



HOKKAIDO UNIVERSITY

Title	PART II -4. THE " USHIO MARU " CRUISE 388, CRUISE 389, CRUISE 390 IN MAY - JUNE 2017
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THE " USHIO MARU "

CRUISE 388

CRUISE 389

CRUISE 390

IN MAY 2017

IN JUNE 2017

1.Cruise Itinerary

1. Cruise Itinerary

Cruise 388

Departure from Hakodate	May	9, 2017
Start hydrographic research (US17204)		9
Towing frame trawl net		9
Aarrival at Usujiri		9
Departure from Usujiri		10
Towing frame trawl net		10
Retrieving mooring ADCP system		10
Arrival at Muroran		10
Departure from Muroran		11
Towing frame trawl net		11
Setting mooring ADCP system		11
Aarrival at Usujiri		11
Departure from Usujiri		12
Sampling by mid-water trawl net		12
Aarrival at Muroran		12
Departure from Muroran		12
Finish hydrographic research (US17227)		12
Return to Hakodate		13
Total coverage 374.6 miles		

Cruise 389

Departure from Hakodate	May.	19, 2017
Aarrival at Usujiri		19
Departure from Usujiri		19
Start hydrographic research (US17228)		19
Hook and line jigging for pointhead flounder		20
Towing frame trawl net		20
Echo sounding research by EK-60		21
Aarrival at Usujiri		21
Departure from Usujiri		21
Towing frame trawl net		21
Towing frame trawl net		22
Observation by underwater camera		22
Aarrival at Hakodate		23
Departure from Hakodate		24
Finish hydrographic research (US17250)		26
Return to Hakodate		26
Total coverage 514.8 miles		

Cruise 390		
Departure from Hakodate	May.	29, 2017
Start hydrographic research (US17251)		29
Sampling by bottom trawl net		29
Arrival at Aomori		29
Departure from Aomori		30
Sampling by bottom trawl net		30
Arrival at Noheji		30
Departure from Noheji		31
Sampling by bottom trawl net		31
Arrival at Ominato		31
Departure from Ominato	Jun.	1, 2017
Finish hydrographic research (US17274)		1
Return to Hakodate		2
Total coverage 212.2 miles		

2. Data on Temperature, Salinity and Pressure

Hydrographic work on deck and the data processing were made by the deck officers, crews, research staff and cadets of the “Ushio Maru”. Temperature, salinity and pressure were measured by CTD (Seabird SBE-19Plus and SBE-19).

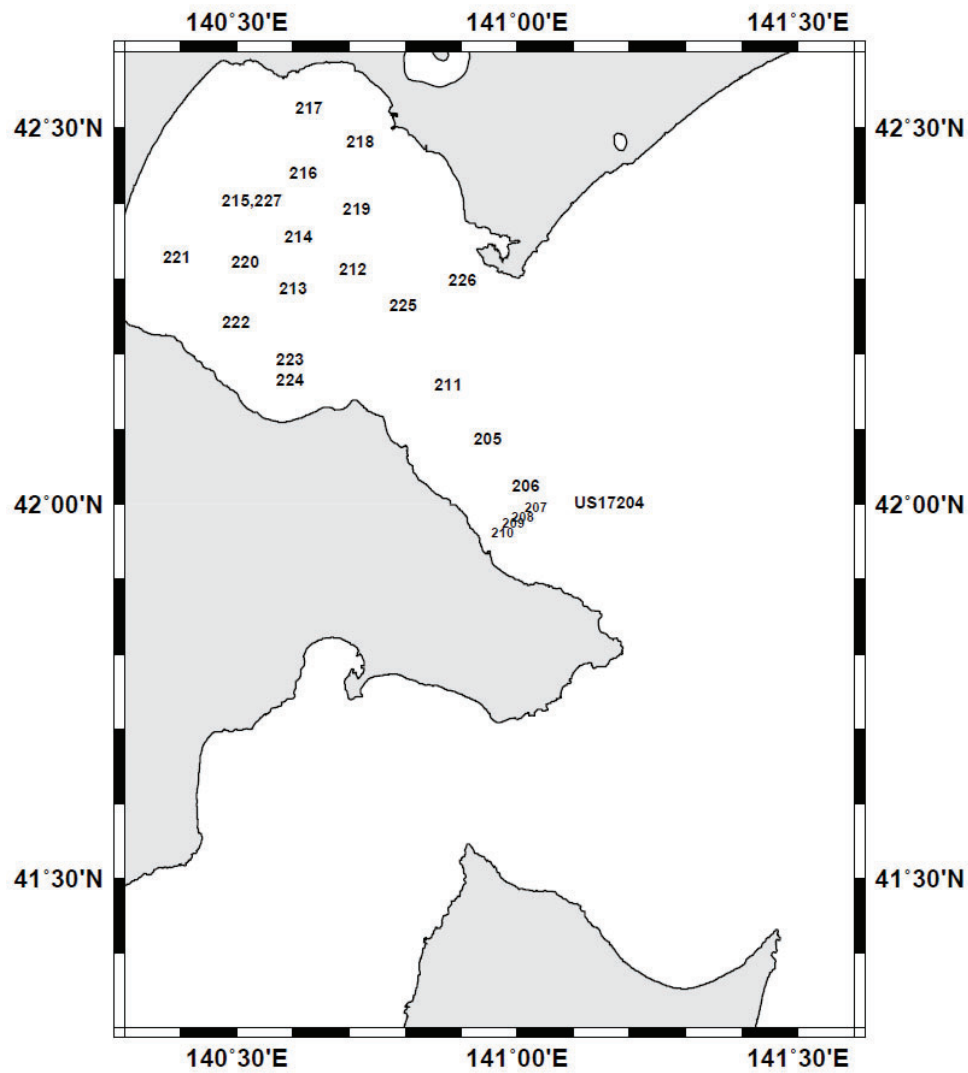


Figure 1. Oceanographic stations (Cruise 388)

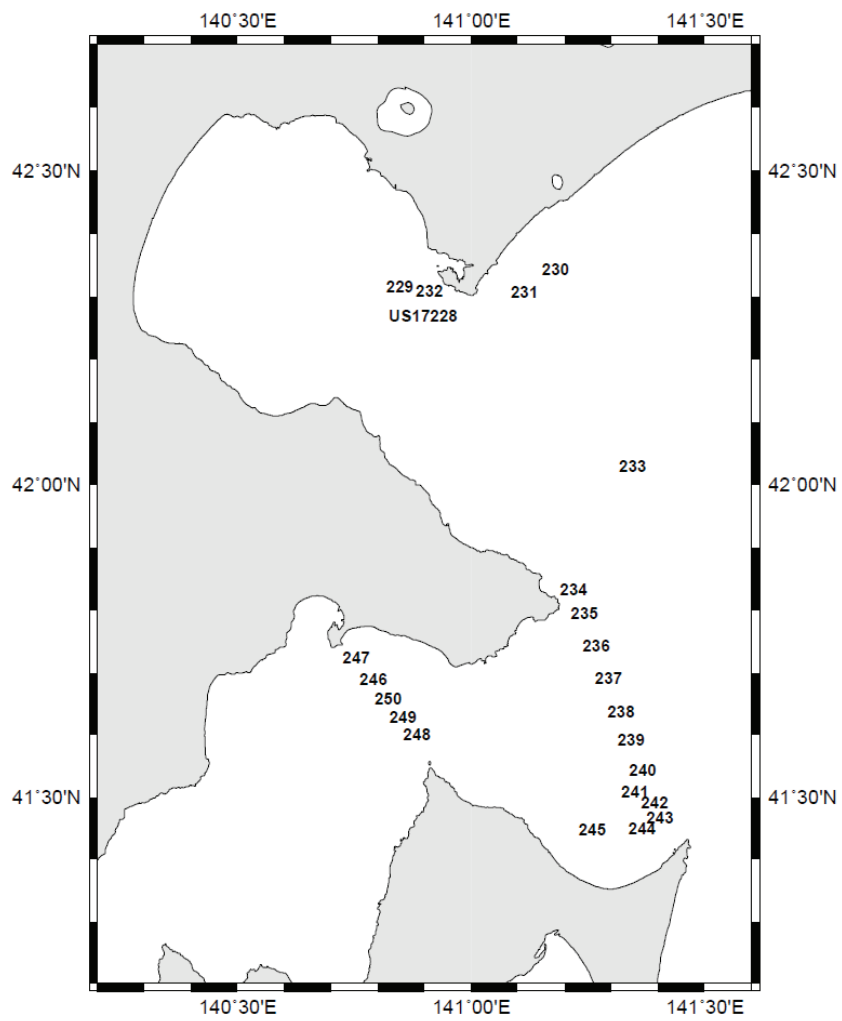


Figure 2. Oceanographic stations (Cruise 389)

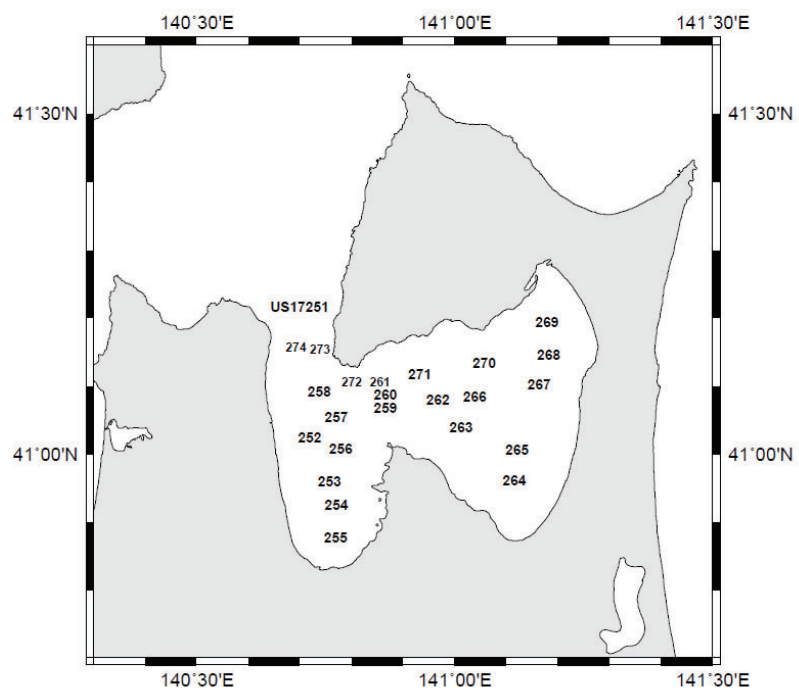


Figure 3. Oceanographic stations (Cruise 390)

Table 1. List of Oceanographic Station

Crs388												
station	Lat. (N)°	Long. (E)°	Date	Hour (JST)	Depth (m)	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar (hPa)
US17204	41-59.7	141-09.8	5/9	1154-1204	137	South-2	South-1	South-2	10.1	6.1	b	1019.3
US17205	42-04.8	140-56.8	5/9	1325-1333	84	SE-2	ESE-1	SE-3	12.4	6.7	b	1018.2
US17206	42-01.0	141-00.9	5/9	1433-1441	91	Calm	ESE-1	Calm	11.6	6.6	b	1018.2
US17207	41-59.4	141-02.0	5/9	1514-1523	102	Calm	ESE-1	Calm	15.8	7.3	b	1018.4
US17208	41-58.6	141-00.6	5/9	1534-1541	94	Calm	ESE-1	Calm	13.8	5.9	b	1018.4
US17209	41-58.1	140-59.6	5/9	1549-1557	87	ESE-1	ESE-1	ESE-2	13.2	7.5	b	1018.3
US17210	41-57.4	140-58.4	5/9	1605-1610	80	SE-1	ESE-1	SE-2	14.8	7.7	b	1018.3
US17211	42-09.1	140-52.6	5/10	0615-0620	78	ENE-2	ENE-1	ENE-4	7.8	6.5	c	1017.3
US17212	42-18.3	140-42.4	5/10	0743-0750	62	ESE-2	ESE-1	ESE-4	8.9	7.7	o	1017
US17213	42-16.8	140-36.0	5/10	0904-0913	90	ESE-3	ESE-1	ESE-5	9.3	7.7	o	1016.1
US17214	42-20.9	140-36.6	5/10	1013-1021	82	East-3	East-1	East-5	9.6	7.5	o	1016.2
US17215	42-23.7	140-31.6	5/10	1106-1112	94	East-3	East-1	East-5	9.6	7.7	o	1017.2
US17216	42-26.0	140-37.1	5/10	1158-1206	86	ESE-3	ESE-1	ESE-5	9.3	7.5	o	1014.8
US17217	42-31.1	140-37.7	5/10	1237-1246	61	SE-3	ESE-1	SE-4	9.4	7.4	o	1014.6
US17218	42-28.4	140-43.2	5/10	1336-1342	60	SSE-3	SE-1	SSE-5	9.4	6.5	o	1014
US17219	42-23.1	140-42.8	5/10	1436-1442	60	ESE-3	SE-1	ESE-5	10.1	7.3	o	1012.5
US17220	42-18.9	140-30.9	5/11	0830-0838	93	SSE-2	ESE-1	SSE-3	8.1	7.5	r	1005.8
US17221	42-19.3	140-23.6	5/11	0912-0918	56	South-1	ESE-1	South-2	8.3	7.6	r	1005.5
US17222	42-14.1	140-29.9	5/11	1023-1028	77	Calm	ESE-1	Calm	8.3	7.7	m	1005.7
US17223	42-11.1	140-35.7	5/11	1129-1135	80	Calm	ESE-1	Calm	8.6	7.7	m	1005.6
US17224	42-09.5	140-35.7	5/11	1154-1202	70	Calm	ESE-1	Calm	8.4	7.7	m	1005.6
US17225	42-15.4	140-47.8	5/11	1325-1330	71	Calm	ESE-1	Calm	9.6	7.7	m	1005.6
US17226	42-17.4	140-54.1	5/12	0756-0801	56	East-1	SE-1	East-3	8.1	7.6	o	1015.6
US17227	42-23.8	140-31.3	5/12	1157-1204	95	ESE-2	SE-1	ESE-4	9.8	8	bc	1016.8

Crs389												
station	Lat. (N)°	Long. (E)°	Date	Hour (JST)	Depth (m)	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar (hPa)
US17228	42-15.6	140-53.8	5/19	1953-1957	60	Calm	ESE-1	Calm	14.2	11.2	bc	1013.6
US17229	42-18.4	140-50.8	5/19	2051-2054	59	NW-1	SE-1	NW-3	14.1	11.8	bc	1013.6
US17230	42-20.0	141-10.8	5/20	1041-1048	78	ENE-2	ESE-1	ENE-3	10.7	7.8	bc	1013.4
US17231	42-17.9	141-06.8	5/20	1113-1118	71	Calm	ESE-1	Calm	13.5	8.2	bc	1013.3
US17232	42-18.0	140-54.6	5/20	1540-1547	56	Calm	SE-1	Calm	17.2	10.2	bc	1013
US17233	42-01.2	141-20.7	5/21	1615-1635	324	ESE-2	SE-1	ESE-4	9.3	7.7	bc	1014.7
US17234	41-49.4	141-13.1	5/24	1124-1139	169	East-1	East-1	East-2	9.8	7.6	o	1010.6
US17235	41-47.1	141-14.5	5/24	1249-1307	199	West-2	East-1	West-3	14.8	7.9	o	1010.5
US17236	41-44.0	141-16.0	5/24	1333-1352	230	SSW-2	SE-1	SSW-3	13	7.4	o	1010.5
US17237	41-40.9	141-17.6	5/24	1416-1433	232	WSW-2	SE-1	WSW-3	12.1	8.7	o	1010.5
US17238	41-37.7	141-19.2	5/24	1456-1513	214	WSW-2	East-1	WSW-4	12.7	9.4	o	1010.5
US17239	41-34.9	141-20.5	5/24	1532-1554	323	West-2	ESE-1	West-4	13.7	12.1	o	1010.7
US17240	41-32.0	141-22.0	5/24	1615-1632	255	ESE-2	SE-1	ESE-4	13.6	11.9	o	1010.7
US17241	41-29.9	141-21.0	5/24	1737-1756	226	SSE-2	SE-1	SSE-3	13.2	12.1	o	1010.7
US17242	41-28.9	141-23.5	5/24	1811-1820	93	East-2	SE-1	East-3	13.3	12.2	o	1010.8
US17243	41-27.4	141-24.2	5/25	0701-0706	48	NNE-2	NNE-1	NNE-4	11.2	12.1	f	1012.6
US17244	41-26.4	141-21.9	5/25	0727-0734	67	NNE-1	NNE-1	NNE-3	11.1	12	f	1012.1
US17245	41-26.3	141-15.5	5/25	0801-0808	78	NNE-1	NNE-1	NNE-2	10.7	12.1	m	1012.1
US17246	41-40.8	140-47.4	5/25	1143-1200	225	East-1	ENE-1	East-4	13	12	o	1011.9
US17247	41-42.8	140-45.2	5/25	1220-1227	84	ESE-2	East-1	ESE-4	13.4	11.7	o	1011.2
US17248	41-35.5	140-53.0	5/26	0328-0333	43	East-3	East-1	East-5	12.7	13.6	o	1018.8
US17249	41-37.1	140-51.2	5/26	0352-0401	101	East-3	East-1	East-5	12.5	13.1	o	1019.1
US17250	41-38.9	140-49.3	5/26	0417-0442	343	East-3	East-1	East-4	12.6	13.8	o	1019.3

Table 1. List of Oceanographic Station (continued)

Crs390												
station	Lat. (N)°	Long. (E)°	Date	Hour (JST)	Depth (m)	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar (hPa)
US17251	41-12.5	140-41.9	5/29	1146-1152	76	West-3	WNW-1	West-5	18.7	13.7	bc	1011.6
US17252	41-01.0	140-43.1	5/29	1328-1336	55	West-3	West-1	West-5	19.2	13.3	bc	1011.1
US17253	40-57.1	140-45.4	5/29	1408-1414	46	West-3	West-1	West-5	19.4	13.5	bc	1011.5
US17254	40-55.1	140-46.2	5/29	1458-1503	40	West-3	West-1	West-4	20.1	13.8	bc	1010.5
US17255	40-52..2	140-46.1	5/29	1527-1531	29	West-3	West-1	West-4	19.5	13.8	bc	1010.7
US17256	41-00.0	140-46.7	5/30	0755-0804	51	Calm	NW-1	Calm	18	13.5	o	1010.1
US17257	41-02.8	140-46.2	5/30	0900-0903	52	Calm	NW-1	Calm	17.5	13.7	o	1010.1
US17258	41-05.1	140-44.2	5/30	0934-0938	60	Calm	NNW-1	Calm	17.4	13.7	o	1009.8
US17259	41-03.6	140-51.9	5/30	1105-1109	50	Calm	WNW-1	Calm	17.4	13.5	c	1009.6
US17260	41-04.8	140-51.9	5/30	1127-1131	51	Calm	WNW-1	Calm	16.5	13.4	c	1009.8
US17261	41-06.0	140-51.3	5/30	1142-1146	51	ESE-1	SSW-1	ESE-2	17.4	13.6	c	1009.6
US17262	41-04.3	140-58.0	5/30	1314-1317	49	Calm	SSW-1	Calm	21.6	14.5	bc	1009.1
US17263	41-01.9	141-00.7	5/30	1338-1342	47	WSW-1	SSW-1	WSE-2	20.2	14.2	bc	1009
US17264	40-57.2	141-06.9	5/30	1430-1435	36	NW-1	NW-1	NW-4	23.8	15.2	bc	1008.5
US17265	40-59.9	141-07.2	5/31	0735-0739	42	South-1	SW-1	South-2	16.9	14.2	c	1007
US17266	41-04.6	141-02.3	5/31	0841-0845	47	South-1	SW-1	South-2	16.2	14.1	bc	1006.8
US17267	41-05.7	141-09.8	5/31	0949-0953	38	West-1	SW-1	West-2	19.4	14.4	bc	1006.5
US17268	41-08.3	141-10.9	5/31	1013-1016	34	NW-3	SW-1	NW-3	18.6	14.4	bc	1006.4
US17269	41-11.2	141-10.7	5/31	1042-1044	28	West-1	SW-1	West-2	19.9	14.4	bc	1006.3
US17270	41-07.6	141-03.4	6/1	0802-0806	38	NE-3	NE-1	NE-5	14.4	14	o	1004.7
US17271	41-06.6	140-55.9	6/1	0848-0852	46	ENE-3	NE-1	ENE-5	14.6	14.5	o	1004.5
US17272	41-06.0	140-48.0	6/1	0929-0935	45	ENE-3	NE-1	ENE-4	15.4	14.3	o	1003.7
US17273	41-08.8	140-44.3	6/1	1004-1016	63	NE-2	ESE-1	NE-4	15.1	13.2	o	1003.2
US17274	41-09.0	140-41.5	6/1	1035-1040	52	East-2	ESE-1	East-3	15.3	14	o	1003.2

Table 2. Oceanographic data

STATION US17204			
LATITUDE 41-59.7 N			
LONGITUDE 141-09.8 E			
DEPTH (m) 137			
Press.	Temp.	Salinity	Sigma-T
5	5.6078	32.5226	25.6424
10	5.4457	32.5264	25.6643
20	4.8861	32.478	25.6887
30	2.6539	32.7835	26.1452
40	3.2984	32.9858	26.2509
50	2.9912	33.0727	26.3475
75	4.5758	33.4277	26.4756
100	4.9433	33.5612	26.5409
125	4.6346	33.5223	26.5442
132	4.6033	33.5265	26.551

STATION US17207			
LATITUDE 41-59.4 N			
LONGITUDE 141-02.0 E			
DEPTH (m) 102			
Press.	Temp.	Salinity	Sigma-T
5	5.7179	32.5543	25.6544
10	5.3576	32.6077	25.7388
20	4.6299	32.5713	25.7902
30	3.2243	32.6789	26.0127
40	4.7911	33.2348	26.2991
50	4.4098	33.3094	26.3992
75	5.2089	33.5046	26.4659
97	4.6569	33.4917	26.5175

STATION US17210			
LATITUDE 41-57.4 N			
LONGITUDE 140-58.4 E			
DEPTH (m) 80			
Press.	Temp.	Salinity	Sigma-T
5	7.7365	32.019	24.9707
10	6.8196	32.1449	25.1941
20	6.2374	32.2255	25.3317
30	4.9945	32.3292	25.5588
40	3.9497	32.9915	26.1936
50	4.5296	33.2093	26.3071
73	4.4563	33.4776	26.5279

STATION US17213			
LATITUDE 42-16.8 N			
LONGITUDE 140-36.0 E			
DEPTH (m) 90			
Press.	Temp.	Salinity	Sigma-T
5	7.8631	32.1505	25.0562
10	7.74	32.1446	25.069
20	5.3953	32.1359	25.3607
30	3.5328	32.4364	25.7916
40	3.3972	32.5672	25.9083
50	3.5111	32.6864	25.9928
75	4.7917	33.5377	26.5393
87	4.792	33.611	26.598

STATION US17216			
LATITUDE 42-26.0 N			
LONGITUDE 140-37.1 E			
DEPTH (m) 86			
Press.	Temp.	Salinity	Sigma-T
5	7.736	32.0819	25.0203
10	7.6136	32.0702	25.0282
20	3.6965	32.4274	25.7693
30	3.576	32.4999	25.8383
40	3.5931	32.5519	25.878
50	3.5372	32.75	26.041
72	4.7238	33.4126	26.4474

STATION US17205			
LATITUDE 42-04.8 N			
LONGITUDE 140-56.8 E			
DEPTH (m) 84			
Press.	Temp.	Salinity	Sigma-T
5	6.4018	32.3894	25.4404
10	5.9314	32.3413	25.4604
20	3.7467	32.3086	25.6698
30	3.043	32.6523	26.0076
40	3.4689	32.8667	26.1403
50	3.5794	33.0873	26.3055
75	4.916	33.4238	26.4351
81	4.9056	33.4331	26.4436

STATION US17208			
LATITUDE 41-58.6 N			
LONGITUDE 141-00.6 E			
DEPTH (m) 94			
Press.	Temp.	Salinity	Sigma-T
5	6.0447	32.2133	25.3457
10	5.2523	32.2847	25.495
20	5.0653	32.5294	25.7097
30	3.6368	32.8873	26.141
40	4.4368	33.0558	26.195
50	5.236	33.4271	26.4014
75	4.9162	33.4783	26.4783
89	4.5612	33.4962	26.5315

STATION US17211			
LATITUDE 42-09.1 N			
LONGITUDE 140-52.6 E			
DEPTH (m) 78			
Press.	Temp.	Salinity	Sigma-T
5	6.6327	32.2467	25.2985
10	6.6104	32.2562	25.3088
20	6.2104	32.286	25.3827
30	4.873	32.368	25.6029
40	2.9581	32.586	25.962
50	2.8075	32.7751	26.1257
71	4.8564	33.3642	26.3945

STATION US17214			
LATITUDE 42-20.9 N			
LONGITUDE 140-36.6 E			
DEPTH (m) 82			
Press.	Temp.	Salinity	Sigma-T
5	7.7555	32.1405	25.0636
10	7.7488	32.1395	25.0638
20	5.3976	32.0334	25.2794
30	3.3275	32.4438	25.8162
40	3.4985	32.5843	25.9126
50	3.3479	32.6965	26.0157
75	4.7912	33.5296	26.5329
82	4.8044	33.5955	26.5837

STATION US17217			
LATITUDE 42-31.1 N			
LONGITUDE 140-37.7 E			
DEPTH (m) 61			
Press.	Temp.	Salinity	Sigma-T
5	7.3118	32.096	25.09
10	6.8761	32.1085	25.158
20	4.4698	32.3088	25.5986
30	3.4308	32.4895	25.8433
40	3.3331	32.5952	25.9364
50	4.4451	33.2598	26.3562
57	4.7462	33.3491	26.3946

STATION US17206			
LATITUDE 42-01.0 N			
LONGITUDE 141-00.9 E			
DEPTH (m) 91			
Press.	Temp.	Salinity	Sigma-T
5	5.5085	32.6083	25.7217
10	4.8871	32.5921	25.779
20	4.2158	32.5248	25.7961
30	2.9821	32.9367	26.2397
40	4.273	33.1198	26.2629
50	5.2268	33.449	26.4198
75	4.8107	33.4294	26.4512
88	4.6413	33.4796	26.5096

STATION US17209			
LATITUDE 41-58.1 N			
LONGITUDE 140-59.6 E			
DEPTH (m) 87			
Press.	Temp.	Salinity	Sigma-T
5	6.7688	32.2158	25.2565
10	5.5347	32.2875	25.465
20	5.0692	32.4437	25.6414
30	4.5876	32.3345	25.6066
40	3.5359	33.1052	26.3239
50	4.7035	33.3035	26.3631
75	4.5588	33.4761	26.5158
83	4.52	33.4922	26.5327

STATION US17212			
LATITUDE 42-18.3 N			
LONGITUDE 140-42.4 E			
DEPTH (m) 62			
Press.	Temp.	Salinity	Sigma-T
5	7.7871	32.0868	25.0169
10	7.4684	32.0717	25.0495
20	6.0518	32.0257	25.1965
30	3.1346	32.3892	25.7898
40	2.9539	32.5737	25.9525
50	3.0869	32.6144	25.9735
59	3.5476	32.9767	26.2209

STATION US17215			
LATITUDE 42-23.7 N			
LONGITUDE 140-31.6 E			
DEPTH (m) 94			
Press.	Temp.	Salinity	Sigma-T
5	7.8057	32.079	25.0082
10	7.648	32.0361	24.9967
20	3.7735	32.3201	25.6765
30	3.5741	32.4979	25.8368
40	3.079	32.5604	25.9311
50	3.5685	32.7846	26.0656
75	4.7903	33.5707	26.5656
82	4.7974	33.6082	26.5946

STATION US17218			
LATITUDE 42-28.4 N			
LONGITUDE 140-43.2 E			
DEPTH (m) 60			
Press.	Temp.	Salinity	Sigma-T
5	6.8355	32.1195	25.172
10	6.616	32.099	25.1842
20	3.812	32.2997	25.6567
30	3.4085	32.5008	25.8544
40	3.3762	32.5855	25.9248
50	3.8293	33.0533	26.2545
57	4.5084	33.2617	26.3509

STATION US17219			
LATITUDE 42-23.1 N			
LONGITUI 140-42.8 E			
DEPTH (m) 60			
Press.	Temp.	Salinity	Sigma-T
5	7.5304	32.0985	25.062
10	7.505	32.0906	25.0593
20	5.2187	32.1904	25.4241
30	3.3769	32.4641	25.828
40	3.4639	32.5399	25.8805
50	3.4563	32.6329	25.9552
56	3.5638	32.874	26.1372

STATION US17220			
LATITUDE 42-18.9 N			
LONGITUI 140-30.9 E			
DEPTH (m) 93			
Press.	Temp.	Salinity	Sigma-T
5	7.4909	32.0897	25.0605
10	7.3644	32.0878	25.0764
20	3.702	32.2866	25.657
30	3.5403	32.5622	25.8911
40	3.2827	32.5921	25.9384
50	3.1244	32.7501	26.0785
75	4.7956	33.5856	26.5768
91	4.7983	33.5964	26.5851

STATION US17221			
LATITUDE 42-19.3 N			
LONGITUI 140-23.6 E			
DEPTH (m) 56			
Press.	Temp.	Salinity	Sigma-T
5	7.8094	32.0174	24.9593
10	7.3666	31.9626	24.9776
20	3.6033	32.4052	25.7603
30	3.339	32.5207	25.8765
40	3.4664	32.6274	25.9499
50	3.4964	32.828	26.1069
55	4.1341	33.1172	26.2751

STATION US17222			
LATITUDE 42-14.1 N			
LONGITUI 140-29.9 E			
DEPTH (m) 77			
Press.	Temp.	Salinity	Sigma-T
5	7.6248	32.0488	25.0099
10	7.547	32.1117	25.07
20	4.6384	32.1162	25.4281
30	3.4645	32.5204	25.8649
40	3.0917	32.7028	26.0436
50	3.9734	33.1116	26.2867
74	4.7779	33.5252	26.5308

STATION US17223			
LATITUDE 42-11.1 N			
LONGITUI 140-35.7 E			
DEPTH (m) 80			
Press.	Temp.	Salinity	Sigma-T
5	7.7303	32.042	24.9898
10	7.6428	32.058	25.0146
20	4.1658	32.1843	25.5306
30	3.531	32.5108	25.851
40	3.5646	32.6616	25.968
50	3.7123	32.8549	26.108
75	4.7374	33.4695	26.4911
76	4.7342	33.4691	26.4911

STATION US17224			
LATITUDE 42-09.5 N			
LONGITUI 140-35.7 E			
DEPTH (m) 70			
Press.	Temp.	Salinity	Sigma-T
5	7.727	32.0847	25.0238
10	6.1653	32.1654	25.2927
20	3.5184	32.4477	25.802
30	3.5734	32.5675	25.8923
40	3.5519	32.7004	26.0001
50	4.0836	33.0422	26.2206
66	4.6099	33.3487	26.4091

STATION US17225			
LATITUDE 42-15.4 N			
LONGITUI 140-47.8 E			
DEPTH (m) 71			
Press.	Temp.	Salinity	Sigma-T
5	7.6655	32.1366	25.0731
10	7.4486	32.1399	25.1058
20	6.7863	32.0158	25.0967
30	3.7884	32.4501	25.7786
40	3.3973	32.528	25.877
50	3.3966	32.6207	25.951
68	4.3729	33.2725	26.3738

STATION US17226			
LATITUDE 42-17.4 N			
LONGITUI 140-54.1 E			
DEPTH (m) 56			
Press.	Temp.	Salinity	Sigma-T
5	7.691	31.8267	24.8262
10	7.032	31.8359	24.9229
20	3.51	32.4311	25.7896
30	3.3691	32.7339	26.0436
40	3.7951	32.9372	26.1655
50	3.8838	33.033	26.2331
54	4.019	33.1032	26.2756

STATION US17227			
LATITUDE 42-23.8 N			
LONGITUI 140-31.3 E			
DEPTH (m) 95			
Press.	Temp.	Salinity	Sigma-T
5	8.2775	32.0187	24.893
10	7.295	32.0206	25.033
20	4.8055	32.1468	25.4347
30	3.6033	32.469	25.8111
40	2.9951	32.431	25.8351
50	3.443	32.7406	26.0422
75	4.7875	33.5301	26.5337
92	4.8007	33.6117	26.5969

STATION US17228			
LATITUDE 42-15.6 N			
LONGITUI 140-53.8 E			
DEPTH (m) 60			
Press.	Temp.	Salinity	Sigma-T
5	8.5158	31.6405	24.5614
10	7.1881	32.0057	25.0357
20	5.4534	32.0258	25.2674
30	4.9649	32.3315	25.5639
40	4.277	32.4318	25.716
50	2.9562	32.5393	25.9249
55	3.7596	32.6911	25.9731

STATION US17229			
LATITUDE 42-18.4 N			
LONGITUI 140-50.8 E			
DEPTH (m) 59			
Press.	Temp.	Salinity	Sigma-T
5	8.6709	31.6433	24.5404
10	6.8525	31.8393	24.9491
20	6.5309	32.0295	25.1403
30	5.5034	32.1651	25.3718
40	2.9251	32.3737	25.7953
50	2.8639	32.4441	25.8566
53	2.915	32.4586	25.864

STATION US17230			
LATITUDE 42-20.0 N			
LONGITUI 141-10.8 E			
DEPTH (m) 78			
Press.	Temp.	Salinity	Sigma-T
5	6.1172	32.6506	25.682
10	6.2039	32.631	25.6558
20	6.8228	32.8453	25.7453
30	5.68	32.6003	25.6952
40	5.2419	32.7116	25.8341
50	3.2437	32.7441	26.0631
73	1.6311	32.7844	26.2233

STATION US17231			
LATITUDE 42-17.9 N			
LONGITUI 141-06.8 E			
DEPTH (m) 71			
Press.	Temp.	Salinity	Sigma-T
5	7.5071	32.219	25.1599
10	6.5436	32.6649	25.6396
20	5.6526	32.5782	25.681
30	5.0992	32.7184	25.8556
40	6.6735	33.0302	25.9107
50	3.9919	32.7014	25.9587
65	1.5072	32.7574	26.2099

STATION US17232			
LATITUDE 42-18.0 N			
LONGITUI 140-54.6 E			
DEPTH (m) 56			
Press.	Temp.	Salinity	Sigma-T
5	5.4463	32.1443	25.3618
10	4.7958	32.2669	25.5311
20	4.6357	32.4514	25.6944
30	4.0481	32.4401	25.7455
40	3.99	32.441	25.7519
50	3.8192	32.4614	25.7846

STATION US17233			
LATITUDE 42-01.2 N			
LONGITUI 141-20.7 E			
DEPTH (m) 324			
Press.	Temp.	Salinity	Sigma-T
5	8.0699	32.3594	25.1905
10	7.8537	32.3099	25.1826
20	6.9921	32.4115	25.3812
30	5.4617	32.4248	25.582
40	6.0643	33.0833	26.0297
50	4.1475	33.1226	26.278
75	4.2142	33.3686	26.4666
100	5.704	33.6015	26.484
125	3.9654	33.3999	26.5168
150	4.1069	33.457	26.548
175	4.1144	33.5014	26.5825
200	4.1475	33.4997	26.5777
250	3.0106	33.4125	26.6169
297	2.964	33.4434	26.6457

STATION US17234			
LATITUDE 41-49.4 N			
LONGITUI 141-13.1 E			
DEPTH (m) 169			
Press.	Temp.	Salinity	Sigma-T
5	7.0336	32.2241	25.2282
10	6.6447	32.2397	25.2914
20	5.6078	32.7135	25.7933
30	4.2504	32.6404	25.8844
40	3.496	32.8888	26.1554
50	4.0507	33.134	26.2968
75	5.0194	33.4208	26.4211
100	4.7021	33.4369	26.4692
125	4.2816	33.4545	26.5279
150	3.765	33.439	26.568
151	3.762	33.439	26.568

STATION US17235			
LATITUDE 41-47.1 N			
LONGITUI 141-14.5 E			
DEPTH (m) 199			
Press.	Temp.	Salinity	Sigma-T
5	6.924	32.2509	25.2638
10	6.1692	32.334	25.4257
20	5.3101	32.6094	25.7454
30	3.8824	32.5075	25.8152
40	3.3228	32.6758	26.0015
50	3.4515	32.7492	26.0483
75	4.2327	33.2026	26.3328
100	4.6108	33.3706	26.4265
125	4.7018	33.4422	26.4734
150	4.2244	33.4527	26.5325
175	3.841	33.4591	26.5763
185	3.7257	33.4617	26.5897

STATION US17236			
LATITUDE 41-44.0 N			
LONGITUI 141-16.0 E			
DEPTH (m) 230			
Press.	Temp.	Salinity	Sigma-T
5	7.0826	32.2049	25.2066
10	5.4092	32.4054	25.5727
20	4.6434	32.4694	25.7079
30	5.2177	32.7345	25.855
40	6.6373	33.1598	26.0174
50	6.56	33.2366	26.0881
75	4.2389	33.1641	26.3016
100	4.0939	33.2714	26.4017
125	4.684	33.428	26.464
150	4.542	33.463	26.507
175	3.678	33.403	26.547
200	3.573	33.437	26.585
220	3.257	33.447	26.622

STATION US17237			
LATITUDE 41-40.9 N			
LONGITUI 141-17.6 E			
DEPTH (m) 232			
Press.	Temp.	Salinity	Sigma-T
5	10.6282	33.6314	25.7755
10	10.3326	33.7532	25.9217
20	10.0316	33.8845	26.0756
30	9.5999	33.94	26.191
40	9.5038	33.9444	26.2103
50	9.2099	33.9252	26.243
75	8.0215	33.8471	26.3652
100	7.5411	33.8089	26.405
125	5.8092	33.6661	26.5222
150	4.3239	33.5359	26.5882
175	3.5228	33.488	26.6302
200	3.1472	33.5153	26.6867
221	2.96	33.5057	26.6958

STATION US17238			
LATITUDE 41-37.7 N			
LONGITUI 141-19.2 E			
DEPTH (m) 214			
Press.	Temp.	Salinity	Sigma-T
5	11.3419	33.5471	25.5826
10	11.5214	33.801	25.7471
20	10.4346	33.659	25.8307
30	10.4891	33.883	25.9958
40	10.2873	33.9484	26.0818
50	9.9979	33.965	26.1441
75	8.9028	33.8875	26.2623
100	7.6939	33.8024	26.3779
125	6.596	33.729	26.471
150	5.741	33.695	26.553
175	4.723	33.657	26.641
200	3.840	33.593	26.683

STATION US17239			
LATITUDE 41-34.9 N			
LONGITUI 141-20.5 E			
DEPTH (m) 323			
Press.	Temp.	Salinity	Sigma-T
5	12.4773	33.8256	25.5857
10	12.4669	33.8251	25.5873
20	12.4816	33.825	25.5843
30	12.5083	33.8227	25.5774
40	12.4244	33.817	25.5892
50	12.214	33.8227	25.6341
75	11.0217	33.9206	25.931
100	10.953	33.920	25.943
125	10.324	33.958	26.083
150	8.961	33.946	26.299
175	8.142	33.850	26.350
200	7.584	33.824	26.411
250	5.702	33.741	26.594
300	3.029	33.579	26.748
310	3.085	33.606	26.765

STATION US17240			
LATITUDE 41-32.0 N			
LONGITUI 141-22.0 E			
DEPTH (m) 255			
Press.	Temp.	Salinity	Sigma-T
5	12.1011	33.8668	25.6898
10	12.0642	33.8393	25.6755
20	11.9734	33.8258	25.6821
30	11.9189	33.8307	25.6962
40	11.9365	33.8316	25.6936
50	11.9454	33.83	25.6907
75	11.782	33.838	25.728
100	11.225	33.897	25.876
125	10.431	33.937	26.048
150	9.630	34.015	26.245
175	9.545	34.018	26.261
200	9.383	34.022	26.291
230	9.025	34.014	26.342

STATION US17241			
LATITUDE 41-29.9 N			
LONGITUI 141-21.0 E			
DEPTH (m) 226			
Press.	Temp.	Salinity	Sigma-T
5	12.3749	33.7581	25.5531
10	12.3566	33.7302	25.535
20	12.2688	33.739	25.5587
30	11.9676	33.7857	25.6522
40	11.8059	33.8089	25.7005
50	11.5703	33.8524	25.7781
75	11.1566	33.8906	25.8834
100	10.5899	33.9288	26.014
125	9.708	33.9948	26.216
150	9.6799	34.0023	26.2265
175	9.5424	33.9985	26.2462
200	9.4702	34.013	26.2694
210	9.2834	34.0169	26.3029

STATION US17242			
LATITUDE 41-28.9 N			
LONGITUI 141-23.5 E			
DEPTH (m) 93			
Press.	Temp.	Salinity	Sigma-T
5	12.4375	33.7241	25.5146
10	12.3821	33.7228	25.5243
20	12.3136	33.7287	25.5421
30	12.2766	33.7365	25.5552
40	11.99	33.7895	25.6509
50	11.9462	33.7978	25.6655
75	11.821	33.8156	25.7029
79	11.6844	33.8334	25.7422

STATION US17243			
LATITUDE 41-27.4 N			
LONGITUI 141-24.2 E			
DEPTH (m) 48			
Press.	Temp.	Salinity	Sigma-T
5	12.0352	33.6367	25.5237
10	12.0354	33.7356	25.6004
20	11.6978	33.818	25.7277
30	11.2164	33.897	25.8775
40	10.8655	33.9349	25.9701
41	10.8389	33.9379	25.9772

STATION US17244			
LATITUDE 41-26.4 N			
LONGITUI 141-21.9 E			
DEPTH (m) 67			
Press.	Temp.	Salinity	Sigma-T
5	12.0638	33.7212	25.5839
10	12.1077	33.7393	25.5896
20	11.5116	33.8646	25.7985
30	11.2658	33.8972	25.8688
40	11.1249	33.9098	25.9041
50	10.9008	33.927	25.9577
61	9.8131	33.9816	26.1883

STATION US17245			
LATITUDE 41-26.3 N			
LONGITUI 141-15.5 E			
DEPTH (m) 78			
Press.	Temp.	Salinity	Sigma-T
5	12.1637	33.7087	25.5552
10	11.8796	33.8034	25.6824
20	11.4612	33.8417	25.7899
30	10.9909	33.897	25.9182
40	10.405	33.937	26.052
50	9.906	33.973	26.166
70	9.474	34.015	26.270

STATION US17246			
LATITUDE 41-40.8 N			
LONGITUI 140-47.4 E			
DEPTH (m) 225			
Press.	Temp.	Salinity	Sigma-T
5	11.9165	34.0521	25.8687
10	11.6158	33.9808	25.8695
20	11.0001	33.931	25.9431
30	10.4132	33.9568	26.0666
40	10.1188	33.9686	26.1264
50	9.5938	33.977	26.221
75	9.142	34.024	26.331
100	8.906	34.030	26.373
125	8.892	34.033	26.378
150	8.851	34.032	26.383
175	8.687	34.026	26.405
200	8.445	34.024	26.441

STATION US17249			
LATITUDE 41-37.1 N			
LONGITUI 140-51.2 E			
DEPTH (m) 101			
Press.	Temp.	Salinity	Sigma-T
5	13.5871	33.4963	25.1101
10	13.8324	33.6268	25.1607
20	12.2624	33.8627	25.6558
30	11.6916	33.9019	25.7941
40	11.6068	33.9076	25.8142
50	11.1705	33.95	25.9272
75	10.518	34.020	26.098
91	10.281	34.026	26.143

STATION US17252			
LATITUDE 41-01.0 N			
LONGITUI 140-43.1 E			
DEPTH (m) 55			
Press.	Temp.	Salinity	Sigma-T
5	13.4984	33.2812	24.9619
10	13.4763	33.2866	24.9705
20	12.7165	33.5049	25.2905
30	11.5585	33.6974	25.6598
40	10.2204	33.6024	25.8233
50	9.9904	33.7811	26.0018
55	10.0066	33.7859	26.0028

STATION US17255			
LATITUDE 40-52...2 N			
LONGITUI 140-46.1 E			
DEPTH (m) 29			
Press.	Temp.	Salinity	Sigma-T
5	14.3861	33.2395	24.7461
10	13.9832	33.1808	24.785
20	11.7746	33.2753	25.2919
28	11.1637	33.3775	25.4829

STATION US17247			
LATITUDE 41-42.8 N			
LONGITUI 140-45.2 E			
DEPTH (m) 84			
Press.	Temp.	Salinity	Sigma-T
5	12.4762	33.993	25.7157
10	12.3007	33.9848	25.7433
20	11.0976	33.9525	25.9422
30	9.6223	33.9803	26.2188
40	8.8363	34.0076	26.3669
50	8.6875	34.0156	26.3964
71	8.6036	34.0209	26.4135

STATION US17250			
LATITUDE 41-38.9 N			
LONGITUI 140-49.3 E			
DEPTH (m) 343			
Press.	Temp.	Salinity	Sigma-T
5	13.6436	33.9592	25.4566
10	13.6271	34.006	25.4961
20	12.5806	34.0112	25.7095
30	11.3854	33.9607	25.8963
40	10.9939	33.9686	25.9734
50	10.8049	34.0126	26.0414
75	10.0965	34.0336	26.1809
100	9.638	34.0377	26.2611
125	9.4921	34.0364	26.2842
150	9.2664	34.0379	26.322
175	9.1531	34.0371	26.3396
200	9.1383	34.0361	26.3412
250	8.8524	34.0259	26.3786
300	8.7262	34.0275	26.3997
321	8.6661	34.0287	26.41

STATION US17253			
LATITUDE 40-57.1 N			
LONGITUI 140-45.4 E			
DEPTH (m) 46			
Press.	Temp.	Salinity	Sigma-T
5	13.5637	33.2556	24.9288
10	13.5272	33.2567	24.937
20	13.2628	33.2694	25.0001
30	10.5631	33.3817	25.5923
40	10.1031	33.4002	25.6855

STATION US17256			
LATITUDE 41-00.0 N			
LONGITUI 140-46.7 E			
DEPTH (m) 51			
Press.	Temp.	Salinity	Sigma-T
5	13.4033	33.2771	24.9779
10	13.4294	33.3085	24.9969
20	12.4677	33.5873	25.4027
30	11.2383	33.512	25.5741
40	10.0802	33.5608	25.8147
50	9.8586	33.798	26.0372

STATION US17248			
LATITUDE 41-35.5 N			
LONGITUI 140-53.0 E			
DEPTH (m) 43			
Press.	Temp.	Salinity	Sigma-T
5	13.186	33.4814	25.1795
10	12.0166	33.8499	25.6928
20	11.2149	33.956	25.9237
30	10.9366	33.9792	25.9919

STATION US17251			
LATITUDE 41-12.5 N			
LONGITUI 140-41.9 E			
DEPTH (m) 76			
Press.	Temp.	Salinity	Sigma-T
5	13.4241	33.3533	25.0326
10	13.4156	33.3541	25.0349
20	13.0479	33.507	25.2268
30	12.2556	33.6769	25.513
40	11.5989	33.8052	25.7362
50	11.2111	33.8758	25.8621
67	10.3725	33.9879	26.0979

STATION US17254			
LATITUDE 40-55.1 N			
LONGITUI 140-46.2 E			
DEPTH (m) 40			
Press.	Temp.	Salinity	Sigma-T
5	13.7359	33.3634	24.977
10	13.5407	33.2482	24.9277
20	12.2202	33.3636	25.2766
30	10.8857	33.3735	25.5294
39	10.4391	33.556	25.7497

STATION US17257			
LATITUDE 41-02.8 N			
LONGITUI 140-46.2 E			
DEPTH (m) 52			
Press.	Temp.	Salinity	Sigma-T
5	13.3594	33.2205	24.9429
10	12.7663	33.2716	25.1
20	11.827	33.2489	25.2615
30	10.3769	33.4853	25.7052
40	9.7637	33.604	25.9014
50	9.9729	33.8094	26.0268

STATION US17258			
LATITUDE 41-05.1 N			
LONGITUI 140-44.2 E			
DEPTH (m) 60			
Press.	Temp.	Salinity	Sigma-T
5	13.4001	33.2989	24.9954
10	13.1279	33.2327	24.9986
20	11.9284	33.3272	25.3035
30	11.2191	33.7041	25.727
40	10.1514	33.5206	25.7712
50	9.7108	33.6581	25.9524
58	9.9753	33.8524	26.06

STATION US17261			
LATITUDE 41-06.0 N			
LONGITUI 140-51.3 E			
DEPTH (m) 51			
Press.	Temp.	Salinity	Sigma-T
5	12.5306	33.2599	25.1367
10	12.3758	33.3353	25.225
20	11.3044	33.2791	25.3809
30	10.469	33.3486	25.5827
40	9.7018	33.444	25.7867
49	9.6657	33.5826	25.9009

STATION US17264			
LATITUDE 40-57.2 N			
LONGITUI 141-06.9 E			
DEPTH (m) 36			
Press.	Temp.	Salinity	Sigma-T
5	14.378	33.1289	24.6625
10	13.8699	33.1664	24.7972
20	13.1637	33.1992	24.9656
30	10.6614	33.2509	25.4733
34	10.3348	33.3527	25.609

STATION US17267			
LATITUDE 41-05.7 N			
LONGITUI 141-09.8 E			
DEPTH (m) 38			
Press.	Temp.	Salinity	Sigma-T
5	14.0011	33.1893	24.7879
10	12.9658	33.1818	24.9914
20	11.2337	33.298	25.4084
30	10.8268	33.3113	25.4913
36	10.4106	33.3523	25.5957

STATION US17270			
LATITUDE 41-07.6 N			
LONGITUI 141-03.4 E			
DEPTH (m) 38			
Press.	Temp.	Salinity	Sigma-T
5	14.2732	33.1727	24.7184
10	14.1471	33.1346	24.7152
20	12.5372	33.1611	25.0589
30	10.7028	33.313	25.5144
36	10.2079	33.3681	25.6428

STATION US17273			
LATITUDE 41-08.8 N			
LONGITUI 140-44.3 E			
DEPTH (m) 63			
Press.	Temp.	Salinity	Sigma-T
5	13.5624	33.3078	24.9694
10	12.7144	33.3289	25.1545
20	11.2152	33.3716	25.4691
30	10.4124	33.3653	25.6056
40	10.1155	33.5109	25.7697
50	10.2733	33.6574	25.8572
61	9.8779	33.7483	25.9951

STATION US17259			
LATITUDE 41-03.6 N			
LONGITUI 140-51.9 E			
DEPTH (m) 50			
Press.	Temp.	Salinity	Sigma-T
5	13.1454	33.1726	24.9486
10	12.8811	33.284	25.0871
20	12.0423	33.1938	25.1785
30	10.8319	33.2821	25.4677
40	10.2606	33.5047	25.7402
48	9.6561	33.6074	25.9219

STATION US17262			
LATITUDE 41-04.3 N			
LONGITUI 140-58.0 E			
DEPTH (m) 49			
Press.	Temp.	Salinity	Sigma-T
5	13.5322	33.154	24.8566
10	12.5884	33.1091	25.0087
20	11.6217	33.2387	25.2917
30	10.5342	33.3291	25.5563
40	10.1984	33.4863	25.7366
45	9.0412	33.4411	25.891

STATION US17265			
LATITUDE 40-59.9 N			
LONGITUI 141-07.2 E			
DEPTH (m) 42			
Press.	Temp.	Salinity	Sigma-T
5	13.6539	33.1147	24.8015
10	12.9814	33.1723	24.9809
20	12.5497	33.2009	25.0873
30	11.578	33.211	25.2781
40	9.7919	33.3557	25.7028

STATION US17268			
LATITUDE 41-08.3 N			
LONGITUI 141-10.9 E			
DEPTH (m) 34			
Press.	Temp.	Salinity	Sigma-T
5	12.4597	33.0677	25.0011
10	11.5439	33.2561	25.3195
20	11.1615	33.3129	25.433
30	10.2483	33.3282	25.6047
33	9.9198	33.3643	25.6883

STATION US17271			
LATITUDE 41-06.6 N			
LONGITUI 140-55.9 E			
DEPTH (m) 46			
Press.	Temp.	Salinity	Sigma-T
5	14.4901	33.1725	24.6725
10	13.5147	33.1384	24.8482
20	11.7707	33.2005	25.2344
30	10.524	33.3424	25.5684
40	9.9727	33.4181	25.7214
44	9.9788	33.4262	25.7267

STATION US17274			
LATITUDE 41-09.0 N			
LONGITUI 140-41.5 E			
DEPTH (m) 52			
Press.	Temp.	Salinity	Sigma-T
5	14.4641	33.758	25.1297
10	14.1954	33.7688	25.1948
20	13.6489	33.8071	25.3378
30	13.4432	33.8211	25.3906
40	13.0048	33.7989	25.4614
50	12.4141	33.798	25.5764

STATION US17260			
LATITUDE 41-04.8 N			
LONGITUI 140-51.9 E			
DEPTH (m) 51			
Press.	Temp.	Salinity	Sigma-T
5	13.1534	33.243	25.0015
10	12.985	33.2524	25.0422
20	11.403	33.225	25.3211
30	10.5815	33.3311	25.5496
40	10.1178	33.4029	25.6851
49	9.5739	33.6161	25.9422

STATION US17263			
LATITUDE 41-01.9 N			
LONGITUI 141-00.7 E			
DEPTH (m) 47			
Press.	Temp.	Salinity	Sigma-T
5	13.7183	33.1778	24.8372
10	13.389	33.1559	24.8869
20	12.8456	33.1675	25.0039
30	11.6795	33.2079	25.257
40	10.3064	33.3384	25.6027
45	8.9604	33.4812	25.9353

STATION US17266			
LATITUDE 41-04.6 N			
LONGITUI 141-02.3 E			
DEPTH (m) 47			
Press.	Temp.	Salinity	Sigma-T
5	13.9146	33.1419	24.7691
10	13.7666	33.1469	24.8034
20	13.0726	33.1882	24.9752
30	12.12	33.2199	25.1841
40	10.6439	33.3577	25.5595
45	9.994	33.1935	25.5423

STATION US17269			
LATITUDE 41-11.2 N			
LONGITUI 141-10.7 E			
DEPTH (m) 28			
Press.	Temp.	Salinity	Sigma-T
5	14.2365	33.1163	24.6825
10	12.4716	33.1753	25.0825
20	11.2543	33.2588	25.3742
25	10.4914	33.3338	25.5674

STATION US17272			
LATITUDE 41-06.0 N			
LONGITUI 140-48.0 E			
DEPTH (m) 45			
Press.	Temp.	Salinity	Sigma-T
5	13.8106	33.2699	24.8894
10	13.8041	33.2697	24.8905
20	12.7273	33.2999	25.1295
30	10.6642	33.3313	25.5354
40	9.7089	33.4732	25.8083
42	9.7412	33.6486	25.94