



HOKKAIDO UNIVERSITY

Title	2. The "Ushio Maru" Cruise 218, 219 and 220 in January - February 2011
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THE " USHIO MARU "

CRUISE 218

CRUISE 219

CRUISE 220

IN JANUARY - FEBRUARY 2011

1. Cruise Itinerary

Cruise 218

Departure from Hakodate	Jan. 27, 2011
Start hydrographic research (US11028)	27
Arrival at Fukushima	27
Departure from Fukushima	28
Finish hydrographic research (US11051)	28
Return to Hakodate	29
Total coverage 118.4 miles	

Cruise 219

Departure from Hakodate	Feb. 1, 2011
Arrival at Usujiri	1
Departure from Usujiri	2
Start hydrographic research (US11052)	2
Arrival at Usujiri	2
Departure from Usujiri	3
Retrieval mooring ADCP system	3
Arrival at Usujiri	3
Departure from Usujiri	4
Set mooring ADCP system	4
Arrival at Muroran	4
Departure from Muroran and arrival at Usujiri	5
Departure from Usujiri	6
Finish hydrographic research (US11082)	6
Arrival at Usujiri	6
Departure from Usujiri	7
Return to Hakodate	8
Total coverage 380.9 miles	

Cruise 220

Departure from Hakodate	Feb. 14, 2011
Start hydrographic research (US11083)	14
Arrival at Fukushima	14
Departure from Fukushima	15
Finish hydrographic research (US11111)	15
Return to Hakodate	16
Total coverage 140.0 miles	

2. 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”.

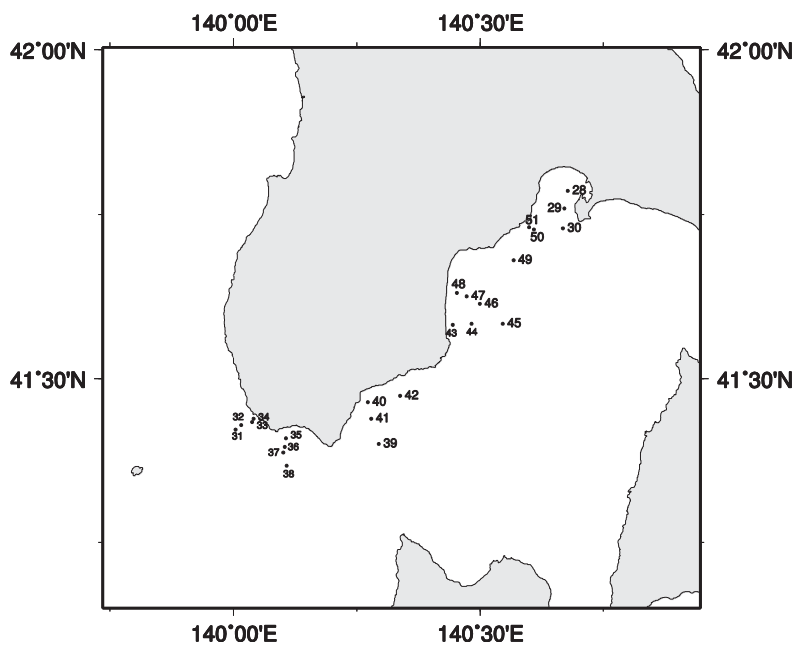


Figure 1. Oceanographic stations (Cruise 218)

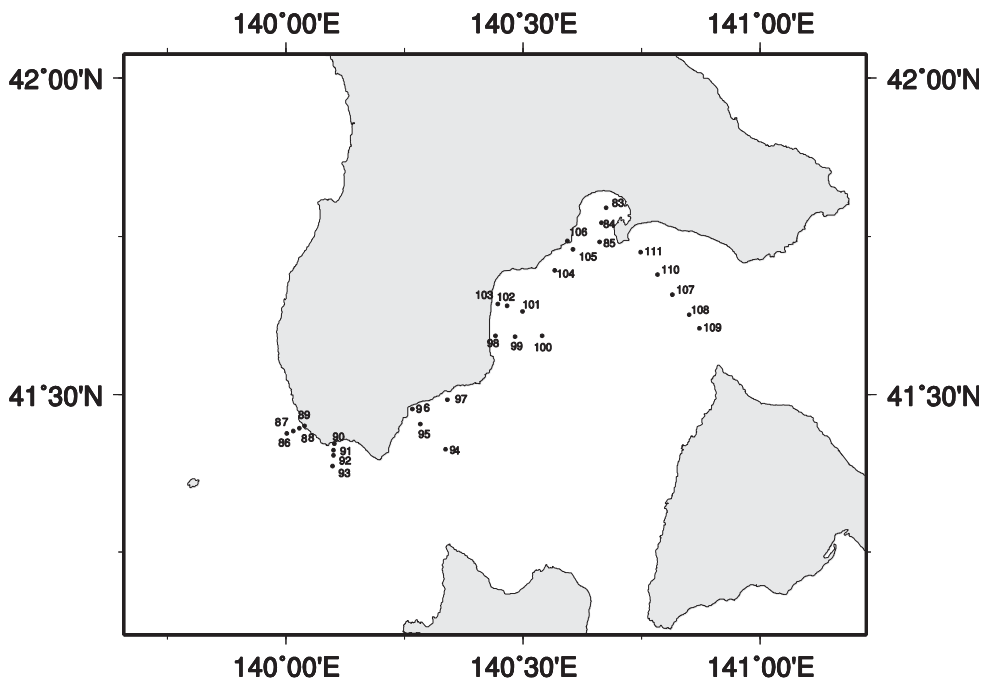


Figure 2. Oceanographic stations (Cruise 220)

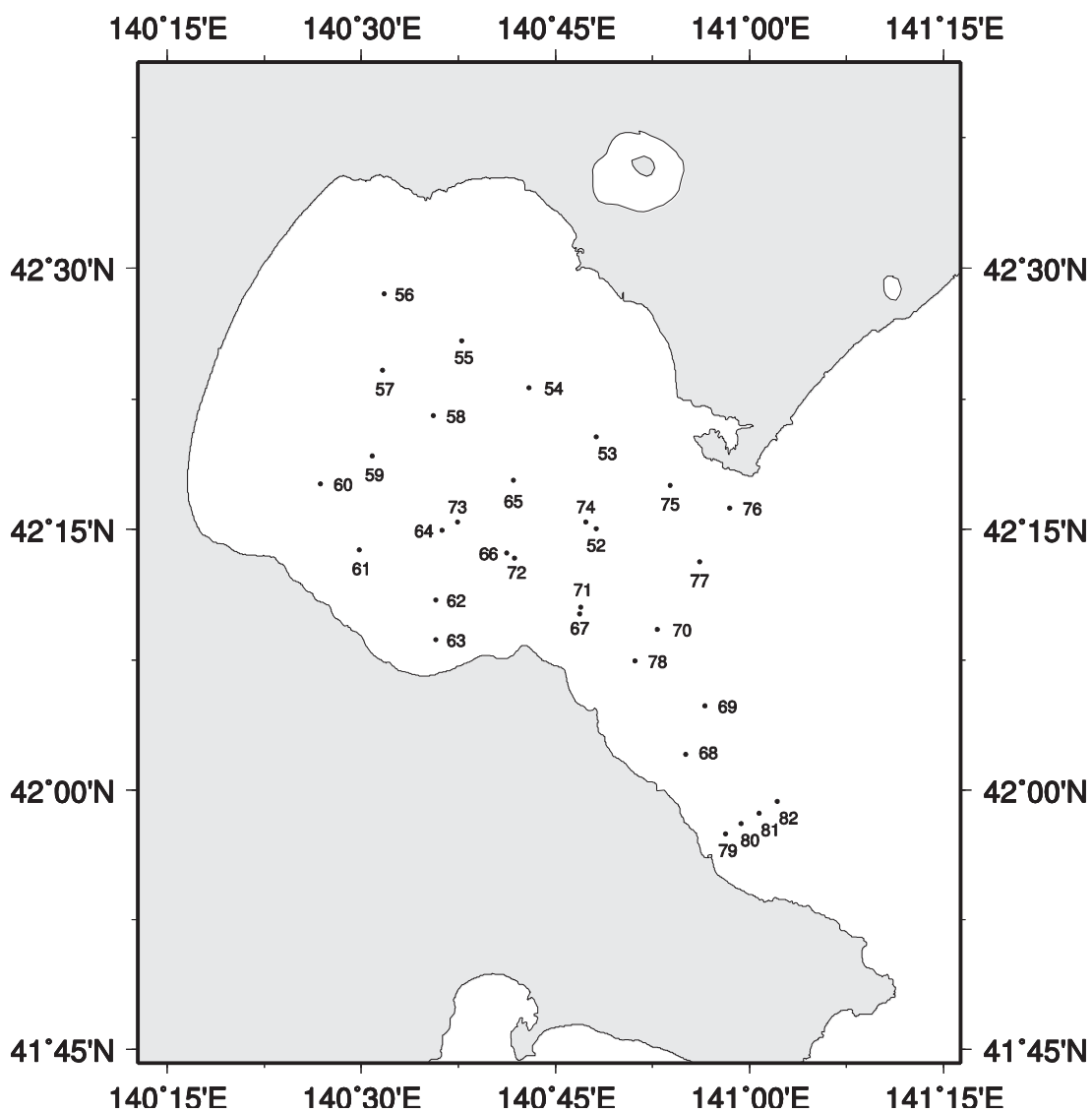


Figure 3. Oceanographic stations (Cruise 219)

Table 1: List of oceanographic stations

Cruise 218

Station	Lat. (N)*	Long. (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US11028	41-47.2	140-40.6	1/27	0858-0901	20	NNE-1	SSW-1	NNE-2	-3.2	7.5	bc	1023.6
US11029	41-45.6	140-40.2	1/27	0918-0921	35	North-1	SSW-1	North-2	-1.2	8.9	bc	1023.6
US11030	41-43.8	140-40.0	1/27	0940-0943	64	North-1	SSW-1	North-2	0.1	9.2	bc	1023.6
US11031	41-25.4	140-00.2	1/27	1309-1314	104	Calm	WNW-1	Calm	3.0	9.6	bc	1021.6
US11032	41-25.8	140-00.9	1/27	1327-1331	95	Calm	WNW-1	Calm	3.0	9.3	bc	1021.2
US11033	41-26.1	140-02.2	1/27	1349-1352	45	Calm	WNW-1	Calm	3.3	8.2	bc	1021.1
US11034	41-26.4	140-02.4	1/27	1354-1357	31	East-1	WNW-1	East-2	2.8	8.6	bc	1021.0
US11035	41-24.6	140-06.3	1/27	1434-1437	51	Calm	WNW-1	Calm	2.2	10.0	bc	1020.6
US11036	41-23.8	140-06.2	1/27	1451-1455	87	SE -1	WNW-1	SE -3	3.3	10.0	bc	1020.6
US11037	41-23.3	140-06.0	1/27	1508-1513	102	East-1	WNW-1	East-3	3.6	10.0	bc	1020.6
US11038	41-22.1	140-06.4	1/27	1530-1534	119	East-2	WNW-1	East-4	3.0	10.0	c	1020.6
US11039	41-24.1	140-17.6	1/27	1636-1640	95	East-1	West-1	East-2	1.7	9.3	c	1020.6
US11040	41-27.9	140-16.3	1/28	0741-0743	28	NW -1	South-1	NW -3	-2.0	8.0	s	1015.2
US11041	41-26.4	140-16.7	1/28	0801-0804	59	NW -1	South-1	NW -3	-1.6	8.4	s	1014.9
US11042	41-28.5	140-20.2	1/28	0838-0842	61	ENE-1	SSW-1	ENE-3	-0.5	8.9	c	1014.6
US11043	41-35.0	140-26.6	1/28	0947-0949	14	ENE-2	SSE-1	ENE-4	-0.2	8.0	s	1014.5
US11044	41-35.1	140-28.9	1/28	1010-1012	31	East-1	SSE-1	East-3	-0.2	8.8	o	1014.5
US11045	41-35.1	140-32.7	1/28	1042-1045	57	East-1	South-1	East-3	0.4	9.0	s	1014.2
US11046	41-36.9	140-29.9	1/28	1110-1113	33	NE -1	ENE-1	NE -3	0.8	8.9	c	1014.1
US11047	41-37.6	140-28.3	1/28	1137-1139	23	North-2	East-1	North-4	1.2	8.8	c	1013.8
US11048	41-37.9	140-27.1	1/28	1154-1155	17	North-2	East-1	North-4	1.2	8.6	c	1013.8
US11049	41-40.9	140-34.0	1/28	1248-1251	42	NW -1	East-1	NW -3	1.2	9.1	s	1013.5
US11050	41-43.7	140-36.5	1/28	1321-1324	35	NW -1	ESE-1	NW -3	0.9	8.8	s	1013.5
US11051	41-43.9	140-35.9	1/28	1331-1333	16	North-1	ESE-1	North-2	0.5	8.4	c	1013.5

Cruise 219

Station	Lat. (N)*	Long. (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US11052	42-15.1	140-48.1	2/2	0651-0655	71	West-1	West-1	West-3	-0.6	3.4	bc	1021
US11053	42-20.4	140-48.1	2/2	0739-0743	56	Calm	West-1	Calm	-1.5	3.5	c	1021.2
US11054	42-23.2	140-42.9	2/2	0819-0823	61	NE -1	West-1	NE -2	-1.3	4	c	1021.2
US11055	42-25.9	140-37.7	2/2	0900-0904	83	East-1	West-1	East-2	-1	3.9	c	1022.5
US11056	42-28.6	140-31.7	2/2	0944-0948	79	East-1	South-1	East-2	-0.6	4	c	1021.4
US11057	42-24.2	140-31.6	2/2	1025-1029	96	West-1	South-1	West-3	0.4	3.3	c	1021.4
US11058	42-21.6	140-35.5	2/2	1102-1107	92	NW -1	SW -1	NW -3	1	3.6	c	1021.2
US11059	42-19.3	140-30.8	2/2	1158-1202	95	SW -1	WSW-1	SW -3	2.3	3.5	bc	1021
US11060	42-17.7	140-26.8	2/2	1303-1307	77	WSW-2	WSW-1	WSW-4	2.8	3.6	bc	1020.2
US11061	42-13.9	140-29.8	2/2	1412-1416	78	West-2	West-1	West-4	2.8	3.3	bc	1020.1
US11062	42-11.0	140-35.7	2/2	1529-1533	82	SW -2	West-1	SW -4	3.1	3.3	bc	1020
US11063	42-08.7	140-35.7	2/2	1609-1613	65	WSW-2	West-1	WSW-4	2.5	3.1	bc	1020.1
US11064	42-15.0	140-36.2	2/3	0805-0810	92	NW -2	NW -1	NW -4	3.8	3.5	bc	1018.1
US11065	42-17.9	140-41.7	2/3	0918-0922	67	NW -2	NW -1	NW -4	4.3	4.1	bc	1018.6
US11066	42-13.7	140-41.2	2/3	1018-1022	89	NW -1	NW -1	NW -3	4.5	3.3	bc	1018.6
US11067	42-10.2	140-46.8	2/3	1120-1125	96	NW -1	NW -1	NW -2	4.9	3.7	bc	1018.2
US11068	42-02.1	140-55.0	2/6	0659-0703	79	Calm	ESE-1	Calm	-2	3.3	bc	1019.8
US11069	42-04.9	140-56.5	2/6	0756-0806	86	Calm	ESE-1	Calm	-1.3	3.3	bc	1020.1
US11070	42-09.3	140-52.8	2/6	0907-0911	79	SE -1	ESE-1	SE -3	0.5	3.2	c	1019.6
US11071	42-10.6	140-46.9	2/6	0939-0943	94	SE -2	ESE-1	SE -4	0.6	3.2	c	1019.1
US11072	42-13.4	140-41.8	2/6	1012-1016	89	SE -2	ESE-1	SE -4	1.2	3.4	c	1018.3
US11073	42-15.5	140-37.4	2/6	1057-1106	90	SE -2	ESE-1	SE -5	1.4	3.2	bc	1017.8
US11074	42-15.5	140-47.3	2/6	1210-1214	73	ESE-2	ESE-1	ESE-5	1.6	3.2	c	1016
US11075	42-17.6	140-53.8	2/6	1300-1310	58	SE -3	ESE-1	SE -5	1.5	3.2	c	1015.6
US11076	42-16.3	140-58.4	2/6	1355-1358	63	SE -3	ESE-1	SE -5	2.1	3.1	bc	1014.6
US11077	42-13.2	140-56.1	2/6	1420-1423	69	SE -3	ESE-1	SE -5	2.5	3.3	bc	1013.6
US11078	42-07.5	140-51.1	2/6	1503-1507	85	ESE-3	ESE-1	ESE-5	2.9	3.4	c	1012.4
US11079	41-57.5	140-58.1	2/6	1616-1620	80	SE -2	ESE-1	SE -4	3.2	3.3	c	1011.6
US11080	41-58.1	140-59.3	2/6	1627-1631	87	SE -3	ESE-1	SE -5	3.2	3.4	c	1011.6
US11081	41-58.7	141-00.7	2/6	1639-1643	96	SE -3	ESE-1	SE -5	3.2	3.4	o	1011.6
US11082	41-59.4	141-02.1	2/6	1651-1656	104	SE -3	ESE-1	SE -5	3.5	3.5	o	1011.4

Cruise 220

Station	Lat. (N)*	Long. (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US11083	41-47.0	140-40.7	2/14	0834-0836	21	North-1	SSW-1	North-2	-3.3	6.5	bc	1023.2
US11084	41-45.6	140-40.1	2/14	0855-0857	37	Calm	SSW-1	Calm	-0.6	6.7	bc	1023.2
US11085	41-43.8	140-39.9	2/14	0918-0921	64	SW -1	SSW-1	SW -2	-0.7	7.6	bc	1023.2
US11086	41-25.6	140-00.3	2/14	1255-1300	104	West-1	WNW-1	West-3	2	9	c	1021.6
US11087	41-25.8	140-01.1	2/14	1313-1317	89	NW -2	WNW-1	NW -4	2.3	9.1	c	1021.6
US11088	41-26.1	140-01.9	2/14	1330-1334	53	NW -2	WNW-1	NW -4	1.6	9.1	c	1021.6
US11089	41-26.3	140-02.5	2/14	1347-1350	29	NNW-1	WNW-1	NNW-3	2.4	9	c	1021.5
US11090	41-24.6	140-06.3	2/14	1421-1424	49	West-2	WNW-1	West-5	2	8.9	s	1021.2
US11091	41-24.0	140-06.2	2/14	1437-1441	81	West-2	WNW-1	West-4	1.1	9	s	1021.3
US11092	41-23.5	140-06.2	2/14	1454-1459	95	West-2	WNW-1	West-5	-0.1	9.2	s	1021.2
US11093	41-22.5	140-06.1	2/14	1515-1520	116	West-2	WNW-1	West-5	0.9	9	s	1021.1
US11094	41-24.1	140-20.4	2/14	1628-1632	95	SW -1	West-1	SW -3	0.5	8.9	s	1021.6
US11095	41-27.9	140-16.2	2/15	0634-0636	25	NW -2	SSE-1	NW -4	-4.2	7.1	bc	1020.6
US11096	41-26.5	140-17.2	2/15	0655-0659	63	NW -2	SSE-1	NW -5	-1.9	7.9	bc	1020.6
US11097	41-28.8	140-20.6	2/15	0735-0739	62	NNW-3	SSW-1	NNW-5	0	8	bc	1020.6
US11098	41-34.9	140-26.7	2/15	0841-0843	16	NW -1	South-1	NW -3	-0.7	7.2	bc	1021.2
US11099	41-34.8	140-29.2	2/15	0905-0907	33	NNW-1	South-1	NNW-3	0.3	7.4	bc	1021.6
US11100	41-34.9	140-32.6	2/15	0933-0936	58	NW -1	SE -1	NW -3	0.7	7.7	bc	1021.6
US11101	41-37.2	140-30.1	2/15	1005-1008	32	WNW-1	SE -1	WNW-3	-0.9	7.7	bc	1021.6
US11102	41-37.7	140-28.2	2/15	1026-1028	23	West-1	SE -1	West-2	0.2	7.5	bc	1021.6
US11103	41-37.9	140-27.0	2/15	1043-1045	17	NW -1	SE -1	NW -2	0.6	7.3	bc	1021.6
US11104	41-41.1	140-34.2	2/15	1139-1143	43	SW -1	SSE-1	SW -2	3	7.7	bc	1021.2
US11105	41-43.1	140-36.5	2/15	1213-1216	51	NW -1	South-1	NW -3	3.0	7.6	bc	1020.6
US11106	41-43.9	140-35.8	2/15	1224-1226	16	NNW-2	South-1	NNW-4	2.4	7.6	bc	1020.6
US11107	41-38.8	140-49.1	2/15	1343-1354	349	West-2	WNW-1	West-4	2.8	8.6	bc	1019.8
US11108	41-36.9	140-51.2	2/15	1412-1417	94	West-3	WNW-1	West-5	2.7	8.6	bc	1019.7
US11109	41-35.6	140-52.5	2/15	1427-1430	35	WNW-3	WNW-1	WNW-5	2.8	8.6	bc	1020.1
US11110	41-40.7	140-47.2	2/15	1510-1518	227	West-3	West-1	West-5	2.0	8.5	bc	1020.1
US11111	41-42.8	140-45.1	2/15	1537-1541	86	West-3	West-1	West-5	2.2	8.4	bc	1020.2

(*) : Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION		US11028	
LATITUDE		41-47.2	N
LONGITUDE		140-40.6	E
DEPTH (m)		20	
Press.	Temp.	Salinity	Sigma-T
5	8.764	33.821	26.232
10	8.703	33.804	26.228

STATION		US11029	
LATITUDE		41-45.6	N
LONGITUDE		140-40.2	E
DEPTH (m)		35	
Press.	Temp.	Salinity	Sigma-T
5	9.421	33.909	26.196
10	9.424	33.904	26.192
20	9.110	33.863	26.210
30	9.049	33.865	26.222

STATION		US11030	
LATITUDE		41-43.8	N
LONGITUDE		140-40.0	E
DEPTH (m)		64	
Press.	Temp.	Salinity	Sigma-T
5	9.557	33.914	26.178
10	9.562	33.913	26.176
20	9.527	33.908	26.178
30	9.414	33.895	26.186
40	9.306	33.884	26.195
50	9.042	33.832	26.197

STATION		US11031	
LATITUDE		41-25.4	N
LONGITUDE		140-00.2	E
DEPTH (m)		104	
Press.	Temp.	Salinity	Sigma-T
5	9.381	33.946	26.232
10	9.296	33.942	26.242
20	9.058	33.947	26.285
30	8.921	33.948	26.307
40	8.753	33.960	26.343
50	8.705	33.978	26.364
75	8.665	33.966	26.361
100	7.752	33.974	26.505

STATION		US11032	
LATITUDE		41-25.8	N
LONGITUDE		140-00.9	E
DEPTH (m)		95	
Press.	Temp.	Salinity	Sigma-T
5	9.584	33.925	26.182
10	9.248	33.896	26.214
20	8.926	33.941	26.301
30	8.724	33.943	26.334
40	8.372	33.947	26.391
50	8.146	33.967	26.441
75	7.870	33.960	26.476

STATION		US11033	
LATITUDE		41-26.1	N
LONGITUDE		140-02.2	E
DEPTH (m)		45	
Press.	Temp.	Salinity	Sigma-T
5	8.324	33.946	26.397
10	8.307	33.956	26.408
20	8.259	33.955	26.414
30	8.258	33.956	26.415
40	8.299	33.957	26.410

STATION		US11034	
LATITUDE		41-26.4	N
LONGITUDE		140-02.4	E
DEPTH (m)		31	
Press.	Temp.	Salinity	Sigma-T
5	8.728	33.927	26.321
10	8.704	33.946	26.339
20	8.729	33.941	26.331
30	8.732	33.944	26.334

STATION		US11035	
LATITUDE		41-24.6	N
LONGITUDE		140-06.3	E
DEPTH (m)		51	
Press.	Temp.	Salinity	Sigma-T
5	10.260	33.918	26.063
10	10.143	33.918	26.083
20	9.553	33.891	26.160
30	9.278	33.910	26.220
40	9.196	33.916	26.238
50	8.934	33.869	26.243

STATION		US11036	
LATITUDE		41-23.8	N
LONGITUDE		140-06.2	E
DEPTH (m)		87	
Press.	Temp.	Salinity	Sigma-T
5	10.293	33.922	26.060
10	10.275	33.920	26.062
20	10.099	33.921	26.093
30	9.973	33.916	26.110
40	9.858	33.912	26.127
50	9.664	33.910	26.157
75	9.113	33.911	26.247

STATION		US11037	
LATITUDE		41-23.3	N
LONGITUDE		140-06.0	E
DEPTH (m)		102	
Press.	Temp.	Salinity	Sigma-T
5	10.295	33.921	26.059
10	10.300	33.924	26.061
20	10.160	33.921	26.083
30	10.096	33.920	26.093
40	10.013	33.921	26.107
50	9.987	33.920	26.111
75	9.508	33.895	26.171
100	9.278	33.905	26.216

STATION		US11038	
LATITUDE		41-22.1	N
LONGITUDE		140-06.4	E
DEPTH (m)		119	
Press.	Temp.	Salinity	Sigma-T
5	10.307	33.892	26.035
10	10.310	33.923	26.058
20	10.311	33.922	26.057
30	10.244	33.919	26.066
40	9.794	33.900	26.128
50	9.538	33.911	26.179
75	9.435	33.914	26.198
100	9.146	33.910	26.241

STATION		US11039	
LATITUDE		41-24.1	N
LONGITUDE		140-17.6	E
DEPTH (m)		95	
Press.	Temp.	Salinity	Sigma-T
5	9.755	33.831	26.080
10	9.736	33.881	26.123
20	9.518	33.911	26.181
30	9.483	33.915	26.191
40	9.409	33.912	26.200
50	9.305	33.912	26.217
75	9.052	33.912	26.258

STATION		US11040	
LATITUDE		41-27.9	N
LONGITUDE		140-16.3	E
DEPTH (m)		28	
Press.	Temp.	Salinity	Sigma-T
5	8.959	33.981	26.327
10	9.116	33.979	26.300
20	9.117	33.972	26.295

STATION		US11041	
LATITUDE		41-26.4	N
LONGITUDE		140-16.7	E
DEPTH (m)		59	
Press.	Temp.	Salinity	Sigma-T
5	9.266	33.926	26.235
10	9.257	33.925	26.235
20	9.240	33.924	26.237
30	9.187	33.927	26.248
40	9.187	33.918	26.241
50	9.146	33.923	26.251

STATION		US11042	
LATITUDE		41-28.5	N
LONGITUDE		140-20.2	E
DEPTH (m)		61	
Press.	Temp.	Salinity	Sigma-T
5	9.257	33.914	26.227
10	9.257	33.915	26.227
20	9.306	33.929	26.231
30	9.279	33.922	26.230
40	9.081	33.928	26.266
50	9.063	33.935	26.274

STATION		US11043	
LATITUDE		41-35.0	N
LONGITUDE		140-26.6	E
DEPTH (m)		14	
Press.	Temp.	Salinity	Sigma-T
5	7.838	33.692	26.270
10	7.848	33.754	26.318

STATION		US11044	
LATITUDE		41-35.1	N
LONGITUDE		140-28.9	E
DEPTH (m)		31	
Press.	Temp.	Salinity	Sigma-T
5	9.019	33.879	26.237
10	9.015	33.881	26.240
20	9.019	33.880	26.238

STATION		US11045	
LATITUDE		41-35.1	N
LONGITUDE		140-32.7	E
DEPTH (m)		57	
Press.	Temp.	Salinity	Sigma-T
5	9.377	33.916	26.209
10	9.380	33.916	26.208
20	9.360	33.912	26.208
30	9.351	33.916	26.213
40	9.323	33.913	26.216
50	9.319	33.913	26.216

STATION US11046			
LATITUDE 41-36.9 N			
LONGITUDE 140-29.9 E			
DEPTH (m) 33			
Press.	Temp.	Salinity	Sigma-T
5	9.181	33.899	26.227
10	9.185	33.903	26.230
20	9.166	33.902	26.232
30	9.165	33.902	26.232

STATION US11049			
LATITUDE 41-40.9 N			
LONGITUDE 140-34.0 E			
DEPTH (m) 42			
Press.	Temp.	Salinity	Sigma-T
5	9.213	33.893	26.217
10	9.175	33.891	26.222
20	9.102	33.866	26.214
30	9.022	33.869	26.229
40	9.003	33.864	26.228

STATION US11052			
LATITUDE 42-15.1 N			
LONGITUDE 140-48.1 E			
DEPTH (m) 71			
Press.	Temp.	Salinity	Sigma-T
5	3.719	33.191	26.375
10	3.724	33.199	26.381
20	3.731	33.201	26.381
30	3.799	33.226	26.395
40	4.017	33.344	26.468
50	3.998	33.459	26.560

STATION US11055			
LATITUDE 42-25.9 N			
LONGITUDE 140-37.7 E			
DEPTH (m) 83			
Press.	Temp.	Salinity	Sigma-T
5	4.047	33.488	26.579
10	4.047	33.486	26.577
20	4.318	33.543	26.594
40	4.338	33.536	26.587
50	4.342	33.540	26.589
75	4.367	33.556	26.599

STATION US11058			
LATITUDE 42-21.6 N			
LONGITUDE 140-35.5 E			
DEPTH (m) 92			
Press.	Temp.	Salinity	Sigma-T
5	3.901	33.388	26.514
10	3.899	33.396	26.520
20	3.914	33.401	26.523
30	3.982	33.413	26.525
40	4.037	33.428	26.532
50	4.391	33.496	26.550
75	4.232	33.515	26.581

STATION US11061			
LATITUDE 42-13.9 N			
LONGITUDE 140-29.8 E			
DEPTH (m) 78			
Press.	Temp.	Salinity	Sigma-T
5	3.494	33.197	26.401
10	3.496	33.204	26.406
20	3.474	33.207	26.411
30	3.945	33.418	26.533
40	4.390	33.519	26.568
50	4.498	33.533	26.567
75	4.413	33.533	26.576

STATION US11047			
LATITUDE 41-37.6 N			
LONGITUDE 140-28.3 E			
DEPTH (m) 23			
Press.	Temp.	Salinity	Sigma-T
5	9.016	33.883	26.241
10	9.022	33.883	26.240
20	9.016	33.884	26.242

STATION US11050			
LATITUDE 41-43.7 N			
LONGITUDE 140-36.5 E			
DEPTH (m) 35			
Press.	Temp.	Salinity	Sigma-T
5	9.172	33.896	26.226
10	8.955	33.867	26.238
20	9.069	33.920	26.262
30	9.074	33.930	26.269

STATION US11053			
LATITUDE 42-20.4 N			
LONGITUDE 140-48.1 E			
DEPTH (m) 56			
Press.	Temp.	Salinity	Sigma-T
5	3.911	33.478	26.584
10	3.945	33.486	26.587
20	3.984	33.492	26.589
30	4.079	33.509	26.593
40	4.135	33.531	26.604
50	4.150	33.534	26.605

STATION US11056			
LATITUDE 42-28.6 N			
LONGITUDE 140-31.7 E			
DEPTH (m) 79			
Press.	Temp.	Salinity	Sigma-T
5	4.354	33.566	26.609
10	4.358	33.566	26.609
20	4.362	33.567	26.609
30	4.362	33.566	26.608
40	4.364	33.567	26.609
50	4.366	33.567	26.609
75	4.373	33.568	26.609

STATION US11059			
LATITUDE 42-19.3 N			
LONGITUDE 140-30.8 E			
DEPTH (m) 95			
Press.	Temp.	Salinity	Sigma-T
5	3.635	33.326	26.490
10	3.664	33.337	26.496
20	3.774	33.385	26.524
30	3.950	33.436	26.547
40	4.017	33.454	26.555
50	4.054	33.458	26.554
75	4.243	33.503	26.570

STATION US11062			
LATITUDE 42-11.0 N			
LONGITUDE 140-35.7 E			
DEPTH (m) 82			
Press.	Temp.	Salinity	Sigma-T
5	3.710	33.267	26.436
10	3.746	33.293	26.453
20	3.795	33.352	26.496
30	4.012	33.474	26.571
40	4.190	33.549	26.612
50	4.193	33.547	26.611
75	4.189	33.546	26.610

STATION US11048			
LATITUDE 41-37.9 N			
LONGITUDE 140-27.1 E			
DEPTH (m) 17			
Press.	Temp.	Salinity	Sigma-T
5	8.643	33.827	26.255
10	8.647	33.842	26.267

STATION US11051			
LATITUDE 41-43.9 N			
LONGITUDE 140-35.9 E			
DEPTH (m) 16			
Press.	Temp.	Salinity	Sigma-T
5	9.048	33.852	26.212
10	9.092	33.860	26.211

STATION US11054			
LATITUDE 42-23.2 N			
LONGITUDE 140-42.9 E			
DEPTH (m) 61			
Press.	Temp.	Salinity	Sigma-T
5	4.301	33.558	26.608
10	4.308	33.570	26.617
20	4.306	33.570	26.617
30	4.310	33.570	26.617
40	4.310	33.570	26.616
50	4.309	33.568	26.615

STATION US11057			
LATITUDE 42-24.2 N			
LONGITUDE 140-31.6 E			
DEPTH (m) 96			
Press.	Temp.	Salinity	Sigma-T
5	3.682	33.310	26.473
10	3.681	33.344	26.500
20	4.223	33.501	26.571
30	4.376	33.552	26.596
40	4.386	33.556	26.598
50	4.289	33.543	26.598
75	4.290	33.553	26.605

STATION US11060			
LATITUDE 42-17.7 N			
LONGITUDE 140-26.8 E			
DEPTH (m) 77			
Press.	Temp.	Salinity	Sigma-T
5	3.872	33.515	26.618
10	3.875	33.538	26.636
20	3.945	33.559	26.645
30	3.970	33.555	26.640
40	3.970	33.555	26.640
50	3.971	33.556	26.641
75	3.969	33.558	26.642

STATION US11063			
LATITUDE 42-08.7 N			
LONGITUDE 140-35.7 E			
DEPTH (m) 65			
Press.	Temp.	Salinity	Sigma-T
5	3.434	33.246	26.446
10	3.432	33.255	26.453
20	3.437	33.257	26.454
30	3.467	33.277	26.467
40	3.848	33.367	26.502
50	4.500	33.544	26.576

STATION		US11064		
LATITUDE		42-15.0	N	
LONGITUDE		140-36.2	E	
DEPTH (m)		92		
Press.	Temp.	Salinity	Sigma-T	
5	3.866	33.385	26.515	
10	4.036	33.465	26.561	
20	4.115	33.478	26.564	
30	4.139	33.488	26.569	
40	4.162	33.509	26.584	
50	4.246	33.540	26.600	
75	4.279	33.546	26.601	

STATION		US11065		
LATITUDE		42-17.9	N	
LONGITUDE		140-41.7	E	
DEPTH (m)		67		
Press.	Temp.	Salinity	Sigma-T	
5	4.265	33.567	26.619	
10	4.262	33.565	26.618	
20	4.250	33.562	26.616	
30	4.238	33.560	26.617	
40	4.246	33.561	26.617	
50	4.253	33.562	26.616	

STATION		US11066		
LATITUDE		42-13.7	N	
LONGITUDE		140-41.2	E	
DEPTH (m)		89		
Press.	Temp.	Salinity	Sigma-T	
5	3.663	33.208	26.394	
10	3.641	33.206	26.395	
20	3.847	33.307	26.455	
30	4.191	33.409	26.501	
40	4.015	33.444	26.547	
50	4.030	33.498	26.588	
75	4.067	33.532	26.611	

STATION		US11067		
LATITUDE		42-10.2	N	
LONGITUDE		140-46.8	E	
DEPTH (m)		96		
Press.	Temp.	Salinity	Sigma-T	
5	3.634	33.217	26.404	
10	3.587	33.208	26.401	
20	3.722	33.260	26.429	
30	4.266	33.422	26.504	
40	4.393	33.475	26.532	
50	4.011	33.438	26.543	
75	4.121	33.527	26.602	

STATION		US11068		
LATITUDE		42-02.1	N	
LONGITUDE		140-55.0	E	
DEPTH (m)		79		
Press.	Temp.	Salinity	Sigma-T	
5	3.600	33.219	26.409	
10	3.602	33.220	26.409	
20	3.604	33.215	26.405	
30	3.622	33.213	26.402	
40	3.620	33.209	26.398	
50	3.614	33.205	26.396	
75	3.821	33.322	26.469	

STATION		US11069		
LATITUDE		42-04.9	N	
LONGITUDE		140-56.5	E	
DEPTH (m)		86		
Press.	Temp.	Salinity	Sigma-T	
5	3.608	33.225	26.412	
10	3.615	33.223	26.410	
20	3.639	33.227	26.411	
30	3.645	33.229	26.412	
40	3.689	33.238	26.415	
50	3.693	33.240	26.417	
75	3.809	33.305	26.457	

STATION		US11070		
LATITUDE		42-09.3	N	
LONGITUDE		140-52.8	E	
DEPTH (m)		79		
Press.	Temp.	Salinity	Sigma-T	
5	3.501	33.228	26.425	
10	3.507	33.229	26.426	
20	3.510	33.229	26.425	
30	3.512	33.230	26.426	
40	3.525	33.232	26.426	
50	3.530	33.233	26.426	
75	3.973	33.339	26.467	

STATION		US11071		
LATITUDE		42-10.6	N	
LONGITUDE		140-46.9	E	
DEPTH (m)		94		
Press.	Temp.	Salinity	Sigma-T	
5	3.478	33.192	26.399	
10	3.474	33.191	26.398	
20	3.625	33.288	26.462	
30	3.878	33.333	26.472	
40	4.156	33.441	26.530	
50	4.526	33.515	26.550	
75	4.165	33.529	26.600	

STATION		US11072		
LATITUDE		42-13.4	N	
LONGITUDE		140-41.8	E	
DEPTH (m)		89		
Press.	Temp.	Salinity	Sigma-T	
5	3.733	33.375	26.520	
10	3.729	33.374	26.519	
20	3.739	33.374	26.519	
30	4.134	33.524	26.599	
40	4.290	33.569	26.618	
50	4.309	33.569	26.616	
75	4.331	33.572	26.616	

STATION		US11073		
LATITUDE		42-15.5	N	
LONGITUDE		140-37.4	E	
DEPTH (m)		90		
Press.	Temp.	Salinity	Sigma-T	
5	3.882	33.424	26.544	
10	3.880	33.423	26.544	
20	3.877	33.423	26.544	
30	3.878	33.425	26.545	
40	3.880	33.426	26.546	
50	3.994	33.453	26.556	
75	4.282	33.553	26.606	

STATION		US11074		
LATITUDE		42-15.5	N	
LONGITUDE		140-47.3	E	
DEPTH (m)		73		
Press.	Temp.	Salinity	Sigma-T	
5	3.607	33.222	26.410	
10	3.602	33.223	26.411	
20	3.603	33.221	26.410	
30	3.648	33.247	26.426	
40	4.467	33.496	26.541	
50	4.407	33.480	26.535	

STATION		US11075		
LATITUDE		42-17.6	N	
LONGITUDE		140-53.8	E	
DEPTH (m)		58		
Press.	Temp.	Salinity	Sigma-T	
5	3.604	33.280	26.457	
10	3.623	33.284	26.458	
20	3.652	33.290	26.461	
30	3.729	33.325	26.480	
40	3.718	33.328	26.484	
50	3.995	33.413	26.524	

STATION		US11076		
LATITUDE		42-16.3	N	
LONGITUDE		140-58.4	E	
DEPTH (m)		63		
Press.	Temp.	Salinity	Sigma-T	
5	3.476	33.211	26.414	
10	3.471	33.224	26.425	
20	3.449	33.229	26.431	
30	3.421	33.229	26.433	
40	3.418	33.228	26.433	
50	3.385	33.224	26.433	

STATION		US11077		
LATITUDE		42-13.2	N	
LONGITUDE		140-56.1	E	
DEPTH (m)		69		
Press.	Temp.	Salinity	Sigma-T	
5	3.626	33.241	26.424	
10	3.622	33.242	26.425	
20	3.619	33.243	26.426	
30	3.620	33.244	26.426	
40	3.712	33.272	26.440	
50	3.744	33.279	26.442	

STATION		US11078		
LATITUDE		42-07.5	N	
LONGITUDE		140-51.1	E	
DEPTH (m)		85		
Press.	Temp.	Salinity	Sigma-T	
5	3.703	33.047	26.261	
10	3.707	33.216	26.396	
20	3.701	33.218	26.398	
30	3.663	33.229	26.410	
40	3.655	33.231	26.413	
50	3.817	33.297	26.450	
75	4.169	33.539	26.607	

STATION		US11079		
LATITUDE		41-57.5	N	
LONGITUDE		140-58.1	E	
DEPTH (m)		80		
Press.	Temp.	Salinity	Sigma-T	
5	3.708	33.208	26.390	
10	3.711	33.208	26.389	
20	3.707	33.210	26.391	
30	3.685	33.208	26.391	
40	3.684	33.210	26.394	
50	3.698	33.214	26.396	
75	3.885	33.341	26.478	

STATION		US11080		
LATITUDE		41-58.1	N	
LONGITUDE		140-59.3	E	
DEPTH (m)		87		
Press.	Temp.	Salinity	Sigma-T	
5	3.732	33.208	26.387	
10	3.732	33.207	26.386	
20	3.718	33.205	26.386	
30	3.686	33.206	26.390	
40	3.679	33.208	26.392	
50	3.674	33.208	26.393	
75	3.709	33.217	26.397	

STATION		US11081	
LATITUDE		41-58.7	N
LONGITUDE		141-00.7	E
DEPTH (m)		96	
Press.	Temp.	Salinity	Sigma-T
5	3.839	33.208	26.377
10	3.842	33.214	26.381
20	3.813	33.211	26.382
30	3.726	33.209	26.388
40	3.705	33.211	26.392
50	3.683	33.211	26.394
75	3.671	33.212	26.396

STATION	US11082		
LATITUDE	41-59.4	N	
LONGITUDE	141-02.1	E	
DEPTH (m)	104		
Press.	Temp.	Salinity	Sigma-T
5	3.832	33.211	26.380
10	3.812	33.216	26.386
20	3.683	33.216	26.398
30	3.669	33.218	26.401
40	3.649	33.223	26.407
50	3.654	33.229	26.411
75	3.659	33.230	26.412
100	3.780	33.282	26.441

STATION	US11085		
LATITUDE	41-43.8	N	
LONGITUDE	140-39.9	E	
DEPTH (m)	64		
Press.	Temp.	Salinity	Sigma-T
5	8.081	33.918	26.412
10	8.084	33.916	26.410
20	8.081	33.912	26.407
30	7.972	33.900	26.414
40	7.863	33.912	26.439
50	7.859	33.913	26.441

STATION	US11088		
LATITUDE	41-26.1	N	
LONGITUDE	140-01.9	E	
DEPTH (m)	53		
Press.	Temp.	Salinity	Sigma-T
5	9.272	33.850	26.174
10	9.271	33.850	26.175
20	9.190	33.846	26.184
30	9.106	33.847	26.198
40	9.006	33.853	26.219
50	8.798	33.858	26.255

STATION	US11091		
LATITUDE	41-24.0	N	
LONGITUDE	140-06.2	E	
DEPTH (m)	81		
Press.	Temp.	Salinity	Sigma-T
5	9.376	33.857	26.163
10	9.370	33.857	26.164
20	9.322	33.853	26.168
30	9.318	33.853	26.169
40	9.314	33.853	26.170
50	9.314	33.852	26.169
75	9.016	33.868	26.229

STATION	US11094		
LATITUDE	41-24.1	N	
LONGITUDE	140-20.4	E	
DEPTH (m)	95		
Press.	Temp.	Salinity	Sigma-T
5	9.264	33.797	26.134
10	9.273	33.865	26.185
20	9.286	33.863	26.182
30	9.283	33.863	26.183
40	9.279	33.864	26.184
50	9.247	33.859	26.185
75	8.421	33.906	26.352

STATION	US11097		
LATITUDE	41-28.8	N	
LONGITUDE	140-20.6	E	
DEPTH (m)	62		
Press.	Temp.	Salinity	Sigma-T
5	8.265	33.917	26.384
10	8.265	33.921	26.387
20	8.117	33.931	26.417
30	7.991	33.933	26.437
40	7.821	33.940	26.468
50	7.543	33.959	26.523

STATION	US11083		
LATITUDE	41-47.0	N	
LONGITUDE	140-40.7	E	
DEPTH (m)	21		
Press.	Temp.	Salinity	Sigma-T
5	6.952	33.685	26.390
10	6.984	33.747	26.434

STATION	US11086		
LATITUDE	41-25.6	N	
LONGITUDE	140-00.3	E	
DEPTH (m)	104		
Press.	Temp.	Salinity	Sigma-T
5	9.299	33.841	26.163
10	9.286	33.837	26.162
20	9.077	33.858	26.212
30	8.966	33.862	26.232
40	8.908	33.866	26.245
50	8.874	33.866	26.250
75	8.621	33.880	26.300
100	8.194	33.921	26.397

STATION	US11089		
LATITUDE	41-26.3	N	
LONGITUDE	140-02.5	E	
DEPTH (m)	29		
Press.	Temp.	Salinity	Sigma-T
5	9.146	33.840	26.187
10	9.151	33.852	26.195
20	8.991	33.854	26.222

STATION	US11092		
LATITUDE	41-23.5	N	
LONGITUDE	140-06.2	E	
DEPTH (m)	95		
Press.	Temp.	Salinity	Sigma-T
5	9.346	33.860	26.170
10	9.356	33.859	26.168
20	9.339	33.858	26.170
30	9.255	33.859	26.184
40	9.194	33.869	26.201
50	9.185	33.870	26.204
75	9.106	33.873	26.219

STATION	US11095		
LATITUDE	41-27.9	N	
LONGITUDE	140-16.2	E	
DEPTH (m)	25		
Press.	Temp.	Salinity	Sigma-T
5	7.653	33.958	26.506
10	7.660	33.958	26.505
20	7.670	33.952	26.499

STATION	US11098		
LATITUDE	41-34.9	N	
LONGITUDE	140-26.7	E	
DEPTH (m)	16		
Press.	Temp.	Salinity	Sigma-T
10	7.571	33.851	26.434

STATION	US11084		
LATITUDE	41-45.6	N	
LONGITUDE	140-40.1	E	
DEPTH (m)	37		
Press.	Temp.	Salinity	Sigma-T
5	7.182	33.781	26.434
10	7.181	33.823	26.467
20	7.491	33.876	26.465
30	7.490	33.872	26.462

STATION	US11087		
LATITUDE	41-25.8	N	
LONGITUDE	140-01.1	E	
DEPTH (m)	89		
Press.	Temp.	Salinity	Sigma-T
5	9.292	33.836	26.160
10	9.272	33.847	26.172
20	9.192	33.853	26.189
30	9.165	33.855	26.195
40	9.155	33.855	26.197
50	9.115	33.846	26.196
75	8.723	33.878	26.283

STATION	US11090		
LATITUDE	41-24.6	N	
LONGITUDE	140-06.3	E	
DEPTH (m)	49		
Press.	Temp.	Salinity	Sigma-T
5	9.277	33.840	26.166
10	9.279	33.841	26.166
20	9.231	33.848	26.179
30	9.167	33.847	26.189
40	9.023	33.856	26.219
50	8.863	33.868	26.254

STATION	US11093		
LATITUDE	41-22.5	N	
LONGITUDE	140-06.1	E	
DEPTH (m)	116		
Press.	Temp.	Salinity	Sigma-T
5	9.000	33.872	26.235
10	9.007	33.876	26.237
20	9.030	33.875	26.233
30	9.034	33.875	26.232
40	9.038	33.875	26.231
50	9.049	33.879	26.232
75	8.544	33.899	26.327
100	8.418	33.907	26.352

STATION	US11096		
LATITUDE	41-26.5	N	
LONGITUDE	140-17.2	E	
DEPTH (m)	63		
Press.	Temp.	Salinity	Sigma-T
5	8.547	33.900	26.327
10	8.395	33.890	26.343
20	7.888	33.936	26.455
30	7.881	33.940	26.459
40	7.833	33.943	26.468
50	7.821	33.943	26.470

STATION	US11099		
LATITUDE	41-34.8	N	
LONGITUDE	140-29.2	E	
DEPTH (m)	33		
Press.	Temp.	Salinity	Sigma-T
5	7.746	33.913	26.457
10	7.741	33.925	26.468
20	7.736	33.927	26.470
30	7.724	33.925	26.470

STATION US11100			
LATITUDE 41-34.9 N			
LONGITUDE 140-32.6 E			
DEPTH (m) 58			
Press.	Temp.	Salinity	Sigma-T
5	7.917	33.899	26.421
10	7.918	33.916	26.435
20	7.921	33.917	26.435
30	7.910	33.916	26.435
40	7.802	33.916	26.452
50	7.709	33.917	26.466

STATION US11103			
LATITUDE 41-37.9 N			
LONGITUDE 140-27.0 E			
DEPTH (m) 17			
Press.	Temp.	Salinity	Sigma-T
5	7.497	33.916	26.496
10	7.493	33.917	26.497

STATION US11106			
LATITUDE 41-43.9 N			
LONGITUDE 140-35.8 E			
DEPTH (m) 16			
Press.	Temp.	Salinity	Sigma-T
5	6.654	33.666	26.415
10	7.297	33.850	26.472

STATION US11109			
LATITUDE 41-35.6 N			
LONGITUDE 140-52.5 E			
DEPTH (m) 35			
Press.	Temp.	Salinity	Sigma-T
5	8.789	33.848	26.249
10	8.730	33.870	26.276
20	8.711	33.880	26.286
30	8.574	33.891	26.316

STATION US11101			
LATITUDE 41-37.2 N			
LONGITUDE 140-30.1 E			
DEPTH (m) 32			
Press.	Temp.	Salinity	Sigma-T
5	7.792	33.935	26.468
10	7.788	33.935	26.468
20	7.777	33.936	26.471
30	7.778	33.936	26.471

STATION US11104			
LATITUDE 41-41.1 N			
LONGITUDE 140-34.2 E			
DEPTH (m) 43			
Press.	Temp.	Salinity	Sigma-T
5	7.967	33.913	26.425
10	7.959	33.912	26.426
20	7.923	33.913	26.432
30	7.845	33.915	26.444
40	7.835	33.917	26.448

STATION US11107			
LATITUDE 41-38.8 N			
LONGITUDE 140-49.1 E			
DEPTH (m) 349			
Press.	Temp.	Salinity	Sigma-T
5	8.810	33.884	26.274
10	8.814	33.885	26.274
20	8.816	33.884	26.273
30	8.816	33.883	26.273
40	8.804	33.884	26.275
50	8.802	33.884	26.275
75	8.818	33.882	26.272
100	8.797	33.883	26.275
125	8.766	33.882	26.280
150	8.708	33.888	26.293
175	8.714	33.884	26.289
200	8.579	33.900	26.322
250	8.556	33.902	26.328
300	8.465	33.905	26.344

STATION US11110			
LATITUDE 41-40.7 N			
LONGITUDE 140-47.2 E			
DEPTH (m) 227			
Press.	Temp.	Salinity	Sigma-T
5	8.874	33.876	26.258
10	8.851	33.870	26.257
20	8.712	33.883	26.288
30	8.603	33.896	26.315
40	8.582	33.899	26.321
50	8.544	33.901	26.329
75	8.537	33.903	26.331
100	8.496	33.906	26.340
125	8.457	33.909	26.348
150	8.413	33.911	26.357
175	8.271	33.911	26.378
200	8.145	33.920	26.404

STATION US11102			
LATITUDE 41-37.7 N			
LONGITUDE 140-28.2 E			
DEPTH (m) 23			
Press.	Temp.	Salinity	Sigma-T
5	7.512	33.907	26.486
10	7.457	33.906	26.493
20	7.460	33.921	26.504

STATION US11105			
LATITUDE 41-43.1 N			
LONGITUDE 140-36.5 E			
DEPTH (m) 51			
Press.	Temp.	Salinity	Sigma-T
5	8.009	33.902	26.411
10	8.006	33.902	26.411
20	7.977	33.899	26.413
30	7.957	33.900	26.417
40	7.913	33.899	26.422
50	7.803	33.897	26.436

STATION US11108			
LATITUDE 41-36.9 N			
LONGITUDE 140-51.2 E			
DEPTH (m) 94			
Press.	Temp.	Salinity	Sigma-T
5	8.969	33.868	26.236
10	8.962	33.868	26.238
20	8.960	33.869	26.239
30	8.953	33.867	26.239
40	8.953	33.869	26.240
50	8.957	33.867	26.238
75	8.883	33.870	26.252

STATION US11111			
LATITUDE 41-42.8 N			
LONGITUDE 140-45.1 E			
DEPTH (m) 86			
Press.	Temp.	Salinity	Sigma-T
5	8.549	33.894	26.322
10	8.550	33.894	26.323
20	8.484	33.899	26.336
30	8.437	33.906	26.349
40	8.392	33.909	26.358
50	8.371	33.910	26.362
75	8.291	33.911	26.375