	3.684	32.658	25.954
40	3.611	32.680	25.979
50	3.390	32.844	26.130
75	4.286	33.478	26.546

STATION US10201			
LATITUDE 41-59.0 N			
LONGITUDE 140-59.6 E			
DEPTH (m) 88			
Press.	Temp.	Salinity	Sigma-T
5	5.395	32.323	25.510
10	4.897	32.392	25.620
20	4.147	32.673	25.921
30	3.846	32.811	26.060
40	3.710	32.967	26.197
50	4.161	33.284	26.405
75	4.849	33.511	26.511

STATION US10204			
LATITUDE 41-58.0 N			
LONGITUDE 140-59.5 E			
DEPTH (m) 88			
Press.	Temp.	Salinity	Sigma-T
5	5.904	32.307	25.436
10	5.261	32.363	25.556
20	4.489	32.686	25.896
30	3.854	32.823	26.069
40	3.970	33.072	26.256
50	4.120	33.196	26.339
75	3.924	33.294	26.437

STATION US10190			
LATITUDE 42-03.8 N			
LONGITUDE 141-03.2 E			
DEPTH (m) 99			
Press.	Temp.	Salinity	Sigma-T
5	3.474	32.846	26.123
10	3.470	32.846	26.123
20	3.291	32.858	26.150
30	3.039	32.895	26.201
40	3.150	32.958	26.242
50	3.179	33.023	26.291
75	4.695	33.461	26.489

STATION US10193			
LATITUDE 42-18.0 N			
LONGITUDE 140-25.4 E			
DEPTH (m) 67			
Press.	Temp.	Salinity	Sigma-T
5	3.432	32.542	25.885
10	3.356	32.548	25.897
20	2.805	32.646	26.023
30	2.592	32.719	26.099
40	2.555	32.805	26.171
50	4.028	33.360	26.479

STATION US10196			
LATITUDE 41-50.2 N			
LONGITUDE 141-14.2 E			
DEPTH (m) 218			
Press.	Temp.	Salinity	Sigma-T
5	5.368	32.316	25.507
10	5.349	32.321	25.513
20	4.720	32.634	25.830
30	4.537	32.681	25.887
40	3.562	32.832	26.104
50	3.430	32.870	26.147
75	3.499	33.093	26.318
100	3.863	33.237	26.397
125	4.368	33.444	26.510
150	4.700	33.553	26.561
175	4.679	33.555	26.565
200	4.679	33.555	26.565

STATION US10199			
LATITUDE 41-55.4 N			
LONGITUDE 141-04.8 E			
DEPTH (m) 114			
Press.	Temp.	Salinity	Sigma-T
5	4.714	32.410	25.654
10	4.556	32.454	25.705
20	4.208	32.627	25.878
30	4.063	32.764	26.001
40	3.789	32.796	26.053
50	3.988	32.966	26.170
75	4.296	33.332	26.429
100	4.388	33.532	26.578

STATION US10202			
LATITUDE 41-57.1 N			
LONGITUDE 140-57.6 E			
DEPTH (m) 64			
Press.	Temp.	Salinity	Sigma-T
5	4.855	32.444	25.665
10	4.382	32.538	25.790
20	3.771	32.754	26.022
30	3.464	32.854	26.131
40	3.440	32.916	26.182
50	3.421	32.980	26.235

STATION US10205			
LATITUDE 41-58.7 N			
LONGITUDE 141-00.7 E			
DEPTH (m) 96			
Press.	Temp.	Salinity	Sigma-T
5	5.775	32.552	25.645
10	5.474	32.595	25.715
20	5.001	32.706	25.857
30	3.980	32.860	26.086
40	3.579	33.008	26.242
50	3.539	33.087	26.309
75	4.378	33.453	26.517

STATION US10191			
LATITUDE 42-00.7 N			
LONGITUDE 141-00.7 E			
DEPTH (m) 91			
Press.	Temp.	Salinity	Sigma-T
5	3.621	32.822	26.091
10	3.473	32.863	26.137
20	3.200	32.915	26.203
30	3.150	32.997	26.274
40	3.098	33.076	26.341
50	3.279	33.131	26.368
75	4.614	33.437	26.479

STATION US10194			
LATITUDE 42-08.7 N			
LONGITUDE 140-35.7 E			
DEPTH (m) 64			
Press.	Temp.	Salinity	Sigma-T
5	3.744	32.350	25.703
10	3.361	32.593	25.932
20	3.280	32.660	25.993
30	3.016	32.826	26.149
40	3.092	32.930	26.225
50	3.526	33.283	26.467

STATION US10197			
LATITUDE 41-51.4 N			
LONGITUDE 141-10.3 E			
DEPTH (m) 112			
Press.	Temp.	Salinity	Sigma-T
5	5.143	32.360	25.567
10	5.127	32.384	25.588
20	4.605	32.520	25.752
30	4.388	32.586	25.827
40	4.328	32.615	25.856
50	4.102	32.658	25.914
75	3.387	32.972	26.232
100	3.896	33.262	26.414

STATION US10200			
LATITUDE 41-57.0 N			
LONGITUDE 141-02.3 E			
DEPTH (m) 107			
Press.	Temp.	Salinity	Sigma-T
5	4.509	32.469	25.722
10	4.413	32.481	25.742
20	4.080	32.570	25.846
30	3.735	32.725	26.003
40	3.957	32.850	26.080
50	3.962	32.987	26.189
75	4.458	33.394	26.461

STATION US10203			
LATITUDE 41-57.4 N			
LONGITUDE 140-58.3 E			
DEPTH (m) 80			
Press.	Temp.	Salinity	Sigma-T
5	4.850	32.596	25.786
10	4.008	32.669	25.931
20	3.784	32.753	26.020
30	3.375	32.892	26.169
40	3.361	32.928	26.199
50	3.416	33.008	26.258
75	3.798	33.223	26.393

STATION US10206			
LATITUDE 41-59.3 N			
LONGITUDE 141-01.9 E			
DEPTH (m) 103			
Press.	Temp.	Salinity	Sigma-T
5	5.650	32.610	25.706
10	5.507	32.627	25.737
20	4.889	32.707	25.870
30	4.201	32.949	26.134
40	3.866	32.941	26.162
50	3.584	32.989	26.227
75	3.746	33.258	26.425
100	4.516	33.498	26.538

STATION		US10207	
LATITUDE		41-59.7	N
LONGITUDE		141-17.5	E
DEPTH (m)		266	
Press.	Temp.	Salinity	Sigma-T
5	5.894	32.756	25.792
10	5.778	32.783	25.828
20	5.145	32.868	25.969
30	4.015	32.918	26.128
40	3.690	33.160	26.353
50	4.192	33.357	26.460
75	5.762	33.659	26.522
100	5.668	33.671	26.543
125	4.634	33.541	26.559
150	4.303	33.536	26.591
175	4.475	33.590	26.615
200	4.290	33.581	26.628
250	3.826	33.571	26.667

STATION		US10210	
LATITUDE		42-15.2	N
LONGITUDE		140-31.6	E
DEPTH (m)		89	
Press.	Temp.	Salinity	Sigma-T
5	5.965	32.206	25.350
10	5.910	32.240	25.383
20	5.376	32.446	25.608
30	4.871	32.620	25.803
40	3.549	32.809	26.087
50	3.754	32.942	26.173
75	3.879	33.362	26.496

STATION		US10213	
LATITUDE		42-21.4	N
LONGITUDE		140-36.4	E
DEPTH (m)		90	
Press.	Temp.	Salinity	Sigma-T
5	6.197	32.199	25.316
10	6.167	32.207	25.326
20	5.591	32.361	25.516
30	5.018	32.546	25.728
40	4.107	32.680	25.931
50	3.846	32.767	26.025
75	3.947	33.296	26.436

STATION		US10216	
LATITUDE		42-15.9	N
LONGITUDE		140-34.4	E
DEPTH (m)		92	
Press.	Temp.	Salinity	Sigma-T
5	5.695	32.389	25.526
10	5.581	32.373	25.528
20	5.365	32.476	25.634
30	4.605	32.630	25.839
40	3.928	32.799	26.042
50	3.716	32.954	26.186
75	4.091	33.384	26.491

STATION		US10219	
LATITUDE		42-20.8	N
LONGITUDE		140-48.7	E
DEPTH (m)		52	
Press.	Temp.	Salinity	Sigma-T
5	7.206	31.516	24.648
10	6.516	32.116	25.211
20	5.937	32.343	25.461
30	4.952	32.466	25.672
40	4.098	32.903	26.108

STATION		US10222	
LATITUDE		42-31.0	N
LONGITUDE		140-38.1	E
DEPTH (m)		62	
Press.	Temp.	Salinity	Sigma-T
5	7.057	32.116	25.140
10	6.531	32.169	25.250
20	4.606	32.519	25.751
30	4.416	32.556	25.800
40	4.069	32.682	25.936
50	3.554	32.839	26.110

STATION		US10208	
LATITUDE		42-13.3	N
LONGITUDE		140-41.3	E
DEPTH (m)		90	
Press.	Temp.	Salinity	Sigma-T
5	5.138	32.426	25.620
10	5.084	32.433	25.632
20	5.029	32.474	25.670
30	4.335	32.754	25.966
40	3.691	32.857	26.111
50	3.758	33.123	26.317
75	4.191	33.399	26.493

STATION		US10211	
LATITUDE		42-20.0	N
LONGITUDE		140-31.5	E
DEPTH (m)		96	
Press.	Temp.	Salinity	Sigma-T
5	5.932	32.332	25.453
10	5.884	32.302	25.435
20	5.602	32.381	25.531
30	5.005	32.537	25.723
40	4.289	32.671	25.905
50	3.923	32.736	25.993
75	3.514	33.132	26.348

STATION		US10214	
LATITUDE		42-18.9	N
LONGITUDE		140-41.9	E
DEPTH (m)		72	
Press.	Temp.	Salinity	Sigma-T
5	6.301	32.140	25.257
10	5.554	32.336	25.501
20	5.221	32.453	25.631
30	4.941	32.645	25.815
40	3.970	32.763	26.010
50	3.693	32.901	26.147

STATION		US10217	
LATITUDE		42-04.6	N
LONGITUDE		140-56.6	E
DEPTH (m)		86	
Press.	Temp.	Salinity	Sigma-T
5	6.725	31.853	24.976
10	5.825	32.442	25.553
20	4.827	32.808	25.957
30	4.209	32.888	26.085
40	3.820	32.920	26.149
50	3.741	32.963	26.192
75	3.506	33.230	26.426

STATION		US10220	
LATITUDE		42-25.1	N
LONGITUDE		140-48.6	E
DEPTH (m)		43	
Press.	Temp.	Salinity	Sigma-T
5	6.919	32.046	25.103
10	6.276	32.225	25.326
20	5.536	32.441	25.586
30	4.077	32.788	26.019

STATION		US10223	
LATITUDE		42-29.1	N
LONGITUDE		140-31.3	E
DEPTH (m)		74	
Press.	Temp.	Salinity	Sigma-T
5	7.315	32.027	25.035
10	6.701	32.078	25.157
20	5.386	32.464	25.622
30	4.950	32.598	25.777
40	4.220	32.752	25.976
50	3.603	32.836	26.103

STATION		US10209	
LATITUDE		42-11.8	N
LONGITUDE		140-35.7	E
DEPTH (m)		84	
Press.	Temp.	Salinity	Sigma-T
5	5.783	32.318	25.460
10	5.652	32.337	25.489
20	5.075	32.582	25.747
30	4.420	32.709	25.920
40	3.918	32.865	26.095
50	3.990	33.079	26.259
75	3.872	33.359	26.494

STATION		US10212	
LATITUDE		42-23.7	N
LONGITUDE		140-31.4	E
DEPTH (m)		98	
Press.	Temp.	Salinity	Sigma-T
5	6.085	32.287	25.399
10	6.028	32.284	25.403
20	5.790	32.356	25.489
30	5.362	32.513	25.663
40	4.485	32.538	25.779
50	4.203	32.663	25.907
75	3.304	33.065	26.313

STATION		US10215	
LATITUDE		42-22.6	N
LONGITUDE		140-42.8	E
DEPTH (m)		62	
Press.	Temp.	Salinity	Sigma-T
5	6.775	31.877	24.989
10	6.721	31.892	25.007
20	6.054	32.206	25.339
30	5.266	32.521	25.681
40	4.815	32.609	25.800
50	4.005	32.761	26.004

STATION		US10218	
LATITUDE		42-17.3	N
LONGITUDE		140-53.9	E
DEPTH (m)		57	
Press.	Temp.	Salinity	Sigma-T
5	6.564	32.097	25.189
10	5.565	32.381	25.536
20	4.751	32.655	25.844
30	3.803	32.849	26.095
40	3.715	32.910	26.151
50	3.709	32.921	26.161

STATION		US10221	
LATITUDE		42-28.1	N
LONGITUDE		140-43.6	E
DEPTH (m)		59	
Press.	Temp.	Salinity	Sigma-T
5	6.826	32.030	25.103
10	6.272	32.242	25.340
20	4.978	32.465	25.668
30	4.575	32.545	25.775
40	4.244	32.717	25.946
50	3.762	33.002	26.220

STATION		US10224	
LATITUDE		42-26.6	N
LONGITUDE		140-25.8	E
DEPTH (m)		66	
Press.	Temp.	Salinity	Sigma-T
5	7.089	31.861	24.935
10	6.575	32.176	25.250
20	6.079	32.284	25.398
30	5.282	32.370	25.559
40	4.212	32.541	25.809
50	3.988	32.725	25.978

STATION		US10225	
LATITUDE		42-23. 6	N
LONGITUDE		140-30. 3	E
DEPTH (m)		95	
Press.	Temp.	Salinity	Sigma-T
5	6. 759	32. 196	25. 242
10	6. 644	32. 122	25. 199
20	5. 811	32. 326	25. 463
30	5. 196	32. 518	25. 686
40	4. 258	32. 683	25. 918
50	3. 859	32. 773	26. 028
75	3. 895	33. 192	26. 358

STATION		US10228	
LATITUDE		42-17. 3	N
LONGITUDE		140-26. 7	E
DEPTH (m)		72	
Press.	Temp.	Salinity	Sigma-T
5	7. 326	32. 190	25. 162
10	6. 358	32. 329	25. 399
20	5. 459	32. 444	25. 598
30	5. 065	32. 527	25. 708
40	4. 376	32. 705	25. 923
50	3. 709	32. 790	26. 057

STATION		US10231	
LATITUDE		42-20. 9	N
LONGITUDE		140-36. 3	E
DEPTH (m)		90	
Press.	Temp.	Salinity	Sigma-T
5	7. 517	31. 870	24. 884
10	7. 036	31. 920	24. 989
20	6. 034	32. 229	25. 360
30	5. 409	32. 492	25. 641
40	5. 159	32. 556	25. 720
50	4. 172	32. 793	26. 013
75	4. 256	33. 332	26. 434

STATION		US10234	
LATITUDE		42-18. 2	N
LONGITUDE		140-41. 7	E
DEPTH (m)		70	
Press.	Temp.	Salinity	Sigma-T
5	7. 527	31. 970	24. 962
10	7. 412	31. 975	24. 981
20	6. 039	32. 287	25. 404
30	5. 276	32. 509	25. 670
40	4. 546	32. 740	25. 933
50	3. 731	32. 806	26. 067

STATION		US10237	
LATITUDE		42-04. 9	N
LONGITUDE		140-56. 3	E
DEPTH (m)		86	
Press.	Temp.	Salinity	Sigma-T
5	7. 028	32. 297	25. 286
10	6. 884	32. 590	25. 536
20	4. 155	32. 741	25. 974
30	3. 749	32. 806	26. 066
40	3. 691	32. 872	26. 123
50	3. 748	32. 969	26. 196
75	3. 980	33. 374	26. 495

STATION		US10226	
LATITUDE		42-21. 8	N
LONGITUDE		140-25. 8	E
DEPTH (m)		76	
Press.	Temp.	Salinity	Sigma-T
5	7. 210	32. 182	25. 171
10	6. 648	32. 091	25. 173
20	5. 666	32. 353	25. 502
30	5. 058	32. 518	25. 701
40	4. 444	32. 582	25. 819
50	3. 703	32. 731	26. 010

STATION		US10229	
LATITUDE		42-14. 5	N
LONGITUDE		140-30. 0	E
DEPTH (m)		82	
Press.	Temp.	Salinity	Sigma-T
5	7. 071	32. 286	25. 272
10	6. 137	32. 373	25. 461
20	5. 396	32. 411	25. 579
30	4. 813	32. 576	25. 774
40	4. 128	32. 730	25. 968
50	3. 755	32. 858	26. 106
75	3. 702	33. 294	26. 458

STATION		US10232	
LATITUDE		42-25. 4	N
LONGITUDE		140-37. 2	E
DEPTH (m)		86	
Press.	Temp.	Salinity	Sigma-T
5	7. 329	32. 119	25. 106
10	7. 005	32. 025	25. 076
20	5. 831	32. 290	25. 432
30	5. 200	32. 531	25. 696
40	4. 396	32. 578	25. 820
50	4. 002	32. 721	25. 973
75	3. 495	33. 262	26. 452

STATION		US10235	
LATITUDE		42-14. 2	N
LONGITUDE		140-41. 8	E
DEPTH (m)		88	
Press.	Temp.	Salinity	Sigma-T
5	7. 281	32. 174	25. 156
10	6. 893	32. 210	25. 236
20	5. 605	32. 428	25. 568
30	4. 184	32. 605	25. 863
40	4. 358	32. 788	25. 991
50	3. 512	32. 837	26. 112
75	4. 003	33. 360	26. 481

STATION		US10238	
LATITUDE		41-46. 8	N
LONGITUDE		141-14. 3	E
DEPTH (m)		196	
Press.	Temp.	Salinity	Sigma-T
5	6. 132	32. 754	25. 762
10	5. 866	32. 784	25. 818
20	5. 438	32. 780	25. 865
30	5. 389	32. 786	25. 876
40	5. 009	32. 770	25. 907
50	5. 328	32. 968	26. 027
75	4. 986	33. 123	26. 189
100	4. 569	33. 267	26. 348
125	4. 653	33. 289	26. 358
150	4. 770	33. 319	26. 369
175	5. 021	33. 396	26. 401

STATION		US10227	
LATITUDE		42-19. 1	N
LONGITUDE		140-29. 9	E
DEPTH (m)		93	
Press.	Temp.	Salinity	Sigma-T
5	6. 294	32. 431	25. 487
10	5. 454	32. 548	25. 681
20	5. 184	32. 466	25. 646
30	5. 095	32. 481	25. 668
40	4. 725	32. 514	25. 734
50	3. 896	32. 850	26. 086
75	3. 984	33. 366	26. 488

STATION		US10230	
LATITUDE		42-16. 3	N
LONGITUDE		140-35. 0	E
DEPTH (m)		93	
Press.	Temp.	Salinity	Sigma-T
5	7. 642	32. 045	25. 005
10	6. 837	32. 097	25. 154
20	6. 023	32. 325	25. 437
30	4. 590	32. 562	25. 787
40	3. 623	32. 724	26. 012
50	3. 688	33. 011	26. 235
75	4. 136	33. 371	26. 477

STATION		US10233	
LATITUDE		42-23. 2	N
LONGITUDE		140-42. 0	E
DEPTH (m)		65	
Press.	Temp.	Salinity	Sigma-T
5	7. 112	32. 002	25. 043
10	6. 834	32. 018	25. 093
20	6. 231	32. 175	25. 292
30	4. 830	32. 460	25. 680
40	4. 355	32. 632	25. 867
50	4. 217	32. 721	25. 952

STATION		US10236	
LATITUDE		41-49. 6	N
LONGITUDE		141-13. 2	E
DEPTH (m)		179	
Press.	Temp.	Salinity	Sigma-T
5	6. 142	32. 597	25. 637
10	5. 605	32. 935	25. 969
20	4. 748	32. 999	26. 116
30	4. 008	32. 967	26. 168
40	3. 914	33. 006	26. 209
50	3. 970	33. 083	26. 264
75	4. 830	33. 343	26. 381
100	4. 706	33. 356	26. 405
125	4. 652	33. 362	26. 415
150	5. 151	33. 548	26. 507

STATION		US10239	
LATITUDE		41-43. 9	N
LONGITUDE		141-15. 9	E
DEPTH (m)		230	
Press.	Temp.	Salinity	Sigma-T
5	5. 851	32. 706	25. 759
10	5. 811	32. 711	25. 767
20	5. 336	32. 764	25. 865
30	4. 415	32. 899	26. 073
40	4. 184	33. 052	26. 218
50	4. 452	33. 163	26. 278
75	5. 029	33. 435	26. 432
100	5. 572	33. 597	26. 497
125	5. 963	33. 693	26. 524
150	4. 676	33. 563	26. 572
175	4. 644	33. 603	26. 607
200	4. 558	33. 613	26. 625

	STATION	US10240		
	LATITUDE	41-40.8	N	
	LONGITUDE	141-17.3	E	
	DEPTH (m)	232		
Press.	Temp.	Salinity	Sigma-T	
5	5.878	32.613	25.682	
10	5.871	32.615	25.684	
20	5.864	32.633	25.700	
30	5.485	32.804	25.879	
40	4.792	33.049	26.152	
50	4.811	33.317	26.363	
75	4.729	33.442	26.470	
100	6.075	33.729	26.539	
125	5.942	33.770	26.588	
150	5.324	33.716	26.620	
175	4.459	33.630	26.649	
200	3.906	33.588	26.672	

	STATION	US10243		
	LATITUDE	41-32.0	N	
	LONGITUDE	141-22.1	E	
	DEPTH (m)	247		
Press.	Temp.	Salinity	Sigma-T	
5	10.308	33.869	26.016	
10	10.265	33.873	26.027	
20	10.100	33.911	26.084	
30	10.056	33.919	26.099	
40	9.981	33.924	26.115	
50	9.944	33.924	26.121	
75	9.832	33.934	26.148	
100	9.643	33.957	26.197	
125	9.535	33.968	26.224	
150	9.336	34.013	26.292	
175	8.653	33.985	26.378	
200	8.181	33.948	26.421	

	STATION	US10246		
	LATITUDE	41-35.2	N	
	LONGITUDE	140-54.0	E	
	DEPTH (m)	57		
Press.	Temp.	Salinity	Sigma-T	
5	10.977	33.838	25.875	
10	10.925	33.845	25.890	
20	10.845	33.860	25.916	
30	10.833	33.862	25.919	
40	10.833	33.862	25.919	
50	10.815	33.863	25.923	

	STATION	US10241		
	LATITUDE	41-37.8	N	
	LONGITUDE	141-19.0	E	
	DEPTH (m)	218		
Press.	Temp.	Salinity	Sigma-T	
5	7.896	32.634	25.431	
10	7.844	32.663	25.461	
20	9.183	33.829	26.172	
30	9.279	33.938	26.242	
40	8.451	33.789	26.255	
50	8.775	33.923	26.310	
75	8.480	33.937	26.367	
100	7.351	33.835	26.452	
125	6.794	33.817	26.514	
150	5.686	33.734	26.591	
175	4.498	33.651	26.661	
200	3.137	33.550	26.716	

	STATION	US10244		
	LATITUDE	41-29.2	N	
	LONGITUDE	141-23.3	E	
	DEPTH (m)	109		
Press.	Temp.	Salinity	Sigma-T	
5	10.344	33.887	26.024	
10	10.342	33.887	26.025	
20	10.214	33.899	26.056	
30	10.030	33.917	26.101	
40	9.983	33.923	26.114	
50	9.890	33.931	26.136	
75	9.841	33.940	26.151	

	STATION	US10242		
	LATITUDE	41-35.0	N	
	LONGITUDE	141-20.5	E	
	DEPTH (m)	311		
Press.	Temp.	Salinity	Sigma-T	
5	7.219	32.666	25.551	
10	7.208	32.668	25.554	
20	6.484	32.756	25.719	
30	6.326	32.824	25.792	
40	6.169	32.902	25.874	
50	5.787	33.068	26.052	
75	7.807	33.760	26.328	
100	7.601	33.838	26.419	
125	7.544	33.873	26.455	
150	6.972	33.839	26.508	
175	6.017	33.768	26.577	
200	5.378	33.732	26.626	
250	4.346	33.656	26.681	
300	3.784	33.628	26.717	

	STATION	US10245		
	LATITUDE	41-27.6	N	
	LONGITUDE	141-24.1	E	
	DEPTH (m)	55		
Press.	Temp.	Salinity	Sigma-T	
5	9.649	33.953	26.193	
10	9.513	33.964	26.224	
20	9.354	33.980	26.263	
30	9.342	33.995	26.276	
40	9.207	33.998	26.300	

THE " USHIO MARU "

CRUISE 197

CRUISE 198

CRUISE 199

IN MAY - JUNE 2010

1. Cruise Itinerary

Cruise 197

Departure from Hakodate	May	29 , 2010
Arrival at and departure from Shiraoi		29
Start hydrographic research (US10247)		30
Arrival at and departure from Shiraoi	Jun.	1
Finish hydrographic research (US10267)		1
Return to Hakodate		2

Total coverage 724.8 miles

Cruise 198

Departure from Hakodate	Jun.	6 , 2010
Start trawl net research		6
Start hydrographic research (US10268)		6
Arrival at Wakinosawa		6
Departure from Wakinosawa		7
Arrival at Aomori		7
Departure from Aomori		8
Finish trawl net research		8
Finish hydrographic research (US10295)		9
Return to Hakodate		10

Total coverage 212.1 miles

Cruise 199

Departure from Hakodate	Jun.	14 , 2010
Start hydrographic research (US10296)		14
Arrival at and departure from Usujiri		16
Arrival at Usujiri		17
Departure from Usujiri		18
Retrieval Sediment trap system		18
Set Sediment trap system		19
Arrival at Usujiri		19
Departure from Usujiri		20
Arrival at Usujiri		20
Departure from Usujiri		21
Sampling by Frame trawl net		22
Finish hydrographic research (US10341)		23
Arrival at and departure from Usujiri		23
Return to Hakodate		24

Total coverage 1100.0 miles

2. Vessel Personnel

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

Cruise 197

Graduate Students:	Graduate School of Environmental Science:	3 persons
Under Graduate Students:	Department of Marine Biology:	2 persons

Cruise 198

Research Staff:	Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
	Associate Professor	(Laboratory of Marine Environmental Science)	Isao Kudo
Graduate Students:	Chair of Marine Bioresource Science:		2 persons
	Graduate School of Environmental Science:		1 person
Under Graduate Students:	Department of Marine Biology:		10 persons

Cruise 199

Research Staff:	Professor	(Laboratory of Marine Environmental Science)	Kenshi Kuma
	Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Seiichi Saitoh
	Professor	(Laboratory of Marine Industrial Science and Technology)	Yasuzumi Fujimori
	Associate Professor	(Laboratory of Marine Environmental Science)	Isao Kudo
	Associate Professor	(Laboratory of Marine Environmental Science)	Yutaka Isoda
	Associate Professor	(Laboratory of Marine Bioresource Science)	Toshikuni Nakatani
	Postdoctoral fellow	(Faculty of Fisheries Sciences)	Tomonori Isada
Guest Scientist (Domestic)		(Ehime University)	Michinobu Kuwae
		(National Institute for Environmental Studies)	Takafumi Aramaki
Research Students:	Faculty of Fisheries Sciences:		1 person
Graduate Students:	Chair of Marine Bioresource Science:		1 person
	Chair of Marine Environmental Science:		2 persons
	Chair of Marine Bioresource and Environment Sensing:		7 persons
	Chair of Marine Industrial Science and Technology:		1 person
	Graduate School of Environmental Science:		1 person
Under Graduate Students:	Department of Marine Biology:		8 persons
	Department of Applied Marine Science:		10 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”.

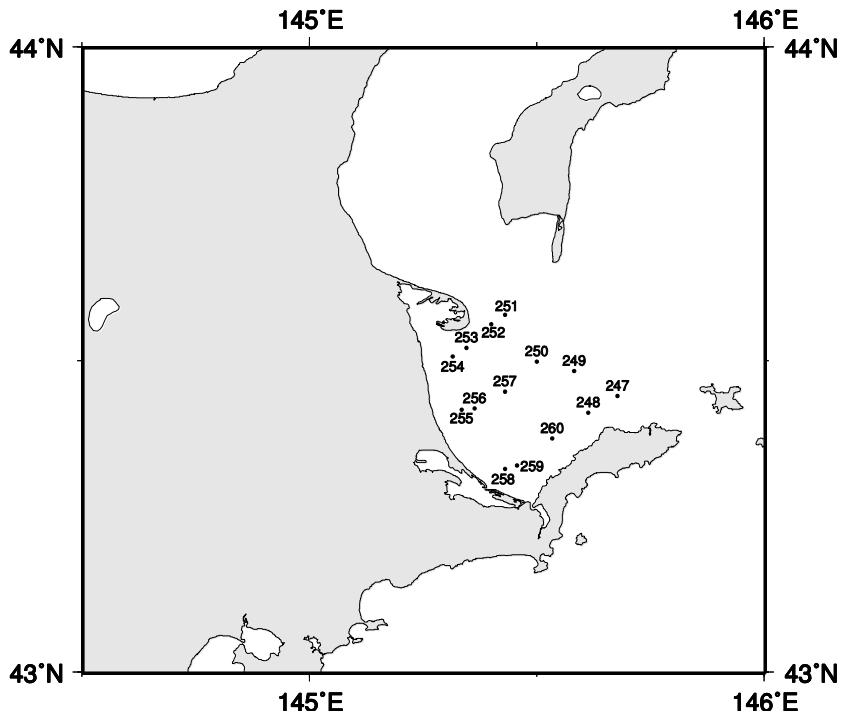


Figure 1-1: Oceanographic stations at Nemuro Strait (Cruise 197)

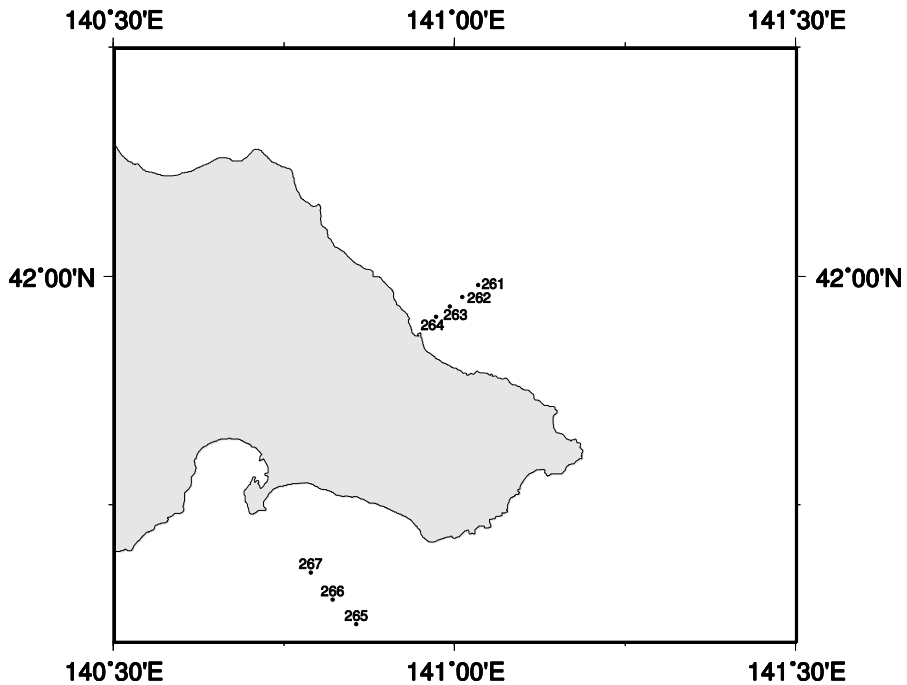


Figure 1-2: Oceanographic stations at South East Hokkaido (Cruise 197)

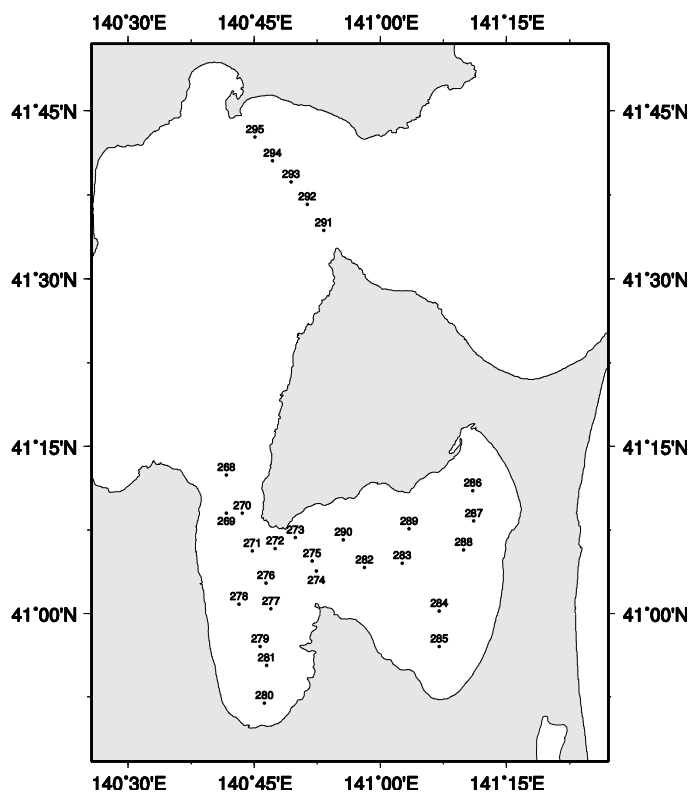


Figure 2: Oceanographic stations (Cruise 198)

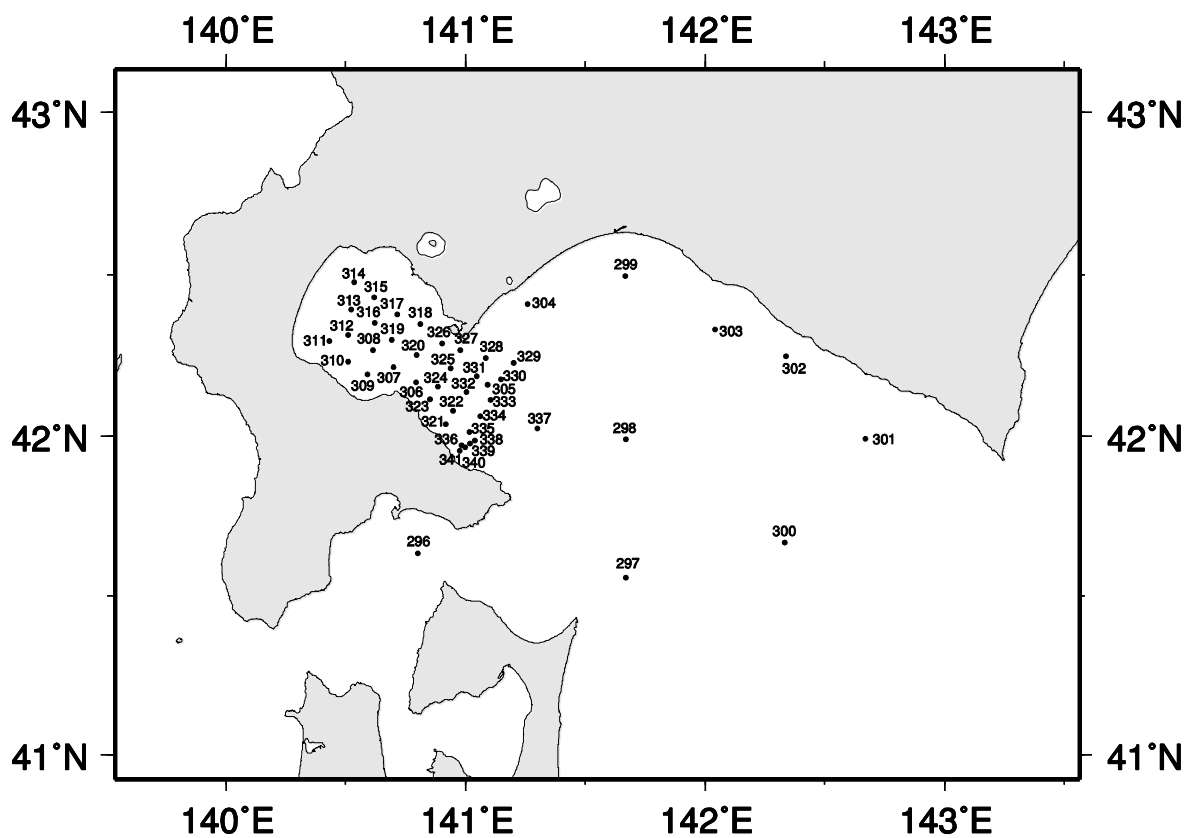


Figure 3: Oceanographic stations (Cruise 199)

Table 1: List of oceanographic stations

Cruise 197

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10247	43-26.7	145-40.5	5/30	1547-1555	29	NE -3	NE -1	NE -5	3.6	4.5	c	1014.7
US10248	43-25.1	145-36.7	5/30	1616-1619	28	NE -1	NE -1	NE -3	4.4	4.9	c	1015.0
US10249	43-29.1	145-34.8	5/30	1646-1649	30	ENE-2	NE -1	ENE-4	3.7	5.2	c	1015.0
US10250	43-30.0	145-29.9	5/30	1711-1713	25	East-1	NE -1	East-3	4.2	5.9	bc	1015.1
US10251	43-34.5	145-25.7	5/30	1745-1747	12	ENE-1	NE -1	ENE-3	4.2	5.4	bc	1015.1
US10252	43-33.6	145-23.9	5/30	1759-1800	12	East-1	East-1	East-2	4.5	5.4	bc	1015.1
US10253	43-31.3	145-20.6	5/30	1835-1836	8	NE -1	East-1	NE -2	4.3	5.5	bc	1015.1
US10254	43-30.5	145-18.8	5/30	1848-1849	7	NNE-1	East-1	NNE-2	4.3	5.2	bc	1015.2
US10255	43-25.4	145-20.0	5/30	1924-1926	10	NE -1	East-1	NE -2	4.5	5.2	c	1015.6
US10256	43-25.5	145-21.7	5/30	1934-1936	11	NE -1	East-1	NE -3	4.8	7.6	c	1016.0
US10257	43-27.1	145-25.7	5/30	2001-2004	19	NE -1	East-1	NE -3	4.2	7.3	c	1016.0
US10258	43-19.7	145-25.7	5/31	0643-0645	13	NNW-2	North-1	NNW-4	4.8	6.2	bc	1016.9
US10259	43-20.0	145-27.3	5/31	0655-0656	15	NNW-3	North-1	NNW-5	5.5	6.3	c	1017.0
US10260	43-22.6	145-31.9	5/31	0724-0726	19	NNE-1	North-1	NNE-3	5.2	6.7	bc	1017.0
US10261	41-59.5	141-02.0	6/1	1257-1302	101	ESE-1	East-1	ESE-2	8.5	9.4	f	1015.7
US10262	41-58.7	141-00.6	6/1	1310-1314	94	East-1	East-1	East-2	9.6	9.1	f	1015.7
US10263	41-58.1	140-59.5	6/1	1320-1324	87	ESE-1	East-1	ESE-2	10.1	11.2	m	1015.6
US10264	41-57.4	140-58.3	6/1	1332-1336	79	SE -1	East-1	SE -2	10.3	11.4	m	1015.6
US10265	41-37.2	140-51.3	6/1	1707-1713	117	SW -3	East-1	SW -5	13.1	11.3	bc	1015.6
US10266	41-38.8	140-49.2	6/1	1731-1743	326	SW -3	East-1	SW -5	13.1	10.0	bc	1015.6
US10267	41-40.6	140-47.3	6/1	1800-1810	236	SW -2	East-1	SW -4	12.9	9.3	bc	1015.7

Cruise 198

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10268	41-12.5	140-41.6	6/6	1217-1221	78	WNW-3	NW -1	WNW-5	14.8	13.2	bc	1015.6
US10269	41-09.1	140-41.6	6/6	1250-1257	55	NNW-2	NW -1	NNW-4	15.4	12.8	bc	1015.4
US10270	41-09.1	140-43.5	6/6	1316-1322	63	NW -3	NW -1	NW -5	16.0	14.0	bc	1015.1
US10271	41-05.7	140-44.7	6/6	1415-1419	62	NW -2	NW -1	NW -4	18.9	14.5	bc	1015.1
US10272	41-05.9	140-47.4	6/6	1454-1458	60	NW -2	NW -1	NW -4	17.6	13.9	bc	1015.0
US10273	41-06.9	140-49.8	6/6	1522-1525	47	NW -2	NW -1	NW -4	18.3	14.7	bc	1014.8
US10274	41-03.9	140-52.3	6/7	0726-0733	52	SW -1	SW -1	SW -3	15.5	14.2	bc	1018.6
US10275	41-04.8	140-51.8	6/7	0745-0748	53	SW -1	SW -1	SW -3	16.4	13.8	bc	1018.6
US10276	41-02.8	140-46.3	6/7	0900-0908	52	NW -1	SE -1	NW -3	16.3	14.7	bc	1018.6
US10277	41-00.5	140-46.9	6/7	0948-0951	52	NNW-1	South-1	NNW-3	17.5	14.3	bc	1018.8
US10278	41-00.9	140-43.1	6/7	1030-1033	56	North-2	North-1	North-4	16.5	14.7	bc	1019.0
US10279	40-57.1	140-45.6	6/7	1134-1141	51	NNW-2	North-1	NNW-4	17.0	15.0	bc	1018.6
US10280	40-52.0	140-46.1	6/8	0638-0640	28	NNW-1	North-1	NNW-2	14.8	15.5	o	1019.6
US10281	40-55.4	140-46.4	6/8	0720-0722	42	Calm	North-1	Calm	14.5	14.4	o	1019.6
US10282	41-04.2	140-58.0	6/8	0903-0906	50	ESE-2	East-1	ESE-4	12.2	13.9	o	1020.1
US10283	41-04.6	141-02.5	6/8	0947-0952	48	ESE-2	East-1	ESE-4	12.5	14.2	o	1020.0
US10284	41-00.3	141-06.9	6/8	1206-1209	44	ESE-2	ESE-1	ESE-4	13.7	14.2	c	1019.1
US10285	40-57.1	141-06.9	6/8	1251-1256	37	ESE-3	ESE-1	ESE-5	14.3	14.5	c	1018.2
US10286	41-11.1	141-10.9	6/8	1523-1534	30	SSW-1	South-1	SSW-2	16.8	16.0	bc	1017.6
US10287	41-08.4	141-11.0	6/8	1638-1641	35	South-1	South-1	South-3	15.6	15.2	bc	1017.1
US10288	41-05.8	141-09.8	6/9	0646-0648	38	NNE-1	NNE-1	NNE-1	12.8	14.5	o	1018.5
US10289	41-07.7	141-03.3	6/9	0740-0742	39	North-1	ESE-1	North-2	12.1	14.8	o	1017.1
US10290	41-06.7	140-55.5	6/9	0840-0843	47	NNW-1	ESE-1	NNW-2	12.6	14.3	o	1017.1
US10291	41-34.4	140-53.2	6/9	1225-1227	31	East-3	ESE-1	East-5	12.5	13.0	c	1015.8
US10292	41-36.7	140-51.2	6/9	1249-1253	86	East-2	ESE-1	East-4	12.6	12.5	c	1015.6
US10293	41-38.7	140-49.3	6/9	1312-1324	310	East-1	ESE-1	East-3	13.4	13.5	c	1015.5
US10294	41-40.6	140-47.1	6/9	1345-1353	230	East-1	ESE-1	East-2	13.3	12.4	c	1015.1
US10295	41-42.7	140-45.0	6/9	1413-1417	86	SE -1	ESE-1	SE -2	14.8	14.3	o	1015.1

Cruise 199

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10296	41-38.2	140-47.7	6/14	0956-1008	206	East-1	East-1	East-3	14.3	12.9	f	1015.1
US10297	41-33.7	141-39.9	6/14	1329-1345	557	NE -1	ESE-2	NE -2	12.8	10.9	f	1014.6
US10298	41-59.6	141-39.9	6/14	1619-1639	845	ENE-1	ESE-2	ENE-3	13.3	12.3	f	1013.7
US10299	42-30.0	141-39.7	6/14	1921-1925	50	ESE-2	SE -1	ESE-4	13.8	11.7	c	1014.0
US10300	41-40.3	142-19.6	6/15	0112-0128	1183	SE -2	SSE-2	SE -4	13.5	12.3	f	1013.2
US10301	41-59.7	142-39.8	6/15	0351-0407	572	East-2	South-1	East-4	13.1	12.9	f	1013.5
US10302	42-15.1	142-19.9	6/15	0609-0618	99	East-2	South-1	East-4	14.1	12.0	o	1013.5
US10303	42-20.1	142-02.2	6/15	1142-1149	93	East-2	South-1	East-4	12.8	11.0	o	1012.9
US10304	42-24.8	141-15.2	6/16	1520-1526	72	West-1	SE -1	West-2	15.4	13.6	r	1003.1
US10305	42-09.8	141-05.2	6/16	2137-2148	93	West-2	SE -1	West-4	14.1	13.4	o	1003.0
US10306	42-10.3	140-47.2	6/18	0804-0808	95	NE -1	ESE-1	NE -2	16.4	14.4	o	1009.1
US10307	42-13.1	140-41.7	6/18	0845-0849	90	ENE-1	ESE-1	ENE-3	16.2	14.6	o	1009.1
US10308	42-16.2	140-36.5	6/18	0941-0947	91	Calm	ESE-1	Calm	18.7	15.0	o	1009.1
US10309	42-11.7	140-35.1	6/18	1037-1041	83	Calm	ESE-1	Calm	18.0	14.7	o	1009.1
US10310	42-14.1	140-30.2	6/18	1111-1115	80	Calm	ESE-1	Calm	17.4	15.2	o	1009.1
US10311	42-17.9	140-25.6	6/18	1148-1151	66	Calm	ESE-1	Calm	17.9	15.2	o	1009.1
US10312	42-19.0	140-30.2	6/18	1219-1226	92	Calm	ESE-1	Calm	17.9	15.6	o	1008.8
US10313	42-23.8	140-31.0	6/18	1311-1317	95	Calm	ESE-1	Calm	17.9	16.0	o	1008.6
US10314	42-28.8	140-31.7	6/18	1357-1401	77	South-1	ESE-1	South-2	19.1	16.0	o	1008.6
US10315	42-26.0	140-36.8	6/18	1434-1438	85	Calm	ESE-1	Calm	17.9	16.3	o	1008.6
US10316	42-21.3	140-37.0	6/18	1514-1518	86	Calm	SE -1	Calm	17.5	16.1	o	1008.0
US10317	42-22.9	140-42.6	6/18	1549-1553	61	NE -1	ESE-1	NE -2	17.7	15.7	o	1007.6
US10318	42-21.1	140-48.3	6/18	1623-1626	52	ESE-1	ESE-1	ESE-3	17.4	15.0	o	1007.4
US10319	42-18.1	140-41.2	6/19	0719-0723	75	Calm	ESE-1	Calm	15.2	15.2	f	1006.8
US10320	42-15.3	140-47.4	6/19	0844-0848	73	Calm	ESE-1	Calm	16.3	15.4	f	1001.6
US10321	42-02.4	140-54.7	6/20	0705-0709	77	NE -1	East-1	NE -2	14.4	15.4	f	1006.6
US10322	42-04.9	140-56.5	6/20	0749-0757	85	East-1	East-1	East-2	14.3	15.2	f	1006.6
US10323	42-07.1	140-50.8	6/20	0844-0848	75	East-1	East-1	East-2	14.9	15.7	o	1006.2

Cruise 199 (continued)

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10324	42-09.5	140-52.7	6/20	0906-0910	79	East-1	East-1	East-2	14.9	15.7	o	1006.2
US10325	42-12.9	140-55.9	6/20	0935-0939	69	NE -1	East-1	NE -3	15.1	16.1	o	1006.1
US10326	42-17.5	140-53.8	6/20	1044-1050	57	East-1	SE -1	East-3	15.3	15.1	o	1005.6
US10327	42-16.2	140-58.4	6/20	1136-1140	63	East-2	ESE-1	East-4	16.2	15.2	o	1005.2
US10328	42-14.8	141-04.8	6/20	1210-1213	80	East-1	ESE-1	East-3	15.7	16.3	o	1005.4
US10329	42-13.9	141-11.7	6/20	1247-1252	125	East-1	ESE-1	East-3	15.5	15.7	o	1005.5
US10330	42-10.8	141-08.5	6/20	1317-1321	106	ESE-1	ESE-1	ESE-3	15.7	16.0	r	1005.2
US10331	42-11.4	141-02.4	6/20	1349-1352	82	East-1	ESE-1	East-2	15.6	15.8	o	1005.1
US10332	42-08.4	140-59.9	6/20	1416-1419	84	Calm	ESE-1	Calm	15.6	16.0	o	1004.7
US10333	42-07.0	141-06.0	6/20	1452-1456	106	East-1	ESE-1	East-3	15.3	16.0	f	1004.6
US10334	42-03.9	141-03.3	6/20	1520-1524	99	East-1	ESE-1	East-3	15.4	15.1	f	1004.6
US10335	42-01.0	141-00.7	6/20	1547-1551	91	East-1	ESE-1	East-3	15.4	15.4	o	1004.2
US10336	41-58.5	140-58.6	6/20	1611-1615	84	East-1	ESE-1	East-2	15.5	15.6	o	1004.2
US10337	42-01.6	141-17.6	6/21	1713-1722	256	Calm	SE -1	Calm	15.9	14.5	f	1004.1
US10338	41-59.4	141-02.0	6/23	0540-0545	102	SE -3	ESE-1	SE -5	15.6	15.4	f	1007.0
US10339	41-58.8	141-00.8	6/23	0554-0557	94	SE -3	ESE-1	SE -5	15.5	15.3	f	1007.0
US10340	41-58.1	140-59.5	6/23	0606-0610	87	ESE-1	ESE-1	ESE-3	15.6	15.2	o	1007.0
US10341	41-57.4	140-58.2	6/23	0617-0620	78	WSW-1	ESE-1	WSW-2	15.8	15.2	c	1006.8

(*) : Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US10247				STATION US10248				STATION US10249			
LATITUDE 43-26.7 N				LATITUDE 43-25.1 N				LATITUDE 43-29.1 N			
LONGITUDE 145-40.5 E				LONGITUDE 145-36.7 E				LONGITUDE 145-34.8 E			
DEPTH (m) 29				DEPTH (m) 28				DEPTH (m) 30			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	4.930	32.267	25.516	5	5.563	31.832	25.101	5	5.258	32.042	25.302
10	4.813	32.269	25.531	10	5.118	31.942	25.238	10	5.176	32.130	25.381
20	4.246	32.307	25.620	20	4.881	32.066	25.363	20	4.217	32.348	25.656
STATION US10250				STATION US10251				STATION US10252			
LATITUDE 43-30.0 N				LATITUDE 43-34.5 N				LATITUDE 43-33.6 N			
LONGITUDE 145-29.9 E				LONGITUDE 145-25.7 E				LONGITUDE 145-23.9 E			
DEPTH (m) 25				DEPTH (m) 12				DEPTH (m) 12			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.262	31.660	24.882	5	5.634	31.913	25.157	5	6.010	31.219	24.565
10	5.507	32.046	25.277								
20	4.043	32.351	25.675								
STATION US10253				STATION US10254				STATION US10255			
LATITUDE 43-31.3 N				LATITUDE 43-30.5 N				LATITUDE 43-25.4 N			
LONGITUDE 145-20.6 E				LONGITUDE 145-18.8 E				LONGITUDE 145-20.0 E			
DEPTH (m) 8				DEPTH (m) 7				DEPTH (m) 10			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	5.478	31.741	25.039	5	5.577	32.007	25.239	5	7.022	31.035	24.294
STATION US10256				STATION US10257				STATION US10258			
LATITUDE 43-25.5 N				LATITUDE 43-27.1 N				LATITUDE 43-19.7 N			
LONGITUDE 145-21.7 E				LONGITUDE 145-25.7 E				LONGITUDE 145-25.7 E			
DEPTH (m) 11				DEPTH (m) 19				DEPTH (m) 13			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	5.588	32.097	25.308	5	5.995	31.653	24.909	5	6.561	30.689	24.080
				10	4.650	32.251	25.534				
STATION US10259				STATION US10260				STATION US10261			
LATITUDE 43-20.0 N				LATITUDE 43-22.6 N				LATITUDE 41-59.5 N			
LONGITUDE 145-27.3 E				LONGITUDE 145-31.9 E				LONGITUDE 141-02.0 E			
DEPTH (m) 15				DEPTH (m) 19				DEPTH (m) 101			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.516	31.083	24.396	5	6.717	31.043	24.340	5	8.918	31.994	24.777
10	6.002	31.699	24.945	10	6.208	31.411	24.693	10	7.931	32.098	25.006
								20	6.013	32.690	25.726
								30	6.082	32.831	25.829
								40	6.867	33.067	25.914
								50	6.699	33.092	25.956
								75	5.712	33.122	26.104
STATION US10262				STATION US10263				STATION US10264			
LATITUDE 41-58.7 N				LATITUDE 41-58.1 N				LATITUDE 41-57.4 N			
LONGITUDE 141-00.6 E				LONGITUDE 140-59.5 E				LONGITUDE 140-58.3 E			
DEPTH (m) 94				DEPTH (m) 87				DEPTH (m) 79			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	8.727	32.350	25.085	5	10.565	31.437	24.077	5	9.819	31.557	24.294
10	8.556	32.561	25.277	10	8.393	32.146	24.976	10	7.668	31.974	24.945
20	7.235	32.740	25.607	20	7.000	32.499	25.449	20	6.523	32.281	25.340
30	7.128	33.045	25.862	30	6.514	32.813	25.760	30	5.973	32.509	25.588
40	7.017	33.065	25.893	40	6.158	32.878	25.857	40	5.238	32.529	25.690
50	6.782	33.116	25.964	50	6.431	33.055	25.961	50	5.253	32.733	25.850
75	4.891	33.134	26.208	75	4.816	33.113	26.200	75	4.179	33.148	26.295

STATION		US10265		
LATITUDE		41-37.2	N	
LONGITUDE		140-51.3	E	
DEPTH (m)		117		
Press.	Temp.	Salinity	Sigma-T	
5	11.527	33.704	25.671	
10	11.495	33.705	25.677	
20	10.974	33.777	25.827	
30	10.094	33.927	26.098	
40	9.935	33.952	26.145	
50	9.899	33.961	26.158	
75	9.838	33.975	26.179	
100	9.828	33.977	26.183	

STATION		US10266		
LATITUDE		41-38.8	N	
LONGITUDE		140-49.2	E	
DEPTH (m)		326		
Press.	Temp.	Salinity	Sigma-T	
5	11.507	33.721	25.687	
10	11.451	33.718	25.696	
20	11.350	33.730	25.723	
30	11.372	33.728	25.718	
40	11.239	33.741	25.753	
50	11.139	33.755	25.781	
75	10.811	33.817	25.888	
100	9.926	33.958	26.151	
125	9.757	34.000	26.212	
150	9.697	34.014	26.233	
175	9.570	34.022	26.261	
200	9.606	34.020	26.252	
250	9.194	34.048	26.341	

STATION		US10267		
LATITUDE		41-40.6	N	
LONGITUDE		140-47.3	E	
DEPTH (m)		236		
Press.	Temp.	Salinity	Sigma-T	
5	9.227	33.048	25.554	
10	9.472	33.308	25.718	
20	10.664	33.780	25.885	
30	10.505	33.826	25.948	
40	9.782	33.811	26.060	
50	9.829	33.878	26.105	
75	9.922	33.979	26.168	
100	9.564	33.943	26.199	
125	9.349	33.943	26.235	
150	9.435	33.972	26.243	
175	9.417	33.964	26.239	
200	9.415	33.974	26.248	

STATION		US10268		
LATITUDE		41-12.5	N	
LONGITUDE		140-41.6	E	
DEPTH (m)		78		
Press.	Temp.	Salinity	Sigma-T	
5	13.154	33.169	24.944	
10	12.268	33.287	25.208	
20	10.614	33.466	25.649	
30	10.875	33.666	25.759	
40	10.551	33.682	25.829	
50	10.199	33.764	25.953	
75	9.277	33.865	26.185	

STATION		US10269		
LATITUDE		41-09.1	N	
LONGITUDE		140-41.6	E	
DEPTH (m)		55		
Press.	Temp.	Salinity	Sigma-T	
5	13.264	33.372	25.079	
10	12.081	33.685	25.553	
20	11.835	33.710	25.618	
30	10.913	33.711	25.788	
40	10.105	33.774	25.976	
50	10.036	33.857	26.053	

STATION		US10270		
LATITUDE		41-09.1	N	
LONGITUDE		140-43.5	E	
DEPTH (m)		63		
Press.	Temp.	Salinity	Sigma-T	
5	14.145	32.711	24.389	
10	12.680	33.554	25.336	
20	11.695	33.720	25.652	
30	10.591	33.678	25.818	
40	9.722	33.705	25.988	
50	8.965	33.659	26.073	

STATION		US10271		
LATITUDE		41-05.7	N	
LONGITUDE		140-44.7	E	
DEPTH (m)		62		
Press.	Temp.	Salinity	Sigma-T	
5	14.131	32.775	24.441	
10	11.103	33.000	25.200	
20	10.078	33.346	25.648	
30	10.365	33.691	25.868	
40	9.858	33.695	25.957	
50	9.602	33.822	26.098	

STATION		US10272		
LATITUDE		41-05.9	N	
LONGITUDE		140-47.4	E	
DEPTH (m)		60		
Press.	Temp.	Salinity	Sigma-T	
5	14.186	32.700	24.372	
10	11.950	33.201	25.201	
20	9.071	33.185	25.686	
30	8.446	33.273	25.851	
40	7.966	33.358	25.989	
50	7.282	33.374	26.099	

STATION		US10273		
LATITUDE		41-06.9	N	
LONGITUDE		140-49.8	E	
DEPTH (m)		47		
Press.	Temp.	Salinity	Sigma-T	
5	14.264	32.591	24.272	
10	12.431	33.044	24.989	
20	8.931	33.121	25.658	
30	8.419	33.291	25.869	
40	7.556	33.376	26.063	

STATION		US10274		
LATITUDE		41-03.9	N	
LONGITUDE		140-52.3	E	
DEPTH (m)		52		
Press.	Temp.	Salinity	Sigma-T	
5	13.948	32.849	24.536	
10	12.447	33.365	25.234	
20	10.280	33.318	25.592	
30	10.578	33.746	25.873	
40	10.369	33.768	25.927	

STATION		US10275		
LATITUDE		41-04.8	N	
LONGITUDE		140-51.8	E	
DEPTH (m)		53		
Press.	Temp.	Salinity	Sigma-T	
5	14.076	32.855	24.514	
10	13.094	33.122	24.919	
20	10.874	33.500	25.630	
30	10.050	33.605	25.855	
40	9.898	33.797	26.030	
50	9.499	33.871	26.154	

STATION		US10276		
LATITUDE		41-02.8	N	
LONGITUDE		140-46.3	E	
DEPTH (m)		52		
Press.	Temp.	Salinity	Sigma-T	
5	13.786	32.871	24.586	
10	10.545	33.211	25.462	
20	11.052	33.681	25.739	
30	10.638	33.696	25.824	
40	10.027	33.672	25.910	

STATION		US10277		
LATITUDE		41-00.5	N	
LONGITUDE		140-46.9	E	
DEPTH (m)		52		
Press.	Temp.	Salinity	Sigma-T	
5	13.878	33.182	24.808	
10	13.453	33.126	24.851	
20	11.142	33.615	25.672	
30	10.778	33.661	25.772	
40	10.100	33.667	25.894	
50	10.025	33.862	26.059	

STATION		US10278		
LATITUDE		41-00.9	N	
LONGITUDE		140-43.1	E	
DEPTH (m)		56		
Press.	Temp.	Salinity	Sigma-T	
5	14.513	33.108	24.618	
10	12.995	33.614	25.320	
20	11.745	33.721	25.644	
30	11.096	33.678	25.729	
40	10.586	33.678	25.819	
50	9.838	33.718	25.978	

STATION		US10279		
LATITUDE		40-57.1	N	
LONGITUDE		140-45.6	E	
DEPTH (m)		51		
Press.	Temp.	Salinity	Sigma-T	
5	13.942	33.293	24.880	
10	12.572	33.636	25.421	
20	11.745	33.652	25.590	
30	11.426	33.667	25.661	
40	10.839	33.660	25.761	

STATION		US10280		
LATITUDE		40-52.0	N	
LONGITUDE		140-46.1	E	
DEPTH (m)		28		
Press.	Temp.	Salinity	Sigma-T	
5	15.296	32.696	24.132	
10	12.136	32.819	24.870	
20	10.500	33.375	25.598	

STATION		US10281		
LATITUDE		40-55.4	N	
LONGITUDE		140-46.4	E	
DEPTH (m)		42		
Press.	Temp.	Salinity	Sigma-T	
5	14.448	33.010	24.556	
10	12.401	33.397	25.268	
20	11.813	33.673	25.593	
30	11.053	33.647	25.712	
40	10.545	33.665	25.816	

STATION		US10282		
LATITUDE		41-04.2	N	
LONGITUDE		140-58.0	E	
DEPTH (m)		50		
Press.	Temp.	Salinity	Sigma-T	
5	14.206	32.817	24.458	
10	14.040	32.819	24.494	
20	10.683	33.104	25.355	
30	8.767	33.237	25.774	
40	8.479	33.435	25.973	

STATION		US10283	
LATITUDE		41-04.6	N
LONGITUDE		141-02.5	E
DEPTH (m)		48	
Press.	Temp.	Salinity	Sigma-T
5	14.476	32.820	24.404
10	14.430	32.821	24.414
20	9.719	33.074	25.495
30	8.867	33.230	25.753
40	8.110	33.350	25.962

STATION		US10286	
LATITUDE		41-11.1	N
LONGITUDE		141-10.9	E
DEPTH (m)		30	
Press.	Temp.	Salinity	Sigma-T
5	15.706	32.643	24.001
10	12.843	32.661	24.612
20	9.714	33.057	25.483

STATION		US10289	
LATITUDE		41-07.7	N
LONGITUDE		141-03.3	E
DEPTH (m)		39	
Press.	Temp.	Salinity	Sigma-T
5	14.937	32.698	24.211
10	14.596	32.691	24.279
20	9.883	33.083	25.475
30	8.592	33.289	25.842

STATION		US10292	
LATITUDE		41-36.7	N
LONGITUDE		140-51.2	E
DEPTH (m)		86	
Press.	Temp.	Salinity	Sigma-T
5	12.842	33.731	25.441
10	12.805	33.730	25.448
20	11.697	33.826	25.734
30	11.045	33.921	25.927
40	10.178	34.016	26.153
50	10.080	34.038	26.187
75	10.061	34.046	26.197

STATION		US10295	
LATITUDE		41-42.7	N
LONGITUDE		140-45.0	E
DEPTH (m)		86	
Press.	Temp.	Salinity	Sigma-T
5	13.614	33.765	25.313
10	12.522	33.836	25.585
20	9.927	33.776	26.008
30	9.477	33.915	26.191
40	9.392	33.951	26.234
50	9.375	34.000	26.275
75	8.805	34.087	26.434

STATION		US10284	
LATITUDE		41-00.3	N
LONGITUDE		141-06.9	E
DEPTH (m)		44	
Press.	Temp.	Salinity	Sigma-T
5	14.362	32.750	24.374
10	11.474	33.002	25.135
20	9.588	33.109	25.543
30	8.596	33.289	25.841
40	7.424	33.364	26.071

STATION		US10287	
LATITUDE		41-08.4	N
LONGITUDE		141-11.0	E
DEPTH (m)		35	
Press.	Temp.	Salinity	Sigma-T
5	15.442	32.608	24.032
10	15.094	32.661	24.149
20	9.469	33.115	25.567
30	8.062	33.347	25.967

STATION		US10290	
LATITUDE		41-08.7	N
LONGITUDE		140-55.5	E
DEPTH (m)		47	
Press.	Temp.	Salinity	Sigma-T
5	14.405	32.784	24.391
10	14.380	32.795	24.404
20	10.321	33.160	25.461
30	8.666	33.274	25.819
40	7.475	33.341	26.046

STATION		US10293	
LATITUDE		41-38.7	N
LONGITUDE		140-49.3	E
DEPTH (m)		310	
Press.	Temp.	Salinity	Sigma-T
5	13.647	33.660	25.224
10	13.583	33.673	25.248
20	12.986	33.796	25.463
30	12.601	33.849	25.580
40	10.992	33.996	25.995
50	10.480	34.013	26.099
75	9.771	34.042	26.242
100	9.599	34.086	26.305
125	8.897	34.091	26.422
150	8.679	34.111	26.473
175	8.971	34.123	26.436
200	9.143	34.111	26.399
250	8.351	34.115	26.526
300	8.011	34.117	26.579

STATION		US10296	
LATITUDE		41-38.2	N
LONGITUDE		140-47.7	E
DEPTH (m)		206	
Press.	Temp.	Salinity	Sigma-T
5	12.818	33.738	25.451
10	12.506	33.707	25.488
20	11.480	33.907	25.837
30	10.716	33.954	26.012
40	10.509	33.952	26.046
50	10.426	33.955	26.063
75	10.276	33.976	26.106
100	10.310	33.996	26.115
125	10.232	33.997	26.129
150	10.204	33.997	26.134
175	10.194	33.997	26.136
200	10.136	33.998	26.147

STATION		US10285	
LATITUDE		40-57.1	N
LONGITUDE		141-06.9	E
DEPTH (m)		37	
Press.	Temp.	Salinity	Sigma-T
5	14.770	32.647	24.208
10	13.300	32.682	24.536
20	9.216	33.146	25.633
30	7.946	33.251	25.908

STATION		US10288	
LATITUDE		41-05.8	N
LONGITUDE		141-09.8	E
DEPTH (m)		38	
Press.	Temp.	Salinity	Sigma-T
5	14.728	32.729	24.280
10	14.242	32.806	24.442
20	9.408	33.133	25.591
30	8.468	33.370	25.924

STATION		US10291	
LATITUDE		41-34.4	N
LONGITUDE		140-53.2	E
DEPTH (m)		31	
Press.	Temp.	Salinity	Sigma-T
5	13.284	33.705	25.333
10	11.920	33.819	25.687
20	11.886	33.861	25.726

STATION		US10294	
LATITUDE		41-40.6	N
LONGITUDE		140-47.1	E
DEPTH (m)		230	
Press.	Temp.	Salinity	Sigma-T
5	12.901	33.854	25.525
10	12.760	33.872	25.566
20	11.324	33.957	25.905
30	10.295	34.027	26.142
40	9.968	34.056	26.220
50	9.947	34.071	26.236
75	9.190	34.120	26.398
100	8.630	34.115	26.483
125	8.387	34.114	26.520
150	8.231	34.114	26.543
175	8.189	34.114	26.550
200	8.069	34.111	26.566

STATION		US10297	
LATITUDE		41-33.7	N
LONGITUDE		141-39.9	E
DEPTH (m)		557	
Press.	Temp.	Salinity	Sigma-T
5	11.278	33.986	25.935
10	10.344	33.826	25.977
20	10.191	33.879	26.044
30	10.186	33.890	26.053
40	10.173	33.905	26.067
50	10.131	33.913	26.081
75	10.102	33.952	26.116
100	10.050	33.959	26.131
125	9.987	33.962	26.143
150	9.741	33.960	26.184
175	8.923	33.913	26.279
200	7.288	33.827	26.455
250	5.305	33.708	26.616
300	3.831	33.611	26.698

	STATION	US10298		
	LATITUDE	41-59.6	N	
	LONGITUDE	141-39.9	E	
	DEPTH (m)	845		
Press.	Temp.	Salinity	Sigma-T	
5	11.097	32.470	24.789	
10	7.459	32.663	25.516	
20	6.699	33.071	25.939	
30	6.442	33.131	26.020	
40	6.293	33.176	26.075	
50	7.527	33.513	26.174	
75	7.036	33.435	26.181	
100	7.076	33.538	26.257	
125	6.855	33.693	26.409	
150	5.287	33.536	26.481	
175	5.275	33.619	26.549	
200	5.569	33.692	26.572	
250	4.712	33.641	26.630	
300	2.530	33.424	26.667	

	STATION	US10301		
	LATITUDE	41-59.7	N	
	LONGITUDE	142-39.8	E	
	DEPTH (m)	572		
Press.	Temp.	Salinity	Sigma-T	
5	11.308	32.626	24.873	
10	10.126	32.559	25.025	
20	4.830	32.629	25.814	
30	4.378	32.775	25.978	
40	6.199	33.240	26.137	
50	7.263	33.503	26.203	
75	7.653	33.583	26.211	
100	6.510	33.591	26.374	
125	3.502	33.325	26.502	
150	2.514	33.295	26.565	
175	2.668	33.359	26.603	
200	4.583	33.630	26.635	
250	2.319	33.412	26.675	
300	2.977	33.557	26.735	

	STATION	US10304		
	LATITUDE	42-24.8	N	
	LONGITUDE	141-15.2	E	
	DEPTH (m)	72		
Press.	Temp.	Salinity	Sigma-T	
5	13.665	31.228	23.341	
10	13.086	32.348	24.322	
20	7.500	32.549	25.421	
30	6.680	32.982	25.872	
40	6.645	33.150	26.009	
50	6.458	33.313	26.161	

	STATION	US10307		
	LATITUDE	42-13.1	N	
	LONGITUDE	140-41.7	E	
	DEPTH (m)	90		
Press.	Temp.	Salinity	Sigma-T	
5	14.091	31.235	23.261	
10	13.919	31.312	23.356	
20	11.222	31.509	24.020	
30	7.343	32.235	25.195	
40	5.487	32.558	25.684	
50	4.666	32.844	26.003	
75	5.334	33.503	26.450	

	STATION	US10310		
	LATITUDE	42-14.1	N	
	LONGITUDE	140-30.2	E	
	DEPTH (m)	80		
Press.	Temp.	Salinity	Sigma-T	
5	14.509	31.230	23.171	
10	13.991	31.319	23.346	
20	9.099	31.885	24.664	
30	5.965	32.349	25.462	
40	5.174	32.632	25.779	
50	4.595	32.775	25.955	
75	3.703	33.094	26.299	

	STATION	US10299		
	LATITUDE	42-30.0	N	
	LONGITUDE	141-39.7	E	
	DEPTH (m)	50		
Press.	Temp.	Salinity	Sigma-T	
5	12.055	31.673	23.996	
10	9.127	31.940	24.703	
20	6.409	32.449	25.486	
30	6.393	32.984	25.911	
40	6.470	33.199	26.070	

	STATION	US10302		
	LATITUDE	42-15.1	N	
	LONGITUDE	142-19.9	E	
	DEPTH (m)	99		
Press.	Temp.	Salinity	Sigma-T	
5	12.249	32.048	24.251	
10	12.118	32.054	24.280	
20	6.482	32.836	25.782	
30	5.483	32.898	25.954	
40	5.650	33.015	26.027	
50	6.357	33.270	26.141	
75	6.599	33.549	26.329	

	STATION	US10305		
	LATITUDE	42-09.8	N	
	LONGITUDE	141-05.2	E	
	DEPTH (m)	93		
Press.	Temp.	Salinity	Sigma-T	
5	10.679	32.404	24.808	
10	7.828	32.827	25.593	
20	6.935	33.077	25.913	
30	7.427	33.369	26.075	
40	7.951	33.546	26.140	
50	7.888	33.550	26.152	
75	5.761	33.484	26.384	

	STATION	US10308		
	LATITUDE	42-16.2	N	
	LONGITUDE	140-36.5	E	
	DEPTH (m)	91		
Press.	Temp.	Salinity	Sigma-T	
5	15.022	31.284	23.104	
10	14.836	31.312	23.166	
20	11.546	31.423	23.894	
30	7.934	31.898	24.848	
40	6.627	32.255	25.306	
50	4.566	32.679	25.882	
75	5.133	33.415	26.404	

	STATION	US10311		
	LATITUDE	42-17.9	N	
	LONGITUDE	140-25.6	E	
	DEPTH (m)	66		
Press.	Temp.	Salinity	Sigma-T	
5	13.316	31.239	23.420	
10	9.890	31.649	24.355	
20	7.261	32.085	25.088	
30	5.931	32.400	25.507	
40	5.070	32.637	25.794	
50	4.381	32.714	25.929	

	STATION	US10300		
	LATITUDE	41-40.3	N	
	LONGITUDE	142-19.6	E	
	DEPTH (m)	1183		
Press.	Temp.	Salinity	Sigma-T	
5	12.309	32.973	24.957	
10	9.532	32.967	25.441	
20	6.420	32.963	25.890	
30	6.543	33.190	26.053	
40	7.563	33.527	26.180	
50	6.907	33.417	26.185	
75	7.640	33.747	26.342	
100	6.778	33.722	26.442	
125	4.232	33.434	26.517	
150	3.945	33.484	26.586	
175	4.765	33.651	26.632	
200	4.108	33.606	26.666	
250	3.019	33.553	26.728	
300	2.766	33.612	26.797	

	STATION	US10303		
	LATITUDE	42-20.1	N	
	LONGITUDE	142-02.2	E	
	DEPTH (m)	93		
Press.	Temp.	Salinity	Sigma-T	
5	11.440	31.985	24.351	
10	11.259	32.009	24.401	
20	5.551	32.660	25.757	
30	5.822	32.953	25.957	
40	7.406	33.388	26.093	
50	7.587	33.453	26.119	
75	6.487	33.489	26.297	

	STATION	US10306		
	LATITUDE	42-10.3	N	
	LONGITUDE	140-47.2	E	
	DEPTH (m)	95		
Press.	Temp.	Salinity	Sigma-T	
5	13.424	31.364	23.494	
10	12.321	31.474	23.793	
20	8.157	32.205	25.057	
30	6.586	32.576	25.563	
40	4.898	32.677	25.845	
50	4.761	32.900	26.037	
75	4.085	33.318	26.440	

	STATION	US10309		
	LATITUDE	42-11.7	N	
	LONGITUDE	140-35.1	E	
	DEPTH (m)	83		
Press.	Temp.	Salinity	Sigma-T	
5	14.221	31.244	23.241	
10	14.200	31.264	23.261	
20	9.772	31.857	24.535	
30	6.118	32.371	25.462	
40	4.805	32.642	25.827	
50	4.363	32.850	26.039	
75	3.694	33.198	26.383	

	STATION	US10312		
	LATITUDE	42-19.0	N	
	LONGITUDE	140-30.2	E	
	DEPTH (m)	92		
Press.	Temp.	Salinity	Sigma-T	
5	14.462	31.254	23.199	
10	14.489	31.267	23.204	
20	7.785	31.912	24.880	
30	6.797	32.187	25.230	
40	5.977	32.514	25.591	
50	4.420	32.701	25.915	
75	3.797	32.962	26.185	

STATION		US10313	
LATITUDE		42-23.8 N	
LONGITUDE		140-31.0 E	
DEPTH (m)		95	
Press.	Temp.	Salinity	Sigma-T
5	14.876	30.984	22.904
10	12.937	31.605	23.776
20	7.429	31.988	24.990
30	6.697	32.216	25.266
40	5.889	32.578	25.653
50	4.329	32.701	25.925
75	3.801	33.113	26.305

STATION		US10316	
LATITUDE		42-21.3 N	
LONGITUDE		140-37.0 E	
DEPTH (m)		86	
Press.	Temp.	Salinity	Sigma-T
5	15.443	31.242	22.981
10	14.903	31.248	23.102
20	8.813	31.755	24.606
30	7.592	31.980	24.960
40	6.549	32.273	25.330
50	5.458	32.550	25.681
75	3.802	33.120	26.311

STATION		US10319	
LATITUDE		42-18.1 N	
LONGITUDE		140-41.2 E	
DEPTH (m)		75	
Press.	Temp.	Salinity	Sigma-T
5	15.489	31.267	22.990
10	14.671	31.252	23.154
20	8.624	31.734	24.619
30	7.567	31.975	24.960
40	6.554	32.266	25.324
50	4.650	32.713	25.901

STATION		US10322	
LATITUDE		42-04.9 N	
LONGITUDE		140-56.5 E	
DEPTH (m)		85	
Press.	Temp.	Salinity	Sigma-T
5	12.795	31.477	23.705
10	9.990	31.985	24.600
20	7.091	32.538	25.468
30	5.364	32.595	25.728
40	4.677	32.755	25.931
50	4.423	32.976	26.133
75	4.980	33.370	26.385

STATION		US10325	
LATITUDE		42-12.9 N	
LONGITUDE		140-55.9 E	
DEPTH (m)		69	
Press.	Temp.	Salinity	Sigma-T
5	11.639	31.648	24.052
10	8.232	32.133	24.989
20	5.933	32.270	25.404
30	6.116	32.613	25.652
40	6.037	32.837	25.839
50	6.766	33.237	26.062

STATION		US10328	
LATITUDE		42-14.8 N	
LONGITUDE		141-04.8 E	
DEPTH (m)		80	
Press.	Temp.	Salinity	Sigma-T
5	15.754	30.654	22.462
10	7.442	31.943	24.952
20	6.413	32.909	25.848
30	6.350	33.048	25.966
40	6.386	33.154	26.045
50	6.112	33.272	26.174
75	5.898	33.551	26.420

STATION		US10314	
LATITUDE		42-28.8 N	
LONGITUDE		140-31.7 E	
DEPTH (m)		77	
Press.	Temp.	Salinity	Sigma-T
5	11.508	31.475	23.942
10	8.249	31.883	24.791
20	6.704	32.250	25.292
30	5.983	32.494	25.575
40	5.279	32.703	25.823
50	4.092	32.752	25.989

STATION		US10317	
LATITUDE		42-22.9 N	
LONGITUDE		140-42.6 E	
DEPTH (m)		61	
Press.	Temp.	Salinity	Sigma-T
5	15.231	31.239	23.025
10	13.979	31.272	23.311
20	8.357	31.797	24.708
30	7.183	32.090	25.103
40	6.063	32.421	25.508
50	4.635	32.716	25.904

STATION		US10320	
LATITUDE		42-15.3 N	
LONGITUDE		140-47.4 E	
DEPTH (m)		73	
Press.	Temp.	Salinity	Sigma-T
5	14.919	31.186	23.051
10	11.601	31.609	24.030
20	7.394	32.061	25.052
30	6.130	32.592	25.634
40	6.780	33.065	25.924
50	6.945	33.271	26.065

STATION		US10323	
LATITUDE		42-07.1 N	
LONGITUDE		140-50.8 E	
DEPTH (m)		75	
Press.	Temp.	Salinity	Sigma-T
5	14.825	31.387	23.225
10	10.550	31.964	24.489
20	6.965	32.536	25.483
30	5.301	32.631	25.764
40	5.261	32.938	26.011
50	3.861	32.883	26.116

STATION		US10326	
LATITUDE		42-17.5 N	
LONGITUDE		140-53.8 E	
DEPTH (m)		57	
Press.	Temp.	Salinity	Sigma-T
5	14.940	31.348	23.171
10	10.047	31.623	24.308
20	6.380	32.342	25.406
30	6.678	32.860	25.776
40	6.731	33.109	25.965
50	5.514	33.076	26.091

STATION		US10329	
LATITUDE		42-13.9 N	
LONGITUDE		141-11.7 E	
DEPTH (m)		125	
Press.	Temp.	Salinity	Sigma-T
5	14.673	32.064	23.776
10	9.986	33.248	25.586
20	7.038	33.083	25.904
30	6.997	33.329	26.103
40	7.163	33.448	26.174
50	6.504	33.384	26.212
75	5.949	33.478	26.356
100	5.709	33.577	26.464

STATION		US10315	
LATITUDE		42-26.0 N	
LONGITUDE		140-36.8 E	
DEPTH (m)		85	
Press.	Temp.	Salinity	Sigma-T
5	14.659	31.162	23.087
10	11.741	31.601	23.997
20	7.527	31.971	24.962
30	6.606	32.278	25.327
40	5.828	32.475	25.579
50	5.869	32.844	25.865
75	3.790	33.088	26.286

STATION		US10318	
LATITUDE		42-21.1 N	
LONGITUDE		140-48.3 E	
DEPTH (m)		52	
Press.	Temp.	Salinity	Sigma-T
5	15.165	31.070	22.909
10	12.909	31.700	23.855
20	7.819	31.892	24.860
30	6.562	32.308	25.356
40	5.594	32.564	25.677

STATION		US10321	
LATITUDE		42-02.4 N	
LONGITUDE		140-54.7 E	
DEPTH (m)		77	
Press.	Temp.	Salinity	Sigma-T
5	15.088	31.196	23.023
10	9.573	31.781	24.508
20	6.232	32.359	25.438
30	5.727	32.673	25.747
40	5.539	32.898	25.948
50	5.103	32.931	26.024

STATION		US10324	
LATITUDE		42-09.5 N	
LONGITUDE		140-52.7 E	
DEPTH (m)		79	
Press.	Temp.	Salinity	Sigma-T
5	15.595	31.488	23.138
10	11.779	32.327	24.554
20	5.862	32.530	25.618
30	5.453	32.785	25.868
40	6.208	33.071	26.003
50	6.600	33.286	26.122

STATION		US10327	
LATITUDE		42-16.2 N	
LONGITUDE		140-58.4 E	
DEPTH (m)		63	
Press.	Temp.	Salinity	Sigma-T
5	12.574	31.553	23.805
10	7.581	32.040	25.008
20	6.664	32.632	25.598
30	6.611	33.030	25.919
40	6.701	33.196	26.038
50	6.394	33.312	26.169

STATION		US10330	
LATITUDE		42-10.8 N	
LONGITUDE		141-08.5 E	
DEPTH (m)		106	
Press.	Temp.	Salinity	Sigma-T
5	12.735	32.316	24.365
10	8.937	32.808	25.412
20	7.591	33.130	25.864
30	6.750	33.250	26.074
40	6.569	33.388	26.207
50	7.038	33.583	26.297
75	6.719	33.729	26.456
100	5.690	33.604	26.488

STATION US10331			
LATITUDE 42-11.4 N			
LONGITUDE 141-02.4 E			
DEPTH (m) 82			
Press.	Temp.	Salinity	Sigma-T
5	12.782	31.675	23.861
10	7.666	32.085	25.033
20	6.409	32.492	25.520
30	6.523	32.845	25.784
40	6.586	33.126	25.998
50	6.171	33.297	26.186
75	5.735	33.550	26.439

STATION US10334			
LATITUDE 42-03.9 N			
LONGITUDE 141-03.3 E			
DEPTH (m) 99			
Press.	Temp.	Salinity	Sigma-T
5	13.636	32.343	24.209
10	6.720	32.333	25.355
20	5.702	32.646	25.729
30	5.280	32.762	25.870
40	6.654	33.197	26.045
50	8.018	33.609	26.178
75	6.040	33.445	26.319

STATION US10337			
LATITUDE 42-01.6 N			
LONGITUDE 141-17.6 E			
DEPTH (m) 256			
Press.	Temp.	Salinity	Sigma-T
5	11.753	32.100	24.383
10	7.660	32.461	25.328
20	7.203	33.089	25.886
30	6.697	33.139	25.993
40	6.617	33.288	26.121
50	6.476	33.460	26.276
75	5.996	33.639	26.478
100	5.545	33.643	26.536
125	5.263	33.645	26.571
150	4.689	33.605	26.604
175	4.238	33.577	26.630
200	4.395	33.623	26.650

STATION US10340			
LATITUDE 41-58.1 N			
LONGITUDE 140-59.5 E			
DEPTH (m) 87			
Press.	Temp.	Salinity	Sigma-T
5	12.015	31.664	23.996
10	8.133	31.927	24.842
20	6.509	32.549	25.553
30	6.167	32.847	25.831
40	4.698	32.870	26.020
50	4.724	33.047	26.157
75	5.074	33.442	26.431

STATION US10332			
LATITUDE 42-08.4 N			
LONGITUDE 140-59.9 E			
DEPTH (m) 84			
Press.	Temp.	Salinity	Sigma-T
5	10.868	31.841	24.339
10	8.993	32.363	25.055
20	6.395	32.577	25.590
30	6.620	32.953	25.856
40	6.567	33.214	26.070
50	6.572	33.343	26.171
75	4.888	33.413	26.430

STATION US10335			
LATITUDE 42-01.0 N			
LONGITUDE 141-00.7 E			
DEPTH (m) 91			
Press.	Temp.	Salinity	Sigma-T
5	10.297	31.862	24.453
10	8.073	32.415	25.233
20	7.863	33.095	25.798
30	7.433	33.247	25.978
40	8.643	33.677	26.138
50	9.346	33.857	26.168
75	7.487	33.729	26.350

STATION US10338			
LATITUDE 41-59.4 N			
LONGITUDE 141-02.0 E			
DEPTH (m) 102			
Press.	Temp.	Salinity	Sigma-T
5	15.342	31.551	23.241
10	10.987	32.799	25.064
20	8.192	33.096	25.750
30	6.875	33.095	25.935
40	6.678	33.272	26.100
50	6.677	33.453	26.244
75	5.609	33.459	26.383

STATION US10341			
LATITUDE 41-57.4 N			
LONGITUDE 140-58.2 E			
DEPTH (m) 78			
Press.	Temp.	Salinity	Sigma-T
5	13.331	31.787	23.840
10	10.849	32.403	24.780
20	6.672	32.488	25.483
30	5.633	32.721	25.796
40	5.119	32.850	25.958
50	5.182	33.046	26.106
75	5.071	33.426	26.420

STATION US10333			
LATITUDE 42-07.0 N			
LONGITUDE 141-06.0 E			
DEPTH (m) 106			
Press.	Temp.	Salinity	Sigma-T
5	15.446	31.215	22.960
10	9.991	32.648	25.117
20	6.919	33.020	25.870
30	6.803	33.212	26.037
40	6.553	33.303	26.142
50	6.429	33.444	26.269
75	5.451	33.480	26.418
100	5.625	33.612	26.502

STATION US10336			
LATITUDE 41-58.5 N			
LONGITUDE 140-58.6 E			
DEPTH (m) 84			
Press.	Temp.	Salinity	Sigma-T
5	13.473	31.500	23.590
10	9.860	32.215	24.800
20	7.009	32.307	25.297
30	5.662	32.633	25.723
40	7.873	33.327	25.978
50	8.049	33.528	26.110
75	5.312	33.518	26.465

STATION US10339			
LATITUDE 41-58.8 N			
LONGITUDE 141-00.8 E			
DEPTH (m) 94			
Press.	Temp.	Salinity	Sigma-T
5	14.787	31.405	23.247
10	11.945	32.687	24.803
20	7.357	32.830	25.661
30	7.118	33.084	25.893
40	7.576	33.377	26.061
50	7.074	33.423	26.167
75	6.058	33.559	26.406

THE " USHIO MARU "

CRUISE 200

CRUISE 201

CRUISE 202

IN JULY - SEPTEMBER 2010

1. Cruise Itinerary

Cruise 200		
Departure from Hakodate	Jul.	28 , 2010
Start hydrographic research (US10342)		28
Start Frame trawl net sampling		28
Finish Frame trawl net sampling		29
Arrival at Usujiri		30
Departure from Usujiri		31
Arrival at Usujiri		31
Departure from Usujiri	Aug.	2
Arrival at Hakodate		2
Departure from Hakodate		4
Start trawl net research		4
Arrival at Aomori		4
Departure from Aomori		5
Finish trawl net research		5
Finish hydrographic research (US10385)		5
Return to Hakodate		6

Total coverage 504.1 miles

Cruise 201		
Departure from Hakodate	Aug.	20 , 2010
Start hydrographic research (US10386)		20
Arrival at and departure from Muroran		20
Arrival at and departure from Muroran		22
Retrieval Sediment trap system		22
Arrival at Muroran		22
Departure from Muroran		23
Set Sediment trap system		23
Arrival at Mori		23
Departure from Mori		24
Start trawl net research		24
Arrival at Muroran		24
Departure from Muroran		25
Arrival at Mori		25
Departure from Mori		26
Finish trawl net research		26
Arrival at Mori		26
Departure from Mori		27
Arrival at Usujiri		27
Departure from Usujiri		28
Finish hydrographic research (US10434)		29
Return to Hakodate		30

Total coverage 797.7 miles

Cruise 202		
Departure from Hakodate	Sep.	2 , 2010
Arrival at Nemuro		3
Departure from Nemuro		4
Start hydrographic research (US10435)		4
Arrival at Nemuro		4
Departure from Nemuro		5
Arrival at Rausu		5
Departure from Rausu		6
Finish hydrographic research (US10478)		7
Arrival at and departure from Rausu		7
Arrival at and departure from Shiraoi		9
Arrival at and departure from Shiraoi		10
Return to Hakodate		11

Total coverage 1054.6 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 200			
Research Staff:	Professor	(Laboratory of Marine Environmental Science)	Shigeru Montani
	Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Tohru Mukai
	Associate Professor	(Laboratory of Marine Bioresource Science)	Toshikuni Nakatani
Guest Scientist (Domestic):		(Geological Survey of Hokkaido)	Kazuo Kido
Teaching Assistant:	Chair of Marine Bioresource Science:		2 persons
Participant:	Teacher at High School:		9 persons
	Teacher at Junior High School:		1 person
Graduate Students:	Chair of Marine Bioresource Science:		1 person
	Chair of Marine Bioresource and environment Sensing:		6 persons
	Chair of Marine Industrial Science and Technology:		1 person
	Graduate School of Environmental Science:		2 persons
Under Graduate Students:	Department of Marine Biology:		5 persons
	Department of Applied Marine Science:		6 persons
Cruise 201			
Research Staff:	Professor	(Laboratory of Marine Environmental Science)	Shigeru Montani
	Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
	Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Seiichi Saitoh
	Professor	(Laboratory of Marine Environmental Science)	Kenshi Kuma
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Tohru Hirawake
	Assistant Professor	(Laboratory of Marine Environmental Science)	Hiroji Onishi
	Postdoctoral fellow	(Faculty of Fisheries Sciences)	Tomonori Isada
Guest Scientist (Domestic):		(Ehime University)	Michinobu Kuwae
		(JAMSTEC)	Yasushi Yoshikawa
		(JAMSTEC)	Masahide Wakita
		(JAMSTEC)	Mitsumasa Kano
Participant:			7 persons
Research Students:	Faculty of Fisheries Sciences:		1 person
Graduate Students:	Chair of Marine Bioresource Science:		4 persons
	Chair of Marine Bioresource and Environment Sensing:		3 persons
	Chair of Marine Environmental Science:		1 person
	Graduate School of Environmental Science:		4 persons
	Kyoto University:		1 person
Under Graduate Students:	Department of Marine Biology:		4 persons

Department of Applied Marine Science:	5 persons
Department of Applied Marine Science (Third grade):	1 person

		Cruise 202
Research Staff:	Professor	(Laboratory of Marine Environmental Science)
		Shigeru Montani

Graduate Students:	Graduate School of Environmental Science:	4 persons
Under Graduate Students:	Department of Marine Biology:	3 persons
	Department of Applied Marine Science:	1 person

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”.

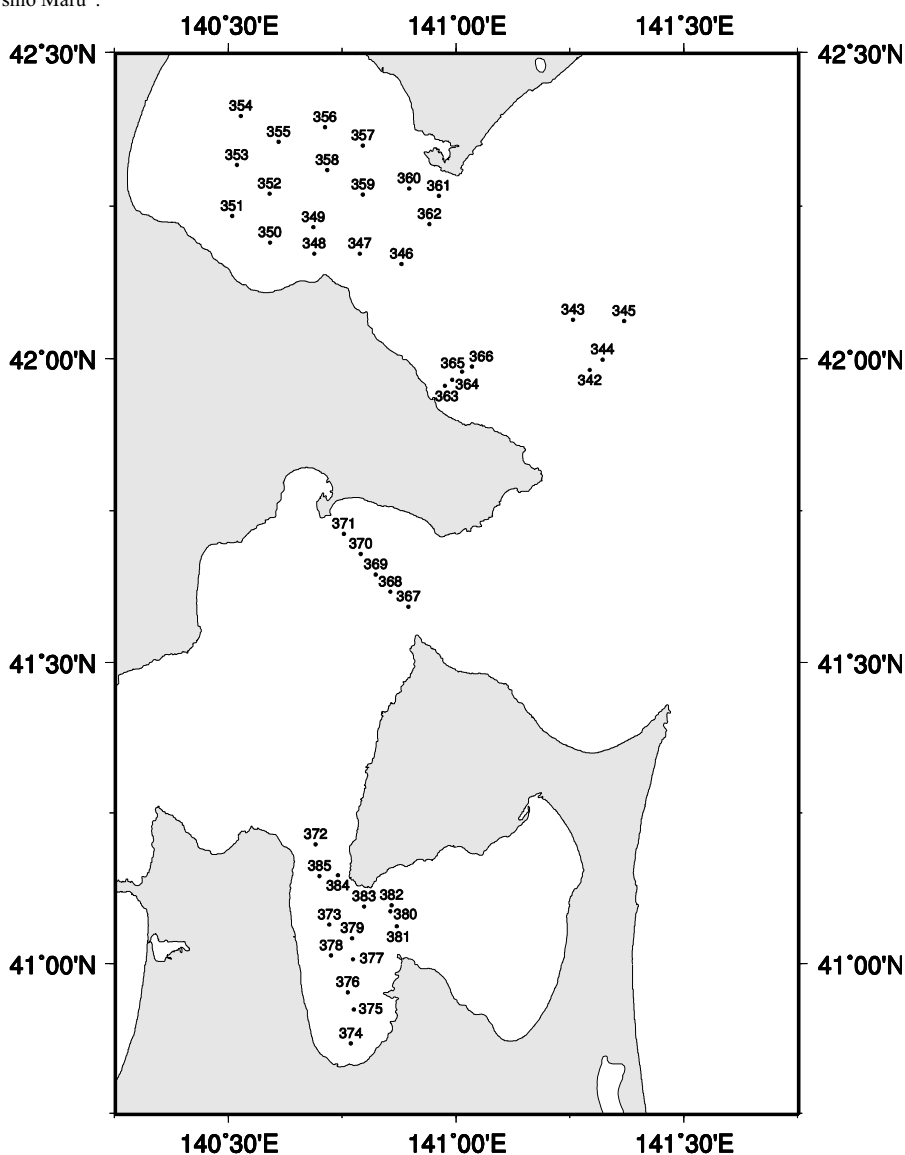


Figure 1: Oceanographic stations (Cruise 200)

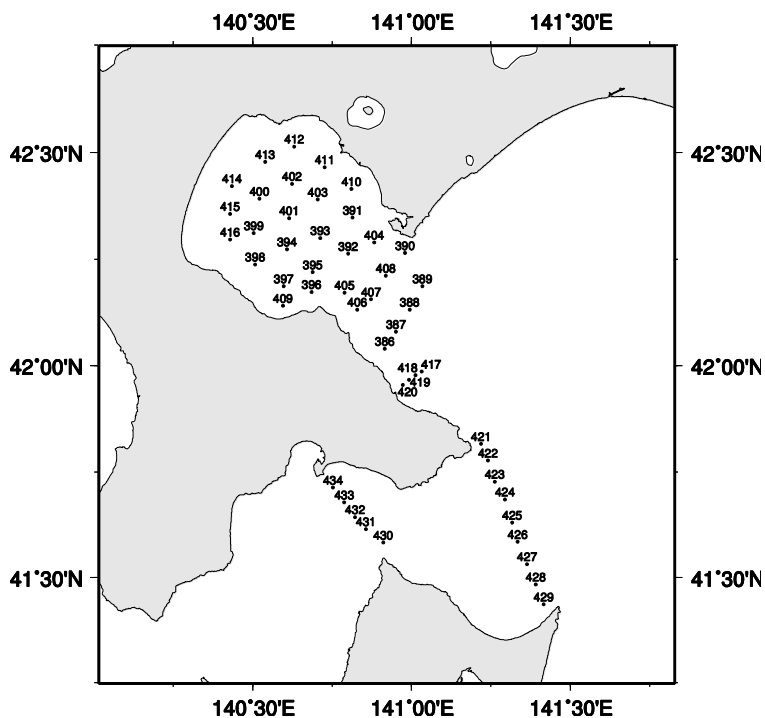


Figure 2: Oceanographic stations (Cruise 201)

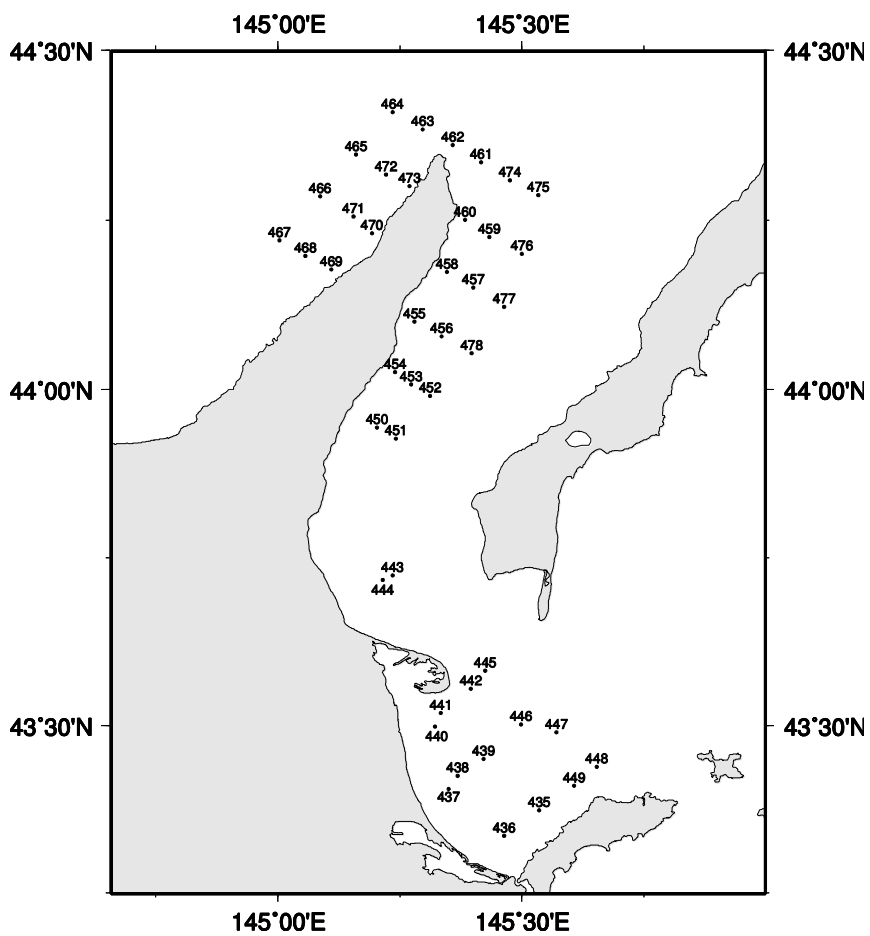


Figure 3: Oceanographic stations (Cruise 202)

Table 1: List of oceanographic stations

Cruise 200												
Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10342	41-59.0	141-17.5	7/28	1703-1713	283	SSW-3	SW -1	SSW-5	22.8	17.0	c	1007.3
US10343	42-03.9	141-15.3	7/29	1154-1202	232	South-2	SE -1	South-4	19.4	16.6	r	1001.0
US10344	42-00.0	141-19.2	7/29	1246-1256	297	SSE-2	SE -1	SSE-4	19.0	16.7	r	1000.1
US10345	42-03.8	141-22.0	7/29	1336-1348	359	SSE-3	SE -1	SSE-5	19.5	17.0	r	999.5
US10346	42-09.4	140-52.7	7/31	0740-0751	78	East-1	ESE-1	East-2	22.3	21.3	bc	1005.0
US10347	42-10.4	140-47.2	7/31	0831-0838	92	East-1	ESE-1	East-2	21.7	21.5	c	1005.1
US10348	42-10.4	140-41.2	7/31	0915-0922	86	East-1	ESE-1	East-3	23.2	21.6	bc	1005.1
US10349	42-13.0	140-41.1	7/31	0954-1000	90	East-1	ESE-1	East-3	21.9	22.2	bc	1005.1
US10350	42-11.5	140-35.4	7/31	1041-1047	82	East-1	ESE-1	East-3	26.6	21.7	bc	1005.1
US10351	42-14.1	140-30.4	7/31	1123-1131	81	East-1	ESE-1	East-3	23.8	21.8	bc	1005.1
US10352	42-16.3	140-35.3	7/31	1210-1219	91	East-2	ESE-1	East-4	22.9	22.0	bc	1005.1
US10353	42-19.1	140-31.0	7/31	1257-1303	93	ESE-1	ESE-1	ESE-3	26.4	22.2	bc	1005.1
US10354	42-23.9	140-31.5	7/31	1342-1349	95	ESE-1	ESE-1	ESE-3	23.8	22.5	bc	1005.1
US10355	42-21.4	140-36.5	7/31	1432-1439	88	ESE-2	ESE-1	ESE-4	23.8	22.0	c	1004.6
US10356	42-22.8	140-42.6	7/31	1517-1522	61	ESE-3	ESE-1	ESE-5	22.4	21.9	c	1004.6
US10357	42-21.0	140-47.6	7/31	1557-1603	52	ESE-3	ESE-1	ESE-5	23.4	22.0	c	1004.6
US10358	42-18.6	140-42.9	7/31	1641-1646	62	East-3	ESE-1	East-5	22.4	21.8	c	1004.5
US10359	42-16.2	140-47.6	7/31	1726-1731	70	East-3	ESE-1	East-5	21.6	21.6	c	1004.2
US10360	42-16.8	140-53.7	7/31	1816-1821	59	East-3	ESE-1	East-5	21.5	22.0	c	1004.2
US10361	42-16.1	140-57.6	7/31	1849-1855	62	ENE-3	ESE-1	ENE-5	20.9	18.6	c	1004.6
US10362	42-13.3	140-56.4	7/31	1923-1929	69	NE -2	ESE-1	NE -4	20.5	19.1	c	1005.0
US10363	41-57.4	140-58.4	8/2	0902-0905	80	Calm	East-1	Calm	22.8	20.8	bc	1007.2
US10364	41-58.0	140-59.4	8/2	0916-0920	87	Calm	East-1	Calm	22.2	18.6	bc	1007.2
US10365	41-58.8	141-00.7	8/2	0928-0932	95	Calm	East-1	Calm	22.7	18.4	bc	1007.3
US10366	41-59.3	141-02.0	8/2	0939-0943	102	Calm	East-1	Calm	23.0	19.2	bc	1007.5
US10367	41-35.6	140-53.6	8/2	1305-1308	56	SW-3	East-1	SW-5	23.4	23.2	c	1007.6
US10368	41-37.1	140-51.2	8/2	1328-1332	100	SW-3	East-1	SW-5	23.6	23.4	c	1007.6
US10369	41-38.8	140-49.3	8/2	1349-1400	324	SW-3	East-1	SW-5	23.9	23.0	c	1007.6
US10370	41-40.8	140-47.3	8/2	1419-1427	225	SW-3	East-1	SW-5	23.9	21.8	c	1007.6
US10371	41-42.8	140-45.1	8/2	1445-1450	84	SW-3	East-1	SW-5	23.1	20.5	c	1007.5
US10372	41-12.0	140-41.4	8/4	1218-1221	75	SSE-1	South-1	SSE-3	22.6	23.4	r	1013.2
US10373	41-04.0	140-43.2	8/4	1344-1347	60	NE -1	East-1	NE -2	23.5	23.1	o	1013.2
US10374	40-52.1	140-46.0	8/4	1505-1508	29	NNW-1	NNE-1	NNW-2	26.1	23.5	c	1013.1
US10375	40-55.5	140-46.4	8/5	0658-0701	42	Calm	NNE-1	Calm	25.5	23.6	bc	1017.9
US10376	40-57.2	140-45.6	8/5	0718-0721	50	Calm	NNE-1	Calm	27.2	23.1	bc	1017.8
US10377	41-00.5	140-46.3	8/5	0839-0843	52	Calm	North-1	Calm	30.3	23.3	bc	1018.0
US10378	41-00.9	140-43.4	8/5	0901-0904	56	Calm	North-1	Calm	29.2	23.5	bc	1018.1
US10379	41-02.6	140-46.2	8/5	0925-0928	52	Calm	North-1	Calm	27.9	24.0	bc	1018.1
US10380	41-05.3	140-51.2	8/5	1024-1027	53	West-1	NW -1	West-2	31.3	24.6	bc	1018.2
US10381	41-03.8	140-52.1	8/5	1046-1049	51	West-1	NW -1	West-1	31.4	24.3	bc	1018.2
US10382	41-05.9	140-51.4	8/5	1106-1109	53	West-1	NW -1	West-3	31.0	24.3	bc	1018.2
US10383	41-05.8	140-47.8	8/5	1131-1134	50	West-1	NW -1	West-3	29.0	24.6	bc	1018.2
US10384	41-08.9	140-44.3	8/5	1202-1206	62	North-1	SW -1	North-3	29.7	24.2	bc	1018.2
US10385	41-08.8	140-41.9	8/5	1224-1228	56	NNE-1	SW -1	NNE-3	28.6	24.3	bc	1018.2

Cruise 201												
Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10386	42-02.5	140-54.8	8/20	1300-1305	77	East-3	East-1	East-5	22.7	20.2	bc	1021.5
US10387	42-04.9	140-56.9	8/20	1340-1348	83	ESE-3	East-1	ESE-5	22.9	21.9	bc	1021.1
US10388	42-08.0	140-59.5	8/20	1437-1440	84	East-3	East-1	East-5	22.9	22.1	bc	1020.6
US10389	42-11.3	141-01.9	8/20	1506-1510	81	ENE-3	East-1	ENE-5	21.9	21.2	c	1020.6
US10390	42-16.0	140-58.6	8/20	1545-1548	65	ENE-3	East-1	ENE-5	21.5	19.9	bc	1020.5
US10391	42-21.0	140-48.7	8/20	1818-1821	52	East-3	East-1	East-5	21.3	20.9	bc	1019.8
US10392	42-15.9	140-47.9	8/20	1855-1859	70	East-3	East-1	East-5	21.0	20.1	bc	1019.7
US10393	42-18.1	140-42.6	8/20	1927-1930	63	East-3	East-1	East-5	21.5	23.2	c	1020.0
US10394	42-16.5	140-36.3	8/20	2005-2014	91	East-2	East-1	East-4	22.4	22.7	c	1020.1
US10395	42-13.3	140-41.2	8/20	2100-2103	90	East-2	East-1	East-4	22.5	22.4	bc	1019.7
US10396	42-10.5	140-41.0	8/20	2127-2130	87	East-2	East-1	East-4	21.1	17.8	bc	1019.6
US10397	42-11.3	140-35.7	8/20	2157-2200	82	ESE-2	East-1	ESE-4	21.3	20.4	bc	1019.2
US10398	42-14.4	140-30.3	8/20	2358-0003	83	ESE-2	East-1	ESE-3	21.6	21.7	bc	1019.0
US10399	42-18.8	140-30.0	8/21	0030-0035	92	SE -1	East-1	SE -3	22.1	21.2	bc	1018.6
US10400	42-23.6	140-31.1	8/21	0106-0111	96	ESE-2	East-1	ESE-4	22.3	22.7	bc	1018.6
US10401	42-20.9	140-36.7	8/21	0257-0302	88	ESE-2	East-1	ESE-4	22.1	23.5	bc	1017.6
US10402	42-25.7	140-37.3	8/21	0335-0340	84	ESE-2	East-1	ESE-4	22.3	23.3	bc	1017.6
US10403	42-23.5	140-42.1	8/21	0407-0410	65	ESE-2	East-1	ESE-4	22.3	23.3	bc	1017.1
US10404	42-17.5	140-52.8	8/21	0927-0933	59	ESE-2	East-1	ESE-4	22.1	19.8	bc	1017.2
US10405	42-10.4	140-47.2	8/21	1215-1220	93	SE -1	East-1	SE -3	23.2	22.4	c	1015.9
US10406	42-08.0	140-49.6	8/21	2048-2052	85	SW-2	East-1	SW -4	26.2	22.4	bc	1013.6
US10407	42-09.5	140-52.2	8/21	2108-2112	76	SW -1	East-1	SW -3	26.6	21.7	bc	1013.6
US10408	42-12.8	140-55.0	8/21	2137-2140	68	WSW-1	East-1	WSW-3	25.2	19.8	bc	1013.6
US10409	42-08.6	140-35.6	8/23	1246-1250	63	East-3	East-1	East-5	23.9	23.9	c	1011.1
US10410	42-25.0	140-48.5	8/25	0751-0754	44	Calm	SSE-1	Calm	22.5	23.5	c	1014.7
US10411	42-28.0	140-43.4	8/25	0829-0833	59	Calm	SSE-1	Calm	23.2	23.1	c	1015.1
US10412	42-30.9	140-37.7	8/25	0908-0912	62	North-1	SSE-1	North-2	22.6	22.8	c	1015.1
US10413	42-28.8	140-32.2	8/25	0943-0948	76	East-1	East-1	East-2	23.8	23.7	c	1015.3
US10414	42-25.4	140-25.9	8/26	1120-1125	70	South-1	East-1	South-2	26.7	23.9	bc	1019.1
US10415	42-21.5	140-25.6	8/26	1201-1206	74	South-1	East-1	South-1	26.3	24.5	bc	1019.1
US10416	42-17.9	140-25.6	8/26	1235-1240	66	Calm	East-1	Calm	28.1	24.0	bc	1019.1
US10417	41-59.3	141-01.8	8/27	1212-1217	101	ENE-1	ESE-1	ENE-2	23.2	21.3	c	1021.0
US10418	41-58.8	141-00.6	8/27	1223-1227	94	ENE-1	ESE-1	ENE-2	23.6	22.3	c	1021.0
US10419	41-58.1	140-59.4	8/27	1235-1239	86	Calm	ESE-1	Calm	23.6	23.0	c	1021.0
US10420	41-57.4	140-58.2	8/27	1246-1250	79	Calm	ESE-1	Calm	24.3	22.8	c	1021.0
US10421	41-49.1	141-13.0	8/28	1001-1013	162	NNW-1	ESE-1	NNW-3	25.0	22.6	bc	1021.0

Cruise 201 (Continued)

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10422	41-46.7	141-14.3	8/28	1123-1137	195	NNE-1	ESE-1	NNE-3	25.5	22.5	c	1020.7
US10423	41-43.7	141-15.6	8/28	1156-1212	228	NNE-1	ESE-1	NNE-3	25.2	21.9	bc	1020.6
US10424	41-41.2	141-17.5	8/28	1231-1253	235	NE -1	ESE-1	NE -3	26.1	26.5	bc	1020.1
US10425	41-37.9	141-18.9	8/28	1317-1330	212	ENE-1	ESE-1	ENE-3	27.6	27.0	bc	1020.0
US10426	41-35.2	141-19.9	8/28	1344-1400	287	East-1	ESE-1	East-3	26.7	27.3	bc	1019.8
US10427	41-32.0	141-21.7	8/28	1416-1429	259	West-1	ESE-1	East-2	27.1	26.2	bc	1019.6
US10428	41-29.1	141-23.3	8/28	1448-1455	105	East-1	SE -1	East-2	27.2	25.9	bc	1019.6
US10429	41-26.3	141-24.8	8/28	1513-1517	38	East-1	ESE-1	East-3	27.1	25.5	bc	1019.5
US10430	41-35.1	140-54.5	8/29	1729-1733	55	Calm	East-1	Calm	28.4	26.7	bc	1015.1
US10431	41-37.0	140-51.2	8/29	1757-1802	94	Calm	East-1	Calm	28.0	28.2	bc	1015.1
US10432	41-38.7	140-49.2	8/29	1820-1832	336	NE -1	East-1	NE -2	28.0	28.3	bc	1015.1
US10433	41-40.8	140-47.1	8/29	1851-1858	222	NE -1	East-1	NE -3	26.4	26.1	bc	1015.1
US10434	41-42.9	140-45.0	8/29	1914-1918	84	Calm	ESE-1	Calm	26.4	24.7	bc	1015.1

Cruise 202

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10435	43-22.5	145-32.0	9/4	0903-0907	18	North-1	NE -1	North-3	20.6	20.9	bc	1013.1
US10436	43-20.2	145-27.7	9/4	0933-0936	15	NNE-1	NE -1	NNE-2	21.7	21.1	bc	1013.5
US10437	43-24.4	145-20.9	9/4	1019-1020	9	Calm	NE -1	Calm	21.9	20.9	bc	1013.5
US10438	43-25.6	145-22.0	9/4	1036-1038	10	Calm	NE -1	Calm	22.6	21.0	bc	1013.2
US10439	43-27.1	145-25.2	9/4	1102-1105	17	Calm	NE -1	Calm	22.0	20.3	bc	1013.2
US10440	43-30.0	145-19.2	9/4	1140-1142	8	NE -1	NE -1	NE -2	22.5	20.9	bc	1013.1
US10441	43-31.2	145-19.9	9/4	1154-1200	7	NE -1	NE -1	NE -2	22.9	20.9	bc	1013.1
US10442	43-33.4	145-23.6	9/4	1233-1237	11	Calm	NE -1	Calm	23.8	21.9	bc	1013.1
US10443	43-43.5	145-14.0	9/4	1340-1346	18	SE -1	NNW-1	SE -2	24.4	21.9	bc	1012.7
US10444	43-43.1	145-12.8	9/4	1404-1407	17	Calm	NNW-1	Calm	25.5	20.7	bc	1013.0
US10445	43-35.0	145-25.4	9/4	1527-1531	13	Calm	NW -1	Calm	23.3	19.2	bc	1012.6
US10446	43-30.2	145-29.8	9/4	1609-1614	24	Calm	ENE-1	Calm	23.0	19.9	bc	1012.6
US10447	43-29.5	145-34.1	9/4	1641-1644	30	Calm	ENE-1	Calm	23.0	21.8	bc	1012.7
US10448	43-26.4	145-39.1	9/4	1718-1721	30	SSW-1	NE -1	SSW-3	21.9	21.4	bc	1013.1
US10449	43-24.7	145-36.3	9/4	1543-1546	27	SSW-1	NE -1	SSW-3	22.1	21.5	bc	1013.1
US10450	43-56.7	145-12.1	9/6	0649-0652	82	Calm	South-1	Calm	21.9	21.5	c	1008.2
US10451	43-55.7	145-14.4	9/6	0706-0709	80	NNE-1	South-1	NNE-3	22.2	21.6	c	1008.1
US10452	43-59.5	145-18.6	9/6	0740-0749	266	NNW-2	NE -1	NNW-4	22.1	22.1	r	1008.1
US10453	44-00.5	145-16.3	9/6	0801-0816	467	NNE-2	NE -1	NNE-4	22.1	21.7	c	1008.2
US10454	44-01.6	145-14.3	9/6	0827-0839	373	NNE-1	NE -1	NNE-3	21.8	21.1	r	1008.6
US10455	44-06.1	145-16.7	9/6	0909-0922	421	NNW-1	NE -1	NNW-3	22.4	21.1	r	1008.6
US10456	44-04.8	145-20.0	9/6	0941-0957	725	NNE-1	NE -1	NNE-3	22.4	21.1	c	1008.7
US10457	44-09.1	145-23.9	9/6	1028-1045	1493	SE -1	NE -1	SE -3	21.7	21.7	r	1008.1
US10458	44-10.5	145-20.7	9/6	1102-1106	122	West-2	NE -1	West-4	21.5	21.0	r	1008.5
US10459	44-13.6	145-25.9	9/6	1135-1152	1396	NE -1	NNE-1	NE -2	22.8	20.3	r	1007.6
US10460	44-15.1	145-22.9	9/6	1209-1219	350	SSW-1	NE -1	SSW-2	22.4	20.2	c	1006.7
US10461	44-20.2	145-24.9	9/6	1248-1305	898	NW -1	NE -1	NW -3	22.9	20.2	c	1007.2
US10462	44-21.7	145-21.4	9/6	1327-1330	80	WSW-2	NE -1	WSW-4	23.1	19.5	bc	1007.1
US10463	44-23.1	145-17.7	9/6	1352-1408	708	SW -2	NE -1	SW -4	23.3	20.6	bc	1006.6
US10464	44-24.6	145-14.0	9/6	1430-1446	1398	SW -2	NE -1	SW -4	23.3	21.0	bc	1006.3
US10465	44-20.9	145-09.5	9/6	1532-1549	1166	SW -2	NE -1	SW -4	23.2	21.1	bc	1006.6
US10466	44-17.2	145-05.1	9/6	1633-1650	882	SW -1	NE -1	SW -3	22.8	20.0	bc	1007.0
US10467	44-13.3	145-00.1	9/6	1736-1752	662	SW -1	NE -1	SW -3	23.2	20.3	bc	1006.8
US10468	44-11.9	145-03.3	9/6	1808-1823	447	South-1	NE -1	South-3	22.7	19.7	bc	1007.0
US10469	44-10.7	145-06.5	9/6	1839-1847	305	South-1	NE -1	South-3	23.6	21.7	bc	1007.4
US10470	44-13.9	145-11.5	9/6	1915-1919	118	SW -1	NE -1	SW -3	24.5	21.5	bc	1007.7
US10471	44-15.4	145-09.2	9/6	1936-1952	615	WSW-1	NE -1	WSW-3	25.1	20.8	bc	1007.7
US10472	44-19.1	145-13.2	9/6	2015-2031	666	SW -1	NE -1	SW -3	24.4	20.9	bc	1008.0
US10473	44-18.1	145-16.1	9/6	2045-2051	155	SSW-1	NE -1	SSW -3	23.2	21.0	bc	1007.7
US10474	44-18.6	145-28.4	9/7	0454-0511	1503	SSW-1	NE -1	SSW-3	22.1	21.6	o	1005.6
US10475	44-17.3	145-31.9	9/7	0530-0547	2085	South-1	NE -1	South-3	21.5	21.7	o	1004.6
US10476	44-12.1	145-29.9	9/7	0623-0640	2067	South-1	NE -1	South-3	21.9	20.5	o	1004.1
US10477	44-07.4	145-27.7	9/7	0715-0731	1228	SSW-1	NE -1	SSW-2	21.9	21.1	r	1003.3
US10478	44-03.3	145-23.7	9/7	0805-0820	531	SSE-1	NE -1	SSE-2	22.1	21.1	r	1002.6

(*): Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US10342				STATION US10343				STATION US10344			
LATITUDE		41-59.0 N		LATITUDE		42-03.9 N		LATITUDE		42-00.0 N	
LONGITUDE		141-17.5 E		LONGITUDE		141-15.3 E		LONGITUDE		141-19.2 E	
DEPTH (m)		283		DEPTH (m)		232		DEPTH (m)		297	
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	16.818	31.874	23.158	5	15.493	31.982	23.539	5	15.644	32.105	23.601
10	9.781	32.445	24.992	10	10.555	32.373	24.807	10	10.652	32.373	24.790
20	3.558	32.752	26.040	20	5.410	32.800	25.885	20	4.821	32.791	25.944
30	2.698	32.876	26.215	30	4.138	33.092	26.254	30	3.563	32.990	26.230
40	2.105	32.935	26.310	40	3.683	33.137	26.335	40	5.066	33.391	26.392
50	2.119	33.028	26.383	50	2.771	33.074	26.368	50	3.438	33.200	26.409
75	1.345	33.052	26.457	75	2.034	33.120	26.463	75	1.431	33.091	26.482
100	1.037	33.104	26.518	100	1.522	33.142	26.517	100	1.615	33.146	26.514
125	0.994	33.155	26.562	125	1.062	33.146	26.551	125	1.099	33.146	26.548
150	1.210	33.208	26.591	150	1.650	33.268	26.609	150	1.046	33.188	26.586
175	1.173	33.239	26.619	175	1.200	33.239	26.617	175	1.065	33.217	26.608
200	2.315	33.412	26.675	200	1.686	33.346	26.669	200	1.390	33.276	26.634
								250	2.885	33.507	26.703

		STATION	US10345		
		LATITUDE	42-03.8	N	
		LONGITUDE	141-22.0	E	
		DEPTH (m)	359		
Press.	Temp.	Salinity	Sigma-T		
5	17.036	32.030	23.227		
10	12.941	32.207	24.242		
20	6.015	32.720	25.749		
30	4.415	32.935	26.101		
40	4.132	33.173	26.320		
50	4.217	33.287	26.402		
75	2.445	33.202	26.497		
100	1.013	33.123	26.536		
125	1.019	33.165	26.569		
150	1.138	33.220	26.605		
175	1.347	33.274	26.635		
200	1.405	33.297	26.650		
250	1.572	33.367	26.695		
300	2.349	33.499	26.742		

		STATION	US10348		
		LATITUDE	42-10.4	N	
		LONGITUDE	140-41.2	E	
		DEPTH (m)	86		
Press.	Temp.	Salinity	Sigma-T		
5	21.937	31.035	21.225		
10	21.091	31.032	21.452		
20	11.364	31.887	24.288		
30	7.771	32.611	25.431		
40	6.041	32.755	25.774		
50	5.961	33.065	26.028		
75	4.319	33.253	26.364		

		STATION	US10351		
		LATITUDE	42-14.1	N	
		LONGITUDE	140-30.4	E	
		DEPTH (m)	81		
Press.	Temp.	Salinity	Sigma-T		
5	21.548	31.006	21.309		
10	21.214	31.011	21.403		
20	11.173	32.035	24.437		
30	7.851	32.609	25.418		
40	6.231	32.837	25.815		
50	5.873	33.020	26.004		
75	4.644	33.275	26.347		

		STATION	US10354		
		LATITUDE	42-23.9	N	
		LONGITUDE	140-31.5	E	
		DEPTH (m)	95		
Press.	Temp.	Salinity	Sigma-T		
5	22.528	30.978	21.019		
10	21.404	31.014	21.354		
20	12.152	31.954	24.196		
30	7.865	32.414	25.262		
40	6.167	32.678	25.698		
50	5.551	32.895	25.943		
75	4.603	33.345	26.407		

		STATION	US10357		
		LATITUDE	42-21.0	N	
		LONGITUDE	140-47.6	E	
		DEPTH (m)	52		
Press.	Temp.	Salinity	Sigma-T		
5	21.893	31.093	21.281		
10	20.486	31.315	21.827		
20	11.217	31.832	24.270		
30	6.302	32.450	25.501		
40	5.301	32.619	25.754		

		STATION	US10360		
		LATITUDE	42-16.8	N	
		LONGITUDE	140-53.7	E	
		DEPTH (m)	59		
Press.	Temp.	Salinity	Sigma-T		
5	21.937	30.880	21.108		
10	15.842	31.652	23.209		
20	11.561	32.219	24.510		
30	5.975	32.777	25.800		
40	6.213	33.061	25.994		
50	6.197	33.167	26.080		

		STATION	US10346		
		LATITUDE	42-09.4	N	
		LONGITUDE	140-52.7	E	
		DEPTH (m)	78		
Press.	Temp.	Salinity	Sigma-T		
5	20.112	31.170	21.814		
10	16.529	31.664	23.063		
20	7.965	32.279	25.143		
30	6.060	32.666	25.702		
40	6.245	33.063	25.992		
50	6.547	33.327	26.161		

		STATION	US10349		
		LATITUDE	42-13.0	N	
		LONGITUDE	140-41.1	E	
		DEPTH (m)	90		
Press.	Temp.	Salinity	Sigma-T		
5	22.028	31.041	21.205		
10	21.230	31.058	21.435		
20	14.567	31.860	23.644		
30	7.043	32.234	25.235		
40	5.880	32.713	25.761		
50	4.756	32.784	25.945		
75	5.812	33.413	26.322		

		STATION	US10352		
		LATITUDE	42-16.3	N	
		LONGITUDE	140-35.3	E	
		DEPTH (m)	91		
Press.	Temp.	Salinity	Sigma-T		
5	21.858	31.036	21.248		
10	21.302	31.072	21.426		
20	16.748	31.648	23.002		
30	8.417	32.243	25.048		
40	6.350	32.707	25.697		
50	5.775	33.011	26.008		
75	4.669	33.335	26.392		

		STATION	US10355		
		LATITUDE	42-21.4	N	
		LONGITUDE	140-36.5	E	
		DEPTH (m)	88		
Press.	Temp.	Salinity	Sigma-T		
5	22.064	31.039	21.194		
10	21.440	31.099	21.409		
20	15.731	31.429	23.062		
30	7.795	32.057	24.993		
40	6.580	32.719	25.677		
50	6.425	33.073	25.977		
75	5.775	33.322	26.255		

		STATION	US10358		
		LATITUDE	42-18.6	N	
		LONGITUDE	140-42.9	E	
		DEPTH (m)	62		
Press.	Temp.	Salinity	Sigma-T		
5	21.706	31.106	21.342		
10	21.035	31.184	21.582		
20	16.970	31.496	22.834		
30	8.337	32.170	25.002		
40	6.172	32.555	25.600		
50	6.508	33.148	26.025		

		STATION	US10361		
		LATITUDE	42-16.1	N	
		LONGITUDE	140-57.6	E	
		DEPTH (m)	62		
Press.	Temp.	Salinity	Sigma-T		
5	18.258	31.043	22.182		
10	16.030	31.926	23.377		
20	10.172	32.274	24.795		
30	7.195	32.606	25.507		
40	5.175	32.908	25.998		
50	4.855	32.993	26.100		

		STATION	US10347		
		LATITUDE	42-10.4	N	
		LONGITUDE	140-47.2	E	
		DEPTH (m)	92		
Press.	Temp.	Salinity	Sigma-T		
5	20.958	31.040	21.493		
10	17.496	31.579	22.774		
20	7.439	32.129	25.099		
30	6.352	32.658	25.658		
40	6.297	32.953	25.898		
50	5.047	32.935	26.033		
75	5.683	33.319	26.263		

		STATION	US10350		
		LATITUDE	42-11.5	N	
		LONGITUDE	140-35.4	E	
		DEPTH (m)	82		
Press.	Temp.	Salinity	Sigma-T		
5	21.492	31.040	21.351		
10	21.049	31.024	21.457		
20	11.795	32.028	24.319		
30	6.771	32.400	25.401		
40	5.469	32.742	25.832		
50	4.183	32.798	26.016		
75	4.516	33.310	26.389		

		STATION	US10353		
		LATITUDE	42-19.1	N	
		LONGITUDE	140-31.0	E	
		DEPTH (m)	93		
Press.	Temp.	Salinity	Sigma-T		
5	21.844	31.027	21.245		
10	21.310	31.000	21.369		
20	15.644	31.743	23.322		
30	8.039	32.271	25.125		
40	5.806	32.651	25.720		
50	5.494	32.909	25.962		
75	4.691	33.289	26.353		

		STATION	US10356		
		LATITUDE	42-22.8	N	
		LONGITUDE	140-42.6	E	
		DEPTH (m)	61		
Press.	Temp.	Salinity	Sigma-T		
5	22.159	31.053	21.178		
10	20.990	31.223	21.624		
20	14.258	31.634	23.534		
30	7.546	32.194	25.134		
40	6.556	32.723	25.684		
50	5.947	32.986	25.968		

		STATION	US10359		
		LATITUDE	42-16.2	N	
		LONGITUDE	140-47.6	E	
		DEPTH (m)	70		
Press.	Temp.	Salinity	Sigma-T		
5	21.670	31.100	21.347		
10	20.094	31.242	21.874		
20	17.753	31.527	22.674		
30	7.455	32.139	25.105		
40	6.820	33.033	25.893		
50	6.261	33.236	26.126		

		STATION	US10362		
		LATITUDE	42-13.3	N	
		LONGITUDE	140-56.4	E	
		DEPTH (m)	69		
Press.	Temp.	Salinity	Sigma-T		
5	19.157	31.089	21.995		
10	17.325	31.468	22.729		
20	12.295	32.090	24.275		
30	7.412	32.566	25.446		
40	4.811	32.772	25.930		
50	4.755	32.983	26.103		

	STATION	US10363		
	LATITUDE	41-57.4	N	
	LONGITUDE	140-58.4	E	
	DEPTH (m)	80		
Press.	Temp.	Salinity	Sigma-T	
5	19.926	30.891	21.650	
10	17.613	31.714	22.850	
20	12.813	31.954	24.070	
30	7.661	32.361	25.250	
40	6.403	32.854	25.807	
50	5.375	32.944	26.003	

	STATION	US10366		
	LATITUDE	41-59.3	N	
	LONGITUDE	141-02.0	E	
	DEPTH (m)	102		
Press.	Temp.	Salinity	Sigma-T	
5	18.666	31.597	22.506	
10	12.735	32.064	24.170	
20	8.487	32.591	25.311	
30	6.851	33.028	25.886	
40	5.267	32.964	26.031	
50	6.017	33.203	26.130	
75	6.379	33.505	26.323	
100	5.034	33.492	26.476	

	STATION	US10369		
	LATITUDE	41-38.8	N	
	LONGITUDE	140-49.3	E	
	DEPTH (m)	324		
Press.	Temp.	Salinity	Sigma-T	
5	22.655	33.791	23.115	
10	21.272	33.802	23.508	
20	17.313	33.858	24.564	
30	15.198	34.041	25.189	
40	14.726	34.105	25.342	
50	13.341	34.182	25.691	
75	12.344	34.187	25.892	
100	11.298	34.156	26.064	
125	10.758	34.155	26.161	
150	10.560	34.159	26.199	
175	10.388	34.162	26.231	
200	10.323	34.164	26.244	
250	10.226	34.163	26.260	
300	10.179	34.163	26.268	

	STATION	US10372		
	LATITUDE	41-12.0	N	
	LONGITUDE	140-41.4	E	
	DEPTH (m)	75		
Press.	Temp.	Salinity	Sigma-T	
5	23.275	33.379	22.626	
10	22.825	33.452	22.810	
20	22.022	33.501	23.073	
30	21.726	33.518	23.168	
40	21.283	33.551	23.314	
50	19.212	33.699	23.974	

	STATION	US10375		
	LATITUDE	40-55.5	N	
	LONGITUDE	140-46.4	E	
	DEPTH (m)	42		
Press.	Temp.	Salinity	Sigma-T	
5	23.729	32.558	21.873	
10	22.458	33.030	22.593	
20	21.165	33.152	23.043	
30	20.415	33.215	23.292	
40	19.412	33.245	23.576	

	STATION	US10378		
	LATITUDE	41-00.9	N	
	LONGITUDE	140-43.4	E	
	DEPTH (m)	56		
Press.	Temp.	Salinity	Sigma-T	
5	23.151	33.032	22.398	
10	22.603	33.241	22.713	
20	21.795	33.310	22.991	
30	20.928	33.368	23.271	
40	18.182	33.386	23.992	
50	15.447	33.819	24.964	

	STATION	US10364		
	LATITUDE	41-58.0	N	
	LONGITUDE	140-59.4	E	
	DEPTH (m)	87		
Press.	Temp.	Salinity	Sigma-T	
5	18.497	30.986	22.080	
10	17.234	31.836	23.033	
20	12.264	32.142	24.320	
30	7.475	32.452	25.348	
40	6.655	32.849	25.770	
50	5.053	32.918	26.019	
75	5.486	33.358	26.317	

	STATION	US10367		
	LATITUDE	41-35.6	N	
	LONGITUDE	140-53.6	E	
	DEPTH (m)	56		
Press.	Temp.	Salinity	Sigma-T	
5	22.874	33.459	22.801	
10	22.435	33.498	22.955	
20	20.126	33.639	23.691	
30	19.986	33.666	23.748	
40	19.772	33.678	23.813	
50	19.334	33.707	23.948	

	STATION	US10370		
	LATITUDE	41-40.8	N	
	LONGITUDE	140-47.3	E	
	DEPTH (m)	225		
Press.	Temp.	Salinity	Sigma-T	
5	21.155	33.877	23.597	
10	20.681	33.878	23.726	
20	18.477	33.944	24.345	
30	17.113	34.078	24.780	
40	14.872	34.121	25.322	
50	14.835	34.149	25.352	
75	12.739	34.136	25.775	
100	11.739	34.165	25.990	
125	10.540	34.162	26.204	
150	10.266	34.167	26.256	
175	10.155	34.170	26.277	
200	10.112	34.171	26.286	

	STATION	US10373		
	LATITUDE	41-04.0	N	
	LONGITUDE	140-43.2	E	
	DEPTH (m)	60		
Press.	Temp.	Salinity	Sigma-T	
5	23.047	32.610	22.109	
10	22.842	32.919	22.401	
20	21.176	33.167	23.052	
30	20.383	33.328	23.387	
40	18.422	33.315	23.878	
50	16.824	33.536	24.432	

	STATION	US10376		
	LATITUDE	40-57.2	N	
	LONGITUDE	140-45.6	E	
	DEPTH (m)	50		
Press.	Temp.	Salinity	Sigma-T	
5	23.145	32.751	22.187	
10	22.785	33.298	22.705	
20	22.534	33.354	22.818	
30	20.993	33.243	23.159	
40	19.925	33.289	23.477	
50	17.493	33.707	24.405	

	STATION	US10379		
	LATITUDE	41-02.6	N	
	LONGITUDE	140-46.2	E	
	DEPTH (m)	52		
Press.	Temp.	Salinity	Sigma-T	
5	23.502	32.424	21.838	
10	22.300	32.929	22.561	
20	21.019	33.161	23.090	
30	20.096	33.298	23.439	
40	18.875	33.323	23.771	
50	14.914	33.696	24.985	

	STATION	US10365		
	LATITUDE	41-58.8	N	
	LONGITUDE	141-00.7	E	
	DEPTH (m)	95		
Press.	Temp.	Salinity	Sigma-T	
5	18.533	31.579	22.524	
10	17.949	31.737	22.787	
20	10.462	32.353	24.808	
30	7.831	32.930	25.673	
40	6.468	33.034	25.941	
50	5.793	33.156	26.121	
75	6.006	33.478	26.350	

	STATION	US10368		
	LATITUDE	41-37.1	N	
	LONGITUDE	140-51.2	E	
	DEPTH (m)	100		
Press.	Temp.	Salinity	Sigma-T	
5	23.218	33.678	22.868	
10	22.586	33.651	23.029	
20	20.582	33.508	23.470	
30	16.986	33.893	24.668	
40	14.521	34.066	25.355	
50	13.250	34.119	25.660	
75	12.258	34.170	25.895	

	STATION	US10371		
	LATITUDE	41-42.8	N	
	LONGITUDE	140-45.1	E	
	DEPTH (m)	84		
Press.	Temp.	Salinity	Sigma-T	
5	19.536	33.774	23.947	
10	18.709	33.919	24.268	
20	18.289	33.960	24.405	
30	16.930	34.001	24.764	
40	15.838	34.050	25.053	
50	13.778	34.107	25.544	
75	11.782	34.162	25.980	

	STATION	US10374		
	LATITUDE	40-52.1	N	
	LONGITUDE	140-46.0	E	
	DEPTH (m)	29		
Press.	Temp.	Salinity	Sigma-T	
5	23.577	32.673	22.004	
10	22.357	32.835	22.474	
20	21.736	33.154	22.889	

	STATION	US10377		
	LATITUDE	41-00.5	N	
	LONGITUDE	140-46.3	E	
	DEPTH (m)	52		
Press.	Temp.	Salinity	Sigma-T	
5	22.984	33.348	22.686	
10	22.328	33.232	22.783	
20	21.844	33.344	23.003	
30	20.998	33.395	23.273	
40	18.986	33.368	23.778	
50	14.224	33.856	25.256	

	STATION	US10380		
	LATITUDE	41-05.3	N	
	LONGITUDE	140-51.2	E	
	DEPTH (m)	53		
Press.	Temp.	Salinity	Sigma-T	
5	23.573	32.482	21.860	
10	22.790	32.813	22.335	
20	20.782	33.019	23.045	
30	19.797	33.320	23.534	
40	17.633	33.333	24.085	
50	15.607	33.491	24.676	

		STATION	US10381	
		LATITUDE	41-03.8 N	
		LONGITUDE	140-52.1 E	
		DEPTH (m)	51	
Press.	Temp.	Salinity	Sigma-T	
5	23.620	32.518	21.874	
10	22.702	33.258	22.697	
20	21.137	33.128	23.032	
30	20.090	33.256	23.408	
40	18.072	33.280	23.938	
50	14.228	33.472	24.960	

		STATION	US10384	
		LATITUDE	41-08.9 N	
		LONGITUDE	140-44.3 E	
		DEPTH (m)	62	
Press.	Temp.	Salinity	Sigma-T	
5	23.600	32.755	22.060	
10	23.311	33.158	22.448	
20	23.008	33.433	22.743	
30	21.804	33.523	23.150	
40	18.553	33.278	23.818	
50	16.633	33.398	24.371	

		STATION	US10387	
		LATITUDE	42-04.9 N	
		LONGITUDE	140-56.9 E	
		DEPTH (m)	83	
Press.	Temp.	Salinity	Sigma-T	
5	17.685	31.442	22.623	
10	13.473	32.162	24.102	
20	8.807	32.804	25.428	
30	7.272	32.865	25.700	
40	5.713	32.851	25.889	
50	6.221	33.019	25.960	

		STATION	US10390	
		LATITUDE	42-16.0 N	
		LONGITUDE	140-58.6 E	
		DEPTH (m)	65	
Press.	Temp.	Salinity	Sigma-T	
5	19.919	31.143	21.843	
10	15.808	31.893	23.401	
20	10.804	32.528	24.885	
30	8.001	32.690	25.460	
40	7.149	32.788	25.657	
50	6.474	32.889	25.825	

		STATION	US10393	
		LATITUDE	42-18.1 N	
		LONGITUDE	140-42.6 E	
		DEPTH (m)	63	
Press.	Temp.	Salinity	Sigma-T	
5	23.393	30.129	20.133	
10	23.050	30.329	20.381	
20	11.374	31.959	24.342	
30	7.002	32.643	25.562	
40	5.908	32.874	25.884	
50	5.278	32.937	26.008	

		STATION	US10396	
		LATITUDE	42-10.5 N	
		LONGITUDE	140-41.0 E	
		DEPTH (m)	87	
Press.	Temp.	Salinity	Sigma-T	
5	18.227	31.501	22.540	
10	12.670	31.898	24.054	
20	7.412	32.276	25.218	
30	6.599	32.703	25.662	
40	5.673	32.849	25.892	
50	5.301	33.045	26.091	
75	5.250	33.284	26.286	

		STATION	US10399	
		LATITUDE	42-18.8 N	
		LONGITUDE	140-30.0 E	
		DEPTH (m)	92	
Press.	Temp.	Salinity	Sigma-T	
5	22.158	30.542	20.791	
10	21.028	30.650	21.179	
20	10.345	31.931	24.498	
30	7.253	32.378	25.320	
40	6.250	32.750	25.744	
50	5.428	32.946	25.998	
75	4.718	33.332	26.384	

		STATION	US10382	
		LATITUDE	41-05.9 N	
		LONGITUDE	140-51.4 E	
		DEPTH (m)	53	
Press.	Temp.	Salinity	Sigma-T	
5	24.488	31.646	20.961	
10	22.662	32.623	22.228	
20	20.276	33.052	23.205	
30	19.661	33.316	23.566	
40	17.831	33.312	24.021	
50	15.307	33.485	24.737	

		STATION	US10385	
		LATITUDE	41-08.8 N	
		LONGITUDE	140-41.9 E	
		DEPTH (m)	56	
Press.	Temp.	Salinity	Sigma-T	
5	23.505	33.389	22.567	
10	23.315	33.407	22.636	
20	23.238	33.405	22.656	
30	23.180	33.396	22.666	
40	22.083	33.502	23.057	
50	16.744	33.763	24.625	

		STATION	US10388	
		LATITUDE	42-08.0 N	
		LONGITUDE	140-59.5 E	
		DEPTH (m)	84	
Press.	Temp.	Salinity	Sigma-T	
5	20.325	30.945	21.587	
10	16.121	31.953	23.378	
20	9.234	32.789	25.350	
30	6.603	33.051	25.936	
40	5.804	33.132	26.101	
50	5.524	33.132	26.134	
75	5.449	33.151	26.158	

		STATION	US10391	
		LATITUDE	42-21.0 N	
		LONGITUDE	140-48.7 E	
		DEPTH (m)	52	
Press.	Temp.	Salinity	Sigma-T	
5	20.935	30.551	21.128	
10	19.527	31.283	22.050	
20	9.690	32.343	24.929	
30	7.729	32.606	25.433	
40	6.117	32.709	25.728	

		STATION	US10394	
		LATITUDE	42-16.5 N	
		LONGITUDE	140-36.3 E	
		DEPTH (m)	91	
Press.	Temp.	Salinity	Sigma-T	
5	22.790	30.489	20.576	
10	22.445	30.570	20.733	
20	11.316	32.105	24.466	
30	6.904	32.441	25.416	
40	5.661	32.752	25.817	
50	5.389	33.012	26.055	
75	4.686	33.343	26.396	

		STATION	US10397	
		LATITUDE	42-11.3 N	
		LONGITUDE	140-35.7 E	
		DEPTH (m)	82	
Press.	Temp.	Salinity	Sigma-T	
5	20.361	30.728	21.414	
10	13.745	31.821	23.783	
20	8.263	32.282	25.102	
30	6.753	32.639	25.592	
40	5.992	32.851	25.856	
50	5.596	33.079	26.084	
75	5.632	33.269	26.229	

		STATION	US10400	
		LATITUDE	42-23.6 N	
		LONGITUDE	140-31.1 E	
		DEPTH (m)	96	
Press.	Temp.	Salinity	Sigma-T	
5	23.048	30.421	20.451	
10	22.890	30.489	20.547	
20	16.233	31.632	23.105	
30	7.919	32.379	25.228	
40	6.123	32.684	25.707	
50	5.516	32.897	25.950	
75	4.706	33.311	26.369	

		STATION	US10383	
		LATITUDE	41-05.8 N	
		LONGITUDE	140-47.8 E	
		DEPTH (m)	50	
Press.	Temp.	Salinity	Sigma-T	
5	23.897	32.401	21.705	
10	23.199	32.525	22.001	
20	20.454	32.987	23.108	
30	19.280	33.286	23.641	
40	17.837	33.303	24.012	

		STATION	US10386	
		LATITUDE	42-02.5 N	
		LONGITUDE	140-54.8 E	
		DEPTH (m)	77	
Press.	Temp.	Salinity	Sigma-T	
5	18.080	31.210	22.352	
10	14.979	32.116	23.754	
20	8.503	32.626	25.336	
30	6.893	32.853	25.742	
40	5.368	32.823	25.908	
50	5.561	32.926	25.967	

STATION		US10389	
LATITUDE		42-11.3	N
LONGITUDE		141-01.9	E
DEPTH (m)		81	
Press.	Temp.	Salinity	Sigma-T
5	19.789	31.338	22.024
10	16.253	31.878	23.290
20	10.101	32.714	25.150
30	6.517	33.069	25.962
40	6.198	33.139	26.057
50	5.885	33.138	26.095
75	5.481	33.130	26.138

STATION		US10402	
LATITUDE		42-25.7	N
LONGITUDE		140-37.3	E
DEPTH (m)		84	
Press.	Temp.	Salinity	Sigma-T
5	23.191	30.301	20.320
10	23.181	30.299	20.322
20	14.139	31.667	23.583
30	7.788	32.250	25.145
40	6.166	32.716	25.727
50	5.231	32.828	25.928
75	5.428	33.279	26.262

STATION		US10405	
LATITUDE		42-10.4	N
LONGITUDE		140-47.2	E
DEPTH (m)		93	
Press.	Temp.	Salinity	Sigma-T
5	18.481	31.431	22.424
10	15.810	31.728	23.275
20	9.841	32.039	24.667
30	6.931	32.546	25.495
40	6.515	32.856	25.794
50	5.483	32.900	25.955
75	5.325	33.294	26.286

STATION		US10408	
LATITUDE		42-12.8	N
LONGITUDE		140-55.0	E
DEPTH (m)		68	
Press.	Temp.	Salinity	Sigma-T
5	20.107	30.917	21.623
10	16.439	31.731	23.136
20	11.855	32.595	24.749
30	8.351	32.645	25.374
40	7.069	32.800	25.677
50	7.037	32.869	25.735

STATION		US10411	
LATITUDE		42-28.0	N
LONGITUDE		140-43.4	E
DEPTH (m)		59	
Press.	Temp.	Salinity	Sigma-T
5	23.465	30.240	20.196
10	22.048	30.504	20.792
20	10.860	32.060	24.511
30	8.376	32.625	25.354
40	6.267	32.725	25.722
50	5.402	32.800	25.885

STATION		US10414	
LATITUDE		42-25.4	N
LONGITUDE		140-25.9	E
DEPTH (m)		70	
Press.	Temp.	Salinity	Sigma-T
5	23.467	29.811	19.871
10	21.851	30.332	20.716
20	10.102	31.976	24.575
30	8.140	32.549	25.329
40	5.817	32.733	25.783
50	5.259	32.860	25.949

STATION		US10417	
LATITUDE		41-59.3	N
LONGITUDE		141-01.8	E
DEPTH (m)		101	
Press.	Temp.	Salinity	Sigma-T
5	18.406	32.209	23.036
10	14.363	32.776	24.393
20	9.559	33.063	25.513
30	7.985	33.078	25.767
40	8.033	33.168	25.830
50	7.520	33.210	25.937
75	6.432	33.208	26.082

STATION		US10403	
LATITUDE		42-23.5	N
LONGITUDE		140-42.1	E
DEPTH (m)		65	
Press.	Temp.	Salinity	Sigma-T
5	23.480	30.269	20.214
10	23.482	30.269	20.214
20	12.298	31.813	24.059
30	6.642	32.602	25.577
40	6.361	32.723	25.709
50	5.115	32.876	25.979

STATION		US10406	
LATITUDE		42-08.0	N
LONGITUDE		140-49.6	E
DEPTH (m)		85	
Press.	Temp.	Salinity	Sigma-T
5	20.750	30.663	21.262
10	16.203	31.648	23.125
20	9.796	32.092	24.715
30	6.837	32.382	25.379
40	6.528	32.813	25.758
50	5.907	32.923	25.923
75	5.550	33.271	26.241

STATION		US10409	
LATITUDE		42-08.6	N
LONGITUDE		140-35.6	E
DEPTH (m)		63	
Press.	Temp.	Salinity	Sigma-T
5	24.112	29.733	19.627
10	18.923	31.052	22.025
20	8.545	32.152	24.957
30	6.054	32.582	25.635
40	5.589	32.797	25.862
50	5.123	32.871	25.974

STATION		US10412	
LATITUDE		42-30.9	N
LONGITUDE		140-37.7	E
DEPTH (m)		62	
Press.	Temp.	Salinity	Sigma-T
5	22.896	29.009	19.426
10	18.631	31.199	22.210
20	10.257	32.321	24.817
30	7.317	32.650	25.525
40	6.019	32.745	25.768
50	5.453	32.815	25.892

STATION		US10415	
LATITUDE		42-21.5	N
LONGITUDE		140-25.6	E
DEPTH (m)		74	
Press.	Temp.	Salinity	Sigma-T
5	23.447	29.712	19.802
10	20.905	30.635	21.200
20	9.577	32.019	24.694
30	7.193	32.587	25.492
40	6.224	32.779	25.770
50	4.979	32.854	25.976

STATION		US10418	
LATITUDE		41-58.8	N
LONGITUDE		141-00.6	E
DEPTH (m)		94	
Press.	Temp.	Salinity	Sigma-T
5	21.682	30.670	21.018
10	20.403	31.601	22.066
20	14.686	32.626	24.209
30	8.689	32.822	25.461
40	8.076	33.114	25.781
50	7.650	33.121	25.849
75	6.952	33.213	26.018

STATION		US10404	
LATITUDE		42-17.5	N
LONGITUDE		140-52.8	E
DEPTH (m)		59	
Press.	Temp.	Salinity	Sigma-T
5	19.357	30.915	21.813
10	18.134	31.410	22.492
20	9.108	32.427	25.087
30	8.285	32.577	25.330
40	7.331	32.654	25.526
50	6.894	32.760	25.669

STATION		US10407	
LATITUDE		42-09.5	N
LONGITUDE		140-52.2	E
DEPTH (m)		76	
Press.	Temp.	Salinity	Sigma-T
5	21.301	31.398	21.673
10	17.868	32.051	23.047
20	12.294	32.715	24.760
30	9.125	32.947	25.491
40	6.342	32.793	25.766
50	6.249	32.921	25.879

STATION		US10410	
LATITUDE		42-25.0	N
LONGITUDE		140-48.5	E
DEPTH (m)		44	
Press.	Temp.	Salinity	Sigma-T
5	23.437	29.917	19.960
10	17.536	31.530	22.727
20	10.470	32.503	24.924
30	8.409	32.748	25.445
40	6.698	32.737	25.676

STATION		US10413	
LATITUDE		42-28.8	N
LONGITUDE		140-32.2	E
DEPTH (m)		76	
Press.	Temp.	Salinity	Sigma-T
5	23.722	29.582	19.625
10	23.170	30.207	20.255
20	11.040	31.925	24.374
30	7.626	32.440	25.317
40	6.224	32.751	25.748
50	5.219	32.867	25.960

STATION		US10416	
LATITUDE		42-17.9	N
LONGITUDE		140-25.6	E
DEPTH (m)		66	
Press.	Temp.	Salinity	Sigma-T
5	23.033	30.107	20.218
10	19.440	31.164	21.981
20	8.966	32.102	24.855
30	7.006	32.545	25.484
40	5.983	32.800	25.817
50	5.538	33.012	26.038

STATION		US10419	
LATITUDE		41-58.1	N
LONGITUDE		140-59.4	E
DEPTH (m)		86	
Press.	Temp.	Salinity	Sigma-T
5	19.884	31.188	21.886
10	16.976	31.778	23.049
20	12.987	32.957	24.813
30	10.160	33.040	25.395
40	8.115	33.113	25.775
50	7.823	33.164	25.858
75	6.630	33.079	25.955

		STATION	US10420	
		LATITUDE	41-57.4	N
		LONGITUDE	140-58.2	E
		DEPTH (m)	79	
Press.	Temp.	Salinity	Sigma-T	
5	20.927	30.604	21.171	
10	19.595	31.455	22.164	
20	14.366	32.276	24.007	
30	10.912	32.762	25.049	
40	8.446	32.968	25.612	
50	7.747	33.038	25.770	
75	5.771	33.009	26.007	

		STATION	US10423	
		LATITUDE	41-43.7	N
		LONGITUDE	141-15.6	E
		DEPTH (m)	228	
Press.	Temp.	Salinity	Sigma-T	
5	21.838	30.674	20.979	
10	21.703	30.691	21.028	
20	17.069	32.094	23.269	
30	17.579	33.140	23.950	
40	13.831	33.280	24.893	
50	10.993	33.152	25.338	
75	6.904	33.067	25.909	
100	5.561	33.127	26.126	
125	5.048	33.201	26.244	
150	3.942	33.183	26.347	
175	2.747	33.211	26.479	
200	2.392	33.289	26.571	

		STATION	US10426	
		LATITUDE	41-35.2	N
		LONGITUDE	141-19.9	E
		DEPTH (m)	287	
Press.	Temp.	Salinity	Sigma-T	
5	26.436	33.213	21.550	
10	26.700	33.233	21.482	
20	24.940	33.514	22.237	
30	22.452	33.708	23.110	
40	21.162	33.851	23.576	
50	19.460	33.949	24.101	
75	16.702	34.109	24.901	
100	15.929	34.141	25.103	
125	15.201	34.179	25.295	
150	12.890	34.212	25.804	
175	10.201	33.964	26.109	
200	5.028	33.562	26.532	
250	2.448	33.419	26.670	

		STATION	US10429	
		LATITUDE	41-26.3	N
		LONGITUDE	141-24.8	E
		DEPTH (m)	38	
Press.	Temp.	Salinity	Sigma-T	
5	24.873	33.551	22.285	
10	24.736	33.500	22.288	
20	23.811	33.625	22.656	

		STATION	US10432	
		LATITUDE	41-38.7	N
		LONGITUDE	140-49.2	E
		DEPTH (m)	336	
Press.	Temp.	Salinity	Sigma-T	
5	27.411	33.258	21.275	
10	26.546	33.556	21.774	
20	22.388	33.874	23.254	
30	16.984	34.113	24.837	
40	15.057	34.210	25.350	
50	13.528	34.229	25.689	
75	11.702	34.204	26.027	
100	11.574	34.209	26.055	
125	10.902	34.181	26.156	
150	10.789	34.192	26.184	
175	10.788	34.192	26.184	
200	10.797	34.193	26.183	
250	10.786	34.193	26.185	
300	10.788	34.193	26.185	

		STATION	US10421	
		LATITUDE	41-49.1	N
		LONGITUDE	141-13.0	E
		DEPTH (m)	162	
Press.	Temp.	Salinity	Sigma-T	
5	17.431	31.763	22.930	
10	15.755	32.153	23.614	
20	9.600	32.913	25.388	
30	8.108	33.096	25.763	
40	7.963	33.140	25.819	
50	7.764	33.178	25.877	
75	6.663	33.176	26.027	
100	5.980	33.199	26.132	
125	5.349	33.200	26.208	
150	3.577	33.199	26.395	

		STATION	US10424	
		LATITUDE	41-41.2	N
		LONGITUDE	141-17.5	E
		DEPTH (m)	235	
Press.	Temp.	Salinity	Sigma-T	
5	26.759	33.533	21.689	
10	26.388	33.607	21.862	
20	25.290	33.662	22.242	
30	24.112	33.659	22.594	
40	21.948	33.546	23.128	
50	17.083	33.927	24.671	
75	11.863	33.803	25.685	
100	7.991	33.398	26.017	
125	4.281	33.413	26.495	
150	2.296	33.279	26.570	
175	2.305	33.319	26.602	
200	2.311	33.366	26.639	

		STATION	US10427	
		LATITUDE	41-32.0	N
		LONGITUDE	141-21.7	E
		DEPTH (m)	259	
Press.	Temp.	Salinity	Sigma-T	
5	25.847	33.420	21.889	
10	25.320	33.493	22.105	
20	23.924	33.623	22.622	
30	20.807	33.883	23.696	
40	20.365	33.933	23.852	
50	19.677	33.945	24.042	
75	15.615	34.185	25.208	
100	14.263	34.211	25.522	
125	13.522	34.222	25.684	
150	12.949	34.230	25.807	
175	11.470	34.178	26.050	
200	9.825	34.053	26.242	
250	7.762	33.865	26.417	

		STATION	US10430	
		LATITUDE	41-35.1	N
		LONGITUDE	140-54.5	E
		DEPTH (m)	55	
Press.	Temp.	Salinity	Sigma-T	
5	26.366	33.331	21.661	
10	26.407	33.322	21.641	
20	26.262	33.367	21.721	
30	26.224	33.380	21.742	
40	22.837	33.559	22.888	
50	14.328	33.999	25.344	

		STATION	US10433	
		LATITUDE	41-40.8	N
		LONGITUDE	140-47.1	E
		DEPTH (m)	222	
Press.	Temp.	Salinity	Sigma-T	
5	25.095	33.764	22.378	
10	24.148	33.796	22.686	
20	20.355	34.044	23.939	
30	17.665	34.124	24.683	
40	16.098	34.148	25.070	
50	14.571	34.108	25.377	
75	12.793	34.189	25.805	
100	11.281	34.186	26.091	
125	11.150	34.192	26.120	
150	10.959	34.192	26.154	
175	10.957	34.193	26.155	
200	10.940	34.194	26.158	

		STATION	US10422	
		LATITUDE	41-46.7	N
		LONGITUDE	141-14.3	E
		DEPTH (m)	195	
Press.	Temp.	Salinity	Sigma-T	
5	20.124	31.124	21.776	
10	16.995	31.831	23.085	
20	15.119	32.252	23.829	
30	12.485	32.804	24.792	
40	9.797	32.992	25.418	
50	8.673	32.950	25.564	
75	7.890	33.185	25.865	
100	6.867	33.195	26.015	
125	5.645	33.132	26.120	
150	4.570	33.192	26.289	
175	2.944	33.202	26.455	

		STATION	US10425	
		LATITUDE	41-37.9	N
		LONGITUDE	141-18.9	E
		DEPTH (m)	212	
Press.	Temp.	Salinity	Sigma-T	
5	26.549	33.393	21.650	
10	25.781	33.447	21.929	
20	24.307	33.580	22.476	
30	21.873	33.818	23.356	
40	21.076	33.872	23.615	
50	20.265	33.855	23.819	
75	18.456	33.930	24.340	
100	13.308	34.190	25.703	
125	10.508	33.936	26.034	
150	5.617	33.561	26.462	
175	3.438	33.489	26.639	
200	3.407	33.494	26.646	

		STATION	US10428	
		LATITUDE	41-29.1	N
		LONGITUDE	141-23.3	E
		DEPTH (m)	105	
Press.	Temp.	Salinity	Sigma-T	
5	24.412	33.625	22.479	
10	24.032	33.654	22.613	
20	23.814	33.685	22.701	
30	23.375	33.653	22.805	
40	21.897	33.694	23.254	
50	17.364	33.871	24.562	
75	14.197	34.201	25.528	

		STATION	US10431	
		LATITUDE	41-37.0	N
		LONGITUDE	140-51.2	E
		DEPTH (m)	94	
Press.	Temp.	Salinity	Sigma-T	
5	27.761	32.937	20.921	
10	27.580	33.412	21.037	
20	26.047	33.669	22.015	
30	24.929	33.805	22.460	
40	23.140	33.860	23.028	
50	22.354	33.907	23.288	
75	14.381	34.227	25.510	

		STATION	US10434	
		LATITUDE	41-42.9	N
		LONGITUDE	140-45.0	E
		DEPTH (m)	84	
Press.	Temp.	Salinity	Sigma-T	
5	24.151	33.840	22.719	
10	22.782	33.848	23.123	
20	20.429	33.974	23.866	
30	18.149	34.070	24.524	
40	16.751	34.172	24.937	
50	14.244	34.168	25.493	
75	12.334	34.211	25.912	

STATION US10435			
LATITUDE 43-22.5 N			
LONGITUDE 145-32.0 E			
DEPTH (m) 18			
Press.	Temp.	Salinity	Sigma-T
5	20.908	32.221	22.404
10	18.445	32.713	23.412
STATION US10438			
LATITUDE 43-25.6 N			
LONGITUDE 145-22.0 E			
DEPTH (m) 10			
Press.	Temp.	Salinity	Sigma-T
5	20.315	32.726	22.946
STATION US10441			
LATITUDE 43-31.2 N			
LONGITUDE 145-19.9 E			
DEPTH (m) 7			
Press.	Temp.	Salinity	Sigma-T
5	19.780	32.782	23.128
STATION US10444			
LATITUDE 43-43.1 N			
LONGITUDE 145-12.8 E			
DEPTH (m) 17			
Press.	Temp.	Salinity	Sigma-T
5	20.481	32.999	23.110
10	19.771	33.199	23.448
STATION US10447			
LATITUDE 43-29.5 N			
LONGITUDE 145-34.1 E			
DEPTH (m) 30			
Press.	Temp.	Salinity	Sigma-T
5	19.882	32.894	23.187
10	17.715	32.982	23.796
20	14.631	32.990	24.502
STATION US10450			
LATITUDE 43-56.7 N			
LONGITUDE 145-12.1 E			
DEPTH (m) 82			
Press.	Temp.	Salinity	Sigma-T
5	21.216	33.150	23.028
10	20.244	33.275	23.383
20	18.834	33.348	23.801
30	17.477	33.399	24.173
40	16.047	33.488	24.574
50	14.470	33.655	25.049
75	9.094	33.651	26.047
STATION US10453			
LATITUDE 44-00.5 N			
LONGITUDE 145-16.3 E			
DEPTH (m) 467			
Press.	Temp.	Salinity	Sigma-T
5	21.503	32.930	22.783
10	20.173	33.101	23.269
20	18.087	33.294	23.945
30	16.373	33.430	24.456
40	14.808	33.523	24.875
50	13.519	33.521	25.143
75	10.841	33.808	25.876
100	8.139	33.768	26.285
125	6.497	33.676	26.443
150	5.708	33.631	26.507
175	4.001	33.502	26.594
200	3.176	33.471	26.649
250	2.221	33.446	26.710
300	1.817	33.447	26.741
400	1.684	33.546	26.831

STATION US10436			
LATITUDE 43-20.2 N			
LONGITUDE 145-27.7 E			
DEPTH (m) 15			
Press.	Temp.	Salinity	Sigma-T
5	20.992	32.052	22.253
10	18.397	32.701	23.415
STATION US10439			
LATITUDE 43-27.1 N			
LONGITUDE 145-25.2 E			
DEPTH (m) 17			
Press.	Temp.	Salinity	Sigma-T
5	19.948	32.757	23.066
10	19.961	32.851	23.134
STATION US10442			
LATITUDE 43-33.4 N			
LONGITUDE 145-23.6 E			
DEPTH (m) 11			
Press.	Temp.	Salinity	Sigma-T
5	20.839	32.792	22.857
STATION US10445			
LATITUDE 43-35.0 N			
LONGITUDE 145-25.4 E			
DEPTH (m) 13			
Press.	Temp.	Salinity	Sigma-T
5	18.899	33.058	23.563
STATION US10448			
LATITUDE 43-26.4 N			
LONGITUDE 145-39.1 E			
DEPTH (m) 30			
Press.	Temp.	Salinity	Sigma-T
5	20.236	32.730	22.970
10	18.160	33.001	23.703
20	16.176	32.987	24.160
STATION US10451			
LATITUDE 43-55.7 N			
LONGITUDE 145-14.4 E			
DEPTH (m) 80			
Press.	Temp.	Salinity	Sigma-T
5	21.396	33.000	22.865
10	20.695	33.277	23.264
20	19.413	33.335	23.644
30	18.240	33.368	23.964
40	15.941	33.499	24.607
50	13.872	33.529	25.077
75	10.528	33.717	25.860
STATION US10454			
LATITUDE 44-01.6 N			
LONGITUDE 145-14.3 E			
DEPTH (m) 373			
Press.	Temp.	Salinity	Sigma-T
5	21.126	33.237	23.118
10	19.502	33.261	23.565
20	19.125	33.355	23.733
30	17.977	33.344	24.010
40	15.899	33.434	24.566
50	14.125	33.529	25.024
75	9.616	33.726	26.021
100	7.441	33.709	26.341
125	6.199	33.644	26.456
150	5.275	33.584	26.521
175	3.983	33.497	26.592
200	3.608	33.510	26.640
250	2.406	33.449	26.697
300	1.756	33.450	26.748

STATION US10437			
LATITUDE 43-24.4 N			
LONGITUDE 145-20.9 E			
DEPTH (m) 9			
Press.	Temp.	Salinity	Sigma-T
5	20.326	32.685	22.912
STATION US10440			
LATITUDE 43-30.0 N			
LONGITUDE 145-19.2 E			
DEPTH (m) 8			
Press.	Temp.	Salinity	Sigma-T
5	19.763	32.752	23.109
STATION US10443			
LATITUDE 43-43.5 N			
LONGITUDE 145-14.0 E			
DEPTH (m) 18			
Press.	Temp.	Salinity	Sigma-T
5	20.214	33.129	23.279
10	20.083	33.197	23.365
STATION US10446			
LATITUDE 43-30.2 N			
LONGITUDE 145-29.8 E			
DEPTH (m) 24			
Press.	Temp.	Salinity	Sigma-T
5	19.254	33.089	23.497
10	18.425	33.086	23.703
STATION US10449			
LATITUDE 43-24.7 N			
LONGITUDE 145-36.3 E			
DEPTH (m) 27			
Press.	Temp.	Salinity	Sigma-T
5	21.622	32.199	22.195
10	18.749	32.925	23.499
20	15.849	32.902	24.168
STATION US10452			
LATITUDE 43-59.5 N			
LONGITUDE 145-18.6 E			
DEPTH (m) 266			
Press.	Temp.	Salinity	Sigma-T
5	22.254	32.905	22.556
10	19.192	33.286	23.663
20	16.669	33.391	24.357
30	15.656	33.471	24.649
40	14.638	33.531	24.917
50	13.325	33.616	25.256
75	10.531	33.668	25.821
100	8.210	33.747	26.259
125	6.941	33.719	26.417
150	5.829	33.640	26.499
175	4.798	33.576	26.569
200	3.542	33.481	26.623
STATION US10455			
LATITUDE 44-06.1 N			
LONGITUDE 145-16.7 E			
DEPTH (m) 421			
Press.	Temp.	Salinity	Sigma-T
5	21.207	33.277	23.127
10	20.400	33.337	23.389
20	19.650	33.449	23.670
30	17.854	33.483	24.146
40	15.637	33.472	24.654
50	14.094	33.584	25.073
75	8.760	33.769	26.192
100	7.484	33.765	26.379
125	6.861	33.742	26.447
150	5.977	33.665	26.501
175	5.435	33.629	26.538
200	4.677	33.592	26.595
250	2.965	33.478	26.673
300	1.867	33.451	26.741
400	1.729	33.552	26.832

STATION		US10456	
LATITUDE	44-04.8	N	
LONGITUDE	145-20.0	E	
DEPTH (m)	725		
Press.	Temp.	Salinity	Sigma-T
5	21.337	32.945	22.839
10	19.504	33.226	23.538
20	18.028	33.302	23.965
30	17.243	33.383	24.216
40	15.671	33.471	24.646
50	14.233	33.519	24.994
75	10.996	33.763	25.813
100	8.326	33.652	26.167
125	6.831	33.625	26.358
150	4.817	33.535	26.535
175	3.593	33.494	26.629
200	2.641	33.435	26.667
250	2.151	33.442	26.712
300	1.586	33.451	26.761
400	1.741	33.573	26.848
500	1.881	33.682	26.924

STATION		US10459	
LATITUDE	44-13.6	N	
LONGITUDE	145-25.9	E	
DEPTH (m)	1396		
Press.	Temp.	Salinity	Sigma-T
5	20.677	33.368	23.338
10	20.471	33.504	23.497
20	20.387	33.503	23.518
30	19.590	33.526	23.744
40	19.126	33.605	23.923
50	15.946	33.533	24.632
75	10.655	33.755	25.867
100	8.768	33.869	26.269
125	7.821	33.824	26.376
150	6.926	33.775	26.464
175	6.687	33.825	26.536
200	4.943	33.680	26.635
250	2.188	33.449	26.715
300	1.993	33.505	26.774
400	1.760	33.527	26.810
500	2.058	33.680	26.910

STATION		US10462	
LATITUDE	44-21.7	N	
LONGITUDE	145-21.4	E	
DEPTH (m)	80		
Press.	Temp.	Salinity	Sigma-T
5	19.275	33.516	23.818
10	19.205	33.534	23.849
20	17.796	33.556	24.216
30	15.726	33.675	24.791
40	14.505	33.676	25.058
50	13.335	33.830	25.420

STATION		US10465	
LATITUDE	44-20.9	N	
LONGITUDE	145-09.5	E	
DEPTH (m)	1166		
Press.	Temp.	Salinity	Sigma-T
5	19.844	33.051	23.317
10	18.469	33.502	24.010
20	17.514	33.680	24.379
30	15.549	33.684	24.836
40	9.653	33.623	25.934
50	8.213	33.866	26.352
75	7.893	34.010	26.512
100	7.616	33.998	26.543
125	7.168	33.987	26.598
150	5.713	33.787	26.630
175	4.733	33.712	26.684
200	4.041	33.672	26.725
250	2.184	33.524	26.775
300	2.113	33.554	26.805
400	1.834	33.619	26.878

STATION		US10457	
LATITUDE	44-09.1	N	
LONGITUDE	145-23.9	E	
DEPTH (m)	1493		
Press.	Temp.	Salinity	Sigma-T
5	21.769	32.977	22.745
10	20.400	33.149	23.245
20	18.699	33.330	23.821
30	17.944	33.351	24.023
40	15.904	33.447	24.575
50	14.137	33.611	25.086
75	10.801	33.705	25.802
100	9.127	33.798	26.157
125	7.392	33.742	26.373
150	5.804	33.647	26.508
175	4.746	33.583	26.580
200	3.552	33.497	26.634
250	2.192	33.443	26.709
300	1.594	33.439	26.750
400	1.788	33.559	26.833
500	1.940	33.669	26.910

STATION		US10460	
LATITUDE	44-15.1	N	
LONGITUDE	145-22.9	E	
DEPTH (m)	350		
Press.	Temp.	Salinity	Sigma-T
5	20.595	33.448	23.422
10	20.527	33.462	23.451
20	20.059	33.579	23.663
30	19.601	33.551	23.760
40	19.375	33.536	23.807
50	18.788	33.596	24.002
75	10.900	33.833	25.884
100	9.079	33.844	26.200
125	7.552	33.769	26.372
150	6.563	33.764	26.504
175	6.084	33.761	26.563
200	4.597	33.608	26.616
250	3.713	33.558	26.667

STATION		US10463	
LATITUDE	44-23.1	N	
LONGITUDE	145-17.7	E	
DEPTH (m)	708		
Press.	Temp.	Salinity	Sigma-T
5	20.690	33.473	23.415
10	20.081	33.643	23.706
20	18.915	33.706	24.054
30	16.375	33.796	24.736
40	13.505	33.738	25.314
50	12.277	33.950	25.721
75	10.014	33.997	26.166
100	9.067	33.984	26.312
125	7.919	33.956	26.466
150	7.254	33.952	26.558
175	6.760	33.927	26.606
200	6.411	33.901	26.631
250	3.960	33.622	26.694
300	2.634	33.550	26.759
400	3.138	33.716	26.848

STATION		US10466	
LATITUDE	44-17.2	N	
LONGITUDE	145-05.1	E	
DEPTH (m)	882		
Press.	Temp.	Salinity	Sigma-T
5	18.688	32.882	23.481
10	14.594	32.695	24.283
20	14.080	33.189	24.771
30	10.632	32.944	25.239
40	8.079	33.290	25.920
50	6.481	33.481	26.291
75	6.854	33.968	26.626
100	6.708	33.954	26.634
125	6.621	33.985	26.671
150	4.387	33.615	26.645
175	3.688	33.609	26.711
200	5.371	33.886	26.749
250	2.650	33.582	26.783
300	1.838	33.535	26.810
400	1.757	33.596	26.865

STATION		US10458	
LATITUDE	44-10.5	N	
LONGITUDE	145-20.7	E	
DEPTH (m)	122		
Press.	Temp.	Salinity	Sigma-T
5	20.747	33.232	23.216
10	20.382	33.404	23.445
20	19.066	33.474	23.838
30	18.023	33.550	24.156
40	15.311	33.619	24.839
50	13.812	33.687	25.211
75	11.495	33.797	25.749
100	9.884	33.857	26.079

STATION		US10461	
LATITUDE	44-20.2	N	
LONGITUDE	145-24.9	E	
DEPTH (m)	898		
Press.	Temp.	Salinity	Sigma-T
5	19.351	33.451	23.748
10	18.557	33.533	24.011
20	17.619	33.614	24.303
30	15.666	33.747	24.859
40	15.506	33.754	24.900
50	15.248	33.738	24.945
75	11.731	33.734	25.656
100	8.440	33.797	26.263
125	7.607	33.774	26.368
150	6.526	33.704	26.462
175	5.579	33.683	26.564
200	4.334	33.540	26.591
250	2.444	33.446	26.691
300	2.056	33.456	26.730
400	1.809	33.541	26.817
500	2.062	33.676	26.907

STATION		US10464	
LATITUDE	44-24.6	N	
LONGITUDE	145-14.0	E	
DEPTH (m)	1398		
Press.	Temp.	Salinity	Sigma-T
5	20.836	33.473	23.376
10	20.200	33.631	23.665
20	19.741	33.677	23.820
30	16.202	33.754	24.744
40	10.749	33.610	25.738
50	9.751	33.996	26.209
75	8.760	34.016	26.385
100	7.678	33.990	26.528
125	7.202	34.007	26.608
150	4.605	33.639	26.640
175	3.905	33.639	26.713
200	3.779	33.640	26.726
250	2.842	33.582	26.767
300	2.265	33.563	26.800
400	1.579	33.584	26.868

STATION		US10467	
LATITUDE	44-13.3	N	
LONGITUDE	145-00.1	E	
DEPTH (m)	662		
Press.	Temp.	Salinity	Sigma-T
5	19.185	33.534	23.854
10	16.269	33.792	24.757
20	14.911	33.844	25.100
30	12.667	33.887	25.597
40	11.968	33.999	25.817
50	11.331	34.026	25.957
75	9.581	34.014	26.252
100	6.685	33.773	26.495
125	5.452	33.784	26.659
150	2.931	33.470	26.670
175	3.867	33.668	26.740
200	3.668	33.665	26.757
250	2.824	33.576	26.764
300	3.050	33.643	26.798
400	3.016	33.739	26.877
500	1.900	33.708	26.944

STATION		US10468	
LATITUDE	44-11.9	N	
LONGITUDE	145-03.3	E	
DEPTH (m)	447		
Press.	Temp.	Salinity	Sigma-T
5	19.404	33.064	23.439
10	17.837	33.516	24.175
20	17.238	33.820	24.552
30	16.362	33.841	24.773
40	13.277	33.911	25.493
50	11.964	34.006	25.824
75	10.677	34.036	26.082
100	9.470	34.026	26.280
125	8.391	34.025	26.450
150	6.273	33.854	26.612
175	5.083	33.763	26.685
200	4.871	33.754	26.702
250	4.594	33.758	26.735
300	2.829	33.596	26.779
400	3.103	33.702	26.840

STATION		US10471	
LATITUDE	44-15.4	N	
LONGITUDE	145-09.2	E	
DEPTH (m)	615		
Press.	Temp.	Salinity	Sigma-T
5	20.843	33.582	23.457
10	20.593	33.637	23.565
20	17.000	33.798	24.592
30	14.589	33.895	25.209
40	14.245	33.918	25.299
50	12.787	33.978	25.643
75	11.448	33.960	25.884
100	9.591	33.963	26.211
125	7.246	33.887	26.508
150	7.235	33.951	26.560
175	5.848	33.819	26.639
200	4.397	33.665	26.683
250	3.295	33.618	26.755
300	3.078	33.617	26.774
400	2.977	33.674	26.829

STATION		US10474	
LATITUDE	44-18.6	N	
LONGITUDE	145-28.4	E	
DEPTH (m)	1503		
Press.	Temp.	Salinity	Sigma-T
5	21.819	32.990	22.742
10	21.664	33.118	22.881
20	17.697	33.361	24.091
30	14.416	33.564	24.991
40	12.898	33.636	25.356
50	11.286	33.713	25.722
75	9.325	33.794	26.122
100	8.557	33.808	26.254
125	6.865	33.702	26.415
150	5.121	33.586	26.541
175	3.204	33.467	26.643
200	2.418	33.428	26.680
250	1.459	33.395	26.725
300	1.654	33.486	26.784
400	1.900	33.577	26.839
500	1.991	33.696	26.928

STATION		US10477	
LATITUDE	44-07.4	N	
LONGITUDE	145-27.7	E	
DEPTH (m)	1228		
Press.	Temp.	Salinity	Sigma-T
5	21.305	32.916	22.826
10	21.167	33.143	23.036
20	19.058	33.409	23.791
30	17.396	33.379	24.176
40	16.081	33.447	24.535
50	14.194	33.525	25.007
75	10.839	33.683	25.779
100	8.892	33.733	26.143
125	7.256	33.665	26.332
150	5.327	33.567	26.501
175	4.141	33.493	26.573
200	3.385	33.466	26.626
250	2.146	33.445	26.715
300	1.862	33.475	26.760
400	1.892	33.582	26.844

STATION		US10469	
LATITUDE	44-10.7	N	
LONGITUDE	145-06.5	E	
DEPTH (m)	305		
Press.	Temp.	Salinity	Sigma-T
5	21.138	33.561	23.362
10	20.766	33.594	23.487
20	18.118	33.705	24.252
30	16.811	33.823	24.656
40	14.733	33.838	25.134
50	13.752	33.858	25.356
75	10.736	33.990	26.036
100	9.884	34.054	26.233
125	9.067	34.029	26.347
150	7.675	33.945	26.493
175	7.169	33.928	26.551
200	4.938	33.696	26.649

STATION		US10472	
LATITUDE	44-19.1	N	
LONGITUDE	145-13.2	E	
DEPTH (m)	666		
Press.	Temp.	Salinity	Sigma-T
5	20.026	33.641	23.718
10	17.950	33.718	24.302
20	16.928	33.816	24.622
30	15.083	33.896	25.103
40	13.765	33.931	25.410
50	12.981	33.967	25.596
75	10.170	33.942	26.097
100	7.950	33.905	26.421
125	7.758	33.943	26.479
150	7.198	33.936	26.554
175	6.166	33.829	26.606
200	5.022	33.740	26.674
250	3.342	33.584	26.724
300	3.209	33.658	26.795
400	2.939	33.709	26.860

STATION		US10475	
LATITUDE	44-17.3	N	
LONGITUDE	145-31.9	E	
DEPTH (m)	2085		
Press.	Temp.	Salinity	Sigma-T
5	21.833	33.044	22.779
10	21.806	33.061	22.799
20	17.872	33.358	24.046
30	14.679	33.544	24.919
40	13.144	33.640	25.311
50	11.663	33.687	25.632
75	9.938	33.806	26.030
100	8.185	33.782	26.290
125	6.770	33.693	26.420
150	5.165	33.616	26.559
175	3.909	33.535	26.630
200	2.710	33.444	26.668
250	1.902	33.450	26.738
300	1.734	33.476	26.771
400	1.819	33.587	26.853

STATION		US10478	
LATITUDE	44-03.3	N	
LONGITUDE	145-23.7	E	
DEPTH (m)	531		
Press.	Temp.	Salinity	Sigma-T
5	21.231	32.934	22.859
10	20.972	32.966	22.954
20	18.595	33.349	23.861
30	17.112	33.401	24.261
40	15.891	33.462	24.590
50	14.364	33.556	24.995
75	11.468	33.732	25.703
100	9.540	33.748	26.051
125	7.237	33.694	26.357
150	5.369	33.587	26.513
175	3.279	33.435	26.611
200	2.534	33.440	26.680
250	1.837	33.441	26.735
300	1.565	33.468	26.776
400	1.874	33.592	26.853

STATION		US10470	
LATITUDE	44-13.9	N	
LONGITUDE	145-11.5	E	
DEPTH (m)	118		
Press.	Temp.	Salinity	Sigma-T
5	21.263	33.523	23.299
10	20.650	33.546	23.481
20	19.978	33.619	23.714
30	16.926	33.734	24.561
40	15.082	33.832	25.054
50	12.495	33.950	25.679
75	11.261	34.028	25.971

STATION		US10473	
LATITUDE	44-18.1	N	
LONGITUDE	145-16.1	E	
DEPTH (m)	155		
Press.	Temp.	Salinity	Sigma-T
5	21.078	33.488	23.322
10	19.945	33.579	23.693
20	17.629	33.727	24.387
30	16.733	33.757	24.622
40	13.597	33.874	25.400
50	12.915	33.905	25.562
75	11.064	33.936	25.935
100	9.859	33.965	26.167
125	8.435	33.965	26.395

STATION		US10476	
LATITUDE	44-12.1	N	
LONGITUDE	145-29.9	E	
DEPTH (m)	2067		
Press.	Temp.	Salinity	Sigma-T
5	20.683	33.306	23.290
10	20.656	33.334	23.319
20	19.827	33.507	23.669
30	19.154	33.602	23.914
40	17.333	33.479	24.268
50	14.186	33.588	25.057
75	10.373	33.775	25.932
100	8.440	33.772	26.243
125	7.231	33.707	26.369
150	6.249	33.677	26.476
175	4.394	33.555	26.596
200	3.142	33.466	26.648
250	1.831	33.438	26.733
300	1.651	33.481	26.780
400	1.888	33.585	26.847

THE " USHIO MARU "

CRUISE 203

CRUISE 204

CRUISE 205

IN SEPTEMBER 2010

1. Cruise Itinerary

Cruise 203

Departure from Hakodate	Sep.	14 , 2010
Start practical training in scuba		14
Arrival at Matsumae		14
Departure from Matsumae		15
Finish practical training in scuba		15
Arrival at Kojima		15
Departure from Kojima		16
Return to Hakodate		16

Total coverage 154.1 miles

Cruise 204

Departure from Hakodate	Sep.	20 , 2010
Hydrographic research (US10479, US10480)		21
Research by tuna long-line		21
Return to Hakodate		23

Total coverage 193.8 miles

Cruise 205

Departure from Hakodate	Sep.	27 , 2010
Start hydrographic research (US10481)		27
Arrival at Aomori		27
Departure from Aomori		28
Finish hydrographic research (US10489)		28
Arrival at Ominato		28
Departure from Ominato		30
Return to Hakodate		30

Total coverage 185.3 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 203	
Research Staff:	Professor	(Laboratory of Marine Bioresource Chemistry)	
		Ryuichi Sakai	
	Research Associate	(Laboratory of Marine Bioresource Chemistry)	
		Satoko Matsunaga	

Associate staff (Foreign):		(SOUTHERN MARINE LABORATORY)	Jiro Sakagami
Graduate Students:	Chair of Marine Bioresource Chemistry:		1 person
Under Graduate Students:	Department of Marine Bioresources Chemistry:		3 persons

		Cruise 204	
Teaching Assistant:	Chair of Marine Bioresource and Environment Sensing:		1 person
Under Graduate Students:	Department of Marine Production System Science:		1 person
	Department of Applied Marine Science (Third grade):		7 persons

		Cruise 205	
Research Staff:	Associate Professor	(Laboratory of Marine Environmental Science)	
			Isao Kudo
Graduate Students:	Graduate School of Environmental Science:		1 person
Under Graduate Students:	Department of Marine Biology:		3 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”.

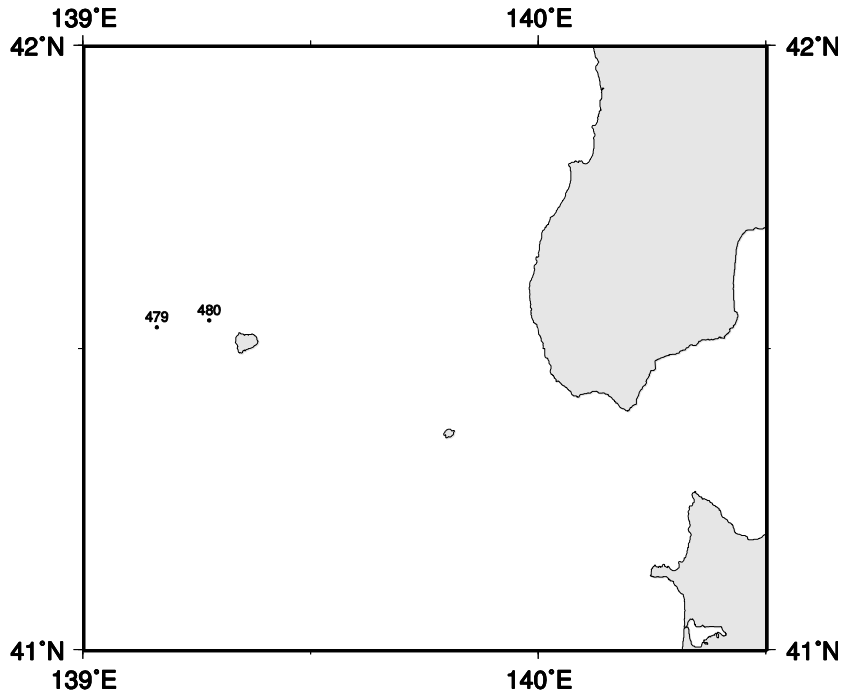


Figure 1: Oceanographic stations (Cruise 204)

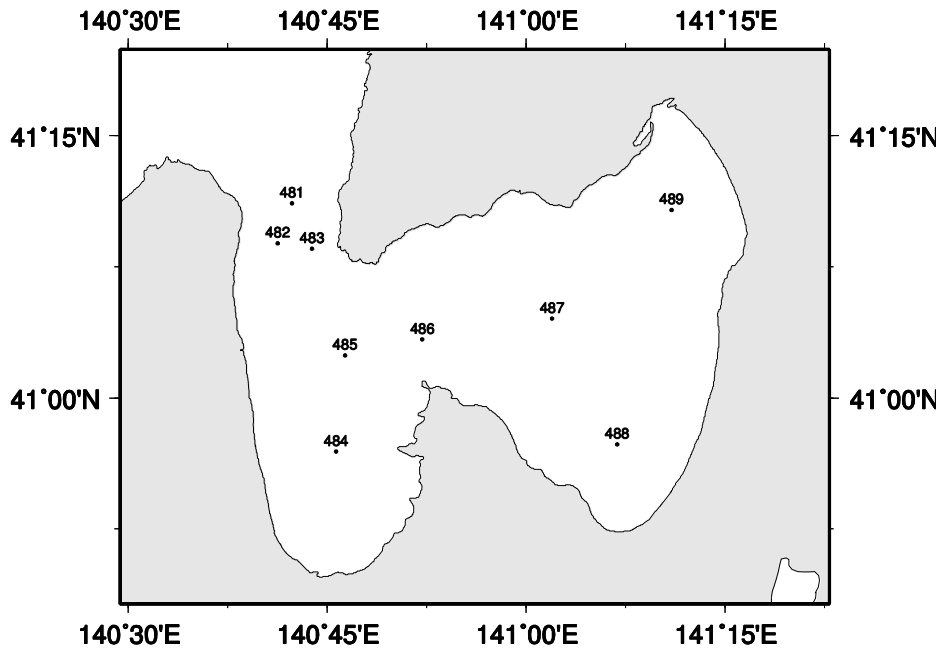


Figure 2: Oceanographic stations (Cruise 205)

Table 1: List of oceanographic stations

Cruise 203

No data

Cruise 204

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10479	41-32.2	139-09.6	9/21	0254-0305	1012	WNW-2	NW -1	WNW-4	23.4	24.8	o	1007.6
US10480	41-32.9	139-16.5	9/21	0428-0439	1260	WNW-2	NW -1	WNW-4	23.3	24.9	o	1008.3

Cruise 205

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10481	41-11.2	140-42.3	9/27	1213-1223	69	SSE-1	SSE-1	SSE-3	21.7	23.7	bc	1020.1
US10482	41-08.9	140-41.2	9/27	1243-1249	47	East-2	SE-1	East-4	22.0	23.7	bc	1019.9
US10483	41-08.6	140-43.8	9/27	1313-1320	59	East-2	SE-1	East-4	22.5	23.5	bc	1019.6
US10484	40-57.0	140-45.6	9/27	1430-1437	49	Calm	NE -1	Calm	24.4	24.0	bc	1018.9
US10485	41-02.5	140-46.3	9/28	0741-0746	51	Calm	NE -1	Calm	20.9	23.2	c	1012.6
US10486	41-03.4	140-52.1	9/28	0818-0825	50	ESE-3	ESE-1	ESE-5	20.4	23.4	o	1012.2
US10487	41-04.6	141-01.9	9/28	0919-0925	47	ESE-3	ESE-1	ESE-5	19.3	23.2	c	1011.7
US10488	40-57.4	141-06.8	9/28	1040-1045	37	SE -4	SE-1	SE -6	20.4	23.1	c	1011.1
US10489	41-10.8	141-10.9	9/28	1205-1210	30	SE -3	SE-1	SE -5	20.7	23.0	r	1010.1

(*): Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US10479				STATION US10480				STATION US10481			
LATITUDE 41-32.2 N				LATITUDE 41-32.9 N				LATITUDE 41-11.2 N			
LONGITUDE 139-09.6 E				LONGITUDE 139-16.5 E				LONGITUDE 140-42.3 E			
DEPTH (m) 1012				DEPTH (m) 1260				DEPTH (m) 69			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	24.790	33.627	22.367	5	24.788	33.598	22.346	5	23.669	33.106	22.305
10	24.828	33.646	22.370	10	24.620	33.664	22.446	10	23.636	33.100	22.310
20	22.317	34.031	23.392	20	23.863	33.953	22.889	20	23.588	33.106	22.328
30	16.694	34.220	24.988	30	17.598	34.198	24.755	30	23.599	33.117	22.334
40	15.977	34.298	25.213	40	15.460	34.311	25.339	40	23.574	33.125	22.347
50	15.086	34.340	25.444	50	14.277	34.342	25.620	50	23.239	33.281	22.562
75	11.177	34.206	26.125	75	10.975	34.222	26.174				
100	9.016	34.146	26.447	100	8.642	34.127	26.491				
125	6.618	34.083	26.748	125	7.385	34.112	26.665				
150	4.736	34.050	26.952	150	5.500	34.072	26.881				
175	3.157	34.064	27.123	175	4.264	34.072	27.020				
200	2.550	34.066	27.179	200	2.642	34.060	27.166				
250	1.692	34.056	27.239	250	1.669	34.068	27.250				
300	1.305	34.069	27.276	300	1.165	34.070	27.287				

STATION US10482				STATION US10483				STATION US10484			
LATITUDE 41-08.9 N				LATITUDE 41-08.6 N				LATITUDE 40-57.0 N			
LONGITUDE 140-41.2 E				LONGITUDE 140-43.8 E				LONGITUDE 140-45.6 E			
DEPTH (m) 47				DEPTH (m) 59				DEPTH (m) 49			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	23.584	33.036	22.277	5	23.633	33.092	22.305	5	24.040	32.929	22.063
10	23.574	33.036	22.280	10	23.623	33.091	22.307	10	23.900	32.946	22.117
20	23.557	33.053	22.298	20	23.582	33.087	22.316	20	23.907	32.996	22.152
30	23.589	33.090	22.316	30	23.571	33.091	22.322	30	23.825	33.056	22.222
40	23.573	33.106	22.333	40	23.564	33.097	22.328	40	21.565	33.542	23.230
				50	22.756	33.335	22.741	50	18.769	33.896	24.235

STATION US10485				STATION US10486				STATION US10487			
LATITUDE 41-02.5 N				LATITUDE 41-03.4 N				LATITUDE 41-04.6 N			
LONGITUDE 140-46.3 E				LONGITUDE 140-52.1 E				LONGITUDE 141-01.9 E			
DEPTH (m) 51				DEPTH (m) 50				DEPTH (m) 47			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	23.392	33.040	22.335	5	23.452	33.012	22.296	5	23.350	32.957	22.285
10	23.378	33.040	22.339	10	23.447	33.010	22.297	10	23.350	32.957	22.285
20	23.375	33.042	22.342	20	23.445	33.005	22.294	20	23.351	32.957	22.284
30	23.464	33.114	22.371	30	23.472	33.017	22.295	30	23.350	32.956	22.283
40	21.487	33.548	23.257	40	22.362	33.519	22.992	40	23.244	33.017	22.360

STATION US10488				STATION US10489							
LATITUDE 40-57.4 N				LATITUDE 41-10.8 N							
LONGITUDE 141-06.8 E				LONGITUDE 141-10.9 E							
DEPTH (m) 37				DEPTH (m) 30							
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T				
5	23.003	32.761	22.235	5	22.998	32.701	22.192				
10	23.006	32.800	22.264	10	23.024	32.808	22.266				
20	23.076	32.839	22.274	20	23.039	32.864	22.303				
30	23.048	32.827	22.273								

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

		Cruise 207	
Research Staff:	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	
			Susumu Shimizu

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

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”.

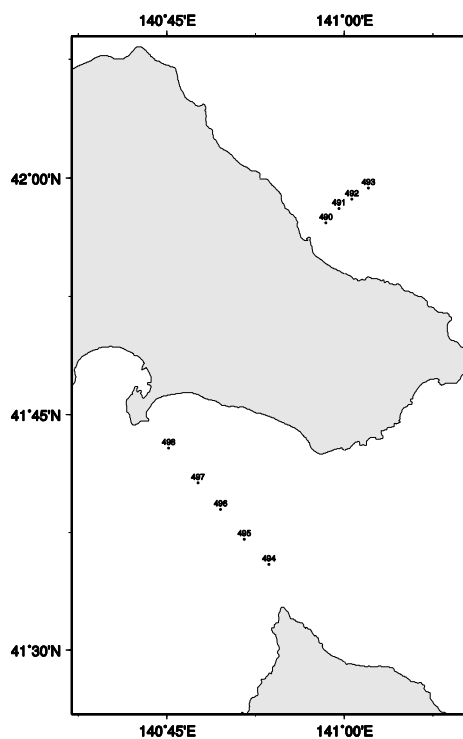


Figure 1: Oceanographic stations (Cruise 206)

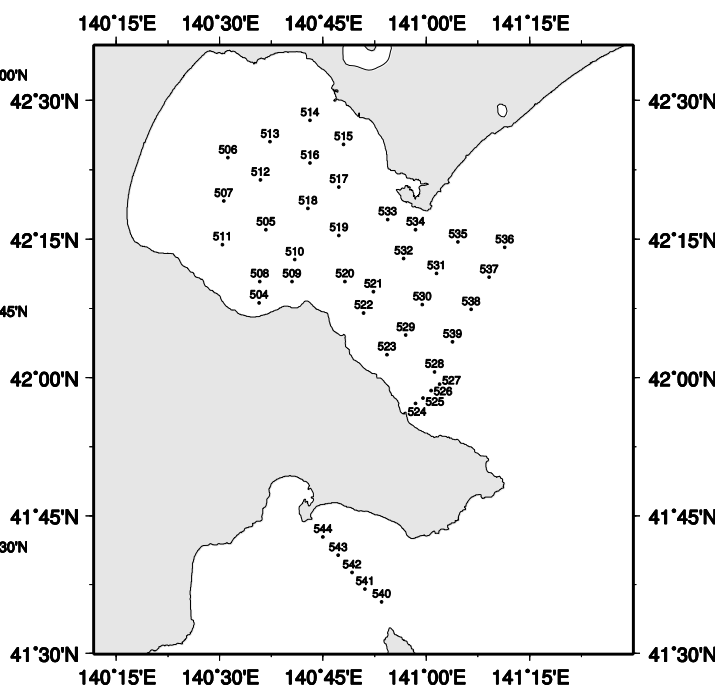


Figure 3: Oceanographic stations (Cruise 208)

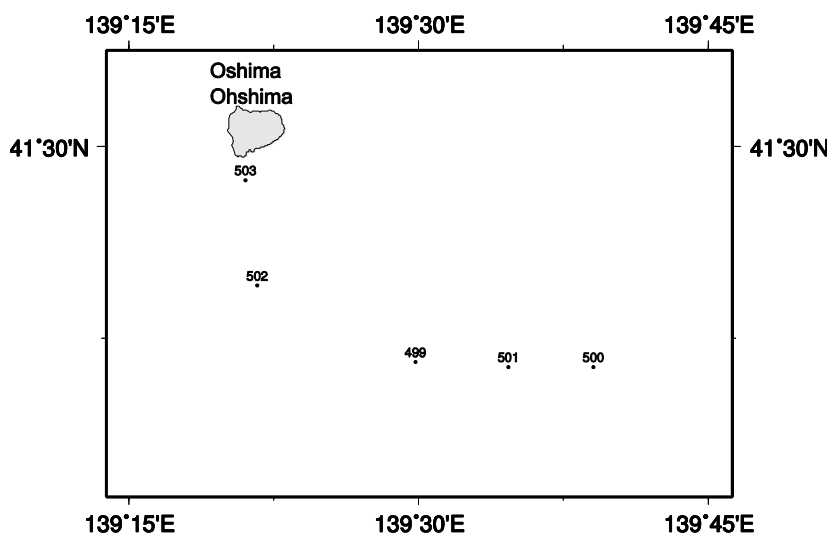


Figure 2: Oceanographic stations (Cruise 207)

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)
US10499	41-21.6	139-29.8	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 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 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 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 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 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 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	34.135	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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 US10516			
LATITUDE 42-23.3 N			
LONGITUDE 140-47.9 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 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 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 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 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 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 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 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 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 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

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 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 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 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 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 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 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 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 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 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

THE " USHIO MARU "

CRUISE 209

CRUISE 210

CRUISE 211

IN NOVEMBER 2010

1. Cruise Itinerary

Cruise 209

Departure from Hakodate	Nov.	1 , 2010
Arrival at Hakodate		1
Departure from Hakodate		2
Arrival at Fukushima		2
Departure from Fukushima		3
Arrival at Fukushima		3
Departure from Fukushima		4
Arrival at Fukushima		4
Departure from Fukushima		5
Return to Hakodate		6

Total coverage 176.0 miles

Cruise 210

Departure from Hakodate	Nov.	10 , 2010
Hydrographic research (US10545 - US10563)		11
Return to Hakodate		13

Total coverage 150.7 miles

Cruise 211

Departure from Hakodate	Nov.	17 , 2010
Start hydrographic research (US10564)		17
Arrival at Aomori		17
Departure from Aomori		18
Arrival at Ominato		18
Departure from Ominato		19
Finish hydrographic research (US10577)		19
Return to Hakodate		20

Total coverage 184.4 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 209

Graduate Students:	Chair of Marine Bioresource Science:	2 persons
	Graduate School of Environmental Science:	2 persons
Under Graduate Students:	Department of Marine Biology:	2 persons

Cruise 210

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	
		Tohru Hirawake	
	Postdoctoral fellow	(Faculty of Fisheries Sciences)	
		Tomonori Isada	
Guest Scientist (Domestic):		(JAMSTEC)	Kenichi Sasaki
		(JAMSTEC)	Yoshiyuki Tanaka
		(Marine Works Japan .LTD)	Fujio Kobayashi

Graduate Students:	Chair of Marine Bioresource and Environment Sensing:	1 person
Under Graduate Students:	Department of Applied Marine Science:	2 persons

Cruise 211

Research Staff:	Associate Professor	(Laboratory of Marine Environmental Science)	
		Isao Kudo	
Graduate Students:	Graduate School of Environmental Science:	1 person	
Under Graduate Students:	Department of Marine Biology:	4 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”.

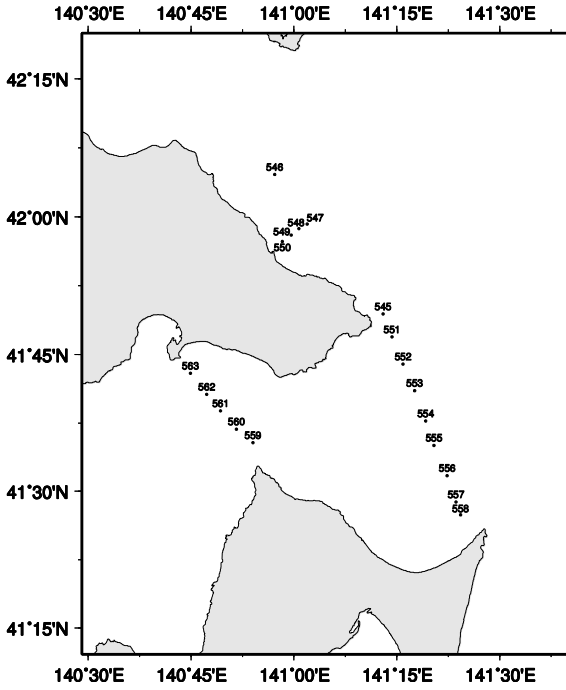


Figure 1: Oceanographic stations (Cruise 210)

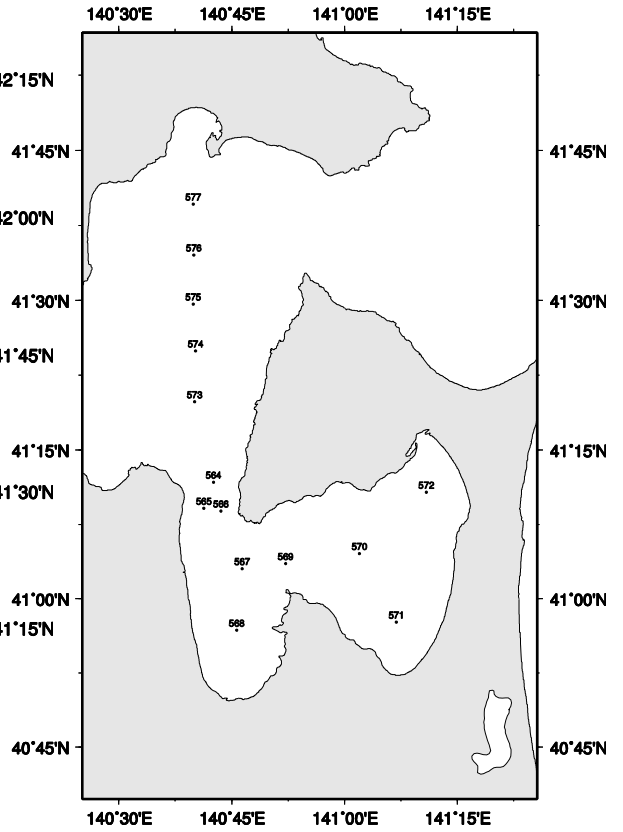


Figure 2: Oceanographic stations (Cruise 211)

Table 1: List of oceanographic stations

Cruise 209

No data

Cruise 210

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10545	41-49.5	141-12.9	11/11	0647-0659	144	West-3	NW -1	West-5	6.6	12.9	bc	1015.6
US10546	42-04.7	140-57.1	11/11	0930-0938	84	West-4	NW -1	West-6	7.3	13.6	bc	1017.1
US10547	41-59.3	141-01.8	11/11	1038-1042	100	West-3	NW -1	West-5	8.2	13.5	bc	1018.1
US10548	41-58.8	141-00.6	11/11	1050-1055	94	West-3	NW -1	West-5	8.0	13.5	bc	1017.6
US10549	41-58.1	140-59.5	11/11	1104-1108	86	WNW-3	NW -1	WNW-5	8.2	13.6	bc	1017.7
US10550	41-57.4	140-58.2	11/11	1117-1120	78	WNW-2	NW -1	WNW-4	8.3	13.6	bc	1017.7
US10551	41-47.0	141-14.2	11/11	1313-1327	192	West-2	NW -1	West-4	8.9	13.5	bc	1018.0
US10552	41-44.0	141-15.8	11/11	1348-1401	227	West-2	West-1	West-5	9.3	13.6	bc	1018.0
US10553	41-41.1	141-17.5	11/11	1421-1439	234	West-3	West-1	West-5	9.3	14.6	bc	1018.5
US10554	41-37.8	141-19.1	11/11	1458-1512	217	West-3	West-1	West-5	9.2	14.5	bc	1019.0
US10555	41-35.1	141-20.3	11/11	1530-1549	306	West-3	West-1	West-5	9.2	14.9	bc	1019.6
US10556	41-31.8	141-22.2	11/11	1611-1628	243	West-3	West-1	West-5	9.3	16.5	bc	1019.8
US10557	41-28.9	141-23.5	11/11	1646-1654	89	West-3	West-1	West-5	9.4	16.2	c	1020.2
US10558	41-27.5	141-24.2	11/11	1704-1710	52	West-3	West-1	West-5	9.7	16.2	c	1020.6
US10559	41-35.4	140-53.9	11/11	1932-1935	58	West-3	West-1	West-5	8.3	16.4	bc	1021.6
US10560	41-36.9	140-51.5	11/11	1958-2002	94	WNW-2	West-1	WNW-4	7.9	16.7	bc	1022.0
US10561	41-38.9	140-49.2	11/11	2026-2038	326	NW -2	West-1	NW -4	7.8	16.4	bc	1021.5
US10562	41-40.7	140-47.2	11/11	2056-2104	227	NW -2	West-1	NW -4	7.4	14.8	bc	1021.1
US10563	41-43.0	140-44.8	11/11	2123-2126	83	NW-2	West-1	NW-3	7.3	15.9	bc	1021.5

Cruise 211

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10564	41-11.8	140-42.5	11/17	1202-1209	73	SE -1	South-1	SE -3	9.4	17.0	bc	1022.5
US10565	41-09.2	140-41.2	11/17	1228-1232	53	SE -1	SE -1	SE -3	10.0	16.6	bc	1022.2
US10566	41-08.9	140-43.5	11/17	1249-1253	61	East-2	SE -1	East-4	9.8	16.8	bc	1022.1
US10567	41-03.1	140-46.3	11/17	1342-1348	53	East-2	East-1	East-4	9.9	15.7	c	1021.7
US10568	40-56.9	140-45.6	11/18	0706-0712	49	South-1	South-1	South-3	6.9	15.8	bc	1022.7
US10569	41-03.6	140-52.1	11/18	0845-0852	52	ESE-1	NE -1	ESE-3	10.9	15.9	bc	1022.8
US10570	41-04.6	141-01.9	11/18	0942-0949	48	ESE-1	SE -1	ESE-2	11.0	14.4	bc	1023.0
US10571	40-57.7	141-06.8	11/18	1107-1112	39	SE -1	SE -1	SE -3	11.6	14.7	bc	1022.8
US10572	41-10.8	141-10.8	11/18	1231-1238	31	East-1	SE -1	East-2	11.8	14.6	bc	1022.2
US10573	41-19.9	140-40.0	11/19	1001-1007	182	WSW-1	SW -1	WSW-3	12.8	16.7	c	1022.6
US10574	41-25.0	140-40.1	11/19	1040-1047	199	WSW-2	ESE-1	WSW-4	13.0	16.9	c	1022.5
US10575	41-29.7	140-39.8	11/19	1117-1125	213	North-1	ESE-1	North-3	12.5	17.0	c	1022.1
US10576	41-34.6	140-39.9	11/19	1155-1203	176	NE -1	NE -1	NE -3	12.0	15.7	bc	1021.7
US10577	41-39.7	140-39.8	11/19	1234-1238	118	NE -1	SE -1	NE -3	12.1	16.1	bc	1021.6

(*): Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US10545				STATION US10546				STATION US10547			
LATITUDE 41-49.5 N				LATITUDE 42-04.7 N				LATITUDE 41-59.3 N			
LONGITUDE 141-12.9 E				LONGITUDE 140-57.1 E				LONGITUDE 141-01.8 E			
DEPTH (m) 144				DEPTH (m) 84				DEPTH (m) 100			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.679	33.661	25.219	5	13.540	33.343	25.001	5	13.773	33.506	25.079
10	13.682	33.661	25.218	10	13.582	33.355	25.002	10	13.780	33.505	25.077
20	13.491	33.654	25.252	20	13.781	33.430	25.019	20	13.789	33.506	25.077
30	13.450	33.658	25.263	30	13.985	33.522	25.048	30	13.799	33.508	25.076
40	13.452	33.659	25.263	40	13.986	33.532	25.056	40	13.804	33.509	25.075
50	13.443	33.659	25.265	50	13.645	33.499	25.101	50	13.806	33.509	25.075
75	11.426	33.716	25.699	75	8.957	33.521	25.966	75	10.488	33.787	25.922
100	9.022	33.680	26.081								
125	7.909	33.728	26.288								
STATION US10548				STATION US10549				STATION US10550			
LATITUDE 41-58.8 N				LATITUDE 41-58.1 N				LATITUDE 41-57.4 N			
LONGITUDE 141-00.6 E				LONGITUDE 140-59.5 E				LONGITUDE 140-58.2 E			
DEPTH (m) 94				DEPTH (m) 86				DEPTH (m) 78			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.902	33.530	25.072	5	13.796	33.549	25.108	5	13.964	33.529	25.058
10	13.902	33.530	25.072	10	13.794	33.549	25.109	10	13.967	33.528	25.057
20	13.909	33.529	25.070	20	13.801	33.548	25.106	20	13.961	33.528	25.057
30	13.911	33.529	25.069	30	13.807	33.547	25.104	30	13.966	33.528	25.057
40	13.907	33.529	25.070	40	13.735	33.564	25.132	40	13.966	33.528	25.056
50	13.562	33.498	25.117	50	13.601	33.572	25.166	50	13.934	33.538	25.071
75	10.014	33.785	26.001	75	9.681	33.659	25.958	75	7.613	33.285	25.983
STATION US10551				STATION US10552				STATION US10553			
LATITUDE 41-47.0 N				LATITUDE 41-44.0 N				LATITUDE 41-41.1 N			
LONGITUDE 141-14.2 E				LONGITUDE 141-15.8 E				LONGITUDE 141-17.5 E			
DEPTH (m) 192				DEPTH (m) 227				DEPTH (m) 234			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.820	33.605	25.147	5	13.911	33.613	25.134	5	14.869	33.672	24.977
10	13.819	33.605	25.147	10	13.909	33.612	25.134	10	14.853	33.673	24.981
20	13.824	33.605	25.146	20	13.911	33.612	25.133	20	14.217	33.693	25.132
30	13.828	33.605	25.145	30	13.909	33.613	25.134	30	13.686	33.741	25.279
40	13.776	33.627	25.173	40	13.887	33.616	25.141	40	13.367	33.763	25.361
50	13.756	33.644	25.190	50	13.303	33.675	25.306	50	12.743	33.774	25.494
75	11.785	33.721	25.636	75	12.470	33.885	25.633	75	11.420	33.839	25.795
100	9.066	33.687	26.080	100	10.459	33.920	26.030	100	8.838	33.851	26.244
125	7.706	33.710	26.303	125	8.849	33.872	26.259	125	6.795	33.663	26.394
150	6.880	33.636	26.361	150	7.013	33.674	26.373	150	5.788	33.592	26.467
175	4.768	33.472	26.490	175	4.286	33.444	26.519	175	4.985	33.523	26.506
				200	3.467	33.410	26.573	200	3.703	33.424	26.562
STATION US10554				STATION US10555				STATION US10556			
LATITUDE 41-37.8 N				LATITUDE 41-35.1 N				LATITUDE 41-31.8 N			
LONGITUDE 141-19.1 E				LONGITUDE 141-20.3 E				LONGITUDE 141-22.2 E			
DEPTH (m) 217				DEPTH (m) 306				DEPTH (m) 243			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.654	33.675	25.025	5	15.243	33.571	24.817	5	16.700	33.333	24.306
10	14.655	33.675	25.025	10	15.255	33.578	24.820	10	16.664	33.343	24.321
20	14.644	33.675	25.028	20	15.225	33.565	24.817	20	16.277	33.417	24.467
30	14.526	33.680	25.057	30	15.256	33.588	24.828	30	16.099	33.453	24.535
40	14.214	33.675	25.118	40	15.280	33.584	24.820	40	15.997	33.477	24.577
50	13.669	33.654	25.216	50	15.265	33.582	24.821	50	15.915	33.501	24.614
75	10.160	33.643	25.865	75	15.194	33.633	24.876	75	15.858	33.519	24.641
100	8.123	33.705	26.239	100	13.906	33.739	25.232	100	15.322	33.581	24.808
125	7.654	33.723	26.321	125	12.801	33.714	25.436	125	14.484	33.704	25.084
150	7.526	33.732	26.347	150	12.639	33.715	25.469	150	13.902	33.829	25.303
175	5.356	33.578	26.507	175	11.598	33.703	25.657	175	12.438	33.963	25.700
200	3.996	33.576	26.654	200	10.134	33.646	25.872	200	12.326	33.959	25.718
				250	6.865	33.696	26.410				
				300	5.176	33.638	26.576				

		STATION	US10557		
		LATITUDE	41-28.9	N	
		LONGITUDE	141-23.5	E	
		DEPTH (m)	89		
Press.	Temp.	Salinity	Sigma-T		
5	16.403	33.397	24.423		
10	16.410	33.397	24.421		
20	16.407	33.399	24.424		
30	16.403	33.401	24.426		
40	16.401	33.402	24.428		
50	16.339	33.419	24.454		
75	16.082	33.477	24.558		

		STATION	US10560		
		LATITUDE	41-36.9	N	
		LONGITUDE	140-51.5	E	
		DEPTH (m)	94		
Press.	Temp.	Salinity	Sigma-T		
5	16.983	33.263	24.185		
10	16.876	33.284	24.226		
20	16.002	33.420	24.532		
30	15.724	33.482	24.643		
40	15.650	33.508	24.679		
50	15.633	33.515	24.688		
75	15.594	33.535	24.712		

		STATION	US10563		
		LATITUDE	41-43.0	N	
		LONGITUDE	140-44.8	E	
		DEPTH (m)	83		
Press.	Temp.	Salinity	Sigma-T		
5	16.242	33.431	24.486		
10	16.242	33.426	24.482		
20	16.097	33.470	24.549		
30	15.427	33.592	24.793		
40	14.967	33.701	24.978		
50	14.403	33.905	25.256		
75	14.193	33.937	25.325		

		STATION	US10566		
		LATITUDE	41-08.9	N	
		LONGITUDE	140-43.5	E	
		DEPTH (m)	61		
Press.	Temp.	Salinity	Sigma-T		
5	16.913	32.926	23.943		
10	16.979	33.070	24.038		
20	16.597	33.154	24.192		
30	15.944	33.176	24.358		
40	15.634	33.183	24.432		
50	15.628	33.195	24.443		

		STATION	US10569		
		LATITUDE	41-03.6	N	
		LONGITUDE	140-52.1	E	
		DEPTH (m)	52		
Press.	Temp.	Salinity	Sigma-T		
5	15.994	33.114	24.299		
10	16.040	33.191	24.348		
20	15.643	33.130	24.390		
30	15.294	33.066	24.417		
40	15.221	33.055	24.425		

		STATION	US10572		
		LATITUDE	41-10.8	N	
		LONGITUDE	141-10.8	E	
		DEPTH (m)	31		
Press.	Temp.	Salinity	Sigma-T		
5	14.609	32.930	24.460		
10	14.554	32.932	24.473		
20	14.679	32.977	24.482		

		STATION	US10558		
		LATITUDE	41-27.5	N	
		LONGITUDE	141-24.2	E	
		DEPTH (m)	52		
Press.	Temp.	Salinity	Sigma-T		
5	16.464	33.382	24.398		
10	16.478	33.381	24.393		
20	16.449	33.390	24.407		
30	16.221	33.443	24.500		
40	16.130	33.465	24.538		

		STATION	US10561		
		LATITUDE	41-38.9	N	
		LONGITUDE	140-49.2	E	
		DEPTH (m)	326		
Press.	Temp.	Salinity	Sigma-T		
5	15.725	33.349	24.540		
10	15.663	33.477	24.652		
20	15.482	33.508	24.716		
30	15.221	33.564	24.817		
40	15.241	33.565	24.813		
50	15.072	33.605	24.881		
75	13.779	33.871	25.360		
100	13.221	34.020	25.589		
125	12.907	34.046	25.672		
150	12.832	34.056	25.695		
175	12.533	34.058	25.755		
200	12.528	34.064	25.760		
250	12.095	34.078	25.855		
300	11.949	34.079	25.883		

		STATION	US10564		
		LATITUDE	41-11.8	N	
		LONGITUDE	140-42.5	E	
		DEPTH (m)	73		
Press.	Temp.	Salinity	Sigma-T		
5	17.017	33.028	23.997		
10	16.983	33.069	24.037		
20	16.899	33.130	24.103		
30	16.896	33.159	24.126		
40	16.845	33.163	24.141		
50	16.443	33.187	24.253		

		STATION	US10567		
		LATITUDE	41-03.1	N	
		LONGITUDE	140-46.3	E	
		DEPTH (m)	53		
Press.	Temp.	Salinity	Sigma-T		
5	15.815	33.095	24.324		
10	15.880	33.193	24.385		
20	15.743	33.195	24.418		
30	15.663	33.207	24.445		
40	15.595	33.211	24.462		

		STATION	US10570		
		LATITUDE	41-04.6	N	
		LONGITUDE	141-01.9	E	
		DEPTH (m)	48		
Press.	Temp.	Salinity	Sigma-T		
5	14.586	32.923	24.460		
10	14.581	32.923	24.461		
20	14.579	32.923	24.462		
30	14.579	32.926	24.464		
40	14.588	32.929	24.464		

		STATION	US10573		
		LATITUDE	41-19.9	N	
		LONGITUDE	140-40.0	E	
		DEPTH (m)	182		
Press.	Temp.	Salinity	Sigma-T		
5	16.874	33.346	24.275		
10	16.864	33.323	24.260		
20	16.883	33.347	24.274		
30	16.883	33.348	24.274		
40	16.922	33.365	24.278		
50	16.934	33.367	24.276		
75	16.359	33.535	24.539		
100	15.888	33.643	24.729		
125	15.510	33.716	24.870		
150	15.380	33.847	25.000		
175	14.407	34.109	25.413		

		STATION	US10559		
		LATITUDE	41-35.4	N	
		LONGITUDE	140-53.9	E	
		DEPTH (m)	58		
Press.	Temp.	Salinity	Sigma-T		
5	16.670	33.340	24.318		
10	16.576	33.367	24.360		
20	16.555	33.376	24.372		
30	16.362	33.430	24.458		
40	16.356	33.434	24.462		
50	16.335	33.440	24.471		

		STATION	US10562		
		LATITUDE	41-40.7	N	
		LONGITUDE	140-47.2	E	
		DEPTH (m)	227		
Press.	Temp.	Salinity	Sigma-T		
5	14.408	33.702	25.098		
10	14.416	33.702	25.097		
20	14.412	33.703	25.098		
30	14.392	33.708	25.106		
40	14.307	33.724	25.137		
50	14.197	33.741	25.173		
75	13.578	33.840	25.378		
100	13.134	33.935	25.541		
125	12.977	33.958	25.590		
150	12.675	33.970	25.659		
175	12.446	34.031	25.751		
200	12.272	34.052	25.801		

		STATION	US10565		
		LATITUDE	41-09.2	N	
		LONGITUDE	140-41.2	E	
		DEPTH (m)	53		
Press.	Temp.	Salinity	Sigma-T		
5	16.944	33.120	24.085		
10	16.974	33.168	24.115		
20	16.924	33.148	24.111		
30	16.915	33.144	24.110		
40	16.890	33.138	24.111		

		STATION	US10568	
		LATITUDE	40-56.9	N
		LONGITUDE	140-45.6	E
		DEPTH (m)	49	
Press.	Temp.	Salinity	Sigma-T	
5	16.389	33.190	24.267	
10	16.374	33.181	24.264	
20	15.064	33.012	24.426	
30	15.111	33.054	24.448	
40	15.138	33.076	24.459	

STATION		US10575	
LATITUDE		41-29.7	N
LONGITUDE		140-39.8	E
DEPTH (m)		213	
Press.	Temp.	Salinity	Sigma-T
5	17.345	33.131	23.999
10	17.327	33.126	23.999
20	17.112	33.241	24.138
30	16.967	33.302	24.219
40	16.852	33.326	24.265
50	16.715	33.349	24.314
75	16.249	33.420	24.476
100	15.186	33.707	24.935
125	14.488	34.098	25.387
150	13.809	34.169	25.585
175	12.616	34.173	25.828
200	11.946	34.184	25.965

STATION		US10576	
LATITUDE		41-34.6	N
LONGITUDE		140-39.9	E
DEPTH (m)		176	
Press.	Temp.	Salinity	Sigma-T
5	15.904	33.434	24.565
10	15.848	33.476	24.610
20	15.499	33.598	24.781
30	15.046	33.695	24.956
40	14.827	33.750	25.046
50	14.539	33.832	25.171
75	13.868	34.026	25.462
100	13.287	34.060	25.607
125	12.824	34.132	25.755
150	12.804	34.152	25.775

STATION		US10577	
LATITUDE		41-39.7	N
LONGITUDE		140-39.8	E
DEPTH (m)		118	
Press.	Temp.	Salinity	Sigma-T
5	16.394	33.270	24.327
10	16.355	33.276	24.341
20	16.057	33.392	24.498
30	15.838	33.451	24.593
40	15.381	33.578	24.792
50	14.632	33.754	25.090
75	13.678	33.981	25.466
100	12.901	34.129	25.737

THE " USHIO MARU "

CRUISE 212

CRUISE 213

CRUISE 214

IN NOVEMBER - DECEMBER 2010

1. Cruise Itinerary

Cruise 212

Departure from Hakodate	Nov.	29 , 2010
Hydrographic research (US10578 - US10587)		29
Return to Hakodate		29

Total coverage 44.5 miles

Cruise 213

Departure from Hakodate	Dec.	13 , 2010
Arrival at and departure from Mori		13
Retrieval mooring ADCP system		13
Anchorage at Muroran		13
Departure from Muroran		14
Start hydrographic research (US10588)		14
Set mooring ADCP system		14
Arrival at Muroran		14
Departure from Muroran		15
Finish hydrographic research (US10599)		15
Return to Hakodate		16

Total coverage 245.8 miles

Cruise 214

Departure from Hakodate	Dec.	20 , 2010
Start hydrographic research (US10600)		20
Arrival at Fukushima		20
Departure from Fukushima		21
Finish hydrographic research (US10622)		21
Return to Hakodate		22

Total coverage 132.0 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 212

Research Staff:	Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
Graduate Students:	Chair of Marine Bioresource Science:		2 persons
Under Graduate Students:	Department of Marine Biology:		2 persons

Cruise 213

Research Staff:	Professor	(Laboratory of Marine Environmental Science)	Kenshi Kuma
	Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
Research Students:	Faculty of Fisheries Sciences:		1 person
Graduate Students:	Chair of Marine Bioresource Science:		2 persons
	Graduate School of Environmental Science:		1 person
Under Graduate Students:	Department of Marine Biology:		6 persons

Cruise 214

Research Staff:	Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
Graduate Students:	Chair of Marine Bioresource Science:		2 persons
Under Graduate Students:	Department of Marine Biology:		3 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”.

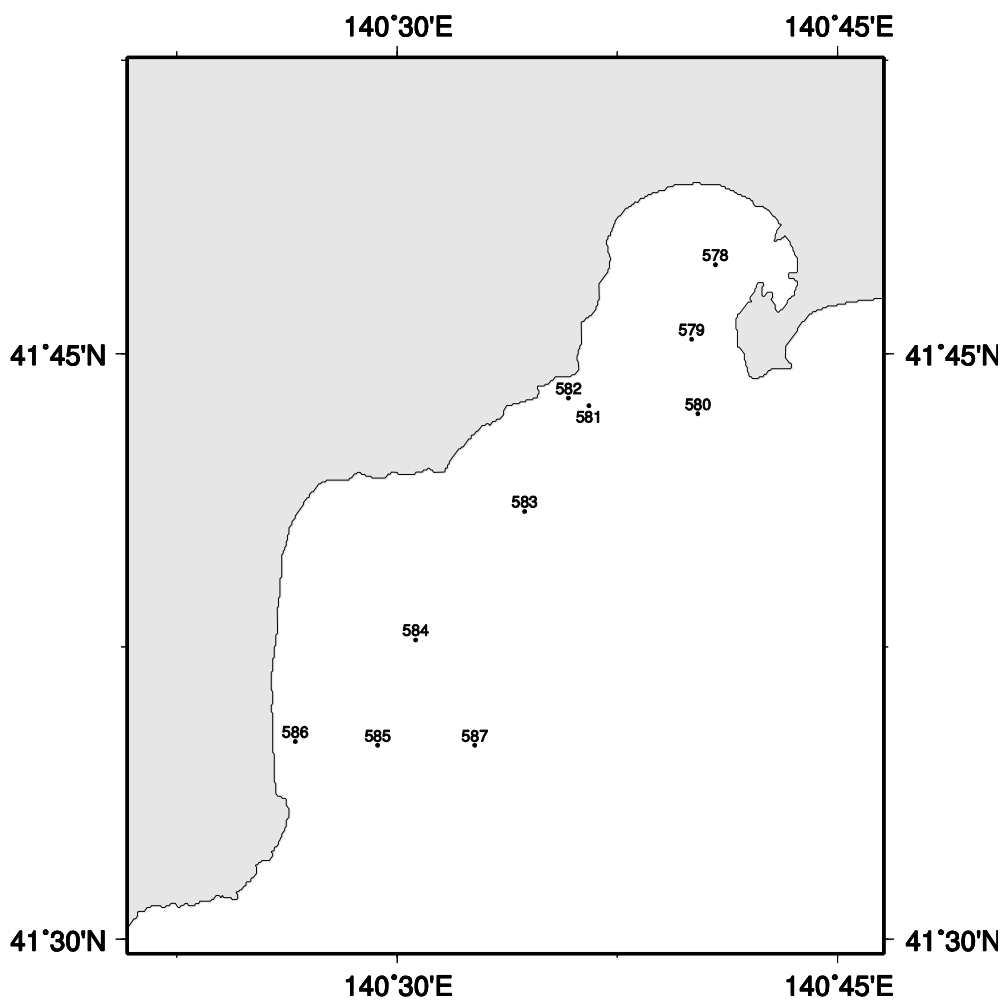


Figure 1: Oceanographic stations (Cruise 212)

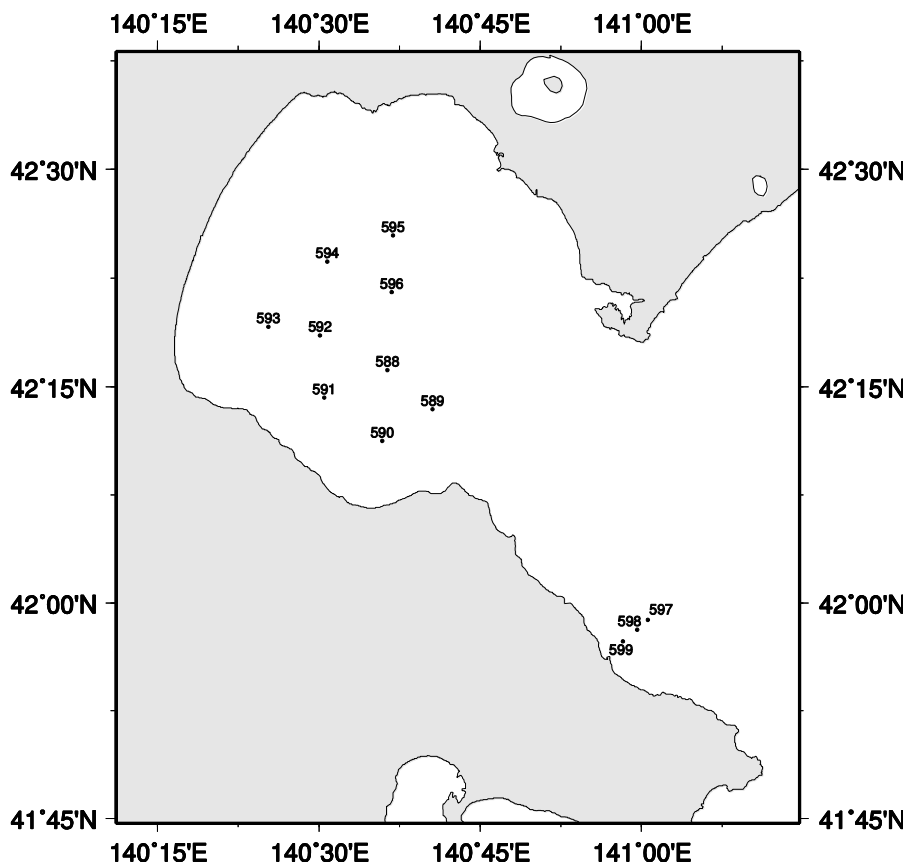


Figure 2: Oceanographic stations (Cruise 213)

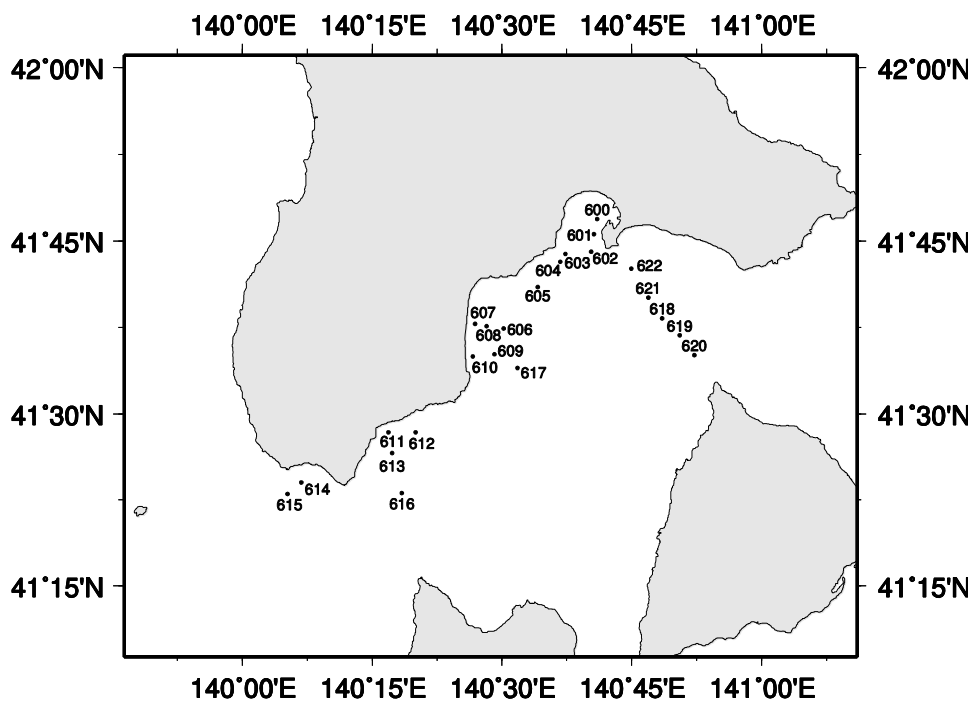


Figure 3: Oceanographic stations (Cruise 214)

Cruise 212

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10578	41-47.3	140-40.8	11/29	0857-0859	20	West-1	SW -1	West-3	0.1	11.3	s	1013.6
US10579	41-45.4	140-40.0	11/29	0920-0923	42	West-1	SSW-1	West-3	0.1	13.7	s	1013.6
US10580	41-43.5	140-40.2	11/29	0942-0946	67	WNW-2	SSW-1	WNW-4	-0.2	13.7	s	1013.7
US10581	41-43.7	140-36.5	11/29	1013-1016	34	West-1	SSW-1	West-3	-0.2	13.6	s	1013.7
US10582	41-43.9	140-35.8	11/29	1021-1023	11	WSW-1	SSW-1	WSW-3	-0.2	13.0	s	1013.7
US10583	41-41.0	140-34.3	11/29	1058-1101	43	West-2	SSW-1	West-5	-0.1	13.6	s	1013.7
US10584	41-37.7	140-30.6	11/29	1135-1137	33	West-2	SW -1	West-5	1.5	13.7	s	1013.1
US10585	41-35.0	140-29.3	11/29	1200-1203	33	West-2	SW -1	West-5	1.1	13.7	s	1013.2
US10586	41-35.1	140-26.5	11/29	1225-1227	14	West-1	South-1	West-3	0.2	13.5	s	1013.2
US10587	41-35.0	140-32.6	11/29	1305-1308	55	NW -3	SW -1	NW -5	0.8	13.8	s	1013.4

Cruise 213

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10588	42-16.2	140-36.3	12/14	0630-0637	91	NW -2	NW -1	NW -4	5.2	8.8	o	1009.6
US10589	42-13.5	140-40.5	12/14	0818-0822	89	NW -3	NW -1	NW -5	5.8	9.0	o	1008.8
US10590	42-11.3	140-35.8	12/14	0911-0915	82	NW -3	NW -1	NW -5	5.1	9.1	bc	1008.5
US10591	42-14.3	140-30.4	12/14	1012-1016	83	NW -4	NW -1	NW -6	4.8	8.9	bc	1008.0
US10592	42-18.6	140-30.0	12/14	1136-1142	92	NNW-4	NW -1	NNW-6	4.5	8.8	bc	1007.2
US10593	42-19.2	140-25.2	12/14	1249-1252	69	NNW-3	NW -1	NNW-5	4.8	8.6	bc	1005.6
US10594	42-23.7	140-30.7	12/14	1406-1412	95	NW -4	NW -1	NW -6	3.5	8.9	bc	1004.8
US10595	42-25.5	140-36.8	12/14	1519-1523	86	NW -3	NW -1	NW -5	3.3	8.9	c	1005.1
US10596	42-21.6	140-36.7	12/14	1600-1604	88	NW -3	NW -1	NW -5	2.9	8.9	c	1005.6
US10597	41-58.9	141-00.5	12/15	1005-1010	94	West-4	WNW-2	West-5	-2.9	10.9	bc	1003.6
US10598	41-58.2	140-59.5	12/15	1017-1021	88	West-4	WNW-2	West-5	-2.5	10.9	bc	1003.7
US10599	41-57.4	140-58.2	12/15	1030-1035	79	West-4	WNW-2	West-6	-2.9	10.7	bc	1003.5

Cruise 214

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10600	41-47.0	140-40.9	12/20	0848-0850	21	SSE-2	South-1	SSE-4	7.1	12.3	r	1007.6
US10601	41-45.7	140-40.5	12/20	0909-0912	31	SSE-3	South-1	SSE-5	7.1	12.5	r	1007.6
US10602	41-44.2	140-40.2	12/20	0931-0934	59	South-3	South-1	South-5	7.6	12.7	r	1007.2
US10603	41-44.0	140-37.2	12/20	1122-1124	41	West-2	South-1	West-4	7.5	12.5	bc	1007.1
US10604	41-43.3	140-36.6	12/20	1147-1150	52	West-3	South-1	West-4	7.4	11.4	bc	1007.0
US10605	41-41.1	140-34.0	12/20	1216-1219	41	WSW-2	South-1	WSW-4	6.8	12.5	r	1006.9
US10606	41-37.5	140-30.1	12/20	1255-1257	31	West-2	SSW-1	West-4	7.6	12.2	r	1007.2
US10607	41-37.9	140-26.8	12/20	1315-1317	17	West-2	South-1	West-5	7.0	11.9	r	1007.5
US10608	41-37.7	140-28.1	12/20	1332-1334	22	West-2	South-1	West-4	6.6	11.6	r	1007.6
US10609	41-35.3	140-29.0	12/20	1411-1413	31	West-2	South-1	West-4	7.3	12.3	r	1008.5
US10610	41-35.1	140-26.5	12/20	1427-1428	14	West-2	South-1	West-4	7.1	12.2	bc	1008.3
US10611	41-28.5	140-16.8	12/21	0709-0710	23	Calm	SSE-1	Calm	5.8	11.8	c	1018.7
US10612	41-28.5	140-19.9	12/21	0737-0740	60	West-1	South-1	West-2	5.8	12.6	bc	1019.1
US10613	41-26.7	140-17.2	12/21	0805-0808	62	West-1	SW -1	West-2	6.1	12.6	bc	1019.2
US10614	41-24.1	140-06.7	12/21	0914-0917	73	WNW-4	WSW-2	WNW-6	7.5	12.4	bc	1020.0
US10615	41-23.1	140-05.1	12/21	0930-0935	111	West-3	WSW-2	West-5	6.8	12.3	bc	1020.5
US10616	41-23.2	140-18.3	12/21	1045-1050	108	West-3	SW -2	West-5	7.6	12.5	bc	1020.1
US10617	41-34.1	140-31.7	12/21	1222-1226	64	NW -3	SW -1	NW -5	6.7	12.4	bc	1019.4
US10618	41-38.4	140-48.4	12/21	1356-1407	328	NW -2	West-1	NW -4	7.8	13.3	bc	1019.3
US10619	41-36.9	140-50.4	12/21	1421-1425	84	NW -2	West-1	NW -4	6.7	13.4	bc	1019.6
US10620	41-35.2	140-52.1	12/21	1442-1445	54	NW -2	West-1	NW -3	6.7	13.3	bc	1019.6
US10621	41-40.2	140-46.8	12/21	1523-1531	246	NW -2	West-1	NW -4	5.9	13.2	bc	1019.8
US10622	41-42.7	140-44.8	12/21	1550-1554	88	NW -2	SW -1	NW -4	5.8	13.4	bc	1020.1

(*) : Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION LATITUDE LONGITUDE DEPTH (m)	US10578 41-47.3 N 140-40.8 E 20				STATION LATITUDE LONGITUDE DEPTH (m)	US10579 41-45.4 N 140-40.0 E 42				STATION LATITUDE LONGITUDE DEPTH (m)	US10580 41-43.5 N 140-40.2 E 67			
	Press.	Temp.	Salinity	Sigma-T		Press.	Temp.	Salinity	Sigma-T		Press.	Temp.	Salinity	Sigma-T
	5	12.562	32.785	24.763		5	13.999	33.609	25.112		5	14.003	33.586	25.093
	10	13.254	33.144	24.905		10	14.005	33.605	25.108		10	14.009	33.582	25.090
STATION LATITUDE LONGITUDE DEPTH (m)	US10581 41-43.7 N 140-36.5 E 34				STATION LATITUDE LONGITUDE DEPTH (m)	US10582 41-43.9 N 140-35.8 E 11				STATION LATITUDE LONGITUDE DEPTH (m)	US10583 41-41.0 N 140-34.3 E 43			
	Press.	Temp.	Salinity	Sigma-T		Press.	Temp.	Salinity	Sigma-T		Press.	Temp.	Salinity	Sigma-T
	5	13.855	33.624	25.154		5	13.189	33.432	25.141		5	13.835	33.577	25.122
	10	13.893	33.645	25.163		10	12.937	33.370	25.143		10	13.849	33.575	25.118
STATION LATITUDE LONGITUDE DEPTH (m)	US10584 41-37.7 N 140-30.6 E 33				STATION LATITUDE LONGITUDE DEPTH (m)	US10585 41-35.0 N 140-29.3 E 33				STATION LATITUDE LONGITUDE DEPTH (m)	US10586 41-35.1 N 140-26.5 E 14			
	Press.	Temp.	Salinity	Sigma-T		Press.	Temp.	Salinity	Sigma-T		Press.	Temp.	Salinity	Sigma-T
	5	13.950	33.614	25.127		5	14.054	33.618	25.108		5	13.866	33.537	25.084
	10	13.959	33.618	25.127		10	14.063	33.617	25.105		10	13.940	33.608	25.124
STATION LATITUDE LONGITUDE DEPTH (m)	US10587 41-35.0 N 140-32.6 E 55				STATION LATITUDE LONGITUDE DEPTH (m)	US10588 42-16.2 N 140-36.3 E 91				STATION LATITUDE LONGITUDE DEPTH (m)	US10589 42-13.5 N 140-40.5 E 89			
	Press.	Temp.	Salinity	Sigma-T		Press.	Temp.	Salinity	Sigma-T		Press.	Temp.	Salinity	Sigma-T
	5	13.924	33.721	25.214		5	13.999	33.609	25.112		5	14.003	33.586	25.093

STATION		US10587	
LATITUDE		41-35.0 N	
LONGITUDE		140-32.6 E	
DEPTH (m)		55	
Press.	Temp.	Salinity	Sigma-T
5	13.980	33.589	25.101
10	13.975	33.587	25.101
20	14.015	33.595	25.098
30	13.887	33.723	25.224
40	13.796	33.796	25.299
50	13.759	33.822	25.327

STATION		US10590	
LATITUDE		42-11.3 N	
LONGITUDE		140-35.8 E	
DEPTH (m)		82	
Press.	Temp.	Salinity	Sigma-T
5	9.389	33.666	26.012
10	9.391	33.682	26.024
20	9.394	33.683	26.024
30	9.462	33.703	26.029
40	9.556	33.720	26.026
50	9.551	33.718	26.026
75	4.979	33.519	26.504

STATION		US10593	
LATITUDE		42-19.2 N	
LONGITUDE		140-25.2 E	
DEPTH (m)		69	
Press.	Temp.	Salinity	Sigma-T
5	8.963	33.612	26.037
10	8.967	33.609	26.035
20	8.970	33.611	26.035
30	8.985	33.613	26.035
40	8.989	33.613	26.034
50	9.125	33.667	26.055

STATION		US10596	
LATITUDE		42-21.6 N	
LONGITUDE		140-36.7 E	
DEPTH (m)		88	
Press.	Temp.	Salinity	Sigma-T
5	9.255	33.133	25.616
10	9.268	33.265	25.717
20	9.278	33.519	25.914
30	9.286	33.565	25.949
40	9.285	33.568	25.952
50	9.278	33.574	25.957
75	7.944	33.611	26.191

STATION		US10599	
LATITUDE		41-57.4 N	
LONGITUDE		140-58.2 E	
DEPTH (m)		79	
Press.	Temp.	Salinity	Sigma-T
5	10.890	33.649	25.743
10	10.886	33.652	25.746
20	10.780	33.632	25.749
30	10.584	33.617	25.772
40	10.370	33.553	25.759
50	8.870	33.505	25.968
75	4.839	33.513	26.514

STATION		US10602	
LATITUDE		41-44.2 N	
LONGITUDE		140-40.2 E	
DEPTH (m)		59	
Press.	Temp.	Salinity	Sigma-T
5	13.031	33.644	25.336
10	13.039	33.651	25.340
20	13.037	33.658	25.346
30	12.979	33.662	25.360
40	12.772	33.658	25.398
50	12.546	33.736	25.503

STATION		US10605	
LATITUDE		41-41.1 N	
LONGITUDE		140-34.0 E	
DEPTH (m)		41	
Press.	Temp.	Salinity	Sigma-T
5	12.744	33.703	25.439
10	12.744	33.705	25.440
20	12.757	33.705	25.438
30	12.760	33.735	25.461
40	12.618	33.740	25.492

STATION		US10588	
LATITUDE		42-16.2 N	
LONGITUDE		140-36.3 E	
DEPTH (m)		91	
Press.	Temp.	Salinity	Sigma-T
5	9.230	33.549	25.945
10	9.267	33.554	25.944
20	9.295	33.560	25.944
30	9.293	33.560	25.944
40	9.290	33.561	25.945
50	9.310	33.577	25.954
75	6.739	33.654	26.394

STATION		US10591	
LATITUDE		42-14.3 N	
LONGITUDE		140-30.4 E	
DEPTH (m)		83	
Press.	Temp.	Salinity	Sigma-T
5	9.298	33.687	26.042
10	9.300	33.694	26.048
20	9.303	33.693	26.046
30	9.289	33.694	26.050
40	9.233	33.680	26.048
50	9.164	33.681	26.059
75	4.166	33.430	26.520

STATION		US10594	
LATITUDE		42-23.7 N	
LONGITUDE		140-30.7 E	
DEPTH (m)		95	
Press.	Temp.	Salinity	Sigma-T
5	9.165	33.451	25.879
10	9.212	33.537	25.939
20	9.238	33.556	25.950
30	9.241	33.555	25.948
40	9.251	33.557	25.948
50	9.241	33.554	25.948
75	7.620	33.702	26.310

STATION		US10597	
LATITUDE		41-58.9 N	
LONGITUDE		141-00.5 E	
DEPTH (m)		94	
Press.	Temp.	Salinity	Sigma-T
5	11.284	33.672	25.690
10	11.280	33.672	25.691
20	11.283	33.673	25.691
30	11.269	33.670	25.692
40	9.996	33.629	25.882
50	9.147	33.653	26.040
75	7.340	33.702	26.349

STATION		US10600	
LATITUDE		41-47.0 N	
LONGITUDE		140-40.9 E	
DEPTH (m)		21	
Press.	Temp.	Salinity	Sigma-T
5	12.860	33.624	25.355
10	12.859	33.614	25.347

STATION		US10603	
LATITUDE		41-44.0 N	
LONGITUDE		140-37.2 E	
DEPTH (m)		41	
Press.	Temp.	Salinity	Sigma-T
5	12.760	33.669	25.409
10	12.773	33.671	25.408
20	12.782	33.681	25.414
30	12.778	33.694	25.425
40	12.716	33.705	25.446

STATION		US10606	
LATITUDE		41-37.5 N	
LONGITUDE		140-30.1 E	
DEPTH (m)		31	
Press.	Temp.	Salinity	Sigma-T
5	12.523	33.677	25.462
10	12.526	33.677	25.461
20	12.534	33.677	25.459
30	12.535	33.677	25.459

STATION		US10589	
LATITUDE		42-13.5 N	
LONGITUDE		140-40.5 E	
DEPTH (m)		89	
Press.	Temp.	Salinity	Sigma-T
5	9.230	33.517	25.921
10	9.228	33.536	25.935
20	9.242	33.545	25.940
30	9.173	33.562	25.965
40	9.136	33.564	25.972
50	9.057	33.564	25.985
75	7.020	33.534	26.261

STATION		US10592	
LATITUDE		42-18.6 N	
LONGITUDE		140-30.0 E	
DEPTH (m)		92	
Press.	Temp.	Salinity	Sigma-T
5	9.238	33.565	25.957
10	9.239	33.562	25.954
20	9.241	33.561	25.953
30	9.211	33.581	25.974
40	9.113	33.587	25.994
50	9.061	33.593	26.007
75	6.886	33.580	26.316

STATION		US10595	
LATITUDE		42-25.5 N	
LONGITUDE		140-36.8 E	
DEPTH (m)		86	
Press.	Temp.	Salinity	Sigma-T
5	9.257	33.542	25.935
10	9.255	33.553	25.945
20	9.274	33.562	25.949
30	9.274	33.563	25.949
40	9.264	33.567	25.954
50	9.240	33.568	25.959
75	7.252	33.513	26.213

STATION		US10598	
LATITUDE		41-58.2 N	
LONGITUDE		140-59.5 E	
DEPTH (m)		88	
Press.	Temp.	Salinity	Sigma-T
5	11.073	33.672	25.728
10	11.072	33.673	25.730
20	11.054	33.670	25.730
30	11.060	33.673	25.731
40	9.906	33.555	25.839
50	9.432	33.648	25.990
75	6.346	33.607	26.408

STATION		US10601	
LATITUDE		41-45.7 N	
LONGITUDE		140-40.5 E	
DEPTH (m)		31	
Press.	Temp.	Salinity	Sigma-T
5	12.849	33.662	25.386
10	12.850	33.663	25.387
20	12.851	33.666	25.389
30	12.712	33.661	25.412

STATION		US10604	
LATITUDE		41-43.3 N	
LONGITUDE		140-36.6 E	
DEPTH (m)		52	
Press.	Temp.	Salinity	Sigma-T
5	12.806	33.650	25.385
10	12.815	33.674	25.402
20	12.825	33.681	25.405
30	12.812	33.685	25.411
40	12.771	33.690	25.423
50	12.741	33.700	25.437

STATION		US10607	
LATITUDE		41-37.9 N	
LONGITUDE		140-26.8 E	
DEPTH (m)		17	
Press.	Temp.	Salinity	Sigma-T
5	11.820	33.502	25.460
10	12.015	33.579	25.483

STATION		US10608		
LATITUDE		41-37.7	N	
LONGITUDE		140-28.1	E	
DEPTH (m)		22		
Press.	Temp.	Salinity	Sigma-T	
5	11.539	33.450	25.471	
10	11.549	33.475	25.489	
20	11.590	33.478	25.483	

STATION		US10611		
LATITUDE		41-28.5	N	
LONGITUDE		140-16.8	E	
DEPTH (m)		23		
Press.	Temp.	Salinity	Sigma-T	
5	12.665	33.747	25.488	
10	12.668	33.704	25.454	

STATION		US10614		
LATITUDE		41-24.1	N	
LONGITUDE		140-06.7	E	
DEPTH (m)		73		
Press.	Temp.	Salinity	Sigma-T	
5	12.560	33.623	25.412	
10	12.285	33.739	25.556	
20	12.248	33.770	25.587	
30	12.122	33.829	25.656	
40	12.060	33.879	25.707	
50	11.886	33.961	25.804	

STATION		US10617		
LATITUDE		41-34.1	N	
LONGITUDE		140-31.7	E	
DEPTH (m)		64		
Press.	Temp.	Salinity	Sigma-T	
5	12.634	33.669	25.434	
10	12.637	33.666	25.431	
20	12.647	33.667	25.430	
30	12.643	33.666	25.430	
40	12.587	33.679	25.451	
50	12.337	33.727	25.536	

STATION		US10620		
LATITUDE		41-35.2	N	
LONGITUDE		140-52.1	E	
DEPTH (m)		54		
Press.	Temp.	Salinity	Sigma-T	
5	13.626	33.455	25.070	
10	13.640	33.456	25.068	
20	13.642	33.457	25.068	
30	13.650	33.457	25.067	
40	13.651	33.457	25.067	
50	13.656	33.459	25.067	

STATION		US10609		
LATITUDE		41-35.3	N	
LONGITUDE		140-29.0	E	
DEPTH (m)		31		
Press.	Temp.	Salinity	Sigma-T	
5	12.544	33.639	25.428	
10	12.548	33.640	25.428	
20	12.564	33.667	25.445	
30	12.570	33.668	25.445	

STATION		US10612		
LATITUDE		41-28.5	N	
LONGITUDE		140-19.9	E	
DEPTH (m)		60		
Press.	Temp.	Salinity	Sigma-T	
5	12.859	33.678	25.397	
10	12.879	33.739	25.440	
20	12.816	33.789	25.491	
30	12.617	33.823	25.557	
40	11.937	33.897	25.744	
50	11.864	33.904	25.764	

STATION		US10615		
LATITUDE		41-23.1	N	
LONGITUDE		140-05.1	E	
DEPTH (m)		111		
Press.	Temp.	Salinity	Sigma-T	
5	12.536	33.590	25.392	
10	12.537	33.603	25.401	
20	11.984	33.805	25.664	
30	11.738	33.875	25.765	
40	11.526	33.939	25.853	
50	11.394	33.973	25.904	
75	11.310	34.026	25.961	
100	11.301	34.035	25.969	

STATION		US10618		
LATITUDE		41-38.4	N	
LONGITUDE		140-48.4	E	
DEPTH (m)		328		
Press.	Temp.	Salinity	Sigma-T	
10	13.601	33.501	25.111	
20	13.606	33.494	25.105	
30	13.607	33.495	25.106	
40	13.601	33.499	25.109	
50	13.575	33.508	25.122	
75	13.489	33.535	25.160	
100	13.321	33.587	25.234	
125	13.000	33.694	25.382	
150	12.855	33.730	25.437	
175	12.643	33.765	25.507	
200	12.551	33.767	25.526	
250	12.506	33.784	25.548	
300	11.950	33.827	25.688	

STATION		US10621		
LATITUDE		41-40.2	N	
LONGITUDE		140-46.8	E	
DEPTH (m)		246		
Press.	Temp.	Salinity	Sigma-T	
5	13.520	33.517	25.140	
10	13.516	33.518	25.141	
20	13.529	33.519	25.140	
30	13.513	33.526	25.148	
40	13.491	33.533	25.158	
50	13.455	33.546	25.175	
75	13.301	33.613	25.259	
100	13.145	33.648	25.317	
125	13.006	33.706	25.390	
150	12.580	33.784	25.534	
175	12.307	33.803	25.601	
200	11.890	33.844	25.712	

STATION		US10610		
LATITUDE		41-35.1	N	
LONGITUDE		140-26.5	E	
DEPTH (m)		14		
Press.	Temp.	Salinity	Sigma-T	
5	11.843	33.156	25.187	
10	12.001	33.540	25.455	

STATION		US10613		
LATITUDE		41-26.7	N	
LONGITUDE		140-17.2	E	
DEPTH (m)		62		
Press.	Temp.	Salinity	Sigma-T	
5	12.862	33.649	25.374	
10	12.870	33.649	25.372	
20	12.889	33.733	25.434	
30	12.737	33.782	25.501	
40	12.560	33.800	25.550	
50	12.426	33.835	25.603	

STATION		US10616		
LATITUDE		41-23.2	N	
LONGITUDE		140-18.3	E	
DEPTH (m)		108		
Press.	Temp.	Salinity	Sigma-T	
5	12.733	33.755	25.481	
10	12.746	33.759	25.481	
20	12.763	33.754	25.475	
30	12.747	33.756	25.479	
40	12.622	33.803	25.540	
50	12.554	33.814	25.562	
75	12.082	33.879	25.703	
100	11.815	33.917	25.783	

STATION		US10619		
LATITUDE		41-36.9	N	
LONGITUDE		140-50.4	E	
DEPTH (m)		84		
Press.	Temp.	Salinity	Sigma-T	
5	13.614	33.493	25.102	
10	13.613	33.491	25.101	
20	13.632	33.490	25.096	
30	13.634	33.490	25.096	
40	13.634	33.490	25.095	
50	13.636	33.489	25.094	
75	13.410	33.544	25.183	

STATION		US10622		
LATITUDE		41-42.7	N	
LONGITUDE		140-44.8	E	
DEPTH (m)		88		
Press.	Temp.	Salinity	Sigma-T	
5	13.615	33.535	25.134	
10	13.624	33.548	25.143	
20	13.619	33.559	25.152	
30	13.607	33.568	25.161	
40	13.570	33.571	25.171	
50	13.501	33.574	25.188	
75	13.122	33.651	25.324	