



HOKKAIDO UNIVERSITY

Title	10. The "Ushio Maru" Cruise 212, 213 and 214 in November - December 2010
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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”.

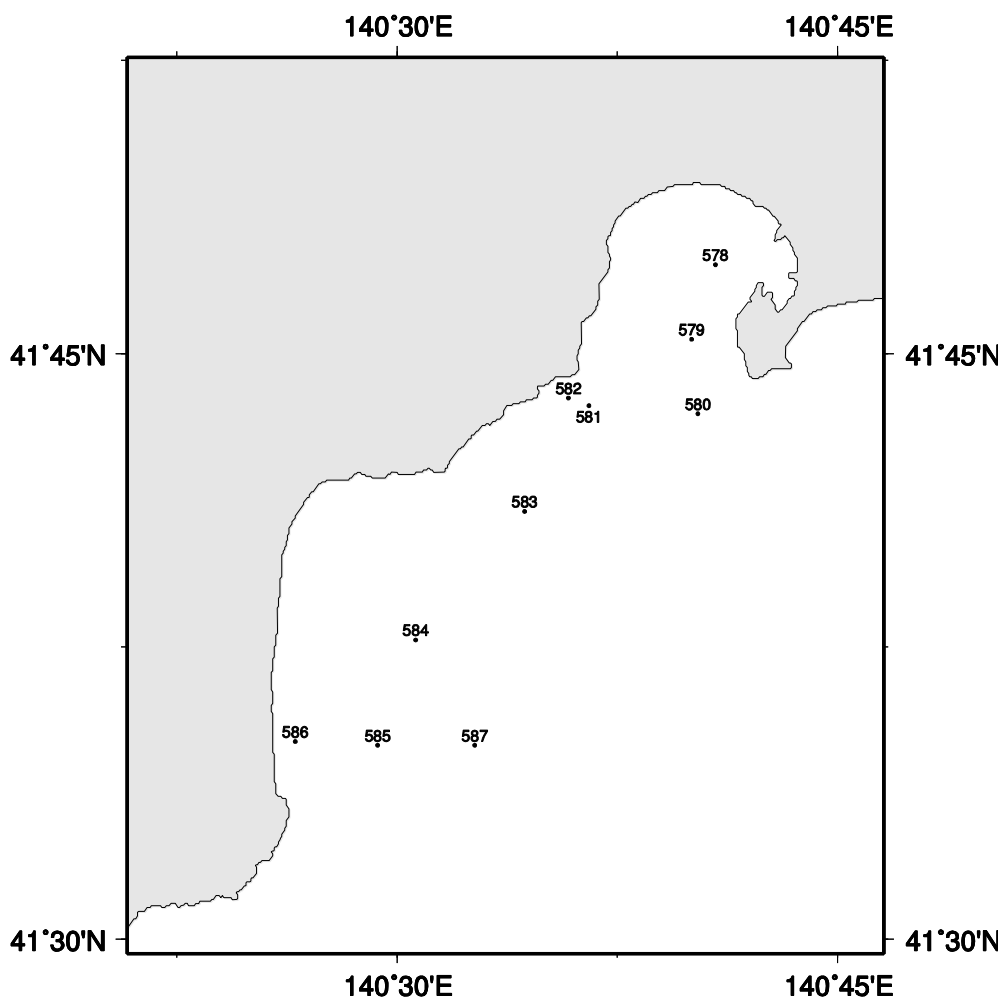


Figure 1: Oceanographic stations (Cruise 212)

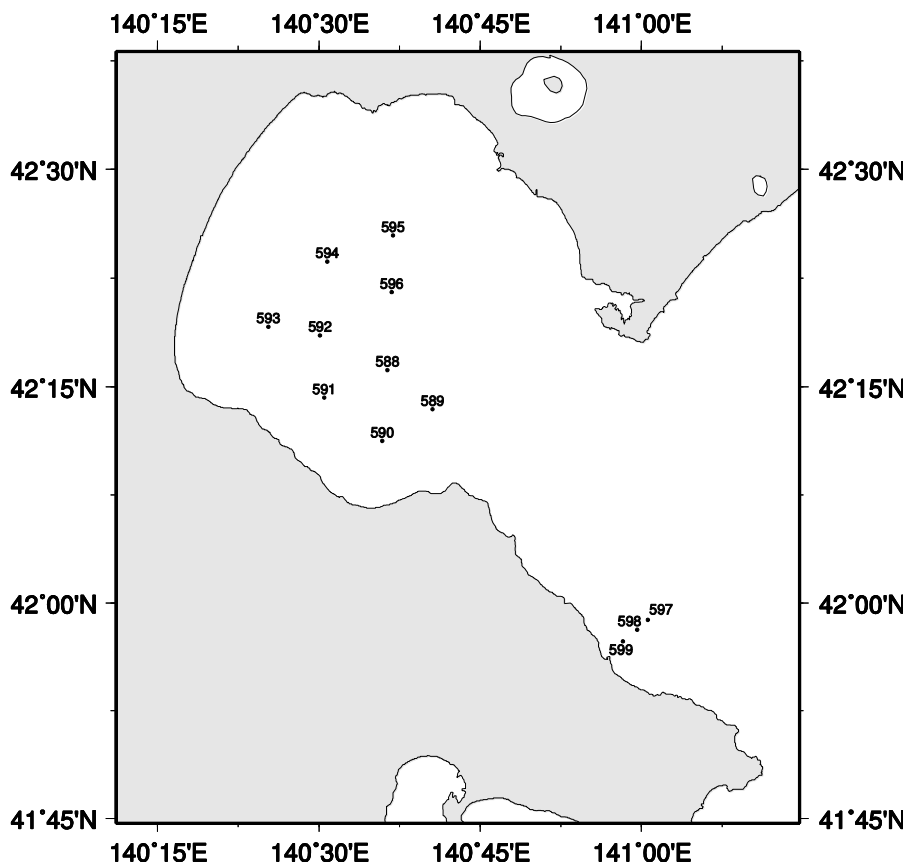


Figure 2: Oceanographic stations (Cruise 213)

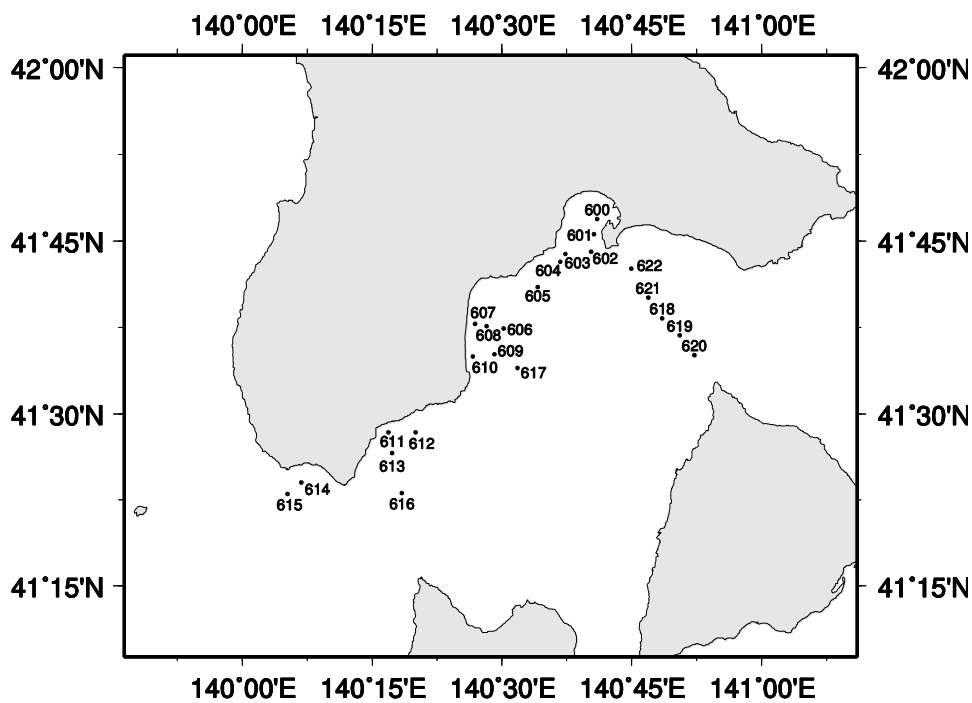


Figure 3: Oceanographic stations (Cruise 214)

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 US10578				STATION US10579				STATION US10580			
LATITUDE 41-47.3 N				LATITUDE 41-45.4 N				LATITUDE 41-43.5 N			
LONGITUDE 140-40.8 E				LONGITUDE 140-40.0 E				LONGITUDE 140-40.2 E			
DEPTH (m) 20				DEPTH (m) 42				DEPTH (m) 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
				20	14.024	33.608	25.107	20	14.014	33.582	25.088
				30	14.042	33.639	25.127	30	14.095	33.690	25.155
				40	14.083	33.682	25.151	40	13.986	33.719	25.200
STATION US10581				STATION US10582				STATION US10583			
LATITUDE 41-43.7 N				LATITUDE 41-43.9 N				LATITUDE 41-41.0 N			
LONGITUDE 140-36.5 E				LONGITUDE 140-35.8 E				LONGITUDE 140-34.3 E			
DEPTH (m) 34				DEPTH (m) 11				DEPTH (m) 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
20	13.995	33.735	25.210					20	13.862	33.588	25.125
30	13.909	33.746	25.237					30	13.904	33.600	25.125
STATION US10584				STATION US10585				STATION US10586			
LATITUDE 41-37.7 N				LATITUDE 41-35.0 N				LATITUDE 41-35.1 N			
LONGITUDE 140-30.6 E				LONGITUDE 140-29.3 E				LONGITUDE 140-26.5 E			
DEPTH (m) 33				DEPTH (m) 33				DEPTH (m) 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
20	13.968	33.624	25.131	20	14.054	33.630	25.117				
30	13.924	33.721	25.214	30	13.981	33.694	25.182				

		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	