



HOKKAIDO UNIVERSITY

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THE “USHIO MARU”

CRUISE 157

CRUISE 158

CRUISE 159

CRUISE 160

IN NOVEMBER-DECEMBER 2008

1. Cruise Itinerary

Cruise 157			
Departure from Hakodate	Nov.	11	, 2008
Start hydrographic research (US08478)		11	
Arrival at Usujiri		11	
Departure from Usujiri		12	
Start larvae net sampling		12	
Sampling by frame trawl net		12	
Arrival at Usujiri		13	
Departure from Usujiri		14	
Research by bottom long-line		14	
Arrival at and departure from Usujiri		14	
Arrival at Mori		14	
Departure from Mori		15	
Research by trawl net and sledge net		15	
Arrival at and departure from Mori		15	
Finish hydrographic research (US08495) and larvae net sampling		15	
Return to Hakodate		16	
Total coverage 338.8 miles			
Cruise 158			
Departure from Hakodate	Nov.	27	, 2008
Hydrographic research (US08496 - US08501) and larvae net sampling		27	
Return to Hakodate		28	
Total coverage 87.8 miles			
Cruise 159			
Departure from Hakodate	Dec.	8	, 2008
Arrival at Usujiri		8	
Departure from Usujiri		9	
Start hydrographic research (US08502) and larvae net sampling		9	
Retrieval Sediment trap system		9	
Arrival at Mori		9	
Departure from Mori		10	
Set Sediment trap system		10	
Arrival at Usujiri		10	
Departure from Usujiri		11	
Arrival at Usujiri		11	
Departure from Usujiri		12	
Arrival at Usujiri		12	
Departure from Usujiri		13	
Arrival at Muroran		13	
Departure from Muroran		14	
Arrival at Muroran		14	
Departure from Muroran		15	
Arrival at and departure from Usujiri		15	
Finish hydrographic research (US08527) and larvae net sampling		15	
Return to Hakodate		16	
Total coverage 421.2 miles			
Cruise 160			
Departure from Hakodate	Dec.	24	, 2008
Hydrographic research (US08528 - US08535) and larvae net sampling		24	
Return to Hakodate		25	
Total coverage 56.4 miles			

2. Vessel Personnel

Captain:		Associate Professor	Hidekazu Yamaguchi
Crew :	Chief Officer	Assistant Professor	Osamu Kimura
	Second Officer	Assistant Professor	Naoto Kobayashi
	And 13 men		

Cruise 157			
Research Staff :	Professor	(Laboratory of Marine Bioresource Science)	
			Toyomi Takahashi
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Susumu Shimizu
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Tohru Mukai

Graduate Students :	Chair of Marine Bioresource Science :	4 persons
	Chair of Marine Bioresource and Environment Sensing :	6 persons

Under Graduate Students :	Department of Marine Biological Science :	5 persons
	Department of Marine Production System Science :	11 persons

Cruise 158			
Research Staff :	Associate Professor	(Laboratory of Marine Bioresource Science)	
			Tetsuya Takatsu

Under Graduate Students :	Department of Marine Biological Science :	4 persons
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Cruise 159			
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 Science)	Tetsuya Takatsu
	Technician	(Field Science Center for Northern Biosphere)	Shinichi Fukui

Graduate Students :	Chair of Marine Bioresource and Environment Sensing :	3 persons
	Chair of Marine Bioresource Science :	1 person
	Chair of Marine Environmental Science :	2 persons
	Graduate School of Environmental Science :	5 persons

Under Graduate Students :	Department of Fisheries Oceanography and Marine Science :	3 persons
	Department of Marine Production System Science :	11 persons
	Department of Marine Biological Science :	3 persons

Cruise 160			
Research Staff :	Associate Professor	(Laboratory of Marine Bioresource Science)	
			Tetsuya Takatsu

Graduate Students :	Chair of Marine Bioresource Science :	2 persons
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Under Graduate Students :	Department of Marine Biological Science :	2 persons
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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 157)

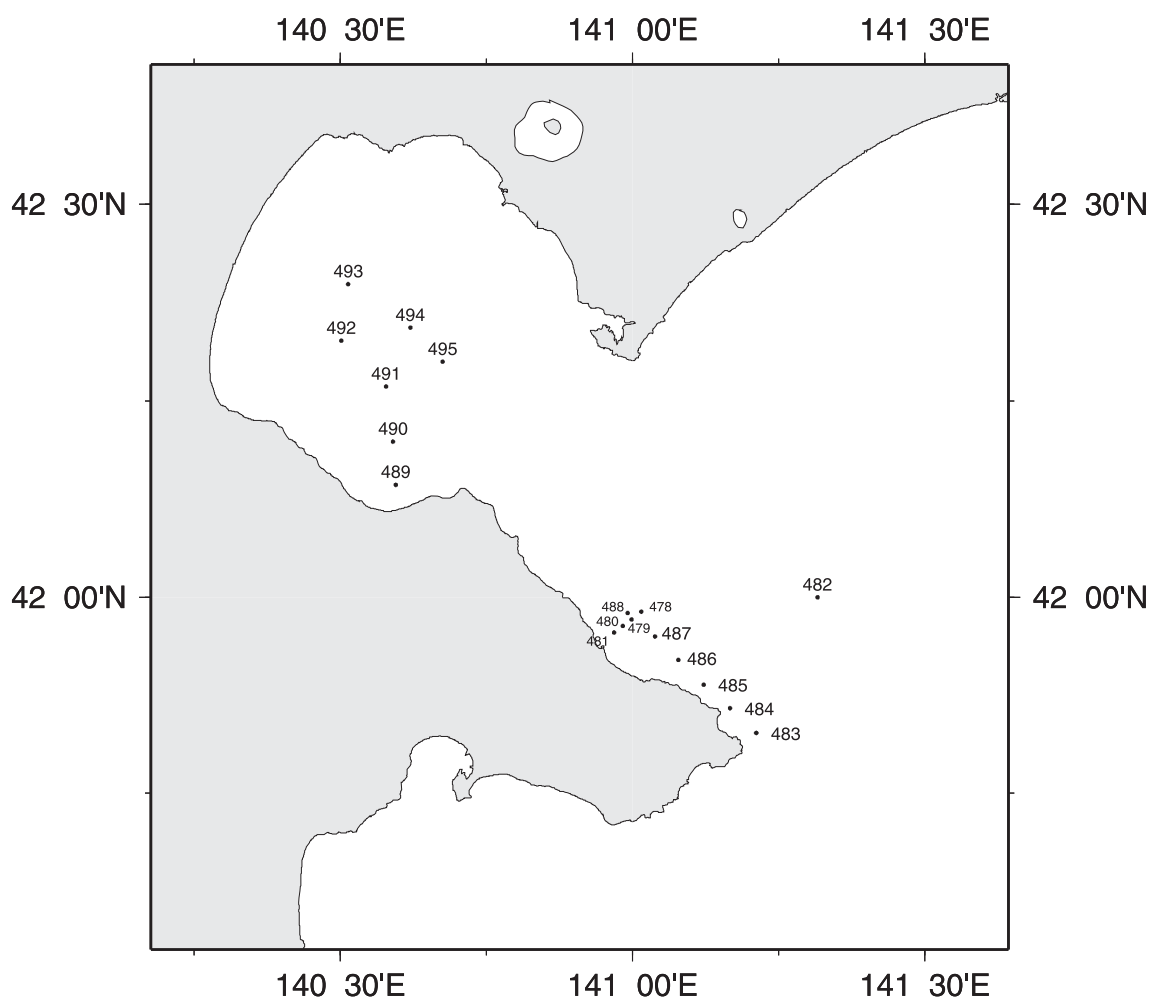


Figure 2: Oceanographic stations (Cruise 158)

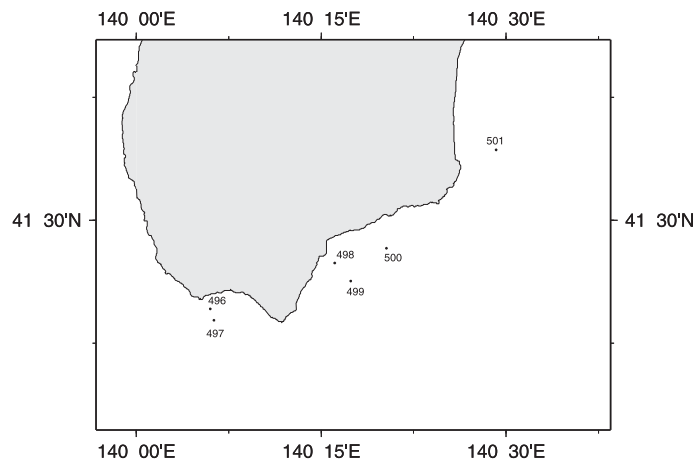


Figure 3: Oceanographic stations (Cruise 159)

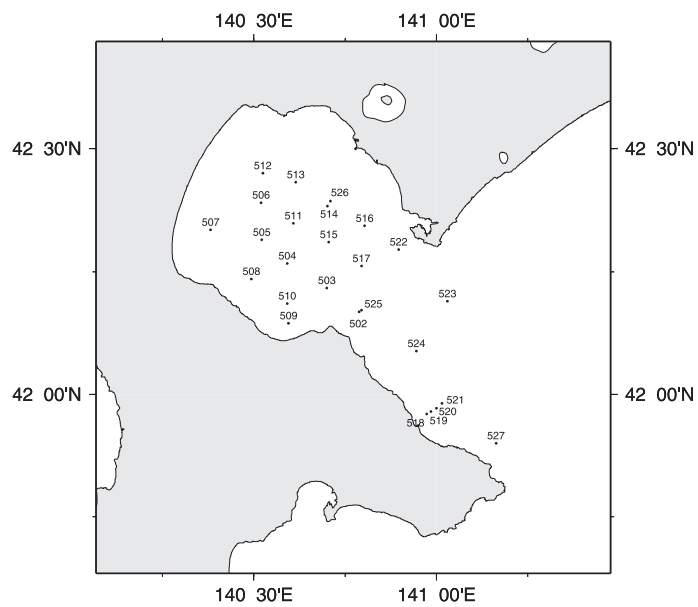


Figure 4: Oceanographic stations (Cruise 160)

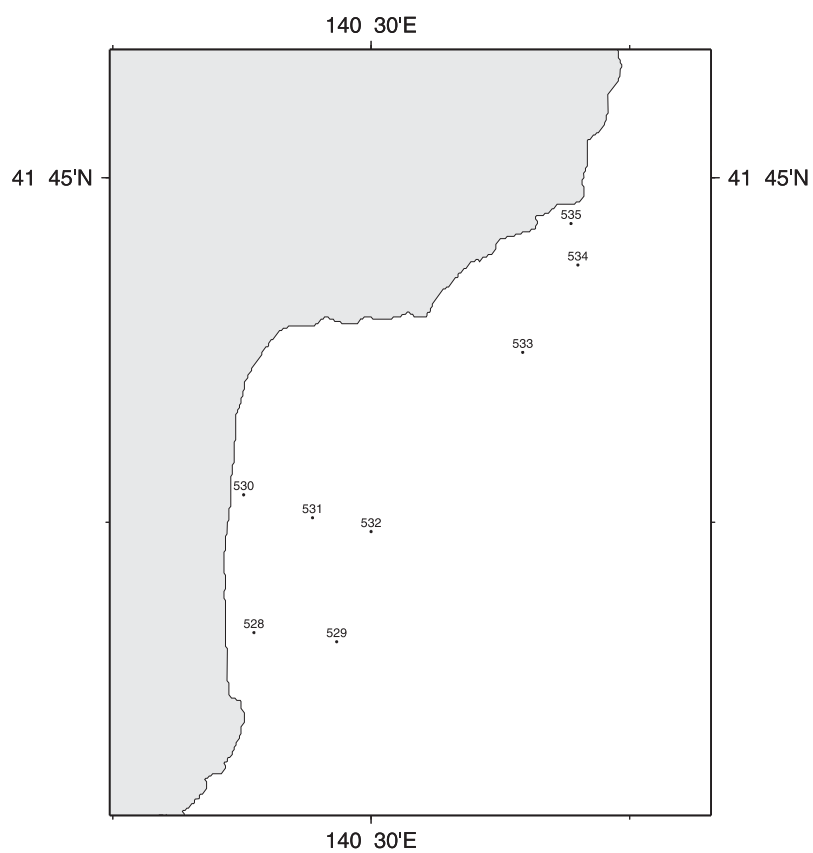


Table 1: List of oceanographic stations

Cruise 157

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr. Bar.	(hPa)
US08478	41-58.9	141-00.9	11/11	1411-1416	96	Calm	NE -1	Calm	9.2	12.8	bc	1028.0
US08479	41-58.3	140-59.9	11/11	1422-1427	89	Calm	NE -1	Calm	9.6	12.6	bc	1028.1
US08480	41-57.8	140-59.0	11/11	1433-1438	85	Calm	NE -1	Calm	9.7	12.6	bc	1028.1
US08481	41-57.3	140-58.1	11/11	1444-1448	78	Calm	NE -1	Calm	9.7	12.7	bc	1028.1
US08482	42-00.0	141-19.0	11/12	1759-1812	292	South-1	South-1	South-3	12.0	12.7	b	1025.7
US08483	41-49.6	141-12.7	11/14	0805-0813	136	Calm	ESE-1	Calm	11.4	12.1	bc	1023.6
US08484	41-51.5	141-10.0	11/14	0835-0841	106	Calm	ESE-1	Calm	11.6	12.1	c	1023.8
US08485	41-53.3	141-07.3	11/14	0903-0907	93	Calm	ESE-1	Calm	11.5	12.1	c	1023.7
US08486	41-55.2	141-04.7	11/14	1025-1030	109	North-1	ESE-1	North-2	11.7	12.3	bc	1023.9
US08487	41-57.0	141-02.3	11/14	1050-1054	104	East-1	ESE-1	East-2	12.1	11.9	bc	1023.6
US08488	41-58.8	140-59.5	11/14	1117-1120	85	NE -1	ESE-1	NE -2	11.6	11.9	bc	1023.0
US08489	42-08.6	140-35.7	11/14	1516-1520	63	Calm	East-1	Calm	13.1	12.2	bc	1021.6
US08490	42-11.9	140-35.4	11/15	1532-1537	85	East-1	East-1	East-3	11.7	11.6	c	1019.7
US08491	42-16.1	140-34.7	11/15	1701-1706	92	East-1	East-1	East-3	11.7	12.2	o	1019.0
US08492	42-19.6	140-30.1	11/15	1758-1803	92	East-2	East-1	East-4	12.0	12.1	o	1018.6
US08493	42-23.9	140-30.8	11/15	1900-1905	95	North-1	East-1	North-2	11.3	11.6	o	1018.1
US08494	42-20.6	140-37.2	11/15	2010-2015	85	East-1	East-1	East-3	12.1	12.2	o	1017.0
US08495	42-18.0	140-40.5	11/15	2110-2115	76	Calm	East-1	Calm	12.1	12.2	o	1016.0

Cruise 158

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr. Bar.	(hPa)
US08496	41-24.6	140-06.0	11/27	1218-1221	52	South-2	SSW-1	South-4	11.2	15.3	c	1016.0
US08497	41-23.9	140-06.3	11/27	1249-1253	84	SSW-1	SSW-1	SSW-5	11.0	15.3	r	1015.7
US08498	41-27.4	140-16.1	11/27	1404-1406	32	WSW-3	SSW-1	WSW-5	10.0	13.5	r	1014.6
US08499	41-26.3	140-17.4	11/27	1448-1452	69	SW -3	SSW-1	SW -5	11.2	13.6	o	1014.0
US08500	41-28.3	140-20.3	11/27	1529-1532	64	SW -3	SSW-1	SW -5	12.1	13.9	c	1014.1
US08501	41-34.3	140-29.2	11/27	1643-1644	36	WNW-1	SSW-1	WNW-2	10.0	13.7	c	1014.2

Cruise 159

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08502	42-10.1	140-47.3	12/9	0814-0818	94	SSE-1	ESE-1	SSE-3	9.7	10.2	bc	1021.6
US08503	42-13.0	140-42.0	12/9	0913-0917	90	SSW-1	ESE-1	SSW-3	11.0	9.6	bc	1022.0
US08504	42-16.0	140-35.5	12/9	1039-1046	92	North-1	ESE-1	North-2	10.1	9.4	bc	1022.2
US08505	42-18.9	140-31.3	12/9	1140-1147	94	Calm	ESE-1	Calm	10.7	9.1	bc	1022.1
US08506	42-23.4	140-31.2	12/9	1238-1245	96	WSW-2	ESE-1	WSW-4	10.9	9.2	bc	1021.6
US08507	42-20.1	140-22.9	12/9	1357-1400	54	West-2	ESE-1	West-3	10.7	9.2	bc	1021.1
US08508	42-14.1	140-29.6	12/9	1500-1503	76	North-1	ESE-1	North-2	10.4	8.3	bc	1021.1
US08509	42-08.7	140-35.7	12/9	1548-1550	63	Calm	ESE-1	Calm	10.1	8.4	bc	1021.0
US08510	42-11.1	140-35.5	12/10	0746-0749	80	West-1	ESE-1	West-2	7.8	9.6	c	1017.5
US08511	42-20.9	140-36.5	12/10	0902-0905	88	West-1	ESE-1	West-4	8.2	9.4	bc	1016.6
US08512	42-27.0	140-31.5	12/10	1006-1010	75	NW -1	ESE-1	NW -3	8.7	9.3	bc	1016.7
US08513	42-25.9	140-36.9	12/10	1055-1059	85	NW -2	ESE-1	NW -3	9.5	9.4	bc	1015.7
US08514	42-23.0	140-42.1	12/10	1138-1141	65	NW -2	ESE-1	NW -3	9.5	9.4	bc	1015.7
US08515	42-18.6	140-42.3	12/10	1216-1219	66	West-2	ESE-1	West-3	9.0	9.4	bc	1015.1
US08516	42-20.6	140-48.2	12/10	1300-1303	55	West-2	ESE-1	West-3	10.1	9.3	bc	1014.7
US08517	42-15.7	140-47.7	12/10	1339-1343	71	West-2	ESE-1	West-4	9.4	10.1	bc	1014.1
US08518	41-57.6	140-58.4	12/11	1338-1341	81	NW -2	ESE-1	NW -3	1.5	10.7	s	1008.1
US08519	41-57.9	140-59.1	12/11	1347-1351	85	NW -2	ESE-1	NW -3	1.7	10.6	s	1007.6
US08520	41-58.3	141-00.0	12/11	1357-1400	90	NW -2	ESE-1	NW -3	1.5	10.6	s	1007.2
US08521	41-58.9	141-00.9	12/11	1407-1411	96	North-2	ESE-1	North-3	1.5	10.6	s	1006.7
US08522	42-17.7	140-53.8	12/14	0713-0721	57	North-1	West-1	North-2	-0.4	9.1	c	1019.0
US08523	42-11.4	141-01.8	12/14	0813-0819	79	NW -1	East-1	NW -2	0.1	8.8	s	1019.1
US08524	42-05.3	140-56.7	12/14	0902-0907	84	West-2	East-1	West-4	0.5	9.7	bc	1018.6
US08525	42-10.3	140-47.7	12/14	0955-1003	91	West-2	East-1	West-4	0.6	9.9	c	1018.7
US08526	42-23.6	140-42.6	12/14	1506-1512	63	NW -1	East-1	NW -2	1.4	8.9	bc	1016.6
US08527	41-54.0	141-09.8	12/15	1235-1240	184	West-2	NW -1	West-3	3.6	11.8	bc	1017.0

Cruise 160

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08528	41-35.1	140-26.6	12/24	1104-1107	14	West-1	SSE-1	West-2	5.1	11.9	bc	1021.1
US08529	41-34.9	140-29.0	12/24	1140-1143	32	SSW-2	SSE-1	SSW-5	5.5	12.2	bc	1020.5
US08530	41-38.1	140-26.3	12/24	1238-1240	15	SSW-2	SSE-1	SSW-4	5.6	11.7	bc	1019.6
US08531	41-37.6	140-28.3	12/24	1259-1301	22	SSW-2	SSE-1	SSW-4	5.4	11.9	bc	1019.1
US08532	41-37.3	140-30.0	12/24	1319-1322	31	West-1	SSE-1	West-3	5.3	12.2	c	1018.7
US08533	41-41.2	140-34.4	12/24	1422-1426	42	SW -1	SSE-1	SW -3	5.5	12.3	c	1018.5
US08534	41-43.1	140-36.0	12/24	1459-1502	36	SW -1	SSE-1	SW -3	5.9	12.0	c	1018.5
US08535	41-44.0	140-35.8	12/24	1516-1518	6	SSE-2	SSE-1	SSE-4	5.7	11.7	r	1018.4

(*):Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US08478 LATITUDE 41-58.9 N LONGITUDE 141-00.9 E DEPTH (m) 96				STATION US08479 LATITUDE 41-58.3 N LONGITUDE 140-59.9 E DEPTH (m) 89				STATION US08480 LATITUDE 41-57.8 N LONGITUDE 140-59.0 E DEPTH (m) 85			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	12.925	33.954	25.597	5	12.843	34.031	25.674	5	12.932	34.003	25.634
10	12.849	34.007	25.654	10	12.776	34.040	25.693	10	12.837	34.021	25.667
20	12.633	34.026	25.711	20	12.609	34.021	25.712	20	12.594	34.017	25.711
30	11.477	33.963	25.882	30	9.876	33.960	26.161	30	9.952	34.027	26.200
40	10.812	34.015	26.042	40	9.683	34.051	26.264	40	9.176	34.000	26.307
50	10.799	34.118	26.125	50	9.437	34.042	26.298	50	8.914	33.997	26.346
75	8.803	33.955	26.331	75	7.413	33.830	26.440	75	6.164	33.725	26.525

STATION US08481 LATITUDE 41-57.3 N LONGITUDE 140-58.1 E DEPTH (m) 78				STATION US08482 LATITUDE 42-00.0 N LONGITUDE 141-19.0 E DEPTH (m) 292				STATION US08483 LATITUDE 41-49.6 N LONGITUDE 141-12.7 E DEPTH (m) 136			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.008	34.019	25.631	5	12.972	34.113	25.711	5	12.478	33.996	25.718
10	12.893	34.022	25.656	10	12.973	34.110	25.709	10	12.486	34.003	25.721
20	12.807	34.035	25.683	20	12.940	34.110	25.716	20	11.792	33.956	25.817
30	11.664	33.951	25.837	30	12.904	34.107	25.720	30	11.221	34.011	25.966
40	9.848	34.022	26.214	40	12.773	34.099	25.740	40	10.875	34.040	26.050
50	8.673	33.940	26.339	50	12.744	34.100	25.747	50	10.521	34.104	26.162
75	4.901	33.620	26.592	75	12.655	34.093	25.759	75	9.537	34.013	26.258
				100	11.583	34.056	25.934	100	8.996	33.980	26.320
				125	8.485	33.951	26.377	125	8.231	33.866	26.349
				150	7.075	33.795	26.459				
				175	6.453	33.749	26.506				
				200	5.335	33.641	26.559				
				250	3.819	33.540	26.643				

STATION US08484 LATITUDE 41-51.5 N LONGITUDE 141-10.0 E DEPTH (m) 106				STATION US08485 LATITUDE 41-53.3 N LONGITUDE 141-07.3 E DEPTH (m) 93				STATION US08486 LATITUDE 41-55.2 N LONGITUDE 141-04.7 E DEPTH (m) 109			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	12.442	34.006	25.733	5	12.266	34.007	25.767	5	12.482	34.028	25.742
10	12.421	34.009	25.739	10	12.259	34.011	25.772	10	12.443	34.031	25.752
20	12.454	34.046	25.761	20	12.263	34.015	25.774	20	12.430	34.032	25.755
30	10.772	33.907	25.965	30	12.237	34.011	25.776	30	12.309	34.015	25.765
40	10.710	33.973	26.027	40	11.759	33.945	25.815	40	11.581	34.023	25.908
50	10.748	33.976	26.023	50	9.912	33.937	26.136	50	10.419	33.938	26.051
75	8.556	33.908	26.333	75	8.160	33.879	26.370	75	7.992	33.855	26.376
100	8.097	33.886	26.385					100	6.768	33.797	26.502

STATION US08487 LATITUDE 41-57.0 N LONGITUDE 141-02.3 E DEPTH (m) 104				STATION US08488 LATITUDE 41-58.8 N LONGITUDE 140-59.5 E DEPTH (m) 85				STATION US08489 LATITUDE 42-08.6 N LONGITUDE 140-35.7 E DEPTH (m) 63			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	12.201	33.844	25.653	5	12.248	33.855	25.653	5	12.493	32.671	24.690
10	12.171	33.843	25.658	10	12.056	33.820	25.662	10	12.408	33.901	25.658
20	11.922	33.801	25.679	20	10.810	33.869	25.929	20	12.297	33.922	25.695
30	11.732	34.007	25.868	30	9.547	33.924	26.187	30	12.308	33.929	25.699
40	9.882	33.836	26.063	40	8.779	33.886	26.281	40	9.255	33.738	26.089
50	8.816	33.920	26.302	50	7.839	33.859	26.402	50	8.389	33.767	26.247
75	7.363	33.822	26.441	75	7.475	33.854	26.450				
100	6.757	33.793	26.501								

STATION US08490 LATITUDE 42-11.9 N LONGITUDE 140-35.4 E DEPTH (m) 85				STATION US08491 LATITUDE 42-16.1 N LONGITUDE 140-34.7 E DEPTH (m) 92				STATION US08492 LATITUDE 42-19.6 N LONGITUDE 140-30.1 E DEPTH (m) 92			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	12.391	33.872	25.638	5	12.531	33.861	25.603	5	12.430	33.859	25.621
10	12.401	33.878	25.641	10	12.531	33.863	25.604	10	12.411	33.854	25.620
20	12.346	33.897	25.667	20	12.516	33.862	25.607	20	12.349	33.872	25.646
30	11.959	33.900	25.743	30	12.489	33.861	25.611	30	12.144	33.913	25.717
40	11.019	33.699	25.759	40	12.550	33.948	25.667	40	11.250	33.840	25.827
50	9.720	33.864	26.112	50	12.618	33.976	25.675	50	9.066	33.881	26.232
75	5.979	33.646	26.485	75	7.736	33.832	26.395	75	8.548	33.906	26.332

STATION US08493 LATITUDE 42-23.9 N LONGITUDE 140-30.8 E DEPTH (m) 95				STATION US08494 LATITUDE 42-20.6 N LONGITUDE 140-37.2 E DEPTH (m) 85				STATION US08495 LATITUDE 42-18.0 N LONGITUDE 140-40.5 E DEPTH (m) 76			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	11.942	33.822	25.685	5	12.520	33.910	25.643	5	12.508	33.861	25.607
10	11.898	33.823	25.694	10	12.521	33.911	25.643	10	12.509	33.861	25.607
20	11.860	33.823	25.702	20	12.546	33.919	25.645	20	12.501	33.862	25.609
30	10.531	33.698	25.844	30	12.555	33.923	25.646	30	12.491	33.863	25.612
40	8.618	33.911	26.325	40	12.561	33.932	25.652	40	12.488	33.870	25.618
50	7.997	33.878	26.393	50	12.666	33.963	25.656	50	12.484	33.881	25.627
75	5.953	33.662	26.501	75	7.890	33.782	26.334	75	9.052	33.929	26.271

STATION US08496 LATITUDE 41-24.6 N LONGITUDE 140-06.0 E DEPTH (m) 52				STATION US08497 LATITUDE 41-23.9 N LONGITUDE 140-06.3 E DEPTH (m) 84				STATION US08498 LATITUDE 41-27.4 N LONGITUDE 140-16.1 E DEPTH (m) 32			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	15.314	33.963	25.104	5	15.609	33.921	25.006	5	13.749	34.060	25.513
10	15.301	33.960	25.104	10	15.613	33.917	25.002	10	13.749	34.074	25.523
20	15.123	33.977	25.157	20	15.553	33.916	25.014	20	13.697	34.078	25.538
30	15.022	33.991	25.189	30	15.257	33.952	25.108				
40	15.015	33.995	25.194	40	15.045	33.998	25.190				
50	15.015	33.995	25.194	50	14.977	34.013	25.216				

STATION US08499 LATITUDE 41-26.3 N LONGITUDE 140-17.4 E DEPTH (m) 69				STATION US08500 LATITUDE 41-28.3 N LONGITUDE 140-20.3 E DEPTH (m) 64				STATION US08501 LATITUDE 41-34.3 N LONGITUDE 140-29.2 E DEPTH (m) 36			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.891	34.089	25.506	5	14.279	34.060	25.402	5	14.215	34.027	25.390
10	13.876	34.093	25.512	10	14.279	34.060	25.402	10	14.219	34.025	25.388
20	13.795	34.095	25.531	20	14.224	34.065	25.417	20	14.120	33.996	25.386
30	13.774	34.098	25.537	30	14.187	34.069	25.428	30	14.028	34.022	25.426
40	13.750	34.102	25.545	40	14.182	34.070	25.430				
50	13.699	34.101	25.555	50	14.171	34.071	25.434				

STATION US08502 LATITUDE 42-10.1 N LONGITUDE 140-47.3 E DEPTH (m) 94				STATION US08503 LATITUDE 42-13.0 N LONGITUDE 140-42.0 E DEPTH (m) 90				STATION US08504 LATITUDE 42-16.0 N LONGITUDE 140-35.5 E DEPTH (m) 92			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	10.837	34.081	26.089	5	9.897	33.989	26.180	5	9.697	33.973	26.201
10	10.843	34.076	26.084	10	9.895	33.993	26.183	10	9.694	33.973	26.201
20	10.285	33.914	26.055	20	9.892	33.997	26.187	20	9.680	33.973	26.204
30	10.119	33.999	26.150	30	9.883	34.003	26.193	30	9.683	33.975	26.204
40	10.062	33.982	26.146	40	9.796	33.991	26.198	40	9.685	33.975	26.204
50	9.617	33.924	26.176	50	9.748	33.986	26.202	50	9.683	33.974	26.204
75	7.392	33.793	26.413	75	9.307	33.959	26.254	75	9.670	33.971	26.204

STATION US08505 LATITUDE 42-18.9 N LONGITUDE 140-31.3 E DEPTH (m) 94				STATION US08506 LATITUDE 42-23.4 N LONGITUDE 140-31.2 E DEPTH (m) 96				STATION US08507 LATITUDE 42-20.1 N LONGITUDE 140-22.9 E DEPTH (m) 54			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	9.400	33.868	26.168	5	9.606	33.925	26.178	5	9.400	33.762	26.085
10	9.390	33.876	26.175	10	9.725	33.965	26.190	10	9.691	33.910	26.152
20	9.410	33.888	26.181	20	9.681	33.966	26.198	20	9.720	33.935	26.168
30	9.405	33.887	26.182	30	9.671	33.966	26.200	30	9.695	33.937	26.173
40	9.380	33.883	26.182	40	9.666	33.967	26.202	40	9.602	33.931	26.184
50	9.316	33.911	26.215	50	9.650	33.968	26.205	50	9.372	33.916	26.210
75	8.058	33.883	26.388	75	7.058	33.779	26.449				

STATION US08508 LATITUDE 42-14.1 N LONGITUDE 140-29.6 E DEPTH (m) 76				STATION US08509 LATITUDE 42-08.7 N LONGITUDE 140-35.7 E DEPTH (m) 63				STATION US08510 LATITUDE 42-11.1 N LONGITUDE 140-35.5 E DEPTH (m) 80			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	9.407	33.732	26.060	5	8.869	33.455	25.929	5	9.922	33.954	26.148
10	9.626	33.945	26.191	10	9.727	33.930	26.162	10	9.956	34.004	26.182
20	9.706	33.977	26.202	20	9.799	33.978	26.187	20	9.959	34.003	26.181
30	9.714	33.984	26.207	30	9.714	33.971	26.196	30	9.917	34.003	26.187
40	9.712	33.985	26.208	40	9.698	33.977	26.204	40	9.792	33.997	26.203
50	9.726	33.996	26.214	50	9.707	33.984	26.207	50	9.761	33.999	26.210
								75	8.282	33.859	26.336

STATION US08511 LATITUDE 42-20.9 N LONGITUDE 140-36.5 E DEPTH (m) 88				STATION US08512 LATITUDE 42-27.0 N LONGITUDE 140-31.5 E DEPTH (m) 75				STATION US08513 LATITUDE 42-25.9 N LONGITUDE 140-36.9 E DEPTH (m) 85			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	9.785	33.946	26.165	5	9.578	33.946	26.199	5	9.924	33.972	26.162
10	9.796	33.961	26.175	10	9.578	33.961	26.211	10	9.922	33.971	26.162
20	9.795	33.960	26.174	20	9.573	33.960	26.211	20	9.914	33.970	26.162
30	9.797	33.960	26.174	30	9.574	33.960	26.211	30	9.913	33.970	26.162
40	9.796	33.959	26.173	40	9.572	33.960	26.211	40	9.889	33.969	26.165
50	9.775	33.955	26.174	50	9.571	33.960	26.211	50	9.857	33.967	26.169
75	9.591	33.948	26.199					75	9.755	33.963	26.183

STATION US08514 LATITUDE 42-23.0 N LONGITUDE 140-42.1 E DEPTH (m) 65				STATION US08515 LATITUDE 42-18.6 N LONGITUDE 140-42.3 E DEPTH (m) 66				STATION US08516 LATITUDE 42-20.6 N LONGITUDE 140-48.2 E DEPTH (m) 55			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	9.756	33.965	26.185	5	9.719	33.926	26.161	5	9.253	33.943	26.250
10	9.738	33.950	26.176	10	9.718	33.946	26.176	10	9.203	33.940	26.255
20	9.706	33.947	26.179	20	9.677	33.942	26.180	20	9.083	33.930	26.267
30	9.680	33.944	26.181	30	9.647	33.938	26.182	30	8.945	33.931	26.289
40	9.527	33.927	26.193	40	9.630	33.936	26.183	40	8.916	33.932	26.295
50	9.513	33.932	26.200	50	9.596	33.932	26.186	50	8.458	33.879	26.325

STATION US08517 LATITUDE 42-15.7 N LONGITUDE 140-47.7 E DEPTH (m) 71				STATION US08518 LATITUDE 41-57.6 N LONGITUDE 140-58.4 E DEPTH (m) 81				STATION US08519 LATITUDE 41-57.9 N LONGITUDE 140-59.1 E DEPTH (m) 85			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	10.780	34.037	26.065	5	11.229	33.901	25.878	5	11.235	34.054	25.996
10	10.805	34.065	26.083	10	11.489	34.047	25.944	10	11.361	34.067	25.984
20	10.410	34.032	26.126	20	11.369	34.068	25.982	20	11.194	34.077	26.022
30	9.967	34.001	26.177	30	11.234	34.081	26.017	30	11.164	34.081	26.030
40	9.790	33.999	26.205	40	11.164	34.064	26.017	40	11.159	34.082	26.032
50	9.571	33.995	26.239	50	10.178	33.974	26.121	50	11.029	34.056	26.035
				75	8.814	33.873	26.265	75	9.301	33.926	26.229

STATION US08520				STATION US08521				STATION US08522			
LATITUDE 41-58.3 N				LATITUDE 41-58.9 N				LATITUDE 42-17.7 N			
LONGITUDE 141-00.0 E				LONGITUDE 141-00.9 E				LONGITUDE 140-53.8 E			
DEPTH (m) 90				DEPTH (m) 96				DEPTH (m) 57			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	11.145	34.083	26.035	5	10.970	33.990	25.994	5	8.914	33.947	26.307
10	11.163	34.080	26.029	10	11.124	34.065	26.025	10	8.919	33.947	26.306
20	11.168	34.078	26.027	20	11.111	34.062	26.025	20	8.918	33.946	26.306
30	11.156	34.077	26.028	30	11.116	34.064	26.025	30	8.916	33.947	26.307
40	11.126	34.075	26.033	40	11.114	34.064	26.026	40	8.913	33.947	26.307
50	11.045	34.074	26.047	50	10.931	34.055	26.052	50	8.915	33.948	26.308
75	9.916	33.935	26.134	75	10.266	33.939	26.079				
STATION US08523				STATION US08524				STATION US08525			
LATITUDE 42-11.4 N				LATITUDE 42-05.3 N				LATITUDE 42-10.3 N			
LONGITUDE 141-01.8 E				LONGITUDE 140-56.7 E				LONGITUDE 140-47.7 E			
DEPTH (m) 79				DEPTH (m) 84				DEPTH (m) 91			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	9.193	33.992	26.298	5	10.149	33.868	26.043	5	9.992	33.577	25.842
10	9.202	33.984	26.290	10	10.219	33.997	26.132	10	10.234	34.043	26.165
20	9.107	33.961	26.287	20	10.216	33.992	26.128	20	10.242	34.040	26.161
30	8.974	33.941	26.293	30	10.211	33.990	26.127	30	10.245	34.040	26.161
40	8.918	33.934	26.297	40	10.192	33.989	26.130	40	10.251	34.039	26.159
50	8.904	33.932	26.297	50	10.181	33.988	26.131	50	9.509	33.939	26.205
75	8.770	33.921	26.310	75	9.946	33.963	26.151	75	9.099	33.948	26.279
STATION US08526				STATION US08527				STATION US08528			
LATITUDE 42-23.6 N				LATITUDE 41-54.0 N				LATITUDE 41-35.1 N			
LONGITUDE 140-42.6 E				LONGITUDE 141-09.8 E				LONGITUDE 140-26.6 E			
DEPTH (m) 63				DEPTH (m) 184				DEPTH (m) 14			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	9.242	33.881	26.203	5	12.139	33.924	25.727	5	12.325	33.769	25.572
10	9.295	33.954	26.252	10	12.130	33.923	25.728	10	12.323	33.764	25.568
20	9.287	33.953	26.253	20	11.475	33.907	25.838				
30	9.231	33.947	26.257	30	11.482	33.986	25.898				
40	9.130	33.936	26.264	40	9.533	33.614	25.947				
50	9.097	33.934	26.268	50	8.647	33.584	26.065				
				75	7.881	33.501	26.114				
				100	8.954	33.855	26.229				
STATION US08529				STATION US08530				STATION US08531			
LATITUDE 41-34.9 N				LATITUDE 41-38.1 N				LATITUDE 41-37.6 N			
LONGITUDE 140-29.0 E				LONGITUDE 140-26.3 E				LONGITUDE 140-28.3 E			
DEPTH (m) 32				DEPTH (m) 15				DEPTH (m) 22			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	12.607	33.961	25.666	5	12.459	33.781	25.555	5	12.563	33.949	25.665
10	12.608	33.960	25.664					10	12.563	33.950	25.666
20	12.610	33.960	25.664								
STATION US08532				STATION US08533				STATION US08534			
LATITUDE 41-37.3 N				LATITUDE 41-41.2 N				LATITUDE 41-43.1 N			
LONGITUDE 140-30.0 E				LONGITUDE 140-34.4 E				LONGITUDE 140-36.0 E			
DEPTH (m) 31				DEPTH (m) 42				DEPTH (m) 36			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	12.537	33.923	25.650	5	12.623	33.935	25.642	5	12.224	33.730	25.560
10	12.539	33.923	25.650	10	12.631	33.932	25.639	10	12.457	33.896	25.644
20	12.540	33.923	25.649	20	12.866	34.023	25.662	20	12.544	33.901	25.631
				30	12.842	34.030	25.673	30	12.728	33.987	25.662
STATION US08535											
LATITUDE 41-44.0 N											
LONGITUDE 140-35.8 E											
DEPTH (m) 6											
Press.	Temp.	Salinity	Sigma-T								
4	12.100	33.749	25.599								