HOKKAIDO UNIVERSITY

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PART II

USHIO MARU CRUISES

FROM JANUARY TO DECEMBER 2008

I. Crew List

Captain:		Hidekazu Yamaguchi
Crew:	Chief Officer	Osamu Kimura
	Second Officer	Naoto Kobayashi
	Chief Engineer	Hideo Ito
	First Engineer	Senetsu Nakai
	Second Engineer	Kenichi Shindo
	Chief Radio Officer	Yoshiki Suzuki
	Boatswain	Noriyasu Takahashi (Cruise 139 - 145)
		Yoshitaka Yoshida (Cruise 146 -)
	Jr. Boatswain	Yoshitaka Yoshida (Cruise 139 - 145)
		Yukio Tabata (Cruise 146 -)
	Quartermaster	Yutaka Takeda
	Sailor	Daisuke Sasaki
	No.1 Oiler	Syuichi Hasegawa (Cruise 139 - 145)
		Nobuyuki Sawada (Cruise 146 -)
	No.2 Oiler	Nobuyuki Sawada (Cruise 139 - 145)
		Konichi Tomosugi (Cruise 146 -)
	Oiler	Konichi Tomosugi (Cruise 139 - 145)
		Akira Sugihara (Cruise 146 -)
	Chief Steward	Tsutomu Takahashi
	Head Steward	Hajime Morihiro

II. Particulars

Length (R.L.)	33.74 m
Length (O.L.)	39.39 m
Breadth (mid)	6.50 m
Depth (mid)	3.00 m
Gross tonnage (Domestic)	179 tons
International Gross tonnage	286 tons
Main engine	735 kW
Call sign	JD2672

1

THE “USHIO MARU”

CRUISE 139
CRUISE 140
CRUISE 141

IN JANUARY-FEBRUARY 2008

1. Cruise Itinerary

Cruise 139

Departure from Hakodate	Jan.	9	, 2008
Return to Hakodate		10	
Total coverage 6.3 miles			

Cruise 140

Departure from Hakodate	Jan.	21	, 2008
Arrival at and departure from Usujiri		21	
Start hydrographic research (US08001) and larvae net sampling		21	
Sampling by Frame Trawl net		21	
Arrival at Usujiri		22	
Departure from Usujiri		23	
Finish hydrographic research (US08013) and larvae net sampling		23	
Departure from Usujiri		26	
Return to Hakodate		26	
Total coverage 255.9 miles			

Cruise 141

Departure from Hakodate	Feb.	4	, 2008
Start hydrographic research (US08014) and larvae net sampling		4	
Finish hydrographic research (US08028) and larvae net sampling		5	
Return to Hakodate		6	
Total coverage 197.7 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 139

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
Graduate Students:	Laboratory of Marine Bioresource Science :		1 person
Under Graduate Students:	Department of Marine Biological Science :		3 persons

Cruise 140

Research Staff :	Associate Professor	(Laboratory of Marine Bioresource Science)	Toshikuni Nakatani
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Tohru Mukai
Graduate Students :	Laboratory of Marine Bioresource Science :		2 persons
	Laboratory of Marine Bioresource and Environment Sensing :		1 person
Under Graduate Students :	Department of Marine Biological Science :		3 persons
	Department of Marine Production System Science :		3 persons

Cruise 141

Research Staff :	Associate Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
Graduate Students :	Laboratory of Marine Bioresource Science :		1 person
Under Graduate Students :	Department of Marine Biological Science :		3 persons

3. Data on Temperature, Salinity, and Computed Dynamic Depth Anomaly

Hydrographic work on deck and the data processing were made by the deck officers, crews, research staff and cadets of the “Ushio Maru”.
Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19).
Dynamic computations were made using a desk-top computer aboard the “Ushio Maru”.

Figure 1: Oceanographic stations (Cruise 140)

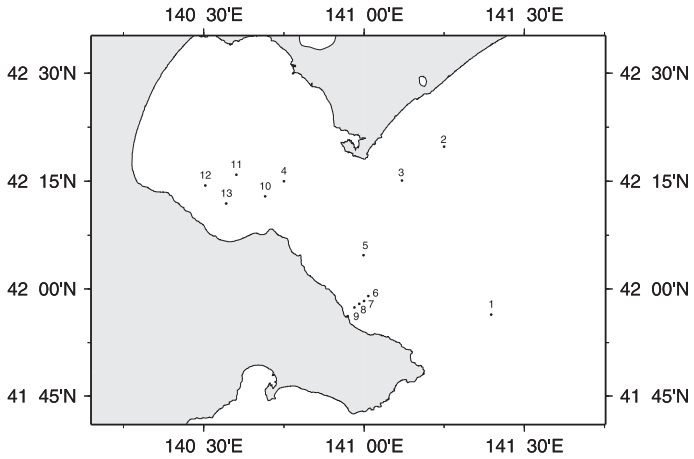

Figure 2: Oceanographic stations (Cruise 141)

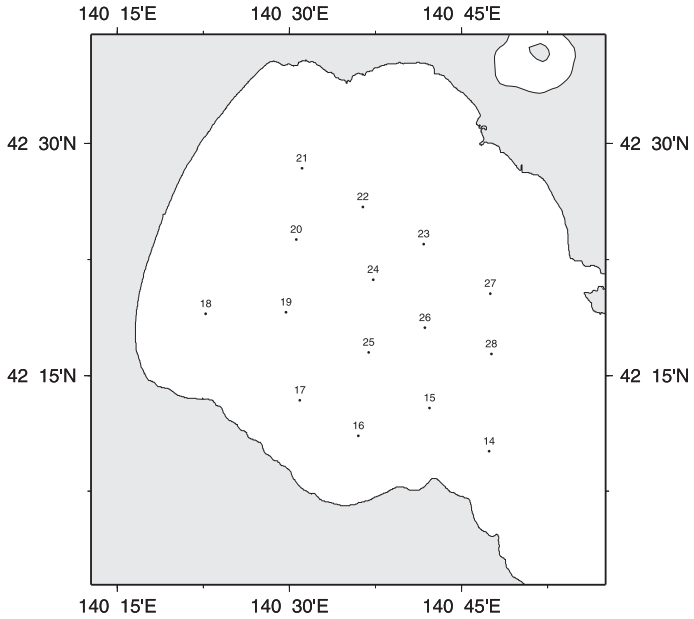

Table 1: List of oceanographic stations

Cruise 139 No Data

Cruise 140

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08001	41-56.4	141-23.8	1/21	1755-1803	355	NW-2	NW -1	NW -4	-2.2	8.0	s	1023.7
US08002	42-19.8	141-15.0	1/21	2315-2320	97	North-1	NW -2	North-3	-3.8	7.5	o	1023.8
US08003	42-15.1	141-07.1	1/22	0039-0043	83	NW -2	NW -1	NW -4	-2.9	7.4	s	1024.0
US08004	42-15.0	140-45.0	1/22	0245-0249	78	WNW-2	WNW-1	WNW-4	-2.4	7.0	c	1024.0
US08005	42-04.7	140-59.9	1/22	0445-0450	82	West-1	NNW-1	West-3	-2.6	7.9	c	1024.2
US08006	41-59.0	141-00.8	1/22	0547-0552	95	West-1	NW -1	West-3	-2.1	7.9	s	1024.1
US08007	41-58.3	141-00.0	1/22	0604-0609	90	WNW-1	NW -1	WNW-3	-2.6	7.7	s	1024.1
US08008	41-57.9	140-59.1	1/22	0620-0625	85	NW -1	NW -1	NW -3	-2.5	7.7	c	1024.1
US08009	41-57.4	140-58.2	1/22	0635-0640	79	West-1	NW -1	West-3	-2.4	7.9	s	1024.1
US08010	42-12.9	140-41.5	1/23	1314-1320	91	Calm	ESE-1	Calm	0.7	6.4	c	1019.2
US08011	42-15.9	140-36.1	1/23	1421-1427	92	Calm	ESE-1	Calm	-0.1	5.2	o	1018.5
US08012	42-14.4	140-30.3	1/23	1529-1534	81	Calm	ESE-1	Calm	0.0	5.2	c	1018.0
US08013	42-11.9	140-34.2	1/23	1625-1629	83	Calm	ESE-1	Calm	-0.1	5.1	c	1017.1

Cruise 141

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08014	42-10.1	140-47.4	2/4	1426-1430	95	NW -1	ESE-1	NW -2	-0.8	4.5	bc	1013.9
US08015	42-12.9	140-42.2	2/4	1512-1517	91	WNW-2	ESE-1	WNW-3	-0.7	5.1	s	1014.2
US08016	42-11.1	140-36.0	2/4	1611-1615	82	NW -2	ESE-1	NW -4	-0.6	4.9	bc	1014.6
US08017	42-13.4	140-30.9	2/4	1710-1714	81	WNW-3	ESE-1	WNW-5	-0.8	4.8	c	1014.8
US08018	42-19.0	140-22.7	2/5	0717-0721	53	WSW-1	ESE-1	WSW-3	-2.7	4.8	s	1014.1
US08019	42-19.1	140-29.7	2/5	0822-0826	92	WSW-2	East-1	WSW-4	-2.1	5.1	o	1014.1
US08020	42-23.8	140-30.6	2/5	0919-0923	76	West-1	ESE-1	West-3	-2.0	5.2	bc	1014.1
US08021	42-28.4	140-31.1	2/5	1002-1006	78	West-1	ESE-1	West-2	-1.3	5.3	bc	1014.2
US08022	42-25.9	140-36.4	2/5	1042-1046	86	West-1	ESE-1	West-2	0.0	5.1	bc	1014.3
US08023	42-23.5	140-41.7	2/5	1123-1126	68	West-2	ESE-1	West-3	0.2	4.9	bc	1014.1
US08024	42-21.2	140-37.3	2/5	1200-1204	86	WNW-3	West-1	WNW-5	-0.7	5.5	s	1013.6
US08025	42-16.5	140-36.9	2/5	1251-1254	91	West-3	West-1	West-5	-0.3	5.0	bc	1013.4
US08026	42-18.1	140-41.8	2/5	1339-1342	67	West-3	West-1	West-5	-0.1	4.7	bc	1013.0
US08027	42-20.3	140-47.5	2/5	1425-1427	58	West-3	West-1	West-5	0.2	4.1	bc	1013.1
US08028	42-16.4	140-47.6	2/5	1500-1503	70	West-3	West-1	West-6	-0.1	4.5	bc	1013.0

(*):Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US08001
LATITUDE 41-56.4 N
LONGITUDE 141-23.8 E
DEPTH (m) 355

Press.	Temp.	Salinity	Sigma-T
5	8.325	33.883	26.348
10	8.317	33.884	26.350
20	8.332	33.890	26.353
30	8.330	33.894	26.356
40	8.330	33.898	26.359
50	8.330	33.900	26.361
75	8.335	33.909	26.367
100	8.316	33.905	26.366
125	8.277	33.902	26.370

STATION US08002
LATITUDE 42-19.8 N
LONGITUDE 141-15.0 E
DEPTH (m) 97

Press.	Temp.	Salinity	Sigma-T
5	7.652	33.899	26.460
10	7.649	33.899	26.460
20	7.721	33.915	26.463
30	7.734	33.916	26.462
40	7.736	33.914	26.460
50	7.735	33.912	26.458
75	7.712	33.914	26.463

STATION US08003
LATITUDE 42-15.1 N
LONGITUDE 141-07.1 E
DEPTH (m) 83

Press.	Temp.	Salinity	Sigma-T
5	7.865	33.917	26.443
10	7.877	33.918	26.442
20	7.882	33.916	26.440
30	7.874	33.913	26.438
40	7.904	33.935	26.452
50	7.842	33.933	26.459
75	7.798	33.934	26.466

STATION US08004
LATITUDE 42-15.0 N
LONGITUDE 140-45.0 E
DEPTH (m) 78

Press.	Temp.	Salinity	Sigma-T
5	7.432	33.946	26.528
10	7.440	33.945	26.526
20	7.440	33.940	26.523
30	7.420	33.937	26.523
40	5.961	33.894	26.684
50	5.896	33.917	26.710

STATION US08005
LATITUDE 42-04.7 N
LONGITUDE 140-59.9 E
DEPTH (m) 82

Press.	Temp.	Salinity	Sigma-T
5	8.320	33.927	26.383
10	8.307	33.926	26.385
20	8.319	33.923	26.380
30	8.326	33.924	26.380
40	8.328	33.924	26.380

STATION US08006
LATITUDE 41-59.0 N
LONGITUDE 141-00.8 E
DEPTH (m) 95

Press.	Temp.	Salinity	Sigma-T
5	8.194	33.948	26.419
10	8.192	33.946	26.418
20	8.193	33.947	26.418
30	8.152	33.938	26.417
40	7.879	33.918	26.442
50	7.798	33.910	26.447
75	7.680	33.893	26.452

STATION US08007
LATITUDE 41-58.3 N
LONGITUDE 141-00.0 E
DEPTH (m) 90

Press.	Temp.	Salinity	Sigma-T
5	8.153	33.949	26.426
10	8.155	33.950	26.427
20	8.153	33.950	26.426
30	8.150	33.948	26.425
40	7.813	33.901	26.438
50	7.762	33.904	26.448
75	7.528	33.874	26.458

STATION US08008
LATITUDE 41-57.9 N
LONGITUDE 140-59.1 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	8.277	33.940	26.400
10	8.209	33.940	26.410
20	8.117	33.942	26.426
30	8.070	33.937	26.428
40	7.678	33.859	26.425
50	7.596	33.880	26.454
75	6.001	33.875	26.663

STATION US08009
LATITUDE 41-57.4 N
LONGITUDE 140-58.2 E
DEPTH (m) 79

Press.	Temp.	Salinity	Sigma-T
5	8.308	33.941	26.396
10	8.253	33.923	26.390
20	8.034	33.942	26.438
30	7.901	33.941	26.457
40	7.685	33.933	26.482
50	7.483	33.914	26.496
75	6.172	33.883	26.648

STATION US08010
LATITUDE 42-12.9 N
LONGITUDE 140-41.5 E
DEPTH (m) 91

Press.	Temp.	Salinity	Sigma-T
5	6.232	33.932	26.679
10	6.021	33.908	26.687
20	5.800	33.901	26.709
30	5.751	33.902	26.716
40	5.694	33.896	26.718
50	5.693	33.897	26.719
75	5.583	33.887	26.725

STATION US08011
LATITUDE 42-15.9 N
LONGITUDE 140-36.1 E
DEPTH (m) 92

Press.	Temp.	Salinity	Sigma-T
5	5.642	33.869	26.703
10	5.650	33.909	26.734
20	5.650	33.908	26.733
30	5.650	33.909	26.734
40	5.652	33.910	26.735
50	5.649	33.910	26.735
75	5.648	33.911	26.736

STATION US08012
LATITUDE 42-14.4 N
LONGITUDE 140-30.3 E
DEPTH (m) 81

Press.	Temp.	Salinity	Sigma-T
5	5.672	33.899	26.723
10	5.682	33.911	26.731
20	5.677	33.909	26.731
30	5.671	33.909	26.731
40	5.661	33.908	26.732
50	5.662	33.908	26.731
75	5.623	33.911	26.738

STATION US08013
LATITUDE 42-11.9 N
LONGITUDE 140-34.2 E
DEPTH (m) 83

Press.	Temp.	Salinity	Sigma-T
5	5.495	33.821	26.683
10	5.534	33.896	26.738
20	5.521	33.895	26.738
30	5.510	33.895	26.739
40	5.510	33.895	26.739
50	5.505	33.895	26.740
75	5.480	33.896	26.744

STATION US08014
LATITUDE 42-10.1 N
LONGITUDE 140-47.4 E
DEPTH (m) 95

Press.	Temp.	Salinity	Sigma-T
5	5.128	33.721	26.647
10	5.211	33.886	26.767
20	5.198	33.890	26.773
30	5.169	33.890	26.776
40	5.141	33.889	26.778
50	5.116	33.889	26.781
75	4.875	33.870	26.794

STATION US08015
LATITUDE 42-12.9 N
LONGITUDE 140-42.2 E
DEPTH (m) 91

Press.	Temp.	Salinity	Sigma-T
5	5.212	33.796	26.697
10	5.192	33.846	26.738
20	5.185	33.897	26.780
30	5.163	33.895	26.781
40	4.705	33.842	26.790
50	4.382	33.816	26.805
75	4.739	33.898	26.831

STATION US08016
LATITUDE 42-11.1 N
LONGITUDE 140-36.0 E
DEPTH (m) 82

Press.	Temp.	Salinity	Sigma-T
5	4.749	33.666	26.646
10	4.767	33.745	26.707
20	4.780	33.893	26.823
30	4.777	33.895	26.824
40	4.771	33.894	26.824
50	4.767	33.894	26.824
75	4.759	33.894	26.825

STATION US08017
LATITUDE 42-13.4 N
LONGITUDE 140-30.9 E
DEPTH (m) 81

Press.	Temp.	Salinity	Sigma-T
5	4.699	33.787	26.747
10	4.754	33.891	26.823
20	4.762	33.896	26.827
30	4.762	33.895	26.826
40	4.752	33.894	26.826
50	4.744	33.894	26.827
75	4.730	33.893	26.828

STATION US08018
LATITUDE 42-19.0 N
LONGITUDE 140-22.7 E
DEPTH (m) 53

Press.	Temp.	Salinity	Sigma-T
5	4.599	33.762	26.739
10	4.678	33.898	26.837
20	4.677	33.895	26.835
30	4.685	33.894	26.833
40	4.687	33.895	26.834
50	4.688	33.894	26.833

STATION US08019
LATITUDE 42-19.1 N
LONGITUDE 140-29.7 E
DEPTH (m) 92

Press.	Temp.	Salinity	Sigma-T
5	5.015	33.881	26.786
10	5.054	33.915	26.809
20	5.061	33.913	26.807
30	5.058	33.913	26.807
40	5.061	33.913	26.806
50	5.043	33.909	26.806
75	5.008	33.909	26.809

STATION US08020
LATITUDE 42-23.8 N
LONGITUDE 140-30.6 E
DEPTH (m) 76

Press.	Temp.	Salinity	Sigma-T
5	5.073	33.756	26.681
10	5.106	33.837	26.741
20	5.127	33.912	26.798
30	5.107	33.911	26.800
40	5.064	33.907	26.802
50	5.033	33.903	26.802
75	4.852	33.886	26.809

STATION US08021
LATITUDE 42-28.4 N
LONGITUDE 140-31.1 E
DEPTH (m) 78

Press.	Temp.	Salinity	Sigma-T
5	5.184	33.844	26.738
10	5.203	33.890	26.772
20	5.212	33.910	26.787
30	5.210	33.910	26.787
40	5.210	33.910	26.787
50	5.210	33.910	26.787
75	5.101	33.913	26.802

STATION US08022
LATITUDE 42-25.9 N
LONGITUDE 140-36.4 E
DEPTH (m) 86

Press.	Temp.	Salinity	Sigma-T
5	4.971	33.851	26.768
10	4.986	33.870	26.781
20	4.994	33.904	26.807
30	4.987	33.903	26.807
40	4.978	33.902	26.807
50	4.944	33.900	26.809
75	4.901	33.897	26.812

STATION US08023
LATITUDE 42-23.5 N
LONGITUDE 140-41.7 E
DEPTH (m) 68

Press.	Temp.	Salinity	Sigma-T
5	4.732	33.576	26.576
10	5.152	33.663	26.598
20	5.512	33.897	26.741
30	5.506	33.901	26.745
40	5.513	33.911	26.752
50	5.462	33.911	26.758

STATION US08024
LATITUDE 42-21.2 N
LONGITUDE 140-37.3 E
DEPTH (m) 86

Press.	Temp.	Salinity	Sigma-T
5	5.391	33.863	26.728
10	5.408	33.920	26.772
20	5.382	33.915	26.770
30	5.361	33.914	26.772
40	5.346	33.914	26.774
50	5.266	33.912	26.782
75	4.941	33.893	26.804

STATION US08025
LATITUDE 42-16.5 N
LONGITUDE 140-36.9 E
DEPTH (m) 91

Press.	Temp.	Salinity	Sigma-T
5	4.726	33.893	26.829
10	4.727	33.889	26.825
20	4.734	33.885	26.821
30	4.736	33.885	26.821
40	4.734	33.885	26.821
50	4.736	33.884	26.820
75	4.750	33.887	26.821

STATION US08026
LATITUDE 42-18.1 N
LONGITUDE 140-41.8 E
DEPTH (m) 67

Press.	Temp.	Salinity	Sigma-T
5	4.604	33.507	26.536
10	4.818	33.623	26.604
20	5.421	33.921	26.771
30	5.320	33.910	26.774
40	5.235	33.907	26.781
50	5.180	33.907	26.788

STATION US08027
LATITUDE 42-20.3 N
LONGITUDE 140-47.5 E
DEPTH (m) 58

Press.	Temp.	Salinity	Sigma-T
5	3.952	33.279	26.422
10	3.959	33.296	26.435
20	4.567	33.458	26.501
30	4.553	33.451	26.496
40	4.376	33.433	26.501
50	4.377	33.437	26.504

STATION US08028
LATITUDE 42-16.4 N
LONGITUDE 140-47.6 E
DEPTH (m) 70

Press.	Temp.	Salinity	Sigma-T
5	4.418	33.420	26.486
10	4.420	33.427	26.492
20	5.392	33.718	26.613
30	5.471	33.720	26.606
40	5.536	33.730	26.606
50	5.604	33.822	26.671

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THE “USHIO MARU”

CRUISE 142
CRUISE 143
CRUISE 144

IN FEBRUARY-MARCH 2008

1. Cruise Itinerary

Cruise 142

Departure from Hakodate	Feb.	19	, 2008
Arrival at and departure from Usujiri		19	
Start hydrographic research (US08029) and larvae net sampling		19	
Sampling by Frame trawl net		19	
Arrival at Usujiri		20	
Departure from Usujiri		22	
Retrieval mooring sea temperature meter system		22	
Set Sediment trap system		22	
Arrival at Usujiri		22	
Departure from Usujiri		25	
Research by tawl net		25	
Finish hydrographic research (US08043) and larvae net sampling		25	
Return to Hakodate		26	

Total coverage 325.6 miles

Cruise 143

Departure from Hakodate	Mar.	4	, 2008
Start hydrographic research (US08044) and larvae net sampling		5	
Start trawl net research		5	
Finish hudrographic research (US08058) and larvae net sampling		6	
Finish trawl net research		6	
Return to Hakodate		7	

Total coverage 211.0 miles

Cruise 144

Departure from Hakodate	Mar.	11	, 2008
Start hydrographic research (US08059) and larvae net sampling		11	
Arrival at Fukushima		11	
Departure from Fukushima		12	
Fisnish hydrographic research (US08074) and larvae net sampling		12	
Returen toHakodate		13	

Return to Hakodate 81.4 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 142

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	Toshikuni Nakatani
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Tohru Mukai
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Susumu Shimizu

Graduate Students :	Laboratory of Marine Bioresource Science :	2 persons
	Laboratory of Marine Bioresource and Environment Sensing :	4 persons
	Laboratory of Marine Environmental Science :	1 person
Under Graduate Students :	Department of Marine Biological Science :	3 persons
	Department of Marine Production System Science :	7 persons
	Department of Fisheries Oceanography and Marine Science :	5 persons

Cruise 143

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

Graduate Students :	Laboratory of Marine Bioresource Science :	1 person
Under Graduate Students :	Department of Marine Biological Science :	3 persons
	Department of Marine Biological Science (Third grade) :	3 persons

Cruise 144

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

Graduate Students :	Laboratory of Marine Bioresource Science :	2 persons
Under Graduate Students :	Department of Marine Biological Science (Third grade) :	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 142)

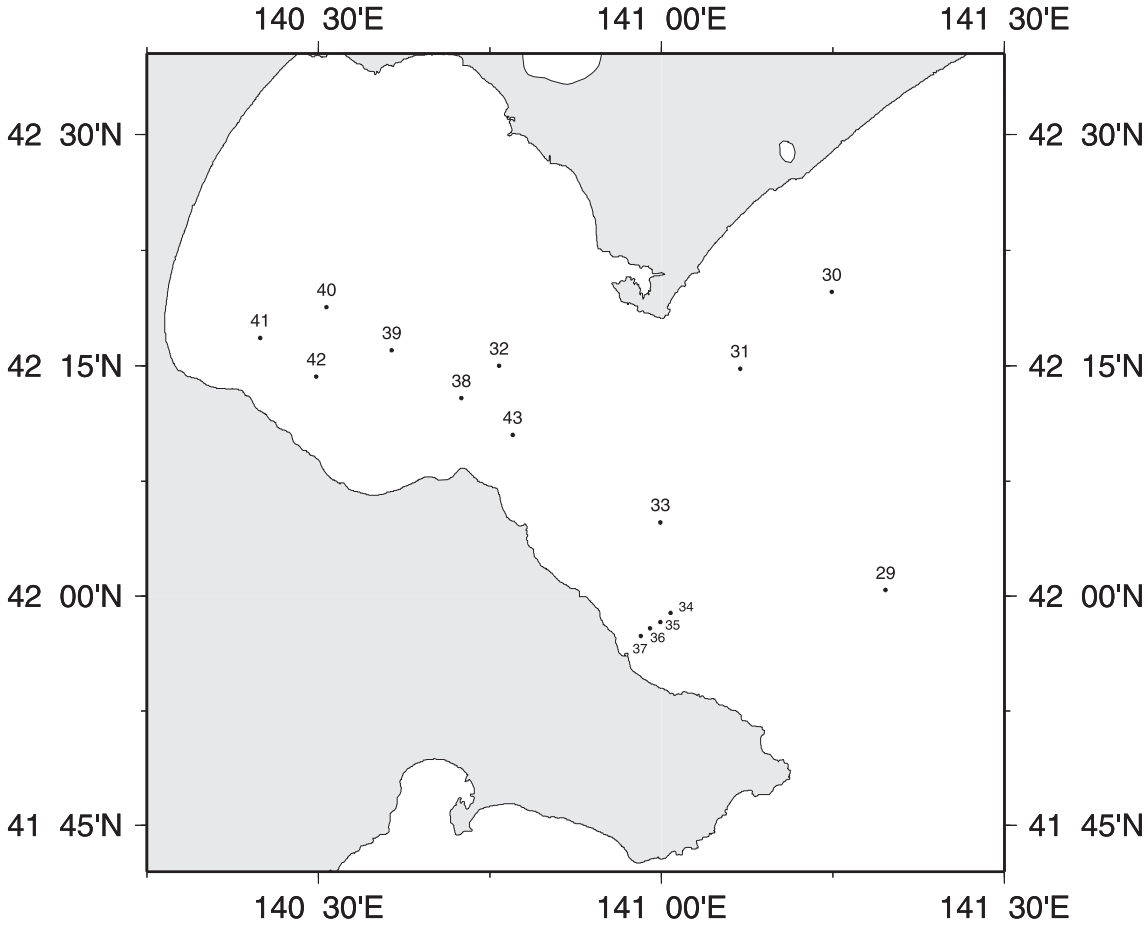

Figure 2: Oceanographic stations (Cruise 143)

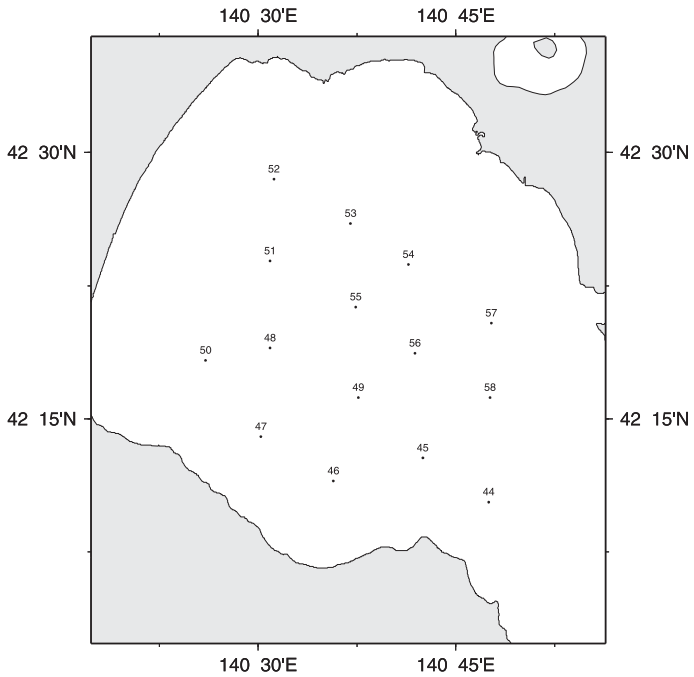

Figure 3: Oceanographic stations (Cruise 144)

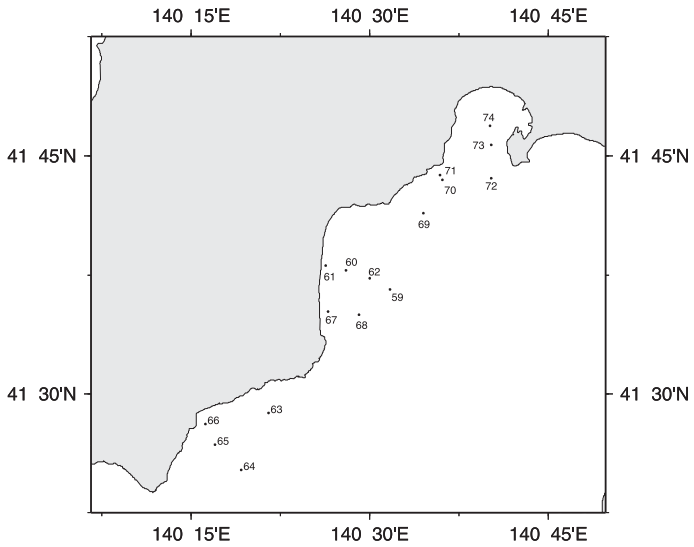

Table 1: List of oceanographic stations

Cruise 142

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08029	42-00.4	141-19.6	2/19	1829-1843	307	SE -1	NNW-1	SE -2	0.0	2.7	bc	1020.1
US08030	42-19.8	141-14.9	2/19	2340-2345	97	West-1	West-1	West-4	1.9	3.2	bc	1017.6
US08031	42-14.8	141-06.9	2/20	0209-0213	86	West-2	West-1	West-4	1.4	3.0	bc	1017.1
US08032	42-15.0	140-45.8	2/20	0410-0414	78	West-1	West-1	West-3	0.8	3.5	bc	1016.5
US08033	42-04.8	140-59.9	2/20	0611-0615	83	West-1	West-1	West-2	1.1	3.2	b	1016.1
US08034	41-58.9	141-00.8	2/20	0650-0655	96	Calm	NW -1	Calm	1.2	2.9	b	1015.6
US08035	41-58.3	140-59.9	2/20	0702-0707	90	South-1	NW -1	South-2	1.0	2.9	b	1015.7
US08036	41-57.9	140-59.0	2/20	0713-0717	86	Calm	NW -1	Calm	1.3	2.8	b	1015.7
US08037	41-57.4	140-58.2	2/20	0722-0727	80	Calm	NW -1	Calm	0.6	2.8	b	1015.8
US08038	42-12.9	140-42.5	2/22	0820-0824	91	ESE-2	East-1	ESE-4	0.1	3.5	s	1018.2
US08039	42-16.0	140-36.4	2/22	0918-0927	91	SE -2	East-1	SE -4	-0.2	3.5	s	1018.0
US08040	42-18.8	140-30.7	2/22	1110-1118	94	SE -2	East-1	SE -4	1.1	3.5	o	1016.0
US08041	42-16.8	140-24.9	2/22	1212-1216	58	SE -2	East-1	SE -4	1.7	3.6	o	1014.4
US08042	42-14.3	140-29.8	2/22	1331-1335	79	SE -3	East-1	SE -5	2.3	3.6	r	1013.1
US08043	42-10.5	140-47.0	2/22	1545-1550	94	Calm	East-1	Calm	3.4	3.6	o	1011.6

Cruise 143

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08044	42-10.3	140-47.5	3/5	1008-1012	93	NE -1	East-1	NE -3	0.9	3.2	c	1017.6
US08045	42-12.8	140-42.5	3/5	1050-1055	92	NE -1	East-1	NE -3	0.8	3.3	c	1017.7
US08046	42-11.5	140-35.7	3/5	1211-1215	84	NE -1	East-1	NE -3	2.2	3.4	c	1017.6
US08047	42-14.0	140-30.2	3/5	1339-1343	80	ENE-1	East-1	ENE-3	1.7	3.3	bc	1017.2
US08048	42-19.0	140-30.9	3/5	1424-1428	95	NE -1	East-1	NE -2	1.3	3.7	bc	1017.1
US08049	42-16.2	140-37.6	3/5	1550-1555	90	SE -1	East-1	SE -2	1.6	3.4	bc	1017.2
US08050	42-18.3	140-26.0	3/6	0600-0604	72	NNW-3	ESE-1	NNW-5	0.3	3.5	c	1019.6
US08051	42-23.9	140-30.9	3/6	0732-0737	96	NNW-2	ESE-1	NNW-4	1.3	3.3	bc	1020.2
US08052	42-28.5	140-31.2	3/6	0822-0827	79	NW -2	ESE-1	NW -4	0.9	3.5	bc	1020.5
US08053	42-26.0	140-37.0	3/6	0907-0911	85	NW -1	ESE-1	NW -3	2.7	3.4	bc	1020.6
US08054	42-23.7	140-41.4	3/6	0945-0949	70	NNW-1	ESE-1	NNW-3	2.7	3.2	bc	1020.6
US08055	42-21.3	140-37.4	3/6	1022-1026	86	NW -1	ESE-1	NW -3	2.5	3.1	bc	1020.6
US08056	42-18.7	140-41.9	3/6	1102-1105	71	NW -1	ESE-1	NW -3	3.2	3.2	c	1020.6
US08057	42-20.4	140-47.7	3/6	1145-1148	58	West-1	ESE-1	West-3	3.8	2.8	bc	1020.5
US08058	42-16.2	140-47.6	3/6	1224-1228	71	West-1	ESE-1	West-3	3.2	2.5	bc	1020.0

Cruise 144

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08059	41-36.6	140-31.7	3/11	1007-1010	42	NW -2	SW -1	NW -4	6.6	7.3	r	1011.1
US08060	41-37.8	140-28.0	3/11	1126-1129	19	WNW-3	SW -1	WNW-5	6.5	6.3	c	1011.1
US08061	41-38.1	140-26.3	3/11	1110-1113	12	WNW-2	SW -1	WNW-5	6.0	6.1	c	1011.1
US08062	41-37.3	140-30.0	3/11	1148-1151	32	WNW-3	SW -1	WNW-5	6.4	7.0	c	1011.5
US08063	41-28.8	140-21.5	3/11	1313-1317	74	WNW-1	SW -1	WNW-3	6.0	7.7	c	1011.7
US08064	41-25.2	140-19.2	3/11	1416-1420	85	NW -3	SW -1	NW -5	6.7	7.7	c	1013.5
US08065	41-26.8	140-17.0	3/11	1451-1455	59	NW -3	SW -1	NW -5	5.7	7.4	c	1014.1
US08066	41-28.1	140-16.2	3/11	1533-1536	23	West-1	SW -1	West-3	6.2	7.7	c	1014.6
US08067	41-35.2	140-26.5	3/12	0734-0738	13	WNW-1	SSE-1	WNW-2	2.5	5.7	bc	1029.6
US08068	41-35.0	140-29.1	3/12	0801-0804	32	West-1	SSE-1	West-2	3.7	7.7	bc	1029.6
US08069	41-41.4	140-34.5	3/12	0924-0927	43	Calm	SE -1	Calm	4.7	7.2	bc	1030.1
US08070	41-43.5	140-36.1	3/12	1005-1008	30	NNE-1	SE -1	NNE-3	5.1	6.6	bc	1030.1
US08071	41-43.8	140-35.9	3/12	1020-1023	17	NNE-1	SE -1	NNE-3	5.6	6.6	bc	1030.1
US08072	41-43.6	140-40.2	3/12	1053-1057	67	East-1	SW -1	East-2	5.1	7.4	bc	1030.2
US08073	41-45.7	140-40.2	3/12	1132-1135	33	SE -1	SW -1	SE -3	5.1	6.9	bc	1030.5
US08074	41-46.9	140-40.1	3/12	1155-1158	21	SSE-2	SW -1	SSE-3	4.7	6.6	bc	1030.5

(*):Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US08029
LATITUDE 42-00.4 N
LONGITUDE 141-19.6 E
DEPTH (m) 307

Press.	Temp.	Salinity	Sigma-T
5	3.033	33.174	26.425
10	3.008	33.173	26.426
20	2.930	33.184	26.442
30	2.977	33.193	26.444
40	2.996	33.190	26.441
50	3.074	33.205	26.446
75	4.229	33.389	26.482
100	4.643	33.450	26.486
125	4.906	33.522	26.514
150	5.913	33.692	26.530
175	4.158	33.463	26.548
200	3.980	33.619	26.690
250	3.940	33.739	26.789

STATION US08030
LATITUDE 42-19.8 N
LONGITUDE 141-14.9 E
DEPTH (m) 97

Press.	Temp.	Salinity	Sigma-T
5	3.693	33.311	26.473
10	3.699	33.310	26.471
20	3.709	33.308	26.469
30	4.476	33.445	26.500
40	3.812	33.340	26.484
50	3.810	33.337	26.482
75	4.396	33.466	26.525

STATION US08031
LATITUDE 42-14.8 N
LONGITUDE 141-06.9 E
DEPTH (m) 86

Press.	Temp.	Salinity	Sigma-T
5	3.371	33.371	26.551
10	3.366	33.372	26.552
20	3.373	33.367	26.548
30	3.381	33.378	26.556
40	3.589	33.426	26.574
50	3.803	33.499	26.612
75	3.926	33.534	26.627

STATION US08032
LATITUDE 42-15.0 N
LONGITUDE 140-45.8 E
DEPTH (m) 78

Press.	Temp.	Salinity	Sigma-T
5	4.082	33.444	26.540
10	4.039	33.449	26.548
20	3.668	33.484	26.613
30	3.645	33.504	26.631
40	3.577	33.559	26.681
50	3.968	33.657	26.721

STATION US08033
LATITUDE 42-04.8 N
LONGITUDE 140-59.9 E
DEPTH (m) 83

Press.	Temp.	Salinity	Sigma-T
5	3.700	33.311	26.473
10	3.702	33.311	26.472
20	3.743	33.317	26.472
30	3.780	33.326	26.476
40	3.742	33.348	26.498
50	3.742	33.385	26.527
75	4.031	33.700	26.749

STATION US08034
LATITUDE 41-58.9 N
LONGITUDE 141-00.8 E
DEPTH (m) 96

Press.	Temp.	Salinity	Sigma-T
5	3.416	33.266	26.463
10	3.429	33.272	26.467
20	3.520	33.288	26.471
30	3.528	33.282	26.465
40	3.655	33.303	26.470
50	3.729	33.335	26.489
75	3.985	33.658	26.720

STATION US08035
LATITUDE 41-58.3 N
LONGITUDE 140-59.9 E
DEPTH (m) 90

Press.	Temp.	Salinity	Sigma-T
5	3.346	33.254	26.460
10	3.344	33.251	26.458
20	3.469	33.291	26.479
30	3.770	33.371	26.513
40	3.833	33.427	26.552
50	3.821	33.412	26.540
75	3.976	33.685	26.743

STATION US08036
LATITUDE 41-57.9 N
LONGITUDE 140-59.0 E
DEPTH (m) 86

Press.	Temp.	Salinity	Sigma-T
5	3.299	33.272	26.479
10	3.295	33.274	26.481
20	3.888	33.417	26.538
30	4.070	33.461	26.555
40	3.987	33.446	26.551
50	3.801	33.455	26.577
75	3.900	33.677	26.744

STATION US08037
LATITUDE 41-57.4 N
LONGITUDE 140-58.2 E
DEPTH (m) 80

Press.	Temp.	Salinity	Sigma-T
5	3.455	33.324	26.506
10	3.520	33.349	26.520
20	3.688	33.381	26.529
30	3.422	33.410	26.578
40	3.673	33.479	26.609
50	3.656	33.466	26.600
75	3.936	33.683	26.745

STATION US08038
LATITUDE 42-12.9 N
LONGITUDE 140-42.5 E
DEPTH (m) 91

Press.	Temp.	Salinity	Sigma-T
5	3.534	33.563	26.689
10	3.515	33.557	26.686
20	3.521	33.561	26.689
30	3.626	33.590	26.701
40	3.785	33.627	26.715
50	4.187	33.743	26.767
75	4.608	33.895	26.843

STATION US08039
LATITUDE 42-16.0 N
LONGITUDE 140-36.4 E
DEPTH (m) 91

Press.	Temp.	Salinity	Sigma-T
5	3.504	33.482	26.627
10	3.510	33.483	26.627
20	3.530	33.487	26.628
30	3.629	33.527	26.651
40	4.062	33.692	26.740
50	4.111	33.709	26.748
75	4.783	33.864	26.799

STATION US08040
LATITUDE 42-18.8 N
LONGITUDE 140-30.7 E
DEPTH (m) 94

Press.	Temp.	Salinity	Sigma-T
5	3.415	33.513	26.660
10	3.426	33.518	26.663
20	3.540	33.574	26.697
30	3.624	33.606	26.714
40	3.689	33.619	26.719
50	3.712	33.625	26.721
75	4.446	33.808	26.791

STATION US08041
LATITUDE 42-16.8 N
LONGITUDE 140-24.9 E
DEPTH (m) 58

Press.	Temp.	Salinity	Sigma-T
5	3.488	33.556	26.688
10	3.481	33.562	26.693
20	3.484	33.564	26.694
30	3.583	33.593	26.708
40	4.793	33.895	26.822
50	4.855	33.890	26.811

STATION US08042
LATITUDE 42-14.3 N
LONGITUDE 140-29.8 E
DEPTH (m) 79

Press.	Temp.	Salinity	Sigma-T
5	3.532	33.569	26.694
10	3.613	33.595	26.707
20	3.670	33.608	26.711
30	3.676	33.609	26.712
40	3.665	33.610	26.714
50	4.263	33.768	26.779
75	4.603	33.860	26.816

STATION US08043
LATITUDE 42-10.5 N
LONGITUDE 140-47.0 E
DEPTH (m) 94

Press.	Temp.	Salinity	Sigma-T
5	3.543	33.528	26.661
10	3.553	33.532	26.662
20	3.557	33.555	26.680
30	3.532	33.554	26.682
40	3.552	33.559	26.684
50	3.584	33.566	26.686
75	4.057	33.583	26.653

STATION US08044
LATITUDE 42-10.3 N
LONGITUDE 140-47.5 E
DEPTH (m) 93

Press.	Temp.	Salinity	Sigma-T
5	3.147	33.426	26.615
10	3.099	33.412	26.608
20	3.107	33.440	26.630
30	3.159	33.474	26.653
40	3.379	33.545	26.689
50	3.416	33.567	26.703
75	4.244	33.708	26.733

STATION US08045
LATITUDE 42-12.8 N
LONGITUDE 140-42.5 E
DEPTH (m) 92

Press.	Temp.	Salinity	Sigma-T
5	3.213	33.430	26.613
10	3.191	33.488	26.661
20	3.200	33.492	26.663
30	3.251	33.510	26.673
40	3.273	33.520	26.679
50	3.466	33.575	26.705
75	4.455	33.810	26.792

STATION US08046
LATITUDE 42-11.5 N
LONGITUDE 140-35.7 E
DEPTH (m) 84

Press.	Temp.	Salinity	Sigma-T
5	3.293	33.488	26.652
10	3.300	33.518	26.675
20	3.297	33.538	26.691
30	3.303	33.542	26.693
40	3.372	33.557	26.700
50	3.443	33.577	26.708
75	4.404	33.769	26.765

STATION US08047
LATITUDE 42-14.0 N
LONGITUDE 140-30.2 E
DEPTH (m) 80

Press.	Temp.	Salinity	Sigma-T
5	3.296	33.407	26.587
10	3.132	33.418	26.610
20	3.558	33.573	26.694
30	3.696	33.615	26.715
40	3.812	33.645	26.727
50	3.909	33.666	26.734
75	4.424	33.801	26.788

STATION US08048
LATITUDE 42-19.0 N
LONGITUDE 140-30.9 E
DEPTH (m) 95

Press.	Temp.	Salinity	Sigma-T
5	3.315	33.398	26.578
10	3.243	33.439	26.618
20	3.229	33.460	26.635
30	3.272	33.477	26.645
40	3.272	33.492	26.657
50	3.408	33.534	26.678
75	4.296	33.777	26.783

STATION US08049
LATITUDE 42-16.2 N
LONGITUDE 140-37.6 E
DEPTH (m) 90

Press.	Temp.	Salinity	Sigma-T
5	3.131	33.342	26.550
10	3.026	33.359	26.573
20	3.016	33.373	26.585
30	3.303	33.484	26.648
40	3.330	33.503	26.660
50	3.439	33.533	26.674
75	4.668	33.881	26.826

STATION US08050
LATITUDE 42-18.3 N
LONGITUDE 140-26.0 E
DEPTH (m) 72

Press.	Temp.	Salinity	Sigma-T
5	3.391	33.557	26.698
10	3.266	33.551	26.705
20	3.311	33.576	26.720
30	3.407	33.593	26.725
40	3.186	33.569	26.726
50	3.206	33.590	26.741

STATION US08051
LATITUDE 42-23.9 N
LONGITUDE 140-30.9 E
DEPTH (m) 96

Press.	Temp.	Salinity	Sigma-T
5	3.222	33.423	26.606
10	3.225	33.426	26.609
20	3.237	33.433	26.613
30	3.367	33.542	26.688
40	3.430	33.578	26.710
50	3.473	33.600	26.724
75	4.114	33.747	26.778

STATION US08052
LATITUDE 42-28.5 N
LONGITUDE 140-31.2 E
DEPTH (m) 79

Press.	Temp.	Salinity	Sigma-T
5	3.376	33.443	26.608
10	3.374	33.442	26.608
20	3.313	33.471	26.636
30	3.361	33.508	26.662
40	3.559	33.573	26.694
50	4.172	33.734	26.762
75	4.581	33.871	26.827

STATION US08053
LATITUDE 42-26.0 N
LONGITUDE 140-37.0 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	3.288	33.446	26.619
10	3.260	33.444	26.620
20	3.275	33.452	26.625
30	3.294	33.480	26.645
40	3.282	33.485	26.650
50	3.329	33.499	26.657
75	3.747	33.587	26.687

STATION US08054
LATITUDE 42-23.7 N
LONGITUDE 140-41.4 E
DEPTH (m) 70

Press.	Temp.	Salinity	Sigma-T
5	2.992	33.290	26.521
10	2.950	33.289	26.524
20	3.063	33.314	26.534
30	3.184	33.340	26.544
40	3.230	33.350	26.547
50	3.197	33.376	26.571

STATION US08055
LATITUDE 42-21.3 N
LONGITUDE 140-37.4 E
DEPTH (m) 86

Press.	Temp.	Salinity	Sigma-T
5	3.020	33.264	26.498
10	3.018	33.315	26.539
20	2.983	33.318	26.544
30	3.090	33.391	26.593
40	3.339	33.502	26.658
50	3.476	33.543	26.678
75	3.893	33.647	26.721

STATION US08056
LATITUDE 42-18.7 N
LONGITUDE 140-41.9 E
DEPTH (m) 71

Press.	Temp.	Salinity	Sigma-T
5	3.095	33.207	26.446
10	3.067	33.293	26.517
20	3.107	33.329	26.542
30	3.156	33.354	26.557
40	3.222	33.400	26.588
50	3.391	33.488	26.642

STATION US08057
LATITUDE 42-20.4 N
LONGITUDE 140-47.7 E
DEPTH (m) 58

Press.	Temp.	Salinity	Sigma-T
5	2.717	33.204	26.476
10	2.997	33.271	26.505
20	2.920	33.281	26.520
30	2.935	33.290	26.526
40	2.950	33.315	26.544
50	3.059	33.350	26.563

STATION US08058
LATITUDE 42-16.2 N
LONGITUDE 140-47.6 E
DEPTH (m) 71

Press.	Temp.	Salinity	Sigma-T
5	2.393	33.079	26.402
10	2.332	33.080	26.408
20	2.857	33.207	26.467
30	2.991	33.255	26.493
40	2.932	33.260	26.502
50	2.924	33.264	26.506

STATION US08059
LATITUDE 41-36.6 N
LONGITUDE 140-31.7 E
DEPTH (m) 42

Press.	Temp.	Salinity	Sigma-T
5	7.976	34.070	26.547
10	7.982	34.078	26.552
20	7.744	34.031	26.551
30	7.540	34.054	26.598

STATION US08060
LATITUDE 41-37.8 N
LONGITUDE 140-28.0 E
DEPTH (m) 19

Press.	Temp.	Salinity	Sigma-T
5	7.403	34.108	26.660
10	7.480	34.037	26.593

STATION US08061
LATITUDE 41-38.1 N
LONGITUDE 140-26.3 E
DEPTH (m) 12

Press.	Temp.	Salinity	Sigma-T
5	6.367	33.846	26.594

STATION US08062
LATITUDE 41-37.3 N
LONGITUDE 140-30.0 E
DEPTH (m) 32

Press.	Temp.	Salinity	Sigma-T
5	7.654	33.974	26.519
10	7.769	34.059	26.569
20	7.858	34.087	26.578

STATION US08063
LATITUDE 41-28.8 N
LONGITUDE 140-21.5 E
DEPTH (m) 74

Press.	Temp.	Salinity	Sigma-T
5	8.108	34.061	26.521
10	8.094	34.083	26.540
20	8.074	34.091	26.549
30	8.058	34.092	26.552
40	8.045	34.093	26.555
50	8.047	34.095	26.556

STATION US08064
LATITUDE 41-25.2 N
LONGITUDE 140-19.2 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	8.123	34.146	26.585
10	8.126	34.145	26.584
20	8.129	34.143	26.581
30	8.115	34.145	26.585
40	8.119	34.145	26.585
50	8.121	34.141	26.581
75	8.100	34.143	26.586

STATION US08065
LATITUDE 41-26.8 N
LONGITUDE 140-17.0 E
DEPTH (m) 59

Press.	Temp.	Salinity	Sigma-T
5	8.118	34.129	26.572
10	8.060	34.129	26.581
20	7.939	34.133	26.602
30	7.867	34.136	26.615
40	7.835	34.142	26.624
50	7.825	34.141	26.625

STATION US08066
LATITUDE 41-28.1 N
LONGITUDE 140-16.2 E
DEPTH (m) 23

Press.	Temp.	Salinity	Sigma-T
5	8.177	34.029	26.485
10	8.167	34.108	26.549

STATION US08067
LATITUDE 41-35.2 N
LONGITUDE 140-26.5 E
DEPTH (m) 13

Press.	Temp.	Salinity	Sigma-T
5	7.585	33.967	26.523

STATION US08068
LATITUDE 41-35.0 N
LONGITUDE 140-29.1 E
DEPTH (m) 32

Press.	Temp.	Salinity	Sigma-T
5	8.159	34.106	26.548
10	8.159	34.108	26.550
20	8.160	34.108	26.549

STATION US08069
LATITUDE 41-41.4 N
LONGITUDE 140-34.5 E
DEPTH (m) 43

Press.	Temp.	Salinity	Sigma-T
5	7.408	33.954	26.538
10	7.470	33.997	26.563
20	7.558	34.062	26.602
30	7.487	34.054	26.606

STATION US08070
LATITUDE 41-43.5 N
LONGITUDE 140-36.1 E
DEPTH (m) 30

Press.	Temp.	Salinity	Sigma-T
5	7.449	33.826	26.431
10	7.640	34.038	26.571
20	7.725	34.077	26.589

STATION US08071
LATITUDE 41-43.8 N
LONGITUDE 140-35.9 E
DEPTH (m) 17

Press.	Temp.	Salinity	Sigma-T
5	7.242	33.640	26.314
10	7.542	34.013	26.565

STATION US08072
LATITUDE 41-43.6 N
LONGITUDE 140-40.2 E
DEPTH (m) 67

Press.	Temp.	Salinity	Sigma-T
5	7.924	34.083	26.565
10	7.921	34.096	26.575
20	7.950	34.115	26.586
30	7.961	34.119	26.588
40	7.926	34.113	26.588
50	7.901	34.110	26.590

STATION US08073
LATITUDE 41-45.7 N
LONGITUDE 140-40.2 E
DEPTH (m) 33

Press.	Temp.	Salinity	Sigma-T
5	7.359	33.974	26.561
10	7.652	34.060	26.587
20	7.636	34.056	26.586

STATION US08074
LATITUDE 41-46.9 N
LONGITUDE 140-40.1 E
DEPTH (m) 21

Press.	Temp.	Salinity	Sigma-T
5	7.158	33.690	26.366
10	7.438	34.016	26.582

3

THE “USHIO MARU”

CRUISE 145
CRUISE 146
CRUISE 147

IN MARCH-MAY 2008

1. Cruise Itinerary

Cruise 145

Departure from Hakodate	Mar.	17	, 2008
Arrival at and departure from Usujiri		17	
Start hydrographic research (US08075) and larvae net sampling		17	
Arrival at Usujiri		18	
Departure from Usujiri		19	
Finish hydrographic research (US08094) and larvae net sampling		19	
Arrival at Usujiri		19	
Departure from Usujiri		20	
Return to Hakodate		20	

Total coverage 300.4 miles

Cruise 146

Departure from Hakodate	Apr.	14	, 2008
Arrival at Usujiri		14	
Departure from Usujiri		15	
Start hydrographic research (US08095) and larvae net sampling		15	
Retrieval Sediment trap system		15	
Arrival at and departure from Mori		15	
Set Sediment trap system		16	
Arrival at Usujiri		16	
Departure from Usujiri		17	
Sampling by frame trawl net		17	
Arrival at Usujiri		17	
Departure from Usujiri		19	
Arrival at Muroran		19	
Departure from Muroran		20	
Arrival at and departure from Muroran		21	
Arrival at Usujiri		21	
Departure from Usujiri		22	
Start frame trawl net samling		22	
Finish frame trawl net sampling		23	
Finish hydrographic research (US08131) and larvae net sampling		23	
Return to Hakodate		24	

Total coverage 651.2 miles

Cruise 147

Departure from Hakodate	May	7	, 2008
Arrival at Muroran		7	
Departure from Muroran		8	
Start hydrographic research (US08132) and larvae net sampling		8	
Arrival at Muroran		8	
Departure from Muroran		9	
Arrival at Usujiri		9	
Departure from Usujiri		10	
Sampling by bottom long line		10	
Arrival at Usujiri		10	
Departure from Usujiri		11	
Sampling by frame trawl net		11	
Arrival at Usujiri		12	
Departure from Usujiri		13	
Start trawl net research		13	
Arrival at Muroran		13	
Ddeparture from Muroran		15	
Finish trawl net research		15	
Arrival at Usujiri		15	
Departure from Usujiri		16	
Start frame trawl net sampling		16	
Arrival at Usujiri		16	
Departure from Usujiri		17	
Finish hydrographic research (US08170) and larvae net sampling		17	
Finish frame trawl net sampling		17	
Arrival at and departure from Usujiri		17	
Return to Hakodate		18	

Total coverage 682.4 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 145

Research Staff :	Associate Professor	(Laboratory of Marine Bioresource Science)	Toshikuni Nakatani
	Assistant Professor	(Field Science Center for Northern Biosphere)	Jun Yamamoto

Graduate Students :	Laboratory of Marine Bioresource Science :	2 persons
	Laboratory of Marine Bioresource and Environment Sensing :	1 person
Under Graduate Students :	Department of Marine Biological Science :	1 person
	Department of Marine Production System Science :	3 persons
	Department of Marine Biological Science (Third grade) :	4 persons

Cruise 146

Research Staff :	Professor	(Laboratory of Marine Environmental Science)	Mitsuru Yanada
	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

Graduate Students :	Chair of Marine Environmental Science :	1 person
	Chair of Marine Bioresource and Environment Sensing :	3 persons
	Chair of of Marine Bioresource Science :	4 persons
	Graduate School of Environmental Science :	7 persons
Under Graduate Students :	Department of Fisheries Oceanography and Marine Science :	7 persons
	Department of Marine Production System Science :	7 persons
	Department of Marine Biological Science :	2 persons

Cruise 147

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

Graduate Students :	Chair of of Marine Bioresource Science :	3 persons
	Chair of Marine Bioresource and Environment Sensing :	4 persons
	Graduate School of the Fisheries Sciences :	1 person
	Graduate School of Environmental Science :	7 persons
Under Graduate Students :	Department of Marine Biological Science :	5 persons
	Department of Fisheries Oceanography and Marine Science :	2 persons
	Department of Marine Production System Science :	8 persons
	Department of Marine Production System Science (Third grade) :	3 persons
	Department of Applied Marine Science (Third grade) :	3 persons

3. Data on Temperature, Salinity, and Computed Dynamic Depth Anomaly

Hydrographic work on deck and the data processing were made by the deck officers, crews, research staff and cadets of the “Ushio Maru”.
Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19).
Dynamic computations were made using a desk-top computer aboard the “Ushio Maru”.

Figure 1: Oceanographic stations (Cruise 145)

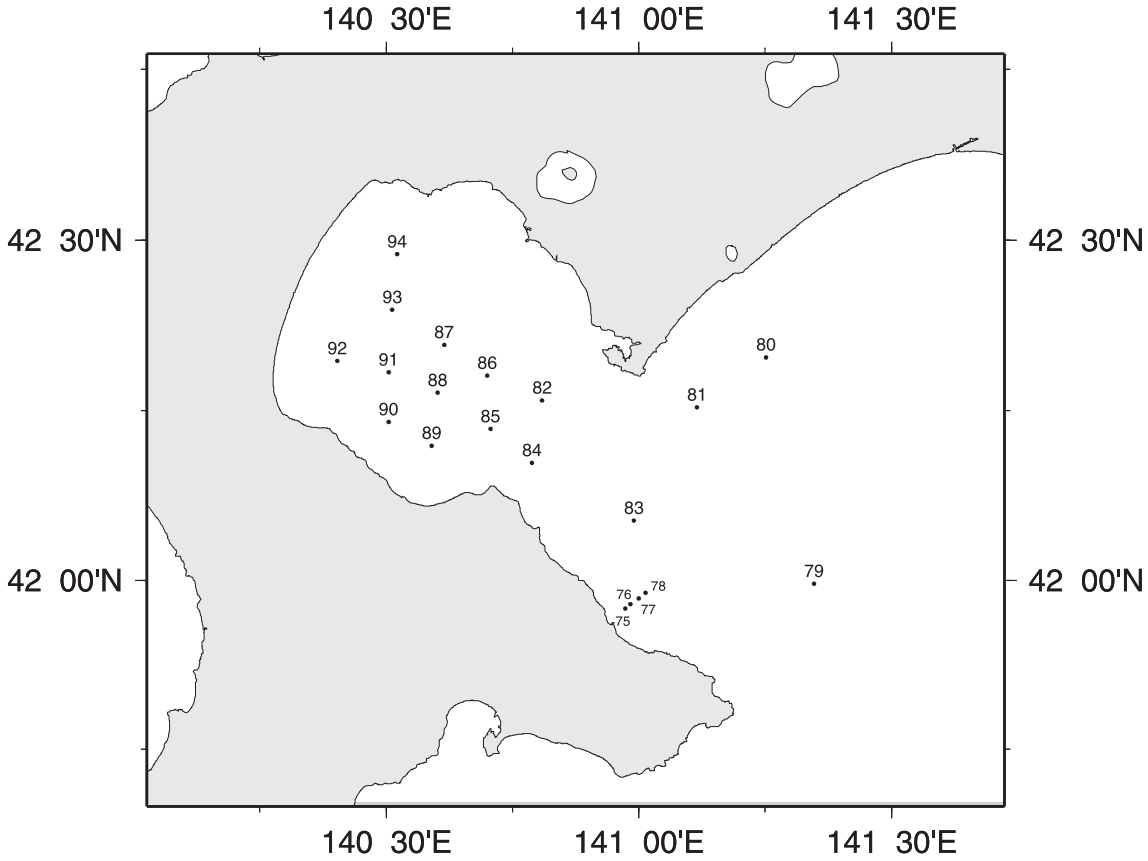

Figure 2: Oceanographic stations (Cruise 146)

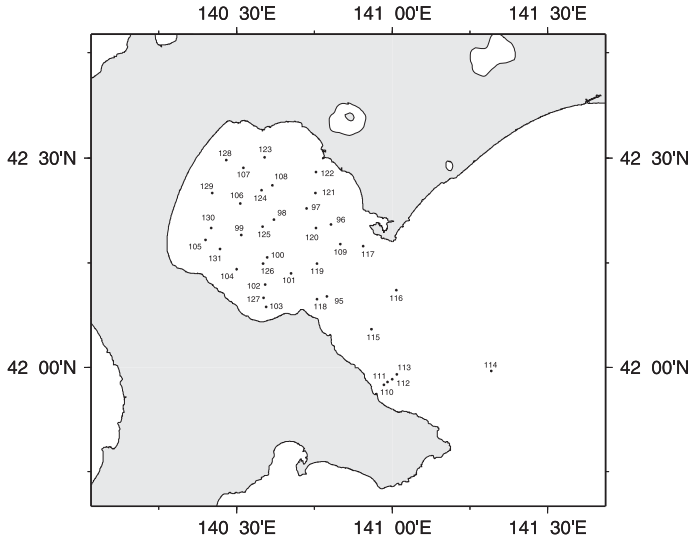

Figure 3: Oceanographic stations (Cruise 147)

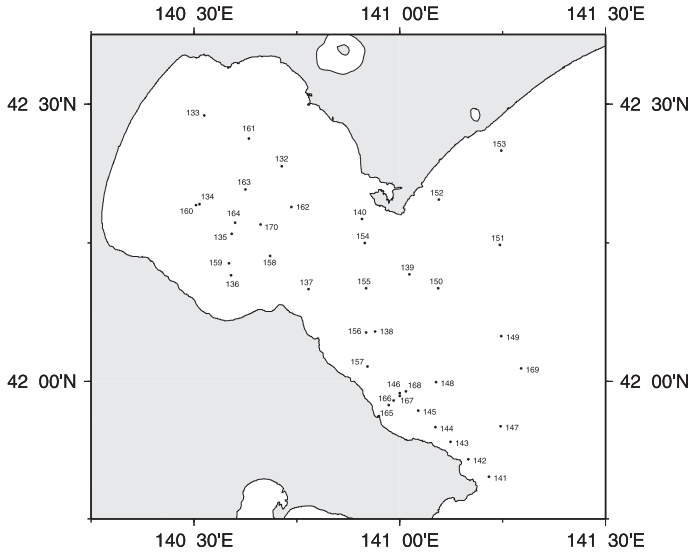

Table 1: List of oceanographic stations

Cruise 145

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08075	41-57.5	140-58.4	3/17	1440-1444	81	North-1	East-1	North-3	5.3	2.3	c	1016.2
US08076	41-57.9	140-59.0	3/17	1449-1453	86	North-1	East-1	North-3	5.0	2.6	c	1016.2
US08077	41-58.4	141-00.0	3/17	1500-1504	90	NNW-2	East-1	NNW-4	5.2	2.8	c	1016.3
US08078	41-58.9	141-00.8	3/17	1511-1515	96	NNW-2	East-1	NNW-4	5.2	2.4	c	1016.4
US08079	41-59.7	141-20.8	3/17	1901-1915	327	NW -1	East-1	NW -2	3.2	3.4	c	1018.1
US08080	42-19.7	141-15.1	3/17	2300-2307	100	West-1	East-1	West-3	3.7	1.5	bc	1019.0
US08081	42-15.3	141-06.9	3/17	2356-2400	84	WSW-1	East-1	WSW-3	3.3	1.5	bc	1019.4
US08082	42-15.9	140-48.5	3/18	0220-0224	70	West-1	East-1	West-3	3.3	2.3	bc	1020.1
US08083	42-05.3	140-59.4	3/18	0344-0348	84	West-1	East-1	West-2	2.8	1.6	o	1020.6
US08084	42-10.4	140-47.3	3/19	0731-0736	93	ENE-2	East-1	ENE-4	3.4	3.1	bc	1021.1
US08085	42-13.4	140-42.4	3/19	0830-0835	90	ENE-2	East-1	ENE-4	3.0	2.7	bc	1021.1
US08086	42-18.1	140-42.0	3/19	0926-0929	66	East-2	East-1	East-4	3.7	2.9	c	1021.1
US08087	42-20.8	140-36.9	3/19	1008-1012	88	ESE-2	East-1	ESE-4	4.7	3.2	c	1021.5
US08088	42-16.6	140-36.1	3/19	1048-1052	92	East-2	East-1	East-4	5.2	2.9	c	1021.6
US08089	42-11.9	140-35.4	3/19	1202-1206	85	East-3	East-1	East-5	4.4	3.9	c	1020.4
US08090	42-14.0	140-30.3	3/19	1304-1308	81	East-2	East-1	East-4	4.0	4.5	c	1020.4
US08091	42-18.4	140-30.3	3/19	1353-1358	93	ESE-2	East-1	ESE-4	3.9	4.4	c	1020.5
US08092	42-19.4	140-24.2	3/19	1457-1501	63	SE -1	East-1	SE -3	5.1	4.2	c	1020.6
US08093	42-23.9	140-30.7	3/19	1559-1604	96	SSE-1	East-1	SSE-3	4.1	3.7	c	1020.6
US08094	42-28.8	140-31.3	3/19	1644-1648	77	SSW-1	East-1	SSW-2	4.4	4.3	c	1020.6

Cruise 146

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08095	42-10.2	140-47.4	4/15	0805-0810	95	West-2	East-1	West-4	3.5	3.5	f	1019.1
US08096	42-20.5	140-48.2	4/15	0922-0926	55	West-2	East-1	West-4	4.3	3.0	f	1019.4
US08097	42-22.8	140-43.5	4/15	1003-1008	58	West-2	East-1	West-4	5.2	4.8	bc	1019.1
US08098	42-21.2	140-37.2	4/15	1050-1055	87	NW -1	East-1	NW -3	6.1	5.4	bc	1019.1
US08099	42-19.0	140-30.9	4/15	11560-1159	95	Calm	East-1	Calm	8.6	6.1	bc	1018.7
US08100	42-15.8	140-35.9	4/15	1407-1415	93	Calm	East-1	Calm	11.3	4.7	bc	1018.5
US08101	42-13.5	140-40.5	4/15	1518-1522	90	SSE-1	East-2	SSE-3	8.9	6.7	bc	1017.0
US08102	42-11.9	140-35.5	4/15	1629-1633	84	Calm	East-2	Calm	10.3	7.0	bc	1017.0
US08103	42-08.7	140-35.7	4/15	1716-1720	64	Calm	East-1	Calm	10.2	5.8	bc	1017.0
US08104	42-14.1	140-30.0	4/16	0722-0727	79	SW -3	East-1	SW -5	10.4	4.2	bc	1017.0
US08105	42-18.3	140-24.0	4/16	0827-0831	59	WSW-3	East-1	WSW-5	10.7	6.0	bc	1017.1
US08106	42-23.5	140-30.7	4/16	0945-0952	97	SW -2	East-1	SW -4	10.8	5.5	bc	1017.8
US08107	42-28.6	140-31.3	4/16	1046-1050	79	WSW-2	East-1	WSW-3	11.3	6.0	bc	1018.0
US08108	42-26.1	140-36.9	4/16	1135-1139	85	SW -1	East-1	SW -3	10.1	5.9	bc	1017.6
US08109	42-17.7	140-50.0	4/16	1323-1326	70	West-2	East-1	West-4	12.7	5.7	bc	1017.2
US08110	41-57.5	140-58.4	4/17	1202-1207	82	Calm	NE-1	Calm	7.9	4.8	f	1023.2
US08111	41-57.9	140-59.1	4/17	1214-1218	86	Calm	NE-1	Calm	5.9	4.6	f	1023.0
US08112	41-58.3	141-00.0	4/17	1225-1229	91	Calm	NE-1	Calm	5.7	3.9	c	1023.0
US08113	41-59.0	141-00.9	4/17	1237-1242	97	East-1	NE-1	Calm	6.0	4.1	f	1023.0
US08114	41-59.5	141-19.1	4/17	1454-1505	304	SE -2	East-1	SE -4	3.4	3.4	f	1022.1
US08115	42-05.5	140-56.0	4/21	0910-0917	86	Calm	East-1	Calm	7.2	4.8	c	1023.2
US08116	42-11.1	141-00.8	4/21	0958-1005	79	East-1	East-1	East-3	7.0	5.0	c	1023.6
US08117	42-17.4	140-54.4	4/21	1052-1057	57	ENE-1	East-1	ENE-3	7.8	4.6	c	1023.6
US08118	42-09.8	140-45.5	4/22	0926-0931	89	East-1	ESE-1	East-2	7.4	7.2	c	1021.1
US08119	42-14.9	140-45.5	4/22	1014-1018	80	East-1	ESE-1	East-3	7.6	6.5	c	1021.1
US08120	42-20.0	140-45.3	4/22	1055-1059	60	SE -1	ESE-1	SE -2	7.0	5.0	c	1020.6
US08121	42-25.0	140-45.2	4/22	1132-1136	56	Calm	ESE-1	Calm	9.0	6.4	c	1020.3
US08122	42-28.0	140-45.3	4/22	1226-1229	54	Calm	ESE-1	Calm	10.4	8.3	c	1019.6
US08123	42-30.1	140-35.4	4/22	1322-1326	71	Calm	ESE-1	Calm	9.5	8.3	c	1019.1
US08124	42-25.4	140-34.8	4/22	1400-1404	91	Calm	ESE-1	Calm	9.8	8.2	c	1019.0
US08125	42-20.2	140-35.0	4/22	1540-1544	94	ESE-1	ESE-1	ESE-2	8.3	7.1	c	1018.6
US08126	42-14.9	140-35.1	4/22	1624-1628	93	Calm	ESE-1	Calm	8.2	6.9	c	1018.4
US08127	42-10.0	140-35.2	4/22	1703-1707	76	East-1	ESE-1	East-2	8.2	6.7	c	1018.3
US08128	42-29.7	140-28.0	4/23	0535-0538	64	Calm	SE -1	Calm	6.3	7.5	c	1018.6
US08129	42-25.0	140-25.3	4/23	0615-0618	70	SSE-1	SE -1	SSE-3	7.3	8.6	c	1018.1
US08130	42-20.0	140-25.1	4/23	0655-0659	71	SSE-1	SE -1	SSE-3	7.4	7.5	c	1018.0
US08131	42-17.0	140-26.8	4/23	0829-0833	73	ESE-1	SE -1	ESE-2	7.8	6.3	c	1018.0

Cruise 147

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08132	42-23.3	140-42.8	5/8	0707-0714	61	Calm	East-1	Calm	8.8	7.2	bc	1009.1
US08133	42-28.8	140-31.5	5/8	0818-0824	76	Calm	East-1	Calm	8.3	7.0	bc	1009.6
US08134	42-19.2	140-30.8	5/8	0932-0940	94	Calm	ESE-1	Calm	10.7	7.2	bc	1009.6
US08135	42-16.0	140-35.5	5/8	1014-1024	91	ENE-1	ESE-1	ENE-2	10.1	7.9	bc	1009.6
US08136	42-11.5	140-35.4	5/8	1111-1118	82	Calm	ESE-1	Calm	11.4	8.0	bc	1009.6
US08137	42-10.0	140-46.7	5/8	1213-1221	96	Calm	ESE-1	Calm	12.1	7.9	bc	1009.1
US08138	42-05.4	140-56.4	5/8	1314-1320	85	SSE-1	ESE-1	SSE-2	9.7	6.1	bc	1008.8
US08139	42-11.6	141-01.4	5/8	1403-1409	79	Calm	ESE-1	Calm	10.7	6.7	bc	1008.7
US08140	42-17.6	140-54.5	5/8	1451-1503	57	Calm	ESE-1	Calm	13.1	9.9	bc	1008.2
US08141	41-49.6	141-13.0	5/10	0733-0740	173	NE -3	NE -1	NE -4	5.6	7.0	c	1023.5
US08142	41-51.5	141-10.0	5/10	0802-0806	107	NE -2	NE -1	NE -4	5.5	6.0	bc	1023.5
US08143	41-53.4	141-07.4	5/10	0826-0830	96	NNW-1	NE -1	NNW-2	5.8	5.7	bc	1023.3
US08144	41-55.0	141-05.2	5/10	1220-1226	111	Calm	NE -1	Calm	7.3	6.4	bc	1022.2
US08145	41-56.8	141-02.7	5/10	1244-1249	106	ESE-1	NE -1	ESE-2	8.6	6.4	bc	1022.0
US08146	41-58.7	141-00.0	5/10	1307-1313	88	Calm	NE -1	Calm	9.2	6.5	bc	1021.7
US08147	41-55.1	141-14.7	5/11	0715-0725	244	Calm	NE -1	Calm	6.7	6.6	bc	1019.9
US08148	41-59.9	141-05.3	5/11	0826-0830	118	NE -1	NE -1	NE -3	6.5	5.9	c	1020.1
US08149	42-04.9	141-14.8	5/11	1038-1046	222	East-1	NE -1	East-3	6.3	6.8	bc	1020.1
US08150	42-10.1	141-05.6	5/11	1144-1148	94	SE -1	NE -1	SE -3	9.8	6.4	bc	1020.0
US08151	42-14.8	141-14.6	5/11	1242-1248	164	SSE-1	NE -1	SSE-3	7.1	6.8	bc	1019.6
US08152	42-19.7	141-05.7	5/11	1346-1349	55	South-1	NE -1	South-3	8.8	6.4	bc	1019.5
US08153	42-25.0	141-14.8	5/11	1532-1536	69	SSW-2	South-1	SSW-3	7.7	6.9	bc	1019.1
US08154	42-15.0	140-54.9	5/12	0527-0530	63	NW -1	East-1	NW -2	5.7	5.2	bc	1023.5
US08155	42-10.1	140-55.1	5/12	0605-0608	77	West-2	East-1	West-3	7.1	6.3	bc	1023.7
US08156	42-05.3	140-55.1	5/12	0644-0648	88	West-1	East-1	West-2	7.3	6.7	bc	1024.0
US08157	42-01.6	140-55.3	5/12	0715-0719	80	West-1	East-1	West-2	7.6	7.3	bc	1024.0
US08158	42-13.6	140-41.1	5/13	0725-0730	90	East-3	East-1	East-5	7.5	7.4	c	1024.8
US08159	42-12.8	140-35.1	5/13	0922-0927	87	East-3	East-1	East-5	8.0	7.2	bc	1024.5
US08160	42-19.1	140-30.3	5/13	1058-1104	94	East-3	East-1	East-5	7.7	7.3	bc	1024.2
US08161	42-26.3	140-38.0	5/13	1301-1305	82	ESE-3	East-1	ESE-5	7.1	7.4	bc	1023.8
US08162	42-18.9	140-44.2	5/15	0802-0806	62	ESE-1	ESE-2	ESE-2	7.7	7.6	c	1012.1
US08163	42-20.8	140-37.5	5/15	0924-0929	86	Calm	ESE-2	Calm	8.0	7.0	f	1012.2
US08164	42-17.2	140-36.0	5/15	1049-1054	92	Calm	ESE-1	Calm	8.8	7.3	o	1012.6
US08165	41-57.4	140-58.4	5/16	1233-1237	81	Calm	ESE-1	Calm	13.1	7.7	bc	1015.2
US08166	41-57.9	140-59.1	5/16	1243-1247	86	Calm	ESE-1	Calm	12.6	8.3	bc	1015.1
US08167	41-58.4	141-00.0	5/16	1254-1258	91	Calm	ESE-1	Calm	13.2	7.9	bc	1015.1
US08168	41-58.9	141-00.9	5/16	1305-1310	97	ESE-1	ESE-1	ESE-2	12.7	8.0	bc	1015.1
US08169	42-01.4	141-17.7	5/16	1506-1515	262	Calm	SSE-1	Calm	14.8	7.5	bc	1014.1
US08170	42-17.0	140-39.7	5/17	1144-1148	84	SE -1	ESE-1	SE -2	11.9	10.1	bc	1013.1

(*):Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US08075
LATITUDE 41-57.5 N
LONGITUDE 140-58.4 E
DEPTH (m) 81

Press.	Temp.	Salinity	Sigma-T
5	1.924	32.927	26.317
10	1.875	32.997	26.376
20	2.456	33.185	26.482
30	2.521	33.187	26.478
40	2.614	33.233	26.507
50	3.097	33.365	26.571
75	3.498	33.574	26.701

STATION US08076
LATITUDE 41-57.9 N
LONGITUDE 140-59.0 E
DEPTH (m) 86

Press.	Temp.	Salinity	Sigma-T
5	2.911	32.988	26.287
10	2.785	32.994	26.302
20	2.723	33.090	26.384
30	2.934	33.226	26.475
40	3.345	33.325	26.517
50	3.282	33.388	26.573
75	3.676	33.612	26.714

STATION US08077
LATITUDE 41-58.4 N
LONGITUDE 141-00.0 E
DEPTH (m) 90

Press.	Temp.	Salinity	Sigma-T
5	2.895	33.017	26.311
10	2.803	33.041	26.338
20	3.142	33.208	26.442
30	3.083	33.265	26.493
40	3.145	33.273	26.494
50	3.194	33.345	26.547
75	3.653	33.583	26.694

STATION US08078
LATITUDE 41-58.9 N
LONGITUDE 141-00.8 E
DEPTH (m) 96

Press.	Temp.	Salinity	Sigma-T
5	2.414	32.873	26.236
10	3.012	32.999	26.287
20	3.126	33.111	26.366
30	3.155	33.208	26.441
40	3.256	33.257	26.471
50	3.375	33.346	26.531
75	3.474	33.521	26.661

STATION US08079
LATITUDE 41-59.7 N
LONGITUDE 141-20.8 E
DEPTH (m) 327

Press.	Temp.	Salinity	Sigma-T
5	1.265	32.809	26.267
10	1.136	32.882	26.334
20	1.475	32.952	26.368
30	1.576	32.975	26.380
40	1.584	32.983	26.386
50	1.601	32.987	26.388
75	1.977	33.075	26.431
100	2.829	33.261	26.511
125	3.516	33.375	26.541
150	3.344	33.358	26.543
175	3.235	33.394	26.582
200	2.818	33.368	26.599
250	2.548	33.382	26.632
300	3.194	33.567	26.724

STATION US08080
LATITUDE 42-19.7 N
LONGITUDE 141-15.1 E
DEPTH (m) 100

Press.	Temp.	Salinity	Sigma-T
5	1.964	32.813	26.222
10	1.972	32.812	26.221
20	1.949	32.805	26.217
30	1.790	32.833	26.251
40	1.580	32.895	26.316
50	1.457	32.908	26.334
75	1.776	33.041	26.419

STATION US08081
LATITUDE 42-15.3 N
LONGITUDE 141-06.9 E
DEPTH (m) 84

Press.	Temp.	Salinity	Sigma-T
5	2.047	32.836	26.234
10	1.992	32.859	26.257
20	1.887	32.893	26.292
30	1.880	32.929	26.322
40	2.021	33.069	26.423
50	2.424	33.127	26.438
75	2.539	33.142	26.441

STATION US08082
LATITUDE 42-15.9 N
LONGITUDE 140-48.5 E
DEPTH (m) 70

Press.	Temp.	Salinity	Sigma-T
5	2.677	32.920	26.253
10	2.675	32.922	26.254
20	2.016	32.956	26.333
30	1.933	33.032	26.400
40	2.182	33.092	26.429
50	2.601	33.184	26.469

STATION US08083
LATITUDE 42-05.3 N
LONGITUDE 140-59.4 E
DEPTH (m) 84

Press.	Temp.	Salinity	Sigma-T
5	1.897	32.903	26.299
10	1.901	32.906	26.301
20	1.914	32.904	26.299
30	1.913	32.923	26.314
40	1.611	32.973	26.375
50	1.990	33.083	26.436

STATION US08084
LATITUDE 42-10.4 N
LONGITUDE 140-47.3 E
DEPTH (m) 93

Press.	Temp.	Salinity	Sigma-T
5	3.159	32.962	26.244
10	3.092	33.079	26.343
20	3.053	33.254	26.487
30	3.287	33.327	26.524
40	3.312	33.477	26.641
50	3.420	33.570	26.705
75	4.565	33.802	26.774

STATION US08085
LATITUDE 42-13.4 N
LONGITUDE 140-42.4 E
DEPTH (m) 90

Press.	Temp.	Salinity	Sigma-T
5	2.590	32.894	26.239
10	2.585	32.899	26.243
20	2.585	33.133	26.430
30	2.994	33.233	26.475
40	3.062	33.280	26.507
50	3.406	33.480	26.635
75	4.041	33.695	26.744

STATION US08086
LATITUDE 42-18.1 N
LONGITUDE 140-42.0 E
DEPTH (m) 66

Press.	Temp.	Salinity	Sigma-T
5	2.819	32.875	26.204
10	2.498	32.892	26.245
20	1.753	32.948	26.345
30	2.010	33.033	26.395
40	2.289	33.107	26.433
50	2.679	33.192	26.469

STATION US08087
LATITUDE 42-20.8 N
LONGITUDE 140-36.9 E
DEPTH (m) 88

Press.	Temp.	Salinity	Sigma-T
5	2.943	32.975	26.274
10	2.829	32.949	26.263
20	2.903	33.147	26.415
30	2.936	33.195	26.450
40	3.036	33.229	26.468
50	3.104	33.316	26.532
75	3.941	33.678	26.741

STATION US08088
LATITUDE 42-16.6 N
LONGITUDE 140-36.1 E
DEPTH (m) 92

Press.	Temp.	Salinity	Sigma-T
5	2.791	32.948	26.265
10	2.753	32.951	26.270
20	2.446	33.094	26.410
30	3.039	33.269	26.500
40	3.330	33.336	26.527
50	3.521	33.397	26.558
75	4.020	33.669	26.725

STATION US08089
LATITUDE 42-11.9 N
LONGITUDE 140-35.4 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	3.930	33.128	26.304
10	3.846	33.160	26.338
20	3.651	33.350	26.508
30	3.604	33.395	26.549
40	3.529	33.435	26.587
50	3.372	33.508	26.660
75	3.780	33.622	26.712

STATION US08090
LATITUDE 42-14.0 N
LONGITUDE 140-30.3 E
DEPTH (m) 81

Press.	Temp.	Salinity	Sigma-T
5	3.970	33.153	26.320
10	3.716	33.233	26.409
20	3.339	33.347	26.535
30	3.416	33.384	26.557
40	3.427	33.418	26.584
50	3.413	33.453	26.613
75	3.480	33.507	26.649

STATION US08091
LATITUDE 42-18.4 N
LONGITUDE 140-30.3 E
DEPTH (m) 93

Press.	Temp.	Salinity	Sigma-T
5	4.263	33.194	26.323
10	3.877	33.181	26.352
20	3.752	33.313	26.469
30	3.363	33.363	26.546
40	3.499	33.495	26.638
50	3.490	33.529	26.666
75	3.924	33.672	26.737

STATION US08092
LATITUDE 42-19.4 N
LONGITUDE 140-24.2 E
DEPTH (m) 63

Press.	Temp.	Salinity	Sigma-T
5	4.079	33.166	26.319
10	3.842	33.221	26.387
20	3.664	33.364	26.518
30	3.539	33.396	26.555
40	3.496	33.421	26.579
50	3.368	33.461	26.623

STATION US08093
LATITUDE 42-23.9 N
LONGITUDE 140-30.7 E
DEPTH (m) 96

Press.	Temp.	Salinity	Sigma-T
5	3.676	33.029	26.250
10	3.044	33.062	26.334
20	2.737	33.119	26.406
30	2.881	33.182	26.445
40	3.167	33.272	26.491
50	3.311	33.398	26.579
75	3.431	33.566	26.701

STATION US08094
LATITUDE 42-28.8 N
LONGITUDE 140-31.3 E
DEPTH (m) 77

Press.	Temp.	Salinity	Sigma-T
5	4.140	33.076	26.242
10	3.785	33.146	26.333
20	3.351	33.226	26.437
30	3.281	33.252	26.465
40	3.299	33.307	26.507
50	3.331	33.317	26.512

STATION US08095
LATITUDE 42-10.2 N
LONGITUDE 140-47.4 E
DEPTH (m) 95

Press.	Temp.	Salinity	Sigma-T
5	3.437	32.506	25.856
10	3.191	32.541	25.906
20	2.674	32.577	25.979
30	1.795	32.759	26.191
40	2.021	32.968	26.342
50	2.091	33.111	26.452
75	3.753	33.604	26.700

STATION US08096
LATITUDE 42-20.5 N
LONGITUDE 140-48.2 E
DEPTH (m) 55

Press.	Temp.	Salinity	Sigma-T
5	2.870	32.557	25.946
10	2.437	32.528	25.958
20	2.352	32.549	25.982
30	2.741	32.832	26.177
40	3.338	33.054	26.301
50	1.826	33.033	26.409

STATION US08097
LATITUDE 42-22.8 N
LONGITUDE 140-43.5 E
DEPTH (m) 58

Press.	Temp.	Salinity	Sigma-T
5	4.601	32.619	25.831
10	4.437	32.642	25.867
20	4.030	32.680	25.938
30	2.780	32.942	26.261
40	2.607	33.041	26.355
50	2.951	33.216	26.466

STATION US08098
LATITUDE 42-21.2 N
LONGITUDE 140-37.2 E
DEPTH (m) 87

Press.	Temp.	Salinity	Sigma-T
5	4.512	32.571	25.802
10	4.466	32.590	25.822
20	3.322	32.824	26.120
30	3.080	32.958	26.248
40	3.025	33.000	26.286
50	2.452	32.988	26.325
75	2.905	33.217	26.470

STATION US08099
LATITUDE 42-19.0 N
LONGITUDE 140-30.9 E
DEPTH (m) 95

Press.	Temp.	Salinity	Sigma-T
5	4.621	32.595	25.810
10	4.364	32.632	25.866
20	3.777	32.681	25.963
30	1.479	32.713	26.176
40	0.770	32.788	26.281
50	2.053	33.028	26.388
75	3.437	33.498	26.646

STATION US08100
LATITUDE 42-15.8 N
LONGITUDE 140-35.9 E
DEPTH (m) 93

Press.	Temp.	Salinity	Sigma-T
5	4.491	32.608	25.834
10	4.326	32.618	25.859
20	2.708	32.754	26.117
30	2.898	32.887	26.207
40	2.724	32.928	26.255
50	2.109	32.925	26.301
75	3.365	33.420	26.591

STATION US08101
LATITUDE 42-13.5 N
LONGITUDE 140-40.5 E
DEPTH (m) 90

Press.	Temp.	Salinity	Sigma-T
5	4.532	32.632	25.848
10	4.449	32.641	25.865
20	4.148	32.658	25.909
30	2.877	32.833	26.166
40	2.388	32.931	26.284
50	2.468	33.006	26.338
75	3.532	33.520	26.655

STATION US08102
LATITUDE 42-11.9 N
LONGITUDE 140-35.5 E
DEPTH (m) 84

Press.	Temp.	Salinity	Sigma-T
5	4.310	32.467	25.741
10	3.210	32.502	25.873
20	2.443	32.797	26.173
30	2.708	32.889	26.225
40	2.356	32.882	26.248
50	2.333	33.012	26.354
75	3.434	33.470	26.624

STATION US08103
LATITUDE 42-08.7 N
LONGITUDE 140-35.7 E
DEPTH (m) 64

Press.	Temp.	Salinity	Sigma-T
5	2.938	32.602	25.976
10	2.144	32.710	26.126
20	1.848	32.796	26.217
30	1.723	32.842	26.263
40	2.786	33.082	26.373
50	3.199	33.277	26.492

STATION US08104
LATITUDE 42-14.1 N
LONGITUDE 140-30.0 E
DEPTH (m) 79

Press.	Temp.	Salinity	Sigma-T
5	3.857	32.501	25.812
10	3.364	32.559	25.904
20	2.440	32.846	26.212
30	3.133	32.932	26.223
40	2.603	32.951	26.283
50	2.478	33.046	26.369
75	3.750	33.634	26.725

STATION US08105
LATITUDE 42-18.3 N
LONGITUDE 140-24.0 E
DEPTH (m) 59

Press.	Temp.	Salinity	Sigma-T
5	5.910	32.264	25.402
10	5.464	32.305	25.487
20	2.736	32.743	26.106
30	2.335	32.846	26.221
40	2.837	33.007	26.308
50	2.902	33.143	26.411

STATION US08106
LATITUDE 42-23.5 N
LONGITUDE 140-30.7 E
DEPTH (m) 97

Press.	Temp.	Salinity	Sigma-T
5	5.522	32.466	25.608
10	4.355	32.521	25.779
20	3.543	32.709	26.008
30	2.628	32.865	26.213
40	1.896	32.822	26.235
50	2.389	33.053	26.382
75	3.713	33.613	26.712

STATION US08107
LATITUDE 42-28.6 N
LONGITUDE 140-31.3 E
DEPTH (m) 79

Press.	Temp.	Salinity	Sigma-T
5	5.200	32.727	25.851
10	4.852	32.657	25.835
20	3.811	32.781	26.040
30	3.415	32.994	26.247
40	3.166	33.186	26.422
50	3.203	33.303	26.513
75	3.958	33.679	26.740

STATION US08108
LATITUDE 42-26.1 N
LONGITUDE 140-36.9 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	5.188	32.337	25.543
10	4.504	32.553	25.789
20	3.998	32.659	25.924
30	3.888	32.682	25.953
40	3.150	32.920	26.212
50	3.186	33.029	26.295
75	3.529	33.506	26.644

STATION US08109
LATITUDE 42-17.7 N
LONGITUDE 140-50.0 E
DEPTH (m) 70

Press.	Temp.	Salinity	Sigma-T
5	5.464	32.601	25.721
10	5.148	32.603	25.759
20	4.037	32.663	25.924
30	2.822	32.884	26.211
40	2.656	32.960	26.286
50	2.629	33.072	26.378

STATION US08110
LATITUDE 41-57.5 N
LONGITUDE 140-58.4 E
DEPTH (m) 82

Press.	Temp.	Salinity	Sigma-T
5	3.495	32.517	25.860
10	3.186	32.560	25.922
20	2.433	32.587	26.006
30	1.986	32.776	26.191
40	1.939	32.887	26.283
50	1.483	32.939	26.357
75	2.355	33.178	26.485

STATION US08111
LATITUDE 41-57.9 N
LONGITUDE 140-59.1 E
DEPTH (m) 86

Press.	Temp.	Salinity	Sigma-T
5	3.306	32.514	25.874
10	2.999	32.532	25.915
20	2.421	32.523	25.956
30	1.054	32.712	26.203
40	0.918	32.804	26.284
50	1.299	32.918	26.352
75	3.065	33.347	26.560

STATION US08112
LATITUDE 41-58.3 N
LONGITUDE 141-00.0 E
DEPTH (m) 91

Press.	Temp.	Salinity	Sigma-T
5	3.537	32.543	25.876
10	2.722	32.532	25.938
20	1.804	32.481	25.968
30	0.755	32.677	26.192
40	1.107	32.900	26.350
50	1.252	32.915	26.353
75	2.043	33.159	26.493

STATION US08113
LATITUDE 41-59.0 N
LONGITUDE 141-00.9 E
DEPTH (m) 97

Press.	Temp.	Salinity	Sigma-T
5	2.767	32.502	25.911
10	2.648	32.531	25.944
20	2.069	32.544	26.000
30	1.115	32.607	26.114
40	0.735	32.697	26.209
50	0.755	32.751	26.251
75	1.038	32.942	26.389

STATION US08114
LATITUDE 41-59.5 N
LONGITUDE 141-19.1 E
DEPTH (m) 304

Press.	Temp.	Salinity	Sigma-T
5	3.065	32.558	25.930
10	2.286	32.724	26.127
20	2.763	32.844	26.185
30	1.068	32.758	26.238
40	0.985	32.867	26.331
50	1.191	32.922	26.362
75	1.670	33.173	26.532
100	2.701	33.282	26.540
125	3.690	33.445	26.580
150	3.470	33.417	26.579
175	3.577	33.462	26.605
200	3.980	33.714	26.765
250	3.157	33.497	26.672

STATION US08115
LATITUDE 42-05.5 N
LONGITUDE 140-56.0 E
DEPTH (m) 86

Press.	Temp.	Salinity	Sigma-T
5	5.087	32.527	25.705
10	4.825	32.529	25.736
20	2.783	32.478	25.890
30	2.767	32.857	26.195
40	2.814	32.939	26.256
50	2.565	32.978	26.308
75	3.212	33.335	26.537

STATION US08116
LATITUDE 42-11.1 N
LONGITUDE 141-00.8 E
DEPTH (m) 79

Press.	Temp.	Salinity	Sigma-T
5	5.362	32.577	25.714
10	5.089	32.590	25.755
20	1.733	32.520	26.004
30	1.198	32.747	26.221
40	1.630	32.875	26.296
50	0.954	32.828	26.302
75	1.454	33.004	26.412

STATION US08117
LATITUDE 42-17.4 N
LONGITUDE 140-54.4 E
DEPTH (m) 57

Press.	Temp.	Salinity	Sigma-T
5	4.760	32.430	25.665
10	4.423	32.444	25.710
20	2.697	32.627	26.016
30	2.103	32.772	26.179
40	1.600	32.817	26.251
50	1.688	32.843	26.266

STATION US08118
LATITUDE 42-09.8 N
LONGITUDE 140-45.5 E
DEPTH (m) 89

Press.	Temp.	Salinity	Sigma-T
5	4.730	32.514	25.734
10	3.482	32.557	25.892
20	2.956	32.828	26.155
30	2.597	32.828	26.186
40	2.650	33.003	26.321
50	2.723	33.038	26.343
75	3.122	33.341	26.550

STATION US08119
LATITUDE 42-14.9 N
LONGITUDE 140-45.5 E
DEPTH (m) 80

Press.	Temp.	Salinity	Sigma-T
5	5.263	32.568	25.718
10	4.866	32.554	25.751
20	3.155	32.665	26.008
30	2.681	32.858	26.202
40	2.685	32.964	26.286
50	2.806	33.089	26.377

STATION US08120
LATITUDE 42-20.0 N
LONGITUDE 140-45.3 E
DEPTH (m) 60

Press.	Temp.	Salinity	Sigma-T
5	5.067	32.460	25.655
10	4.905	32.448	25.663
20	3.598	32.423	25.775
30	1.576	32.654	26.122
40	1.314	32.756	26.221

STATION US08121
LATITUDE 42-25.0 N
LONGITUDE 140-45.2 E
DEPTH (m) 56

Press.	Temp.	Salinity	Sigma-T
5	6.181	32.582	25.620
10	5.687	32.546	25.652
20	4.176	32.577	25.842
30	3.421	32.500	25.853
40	2.797	32.848	26.184

STATION US08122
LATITUDE 42-28.0 N
LONGITUDE 140-45.3 E
DEPTH (m) 54

Press.	Temp.	Salinity	Sigma-T
5	6.000	32.538	25.608
10	5.336	32.561	25.704
20	4.434	32.627	25.855
30	2.407	32.780	26.162
40	2.755	32.926	26.251

STATION US08123
LATITUDE 42-30.1 N
LONGITUDE 140-35.4 E
DEPTH (m) 71

Press.	Temp.	Salinity	Sigma-T
5	6.393	32.570	25.584
10	5.652	32.517	25.633
20	4.211	32.636	25.885
30	3.205	32.840	26.143
40	2.791	32.961	26.276
50	2.888	33.125	26.398

STATION US08124
LATITUDE 42-25.4 N
LONGITUDE 140-34.8 E
DEPTH (m) 91

Press.	Temp.	Salinity	Sigma-T
5	7.592	32.475	25.349
10	5.785	32.529	25.626
20	3.764	32.537	25.850
30	3.158	32.809	26.122
40	2.807	32.940	26.257
50	2.609	33.053	26.364
75	3.476	33.524	26.663

STATION US08125
LATITUDE 42-20.2 N
LONGITUDE 140-35.0 E
DEPTH (m) 94

Press.	Temp.	Salinity	Sigma-T
5	6.335	32.659	25.661
10	6.009	32.547	25.614
20	5.036	32.489	25.681
30	2.441	32.681	26.080
40	2.532	32.884	26.236
50	2.641	32.990	26.311
75	3.234	33.368	26.561

STATION US08126
LATITUDE 42-14.9 N
LONGITUDE 140-35.1 E
DEPTH (m) 93

Press.	Temp.	Salinity	Sigma-T
5	5.937	32.511	25.594
10	4.856	32.471	25.687
20	3.358	32.589	25.930
30	2.686	32.707	26.081
40	2.908	32.941	26.249
50	2.673	32.978	26.299
75	3.274	33.369	26.558

STATION US08127
LATITUDE 42-10.0 N
LONGITUDE 140-35.2 E
DEPTH (m) 76

Press.	Temp.	Salinity	Sigma-T
5	7.608	32.385	25.276
10	5.555	32.480	25.615
20	4.125	32.637	25.895
30	2.782	32.828	26.170
40	2.654	32.896	26.235
50	2.524	32.952	26.291

STATION US08128
LATITUDE 42-29.7 N
LONGITUDE 140-28.0 E
DEPTH (m) 64

Press.	Temp.	Salinity	Sigma-T
5	4.385	32.464	25.731
10	4.059	32.535	25.820
20	2.757	32.580	25.974
30	2.944	32.872	26.191
40	2.685	32.941	26.268
50	2.587	33.077	26.385

STATION US08129
LATITUDE 42-25.0 N
LONGITUDE 140-25.3 E
DEPTH (m) 70

Press.	Temp.	Salinity	Sigma-T
5	5.787	32.560	25.651
10	5.284	32.613	25.751
20	3.047	32.346	25.763
30	3.113	32.755	26.083
40	2.538	32.944	26.283
50	2.511	32.999	26.329

STATION US08130
LATITUDE 42-20.0 N
LONGITUDE 140-25.1 E
DEPTH (m) 71

Press.	Temp.	Salinity	Sigma-T
5	5.772	32.490	25.597
10	5.265	32.547	25.702
20	4.195	32.682	25.923
30	2.795	32.811	26.155
40	2.769	32.950	26.269
50	2.570	33.025	26.345

STATION US08131
LATITUDE 42-17.0 N
LONGITUDE 140-26.8 E
DEPTH (m) 73

Press.	Temp.	Salinity	Sigma-T
5	8.044	31.881	24.818
10	4.932	32.420	25.638
20	3.754	32.625	25.921
30	3.253	32.893	26.181
40	2.609	32.889	26.233
50	2.616	32.988	26.312

STATION US08132
LATITUDE 42-23.3 N
LONGITUDE 140-42.8 E
DEPTH (m) 61

Press.	Temp.	Salinity	Sigma-T
5	7.320	32.353	25.291
10	6.733	32.419	25.421
20	5.996	32.442	25.532
30	4.433	32.545	25.790
40	2.734	32.824	26.171
50	2.802	32.986	26.294

STATION US08133
LATITUDE 42-28.8 N
LONGITUDE 140-31.5 E
DEPTH (m) 76

Press.	Temp.	Salinity	Sigma-T
5	7.320	32.413	25.338
10	7.286	32.413	25.343
20	6.794	32.421	25.415
30	5.672	32.484	25.604
40	3.013	32.632	25.994
50	2.292	32.811	26.196

STATION US08134
LATITUDE 42-19.2 N
LONGITUDE 140-30.8 E
DEPTH (m) 94

Press.	Temp.	Salinity	Sigma-T
5	6.963	32.432	25.401
10	6.154	32.447	25.517
20	5.574	32.491	25.622
30	4.968	32.543	25.732
40	2.735	32.685	26.059
50	2.314	32.868	26.240
75	3.356	33.401	26.577

STATION US08135
LATITUDE 42-16.0 N
LONGITUDE 140-35.5 E
DEPTH (m) 91

Press.	Temp.	Salinity	Sigma-T
5	7.851	32.375	25.234
10	7.557	32.382	25.281
20	5.552	32.454	25.595
30	4.098	32.627	25.889
40	3.307	32.771	26.079
50	2.697	32.954	26.277
75	3.271	33.370	26.560

STATION US08136
LATITUDE 42-11.5 N
LONGITUDE 140-35.4 E
DEPTH (m) 82

Press.	Temp.	Salinity	Sigma-T
5	6.417	32.460	25.495
10	5.833	32.488	25.588
20	4.794	32.570	25.771
30	2.488	32.711	26.101
40	2.916	32.918	26.230
50	1.837	32.860	26.269
75	3.388	33.417	26.586

STATION US08137
LATITUDE 42-10.0 N
LONGITUDE 140-46.7 E
DEPTH (m) 96

Press.	Temp.	Salinity	Sigma-T
5	7.714	32.407	25.279
10	7.513	32.409	25.309
20	5.329	32.481	25.642
30	2.161	32.626	26.058
40	1.665	32.834	26.260
50	2.022	32.980	26.352
75	2.680	33.271	26.532

STATION US08138
LATITUDE 42-05.4 N
LONGITUDE 140-56.4 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	6.080	32.596	25.643
10	5.085	32.605	25.768
20	4.051	32.699	25.951
30	3.845	32.724	25.991
40	2.578	32.892	26.238
50	2.509	33.084	26.397
75	3.346	33.430	26.601

STATION US08139
LATITUDE 42-11.6 N
LONGITUDE 141-01.4 E
DEPTH (m) 79

Press.	Temp.	Salinity	Sigma-T
5	6.366	32.396	25.450
10	5.960	32.408	25.510
20	5.497	32.423	25.576
30	2.516	32.551	25.971
40	1.341	32.798	26.253
50	2.297	33.007	26.352
75	2.247	33.182	26.497

STATION US08140
LATITUDE 42-17.6 N
LONGITUDE 140-54.5 E
DEPTH (m) 57

Press.	Temp.	Salinity	Sigma-T
5	8.859	32.193	24.943
10	6.990	32.337	25.323
20	3.210	32.580	25.935
30	2.136	32.842	26.232
40	1.706	32.946	26.348
50	1.815	33.005	26.387

STATION US08141
LATITUDE 41-49.6 N
LONGITUDE 141-13.0 E
DEPTH (m) 173

Press.	Temp.	Salinity	Sigma-T
5	6.292	32.576	25.601
10	6.285	32.642	25.655
20	4.686	32.729	25.910
30	5.267	33.204	26.221
40	5.523	33.547	26.463
50	6.204	33.752	26.541
75	4.953	33.630	26.595
100	5.052	33.670	26.615
125	4.585	33.633	26.638
150	4.319	33.611	26.649

STATION US08142
LATITUDE 41-51.5 N
LONGITUDE 141-10.0 E
DEPTH (m) 107

Press.	Temp.	Salinity	Sigma-T
5	6.051	32.598	25.649
10	6.053	32.598	25.648
20	6.055	32.625	25.669
30	5.679	32.650	25.735
40	4.227	32.685	25.922
50	3.964	33.053	26.241
75	5.429	33.642	26.549
100	4.877	33.616	26.592

STATION US08143
LATITUDE 41-53.4 N
LONGITUDE 141-07.4 E
DEPTH (m) 96

Press.	Temp.	Salinity	Sigma-T
5	6.051	32.618	25.664
10	6.003	32.621	25.673
20	5.982	32.624	25.678
30	5.638	32.621	25.717
40	4.963	32.741	25.889
50	3.860	33.049	26.248
75	3.496	33.331	26.508

STATION US08144
LATITUDE 41-55.0 N
LONGITUDE 141-05.2 E
DEPTH (m) 111

Press.	Temp.	Salinity	Sigma-T
5	6.386	32.483	25.517
10	6.219	32.496	25.548
20	5.845	32.526	25.617
30	5.702	32.587	25.682
40	5.248	32.743	25.858
50	3.909	32.888	26.115
75	4.456	33.559	26.593
100	4.602	33.599	26.609

STATION US08145
LATITUDE 41-56.8 N
LONGITUDE 141-02.7 E
DEPTH (m) 106

Press.	Temp.	Salinity	Sigma-T
5	5.837	32.581	25.661
10	5.793	32.597	25.679
20	5.708	32.611	25.700
30	5.301	32.666	25.792
40	4.940	32.835	25.966
50	2.745	33.021	26.327
75	4.598	33.565	26.582

STATION US08146
LATITUDE 41-58.7 N
LONGITUDE 141-00.0 E
DEPTH (m) 88

Press.	Temp.	Salinity	Sigma-T
5	5.872	32.540	25.625
10	5.759	32.569	25.661
20	5.724	32.604	25.693
30	4.997	32.572	25.751
40	3.618	32.790	26.065
50	3.434	33.021	26.266
75	5.097	33.695	26.629

STATION US08147
LATITUDE 41-55.1 N
LONGITUDE 141-14.7 E
DEPTH (m) 244

Press.	Temp.	Salinity	Sigma-T
5	7.556	32.877	25.671
10	7.367	32.980	25.778
20	5.300	32.741	25.850
30	3.444	32.873	26.147
40	2.369	33.252	26.543
50	3.921	33.455	26.565
75	5.969	33.701	26.530
100	4.402	33.544	26.586
125	4.406	33.587	26.620
150	4.354	33.594	26.631
175	4.347	33.609	26.644
200	3.915	33.572	26.658

STATION US08148
LATITUDE 41-59.9 N
LONGITUDE 141-05.3 E
DEPTH (m) 118

Press.	Temp.	Salinity	Sigma-T
5	6.213	32.560	25.599
10	6.210	32.562	25.600
20	5.224	32.575	25.728
30	3.202	32.736	26.060
40	4.001	33.059	26.242
50	3.376	33.198	26.413
75	5.388	33.692	26.593
100	4.341	33.611	26.646

STATION US08149
LATITUDE 42-04.9 N
LONGITUDE 141-14.8 E
DEPTH (m) 222

Press.	Temp.	Salinity	Sigma-T
5	7.198	32.735	25.608
10	7.119	33.012	25.837
20	6.499	33.384	26.212
30	6.995	33.764	26.446
40	6.849	33.822	26.511
50	6.563	33.809	26.539
75	7.231	33.968	26.574
100	6.168	33.804	26.586
125	5.724	33.752	26.601
150	5.514	33.762	26.634
175	5.527	33.788	26.653
200	5.595	33.809	26.661

STATION US08150
LATITUDE 42-10.1 N
LONGITUDE 141-05.6 E
DEPTH (m) 94

Press.	Temp.	Salinity	Sigma-T
5	6.867	32.431	25.414
10	6.781	32.383	25.386
20	5.626	32.382	25.529
30	1.968	32.554	26.015
40	1.096	32.795	26.267
50	1.035	32.906	26.360
75	2.324	33.183	26.492

STATION US08151
LATITUDE 42-14.8 N
LONGITUDE 141-14.6 E
DEPTH (m) 164

Press.	Temp.	Salinity	Sigma-T
5	7.047	32.515	25.456
10	6.759	32.811	25.726
20	6.465	33.382	26.215
30	4.929	33.327	26.357
40	3.478	33.219	26.420
50	2.713	33.258	26.519
75	5.166	33.666	26.599
100	5.741	33.752	26.598
125	5.470	33.736	26.619

STATION US08152
LATITUDE 42-19.7 N
LONGITUDE 141-05.7 E
DEPTH (m) 55

Press.	Temp.	Salinity	Sigma-T
5	6.693	32.339	25.364
10	6.401	32.284	25.357
20	3.670	32.425	25.770
30	2.116	32.684	26.108
40	2.674	32.914	26.248

STATION US08153
LATITUDE 42-25.0 N
LONGITUDE 141-14.8 E
DEPTH (m) 69

Press.	Temp.	Salinity	Sigma-T
5	7.150	32.771	25.643
10	6.474	32.944	25.869
20	6.444	33.098	25.994
30	6.763	33.425	26.210
40	2.653	32.955	26.282
50	2.561	33.133	26.432

STATION US08154
LATITUDE 42-15.0 N
LONGITUDE 140-54.9 E
DEPTH (m) 63

Press.	Temp.	Salinity	Sigma-T
5	6.388	32.512	25.539
10	5.692	32.512	25.624
20	2.144	32.624	26.058
30	1.930	32.902	26.296
40	2.263	33.004	26.353
50	2.181	33.142	26.470

STATION US08155
LATITUDE 42-10.1 N
LONGITUDE 140-55.1 E
DEPTH (m) 77

Press.	Temp.	Salinity	Sigma-T
5	6.886	32.452	25.427
10	5.725	32.404	25.534
20	2.906	32.809	26.144
30	3.373	33.079	26.318
40	2.933	33.094	26.370
50	1.972	33.062	26.421

STATION US08156
LATITUDE 42-05.3 N
LONGITUDE 140-55.1 E
DEPTH (m) 88

Press.	Temp.	Salinity	Sigma-T
5	7.306	32.401	25.330
10	6.866	32.388	25.380
20	4.971	32.469	25.672
30	2.767	32.860	26.197
40	2.108	32.903	26.284
50	2.183	32.989	26.347
75	3.404	33.467	26.625

STATION US08157
LATITUDE 42-01.6 N
LONGITUDE 140-55.3 E
DEPTH (m) 80

Press.	Temp.	Salinity	Sigma-T
5	7.780	32.386	25.253
10	7.731	32.387	25.261
20	6.320	32.444	25.494
30	3.491	32.604	25.929
40	2.895	32.904	26.221
50	3.190	33.129	26.375

STATION US08158
LATITUDE 42-13.6 N
LONGITUDE 140-41.1 E
DEPTH (m) 90

Press.	Temp.	Salinity	Sigma-T
5	7.785	32.492	25.335
10	7.676	32.468	25.332
20	6.233	32.472	25.527
30	5.276	32.559	25.709
40	3.125	32.804	26.121
50	2.817	32.977	26.286
75	3.135	33.423	26.614

STATION US08159
LATITUDE 42-12.8 N
LONGITUDE 140-35.1 E
DEPTH (m) 87

Press.	Temp.	Salinity	Sigma-T
5	7.554	32.454	25.338
10	7.397	32.434	25.345
20	6.003	32.464	25.549
30	4.351	32.558	25.809
40	2.047	32.658	26.092
50	2.429	32.986	26.325
75	3.191	33.364	26.562

STATION US08160
LATITUDE 42-19.1 N
LONGITUDE 140-30.3 E
DEPTH (m) 94

Press.	Temp.	Salinity	Sigma-T
5	7.702	32.432	25.300
10	7.680	32.414	25.289
20	5.230	32.435	25.617
30	3.092	32.594	25.956
40	2.388	32.863	26.230
50	1.562	32.842	26.274
75	2.978	33.307	26.535

STATION US08161
LATITUDE 42-26.3 N
LONGITUDE 140-38.0 E
DEPTH (m) 82

Press.	Temp.	Salinity	Sigma-T
5	7.869	32.422	25.268
10	7.890	32.421	25.265
20	7.541	32.387	25.287
30	4.628	32.443	25.689
40	2.223	32.668	26.087
50	2.526	32.967	26.302
75	3.646	33.548	26.666

STATION US08162
LATITUDE 42-18.9 N
LONGITUDE 140-44.2 E
DEPTH (m) 62

Press.	Temp.	Salinity	Sigma-T
5	7.987	32.398	25.233
10	7.947	32.399	25.239
20	5.950	32.439	25.535
30	4.026	32.666	25.928
40	2.527	32.800	26.169
50	2.538	32.993	26.322

STATION US08163
LATITUDE 42-20.8 N
LONGITUDE 140-37.5 E
DEPTH (m) 86

Press.	Temp.	Salinity	Sigma-T
5	7.424	32.416	25.326
10	7.338	32.416	25.338
20	7.166	32.420	25.365
30	6.963	32.442	25.409
40	4.408	32.542	25.790
50	2.394	32.811	26.188
75	2.813	33.169	26.440

STATION US08164
LATITUDE 42-17.2 N
LONGITUDE 140-36.0 E
DEPTH (m) 92

Press.	Temp.	Salinity	Sigma-T
5	7.476	32.404	25.310
10	7.419	32.421	25.331
20	7.380	32.429	25.343
30	7.201	32.433	25.370
40	4.189	32.594	25.854
50	2.263	32.800	26.189
75	3.066	33.248	26.481

STATION US08165
LATITUDE 41-57.4 N
LONGITUDE 140-58.4 E
DEPTH (m) 81

Press.	Temp.	Salinity	Sigma-T
5	7.380	32.442	25.353
10	7.138	32.451	25.393
20	3.426	32.701	26.012
30	2.533	32.876	26.229
40	2.047	32.955	26.330
50	2.152	33.027	26.380
75	3.021	33.274	26.505

STATION US08166
LATITUDE 41-57.9 N
LONGITUDE 140-59.1 E
DEPTH (m) 86

Press.	Temp.	Salinity	Sigma-T
5	7.646	32.418	25.297
10	7.369	32.427	25.342
20	4.145	32.623	25.881
30	2.300	32.855	26.230
40	2.281	32.973	26.326
50	2.341	33.068	26.398
75	3.495	33.373	26.541

STATION US08167
LATITUDE 41-58.4 N
LONGITUDE 141-00.0 E
DEPTH (m) 91

Press.	Temp.	Salinity	Sigma-T
5	7.554	32.418	25.310
10	7.475	32.425	25.326
20	4.596	32.565	25.789
30	2.443	32.887	26.245
40	3.079	33.126	26.382
50	3.109	33.185	26.427
75	3.918	33.399	26.521

STATION US08168
LATITUDE 41-58.9 N
LONGITUDE 141-00.9 E
DEPTH (m) 97

Press.	Temp.	Salinity	Sigma-T
5	7.955	32.413	25.249
10	7.500	32.404	25.306
20	3.917	32.692	25.958
30	2.603	32.920	26.258
40	2.632	33.048	26.358
50	3.484	33.231	26.429
75	3.669	33.350	26.506

STATION US08169
LATITUDE 42-01.4 N
LONGITUDE 141-17.7 E
DEPTH (m) 262

Press.	Temp.	Salinity	Sigma-T
5	8.241	32.690	25.425
10	8.327	33.529	26.070
20	8.684	33.876	26.288
30	8.536	34.031	26.432
40	8.480	34.051	26.456
50	8.256	34.041	26.483
75	7.732	33.979	26.512
100	7.336	33.965	26.557
125	6.731	33.898	26.587
150	6.558	33.879	26.595
175	6.097	33.838	26.622
200	5.539	33.780	26.645

STATION US08170
LATITUDE 42-17.0 N
LONGITUDE 140-39.7 E
DEPTH (m) 84

Press.	Temp.	Salinity	Sigma-T
5	9.272	32.362	25.010
10	8.176	32.380	25.191
20	6.925	32.444	25.416
30	3.213	32.705	26.035
40	2.772	32.911	26.237
50	1.850	32.943	26.335

4

THE “USHIO MARU”

CRUISE 148
CRUISE 149
CRUISE 150

IN MAY-JUNE 2008

1. Cruise Itinerary

Cruise 148

Departure from Hakodate	May	23	, 2008
Arrival at and departure from Shiraoi		23	
Start hydrographic research (US08171)		24	
Arrival at Nemuro		25	
Departure from Nemuro		29	
Start frame trawl net sampling		29	
Arrival at Rausu		29	
Departure from Rausu		30	
Start juvenile salmon sampling		30	
Research by R.O.V.	Jun.	1	
Finish frame trawl net sampling		1	
Finish juvenile salmon sampling		2	
Finish haydrographic research (US08213)		2	
Arrival at Abashiri		2	
Departure from Abashiri		3	
Arrival at Otaru		4	
Departure from Otaru		5	
Return to Hakodate		7	

Total coverage 1204.5 miles

Cruise 149

Departure from Hakodate	Jun.	11	, 2008
Start hydrographic research (US08214) and larvae net sampling		11	
Start trawl net research		11	
Arrival at Wakinosawa		11	
Departure from Wakinosawa		12	
Arrival at Aomori		12	
Departure from Aomori		13	
Arrival at Noheji		13	
Departure from Noheji		14	
Finish hydrographic research (US08237) and larvae net sampling		14	
Finish trawl net research		14	
Return to Hakodate		15	

Total coverage 236.0 miles

Cruise 150

Departure from Hakodate	Jun.	20	, 2008
Arrival at and departure from		20	
Start hydrographic research (US08238) and larvae net sampling		20	
Sampling by frame trawl net		20	
Arrival at Usujiri		21	
Departure from Usujiri		22	
Arrival at Usujiri		22	
Departure from Usujiri		23	
Retrieval Sediment trap system		23	
Arrival at Usujiri		23	
Departure from Usujiri		24	
Arrival at and departure from Muroran		24	
Arrival at and departure from Muroran		25	
Arrival at Usujiri		25	
Departure from Usujiri		26	
Set Sediment trap system		26	
Research by trawl net and mid water trawl net		26	
Arrival at Usujiri		26	
Departure from Usujiri		28	
Sampling by frame trawl net		28	
Finish hydrographic research (US08269) and larvae net sampling		29	
Return to Hakodate		30	

Total coverage 684.1 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 148

Research Staff :	Professor	(Laboratory of Marine Environmental Science)	Shigeru Montani
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Tohru Hirawake
	Assistant Professor	(Field Science Center for Northern Biosphere)	Jun Yamamoto
	Research Associate	(Field Science Center for Northern Biosphere)	Toshihiro Iwamori
Guest Scientist (Domestic) :	Professor	(Tokyo University of Agriculture)	Akihiro Shiomoto

Graduate Students :	Chair of Marine Bioresource and Environment Sensing :	1 person
	Chair of of Marine Bioresource Science :	1 person
	Chair of Strategic Studies on Marine Biorresource Conservation and Management :	1 person
	Graduate School of the Fisheries Sciences :	1 person
	Graduate School of Environmental Science :	5 persons
Under Graduate Students :	Department of Fisheries Oceanography and Marine Science :	3 persons

Cruise 149

Research Staff :	Associate Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
Graduate Students :	Chair of Marine Bioresource Science :		2 persons
Under Graduate Students :	Department of Marine Biological Science :		10 persons

Cruise 150

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

Graduate Students :	Chair of Marine Bioresource Science :	3 persons
	Chair of Marine Bioresource and Environment Sensing :	3 persons
	Chair of Marine Environmental Science :	1 person
	Graduate School of the Fisheries Sciences :	1 person
	Graduate School of Environmental Science :	2 persons
Under Graduate Students :	Department of Marine Biological Science :	3 persons
	Department of Marine Production System Science :	8 persons
	Department of Marine Production System Science (Third grade) :	1 person
	Department of Applied Marine Science (Third grade) :	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 148)

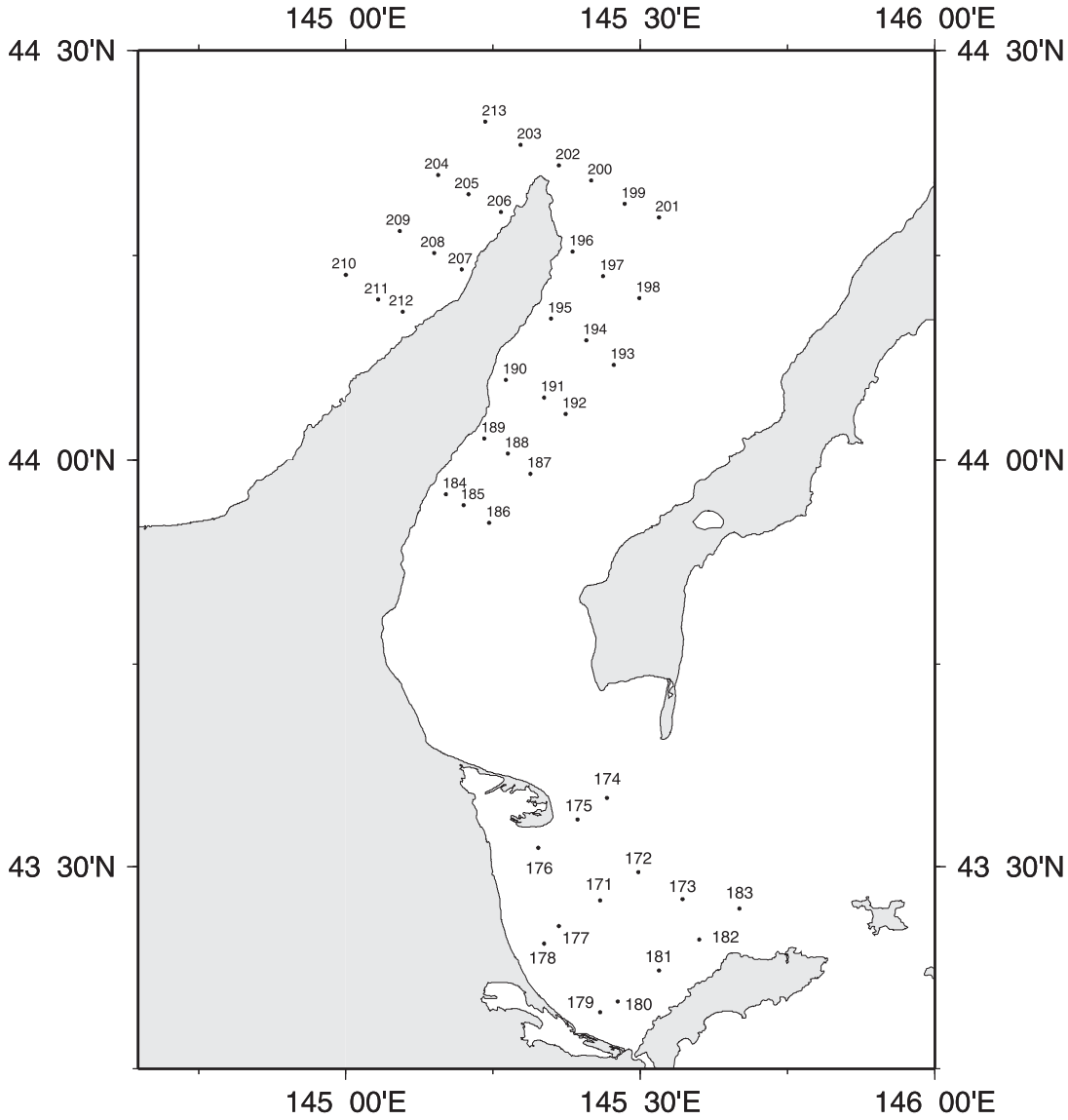

Figure 2: Oceanographic stations (Cruise 149)

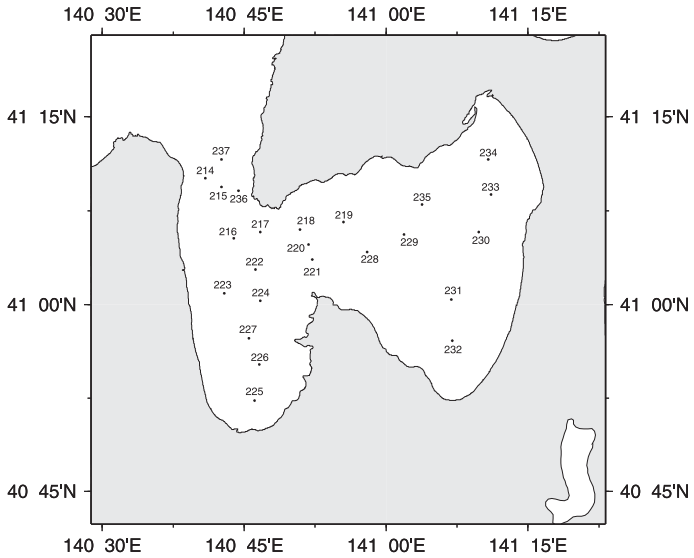

Figure 3: Oceanographic stations (Cruise 150)

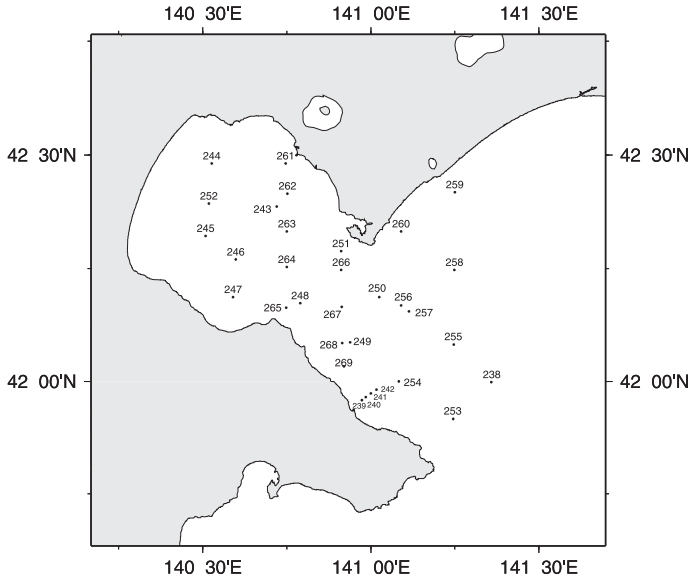

Table 1: List of oceanographic stations

Cruise 148

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08171	43-27.5	145-25.9	5/25	0501-0505	20	SSE-1	East-1	SSE-3	8.6	6.8	f	1012.2
US08172	43-29.6	145-29.8	5/25	0533-0541	24	SSE-1	East-1	SSE-3	8.1	6.4	f	1012.0
US08173	43-27.6	145-34.3	5/25	0609-0614	30	South-2	East-1	South-4	8.5	6.5	f	1011.6
US08174	43-35.1	145-26.6	5/25	0712-0714	13	South-1	East-1	South-3	8.7	6.1	f	1011.0
US08175	43-33.5	145-23.6	5/25	0739-0742	12	SSE-2	East-1	SSE-4	9.2	8.1	f	1010.3
US08176	43-31.4	145-19.6	5/25	0814-0817	6	SSE-1	East-1	SSE-3	9.3	8.5	f	1010.1
US08177	43-25.6	145-21.7	5/25	0857-0900	11	SSW-1	East-1	SSW-3	9.7	7.3	f	1010.1
US08178	43-24.3	145-20.2	5/25	0915-0918	9	SSW-2	East-1	SSW-5	10.4	7.1	f	1010.2
US08179	43-19.2	145-25.9	5/25	1002-1009	12	SSW-3	East-1	SSW-5	9.5	7.0	f	1010.2
US08180	43-20.0	145-27.7	5/25	1017-1020	14	SSW-3	East-1	SSW-5	9.7	6.7	f	1010.5
US08181	43-22.3	145-31.9	5/25	1047-1050	17	SSW-3	South-1	SSW-5	9.4	6.7	f	1010.3
US08182	43-24.6	145-36.0	5/25	1113-1117	25	South-2	South-1	South-3	9.4	6.4	f	1010.1
US08183	43-26.9	145-40.1	5/25	1141-1144	31	SSE-1	South-1	SSE-3	9.0	6.3	f	1010.1
US08184	43-57.5	145-10.2	5/29	1305-1317	79	East-2	NE -1	East-4	5.2	5.6	bc	1015.6
US08185	43-56.7	145-12.0	5/29	1344-1350	84	East-2	NE -1	East-4	5.7	5.7	bc	1015.6
US08186	43-55.4	145-14.6	5/29	1415-1422	82	NE -3	NE -1	NE -5	5.2	5.0	bc	1016.0
US08187	43-59.0	145-18.8	5/29	1519-1531	270	ENE-3	NE -1	ENE-5	5.2	5.2	bc	1015.7
US08188	44-00.5	145-16.5	5/29	1550-1609	442	NNE-3	NE -1	NNE-5	5.6	5.9	bc	1015.8
US08189	44-01.6	145-14.1	5/29	1629-1641	288	SSW-1	NE -1	SSW-3	6.7	5.9	bc	1016.0
US08190	44-05.9	145-16.3	5/30	0547-0601	328	NNE-2	NE -1	NNE-4	4.0	4.8	o	1022.1
US08191	44-04.6	145-20.2	5/30	0650-0723	828	NNE-2	NE -1	NNE-4	3.9	4.2	o	1022.5
US08192	44-03.4	145-22.4	5/30	0758-0822	540	NNE-2	NE -1	NNE-4	4.3	3.8	o	1022.4
US08193	44-07.0	145-27.3	5/30	0919-1001	1124	NNE-2	NNE-1	NNE-4	4.0	3.8	o	1023.1
US08194	44-08.8	145-24.5	5/30	1034-1120	1512	NNE-2	NNE-1	NNE-4	3.7	4.0	o	1023.6
US08195	44-10.4	145-20.9	5/30	1141-1152	264	NNE-2	NNE-1	NNE-4	4.0	3.9	o	1023.7
US08196	44-15.3	145-23.1	5/30	1232-1243	140	North-2	NNE-1	North-4	5.1	4.1	c	1023.6
US08197	44-13.5	145-26.2	5/30	1306-1357	1570	North-1	NE -1	North-4	5.4	4.3	o	1023.6
US08198	44-11.9	145-29.9	5/30	1424-1514	2057	NNE-2	NE -1	NNE-4	5.0	4.3	o	1023.7
US08199	44-18.8	145-28.4	5/30	1612-1705	1599	NE -2	NE -1	NE -3	3.6	4.2	o	1023.7
US08200	44-20.5	145-25.0	5/30	1723-1756	1038	East-1	NNE-1	East-3	3.8	4.2	o	1024.0
US08201	44-17.8	145-31.9	5/31	0557-0649	2120	South-3	SE -1	South-5	2.9	3.9	f	1023.0
US08202	44-21.6	145-21.7	5/31	0753-0800	73	SSE-3	SSW-1	SSE-6	4.6	3.9	c	1021.8
US08203	44-23.1	145-17.8	5/31	0830-0852	723	NW -1	NE -1	NW -3	5.2	5.4	bc	1021.5
US08204	44-20.9	145-09.4	5/31	0942-1017	1235	Calm	NE -1	Calm	5.7	3.9	bc	1021.6
US08205	44-19.5	145-12.5	5/31	1058-1118	741	NNE-1	NE -1	NNE-2	8.3	6.2	bc	1020.6
US08206	44-18.2	145-15.8	5/31	1146-1152	100	Calm	NE -1	Calm	9.2	6.4	bc	1020.1
US08207	44-14.0	145-11.8	5/31	1232-1239	101	ESE-3	North-1	ESE-6	11.9	6.1	bc	1019.1
US08208	44-15.2	145-09.0	5/31	1305-1328	595	SSE-2	NE -1	SSE-4	10.1	6.9	bc	1019.2
US08209	44-16.8	145-05.5	5/31	1404-1425	901	Calm	NE -1	Calm	8.0	4.5	bc	1019.1
US08210	44-13.6	145-00.0	5/31	1515-1536	671	ENE-1	South-1	ENE-2	11.0	4.5	bc	1018.5
US08211	44-11.8	145-03.3	5/31	1612-1628	465	NNW-1	Soouth-1	NNW-2	11.1	4.5	bc	1017.6
US08212	44-10.9	145-05.8	6/1	0604-0625	368	Calm	NE -1	Calm	7.0	6.4	bc	1018.0
US08213	44-24.8	145-14.2	6/2	0400-0453	1425	Calm	East-1	Calm	5.9	4.9	bc	1023.4

Cruise 149

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08214	41-10.1	140-40.9	6/11	1233-1236	58	West-3	WNW-1	West-5	15.5	13.8	bc	1006.5
US08215	41-09.4	140-42.6	6/11	1257-1301	77	West-2	WNW-1	West-4	19.7	14.4	bc	1006.3
US08216	41-05.3	140-43.9	6/11	1407-1411	61	WNW-2	West-1	WNW-4	18.4	14.2	bc	1006.2
US08217	41-05.8	140-46.7	6/11	1500-1504	63	NW -1	NW -1	NW -3	19.2	14.3	bc	1006.0
US08218	41-06.0	140-50.9	6/11	1530-1534	54	WNW-2	West-1	WNW-4	19.1	12.9	bc	1006.1
US08219	41-06.6	140-55.5	6/12	0631-0635	48	WSW-1	South-1	WSW-2	13.8	13.7	bc	1007.6
US08220	41-04.8	140-51.8	6/12	0838-0842	53	Calm	South-1	Calm	15.7	14.1	bc	1007.6
US08221	41-03.6	140-52.2	6/12	0913-0917	51	Calm	South-1	Calm	17.5	13.9	bc	1007.6
US08222	41-02.8	140-46.2	6/12	1004-1008	53	Calm	South-1	Calm	17.9	14.7	bc	1007.1
US08223	41-00.9	140-42.9	6/12	1042-1046	56	Calm	South-1	Calm	18.9	14.6	bc	1006.6
US08224	41-00.3	140-46.7	6/12	1230-1234	53	Calm	NNW-1	Calm	22.0	16.0	bc	1005.8
US08225	40-52.3	140-46.1	6/12	1352-1355	31	NNW-2	NNW-1	NNW-4	19.6	17.3	bc	1005.1
US08226	40-55.2	140-46.6	6/13	0721-0724	42	Calm	NNW-1	Calm	17.6	15.8	bc	1005.4
US08227	40-57.3	140-45.5	6/13	0823-0826	51	NNE-1	North-1	NNE-3	17.7	14.9	bc	1006.0
US08228	41-04.2	140-58.0	6/13	1011-1015	51	NE -2	ENE-1	NE -4	15.5	14.5	r	1006.7
US08229	41-05.6	141-01.9	6/13	1128-1132	47	ENE-1	ENE-1	ENE-3	14.7	14.4	c	1007.1
US08230	41-05.8	141-09.8	6/13	1237-1241	39	ESE-2	NE -1	ESE-3	14.4	14.5	c	1007.4
US08231	41-00.4	141-06.9	6/13	1454-1458	44	ESE-2	SE-1	ESE-4	13.0	14.5	r	1008.0
US08232	40-57.1	141-07.0	6/13	1541-1545	37	ESE-3	SE-1	ESE-5	14.0	14.7	o	1007.5
US08233	41-08.8	141-11.1	6/14	0728-0730	35	NNE-1	NNE-1	NNE-3	12.6	14.6	o	1013.6
US08234	41-11.6	141-10.8	6/14	0841-0844	29	Calm	North-1	Calm	14.0	14.8	bc	1013.6
US08235	41-08.0	141-03.8	6/14	0947-0950	37	South-1	North-1	South-2	14.6	14.7	c	1013.6
US08236	41-09.1	140-44.4	6/14	1137-1141	62	Calm	NW -1	Calm	16.3	14.9	bc	1013.7
US08237	41-11.6	140-42.6	6/14	1203-1207	73	Calm	NW -1	Calm	15.8	14.5	bc	1013.7

Cruise 150

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08238	41-59.9	141-21.5	6/20	1758-1810	332	SSW-1	South-1	SSW-2	16.1	14.5	c	1007.6
US08239	41-57.5	140-58.4	6/22	0903-0907	80	ESE-1	East-1	ESE-3	14.7	11.5	o	1007.7
US08240	41-57.9	140-59.1	6/22	0911-0915	85	SE -2	East-2	SE -4	13.5	11.4	o	1007.7
US08241	41-58.4	141-00.0	6/22	0921-0925	90	SE -2	East-2	SE -4	13.4	12.0	o	1007.7
US08242	41-58.9	141-01.0	6/22	0931-0935	96	ESE-2	East-2	ESE-4	13.2	12.5	o	1007.7
US08243	42-23.2	140-43.2	6/24	1304-1311	58	WSW-1	SE -1	WSW-3	18.3	15.1	bc	1006.7
US08244	42-28.9	140-31.6	6/24	1414-1422	76	Calm	SE -1	Calm	20.3	15.9	bc	1006.1
US08245	42-19.3	140-30.5	6/24	1621-1627	94	SE -1	SE -1	SE -2	18.1	15.4	c	1005.6
US08246	42-16.2	140-35.9	6/24	1711-1719	92	Calm	SE -1	Calm	18.9	16.6	bc	1005.6
US08247	42-11.2	140-35.4	6/25	0613-0622	82	Calm	SE -1	Calm	17.1	15.9	bc	1007.1
US08248	42-10.4	140-47.4	6/25	0717-0725	93	ESE-1	SE -1	ESE-2	16.9	15.2	c	1007.6
US08249	42-05.2	140-56.3	6/25	0825-0831	86	Calm	SE -1	Calm	17.2	15.8	c	1007.6
US08250	42-11.2	141-01.5	6/25	0916-0922	81	Calm	SE -1	Calm	17.3	14.8	bc	1007.6
US08251	42-17.3	140-54.7	6/25	1008-1013	57	SE -1	SE -1	SE -3	19.1	16.2	bc	1007.7
US08252	42-23.6	140-31.1	6/26	1306-1312	96	ESE-2	ESE-1	ESE-4	15.2	16.1	bc	1008.2
US08253	41-55.0	141-14.7	6/28	0819-0827	240	NE -1	East-1	NE -3	15.0	14.5	c	1015.6
US08254	42-00.0	141-05.0	6/28	0930-0934	117	Calm	East-1	Calm	16.0	15.3	c	1015.2
US08255	42-04.9	141-14.8	6/28	1035-1043	224	Calm	East-1	Calm	16.2	14.7	c	1015.1
US08256	42-10.1	141-05.4	6/28	1145-1149	93	Calm	ESE-1	Calm	18.5	15.9	c	1014.6
US08257	42-09.3	141-06.8	6/28	1204-1209	100	Calm	ESE-1	Calm	19.6	15.9	c	1014.6
US08258	42-14.8	141-14.9	6/28	1337-1343	172	ESE-1	ESE-1	ESE-3	15.9	16.4	c	1014.2
US08259	42-25.1	141-15.0	6/28	1549-1552	69	Calm	ESE-1	Calm	15.9	16.1	c	1013.5
US08260	42-19.9	141-05.4	6/28	1757-1800	52	SE -1	ESE-1	SE -2	16.6	16.8	bc	1012.4
US08261	42-28.9	140-44.8	6/29	No Data								
US08262	42-24.9	140-45.1	6/29	0534-0536	55	SSE-1	SSE-1	SSE-2	16.2	17.3	o	1011.6
US08263	42-19.9	140-45.0	6/29	0610-0614	59	SSW-1	SSE-1	SSW-3	16.1	16.7	o	1011.5
US08264	42-15.2	140-45.0	6/29	0646-0650	78	SW -2	SSE-1	SW -2	15.8	16.0	o	1011.4
US08265	42-09.8	140-44.9	6/29	0729-0733	87	Calm	SSE-1	Calm	16.1	15.8	o	1011.5
US08266	42-14.8	140-54.7	6/29	0834-0837	61	Calm	SE -1	Calm	16.9	17.7	o	1011.3
US08267	42-09.9	140-54.8	6/29	0909-0913	76	Calm	SE -1	Calm	17.8	16.1	c	1011.1
US08268	42-05.1	140-54.9	6/29	0946-0950	88	SE -1	SE -1	SE -3	16.9	16.6	o	1011.1
US08269	42-02.0	140-55.2	6/29	1012-1016	79	East-2	SE -1	East-4	16.4	16.0	o	1010.8

(*):Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION	US08171		
LATITUDE	43-27.5	N	
LONGITUDE	145-25.9	E	
DEPTH (m)	20		

Press.	Temp.	Salinity	Sigma-T
5	6.941	32.123	25.161
10	5.143	32.280	25.503

STATION	US08172		
LATITUDE	43-29.6	N	
LONGITUDE	145-29.8	E	
DEPTH (m)	24		

Press.	Temp.	Salinity	Sigma-T
5	6.874	32.034	25.100
10	5.853	32.415	25.528
20	3.646	32.688	25.982

STATION	US08173		
LATITUDE	43-27.6	N	
LONGITUDE	145-34.3	E	
DEPTH (m)	30		

Press.	Temp.	Salinity	Sigma-T
5	6.635	32.243	25.295
10	5.613	32.443	25.578
20	3.808	32.654	25.939

STATION	US08174		
LATITUDE	43-35.1	N	
LONGITUDE	145-26.6	E	
DEPTH (m)	13		

Press.	Temp.	Salinity	Sigma-T
5	6.578	32.090	25.182
10	5.356	32.298	25.494

STATION	US08175		
LATITUDE	43-33.5	N	
LONGITUDE	145-23.6	E	
DEPTH (m)	12		

Press.	Temp.	Salinity	Sigma-T
5	7.946	31.757	24.735

STATION	US08176		
LATITUDE	43-31.4	N	
LONGITUDE	145-19.6	E	
DEPTH (m)	6		

Press.	Temp.	Salinity	Sigma-T
5	8.032	31.778	24.739

STATION	US08177		
LATITUDE	43-25.6	N	
LONGITUDE	145-21.7	E	
DEPTH (m)	11		

Press.	Temp.	Salinity	Sigma-T
5	7.723	31.942	24.912

STATION	US08178		
LATITUDE	43-24.3	N	
LONGITUDE	145-20.2	E	
DEPTH (m)	9		

Press.	Temp.	Salinity	Sigma-T
5	6.973	31.963	25.030

STATION	US08179		
LATITUDE	43-19.2	N	
LONGITUDE	145-25.9	E	
DEPTH (m)	12		

Press.	Temp.	Salinity	Sigma-T
5	6.466	32.144	25.239

STATION	US08180		
LATITUDE	43-20.0	N	
LONGITUDE	145-27.7	E	
DEPTH (m)	14		

Press.	Temp.	Salinity	Sigma-T
5	7.035	31.901	24.974
10	4.933	32.295	25.539

STATION	US08181		
LATITUDE	43-22.3	N	
LONGITUDE	145-31.9	E	
DEPTH (m)	17		

Press.	Temp.	Salinity	Sigma-T
5	7.080	31.994	25.041
10	6.476	32.112	25.212

STATION	US08182		
LATITUDE	43-24.6	N	
LONGITUDE	145-36.0	E	
DEPTH (m)	25		

Press.	Temp.	Salinity	Sigma-T
5	6.613	32.127	25.206
10	5.406	32.312	25.499
20	3.673	32.683	25.975

STATION	US08183		
LATITUDE	43-26.9	N	
LONGITUDE	145-40.1	E	
DEPTH (m)	31		

Press.	Temp.	Salinity	Sigma-T
5	6.701	32.216	25.266
10	5.178	32.550	25.714
20	3.779	32.712	25.988

STATION	US08184		
LATITUDE	43-57.5	N	
LONGITUDE	145-10.2	E	
DEPTH (m)	79		

Press.	Temp.	Salinity	Sigma-T
5	6.268	32.094	25.224
10	5.636	32.140	25.337
20	4.804	32.264	25.528
30	3.681	32.280	25.653
40	−0.236	32.813	26.352
50	−0.022	32.925	26.432
75	−0.104	33.036	26.526

STATION	US08185		
LATITUDE	43-56.7	N	
LONGITUDE	145-12.0	E	
DEPTH (m)	84		

Press.	Temp.	Salinity	Sigma-T
5	6.118	32.125	25.267
10	5.616	32.137	25.337
20	5.136	32.283	25.507
30	3.940	32.290	25.637
40	1.071	32.458	25.997
50	−0.213	32.801	26.341
75	−0.089	33.038	26.527

STATION	US08186		
LATITUDE	43-55.4	N	
LONGITUDE	145-14.6	E	
DEPTH (m)	82		

Press.	Temp.	Salinity	Sigma-T
5	5.336	32.198	25.417
10	5.259	32.191	25.420
20	5.025	32.264	25.504
30	4.776	32.258	25.526
40	3.531	32.310	25.691
50	0.275	32.607	26.161
75	−0.217	33.057	26.548

STATION	US08187		
LATITUDE	43-59.0	N	
LONGITUDE	145-18.8	E	
DEPTH (m)	270		

Press.	Temp.	Salinity	Sigma-T
5	5.938	32.090	25.262
10	5.160	32.204	25.442
20	4.644	32.445	25.688
30	4.076	32.582	25.855
40	4.043	32.627	25.895
50	2.743	32.729	26.094
75	0.090	32.938	26.438
100	−0.309	33.062	26.556
125	−0.158	33.143	26.615
150	−0.014	33.170	26.629
175	0.073	33.210	26.658
200	0.165	33.246	26.682

STATION	US08188		
LATITUDE	44-00.5	N	
LONGITUDE	145-16.5	E	
DEPTH (m)	442		

Press.	Temp.	Salinity	Sigma-T
5	5.305	32.258	25.468
10	5.162	32.269	25.492
20	4.824	32.254	25.518
30	4.052	32.419	25.728
40	4.052	32.496	25.790
50	2.090	32.707	26.128
75	0.173	32.943	26.438
100	−0.133	33.038	26.528
125	−0.266	33.085	26.573
150	−0.190	33.140	26.614
175	0.031	33.211	26.661
200	0.271	33.290	26.712
250	0.591	33.363	26.753
300	0.783	33.436	26.801
400	1.072	33.534	26.862

STATION US08189
LATITUDE 44-01.6 N
LONGITUDE 145-14.1 E
DEPTH (m) 288

Press.	Temp.	Salinity	Sigma-T
5	5.572	32.143	25.347
10	5.188	32.247	25.472
20	4.699	32.279	25.551
30	4.184	32.343	25.655
40	2.200	32.407	25.880
50	0.500	32.701	26.225
75	0.019	32.972	26.468
100	−0.158	33.078	26.562
125	−0.160	33.140	26.612
150	−0.150	33.165	26.632
175	−0.073	33.209	26.664
200	0.003	33.237	26.683
250	0.336	33.315	26.729

STATION US08190
LATITUDE 44-05.9 N
LONGITUDE 145-16.3 E
DEPTH (m) 328

Press.	Temp.	Salinity	Sigma-T
5	5.335	32.168	25.393
10	4.671	32.301	25.572
20	4.347	32.349	25.643
30	4.308	32.395	25.683
40	2.037	32.475	25.946
50	0.386	32.723	26.249
75	0.205	33.002	26.483
100	−0.102	33.057	26.543
125	−0.072	33.095	26.572
150	−0.177	33.151	26.622
175	0.119	33.181	26.632
200	0.281	33.260	26.687
250	0.458	33.344	26.746

STATION US08191
LATITUDE 44-04.6 N
LONGITUDE 145-20.2 E
DEPTH (m) 828

Press.	Temp.	Salinity	Sigma-T
5	4.555	32.352	25.624
10	4.330	32.387	25.675
20	4.254	32.403	25.695
30	3.850	32.476	25.793
40	3.492	32.597	25.923
50	2.849	32.771	26.119
75	1.432	33.010	26.418
100	−0.147	33.113	26.590
125	−0.336	33.113	26.599
150	−0.268	33.145	26.621
175	−0.145	33.182	26.645
200	0.121	33.236	26.676
250	0.450	33.345	26.747
300	0.834	33.431	26.794
400	1.025	33.529	26.861
500	1.249	33.623	26.922
600	1.476	33.713	26.979
700	1.720	33.815	27.043

STATION US08192
LATITUDE 44-03.4 N
LONGITUDE 145-22.4 E
DEPTH (m) 540

Press.	Temp.	Salinity	Sigma-T
5	4.356	32.033	25.392
10	4.095	32.469	25.764
20	4.100	32.614	25.879
30	3.610	32.677	25.976
40	3.175	32.818	26.128
50	3.143	32.959	26.243
75	1.146	33.226	26.610
100	1.362	33.123	26.513
125	0.118	33.167	26.621
150	−0.136	33.176	26.640
175	−0.118	33.198	26.657
200	0.082	33.254	26.693
250	0.549	33.345	26.741
300	0.680	33.378	26.761
400	1.091	33.545	26.870

STATION US08193
LATITUDE 44-07.0 N
LONGITUDE 145-27.3 E
DEPTH (m) 1124

Press.	Temp.	Salinity	Sigma-T
5	4.223	32.462	25.746
10	4.019	32.492	25.790
20	3.884	32.567	25.862
30	3.345	32.625	25.959
40	3.067	32.659	26.011
50	2.690	32.732	26.101
75	1.454	32.953	26.371
100	1.548	33.125	26.502
125	0.482	33.147	26.585
150	−0.174	33.178	26.643
175	−0.141	33.211	26.669
200	0.389	33.279	26.697
250	0.782	33.399	26.771
300	0.830	33.446	26.807
400	1.142	33.560	26.879
500	1.346	33.628	26.920
600	1.402	33.675	26.953
700	1.647	33.773	27.015
800	2.030	33.952	27.129
900	2.238	34.127	27.253

STATION US08194
LATITUDE 44-08.8 N
LONGITUDE 145-24.5 E
DEPTH (m) 1512

Press.	Temp.	Salinity	Sigma-T
5	4.426	32.376	25.657
10	4.395	32.406	25.683
20	3.914	32.539	25.837
30	3.726	32.611	25.913
40	3.685	32.628	25.930
50	3.720	32.632	25.930
75	2.609	32.966	26.295
100	0.673	33.070	26.513
125	−0.292	33.103	26.589
150	−0.347	33.151	26.629
175	−0.392	33.174	26.650
200	0.055	33.219	26.666
250	0.680	33.367	26.752
300	0.958	33.462	26.812
400	1.205	33.563	26.877
500	1.265	33.615	26.915
600	1.424	33.696	26.969
700	1.701	33.794	27.028
800	2.083	33.983	27.150
900	2.241	34.114	27.243
1000	2.273	34.220	27.325
1200	2.258	34.367	27.444

STATION US08195
LATITUDE 44-10.4 N
LONGITUDE 145-20.9 E
DEPTH (m) 264

Press.	Temp.	Salinity	Sigma-T
5	4.391	32.331	25.624
10	4.375	32.334	25.628
20	4.177	32.382	25.687
30	3.965	32.478	25.783
40	3.661	32.649	25.949
50	3.393	32.735	26.042
75	0.702	32.948	26.413
100	0.400	33.101	26.553
125	0.284	33.132	26.584
150	0.052	33.174	26.629
175	0.148	33.214	26.658
200	0.206	33.243	26.678

STATION US08196
LATITUDE 44-15.3 N
LONGITUDE 145-23.1 E
DEPTH (m) 140

Press.	Temp.	Salinity	Sigma-T
5	4.394	32.368	25.654
10	4.340	32.419	25.699
20	4.097	32.569	25.843
30	3.571	32.873	26.136
40	3.879	32.978	26.190
50	4.642	33.138	26.239
75	3.317	33.308	26.506
100	1.853	33.237	26.570

STATION US08197
LATITUDE 44-13.5 N
LONGITUDE 145-26.2 E
DEPTH (m) 1570

Press.	Temp.	Salinity	Sigma-T
5	4.652	32.283	25.559
10	4.607	32.352	25.619
20	4.244	32.485	25.761
30	4.152	32.509	25.790
40	4.082	32.548	25.828
50	4.033	32.611	25.883
75	1.927	32.992	26.369
100	1.010	33.065	26.489
125	0.220	33.089	26.552
150	−0.370	33.120	26.606
175	−0.258	33.159	26.632
200	0.047	33.210	26.659
250	0.287	33.298	26.717
300	0.703	33.417	26.791
400	1.096	33.559	26.881
500	1.273	33.621	26.919
600	1.405	33.686	26.962
700	1.684	33.790	27.026
800	2.133	34.020	27.176
900	2.242	34.134	27.259
1000	2.305	34.239	27.338
1200	2.258	34.380	27.455

STATION US08198
LATITUDE 44-11.9 N
LONGITUDE 145-29.9 E
DEPTH (m) 2057

Press.	Temp.	Salinity	Sigma-T
5	4.701	32.290	25.559
10	4.699	32.294	25.563
20	4.535	32.369	25.640
30	3.461	32.664	25.980
40	4.172	32.894	26.094
50	4.159	33.014	26.190
75	4.750	33.269	26.331
100	1.498	33.301	26.647
125	0.466	33.107	26.554
150	0.032	33.138	26.602
175	0.065	33.191	26.643
200	−0.136	33.225	26.680
250	0.513	33.359	26.755
300	0.775	33.441	26.806
400	1.105	33.563	26.883
500	1.375	33.645	26.931
600	1.461	33.701	26.970
700	1.625	33.767	27.011
800	2.056	33.955	27.130
900	2.251	34.126	27.252
1000	2.291	34.243	27.342
1200	2.275	34.364	27.440

STATION US08199
LATITUDE 44-18.8 N
LONGITUDE 145-28.4 E
DEPTH (m) 1599

Press.	Temp.	Salinity	Sigma-T
5	4.721	32.251	25.526
10	4.628	32.313	25.585
20	4.404	32.410	25.685
30	3.973	32.539	25.831
40	3.788	32.664	25.949
50	3.317	32.811	26.110
75	1.774	33.073	26.444
100	1.148	33.155	26.552
125	0.451	33.099	26.549
150	−0.280	33.131	26.610
175	−0.606	33.196	26.676
200	−0.206	33.194	26.658
250	0.264	33.309	26.728
300	0.541	33.372	26.764
400	0.900	33.484	26.832
500	1.139	33.589	26.902
600	1.325	33.659	26.946
700	1.863	33.868	27.075
800	2.190	34.061	27.205
900	2.278	34.158	27.275
1000	2.308	34.254	27.350
1200	2.270	34.378	27.452

STATION US08200
LATITUDE 44-20.5 N
LONGITUDE 145-25.0 E
DEPTH (m) 1038

Press.	Temp.	Salinity	Sigma-T
5	4.634	32.330	25.598
10	4.613	32.348	25.615
20	4.348	32.516	25.776
30	4.068	32.637	25.900
40	2.681	32.904	26.239
50	0.227	32.966	26.453
75	0.953	33.053	26.482
100	0.301	33.107	26.563
125	0.530	33.095	26.541
150	−0.221	33.184	26.650
175	0.564	33.271	26.681
200	1.989	33.438	26.721
250	1.372	33.434	26.762
300	1.491	33.461	26.776
400	1.071	33.556	26.880
500	1.263	33.636	26.932
600	1.464	33.704	26.973
700	1.707	33.795	27.028

STATION US08201
LATITUDE 44-17.8 N
LONGITUDE 145-31.9 E
DEPTH (m) 2120

Press.	Temp.	Salinity	Sigma-T
5	4.698	32.351	25.608
10	4.695	32.347	25.606
20	4.363	32.450	25.722
30	3.800	32.730	26.000
40	3.010	32.801	26.129
50	4.086	33.077	26.248
75	4.090	33.223	26.364
100	4.775	33.382	26.418
125	4.174	33.408	26.502
150	2.716	33.415	26.645
175	0.143	33.261	26.696
200	−0.110	33.223	26.677
250	0.388	33.328	26.736
300	1.044	33.453	26.799
400	1.214	33.548	26.864
500	1.176	33.600	26.908
600	1.393	33.684	26.961
700	1.741	33.802	27.031
800	2.123	34.001	27.161
900	2.269	34.151	27.270
1000	2.308	34.258	27.352
1200	2.258	34.389	27.462

STATION US08202
LATITUDE 44-21.6 N
LONGITUDE 145-21.7 E
DEPTH (m) 73

Press.	Temp.	Salinity	Sigma-T
5	4.803	33.093	26.185
10	4.934	33.130	26.200
20	5.261	33.224	26.238
30	5.271	33.256	26.262
40	5.355	33.271	26.264
50	5.232	33.346	26.338

STATION US08203
LATITUDE 44-23.1 N
LONGITUDE 145-17.8 E
DEPTH (m) 723

Press.	Temp.	Salinity	Sigma-T
5	5.765	33.171	26.136
10	5.837	33.274	26.209
20	5.701	33.396	26.322
30	5.495	33.394	26.345
40	5.130	33.435	26.420
50	4.988	33.449	26.447
75	3.511	33.388	26.551
100	3.015	33.424	26.625
125	3.152	33.521	26.691
150	2.953	33.506	26.696
175	2.833	33.512	26.712
200	1.904	33.510	26.785
250	1.400	33.433	26.759
300	1.457	33.505	26.814
400	2.232	33.686	26.901
500	1.950	33.704	26.937

STATION US08204
LATITUDE 44-20.9 N
LONGITUDE 145-09.4 E
DEPTH (m) 1235

Press.	Temp.	Salinity	Sigma-T
5	3.816	32.788	26.045
10	3.837	32.820	26.068
20	4.037	33.110	26.280
30	3.412	33.162	26.381
40	2.477	33.193	26.487
50	1.023	33.133	26.543
75	0.337	33.187	26.626
100	1.121	33.270	26.647
125	2.996	33.508	26.695
150	1.329	33.633	26.924
175	1.271	33.472	26.799
200	1.753	33.538	26.819
250	2.869	33.704	26.862
300	1.635	33.602	26.878
400	2.049	33.658	26.893
500	1.667	33.716	26.968
600	2.026	33.808	27.015
700	2.051	33.836	27.035
800	2.086	33.965	27.136
900	2.267	34.167	27.283
1000	2.298	34.267	27.361

STATION US08205
LATITUDE 44-19.5 N
LONGITUDE 145-12.5 E
DEPTH (m) 741

Press.	Temp.	Salinity	Sigma-T
5	6.503	33.418	26.239
10	5.196	33.343	26.339
20	4.514	33.269	26.356
30	4.489	33.433	26.489
40	5.118	33.545	26.508
50	4.507	33.560	26.588
75	3.130	33.432	26.622
100	2.794	33.502	26.707
125	2.705	33.515	26.726
150	2.469	33.532	26.759
175	2.305	33.562	26.796
200	2.201	33.571	26.812
250	2.296	33.642	26.860
300	2.165	33.663	26.888
400	2.251	33.698	26.909
500	2.257	33.763	26.960

STATION US08206
LATITUDE 44-18.2 N
LONGITUDE 145-15.8 E
DEPTH (m) 100

Press.	Temp.	Salinity	Sigma-T
5	5.922	33.324	26.238
10	5.499	33.349	26.309
20	5.232	33.469	26.435
30	5.049	33.535	26.508
40	4.944	33.520	26.508
50	4.860	33.512	26.511
75	4.281	33.524	26.583

STATION US08207
LATITUDE 44-14.0 N
LONGITUDE 145-11.8 E
DEPTH (m) 101

Press.	Temp.	Salinity	Sigma-T
5	6.730	33.489	26.265
10	6.634	33.486	26.275
20	5.746	33.469	26.375
30	5.645	33.515	26.422
40	5.698	33.573	26.462
50	5.579	33.597	26.496
75	5.363	33.600	26.524

STATION US08208
LATITUDE 44-15.2 N
LONGITUDE 145-09.0 E
DEPTH (m) 595

Press.	Temp.	Salinity	Sigma-T
5	7.259	33.529	26.225
10	5.164	33.480	26.451
20	5.522	33.620	26.521
30	5.145	33.594	26.544
40	5.031	33.584	26.549
50	4.798	33.579	26.572
75	3.866	33.543	26.641
100	2.421	33.514	26.748
125	2.899	33.578	26.759
150	3.351	33.621	26.752
175	2.977	33.639	26.801
200	2.931	33.672	26.831
250	2.420	33.662	26.867
300	2.001	33.640	26.882
400	1.951	33.701	26.934
500	2.161	33.741	26.950

STATION US08209
LATITUDE 44-16.8 N
LONGITUDE 145-05.5 E
DEPTH (m) 901

Press.	Temp.	Salinity	Sigma-T
5	4.088	33.020	26.202
10	3.412	33.229	26.434
20	2.091	33.442	26.717
30	0.806	33.386	26.760
40	0.420	33.309	26.719
50	0.711	33.339	26.727
75	1.051	33.340	26.708
100	2.453	33.513	26.745
125	0.821	33.401	26.771
150	0.672	33.425	26.799
175	0.766	33.437	26.803
200	0.867	33.464	26.819
250	2.453	33.676	26.875
300	2.830	33.768	26.917
400	2.683	33.784	26.942

STATION US08210
LATITUDE 44-13.6 N
LONGITUDE 145-00.0 E
DEPTH (m) 671

Press.	Temp.	Salinity	Sigma-T
5	4.332	33.162	26.291
10	4.034	33.242	26.385
20	3.558	33.429	26.580
30	2.485	33.449	26.691
40	2.413	33.381	26.643
50	2.182	33.422	26.693
75	2.454	33.442	26.688
100	2.064	33.473	26.744
125	1.953	33.495	26.769
150	2.367	33.533	26.768
175	3.128	33.694	26.831
200	3.165	33.723	26.851
250	3.057	33.732	26.868
300	1.930	33.645	26.891
400	2.375	33.747	26.939

STATION US08211
LATITUDE 44-11.8 N
LONGITUDE 145-03.3 E
DEPTH (m) 465

Press.	Temp.	Salinity	Sigma-T
5	7.214	33.360	26.097
10	7.159	33.384	26.124
20	6.687	33.537	26.308
30	6.431	33.565	26.364
40	6.197	33.571	26.399
50	5.951	33.588	26.443
75	4.821	33.601	26.586
100	4.370	33.647	26.672
125	3.837	33.630	26.713
150	2.995	33.522	26.706
175	3.267	33.677	26.805
200	3.388	33.703	26.814
250	3.467	33.742	26.838
300	3.166	33.736	26.861

STATION US08212
LATITUDE 44-10.9 N
LONGITUDE 145-05.8 E
DEPTH (m) 368

Press.	Temp.	Salinity	Sigma-T
5	6.521	33.308	26.149
10	6.091	33.416	26.289
20	5.816	33.484	26.377
30	5.837	33.513	26.398
40	5.836	33.545	26.423
50	5.713	33.569	26.457
75	5.352	33.578	26.508
100	2.746	33.502	26.712
125	2.515	33.472	26.707
150	3.126	33.563	26.727
175	3.465	33.679	26.788
200	3.223	33.694	26.823
250	3.154	33.691	26.826
300	2.964	33.676	26.831

STATION US08213
LATITUDE 44-24.8 N
LONGITUDE 145-14.2 E
DEPTH (m) 1425

Press.	Temp.	Salinity	Sigma-T
5	5.317	33.141	26.166
10	5.405	33.173	26.181
20	4.997	33.310	26.336
30	5.396	33.426	26.382
40	4.139	33.426	26.520
50	3.102	33.471	26.655
75	2.770	33.498	26.706
100	2.174	33.486	26.745
125	2.950	33.547	26.730
150	2.366	33.592	26.815
175	2.009	33.567	26.823
200	2.016	33.555	26.813
250	2.002	33.585	26.838
300	2.207	33.643	26.868
400	2.091	33.729	26.947
500	2.357	33.778	26.965
600	2.050	33.786	26.995
700	1.983	33.816	27.024
800	2.120	33.994	27.157
900	2.282	34.165	27.280
1000	2.317	34.274	27.365
1200	2.237	34.405	27.476

STATION US08214
LATITUDE 41-10.1 N
LONGITUDE 140-40.9 E
DEPTH (m) 58

Press.	Temp.	Salinity	Sigma-T
5	14.200	33.770	25.195
10	13.785	33.795	25.301
20	13.586	33.825	25.365
30	13.405	33.835	25.409
40	13.045	33.858	25.499
50	11.799	33.936	25.801

STATION US08215
LATITUDE 41-09.4 N
LONGITUDE 140-42.6 E
DEPTH (m) 77

Press.	Temp.	Salinity	Sigma-T
5	13.789	33.795	25.299
10	13.619	33.805	25.342
20	13.461	33.858	25.415
30	12.872	33.878	25.549
40	12.283	33.918	25.695
50	11.507	33.928	25.848

STATION US08216
LATITUDE 41-05.3 N
LONGITUDE 140-43.9 E
DEPTH (m) 61

Press.	Temp.	Salinity	Sigma-T
5	13.931	33.681	25.182
10	13.720	33.699	25.240
20	12.394	33.825	25.601
30	11.367	33.681	25.682
40	11.092	33.741	25.779
50	10.433	33.883	26.006

STATION US08217
LATITUDE 41-05.8 N
LONGITUDE 140-46.7 E
DEPTH (m) 63

Press.	Temp.	Salinity	Sigma-T
5	14.300	33.511	24.974
10	12.275	33.515	25.384
20	11.632	33.624	25.589
30	11.320	33.685	25.694
40	10.969	33.775	25.827
50	9.618	33.739	26.031

STATION US08218
LATITUDE 41-06.0 N
LONGITUDE 140-50.9 E
DEPTH (m) 54

Press.	Temp.	Salinity	Sigma-T
5	13.379	33.439	25.108
10	12.243	33.532	25.403
20	11.716	33.634	25.582
30	11.630	33.774	25.706
40	10.285	33.665	25.861
50	7.745	33.564	26.183

STATION US08219
LATITUDE 41-06.6 N
LONGITUDE 140-55.5 E
DEPTH (m) 48

Press.	Temp.	Salinity	Sigma-T
5	14.036	33.404	24.947
10	13.132	33.482	25.191
20	10.870	33.421	25.569
30	10.496	33.514	25.707
40	9.242	33.550	25.944

STATION US08220
LATITUDE 41-04.8 N
LONGITUDE 140-51.8 E
DEPTH (m) 53

Press.	Temp.	Salinity	Sigma-T
5	13.770	33.441	25.030
10	12.717	33.474	25.267
20	11.787	33.612	25.552
30	11.045	33.670	25.732
40	10.433	33.752	25.904
50	9.765	33.901	26.133

STATION US08221
LATITUDE 41-03.6 N
LONGITUDE 140-52.2 E
DEPTH (m) 51

Press.	Temp.	Salinity	Sigma-T
5	13.962	33.381	24.944
10	13.646	33.406	25.028
20	11.949	33.540	25.465
30	10.420	33.483	25.696
40	10.965	33.843	25.881

STATION US08222
LATITUDE 41-02.8 N
LONGITUDE 140-46.2 E
DEPTH (m) 53

Press.	Temp.	Salinity	Sigma-T
5	14.371	33.386	24.862
10	12.951	33.439	25.194
20	12.030	33.652	25.537
30	11.408	33.687	25.679
40	11.428	33.831	25.788
50	10.830	33.886	25.939

STATION US08223
LATITUDE 41-00.9 N
LONGITUDE 140-42.9 E
DEPTH (m) 56

Press.	Temp.	Salinity	Sigma-T
5	14.100	33.425	24.950
10	14.008	33.692	25.175
20	12.987	33.827	25.487
30	11.762	33.687	25.614
40	11.204	33.718	25.741
50	10.809	33.918	25.967

STATION US08224
LATITUDE 41-00.3 N
LONGITUDE 140-46.7 E
DEPTH (m) 53

Press.	Temp.	Salinity	Sigma-T
5	15.047	33.579	24.866
10	12.844	33.495	25.258
20	11.748	33.631	25.573
30	11.262	33.689	25.707
40	11.063	33.802	25.832
50	10.633	33.918	25.998

STATION US08225
LATITUDE 40-52.3 N
LONGITUDE 140-46.1 E
DEPTH (m) 31

Press.	Temp.	Salinity	Sigma-T
5	15.450	33.350	24.601
10	14.187	33.424	24.930
20	12.267	33.679	25.512
30	11.523	33.726	25.688

STATION US08226
LATITUDE 40-55.2 N
LONGITUDE 140-46.6 E
DEPTH (m) 42

Press.	Temp.	Salinity	Sigma-T
5	14.591	33.408	24.833
10	14.340	33.650	25.072
20	12.196	33.493	25.381
30	11.614	33.642	25.606

STATION US08227
LATITUDE 40-57.3 N
LONGITUDE 140-45.5 E
DEPTH (m) 51

Press.	Temp.	Salinity	Sigma-T
5	14.455	33.729	25.109
10	13.986	33.783	25.250
20	13.342	33.826	25.415
30	12.668	33.840	25.560
40	12.360	33.874	25.646
50	10.809	33.911	25.962

STATION US08228
LATITUDE 41-04.2 N
LONGITUDE 140-58.0 E
DEPTH (m) 51

Press.	Temp.	Salinity	Sigma-T
5	14.814	33.341	24.734
10	14.441	33.376	24.840
20	12.006	33.553	25.464
30	11.639	33.698	25.645
40	10.776	33.712	25.812

STATION US08229
LATITUDE 41-05.6 N
LONGITUDE 141-01.9 E
DEPTH (m) 47

Press.	Temp.	Salinity	Sigma-T
5	14.745	33.324	24.735
10	14.337	33.356	24.846
20	11.277	33.375	25.460
30	10.792	33.423	25.585
40	9.493	33.537	25.893

STATION US08230
LATITUDE 41-05.8 N
LONGITUDE 141-09.8 E
DEPTH (m) 39

Press.	Temp.	Salinity	Sigma-T
5	14.861	33.220	24.630
10	14.601	33.241	24.702
20	11.130	33.323	25.446
30	10.666	33.418	25.603

STATION US08231
LATITUDE 41-00.4 N
LONGITUDE 141-06.9 E
DEPTH (m) 44

Press.	Temp.	Salinity	Sigma-T
5	14.768	33.242	24.667
10	13.138	33.187	24.961
20	11.561	33.310	25.358
30	9.973	33.423	25.725
40	9.520	33.664	25.989

STATION US08232
LATITUDE 40-57.1 N
LONGITUDE 141-07.0 E
DEPTH (m) 37

Press.	Temp.	Salinity	Sigma-T
5	15.050	33.201	24.575
10	12.961	33.188	24.997
20	11.025	33.352	25.488
30	10.401	33.464	25.685

STATION US08233
LATITUDE 40-08.8 N
LONGITUDE 141-11.1 E
DEPTH (m) 35

Press.	Temp.	Salinity	Sigma-T
5	14.799	33.068	24.526
10	12.720	33.225	25.073
20	11.665	33.394	25.404
30	10.342	33.479	25.706

STATION US08234
LATITUDE 41-11.6 N
LONGITUDE 141-10.8 E
DEPTH (m) 29

Press.	Temp.	Salinity	Sigma-T
5	14.802	33.034	24.499
10	13.095	33.192	24.974
20	11.864	33.311	25.303

STATION US08235
LATITUDE 41-08.0 N
LONGITUDE 141-03.8 E
DEPTH (m) 37

Press.	Temp.	Salinity	Sigma-T
5	14.643	33.193	24.656
10	14.617	33.220	24.682
20	12.343	33.284	25.192
30	11.189	33.371	25.473

STATION US08236
LATITUDE 41-09.1 N
LONGITUDE 140-44.4 E
DEPTH (m) 62

Press.	Temp.	Salinity	Sigma-T
5	14.649	33.304	24.740
10	14.070	33.454	24.978
20	13.474	33.779	25.352
30	12.971	33.874	25.527
40	12.319	33.922	25.691
50	10.917	33.806	25.861

STATION US08237
LATITUDE 41-11.6 N
LONGITUDE 140-42.6 E
DEPTH (m) 73

Press.	Temp.	Salinity	Sigma-T
5	14.449	33.619	25.026
10	14.182	33.737	25.173
20	13.507	33.796	25.358
30	13.091	33.851	25.485
40	11.685	33.952	25.835
50	11.450	33.979	25.899

STATION US08238
LATITUDE 41-59.9 N
LONGITUDE 141-21.5 E
DEPTH (m) 332

Press.	Temp.	Salinity	Sigma-T
5	11.915	33.068	25.105
10	10.907	33.106	25.317
20	8.423	33.104	25.723
30	8.198	33.374	25.967
40	7.058	33.364	26.122
50	7.023	33.567	26.287
75	7.615	33.938	26.496
100	6.732	33.841	26.542
125	5.920	33.754	26.578
150	5.320	33.687	26.598
175	4.940	33.643	26.606
200	4.710	33.639	26.629
250	4.564	33.685	26.681

STATION US08239
LATITUDE 41-57.5 N
LONGITUDE 140-58.4 E
DEPTH (m) 80

Press.	Temp.	Salinity	Sigma-T
5	10.305	32.435	24.898
10	8.323	32.574	25.322
20	8.416	32.970	25.618
30	8.257	33.307	25.906
40	7.312	33.460	26.163
50	6.978	33.703	26.400
75	5.599	33.721	26.591

STATION US08240
LATITUDE 41-57.9 N
LONGITUDE 140-59.1 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	10.438	32.410	24.855
10	8.408	32.536	25.279
20	8.222	32.922	25.610
30	8.579	33.340	25.884
40	7.933	33.444	26.061
50	6.013	33.442	26.320
75	5.660	33.745	26.603

STATION US08241
LATITUDE 41-58.4 N
LONGITUDE 141-00.0 E
DEPTH (m) 90

Press.	Temp.	Salinity	Sigma-T
5	12.775	32.228	24.290
10	8.533	32.503	25.235
20	8.657	33.004	25.608
30	8.885	33.314	25.816
40	8.289	33.421	25.991
50	5.282	33.347	26.333
75	5.791	33.776	26.611

STATION US08242
LATITUDE 41-58.9 N
LONGITUDE 141-01.0 E
DEPTH (m) 96

Press.	Temp.	Salinity	Sigma-T
5	10.053	32.456	24.955
10	8.890	32.547	25.215
20	8.037	32.781	25.526
30	8.388	33.220	25.818
40	8.317	33.371	25.947
50	5.917	33.416	26.311
75	5.686	33.740	26.596

STATION US08243
LATITUDE 42-23.2 N
LONGITUDE 140-43.2 E
DEPTH (m) 58

Press.	Temp.	Salinity	Sigma-T
5	14.438	32.153	23.897
10	13.862	32.164	24.025
20	8.969	32.302	25.011
30	7.974	32.679	25.455
40	7.896	33.046	25.755
50	5.651	33.081	26.078

STATION US08244
LATITUDE 42-28.9 N
LONGITUDE 140-31.6 E
DEPTH (m) 76

Press.	Temp.	Salinity	Sigma-T
5	14.529	32.089	23.829
10	12.558	32.091	24.225
20	9.305	32.276	24.938
30	8.022	32.635	25.414
40	6.656	32.931	25.835
50	3.280	32.833	26.131

STATION US08245
LATITUDE 42-19.3 N
LONGITUDE 140-30.5 E
DEPTH (m) 94

Press.	Temp.	Salinity	Sigma-T
5	14.717	32.094	23.793
10	13.938	32.516	24.281
20	9.218	32.423	25.067
30	7.859	32.630	25.433
40	5.874	32.775	25.810
50	5.797	33.145	26.112
75	3.930	33.329	26.464

STATION US08246
LATITUDE 42-16.2 N
LONGITUDE 140-35.9 E
DEPTH (m) 92

Press.	Temp.	Salinity	Sigma-T
5	14.781	32.395	24.011
10	13.201	32.810	24.657
20	9.260	32.496	25.117
30	7.459	32.703	25.547
40	6.341	33.005	25.933
50	3.554	32.830	26.103
75	3.138	33.303	26.518

STATION US08247
LATITUDE 42-11.2 N
LONGITUDE 140-35.4 E
DEPTH (m) 82

Press.	Temp.	Salinity	Sigma-T
5	14.566	32.250	23.945
10	11.113	32.258	24.620
20	8.564	32.437	25.179
30	7.893	32.791	25.554
40	6.837	32.925	25.806
50	5.266	33.062	26.109
75	3.090	33.276	26.501

STATION US08248
LATITUDE 42-10.4 N
LONGITUDE 140-47.4 E
DEPTH (m) 93

Press.	Temp.	Salinity	Sigma-T
5	14.122	32.328	24.098
10	13.290	32.374	24.302
20	8.674	32.561	25.259
30	8.593	33.038	25.645
40	9.227	33.398	25.828
50	8.679	33.471	25.971
75	5.439	33.598	26.513

STATION US08249
LATITUDE 42-05.2 N
LONGITUDE 140-56.3 E
DEPTH (m) 86

Press.	Temp.	Salinity	Sigma-T
5	14.580	32.118	23.840
10	10.609	32.349	24.780
20	8.622	32.940	25.563
30	7.107	33.025	25.849
40	9.071	33.702	26.090
50	7.995	33.630	26.198
75	5.185	33.611	26.553

STATION US08250
LATITUDE 42-11.2 N
LONGITUDE 141-01.5 E
DEPTH (m) 81

Press.	Temp.	Salinity	Sigma-T
5	14.670	32.296	23.959
10	11.584	32.647	24.839
20	10.227	33.356	25.630
30	8.208	33.445	26.022
40	7.992	33.624	26.195
50	7.020	33.645	26.349
75	5.456	33.643	26.547

STATION US08251
LATITUDE 42-17.3 N
LONGITUDE 140-54.7 E
DEPTH (m) 57

Press.	Temp.	Salinity	Sigma-T
5	15.018	32.010	23.664
10	10.732	32.649	24.992
20	9.298	33.026	25.526
30	8.986	33.271	25.766
40	8.397	33.424	25.977
50	8.255	33.604	26.140

STATION US08252
LATITUDE 42-23.6 N
LONGITUDE 140-31.1 E
DEPTH (m) 96

Press.	Temp.	Salinity	Sigma-T
5	15.669	32.132	23.616
10	12.096	32.417	24.566
20	9.695	32.276	24.876
30	8.129	32.539	25.323
40	7.956	32.811	25.562
50	6.049	33.061	26.015
75	2.927	33.141	26.408

STATION US08253
LATITUDE 41-55.0 N
LONGITUDE 141-14.7 E
DEPTH (m) 240

Press.	Temp.	Salinity	Sigma-T
5	13.702	32.539	24.347
10	12.887	33.081	24.929
20	10.944	33.397	25.537
30	8.503	33.325	25.884
40	8.187	33.417	26.003
50	7.542	33.546	26.199
75	7.168	33.806	26.455
100	6.795	33.812	26.511
125	6.248	33.776	26.554
150	5.762	33.747	26.592
175	5.154	33.687	26.617
200	5.048	33.709	26.646

STATION US08254
LATITUDE 42-00.0 N
LONGITUDE 141-05.0 E
DEPTH (m) 117

Press.	Temp.	Salinity	Sigma-T
5	13.398	32.619	24.468
10	9.852	33.134	25.519
20	9.302	33.561	25.943
30	8.206	33.577	26.126
40	8.947	33.916	26.278
50	8.763	33.911	26.303
75	8.056	33.856	26.367
100	6.963	33.777	26.461

STATION US08255
LATITUDE 42-04.9 N
LONGITUDE 141-14.8 E
DEPTH (m) 224

Press.	Temp.	Salinity	Sigma-T
5	14.614	32.361	24.020
10	10.860	32.921	25.182
20	8.540	33.199	25.779
30	8.886	33.603	26.042
40	8.354	33.648	26.159
50	8.574	33.800	26.245
75	7.601	33.817	26.403
100	6.809	33.801	26.500
125	6.133	33.746	26.545
150	5.516	33.704	26.588
175	4.979	33.652	26.609
200	4.987	33.698	26.645

STATION US08256
LATITUDE 42-10.1 N
LONGITUDE 141-05.4 E
DEPTH (m) 93

Press.	Temp.	Salinity	Sigma-T
5	15.366	32.631	24.067
10	13.055	32.946	24.791
20	8.977	33.127	25.655
30	8.677	33.418	25.929
40	7.750	33.404	26.057
50	8.511	33.808	26.261
75	5.654	33.446	26.367

STATION US08257
LATITUDE 42-09.3 N
LONGITUDE 141-06.8 E
DEPTH (m) 100

Press.	Temp.	Salinity	Sigma-T
5	15.585	32.608	24.001
10	14.430	32.592	24.237
20	9.189	33.181	25.664
30	8.619	33.430	25.948
40	7.383	33.486	26.173
50	7.612	33.698	26.308
75	5.885	33.530	26.405

STATION US08258
LATITUDE 42-14.8 N
LONGITUDE 141-14.9 E
DEPTH (m) 172

Press.	Temp.	Salinity	Sigma-T
5	16.016	32.592	23.893
10	14.868	32.612	24.160
20	10.038	32.880	25.291
30	8.224	33.206	25.832
40	8.942	33.619	26.046
50	8.540	33.730	26.195
75	7.045	33.761	26.437
100	6.994	33.875	26.533
125	6.218	33.785	26.565
150	5.782	33.739	26.583

STATION US08259
LATITUDE 42-25.1 N
LONGITUDE 141-15.0 E
DEPTH (m) 69

Press.	Temp.	Salinity	Sigma-T
5	15.781	32.057	23.534
10	14.353	32.442	24.138
20	12.591	33.195	25.075
30	8.813	33.108	25.666
40	7.986	33.317	25.954
50	7.932	33.427	26.049

STATION US08260
LATITUDE 42-19.9 N
LONGITUDE 141-05.4 E
DEPTH (m) 52

Press.	Temp.	Salinity	Sigma-T
5	15.025	32.100	23.731
10	10.983	32.520	24.847
20	8.805	33.007	25.588
30	8.654	33.221	25.779
40	8.339	33.314	25.900

STATION US08261
LATITUDE 42-28.9 N
LONGITUDE 140-44.8 E
DEPTH (m) 52

No data

STATION US08262
LATITUDE 42-24.9 N
LONGITUDE 140-45.1 E
DEPTH (m) 55

Press.	Temp.	Salinity	Sigma-T
5	17.144	32.131	23.280
10	15.053	32.199	23.802
20	10.801	32.404	24.789
30	7.904	32.565	25.376
40	4.782	32.799	25.954

STATION US08263
LATITUDE 42-19.9 N
LONGITUDE 140-45.0 E
DEPTH (m) 59

Press.	Temp.	Salinity	Sigma-T
5	16.459	32.145	23.449
10	15.169	32.103	23.703
20	12.796	32.497	24.494
30	7.444	32.584	25.455
40	6.776	33.027	25.895
50	5.829	33.204	26.155

STATION US08264
LATITUDE 42-15.2 N
LONGITUDE 140-45.0 E
DEPTH (m) 78

Press.	Temp.	Salinity	Sigma-T
5	15.780	32.191	23.637
10	15.176	32.180	23.761
20	13.525	32.520	24.367
30	8.271	32.705	25.432
40	7.299	33.070	25.858
50	5.677	33.147	26.128

STATION US08265
LATITUDE 42-09.8 N
LONGITUDE 140-44.9 E
DEPTH (m) 87

Press.	Temp.	Salinity	Sigma-T
5	16.281	32.296	23.605
10	14.163	32.530	24.245
20	8.877	32.415	25.114
30	8.493	32.808	25.480
40	8.858	33.194	25.726
50	5.567	33.012	26.034
75	2.922	33.189	26.447

STATION US08266
LATITUDE 42-14.8 N
LONGITUDE 140-54.7 E
DEPTH (m) 61

Press.	Temp.	Salinity	Sigma-T
5	15.057	32.007	23.648
10	12.389	32.587	24.642
20	10.190	32.779	25.186
30	8.852	33.042	25.608
40	8.522	33.229	25.805
50	8.090	33.330	25.949

STATION US08267
LATITUDE 42-09.9 N
LONGITUDE 140-54.8 E
DEPTH (m) 76

Press.	Temp.	Salinity	Sigma-T
5	15.658	32.652	24.019
10	12.806	33.053	24.923
20	8.536	33.011	25.632
30	8.042	33.166	25.827
40	8.533	33.431	25.962
50	8.060	33.522	26.104

STATION US08268
LATITUDE 42-05.1 N
LONGITUDE 140-54.9 E
DEPTH (m) 88

Press.	Temp.	Salinity	Sigma-T
5	16.258	32.489	23.758
10	13.657	32.891	24.628
20	9.545	33.054	25.508
30	8.769	33.410	25.909
40	8.620	33.646	26.117
50	8.838	33.820	26.220
75	4.154	33.335	26.447

STATION US08269
LATITUDE 42-02.0 N
LONGITUDE 140-55.2 E
DEPTH (m) 79

Press.	Temp.	Salinity	Sigma-T
5	15.973	32.171	23.579
10	12.364	32.684	24.722
20	9.964	33.193	25.548
30	8.920	33.433	25.904
40	8.691	33.612	26.079
50	8.693	33.743	26.182

5

THE “USHIO MARU”

CRUISE 151
CRUISE 152
CRUISE 153

IN JULY-AUGUST 2008

1. Cruise Itinerary

Cruise 151

Departure from Hakodate	Jul.	7	, 2008
Arrival at and departure from Usujiri		7	
Start hydrographic research (US08270) and larvae net sampling		7	
Start frame trawl net sampling		7	
Arrival at Usujiri		7	
Departure from Usujiri		8	
Arrival at Shiraoi		8	
Departure from Shiraoi		9	
Arrival at Usujiri		10	
Departure from Usujiri		11	
Arrival at Muroran		11	
Departure from Muroran		12	
Arrival at and departure from Muroran		13	
Arrival at Usujiri		13	
Departure from Usujiri		14	
Finish frame trawl net sampling		15	
Arrival at Usujiri		15	
Departure from Usujiri		17	
Arrival at Usujiri		17	
Departure from Usujiri		18	
Research by trawl net and mid water trawl net		18	
Finish hydrographic research (US08303) and larvae net sampling		18	
Arrival at and departure from Usujiri		18	
Return to Hakodate		19	

Total coverage 809.3 miles

Cruise 152

Departure from Hakodate	Jul.	24	, 2008
Arrival at Otaru		25	
Departure from Otaru		26	
Start hydrographic research (US08304) and larvae net sampling		26	
Arrival at Rausu		30	
Departure from Rausu		31	
Finish hydrographic research (US08377) and larvae net sampling	Aug.	1	
Arrival at Shiraoi		2	
Departure from Shiraoi		3	
Return to Hakodate		4	

Total coverage 1247.8 miles

Cruise 153

Departure from Hakodate	Aug.	18	, 2008
Experiment of X.B.T.		18	
Start hydrographic research (US08378)		18	
Arrival at Usujiri		18	
Departure from Usujiri		19	
Arrival at Muroran		19	
Departure from Muroran		20	
Start larvae net sampling		20	
Arrival at Muroran		20	
Departure from Muroran		21	
Retrieval Sediment trap system		21	
Arrival at and departure from Mori		21	
Start trawl net research		21	
Finish trawl net research		22	
Finish hydrographic research (US08391) and larvae net sampling		22	
Arrival at and departure from Mori		22	
Set Sediment trap system		22	
Return to Hakodate		26	

Total coverage 341.4 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 151

Research Staff :	Associate Professor	(Laboratory of Marine Bioresource Science)	Toshikuni Nakatani
	Associate Professor	(Laboratory of Marine Environmental Science)	Isao Kudo
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Tohru Mukai
	Research Associate	(Field Science Center for Northern Biosphere)	Hiroki Yasuma

Graduate Students :	Chair of of Marine Bioresource Science :	4 persons
	Chair of Marine Bioresource and Environment Sensing :	3 persons
	Graduate School of the Fisheries Sciences :	1 person
	Graduate School of Environmental Science :	6 persons
Under Graduate Students :	Department of Marine Biological Science :	4 persons
	Department of Fisheries Oceanography and Marine Science :	2 persons
	Department of Marine Production System Science :	6 persons

Cruise 152

Research Staff :	Professor	(Laboratory of Marine Environmental Science)	Shigeru Montani
	Associate Professor	(Laboratory of Marine Environmental Science)	Isao Kudo
	Associate Professor	(Laboratory of Marine Environmental Science)	Yutaka Isoda

Graduate Students :	Chair of Marine Environmental Science :	2 persons
	Graduate School of Environmental Science :	7 persons
Under Graduate Students :	Department of Fisheries Oceanography and Marine Science :	5 persons

Cruise 153

Research Staff :	Professor	(Laboratory of Marine Bioresource Science)	Toyomi Takahashi
	Associate Professor	(Laboratory of Marine Industorial Science and Technology)	Shynji Jiyanuma
	Associate Professor	(Laboratory of Marine Environmental Science)	Isao Kudo
	Assistant Professor	(Laboratory of Marine Environmental Science)	Hiroji Ohnishi
	Technician	(Field Science Center for Northern Biosphere)	Shinichi Fukui
	Visiting Associate Professor	(Faculty of the Fisheries Sciences)	Koutaro Tetsumura
	Visiting Researcher	(Faculty of the Fisheries Sciences)	Nariyuki Mohnai
	Research Associate	(Field Science Center for Northern Biosphere)	Toshihiro Iwamori

Graduate Students :	Chair of of Marine Bioresource Science :	4 persons
	Chair of Marine Environmental Science :	2 persons
	Graduate School of Environmental Science :	4 persons
Under Graduate Students :	Department of Marine Biological Science :	4 persons
	Department of Fisheries Oceanography and Marine Science :	4 persons
	Department of Marine Production System 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 151)

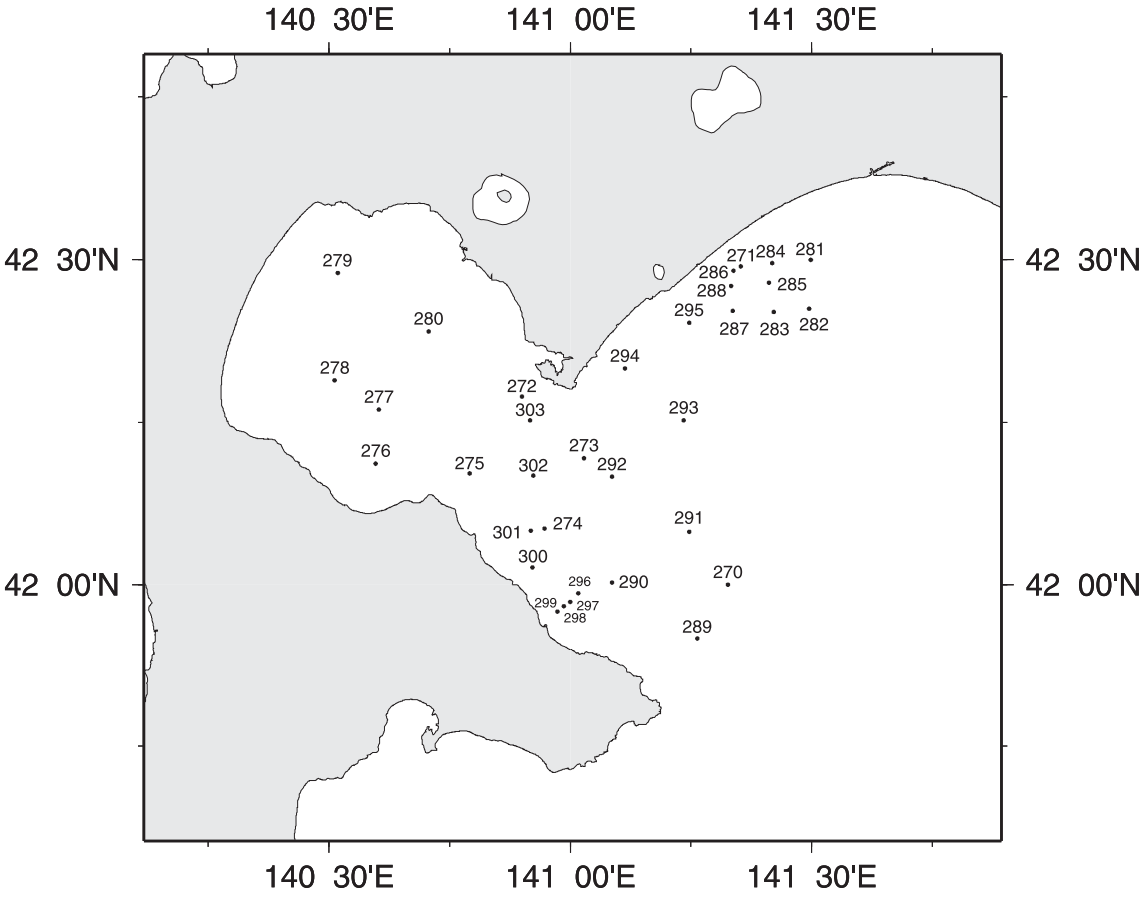

Figure 2: Oceanographic stations (Cruise 152)

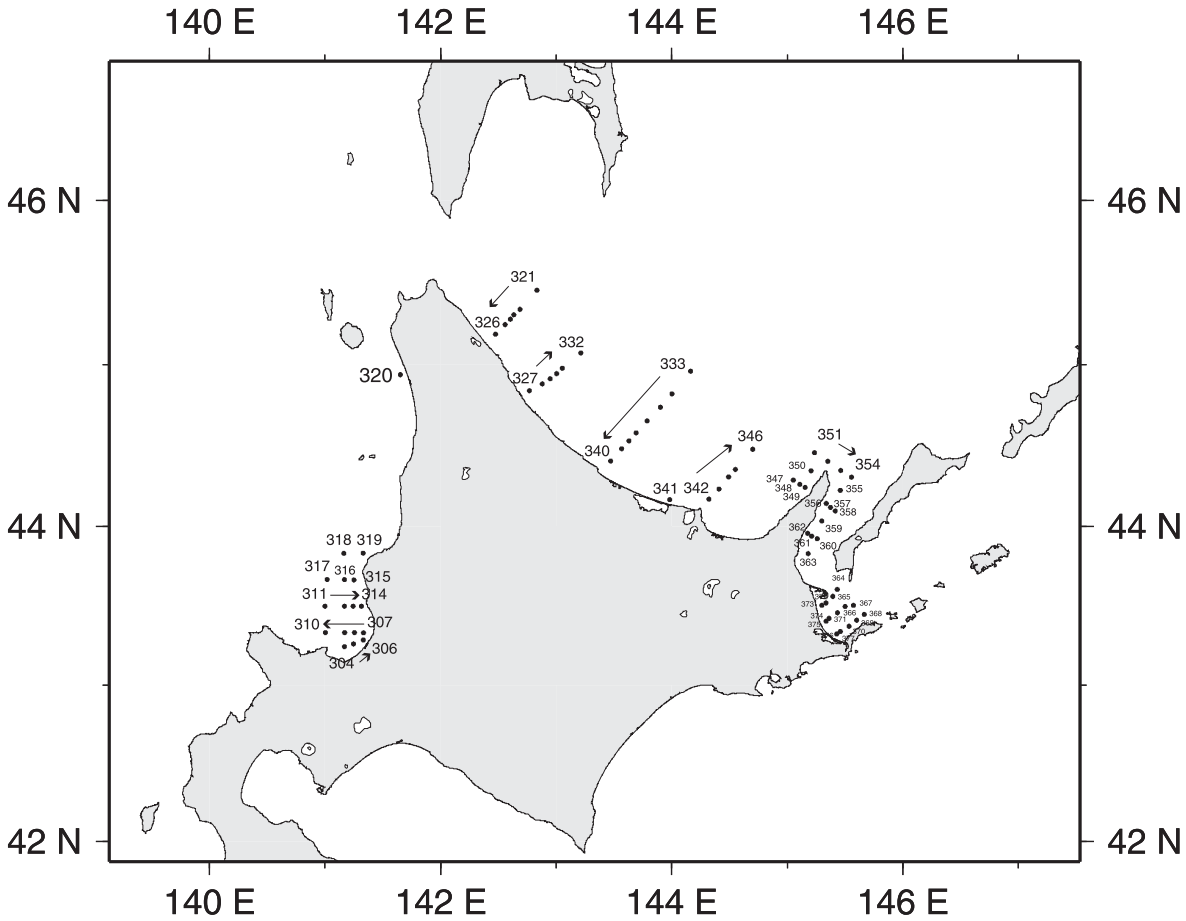

Figure 3: Oceanographic stations (Cruise 153)

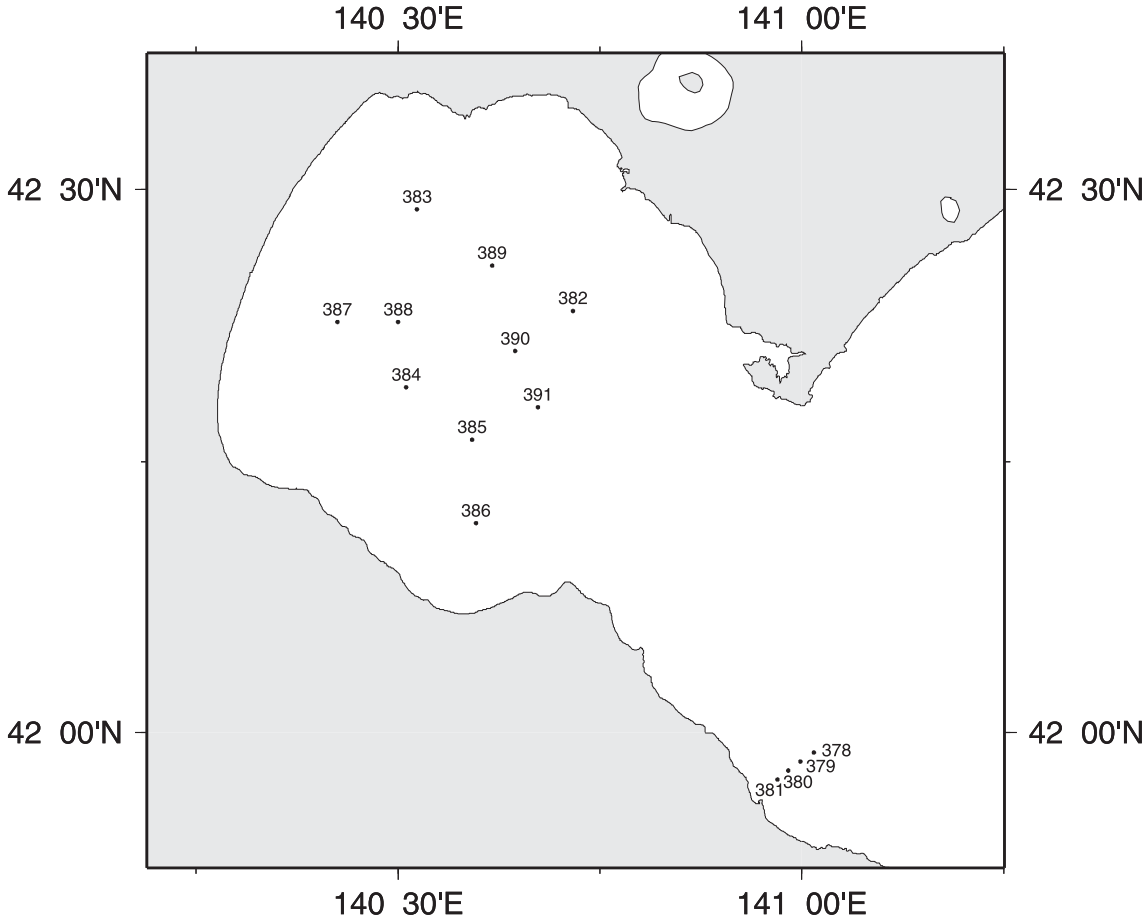

Table 1: List of oceanographic stations

Cruise 151

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08270	42-00.0	141-19.6	7/7	1728-1740	308	East-1	East-1	East-3	16.5	16.5	o	1012.2
US08271	42-29.4	141-21.2	7/9	0722-0726	63	Calm	SSE-1	Calm	17.0	15.8	o	1015.1
US08272	42-17.4	140-54.0	7/12	0740-0745	57	WNW-1	West-1	WNW-3	18.9	18.6	bc	1004.1
US08273	42-11.7	141-01.7	7/12	0836-0843	78	West-2	SE -1	West-4	19.2	17.4	bc	1004.1
US08274	42-05.2	140-56.8	7/12	0930-0936	84	WNW-2	SE -1	WNW-4	18.8	17.2	bc	1004.1
US08275	42-10.3	140-47.5	7/12	1029-1037	92	WNW-2	SE -1	WNW-4	20.5	18.4	bc	1004.1
US08276	42-11.2	140-35.8	7/12	1133-1140	81	NW -1	NW -1	NW -2	21.0	18.8	bc	1004.5
US08277	42-16.2	140-36.2	7/12	1216-1222	91	NNW-2	SE -1	NNW-4	21.2	18.3	bc	1004.4
US08278	42-18.9	140-30.7	7/12	1415-1422	93	NNW-2	NNW-1	NNW-4	20.4	18.3	bc	1004.1
US08279	42-28.8	140-31.1	7/13	0630-0640	76	Calm	SE -1	Calm	19.4	17.7	bc	1008.5
US08280	42-23.4	140-42.4	7/13	0842-0848	63	Calm	SE -1	Calm	20.0	19.0	bc	1008.6
US08281	42-30.0	141-29.9	7/14	1131-1135	75	Calm	ESE-1	Calm	19.1	16.8	c	1009.1
US08282	42-25.5	141-29.7	7/14	1208-1213	116	Calm	ESE-1	Calm	19.0	15.8	o	1009.1
US08283	42-25.2	141-25.3	7/14	1240-1245	103	Calm	ESE-1	Calm	18.6	16.9	o	1009.0
US08284	42-29.7	141-25.1	7/14	1320-1324	77	Calm	ESE-1	Calm	19.1	17.1	c	1008.7
US08285	42-27.9	141-24.7	7/14	1357-1401	86	Calm	ESE-1	Calm	19.2	16.8	r	1008.6
US08286	42-29.0	141-20.3	7/14	1429-1432	61	Calm	ESE-1	Calm	19.5	17.6	c	1008.7
US08287	42-25.3	141-20.2	7/14	1500-1504	91	West-1	ESE-1	West-3	18.6	16.8	c	1008.6
US08288	42-27.6	141-20.0	7/14	1605-1608	75	WSW-1	ESE-1	WSW-2	18.8	17.1	c	1009.0
US08289	41-55.0	141-15.8	7/15	0500-0511	261	WNW-1	SE -1	WNW-3	18.2	16.6	bc	1010.8
US08290	42-00.2	141-05.2	7/15	0620-0635	116	NNW-1	SE -1	NNW-3	18.1	17.6	o	1011.2
US08291	42-04.9	141-14.8	7/15	0738-0745	226	Calm	SE -1	Calm	18.9	17.6	o	1011.6
US08292	42-10.0	141-05.2	7/15	0848-0853	90	Calm	SE -1	Calm	20.8	16.2	o	1011.5
US08293	42-15.2	141-14.1	7/15	0950-0955	144	SW -1	SE -1	SW -2	21.7	18.1	bc	1011.4
US08294	42-20.0	141-06.8	7/15	1046-1049	58	SSW-1	SE -1	SSW-3	21.6	18.4	bc	1011.0
US08295	42-24.2	141-14.8	7/15	1158-1202	74	South-1	SE -1	South-3	20.2	18.0	bc	1010.6
US08296	41-59.2	141-01.0	7/15	1445-1449	96	Calm	SE -1	Calm	21.3	18.7	bc	1010.1
US08297	41-58.4	141-00.0	7/15	1456-1500	90	Calm	SE -1	Calm	21.6	18.3	bc	1010.0
US08298	41-58.0	140-59.2	7/15	1505-1509	85	Calm	SE -1	Calm	22.0	19.2	bc	1010.0
US08299	41-57.5	140-58.4	7/15	1514-1518	81	Calm	SE -1	Calm	22.5	17.9	c	1010.0
US08300	42-01.6	140-55.3	7/15	1548-1552	79	Calm	SE -1	Calm	21.2	20.4	bc	1010.0
US08301	42-05.0	140-55.1	7/15	1618-1622	87	Calm	SE -1	Calm	20.8	18.9	bc	1010.0
US08302	42-10.1	140-55.4	7/15	1657-1701	76	ESE-1	SE -1	ESE-2	20.2	19.1	bc	1009.8
US08303	42-15.2	140-55.0	7/15	1738-1742	60	SSE-1	SE -1	SSE-2	20.4	19.7	c	1009.9

Cruise 153

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08378	41-58.9	141-00.9	8/18	1356-1400	96	East-1	East-1	East-3	21.8	21.2	bc	1011.0
US08379	41-58.4	140-59.9	8/18	1407-1411	89	East-1	East-1	East-3	21.9	21.0	bc	1011.0
US08380	41-57.9	140-59.0	8/18	1417-1420	84	East-1	East-1	East-3	22.3	21.1	bc	1011.0
US08381	41-57.4	140-58.2	8/18	1426-1430	79	East-1	East-1	East-3	22.6	21.0	bc	1011.0
US08382	42-23.3	140-43.0	8/20	0803-0818	59	ESE-1	SE -1	ESE-2	18.3	20.4	r	1003.0
US08383	42-28.9	140-31.4	8/20	0924-0930	75	ESE-1	SE -1	ESE-2	18.9	20.7	o	1003.7
US08384	42-19.1	140-30.6	8/20	1111-1118	92	ESE-2	ESE-1	ESE-4	19.4	20.6	r	1003.8
US08385	42-16.2	140-35.5	8/20	1159-1206	90	East-3	ESE-1	East-5	19.0	20.5	o	1003.6
US08386	42-11.6	140-35.8	8/21	1149-1153	83	South-2	ESE-1	South-4	18.6	20.5	c	1009.6
US08387	42-22.7	140-25.5	8/21	1542-1546	73	ESE-2	SE -1	ESE-4	19.1	20.6	bc	1010.3
US08388	42-22.7	140-30.0	8/21	1633-1640	95	ESE-2	SE -1	ESE-4	19.0	20.5	bc	1010.9
US08389	42-25.8	140-37.0	8/22	0753-0757	84	SW -1	SE -1	SW -2	19.7	20.4	bc	1014.6
US08390	42-21.1	140-38.7	8/22	1028-1032	80	SSE-1	SE -1	SSE-2	19.2	20.6	bc	1015.1
US08391	42-18.0	140-40.4	8/22	1201-1205	77	SE -2	SE -1	SE -4	19.9	20.5	bc	1014.8

Cruise 152

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08304	43-14.7	141-10.1	7/26	0810-0813	24	NNW-2	North-1	NNW-4	20.8	19.6	bc	1012.2
US08305	43-15.7	141-14.8	7/26	0840-0843	22	NNW-2	North-1	NNW-4	21.6	20.2	bc	1012.2
US08306	43-17.2	141-19.9	7/26	0909-0913	16	West-1	North-1	West-3	21.9	20.9	bc	1012.2
US08307	43-19.9	141-20.0	7/26	0930-0933	21	NW -1	North-1	NW -3	21.0	21.3	bc	1012.2
US08308	43-20.0	141-15.3	7/26	0955-0959	27	NW-2	North-1	NW -4	20.0	19.7	bc	1012.2
US08309	43-20.0	141-10.2	7/26	1021-1026	36	NW -2	North-1	NW -4	19.7	19.8	bc	1012.2
US08310	43-20.0	141-00.2	7/26	1114-1119	49	NW -1	North-1	NW -3	19.9	21.2	bc	1012.4
US08311	43-30.0	141-00.0	7/26	1226-1232	92	North-1	North-1	North-3	21.6	20.2	bc	1012.2
US08312	43-30.0	141-10.1	7/26	1324-1330	58	North-1	North-1	North-3	21.3	20.2	bc	1012.0
US08313	43-30.0	141-14.6	7/26	1357-1400	40	NNW-2	North-1	NNW-4	22.4	20.3	bc	1012.0
US08314	43-30.0	141-18.9	7/26	1421-1425	31	NNW-2	North-1	NNW-4	22.6	20.4	bc	1012.0
US08315	43-39.9	141-15.0	7/26	1533-1538	64	NNW-2	North-1	NNW-4	21.4	18.3	bc	1012.0
US08316	43-40.0	141-10.1	7/26	1602-1608	81	NNW-2	North-1	NNW-4	20.7	20.4	bc	1012.1
US08317	43-40.1	141-01.1	7/26	1655-1710	285	NNE-2	North-1	NNE-4	20.8	20.0	bc	1012.2
US08318	43-49.9	141-09.8	7/26	1834-1847	232	NNE-2	North-1	NNE-5	20.8	20.1	bc	1011.8
US08319	43-50.0	141-19.8	7/26	1943-1950	80	NNE-2	North-1	NNE-4	21.0	20.9	bc	1012.0
US08320	44-56.4	141-39.1	7/27	0421-0425	28	East-1	NE -1	East-3	16.5	19.5	bc	1014.1
US08321	45-27.4	142-50.0	7/27	1158-1206	118	SSE-2	East-1	SSE-4	16.7	15.7	bc	1014.7
US08322	45-20.4	142-41.2	7/27	1310-1317	97	SE -2	East-1	SE -4	18.1	15.8	bc	1014.8
US08323	45-18.4	142-38.0	7/27	1341-1348	87	SE -2	East-1	SE -4	18.0	16.2	bc	1014.5
US08324	45-16.8	142-36.2	7/27	1403-1407	78	SE -2	East-1	SE -5	17.9	17.0	bc	1014.0
US08325	45-14.8	142-33.5	7/27	1432-1438	64	SE -3	ESE-1	SE -5	17.8	17.0	bc	1014.7
US08326	45-11.3	142-28.5	7/27	1510-1515	43	SE -3	ESE-1	SE -5	18.7	17.8	bc	1013.3
US08327	44-50.5	142-46.1	7/27	1724-1728	49	ESE-2	SE -1	ESE-4	18.1	17.5	bc	1013.6
US08328	44-53.0	142-52.8	7/27	1759-1802	87	ESE-2	East-1	ESE-4	17.0	16.4	bc	1013.6
US08329	44-54.9	142-56.9	7/27	1831-1840	114	ESE-2	East-1	ESE-4	16.5	16.8	bc	1013.6
US08330	44-56.8	143-00.2	7/27	1902-1910	127	ESE-2	East-1	ESE-4	15.9	15.2	bc	1013.7
US08331	44-58.8	143-03.2	7/27	1932-1940	130	ESE-2	East-1	ESE-4	15.8	15.2	bc	1013.5
US08332	45-04.4	143-12.8	7/27	2035-2046	138	ESE-2	East-1	ESE-4	16.1	16.3	bc	1012.8
US08333	44-57.7	144-09.8	7/28	0610-0636	230	ESE-1	East-1	ESE-3	14.6	13.4	bc	1012.5
US08334	44-49.3	144-00.1	7/28	0743-0802	184	ESE-1	East-1	ESE-2	16.2	13.6	bc	1012.6
US08335	44-44.4	143-54.1	7/28	0841-0859	172	SE -1	NE -1	SE -3	16.8	13.2	bc	1012.4
US08336	44-39.3	143-47.2	7/28	1115-1125	159	East-1	ENE-1	East-2	19.7	15.2	bc	1012.1
US08337	44-34.9	143-41.5	7/28	1204-1215	148	East-1	ENE-1	East-2	21.4	16.1	bc	1011.7
US08338	44-31.9	143-37.8	7/28	1242-1253	131	ENE-1	ENE-1	ENE-3	20.7	16.8	bc	1011.7
US08339	44-29.0	143-34.0	7/28	1412-1421	95	ENE-1	ENE-1	ENE-3	20.1	15.8	bc	1010.7
US08340	44-24.4	143-28.3	7/28	1500-1507	56	NE -1	ENE-1	NE -2	21.4	17.8	bc	1010.5
US08341	44-10.0	143-58.9	7/28	1804-1809	37	SE -1	ENE-1	SE -3	21.6	17.1	bc	1010.0
US08342	44-10.2	144-19.3	7/28	1955-2002	110	SSE-2	ESE-1	SSE-5	17.4	15.6	bc	1011.0
US08343	44-14.0	144-24.5	7/28	2033-2048	321	SSE-2	SE -1	SSE-5	16.9	14.5	bc	1011.5
US08344	44-18.5	144-29.5	7/28	2128-2204	923	South-2	SE -1	South-5	15.9	14.2	bc	1011.8
US08345	44-21.3	144-33.0	7/28	2237-0020	1131	South-2	SE -1	South-4	16.3	14.1	bc	1012.0
US08346	44-28.8	144-42.0	7/29	0132-0227	1473	South-2	SE -1	South-4	14.9	12.8	bc	1011.6
US08347	44-17.3	145-03.1	7/29	0435-0452	802	WSW-1	SE -1	WSW-3	15.0	13.5	bc	1012.7
US08348	44-15.7	145-06.5	7/29	0515-0531	755	SE -1	SE -1	SE -2	15.5	14.3	bc	1013.0
US08349	44-14.6	145-09.2	7/29	0550-0606	406	SE -1	SE -1	SE -6	15.4	16.0	bc	1012.8
US08350	44-20.8	145-12.3	7/29	0640-0655	985	NNE-1	SE -1	NNE-3	15.4	13.6	bc	1013.1
US08351	44-27.5	145-14.1	7/29	0734-0748	1773	ESE-1	East-1	ESE-2	16.0	13.9	bc	1013.1
US08352	44-24.3	145-21.0	7/29	0829-0843	436	SE -3	SE -1	SE -6	15.0	13.6	bc	1012.7
US08353	44-20.9	145-27.7	7/29	0921-0935	1672	SSE-3	SE -1	SSE-6	14.3	13.0	c	1013.1
US08354	44-18.4	145-33.3	7/29	1005-1020	2388	SSE-3	SE -1	SSE-6	13.8	13.4	c	1013.6
US08355	44-13.5	145-27.5	7/29	1107-1147	1818	SSE-3	SE -1	SSE-5	14.0	13.7	c	1013.8
US08356	44-08.6	145-20.2	7/29	1249-1301	510	South-3	SSW-1	South-5	14.6	13.7	o	1014.0
US08357	44-07.1	145-22.4	7/29	1317-1330	985	SSW-2	SSW-1	SSW-4	14.5	14.1	o	1014.0
US08358	44-05.8	145-24.9	7/29	1340-1357	1008	SSE-2	SSE-1	SSE-4	14.6	13.8	o	1013.9
US08359	44-02.0	145-17.9	7/29	1442-1453	424	South-3	South-1	South-5	15.0	13.9	o	1013.6
US08360	43-55.4	145-15.5	7/29	1540-1546	85	SSE-3	SSE-1	SSE-5	14.9	14.7	c	1013.9
US08361	43-56.4	145-12.6	7/29	1602-1610	83	SSE-1	SSE-1	SSE-3	15.1	14.6	o	1014.2
US08362	43-57.4	145-10.5	7/29	1624-1630	82	SSW-1	SSE-1	SSW-3	14.9	14.6	o	1014.5
US08363	43-49.8	145-10.8	7/31	1601-1606	42	SSE-2	SSE-1	SSE-5	16.2	15.1	bc	1015.8
US08364	43-36.3	145-25.9	7/31	1807-1812	23	SSE-2	SSE-1	SSE-4	14.8	12.6	o	1016.8
US08365	43-33.7	145-23.6	7/31	1850-1852	12	SSW-2	SSE-1	SSW-4	15.2	13.0	o	1017.2
US08366	43-29.9	145-30.0	7/31	1942-1944	24	SSW-1	SSE-1	SSW-4	15.1	13.6	o	1017.2
US08367	43-30.3	145-34.3	7/31	2008-2011	29	SSW-1	SSE-1	SSW-4	15.5	14.9	o	1017.6
US08368	43-26.9	145-39.9	7/31	2050-2052	31	South-1	South-1	South-4	15.6	14.6	o	1017.4
US08369	43-24.7	145-36.0	7/31	2120-2123	26	SSW-1	South-1	SSW-3	15.9	14.5	o	1017.6
US08370	43-22.4	145-32.0	7/31	2151-2153	18	SW -1	South-1	SW -3	15.7	15.6	o	1017.6
US08371	43-27.5	145-26.0	7/31	2240-2243	20	South-1	South-1	South-3	15.8	15.1	o	1017.5
US08372	43-31.2	145-20.0	8/1	0415-0418	7	South-1	SE -1	South-3	15.7	14.7	o	1016.6
US08373	43-30.3	145-17.9	8/1	0442-0445	7	South-1	SE -1	South-3	15.6	14.6	o	1016.7
US08374	43-25.4	145-21.6	8/1	0524-0527	11	South-1	SE -1	South-3	15.8	14.3	o	1017.0
US08375	43-24.3	145-20.1	8/1	0542-0544	9	South-1	SE -1	South-3	16.2	14.4	o	1017.1
US08376	43-19.5	145-25.6	8/1	0628-0631	12	South-1	SE -1	South-3	16.5	15.7	o	1017.0
US08377	43-20.4	145-27.5	8/1	0646-0648	15	South-1	SE -1	South-3	16.7	16.0	o	1017.1

(*):Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION	US08270	
LATITUDE	42-00.0	N
LONGITUDE	141-19.6	E
DEPTH (m)	308	

Press.	Temp.	Salinity	Sigma-T
5	16.297	32.837	24.017
10	15.426	32.976	24.319
20	12.205	33.976	25.755
30	11.127	34.013	25.984
40	10.471	34.010	26.098
50	8.597	33.798	26.240
75	6.820	33.753	26.461
100	7.133	33.916	26.546
125	6.176	33.806	26.587
150	5.010	33.704	26.647
175	4.575	33.678	26.674
200	2.918	33.490	26.687
250	3.281	33.603	26.745

STATION	US08271	
LATITUDE	42-29.4	N
LONGITUDE	141-21.2	E
DEPTH (m)	63	

Press.	Temp.	Salinity	Sigma-T
5	15.672	32.839	24.159
10	15.605	32.886	24.210
20	13.883	32.802	24.513
30	12.760	33.332	25.148
40	9.158	33.099	25.605
50	8.081	33.261	25.896

STATION	US08272	
LATITUDE	42-17.4	N
LONGITUDE	140-54.0	E
DEPTH (m)	57	

Press.	Temp.	Salinity	Sigma-T
5	18.423	31.926	22.816
10	16.568	32.171	23.444
20	9.877	32.632	25.124
30	8.408	32.876	25.546
40	7.434	33.042	25.817
50	7.761	33.381	26.037

STATION	US08273	
LATITUDE	42-11.7	N
LONGITUDE	141-01.7	E
DEPTH (m)	78	

Press.	Temp.	Salinity	Sigma-T
5	15.824	32.816	24.107
10	14.905	32.955	24.416
20	11.597	33.140	25.219
30	8.809	33.082	25.646
40	8.015	33.230	25.881
50	8.088	33.362	25.974

STATION	US08274	
LATITUDE	42-05.2	N
LONGITUDE	140-56.8	E
DEPTH (m)	84	

Press.	Temp.	Salinity	Sigma-T
5	16.750	32.889	23.953
10	14.956	33.045	24.474
20	11.334	33.027	25.180
30	8.492	33.223	25.805
40	8.089	33.342	25.959
50	4.183	32.900	26.097
75	3.716	33.315	26.474

STATION	US08275	
LATITUDE	42-10.3	N
LONGITUDE	140-47.5	E
DEPTH (m)	92	

Press.	Temp.	Salinity	Sigma-T
5	18.262	31.937	22.864
10	16.247	32.283	23.603
20	14.013	32.427	24.197
30	9.260	32.386	25.031
40	8.611	32.860	25.503
50	6.578	32.899	25.820
75	3.491	33.156	26.368

STATION	US08276	
LATITUDE	42-11.2	N
LONGITUDE	140-35.8	E
DEPTH (m)	81	

Press.	Temp.	Salinity	Sigma-T
5	18.577	32.160	22.957
10	17.020	32.209	23.368
20	16.047	32.390	23.730
30	10.932	32.517	24.854
40	7.648	32.699	25.518
50	5.919	32.889	25.895
75	2.687	32.919	26.251

STATION	US08277	
LATITUDE	42-16.2	N
LONGITUDE	140-36.2	E
DEPTH (m)	91	

Press.	Temp.	Salinity	Sigma-T
5	17.955	32.142	23.095
10	17.242	32.171	23.288
20	16.850	32.287	23.468
30	15.743	32.498	23.881
40	9.926	32.438	24.964
50	7.049	32.723	25.619
75	2.661	33.037	26.347

STATION	US08278	
LATITUDE	42-18.9	N
LONGITUDE	140-30.7	E
DEPTH (m)	93	

Press.	Temp.	Salinity	Sigma-T
5	17.561	32.217	23.247
10	17.346	32.226	23.305
20	16.588	32.267	23.513
30	15.997	32.492	23.820
40	9.447	32.485	25.079
50	7.281	32.858	25.694
75	3.178	33.063	26.323

STATION	US08279	
LATITUDE	42-28.8	N
LONGITUDE	140-31.1	E
DEPTH (m)	76	

Press.	Temp.	Salinity	Sigma-T
5	17.356	32.113	23.216
10	16.002	32.523	23.843
20	13.920	32.484	24.260
30	8.602	32.537	25.251
40	8.029	33.061	25.747
50	6.297	33.114	26.025

STATION	US08280	
LATITUDE	42-23.4	N
LONGITUDE	140-42.4	E
DEPTH (m)	63	

Press.	Temp.	Salinity	Sigma-T
5	18.189	32.081	22.992
10	16.752	32.244	23.458
20	16.067	32.453	23.775
30	9.475	32.262	24.900
40	8.194	32.572	25.339
50	6.910	32.974	25.835

STATION	US08281	
LATITUDE	42-30.0	N
LONGITUDE	141-29.9	E
DEPTH (m)	75	

Press.	Temp.	Salinity	Sigma-T
5	16.180	32.906	24.097
10	14.654	33.024	24.524
20	9.943	32.984	25.387
30	9.397	33.298	25.722
40	7.825	33.345	26.000
50	6.891	33.384	26.160

STATION	US08282	
LATITUDE	42-25.5	N
LONGITUDE	141-29.7	E
DEPTH (m)	116	

Press.	Temp.	Salinity	Sigma-T
5	15.182	33.045	24.425
10	10.525	32.950	25.263
20	8.560	33.213	25.787
30	7.506	33.306	26.015
40	9.676	34.003	26.228
50	9.619	34.024	26.254
75	9.209	34.001	26.303
100	6.825	33.759	26.465

STATION	US08283	
LATITUDE	42-25.2	N
LONGITUDE	141-25.3	E
DEPTH (m)	103	

Press.	Temp.	Salinity	Sigma-T
5	15.640	33.348	24.558
10	12.337	33.597	25.435
20	10.669	33.602	25.745
30	9.696	33.722	26.004
40	9.970	33.973	26.155
50	9.759	34.014	26.222
75	8.023	33.874	26.386

STATION	US08284	
LATITUDE	42-29.7	N
LONGITUDE	141-25.1	E
DEPTH (m)	77	

Press.	Temp.	Salinity	Sigma-T
5	15.660	32.843	24.165
10	13.489	33.020	24.762
20	10.050	32.975	25.362
30	8.357	33.171	25.785
40	7.952	33.320	25.962
50	7.777	33.525	26.148

STATION US08285
LATITUDE 42-27.9 N
LONGITUDE 141-24.7 E
DEPTH (m) 86

Press.	Temp.	Salinity	Sigma-T
5	15.980	33.033	24.240
10	14.032	33.146	24.748
20	12.153	33.486	25.384
30	10.264	33.665	25.865
40	9.490	33.779	26.083
50	8.610	33.765	26.212
75	6.602	33.696	26.445

STATION US08286
LATITUDE 42-29.0 N
LONGITUDE 141-20.3 E
DEPTH (m) 61

Press.	Temp.	Salinity	Sigma-T
5	17.295	32.821	23.773
10	15.571	33.015	24.317
20	11.258	33.035	25.200
30	9.764	33.267	25.638
40	8.166	33.300	25.914

STATION US08287
LATITUDE 42-25.3 N
LONGITUDE 141-20.2 E
DEPTH (m) 91

Press.	Temp.	Salinity	Sigma-T
5	16.236	32.935	24.106
10	14.684	33.207	24.657
20	10.120	33.147	25.485
30	9.695	33.669	25.964
40	8.559	33.662	26.139
50	8.657	33.825	26.252
75	7.023	33.770	26.447

STATION US08288
LATITUDE 42-27.6 N
LONGITUDE 141-20.0 E
DEPTH (m) 75

Press.	Temp.	Salinity	Sigma-T
5	16.843	32.868	23.915
10	14.857	33.023	24.479
20	10.905	33.182	25.377
30	10.898	33.685	25.770
40	8.226	33.480	26.047
50	7.387	33.596	26.260

STATION US08289
LATITUDE 41-55.0 N
LONGITUDE 141-15.8 E
DEPTH (m) 261

Press.	Temp.	Salinity	Sigma-T
5	15.910	33.141	24.338
10	12.774	33.100	24.965
20	8.765	33.078	25.650
30	8.173	33.365	25.965
40	7.760	33.416	26.065
50	7.522	33.426	26.107
75	8.207	33.976	26.439
100	7.578	33.897	26.469
125	7.029	33.866	26.521
150	5.797	33.728	26.573
175	5.362	33.715	26.614
200	5.173	33.696	26.622

STATION US08290
LATITUDE 42-00.2 N
LONGITUDE 141-05.2 E
DEPTH (m) 116

Press.	Temp.	Salinity	Sigma-T
5	17.813	32.657	23.524
10	15.659	32.949	24.247
20	12.376	33.167	25.095
30	11.366	33.657	25.664
40	8.190	33.295	25.907
50	8.169	33.500	26.071
75	6.385	33.591	26.390
100	6.247	33.756	26.538

STATION US08291
LATITUDE 42-04.9 N
LONGITUDE 141-14.8 E
DEPTH (m) 226

Press.	Temp.	Salinity	Sigma-T
5	17.862	32.868	23.673
10	14.172	33.505	24.996
20	11.077	33.689	25.741
30	10.076	33.789	25.993
40	8.716	33.723	26.162
50	8.101	33.763	26.287
75	7.124	33.814	26.468
100	6.045	33.727	26.541
125	5.926	33.778	26.596
150	4.761	33.635	26.619
175	4.408	33.599	26.629
200	4.319	33.595	26.635

STATION US08292
LATITUDE 42-10.0 N
LONGITUDE 141-05.2 E
DEPTH (m) 90

Press.	Temp.	Salinity	Sigma-T
5	17.892	32.112	23.088
10	15.203	32.712	24.165
20	11.884	33.224	25.231
30	8.197	32.951	25.636
40	8.021	33.183	25.844
50	8.025	33.274	25.915
75	6.622	33.568	26.342

STATION US08293
LATITUDE 42-15.2 N
LONGITUDE 141-14.1 E
DEPTH (m) 144

Press.	Temp.	Salinity	Sigma-T
5	16.940	32.900	23.917
10	14.129	33.287	24.837
20	10.632	33.447	25.631
30	10.752	33.916	25.975
40	9.359	33.828	26.143
50	9.699	34.021	26.238
75	7.862	33.876	26.412
100	6.910	33.821	26.502
125	5.870	33.745	26.577

STATION US08294
LATITUDE 42-20.0 N
LONGITUDE 141-06.8 E
DEPTH (m) 58

Press.	Temp.	Salinity	Sigma-T
5	18.168	32.548	23.354
10	15.499	32.818	24.181
20	11.574	32.905	25.041
30	8.048	33.263	25.903
40	7.065	33.392	26.143
50	5.999	33.527	26.389

STATION US08295
LATITUDE 42-24.2 N
LONGITUDE 141-14.8 E
DEPTH (m) 74

Press.	Temp.	Salinity	Sigma-T
5	16.321	32.755	23.948
10	15.435	33.019	24.350
20	11.699	33.099	25.168
30	8.501	33.073	25.686
40	9.473	33.587	25.936
50	7.280	33.543	26.233

STATION US08296
LATITUDE 41-59.2 N
LONGITUDE 141-01.0 E
DEPTH (m) 96

Press.	Temp.	Salinity	Sigma-T
5	17.469	32.446	23.445
10	16.891	32.435	23.572
20	12.920	33.025	24.879
30	12.029	33.221	25.202
40	8.653	33.273	25.820
50	7.622	33.382	26.058
75	6.384	33.711	26.485

STATION US08297
LATITUDE 41-58.4 N
LONGITUDE 141-00.0 E
DEPTH (m) 90

Press.	Temp.	Salinity	Sigma-T
5	17.780	32.468	23.387
10	17.260	32.398	23.457
20	15.189	33.120	24.482
30	11.462	33.137	25.242
40	8.386	33.255	25.846
50	7.555	33.388	26.072
75	5.873	33.670	26.517

STATION US08298
LATITUDE 41-58.0 N
LONGITUDE 140-59.2 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	17.615	32.394	23.370
10	17.530	32.466	23.446
20	15.310	33.043	24.396
30	13.075	33.331	25.086
40	8.979	33.081	25.619
50	7.907	33.382	26.017
75	5.583	33.687	26.566

STATION US08299
LATITUDE 41-57.5 N
LONGITUDE 140-58.4 E
DEPTH (m) 81

Press.	Temp.	Salinity	Sigma-T
5	17.904	32.218	23.166
10	17.208	32.390	23.463
20	15.408	33.063	24.390
30	12.924	33.190	25.006
40	9.721	33.037	25.465
50	8.030	33.336	25.962
75	5.497	33.709	26.594

STATION US08300
LATITUDE 42-01.6 N
LONGITUDE 140-55.3 E
DEPTH (m) 79

Press.	Temp.	Salinity	Sigma-T
5	18.363	32.098	22.963
10	17.606	32.204	23.227
20	14.905	32.456	24.031
30	13.497	33.281	24.962
40	9.720	33.047	25.473
50	8.281	33.307	25.903

STATION US08301
LATITUDE 42-05.0 N
LONGITUDE 140-55.1 E
DEPTH (m) 87

Press.	Temp.	Salinity	Sigma-T
5	18.287	32.098	22.981
10	16.537	32.323	23.568
20	15.118	32.980	24.389
30	13.354	33.302	25.007
40	8.879	33.003	25.573
50	8.168	33.353	25.956
75	5.669	33.700	26.567

STATION US08302
LATITUDE 42-10.1 N
LONGITUDE 140-55.4 E
DEPTH (m) 76

Press.	Temp.	Salinity	Sigma-T
5	17.423	32.131	23.214
10	15.123	32.543	24.052
20	11.206	33.024	25.200
30	8.473	33.010	25.641
40	8.179	33.330	25.936
50	6.731	33.224	26.056

STATION US08303
LATITUDE 42-15.2 N
LONGITUDE 140-55.0 E
DEPTH (m) 60

Press.	Temp.	Salinity	Sigma-T
5	18.272	32.038	22.939
10	15.141	32.373	23.917
20	9.520	32.632	25.182
30	8.924	33.143	25.676
40	7.693	33.337	26.013
50	6.527	33.382	26.207

STATION US08304
LATITUDE 43-14.7 N
LONGITUDE 141-10.1 E
DEPTH (m) 24

Press.	Temp.	Salinity	Sigma-T
5	20.017	33.347	23.497
10	18.850	33.937	24.247
20	16.384	34.044	24.924

STATION US08305
LATITUDE 43-15.7 N
LONGITUDE 141-14.8 E
DEPTH (m) 22

Press.	Temp.	Salinity	Sigma-T
5	20.005	33.441	23.571
10	19.457	33.554	23.799

STATION US08306
LATITUDE 43-17.2 N
LONGITUDE 141-19.9 E
DEPTH (m) 16

Press.	Temp.	Salinity	Sigma-T
5	19.351	33.316	23.646
10	18.294	33.863	24.329

STATION US08307
LATITUDE 43-19.9 N
LONGITUDE 141-20.0 E
DEPTH (m) 21

Press.	Temp.	Salinity	Sigma-T
5	19.709	33.585	23.758
10	19.332	33.599	23.866

STATION US08308
LATITUDE 43-20.0 N
LONGITUDE 141-15.3 E
DEPTH (m) 27

Press.	Temp.	Salinity	Sigma-T
5	19.905	33.296	23.488
10	19.470	33.455	23.721
20	17.658	33.950	24.551

STATION US08309
LATITUDE 43-20.0 N
LONGITUDE 141-10.2 E
DEPTH (m) 36

Press.	Temp.	Salinity	Sigma-T
5	19.910	0.389	946.230
10	19.324	0.155	481.690
20	17.940	0.186	238.180

STATION US08310
LATITUDE 43-20.0 N
LONGITUDE 141-00.2 E
DEPTH (m) 49

Press.	Temp.	Salinity	Sigma-T
5	20.877	0.321	190.530
10	17.958	0.147	210.450
20	13.476	0.209	162.200
30	12.045	0.378	80.208
40	10.820	0.598	37.023

STATION US08311
LATITUDE 43-30.0 N
LONGITUDE 141-00.0 E
DEPTH (m) 92

Press.	Temp.	Salinity	Sigma-T
5	20.628	0.192	156.150
10	18.774	0.143	146.920
20	14.905	0.392	117.580
30	12.502	0.390	79.736
40	11.261	0.534	36.528
50	9.879	0.290	16.176
75	8.265	0.247	3.883

STATION US08312
LATITUDE 43-30.0 N
LONGITUDE 141-10.1 E
DEPTH (m) 58

Press.	Temp.	Salinity	Sigma-T
5	20.449	32.959	23.088
10	20.060	33.145	23.332
20	16.060	33.991	24.958
30	12.947	34.031	25.652
40	10.887	34.077	26.077
50	9.218	34.114	26.389

STATION US08313
LATITUDE 43-30.0 N
LONGITUDE 141-14.6 E
DEPTH (m) 40

Press.	Temp.	Salinity	Sigma-T
5	20.565	32.902	23.014
10	20.151	33.002	23.199
20	17.007	33.991	24.738
30	12.632	33.987	25.680

STATION US08314
LATITUDE 43-30.0 N
LONGITUDE 141-18.9 E
DEPTH (m) 31

Press.	Temp.	Salinity	Sigma-T
5	20.681	33.523	23.456
10	20.278	33.533	23.570
20	16.171	33.984	24.927

STATION US08315
LATITUDE 43-39.9 N
LONGITUDE 141-15.0 E
DEPTH (m) 64

Press.	Temp.	Salinity	Sigma-T
5	19.599	33.784	23.939
10	18.735	33.847	24.207
20	16.267	33.992	24.911
30	12.271	33.985	25.749
40	10.482	34.087	26.156
50	9.617	34.150	26.353

STATION US08316
LATITUDE 43-40.0 N
LONGITUDE 141-10.1 E
DEPTH (m) 81

Press.	Temp.	Salinity	Sigma-T
5	20.381	33.629	23.616
10	19.566	33.837	23.988
20	18.300	33.962	24.404
30	16.162	34.050	24.980
40	12.630	34.007	25.696
50	9.995	34.096	26.247
75	8.628	34.172	26.528

STATION US08317
LATITUDE 43-40.1 N
LONGITUDE 141-01.1 E
DEPTH (m) 285

Press.	Temp.	Salinity	Sigma-T
5	20.252	33.717	23.717
10	20.097	33.709	23.752
20	19.415	33.774	23.979
30	18.888	33.916	24.221
40	16.674	34.032	24.848
50	13.418	34.119	25.626
75	10.093	34.239	26.342
100	7.983	34.158	26.615
125	6.353	34.113	26.807
150	4.892	34.088	26.965
175	3.995	34.076	27.051
200	3.291	34.093	27.135
250	2.092	34.077	27.225

STATION US08318
LATITUDE 43-49.9 N
LONGITUDE 141-09.8 E
DEPTH (m) 232

Press.	Temp.	Salinity	Sigma-T
5	20.348	33.506	23.531
10	19.850	33.667	23.785
20	18.821	33.859	24.195
30	15.658	34.008	25.062
40	13.187	34.084	25.646
50	11.479	34.153	26.029
75	9.395	34.203	26.430
100	8.276	34.190	26.596
125	6.363	34.118	26.809
150	4.810	34.079	26.966
175	3.696	34.087	27.090
200	3.115	34.080	27.141

STATION US08319
LATITUDE 43-50.0 N
LONGITUDE 141-19.8 E
DEPTH (m) 80

Press.	Temp.	Salinity	Sigma-T
5	20.621	33.520	23.470
10	19.119	33.830	24.097
20	16.992	33.990	24.741
30	15.051	34.078	25.250
40	12.944	34.067	25.681
50	10.486	34.066	26.139

STATION US08320
LATITUDE 44-56.4 N
LONGITUDE 141-39.1 E
DEPTH (m) 28

Press.	Temp.	Salinity	Sigma-T
5	19.770	33.590	23.747
10	19.731	33.664	23.813
20	15.886	33.965	24.977

STATION US08321
LATITUDE 45-27.4 N
LONGITUDE 142-50.0 E
DEPTH (m) 118

Press.	Temp.	Salinity	Sigma-T
5	15.318	31.805	23.441
10	10.964	31.948	24.405
20	8.237	32.154	25.005
30	3.971	32.250	25.602
40	2.342	32.584	26.010
50	0.703	32.651	26.174
75	−0.725	33.102	26.606
100	1.566	33.209	26.568

STATION US08322
LATITUDE 45-20.4 N
LONGITUDE 142-41.2 E
DEPTH (m) 97

Press.	Temp.	Salinity	Sigma-T
5	15.432	31.961	23.537
10	10.672	32.048	24.534
20	7.294	32.573	25.468
30	5.773	33.164	26.130
40	5.317	33.490	26.442
50	4.394	33.598	26.630
75	4.103	34.000	26.980

STATION US08323
LATITUDE 45-18.4 N
LONGITUDE 142-38.0 E
DEPTH (m) 87

Press.	Temp.	Salinity	Sigma-T
5	16.522	33.650	24.590
10	12.247	33.227	25.166
20	8.728	33.555	26.029
30	6.439	34.018	26.721
40	6.423	34.044	26.743
50	6.437	34.051	26.747
75	5.280	34.058	26.896

STATION US08324
LATITUDE 45-16.8 N
LONGITUDE 142-36.2 E
DEPTH (m) 78

Press.	Temp.	Salinity	Sigma-T
5	17.220	33.598	24.386
10	15.847	33.741	24.814
20	9.338	33.861	26.172
30	8.984	34.036	26.366
40	8.811	34.056	26.409
50	8.581	34.058	26.446

STATION US08325
LATITUDE 45-14.8 N
LONGITUDE 142-33.5 E
DEPTH (m) 64

Press.	Temp.	Salinity	Sigma-T
5	16.883	33.876	24.679
10	13.702	33.908	25.405
20	12.595	33.995	25.695
30	12.374	34.013	25.751
40	10.780	34.010	26.044
50	10.323	34.036	26.144

STATION US08326
LATITUDE 45-11.3 N
LONGITUDE 142-28.5 E
DEPTH (m) 43

Press.	Temp.	Salinity	Sigma-T
5	18.152	33.911	24.401
10	16.207	33.896	24.851
20	15.729	33.945	24.998
30	15.652	33.955	25.022

STATION US08327
LATITUDE 44-50.5 N
LONGITUDE 142-46.1 E
DEPTH (m) 49

Press.	Temp.	Salinity	Sigma-T
5	17.858	33.959	24.510
10	17.165	33.916	24.644
20	16.610	33.930	24.784
30	16.485	33.934	24.817
40	16.150	33.943	24.900

STATION US08328
LATITUDE 44-53.0 N
LONGITUDE 142-52.8 E
DEPTH (m) 87

Press.	Temp.	Salinity	Sigma-T
5	16.893	33.894	24.691
10	15.863	33.914	24.943
20	14.513	33.920	25.245
30	11.119	33.980	25.960
40	10.574	34.028	26.094
50	10.339	34.034	26.140
75	9.300	34.043	26.320

STATION US08329
LATITUDE 45-54.9 N
LONGITUDE 142-56.9 E
DEPTH (m) 114

Press.	Temp.	Salinity	Sigma-T
5	16.930	33.724	24.551
10	16.667	33.692	24.588
20	6.611	33.124	25.993
30	6.031	33.549	26.402
40	5.626	33.845	26.686
50	5.665	34.022	26.821
75	5.513	34.029	26.846
100	5.321	34.038	26.875

STATION US08330
LATITUDE 44-56.8 N
LONGITUDE 143-00.2 E
DEPTH (m) 127

Press.	Temp.	Salinity	Sigma-T
5	13.628	32.415	24.265
10	10.506	32.824	25.168
20	6.744	33.043	25.912
30	5.869	33.500	26.384
40	5.247	33.802	26.697
50	5.114	33.902	26.792
75	4.803	33.974	26.884
100	4.460	34.000	26.942

STATION US08331
LATITUDE 44-58.8 N
LONGITUDE 143-03.2 E
DEPTH (m) 130

Press.	Temp.	Salinity	Sigma-T
5	15.965	32.148	23.563
10	9.499	32.379	24.987
20	2.876	32.363	25.791
30	0.739	32.592	26.124
40	3.469	33.295	26.481
50	4.568	33.545	26.569
75	4.984	33.957	26.850
100	4.640	33.983	26.909

STATION US08332
LATITUDE 45-04.4 N
LONGITUDE 143-12.8 E
DEPTH (m) 138

Press.	Temp.	Salinity	Sigma-T
5	16.225	32.312	23.631
10	11.354	32.706	24.926
20	3.187	32.536	25.902
30	2.618	32.952	26.283
40	0.841	32.964	26.418
50	0.856	33.096	26.523
75	−0.052	33.183	26.642
100	1.010	33.340	26.710
125	2.975	33.563	26.740

STATION US08333
LATITUDE 44-57.7 N
LONGITUDE 144-09.8 E
DEPTH (m) 230

Press.	Temp.	Salinity	Sigma-T
5	13.781	32.396	24.220
10	9.732	32.315	24.899
20	2.962	32.539	25.924
30	1.513	32.725	26.184
40	0.512	32.868	26.359
50	−0.476	32.936	26.461
75	−0.638	33.097	26.598
100	−0.592	33.135	26.627
125	−0.012	33.218	26.668
150	0.352	33.269	26.691
175	−0.058	33.304	26.740
200	−0.081	33.305	26.742

STATION US08334
LATITUDE 44-49.3 N
LONGITUDE 144-00.1 E
DEPTH (m) 184

Press.	Temp.	Salinity	Sigma-T
5	13.317	32.659	24.517
10	10.934	32.636	24.946
20	3.235	32.808	26.115
30	1.590	32.940	26.351
40	0.942	33.038	26.471
50	0.290	33.089	26.549
75	0.193	33.191	26.636
100	0.320	33.258	26.683
125	0.495	33.292	26.702
150	1.053	33.341	26.708
175	2.928	33.603	26.776

STATION US08335
LATITUDE 44-44.4 N
LONGITUDE 143-54.1 E
DEPTH (m) 172

Press.	Temp.	Salinity	Sigma-T
5	12.833	32.704	24.648
10	11.151	32.696	24.953
20	2.368	32.835	26.209
30	1.144	33.012	26.438
40	1.382	33.196	26.570
50	1.718	33.247	26.588
75	0.271	33.209	26.647
100	0.469	33.243	26.664
125	0.320	33.304	26.721
150	2.497	33.456	26.695

STATION US08336
LATITUDE 44-393 N
LONGITUDE 143-47.2 E
DEPTH (m) 159

Press.	Temp.	Salinity	Sigma-T
5	15.285	32.622	24.077
10	8.144	32.590	25.359
20	1.883	32.594	26.053
30	1.206	32.883	26.331
40	1.108	33.059	26.478
50	0.873	33.190	26.598
75	1.100	33.298	26.670
100	0.771	33.332	26.718
125	2.223	33.540	26.785
150	2.937	33.844	26.968

STATION US08337
LATITUDE 44-34.9 N
LONGITUDE 143-41.5 E
DEPTH (m) 148

Press.	Temp.	Salinity	Sigma-T
5	14.943	32.484	24.045
10	14.429	32.433	24.115
20	4.137	32.683	25.929
30	1.311	32.947	26.375
40	0.483	33.082	26.533
50	0.294	33.162	26.608
75	0.194	33.244	26.679
100	2.482	33.540	26.764
125	4.045	33.726	26.768

STATION US08338
LATITUDE 44-31.9 N
LONGITUDE 143-37.8 E
DEPTH (m) 131

Press.	Temp.	Salinity	Sigma-T
5	14.834	32.433	24.029
10	7.905	32.254	25.131
20	3.982	32.951	26.158
30	4.596	33.480	26.515
40	6.316	33.886	26.632
50	5.810	33.819	26.643
75	4.533	33.693	26.691
100	5.011	33.795	26.719
125	4.985	33.802	26.727

STATION US08339
LATITUDE 44-29.0 N
LONGITUDE 143-34.0 E
DEPTH (m) 95

Press.	Temp.	Salinity	Sigma-T
5	16.220	33.194	24.309
10	14.052	33.555	25.056
20	9.388	33.757	26.083
30	9.485	33.877	26.160
40	8.990	33.911	26.267
50	8.502	33.916	26.347
75	6.818	33.839	26.529

STATION US08340
LATITUDE 44-24.4 N
LONGITUDE 143-28.3 E
DEPTH (m) 56

Press.	Temp.	Salinity	Sigma-T
5	17.673	33.920	24.524
10	17.081	33.908	24.657
20	15.007	33.943	25.156
30	13.215	33.915	25.509
40	12.790	33.927	25.603
50	12.699	33.930	25.624

STATION US08341
LATITUDE 44-10.0 N
LONGITUDE 143-58.9 E
DEPTH (m) 37

Press.	Temp.	Salinity	Sigma-T
5	16.074	33.823	24.825
10	14.970	33.685	24.965
20	14.476	33.857	25.204
30	14.445	33.863	25.215

STATION US08342
LATITUDE 44-10.2 N
LONGITUDE 144-19.3 E
DEPTH (m) 110

Press.	Temp.	Salinity	Sigma-T
5	15.839	33.795	24.857
10	14.707	33.958	25.232
20	13.586	33.865	25.396
30	11.526	33.846	25.781
40	10.080	33.783	25.988
50	9.172	33.776	26.133
75	7.569	33.686	26.304
100	6.830	33.715	26.429

STATION US08343
LATITUDE 44-14.0 N
LONGITUDE 144-24.5 E
DEPTH (m) 321

Press.	Temp.	Salinity	Sigma-T
5	14.843	32.747	24.269
10	10.870	33.302	25.474
20	3.769	32.530	25.844
30	5.488	33.271	26.248
40	5.963	33.588	26.442
50	6.518	33.808	26.544
75	4.781	33.568	26.564
100	5.202	33.769	26.676
125	3.496	33.572	26.700
150	1.520	33.528	26.827
175	3.842	33.601	26.690
200	3.169	33.609	26.759
250	3.966	33.772	26.813
300	3.345	33.734	26.843

STATION US08344
LATITUDE 44-18.5 N
LONGITUDE 144-29.5 E
DEPTH (m) 923

Press.	Temp.	Salinity	Sigma-T
5	14.211	32.749	24.404
10	13.066	32.759	24.643
20	4.316	32.963	26.134
30	2.222	33.217	26.526
40	1.567	33.259	26.608
50	0.410	33.189	26.623
75	0.924	33.273	26.661
100	0.538	33.332	26.732
125	0.576	33.329	26.727
150	0.608	33.345	26.738
175	0.624	33.360	26.749
200	0.987	33.422	26.777
250	1.364	33.503	26.818
300	1.222	33.515	26.837
400	1.570	33.620	26.898
500	1.775	33.704	26.950
600	1.905	33.778	27.000
700	2.043	33.939	27.118
800	2.171	34.063	27.208
900	2.244	34.147	27.269

STATION US08345
LATITUDE 44-21.3 N
LONGITUDE 144-33.0 E
DEPTH (m) 1131

Press.	Temp.	Salinity	Sigma-T
5	14.515	32.869	24.433
10	9.095	32.991	25.530
20	5.568	33.378	26.324
30	5.034	33.489	26.473
40	4.150	33.450	26.538
50	2.474	33.319	26.588
75	2.441	33.424	26.674
100	2.233	33.440	26.704
125	2.055	33.448	26.724
150	0.807	33.340	26.723
175	1.241	33.420	26.759
200	0.850	33.405	26.772
250	2.326	33.594	26.820
300	2.253	33.597	26.828
400	1.718	33.641	26.904
500	2.115	33.761	26.970
600	1.960	33.839	27.044
700	2.093	33.983	27.150
800	2.217	34.081	27.218
900	2.303	34.173	27.285
1000	2.321	34.254	27.348

STATION US08346
LATITUDE 44-28.8 N
LONGITUDE 144-42.0 E
DEPTH (m) 1473

Press.	Temp.	Salinity	Sigma-T
5	12.956	32.969	24.829
10	11.044	33.235	25.394
20	2.972	32.945	26.247
30	1.972	33.113	26.462
40	1.181	33.139	26.538
50	0.420	33.123	26.570
75	0.593	33.226	26.643
100	2.906	33.511	26.705
125	2.219	33.449	26.712
150	2.000	33.443	26.724
175	1.368	33.401	26.736
200	0.925	33.389	26.755
250	0.745	33.417	26.788
300	1.161	33.503	26.832
400	1.392	33.605	26.898
500	1.576	33.712	26.971
600	1.863	33.847	27.058
700	2.099	33.985	27.151
800	2.229	34.090	27.224
900	2.296	34.174	27.286
1000	2.334	34.259	27.351
1200	2.259	34.401	27.471

STATION US08347
LATITUDE 44-17.3 N
LONGITUDE 145-03.1 E
DEPTH (m) 802

Press.	Temp.	Salinity	Sigma-T
5	13.738	32.991	24.688
10	12.155	33.321	25.255
20	11.548	33.768	25.717
30	7.475	33.211	25.944
40	9.034	33.800	26.173
50	7.264	33.571	26.257
75	2.098	33.281	26.587
100	2.850	33.424	26.640
125	1.805	33.531	26.809
150	0.849	33.348	26.726
175	1.342	33.430	26.761
200	2.045	33.481	26.751
250	2.070	33.541	26.797
300	2.230	33.598	26.831

STATION US08348
LATITUDE 44-15.7 N
LONGITUDE 145-06.5 E
DEPTH (m) 755

Press.	Temp.	Salinity	Sigma-T
5	13.794	33.517	25.084
10	13.466	33.781	25.355
20	13.293	33.932	25.507
30	13.177	33.924	25.524
40	12.777	33.929	25.608
50	12.500	33.932	25.664
75	10.345	33.859	26.002
100	3.965	33.409	26.524
125	3.159	33.472	26.651
150	3.597	33.570	26.688
175	2.904	33.519	26.712
200	2.096	33.458	26.729
250	2.069	33.516	26.777
300	2.133	33.574	26.819

STATION US08349
LATITUDE 44-14.6 N
LONGITUDE 145-09.2 E
DEPTH (m) 406

Press.	Temp.	Salinity	Sigma-T
5	16.160	33.625	24.653
10	15.401	33.534	24.754
20	14.204	33.845	25.252
30	14.120	33.866	25.286
40	13.831	33.888	25.363
50	12.996	33.916	25.554
75	12.284	33.926	25.701
100	9.336	33.661	26.016
125	6.223	33.664	26.469
150	4.847	33.611	26.592
175	2.685	33.425	26.655
200	2.759	33.485	26.697
250	2.338	33.518	26.758
300	2.101	33.553	26.804

STATION US08350
LATITUDE 44-20.8 N
LONGITUDE 145-12.3 E
DEPTH (m) 985

Press.	Temp.	Salinity	Sigma-T
5	14.001	33.854	25.301
10	13.965	33.857	25.311
20	13.698	33.897	25.398
30	13.321	33.939	25.507
40	12.678	33.911	25.613
50	11.396	33.737	25.721
75	10.000	33.852	26.056
100	4.082	33.498	26.583
125	4.125	33.615	26.672
150	3.430	33.548	26.687
175	3.032	33.541	26.718
200	3.535	33.622	26.736
250	1.781	33.488	26.777
300	2.225	33.598	26.831

STATION US08351
LATITUDE 44-27.5 N
LONGITUDE 145-14.1 E
DEPTH (m) 1773

Press.	Temp.	Salinity	Sigma-T
5	14.188	32.836	24.476
10	10.982	32.763	25.037
20	5.712	33.003	26.010
30	6.804	33.598	26.341
40	7.382	33.792	26.414
50	6.644	33.730	26.466
75	2.713	33.336	26.582
100	2.139	33.296	26.596
125	0.785	33.316	26.704
150	1.886	33.397	26.696
175	1.964	33.485	26.760
200	2.324	33.508	26.751
250	2.760	33.626	26.809
300	2.035	33.578	26.829

STATION US08352
LATITUDE 44-24.3 N
LONGITUDE 145-21.0 E
DEPTH (m) 436

Press.	Temp.	Salinity	Sigma-T
5	13.871	33.857	25.331
10	13.822	33.853	25.338
20	13.512	33.891	25.431
30	13.119	33.882	25.503
40	12.618	33.861	25.586
50	11.684	33.853	25.758
75	10.765	33.858	25.928
100	7.491	33.726	26.347
125	4.737	33.529	26.538
150	3.215	33.484	26.655
175	2.684	33.460	26.683
200	2.172	33.477	26.739
250	2.097	33.562	26.812
300	2.339	33.613	26.834

STATION US08353
LATITUDE 44-20.9 N
LONGITUDE 145-27.7 E
DEPTH (m) 1672

Press.	Temp.	Salinity	Sigma-T
5	13.252	33.560	25.228
10	13.252	33.567	25.233
20	13.354	33.623	25.255
30	12.234	33.725	25.554
40	11.813	33.757	25.659
50	10.804	33.726	25.819
75	9.250	33.695	26.056
100	7.109	33.609	26.308
125	5.503	33.563	26.477
150	3.934	33.494	26.595
175	2.189	33.367	26.649
200	1.735	33.387	26.699
250	1.511	33.435	26.753
300	1.634	33.493	26.792

STATION US08354
LATITUDE 44-18.4 N
LONGITUDE 145-33.3 E
DEPTH (m) 2388

Press.	Temp.	Salinity	Sigma-T
5	13.753	33.217	24.860
10	13.767	33.434	25.025
20	13.868	33.514	25.066
30	14.179	33.634	25.094
40	12.321	33.651	25.481
50	11.124	33.693	25.736
75	9.183	33.701	26.072
100	7.354	33.626	26.288
125	5.302	33.513	26.461
150	4.911	33.566	26.549
175	3.173	33.419	26.607
200	2.477	33.383	26.638
250	1.547	33.417	26.736
300	1.413	33.490	26.805

STATION US08355
LATITUDE 44-13.5 N
LONGITUDE 145-27.5 E
DEPTH (m) 1818

Press.	Temp.	Salinity	Sigma-T
5	14.037	33.352	24.906
10	14.036	33.406	24.948
20	12.716	33.496	25.284
30	11.681	33.725	25.659
40	11.587	33.735	25.684
50	11.264	33.742	25.748
75	9.639	33.604	25.922
100	7.403	33.576	26.242
125	6.143	33.545	26.385
150	2.881	33.365	26.590
175	1.738	33.353	26.671
200	1.395	33.369	26.709
250	1.093	33.423	26.771
300	1.130	33.478	26.814
400	1.477	33.603	26.891
500	1.566	33.688	26.952
600	1.772	33.802	27.029
700	2.106	34.000	27.162
800	2.235	34.124	27.251
900	2.293	34.211	27.316
1000	2.293	34.282	27.373

STATION US08356
LATITUDE 44-08.6 N
LONGITUDE 145-20.2 E
DEPTH (m) 510

Press.	Temp.	Salinity	Sigma-T
5	14.047	33.307	24.869
10	14.162	33.559	25.040
20	11.921	33.567	25.491
30	11.480	33.637	25.627
40	10.917	33.656	25.744
50	10.414	33.645	25.824
75	8.875	33.669	26.095
100	6.273	33.519	26.348
125	3.131	33.354	26.559
150	1.644	33.347	26.674
175	1.440	33.371	26.707
200	0.885	33.332	26.711
250	1.127	33.434	26.778
300	1.169	33.475	26.808

STATION US08357
LATITUDE 44-07.1 N
LONGITUDE 145-22.4 E
DEPTH (m) 985

Press.	Temp.	Salinity	Sigma-T
5	14.466	33.193	24.693
10	13.730	33.419	25.021
20	11.783	33.582	25.528
30	10.608	33.663	25.804
40	9.932	33.649	25.909
50	9.562	33.622	25.949
75	8.645	33.649	26.116
100	6.104	33.536	26.383
125	4.246	33.430	26.513
150	2.354	33.327	26.604
175	1.489	33.299	26.646
200	0.865	33.322	26.704
250	1.306	33.413	26.750
300	0.944	33.440	26.795

STATION US08358
LATITUDE 44-05.8 N
LONGITUDE 145-24.9 E
DEPTH (m) 1008

Press.	Temp.	Salinity	Sigma-T
5	14.257	33.331	24.844
10	13.958	33.391	24.952
20	12.422	33.527	25.364
30	10.997	33.606	25.690
40	9.913	33.650	25.913
50	9.412	33.652	25.996
75	8.199	33.663	26.194
100	6.246	33.549	26.375
125	4.777	33.474	26.490
150	3.048	33.362	26.573
175	1.838	33.308	26.628
200	1.210	33.304	26.669
250	0.960	33.360	26.729
300	1.044	33.438	26.786

STATION US08359
LATITUDE 44-02.0 N
LONGITUDE 145-17.9 E
DEPTH (m) 424

Press.	Temp.	Salinity	Sigma-T
5	14.247	32.962	24.561
10	13.854	33.116	24.762
20	11.926	33.244	25.239
30	11.004	33.509	25.614
40	10.420	33.550	25.749
50	9.611	33.559	25.892
75	8.525	33.594	26.091
100	6.143	33.533	26.376
125	4.338	33.455	26.523
150	2.691	33.336	26.583
175	2.118	33.355	26.645
200	2.396	33.433	26.685
250	0.814	33.374	26.749
300	0.950	33.441	26.795

STATION US08360
LATITUDE 43-55.4 N
LONGITUDE 145-15.5 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	14.653	32.807	24.356
10	14.769	32.887	24.393
20	13.856	33.270	24.880
30	11.974	33.385	25.340
40	11.002	33.425	25.549
50	10.244	33.547	25.776

STATION US08361
LATITUDE 43-56.4 N
LONGITUDE 145-12.6 E
DEPTH (m) 83

Press.	Temp.	Salinity	Sigma-T
5	14.656	32.790	24.342
10	14.699	32.980	24.480
20	13.191	33.164	24.933
30	11.075	33.288	25.429
40	10.494	33.515	25.708
50	9.946	33.542	25.822

STATION US08362
LATITUDE 43-57.4 N
LONGITUDE 145-10.5 E
DEPTH (m) 82

Press.	Temp.	Salinity	Sigma-T
5	14.980	32.811	24.289
10	14.076	33.024	24.644
20	11.750	33.228	25.259
30	10.563	33.555	25.728
40	9.909	33.560	25.843
50	9.483	33.604	25.947
75	7.663	33.553	26.186

STATION US08363
LATITUDE 43-49.8 N
LONGITUDE 145-10.8 E
DEPTH (m) 42

Press.	Temp.	Salinity	Sigma-T
5	15.391	32.784	24.179
10	13.088	33.016	24.839
20	11.532	33.377	25.415
30	10.340	33.507	25.729

STATION US08364
LATITUDE 43-36.3 N
LONGITUDE 145-25.9 E
DEPTH (m) 23

Press.	Temp.	Salinity	Sigma-T
5	13.143	32.637	24.535
10	11.890	32.623	24.764

STATION US08365
LATITUDE 43-33.7 N
LONGITUDE 145-23.6 E
DEPTH (m) 12

Press.	Temp.	Salinity	Sigma-T
5	13.944	32.578	24.327

STATION US08366
LATITUDE 43-29.9 N
LONGITUDE 145-30.0 E
DEPTH (m) 24

Press.	Temp.	Salinity	Sigma-T
5	13.980	32.346	24.141
10	12.559	32.580	24.604

STATION US08367
LATITUDE 43-30.3 N
LONGITUDE 145-34.3 E
DEPTH (m) 29

Press.	Temp.	Salinity	Sigma-T
5	14.342	32.532	24.209
10	11.490	32.771	24.952
20	9.905	32.739	25.202

STATION US08368
LATITUDE 43-26.9 N
LONGITUDE 145-39.9 E
DEPTH (m) 31

Press.	Temp.	Salinity	Sigma-T
5	14.505	32.467	24.125
10	10.927	32.544	24.876
20	9.510	32.857	25.359

STATION US08369
LATITUDE 43-24.7 N
LONGITUDE 145-36.0 E
DEPTH (m) 26

Press.	Temp.	Salinity	Sigma-T
5	15.098	32.282	23.857
10	12.534	32.574	24.605
20	8.739	32.695	25.354

STATION US08370
LATITUDE 43-22.4 N
LONGITUDE 145-32.0 E
DEPTH (m) 18

Press.	Temp.	Salinity	Sigma-T
5	15.962	32.142	23.559
10	12.557	32.838	24.804

STATION US08371
LATITUDE 43-27.5 N
LONGITUDE 145-26.0 E
DEPTH (m) 20

Press.	Temp.	Salinity	Sigma-T
5	13.988	32.588	24.326
10	12.619	32.579	24.592

STATION US08372
LATITUDE 43-31.2 N
LONGITUDE 145-20.0 E
DEPTH (m) 7

Press.	Temp.	Salinity	Sigma-T
5	14.334	32.411	24.117

STATION US08373
LATITUDE 43-30.3 N
LONGITUDE 145-17.9 E
DEPTH (m) 7

Press.	Temp.	Salinity	Sigma-T
5	14.631	32.382	24.033

STATION US08374
LATITUDE 43-25.4 N
LONGITUDE 145-21.6 E
DEPTH (m) 11

Press.	Temp.	Salinity	Sigma-T
5	14.310	32.356	24.080

STATION US08375
LATITUDE 43-24.3 N
LONGITUDE 145-20.1 E
DEPTH (m) 9

Press.	Temp.	Salinity	Sigma-T
5	13.929	32.427	24.214

STATION US08376
LATITUDE 43-19.5 N
LONGITUDE 145-25.6 E
DEPTH (m) 12

Press.	Temp.	Salinity	Sigma-T
5	15.894	31.772	23.290

STATION US08377
LATITUDE 43-20.4 N
LONGITUDE 145-27.5 E
DEPTH (m) 15

Press.	Temp.	Salinity	Sigma-T
5	16.426	31.814	23.202
10	11.943	32.367	24.559

STATION US08378
LATITUDE 41-58.9 N
LONGITUDE 141-00.9 E
DEPTH (m) 96

Press.	Temp.	Salinity	Sigma-T
5	21.345	32.004	22.122
10	18.149	32.926	23.647
20	11.719	33.624	25.573
30	10.654	33.760	25.871
40	9.317	33.780	26.112
50	8.600	33.772	26.219
75	8.486	33.834	26.285

STATION US08379
LATITUDE 41-58.4 N
LONGITUDE 140-59.9 E
DEPTH (m) 89

Press.	Temp.	Salinity	Sigma-T
5	20.936	32.017	22.242
10	19.821	32.619	22.993
20	14.174	33.426	24.935
30	11.114	33.824	25.839
40	9.664	33.851	26.111
50	9.495	33.946	26.213
75	8.365	33.828	26.299

STATION US08380
LATITUDE 41-57.9 N
LONGITUDE 140-59.0 E
DEPTH (m) 84

Press.	Temp.	Salinity	Sigma-T
5	21.082	31.989	22.182
10	20.545	32.317	22.574
20	15.427	33.372	24.624
30	10.797	33.662	25.769
40	10.302	33.900	26.042
50	9.385	33.915	26.207
75	8.101	33.791	26.309

STATION US08381
LATITUDE 41-57.4 N
LONGITUDE 140-58.2 E
DEPTH (m) 79

Press.	Temp.	Salinity	Sigma-T
5	20.970	32.054	22.261
10	20.514	32.141	22.448
20	14.203	32.995	24.596
30	10.856	33.470	25.610
40	10.094	33.771	25.976
50	8.671	33.662	26.122
75	6.004	33.485	26.355

STATION US08382
LATITUDE 42-23.3 N
LONGITUDE 140-43.0 E
DEPTH (m) 59

Press.	Temp.	Salinity	Sigma-T
5	20.781	31.921	22.210
10	20.859	32.044	22.283
20	19.030	32.124	22.817
30	13.829	32.813	24.533
40	8.932	33.246	25.755
50	7.794	33.359	26.015

STATION US08383
LATITUDE 42-28.9 N
LONGITUDE 140-31.4 E
DEPTH (m) 75

Press.	Temp.	Salinity	Sigma-T
5	20.934	31.996	22.227
10	20.987	32.076	22.273
20	17.459	32.894	23.790
30	9.057	32.528	25.174
40	7.928	33.072	25.770
50	7.514	33.374	26.067

STATION US08384
LATITUDE 42-19.1 N
LONGITUDE 140-30.6 E
DEPTH (m) 92

Press.	Temp.	Salinity	Sigma-T
5	20.857	31.960	22.220
10	20.863	31.976	22.230
20	17.651	32.283	23.276
30	13.455	33.114	24.840
40	8.780	32.958	25.554
50	6.436	33.058	25.963
75	3.667	33.339	26.497

STATION US08385
LATITUDE 42-16.2 N
LONGITUDE 140-35.5 E
DEPTH (m) 90

Press.	Temp.	Salinity	Sigma-T
5	20.778	31.964	22.244
10	20.793	31.970	22.244
20	17.667	32.316	23.298
30	14.211	32.982	24.584
40	8.388	32.641	25.364
50	6.052	32.951	25.927
75	6.382	33.674	26.456

STATION US08386
LATITUDE 42-11.6 N
LONGITUDE 140-35.8 E
DEPTH (m) 83

Press.	Temp.	Salinity	Sigma-T
5	20.729	31.995	22.280
10	20.259	32.012	22.417
20	13.543	32.619	24.440
30	11.779	33.283	25.297
40	7.653	32.976	25.735
50	5.778	32.992	25.993
75	4.326	33.287	26.390

STATION US08387
LATITUDE 42-22.7 N
LONGITUDE 140-25.5 E
DEPTH (m) 73

Press.	Temp.	Salinity	Sigma-T
5	20.409	31.983	22.356
10	19.482	32.089	22.676
20	15.310	32.561	24.025
30	9.057	32.583	25.217
40	7.786	32.978	25.717
50	7.241	33.261	26.016

STATION US08388
LATITUDE 42-22.7 N
LONGITUDE 140-30.0 E
DEPTH (m) 95

Press.	Temp.	Salinity	Sigma-T
5	20.823	31.899	22.182
10	20.824	31.924	22.201
20	18.336	32.372	23.178
30	14.924	33.108	24.530
40	8.680	32.930	25.547
50	7.597	33.279	25.981
75	4.152	33.397	26.496

STATION US08389
LATITUDE 42-25.8 N
LONGITUDE 140-37.0 E
DEPTH (m) 84

Press.	Temp.	Salinity	Sigma-T
5	20.589	31.933	22.270
10	20.578	31.932	22.272
20	19.800	32.252	22.719
30	15.786	32.825	24.123
40	9.373	32.922	25.432
50	8.048	33.219	25.868
75	5.263	33.351	26.338

STATION US08390
LATITUDE 42-21.1 N
LONGITUDE 140-38.7 E
DEPTH (m) 80

Press.	Temp.	Salinity	Sigma-T
5	20.598	31.994	22.314
10	20.571	32.004	22.329
20	20.521	32.030	22.362
30	15.421	32.700	24.108
40	8.837	32.908	25.506
50	8.411	33.467	26.009
75	5.427	33.465	26.409

STATION US08391
LATITUDE 42-18.0 N
LONGITUDE 140-40.4 E
DEPTH (m) 77

Press.	Temp.	Salinity	Sigma-T
5	20.621	31.923	22.254
10	20.513	31.964	22.314
20	20.239	32.113	22.499
30	13.947	32.728	24.443
40	8.804	33.023	25.601
50	6.341	33.153	26.051
75	6.122	33.553	26.394

6

THE “USHIO MARU”

CRUISE 154
CRUISE 155
CRUISE 156

IN AUGUST-OCTOBER 2008

1. Cruise Itinerary

Cruise 154

Departure from Hakodate	Aug.	31	, 2008
Start hydrographic research (US08392) and larvae net sampling	Sep.	1	
Arrival at Rausu		1	
Departure from Rausu		3	
Set profiling float		4	
Research by R.O.V.		6	
Arrival at Rausu		7	
Departure from Rausu		8	
Arrival at Kushiro		9	
Departure from Kushiro		10	
Finish hydrographic research (US08449) and larvae net sampling		13	
Return to Hakodate		15	

Total coverage 1497.1 miles

Cruise 155

Departure from Hakodate	Sep.	18	, 2008
Start hydrographic research (US08450)		18	
Start Tuna Long-line research		19	
Finish Tuna Long-line research		20	
Arrival at Hakodate		21	
Departure from Hakodate		22	
Arrival at Muroran		22	
Departure from Muroran		23	
Finish hydrographic research (US08463)		23	
Arrival at Muroran		23	
Departure from Muroran		24	
Return to Hakodate		25	

Total coverage 489.0 miles

Cruise 156

Departure from Hakodate	Oct.	27	, 2008
Start hydrographic research (US08464)		27	
Arrival at Muroran		27	
Departure from Muroran		28	
Retrieval Sediment trap system		28	
Arrival at Muroran		29	
Departure from Muroran		30	
Finish hydrographic research (US08477)		30	
Set mooring ADCP system		30	
Arrival at and departure from Mori		30	
Return to Hakodate		31	

Total coverage 273.2 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 154

Research Staff :	Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Seiichi Saitoh
	Assistant Professor	(Field Science Center for Northern Biosphere)	Jun Yamamoto
	Research Associate	(Field Science Center for Northern Biosphere)	Toshihiro Iwamori
Guest Scientist (Domestic) :	Professor	(Tokyo University of Agriculture)	Akihiro Shiomoto

Graduate Students :	Chair of Marine Bioresource and Environment Sensing :	3 persons
	Graduate School of the Fisheries Sciences :	1 person
	Graduate School of Environmental Science :	2 persons
Under Graduate Students :	Department of Fisheries Oceanography and Marine Science :	3 persons
	Department of Marine Production System Science :	1 person
	Department of Marine Biology :	1 person

Cruise 155

Research Staff :	Associate Professor	(Laboratory of Marine Environmental Science)	Isao Kudo
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Susumu Shimizu
	Research Associate	(Laboratory of Marine Environmental Science)	Kenji Toya

Graduate Students :	Chair of Marine Bioresource and Environment Sensing :	4 persons
	Chair of Marine Environmental Science :	4 persons
Under Graduate Students :	Department of Fisheries Oceanography and Marine Science :	6 persons
	Department of Applied Marine Science (Third grade) :	5 persons

Cruise 156

Research Staff :	Associate Professor	(Laboratory of Marine Environmental Science)	Isao Kudo

Graduate Students :	Chair of Marine Environmental Science :	1 person
	Graduate School of Environmental Science :	5 persons
Under Graduate Students :	Department of Fisheries Oceanography and Marine Science :	8 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 154)

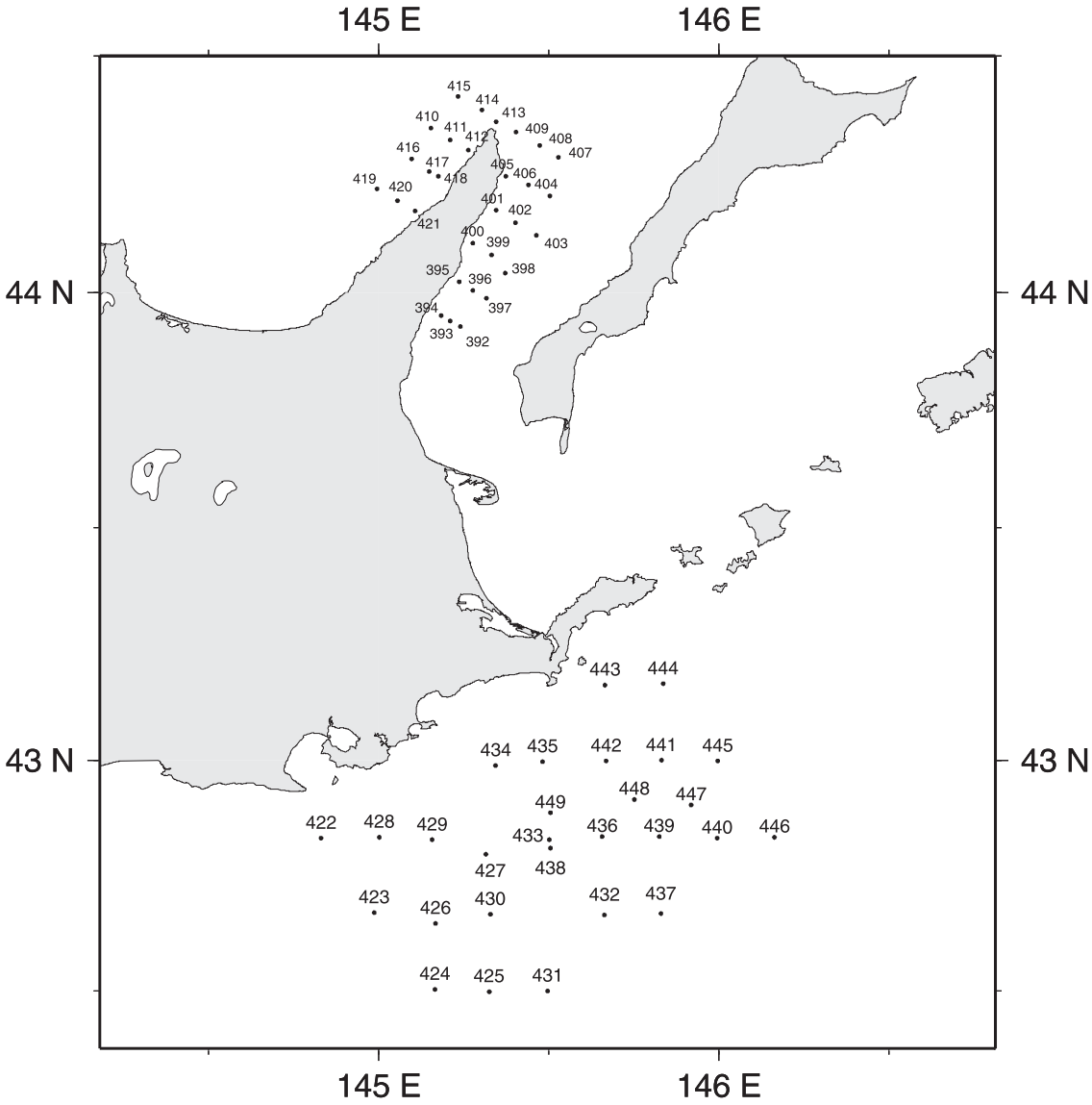

Figure 2: Oceanographic stations (Cruise 155)

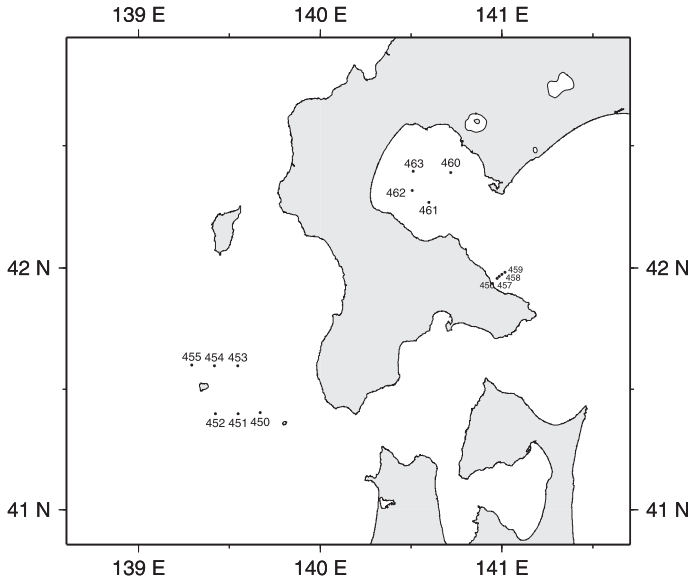

Figure 3: Oceanographic stations (Cruise 156)

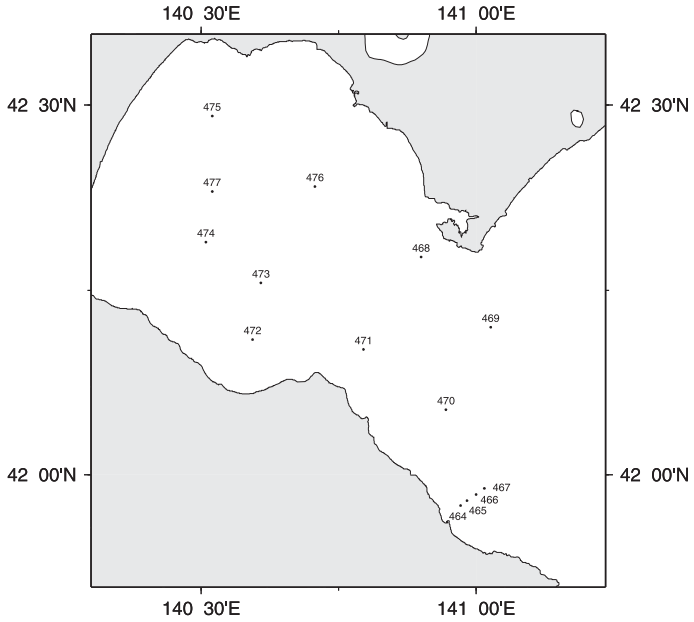

Table 1: List of oceanographic stations

Cruise 154

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08392	43-55.7	145-14.4	9/1	1511-1515	81	NE -1	NE -1	NE -2	17.6	16.6	r	1012.5
US08393	43-56.4	145-12.6	9/1	1535-1538	84	NE -1	NE -1	NE -2	17.7	17.3	r	1012.6
US08394	43-57.1	145-11.0	9/1	1549-1553	82	North-1	NE -1	North-3	18.1	17.6	r	1012.5
US08395	44-01.4	145-14.2	9/3	0713-0726	336	South-1	East-1	South-2	18.4	17.5	f	1009.3
US08396	44-00.3	145-16.6	9/3	0755-0809	382	SSW-1	East-1	SSW-2	18.2	17.1	f	1009.2
US08397	43-59.3	145-19.0	9/3	0821-0830	272	South-1	East-1	South-3	18.4	17.4	f	1009.1
US08398	44-02.5	145-22.3	9/3	0911-0932	910	Calm	East-1	Calm	18.9	17.0	f	1009.0
US08399	44-04.8	145-19.9	9/3	0955-1017	716	South-1	East-1	South-2	18.9	17.1	f	1008.6
US08400	44-06.3	145-16.6	9/3	1050-1102	376	South-2	East-1	South-4	18.7	16.9	c	1007.6
US08401	44-10.5	145-20.7	9/3	1134-1138	136	Calm	East-1	Calm	18.6	16.4	f	1006.8
US08402	44-08.9	145-24.1	9/3	1208-1255	1473	South-2	East-1	South-4	18.4	16.9	r	1006.6
US08403	44-07.3	145-27.8	9/3	1402-1440	1200	South-2	East-1	South-4	18.7	17.5	o	1006.0
US08404	44-12.3	145-30.2	9/3	1523-1638	2075	South-2	East-1	South-4	19.1	17.3	f	1004.6
US08405	44-14.8	145-22.4	9/4	0641-0652	327	NNE-1	South-1	NNE-3	23.3	16.8	bc	1009.7
US08406	44-13.7	145-26.4	9/4	0715-0802	1566	NW -2	NW -1	NW -3	22.6	17.3	bc	1010.5
US08407	44-17.2	145-31.7	9/4	0910-1010	2077	NW -3	NW -1	NW -6	20.4	16.8	bc	1011.4
US08408	44-18.7	145-28.4	9/4	1025-1105	1516	WNW-2	NW -1	WNW-4	21.3	16.7	bc	1012.7
US08409	44-20.4	145-24.2	9/4	1140-1209	849	WNW-3	NW -1	WNW-5	21.4	16.6	bc	1013.5
US08410	44-20.9	145-09.2	9/5	0755-0827	1233	Calm	West-1	Calm	20.4	17.4	bc	1018.8
US08411	44-19.4	145-12.6	9/5	0900-0924	734	Calm	West-1	Calm	21.7	18.5	bc	1019.0
US08412	44-18.1	145-15.8	9/5	0942-0946	139	Calm	West-1	Calm	20.5	17.8	bc	1018.9
US08413	44-21.7	145-20.7	9/5	1026-1030	85	SSE-2	SE -1	SSE-4	17.3	17.0	f	1019.1
US08414	44-23.2	145-18.2	9/5	1047-1107	711	SE -2	SE -1	SE -4	19.0	18.6	f	1019.1
US08415	44-24.9	145-14.0	9/5	1146-1234	1419	East-2	SE -1	East-4	19.3	17.5	bc	1019.1
US08416	44-17.0	145-05.8	9/5	1350-1418	855	Calm	NE -1	Calm	22.5	19.3	bc	1018.7
US08417	44-15.4	145-08.9	9/5	1449-1505	575	Calm	NE -1	Calm	22.5	20.2	bc	1018.7
US08418	44-14.8	145-10.5	9/5	1516-1526	327	Calm	NE -1	Calm	22.7	20.3	bc	1018.7
US08419	44-13.2	144-59.7	9/6	0605-0629	684	Calm	North-1	Calm	20.0	18.8	bc	1019.5
US08420	44-11.7	145-03.3	9/6	0650-0711	460	Calm	North-1	Calm	20.6	18.8	bc	1019.5
US08421	44-10.4	145-06.4	9/6	0748-0755	215	Calm	North-1	Calm	20.8	18.7	bc	1019.4
US08422	42-49.9	144-49.8	9/10	1033-1042	99	East-1	SE -1	East-2	19.9	19.3	bc	1020.1
US08423	42-40.2	144-59.2	9/10	1211-1234	655	South-2	South-1	South-4	19.3	16.1	bc	1019.6
US08424	42-30.2	145-09.9	9/10	1357-1422	1947	South-2	SE -1	South-4	19.9	20.8	c	1019.2
US08425	42-29.9	145-19.5	9/10	1510-1531	2247	South-3	South-1	South-5	19.5	20.9	c	1019.0
US08426	42-38.8	145-10.0	9/10	1645-1707	1352	SW -2	South-1	SW -4	19.8	19.6	c	1019.0
US08427	42-47.8	145-18.9	9/10	1902-1929	605	SW-2	South-1	SW -4	19.2	19.3	bc	1019.8
US08428	42-50.0	145-00.1	9/11	0157-0205	109	SSW-2	South-1	SSW-4	18.3	17.4	bc	1019.1
US08429	42-49.7	145-09.4	9/11	0253-0302	133	South-2	South-1	South-4	17.1	15.1	bc	1019.1
US08430	42-40.0	145-19.7	9/11	0428-0453	1820	SSW-2	South-1	SSW-5	19.3	18.1	bc	1019.0
US08431	42-30.0	145-29.8	9/11	0607-0929	2524	SSW-2	South-1	SSW-4	20.1	19.0	bc	1019.1
US08432	42-39.9	145-39.8	9/11	0743-0806	2310	SSW-1	South-1	SSW-3	21.4	18.8	bc	1019.2
US08433	42-49.7	145-30.1	9/11	0922-0943	1175	South-1	South-1	South-3	20.9	17.0	bc	1018.8
US08434	42-59.3	145-20.6	9/11	1053-1059	70	South-1	South-1	South-3	20.5	16.2	bc	1018.5
US08435	42-59.8	145-28.9	9/11	1143-1152	87	South-1	South-1	South-3	21.0	16.5	bc	1018.1
US08436	42-50.1	145-39.4	9/11	1308-1329	1586	South-1	South-1	South-3	19.9	17.8	bc	1017.3
US08437	42-40.1	145-49.8	9/11	1452-1505	2591	South-2	South-1	South-4	21.2	19.7	bc	1016.7
US08438	42-48.6	145-30.3	9/11	1857-1923	415	SSE-1	South-1	SSE-2	19.1	17.4	bc	1017.6
US08439	42-50.1	145-49.5	9/12	0303-0327	2071	NE -1	South-1	NE -3	20.1	19.0	r	1012.8
US08440	42-49.9	145-59.7	9/12	0426-0449	2268	SSE-1	South-1	SSE-4	20.8	18.9	r	1012.1
US08441	43-00.0	145-49.9	9/12	0603-0626	710	SSE-1	South-1	SSE-3	20.5	17.7	f	1011.7
US08442	42-59.9	145-40.1	9/12	0711-0719	116	SSE-2	South-1	SSE-5	19.8	16.3	o	1010.5
US08443	43-09.7	145-39.9	9/12	0822-0830	55	SSE-2	South-1	SSE-5	19.1	16.1	r	1009.0
US08444	43-09.9	145-50.2	9/13	0723-0731	89	SW -1	SSE-1	SW -2	16.0	14.0	bc	1011.6
US08445	42-59.9	145-59.8	9/13	0842-0908	1661	SW -1	SSE-2	SW -3	18.7	17.9	bc	1012.5
US08446	42-50.0	146-09.8	9/13	1018-1040	2607	SW -1	SSE-2	SW-2	20.2	20.0	bc	1013.0
US08447	42-54.2	145-55.1	9/13	1243-1304	1895	South-1	SSE-2	South-2	22.1	18.6	bc	1012.6
US08448	42-54.9	145-45.1	9/13	1449-1509	993	South-1	SSE-2	South-2	20.2	17.7	bc	1012.2
US08449	42-53.2	145-30.3	9/13	1838-1856	381	South-1	SSE-2	South-2	18.6	16.0	c	1013.1

Cruise 155

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08450	41-24.2	139-40.2	9/18	1523-1530	806	South-2	SE -1	South-4	26.1	24.5	bc	1012.5
US08451	41-23.9	139-32.9	9/18	1611-1622	1525	South-2	SE -1	South-4	25.6	24.3	bc	1012.1
US08452	41-23.9	139-25.4	9/18	1705-1713	2298	South-2	SE -1	South-4	25.4	24.3	bc	1011.6
US08453	41-35.8	139-32.8	9/19	1042-1051	1100	WNW-3	West-1	WNW-5	24.0	23.9	bc	1014.0
US08454	41-35.8	139-25.1	9/19	1130-1138	1750	NW -2	WNW-1	NW -5	22.1	24.2	c	1013.6
US08455	41-36.0	139-17.6	9/19	1217-1225	1602	NW -2	WNW-1	NW -5	22.3	24.1	bc	1013.6
US08456	41-57.4	140-58.4	9/22	1350-1354	80	ESE-2	East-1	ESE-4	20.8	20.0	c	1011.0
US08457	41-57.9	140-59.1	9/22	1359-1403	84	ESE-2	East-1	ESE-5	20.8	20.1	c	1010.5
US08458	41-58.4	141-00.0	9/22	1409-1413	88	ESE-2	East-1	ESE-5	20.5	20.0	c	1010.5
US08459	41-58.9	141-01.0	9/22	1420-1424	95	ESE-2	East-1	ESE-5	20.4	20.1	c	1010.5
US08460	42-23.4	140-43.1	9/23	0805-0815	58	SSW-2	SE -1	SSW-4	21.0	20.1	r	1001.7
US08461	42-16.1	140-35.9	9/23	0907-0917	91	WSW-2	SE -1	WSW-5	19.3	20.1	r	1001.8
US08462	42-19.0	140-30.4	9/23	1103-1111	93	WNW-3	SE -1	WNW-6	19.3	20.2	c	1002.1
US08463	42-23.7	140-30.7	9/23	1151-1157	95	NW -3	West-1	NW -5	19.6	19.9	bc	1002.0

Cruise 156

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US08464	41-57.5	140-58.3	10/27	1258-1302	80	West-3	ESE-1	West-5	11.1	14.0	c	1006.6
US08465	41-57.9	140-59.0	10/27	1307-1311	85	West-3	ESE-1	West-5	11.5	14.1	c	1007.1
US08466	41-58.4	141-00.0	10/27	1317-1321	89	WNW-2	ESE-1	WNW-4	11.3	14.0	r	1007.2
US08467	41-58.9	141-00.9	10/27	1327-1332	96	WNW-2	ESE-1	WNW-4	11.1	13.9	c	1007.2
US08468	42-17.7	140-54.0	10/28	0707-0710	56	West-2	WSW-1	West-5	10.8	14.4	c	1008.1
US08469	42-12.0	141-01.6	10/28	0805-0809	78	West-2	West-1	West-4	11.1	14.3	bc	1008.1
US08470	42-05.3	140-56.7	10/28	0901-0905	83	WSW-2	ESE-1	WSW-4	11.4	14.0	bc	1008.0
US08471	42-10.2	140-47.7	10/28	0959-1003	91	WSW-2	West-1	WSW-3	11.9	14.2	c	1007.6
US08472	42-11.0	140-35.6	10/28	1108-1112	80	WSW-3	West-1	WSW-5	13.2	14.3	c	1007.1
US08473	42-15.6	140-36.5	10/28	1200-1205	90	West-3	West-1	West-5	13.3	14.2	bc	1006.6
US08474	42-18.9	140-30.5	10/28	1407-1411	94	West-3	West-1	West-5	11.8	14.1	bc	1006.2
US08475	42-29.1	140-31.2	10/29	0630-0635	74	NW -2	West-1	NW -4	6.3	13.3	c	1007.0
US08476	42-23.4	140-42.4	10/29	0842-0846	62	West-2	NW -1	West-4	7.5	13.8	bc	1008.6
US08477	42-23.0	140-31.2	10/30	0829-0834	96	West-3	West-1	West-5	8.9	13.7	bc	1016.2

(*):Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US08392
LATITUDE 43-55.7 N
LONGITUDE 145-14.4 E
DEPTH (m) 81

Press.	Temp.	Salinity	Sigma-T
5	17.201	33.355	24.205
10	16.972	33.481	24.355
20	16.007	33.636	24.697
30	15.790	33.661	24.765
40	13.274	33.708	25.337
50	11.898	33.729	25.622
75	8.113	33.660	26.204

STATION US08393
LATITUDE 43-56.4 N
LONGITUDE 145-12.6 E
DEPTH (m) 84

Press.	Temp.	Salinity	Sigma-T
5	17.134	33.229	24.124
10	16.823	33.494	24.400
20	16.658	33.618	24.534
30	15.862	33.659	24.748
40	13.324	33.724	25.340
50	12.016	33.747	25.613
75	8.275	33.672	26.190

STATION US08394
LATITUDE 43-57.1 N
LONGITUDE 145-11.0 E
DEPTH (m) 82

Press.	Temp.	Salinity	Sigma-T
5	17.330	33.081	23.964
10	17.070	33.559	24.392
20	16.440	33.623	24.588
30	15.598	33.680	24.823
40	14.050	33.733	25.198
50	12.056	33.736	25.597
75	9.494	33.738	26.051

STATION US08395
LATITUDE 44-01.4 N
LONGITUDE 145-14.2 E
DEPTH (m) 336

Press.	Temp.	Salinity	Sigma-T
5	17.518	33.086	23.923
10	16.629	33.314	24.307
20	16.330	33.651	24.635
30	15.968	33.686	24.744
40	15.416	33.709	24.886
50	14.372	33.709	25.112
75	11.328	33.733	25.729
100	8.873	33.716	26.133
125	6.934	33.671	26.381
150	5.693	33.606	26.489
175	4.407	33.536	26.579
200	3.424	33.481	26.634
250	1.987	33.405	26.695
300	1.537	33.422	26.741

STATION US08396
LATITUDE 44-00.3 N
LONGITUDE 145-16.6 E
DEPTH (m) 382

Press.	Temp.	Salinity	Sigma-T
5	17.267	33.148	24.031
10	16.607	33.260	24.271
20	16.153	33.342	24.438
30	15.653	33.702	24.827
40	14.378	33.722	25.120
50	13.342	33.712	25.327
75	10.007	33.722	25.953
100	8.685	33.724	26.168
125	7.395	33.681	26.325
150	6.081	33.626	26.457
175	5.042	33.585	26.549
200	3.986	33.509	26.602
250	2.656	33.446	26.674
300	2.001	33.459	26.737

STATION US08397
LATITUDE 43-59.3 N
LONGITUDE 145-19.0 E
DEPTH (m) 272

Press.	Temp.	Salinity	Sigma-T
5	17.139	33.236	24.128
10	16.706	33.250	24.240
20	16.312	33.325	24.389
30	15.427	33.607	24.804
40	14.222	33.814	25.224
50	12.657	33.708	25.460
75	9.271	33.727	26.078
100	8.706	33.736	26.174
125	7.587	33.694	26.308
150	6.302	33.643	26.442
175	5.168	33.587	26.536
200	4.458	33.556	26.590

STATION US08398
LATITUDE 44-02.5 N
LONGITUDE 145-22.3 E
DEPTH (m) 910

Press.	Temp.	Salinity	Sigma-T
5	17.199	33.525	24.336
10	17.035	33.539	24.385
20	16.236	33.631	24.641
30	14.808	33.712	25.020
40	13.346	33.740	25.348
50	12.954	33.826	25.493
75	9.184	33.720	26.086
100	6.898	33.668	26.384
125	5.053	33.561	26.529
150	3.318	33.452	26.621
175	2.654	33.432	26.663
200	2.335	33.431	26.688
250	2.057	33.453	26.728
300	1.859	33.462	26.750
400	1.413	33.517	26.826
500	1.533	33.627	26.906

STATION US08399
LATITUDE 44-04.8 N
LONGITUDE 145-19.9 E
DEPTH (m) 716

Press.	Temp.	Salinity	Sigma-T
5	17.379	33.501	24.274
10	16.948	33.677	24.511
20	16.418	33.672	24.631
30	16.125	33.721	24.735
40	14.779	33.683	25.005
50	13.042	33.714	25.388
75	9.580	33.701	26.008
100	7.307	33.651	26.314
125	5.634	33.592	26.485
150	4.495	33.536	26.570
175	3.150	33.436	26.623
200	2.364	33.421	26.679
250	1.558	33.400	26.722
300	1.878	33.484	26.766
400	1.369	33.522	26.833
500	1.522	33.627	26.906
600	1.738	33.784	27.017

STATION US08400
LATITUDE 44-06.3 N
LONGITUDE 145-16.6 E
DEPTH (m) 376

Press.	Temp.	Salinity	Sigma-T
5	16.970	33.471	24.348
10	16.820	33.525	24.425
20	16.395	33.695	24.654
30	15.683	33.700	24.819
40	14.853	33.717	25.015
50	14.254	33.732	25.154
75	11.222	33.726	25.744
100	8.584	33.734	26.192
125	7.190	33.693	26.363
150	4.946	33.564	26.543
175	3.842	33.500	26.609
200	2.926	33.464	26.666
250	2.036	33.450	26.727
300	1.914	33.489	26.768

STATION US08401
LATITUDE 44-10.5 N
LONGITUDE 145-20.7 E
DEPTH (m) 136

Press.	Temp.	Salinity	Sigma-T
5	16.806	33.604	24.488
10	16.697	33.669	24.564
20	16.440	33.699	24.647
30	15.907	33.736	24.797
40	15.854	33.741	24.812
50	12.937	33.682	25.385
75	9.094	33.727	26.106

STATION US08402
LATITUDE 44-08.9 N
LONGITUDE 145-24.1 E
DEPTH (m) 1473

Press.	Temp.	Salinity	Sigma-T
5	17.309	33.280	24.122
10	16.965	33.513	24.381
20	16.678	33.649	24.553
30	14.711	33.704	25.035
40	12.862	33.707	25.419
50	10.569	33.725	25.859
75	7.165	33.635	26.321
100	5.810	33.602	26.471
125	5.292	33.585	26.520
150	4.635	33.561	26.575
175	3.330	33.461	26.626
200	2.375	33.419	26.676
250	1.525	33.405	26.728
300	1.757	33.479	26.771
400	1.430	33.532	26.837
500	1.568	33.625	26.902
600	1.726	33.763	27.001
700	2.071	33.971	27.141
800	2.201	34.100	27.235
900	2.215	34.175	27.293
1000	2.250	34.256	27.356
1200	2.237	34.384	27.459

STATION US08403
LATITUDE 44-07.3 N
LONGITUDE 145-27.8 E
DEPTH (m) 1200

Press.	Temp.	Salinity	Sigma-T
5	17.500	33.240	24.045
10	16.870	33.583	24.458
20	16.181	33.696	24.704
30	13.872	33.705	25.213
40	11.023	33.693	25.753
50	9.298	33.695	26.048
75	7.236	33.668	26.337
100	5.751	33.614	26.488
125	4.553	33.551	26.576
150	3.345	33.463	26.627
175	2.998	33.475	26.668
200	2.509	33.443	26.684
250	2.411	33.480	26.722
300	2.136	33.501	26.761
400	1.642	33.553	26.839
500	1.664	33.635	26.903
600	1.728	33.771	27.007
700	2.054	33.960	27.134
800	2.212	34.099	27.233
900	2.284	34.188	27.298
1000	2.296	34.258	27.354
1200	2.269	34.382	27.455
1500	2.162	34.467	27.531

STATION US08404
LATITUDE 44-12.3 N
LONGITUDE 145-30.2 E
DEPTH (m) 2075

Press.	Temp.	Salinity	Sigma-T
5	17.858	33.239	23.958
10	17.155	33.313	24.183
20	14.050	33.705	25.176
30	10.922	33.723	25.795
40	9.395	33.723	26.055
50	8.293	33.667	26.184
75	6.966	33.662	26.369
100	5.028	33.544	26.518
125	4.210	33.527	26.593
150	2.892	33.445	26.653
175	2.248	33.420	26.687
200	1.963	33.413	26.703
250	1.565	33.413	26.732
300	2.188	33.510	26.763
400	1.713	33.557	26.837
500	2.320	33.712	26.915
600	1.769	33.777	27.010
700	2.061	33.972	27.143
800	2.214	34.088	27.224
900	2.278	34.187	27.298
1000	2.251	34.270	27.367

STATION US08405
LATITUDE 44-14.8 N
LONGITUDE 145-22.4 E
DEPTH (m) 327

Press.	Temp.	Salinity	Sigma-T
5	16.843	33.675	24.535
10	16.763	33.681	24.558
20	16.563	33.694	24.614
30	15.579	33.718	24.856
40	14.432	33.764	25.141
50	11.823	33.731	25.637
75	9.221	33.717	26.078
100	7.865	33.712	26.282
125	6.103	33.647	26.471
150	4.532	33.553	26.580
175	3.605	33.497	26.629
200	3.157	33.466	26.647
250	2.346	33.450	26.703

STATION US08406
LATITUDE 44-13.7 N
LONGITUDE 145-26.4 E
DEPTH (m) 1566

Press.	Temp.	Salinity	Sigma-T
5	17.912	33.262	23.963
10	16.969	33.434	24.320
20	15.289	33.709	24.914
30	14.257	33.749	25.166
40	12.200	33.751	25.581
50	11.028	33.734	25.785
75	7.865	33.687	26.263
100	6.908	33.708	26.414
125	5.110	33.583	26.539
150	4.425	33.542	26.582
175	3.352	33.463	26.626
200	2.798	33.452	26.667
250	2.122	33.446	26.718
300	1.453	33.413	26.740
400	1.388	33.509	26.821
500	1.541	33.620	26.900
600	1.738	33.765	27.002
700	2.026	33.957	27.134
800	2.187	34.087	27.226
900	2.257	34.183	27.297
1000	2.282	34.271	27.365
1200	2.235	34.383	27.459

STATION US08407
LATITUDE 44-17.2 N
LONGITUDE 145-31.7 E
DEPTH (m) 2077

Press.	Temp.	Salinity	Sigma-T
5	17.161	33.680	24.463
10	17.145	33.683	24.470
20	16.723	33.694	24.577
30	14.471	33.764	25.133
40	13.042	33.766	25.428
50	12.443	33.796	25.569
75	10.899	33.812	25.868
100	9.488	33.747	26.059
125	6.696	33.636	26.385
150	5.322	33.607	26.534
175	3.467	33.476	26.626
200	2.888	33.472	26.676
250	2.080	33.459	26.731
300	1.950	33.478	26.756
400	1.451	33.522	26.827
500	1.596	33.629	26.903
600	1.754	33.778	27.011
700	2.088	33.985	27.151
800	2.178	34.088	27.227
900	2.273	34.187	27.299
1000	2.290	34.265	27.360
1200	2.263	34.385	27.458
1500	2.173	34.463	27.528

STATION US08408
LATITUDE 44-18.7 N
LONGITUDE 145-28.4 E
DEPTH (m) 1516

Press.	Temp.	Salinity	Sigma-T
5	16.981	33.712	24.531
10	16.947	33.714	24.540
20	16.422	33.756	24.694
30	15.148	33.871	25.070
40	13.767	33.755	25.274
50	13.229	33.779	25.401
75	12.279	33.889	25.673
100	10.134	33.781	25.977
125	7.221	33.654	26.328
150	5.352	33.597	26.522
175	4.222	33.549	26.609
200	3.537	33.583	26.704
250	2.777	33.524	26.726
300	2.693	33.566	26.767
400	1.832	33.570	26.839
500	1.731	33.644	26.905
600	1.768	33.774	27.007
700	2.052	33.955	27.130
800	2.183	34.094	27.232
900	2.266	34.180	27.293
1000	2.283	34.281	27.373
1200	2.256	34.393	27.465

STATION US08409
LATITUDE 44-20.4 N
LONGITUDE 145-24.2 E
DEPTH (m) 849

Press.	Temp.	Salinity	Sigma-T
5	16.798	33.592	24.481
10	16.745	33.591	24.493
20	16.589	33.604	24.539
30	16.032	33.693	24.735
40	14.714	33.788	25.100
50	13.281	33.744	25.364
75	11.458	33.751	25.720
100	9.131	33.732	26.104
125	6.912	33.666	26.380
150	5.245	33.642	26.571
175	4.022	33.573	26.648
200	2.478	33.452	26.694
250	2.245	33.488	26.741
300	2.140	33.519	26.774
400	1.842	33.571	26.838
500	1.657	33.658	26.922
600	1.731	33.768	27.005
700	2.034	33.940	27.120
800	2.194	34.076	27.216

STATION US08410
LATITUDE 44-20.9 N
LONGITUDE 145-09.2 E
DEPTH (m) 1233

Press.	Temp.	Salinity	Sigma-T
5	17.601	33.405	24.148
10	17.349	33.467	24.255
20	14.223	33.287	24.817
30	11.452	33.589	25.595
40	8.709	33.544	26.023
50	9.660	33.768	26.047
75	8.274	33.756	26.256
100	5.600	33.557	26.461
125	4.969	33.702	26.650
150	4.722	33.691	26.669
175	3.375	33.561	26.702
200	2.810	33.547	26.742
250	2.011	33.507	26.775
300	2.120	33.545	26.797
400	2.282	33.654	26.871
500	2.143	33.702	26.920
600	1.822	33.799	27.023
700	2.082	33.959	27.131
800	2.203	34.076	27.216

STATION US08411
LATITUDE 44-19.4 N
LONGITUDE 145-12.6 E
DEPTH (m) 734

Press.	Temp.	Salinity	Sigma-T
5	17.959	33.911	24.448
10	16.913	33.984	24.755
20	16.521	34.013	24.869
30	16.259	33.988	24.910
40	15.140	33.939	25.123
50	14.533	33.941	25.256
75	11.171	33.824	25.829
100	6.513	33.551	26.343
125	5.675	33.729	26.589
150	4.795	33.709	26.675
175	2.907	33.509	26.703
200	2.490	33.495	26.727
250	2.120	33.490	26.753
300	2.175	33.522	26.774
400	2.188	33.614	26.847
500	2.275	33.681	26.893
600	1.883	33.815	27.031

STATION US08412
LATITUDE 44-18.1 N
LONGITUDE 145-15.8 E
DEPTH (m) 139

Press.	Temp.	Salinity	Sigma-T
5	17.737	33.779	24.401
10	17.592	33.792	24.446
20	16.854	33.887	24.695
30	16.306	33.920	24.847
40	15.703	33.977	25.027
50	15.174	33.967	25.138
75	13.672	33.969	25.459

STATION US08413
LATITUDE 44-21.7 N
LONGITUDE 145-20.7 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	17.119	33.727	24.509
10	17.103	33.741	24.524
20	17.168	33.771	24.531
30	17.208	33.772	24.522
40	16.849	33.832	24.653
50	14.904	33.955	25.187

STATION US08414
LATITUDE 44-23.2 N
LONGITUDE 145-18.2 E
DEPTH (m) 711

Press.	Temp.	Salinity	Sigma-T
5	18.797	33.892	24.226
10	18.127	33.939	24.428
20	16.407	34.003	24.887
30	16.015	33.978	24.958
40	15.007	33.946	25.158
50	14.569	33.970	25.271
75	11.285	33.839	25.820
100	6.856	33.469	26.233
125	5.369	33.527	26.465
150	4.828	33.647	26.622
175	4.540	33.689	26.687
200	3.882	33.638	26.715
250	2.481	33.520	26.748
300	2.409	33.561	26.786
400	2.105	33.596	26.839
500	1.531	33.620	26.900

STATION US08415
LATITUDE 44-24.9 N
LONGITUDE 145-14.0 E
DEPTH (m) 1419

Press.	Temp.	Salinity	Sigma-T
5	17.859	33.394	24.077
10	16.800	33.354	24.298
20	13.464	33.324	25.002
30	9.435	33.283	25.705
40	10.728	33.806	25.894
50	10.543	33.857	25.966
75	7.406	33.582	26.246
100	1.239	33.097	26.501
125	0.346	33.181	26.620
150	0.449	33.236	26.659
175	0.423	33.257	26.678
200	0.640	33.297	26.698
250	0.572	33.340	26.736
300	0.996	33.426	26.780
400	1.401	33.536	26.842
500	1.718	33.663	26.921
600	1.763	33.778	27.010
700	2.073	33.962	27.134
800	2.230	34.090	27.224
900	2.295	34.185	27.295
1000	2.307	34.270	27.362

STATION US08416
LATITUDE 44-17.0 N
LONGITUDE 145-05.8 E
DEPTH (m) 855

Press.	Temp.	Salinity	Sigma-T
5	18.180	33.824	24.327
10	16.640	33.969	24.808
20	16.166	33.987	24.930
30	15.635	33.971	25.038
40	15.178	33.946	25.120
50	14.312	33.909	25.279
75	5.159	33.262	26.279
100	5.752	33.729	26.579
125	5.055	33.713	26.649
150	3.830	33.608	26.696
175	2.642	33.498	26.717
200	2.372	33.493	26.735
250	1.969	33.492	26.766
300	1.977	33.526	26.793
400	1.715	33.552	26.833
500	2.202	33.696	26.911
600	1.956	33.792	27.007
700	2.074	33.953	27.127

STATION US08417
LATITUDE 44-15.4 N
LONGITUDE 145-08.9 E
DEPTH (m) 575

Press.	Temp.	Salinity	Sigma-T
5	18.316	33.901	24.352
10	17.399	33.971	24.630
20	15.893	33.941	24.958
30	15.548	33.956	25.047
40	15.275	33.958	25.108
50	14.682	33.946	25.228
75	9.991	33.815	26.028
100	6.460	33.732	26.492
125	5.949	33.776	26.592
150	4.702	33.668	26.652
175	3.690	33.583	26.690
200	2.829	33.529	26.726
250	2.294	33.526	26.768
300	2.213	33.562	26.803
400	1.911	33.586	26.845

STATION US08418
LATITUDE 44-14.8 N
LONGITUDE 145-10.5 E
DEPTH (m) 327

Press.	Temp.	Salinity	Sigma-T
5	18.530	33.848	24.259
10	18.213	33.893	24.372
20	16.445	33.973	24.855
30	15.813	33.975	25.002
40	15.391	33.963	25.086
50	14.704	33.943	25.221
75	10.998	33.832	25.866
100	7.075	33.748	26.422
125	5.322	33.699	26.606
150	4.581	33.653	26.654
175	3.688	33.587	26.693
200	2.564	33.511	26.734
250	2.271	33.538	26.779

STATION US08419
LATITUDE 44-13.2 N
LONGITUDE 144-59.7 E
DEPTH (m) 684

Press.	Temp.	Salinity	Sigma-T
5	19.135	33.985	24.211
10	18.989	33.960	24.229
20	16.400	33.602	24.581
30	14.751	33.741	25.055
40	10.462	33.395	25.620
50	10.476	33.784	25.921
75	9.033	33.731	26.120
100	5.359	33.368	26.341
125	4.181	33.560	26.622
150	4.172	33.661	26.703
175	2.884	33.566	26.751
200	2.308	33.528	26.768
250	2.649	33.603	26.801
300	3.198	33.698	26.828
400	1.936	33.586	26.844
500	1.430	33.634	26.919

STATION US08420
LATITUDE 44-11.7 N
LONGITUDE 145-03.3 E
DEPTH (m) 460

Press.	Temp.	Salinity	Sigma-T
5	18.990	33.940	24.214
10	18.939	33.950	24.234
20	16.852	33.988	24.773
30	15.861	33.943	24.966
40	15.415	33.951	25.072
50	15.058	33.938	25.140
75	14.349	33.880	25.248
100	7.878	33.676	26.252
125	7.162	33.683	26.359
150	5.485	33.645	26.545
175	3.993	33.575	26.653
200	2.710	33.520	26.729
250	2.490	33.564	26.783
300	2.276	33.576	26.810

STATION US08421
LATITUDE 44-10.4 N
LONGITUDE 145-06.4 E
DEPTH (m) 215

Press.	Temp.	Salinity	Sigma-T
5	18.862	33.892	24.209
10	18.287	33.839	24.312
20	17.002	33.888	24.660
30	16.481	33.912	24.801
40	15.714	33.922	24.983
50	15.643	33.952	25.022
75	15.263	33.944	25.100
100	11.441	33.635	25.629
125	6.644	33.598	26.362

STATION US08422
LATITUDE 42-49.9 N
LONGITUDE 144-49.8 E
DEPTH (m) 99

Press.	Temp.	Salinity	Sigma-T
5	17.928	32.774	23.585
10	15.220	33.379	24.675
20	12.857	33.433	25.207
30	11.456	33.404	25.451
40	10.662	33.414	25.600
50	9.975	33.421	25.723
75	6.345	33.338	26.196

STATION US08423
LATITUDE 42-40.2 N
LONGITUDE 144-59.2 E
DEPTH (m) 655

Press.	Temp.	Salinity	Sigma-T
5	10.119	33.381	25.668
10	9.606	33.370	25.745
20	7.287	33.312	26.049
30	5.775	33.298	26.235
40	3.156	33.123	26.373
50	2.610	33.182	26.467
75	3.356	33.399	26.575
100	2.655	33.398	26.636
125	1.984	33.358	26.658
150	1.959	33.421	26.709
175	2.000	33.432	26.716
200	2.004	33.449	26.729
250	2.007	33.471	26.746
300	2.110	33.552	26.803
400	2.591	33.773	26.942
500	2.763	33.889	27.019

STATION US08424
LATITUDE 42-30.2 N
LONGITUDE 145-09.9 E
DEPTH (m) 1947

Press.	Temp.	Salinity	Sigma-T
5	21.003	33.091	23.041
10	20.794	33.320	23.270
20	18.094	33.234	23.896
30	7.592	32.798	25.603
40	5.182	32.984	26.057
50	3.790	33.069	26.271
75	2.432	33.169	26.472
100	2.134	33.255	26.563
125	2.027	33.331	26.632
150	2.001	33.384	26.677
175	2.065	33.448	26.723
200	2.314	33.536	26.774
250	2.391	33.615	26.832
300	2.456	33.694	26.890
400	2.970	33.897	27.007
500	2.737	33.966	27.083

STATION US08425
LATITUDE 42-29.9 N
LONGITUDE 145-19.5 E
DEPTH (m) 2247

Press.	Temp.	Salinity	Sigma-T
5	21.117	33.358	23.213
10	21.046	33.332	23.213
20	20.271	33.302	23.396
30	9.656	32.747	25.249
40	5.347	32.959	26.018
50	3.449	33.049	26.287
75	2.100	33.143	26.476
100	1.753	33.247	26.586
125	1.862	33.322	26.638
150	2.033	33.391	26.680
175	2.119	33.457	26.727
200	2.234	33.520	26.768
250	2.454	33.632	26.839
300	2.977	33.758	26.896
400	2.707	33.873	27.011
500	2.765	33.977	27.089

STATION US08426
LATITUDE 42-38.8 N
LONGITUDE 145-10.0 E
DEPTH (m) 1352

Press.	Temp.	Salinity	Sigma-T
5	19.804	32.612	22.992
10	19.194	32.883	23.355
20	11.317	32.746	24.962
30	5.187	32.995	26.064
40	3.955	33.071	26.256
50	3.170	33.124	26.372
75	2.144	33.213	26.529
100	1.971	33.280	26.596
125	1.928	33.340	26.647
150	1.936	33.386	26.684
175	1.807	33.409	26.711
200	1.932	33.459	26.742
250	2.026	33.525	26.788
300	2.298	33.620	26.843
400	2.698	33.799	26.953
500	2.858	33.931	27.045

STATION US08427
LATITUDE 42-47.8 N
LONGITUDE 145-18.9 E
DEPTH (m) 605

Press.	Temp.	Salinity	Sigma-T
5	19.385	32.587	23.081
10	16.978	32.639	23.708
20	9.189	32.845	25.400
30	4.780	33.033	26.140
40	3.537	33.091	26.313
50	2.852	33.143	26.415
75	2.123	33.228	26.543
100	2.067	33.299	26.604
125	2.004	33.356	26.655
150	1.963	33.394	26.688
175	1.883	33.414	26.710
200	1.925	33.440	26.728
250	1.943	33.496	26.771
300	2.147	33.555	26.802
400	2.337	33.681	26.889
500	2.737	33.829	26.973

STATION US08428
LATITUDE 42-50.0 N
LONGITUDE 145-00.1 E
DEPTH (m) 109

Press.	Temp.	Salinity	Sigma-T
5	15.551	33.325	24.559
10	13.331	33.457	25.131
20	11.820	33.452	25.421
30	10.350	33.407	25.649
40	10.188	33.447	25.707
50	8.801	33.399	25.896
75	5.361	33.351	26.326

STATION US08429
LATITUDE 42-49.7 N
LONGITUDE 145-09.4 E
DEPTH (m) 133

Press.	Temp.	Salinity	Sigma-T
5	14.990	33.228	24.608
10	11.848	33.289	25.289
20	10.883	33.467	25.603
30	9.171	33.475	25.897
40	6.287	33.469	26.307
50	5.900	33.387	26.291
75	5.598	33.385	26.326
100	4.988	33.406	26.413

STATION US08430
LATITUDE 42-40.0 N
LONGITUDE 145-19.7 E
DEPTH (m) 1820

Press.	Temp.	Salinity	Sigma-T
5	19.189	32.601	23.141
10	19.001	32.631	23.211
20	12.168	32.823	24.867
30	5.421	32.976	26.023
40	4.245	33.113	26.260
50	3.386	33.196	26.411
75	2.350	33.237	26.533
100	1.956	33.294	26.609
125	1.890	33.343	26.652
150	1.906	33.372	26.675
175	1.787	33.415	26.717
200	1.977	33.465	26.744
250	2.019	33.529	26.792
300	2.188	33.607	26.841
400	2.652	33.784	26.945
500	2.737	33.919	27.045

STATION US08431
LATITUDE 42-30.0 N
LONGITUDE 145-29.8 E
DEPTH (m) 2524

Press.	Temp.	Salinity	Sigma-T
5	19.298	32.573	23.092
10	18.606	32.557	23.254
20	14.700	32.688	24.254
30	8.374	32.987	25.638
40	4.504	33.016	26.156
50	3.423	33.092	26.324
75	2.100	33.213	26.533
100	1.966	33.325	26.632
125	1.799	33.357	26.671
150	1.787	33.404	26.709
175	1.985	33.475	26.751
200	2.057	33.518	26.780
250	2.200	33.605	26.838
300	2.427	33.707	26.902
400	2.768	33.875	27.007
500	3.329	34.055	27.101

STATION US08432
LATITUDE 42-39.9 N
LONGITUDE 145-39.8 E
DEPTH (m) 2310

Press.	Temp.	Salinity	Sigma-T
5	18.835	32.483	23.140
10	14.884	32.589	24.138
20	8.038	32.869	25.595
30	5.606	33.007	26.026
40	4.245	33.056	26.215
50	2.956	33.116	26.385
75	2.132	33.225	26.539
100	2.035	33.296	26.604
125	1.870	33.339	26.651
150	1.879	33.393	26.693
175	2.072	33.480	26.748
200	2.239	33.544	26.787
250	2.264	33.625	26.850
300	2.536	33.719	26.903
400	2.739	33.843	26.984

STATION US08433
LATITUDE 42-49.7 N
LONGITUDE 145-30.1 E
DEPTH (m) 1175

Press.	Temp.	Salinity	Sigma-T
5	15.637	33.193	24.439
10	12.354	33.116	25.059
20	8.484	33.244	25.822
30	5.886	33.244	26.179
40	4.092	33.165	26.317
50	2.968	33.187	26.441
75	2.220	33.257	26.558
100	2.115	33.311	26.610
125	1.957	33.332	26.639
150	1.849	33.372	26.679
175	1.960	33.407	26.698
200	1.884	33.435	26.727
250	1.981	33.498	26.770
300	2.079	33.553	26.806
400	2.525	33.722	26.906

STATION US08434
LATITUDE 42-59.3 N
LONGITUDE 145-20.6 E
DEPTH (m) 70

Press.	Temp.	Salinity	Sigma-T
5	15.697	33.311	24.517
10	13.966	33.408	24.964
20	11.867	33.449	25.410
30	10.691	33.424	25.603
40	10.147	33.433	25.703
50	9.586	33.416	25.784

STATION US08435
LATITUDE 42-59.8 N
LONGITUDE 145-28.9 E
DEPTH (m) 87

Press.	Temp.	Salinity	Sigma-T
5	16.600	33.191	24.220
10	15.774	33.264	24.463
20	12.380	33.410	25.282
30	11.670	33.451	25.448
40	9.440	33.354	25.759
50	7.895	33.377	26.015
75	6.592	33.384	26.201

STATION US08436
LATITUDE 42-50.1 N
LONGITUDE 145-39.4 E
DEPTH (m) 1586

Press.	Temp.	Salinity	Sigma-T
5	18.866	32.639	23.251
10	16.139	32.655	23.912
20	8.446	32.932	25.584
30	4.867	33.046	26.141
40	3.598	33.129	26.337
50	2.901	33.189	26.448
75	2.370	33.300	26.581
100	2.106	33.389	26.673
125	1.863	33.365	26.672
150	1.743	33.390	26.701
175	1.939	33.440	26.727
200	2.003	33.476	26.750
250	2.055	33.543	26.801
300	2.486	33.662	26.861
400	2.607	33.795	26.958
500	3.002	33.951	27.048

STATION US08437
LATITUDE 42-40.1 N
LONGITUDE 145-49.8 E
DEPTH (m) 2591

Press.	Temp.	Salinity	Sigma-T
5	20.494	32.935	23.058
10	19.384	33.459	23.746
20	8.664	32.843	25.481
30	5.600	33.008	26.027
40	4.398	33.120	26.250
50	3.771	33.156	26.342
75	2.620	33.219	26.496
100	2.216	33.341	26.626
125	2.098	33.392	26.676
150	2.125	33.452	26.722
175	2.060	33.485	26.754
200	2.040	33.518	26.781
250	2.263	33.609	26.837
300	2.679	33.740	26.908
400	2.799	33.883	27.011
500	3.026	34.014	27.095

STATION US08438
LATITUDE 42-48.6 N
LONGITUDE 145-30.3 E
DEPTH (m) 415

Press.	Temp.	Salinity	Sigma-T
5	17.055	33.040	23.997
10	16.363	33.199	24.280
20	9.713	33.060	25.484
30	4.916	33.046	26.136
40	4.601	33.827	26.789
50	3.157	33.931	27.017
75	2.151	33.311	26.607
100	2.346	33.370	26.639
125	1.985	33.354	26.654
150	1.919	33.378	26.678
175	1.827	33.400	26.703
200	1.956	33.445	26.729
250	1.982	33.514	26.783
300	2.196	33.603	26.838
400	2.607	33.767	26.935
500	2.890	33.898	27.015

STATION US08439
LATITUDE 42-50.1 N
LONGITUDE 145-49.5 E
DEPTH (m) 2071

Press.	Temp.	Salinity	Sigma-T
5	19.161	32.481	23.057
10	13.990	32.498	24.256
20	6.073	32.951	25.925
30	4.446	33.061	26.198
40	3.303	33.139	26.373
50	3.076	33.200	26.441
75	2.402	33.275	26.559
100	2.184	33.325	26.616
125	1.882	33.367	26.672
150	1.828	33.392	26.696
175	1.824	33.423	26.721
200	1.880	33.459	26.746
250	2.018	33.532	26.795
300	2.245	33.621	26.848
400	2.583	33.803	26.966
500	2.721	33.937	27.061

STATION US08440
LATITUDE 42-49.9 N
LONGITUDE 145-59.7 E
DEPTH (m) 2268

Press.	Temp.	Salinity	Sigma-T
5	19.277	32.467	23.016
10	14.593	32.546	24.167
20	8.176	32.903	25.601
30	5.863	33.051	26.029
40	4.608	33.277	26.352
50	3.255	33.182	26.411
75	2.167	33.363	26.648
100	2.028	33.322	26.625
125	2.055	33.382	26.672
150	2.047	33.426	26.707
175	2.018	33.463	26.739
200	1.979	33.494	26.767
250	2.228	33.585	26.820
300	2.377	33.663	26.870
400	2.677	33.829	26.979
500	2.737	33.951	27.071

STATION US08441
LATITUDE 43-00.0 N
LONGITUDE 145-49.9 E
DEPTH (m) 710

Press.	Temp.	Salinity	Sigma-T
5	16.979	32.627	23.699
10	15.019	32.849	24.310
20	8.681	33.018	25.615
30	5.874	33.101	26.068
40	3.768	33.313	26.467
50	2.865	33.260	26.508
75	2.139	33.248	26.557
100	2.158	33.328	26.620
125	1.991	33.372	26.668
150	1.832	33.378	26.685
175	1.834	33.408	26.708
200	1.871	33.441	26.733
250	1.954	33.481	26.758
300	2.055	33.538	26.797
400	2.473	33.697	26.890
500	2.635	33.816	26.972

STATION US08442
LATITUDE 42-59.9 N
LONGITUDE 145-40.1 E
DEPTH (m) 116

Press.	Temp.	Salinity	Sigma-T
5	15.346	33.023	24.372
10	13.573	33.182	24.870
20	9.371	33.182	25.636
30	5.904	33.250	26.182
40	5.583	33.540	26.450
50	4.774	33.395	26.428
75	3.873	33.356	26.491
100	3.623	33.354	26.514

STATION US08443
LATITUDE 43-09.7 N
LONGITUDE 145-39.9 E
DEPTH (m) 55

Press.	Temp.	Salinity	Sigma-T
5	14.812	33.330	24.726
10	13.539	33.414	25.056
20	11.660	33.438	25.439
30	11.006	33.443	25.562
40	10.474	33.444	25.656

STATION US08444
LATITUDE 43-09.9 N
LONGITUDE 145-50.2 E
DEPTH (m) 89

Press.	Temp.	Salinity	Sigma-T
5	14.643	32.750	24.315
10	12.739	33.407	25.211
20	10.259	33.408	25.665
30	9.253	33.416	25.838
40	8.852	33.427	25.910
50	7.900	33.346	25.989
75	6.285	33.339	26.204

STATION US08445
LATITUDE 42-59.9 N
LONGITUDE 145-59.8 E
DEPTH (m) 1661

Press.	Temp.	Salinity	Sigma-T
5	18.295	32.205	23.061
10	18.152	32.219	23.107
20	9.221	32.831	25.385
30	5.715	32.985	25.995
40	3.593	33.070	26.291
50	2.336	33.124	26.443
75	1.739	33.193	26.543
100	1.762	33.259	26.594
125	1.848	33.336	26.650
150	2.037	33.388	26.677
175	2.086	33.462	26.733
200	2.316	33.520	26.761
250	2.401	33.606	26.823
300	2.423	33.667	26.870
400	2.815	33.834	26.970
500	3.027	33.956	27.049

STATION US08446
LATITUDE 42-50.0 N
LONGITUDE 146-09.8 E
DEPTH (m) 2607

Press.	Temp.	Salinity	Sigma-T
5	20.178	32.781	23.023
10	20.173	32.840	23.070
20	10.791	32.920	25.191
30	5.590	32.978	26.004
40	3.931	33.072	26.260
50	3.428	33.170	26.386
75	2.132	33.197	26.517
100	2.023	33.295	26.604
125	2.153	33.378	26.661
150	2.128	33.440	26.712
175	2.189	33.503	26.758
200	2.284	33.557	26.794
250	2.289	33.633	26.854
300	2.831	33.779	26.925
400	2.961	33.922	27.028
500	3.486	34.099	27.120

STATION US08447
LATITUDE 42-54.2 N
LONGITUDE 145-55.1 E
DEPTH (m) 1895

Press.	Temp.	Salinity	Sigma-T
5	18.465	32.185	23.004
10	17.907	32.239	23.182
20	8.322	32.813	25.510
30	6.167	32.976	25.933
40	4.299	33.078	26.227
50	3.235	33.138	26.378
75	1.885	33.186	26.527
100	1.827	33.284	26.610
125	2.000	33.363	26.660
150	2.054	33.414	26.697
175	2.390	33.512	26.749
200	2.378	33.568	26.794
250	2.492	33.648	26.849
300	2.348	33.689	26.894
400	2.855	33.857	26.986
500	3.005	33.983	27.073

STATION US08448
LATITUDE 42-54.9 N
LONGITUDE 145-45.1 E
DEPTH (m) 993

Press.	Temp.	Salinity	Sigma-T
5	16.857	32.340	23.507
10	11.096	32.630	24.911
20	5.636	32.977	25.999
30	3.936	33.077	26.263
40	3.023	33.136	26.395
50	2.623	33.225	26.500
75	2.365	33.309	26.589
100	2.386	33.376	26.641
125	1.958	33.401	26.694
150	1.668	33.387	26.704
175	1.660	33.409	26.722
200	1.908	33.469	26.752
250	2.059	33.536	26.795
300	2.239	33.613	26.842
400	2.662	33.787	26.946
500	2.912	33.919	27.030

STATION US08449
LATITUDE 42-53.2 N
LONGITUDE 145-30.3 E
DEPTH (m) 381

Press.	Temp.	Salinity	Sigma-T
5	15.665	32.555	23.943
10	12.855	32.867	24.769
20	6.648	33.077	25.951
30	4.404	33.119	26.248
40	4.373	33.277	26.377
50	3.983	33.339	26.467
75	3.286	33.366	26.555
100	2.342	33.385	26.651
125	2.047	33.405	26.691
150	2.026	33.411	26.697
175	2.013	33.409	26.696
200	1.969	33.435	26.720
250	1.942	33.470	26.750
300	2.022	33.526	26.789

STATION US08450
LATITUDE 41-24.2 N
LONGITUDE 139-40.2 E
DEPTH (m) 806

Press.	Temp.	Salinity	Sigma-T
5	24.773	33.540	22.307
10	24.612	33.625	22.419
20	21.328	34.196	23.792
30	18.507	34.367	24.662
40	17.012	34.432	25.076
50	16.094	34.479	25.325
75	14.112	34.458	25.745
100	12.061	34.369	26.087
125	10.731	34.283	26.265
150	9.754	34.261	26.416
175	7.821	34.172	26.650

STATION US08451
LATITUDE 41-23.9 N
LONGITUDE 139-32.9 E
DEPTH (m) 1525

Press.	Temp.	Salinity	Sigma-T
5	24.433	33.609	22.461
10	24.073	33.718	22.649
20	23.130	34.051	23.177
30	18.854	34.352	24.563
40	16.988	34.438	25.086
50	15.835	34.503	25.403
75	13.086	34.411	25.919
100	11.252	34.315	26.196
125	10.432	34.269	26.307
150	9.635	34.240	26.420
175	8.527	34.200	26.566

STATION US08452
LATITUDE 41-23.9 N
LONGITUDE 139-25.4 E
DEPTH (m) 2298

Press.	Temp.	Salinity	Sigma-T
5	24.431	33.600	22.454
10	24.407	33.603	22.463
20	23.924	34.054	22.948
30	21.242	33.951	23.629
40	17.102	34.342	24.985
50	15.539	34.444	25.424
75	13.489	34.432	25.854
100	11.398	34.318	26.172
125	9.871	34.225	26.368
150	8.118	34.174	26.608
175	6.057	34.106	26.839

STATION US08453
LATITUDE 41-35.8 N
LONGITUDE 139-32.8 E
DEPTH (m) 1100

Press.	Temp.	Salinity	Sigma-T
5	24.145	33.683	22.602
10	24.126	33.682	22.607
20	23.921	33.956	22.875
30	18.552	34.354	24.640
40	16.521	34.438	25.195
50	15.445	34.476	25.469
75	12.777	34.410	25.980
100	10.497	34.272	26.298
125	9.447	34.218	26.434
150	7.332	34.144	26.699
175	5.198	34.068	26.914
200	3.555	34.059	27.082

STATION US08454
LATITUDE 41-35.8 N
LONGITUDE 139-25.1 E
DEPTH (m) 1750

Press.	Temp.	Salinity	Sigma-T
5	24.446	33.565	22.423
10	24.399	33.571	22.442
20	22.508	33.872	23.218
30	17.584	34.346	24.873
40	16.223	34.457	25.279
50	15.415	34.481	25.480
75	12.377	34.378	26.034
100	10.898	34.299	26.248
125	9.344	34.223	26.454
150	7.370	34.150	26.698
175	4.425	34.063	26.996
200	3.219	34.052	27.108

STATION US08455
LATITUDE 41-36.0 N
LONGITUDE 139-17.6 E
DEPTH (m) 1602

Press.	Temp.	Salinity	Sigma-T
5	24.104	33.670	22.604
10	24.047	33.699	22.643
20	23.617	34.032	23.021
30	17.630	34.351	24.865
40	16.066	34.454	25.313
50	14.776	34.471	25.613
75	11.967	34.353	26.092
100	10.506	34.258	26.286
125	9.135	34.210	26.477
150	6.623	34.123	26.779
175	4.434	34.064	26.996
200	2.877	34.051	27.138

STATION US08456
LATITUDE 41-57.4 N
LONGITUDE 140-58.4 E
DEPTH (m) 80

Press.	Temp.	Salinity	Sigma-T
5	20.302	33.373	23.442
10	20.154	33.308	23.431
20	17.288	33.379	24.203
30	15.695	33.491	24.656
40	13.051	33.330	25.089
50	9.743	33.127	25.532
75	9.290	33.830	26.156

STATION US08457
LATITUDE 41-57.9 N
LONGITUDE 140-59.1 E
DEPTH (m) 84

Press.	Temp.	Salinity	Sigma-T
5	20.329	33.356	23.422
10	20.227	33.346	23.441
20	17.756	33.546	24.218
30	14.169	33.283	24.825
40	11.213	33.378	25.474
50	9.292	33.439	25.850
75	9.635	33.896	26.151

STATION US08458
LATITUDE 41-58.4 N
LONGITUDE 141-00.0 E
DEPTH (m) 88

Press.	Temp.	Salinity	Sigma-T
5	20.307	33.321	23.401
10	20.285	33.328	23.412
20	18.662	33.604	24.039
30	13.968	33.374	24.938
40	13.793	33.985	25.445
50	11.813	33.972	25.826
75	10.303	34.017	26.133

STATION US08459
LATITUDE 41-58.9 N
LONGITUDE 141-01.0 E
DEPTH (m) 95

Press.	Temp.	Salinity	Sigma-T
5	20.305	33.388	23.453
10	20.283	33.384	23.456
20	19.152	33.683	23.976
30	14.493	33.326	24.790
40	13.234	33.993	25.566
50	12.052	33.997	25.801
75	10.082	33.958	26.124

STATION US08460
LATITUDE 42-23.4 N
LONGITUDE 140-43.1 E
DEPTH (m) 58

Press.	Temp.	Salinity	Sigma-T
5	20.337	32.374	22.673
10	20.339	32.378	22.675
20	18.610	33.103	23.669
30	15.930	33.272	24.434
40	12.325	33.389	25.276
50	9.993	33.578	25.843

STATION US08461
LATITUDE 42-16.1 N
LONGITUDE 140-35.9 E
DEPTH (m) 91

Press.	Temp.	Salinity	Sigma-T
5	20.387	32.347	22.638
10	20.396	32.363	22.648
20	18.089	33.033	23.744
30	16.484	33.206	24.258
40	13.383	33.366	25.051
50	10.072	33.476	25.750
75	5.437	33.377	26.338

STATION US08462
LATITUDE 42-19.0 N
LONGITUDE 140-30.4 E
DEPTH (m) 93

Press.	Temp.	Salinity	Sigma-T
5	20.115	32.431	22.773
10	20.134	32.452	22.784
20	17.919	33.104	23.840
30	16.974	33.727	24.543
40	12.052	33.171	25.159
50	8.353	33.296	25.883
75	6.099	33.426	26.297

STATION US08463
LATITUDE 42-23.7 N
LONGITUDE 140-30.7 E
DEPTH (m) 95

Press.	Temp.	Salinity	Sigma-T
5	20.158	32.498	22.813
10	20.147	32.507	22.823
20	17.631	33.011	23.838
30	16.046	33.421	24.523
40	12.209	33.048	25.034
50	8.853	33.326	25.830
75	5.524	33.398	26.344

STATION US08464
LATITUDE 41-57.5 N
LONGITUDE 140-58.3 E
DEPTH (m) 80

Press.	Temp.	Salinity	Sigma-T
5	14.451	33.449	24.894
10	14.353	33.439	24.907
20	14.238	33.444	24.935
30	14.186	33.478	24.973
40	14.157	33.615	25.084
50	14.041	33.803	25.253
75	8.267	33.933	26.396

STATION US08465
LATITUDE 41-57.9 N
LONGITUDE 140-59.0 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	14.416	33.482	24.927
10	14.396	33.482	24.931
20	14.088	33.527	25.030
30	14.222	33.680	25.120
40	14.262	33.834	25.231
50	12.882	33.792	25.481
75	7.934	33.913	26.430

STATION US08466
LATITUDE 41-58.4 N
LONGITUDE 141-00.0 E
DEPTH (m) 89

Press.	Temp.	Salinity	Sigma-T
5	14.247	33.521	24.993
10	14.201	33.524	25.005
20	14.389	33.786	25.167
30	14.941	34.054	25.256
40	13.512	33.794	25.355
50	11.815	33.780	25.676
75	7.990	33.894	26.406

STATION US08467
LATITUDE 41-58.9 N
LONGITUDE 141-00.9 E
DEPTH (m) 96

Press.	Temp.	Salinity	Sigma-T
5	14.292	33.665	25.094
10	14.421	33.835	25.198
20	14.915	34.100	25.297
30	13.946	33.740	25.224
40	13.103	33.881	25.505
50	11.791	33.871	25.751
75	9.510	34.019	26.267

STATION US08468
LATITUDE 42-17.7 N
LONGITUDE 140-54.0 E
DEPTH (m) 56

Press.	Temp.	Salinity	Sigma-T
5	15.159	35.018	25.956
10	14.974	34.024	25.225
20	14.983	34.025	25.224
30	14.981	34.025	25.225
40	14.940	34.017	25.228
50	11.780	33.662	25.591

STATION US08469
LATITUDE 42-12.0 N
LONGITUDE 141-01.6 E
DEPTH (m) 78

Press.	Temp.	Salinity	Sigma-T
5	14.619	34.022	25.300
10	14.658	34.044	25.309
20	14.769	34.110	25.336
30	14.448	34.016	25.332
40	11.342	33.761	25.749
50	10.696	33.823	25.913
75	9.127	33.994	26.310

STATION US08470
LATITUDE 42-05.3 N
LONGITUDE 140-56.7 E
DEPTH (m) 83

Press.	Temp.	Salinity	Sigma-T
10	14.305	33.662	25.090
20	14.334	33.711	25.121
30	13.872	33.771	25.264
40	13.032	33.906	25.539
50	12.472	33.972	25.701
75	8.963	33.975	26.322

STATION US08471
LATITUDE 42-10.2 N
LONGITUDE 140-47.7 E
DEPTH (m) 91

Press.	Temp.	Salinity	Sigma-T
5	14.414	33.507	24.947
10	14.420	33.529	24.962
20	14.371	33.616	25.040
30	14.518	33.772	25.129
40	13.448	33.728	25.318
50	12.861	33.779	25.475
75	8.777	33.792	26.207

STATION US08472
LATITUDE 42-11.0 N
LONGITUDE 140-35.6 E
DEPTH (m) 80

Press.	Temp.	Salinity	Sigma-T
5	14.494	33.449	24.885
10	14.504	33.544	24.956
20	14.504	33.556	24.966
30	14.494	33.577	24.984
40	14.510	33.601	24.999
50	14.321	33.593	25.033
75	8.852	33.703	26.126

STATION US08473
LATITUDE 42-15.6 N
LONGITUDE 140-36.5 E
DEPTH (m) 90

Press.	Temp.	Salinity	Sigma-T
5	14.447	33.663	25.060
10	14.433	33.659	25.060
20	14.439	33.660	25.060
30	14.383	33.737	25.130
40	13.266	33.745	25.367
50	12.688	33.758	25.493
75	9.755	33.809	26.063

STATION US08474
LATITUDE 42-18.9 N
LONGITUDE 140-30.5 E
DEPTH (m) 94

Press.	Temp.	Salinity	Sigma-T
5	14.447	33.648	25.048
10	14.446	33.648	25.049
20	14.472	33.654	25.048
30	14.579	33.713	25.071
40	14.280	33.846	25.237
50	12.978	33.839	25.498
75	7.993	33.700	26.254

STATION US08475
LATITUDE 42-29.1 N
LONGITUDE 140-31.2 E
DEPTH (m) 74

Press.	Temp.	Salinity	Sigma-T
5	14.344	33.729	25.133
10	14.323	33.732	25.140
20	14.351	33.749	25.147
30	14.293	33.862	25.246
40	12.983	33.912	25.554
50	11.859	33.878	25.745

STATION US08476
LATITUDE 42-23.4 N
LONGITUDE 140-42.4 E
DEPTH (m) 62

Press.	Temp.	Salinity	Sigma-T
5	14.154	33.547	25.032
10	14.176	33.631	25.093
20	14.176	33.652	25.109
30	14.191	33.691	25.135
40	12.089	33.698	25.561
50	11.567	33.903	25.818

STATION US08477
LATITUDE 42-23.0 N
LONGITUDE 140-31.2 E
DEPTH (m) 96

Press.	Temp.	Salinity	Sigma-T
5	14.134	33.775	25.213
10	14.151	33.784	25.216
20	14.164	33.783	25.213
30	14.247	33.819	25.223
40	14.258	33.874	25.263
50	11.773	33.753	25.663
75	6.336	33.495	26.320

7

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

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
Under Graduate Students :	Department of Marine Biological 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 157)

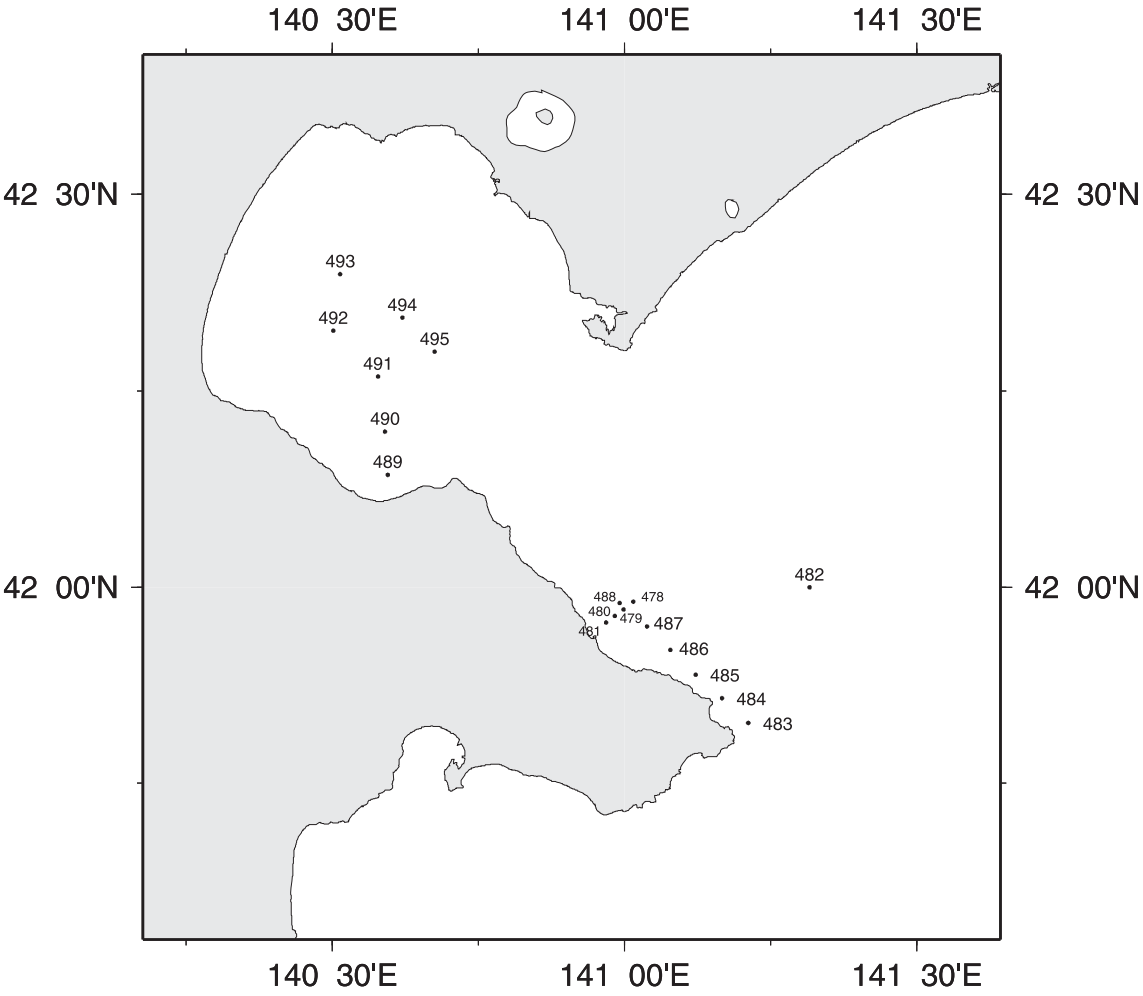

Figure 2: Oceanographic stations (Cruise 158)

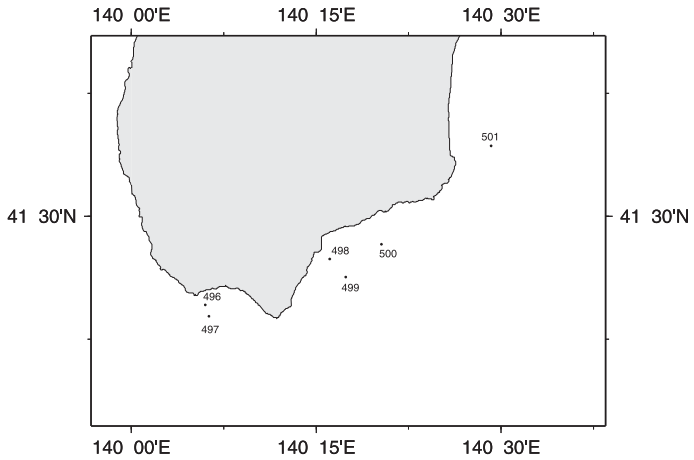

Figure 3: Oceanographic stations (Cruise 159)

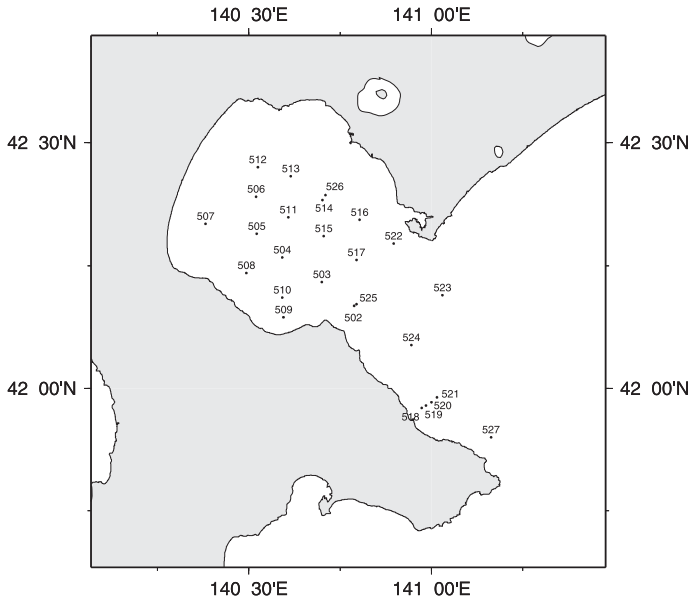

Figure 4: Oceanographic stations (Cruise 160)

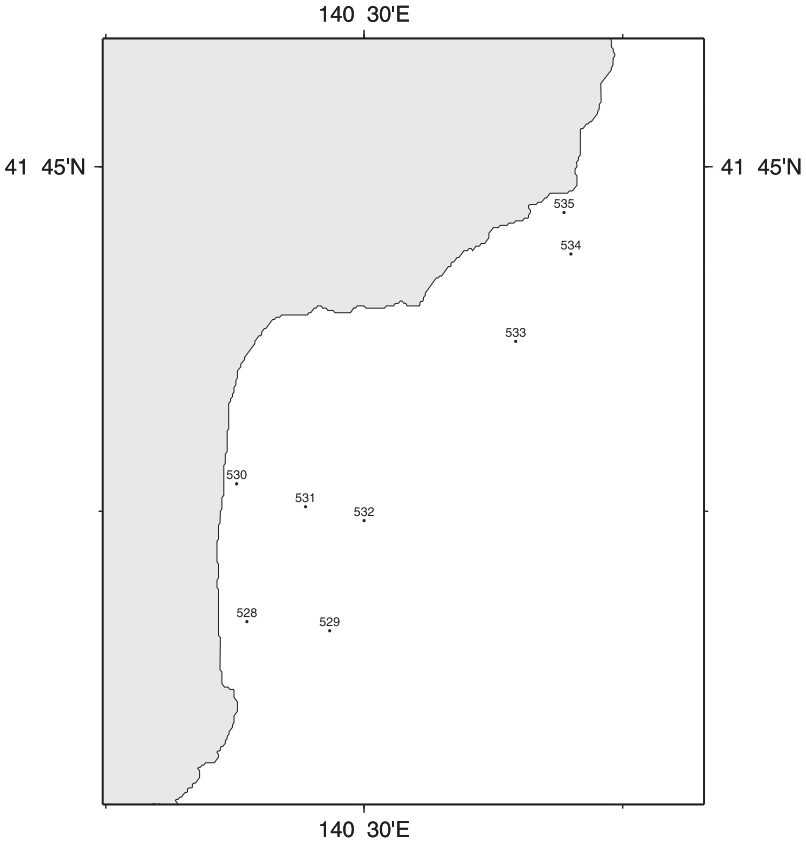

Table 1: List of oceanographic stations

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

Press.	Temp.	Salinity	Sigma-T
5	12.925	33.954	25.597
10	12.849	34.007	25.654
20	12.633	34.026	25.711
30	11.477	33.963	25.882
40	10.812	34.015	26.042
50	10.799	34.118	26.125
75	8.803	33.955	26.331

STATION US08479
LATITUDE 41-58.3 N
LONGITUDE 140-59.9 E
DEPTH (m) 89

Press.	Temp.	Salinity	Sigma-T
5	12.843	34.031	25.674
10	12.776	34.040	25.693
20	12.609	34.021	25.712
30	9.876	33.960	26.161
40	9.683	34.051	26.264
50	9.437	34.042	26.298
75	7.413	33.830	26.440

STATION US08480
LATITUDE 41-57.8 N
LONGITUDE 140-59.0 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	12.932	34.003	25.634
10	12.837	34.021	25.667
20	12.594	34.017	25.711
30	9.952	34.027	26.200
40	9.176	34.000	26.307
50	8.914	33.997	26.346
75	6.164	33.725	26.525

STATION US08481
LATITUDE 41-57.3 N
LONGITUDE 140-58.1 E
DEPTH (m) 78

Press.	Temp.	Salinity	Sigma-T
5	13.008	34.019	25.631
10	12.893	34.022	25.656
20	12.807	34.035	25.683
30	11.664	33.951	25.837
40	9.848	34.022	26.214
50	8.673	33.940	26.339
75	4.901	33.620	26.592

STATION US08482
LATITUDE 42-00.0 N
LONGITUDE 141-19.0 E
DEPTH (m) 292

Press.	Temp.	Salinity	Sigma-T
5	12.972	34.113	25.711
10	12.973	34.110	25.709
20	12.940	34.110	25.716
30	12.904	34.107	25.720
40	12.773	34.099	25.740
50	12.744	34.100	25.747
75	12.655	34.093	25.759
100	11.583	34.056	25.934
125	8.485	33.951	26.377
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 US08483
LATITUDE 41-49.6 N
LONGITUDE 141-12.7 E
DEPTH (m) 136

Press.	Temp.	Salinity	Sigma-T
5	12.478	33.996	25.718
10	12.486	34.003	25.721
20	11.792	33.956	25.817
30	11.221	34.011	25.966
40	10.875	34.040	26.050
50	10.521	34.104	26.162
75	9.537	34.013	26.258
100	8.996	33.980	26.320
125	8.231	33.866	26.349

STATION US08484
LATITUDE 41-51.5 N
LONGITUDE 141-10.0 E
DEPTH (m) 106

Press.	Temp.	Salinity	Sigma-T
5	12.442	34.006	25.733
10	12.421	34.009	25.739
20	12.454	34.046	25.761
30	10.772	33.907	25.965
40	10.710	33.973	26.027
50	10.748	33.976	26.023
75	8.556	33.908	26.333
100	8.097	33.886	26.385

STATION US08485
LATITUDE 41-53.3 N
LONGITUDE 141-07.3 E
DEPTH (m) 93

Press.	Temp.	Salinity	Sigma-T
5	12.266	34.007	25.767
10	12.259	34.011	25.772
20	12.263	34.015	25.774
30	12.237	34.011	25.776
40	11.759	33.945	25.815
50	9.912	33.937	26.136
75	8.160	33.879	26.370

STATION US08486
LATITUDE 41-55.2 N
LONGITUDE 141-04.7 E
DEPTH (m) 109

Press.	Temp.	Salinity	Sigma-T
5	12.482	34.028	25.742
10	12.443	34.031	25.752
20	12.430	34.032	25.755
30	12.309	34.015	25.765
40	11.581	34.023	25.908
50	10.419	33.938	26.051
75	7.992	33.855	26.376
100	6.768	33.797	26.502

STATION US08487
LATITUDE 41-57.0 N
LONGITUDE 141-02.3 E
DEPTH (m) 104

Press.	Temp.	Salinity	Sigma-T
5	12.201	33.844	25.653
10	12.171	33.843	25.658
20	11.922	33.801	25.679
30	11.732	34.007	25.868
40	9.882	33.836	26.063
50	8.816	33.920	26.302
75	7.363	33.822	26.441
100	6.757	33.793	26.501

STATION US08488
LATITUDE 41-58.8 N
LONGITUDE 140-59.5 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	12.248	33.855	25.653
10	12.056	33.820	25.662
20	10.810	33.869	25.929
30	9.547	33.924	26.187
40	8.779	33.886	26.281
50	7.839	33.859	26.402
75	7.475	33.854	26.450

STATION US08489
LATITUDE 42-08.6 N
LONGITUDE 140-35.7 E
DEPTH (m) 63

Press.	Temp.	Salinity	Sigma-T
5	12.493	32.671	24.690
10	12.408	33.901	25.658
20	12.297	33.922	25.695
30	12.308	33.929	25.699
40	9.255	33.738	26.089
50	8.389	33.767	26.247

STATION US08490
LATITUDE 42-11.9 N
LONGITUDE 140-35.4 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	12.391	33.872	25.638
10	12.401	33.878	25.641
20	12.346	33.897	25.667
30	11.959	33.900	25.743
40	11.019	33.699	25.759
50	9.720	33.864	26.112
75	5.979	33.646	26.485

STATION US08491
LATITUDE 42-16.1 N
LONGITUDE 140-34.7 E
DEPTH (m) 92

Press.	Temp.	Salinity	Sigma-T
5	12.531	33.861	25.603
10	12.531	33.863	25.604
20	12.516	33.862	25.607
30	12.489	33.861	25.611
40	12.550	33.948	25.667
50	12.618	33.976	25.675
75	7.736	33.832	26.395

STATION US08492
LATITUDE 42-19.6 N
LONGITUDE 140-30.1 E
DEPTH (m) 92

Press.	Temp.	Salinity	Sigma-T
5	12.430	33.859	25.621
10	12.411	33.854	25.620
20	12.349	33.872	25.646
30	12.144	33.913	25.717
40	11.250	33.840	25.827
50	9.066	33.881	26.232
75	8.548	33.906	26.332

STATION US08493
LATITUDE 42-23.9 N
LONGITUDE 140-30.8 E
DEPTH (m) 95

Press.	Temp.	Salinity	Sigma-T
5	11.942	33.822	25.685
10	11.898	33.823	25.694
20	11.860	33.823	25.702
30	10.531	33.698	25.844
40	8.618	33.911	26.325
50	7.997	33.878	26.393
75	5.953	33.662	26.501

STATION US08494
LATITUDE 42-20.6 N
LONGITUDE 140-37.2 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	12.520	33.910	25.643
10	12.521	33.911	25.643
20	12.546	33.919	25.645
30	12.555	33.923	25.646
40	12.561	33.932	25.652
50	12.666	33.963	25.656
75	7.890	33.782	26.334

STATION US08495
LATITUDE 42-18.0 N
LONGITUDE 140-40.5 E
DEPTH (m) 76

Press.	Temp.	Salinity	Sigma-T
5	12.508	33.861	25.607
10	12.509	33.861	25.607
20	12.501	33.862	25.609
30	12.491	33.863	25.612
40	12.488	33.870	25.618
50	12.484	33.881	25.627
75	9.052	33.929	26.271

STATION US08496
LATITUDE 41-24.6 N
LONGITUDE 140-06.0 E
DEPTH (m) 52

Press.	Temp.	Salinity	Sigma-T
5	15.314	33.963	25.104
10	15.301	33.960	25.104
20	15.123	33.977	25.157
30	15.022	33.991	25.189
40	15.015	33.995	25.194
50	15.015	33.995	25.194

STATION US08497
LATITUDE 41-23.9 N
LONGITUDE 140-06.3 E
DEPTH (m) 84

Press.	Temp.	Salinity	Sigma-T
5	15.609	33.921	25.006
10	15.613	33.917	25.002
20	15.553	33.916	25.014
30	15.257	33.952	25.108
40	15.045	33.998	25.190
50	14.977	34.013	25.216

STATION US08498
LATITUDE 41-27.4 N
LONGITUDE 140-16.1 E
DEPTH (m) 32

Press.	Temp.	Salinity	Sigma-T
5	13.749	34.060	25.513
10	13.749	34.074	25.523
20	13.697	34.078	25.538

STATION US08499
LATITUDE 41-26.3 N
LONGITUDE 140-17.4 E
DEPTH (m) 69

Press.	Temp.	Salinity	Sigma-T
5	13.891	34.089	25.506
10	13.876	34.093	25.512
20	13.795	34.095	25.531
30	13.774	34.098	25.537
40	13.750	34.102	25.545
50	13.699	34.101	25.555

STATION US08500
LATITUDE 41-28.3 N
LONGITUDE 140-20.3 E
DEPTH (m) 64

Press.	Temp.	Salinity	Sigma-T
5	14.279	34.060	25.402
10	14.279	34.060	25.402
20	14.224	34.065	25.417
30	14.187	34.069	25.428
40	14.182	34.070	25.430
50	14.171	34.071	25.434

STATION US08501
LATITUDE 41-34.3 N
LONGITUDE 140-29.2 E
DEPTH (m) 36

Press.	Temp.	Salinity	Sigma-T
5	14.215	34.027	25.390
10	14.219	34.025	25.388
20	14.120	33.996	25.386
30	14.028	34.022	25.426

STATION US08502
LATITUDE 42-10.1 N
LONGITUDE 140-47.3 E
DEPTH (m) 94

Press.	Temp.	Salinity	Sigma-T
5	10.837	34.081	26.089
10	10.843	34.076	26.084
20	10.285	33.914	26.055
30	10.119	33.999	26.150
40	10.062	33.982	26.146
50	9.617	33.924	26.176
75	7.392	33.793	26.413

STATION US08503
LATITUDE 42-13.0 N
LONGITUDE 140-42.0 E
DEPTH (m) 90

Press.	Temp.	Salinity	Sigma-T
5	9.897	33.989	26.180
10	9.895	33.993	26.183
20	9.892	33.997	26.187
30	9.883	34.003	26.193
40	9.796	33.991	26.198
50	9.748	33.986	26.202
75	9.307	33.959	26.254

STATION US08504
LATITUDE 42-16.0 N
LONGITUDE 140-35.5 E
DEPTH (m) 92

Press.	Temp.	Salinity	Sigma-T
5	9.697	33.973	26.201
10	9.694	33.973	26.201
20	9.680	33.973	26.204
30	9.683	33.975	26.204
40	9.685	33.975	26.204
50	9.683	33.974	26.204
75	9.670	33.971	26.204

STATION US08505
LATITUDE 42-18.9 N
LONGITUDE 140-31.3 E
DEPTH (m) 94

Press.	Temp.	Salinity	Sigma-T
5	9.400	33.868	26.168
10	9.390	33.876	26.175
20	9.410	33.888	26.181
30	9.405	33.887	26.182
40	9.380	33.883	26.182
50	9.316	33.911	26.215
75	8.058	33.883	26.388

STATION US08506
LATITUDE 42-23.4 N
LONGITUDE 140-31.2 E
DEPTH (m) 96

Press.	Temp.	Salinity	Sigma-T
5	9.606	33.925	26.178
10	9.725	33.965	26.190
20	9.681	33.966	26.198
30	9.671	33.966	26.200
40	9.666	33.967	26.202
50	9.650	33.968	26.205
75	7.058	33.779	26.449

STATION US08507
LATITUDE 42-20.1 N
LONGITUDE 140-22.9 E
DEPTH (m) 54

Press.	Temp.	Salinity	Sigma-T
5	9.400	33.762	26.085
10	9.691	33.910	26.152
20	9.720	33.935	26.168
30	9.695	33.937	26.173
40	9.602	33.931	26.184
50	9.372	33.916	26.210

STATION US08508
LATITUDE 42-14.1 N
LONGITUDE 140-29.6 E
DEPTH (m) 76

Press.	Temp.	Salinity	Sigma-T
5	9.407	33.732	26.060
10	9.626	33.945	26.191
20	9.706	33.977	26.202
30	9.714	33.984	26.207
40	9.712	33.985	26.208
50	9.726	33.996	26.214

STATION US08509
LATITUDE 42-08.7 N
LONGITUDE 140-35.7 E
DEPTH (m) 63

Press.	Temp.	Salinity	Sigma-T
5	8.869	33.455	25.929
10	9.727	33.930	26.162
20	9.799	33.978	26.187
30	9.714	33.971	26.196
40	9.698	33.977	26.204
50	9.707	33.984	26.207

STATION US08510
LATITUDE 42-11.1 N
LONGITUDE 140-35.5 E
DEPTH (m) 80

Press.	Temp.	Salinity	Sigma-T
5	9.922	33.954	26.148
10	9.956	34.004	26.182
20	9.959	34.003	26.181
30	9.917	34.003	26.187
40	9.792	33.997	26.203
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

Press.	Temp.	Salinity	Sigma-T
5	9.785	33.946	26.165
10	9.796	33.961	26.175
20	9.795	33.960	26.174
30	9.797	33.960	26.174
40	9.796	33.959	26.173
50	9.775	33.955	26.174
75	9.591	33.948	26.199

STATION US08512
LATITUDE 42-27.0 N
LONGITUDE 140-31.5 E
DEPTH (m) 75

Press.	Temp.	Salinity	Sigma-T
5	9.578	33.946	26.199
10	9.578	33.961	26.211
20	9.573	33.960	26.211
30	9.574	33.960	26.211
40	9.572	33.960	26.211
50	9.571	33.960	26.211

STATION US08513
LATITUDE 42-25.9 N
LONGITUDE 140-36.9 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	9.924	33.972	26.162
10	9.922	33.971	26.162
20	9.914	33.970	26.162
30	9.913	33.970	26.162
40	9.889	33.969	26.165
50	9.857	33.967	26.169
75	9.755	33.963	26.183

STATION US08514
LATITUDE 42-23.0 N
LONGITUDE 140-42.1 E
DEPTH (m) 65

Press.	Temp.	Salinity	Sigma-T
5	9.756	33.965	26.185
10	9.738	33.950	26.176
20	9.706	33.947	26.179
30	9.680	33.944	26.181
40	9.527	33.927	26.193
50	9.513	33.932	26.200

STATION US08515
LATITUDE 42-18.6 N
LONGITUDE 140-42.3 E
DEPTH (m) 66

Press.	Temp.	Salinity	Sigma-T
5	9.719	33.926	26.161
10	9.718	33.946	26.176
20	9.677	33.942	26.180
30	9.647	33.938	26.182
40	9.630	33.936	26.183
50	9.596	33.932	26.186

STATION US08516
LATITUDE 42-20.6 N
LONGITUDE 140-48.2 E
DEPTH (m) 55

Press.	Temp.	Salinity	Sigma-T
5	9.253	33.943	26.250
10	9.203	33.940	26.255
20	9.083	33.930	26.267
30	8.945	33.931	26.289
40	8.916	33.932	26.295
50	8.458	33.879	26.325

STATION US08517
LATITUDE 42-15.7 N
LONGITUDE 140-47.7 E
DEPTH (m) 71

Press.	Temp.	Salinity	Sigma-T
5	10.780	34.037	26.065
10	10.805	34.065	26.083
20	10.410	34.032	26.126
30	9.967	34.001	26.177
40	9.790	33.999	26.205
50	9.571	33.995	26.239

STATION US08518
LATITUDE 41-57.6 N
LONGITUDE 140-58.4 E
DEPTH (m) 81

Press.	Temp.	Salinity	Sigma-T
5	11.229	33.901	25.878
10	11.489	34.047	25.944
20	11.369	34.068	25.982
30	11.234	34.081	26.017
40	11.164	34.064	26.017
50	10.178	33.974	26.121
75	8.814	33.873	26.265

STATION US08519
LATITUDE 41-57.9 N
LONGITUDE 140-59.1 E
DEPTH (m) 85

Press.	Temp.	Salinity	Sigma-T
5	11.235	34.054	25.996
10	11.361	34.067	25.984
20	11.194	34.077	26.022
30	11.164	34.081	26.030
40	11.159	34.082	26.032
50	11.029	34.056	26.035
75	9.301	33.926	26.229

STATION US08520
LATITUDE 41-58.3 N
LONGITUDE 141-00.0 E
DEPTH (m) 90

Press.	Temp.	Salinity	Sigma-T
5	11.145	34.083	26.035
10	11.163	34.080	26.029
20	11.168	34.078	26.027
30	11.156	34.077	26.028
40	11.126	34.075	26.033
50	11.045	34.074	26.047
75	9.916	33.935	26.134

STATION US08521
LATITUDE 41-58.9 N
LONGITUDE 141-00.9 E
DEPTH (m) 96

Press.	Temp.	Salinity	Sigma-T
5	10.970	33.990	25.994
10	11.124	34.065	26.025
20	11.111	34.062	26.025
30	11.116	34.064	26.025
40	11.114	34.064	26.026
50	10.931	34.055	26.052
75	10.266	33.939	26.079

STATION US08522
LATITUDE 42-17.7 N
LONGITUDE 140-53.8 E
DEPTH (m) 57

Press.	Temp.	Salinity	Sigma-T
5	8.914	33.947	26.307
10	8.919	33.947	26.306
20	8.918	33.946	26.306
30	8.916	33.947	26.307
40	8.913	33.947	26.307
50	8.915	33.948	26.308

STATION US08523
LATITUDE 42-11.4 N
LONGITUDE 141-01.8 E
DEPTH (m) 79

Press.	Temp.	Salinity	Sigma-T
5	9.193	33.992	26.298
10	9.202	33.984	26.290
20	9.107	33.961	26.287
30	8.974	33.941	26.293
40	8.918	33.934	26.297
50	8.904	33.932	26.297
75	8.770	33.921	26.310

STATION US08524
LATITUDE 42-05.3 N
LONGITUDE 140-56.7 E
DEPTH (m) 84

Press.	Temp.	Salinity	Sigma-T
5	10.149	33.868	26.043
10	10.219	33.997	26.132
20	10.216	33.992	26.128
30	10.211	33.990	26.127
40	10.192	33.989	26.130
50	10.181	33.988	26.131
75	9.946	33.963	26.151

STATION US08525
LATITUDE 42-10.3 N
LONGITUDE 140-47.7 E
DEPTH (m) 91

Press.	Temp.	Salinity	Sigma-T
5	9.992	33.577	25.842
10	10.234	34.043	26.165
20	10.242	34.040	26.161
30	10.245	34.040	26.161
40	10.251	34.039	26.159
50	9.509	33.939	26.205
75	9.099	33.948	26.279

STATION US08526
LATITUDE 42-23.6 N
LONGITUDE 140-42.6 E
DEPTH (m) 63

Press.	Temp.	Salinity	Sigma-T
5	9.242	33.881	26.203
10	9.295	33.954	26.252
20	9.287	33.953	26.253
30	9.231	33.947	26.257
40	9.130	33.936	26.264
50	9.097	33.934	26.268

STATION US08527
LATITUDE 41-54.0 N
LONGITUDE 141-09.8 E
DEPTH (m) 184

Press.	Temp.	Salinity	Sigma-T
5	12.139	33.924	25.727
10	12.130	33.923	25.728
20	11.475	33.907	25.838
30	11.482	33.986	25.898
40	9.533	33.614	25.947
50	8.647	33.584	26.065
75	7.881	33.501	26.114
100	8.954	33.855	26.229

STATION US08528
LATITUDE 41-35.1 N
LONGITUDE 140-26.6 E
DEPTH (m) 14

Press.	Temp.	Salinity	Sigma-T
5	12.325	33.769	25.572
10	12.323	33.764	25.568

STATION US08529
LATITUDE 41-34.9 N
LONGITUDE 140-29.0 E
DEPTH (m) 32

Press.	Temp.	Salinity	Sigma-T
5	12.607	33.961	25.666
10	12.608	33.960	25.664
20	12.610	33.960	25.664

STATION US08530
LATITUDE 41-38.1 N
LONGITUDE 140-26.3 E
DEPTH (m) 15

Press.	Temp.	Salinity	Sigma-T
5	12.459	33.781	25.555

STATION US08531
LATITUDE 41-37.6 N
LONGITUDE 140-28.3 E
DEPTH (m) 22

Press.	Temp.	Salinity	Sigma-T
5	12.563	33.949	25.665
10	12.563	33.950	25.666

STATION US08532
LATITUDE 41-37.3 N
LONGITUDE 140-30.0 E
DEPTH (m) 31

Press.	Temp.	Salinity	Sigma-T
5	12.537	33.923	25.650
10	12.539	33.923	25.650
20	12.540	33.923	25.649

STATION US08533
LATITUDE 41-41.2 N
LONGITUDE 140-34.4 E
DEPTH (m) 42

Press.	Temp.	Salinity	Sigma-T
5	12.623	33.935	25.642
10	12.631	33.932	25.639
20	12.866	34.023	25.662
30	12.842	34.030	25.673

STATION US08534
LATITUDE 41-43.1 N
LONGITUDE 140-36.0 E
DEPTH (m) 36

Press.	Temp.	Salinity	Sigma-T
5	12.224	33.730	25.560
10	12.457	33.896	25.644
20	12.544	33.901	25.631
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