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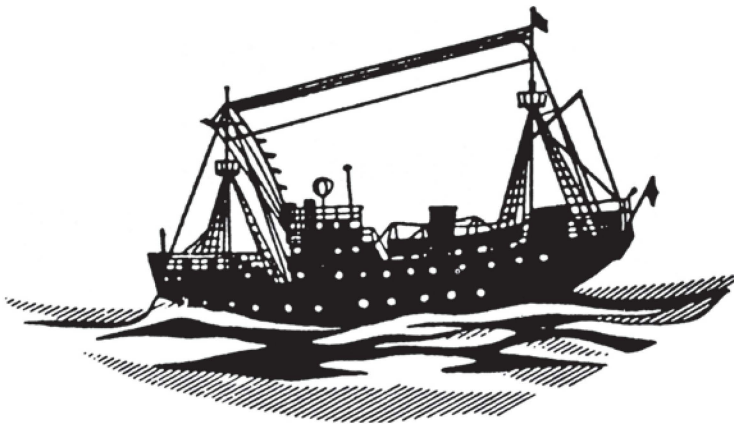
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DATA RECORD
OF
OCEANOGRAPHIC OBSERVATIONS AND
EXPLORATORY FISHING

No. 53

海 洋 調 査 漁 業 試 験 要 報

第 53 号



FACULTY OF FISHERIES SCIENCES,
GRADUATE SCHOOL OF FISHERIES SCIENCES,
SCHOOL OF FISHERIES SCIENCES, HOKKAIDO UNIVERSITY

Hakodate, Japan
October 2010

北海道大学大学院水産科学研究院・大学院水産科学院・水産学部

函 館 市

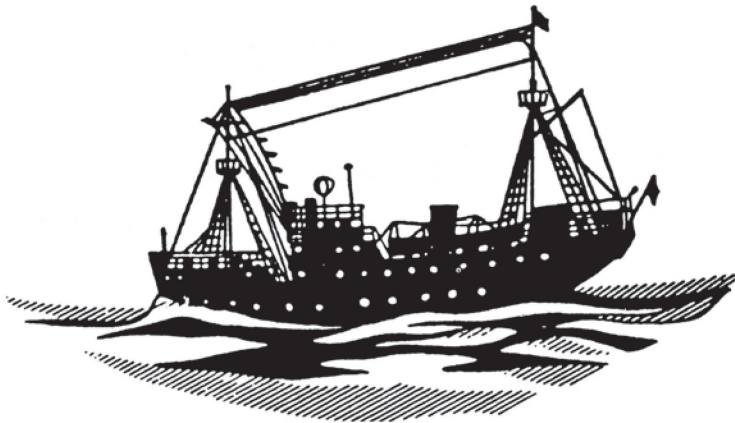
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NOTICE

This publication is being undertaken for the sake of making available to interested persons, as soon as possible, some preliminary data derived from oceanographic, biological or exploratory fishing researchers carried out on the regular or occasional cruises of the training ships of the Faculty of Fisheries, Hokkaido University.

The priority of these data belongs to the research scientists and officers on board. Please ask for permission to the Chief Editor of this Volume, when you quote the data from this "Data Record".

本学部練習船を用いて行われた海洋観測，生物調査，漁業試験の結果が，各研究担当者によって研究論文として纏められ，印刷公表されるまでにはかなりの時日を要し，且研究論文には個々の測定値が表示されない場合が多いことを考慮し，練習船の調査航海毎に調査成果を本要報として逐次刊行し，各方面の参考に供することとした。

本要報のデータは乗船研究者並びに士官に帰属している。本報に掲載されたデータを引用する場合は編集委員長に許可を求められたい。

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2)Vessel personnel	205
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2. Longline research

Scientific name	English name	Japanese name
Mollusca		
Octopoda	Octopus	(Tako)
Pisces		
Lamniformes	Sharks	(Same)
Alepisaurus ferox Lowe	Longnose lancetfish	Mizuuo
Rajiformes	Rays	(Ei)
Coryphaenidae	Dolphins	(Shiira)
Taractichthys steindachneri (Döderlein)	Sickle pomfret	Hirejiromanzaiuo
Tetrapturus audax (Philippi)	Striped marlin	Makajiki
Makaira mazara (Jordan et Snyder)	Black marlin	Kurokajiki
Xiphias gladius Linnaeus	Swordfish	Mekajiki
Acanthocybium solandri (Cuvier)	Wahoo	Kamasusawara
Euthynnus pelamis (Linnaeus)	Skipjack tuna	Katsuo
Thunnus albacares (Bonnaterre)	Yellowfin tuna	Kihada
Thunnus obesus (Lowe)	Bigeye tuna	Mebachi
Gempylus serpens Cuvier	Snake mackerel	Kurotachikamasu
Reptilia		
Cheloniidae	Turtles	(Umigame)

EXPLANATION OF HEADINGS

1. Oceanographic data

The Practical Salinity scale, 1978 and the new International Equation of State of Seawater, 1980 have been used in oceanographic data processing.

DATA	Year shown in tens and units only, month and day in numerals by G.M.T
TIME	Hour and tens of hour in G.M.T
S.M.T	Ship's mean time
DEPTH	Depth to the bottom by echosounder but reading only without correction
COL.	Water color in Forel-Ule scale
TR.	Transparency in meters with Secchi disc
S.T.	Surface temperature
T.D.	Time Difference between Greenwich Mean Time (G.M.T.) and S.M.T.
SEA	Wave direction in a scale of 36 points and sea state in WMO Code 3700
SWELL	Direction in 36 points and amount in JMA Code for swell (Douglas scale)
WIND	Direction in 36 points and wind force in Beaufort scale
AIR TEMP.	Air temperatures recorded from dry and wet bulb thermometers in °C
BAR.	Barometric pressure in hectopascal to the tenth of degree
WEATHER	Weather in WMO Code 4501 r: rain d: drizzling rain f: fog o: 100% clouded c: 75-99% clouded bc: 25-75% clouded b: 0-25% clouded
SIG-T	Sigma-t is defined as $\sigma_t = \rho_{s,t,0} - 1,000$ [kg/m ³]

2. Biological Characteristics of Fishes

No	Number of research operation
Mesh	Mesh size of net used in stretched mesh
B	Research remarks for surface long-line fishing
SPECIES	Fish species
F.L.	Fork length
B.L.	Body length
M.L.	Mantle length
B.W.	Body weight
SEX	F:Female, M:Male, B:Bisexual
G.W.	Gonad weight
AGE	Designation according to Gilbert - Rich's formula (Koo, 1962)

SCIENTIFIC NAME AND COMMON NAME

1. Drift gillnet research

Scientific name	English name	Japanese name
Mollusca		
COLEOIDEA		(Ika)
<i>Todarodes pacificus</i> Steenstrup	Japanese common squid	Surumeika
<i>Onychoteuthis borealijaponica</i> Okada	Boreal clubhook squid	Tsumeika
<i>Gonatopsis borealis</i> Sasaki	Eight-armed squid	Takoika
<i>Ommastrephes bartrami</i> (Lesueur)	Flying squid	Akaika
<i>Symplectoteuthis luminosa</i> Sasaki	Luminous flying squid	Sujiika
Pisces		
<i>Prionace glauca</i> (Linnaeus)	Blue shark	Yoshikirizame
<i>Isurus oxyrinchus</i> Rafinesque	Atlantic mako shark	Aozame
<i>Lamna ditropis</i> Hubbs et Follett	Salmon shark	Nezumizame
<i>Squalus acanthias</i> Linnaeus	Spiny dogfish	Aburatsunoame
<i>Isistius brasiliensis</i> (Quoy et Gaimard)	Cigar shark	Darumazame
<i>Echeneis naucrates</i> Linnaeus	Sharksucker	Kobanzame
<i>Sardinops melanostictus</i> (Temminck et Schlegel)	Japanese scaled sardine	Maiwashi
<i>Engraulis japonica</i> (Houttuyn)	Japanese anchovy	Katakutiiwashi
<i>Oncorhynchus gorbuscha</i> (Walbaum)	Pink salmon	Karafutomasu
<i>Oncorhynchus kisutch</i> (Walbaum)	Coho salmon	Ginzake
<i>Oncorhynchus keta</i> (Walbaum)	Chum salmon	Shirozake
<i>Oncorhynchus tshawytscha</i> (Walbaum)	Chinook salmon	Masunosuke
<i>Diaphus watasei</i> Jordan et Starks	Lantern fishes	Hadakaiwashi
<i>Anotopterus pharao</i> Zugmayer	Daggertooth	Mizuoodamashi
<i>Alepisaurus ferox</i> Lowe	Pacific lancetfish	Mizuo
<i>Cololabis saira</i> (Brevoort)	Pacific saury	Sanma
Exocoetidae	Flyingfishes	(Tobiuo)
<i>Pleurogrammus monopterygius</i> (Pallas)	Atka mackerel	Kitanohokke
Caranginae	Carangidae	(Aji)
<i>Naucrates ductor</i> (Linnaeus)	Pilotfish	Burimodoki
<i>Seriola lalandi</i> Valenciennes	Yellowtail	Hiramasa
<i>Seriola dumerili</i> (RissO)	Amberjack	Kanpati
<i>Pseudocaranx dentex</i> (Bloch et Schneider)	Striped jack	Shimaaji
<i>Coryphaena equiselis</i> Linnaeus	Pompano dolphin	Ebisusiira
<i>Coryphaena hippurus</i> Linnaeus	Dolphinfish	Siira
<i>Brama japonica</i> Hilgendorf	Pacific pomfret	Shimagatsuo
Taractes	Taractes sp.	(Manzaiuo)
<i>Tetrapturus audax</i> (Philippi)	Striped marlin	Makajiki
<i>Tetrapturus angustirostris</i> Tanaka	Shortbill spearfish	Fuuraikajiki
<i>Xiphias gladius</i> Linnaeus	Swordfish	Mekajiki
<i>Scomber japonicus</i> Houttuyn	Chub mackerel	Masaba
<i>Scomber australasicus</i> Cuvier	Slimy mackerel	Gomasaba
Auxis	Auxis sp.	(Soudagatsuo)
<i>Katsuwonus pelamis</i> (Linnaeus)	Skipjack tuna	Katsuo
<i>Thunnus alalunga</i> (Bonnaterre)	Albacore	Bintyou
<i>Gempylus serpens</i> Cuvier	Snake mackerel	Kurotatikamasu
<i>Tetragonurus cuvieri</i> Risso	Smalleye squaretail	Dokuuroko
<i>Ichthyos lockingtoni</i> Jordan et Gilbert	Black ruffe	Kuromedai
<i>Hyperoglyphe japonica</i> (Doderlein)	Japanese butterfish	Medai
<i>Icosteus enigmaticus</i> Lockington	Ragfish	Irezumikonnyakuaji
<i>Aluterus monoceros</i> (Linnaeus)	Unicorn filefish	Usubahagi
<i>Aluterus scriptus</i> Osbeck	Figured scriptus	Soushihagi
<i>Gasterosteus aculeatus</i> Linnaeus	Three-spined stickleback	Itoyo
<i>Mola mola</i> (Linnaeus)	Southern sunfish	Manbou
Aves		
<i>Oceanodroma leucorhoa</i>	Leach's Fork-tailed Petrel	Shijiroumitsubame
<i>Brachyramphus brevirostris</i>	Kittlitz's Murrelet	Kobashiumisuzume
<i>Puffinus tenuirostris</i>	Short-tailed shearwater	Hashibosomizunagi
<i>Puffinus griseus</i>	Grey Fork-tailed Petrel	Hairomizunagidori
<i>Fratercula corniculata</i>	Horned puffin	Tsunomedori
<i>Lunda cirrhata</i>	Tufted puffin	Etopirika
Mammalia		
<i>Delphinus delphis</i> Linnaeus	Common dolophin	Mairuka
<i>Phocoenoides dalli</i> True	Dall's porpoise	Ishiiruka

PART I

OSHORO MARU CRUISES

FROM JANUARY TO DECEMBER 2009

I. Crew List

Captain:		Toshimi Meguro (Cruise - 199)
		Shogo Takagi (Cruise 200 -)
Crew:	Chief Officer	Yoshiyuki Kajiwara (Cruise - 199)
		Yoshihiko Kamei (Cruise 200 -)
	First Officer	Shogo Takagi (Cruise - 199)
		Keiichiro Sakaoka (Cruise 202 -)
	Second Officer	Yoshihiko Kamei (Cruise - 199)
		Keiichiro Sakaoka (Cruise 200 - 201)
		Naoki Hoshi (Cruise 202 -)
	Jr.Second Officer	Keiichiro Sakaoka (Cruise - 199)
	Third Officer	Naoki Hoshi (Cruise 199 - 201)
		Takuzo Abe (Cruise 202 -)
	Chief Engineer	Junichi Kimura
	First Engineer	Fumio Fujimoto
	Second Engineer	Kazuya Sawanaka
	Jr. Second Engineer	Jumpei Shimura
	Chief Radio Officer	Akio Kamijo
	Second Radio Officer	Satoshi Ishigaki
	Boatswain	Yoshiharu Matsui
	Jr. Boatswain	Toshiharu Yosoe
	Quartermaster	Sen Sunakoma
	Quartermaster	Yoshihiro Onodera
	Quartermaster	Naoyuki Eda
	Quartermaster	Tadashi Mishima
	Sailor	Daisuke Sasaki (Cruise 200 -)
	Sailor	Shota Hagiwara
	Sailor	Takahiro Kanazawa(Cruise - 199)
	Sailor	Shunpei Komatsu(Cruise - 206)
	No.1 Oiler	Shuiti Hasegawa
	Junior No.1 Oiler	Kohya Nakamura
	Oiler	Takuya Takano
	Oiler	Tohru Murakami
	Fireman	Keisuke Shindo
	Fireman	Takaaki Arakawa
	Chief Steward	Yoshinori Sawada
	Jr. Chief Steward	Kazuhiro Ikeda
	Head Steward	Kazuo Ishikawa
	Head Steward	Hiroshi Nakamura

II. Particulars

Length (o.a.)	72.85 m
Length (p.p.)	66.00 m
Breadth (mid)	12.60 m
Depth (mid) Upper DK	5.70 m
Gross tonnage (Domestic)	1,396.00 tons
International gross tonnage	1,792.00 tons
Main engine	2,353 kW
Call sign	JDVA

THE “OSHORU MARU” CRUISE 197
TO THE OYASHIO REGION

IN FEBRUARY 2009

1. Cruise Itinerary

Cruise 197

Departure from Hakodate	Feb.	17	2009
Start hydrographic research (OS09001)		18	
Finish hydrographic research (OS09002)		19	
Return to Hakodate		20	

Total coverage 595.1 miles

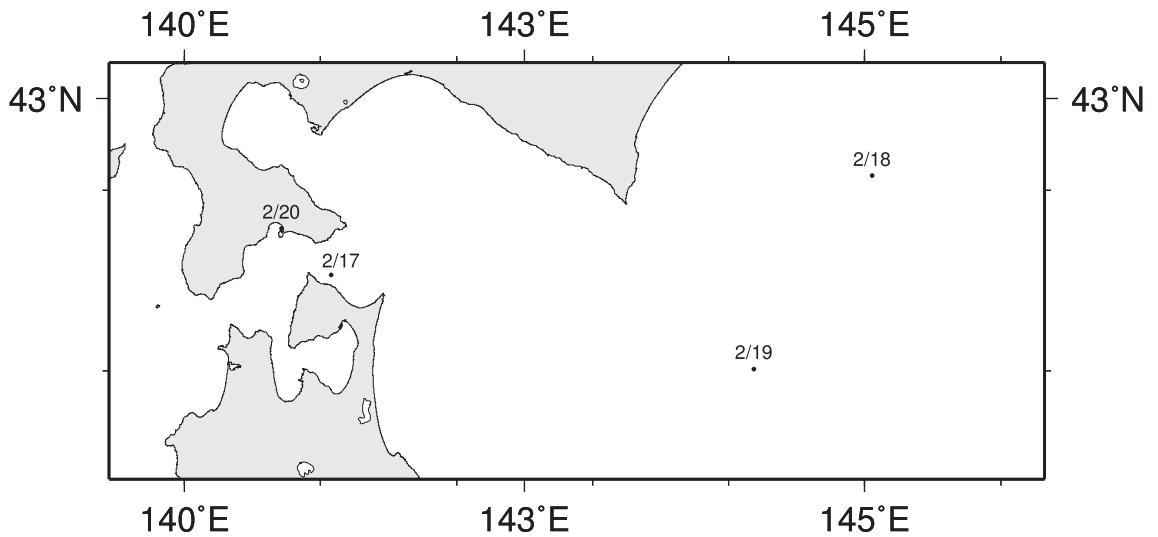


Figure 1: Noon position

2. Vessel Personnel

Captain:		Professor	Toshimi Meguro
Crew :	First Officer	Associate Professor	Shogo Takagi
	Second Officer	Instructor	Yoshihiko Kamei
	Jr. Second Officer	Instructor	Keiichiro Sakaoka
	Chief Engineer	Instructor	Jyunichi Kimura
	And 24 men		

Cruise 197

Research Staff:	Associate Professor	(Graduate School of Environmental Science)	Yutaka Watanabe
	Associate Professor	(Institute of Low Temperature Science, Hokkaido University)	Jun Nishioka
Total			31 persons

3. Items of Research

Hydrographic observations: Fig. 2 Table 1,2

4. 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 “Oshoro Maru”.

Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19).

Dynamic computations were made using a desk-top computer aboard the “Oshoro Maru”.

Table 1: List of Oceanographic Stations

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS09001	42-15.0N	145-00.0E	2/18	0500	9	2624	-	-	1.5	bc	9Plus-0769
OS09002	41-00.0N	146-00.0E	2/19	2300	9	5370	-	-	7.8	r	9Plus-0769

(*):Fixed position by Global Positioning system

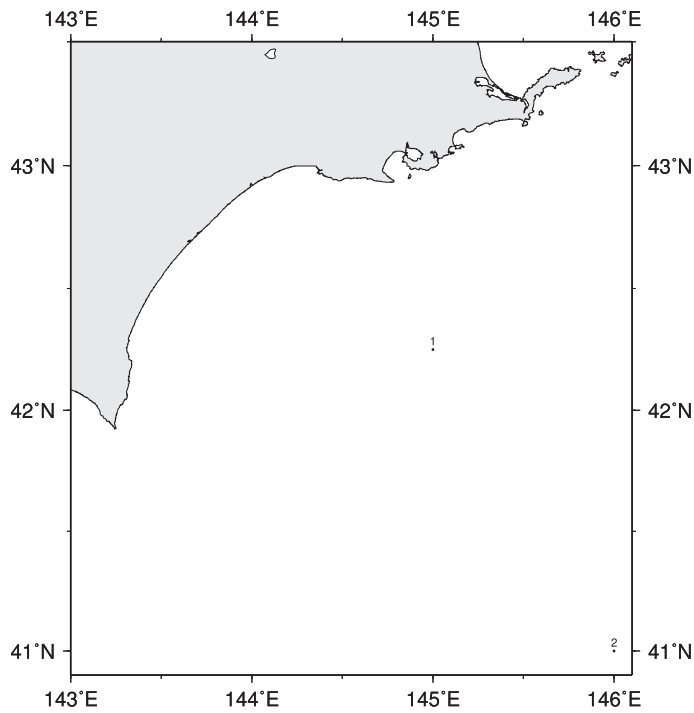


Figure 2: Oceanographic stations

Table 2: Oceanographic data

Station		OS09001	
Longitude		42-15.0N	
Latitude		145-00.0E	
Depth(m)		2624	
Press.	Temp.	Sal.	SIG-T
5	1.576	33.213	26.571
10	1.576	33.213	26.571
20	1.577	33.212	26.570
30	1.577	33.211	26.569
40	1.572	33.211	26.569
50	1.580	33.211	26.569
75	1.585	33.212	26.569
100	1.596	33.214	26.570
125	1.667	33.246	26.591
150	2.038	33.373	26.665
200	2.193	33.497	26.753
250	2.205	33.545	26.790
300	2.275	33.626	26.849
400	2.453	33.752	26.936
500	2.522	33.868	27.023
600	2.844	33.979	27.084
700	2.926	34.092	27.167
800	2.822	34.208	27.269
900	2.685	34.272	27.332
1000	2.648	34.331	27.383

Station		OS09002	
Longitude		41-00.0N	
Latitude		146-00.0E	
Depth(m)		5370	
Press.	Temp.	Sal.	SIG-T
5	8.053	34.081	26.544
10	8.059	34.082	26.544
20	8.059	34.081	26.544
30	8.061	34.081	26.544
40	8.059	34.081	26.544
50	8.056	34.082	26.545
75	8.067	34.081	26.543
100	8.074	34.081	26.541
125	8.069	34.080	26.541
150	8.071	34.080	26.541
200	8.076	34.080	26.540
250	8.081	34.080	26.539
300	8.085	34.081	26.539
400	5.227	33.681	26.604
500	3.636	33.619	26.724
600	3.182	33.702	26.833
700	2.873	33.806	26.943
800	3.487	34.036	27.071
900	3.487	34.159	27.168
1000	3.336	34.253	27.257

THE “OSHORU MARU” CRUISE 198
TO THE NORTHWEST PACIFIC OCEAN

IN FEBRUARY TO MARCH 2009

1. Cruise Itinerary

Cruise 198

Departure from Hakodate	Feb. 27	, 2009
Start hydrographic research (OS09003)	28	
Finish hydrographic research (OS09011)	Mar. 6	
Return to Hakodate	8	

Total coverage 1653.7 miles

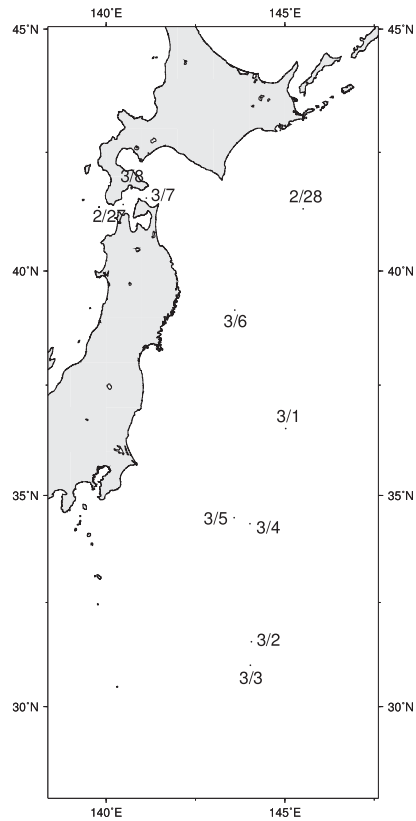


Figure 1: Noon position

2. Vessel Personnel

Captain:		Professor	Toshimi Meguro
Crew :	First Officer	Associate Professor	Shogo Takagi
	Second Officer	Instructor	Yoshihiko Kamei
	Jr. Second Officer	Instructor	Keiichiro Sakaoka
	Chief Engineer	Instructor	Jyunichi Kimura
	And 24 men		

Cruise 198

Research Staff:	Associate Professor	(Laboratory of Marine Biodiversity)	Atsushi Yamaguchi
	Graduate Students		2 persons
	Under Graduate Students		3 persons
	Total		35 persons

3. Items of Research

Hydrographic observations: Fig. 2 Table 1,2

Plankton sampling collected by vertical hauls with a single or twin NORPAC net: Fig. 2 Table 3,4

4. 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 “Oshoro Maru”.

Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19).

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Table 1: List of Oceanographic Stations

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS09003	41-30.2N	145-46.9E	2/28	0630	9	6918	5	16.2	2.8	b	9Plus-1588
OS09004	31-00.4N	144-03.1E	3/3	1100	9	5777	4	19	19.4	bc	9Plus-1588
OS09005	31-43.0N	143-57.8E	3/3	1815	9	5726	-	-	18.2	c	9Plus-1588
OS09006	32-29.9N	144-00.0E	3/4	0005	9	5384	-	-	18.1	-	9Plus-1588
OS09007	34-45.1N	144-00.0E	3/4	1301	9	5615	4	20.1	17.9	c	9Plus-1588
OS09008	36-59.8N	144-00.1E	3/5	1444	9	6090	3	21	11.6	bc	9Plus-1588
OS09009	37-47.6N	143-59.4E	3/5	2055	9	7030	-	-	13.3	c	9Plus-1588
OS09010	38-30.0N	143-59.8E	3/6	0500	9	7035	4	31.3	12.6	bc	9Plus-1588
OS09011	39-14.5N	143-60.0E	3/6	1021	9	5100	-	-	12.9	c	9Plus-1588

(*):Fixed position by Global Positioning system

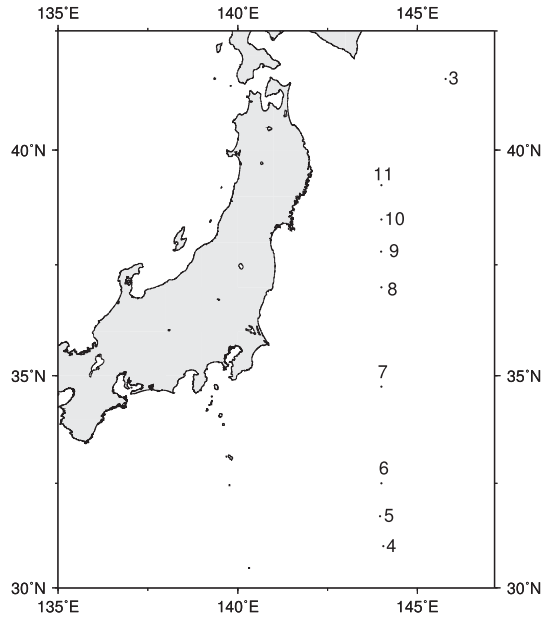


Figure 2: Oceanographic stations

Table 2: Oceanographic data

Station OS09003				Station OS09004				Station OS09005			
Longitude 41-30.2N				Longitude 31-00.4N				Longitude 31-43.0N			
Latitude 145-46.9E				Latitude 144-03.1E				Latitude 143-57.8E			
Depth(m) 6918				Depth(m) 5777				Depth(m) 5726			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	2.725	33.276	26.533	5	19.950	34.694	24.543	5	18.430	34.662	24.908
10	2.729	33.276	26.532	10	19.949	34.694	24.543	10	18.433	34.662	24.907
20	2.733	33.276	26.532	20	19.952	34.694	24.542	20	18.436	34.662	24.907
30	2.735	33.276	26.532	30	19.953	34.694	24.542	30	18.434	34.661	24.906
40	2.730	33.275	26.532	40	19.954	34.694	24.542	40	18.438	34.662	24.906
50	2.716	33.274	26.532	50	19.952	34.694	24.542	50	18.435	34.662	24.907
75	2.685	33.276	26.536	75	19.628	34.706	24.636	75	18.444	34.661	24.904
100	3.108	33.349	26.558	100	18.639	34.613	24.818	100	18.427	34.660	24.907
125	2.812	33.391	26.617	125	18.594	34.632	24.843	125	18.269	34.658	24.945
150	2.280	33.416	26.681	150	18.471	34.640	24.881	150	18.224	34.665	24.961
200	2.682	33.539	26.746	200	18.327	34.767	25.014	200	18.190	34.684	24.984
250	2.650	33.607	26.803	250	17.440	34.755	25.222	250	17.372	34.754	25.237
300	2.880	33.701	26.859	300	16.796	34.719	25.348	300	16.690	34.717	25.371
400	3.096	33.855	26.962	400	14.296	34.541	25.771	400	14.637	34.564	25.715
500	3.305	33.987	27.048	500	11.437	34.350	26.190	500	11.934	34.385	26.124
600	3.076	34.070	27.136	600	7.997	34.091	26.561	600	9.102	34.175	26.456
700	2.998	34.154	27.210	700	5.656	34.018	26.819	700	6.288	34.018	26.740
800	2.874	34.226	27.279	800	4.818	34.102	26.984	800	5.168	34.062	26.913
900	2.842	34.290	27.332	900	4.284	34.187	27.110	900	4.435	34.161	27.073
1000	2.834	34.358	27.387	1000	3.864	34.268	27.218	1000	3.947	34.276	27.216
1200	2.624	34.434	27.466								
1500	2.335	34.506	27.549								
2000	1.996	34.583	27.637								
2500	1.755	34.627	27.692								
3000	1.611	34.654	27.724								

Station		OS09006	
Longitude		32-29.9N	
Latitude		144-00.0E	
Depth(m)		5384	
Press.	Temp.	Sal.	SIG-T
5	18.472	34.658	24.894
10	18.485	34.658	24.891
20	18.488	34.657	24.889
30	18.486	34.657	24.890
40	18.488	34.657	24.890
50	18.489	34.657	24.889
75	18.496	34.657	24.887
100	18.502	34.657	24.886
125	18.508	34.657	24.885
150	18.503	34.657	24.885
200	18.414	34.649	24.902
250	18.341	34.731	24.983
300	17.446	34.749	25.216
400	15.948	34.653	25.494
500	13.155	34.466	25.948
600	10.553	34.304	26.313
700	8.030	34.190	26.633
800	5.622	34.090	26.881
900	5.073	34.230	27.057
1000	4.293	34.269	27.174

Station		OS09007	
Longitude		34-45.1N	
Latitude		144-00.0E	
Depth(m)		5615	
Press.	Temp.	Sal.	SIG-T
5	18.052	34.641	24.985
10	18.051	34.641	24.985
20	18.042	34.643	24.990
30	18.044	34.653	24.997
40	18.046	34.662	25.003
50	18.042	34.671	25.011
75	18.039	34.675	25.014
100	18.037	34.677	25.017
125	18.021	34.678	25.021
150	18.005	34.677	25.025
200	18.008	34.679	25.025
250	17.940	34.728	25.079
300	17.193	34.743	25.272
400	14.986	34.588	25.658
500	12.392	34.404	26.052
600	9.396	34.183	26.415
700	7.521	34.188	26.706
800	5.992	34.203	26.924
900	4.981	34.239	27.074
1000	4.052	34.254	27.187

Station		OS09008	
Longitude		36-59.8N	
Latitude		144-00.1E	
Depth(m)		6090	
Press.	Temp.	Sal.	SIG-T
5	12.153	34.338	26.047
10	12.156	34.339	26.047
20	12.154	34.339	26.047
30	12.151	34.339	26.048
40	12.144	34.340	26.049
50	12.146	34.339	26.049
75	12.141	34.340	26.050
100	12.140	34.339	26.050
125	12.137	34.338	26.050
150	12.124	34.337	26.051
200	10.316	34.185	26.262
250	8.039	33.970	26.459
300	6.923	33.994	26.637
400	5.347	34.009	26.849
500	4.093	34.002	26.983
600	4.254	34.191	27.117
700	3.911	34.257	27.204
800	3.485	34.294	27.276
900	3.113	34.338	27.346
1000	2.978	34.395	27.404

Station		OS09009	
Longitude		37-47.6N	
Latitude		143-59.4E	
Depth(m)		7030	
Press.	Temp.	Sal.	SIG-T
5	13.457	34.471	25.892
10	13.461	34.471	25.891
20	13.459	34.471	25.891
30	13.455	34.469	25.890
40	13.441	34.467	25.892
50	13.177	34.430	25.917
75	13.053	34.427	25.939
100	13.024	34.428	25.945
125	12.997	34.426	25.950
150	12.512	34.343	25.980
200	12.071	34.308	26.039
250	10.069	34.218	26.330
300	8.035	34.028	26.506
400	6.346	34.060	26.766
500	5.080	34.062	26.922
600	4.052	34.115	27.077
700	3.889	34.233	27.187
800	3.308	34.281	27.283
900	3.325	34.376	27.357
1000	3.126	34.407	27.401

Station		OS09010	
Longitude		38-30.0N	
Latitude		143-59.8E	
Depth(m)		7035	
Press.	Temp.	Sal.	SIG-T
5	12.820	34.385	25.953
10	12.830	34.384	25.950
20	12.832	34.384	25.950
30	12.833	34.384	25.950
40	12.834	34.384	25.949
50	12.832	34.384	25.949
75	12.835	34.384	25.949
100	12.845	34.384	25.947
125	12.851	34.384	25.946
150	12.853	34.383	25.945
200	12.863	34.385	25.944
250	12.867	34.385	25.943
300	11.135	34.233	26.154
400	7.627	34.031	26.568
500	4.701	33.855	26.801
600	3.767	33.889	26.926
700	4.418	34.143	27.060
800	4.369	34.297	27.188
900	3.875	34.345	27.278
1000	3.499	34.367	27.333

Station		OS09011	
Longitude		39-14.5N	
Latitude		143-60.0E	
Depth(m)		5100	
Press.	Temp.	Sal.	SIG-T
5	13.196	34.460	25.936
10	13.199	34.459	25.935
20	13.197	34.460	25.935
30	13.199	34.459	25.935
40	13.167	34.455	25.938
50	13.183	34.458	25.937
75	13.143	34.453	25.941
100	13.072	34.440	25.945
125	13.044	34.440	25.951
150	13.041	34.441	25.952
200	11.166	34.249	26.161
250	9.439	34.099	26.343
300	8.790	34.178	26.508
400	5.963	33.988	26.757
500	3.956	33.861	26.885
600	4.973	34.178	27.027
700	3.929	34.180	27.141
800	3.380	34.218	27.225
900	3.319	34.300	27.297
1000	3.052	34.347	27.359
1200	2.683	34.434	27.461
1500	2.373	34.504	27.544
2000	1.958	34.593	27.649
2500	1.710	34.636	27.702
3000	1.580	34.659	27.730

5. Data on plankton collected by vertical hauls with a single or twin NORPAC net

Vertical hauls with a twin-NORPAC net were made at hydrographic stations. This net was composed of 45 cm mouth diameter and 180 cm long conical one which was made of GG54 and XX13 having 0.33 mm and 0.10 mm mesh, respectively. The net was lowered to the estimated depth of 150 m, 500 m or near the bottom when the bottom depth was shallower than 150 m, and immediately hauled to the surface at a speed about 1 m s⁻¹. A flowmeter was mounted at the center of mouth of the net to estimate the volume water filtered. Sampling was conducted by research staffs and measurement of wet weight of the samples were made by A. Yamaguchi, K. Ishii, K. Matsuno, R. Saito, K. Ohgi, Y. Onishi, T. Homma, R. Ohashi, C. Tsukazaki and K. Mishima (Laboratory of Marine Biology).

Table 3: Data on plankton collected by vertical hauls with a single or twin NORPAC net.

GG54:0.33mm mesh, XX13:0.10mm mesh.

Station no.	Position		S.M.T.		Length of wire (m)	Angle of wire (°)	Depth estimated by wire angle (m)	Kind of cloth	Flowmeter		Estimated volume of water filtered (m ³)	Wet weight (g)		Sample no.
	Lat. (N)	Lon.	Date	Hour					No.	Reading		per haul	per 1000 m ³	
OS09003 (Site H)	41-31	145-48 E	28 Feb.	8:45	151	6	150	GG54	1479	1563	23.02	1.7	72	09001
								XX13	2446	1537	22.63			09002
				8:56	511	12	500	GG54	1479	5218	76.84	19.4	253	09003
								XX13	2446	5078	74.78			09004
OS09004	31-00	144-00 E	3 Mar.	7:46	151	5	150	GG54	1479	1338	19.70	1.6	79	09005
								XX13	2446	1898	27.95			09006
OS09005	31-45	144-00 E	3 Mar.	17:29	157	17	150	GG54	1479	1830	26.95	1.0	37	09007
								XX13	2446	1825	26.88			09008
OS09006	32-30	144-00 E	4 Mar.	0:53	150	0	150	GG54	1479	1830	26.95	1.2	46	09009
								XX13	2446	1855	27.32			09010
OS09007	34-45	144-00 E	4 Mar.	14:10	150	4	150	GG54	1479	1880	27.69	0.6	23	09011
								XX13	2446	2270	33.43			09012
OS09008	37-00	144-00 E	5 Mar.	15:42	151	8	150	GG54	1479	1520	22.38	0.5	23	09013
								XX13	2446	1788	26.33			09014
OS09009	37-47	144-00 E	5 Mar.	22:15	150	4	150	GG54	1479	1781	26.23	10.2	390	09015
								XX13	2446	2138	31.48			09016
OS09010	38-30	144-00 E	6 Mar.	6:21	155	13	151	GG54	1479	1760	25.92	0.5	21	09017
								XX13	2446	1762	25.95			09018

1) Exclusively phytoplankton

2) Including some fragments of medusae.

3) *Neocalanus* abundant.

4) Gelatinous zooplankton abundant.

5) Salpida abundant.

6) Chaetognaths abundant.

6. Data on calibration of flowmeters

Flowmeters used for plankton nets were calibrated once in the cruise.

Table 4. Calibration data on flowmeters used for a twin or single NORPAC net and other kind of nets. 50-m wire out at St. OS09010 in 6 Mar. 2009.

Flowmeter No.	Wire length (m)	Revolution						Mean
		1	2	3	4	5	6	
RG1479	50	830*	718	738	658	610*	650	691
RG2446	50	728*	689	680	642	592*	631	661

*: omitted from calculation

THE “OSHORU MARU” CRUISE 199
TO THE WEST OF HOKKAIDO

IN MARCH 2009

1. Cruise Itinerary

Cruise 199

Departure from Hakodate	Mar. 15	, 2009
Start hydrographic research (OS09012)	16	
Arrival at Okushiri	18	
Departure from Okushiri	19	
Arrival at Hakodate and change cadets	20	
Departure from Hakodate	20	
Finish hydrographic research (OS09018)	22	
Return to Hakodate	25	

Total coverage 454.4 miles

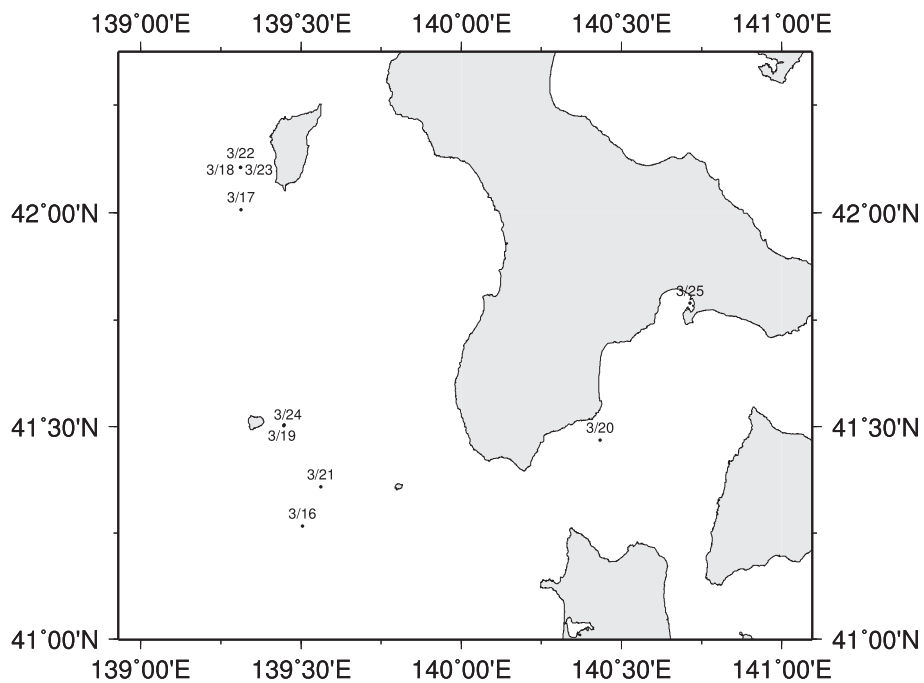


Figure 1: Noon position

2. Vessel Personnel

Captain:		Professor	Toshimi Meguro
Crew :	First Officer	Associate Professor	Shogo Takagi
	Second Officer	Instructor	Yoshihiko Kamei
	Jr. Second Officer	Instructor	Keiichiro Sakaoka
	Chief Engineer	Instructor	Jyunichi Kimura
	Third Officer	Technical Official	Naoki Hoshi
	And 25 men		

Cruise 199

Research Staff:	Associate Professor	(Laboratory of Fishing Production System)	
			Nariharu Yamashita
	Instructor	(Laboratory of Marine Environmental Science)	
			Hiroji Onishi
	Teaching Assistant		2 persons
	Under Graduate Students:		56 persons
	Total		91 persons

3. Items of Research

Hydrographic observations:	Fig. 2	Table 1,2
Mid water trawl observations:	Fig. 3	Table 3,4
Bottom long line research:	Fig. 4	Table 5

4. 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 “Oshoro Maru”.

Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19).

Dynamic computations were made using a desk-top computer aboard the “Oshoro Maru”.

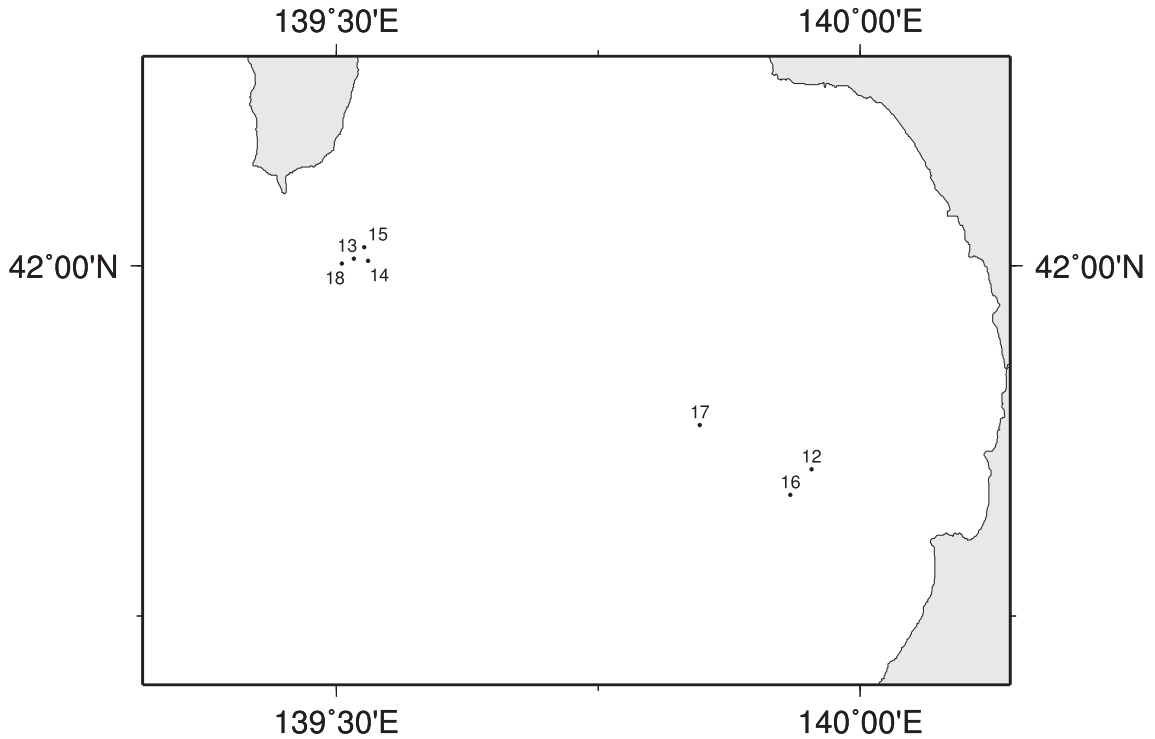


Figure 2: Oceanographic stations

Table 1: List of Oceanographic Stations

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS09012	41-51.3N	139-57.2E	3/16	1800	9	1195	-	-	6.4	o	9Plus-1588
OS09013	42-00.3N	139-31.0E	3/17	0800	9	122	4	12.5	6.2	bc	9Plus-1588
OS09014	42-00.2N	139-31.8E	3/17	1000	9	131	6	14.5	5.5	bc	9Plus-1588
OS09015	42-00.8N	139-31.6E	3/17	1400	9	125	7	11.3	7.1	bc	9Plus-1588
OS09016	41-50.2N	139-56.0E	3/21	1615	9	1275	5	7.8	8.8	bc	9Plus-1588
OS09017	41-53.2N	139-50.8E	3/21	1730	9	1333	5	9.4	8.6	c	9Plus-1588
OS09018	42-00.1N	139-30.3E	3/22	0945	9	111	6	7	8.2	o	9Plus-1588

(*):Fixed position by Global Positioning system

Table 2: Oceanographic data

Station		OS09012	
Longitude		41-51.3N	
Latitude		139-57.2E	
Depth(m)		1195	
Press.	Temp.	Sal.	SIG-T
5	6.110	34.065	26.800
10	6.060	34.076	26.815
20	5.981	34.087	26.834
30	5.982	34.088	26.835
40	5.785	34.085	26.857
50	5.816	34.085	26.853
75	5.300	34.096	26.923
100	4.951	34.088	26.958
125	4.580	34.084	26.996
150	3.447	34.084	27.112
200	2.534	34.063	27.178
250	1.909	34.064	27.229
300	1.257	34.064	27.276
400	0.962	34.067	27.297
500	0.712	34.066	27.313
600	0.549	34.065	27.321

Station		OS09013	
Longitude		42-00.3N	
Latitude		139-31.0E	
Depth(m)		122	
Press.	Temp.	Sal.	SIG-T
5	6.189	33.994	26.734
10	5.161	34.090	26.935
20	4.882	34.084	26.963
30	4.818	34.084	26.970
40	4.774	34.083	26.974
50	4.734	34.083	26.978
75	4.670	34.082	26.985
100	4.434	34.079	27.008

Station		OS09014	
Longitude		42-00.2N	
Latitude		139-31.8E	
Depth(m)		131	
Press.	Temp.	Sal.	SIG-T
5	5.880	34.105	26.860
10	5.153	34.087	26.934
20	4.915	34.087	26.961
30	4.832	34.082	26.967
40	4.773	34.084	26.975
50	4.732	34.083	26.979
75	4.639	34.083	26.989
100	4.445	34.080	27.008

Station		OS09015	
Longitude		42-00.8N	
Latitude		139-31.6E	
Depth(m)		125	
Press.	Temp.	Sal.	SIG-T
5	6.916	34.109	26.728
10	6.835	34.108	26.739
20	6.729	34.110	26.755
30	5.623	34.105	26.892
40	5.070	34.087	26.943
50	4.782	34.082	26.972
75	4.721	34.084	26.980
100	4.704	34.085	26.983

Station		OS09016	
Longitude		41-50.2N	
Latitude		139-56.0E	
Depth(m)		1275	
Press.	Temp.	Sal.	SIG-T
5	9.147	34.013	26.322
10	9.115	34.014	26.328
20	9.006	34.031	26.359
30	8.975	34.057	26.384
40	8.829	34.091	26.434
50	8.664	34.097	26.464
75	8.591	34.097	26.475
100	8.575	34.101	26.481
125	7.373	34.122	26.675
150	5.197	34.094	26.935
200	3.233	34.069	27.121
250	1.961	34.062	27.223
300	1.324	34.061	27.269
400	0.976	34.062	27.293
500	0.731	34.063	27.309
600	0.585	34.064	27.318

Station		OS09017	
Longitude		41-53.2N	
Latitude		139-50.8E	
Depth(m)		1333	
Press.	Temp.	Sal.	SIG-T
5	9.149	34.012	26.321
10	9.146	34.011	26.321
20	9.097	34.013	26.330
30	9.097	34.016	26.333
40	9.095	34.021	26.337
50	9.019	34.043	26.366
75	8.711	34.089	26.450
100	8.126	34.121	26.565
125	6.836	34.121	26.749
150	5.250	34.097	26.931
200	3.730	34.072	27.075
250	2.315	34.064	27.197
300	1.563	34.058	27.250
400	0.922	34.062	27.296
500	0.701	34.063	27.311
600	0.576	34.064	27.319

Station		OS09018	
Longitude		42-00.1N	
Latitude		139-30.3E	
Depth(m)		111	
Press.	Temp.	Sal.	SIG-T
5	8.442	34.069	26.476
10	8.424	34.070	26.480
20	8.355	34.072	26.492
30	7.644	34.090	26.611
40	6.654	34.098	26.755
50	5.903	34.080	26.838
75	5.297	34.090	26.919
100	4.269	34.080	27.026

5. Data on mid water trawl research

Two operations of the stern otter trawl were carried out. These operations were supervised by the captain, and were conducted by deck officers, crews, cadets and research staffs. The data of catch were recorded by the deck officers and reserch staff.

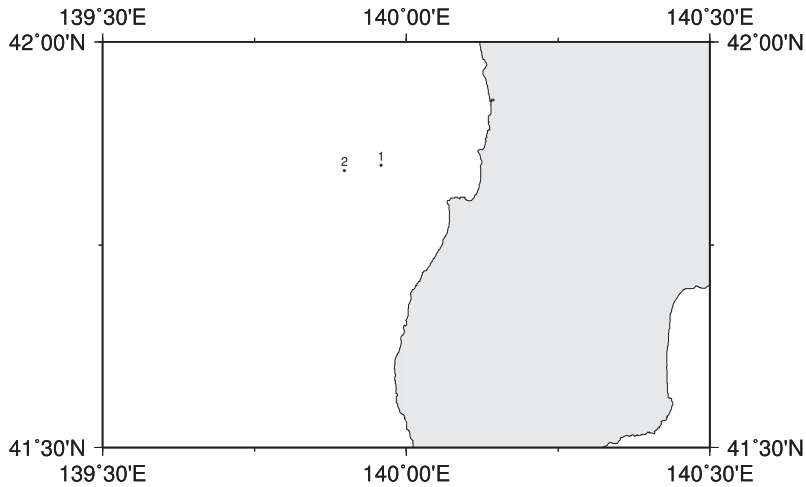


Figure 3: Locations of mid water trawl research

Table 3: Data on mid water trawl research during the "Oshoro Maru" Cruise#199

No. of research	Date and time of net tow (S.M.T.)		Position		Direction of tow	Speed of tow(K' t)	towing depth(m)	Wr	Wind
			Lat.(N)	Long.(E)					
OSMT0901	March 16	1520-1550	41-50.9	139-57.5	WNW	2.3	400	o	WSW-5
OSMT0902	March 21	1400-1430	41-50.5	139-53.9	285	3.2	400	bc	West-4

Wr.: Weather (o: 100% clouded, bc: 25-75% clouded)

Table 4: Data on catches by mid water trawl research

		OSMT 0901		OSMT 0902	
Japanese name	Scientific Name	Number	Weight (kg)	Number	Weight (kg)
Hoteiuo	<i>Aptocyclus ventricosus</i>	-	-	1	0.36
Suketoudara	<i>Theragra chalcogramma</i>	9	4.3	-	-

6. Data on bottom long line research

Three operations of the bottom long line were carried out. These operations were supervised by the captain, and deck officers, crew, research staff, and cadets were engaged in the work. The data of catch were recorded by the deck officers and research staff.



Figure 4: Locations of bottom long line research

Table 5: Data on bottom long line research

No. of research		OSBL0901	OSBL0902	OSBL0903
Date		17-Mar	17-Mar	22-Mar
position of	Lat. (N)	42-00.2	42-00.4	42-00.4
line set	Long. (E)	139-31.1	139-31.2	139-31.0
Time(S.M.T.)	line set	0625	1100	0642
Number of baskets		10	10	20
Surface temp. (°C)		7.0	8.0	8.4
Wether		bc	bc	o
Wind		WNW2	WNW4	ESE5
<i>Okhostk atka mackerel</i>		45	35	14
<i>Gymnocanthus herzensteini</i>		5	16	22
<i>Gadus macrocephalus</i>		1	1	
<i>Okamejei</i> sp.		1	5	6
<i>Hippoglossoides pinetorum</i>				1
<i>Pleuronectes mochigarei</i>			1	

THE “OSHORU MARU” CRUISE 200
TO THE JAPAN SEA

IN APRIL 2009

1. Cruise Itinerary

Cruise 200

Departure from Hakodate	Apr. 23	, 2009
Start hydrographic research (OS09019)	24	
Arrival at Tsuruga	25	
Departure from Tsuruga	27	
Finish hydrographic research (OS09041)	28	
Return to Hakodate	29	

Total coverage 990.6 miles

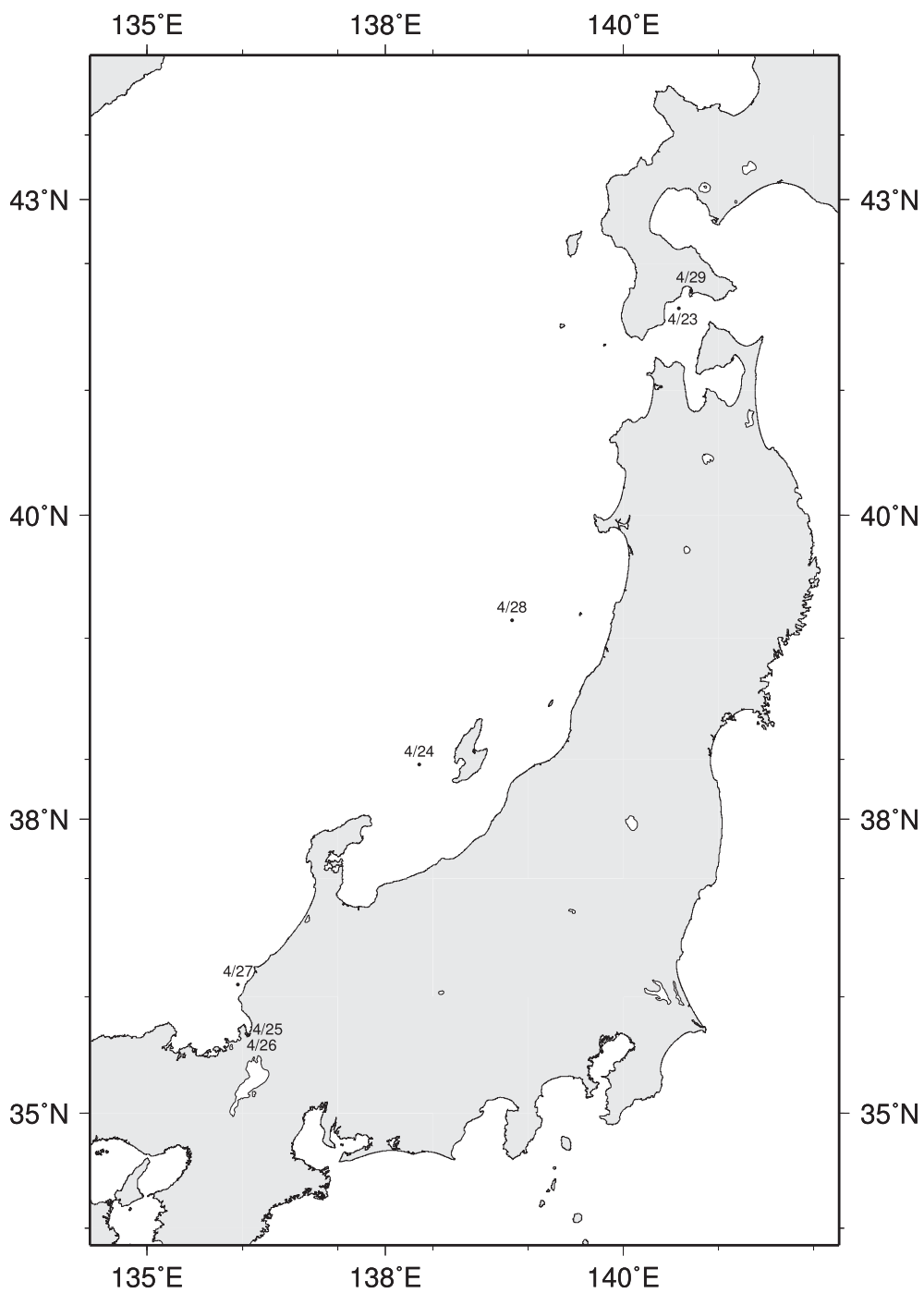


Figure 1: Noon position

2. Vessel Personnel

Captain:		Associate Professor	Shogo Takagi
Crew :	Chief Officer	Instructor	Yoshihiko Kamei
	Second Officer	Instructor	Keiichiro Sakaoka
	Third Officer	Technical Official	Naoki Hoshi
	Chief Engineer	Instructor	Jyunichi Kimura
	And 25 men		

Cruise 200

Research Staff:	Professor	(Research Center for Marine Bioresources)	Osamu Tominaga
	Associate Professor	(Laboratory of Marine Bioresources Ecology)	Tetsuya Takatsu
	Associate Professor	(Laboratory of Marine Environment engineering)	Masabumi Seto
	Associate Professor	(Laboratory of Microbial Ecology)	Ryuji Kondo
	Lecturer	(Laboratory of Marine Environment engineering)	Atsushi kaneda
	Instructor	(Laboratory of Microbial Ecology)	Yoshitake Takao
	Graduate Students		2 persons
	Teaching Assistant		5 persons
	Under Graduate Students		53 persons
	Total		66 persons

3. Items of Research

Hydrographic observations: Fig. 2 Table 1,2

Beam trawl observations

4. 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 “Oshoro Maru”.

Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19).

Dynamic computations were made using a desk-top computer aboard the “Oshoro Maru”.

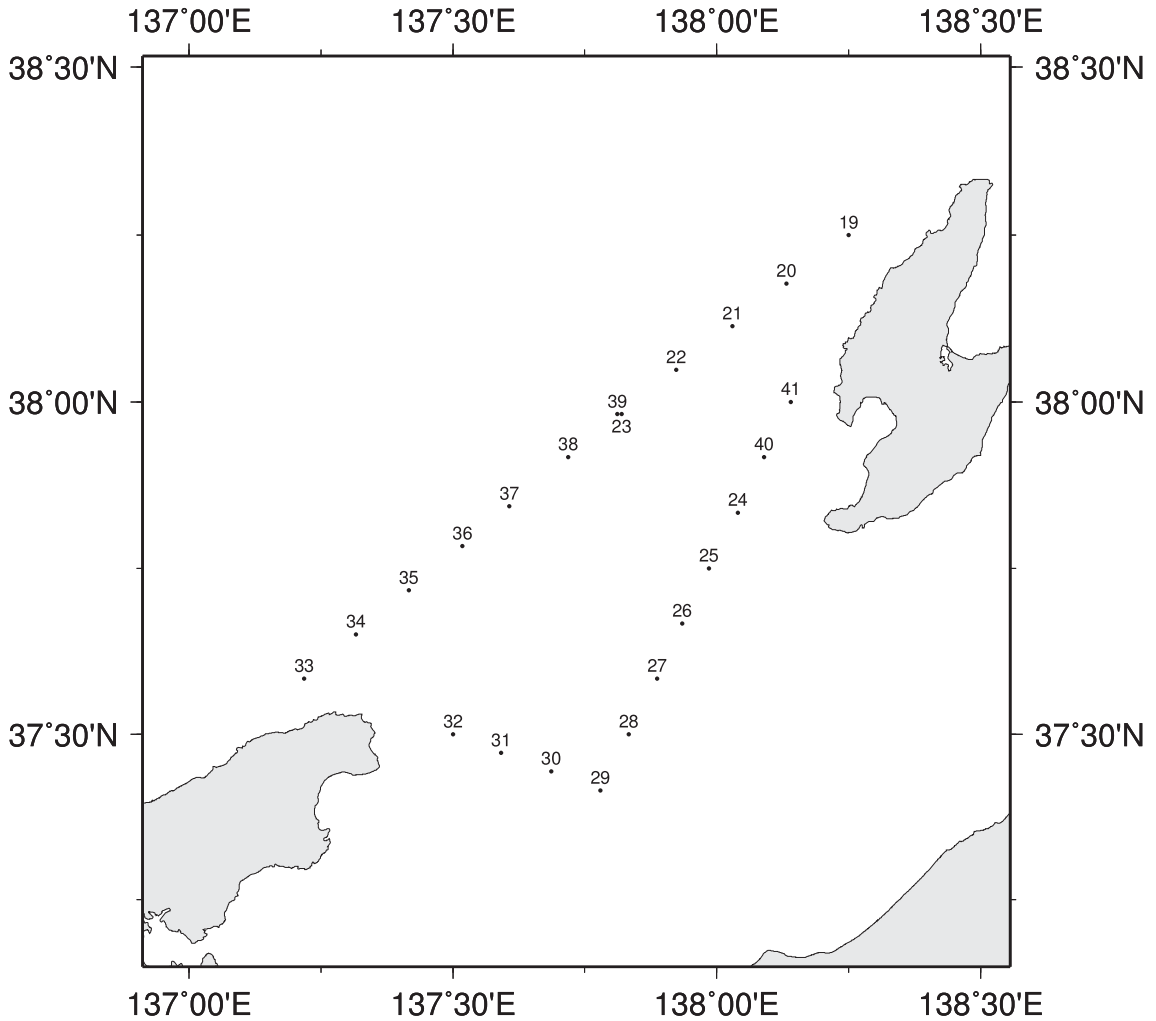


Figure 2: Oceanographic stations

Table 1: List of Oceanographic Stations

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS09019	38-15.0N	138-15.0E	4/24	0750	9	420	-	-	-	o	XBT

(*):Fixed position by Global Positioning system

Table 1: List of Oceanographic Stations

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS09020	38-10.6N	138-07.9E	4/24	0828	9	1605	-	-	-	o	XBT
OS09021	38-06.8N	138-01.8E	4/24	0859	9	1855	-	-	-	o	XBT
OS09022	38-02.9N	137-55.4E	4/24	0931	9	1845	-	-	-	o	XBT
OS09023	37-58.9N	137-49.2E	4/24	1010	9	2050	-	-	-	o	9Plus-1588
OS09024	37-50.0N	138-02.4E	4/24	1300	9	1700	-	-	-	o	XBT
OS09025	37-45.0N	137-59.1E	4/24	1328	9	1635	-	-	-	c	XBT
OS09026	37-40.0N	137-56.1E	4/24	1355	9	1570	-	-	-	c	XBT
OS09027	37-35.0N	137-53.2E	4/24	1421	9	1345	-	-	-	c	XBT
OS09028	37-30.0N	137-50.0E	4/24	1449	9	1023	-	-	-	c	XBT
OS09029	37-24.9N	137-46.8E	4/24	1520	9	1515	-	-	12.1	c	9Plus-1588
OS09030	37-26.6N	137-41.2E	4/24	1759	9	660	-	-	-	c	XBT
OS09031	37-28.3N	137-35.5E	4/24	1822	9	331	-	-	-	c	XBT
OS09032	37-30.0N	137-30.0E	4/24	1846	9	483	-	-	-	c	XBT
OS09033	37-35.0N	137-13.1E	4/27	2207	9	90	-	-	-	bc	XBT
OS09034	37-39.0N	137-19.0E	4/27	2238	9	105	-	-	-	bc	XBT
OS09035	37-43.0N	137-25.0E	4/27	2310	9	140	-	-	-	bc	XBT
OS09036	37-47.0N	137-31.1E	4/27	2343	9	315	-	-	-	bc	XBT
OS09037	37-50.6N	137-36.4E	4/28	0016	9	760	-	-	-	bc	XBT
OS09038	37-55.0N	137-43.1E	4/28	0049	9	1570	-	-	-	bc	XBT
OS09039	37-58.9N	137-48.7E	4/28	0125	9	2010	-	-	-	bc	9Plus-1588
OS09040	37-55.0N	138-05.4E	4/28	0458	9	1559	-	-	-	bc	XBT
OS09041	38-00.0N	138-843.0E	4/28	0528	9	647	-	-	-	bc	XBT

(*):Fixed position by Global Positioning system

Table 2: Oceanographic data

Station OS09019 Longitude 38-15.0N Latitude 138-15.0E Depth(m) 420				Station OS09020 Longitude 38-10.6N Latitude 138-07.9E Depth(m) 1605				Station OS09021 Longitude 38-06.8N Latitude 138-01.8E Depth(m) 1855			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	11.912	-	-	5	12.060	-	-	5	12.099	-	-
10	11.892	-	-	10	12.063	-	-	10	12.081	-	-
20	11.898	-	-	20	11.893	-	-	20	12.067	-	-
30	11.898	-	-	30	11.780	-	-	30	11.931	-	-
40	11.832	-	-	40	10.957	-	-	40	10.990	-	-
50	10.890	-	-	50	10.805	-	-	50	10.785	-	-
75	10.789	-	-	75	10.600	-	-	75	10.630	-	-
100	10.918	-	-	100	10.538	-	-	100	10.636	-	-
125	10.470	-	-	125	10.140	-	-	125	10.350	-	-
150	9.842	-	-	150	9.950	-	-	150	9.536	-	-
200	6.721	-	-	200	7.263	-	-	200	4.311	-	-
250	3.301	-	-	250	2.443	-	-	250	2.203	-	-
300	1.700	-	-	300	1.487	-	-	300	1.397	-	-
400	0.970	-	-	400	0.990	-	-	400	0.873	-	-
				500	0.710	-	-	500	0.631	-	-
				600	0.510	-	-	600	0.481	-	-
				700	0.406	-	-	700	0.416	-	-

Station OS09022 Longitude 38-02.9N Latitude 137-55.4E Depth(m) 1845				Station OS09023 Longitude 37-58.9N Latitude 137-49.2E Depth(m) 2050				Station OS09024 Longitude 37-50.0N Latitude 138-02.4E Depth(m) 1700			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	12.239	-	-	5	12.262	34.102	25.842	5	11.821	-	-
10	12.240	-	-	10	12.233	34.101	25.847	10	11.710	-	-
20	12.112	-	-	20	12.217	34.101	25.850	20	11.392	-	-
30	12.130	-	-	30	12.214	34.103	25.852	30	11.310	-	-
40	12.092	-	-	40	12.164	34.116	25.872	40	10.770	-	-
50	12.058	-	-	50	12.120	34.129	25.890	50	10.758	-	-
75	11.270	-	-	75	11.433	34.179	26.058	75	10.680	-	-
100	10.696	-	-	100	10.390	34.202	26.263	100	10.486	-	-
125	10.020	-	-	125	9.806	34.199	26.359	125	10.190	-	-
150	8.814	-	-	150	9.030	34.179	26.471	150	9.980	-	-
200	5.870	-	-	200	6.069	34.108	26.839	200	8.380	-	-
250	2.689	-	-	250	2.977	34.063	27.139	250	3.543	-	-
300	1.677	-	-	300	1.657	34.056	27.241	300	1.707	-	-
400	0.927	-	-	400	0.892	34.060	27.296	400	1.070	-	-
500	0.667	-	-	500	0.641	34.062	27.313				
600	0.499	-	-	600	0.504	34.063	27.322				
700	0.414	-	-	700	0.412	34.063	27.328				
				800	0.352	34.063	27.331				
				900	0.309	34.064	27.334				
				1000	0.278	34.064	27.336				
				1200	0.244	34.064	27.338				
				1500	0.215	34.064	27.339				

Station		OS09025	
Longitude		37-45.0N	
Latitude		137-59.1E	
Depth(m)		1635	
Press.	Temp.	Sal.	SIG-T
5	11.311	-	-
10	11.310	-	-
20	11.150	-	-
30	11.110	-	-
40	10.882	-	-
50	10.612	-	-
75	10.699	-	-
100	10.550	-	-
125	10.350	-	-
150	10.054	-	-
200	7.262	-	-
250	3.362	-	-
300	1.873	-	-
400	0.873	-	-

Station		OS09026	
Longitude		37-40.0N	
Latitude		137-56.1E	
Depth(m)		1570	
Press.	Temp.	Sal.	SIG-T
5	12.329	-	-
10	12.268	-	-
20	12.157	-	-
30	12.130	-	-
40	10.716	-	-
50	10.644	-	-
75	10.491	-	-
100	10.310	-	-
125	10.080	-	-
150	9.044	-	-
200	4.864	-	-
250	2.370	-	-
300	1.450	-	-
400	0.870	-	-
500	0.659	-	-
600	0.491	-	-
700	0.396	-	-

Station		OS09027	
Longitude		37-35.0N	
Latitude		137-53.2E	
Depth(m)		1345	
Press.	Temp.	Sal.	SIG-T
5	12.080	-	-
10	12.029	-	-
20	11.950	-	-
30	11.315	-	-
40	10.782	-	-
50	10.664	-	-
75	10.589	-	-
100	10.386	-	-
125	10.140	-	-
150	9.086	-	-
200	5.362	-	-
250	2.633	-	-
300	1.610	-	-
400	0.843	-	-
500	0.600	-	-
600	0.549	-	-
700	0.466	-	-

Station		OS09028	
Longitude		37-30.0N	
Latitude		137-50.0E	
Depth(m)		1023	
Press.	Temp.	Sal.	SIG-T
5	12.520	-	-
10	12.520	-	-
20	12.262	-	-
30	12.212	-	-
40	11.624	-	-
50	11.112	-	-
75	10.920	-	-
100	10.648	-	-
125	10.000	-	-
150	9.620	-	-
200	6.621	-	-
250	2.781	-	-
300	1.463	-	-
400	0.847	-	-
500	0.591	-	-
600	0.469	-	-
700	0.380	-	-

Station		OS09029	
Longitude		37-24.9N	
Latitude		137-46.8E	
Depth(m)		1515	
Press.	Temp.	Sal.	SIG-T
5	12.105	33.735	25.587
10	12.081	33.737	25.594
20	12.174	33.972	25.758
30	11.818	33.914	25.781
40	11.244	33.906	25.880
50	11.063	33.975	25.966
75	10.921	34.013	26.021
100	10.742	34.020	26.058
125	10.587	34.051	26.110
150	10.568	34.184	26.217
200	7.495	34.123	26.659
250	3.438	34.074	27.105
300	1.678	34.059	27.242
400	0.889	34.060	27.297
500	0.593	34.062	27.316
600	0.460	34.062	27.324
700	0.375	34.063	27.330
800	0.322	34.063	27.333
900	0.293	34.063	27.335
1000	0.268	34.063	27.336
1200	0.212	34.063	27.339

Station		OS09030	
Longitude		37-26.6N	
Latitude		137-41.2E	
Depth(m)		660	
Press.	Temp.	Sal.	SIG-T
5	12.350	-	-
10	12.341	-	-
20	12.333	-	-
30	12.304	-	-
40	11.702	-	-
50	11.360	-	-
75	11.210	-	-
100	11.154	-	-
125	11.030	-	-
150	10.464	-	-
200	6.441	-	-
250	2.853	-	-
300	1.707	-	-
400	0.969	-	-
500	0.480	-	-
600	0.371	-	-

Station		OS09031	
Longitude		37-28.3N	
Latitude		137-35.5E	
Depth(m)		331	
Press.	Temp.	Sal.	SIG-T
5	12.601	-	-
10	12.600	-	-
20	12.415	-	-
30	11.974	-	-
40	11.720	-	-
50	11.798	-	-
75	11.690	-	-
100	11.470	-	-
125	11.230	-	-
150	10.892	-	-
200	7.301	-	-
250	1.801	-	-
300	1.350	-	-

Station		OS09032	
Longitude		37-30.0N	
Latitude		137-30.0E	
Depth(m)		483	
Press.	Temp.	Sal.	SIG-T
5	12.640	-	-
10	12.641	-	-
20	12.510	-	-
30	12.440	-	-
40	12.314	-	-
50	12.140	-	-
75	12.090	-	-
100	12.064	-	-
125	11.720	-	-
150	11.578	-	-
200	4.950	-	-
250	2.462	-	-
300	1.607	-	-
400	0.997	-	-

Station		OS09033	
Longitude		37-35.0N	
Latitude		137-13.1E	
Depth(m)		90	
Press.	Temp.	Sal.	SIG-T
5	13.049	-	-
10	13.021	-	-
20	12.977	-	-
30	12.852	-	-
40	12.622	-	-
50	12.494	-	-
75	12.399	-	-

Station		OS09034	
Longitude		37-39.0N	
Latitude		137-19.0E	
Depth(m)		105	
Press.	Temp.	Sal.	SIG-T
5	12.421	-	-
10	12.449	-	-
20	12.412	-	-
30	12.430	-	-
40	12.412	-	-
50	12.398	-	-
75	12.369	-	-
100	12.178	-	-

Station		OS09035	
Longitude		37-43.0N	
Latitude		137-25.0E	
Depth(m)		140	
Press.	Temp.	Sal.	SIG-T
5	11.859	-	-
10	11.830	-	-
20	11.788	-	-
30	11.750	-	-
40	11.740	-	-
50	11.720	-	-
75	11.720	-	-
100	11.790	-	-
125	11.650	-	-

Station		OS09036	
Longitude		37-47.0N	
Latitude		137-31.1E	
Depth(m)		315	
Press.	Temp.	Sal.	SIG-T
5	12.110	-	-
10	12.099	-	-
20	12.088	-	-
30	12.050	-	-
40	12.040	-	-
50	12.036	-	-
75	11.710	-	-
100	11.080	-	-
125	10.930	-	-
150	10.546	-	-
200	4.384	-	-
250	1.950	-	-
300	0.920	-	-

		Station	OS09037
		Longitude	37-50.6N
		Latitude	137-36.4E
		Depth(m)	760
Press.	Temp.	Sal.	SIG-T
5	11.049	-	-
10	11.030	-	-
20	11.035	-	-
30	11.040	-	-
40	11.032	-	-
50	11.052	-	-
75	10.709	-	-
100	10.516	-	-
125	10.430	-	-
150	10.742	-	-
200	8.083	-	-
250	5.190	-	-
300	4.420	-	-
400	2.137	-	-

		Station	OS09038
		Longitude	37-55.0N
		Latitude	137-43.1E
		Depth(m)	1570
Press.	Temp.	Sal.	SIG-T
5	11.889	-	-
10	11.873	-	-
20	11.878	-	-
30	11.872	-	-
40	11.872	-	-
50	11.850	-	-
75	11.030	-	-
100	10.840	-	-
125	10.620	-	-
150	10.264	-	-
200	7.951	-	-
250	4.755	-	-
300	2.047	-	-
400	0.904	-	-
500	0.600	-	-
600	0.490	-	-
700	0.416	-	-

		Station	OS09039
		Longitude	37-58.9N
		Latitude	137-48.7E
		Depth(m)	2010
Press.	Temp.	Sal.	SIG-T
5	11.679	-	-
10	11.691	-	-
20	11.663	-	-
30	11.702	-	-
40	11.189	-	-
50	10.978	-	-
75	10.620	-	-
100	10.156	-	-
125	9.970	-	-
150	9.142	-	-
200	6.551	-	-
250	2.960	-	-
300	1.647	-	-
400	0.946	-	-

		Station	OS09040
		Longitude	37-55.0N
		Latitude	138-05.4E
		Depth(m)	1559
Press.	Temp.	Sal.	SIG-T
5	11.501	-	-
10	11.500	-	-
20	11.510	-	-
30	11.455	-	-
40	11.108	-	-
50	10.865	-	-
75	10.620	-	-
100	10.418	-	-
125	9.750	-	-
150	8.962	-	-
200	7.271	-	-
250	3.482	-	-
300	2.070	-	-
400	1.303	-	-

THE “OSHORO MARU” CRUISE 201
TO THE NORTHWEST PACIFIC OCEAN

IN MAY 2009

1. Cruise Itinerary

Cruise 201

Departure from Hakodate	May	8	, 2009
Start hydrographic research (OS09042)		9	
Start Gillnet research (OSG0901)		11	
Finish Gillnet research (OSG0903)		14	
Finish hydrographic research (OS09059)		16	
Return to Hakodate		20	

Total coverage 2239.0 miles

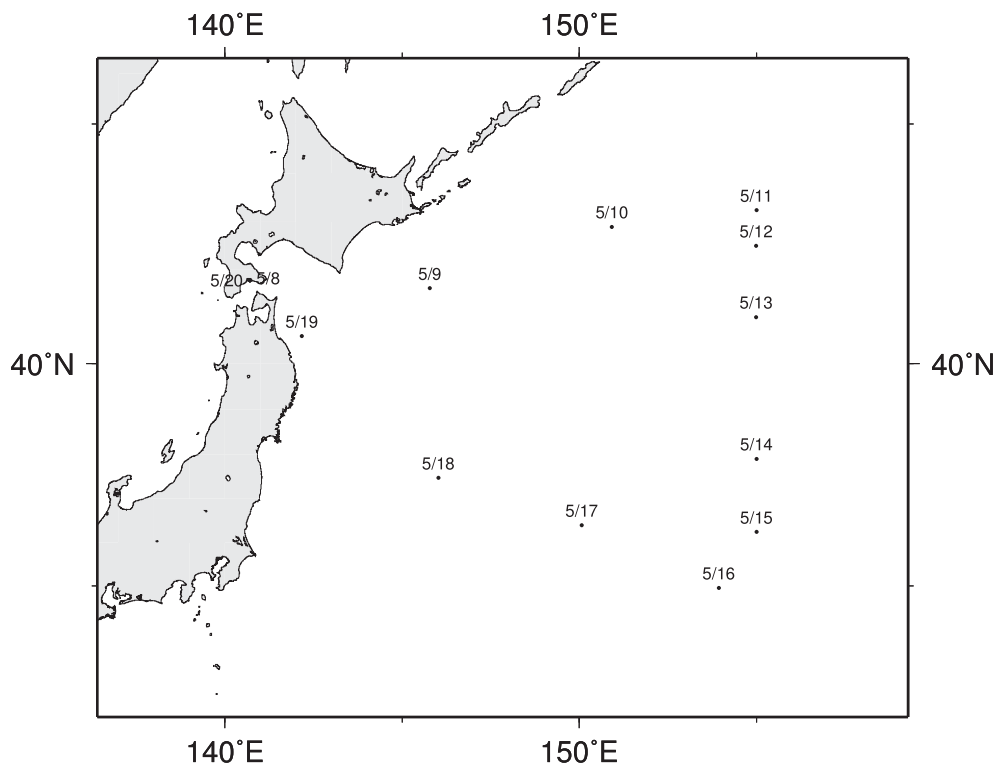


Figure 1: Noon position

2. Vessel Personnel

Captain:		Associate Professor	Shogo Takagi
Crew :	Chief Officer	Instructor	Yoshihiko Kamei
	Second Officer	Technical official	Keiichiro Sakaoka
	Third Officer	Technical official	Naoki Hoshi
	Chief Engineer	Instructor	Jyunichi Kimura
	And 26 men		

Cruise 201

Research Staff:	Associate Professor	(Laboratory of Strategic Studies on Marine Bioresource Conservation and Management)	Hideaki Kudo
	Graduate Students		2 persons
	Teaching Assistant		1 persons
	Under Graduate Students		7 persons
	Total		42 persons

3. Items of Research

Hydrographic observations:	Fig. 2	Table 1,2
Biological research for fishes caught by non-selective drift gillnets:	Fig. 3	Table 3-7
Salmon hook-and-line research:	Fig. 4	Table 8,9
Plankton sampling collected by vertical hauls with single or twin NORPAC net:	Fig. 2	Table 10,11

4. 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 “Oshoro Maru”.

Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19).

Dynamic computations were made using a desk-top computer aboard the “Oshoro Maru”.

Table 1: List of Oceanographic Stations

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS09042	41-33.0N	145-48.0E	5/9	1440	9	6950	4	17	11.7	b	9Plus-91588
OS09043	44-00.0N	155-00.0E	5/11	0528	10	5298	6	9.9	4.8	b	9Plus-91588
OS09044	43-15.0N	155-00.0E	5/11	1044	10	5490	5	18.8	8	bc	9Plus-91588
OS09045	43-33.0N	155-00.0E	5/11	1526	10	5455	4	16.5	6.3	bc	9Plus-91588
OS09046	42-30.0N	155-00.0E	5/12	1055	10	5165	5	15.5	8	o	9Plus-91588
OS09047	41-46.3N	154-58.3E	5/12	1822	10	5515	-	-	8.1	o	9Plus-91588
OS09048	41-00.0N	155-00.0E	5/13	1006	10	5450	6	14.5	10.2	o	9Plus-91588
OS09049	40-15.0N	155-00.0E	5/13	1544	10	5550	5	11.1	10.2	o	9Plus-91588
OS09050	39-30.0N	155-00.0E	5/13	2129	10	5625	-	-	14.9	o	9Plus-91588
OS09051	38-45.0N	155-00.0E	5/14	0540	10	5770	-	-	15.8	r	XCTD2
OS09052	38-00.0N	155-00.0E	5/14	1012	10	5975	5	12.5	14.5	o	9Plus-91588
OS09053	37-15.0N	155-00.0E	5/14	1523	10	5751	5	10	15.6	r	9Plus-91588
OS09054	37-06.6N	155-00.0E	5/14	1828	10	5800	-	-	15.6	o	9Plus-91588
OS09055	36-30.0N	155-00.0E	5/15	0851	10	5600	4	11.9	16.7	r	9Plus-91588
OS09056	35-45.0N	155-00.0E	5/15	1446	10	5235	-	-	16.4	bc	XCTD2
OS09057	35-00.0N	155-00.0E	5/15	1900	10	5634	-	-	17	bc	XCTD2
OS09058	34-17.0N	155-00.0E	5/16	0505	10	5794	3	20.5	19.3	bc	XCTD2
OS09059	35-52.0N	151-56.4E	5/16	2212	10	6020	-	-	18.3	b	9Plus-91588

(*):Fixed position by Global Positioning system

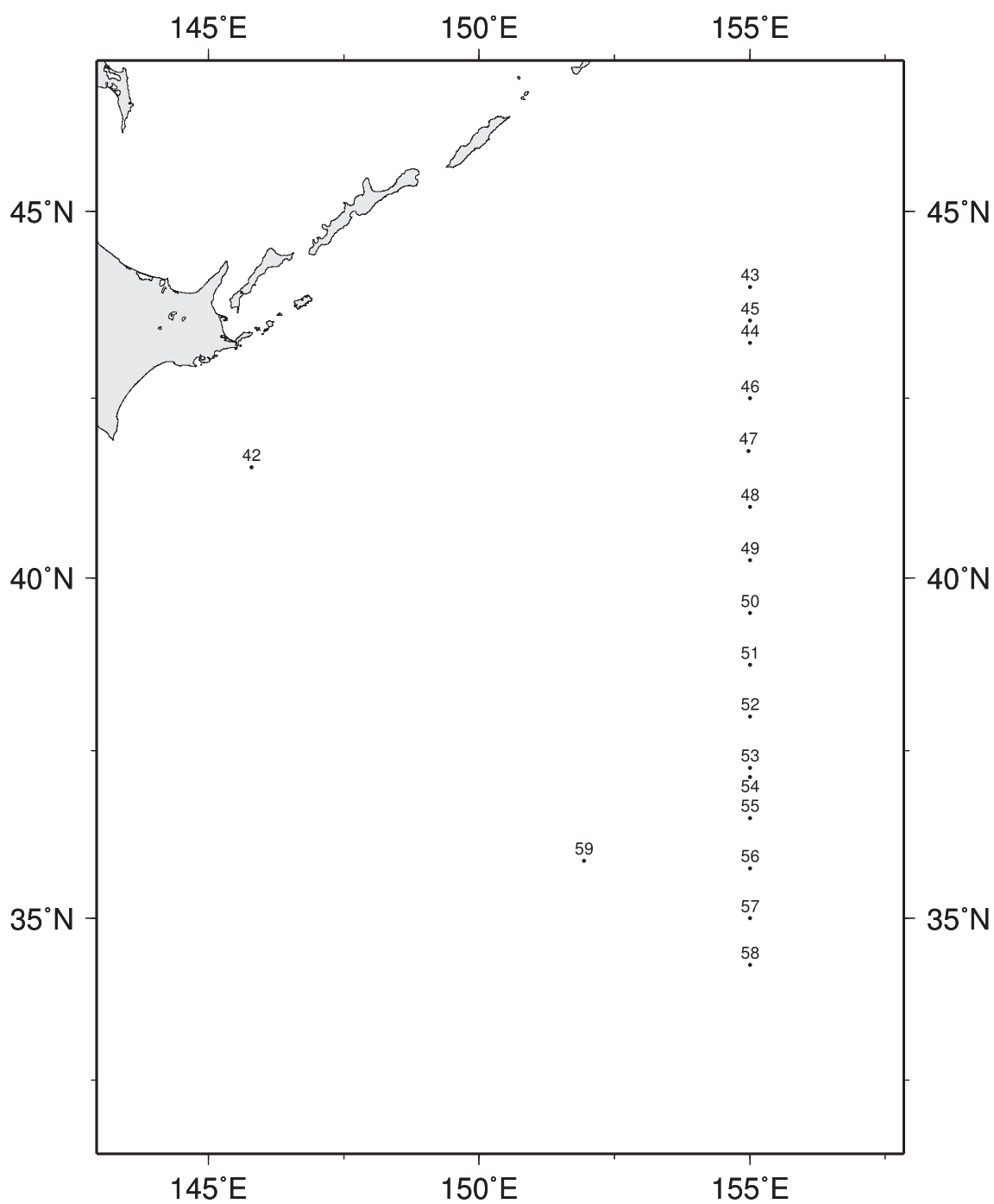


Figure 2: Oceanographic stations

Table 2: Oceanographic data

Station		OS09042	
Longitude		41-33.0N	
Latitude		145-48.0E	
Depth(m)		6950	
Press.	Temp.	Sal.	SIG-T
5	11.320	34.251	26.135
10	11.214	34.240	26.145
20	10.962	34.199	26.159
30	9.674	34.022	26.243
40	9.655	34.086	26.296
50	9.553	34.080	26.309
75	9.253	34.043	26.329
100	9.103	34.028	26.341
125	7.407	33.827	26.438
150	6.014	33.675	26.504
200	5.799	33.688	26.541
250	5.024	33.657	26.608
300	3.543	33.530	26.662
400	3.162	33.629	26.776
500	3.870	33.861	26.893
600	3.703	33.974	27.000
700	3.410	34.060	27.097
800	3.248	34.150	27.183
900	3.156	34.253	27.274
1000	3.183	34.334	27.336
1200	2.757	34.407	27.433
1500	2.396	34.481	27.523

Station		OS09045	
Longitude		43-33.0N	
Latitude		155-00.0E	
Depth(m)		5455	
Press.	Temp.	Sal.	SIG-T
5	5.954	33.323	26.233
10	5.715	33.331	26.269
20	5.628	33.352	26.296
30	5.662	33.369	26.306
40	5.348	33.400	26.367
50	5.213	33.472	26.440
75	5.907	33.622	26.475
100	5.950	33.674	26.511
125	5.244	33.588	26.528
150	4.118	33.517	26.594
200	3.559	33.654	26.759
250	4.119	33.821	26.836
300	4.250	33.909	26.892
400	3.447	33.940	26.997
500	3.053	34.007	27.087
600	3.338	34.156	27.180
700	3.215	34.234	27.254
800	3.033	34.288	27.314
900	2.973	34.351	27.370
1000	2.768	34.385	27.415
1200	2.549	34.448	27.485
1500	2.224	34.513	27.563

Station		OS09043	
Longitude		44-00.0N	
Latitude		155-00.0E	
Depth(m)		5298	
Press.	Temp.	Sal.	SIG-T
5	4.887	33.251	26.301
10	4.856	33.250	26.304
20	4.229	33.261	26.379
30	4.187	33.333	26.441
40	4.254	33.348	26.447
50	4.319	33.366	26.454
75	-	-	-
100	4.712	33.534	26.545
125	-	-	-
150	3.116	33.553	26.720
200	3.786	33.736	26.802
250	2.964	33.717	26.864
300	3.063	33.803	26.924
400	3.697	34.026	27.042
500	3.101	34.048	27.116

Station		OS09044	
Longitude		43-15.0N	
Latitude		155-00.0E	
Depth(m)		5490	
Press.	Temp.	Sal.	SIG-T
5	7.996	33.836	26.361
10	7.947	33.833	26.365
20	7.846	33.833	26.380
30	7.792	33.841	26.394
40	7.331	33.848	26.466
50	7.130	33.840	26.487
75	-	-	-
100	6.744	33.826	26.529
125	-	-	-
150	6.384	33.826	26.576
200	5.014	33.776	26.703
250	4.401	33.792	26.784
300	4.230	33.863	26.858
400	4.130	34.008	26.984
500	3.929	34.102	27.079

Station		OS09046	
Longitude		42-30.0N	
Latitude		155-00.0E	
Depth(m)		5165	
Press.	Temp.	Sal.	SIG-T
5	7.900	33.815	26.358
10	7.847	33.815	26.366
20	7.805	33.815	26.372
30	7.444	33.806	26.417
40	6.668	33.822	26.536
50	6.649	33.824	26.539
75	-	-	-
100	6.604	33.821	26.543
125	-	-	-
150	6.528	33.824	26.556
200	6.313	33.823	26.583
250	5.856	33.808	26.628
300	4.676	33.769	26.736
400	4.165	33.888	26.884
500	3.984	34.007	26.998

Station		OS09047	
Longitude		41-46.3N	
Latitude		154-58.3E	
Depth(m)		5515	
Press.	Temp.	Sal.	SIG-T
5	7.954	33.747	26.297
10	7.955	33.751	26.300
20	7.544	33.719	26.334
30	6.799	33.671	26.399
40	6.311	33.641	26.440
50	6.558	33.770	26.509
75	-	-	-
100	6.175	33.741	26.536
125	-	-	-
150	6.107	33.744	26.547
200	5.824	33.774	26.606
250	4.686	33.785	26.747
300	4.181	33.791	26.806
400	3.991	33.919	26.927
500	3.951	34.056	27.041

Station		OS09048	
Longitude		41-00.0N	
Latitude		155-00.0E	
Depth(m)		5450	
Press.	Temp.	Sal.	SIG-T
5	9.894	34.053	26.231
10	9.874	34.054	26.235
20	9.843	34.053	26.239
30	9.324	34.012	26.292
40	9.104	34.038	26.348
50	8.575	33.991	26.395
75	-	-	-
100	7.639	33.915	26.475
125	-	-	-
150	6.668	33.842	26.552
200	5.936	33.826	26.633
250	4.858	33.798	26.738
300	4.510	33.864	26.829
400	3.923	33.937	26.949
500	3.765	34.055	27.058

Station		OS09049	
Longitude		40-15.0N	
Latitude		155-00.0E	
Depth(m)		5550	
Press.	Temp.	Sal.	SIG-T
5	9.952	33.988	26.171
10	9.928	33.989	26.175
20	9.760	34.005	26.215
30	9.142	34.003	26.315
40	8.628	34.008	26.400
50	8.564	34.009	26.410
75	-	-	-
100	7.348	33.879	26.487
125	-	-	-
150	6.502	33.849	26.579
200	4.907	33.774	26.714
250	4.364	33.809	26.801
300	4.326	33.865	26.849
400	4.191	33.987	26.960
500	3.903	34.073	27.059

Station		OS09050	
Longitude		39-30.0N	
Latitude		155-00.0E	
Depth(m)		5625	
Press.	Temp.	Sal.	SIG-T
5	14.770	34.461	25.607
10	14.767	34.461	25.608
20	14.450	34.479	25.690
30	14.008	34.487	25.790
40	13.539	34.461	25.867
50	13.309	34.449	25.904
75	-	-	-
100	11.057	34.239	26.173
125	-	-	-
150	9.641	34.141	26.342
200	8.656	34.052	26.430
250	7.352	33.894	26.499
300	5.716	33.772	26.618
400	4.286	33.791	26.795
500	4.295	33.976	26.941

Station		OS09051	
Longitude		38-45.0N	
Latitude		155-00.0E	
Depth(m)		5770	
Press.	Temp.	Sal.	SIG-T
5	15.796	34.475	25.391
10	15.805	34.496	25.405
20	15.796	34.508	25.416
30	14.989	34.491	25.583
40	14.625	34.494	25.664
50	14.373	34.487	25.713
75	13.920	34.452	25.781
100	13.222	34.442	25.917
125	12.605	34.385	25.995
150	11.693	34.302	26.105
200	10.167	34.158	26.266
250	9.350	34.160	26.404
300	8.200	34.071	26.515
400	5.814	33.941	26.739
500	4.667	33.969	26.895
600	4.370	34.094	27.027
700	4.052	34.739	27.573
800	3.683	34.415	27.353
900	3.417	34.501	27.448
1000	3.140	34.547	27.511
1200	2.776	34.631	27.611
1500	2.341	34.699	27.703

Station		OS09052	
Longitude		38-00.0N	
Latitude		155-00.0E	
Depth(m)		5975	
Press.	Temp.	Sal.	SIG-T
5	14.534	34.387	25.601
10	14.550	34.401	25.608
20	14.485	34.435	25.649
30	13.039	34.321	25.859
40	11.363	34.247	26.124
50	10.840	34.218	26.196
75	-	-	-
100	9.568	34.125	26.341
125	-	-	-
150	8.781	34.045	26.405
200	8.099	33.965	26.446
250	7.208	33.902	26.525
300	6.121	33.866	26.642
400	4.264	33.808	26.811
500	4.437	34.003	26.947

Station		OS09053	
Longitude		37-15.0N	
Latitude		155-00.0E	
Depth(m)		5751	
Press.	Temp.	Sal.	SIG-T
5	15.568	34.441	25.416
10	15.564	34.441	25.417
20	14.067	34.407	25.716
30	12.541	34.377	26.002
40	12.074	34.341	26.064
50	11.616	34.274	26.098
75	-	-	-
100	10.519	34.231	26.263
125	-	-	-
150	9.061	34.117	26.417
200	7.896	33.985	26.492
250	6.540	33.887	26.604
300	6.619	34.048	26.720
400	5.432	34.063	26.882
500	4.677	34.097	26.996

Station		OS09054	
Longitude		37-06.6N	
Latitude		155-00.0E	
Depth(m)		5800	
Press.	Temp.	Sal.	SIG-T
5	15.820	34.470	25.382
10	15.807	34.471	25.385
20	15.681	34.471	25.414
30	15.223	34.466	25.512
40	13.685	34.446	25.825
50	13.459	34.438	25.866
75	12.670	34.379	25.978
100	11.938	34.337	26.086
125	11.313	34.287	26.164
150	10.713	34.239	26.235
200	8.873	34.087	26.424
250	6.896	33.885	26.555
300	6.626	33.991	26.674
400	4.929	33.952	26.852
500	4.948	34.090	26.960
600	4.454	34.164	27.074
700	4.131	34.240	27.168
800	3.799	34.309	27.257
900	3.390	34.336	27.318
1000	3.086	34.367	27.372
1200	2.750	34.430	27.453
1500	2.380	34.504	27.544

Station		OS09055	
Longitude		36-30.0N	
Latitude		155-00.0E	
Depth(m)		5600	
Press.	Temp.	Sal.	SIG-T
5	16.662	34.522	25.228
10	16.657	34.523	25.230
20	16.635	34.522	25.234
30	16.617	34.521	25.238
40	15.636	34.515	25.458
50	15.301	34.503	25.523
75	-	-	-
100	14.436	34.500	25.709
125	-	-	-
150	13.981	34.470	25.782
200	13.037	34.406	25.925
250	11.671	34.313	26.118
300	9.765	34.135	26.317
400	8.243	34.017	26.466
500	5.772	33.961	26.760

Station		OS09056	
Longitude		35-45.0N	
Latitude		155-00.0E	
Depth(m)		5235	
Press.	Temp.	Sal.	SIG-T
5	16.490	34.328	25.119
10	16.459	34.348	25.142
20	16.182	34.357	25.212
30	15.420	34.416	25.430
40	14.899	34.415	25.544
50	14.721	34.408	25.577
75	14.365	34.427	25.668
100	14.085	34.414	25.717
125	13.885	34.410	25.756
150	13.589	34.399	25.809
200	12.690	34.355	25.955
250	11.234	34.247	26.147
300	10.212	34.190	26.284
400	7.507	33.996	26.557
500	5.525	33.979	26.804
600	4.848	34.057	26.945
700	4.393	34.147	27.066
800	3.945	34.243	27.190
900	3.565	34.312	27.283
1000	3.274	34.366	27.354
1200	2.820	34.442	27.456
1500	2.343	34.523	27.562

Station		OS09057	
Longitude		35-00.0N	
Latitude		155-00.0E	
Depth(m)		5634	
Press.	Temp.	Sal.	SIG-T
5	17.046	34.335	24.994
10	16.942	34.347	25.028
20	16.806	34.349	25.061
30	16.537	34.342	25.119
40	15.621	34.358	25.340
50	14.875	34.366	25.511
75	13.303	34.376	25.849
100	12.357	34.309	25.985
125	11.437	34.256	26.117
150	10.921	34.245	26.202
200	9.634	34.154	26.353
250	8.238	34.051	26.493
300	7.086	34.018	26.634
400	5.124	33.949	26.828
500	4.728	34.067	26.966
600	4.247	34.166	27.097
700	3.886	34.241	27.194
800	3.538	34.315	27.288
900	3.265	34.374	27.361
1000	3.024	34.406	27.409
1200	2.599	34.481	27.506
1500	2.232	34.567	27.606

Station		OS09058	
Longitude		34-17.0N	
Latitude		155-00.0E	
Depth(m)		5794	
Press.	Temp.	Sal.	SIG-T
5	19.629	34.619	24.569
10	19.639	34.633	24.577
20	19.613	34.637	24.587
30	19.592	34.643	24.597
40	18.864	34.651	24.790
50	18.572	34.660	24.871
75	17.900	34.640	25.022
100	16.448	34.569	25.314
125	15.674	34.588	25.505
150	14.732	34.532	25.670
200	13.228	34.419	25.898
250	11.765	34.337	26.119
300	10.033	34.239	26.352
400	5.638	33.779	26.633
500	5.874	34.096	26.854
600	4.506	34.089	27.008
700	4.138	34.192	27.129
800	3.719	34.267	27.232
900	3.428	34.335	27.314
1000	3.166	34.380	27.375
1200	2.732	34.458	27.476
1500	2.325	34.539	27.576

Station		OS09059	
Longitude		35-52.0N	
Latitude		151-56.4E	
Depth(m)		6020	
Press.	Temp.	Sal.	SIG-T
5	18.413	34.614	24.875
10	18.413	34.615	24.876
20	18.303	34.603	24.894
30	18.181	34.598	24.920
40	18.080	34.694	25.019
50	17.756	34.696	25.100
75	17.114	34.693	25.253
100	16.221	34.631	25.414
125	15.353	34.607	25.591
150	14.307	34.538	25.766
200	13.140	34.477	25.960
250	12.389	34.391	26.042
300	11.082	34.251	26.178
400	7.397	33.939	26.528
500	5.383	33.843	26.714
600	4.953	34.008	26.894
700	4.531	34.121	27.031
800	4.077	34.212	27.152
900	3.728	34.281	27.242
1000	3.423	34.334	27.314
1200	2.982	34.426	27.429
1500	2.482	34.496	27.528

5. Data on drift gillnet research

Three gillnet researches were performed during this cruise. The operations were supervised by the captain, and were conducted by deck officers, crews and research staff.

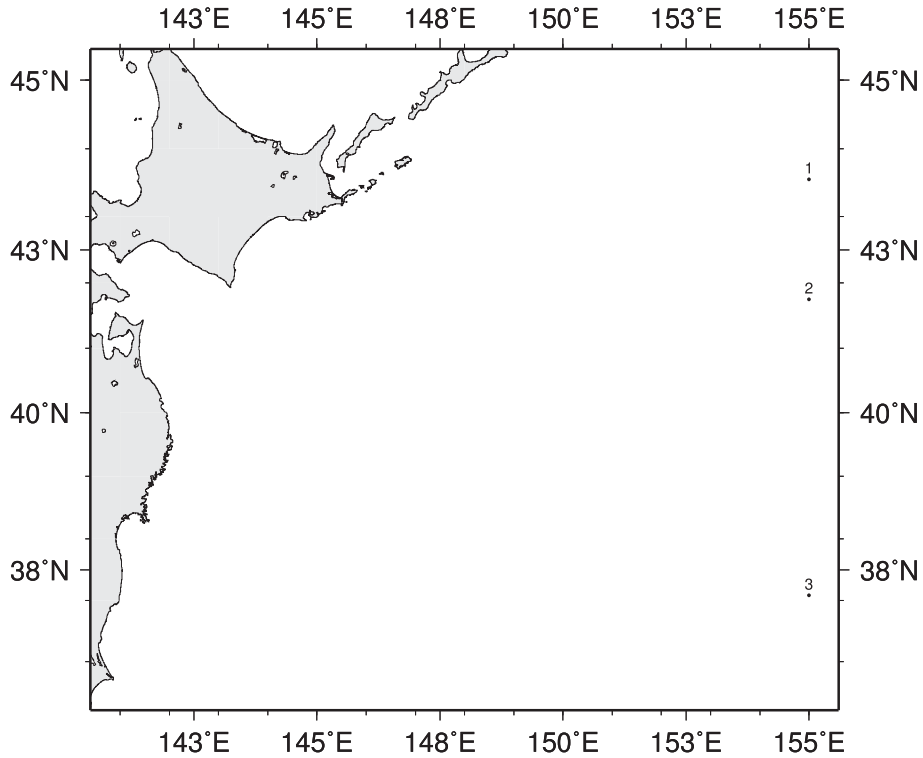


Figure 3: Locations of drift gillnet research

Table 3: Data on drift gillnet research

No. of research	Date and Time (S.M.T.)		T.D.	Position		Bottom		Wr	Wind	S.T. (°C)	Tr (m)
	Net set	Net haul		Lat.(N)	Long.	D.D.	depth(m)				
OSG0901	11-May 1751-1814	12-May 0428-0514	+10h	43-33.1	155-00.0 (E)	220	5450	o	North-2	6.3	16.5
OSG0902	12-May 1751-1812	13-May 0424-0520	+10h	41-44.9	154-59.8 (E)	335	5515	c	ESE-5	8.1	-
OSG0903	14-May 1755-1815	15-May 0424-0536	+10h	37-05.2	154-59.9 (E)	340	5800	c	NE-6	15.1	10.0

T.D.: Time Difference between Greenwich Mean Time (G.M.T.) and S.M.T. D.D : Direction of Drift toward

Wr.: Weather (o: 100% clouded, c: 75-99% clouded) S.T. : Surface temperature Tr : Transparency

Table 4: Nets composition

No. of research	Mesh size (mm)																						Total
	48	55	63	72	82	93	106	121	138	157	112	115	118	121	19	22	25	29	33	37	42		
OSG0901	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1	49	
OSG0902	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1	49	
OSG0903	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1	49	

Table 5: Data on catch number of salmonids by drift gillnet research

Sockeye (catch number)

No. of research	Mesh size (mm)																						Total
	48	55	63	72	82	93	106	121	138	157	112	115	118	121	19	22	25	29	33	37	42		
OSG0901	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0902	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0903	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Chum (catch number)

No. of research	Mesh size (mm)																					Total
	48	55	63	72	82	93	106	121	138	157	112	115	118	121	19	22	25	29	33	37	42	
OSG0901	0	0	1	0	1	4	14	8	0	0	7	7	2	10	0	0	0	0	0	0	0	54
OSG0902	0	0	0	0	0	2	1	3	2	0	3	2	0	3	0	0	0	0	0	0	0	16
OSG0903	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Pink (catch number)

No. of research	Mesh size (mm)																						Total
	48	55	63	72	82	93	106	121	138	157	112	115	118	121	19	22	25	29	33	37	42		
OSG0901	0	0	1	4	51	108	12	1	0	0	3	1	1	0	0	0	0	0	0	0	0	182	
OSG0902	0	0	0	75	207	70	15	0	0	0	0	0	2	1	0	0	0	0	0	0	0	370	
OSG0903	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Coho (catch number)

No. of research	Mesh size (mm)																						Total
	48	55	63	72	82	93	106	121	138	157	112	115	118	121	19	22	25	29	33	37	42		
OSG0901	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0902	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0903	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Chinook (catch number)

No. of research	Mesh size (mm)																						Total
	48	55	63	72	82	93	106	121	138	157	112	115	118	121	19	22	25	29	33	37	42		
OSG0901	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0902	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0903	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Steelhead (catch number)

No. of research	Mesh size (mm)																						Total
	48	55	63	72	82	93	106	121	138	157	112	115	118	121	19	22	25	29	33	37	42		
OSG0901	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0902	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0903	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Table 6. Biological characteristics of salmonids caught by drift gillnet research

CHUM SALMON																	
St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.
	(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)
G01	A112	520	1800	M	3	G01	A121	517	1655	M	2	G01	C121	510	1567	F	37
G01	A112	579	2240	F	20	G01	A121	562	2126	M	2	G01	C121	600	2327	F	22
G01	A112	522	1820	M	4	G01	A121	536	1645	M	1	G01	C121	511	1628	F	37
G01	A112	483	1320	F	25	G01	C063	471	1363	M	2	G01	C121	524	1615	F	21
G01	A112	496	1600	F	32	G01	C082	525	1749	F	52	G01	C121	579	2092	F	53
G01	A112	510	1440	F	17	G01	C093	522	1634	F	21	G01	C121	522	1673	M	2
G01	A112	496	1540	M	2	G01	C093	508	1388	F	15	G01	C121	519	1848	M	5
G01	A115	541	1612	M	1	G01	C093	528	1956	M	10	G02	C093	504	1389	F	12
G01	A115	509	1513	F	16	G01	C093	502	1594	M	3	G02	C093	530	1625	F	25
G01	A115	525	1557	M	2	G01	C106	506	1456	M	4	G02	A112	599	2665	F	33
G01	A115	520	1692	M	3	G01	C106	458	1155	F	14	G02	A112	496	1324	F	26
G01	A115	524	1690	M	3	G01	C106			F	16	G02	A112	538	1616	M	2
G01	A115	561	1873	M	2	G01	C106	475	1520	F	27	G02	A115	586	2380	M	4
G01	A115	525	1803	M	3	G01	C106	540	1707	F	30	G02	A115	528	1670	F	23
G01	A118	508	1960	M	2	G01	C106	538	1782	M	2	G02	A121	554	2069	M	3
G01	A118	552	1800	M	5	G01	C106	510	1660	F	32	G02	A121	532	1988	F	62
G01	A121	565	1988	M	1	G01	C106	477	1276	F	8	G02	A121	491	1457	F	21
G01	A121	534	1814	F	53	G01	C106	546	2012	F	39	G02	C106	528	1625	M	1
G01	A121	606	2442	F	29	G01	C106	524	1615	M	2	G02	C121	558	2343	M	6
G01	A121	580	2229	M	3	G01	C106	503	1635	M	3	G02	C121	522	1643	F	18
G01	A121	508	1416	F	22	G01	C106	503	1724	F	41	G02	C121	508	1583	F	35
G01	A121	504	1578	F	27	G01	C106	513	1638	M	3	G02	C138	594	2356	F	28
G01	A121	526	1758	M	2	G01	C121	617	2646	M	2	G02	C138	608	2558	M	3
PINK SALMON																	
St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.
	(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)
G01	A112	482	1160	M	6	G01	C082	395	680	M	3	G01	C093	432	857	M	4
G01	A112	452	1040	M	6	G01	C082	423	848	M	5	G01	C093	414	813	M	1
G01	A112	492	1260	M	8	G01	C082	433	848	M	4	G01	C093	384	722	M	2
G01	A118	474	1180	M	5	G01	C082	386	717	F	7	G01	C093	420	850	M	1
G01	A121	488	1213	M	2	G01	C082	395	710	F	8	G01	C093	415	827	M	2
G01	C063	402	840	F	37	G01	C082	420	847	M	2	G01	C093	425	898	M	4
G01	C072	400	720	M	4	G01	C082	426	895	M	3	G01	C093	404	718	F	11
G01	C072	398	790	M	3	G01	C082	400	767	M	1	G01	C093	395	731	F	11
G01	C072	350	500	M	2	G01	C082	404	755	M	1	G01	C093	394	673	M	2
G01	C072	396	700	F	9	G01	C082	422	839	M	2	G01	C093	398	757	M	3
G01	C082	403	745	M	3	G01	C082	390	695	M	1	G01	C093	418	816	M	2
G01	C082	383	632	F	5	G01	C082	407	790	M	2	G01	C093	402	758	F	19
G01	C082	432	852	F	10	G01	C082	423	853	M	4	G01	C093	400	764	F	10
G01	C082	390	678	M	3	G01	C082	417	834	F	14	G01	C093	402	744	F	20
G01	C082	422	829	M	1	G01	C082	384	682	F	6	G01	C093	427	861	M	3
G01	C082	401	741	F	18	G01	C082	418	825	M	3	G01	C093	400	751	F	11
G01	C082	428	916	M	4	G01	C082	439	861	M	2	G01	C093	388	709	F	12
G01	C082	396	685	M	2	G01	C093	438	894	M	4	G01	C093	385	680	F	7
G01	C082	397	760	F	14	G01	C093	398	745	M	2	G01	C093	411	846	F	9
G01	C082	408	816	M	2	G01	C093	422	903	M	4	G01	C093	447	965	M	3
G01	C082	393	713	M	3	G01	C093	392	742	F	8	G01	C093	426	903	M	1
G01	C082	385	633	F	6	G01	C093	462	1158	M	4	G01	C093	396	709	F	7
G01	C082	379	673	M	2	G01	C093	391	742	M	1	G01	C093	389	746	M	4
G01	C082	436	1077	M	4	G01	C093	410	818	M	1	G01	C093	429	907	M	3
G01	C082	380	655	M	4	G01	C093	452	977	M	2	G01	C093	410	846	M	4
G01	C082	394	725	F	13	G01	C093	422	840	M	3	G01	C093	431	922	M	2
G01	C082	383	682	F	8	G01	C093	403	863	M	3	G01	C093	420	876	M	2
G01	C082	400	724	F	7	G01	C093	424	857	M	2	G01	C093	418	825	M	1
G01	C082	388	702	F	18	G01	C093	406	804	M	1	G01	C093	432	850	F	7
G01	C082	381	611	M	2	G01	C093	414	883	M	2	G01	C093	431	934	M	2
G01	C082	405	792	M	3	G01	C093	402	779	F	21	G01	C093	372	577	F	5
G01	C082	414	817	M	2	G01	C093	422	890	M	2	G01	C093	412	814	M	2
G01	C082	375	640	F	8	G01	C093	394	738	M	3	G01	C093	423	901	M	3
G01	C082	388	665	M	3	G01	C093	436	883	M	2	G01	C093	434	953	M	3
G01	C082	411	856	M	2	G01	C093	398	665	F	9	G01	C106	404	779	F	16
G01	C082	390	639	M	2	G01	C093	407	770	M	3	G01	C106	435	960	M	2
G01	C082	403	723	F	9	G01	C093	400	735	M	2	G01	C106	429	965	M	7
G01	C082	408	814	M	3	G01	C093	434	973	M	3	G01	C106	395	769	F	10
G01	C082	388	669	F	6	G01	C093	422	800	F	19	G01	C106	499	1005	M	4
G01	C082	425	915	M	2	G01	C093	419	815	M	4	G01	C106	428	918	M	1
G01	C082	401	737	F	11	G01	C093	425	878	F	12	G01	C106	445	1050	M	5
G01	C082	421	871	M	3	G01	C093	410	792	M	3	G01	C106	442	974	M	8

Table 6. Biological characteristics of salmonids caught by drift gillnet research (continued)

PINK SALMON																	
St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.
	(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)
G01	C106	448	1035	M	2	G02	C072	390	649	F	7	G02	C093	392	718	F	20
G01	C106	416	786	M	1	G02	C082	418	857	M	3	G02	C093	386	754	M	2
G01	C106	441	902	M	2	G02	C082	381	630	F	8	G02	C093	408	819	M	5
G01	C121	485	1407	M	3	G02	C082	381	571	M	3	G02	C093	426	936	M	5
G02	A118	482	1250	M	7	G02	C082	434	896	M	4	G02	C093	394	763	M	5
G02	A118	475	1180	M	3	G02	C082	421	832	F	12	G02	C093	400	750	M	4
G02	A121	442	962	M	3	G02	C082	378	617	F	8	G02	C093	431	926	F	20
G02	C072	394	706	M	4	G02	C082	408	714	F	42	G02	C093	436	925	M	3
G02	C072	398	764	F	13	G02	C082	421	844	F	24	G02	C093	405	795	F	18
G02	C072	414	821	F	14	G02	C082	390	712	F	13	G02	C093	401	765	F	20
G02	C072	406	762	F	15	G02	C082	394	688	M	6	G02	C093	402	782	M	4
G02	C072	392	661	F	12	G02	C082	384	648	F	13	G02	C093	392	775	F	16
G02	C072	421	872	M	7	G02	C082	368	535	M	2	G02	C093	419	894	M	5
G02	C072	391	665	F	18	G02	C082	389	667	F	9	G02	C093	390	749	F	17
G02	C072	376	608	F	7	G02	C082	419	735	M	3	G02	C093	408	828	M	4
G02	C072	385	693	F	7	G02	C082	389	680	F	5	G02	C093	397	753	F	50
G02	C072	396	710	F	9	G02	C082	382	674	M	2	G02	C093	403	772	M	4
G02	C072	381	624	M	2	G02	C082	402	669	M	2	G02	C093	406	788	F	12
G02	C072	352	510	M	1	G02	C082	401	672	F	7	G02	C093	380	682	M	3
G02	C072	401	700	M	4	G02	C082	395	755	F	12	G02	C093	451	999	M	4
G02	C072	389	644	M	2	G02	C082	409	775	F	3	G02	C093	399	805	F	23
G02	C072	395	731	M	2	G02	C082	388	595	F	7	G02	C093	444	976		
G02	C072	382	677	F	12	G02	C082	393	613	F	7	G02	C093	393	770	F	12
G02	C072	413	772	F	14	G02	C082	382	585	M	3	G02	C093	438	961	M	5
G02	C072	353	422	F	8	G02	C082	388	635	F	12	G02	C093	388	682	M	7
G02	C072	399	722	F	7	G02	C082	362	497	F	8	G02	C093	408	808	M	5
G02	C072	394	657	M	3	G02	C082	388	643	M	3	G02	C093	406	774	F	32
G02	C072	384	649	F	4	G02	C082	380	620	F	12	G02	C093	396	695	F	11
G02	C072	388	673	F	6	G02	C082	407	731	F	8	G02	C093	418	842	F	7
G02	C072	372	626	M	4	G02	C082	365	640	M	2	G02	C093	384	661	F	13
G02	C072	353	477	F	4	G02	C082	377	591	M	4	G02	C093	444	935	M	3
G02	C072	385	693	M	5	G02	C082	394	680	M	3	G02	C093	409	808	M	5
G02	C072	394	686	F	9	G02	C082	404	740	M	1	G02	C093	402	792	F	12
G02	C072	380	664	F	11	G02	C082	423	800	M	5	G02	C093	410	795	F	13
G02	C072	386	654	M	4	G02	C082	348	590	M	3	G02	C093	371	593	M	2
G02	C072	385	617	F	9	G02	C082	390	700	F	20	G02	C093	430	885	M	4
G02	C072	371	574	F	8	G02	C082	391	660	F	12	G02	C093	374	668	F	19
G02	C072	386	685	F	12	G02	C082	387	750	F	18	G02	C093	406	767	F	17
G02	C072	426	873	F	32	G02	C082	402	720	M	2	G02	C093	412	806	F	12
G02	C072	390	682	M	2	G02	C082	384	680	M	2	G02	C093	441	876	M	3
G02	C072	389	707	F	6	G02	C082	342	550	M	1	G02	C093	408	816	F	10
G02	C072	374	641	F	6	G02	C082	392	670	F	20	G02	C093	401	703	F	20
G02	C072	426	782	F	5	G02	C082	378	620	F	12	G02	C093	426	856	M	2
G02	C072	381	620	M	2	G02	C082	393	731	F	6	G02	C093	388	635	M	3
G02	C072	376	584	F	5	G02	C082	418	840	M	3	G02	C093	390	598	M	2
G02	C072	374	613	F	5	G02	C082	415	812	F	8	G02	C093	423	783	F	18
G02	C072	388	653	F	7	G02	C082	389	660	F	18	G02	C093	466	1092	M	3
G02	C072	403	717	F	15	G02	C082	396	600	M	2	G02	C093	390	696	M	7
G02	C072	368	599	F	6	G02	C082	424	870	F	23	G02	C093	389	733	F	15
G02	C072	384	651	M	1	G02	C082	366	700	F	5	G02	C093	427	901	F	17
G02	C072	353	486	F	5	G02	C082	390	700	M	2	G02	C093	386	673	M	9
G02	C072	378	644	M	4	G02	C082	381	700	F	15	G02	C093	400	708	F	29
G02	C072	398	698	M	7	G02	C082	407	670	M	2	G02	C106	453	959	M	5
G02	C072	393	662	M	1	G02	C082	394	750	F	21	G02	C106	451	1144		
G02	C072	402	696	M	3	G02	C082	394	780	M	3	G02	C106	428	923	F	38
G02	C072	382	621	F	7	G02	C082	402	700	M	2	G02	C106	438	963	M	4
G02	C072	389	695	M	4	G02	C082	429	850	M	2	G02	C106	386	723	M	10
G02	C072	410	801	M	3	G02	C082	388	720	M	3	G02	C106	431	887	F	8
G02	C072	378	580	M	1	G02	C082	393	700	M	3	G02	C106	445	977	M	5
G02	C072	390	662	F	9	G02	C082	333	540	M	2	G02	C106	400	771	M	5
G02	C072	364	552	M	3	G02	C082	394	710	M	2	G02	C106	451	997	F	26
G02	C072	396	721	F	7	G02	C093	406	837	M	7	G02	C106	422	866	M	4
G02	C072	375	604	M	2	G02	C093	438	996	F	14	G02	C106	450	1087	M	5
G02	C072	375	640	M	1	G02	C093	396	837	F	16	G02	C106	431	872	M	2
G02	C072	389	630	M	2	G02	C093	396	750	M	6	G02	C106	419	932	M	3
G02	C072	379	682	M	3	G02	C093	407	817	M	5						

Table 7. Biological characteristics of fishes caught by drift gillnet

NEON FLYING SQUID											
St.	Gear	M.L.	B.W.	St.	Gear	M.L.	B.W.	St.	Gear	M.L.	B.W.
(mm)	(mm)	(mm)	(gr)	(mm)	(mm)	(mm)	(gr)	(mm)	(mm)	(mm)	(gr)
G03	A121	374	1692	G03	C157	450	3000				
BOREAL CLUBHOOK SQUID											
St.	Gear	M.L.	B.W.	St.	Gear	M.L.	B.W.	St.	Gear	M.L.	B.W.
(mm)	(mm)	(mm)	(gr)	(mm)	(mm)	(mm)	(gr)	(mm)	(mm)	(mm)	(gr)
G02	C072			G03	F19	76	14	G03	F33	128	52
G02	C082			G03	F22	96		G03	F37	140	75
G03	A112	142	64	G03	F29	130	52				
PACIFIC SAURY											
St.	Gear	F.L.	B.W.	St.	Gear	F.L.	B.W.	St.	Gear	F.L.	B.W.
(mm)	(mm)	(mm)	(gr)	(mm)	(mm)	(mm)	(gr)	(mm)	(mm)	(mm)	(gr)
G03	F19	175	20	G03	F22	186	23	G03	F25	190	26
G03	F19	159	14	G03	F22	200	33	G03	F25	194	27
G03	F19	153	13	G03	F22	197	31	G03	F25	202	41
G03	F19	188	26	G03	F22	184	21	G03	F25	196	27
G03	F19	146	12	G03	F22	183	21	G03	F25	200	28
G03	F19	139	11	G03	F22			G03	F25	192	27
G03	F19	200	32	G03	F22	166	14	G03	F25	204	32
G03	F19	177	26	G03	F22	170	18	G03	F25	182	22
G03	F19	167	17	G03	F22	178	21	G03	F25	197	24
G03	F19	165	16	G03	F22	201	35	G03	F25	204	33
G03	F19	193	23	G03	F22	177	20	G03	F25	206	33
G03	F19	157	16	G03	F22	180	15	G03	F25	200	29
G03	F19	184	22	G03	F22	188	30	G03	F25	204	35
G03	F22	170	18	G03	F22	187	24	G03	F25	200	31
G03	F22	182	26	G03	F22	160	11	G03	F25	220	39
G03	F22	202	30	G03	F22	160	14	G03	F25	198	27
G03	F22	167	21	G03	F22	198	29	G03	F25	203	33
G03	F22	173	18	G03	F22	167	19	G03	F25	196	31
G03	F22	171	20	G03	F22	180	18	G03	F25	214	38
G03	F22	186	25	G03	F22	189	31	G03	F25	194	30
G03	F22	187	17	G03	F22	190	28	G03	F25	202	31
G03	F22	165	19	G03	F22	200	33	G03	F25	185	24
G03	F22	182	22	G03	F22	180	24	G03	F25	194	27
G03	F22	194	27	G03	F22	168	19	G03	F25	224	46
G03	F22	170	17	G03	F22	172	17	G03	F25	185	19
G03	F22	195	22	G03	F22	186	24	G03	F25	199	29
G03	F22	190	25	G03	F22	170	19	G03	F25	193	28
G03	F22	188	26	G03	F25	224	39	G03	F25		
G03	F22	188	24	G03	F25	188	25	G03	F25	196	29
G03	F22	165	18	G03	F25	189	25	G03	F25	192	26
G03	F22	174	17	G03	F25	208	3	G03	F25	200	30
G03	F22	205	33	G03	F25	193	28	G03	F25	195	31
G03	F22	186	26	G03	F25	205	32	G03	F29	168	17
G03	F22	203	35	G03	F25	194	28	G03	F29	215	38
G03	F22	194	24	G03	F25	190	28	G03	F29	224	42
G03	F22	175	20	G03	F25	208	37	G03	F29	220	45
G03	F22	182	24	G03	F25	194	28	G03	F29	206	35
G03	F22	195	30	G03	F25	205	26	G03	F29	302	81
G03	F22	167	21	G03	F25	200	28	G03	F29	224	43
G03	F22	173	10	G03	F25	182	22	G03	F29	228	46
G03	F22	184	24	G03	F25	189	26	G03	F29	238	47
G03	F22	182	22	G03	F25	192	23	G03	F29		
G03	F22	175	21	G03	F25	198	29	G03	F33	246	56.3
G03	F22	183	22	G03	F25	206	33	G03	F33	135	54.3
G03	F22	169	18	G03	F25	188	25	G03	F37	310	
G03	F22	178	20	G03	F25	205	33	G03	F37	273	75
PACIFIC POMFRET											
St.	Gear	F.L.	B.W.	St.	Gear	F.L.	B.W.	St.	Gear	F.L.	B.W.
(mm)	(mm)	(mm)	(gr)	(mm)	(mm)	(mm)	(gr)	(mm)	(mm)	(mm)	(gr)
G03	A112	498	1359	G03	A118	408	1250	G03	A121	430	1479
G03	A112	425	1965	G03	A118	416	1430	G03	A121	442	1383
G03	A112	441	5482	G03	A118	452	1500	G03	A121	430	1505
G03	A115	444	1484	G03	A118	422	1370	G03	C106	436	1688
G03	A115	424	1369	G03	A121	436	1563	G03	C106	452	1796
G03	A115	450	1606	G03	A121	430	1411	G03	C121	450	1491
G03	A115	395	1227	G03	A121	442	1600	G03	C121	443	1355
G03	A118	428	1210	G03	A121	405	1086	G03	C121	455	1399

Table 7. Biological characteristics of fishes caught by drift gillnet (continued)

PACIFIC POMFRET											
St.	Gear (mm)	F.L. (mm)	B.W. (gr)	St.	Gear (mm)	F.L. (mm)	B.W. (gr)	St.	Gear (mm)	F.L. (mm)	B.W. (gr)
G03	C121	413	1470	G03	C138	450	1518	G03	C157	482	2035
G03	C121	429	1306	G03	C138	418	1428	G03	C157	390	996
G03	C121	439	1308	G03	C138	440	1405	G03	C157	400	1164
G03	C138	435	1441	G03	C138	435	1350	G03	C157	404	1101
G03	C138	438	1467	G03	C157	384	948	G03	C157	436	1575
G03	C138	453	1623	G03	C157	437	1391	G03	C157	446	1466
G03	C138	455	1698	G03	C157	420	1341	G03	C157	453	1668
G03	C138	450	1391	G03	C157	434	1548	G03	C157	445	1425
G03	C138	443	1519	G03	C157	430	1395	G03	C157	477	1677
G03	C138	423	1192	G03	C157	465	1770	G03	C157	440	1633
G03	C138	422	1235	G03	C157	440	1508	G03	C55	440	1558
G03	C138	440	1561	G03	C157	440	1394	G03	C55	155	66
G03	C138	464	1718	G03	C157	455	1719	G03	C55	154	70
G03	C138	430	1332	G03	C157	432	1533	G03	C55	150	61
G03	C138	425	1405	G03	C157	460	1484	G03	C63	148	57
G03	C138	413	1331	G03	C157	474	1751	G03	C72	450	1558
G03	C138	460	1706	G03	C157	430	1464	G03	C82	435	1501
G03	C138	413	1173	G03	C157	429	1204	G03	C82	440	1509
G03	C138	457	1586	G03	C157	466	1745	G03	F37	436	1400
								G03	F42	448	1403
ALBACORE											
St.	Gear (mm)	F.L. (mm)	B.W. (gr)	St.	Gear (mm)	F.L. (mm)	B.W. (gr)	St.	Gear (mm)	F.L. (mm)	B.W. (gr)
G03	A112	630	5482	G03	C106	610	4760	G03	C63	500	2612
G03	A121	485	2394	G03	C121	630	5590	G03	C72	618	5342
G03	C106	625	5544	G03	C138	495	2511	G03	C72	512	2900
G03	C106	618	4824	G03	C138	636	5250	G03	C72	500	2619
								G03	C72	698	6315

6. Salmon Hook-and-Line Research

To collect salmons, hook-and-line gears were used along 155°E line in the Central North Pacific during Cruise#201. Five to ten anglers were engaged in the work. These samplings were mainly conducted with observations when ship was under drifting.

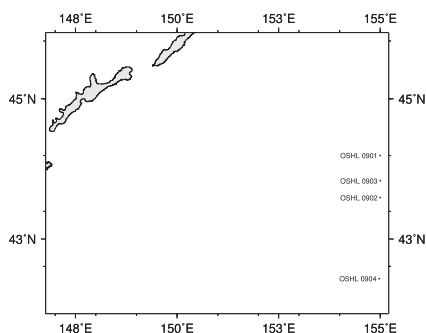


Figure 4: Locations of salmon hook-and-line research

Table 8: List of hook-and-line sampling (OSHL 09XX) station during the "Oshoro Maru" Cruise #201

Station	Date and Time (S.M.T.)					Set Position		D.S.	No. of hooks	Wr.	Wind (Force)	Oceanographic Station No.
	Line set		Line haul		T.D.	Lat.	Long.					
OSHL 0901	11-May	05:45	11-May	06:45	+10h	44-00.0N	155-00.0E	-	-	b	NNE-4	OS 09043
OSHL 0902	11-May	10:45	11-May	12:25	+10h	43-15.0N	155-00.0E	-	-	bc	NNE-4	OS 09044
OSHL 0903	11-May	15:30	12-May	03:00	+10h	43-33.0N	155-00.0E	-	-	bc	NNW-2	OS 09045
OSHL 0904	12-May	20:45	13-May	03:00	+10h	41-46.3N	154-58.3E	-	-	o	ESE-5	OS 09047

S.M.T. : Ship's Mean Time T.D.: Time Difference between Greenwich Mean Time (G.M.T.) and S.M.T.

D.S. : Direction in which line was set Wr.: Weather (o: 100% clouded, b: 0-25% clouded, bc: 25-75% clouded)

Table 9. Biological characteristics of salmonids caught by hook-and-line research

CHUM SALMON														
St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)
HL03	472	1200			HL03	482	1320	F	30	HL03	540	2150	F	25
HL03	528	1570	F	25	HL03	514	1600	F	24	HL03	558	2300	M	9
HL03	466	1100	M	1	HL03	506	1620	F	25	HL04	620	3500	F	35
HL03	605	2750	F	37	HL03	556	1960	M	8	HL04	539	1700	M	4
HL03	598	2500	F	35	HL03	612	3000	M	7					
PINK SALMON														
St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)
HL01	434	880	F	28	HL03	433	820	M	10	HL04	456	1000		
HL01	422	830	M	2	HL03	405	740			HL04	400	680		
HL02	412	780	M	5	HL03	424	980			HL04	437	860		
HL03	394	720			HL03	407	720	M	14	HL04	424	820		
HL03	397	680			HL03	423	920	F	25	HL04	398	620		
HL03	401	800			HL03	378	580	M	4	HL04	441	960		
HL03	393	740			HL03	406	780	M	6	HL04	422	820		
HL03	409	840			HL03	424	820	M	8	HL04	408	780		
HL03	360	620			HL03	418	810	M	5	HL04	414	800		
HL03	393	660			HL03	410	760			HL04	404	720		
HL03	406	900			HL03	444	940	M	10	HL04	410	680		
HL03	403	780			HL03	398	810	F	17	HL04	378	600		
HL03	392	720			HL03	402	740	M	10	HL04	384	620	F	7
HL03	400	720			HL03	390	680	F	23	HL04	348	490	M	4
HL03	417	960			HL03	400	690	M	5	HL04	370	600	M	3
HL03	399	720			HL03	413	700	M	10	HL04	420	770	M	8
HL03	418	940			HL03	418	820	M	7	HL04	390	630	F	8
HL03	402	840			HL03	390	660	F	20	HL04	392	640		
HL03	410	880			HL03	382	640	F	17	HL04	417	830	M	6
HL03	415	980			HL03	404	700	M	6	HL04	412	680		
HL03	400	680			HL03	401	740	F	12	HL04	393	660		
HL03	396	720			HL03	400	700	F	15	HL04	405	680		
HL03	410	800			HL03	436	850	M	8	HL04	404	720		
HL03	390	720			HL04	419	740			HL04	398	720		
HL03	389	700			HL04	426	840			HL04	408	700		
HL03	399	740			HL04	395	680			HL04	442	820		
HL03	398	720			HL04	395	670	M	4	HL04	412	800	F	7
HL03	410	800			HL04	420	775	F	25	HL04	392	690	F	10
HL03	400	600			HL04	410	805	F	24	HL04	402	660	F	16
HL03	408	800	M	6	HL04	398	720	M	4	HL04	402	720	F	10
HL03	429	1000	F	14	HL04	430	895	F	13	HL04	381	660	F	1
HL03	414	740			HL04	421	840			HL04	388	660	F	2
HL03	407	800	M	6	HL04	400	660	F	10	HL04	392	650	M	5
HL03	401	780	M	7	HL04	440	870	F	15	HL04	405	740	F	5
HL03	402	700	M	8	HL04	417	840			HL04	375	550	F	7
HL03	403	720	M	6	HL04	400	720			HL04	410	760	F	5
HL03	404	760	F	16	HL04	408	710	M	7	HL04	410	740	F	7
HL03	408	760	M	10	HL04	394	640			HL04	420	870	F	12
HL03	412	840	F	16	HL04	400	760			HL04	398	650	F	14
HL03	426	780	M	8	HL04	432	940			HL04	380	680	F	12
HL03	416	740	F	14	HL04	471	1050			HL04	383	620	F	16
										HL04	397	660	M	8

7. Data on plankton collected by vertical hauls with a single or twin NORPAC net

Vertical hauls with a twin-NORPAC net were made at hydrographic stations. This net was composed of 45 cm mouth diameter and 180 cm long conical one which was made of GG54 and XX13 having 0.33 mm and 0.10 mm mesh, respectively. The net was lowered to the estimated depth of 150 m, 500 m or near the bottom when the bottom depth was shallower than 150 m, and immediately hauled to the surface at a speed about 1 m s⁻¹. A flowmeter was mounted at the center of mouth of the net to estimate the volume water filtered. Sampling was conducted by research staffs and measurement of wet weight of the samples were made by A. Yamaguchi, K. Ishii, K. Matsuno, R. Saito, K. Ohgi, Y. Onishi, T. Homma, R. Ohashi, C. Tsukazaki and K. Mishima (Laboratory of Marine Biology).

Table 10: Data on plankton collected by vertical hauls with a single or twin NORPAC net.

GG54:0.33mm mesh, XX13:0.10mm mesh.

Station no.	Position		S.M.T.		Length of wire (m)	Angle of wire (°)	Depth estimated by wire angle (m)	Kind of cloth	Flowmeter		Estimated volume of water filtered (m ³)	Wet weight (g)		Sample no.
	Lat. (N)	Lon.	Date	Hour					No.	Reading		per haul	per 1000 m ³	
OS09042 (site H)	41-30	145-47 E	9-May	13:53	150	1	150	GG54	1852	1354	22.69	12.2	540	09101
								XX13	2555	1098	22.45			09102
				14:04	500	1	500	GG54	1852	4530	75.92	15.2	200	3) 09103
								XX13	2555	3198	65.38			09104
OS09043	44-00	155-00 E	11-May	6:37	150	1	150	GG54	1852	1368	22.93	7.7	335	09105
								XX13	2555	1003	20.50			09106
OS09044	43-15	155-00 E	11-May	12:17	150	14	146	GG54	1852	1474	24.70	10.8	436	09107
								XX13	2555	1142	23.35			09108
OS09045	43-33	155-00 E	11-May	15:23	155	15	150	GG54	1852	1533	25.69	17.6	686	3) 09109
								XX13	2555	1178	24.08			09110
OS09046	42-30	155-00 E	12-May	12:16	158	18	150	GG54	1852	1688	28.29	7.9	280	09111
								XX13	2555	1303	26.64			09112
OS09047	41-47	154-57 E	12-May	19:33	162	22	150	GG54	1852	2015	33.77	29.1	863	2) 09113
								XX13	2555	1441	29.46			09114
OS09048	41-00	155-00 E	13-May	11:41	156	16	150	GG54	1852	1556	26.08	8.1	310	09115
								XX13	2555	1278	26.13			09116
OS09049	40-15	155-00 E	13-May	17:05	152	10	150	GG54	1852	1517	25.42	11.3	444	09117
								XX13	2555	1068	21.83			09118
OS09050	39-30	155-00 E	13-May	23:07	163	23	150	GG54	1852	1596	26.75	9.4	352	1) 09119
								XX13	2555	1070	21.87			09120
OS09052	38-00	155-00 E	14-May	11:17	150	4	150	GG54	1852	1435	24.05	12.8	531	1) 09121
								XX13	2555	913	18.66			09122
OS09053	37-15	155-00 E	14-May	15:44	151	6	150	GG54	1852	1481	24.82	15.9	640	1) 09123
								XX13	2555	1062	21.71			09124
OS09054	37-05	155-00 E	14-May	20:23	151	8	150	GG54	1852	1501	25.16	28.4	1129	1) 09125
								XX13	2555	1006	20.57			09126
OS09055	36-30	155-00 E	15-May	10:23	150	2	150	GG54	1852	1570	26.31	44.9	1706	1) 09127
								XX13	2555	1030	21.06			09128
OS09058	34-13	154-57 E	16-May	3:00	153	12	150	GG54	1852	1761	29.51	13.7	465	09129
								XX13	2555	1553	31.75			09130

1) Exclusively phytoplankton

2) Including some fragments of medusae.

3) *Neocalanus* abundant.

4) Gelatinous zooplankton abundant.

5) *Salpida* abundant.

6) *Chaetognaths* abundant.

8. Data on calibration of flowmeters

Flowmeters used for plankton nets were calibrated once in the cruise.

Table 11. Calibration data on flowmeters used for a twin or single NORPAC net and other kind of nets. 100-m wire out at 35°48'N, 151°57'E in 16 May 2009.

Flowmeter No.	Wire length (m)	Revolution						Mean
		1	2	3	4	5	6	
RG1852	100	938	972*	968	950	927*	940	949
RG2555	100	778	778	780*	768*	778	778	778
RG2826	100	1020	1005	1095*	1090	1004*	1025	1035
RG3023	100	1030	1027	1034	1019	951*	1035*	1028
RG3024	100	1010*	1036	1080*	1078	1030	1048	1048

*: omitted from calculation

THE “OSHORO MARU” CRUISE 202
TO THE NORTHWEST PACIFIC OCEAN AND THE BERING SEA

IN JUNE - JULY 2009

1. Cruise Itinerary

Cruise 202			
Departure from Hakodate	June	2	, 2009
Start hydrographic research (OS09060)		3	
Start salmon hook and line research (OSHL0905)		5	
Gillnet research (OSG0904)		6	
Date change, repeat June 11th		11	
Start salmon long line research (OSSL0901)		13	
Arrival at Dutch Harbor and change research staff		19	
Departure from Dutch Harbor		22	
Finish salmon long line research (OSSL0902)		29	
Finish Gillnet research (OSG0910)	July	3	
Arrival at Dutch Harbor and change research staff		5	
Departure from Dutch Harbor		8	
Start bottom trawl research (OST0901)		4	
Finish bottom trawl research (OST0906)		14	
Finish salmon hook and line research (OSHL0926)		17	
Arrival at Dutch Harbor and change research staff		17	
Departure from Dutch Harbor		20	
Date change, skip July 23		22	
Finish hydrographic research (OS09143)		29	
Return to Hakodate	July	31	, 2009
Total coverage 9350.9 miles 51days at sea and 9days in port			

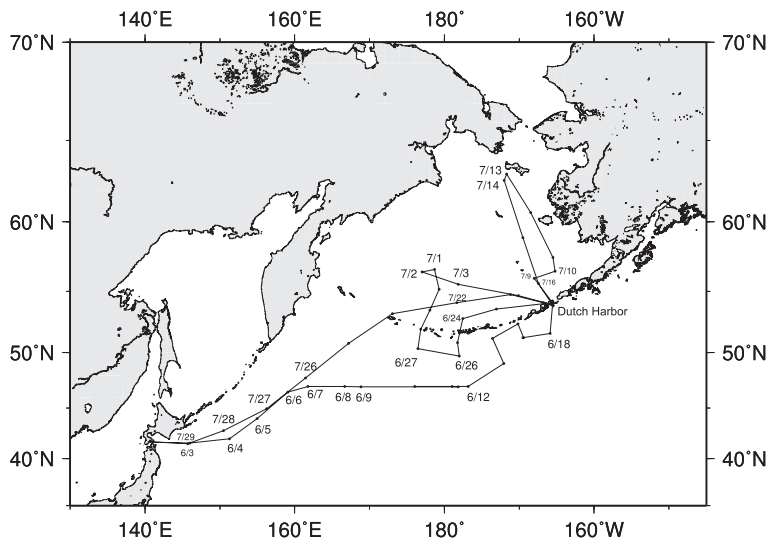


Figure 1: Track and Noon position

2. Vessel Personnel

Captain:		Associate Professor	Shogo Takagi
Crew :	Chief Officer	Instructor	Yoshihiko Kamei
	First Officer	Instructor	Keiichiro Sakaoka
	Second Officer		Naoki Hoshi
	Third Officer		Takuzo Abe
	Chief Engineer	Instructor	Junichi Kimura
	And 25 men		
Cruise 202			
Research Staff:	Professor	(Laboratory of Marine Environmental Science)	
		Hakodate - Dutch Harbor	Kenshi Kuma
	Professor	(Laboratory of Marine Environment and Resource Sensing)	
		Dutch Harbor - Dutch Harbor	Seiichi Saitoh
	Associate Professor	(Laboratory of Marine Biodiversity)	
		Hakodate - Hakodate	Atsushi Yamaguchi
	Instructor	(Laboratory of Marine Environmental Science)	
		Hakodate - Dutch Harbor	Hiroji Onishi
	Instructor	(Laboratory of Marine Environmental Science)	
		Hakodate - Dutch Harbor	Hiromichi Ueno
	Professor	(Graduate School of Science, The University of Tokyo)	
		Hakodate - Dutch Harbor	Ichirou Yasuda
	Associate Professor	(Graduate School of Environmental Science)	
		Hakodate - Dutch Harbor	Yutaka Watanabe
	Associate Professor	(Institute of Low Temperature Science, Hokkaido University)	
		Hakodate - Dutch Harbor	Jun Nishioka
	Associate Professor	(TEIKYO University of Science & Technology)	
		Hakodate - Hakodate	Kyoichi Mori
	Instructor	(Field Science Center for Northern Biospher, Hokkaido University)	
		Dutch Harbor - Dutch Harbor	Jun Yamamoto
	Instructor	(Field Science Center for Northern Biospher, Hokkaido University)	
		Dutch Harbor - Dutch Harbor	Yoko Mitani
	Post Doctor		1 person
	Graduate Students		14 persons
	Under Graduate Students		5 persons
Foreign Scientists:		(Pacific Aquaculture and Coastal Resources Center, University of Hawaii at Hiro)	
		Hakodate - Hakodate	Keiko Sekiguchi
		(Institute Marine Science, University of Alaska Fairbanks)	
		Dutch Harbor - Dutch Harbor	Michael Kong
		(Institute Marine Science, University of Alaska Fairbanks)	
		Dutch Harbor - Dutch Harbor	Kristen L. Shake
		(Pacific Rim Services, USA)	
		Dutch Harbor - Dutch Harbor	Thoru Chino
		(Biglow Laboratory for Ocean Science)	
		Dutch Harbor - Dutch Harbor	Joaquim I. Goes
		(Biglow Laboratory for Ocean Science)	
		Dutch Harbor - Dutch Harbor	Andrew R. Gross
		(Biglow Laboratory for Ocean Science)	
		Dutch Harbor - Dutch Harbor	Stacey Keith
		(Biglow Laboratory for Ocean Science)	
		Dutch Harbor - Dutch Harbor	Eurico D'Sa
Total			70 persons

3. Items and Objects of Research

Items

Hydrographic observation by CTD, XCTD, XCP, and VMP-5500 casts and set Mooring-current-meter:	Table 1,2 ; Figure 2
Biological research for fishes caught by non-selective drift gillnets:	Table 3 - 7 ; Figure 3
Salmon longline and hook-and-line research:	Table 8 - 11 ; Figure 4
Biological research for fishes caught by bottom trawl observations:	Table 12, 13 ; Figure 5
Biological research for squid caught by jigging:	
Plankton samplings by NORPAC-net, MTD-net, Closing-net, Bongo-net, SCOR-net, and VMPS-net:	Table 14, 15 ; Figure 2
Water samplings by Niskin bottles and underwater tug plane:	Table 16

Objects

Study on geochemistry and metal distributions in the water along the 170E line, Bering Sea.
A study about the elucidation of the behavior of the material circulation change of the North Pacific.
CTD, X-CTD, and ADCP observation are performed, Recovery and installation of sediment-traps are performed for the purpose of investigating correspondence with a climate change and relation of an east-and-west subarctic gyre.
About turbulence strength direct observation and nutrient cloth in the North Pacific subarctic.
In order to clarify the relation between micro-scale (~1cm) and fine-scale(~10cm) current shear in the deep ocean , we carry out micro-scale measurements using TurboMAP D2 and fine-scale measurements using XCP simul tenuously.
Sampling for comparative study on the nekton and zooplankton distributions along the Bering Sea
Ecological study of Gadid fish in Bering Sea. Distribution of larval fishes in the North Pacific and Bering Sea. Identification, count, and measurement of weight of fishes collected by bottom trawl net.
Study on experimental biology of marine zooplankton in the northern North Pacific.
Vertical distribution of diatom assemblages using sea waters obtained with CTD observation
Geographical distribution of diatom and radiolarian assemblages using plankton tows obtained with Twin Norpac plankton net.
Recoveries, maintenances and re-deployments of two sediment traps.
Research of growth, feeding ecology and trophic dynamics of Pacific salmon in the North Pacific and Bering Sea.
Marine mammal shipboard sighting survey.
Fundamental study for the development of the high latitude bio-optical algorithm for satellite ocean color remote sensing.
Ecological Study on Benthos in the Bering Sea.
Production Process of DMS in the Bering Sea.
Taking some sea water samples by depth to check the contamination of plastic and observe any bad influences to plankton/seaweed.

4. Data of 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 "Oshoromaru". Temperature and salinity were measured by CTD (Seabird SBE-9Plus, SBE-19Plus and XCTD1 or 2). Dynamic computations were made using a desk-top computer aboard the "Oshoromaru". Water and Plankton sampling were also carried out at almost hydrographic stations.

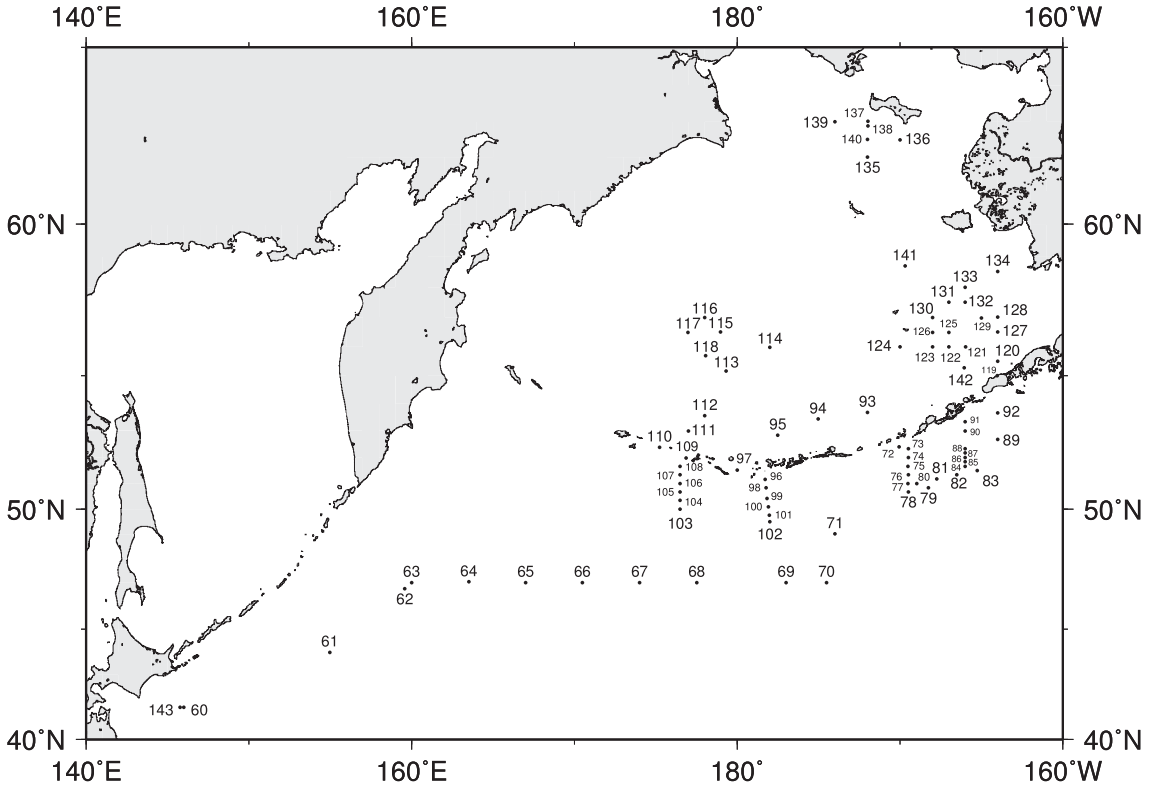


Figure 2: Oceanographic Stations

Table 1: List of Oceanographic Stations

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS09060	41-29.6N	146-00.1E	6/3	0704	9	6371	6	8.7	12.2	bc	9Plus-0769
OS09061	43-59.0N	154-57.5E	6/5	1240	10	5310	4	19.8	8.6	c	9Plus-0769
OS09062	46-44.8N	159-33.9E	6/6	1418	10	5150	-	-	-	o	XCTD1
OS09063	47-00.0N	159-59.9E	6/6	2256	10	5173	5	10	5.5	f	9Plus-0769
OS09064	47-01.9N	163-31.2E	6/7	2040	10	5745	4	13.3	6.1	c	9Plus-0769
OS09065	46-59.7N	166-59.9E	6/8	1315	11	5985	4	12.3	5.4	c	9Plus-0769
OS09066	47-00.0N	170-29.3E	6/9	1758	11	6310	4	13	5.9	c	9Plus-0769
OS09067	47-00.0N	173-59.9E	6/10	1232	11	5607	4	10	6.1	o	9Plus-0769

(*):Fixed position by Global Positioning system

Table 1: List of Oceanographic Stations

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS09068	47-00.1N	177-30.1E	6/11	1739	11	5478	4	11.6	7.1	r	9Plus-0769
OS09069	46-60.0N	178-59.9W	6/11	1235	-12	5300	4	13.2	8.9	bc	9Plus-0769
OS09070	46-60.0N	175-30.0W	6/12	1744	-12	5644	3	17.7	10.0	c	9Plus-0769
OS09071	49-00.1N	174-00.1W	6/13	1357	-12	5415	7	7	10.0	r	9Plus-0769
OS09072	52-23.7N	171-56.8W	6/15	1347	-11	305	4	16	5.1	r	9Plus-0769
OS09073	52-20.0N	170-30.7W	6/15	2243	-11	560	-	-	6.9	o	9Plus-0769
OS09074	52-00.0N	170-30.3W	6/16	0327	-11	3360	4	9.5	7.5	r	9Plus-0769
OS09075	51-40.0N	170-30.0W	6/16	1338	-11	4645	5	15	7.7	bc	9Plus-0769
OS09076	51-20.5N	170-30.2W	6/17	0841	-10	6140	5	10.7	7.8	c	9Plus-0769
OS09077	50-59.8N	170-30.0W	6/17	1331	-10	6940	4	10	8.0	o	9Plus-0769
OS09078	50-40.0N	170-30.1W	6/17	1759	-10	5473	4	13.2	8.2	o	9Plus-0769
OS09079	50-50.1N	169-45.3W	6/17	2340	-10	5510	-	-	-	c	XCTD1
OS09080	50-59.6N	169-01.2W	6/18	0204	-10	5255	-	-	-	c	XCTD1
OS09081	51-10.2N	168-15.0W	6/18	0445	-10	5144	-	-	-	c	XCTD1
OS09082	51-20.1N	167-29.9W	6/18	0723	-10	4965	-	-	-	c	XCTD1
OS09083	51-30.3N	166-44.2W	6/18	0958	-10	4960	-	-	-	c	XCTD1
OS09084	51-40.0N	166-00.0W	6/18	1235	-10	4920	-	-	-	bc	XCTD2
OS09085	51-50.0N	166-00.2W	6/18	1338	-10	5290	-	-	-	bc	XCTD2
OS09086	51-59.9N	166-00.1W	6/18	1437	-10	5900	-	-	-	bc	XCTD2
OS09087	52-10.0N	166-00.1W	6/18	1541	-10	6615	-	-	-	bc	XCTD2
OS09088	52-20.0N	166-00.0W	6/18	1637	-10	7025	-	-	-	c	XCTD2
OS09089	52-40.6N	165-59.8W	6/18	1839	-10	4613	-	-	-	r	XCTD2
OS09090	52-59.6N	166-00.1W	6/18	2055	-10	3870	-	-	-	r	XCTD2
OS09091	53-19.9N	166-00.2W	6/18	2341	-10	625	-	-	-	bc	XCTD2
OS09092	53-40.0N	165-59.9W	6/19	0200	-10	84	-	-	-	c	XCTD2
OS09093	53-40.1N	173-59.7W	6/23	0826	-11	3650	4	17.5	6.9	c	XCTD2
OS09094	53-25.8N	176-59.0W	6/23	2030	-11	3775	5	6.1	7.8	c	9Plus-0769
OS09095	52-50.1N	178-28.8W	6/24	1215	-11	3700	6	5	7.1	c	9Plus-0769
OS09096	51-10.0N	179-43.4W	6/24	2252	-11	3675	-	-	5.2	c	9Plus-0769
OS09097	51-30.6N	179-59.9E	6/25	0349	-11	1045	-	-	4.2	c	9Plus-0769
OS09098	50-50.6N	179-46.2W	6/25	1044	-11	5440	4	15.9	7.2	c	9Plus-0769
OS09099	50-25.3N	179-50.0W	6/25	1803	-11	6453	4	12.2	7.7	o	9Plus-0769
OS09100	50-05.4N	179-54.5W	6/26	0015	-11	5990	-	-	6.8	o	9Plus-0769
OS09101	49-45.8N	179-59.1W	6/26	0755	-11	5178	5	9.2	6.2	o	9Plus-0769
OS09102	49-30.3N	179-60.0W	6/26	1415	-11	4810	4	18.2	7.7	o	9Plus-0769
OS09103	49-59.9N	176-29.7E	6/27	0544	-11	4674	5	8.6	7.4	r	9Plus-0769
OS09104	50-20.5N	176-28.9E	6/27	1054	-11	5010	4	13.5	7.3	r	9Plus-0769
OS09105	50-40.0N	176-29.9E	6/27	1528	-11	6480	4	15.7	7.3	o	SBE-19plus
OS09106	50-59.9N	176-29.8E	6/27	2018	-11	6250	4	11.3	7.3	r	SBE-19plus
OS09107	51-20.2N	176-30.0E	6/28	0035	-11	4750	-	-	5.6	c	SBE-19plus
OS09108	51-39.8N	176-29.8E	6/28	0527	-11	3934	5	11.1	6.1	o	9Plus-0769
OS09109	51-58.3N	176-51.2E	6/28	1127	-11	160	4	17	4.5	o	9Plus-0769
OS09110	52-22.7N	175-13.9E	6/28	2006	-11	740	4	16.7	6.9	c	9Plus-0769

(*):Fixed position by Global Positioning system

Table 1: List of Oceanographic Stations

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS09111	52-59.9N	177-00.6E	6/29	0452	-11	3939	6	7.5	6.5	f	9Plus-0769
OS09112	53-33.2N	178-00.1E	6/30	0007	-11	3903	5	10	6.6	r	9Plus-0769
OS09113	55-09.6N	179-19.3E	6/30	1138	-11	3830	6	6.1	6.3	o	XCTD2
OS09114	55-59.1N	179-59.2W	6/30	2000	-11	3840	4	19.5	6.5	r	9Plus-0769
OS09115	56-30.2N	178-58.4E	7/1	1000	-11	3845	6	9.3	6.4	r	9Plus-0769
OS09116	56-59.9N	178-00.1E	7/1	1554	-11	3840	6	8.7	6.4	o	9Plus-0769
OS09117	56-29.8N	176-58.4E	7/2	1035	-11	3855	5	11.6	6.6	f	9Plus-0769
OS09118	55-41.8N	178-04.0E	7/2	1904	-11	3850	5	7.5	6.5	o	9Plus-0769
OS09119	54-60.0N	165-59.1W	7/8	1715	-8	135	6	11	6.8	o	9Plus-0769
OS09120	55-30.0N	165-59.9W	7/8	2200	-8	121	5	9.7	8.5	c	9Plus-0769
OS09121	55-59.5N	166-00.9W	7/9	0200	-8	113	-	-	8.3	c	9Plus-0769
OS09122	55-59.8N	167-00.0W	7/9	0555	-8	133	4	6	7.9	c	9Plus-0769
OS09123	56-00.1N	168-00.6W	7/9	1225	-8	136	8	5.2	6.9	o	9Plus-0769
OS09124	55-59.7N	170-00.2W	7/9	2010	-8	220	6	10.1	7.0	c	9Plus-0769
OS09125	56-29.5N	168-59.9W	7/10	0208	-8	102	-	-	7.0	c	9Plus-0769
OS09126	56-29.7N	168-00.0W	7/10	0613	-8	115	6	7	7.2	c	9Plus-0769
OS09127	56-30.1N	165-59.9W	7/10	1435	-8	84	5	10.8	7.9	f	9Plus-0769
OS09128	57-00.2N	165-59.6W	7/10	1852	-8	70	6	9	7.4	f	9Plus-0769
OS09129	56-59.0N	166-59.9W	7/10	2306	-8	75	5	7.7	7.6	f	9Plus-0769
OS09130	56-59.7N	168-00.1W	7/11	0344	-8	77	-	-	7.0	f	9Plus-0769
OS09131	57-30.0N	167-00.1W	7/11	0825	-8	70	5	11.9	7.0	f	9Plus-0769
OS09132	57-30.0N	166-00.5W	7/11	1335	-8	64	6	8.3	7.6	f	9Plus-0769
OS09133	57-59.5N	166-00.2W	7/11	1730	-8	54	5	11	6.1	c	9Plus-0769
OS09134	58-30.1N	165-59.6W	7/11	2112	-8	45	6	10.6	7.2	c	9Plus-0769
OS09135	62-00.0N	172-00.1W	7/12	2109	-8	55	5	12.2	3.9	o	9Plus-0769
OS09136	62-29.5N	171-60.0W	7/13	0100	-8	45	-	-	5.1	o	9Plus-0769
OS09137	63-00.5N	172-00.9W	7/13	1315	-8	53	3	15.4	5.1	o	9Plus-0769
OS09138	62-53.4N	172-01.5W	7/13	1543	-8	50	3	17	5.1	o	9Plus-0769
OS09139	63-00.0N	174-00.2W	7/13	2122	-8	74	6	12.4	4.8	o	9Plus-0769
OS09140	62-30.1N	173-59.9W	7/14	1430	-8	68	-	-	3.9	f	SBE-19plus
OS09141	58-41.1N	170-19.2W	7/15	1400	-8	70	4	12	5.8	o	9Plus-0769
OS09142	55-15.9N	167-56.4W	7/16	1505	-8	424	9	2.9	7.5	o	9Plus-0769
OS09143	41-30.0N	145-46.7E	7/29	0835	10	6860	3	14.7	17.7	f	9Plus-0769

(*):Fixed position by Global Positioning system

Table 2: Oceanographic data

Station OS09060				Station OS09061				Station OS09062			
Longitude 41-29.6N				Longitude 43-59.0N				Longitude 46-44.8N			
Latitude 146-00.1E				Latitude 154-57.5E				Latitude 159-33.9E			
Depth(m) 6371				Depth(m) 5310				Depth(m) 5150			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	11.710	34.158	25.990	5	8.040	33.313	25.943	5	2.787	33.020	26.323
10	11.561	34.166	26.024	10	7.924	33.317	25.964	10	2.396	33.039	26.370
20	11.522	34.163	26.029	20	7.933	33.332	25.974	20	1.781	33.059	26.433
30	11.516	34.164	26.031	30	6.977	33.455	26.205	30	1.607	33.073	26.456
40	11.512	34.164	26.032	40	7.481	33.749	26.366	40	1.525	33.087	26.473
50	11.392	34.158	26.049	50	7.294	33.788	26.424	50	1.425	33.095	26.486
75	10.412	34.252	26.298	75	6.373	33.701	26.479	75	1.297	33.129	26.522
100	9.935	34.182	26.325	100	5.288	33.596	26.529	100	2.190	33.393	26.670
125	8.465	34.007	26.424	125	4.223	33.528	26.592	125	3.206	33.655	26.793
150	7.291	33.874	26.492	150	4.311	33.624	26.660	150	3.498	33.774	26.860
200	7.076	33.945	26.578	200	3.886	33.707	26.769	200	3.658	33.909	26.953
250	6.469	33.862	26.594	250	3.447	33.744	26.841	250	3.668	34.004	27.027
300	4.796	33.684	26.655	300	3.490	33.840	26.913	300	3.638	34.082	27.092
400	3.549	33.678	26.779	400	3.445	33.988	27.036	400	3.488	34.181	27.186
500	3.599	33.828	26.894	500	3.761	34.151	27.135	500	3.327	34.247	27.254
600	3.520	33.943	26.993	600	3.136	34.163	27.204	600	3.144	34.313	27.324
700	3.487	34.065	27.093	700	3.032	34.246	27.281	700	2.984	34.365	27.380
800	3.352	34.157	27.179	800	3.129	34.334	27.341	800	2.843	34.410	27.428
900	3.077	34.225	27.259	900	2.952	34.370	27.386	900	2.684	34.447	27.472
1000	2.997	34.294	27.322	1000	2.776	34.401	27.427	1000	2.540	34.479	27.510
1200	2.850	34.414	27.431	1200	2.459	34.453	27.496				
1500	2.432	34.486	27.524	1500	2.206	34.516	27.567				
2000	2.067	34.574	27.625	2000	1.903	34.599	27.658				
				2500	1.688	34.639	27.706				
				3000	1.562	34.662	27.734				

Station OS09063				Station OS09064				Station OS09065			
Longitude 47-00.0N				Longitude 47-01.9N				Longitude 46-59.7N			
Latitude 159-59.9E				Latitude 163-31.2E				Latitude 166-59.9E			
Depth(m) 5173				Depth(m) 5745				Depth(m) 5985			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	4.708	32.938	26.073	5	6.134	33.327	26.214	5	4.987	32.961	26.060
10	3.491	32.937	26.194	10	6.135	33.327	26.214	10	4.986	32.961	26.061
20	2.992	32.947	26.247	20	6.082	33.326	26.220	20	4.972	32.960	26.061
30	2.437	32.946	26.292	30	5.417	33.338	26.310	30	4.955	32.960	26.063
40	2.052	32.964	26.337	40	4.463	33.348	26.424	40	4.557	32.969	26.114
50	1.555	33.000	26.401	50	4.173	33.368	26.471	50	4.107	32.978	26.167
75	-	-	-	75	-	-	-	75	-	-	-
100	0.993	33.068	26.492	100	4.025	33.390	26.503	100	2.710	33.043	26.348
125	-	-	-	125	-	-	-	125	-	-	-
150	1.868	33.309	26.627	150	4.061	33.427	26.529	150	3.027	33.584	26.753
200	3.274	33.639	26.774	200	3.996	33.630	26.697	200	3.494	33.820	26.898
250	3.623	33.811	26.878	250	3.767	33.721	26.792	250	3.506	33.914	26.971
300	3.704	33.921	26.958	300	3.725	33.813	26.870	300	3.490	33.981	27.026
400	3.640	34.050	27.066	400	3.752	33.947	26.973	400	3.437	34.106	27.131
500	3.482	34.143	27.156	500	3.660	34.062	27.074	500	3.334	34.192	27.209

Station		OS09066	
Longitude		47-00.0N	
Latitude		170-29.3E	
Depth(m)		6310	
Press.	Temp.	Sal.	SIG-T
5	5.729	32.908	25.933
10	5.730	32.908	25.932
20	5.693	32.906	25.935
30	5.638	32.906	25.942
40	4.365	32.928	26.101
50	3.907	32.957	26.170
75	-	-	-
100	3.041	33.017	26.299
125	-	-	-
150	3.223	33.623	26.765
200	3.516	33.835	26.908
250	3.506	33.921	26.977
300	3.543	33.999	27.035
400	3.493	34.111	27.130
500	3.390	34.196	27.207

Station		OS09067	
Longitude		47-00.0N	
Latitude		173-59.9E	
Depth(m)		5607	
Press.	Temp.	Sal.	SIG-T
5	5.864	32.884	25.897
10	5.836	32.885	25.902
20	5.831	32.886	25.903
30	5.829	32.889	25.906
40	5.536	32.897	25.947
50	4.263	32.920	26.105
75	-	-	-
100	3.430	32.963	26.220
125	-	-	-
150	3.066	33.627	26.783
200	3.236	33.758	26.872
250	3.452	33.877	26.947
300	3.555	33.985	27.023
400	3.566	34.095	27.110
500	3.450	34.194	27.200

Station		OS09068	
Longitude		47-00.1N	
Latitude		177-30.1E	
Depth(m)		5478	
Press.	Temp.	Sal.	SIG-T
5	6.901	32.936	25.807
10	6.900	32.939	25.809
20	6.881	32.944	25.816
30	6.528	32.956	25.871
40	5.159	32.999	26.071
50	4.867	33.008	26.111
75	-	-	-
100	4.205	33.001	26.175
125	-	-	-
150	3.880	33.546	26.642
200	3.414	33.663	26.780
250	3.427	33.761	26.857
300	3.443	33.843	26.921
400	3.661	34.033	27.051
500	3.570	34.134	27.141

Station		OS09069	
Longitude		46-60.0N	
Latitude		178-59.9W	
Depth(m)		5300	
Press.	Temp.	Sal.	SIG-T
5	8.651	32.770	25.426
10	8.619	32.769	25.430
20	6.936	32.801	25.696
30	5.732	32.842	25.881
40	5.171	32.843	25.946
50	4.840	32.835	25.977
75	-	-	-
100	4.144	32.932	26.127
125	-	-	-
150	3.268	33.620	26.760
200	3.289	33.722	26.839
250	3.384	33.823	26.911
300	3.490	33.903	26.964
400	3.621	34.046	27.065
500	3.527	34.156	27.162

Station		OS09070	
Longitude		46-60.0N	
Latitude		175-30.0W	
Depth(m)		5644	
Press.	Temp.	Sal.	SIG-T
5	9.822	32.750	25.225
10	9.683	32.744	25.243
20	7.455	32.760	25.592
30	6.568	32.790	25.736
40	6.247	32.796	25.781
50	6.006	32.807	25.820
75	-	-	-
100	5.028	32.841	25.961
125	-	-	-
150	3.867	33.632	26.711
200	3.665	33.746	26.822
250	3.667	33.839	26.896
300	3.736	33.922	26.955
400	3.728	34.049	27.057
500	3.643	34.149	27.145

Station		OS09071	
Longitude		49-00.1N	
Latitude		174-00.1W	
Depth(m)		5415	
Press.	Temp.	Sal.	SIG-T
5	9.252	32.771	25.334
10	7.792	32.769	25.552
20	5.970	32.812	25.828
30	5.477	32.832	25.903
40	5.092	32.843	25.955
50	4.770	32.850	25.996
75	4.012	32.858	26.081
100	3.799	32.876	26.116
125	3.592	33.034	26.262
150	3.931	33.717	26.773
200	3.864	33.898	26.923
250	3.810	33.971	26.987
300	3.757	34.022	27.033
400	3.595	34.138	27.141
500	3.423	34.209	27.215
600	3.266	34.269	27.277
700	3.109	34.320	27.332
800	2.946	34.359	27.379
900	2.807	34.391	27.416
1000	2.651	34.424	27.457
1200	2.401	34.478	27.521
1500	2.117	34.542	27.595
2000	1.840	34.602	27.665

Station	OS09072		
Longitude	52-23.7N		
Latitude	171-56.8W		
Depth(m)	305		
Press.	Temp.	Sal.	SIG-T
5	4.872	32.825	25.965
10	4.863	32.824	25.966
20	4.870	32.824	25.965
30	4.837	32.834	25.976
40	4.746	32.935	26.067
50	4.684	32.993	26.119
75	4.532	33.201	26.300
100	4.443	33.459	26.515
125	4.450	33.492	26.540
150	4.429	33.577	26.610
200	4.167	33.604	26.658
250	4.094	33.672	26.721

Station	OS09075		
Longitude	51-40.0N		
Latitude	170-30.0W		
Depth(m)	4645		
Press.	Temp.	Sal.	SIG-T
5	7.508	32.702	25.540
10	7.498	32.701	25.541
20	7.414	32.701	25.552
30	7.265	32.704	25.574
40	5.304	32.769	25.873
50	4.700	32.788	25.955
75	4.102	32.800	26.026
100	3.864	32.818	26.064
125	3.732	32.989	26.213
150	3.787	33.611	26.703
200	3.896	33.889	26.913
250	3.873	33.971	26.980
300	3.793	34.022	27.029
400	3.672	34.120	27.119
500	3.504	34.192	27.193
600	3.345	34.251	27.255
700	3.187	34.299	27.308
800	3.016	34.343	27.359
900	2.854	34.379	27.403
1000	2.723	34.408	27.438
1200	2.459	34.466	27.506
1500	2.177	34.530	27.581
2000	1.881	34.594	27.656
2500	1.676	34.635	27.704
3000	1.552	34.660	27.734

Station	OS09073		
Longitude	52-20.0N		
Latitude	170-30.7W		
Depth(m)	560		
Press.	Temp.	Sal.	SIG-T
5	6.726	32.427	25.429
10	6.708	32.429	25.432
20	6.743	32.427	25.426
30	6.735	32.427	25.428
40	5.869	32.408	25.521
50	3.699	32.625	25.926
75	4.012	32.909	26.122
100	4.646	33.274	26.346
125	4.605	33.377	26.432
150	4.585	33.475	26.512
200	4.814	33.641	26.619
250	4.923	33.736	26.682
300	4.777	33.751	26.710
400	4.425	33.928	26.889
500	3.721	34.127	27.120

Station	OS09076		
Longitude	51-20.5N		
Latitude	170-30.2W		
Depth(m)	6140		
Press.	Temp.	Sal.	SIG-T
5	7.812	32.681	25.480
10	7.804	32.681	25.481
20	7.790	32.681	25.483
30	7.710	32.681	25.495
40	5.657	32.771	25.833
50	4.635	32.800	25.971
75	4.097	32.807	26.032
100	3.896	32.851	26.087
125	3.639	33.253	26.432
150	3.806	33.724	26.791
200	3.878	33.878	26.906
250	3.851	33.950	26.966
300	3.806	34.006	27.015
400	3.691	34.101	27.102
500	3.485	34.191	27.194
600	3.289	34.261	27.269
700	3.135	34.307	27.319
800	2.951	34.351	27.372
900	2.791	34.390	27.417
1000	2.680	34.417	27.448
1200	2.464	34.465	27.505
1500	2.187	34.528	27.579
2000	1.874	34.596	27.658
2500	1.685	34.634	27.703
3000	1.569	34.659	27.731

Station	OS09074		
Longitude	52-00.0N		
Latitude	170-30.3W		
Depth(m)	3360		
Press.	Temp.	Sal.	SIG-T
5	7.229	32.617	25.511
10	7.221	32.621	25.515
20	7.215	32.628	25.522
30	7.212	32.632	25.526
40	4.726	32.418	25.659
50	4.356	32.663	25.892
75	4.017	32.780	26.019
100	3.750	32.859	26.107
125	4.101	33.166	26.317
150	3.480	33.491	26.637
200	3.332	33.707	26.823
250	3.492	33.816	26.894
300	3.640	33.903	26.949
400	4.012	34.083	27.056
500	3.612	34.122	27.127
600	3.484	34.196	27.198
700	3.339	34.260	27.263
800	3.203	34.316	27.320
900	3.061	34.341	27.353
1000	2.921	34.373	27.392
1200	2.693	34.424	27.453
1500	2.312	34.502	27.548
2000	1.933	34.586	27.646
2500	1.734	34.627	27.693
3000	1.593	34.654	27.726

Station	OS09077		
Longitude	50-59.8N		
Latitude	170-30.0W		
Depth(m)	6940		
Press.	Temp.	Sal.	SIG-T
5	7.879	32.685	25.474
10	7.867	32.686	25.476
20	7.861	32.685	25.476
30	6.593	32.734	25.688
40	5.445	32.784	25.868
50	4.945	32.795	25.934
75	4.256	32.807	26.016
100	3.779	32.809	26.065
125	3.605	33.021	26.251
150	3.849	33.620	26.703
200	3.881	33.857	26.889
250	3.820	33.940	26.962
300	3.768	34.013	27.024
400	3.685	34.115	27.114
500	3.480	34.195	27.198
600	3.285	34.261	27.269
700	3.123	34.311	27.324
800	2.971	34.350	27.369
900	2.812	34.386	27.412
1000	2.709	34.411	27.441
1200	2.479	34.463	27.502
1500	2.218	34.522	27.571
2000	1.876	34.597	27.658
2500	1.671	34.637	27.706
3000	1.561	34.660	27.732

Station		OS09078	
Longitude		50-40.0N	
Latitude		170-30.1W	
Depth(m)		5473	
Press.	Temp.	Sal.	SIG-T
5	8.085	32.679	25.439
10	8.034	32.678	25.446
20	6.308	32.755	25.741
30	5.494	32.799	25.874
40	4.696	32.806	25.969
50	4.267	32.804	26.012
75	4.019	32.814	26.046
100	3.780	32.925	26.157
125	3.797	33.539	26.645
150	3.877	33.753	26.807
200	3.867	33.870	26.901
250	3.830	33.945	26.964
300	3.798	34.012	27.021
400	3.663	34.108	27.110
500	3.569	34.180	27.177
600	3.354	34.242	27.247
700	3.171	34.292	27.305
800	3.011	34.334	27.353
900	2.883	34.368	27.391
1000	2.747	34.401	27.430
1200	2.477	34.462	27.502
1500	2.173	34.531	27.582
2000	1.852	34.600	27.663
2500	1.665	34.638	27.707
3000	1.544	34.662	27.736

Station		OS09079	
Longitude		50-50.1N	
Latitude		169-45.3W	
Depth(m)		5510	
Press.	Temp.	Sal.	SIG-T
5	8.095	32.617	25.389
10	8.095	32.632	25.401
20	7.960	32.652	25.436
30	5.641	32.765	25.830
40	4.522	32.788	25.974
50	4.287	32.797	26.005
75	4.054	32.817	26.045
100	3.865	32.861	26.098
125	3.535	33.298	26.478
150	3.102	33.569	26.734
200	3.323	33.773	26.876
250	3.484	33.880	26.946
300	3.600	33.982	27.016
400	3.554	34.105	27.119
500	3.434	34.187	27.196
600	3.283	34.253	27.263
700	3.172	34.304	27.314
800	2.981	34.354	27.371
900	2.839	34.391	27.413
1000	2.718	34.415	27.443

Station		OS09080	
Longitude		50-59.6N	
Latitude		169-01.2W	
Depth(m)		5255	
Press.	Temp.	Sal.	SIG-T
5	7.856	32.199	25.096
10	7.861	32.218	25.110
20	7.610	32.443	25.322
30	6.620	32.454	25.464
40	4.250	32.551	25.814
50	4.289	32.635	25.876
75	3.791	32.727	25.999
100	3.661	32.956	26.193
125	4.785	33.482	26.496
150	3.281	33.540	26.694
200	3.324	33.702	26.819
250	3.551	33.833	26.902
300	3.591	33.905	26.956
400	3.668	34.050	27.064
500	3.581	34.126	27.133
600	3.470	34.205	27.207
700	3.310	34.266	27.270
800	3.148	34.326	27.334
900	2.973	34.367	27.382
1000	2.806	34.409	27.431

Station		OS09081	
Longitude		51-10.2N	
Latitude		168-15.0W	
Depth(m)		5144	
Press.	Temp.	Sal.	SIG-T
5	6.957	31.982	25.048
10	6.957	31.993	25.057
20	5.645	32.176	25.364
30	5.353	32.243	25.451
40	4.325	32.218	25.541
50	3.790	32.278	25.642
75	3.711	32.519	25.841
100	3.928	32.726	25.985
125	4.436	33.006	26.156
150	5.137	33.322	26.330
200	5.277	33.695	26.609
250	5.015	33.823	26.741
300	4.723	33.882	26.820
400	4.375	33.975	26.932
500	4.079	34.042	27.016
600	3.850	34.137	27.115
700	3.661	34.209	27.191
800	3.450	34.261	27.253
900	3.225	34.303	27.308
1000	3.038	34.349	27.362

Station		OS09082	
Longitude		51-20.1N	
Latitude		167-29.9W	
Depth(m)		4965	
Press.	Temp.	Sal.	SIG-T
5	7.699	32.252	25.159
10	7.690	32.282	25.184
20	7.449	32.425	25.330
30	7.333	32.470	25.381
40	5.403	32.637	25.757
50	4.676	32.642	25.841
75	3.501	32.775	26.064
100	3.540	33.030	26.264
125	4.191	33.454	26.537
150	4.489	33.777	26.762
200	4.370	33.909	26.880
250	4.241	33.965	26.938
300	3.982	33.998	26.991
400	3.740	34.096	27.093
500	3.742	34.195	27.172
600	3.551	34.253	27.237
700	3.320	34.295	27.293
800	3.139	34.356	27.358
900	2.967	34.390	27.401
1000	2.836	34.431	27.446

Station		OS09083	
Longitude		51-30.3N	
Latitude		166-44.2W	
Depth(m)		4960	
Press.	Temp.	Sal.	SIG-T
5	7.607	32.285	25.198
10	7.588	32.305	25.217
20	7.559	32.321	25.233
30	6.248	32.372	25.446
40	4.745	32.527	25.743
50	4.153	32.556	25.827
75	3.763	32.640	25.932
100	3.823	32.921	26.150
125	4.272	33.370	26.462
150	4.551	33.681	26.679
200	4.322	33.841	26.831
250	4.040	33.912	26.917
300	3.958	33.987	26.985
400	3.853	34.119	27.100
500	3.612	34.192	27.182
600	3.361	34.260	27.261

Station		OS09084	
Longitude		51-40.0N	
Latitude		166-00.0W	
Depth(m)		4920	
Press.	Temp.	Sal.	SIG-T
5	7.579	32.310	25.222
10	7.546	32.326	25.239
20	7.447	32.342	25.265
30	6.934	32.343	25.335
40	4.917	32.494	25.698
50	4.294	32.520	25.784
75	3.656	32.646	25.947
100	3.696	32.935	26.173
125	4.155	33.396	26.495
150	4.323	33.702	26.720
200	4.234	33.861	26.856
250	4.145	33.945	26.932
300	4.046	33.998	26.984
400	3.876	34.085	27.071
500	3.646	34.179	27.169
600	3.416	34.255	27.252
700	3.195	34.299	27.308
800	3.024	34.349	27.363
900	2.862	34.382	27.404
1000	2.721	34.421	27.448
1200	2.446	34.478	27.517
1500	2.131	34.560	27.609

Station		OS09085	
Longitude		51-50.0N	
Latitude		166-00.2W	
Depth(m)		5290	
Press.	Temp.	Sal.	SIG-T
5	7.717	32.367	25.247
10	7.716	32.363	25.244
20	7.618	32.372	25.265
30	6.770	32.424	25.421
40	4.534	32.565	25.795
50	3.881	32.641	25.922
75	3.541	32.818	26.095
100	4.080	33.294	26.421
125	4.286	33.674	26.702
150	4.113	33.751	26.781
200	3.947	33.885	26.905
250	3.876	33.946	26.960
300	4.038	34.036	27.016
400	3.831	34.117	27.101
500	3.671	34.195	27.179
600	3.451	34.246	27.241
700	3.230	34.289	27.296
800	3.058	34.330	27.345
900	2.876	34.367	27.391
1000	2.715	34.403	27.434
1200	2.451	34.466	27.507
1500	2.177	34.522	27.575

Station		OS09086	
Longitude		51-59.9N	
Latitude		166-00.1W	
Depth(m)		5900	
Press.	Temp.	Sal.	SIG-T
5	7.663	32.434	25.307
10	7.587	32.439	25.322
20	7.529	32.451	25.339
30	7.462	32.461	25.357
40	5.942	32.599	25.663
50	4.455	32.684	25.898
75	3.427	32.797	26.089
100	3.745	33.197	26.377
125	4.593	33.663	26.661
150	4.613	33.811	26.776
200	4.386	33.923	26.889
250	4.257	33.977	26.946
300	4.144	34.022	26.997
400	3.929	34.099	27.077
500	3.700	34.184	27.167
600	3.520	34.243	27.232
700	3.270	34.286	27.290
800	3.137	34.337	27.343
900	2.958	34.380	27.394
1000	2.807	34.412	27.433
1200	2.524	34.474	27.507
1500	2.220	34.542	27.587

Station		OS09087	
Longitude		52-10.0N	
Latitude		166-00.1W	
Depth(m)		6615	
Press.	Temp.	Sal.	SIG-T
5	7.564	32.206	25.142
10	7.432	32.230	25.179
20	7.198	32.268	25.241
30	4.405	32.444	25.713
40	4.471	32.658	25.876
50	4.332	32.747	25.961
75	4.291	33.024	26.185
100	4.914	33.349	26.376
125	4.698	33.552	26.561
150	5.063	33.788	26.707
200	4.866	33.893	26.813
250	4.510	33.934	26.885
300	4.371	33.971	26.929
400	4.043	34.066	27.039
500	3.803	34.146	27.127
600	3.623	34.206	27.193
700	3.432	34.259	27.253
800	3.241	34.313	27.314
900	3.030	34.364	27.375
1000	2.878	34.389	27.408
1200	2.584	34.448	27.481
1500	2.268	34.521	27.566

Station		OS09088	
Longitude		52-20.0N	
Latitude		166-00.0W	
Depth(m)		7025	
Press.	Temp.	Sal.	SIG-T
5	6.928	32.338	25.332
10	6.894	32.361	25.355
20	6.949	32.720	25.630
30	6.525	32.734	25.697
40	6.294	32.777	25.760
50	6.022	32.793	25.806
75	4.020	32.977	26.175
100	4.357	33.225	26.338
125	5.156	33.545	26.504
150	5.152	33.677	26.609
200	4.893	33.830	26.760
250	4.706	33.931	26.861
300	4.567	33.990	26.923
400	4.209	34.068	27.023
500	3.880	34.139	27.114
600	3.660	34.186	27.173
700	3.570	34.262	27.242
800	3.289	34.309	27.307
900	3.108	34.363	27.367
1000	2.996	34.414	27.418
1200	2.673	34.479	27.498
1500	2.315	34.561	27.594

Station		OS09089	
Longitude		52-40.6N	
Latitude		165-59.8W	
Depth(m)		4613	
Press.	Temp.	Sal.	SIG-T
5	6.848	31.878	24.980
10	6.799	31.918	25.018
20	6.576	31.952	25.074
30	4.733	32.046	25.363
40	3.797	32.144	25.534
50	3.554	32.222	25.619
75	3.774	32.418	25.755
100	4.084	32.627	25.891
125	4.264	32.817	26.023
150	4.572	33.057	26.182
200	5.274	33.513	26.465
250	5.274	33.761	26.662
300	5.136	33.883	26.774
400	4.542	33.983	26.920
500	4.134	34.056	27.021
600	3.914	34.138	27.109
700	3.724	34.203	27.180
800	3.404	34.257	27.254
900	3.271	34.316	27.314
1000	3.110	34.361	27.365
1200	2.785	34.440	27.457
1500	2.388	34.533	27.566

Station OS09090			
Longitude 52-59.6N			
Latitude 166-00.1W			
Depth(m) 3870			
Press.	Temp.	Sal.	SIG-T
5	7.069	31.890	24.961
10	7.059	31.930	24.994
20	6.967	31.940	25.014
30	5.369	32.072	25.314
40	3.633	32.112	25.524
50	3.553	32.218	25.616
75	3.482	32.388	25.758
100	3.623	32.556	25.879
125	4.031	32.784	26.021
150	4.628	33.041	26.163
200	5.190	33.454	26.428
250	5.302	33.703	26.612
300	5.056	33.834	26.745
400	4.532	33.946	26.892
500	4.193	34.038	27.001
600	3.974	34.117	27.086
700	3.784	34.175	27.152
800	3.603	34.232	27.215
900	3.332	34.279	27.279
1000	3.181	34.328	27.332
1200	2.854	34.404	27.423
1500	2.419	34.493	27.531

Station OS09091			
Longitude 53-19.9N			
Latitude 166-00.2W			
Depth(m) 625			
Press.	Temp.	Sal.	SIG-T
5	7.315	31.965	24.987
10	7.306	31.972	24.994
20	7.281	31.984	25.006
30	6.686	32.245	25.290
40	6.570	32.417	25.441
50	5.831	32.478	25.581
75	4.255	32.602	25.854
100	4.311	32.786	25.994
125	4.431	32.973	26.130
150	4.846	33.246	26.302
200	5.277	33.599	26.533
250	5.251	33.787	26.685
300	4.758	33.874	26.810
400	4.192	33.978	26.953
500	3.873	34.112	27.093
600	4.025	14.880	11.817

Station OS09092			
Longitude 53-40.0N			
Latitude 165-59.9W			
Depth(m) 84			
Press.	Temp.	Sal.	SIG-T
5	6.775	31.959	25.054
10	6.766	31.979	25.071
20	6.713	31.931	25.040
30	4.840	32.053	25.357
40	4.225	32.128	25.480
50	3.927	32.195	25.563
75	4.384	32.350	25.640

Station OS09093			
Longitude 53-40.1N			
Latitude 173-59.7W			
Depth(m) 3650			
Press.	Temp.	Sal.	SIG-T
5	6.655	33.068	25.943
10	6.646	33.088	25.960
20	6.639	33.100	25.970
30	6.629	33.109	25.979
40	4.110	33.186	26.332
50	3.390	33.218	26.428
75	2.946	33.212	26.463
100	2.907	33.266	26.509
125	2.591	33.266	26.536
150	2.377	33.260	26.549
200	3.410	33.486	26.639
250	3.791	32.761	26.026
300	3.832	33.803	26.851
400	3.691	33.995	27.018
500	3.541	34.108	27.122
600	3.450	34.176	27.185
700	3.330	34.233	27.242
800	3.188	34.290	27.301
900	3.017	34.344	27.360
1000	2.865	34.383	27.405
1200	2.591	34.452	27.484
1500	2.234	34.548	27.591

Station OS09094			
Longitude 53-25.8N			
Latitude 176-59.0W			
Depth(m) 3775			
Press.	Temp.	Sal.	SIG-T
5	6.231	33.149	26.061
10	6.234	33.148	26.061
20	5.734	33.139	26.115
30	4.167	33.145	26.294
40	3.357	33.179	26.399
50	2.691	33.219	26.490
75	2.179	33.217	26.529
100	2.111	33.227	26.543
125	1.710	33.206	26.556
150	1.678	33.218	26.568
200	2.679	33.383	26.622
250	3.759	33.649	26.735
300	3.871	33.781	26.830
400	3.741	33.965	26.989
500	3.614	34.076	27.090
600	3.505	34.151	27.160
700	3.348	34.215	27.226
800	3.183	34.272	27.288
900	3.067	34.307	27.326
1000	2.897	34.347	27.373
1200	2.623	34.417	27.453
1500	2.269	34.500	27.549
2000	1.875	34.589	27.652
2500	1.696	34.631	27.700
3000	1.607	34.655	27.726

Station OS09095			
Longitude 52-50.1N			
Latitude 178-28.8W			
Depth(m) 3700			
Press.	Temp.	Sal.	SIG-T
5	6.092	33.144	26.075
10	6.098	33.144	26.074
20	6.085	33.144	26.075
30	5.634	33.149	26.135
40	3.677	33.175	26.366
50	3.225	33.218	26.443
75	2.433	33.225	26.516
100	2.234	33.228	26.534

Station OS09096			
Longitude 51-10.0N			
Latitude 179-43.4W			
Depth(m) 3675			
Press.	Temp.	Sal.	SIG-T
5	4.776	33.017	26.128
10	4.748	33.109	26.204
20	4.726	33.135	26.227
30	4.741	33.147	26.235
40	4.757	33.160	26.244
50	4.741	33.189	26.268
75	4.413	33.352	26.433
100	4.170	33.498	26.574
125	4.111	33.551	26.622
150	4.033	33.627	26.691
200	4.034	33.654	26.712
250	4.042	33.660	26.716
300	4.036	33.743	26.783
400	3.991	33.854	26.876
500	3.731	34.056	27.062
600	3.685	34.100	27.102
700	3.411	34.209	27.215
800	3.222	34.283	27.292
900	3.099	34.320	27.333
1000	2.974	34.355	27.372
1200	2.648	34.428	27.460
1500	2.401	34.484	27.526
2000	1.945	34.581	27.641
2500	1.721	34.627	27.695
3000	1.586	34.655	27.727

Station OS09097			
Longitude 51-30.6N			
Latitude 179-59.9E			
Depth(m) 1045			
Press.	Temp.	Sal.	SIG-T
5	4.025	33.331	26.456
10	4.026	33.331	26.456
20	3.967	33.350	26.477
30	3.847	33.399	26.528
40	3.835	33.406	26.534
50	3.825	33.410	26.539
75	3.630	33.477	26.611
100	3.605	33.515	26.644
125	3.584	33.523	26.652
150	3.557	33.547	26.674
200	3.547	33.640	26.749
250	3.547	33.710	26.805
300	3.557	33.742	26.829
400	3.530	33.839	26.909
500	3.494	33.891	26.954
600	3.533	33.927	26.979
700	3.338	34.059	27.102
800	2.988	34.277	27.309
900	2.783	34.374	27.405
1000	2.592	34.432	27.468

Station OS09098			
Longitude 50-50.6N			
Latitude 179-46.2W			
Depth(m) 5440			
Press.	Temp.	Sal.	SIG-T
5	7.391	32.619	25.491
10	7.382	32.621	25.493
20	7.386	32.619	25.491
30	7.381	32.629	25.500
40	7.083	32.641	25.550
50	4.733	32.723	25.900
75	3.682	32.895	26.142
100	3.789	33.191	26.368
125	3.880	33.560	26.653
150	3.972	33.744	26.790
200	3.992	33.914	26.923
250	3.912	33.975	26.980
300	3.868	34.029	27.027
400	3.706	34.120	27.116
500	3.551	34.181	27.180
600	3.361	34.250	27.253
700	3.217	34.297	27.304
800	3.038	34.338	27.353
900	2.920	34.370	27.390
1000	2.787	34.399	27.424
1200	2.554	34.450	27.485
1500	2.210	34.524	27.573
2000	1.904	34.590	27.651
2500	1.687	34.634	27.703
3000	1.558	34.660	27.733

Station OS09099			
Longitude 50-25.3N			
Latitude 179-50.0W			
Depth(m) 6453			
Press.	Temp.	Sal.	SIG-T
5	7.050	32.774	25.659
10	7.052	32.773	25.658
20	7.046	32.773	25.659
30	6.972	32.774	25.669
40	5.923	32.751	25.786
50	4.338	32.814	26.013
75	3.488	32.976	26.226
100	3.841	33.435	26.557
125	4.068	33.753	26.787
150	4.059	33.858	26.872
200	4.001	33.951	26.951
250	3.903	34.005	27.005
300	3.823	34.066	27.061
400	3.693	34.147	27.138
500	3.506	34.219	27.215
600	3.314	34.273	27.276
700	3.123	34.321	27.332
800	2.961	34.358	27.376
900	2.800	34.395	27.420
1000	2.658	34.424	27.456
1200	2.418	34.477	27.518
1500	2.112	34.543	27.597
2000	1.834	34.603	27.666
2500	1.645	34.640	27.711
3000	1.530	34.663	27.738

Station OS09100			
Longitude 50-05.4N			
Latitude 179-54.5W			
Depth(m) 5990			
Press.	Temp.	Sal.	SIG-T
5	6.679	32.756	25.694
10	6.681	32.756	25.694
20	6.681	32.755	25.693
30	6.682	32.755	25.693
40	6.635	32.756	25.700
50	6.144	32.757	25.763
75	3.653	32.879	26.133
100	3.569	33.095	26.313
125	3.957	33.650	26.717
150	3.697	33.773	26.841
200	3.735	33.886	26.927
250	3.799	33.976	26.992
300	3.858	34.064	27.056
400	3.668	34.163	27.154
500	3.481	34.227	27.223
600	3.258	34.284	27.290
700	3.054	34.332	27.347
800	2.884	34.370	27.392
900	2.741	34.399	27.428
1000	2.599	34.433	27.468
1200	2.378	34.484	27.527
1500	2.114	34.544	27.597
2000	1.804	34.607	27.672
2500	1.632	34.642	27.713
3000	1.514	34.665	27.741

Station OS09101			
Longitude 49-45.8N			
Latitude 179-59.1W			
Depth(m) 5178			
Press.	Temp.	Sal.	SIG-T
5	6.914	32.816	25.710
10	6.902	32.816	25.712
20	6.901	32.817	25.713
30	5.535	32.856	25.915
40	3.892	32.907	26.132
50	3.801	32.913	26.145
75	3.712	32.945	26.180
100	3.274	33.271	26.481
125	3.115	33.647	26.795
150	3.233	33.734	26.853
200	3.456	33.850	26.925
250	3.485	33.926	26.983
300	3.485	33.987	27.031
400	3.445	34.107	27.131
500	3.406	34.192	27.203
600	3.244	34.257	27.269
700	3.089	34.307	27.324
800	2.922	34.353	27.375
900	2.762	34.394	27.423
1000	2.636	34.425	27.459
1200	2.399	34.479	27.522
1500	2.142	34.538	27.591
2000	1.842	34.603	27.666
2500	1.647	34.641	27.711
3000	1.536	34.664	27.738

Station		OS09102	
Longitude		49-30.3N	
Latitude		179-60.0W	
Depth(m)		4810	
Press.	Temp.	Sal.	SIG-T
5	7.101	32.838	25.703
10	7.055	32.837	25.708
20	7.014	32.838	25.714
30	6.947	32.837	25.722
40	6.659	32.837	25.760
50	4.659	32.885	26.036
75	3.887	32.920	26.143
100	3.605	33.007	26.239
125	3.353	33.483	26.642
150	3.299	33.696	26.817
200	3.511	33.831	26.905
250	3.667	33.959	26.991
300	3.663	34.017	27.038
400	3.567	34.137	27.143
500	3.405	34.208	27.215
600	3.249	34.260	27.271
700	3.101	34.306	27.322
800	2.948	34.348	27.369
900	2.813	34.383	27.409
1000	2.680	34.415	27.447
1200	2.438	34.471	27.512
1500	2.183	34.530	27.581
2000	1.873	34.597	27.659
2500	1.658	34.639	27.709
3000	1.539	34.663	27.737

Station		OS09103	
Longitude		49-59.9N	
Latitude		176-29.7E	
Depth(m)		4674	
Press.	Temp.	Sal.	SIG-T
5	7.037	32.715	25.614
10	7.029	32.715	25.616
20	6.884	32.720	25.638
30	6.545	32.735	25.695
40	5.128	32.779	25.901
50	3.775	32.851	26.099
75	3.466	32.947	26.205
100	3.617	33.260	26.440
125	3.847	33.550	26.648
150	4.015	33.785	26.818
200	3.992	33.913	26.923
250	3.950	33.983	26.983
300	3.885	34.051	27.043
400	3.665	34.163	27.154
500	3.434	34.236	27.235
600	3.235	34.290	27.296
700	3.053	34.331	27.346
800	2.884	34.375	27.396
900	2.719	34.410	27.440
1000	2.589	34.439	27.474
1200	2.329	34.495	27.540
1500	2.067	34.552	27.608
2000	1.770	34.614	27.680
2500	1.601	34.646	27.719
3000	1.516	34.667	27.742

Station		OS09104	
Longitude		50-20.5N	
Latitude		176-28.9E	
Depth(m)		5010	
Press.	Temp.	Sal.	SIG-T
5	7.007	32.671	25.584
10	7.000	32.671	25.585
20	6.993	32.671	25.586
30	6.940	32.670	25.592
40	4.929	32.685	25.848
50	4.072	32.760	25.997
75	3.751	32.851	26.101
100	3.607	32.945	26.190
125	3.814	33.413	26.542
150	3.940	33.745	26.794
200	3.931	33.915	26.930
250	3.868	33.989	26.996
300	3.798	34.055	27.055
400	3.668	34.143	27.138
500	3.475	34.224	27.221
600	3.316	34.275	27.277
700	3.121	34.321	27.332
800	2.956	34.360	27.378
900	2.814	34.391	27.416
1000	2.673	34.421	27.452
1200	2.416	34.477	27.519
1500	2.125	34.541	27.594
2000	1.816	34.605	27.670
2500	1.631	34.642	27.713
3000	1.539	34.665	27.739

Station		OS09105	
Longitude		50-40.0N	
Latitude		176-29.9E	
Depth(m)		6480	
Press.	Temp.	Sal.	SIG-T
5	7.129	32.769	25.644
10	7.078	32.655	25.562
20	7.073	32.653	25.561
30	6.999	32.655	25.572
40	4.456	32.746	25.947
50	4.033	32.795	26.029
75	3.609	32.869	26.129
100	3.726	33.088	26.292
125	3.837	33.501	26.610
150	3.931	33.773	26.818
200	3.918	33.917	26.933
250	3.897	33.982	26.987
300	3.795	34.051	27.052
400	3.620	34.152	27.150
500	3.450	34.225	27.224
600	3.293	34.273	27.278
700	3.108	34.313	27.327
800	2.931	34.355	27.376
900	2.777	34.390	27.418
1000	2.624	34.421	27.457
1200	2.384	34.479	27.523
1500	2.119	34.538	27.592
2000	1.821	34.600	27.665
2500	1.637	34.637	27.709
3000	1.542	34.658	27.732

Station		OS09106	
Longitude		50-59.9N	
Latitude		176-29.8E	
Depth(m)		6250	
Press.	Temp.	Sal.	SIG-T
5	7.017	32.679	25.589
10	7.042	32.691	25.595
20	6.595	32.726	25.681
30	5.859	32.795	25.828
40	5.494	32.831	25.900
50	4.502	32.793	25.980
75	4.498	33.043	26.179
100	4.370	33.206	26.321
125	4.179	33.489	26.566
150	4.008	33.719	26.767
200	3.998	33.891	26.904
250	3.940	33.964	26.968
300	3.812	34.017	27.023
400	3.657	34.117	27.119
500	3.526	34.185	27.185
600	3.332	34.246	27.253
700	3.201	34.292	27.301
800	3.060	34.333	27.347
900	2.906	34.367	27.389
1000	2.739	34.390	27.422
1200	2.485	34.460	27.499
1500	2.207	34.520	27.571
2000	1.879	34.592	27.654
2500	1.690	34.629	27.699
3000	1.564	34.655	27.729

Station		OS09107	
Longitude		51-20.2N	
Latitude		176-30.0E	
Depth(m)		4750	
Press.	Temp.	Sal.	SIG-T
5	5.369	32.900	25.969
10	5.183	32.930	26.014
20	4.992	32.999	26.090
30	4.299	32.983	26.151
40	4.346	33.090	26.232
50	4.283	33.158	26.292
75	4.240	33.303	26.412
100	4.106	33.352	26.465
125	4.033	33.365	26.483
150	3.978	33.391	26.508
200	3.829	33.460	26.578
250	3.859	33.663	26.737
300	3.842	33.822	26.865
400	3.687	33.988	27.013
500	3.683	34.119	27.117
600	3.512	34.201	27.199
700	3.297	34.258	27.265
800	3.146	34.310	27.321
900	2.994	34.337	27.357
1000	2.899	34.369	27.391
1200	2.658	34.425	27.456
1500	2.333	34.495	27.540
2000	1.939	34.580	27.640
2500	1.717	34.624	27.692
3000	1.591	34.651	27.723

Station		OS09108	
Longitude		51-39.8N	
Latitude		176-29.8E	
Depth(m)		3934	
Press.	Temp.	Sal.	SIG-T
5	5.813	32.851	25.878
10	5.814	32.850	25.877
20	5.464	32.980	26.021
30	4.902	33.129	26.203
40	4.469	33.198	26.305
50	4.312	33.217	26.336
75	4.092	33.273	26.403
100	3.963	33.325	26.457
125	3.853	33.357	26.494
150	3.812	33.384	26.519
200	3.751	33.456	26.582
250	3.729	33.518	26.634
300	3.738	33.619	26.714
400	3.772	33.776	26.836
500	3.787	33.971	26.990
600	3.693	34.112	27.110
700	3.363	34.223	27.231
800	3.316	34.239	27.249
900	3.213	34.273	27.285
1000	3.089	34.317	27.331
1200	2.948	34.368	27.385
1500	2.413	34.481	27.522
2000	1.953	34.580	27.639
2500	1.722	34.627	27.694
3000	1.589	34.654	27.726

Station		OS09109	
Longitude		51-58.3N	
Latitude		176-51.2E	
Depth(m)		160	
Press.	Temp.	Sal.	SIG-T
5	3.976	33.328	26.458
10	3.973	33.328	26.459
20	3.902	33.326	26.464
30	3.888	33.332	26.471
40	3.895	33.337	26.474
50	3.887	33.343	26.480
75	3.926	33.362	26.491
100	3.994	33.396	26.511

Station		OS09110	
Longitude		52-22.7N	
Latitude		175-13.9E	
Depth(m)		740	
Press.	Temp.	Sal.	SIG-T
5	6.499	32.905	25.835
10	6.492	32.907	25.838
20	6.491	32.909	25.839
30	6.470	32.904	25.838
40	6.473	32.904	25.838
50	6.094	32.913	25.892
75	5.368	32.968	26.023
100	3.627	33.134	26.339
125	3.430	33.260	26.457
150	3.565	33.373	26.535
200	3.740	33.544	26.654
250	3.751	33.591	26.690
300	3.741	33.690	26.770
400	3.717	33.872	26.917
500	3.666	34.011	27.033
600	3.578	34.087	27.102
700	3.216	34.241	27.259

Station		OS09111	
Longitude		52-59.9N	
Latitude		177-00.6E	
Depth(m)		3939	
Press.	Temp.	Sal.	SIG-T
5	6.383	33.013	25.934
10	6.379	33.013	25.936
20	6.290	33.013	25.947
30	6.205	33.015	25.959
40	5.060	33.072	26.140
50	4.026	33.120	26.288
75	3.250	33.153	26.389
100	2.784	33.195	26.463
125	2.613	33.215	26.493
150	2.749	33.259	26.517
200	3.325	33.444	26.614
250	3.973	33.658	26.722
300	4.042	33.793	26.822
400	3.839	33.942	26.961
500	3.763	34.042	27.048
600	3.661	34.125	27.124
700	3.454	34.189	27.195
800	3.307	34.243	27.252
900	3.163	34.286	27.300
1000	2.994	34.332	27.353

Station		OS09112	
Longitude		53-33.2N	
Latitude		178-00.1E	
Depth(m)		3903	
Press.	Temp.	Sal.	SIG-T
5	6.680	33.096	25.962
10	6.679	33.096	25.962
20	6.438	33.102	25.998
30	6.359	33.102	26.008
40	5.427	33.122	26.138
50	4.500	33.170	26.279
75	2.828	33.227	26.485
100	2.699	33.250	26.514
125	2.667	33.266	26.529
150	2.776	33.310	26.556
200	3.603	33.522	26.649
250	3.870	33.694	26.761
300	3.880	33.830	26.868
400	3.759	33.985	27.003
500	3.639	34.076	27.087
600	3.497	34.154	27.163
700	3.358	34.213	27.224
800	3.227	34.265	27.277
900	3.073	34.309	27.327
1000	2.912	34.352	27.376
1200	2.639	34.418	27.453
1500	2.287	34.498	27.547
2000	1.901	34.585	27.647
2500	1.695	34.632	27.700
3000	1.603	34.656	27.727

Station		OS09113	
Longitude		55-09.6N	
Latitude		179-19.3E	
Depth(m)		3830	
Press.	Temp.	Sal.	SIG-T
5	5.812	33.022	26.013
10	5.812	33.040	26.027
20	5.700	33.047	26.046
30	5.441	33.064	26.090
40	4.109	33.090	26.256
50	3.191	33.138	26.382
75	2.056	33.183	26.512
100	1.747	33.200	26.548
125	1.625	33.196	26.554
150	1.574	33.194	26.556
200	1.574	33.241	26.593
250	3.691	33.621	26.720
300	3.871	33.733	26.791
400	3.831	33.887	26.918
500	3.661	34.047	27.062
600	3.544	34.130	27.140
700	3.461	34.165	27.176
800	3.341	34.205	27.219
900	3.212	34.252	27.269
1000	3.019	34.308	27.331
1200	2.696	34.388	27.424
1500	2.331	34.476	27.525

Station		OS09114	
Longitude		55-59.1N	
Latitude		179-59.2W	
Depth(m)		3840	
Press.	Temp.	Sal.	SIG-T
5	6.663	33.141	25.999
10	6.659	33.140	26.000
20	6.401	33.142	26.034
30	6.351	33.144	26.042
40	3.630	33.143	26.345
50	3.402	33.157	26.378
75	2.160	33.199	26.517
100	2.073	33.209	26.531
125	2.134	33.228	26.542
150	1.937	33.222	26.552
200	3.005	33.453	26.650
250	3.818	33.680	26.754
300	3.871	33.787	26.835
400	3.789	33.941	26.966
500	3.646	34.052	27.068
600	3.482	34.132	27.147
700	3.341	34.201	27.216
800	3.212	34.260	27.275
900	3.062	34.301	27.321
1000	2.937	34.339	27.363
1200	2.628	34.416	27.452
1500	2.280	34.495	27.545
2000	1.909	34.583	27.644
2500	1.719	34.628	27.695
3000	1.620	34.654	27.723

Station		OS09115	
Longitude		56-30.2N	
Latitude		178-58.4E	
Depth(m)		3845	
Press.	Temp.	Sal.	SIG-T
5	6.178	33.124	26.048
10	6.165	33.127	26.052
20	6.045	33.127	26.067
30	5.591	33.131	26.126
40	4.039	33.150	26.311
50	3.341	33.177	26.399
75	2.797	33.242	26.499
100	2.654	33.260	26.526
125	2.412	33.252	26.540
150	1.923	33.228	26.558
200	2.768	33.410	26.636
250	3.752	33.649	26.737
300	3.894	33.773	26.821
400	3.786	33.934	26.960
500	3.661	34.065	27.077
600	3.539	34.143	27.151
700	3.394	34.204	27.213
800	3.245	34.252	27.265
900	3.080	34.294	27.314
1000	2.942	34.340	27.364

Station		OS09116	
Longitude		56-59.9N	
Latitude		178-00.1E	
Depth(m)		3840	
Press.	Temp.	Sal.	SIG-T
5	6.093	33.055	26.004
10	5.691	33.072	26.067
20	4.701	33.116	26.215
30	4.050	33.125	26.290
40	2.795	33.152	26.428
50	2.257	33.173	26.489
75	1.742	33.174	26.528
100	1.657	33.186	26.543
125	1.626	33.198	26.555
150	1.672	33.209	26.560
200	1.688	33.245	26.589
250	2.914	33.496	26.692
300	3.828	33.727	26.791
400	3.832	33.915	26.940
500	3.740	34.029	27.040
600	3.573	34.129	27.136
700	3.349	34.190	27.206
800	3.187	34.249	27.269
900	3.021	34.299	27.324
1000	2.871	34.343	27.372
1200	2.599	34.416	27.454
1500	2.283	34.494	27.543
2000	1.914	34.582	27.643
2500	1.726	34.626	27.694
3000	1.625	34.653	27.722

Station		OS09117	
Longitude		56-29.8N	
Latitude		176-58.4E	
Depth(m)		3855	
Press.	Temp.	Sal.	SIG-T
5	6.319	33.047	25.970
10	6.106	33.066	26.012
20	5.635	33.062	26.066
30	4.914	33.087	26.169
40	3.104	33.121	26.376
50	2.352	33.133	26.449
75	2.017	33.165	26.501
100	2.002	33.189	26.521
125	1.915	33.204	26.540
150	1.931	33.219	26.550
200	1.838	33.238	26.572
250	3.017	33.475	26.666
300	3.799	33.681	26.757
400	3.817	33.867	26.904
500	3.674	34.007	27.029
600	3.558	34.113	27.125
700	3.414	34.182	27.194
800	3.243	34.244	27.259
900	3.101	34.291	27.310
1000	2.929	34.328	27.355

Station		OS09118	
Longitude		55-41.8N	
Latitude		178-04.0E	
Depth(m)		3850	
Press.	Temp.	Sal.	SIG-T
5	5.988	33.090	26.045
10	5.901	33.097	26.062
20	5.579	33.101	26.103
30	4.710	33.115	26.213
40	4.031	33.135	26.300
50	3.282	33.166	26.396
75	2.464	33.200	26.493
100	2.209	33.209	26.521
125	2.385	33.254	26.543
150	2.411	33.285	26.566
200	3.336	33.504	26.660
250	3.828	33.684	26.757
300	3.869	33.801	26.845
400	3.797	33.977	26.993
500	3.667	34.074	27.083
600	3.526	34.147	27.155
700	3.389	34.206	27.216
800	3.251	34.256	27.268
900	3.111	34.299	27.316
1000	2.993	34.331	27.352
1200	2.701	34.404	27.436
1500	2.332	34.489	27.535
2000	1.943	34.577	27.637
2500	1.738	34.624	27.691
3000	1.624	34.653	27.723

Station		OS09119	
Longitude		54-60.0N	
Latitude		165-59.1W	
Depth(m)		135	
Press.	Temp.	Sal.	SIG-T
5	6.217	32.515	25.563
10	6.096	32.525	25.586
20	6.075	32.594	25.642
30	6.059	32.597	25.647
40	5.709	32.604	25.695
50	4.927	32.647	25.818
75	4.105	32.786	26.015
100	3.612	32.955	26.197
125	3.679	32.985	26.215

Station	OS09120		
Longitude	55-30.0N		
Latitude	165-59.9W		
Depth(m)	121		
Press.	Temp.	Sal.	SIG-T
5	7.996	31.973	24.898
10	7.620	31.967	24.946
20	7.592	31.981	24.962
30	5.913	32.117	25.286
40	4.773	32.222	25.498
50	4.222	32.343	25.651
75	3.277	32.550	25.906
100	3.534	32.878	26.143

Station	OS09121		
Longitude	55-59.5N		
Latitude	166-00.9W		
Depth(m)	113		
Press.	Temp.	Sal.	SIG-T
5	8.078	31.905	24.833
10	7.730	31.902	24.880
20	7.456	31.904	24.920
30	5.932	32.052	25.232
40	4.377	32.155	25.486
50	3.872	32.229	25.595
75	3.235	32.459	25.836
100	3.550	32.612	25.930

Station	OS09122		
Longitude	55-59.8N		
Latitude	167-00.0W		
Depth(m)	133		
Press.	Temp.	Sal.	SIG-T
5	7.747	31.930	24.899
10	7.594	31.924	24.916
20	7.455	31.933	24.943
30	7.404	31.943	24.957
40	3.155	32.096	25.554
50	2.262	32.072	25.607
75	2.923	32.423	25.835
100	3.329	32.782	26.086
125	3.344	32.790	26.090

Station	OS09123		
Longitude	56-00.1N		
Latitude	168-00.6W		
Depth(m)	136		
Press.	Temp.	Sal.	SIG-T
5	6.684	32.126	25.197
10	6.313	32.234	25.329
20	5.860	32.233	25.384
30	3.317	32.152	25.585
40	2.746	32.255	25.716
50	2.918	32.416	25.830
75	3.437	32.823	26.108
100	3.424	32.856	26.136
125	3.414	32.873	26.150

Station	OS09124		
Longitude	55-59.7N		
Latitude	170-00.2W		
Depth(m)	220		
Press.	Temp.	Sal.	SIG-T
5	6.693	32.374	25.391
10	6.692	32.428	25.434
20	5.525	32.444	25.590
30	4.769	32.484	25.707
40	3.887	32.559	25.856
50	3.829	32.573	25.873
75	3.434	32.749	26.050
100	3.398	32.984	26.241
125	3.364	33.085	26.324
150	3.380	33.115	26.347
200	3.443	33.262	26.458

Station	OS09125		
Longitude	56-29.5N		
Latitude	168-59.9W		
Depth(m)	102		
Press.	Temp.	Sal.	SIG-T
5	6.800	31.989	25.074
10	6.714	31.999	25.093
20	6.185	31.990	25.153
30	2.885	31.967	25.474
40	1.862	32.042	25.612
50	1.882	32.109	25.664
75	1.985	32.157	25.696

Station	OS09126		
Longitude	56-29.7N		
Latitude	168-00.0W		
Depth(m)	115		
Press.	Temp.	Sal.	SIG-T
5	6.946	31.741	24.859
10	6.945	31.752	24.868
20	7.009	31.811	24.907
30	6.818	31.799	24.922
40	2.014	31.910	25.495
50	1.837	32.081	25.645
75	1.850	32.124	25.679
100	1.908	32.159	25.703

Station	OS09127		
Longitude	56-30.1N		
Latitude	165-59.9W		
Depth(m)	84		
Press.	Temp.	Sal.	SIG-T
5	7.149	31.501	24.644
10	6.777	31.500	24.692
20	6.481	31.555	24.773
30	3.878	31.476	24.995
40	-0.666	31.669	25.443
50	-0.448	31.718	25.476
75	0.086	31.810	25.527

Station	OS09128		
Longitude	57-00.2N		
Latitude	165-59.6W		
Depth(m)	70		
Press.	Temp.	Sal.	SIG-T
5	6.473	31.283	24.559
10	6.380	31.283	24.571
20	3.937	31.285	24.838
30	-0.715	31.530	25.333
40	-0.718	31.533	25.335
50	-0.718	31.530	25.333

Station	OS09129		
Longitude	56-59.0N		
Latitude	166-59.9W		
Depth(m)	75		
Press.	Temp.	Sal.	SIG-T
5	7.118	31.498	24.646
10	6.276	31.500	24.755
20	2.686	31.427	25.059
30	-0.234	31.591	25.365
40	-0.231	31.589	25.363
50	-0.227	31.587	25.361

Station	OS09130		
Longitude	56-59.7N		
Latitude	168-00.1W		
Depth(m)	77		
Press.	Temp.	Sal.	SIG-T
5	6.745	31.654	24.818
10	6.228	31.613	24.850
20	5.932	31.614	24.886
30	5.242	31.594	24.950
40	0.059	31.722	25.458
50	0.060	31.723	25.459

Station	OS09131		
Longitude	57-30.0N		
Latitude	167-00.1W		
Depth(m)	70		
Press.	Temp.	Sal.	SIG-T
5	6.582	31.031	24.347
10	6.178	31.009	24.380
20	2.755	31.141	24.825
30	-0.729	31.484	25.296
40	-0.736	31.482	25.294
50	-0.744	31.483	25.296

Station		OS09132	
Longitude		57-30.0N	
Latitude		166-00.5W	
Depth(m)		64	
Press.	Temp.	Sal.	SIG-T
5	6.096	31.283	24.605
10	5.839	31.281	24.634
20	4.620	31.340	24.814
30	0.371	31.469	25.239
40	0.031	31.519	25.295
50	-0.057	31.522	25.301

Station		OS09135	
Longitude		62-00.0N	
Latitude		172-00.1W	
Depth(m)		55	
Press.	Temp.	Sal.	SIG-T
5	3.440	30.726	24.438
10	3.441	30.725	24.438
20	2.271	30.786	24.578
30	-1.570	31.945	25.693
40	-1.638	32.209	25.908

Station		OS09138	
Longitude		62-53.4N	
Latitude		172-01.5W	
Depth(m)		50	
Press.	Temp.	Sal.	SIG-T
5	4.778	30.535	24.161
10	4.778	30.535	24.160
20	3.407	31.263	24.869
30	-1.325	32.366	26.028
40	-1.628	32.532	26.170

Station		OS09141	
Longitude		58-41.1N	
Latitude		170-19.2W	
Depth(m)		70	
Press.	Temp.	Sal.	SIG-T
5	5.371	31.581	24.925
10	5.355	31.580	24.926
20	5.006	31.579	24.964
30	3.088	31.537	25.114
40	0.112	31.575	25.337
50	0.058	31.588	25.350

Station		OS09133	
Longitude		57-59.5N	
Latitude		166-00.2W	
Depth(m)		54	
Press.	Temp.	Sal.	SIG-T
5	5.579	31.245	24.636
10	4.956	31.235	24.697
20	4.456	31.271	24.776
30	3.106	31.389	24.995
40	3.076	31.390	24.998

Station		OS09136	
Longitude		62-29.5N	
Latitude		171-60.0W	
Depth(m)		45	
Press.	Temp.	Sal.	SIG-T
5	4.858	30.347	24.003
10	4.856	30.346	24.003
20	1.525	31.419	25.136
30	-1.499	32.696	26.301
40	-1.504	32.692	26.298

Station		OS09139	
Longitude		63-00.0N	
Latitude		174-00.2W	
Depth(m)		74	
Press.	Temp.	Sal.	SIG-T
5	4.311	30.840	24.449
10	4.304	30.840	24.450
20	4.187	30.867	24.482
30	-1.601	32.036	25.767
40	-1.497	32.100	25.817
50	-1.444	32.128	25.838

Station		OS09142	
Longitude		55-15.9N	
Latitude		167-56.4W	
Depth(m)		424	
Press.	Temp.	Sal.	SIG-T
5	7.191	32.906	25.744
10	7.180	32.905	25.744
20	6.858	32.934	25.811
30	6.182	32.964	25.922
40	5.545	33.043	26.062
50	4.607	33.169	26.267
75	4.086	33.294	26.420
100	4.016	33.334	26.460
125	4.032	33.389	26.502
150	3.855	33.402	26.530
200	3.779	33.514	26.626
250	3.747	33.572	26.676
300	3.727	33.641	26.732
400	3.702	33.734	26.809

Station		OS09134	
Longitude		58-30.1N	
Latitude		165-59.6W	
Depth(m)		45	
Press.	Temp.	Sal.	SIG-T
5	5.575	31.473	24.817
10	5.211	31.594	24.953
20	4.584	31.674	25.084
30	4.582	31.674	25.083
40	4.586	31.674	25.083

Station		OS09137	
Longitude		63-00.5N	
Latitude		172-00.9W	
Depth(m)		53	
Press.	Temp.	Sal.	SIG-T
5	4.725	30.948	24.493
10	4.688	30.963	24.509
20	3.069	31.339	24.958
30	-1.185	32.205	25.894
40	-1.652	32.486	26.134

Station		OS09140	
Longitude		62-30.1N	
Latitude		173-59.9W	
Depth(m)		68	
Press.	Temp.	Sal.	SIG-T
5	3.610	30.781	24.467
10	3.605	30.781	24.468
20	3.543	30.791	24.481
30	-1.278	31.984	25.717
40	-1.660	32.195	25.898
50	-1.668	32.195	25.898

Station		OS09143	
Longitude		41-30.0N	
Latitude		145-46.7E	
Depth(m)		6860	
Press.	Temp.	Sal.	SIG-T
5	17.009	32.658	23.716
10	16.814	32.823	23.889
20	12.778	36.024	27.232
30	12.171	36.347	27.603
40	10.184	36.920	28.420
50	5.601	33.454	26.380
75	4.099	33.398	26.502
100	4.293	33.501	26.563
125	3.489	33.448	26.602
150	4.748	33.680	26.657
200	3.692	33.641	26.736
250	3.481	33.710	26.811
300	3.907	33.849	26.880
400	3.324	33.915	26.990
500	3.473	34.046	27.080
600	3.255	34.137	27.172
700	3.108	34.214	27.248
800	3.183	34.307	27.315
900	2.956	34.352	27.372
1000	2.802	34.392	27.417
1200	2.546	34.453	27.489
1500	2.295	34.521	27.564
2000	1.927	34.593	27.651
2500	1.685	34.636	27.704
3000	1.621	34.651	27.721

5. Data on Drift Gillnet Research

Seven gillnet researches were performed during this cruise. The operations were supervised by the captain, Deck officers, crew and research staff were engaged in the work.

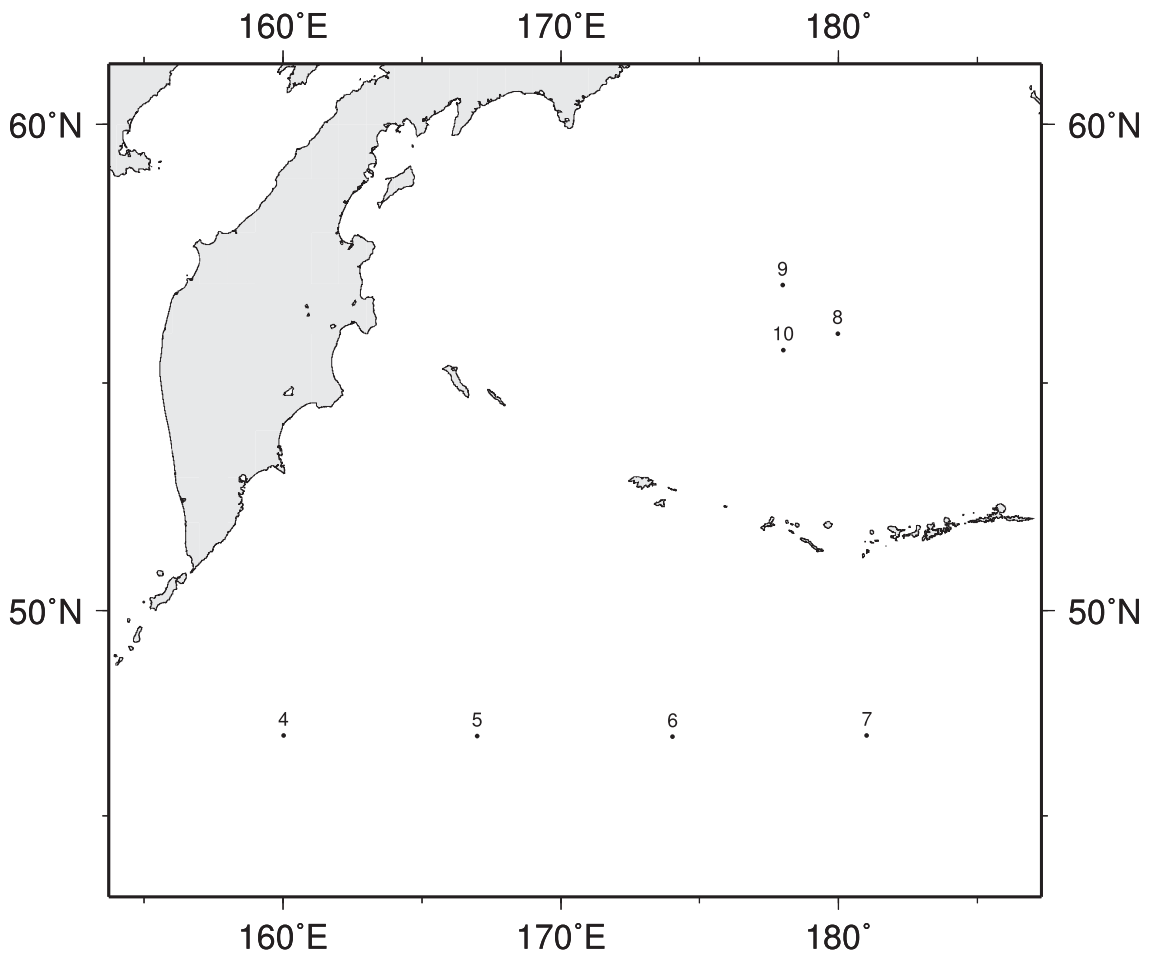


Figure 3: Locations of drift gillnet research

Table 3. Position and research conditions of surface drift gillnet sampling at each station during the Oshoro maru Cruise #202-Leg 1, Leg2, 2009.

Station	Date and Time (S.M.T.*1)		T.D.*2	Set Position		D.S.*3	Wr*4	Wind (Force)
	Net set	Net haul		Lat.	Long.			
Cruise #202 - Leg 1								
OSG 0904	June 6 17:50-18:15	June 7 04:25-05:30	+10h	47-00.7 N	160-01.2 E	270	o	West-5
OSG 0905	June 8 17:45-18:05	June 9 04:20-05:05	+11h	47-00.3 N	166-59.6 E	335	c	NNW-5
OSG 0906	June 10 17:48-18:09	June 11 04:17-05:03	+11h	46-59.6 N	174-01.1 E	150	o	NW-5
OSG 0907	June 11 17:50-18:10	June 12 04:20-05:00	-12h	47-01.1 N	179-00.3 W	050	o	SW-5
Cruise #202 - Leg 2								
OSG 0908	June 30 18:59-19:17	July 1 04:25-05:17	-11h	56-00.6 N	179-57.8 E	125	o	ESE-5
OSG 0909	July 1 18:29-18:50	July 2 04:22-05:25	-11h	56-58.8 N	177-58.9 E	270	f	East-3
OSG 0910	July 2 18:25-18:45	July 3 04:43-05:50	-11h	55-40.6 N	178-00.2 E	070	o	WNW-2

*1 S.M.T. : Ship's Mean Time.

*2 T.D. : Time Difference between Greenwich Mean Time (G.M.T.) and Ship's Mean Time (S.M.T.).

*3 D.S. : Direction of net set.

*4 Wr : Weather (o: 100% clouded, c: over 75-99% clouded).

Table 4. Nets composition

No. of research	Mesh size (mm)																				Total	
	48	55	63	72	82	93	106	121	138	157	112	115	118	121	19	22	25	29	33	37		42
OSG0904	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	49
OSG0905	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	49
OSG0906	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	49
OSG0907	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	49
OSG0908	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	49
OSG0909	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	49
OSG0910	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	49

Table 5. Data on catch number of salmonids by drift gillnet research

Sockeye (catch number)

No. of research	Mesh size (mm)																					Total
	48	55	63	72	82	93	106	121	138	157	112	115	118	121	19	22	25	29	33	37	42	
OSG0904	0	0	0	0	0	2	0	2	3	0	1	2	0	3	0	0	0	0	0	0	0	13
OSG0905	0	2	3	4	9	16	17	4	0	0	6	7	7	2	0	0	0	0	0	0	0	77
OSG0906	0	0	0	1	3	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	8
OSG0907	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OSG0908	0	0	1	2	2	1	3	1	1	0	3	4	0	3	0	0	0	0	0	0	0	21
OSG0909	0	2	3	1	1	1	0	1	1	0	0	0	3	0	0	0	0	0	0	0	0	13
OSG0910	0	2	5	3	8	4	0	0	1	1	0	1	0	2	0	0	0	0	0	0	0	27

Chum (catch number)

No. of research	Mesh size (mm)																						Total
	48	55	63	72	82	93	106	121	138	157	112	115	118	121	19	22	25	29	33	37	42		
OSG0904	0	0	0	0	1	2	3	0	3	0	1	1	2	1	0	0	0	0	0	0	0	14	
OSG0905	0	0	0	1	0	1	8	8	3	1	8	7	5	7	0	0	0	0	0	0	0	49	
OSG0906	0	0	0	1	8	5	4	7	4	0	5	5	5	7	0	0	0	0	0	1	0	52	
OSG0907	0	13	49	9	3	2	2	0	0	1	1	0	1	1	0	0	0	0	0	1	0	83	
OSG0908	0	0	0	1	2	5	7	10	2	0	9	3	0	6	0	0	0	0	0	0	0	45	
OSG0909	0	0	3	0	0	0	6	6	7	0	5	6	2	12	0	0	0	0	0	0	0	47	
OSG0910	0	1	53	50	9	17	12	15	3	1	15	8	10	11	0	0	0	0	0	0	0	205	

Pink (catch number)

No. of research	Mesh size (mm)																						Total
	48	55	63	72	82	93	106	121	138	157	112	115	118	121	19	22	25	29	33	37	42		
OSG0904	0	3	1	1	38	60	75	37	2	0	79	75	70	33	0	0	0	0	0	0	0	474	
OSG0905	0	1	1	2	11	14	20	19	0	0	75	22	13	11	0	0	0	0	0	0	0	189	
OSG0906	0	0	1	2	19	25	8	0	0	0	1	1	0	0	0	0	0	0	0	0	0	57	
OSG0907	0	0	8	1	3	5	2	1	0	0	0	0	0	1	0	0	0	0	0	0	0	21	
OSG0908	0	0	1	3	16	56	38	21	2	0	15	28	2	18	0	0	0	0	0	0	0	200	
OSG0909	2	6	1	17	123	255	248	61	11	0	187	136	54	84	0	0	0	0	0	0	1	1186	
OSG0910	0	0	0	5	47	95	91	26	5	0	95	0	44	60	0	0	0	0	0	0	0	468	

Coho (catch number)

No. of research	Mesh size (mm)																						Total
	48	55	63	72	82	93	106	121	138	157	112	115	118	121	19	22	25	29	33	37	42		
OSG0904	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0906	0	0	0	0	1	0	1	3	0	0	3	2	0	1	0	0	0	0	0	0	0	11	
OSG0907	0	0	0	1	4	3	6	3	0	0	1	6	0	0	0	0	0	0	0	0	0	24	
OSG0908	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0909	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0910	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Chinook (catch number)

No. of research	Mesh size (mm)																						Total
	48	55	63	72	82	93	106	121	138	157	112	115	118	121	19	22	25	29	33	37	42		
OSG0904	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0906	0	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	4	
OSG0907	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0908	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
OSG0909	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0910	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	

Steelhead (catch number)

No. of research	Mesh size (mm)																						Total
	48	55	63	72	82	93	106	121	138	157	112	115	118	121	19	22	25	29	33	37	42		
OSG0904	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0906	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0907	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	3	
OSG0908	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0909	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
OSG0910	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Table 6. Biological characteristics of salmonids caught by drift gillnet research

SOCKEYE SALMON											
St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.
(mm)	(mm)	(mm)	(gr)		(gr)	(mm)	(mm)	(mm)	(gr)		(gr)
G04	A112	587	2882	M	6	G05	C082	460	1140		
G04	A115	548	2061	F	64	G05	C082	468	1100	M	2
G04	A115	594	2619	M	6	G05	C093	370	623	F	22
G04	A121	612	2957	F	24	G05	C093	430	839	M	1
G04	A121	540	1931	F	64	G05	C093	510	1530	F	10
G04	A121	500	1574	F	27	G05	C093	492	1465	F	24
G04	C093	588	2746	M	7	G05	C093	504	1436	F	7
G04	C093	490	1531	F	40	G05	C093	436	938	M	1
G04	C121	570	2717	F	71	G05	C093	439	982	M	1
G04	C121	589	2784	M	10	G05	C093	454	1111	M	10
G04	C138	586	2549	M	44	G05	C093	504	1493	F	5
G04	C138	583	2356	F	73	G05	C093	421	894	F	8
G04	C138	609	2831	M	21	G05	C093	471	1242	F	9
G05	A112	528	1809	M	1	G05	C093	453	1107	F	6
G05	A112	578	2243	F	27	G05	C093	457	1114	M	1
G05	A112	489	1492	M	8	G05	C093	451	1096	M	1
G05	A112	508	1794	M	6	G05	C093	486	1293		
G05	A112	484	1367	F	23	G05	C106	508	1252	M	1
G05	A112	476	1248	M	1	G05	C106	514	1724	M	2
G05	A115	506	1560	M	16	G05	C106	464	1184	M	1
G05	A115	554	1919			G05	C106	502	1538	F	24
G05	A115	508	1778	F	30	G05	C106	486	1611	F	30
G05	A115	486	1413	M	13	G05	C106	446	965	F	6
G05	A115	459	1265	M	7	G05	C106	470	1216		
G05	A115	498	1545	F	23	G05	C106	469	1286	M	3
G05	A115	550	2037	F	39	G05	C106	519	1757	F	56
G05	A118	508	1510	M	6	G05	C106	546	1990	M	1
G05	A118	478	1250	F	32	G05	C106	434	969		
G05	A118	486	1300	F	23	G05	C106	445	1020	M	1
G05	A118	540	1680	M	24	G05	C106	446	1040		
G05	A118	454	1140	M	2	G05	C106	478	1361	F	12
G05	A118	498				G05	C106	506	1429	M	1
G05	A118	520	1680	F	24	G05	C121	506	1340	F	32
G05	A121	484	1440	F	24	G05	C121	478	1264	M	4
G05	A121	471	1339	M	19	G05	C121	536	2200	F	43
G05	C055	272	255	F	1	G05	C121	580	2580	F	42
G05	C055	280	280	F	3	G06	A112	490	1324	M	1
G05	C063	356	566	M	1	G06	C072	300	290	M	1
G05	C063	464	1155	F	8	G06	C082	389	708	F	5
G05	C063	288	306	F	2	G06	C082	444	829	M	
G05	C072	412	940	F	14	G06	C082	426	841	F	6
G05	C072	378	640	M	15	G06	C093	414	814	F	7
G05	C072	448	1100	M	2	G06	C106	431	981	F	9
G05	C072	470	1220	F	13	G06	C106	512	1430	F	16
G05	C082	428	740	F	12	G08	A112	504	1580	F	43
G05	C082	424	920	F	12	G08	A112	600	2700	M	66
G05	C082	440	910	M	2	G08	A112	606	3300	M	16
G05	C082	460	920	F	13	G08	A115	540	2097	M	21
G05	C082	452	1020	M	2	G08	A115	524	1920	F	83
G05	C082	448	1020			G08	A115	562	2774	F	64
G05	C082	470	1150	M	3	G08	A115	618	3412	M	13
CHUM SALMON											
St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.
(mm)	(mm)	(mm)	(gr)		(gr)	(mm)	(mm)	(mm)	(gr)		(gr)
G04	A112	520	1665	F	23	G05	A112	524	1736	M	1
G04	A115	580	2394	M	4	G05	A112	508	1629	F	29
G04	A118	512	1670	F	25	G05	A112	550	1915	M	1
G04	A118	524	1725	F	18	G05	A112	518	1721	M	7
G04	A121	516	1753	M	60	G05	A112	554		F	89
G04	C082	486	1250	M	1	G05	A112	534	1844	F	14
G04	C093	534	1903	F	49	G05	A112	530	1875	F	41
G04	C093	445	1032	F	8	G05	A115	576	2423	M	17
G04	C106	527	1729	F	18	G05	A115	600	2581	M	6
G04	C106	516	1655	M	7	G05	A115	569	2537	F	83
G04	C106	528	1597	F	22	G05	A115	504	1807	F	89
G04	C138	530	1638	M	10	G05	A115	592	2075	M	2
G04	C138	590	2447	F	44	G05	A118	590	2400	M	6
G04	C138	578	2319	M	7	G05	A118	534	2050	M	8
G05	A112	547	1840	M	1	G05	A118	658	3100	M	68
St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.
(mm)	(mm)	(mm)	(gr)		(gr)	(mm)	(mm)	(mm)	(gr)		(gr)
G05	A118	598	2360	M	14	G05	A118	490	1520	M	38
G05	A118	490	1520	M	38	G05	A121	557	2439	F	24
G05	A121	557	2439	F	24	G05	A121	504	1556	M	8
G05	A121	560	2138	M	5	G05	A121	552	1888	F	33
G05	A121	552	1888	F	33	G05	A121	535	2267	F	235
G05	A121	512	1853	M	8	G05	A121	551	1969	F	64
G05	A121	551	1969	F	64	G05	C072	548	2300	F	44
G05	C072	548	2300	F	44	G05	C093	473	1278	F	27
G05	C093	473	1278	F	27	G05	C106	584	2510	M	27
G05	C106	584	2510	M	27	G05	C106	624	2911	M	5
G05	C106	624	2911	M	5	G05	C106	504	1640	F	53
G05	C106	504	1640	F	53	G05	C106	540	1713	M	1
G05	C106	540	1713	M	1						

Table 6. Biological characteristics of salmonids caught by drift gillnet research (continued)

CHUM SALMON																							
St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.
(mm)	(mm)	(mm)	(gr)		(gr)	(mm)	(mm)	(mm)	(gr)		(gr)	(mm)	(mm)	(mm)	(gr)		(gr)	(mm)	(mm)	(mm)	(gr)		(gr)
G05	C106	574	2380	F	47	G07	C055	313	320	F	2	G07	C106	472	1346	F	16	G07	C106	472	1346	F	16
G05	C106	514	1665	M	14	G07	C055	312	325	M	1	G07	C106	476		F	9	G07	C106	476		F	9
G05	C106	530	1969	F	60	G07	C055	290	262	F	2	G07	C157	460	1239	F	10	G07	C157	460	1239	F	10
G05	C106	525	1877	F	10	G07	C055	296	272	F	2	G07	F037	316	396	M	1	G07	F037	316	396	M	1
G05	C121	503	1720	F	44	G07	C055	324	370	M	1	G08	A112	600	2550	M	16	G08	A112	600	2550	M	16
G05	C121	512	1510	F	18	G07	C055	304	278	M	1	G08	A112	518	1740	F	17	G08	A112	518	1740	F	17
G05	C121	560	1820	F	104	G07	C055	307	319	M	1	G08	A112	506		M	5	G08	A112	506		M	5
G05	C121	524	1600	F	23	G07	C055	308	331	M	1	G08	A112	540	1920	M	4	G08	A112	540	1920	M	4
G05	C121	518	1740	M	3	G07	C055	312	340	F	2	G08	A112	610	2600	F	58	G08	A112	610	2600	F	58
G05	C121	532	1750	F	32	G07	C063	332	438	M	1	G08	A112	518	1660	F	15	G08	A112	518	1660	F	15
G05	C121	537	2020	F	40	G07	C063	321	373	M	1	G08	A112	538	1550	F	18	G08	A112	538	1550	F	18
G05	C121	579	2120	M	8	G07	C063	340	394	F	2	G08	A112	510	1640	M	6	G08	A112	510	1640	M	6
G05	C138	569	2600	M	13	G07	C063	332	415	F	2	G08	A112	554	1820	M	10	G08	A112	554	1820	M	10
G05	C138	617	2950	M	8	G07	C063	308	349	M	1	G08	A115	513	1758	F	10	G08	A115	513	1758	F	10
G05	C138	546	2050	F	28	G07	C063	298	312	F	2	G08	A115	546	1899	M	3	G08	A115	546	1899	M	3
G05	C157	497	1396	M	1	G07	C063	292	284	M	1	G08	A115	559	2343	F	57	G08	A115	559	2343	F	57
G06	A112	504	1520	F	24	G07	C063	328	400	M	1	G08	A121	547	2041	F	40	G08	A121	547	2041	F	40
G06	A112	518	1620	M	2	G07	C063	340	420	M	1	G08	A121	503	1560	M	1	G08	A121	503	1560	M	1
G06	A112	542	1940	F	54	G07	C063	310	318	F	2	G08	A121	596	2406	M	8	G08	A121	596	2406	M	8
G06	A112	494	1480	M	2	G07	C063	315	314	M	1	G08	A121	545	2007	F	81	G08	A121	545	2007	F	81
G06	A112	504	1440	F	14	G07	C063	310	340			G08	A121	505	1599	M	2	G08	A121	505	1599	M	2
G06	A115	536	1844	M	2	G07	C063	300	295	M	1	G08	A121	624	2916	F	61	G08	A121	624	2916	F	61
G06	A115	482	1360	M	1	G07	C063	324	382	F	2	G08	C072	334	460	F	2	G08	C072	334	460	F	2
G06	A115	505	1532	F	10	G07	C063	302	287			G08	C082	402	754	F	5	G08	C082	402	754	F	5
G06	A115	500	1620	F	10	G07	C063	304	264			G08	C082	517	1754	M	1	G08	C082	517	1754	M	1
G06	A115	514	1453	M	1	G07	C063	286	255			G08	C093	494	1572	M	2	G08	C093	494	1572	M	2
G06	A118	498	1520	M	2	G07	C063	308	316			G08	C093	462	1351	F	8	G08	C093	462	1351	F	8
G06	A118	540	1960	F	40	G07	C063	312	330			G08	C093	575	2550	F	227	G08	C093	575	2550	F	227
G06	A118	509	1600	M	2	G07	C063	306	288			G08	C093	506	1511	F	13	G08	C093	506	1511	F	13
G06	A118	530	1520	M	6	G07	C063	306	312	F	2	G08	C093	458	1249	F	11	G08	C093	458	1249	F	11
G06	A118	500	1440	M	6	G07	C063	308	330	M	1	G08	C106	500	1629	M	2	G08	C106	500	1629	M	2
G06	A121	512	1588	F	14	G07	C063	344	430	F	3	G08	C106	560	2304	F	58	G08	C106	560	2304	F	58
G06	A121	562	2505	F	58	G07	C063	310	314	F	2	G08	C106	518	1496	F	12	G08	C106	518	1496	F	12
G06	A121	550	1923	F	24	G07	C063	310	336	F	2	G08	C106	490	1420	M	2	G08	C106	490	1420	M	2
G06	A121	515	1611	M	1	G07	C063	314	336	M	1	G08	C106	589	2410	M	6	G08	C106	589	2410	M	6
G06	A121	530	1949	F	47	G07	C063	290	270	F	1	G08	C106	503	1617	M	2	G08	C106	503	1617	M	2
G06	A121	501	1523	F	10	G07	C063	319	337	M	1	G08	C106	470	1355	F	10	G08	C106	470	1355	F	10
G06	A121	478	1393	F	12	G07	C063	309	312	M	1	G08	C121	547	2118	F	16	G08	C121	547	2118	F	16
G06	C072	321	374	F	1	G07	C063	306	314	F	2	G08	C121	537	0	F	21	G08	C121	537	0	F	21
G06	C082	468	1274	M	1	G07	C063	308	325	F	2	G08	C121	493	1643	F	11	G08	C121	493	1643	F	11
G06	C082	448	1055	M	1	G07	C063	324	372	M	1	G08	C121	615	2829	F	49	G08	C121	615	2829	F	49
G06	C082	460	1149	F	6	G07	C063	297	299	F	2	G08	C121	592	2471	M	9	G08	C121	592	2471	M	9
G06	C082	446	1043	F	9	G07	C063	316	325	M	1	G08	C121	516	1563	F	11	G08	C121	516	1563	F	11
G06	C082	476	1333	F	7	G07	C063	301	289	M	1	G08	C121	500	1589	M	2	G08	C121	500	1589	M	2
G06	C082	566	2326	F	162	G07	C063	305	310	F	2	G08	C121	537	1691	F	5	G08	C121	537	1691	F	5
G06	C082	397	754	M	1	G07	C063	304	311	F	2	G08	C121	580	2961	M	94	G08	C121	580	2961	M	94
G06	C082	463	1164	M	1	G07	C063	301	293	M	1	G08	C138	577	2558	M	10	G08	C138	577	2558	M	10
G06	C093	500	1350	F	26	G07	C063	312	350	M	1	G08	C138	604	2979	M	173	G08	C138	604	2979	M	173
G06	C093	466	1163	F	8	G07	C063	302	311	M	1	G09	A112	478	1366	F	10	G09	A112	478	1366	F	10
G06	C093	470	1230	M	1	G07	C063	329	355	F	2	G09	A112	485	1653	M	2	G09	A112	485	1653	M	2
G06	C093	497	1499	M	1	G07	C063	307	312	M	1	G09	A112	590	2841	M	10	G09	A112	590	2841	M	10
G06	C093	464	1068	M	1	G07	C063	336	429	M	1	G09	A112	495	1612	M	2	G09	A112	495	1612	M	2
G06	C106	472	1453	M	2	G07	C063	312	357	F	2	G09	A112	598	2751	F	316	G09	A112	598	2751	F	316
G06	C106	485	1324	F	11	G07	C063	322	376	F	2	G09	A115	529	1858	M	55	G09	A115	529	1858	M	55
G06	C106	577	2670	F	56	G07	C063	324	350	M	1	G09	A115	562	2467	F	79	G09	A115	562	2467	F	79
G06	C106	461	1242	M	1	G07	C063	304	333	M	1	G09	A115	611	2818	M	14	G09	A115	611	2818	M	14
G06	C121	530	1882	F	31	G07	C063	310	289	F	2	G09	A115	535	1818	F	25	G09	A115	535	1818	F	25
G06	C121	534	1869	F	68	G07	C063	306	326	F	2	G09	A115	533	2040	F	79	G09	A115	533	2040	F	79
G06	C121	519	1775	F	23	G07	C072	311	332	F	1	G09	A115	544	1854	M	2	G09	A115	544	1854	M	2
G06	C121	500	1560	M	2	G07	C072	306	321	F	4	G09	A118	525	2005	F	141	G09	A118	525	2005	F	141
G06	C121	472	1306	M	7	G07	C072	300	313	M	1	G09	A118	514	1746	M	2	G09	A118	514	1746	M	2
G06	C121	551	2147	F	46	G07	C072	320	360	F	4	G09	A121	658	4032	M	87	G09	A121	658	4032	M	87
G06	C121	535	1857	F	92	G07	C072	326	392	M	1	G09	A121	554	2553	F	63	G09	A121	554	2553	F	63
G06	C138	594	2694	M	7	G07	C072	312	348	M	1	G09	A121	488	1582	M	1	G09	A121	488	1582	M	1
G06	C138	588	2490	M	9	G07	C072	320	361	F	1	G09	A121	601	2891	F	245	G09	A121	601	2891	F	245
G06	C138	530	2184	M	5	G07	C082	400	757	F	3	G09	A121	489	1629	M	2	G09	A121	489	1629	M	2
G06	F037	518	1620	M	2	G07	C082	438	977	F	4	G09	A121	570	2704	F	241						

Table 6. Biological characteristics of salmonids caught by drift gillnet research (continued)

CHUM SALMON

St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.
	(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)
G09	A121	559	2438	F	243	G10	C063	346	477	F	3	G10	C072	322	397	F	2
G09	A121	536	2360	F	69	G10	C063	341	390	M	1	G10	C072	346	439	M	1
G09	A121	502	1749	F	117	G10	C063	321	368	F	2	G10	C072	341	423	F	3
G09	C063	548	2258	M	141	G10	C063	326	388	M	1	G10	C072	321	378	M	1
G09	C063	683	4270	M	200	G10	C063	334	390	M	1	G10	C072	326	408	M	1
G09	C063	488	1662	M	3	G10	C063	326	374	M	1	G10	C072	340	448	F	2
G09	C106	491	1444	M	2	G10	C063	331	387	F	2	G10	C072	364	523	F	3
G09	C106	620	3150	M	50	G10	C063	329	366	M	1	G10	C072	336	427	M	1
G09	C106	569	2859	F	236	G10	C063	349	460	F	3	G10	C072	322	403	F	2
G09	C106	498	1667	M	2	G10	C063	315	341	F	1	G10	C072	348	505	M	1
G09	C106	499	1541	F	10	G10	C063	342	448	M	1	G10	C072	340	431	M	1
G09	C106	645	3208	F	92	G10	C063	344	522	M	1	G10	C072	348	517	M	1
G09	C121	661	4126	M	137	G10	C063	324	388	F	1	G10	C072	341	464	M	1
G09	C121	505	2956	M	142	G10	C063	338	435	F	2	G10	C072	349	482	F	2
G09	C121	585	2302	M	21	G10	C063	346	410	M	1	G10	C072	344	454	M	1
G09	C121	589	1591	M	2	G10	C063	324	376	M	1	G10	C072	342	480	M	1
G09	C121	464	1244	M	2	G10	C063	330	426	F	2	G10	C072	311	360	F	2
G09	C121	590	2456	M	122	G10	C063	314	378	M	1	G10	C072	318	375	F	2
G09	C138	604	2840	M	146	G10	C063	354	435	M	1	G10	C072	330	424	M	1
G09	C138	629	3606	F	590	G10	C063	294	256	M	1	G10	C072	340	465	F	3
G09	C138	654	3528	F	91	G10	C063	310	331	F	2	G10	C072	316	462	M	1
G09	C138	532	2085	M	4	G10	C063	370	533	M	1	G10	C072	324	422	F	3
G09	C138	601	3068	M	139	G10	C063	354	470	F	2	G10	C072	320	373	M	1
G09	C138	650	3456	F	308	G10	C063	346	442	M	1	G10	C072	332	418	M	1
G09	C138	568	2406	F	193	G10	C063	310	304	M	1	G10	C072	322	400	F	2
G10	A112	592	2800	M	13	G10	C063	354	478	F	1	G10	C072	332	418	M	1
G10	A112	498	1510	M	1	G10	C063	352	479	F	3	G10	C072	339	474	M	1
G10	A112	556	2490	F	2	G10	C063	324	352	F	1	G10	C072	314	381	F	2
G10	A112	550	2650	F	88	G10	C063	338	436	M	2	G10	C072	342	458	F	3
G10	A112	612	3150	F	320	G10	C063	329	417	M	1	G10	C072	314	333	F	2
G10	A112	548	1800	F	35	G10	C063	340	493	F	3	G10	C072	366	550	M	1
G10	A112	504	1640	F	17	G10	C063	346	458	F	3	G10	C072	336	414	F	2
G10	A112	512	1550	F	16	G10	C063	330	434	F	2	G10	C072	361	569	M	1
G10	A112	546	1780	F	152	G10	C063	316	352	F	2	G10	C082	479	1340	M	2
G10	A112	466	1240	F	16	G10	C063	320	369	M	1	G10	C082	510	1639	F	17
G10	A112	478	1270	M	2	G10	C063	294	256	F	1	G10	C082	342	510	M	1
G10	A112	530	1080	F	14	G10	C063	334	371	F	2	G10	C082	420	1075	F	4
G10	A112	550	2350	M	3	G10	C063	334	428	F	2	G10	C082	470	1429	M	3
G10	A112	502	1460	M	2	G10	C063	332	449	M	1	G10	C082	454	1282	F	4
G10	A112	520	1600	M	1	G10	C063	331	362	F	2	G10	C082	516	1792	F	16
G10	A115	454	1243	M	2	G10	C063	338	409	F	3	G10	C082	430	1054	M	2
G10	A115	616	3594	F	365	G10	C063	336	446	F	3	G10	C082	462	1394	F	11
G10	A115	521	1771	F	9	G10	C063	347	368	M	1	G10	C093	420	921	F	5
G10	A115	514	2178	M	3	G10	C063	348	412	M	1	G10	C093	470	1203	F	6
G10	A115	524	1888	M	3	G10	C063	343	442	M	1	G10	C093	396	699	F	6
G10	A115	504	1670	F	11	G10	C063	351	435	F	2	G10	C093	441	1050	F	8
G10	A115	536	1998	M	32	G10	C063	340	447	F	2	G10	C093	440	1094	F	6
G10	A115	459	1235	M	2	G10	C063	324	397	F	1	G10	C093	484	1443	F	10
G10	A118	560	2442	F	138	G10	C063	344	470	M	1	G10	C093	486	1311	F	10
G10	A118	576	2554	M	46	G10	C063	330	389	M	1	G10	C093	434	1046	M	1
G10	A118	521	1589	F	13	G10	C063	334	418	M	1	G10	C093	421	933	F	9
G10	A118	551	2394	F	235	G10	C063	338	409	M	1	G10	C093	454	1212	M	1
G10	A118	548	1966	M	2	G10	C072	340	445	M	1	G10	C093	452	1205	F	8
G10	A118	516	1507	F	10	G10	C072	334	460	M	1	G10	C093	482	1437	F	10
G10	A118	489	1511	M	2	G10	C072	339	435	M	1	G10	C093	476	1456	F	2
G10	A118	474	1353			G10	C072	351	481	M	1	G10	C093	444	1107	F	7
G10	A118	520	1805	F	12	G10	C072	326	397	F	2	G10	C093	446	1107	F	7
G10	A121	524	1926	F	15	G10	C072	336	489	F	3	G10	C093	470	1333	M	2
G10	A121	484	1592	F	6	G10	C072	344	445	F	2	G10	C093	488	1504	F	12
G10	A121	588	2373	F	36	G10	C072	340	446	M	1	G10	C106	488	1605	F	12
G10	A121	552	2590	F	96	G10	C072	341	440	F	2	G10	C106	338	440	M	1
G10	A121	511	1802	F	48	G10	C072	338	427	F	2	G10	C106	444	1055	F	9
G10	A121	580	2612	F	62	G10	C072	344	481	M	1	G10	C106	542	1976	M	3
G10	A121	598	2665	F	85	G10	C072	378	682	M	1	G10	C106	486	1424	F	16
G10	A121	639	3346	F	80	G10	C072	331	418	F	2	G10	C106	469	1138	F	15
G10	A121	492	1525	F	10	G10	C072	336	415	F	3	G10	C106	484	1532	F	13
G10	A121	508	1830	M	3	G10	C072	361	458	M	1	G10	C106	476	1420	F	11
G10	A121	481	1411	F	7	G10	C072	354	485	M	1	G10	C106	461	1217	F	7
G10	C055	339	465	F	2	G10	C072	364	472	M	1	G10	C106	441	1083	F	10
G10	C063	348	395	F	2	G10	C072	330	438	M	1	G10	C106	490	1484	F	12

Table 6. Biological characteristics of salmonids caught by drift gillnet research (continued)

CHUM SALMON																							
St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.
	(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)
G10	C106	452	1223	F	2	G10	C121	458	1224	F	6	G10	C121	479	1518	F	13	G10	C121	479	1518	F	13
G10	C121	556	2534	F	131	G10	C121	528	1881	F	13	G10	C121	538	2077	F	57	G10	C121	538	2077	F	57
G10	C121	464	1312	F	6	G10	C121	541	2179	M	2	G10	C121	484	1398	M	1	G10	C121	484	1398	M	1
G10	C121	516	1768	M	2	G10	C121	471	2408	F	7	G10	C138	512	1786	M	2	G10	C138	512	1786	M	2
G10	C121	489	1556	M	2	G10	C121	566	2549	M	109	G10	C138	538	2132	M	2	G10	C138	538	2132	M	2
G10	C121	498	1624	M	3	G10	C121	550	2646	F	271	G10	C138	584	2713	F	260	G10	C138	584	2713	F	260
												G10	C157	524	2213	F	74						
PINK SALMON																							
St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.
	(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)
G04	A112	446	1133	F	57	G04	A112	456	1191	M	8	G04	A118	456	1355	F	40	G04	A118	456	1355	F	40
G04	A112	438	1131	M	32	G04	A118	450	1238	M	9	G04	A118	480	1359	M	13	G04	A118	480	1359	M	13
G04	A112	444	1236	M	8	G04	A118	468	1255	M	20	G04	C055	396	835	F	4	G04	C055	396	835	F	4
G04	A112	454	1154	M	22	G04	A118	444	1119	M	5	G04	C055	406	901	F	65	G04	C055	406	901	F	65
G04	A112	470	1320	M	13	G04	A118	456	1167	M	15	G04	C055	454	1173	F	64	G04	C055	454	1173	F	64
G04	A112	461	1238	F	49	G04	A118	447	1287	M	16	G04	C063	479	1447	M	4	G04	C063	479	1447	M	4
G04	A112	452	1220	F	31	G04	A118	444	1234	M	21	G04	C072	380	732	M	5	G04	C072	380	732	M	5
G04	A112	459	1303	F	74	G04	A118	451	1084	M	22	G04	C082	433	943	F	25	G04	C082	433	943	F	25
G04	A112	437	1114	M	19	G04	A118	454	1142	F	51	G04	C082	441	1169	F	40	G04	C082	441	1169	F	40
G04	A112	450	1165	F	56	G04	A118	461	1192	M	32	G04	C082	424	1048	F	24	G04	C082	424	1048	F	24
G04	A112	452	1064	M	18	G04	A118	504	1780	M	20	G04	C082	445	1232	F	60	G04	C082	445	1232	F	60
G04	A112	462	1389	M	11	G04	A118	442	1120	M	8	G04	C082	438	1058	M	4	G04	C082	438	1058	M	4
G04	A112	486	1435	M	20	G04	A118	444	1172	M	8	G04	C082	404	969	M	20	G04	C082	404	969	M	20
G04	A112	475	1372	M	5	G04	A118	463	1289	M	14	G04	C082	430	1106	F	49	G04	C082	430	1106	F	49
G04	A112	456	1206	M	6	G04	A118	480	1558	M	9	G04	C082	399	862	M	5	G04	C082	399	862	M	5
G04	A112	458	1265	M	24	G04	A118	436	1145	F	38	G04	C082	400	891	F	38	G04	C082	400	891	F	38
G04	A112	461	1232	M	7	G04	A118	498	1580	M	25	G04	C082	431	1066	F	70	G04	C082	431	1066	F	70
G04	A112	418	1114	M	11	G04	A118	484	1429	M	15	G04	C082	436	1086	M	16	G04	C082	436	1086	M	16
G04	A112	432	1181	M	6	G04	A118	462	1275	M	12	G04	C082	406	839	F	25	G04	C082	406	839	F	25
G04	A112	446	1234	F	57	G04	A118	466	1384	M	16	G04	C082	458	1109	M	3	G04	C082	458	1109	M	3
G04	A112	432	1029	M	4	G04	A118	448	1206	F	30	G04	C082	452	1204	F	30	G04	C082	452	1204	F	30
G04	A112	452	1260	M	23	G04	A118	440	1208	F	53	G04	C082	347	485	M	4	G04	C082	347	485	M	4
G04	A112	480	1569	M	10	G04	A118	468	1331	M	4	G04	C082	444	991	F	10	G04	C082	444	991	F	10
G04	A112	474	1314	M	12	G04	A118	448	1174	M	9	G04	C082	431	1064	F	54	G04	C082	431	1064	F	54
G04	A112	498	1703	M	23	G04	A118	466	1661	M	13	G04	C082	440	1119	F	48	G04	C082	440	1119	F	48
G04	A112	434	1095	F	52	G04	A118	460	1284	M	9	G04	C082	429	1058	F	45	G04	C082	429	1058	F	45
G04	A112	471	1232	F	82	G04	A118	434	1060	M	14	G04	C082	445	1215	M	8	G04	C082	445	1215	M	8
G04	A112	450	1232	M	8	G04	A118	460	1402	M	23	G04	C082	455	1229	M	4	G04	C082	455	1229	M	4
G04	A112	464	1143	M	5	G04	A118	453	1044	M	16	G04	C082	387	864	M	19	G04	C082	387	864	M	19
G04	A112	440	1106	F	36	G04	A118	458	1359	F	40	G04	C082	420	943	F	54	G04	C082	420	943	F	54
G04	A112	461	1217	M	17	G04	A118	469	1253	M	5	G04	C082	426	891	M	3	G04	C082	426	891	M	3
G04	A112	455	1062	M	16	G04	A118	434	1106	F	39	G04	C082	430	1097	M	5	G04	C082	430	1097	M	5
G04	A112	440	1210	F	48	G04	A118	465	1274	M	6	G04	C082	450	1012	M	4	G04	C082	450	1012	M	4
G04	A112	425	1070	M	23	G04	A118	450	1242	M	23	G04	C082	364	703	M	32	G04	C082	364	703	M	32
G04	A112	429	1042	M	10	G04	A118	432	1142	M	16	G04	C082	398	828	M	9	G04	C082	398	828	M	9
G04	A112	465	1366	M	16	G04	A118	455	1253	M	17	G04	C082	416	791	F	35	G04	C082	416	791	F	35
G04	A112	486	1426	M	9	G04	A118	474	1346	F	85	G04	C082	434	1079	F	30	G04	C082	434	1079	F	30
G04	A112	433	1079	M	9	G04	A118	472	1359	M	8	G04	C082	434	975	F	16	G04	C082	434	975	F	16
G04	A112	450	1167	M	18	G04	A118	458	1243	M	5	G04	C082	476	1367	M	15	G04	C082	476	1367	M	15
G04	A112	468	1279	M	9	G04	A118	438	1111	F	43	G04	C082	460	1269	F	40	G04	C082	460	1269	F	40
G04	A112	458	1377	M	7	G04	A118	442	1203	F	38	G04	C082	436	953	M	20	G04	C082	436	953	M	20
G04	A112	436	1177	M	6	G04	A118	458	1344	M	14.2	G04	C082	440	1225	F	58	G04	C082	440	1225	F	58
G04	A112	446	1219	F	51	G04	A118	466	1312	M	28	G04	C082	440	971	M	2	G04	C082	440	971	M	2
G04	A112	456	1125	F	14	G04	A118	492	1638	M	20	G04	C082	420	989	M	15	G04	C082	420	989	M	15
G04	A112	453	1184	M	5	G04	A118	474	1450	F	13.6	G04	C082	443	1149	F	45	G04	C082	443	1149	F	45
G04	A112	434	1115	M	28	G04	A118	460	1292	M	9.6	G04	C093	439	1150	M	5	G04	C093	439	1150	M	5
G04	A112	456	1125	M	16	G04	A118	474	1360	M	10.2	G04	C093	430	1030	M	5	G04	C093	430	1030	M	5
G04	A112	464	1331	F	44	G04	A118	458	1210	F	44.4	G04	C093	458	1100	F	23	G04	C093	458	1100	F	23
G04	A112	450	1667	M	16	G04	A118	462	1303	M	8.9	G04	C093	474	1230	M	6	G04	C093	474	1230	M	6
G04	A112	488	1454	M	4	G04	A118	448	1216	F	52	G04	C093	454	1200	F	25	G04	C093	454	1200	F	25
G04	A112	476	1330	M	13	G04	A118	468	1300	M	17	G04	C093	424	1180	M	13	G04	C093	424	1180	M	13
G04	A112	478	1358	M	8	G04	A118	434															

Table 6. Biological characteristics of salmonids caught by drift gillnet research (continued)

PINK SALMON											
St.	Gear (mm)	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	Gear (mm)	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)
G04	C093	451	1220	M	23	G04	C106	463	1230	M	3
G04	C093	468	1260	F	23	G04	C106	454	1240	M	3
G04	C093	478	1240	F	23	G04	C106	462	1210	M	3
G04	C093	434	1190	F	20	G04	C106	421	1100	M	5
G04	C093	432	1160	F	20	G04	C106	432	1180	M	7
G04	C093	438	1170	M	3	G04	C121	464	1220	M	4
G04	C093	462	1310	F	34	G04	C121	464	1422	M	10
G04	C093	470	1280	M	3	G04	C121	500	1478	M	9
G04	C093	456	1210	F	25	G04	C121	441	1134	M	8
G04	C093	450	1230	F	25	G04	C121	466	1248	F	32
G04	C093	434	1030	F	3	G04	C121	447	1283	M	6
G04	C093	456	1230	M	4	G04	C121	462	1277	F	75
G04	C093	496	1630	M	6	G04	C121	468	1380	M	12
G04	C093	442	1100	F	15	G04	C121	454	1161	M	23
G04	C093	444	1170	F	26	G04	C121	480	1444	F	67
G04	C093	438	1060	M	2	G04	C121	431	1096	M	19
G04	C093	472	1340	M	2	G04	C121	455	1244	F	73
G04	C093	490	1420	M	2	G04	C121	437	1106	M	20
G04	C093	432	1120	F	2	G04	C121	439	1178	M	5
G04	C093	442	1070	F	23	G04	C121	445	1068	M	5
G04	C093	440	1110	F	23	G04	C121	446	1141	M	6
G04	C093	460	1050	F	13	G04	C121	454	1292	F	40
G04	C093	460	1160	F	13	G04	C121	446	1215	F	24
G04	C093	402	1050	M	6	G04	C121	450	1254	M	21
G04	C093	473	1430	M	6	G04	C121	446	1146	M	10
G04	C093	476	1600	M	13	G04	C121	456	1260	M	47
G04	C093	451	1230	F	5	G04	C121	444	1211	F	24
G04	C093	439	1240	F	2	G04	C121	447	1234	F	29
G04	C093	431	1660	F	20	G04	C121	444	1245	F	41
G04	C093	432	1460	M	15	G04	C121	448	1181	M	9
G04	C093	453	1160	M	3	G04	C121	444	1205	F	18
G04	C093	450	1200	F	13	G04	C121	500	1627	M	15
G04	C093	451	1230	F	23	G04	C121	432	1114	F	62
G04	C093	471	1330	M	13	G04	C121	478	1378	M	11
G04	C093	450	1180	M	12	G04	C121	462	1332	F	72
G04	C093	462	1310	F	12	G04	C121	510	1777	M	4
G04	C093	442	1150	M	3	G04	C121	504	1520	M	14
G04	C106	438	1210	F	12	G04	C121	434	1090	F	57
G04	C106	444	1240	M	4	G04	C121	463	1269	M	19
G04	C106	444	1100	F	10	G04	C121	458	1362	F	47
G04	C106	377	740	M	6	G04	C121	460	1208	M	10
G04	C106	472	1380	M	6	G04	C388	458	1252	F	72
G04	C106	425	1140	M	6	G04	C388	454	1305	F	55
G04	C106	442	1260	M	5	G04	C157	446	1120	M	3
G04	C106	449	1210	F	18	G04	C157	484	1600	M	6
G04	C106	452	1230	F	17	G04	C157	458	1170	M	3
G04	C106	486	1460	M	8	G04	C157	458	1250	M	8
G04	C106	448	1230	F	10	G04	C157	452	1140	F	25
G04	C106	490	1840	M	13	G04	C157	430	930	M	4
G04	C106	460	1310	F	13	G04	C157	444	1100	F	28
G04	C106	460	1290	F	13	G04	C157	444	1130	F	10
G04	C106	463	1260	F	13	G04	C157	456	1370	M	10
G04	C106	412	880	M	7	G04	C157	429	1160	M	2
G04	C106	412	1090	M	7	G04	C157	504	1630	M	3
G04	C106	453	1186	F	5	G04	C157	429	1240	M	1
G04	C106	428	1190	M	14	G04	C157	455	1240	F	1
G04	C106	451	1210	F	14	G04	C157	470	1120	F	12
G04	C106	447	1230	F	14	G04	C157	471	1070	F	12
G04	C106	452	1202	F	37	G04	C157	453	1200	F	18
G04	C106	451	1110	F	10	G04	C157	462	1350	M	10
G04	C106	427	1120	F	13	G04	C157	436	1210	F	15
G04	C106	464	1250	F	10	G04	C157	457	1240	F	14
G04	C106	461	1206	M	14	G04	C157	465	1050	M	7
G04	C106	392	799	M	12	G05	A115	487	1493	M	38
G04	C106	450	1199	F	19	G05	A115	463	1184	M	8
G04	C106	450	1211	M	4	G05	A115	446	1123	M	8
G04	C106	452	1094	M	25	G05	A115	471	1418	M	23
G04	C106	466	1132	M	5	G05	A115	430	1077	F	21
G04	C106	443	1180	F	15	G05	A115	469	1365	M	8
G04	C106	454	1115	M	4	G05	A115	464	1359	M	10
G04	C106	450	1180	M	3	G05	A115	486	1550	M	28
G04	C106	469	1201	M	4	G05	A115	462	1264	M	24
G04	C106	442	1068	F	64	G05	A115	454	1296	M	10
G04	C106	476	1341	M	8	G05	A115	448	1192	M	6
G04	C106	454	1103	F	25	G05	A115	460	1311	M	8
G04	C106	444	1192	M	23	G05	A115	448	1220	M	26
G04	C106	440	1031	F	37	G05	A115	428	1032	M	5
G04	C106	469	1131	M	13	G05	A115	458	1262	F	34
G04	C106	414	941	F	20	G05	A115	437	1081	F	39
G04	C106	442	1129	M	20	G05	A115	422	1051	M	27
G04	C106	450	1200	M	2	G05	A115	444	1025	M	10
G04	C106	478	1440	M	2	G05	A115	478	1437	M	28
G04	C106	470	1460	M	17	G05	A115	486	1430	M	28
G04	C106	470	1400	F	4	G05	A115	480	1461	F	28
G04	C106	448	1240	M	7	G05	A115	446	1086	F	25
G04	C106	409	1040	F	13	G05	A115	439	1086	M	12
G04	C106	448	1220	F	8	G05	A115	466	1323	M	15
G04	C106	452	1240	F	10	G05	A115	490	1476	M	15
G04	C106	423	1040	F	10	G05	A115	466	1377	M	5
G04	C106	463	1310	F	7	G05	A115	444	1320	M	13
G04	C106	442	1150	F	18	G05	A115	488	1535	M	24
G04	C106	445	1170	M	15	G05	A115	440	1160	F	63
G04	C106	451	1270	M	3	G05	A115	456	1313	F	20
						G05	A115	456	1361	M	20
						G05	A115	456	1313	F	28
						G05	A115	469	1341	F	69
						G05	A115	444	1221	F	55
						G05	A115	471	1424	F	45
						G05	A115	451	1240	F	49
						G05	A115	500	1501	M	16
						G05	A115	444	1122	M	73
						G05	A115	469	1372	M	25
						G05	A115	460	1435	M	60
						G05	A115	426	1021	F	1
						G05	A115	447	1316	M	25
						G05	A115	498	1481	F	1
						G05	A115	408	941	F	44
						G05	A115	466	1524	F	1
						G05	A115	433	1133	F	1
						G05	A115	465	1302	M	12
						G05	A115	446	1199	M	20
						G05	A115	434	1157	M	48
						G05	A115	424	1058	F	17
						G05	A115	461	1244	F	40
						G05	A115	450	1388	F	55
						G05	A115	471	1331	F	8
						G05	A115	467	1283	M	13
						G05	A115	460	1283	M	10
						G05	A115	431	1083	M	5
						G05	A115	446	1243	M	9
						G05	A115	496	1330	M	8
						G05	A115	460	1131	M	1
						G05	A115	492	1459	M	13
						G05	A115	463	1406	M	16
						G05	C055	434	1160	F	48
						G05	C063	474	1332	F	45
						G05	C072	366	520	F	15
						G05	C072	444	1140	M	20
						G05	C08	438	960	M	38
						G05	C08	403	0		
						G05	C08	456	1020	M	13
						G05	C08	490	1280	M	7
						G05	C08	442	1040	F	60
						G05	C08	449	1020	M	28
						G05	C08	422	800	F	28
						G05	C08	422	680	F	20
						G05	C08	408	740	M	20
						G05	C08	435	920	F	32
						G05	C08	420	900	F	18
						G05	C08	428	987	F	52
						G05	C09	432	977	M	3
						G05	C09	440	1048		

PINK SALMON

Table 6. Biological characteristics of salmonids caught by drift gillnet research (continued)

PINK SALMON											
St.	Gear (mm)	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	Gear (mm)	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)
G09	C138	501	1844	M	92	G10	C082	412		F	82
G09	C138	542	2457	M	115	G10	C082	388		F	55
G09	C138	539	2284	M	84	G10	C082	424	960	M	53
G09	C138	518	2115	M	71	G10	C082	438	1000	F	68
G09	C138	550	2110	M	120	G10	C082	442	990	F	88
G09	C138	498	1693	M	105	G10	C082	420	1080	F	88
G09	C138	409	1780	M	100	G10	C082	438	1020	F	83
G09	C138	598	1718	M	103	G10	C082	466		F	83
G09	F04	437	1115	M	76	G10	C082	411		F	42
G10	A115	471	1378	M	60	G10	C082	427	1080	F	65
G10	A115	504	1646	M	66	G10	C082	446	1050	M	53
G10	A115	468	1328	F	126	G10	C082	420	820	F	51
G10	A115	486	1534	M	91	G10	C082	420	890	F	72
G10	A115	466	1339	M	100	G10	C082	440	1080	F	82
G10	A115	451	1328	M	52	G10	C082	405	850	F	13
G10	A115	520	1757	M	54	G10	C082	441	1130	M	75
G10	A115	471	1318	M	79	G10	C082	409	870	F	72
G10	A115	456	1201	M	56	G10	C082	420	860	F	91
G10	A115	474	1363	M	105	G10	C082	426	980	F	92
G10	A115	444	1206	F	98	G10	C082	431	990	F	94
G10	A115	486	1670	M	60	G10	C082	434	1110	F	63
G10	A115	456	1158	M	98	G10	C082	403	790	F	62
G10	A115	470	1447	M	125	G10	C082	436	990	F	93
G10	A115	429	1076	M	86	G10	C082	440	980	F	97
G10	A115	479	1377	F	106	G10	C082	440	1030	F	72
G10	A115	476	1355	M	90	G10	C082	429	870	M	72
G10	A115	468	1257	M	71	G10	C082	433	980	F	95
G10	A115	499	1664	M	125	G10	C082	425		F	48
G10	A115	438	1108	M	60	G10	C082	423	970	F	73
G10	A115	479	1628	M	145	G10	C082	434	1030	F	65
G10	A115	454	1140	F	98	G10	C082	431	1020	M	62
G10	A115	460	1395	M	59	G10	C093	436	1037	M	54
G10	A115	468	1258	M	74	G10	C093	424	881	F	91
G10	A115	464	1292	M	77	G10	C093	434	1046	M	65
G10	A115	478	1460	M	2	G10	C093	439	1040	F	73
G10	A115	444	1163	M	91	G10	C093	434	854	M	57
G10	A115	458	1321	M	46	G10	C093	442	1020	F	68
G10	A115	436	1150	M	113	G10	C093	440	1167	M	45
G10	A115	478	1480	M	99	G10	C093	421	927	F	91
G10	A121	436	1119	M	56	G10	C093	426	1040	F	73
G10	A121	478	1482	M	116	G10	C093	429	932	F	66
G10	A121	444	1184	M	68	G10	C093	416	892	F	84
G10	A121	448	1217	F	78	G10	C093	436	1123	F	108
G10	A121	414	1043	M	59	G10	C093	440	1042	M	92
G10	A121	466	1170	M	74	G10	C093	464	1232	M	91
G10	A121	446	1183	M	58	G10	C093	440	1066	M	47
G10	A121	480	1547	F	111	G10	C093	422	1003	F	85
G10	A121	469	1324	M	97	G10	C093	481	1374	F	138
G10	A121	476	1439	M	62	G10	C093	470	1253	M	58
G10	A121	440	1180	M	80	G10	C093	429	969	F	74
G10	A121	444	1248	F	86	G10	C093	482	1308	F	91
G10	A121	452	1323	M	97	G10	C093	426	951	F	89
G10	A121	474	1491	M	59	G10	C093	422	862	F	69
G10	A121	466	1295	F	125	G10	C093	416	900	M	56
G10	A121	473	1299	M	63	G10	C093	452	1060	F	94
G10	A121	466	1369	M	99	G10	C093	438	1000	M	53
G10	A121	450	1199	F	79	G10	C093	422	870	F	75
G10	A121	461	1258	F	145	G10	C093	412	880	F	78
G10	A121	464	1352	M	91	G10	C093	462	1120	F	84
G10	A121	458	1244	F	113	G10	C093	442	1170	M	97
G10	A121	444	1193	M	48	G10	C093	464	1160	F	75
G10	A121	450	1294	M	62	G10	C093	404	720	F	56
G10	A121	460	1253	M	96	G10	C093	438	960	M	90
G10	A121	466	1284	F	118	G10	C093	452	1120	F	97
G10	A121	458	1136	M	91	G10	C093	436	1020	F	100
G10	A121	444	1070	M	50	G10	C093	436	950	M	76
G10	A121	456	1198	F	116	G10	C093	448	1151	F	75
G10	A121	456	1294	M	66	G10	C093	452	1130	F	85
G10	A121	440	1126	F	92	G10	C093	420	920	M	43
G10	C072	372	711	M	42	G10	C093	429	949	M	67
G10	C072	428	954	F	80	G10	C093	448	1010	F	97
G10	C072	439	1145	F	93	G10	C093	434	985	M	41
G10	C072	462	1203	M	91	G10	C093	426	980	F	86
G10	C072	474	1525	M	67	G10	C093	432	950	F	65
G10	C082	400	780	M	60	G10	C093	421	883	F	70
G10	C082	424	1050	F	52	G10	C093	406	820	F	53
G10	C082	408	850	F	83	G10	C093	434	1065	M	62
G10	C082	410	850	F	61	G10	C093	398	740	F	62
G10	C082	411	830	F	74	G10	C093	428	960	M	55
G10	C082	433	950	F	75	G10	C093	444	1020	F	70
G10	C082	432	950	F	75	G10	C093	432	1050	F	68
G10	C082	414		F	72	G10	C093	456	1220	F	120
G10	C082	400	860	F	61	G10	C093	438	1040	F	86
G10	C082	402	780	F	46	G10	C093	436	940	F	80
G10	C082	436	1040	F	82	G10	C093	438	960	F	80
G10	C082	422	880	M	57	G10	C093	410	1120	M	46
G10	C082	440	1108	M	73	G10	C093	413	993	F	56
G10	C082	402	660	F	56	G10	C093	414	930	F	58
G10	C082	384	750	M	54	G10	C093	496	1520	F	150
G10	C082	404	620	F	63	G10	C106	430	1022	F	81
G10	C106	414	914	M	48	G10	C106	441	1082	M	38
G10	C106	475	1303	F	116	G10	C106	470	1390	M	35
G10	C106	429	974	M	55	G10	C106	429	974	M	55
G10	C106	408	909	M	75	G10	C106	433	1077	F	71
G10	C106	433	1077	F	71	G10	C106	461	1438	F	91
G10	C106	438	1084	F	116	G10	C106	450	1283	F	72
G10	C106	455	1053	M	72	G10	C106	424	950	M	47
G10	C106	458	1243	F	80	G10	C106	438	971	F	35
G10	C106	450	1126	F	90	G10	C106	469	1283	F	73
G10	C106	426	989	F	102	G10	C106	430	1044	F	61
G10	C106	454	1054	F	65	G10	C106	454	1054	F	65
G10	C106	446	933	F	80	G10	C106	423	1005	M	66
G10	C106	423	1005	M	66	G10	C106	440	1095	M	35
G10	C106	425	1013	M	83	G10	C106	455	1122	M	52
G10	C106	444	1173	F	96	G10	C106	444	1173	F	96
G10	C106	442	1200	F	77	G10	C106	444	1108	F	48
G10	C106	432	1063	M	93	G10	C106	462	1280	M	70
G10	C106	442	1180	F	90	G10	C106	442	1180	F	90
G10	C106	458	1490	M	90	G10	C106	466	1280	M	83
G10	C106	458	1300	M	97	G10	C106	452	1060	F	55
G10	C106	442	960	F	65	G10	C106	438	1100	F	82
G10	C106	450	1050	F	90	G10	C106	469	1279	F	142
G10	C106	432	1180	F	70	G10	C106	432	1180	F	70
G10	C106	420	790	M	34	G10	C106	432	1080	F	85
G10	C106	432	860	F	84	G10	C106	463	1200	F	125
G10	C106	423	950	F	95	G10	C106	423	950	F	95
G10	C106	448	1040	F	73	G10	C106	440	1114	F	59
G10	C106	440	1114	F	59	G10	C106	442	1040	F	86
G10	C106	478	1300	M	90	G10	C106	448	1110	M	74
G10	C106	448	1110	M	74	G10	C106	412	960	F	80
G10	C106	410	860	F	78	G10	C106	410	860	F	78
G10	C106	450	1020	M	35	G10	C106	450	1020	M	35
G10	C106	436	940	F	66	G10	C106	426	1010	F	70
G10	C106	426	1010	F	70	G10	C106	440	1130	F	95
G10	C106	418	850	F	70	G10	C106	418	850	F	70
G10	C106	452	1080	F	90	G10	C106	522	1920	F	230
G10	C106	488	1360	M	75	G10	C106	454	1300	M	88
G10	C106	454	1300	M	88	G10	C106	438	1110	M	80
G10	C106	472	1300	M	110	G10	C106	448	1160	F	96
G10	C106	448	1160	F	96	G10	C106	444	1080	M	55
G10	C106	444	1080	M	55	G10	C106	486	1540	M	76

Table 6. Biological characteristics of salmonids caught by drift gillnet research (continued)

COHO SALMON																	
St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.
	(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)
G06	A112	559	2333	M	24	G07	A112	510	1855	M	13	G07	C093	417	896	M	2
G06	A112	538	1845	F	38	G07	A115	501	1919	F	39	G07	C093	474	1497	F	22
G06	A112	556	2147	M	4	G07	A115	508	1672	M	2	G07	C093	442	1145	F	16
G06	A115	572	2387	M	10	G07	A115	494	1525	M	5	G07	C106	510	1805	M	10
G06	A115	488	1314	F	25	G07	A115	506	1797	F	33	G07	C106	480	1260	M	4
G06	A121	519	1757	M	8	G07	A115	491	1547	F	18	G07	C106	490	1513	F	27
G06	C055	494	1432	F	29	G07	C072	492	1382	F	15	G07	C106	522	1861	F	38
G06	C106	487	1601	F	27	G07	C082	482	1452	F	20	G07	C106	495	1582	F	24
G06	C121	520	1646	F	35	G07	C082	449	1107	M	5	G07	C106	531	1967	F	38
G06	C121	574	2314	F	45	G07	C082	496	1475	F	26	G07	C121	508	1812	M	6
G06	C121	546	2235	F	39	G07	C082	446	1131	F	10	G07	C121	566	2360	M	4
												G07	C121	541	1983	M	9
CHINOOK SALMON																	
St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.
	(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)
G06	A112	636	4072	F	25	G06	C138	549	2165	F	12	G08	C138	820	6405	F	47
G06	C093	614	3102	M	4	G06	C157	632	3268	F	18	G10	C072	534	535	M	2
												G10	C121	608	2789	M	2
STEELHEAD SALMON																	
St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.	St.	Gear	F.L.	B.W.	Sex	G.W.
	(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)		(mm)	(mm)	(gr)		(gr)
G07	A115	610	2246	M	2	G07	A115	529	2576	M	1	G07	C093	561	1920	M	2

Table 7. The number of organisms caught by drift gillnet during the Oshoro maru Cruise # 202-Leg1, Leg2, 2009.
(%) indicates % of total numeric catch by C-gear gillnet at the station.

Station		OSG 0904						OSG 0905					
Common name	Scientific name	Gear					Total	Gear					Total
		A	C	F	CPUE	(%)		A	C	F	CPUE	(%)	
Sockeye salmon	<i>Oncorhynchus nerka</i>	6	7	0	0.2	(2.9)	13	22	55	0	1.8	(36.4)	77
Chum salmon	<i>Oncorhynchus keta</i>	5	9	0	0.3	(3.8)	14	27	22	0	0.7	(14.6)	49
Pink salmon	<i>Oncorhynchus gorbuscha</i>	257	217	0	7.2	(91.2)	474	121	68	0	2.3	(45.0)	189
Coho salmon	<i>Oncorhynchus kisutch</i>	0	0	0	0.0	(0.0)	0	0	0	0	0.0	(0.0)	0
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	0	0	0	0.0	(0.0)	0	0	0	0	0.0	(0.0)	0
Steelhead	<i>Oncorhynchus mykiss</i>	0	0	0	0.0	(0.0)	0	0	0	0	0.0	(0.0)	0
								0	0	0	0.0	(0.0)	0
Eight-armed squid	<i>Gonatopsis borealis</i>	0	3	0	0.1	(1.3)	3	3	0	2	0.0	(0.0)	5
Atka mackerel	<i>Pleurogrammus monopterygius</i>	0	0	0	0.0	(0.0)	0	1	0	0	0.0	(0.0)	1
Common Murre	<i>Uria aalge</i>	0	1	0	0.0	(0.4)	1	0	0	0	0.0	(0.0)	0
Short-tailed shearwater	<i>Puffinus tenuirostris</i>	0	1	0	0.0	(0.4)	1	0	6	0	0.0	(4.0)	6

Station		OSG 0906						OSG 0907					
Common name	Scientific name	Gear					Total	Gear					Total
		A	C	F	CPUE	(%)		A	C	F	CPUE	(%)	
Sockeye salmon	<i>Oncorhynchus nerka</i>	1	7	0	0.2	(4.5)	8	0	0	0	0.0	(0.0)	0
Chum salmon	<i>Oncorhynchus keta</i>	22	29	1	1.0	(18.7)	52	3	79	1	2.6	(61.7)	83
Pink salmon	<i>Oncorhynchus gorbuscha</i>	2	55	0	1.8	(35.5)	57	1	20	0	0.7	(15.6)	21
Coho salmon	<i>Oncorhynchus kisutch</i>	6	5	0	0.2	(3.2)	11	7	17	0	0.6	(13.3)	24
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	2	2	0	0.1	(1.3)	4	0	0	0	0.0	(0.0)	0
Steelhead	<i>Oncorhynchus mykiss</i>	0	0	0	0.0	(0.0)	0	2	1	0	0.0	(0.8)	3
Eight-armed squid	<i>Gonatopsis borealis</i>	0	8	15	0.3	(5.2)	23	0	11	2	0.4	(8.6)	13
Atka mackerel	<i>Pleurogrammus monopterygius</i>	0	48	3	1.6	(31.0)	51	0	0	0	0.0	(0.0)	0
Short-tailed shearwater	<i>Puffinus tenuirostris</i>	0	1	0	0.0	(0.6)	1	0	0	0	0.0	(0.0)	0

Station		OSG 0908						OSG 0909					
Common name	Scientific name	Gear					Total	Gear					Total
		A	C	F	CPUE	(%)		A	C	F	CPUE	(%)	
Sockeye salmon	<i>Oncorhynchus nerka</i>	10	11	0	0.4	(6.0)	21	3	10	0	0.3	(1.3)	13
Chum salmon	<i>Oncorhynchus keta</i>	18	27	0	0.9	(14.8)	45	25	22	0	0.7	(2.9)	47
Pink salmon	<i>Oncorhynchus gorbuscha</i>	63	137	0	4.6	(75.3)	200	461	724	1	24.1	(95.1)	1186
Coho salmon	<i>Oncorhynchus kisutch</i>	0	0	0	0.0	(0.0)	0	0	0	0	0.0	(0.0)	0
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	0	1	0	0.0	(0.5)	1	0	0	0	0.0	(0.0)	0
Steelhead	<i>Oncorhynchus mykiss</i>	0	0	0	0.0	(0.0)	0	0	0	0	0.0	(0.0)	0
Eight-armed squid	<i>Gonatopsis borealis</i>	0	2	0	0.1	(1.1)	2	0	1	1	0.0	(0.1)	2
Spiny dogfish	<i>Squalus acanthias</i>	0	0	0	0.0	(0.0)	0	1	0	0	0.0	(0.0)	1
Atka mackerel	<i>Pleurogrammus monopterygius</i>	0	2	0	0.1	(1.1)	2	0	0	0	0.0	(0.0)	0
Short-tailed shearwater	<i>Puffinus tenuirostris</i>	0	2	0	0.0	(1.1)	2	2	4	0	0.0	(0.5)	6

Station		OSG 0910					
Common name	Scientific name	Gear					Total
		A	C	F	CPUE	(%)	
Sockeye salmon	<i>Oncorhynchus nerka</i>	3	24	0	0.8	(5.2)	27
Chum salmon	<i>Oncorhynchus keta</i>	44	161	0	5.4	(34.8)	205
Pink salmon	<i>Oncorhynchus gorbuscha</i>	199	269	0	9.0	(58.2)	468
Coho salmon	<i>Oncorhynchus kisutch</i>	0	0	0	0.0	(0.0)	0
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	0	2	0	0.1	(0.4)	2
Steelhead	<i>Oncorhynchus mykiss</i>	0	0	0	0.0	(0.0)	0
Eight-armed squid	<i>Gonatopsis borealis</i>	0	1	0	0.0	(0.2)	1
Ragfish	<i>Ikosteus aenigmaticus</i>	1	0	0	0.0	(0.0)	1
Common Murre	<i>Uria aalge</i>	0	1	0	0.0	(0.2)	1
Short-tailed shearwater	<i>Puffinus tenuirostris</i>	4	4	0	0.0	(0.9)	8
Fulmar	<i>Fulmarus glacialis</i>	1	0	0	0.0	(0.0)	1
Tufted Puffin	<i>Fratercula cirrhata</i>	1	0	0	0.0	(0.0)	1

6. Salmon Longline and Hook-and-Line Research

[Longline Sampling]

Two operations using a salmon longline were performed. Ten baskets (hachi) of salmon longline were used in each operation. Basket was composed of 111 m of main line with 49 branch lines and 127m of main line with 34 branch lines. The branch lines, each with hooks hung to about 2m depth. These operations were supervised by the captain, Deck officers, crews, cadets, and research staffs were engaged in the work.

[Hook-and-Line Sampling]

To collect salmon, hook-and-line gears were used along 44degN line and 47degN line in the Central North Pacific and in the Bering Sea during Cruise#202. Five to ten anglers were engaged in the work. These samplings were mainly conducted with observations when ship was under drifting.

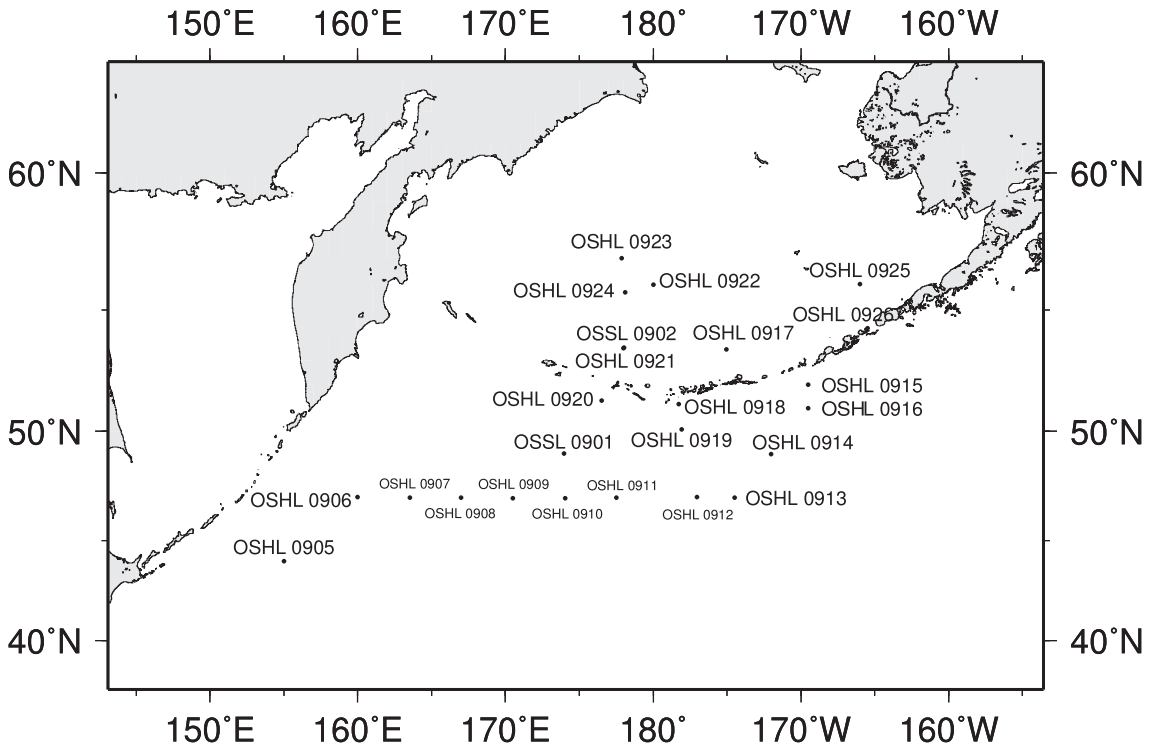


Figure 4: Locations of salmon longline (OSSL 09XX) and hook-and-line (OSHL 09XX) research

Table 8. List of hook-and-line sampling station during the Oshoromaru Cruise #202

Station	Date and Time (S.M.T.)					Set Position		D.S.	No. of hooks	Wr.	Wind (Force)	Oceanographic Station No.
	Line set		Line haul		T.D.	Lat.	Long.					
OSHL 0905	June 5	07:00	June 5	16:00	+10h	43-59.8N	155-00.1E	-	-	o	East-3	OS 09061
OSHL 0906	June 6	20:00	June 7	03:00	+10h	47-02.3N	159-58.3E	-	-	o	West-5	OS 09063
OSHL 0907	June 7	20:00	June 7	23:30	+10h	47-02.0N	163-31.0E	-	-	f	NW-3	OS 09064
OSHL 0908	June 8	20:00	June 9	03:00	+11h	47-02.0N	166-59.6E	-	-	o	North-5	OS 09065
OSHL 0909	June 9	20:00	June 9	23:45	+11h	47-00.0N	170-30.0E	-	-	o	NNW-4	OS 09066
OSHL 0910	June 10	20:00	June 11	03:00	+11h	46-59.1N	174-03.2E	-	-	o	NW-5	OS 09067
OSHL 0911	June 11	20:00	June 11	23:30	+11h	47-00.9N	177-31.0E	-	-	r	SW-5	OS 09068
OSHL 0912	June 11	20:00	June 12	03:30	-12h	47-02.5N	178-57.7W	-	-	c	SW-5	OS 09069
OSHL 0913	June 12	20:00	June 12	23:30	-12h	47-01.1N	175-30.2W	-	-	d	SW-4	OS 09070
OSHL 0914	June 13	20:00	June 13	23:30	-12h	49-00.0N	173-59.8W	-	-	r	SE-6	OS 09071
OSHL 0915	June 16	03:20	June 16	08:00	-11h	52-00.0N	170-30.2W	-	-	d	East-5	OS 09074
OSHL 0916	June 17	13:30	June 17	16:00	-10h	51-00.0N	170-30.0W	-	-	o	NW-3	OS 09077
OSHL 0917	June 23	22:00	June 24	03:30	-11h	53-27.0N	176-57.5W	-	-	d	NW-4	OS 09094
OSHL 0918	June 24	22:30	June 25	01:30	-11h	51-10.0N	179-43.3W	-	-	f	WNW-5	OS 09096
OSHL 0919	June 26	00:00	June 26	03:50	-11h	50-05.2N	179-54.7W	-	-	d	West-6	OS 09100
OSHL 0920	June 28	00:30	June 28	03:15	-11h	51-20.0N	176-30.0E	-	-	r	South-5	OS 09107
OSHL 0921	June 29	23:30	June 30	02:30	-11h	53-30.0N	178-00.0E	-	-	o	SE-4	OS 09112
OSHL 0922	June 30	21:00	July 1	04:00	-11h	55-59.0N	180-00.0E	-	-	o	ESE-5	OS 09114
OSHL 0923	July 1	23:00	July 2	02:40	-11h	56-58.0N	177-52.7E	-	-	f	ESE-3	OS 09116
OSHL 0924	July 2	22:00	July 3	02:30	-11h	55-41.0N	178-06.0E	-	-	o	West-3	OS 09118
OSHL 0925	July 9	01:40	July 9	02:40	-8h	56-00.0N	166-00.0W	-	-	o	NE-4	OS 09121
OSHL 0926	July 17	02:00	July 17	05:30	-8h	54-17.0N	166-31.0W	-	-	bc	SSW-3	-

S.M.T. : Ship's Mean Time T.D.: Time Difference between Greenwich Mean Time (G.M.T.) and S.M.T.

D.S. : Direction in which line was set Wr.: Weather (r: rain, o: 100% clouded, d: drizzling rain, f: fog, bc: 25-75% clouded)

Table 9. Position and research conditions of surface longline sampling at each station during the Oshoro maru Cruise #202-Leg 1 and Leg 2, 2009.

Station	Date and Time (S.M.T.*1)		T.D.*2	Set Position		D.S.*3	Number of baskets	Wr*4	Wind (Force)
	Line set	Line haul		Lat.	Long.				
Cruise #202 - Leg 1									
OSSL 0901	June 13 13:13-13:29	June 13 18:00-18:36	-12h	49-01.8N	173-57.3W	310	10	o	ESE-4
Cruise #202 - Leg 2									
OSSL 0902	June 29 11:40-12:01	June 29 17:00-17:23	-11h	53-30.7N	178-02.6E	080	10	d	West-2

*1 S.M.T. : Ship's Mean Time.

*2 T.D. : Time Difference between Greenwich Mean Time (G.M.T.) and Ship's Mean Time (S.M.T.).

*3 D.S. : Direction of line set.

*4 Wr : Weather (c: over 75-99% clouded, o: 100% clouded, d: drizzling rain, f: fog).

Table 10. The catch number of each salmonid at each station where salmonids were collected by hook-and-line gear, surface longline in the Oshoro maru Cruise #202-Leg 1-2-3, 2009.

	Station Name	Sampling gear	Species name					Total
			Sockeye	Chum	Pink	Coho	Stellhead	
Cruise #202- Leg 1	OSHL 0905	Hook-and-line	0	0	12	0	0	12
	OSHL 0906	Hook-and-line	1	1	6	0	0	8
	OSHL 0907	Hook-and-line	0	1	19	0	0	20
	OSHL 0908	Hook-and-line	2	2	35	0	0	39
	OSHL 0909	Hook-and-line	0	2	19	0	0	21
	OSHL 0910	Hook-and-line	3	2	36	0	0	41
	OSHL 0911	Hook-and-line	0	0	2	0	0	2
	OSHL 0912	Hook-and-line	0	5	4	3	1	13
	OSHL 0913	Hook-and-line	0	1	5	8	1	15
	OSHL 0914	Hook-and-line	0	0	1	0	0	1
	OSSL 0901	Surface longline	0	12	10	0	5	27
	OSHL 0915	Hook-and-line	4	1	5	0	0	10
	OSHL 0916	Hook-and-line	1	5	0	0	0	6
Subtotal			11	32	154	11	7	215
Leg 2	OSHL 0917	Hook-and-line	1	0	1	0	0	2
	OSHL 0918	Hook-and-line	3	0	1	0	0	4
	OSHL 0919	Hook-and-line	2	0	1	0	0	3
	OSHL 0920	Hook-and-line	1	0	0	0	0	1
	OSHL 0921	Hook-and-line	0	1	31	0	0	32
	OSSL 0902	Surface longline	0	0	0	0	0	0
	OSHL 0922	Hook-and-line	2	2	6	0	0	10
	OSHL 0923	Hook-and-line	0	0	4	0	0	4
	OSHL 0924	Hook-and-line	3	1	7	0	0	11
Subtotal			12	4	51	0	0	67
Leg 3	OSHL 0925	Hook-and-line	1	0	0	0	0	1
	OSHL 0926	Hook-and-line	2	1	4	1	0	8
Subtotal			3	1	4	1	0	9
Total			26	37	209	12	7	291

Table 11. Biological characteristics of salmonids caught by surface longline and hook-and-line research

SOCKEYE SALMON																			
St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)					
HL06	600	2580	M	10	HL15	588	2310	M	5	HL20	676	4020	M	42					
HL08	495	1530	F	40	HL15	636	3150	M	36	HL22	609	3000	F	195					
HL08	512	1520	M	2	HL16	604	2860	F	62	HL22	630	3600	M	23					
HL10	462	1100	M	2	HL17	570	2450	F	135	HL24	473	1330	F	6					
HL10	442	990	F	15	HL18	429	860	F	9	HL24	474	1310	M	2					
HL10	424	920	F	12	HL18	422	820			HL24	464	1200	F	7					
HL15	620	2640	F	52	HL18	493	1320	M	1	HL25	625	3200	M	82					
HL15	560	2170	F	56	HL19	632	3400	M	50	HL26	508	1600	M	7					
										HL26	563	2050	M	95					
CHUM SALMON																			
St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)					
HL06	526	2450	M	7	HL13	476	1260	M	1	HL26	496	1320	M	3					
HL07	570	1900	M	7	HL15	466	1110	F	10	SL01	518	1500	M	5					
HL08	555	2000	F	46	HL16	465	1150	F	15	SL01	334	380	M	3					
HL08	590	2500	M	19	HL16	474	1060	M	1	SL01	370	490	F	1					
HL09	598	2750	M	12	HL16	498	1400	F	39	SL01	344	420	M	4					
HL09	506	1470	F	18	HL16	428	1010	M	1	SL01	366	470	M	1					
HL10	492	1380	M	2	HL16	464	1160	M	1	SL01	500	1560	F	12					
HL10	498	1210	M	2	HL21	468	1420	F	12	SL01	410	760	F	18					
HL12	340	380	M	1	HL21	487	1480	M	2	SL01	394	740	F	8					
HL12	444	1020	M	1	HL22	519	1680	M	1	SL01	444	1040	F	88					
HL12	344	400	M	1	HL22	633	3300	F	60	SL01	444	920	M	1					
HL12	452	1140	F	11	HL22	536	1600	M	3	SL01	404	720	M	4					
HL12	327	380	F	1	HL24	598	2900	M	150	SL01	320	340	F	1					
PINK SALMON																			
St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)					
HL05	415	760	M	7	HL08	442	1030	F	26	HL10	478	1130	M	24					
HL05	438	900	F	17	HL08	461	1190	F	40	HL10	394	820	F	35					
HL05	440	940	M	6	HL08	480	1390	M	15	HL10	416	890	F	52					
HL05	448	980	F	35	HL08	483	1420	M	15	HL10	396	780	F	49					
HL05	431	920	M	13	HL08	420	1010	F	30	HL10	426	880	F	37					
HL05	440	970	M	11	HL08	464	1180	M	18	HL10	410	740	F	35					
HL05	482	1380	M	7	HL08	456	1200	M	7	HL10	422	760	F	40					
HL05	450	970	M	7	HL08	446	1050	M	22	HL10	383	780	F	32					
HL05	452	1050	M	6	HL08	416	810	M	12	HL10	390	820	F	45					
HL05	445	1000	F	26	HL08	470	1540	M	25	HL10	400	850	F	38					
HL05	440	980	F	36	HL08	465	1280	F	80	HL10	406	760	F	38					
HL05	430	900	M	13	HL08	455	1080	M	8	HL10	418	830	F	33					
HL06	420	1030	F	55	HL08	420	1020	F	62	HL10	440	980	F	48					
HL06	446	1250	M	30	HL08	486	1440	M	35	HL10	414	830	F	43					
HL06	475	1530	M	40	HL08	448	1050	F	45	HL11	438	980	F	55					
HL06	476	1300	F	45	HL09	407	680	M	13	HL11	429	940	F	65					
HL06	492	1390	M	10	HL09	430	990	F	64	HL12	408	710	F	43					
HL06	450	1140	F	40	HL09	455	1220	M	10	HL12	365	510	F	29					
HL07	475	1265	M	22	HL09	450	1050	M	36	HL12	417	800	F	36					
HL07	482	1240	M	7	HL09	405	730	F	29	HL12	411	710	F	35					
HL07	420	950	M	5	HL09	390	710	F	43	HL13	470	1130	F	93					
HL07	445	1020	F	17	HL09	444	1140	M	13	HL13	448	990	F	49					
HL07	481	1310	F	77	HL09	434	1010	F	37	HL13	460	1120	F	95					
HL07	448	1030	M	10	HL09	423	880	F	46	HL13	426	800	F	37					
HL07	451	1000	F	17	HL09	406	900	F	38	HL13	480	1200	M	27					
HL07	430	990	M	11	HL09	448	1130	F	26	HL14	410	760	M	25					
HL07	444	1190	M	9	HL09	430	820	F	37	HL15	422	920	F	54					
HL07	445	1030	F	27	HL09	478	1380	M	19	HL15	434	920	M	34					
HL07	439	1260	F	62	HL09	450	1100	M	10	HL15	448	1060	F	92					
HL07	444	1080	M	13	HL09	445	1120	M	16	HL15	436	940	M	48					
HL07	456	1180	M	20	HL09	446	960	F	38	HL15	394	800	F	42					
HL07	438	980	F	34	HL09	448	920	F	29	HL17	414	800	F	52					
HL07	448	1120	M	16	HL09	411	810	F	57	HL18	428	780	M	59					
HL07	450	1100	F	37	HL09	424	770	F	39	HL19	393	720	F	59					
HL07	421	1020	M	27	HL10	424	960	F	52	HL21	426	920	M	59					
HL07	464	1310	M	8	HL10	422	940	M	17	HL21	421	950	F	54					
HL08	420	980	F	43	HL10	395	820	F	49	HL21	448	980	F	70					
HL08	468	1190	F	33	HL10	394	800	F	36	HL21	421	960	F	80					
HL08	461	1180	F	49	HL10	390	750	F	56	HL21	445	920	F	69					
HL08	456	1280	F	37	HL10	406	760	F	35	HL21	441	1040	F	109					
HL08	444	1160	F	35	HL10	427	940	M	30	HL21	468	1140	F	140					
HL08	444	1110	F	42	HL10	414	860	F	37	HL21	460	1280	M	53					
HL08	450	1240	M	47	HL10	414	840	F	37	HL21	454	1180	F	100					
HL08	461	1290	M	45	HL10	428	850	F	36	HL21	393	670	F	55					
HL08	430	1040	M	30	HL10	376	650	M	20	HL21	445	1000	F	88					
HL08	382	620	M	8	HL10	410	740	M	25	HL21	413	880	M	57					
HL08	430	1000	F	58	HL10	412	760	F	48	HL21	423	780	M	42					
HL08	422	1040	F	40	HL10	390	670	M	14	HL21	420	980	F	82					
HL08	480	1540	M	32	HL10	386	690	F	36	HL21	438	950	M	67					
HL08	470	1265	F	62	HL10	398	770	M	15	HL21	432	1080	F	77					
HL08	437	920	M	23	HL10	424	920	F	48	HL21	406	820	M	53					
HL08	474	1270	F	54	HL10	454	1060	F	77	HL21	490	1680	M	55					
HL08	474	1560	F	44	HL10	412	780	F	43	HL21	418	1000	F	73					
HL08	470	1220	M	23	HL10	410	790	F	32	HL21	444	1100	F	77					
HL08	452	1070	M	25	HL10	382	640	F	42	HL21	425	1020	M	50					
HL08	444	1120	F	55	HL10	446	990	F	18	HL21	440	1000	F	88					

Table 11. Biological characteristics of salmonids caught by surface longline and hook-and-line research

PINK SALMON														
St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)
HL21	413	810	F	64	HL22	426	960	F	115	HL26	442	920	M	54
HL21	502	1700	M	77	HL22	430	1040	F	58	HL26	498	1400	M	84
HL21	444	1080	F	65	HL23	422	950	F	82	HL26	488	1230	M	74
HL21	441	1070	M	67	HL23	430	954	F	85	HL26	540	1900	M	73
HL21	438	940	F	95	HL23	420	1040	F	94	SL01	450	960	F	66
HL21	434	1020	F	82	HL23	456	1016	F	94	SL01	364	480	F	15
HL21	422	990	F	65	HL24	443	1080	M	64	SL01	422	830	F	44
HL21	429	960	F	98	HL24	454	1240	F	140	SL01	432	820	F	60
HL21	410	1010	F	63	HL24	480	1170	M	98	SL01	478	1220	F	7
HL22	485	1560	F	140	HL24	449	1290	M	46	SL01	396	630	M	5
HL22	458	1026	M	52	HL24	449	1050	F	93	SL01	378	550	M	20
HL22	454	1220	F	95	HL24	441	1060	M	83	SL01	424	840	F	50
HL22	473	1032	F	130	HL24	410	790	F	74	SL01	410	780	F	34
										SL01	384	640	M	15
COHO SALMON														
St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)
HL12	458	1000	M	5	HL13	508	1630	M	10	HL13	532	1060	F	26
HL12	531	1770	F	27	HL13	478	1390	F	20	HL13	544	2050	M	12
HL12	396	680	M	8	HL13	554	1940	M	12	HL13	520	1670	F	29
HL13	477	1360	M	8	HL13	526	1920	M	15	HL26	616	3350	M	140
STEELHEAD SALMON														
St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)	St.	F.L. (mm)	B.W. (gr)	Sex	G.W. (gr)
HL12	590	1930	F	6	SL01	588	2700		1	SL01	680	3000	F	29
HL13	559	1780	M	1	SL01	710	3000	M	10	SL01	572	2100	M	1
										SL01	574	1740	M	2

7. Bottom Trawl Research

Six operations of the stern otter bottom trawl were carried out. These operation were supervised by the captain, Deck officer, crew, research staff, and cadets were engaged in the work.

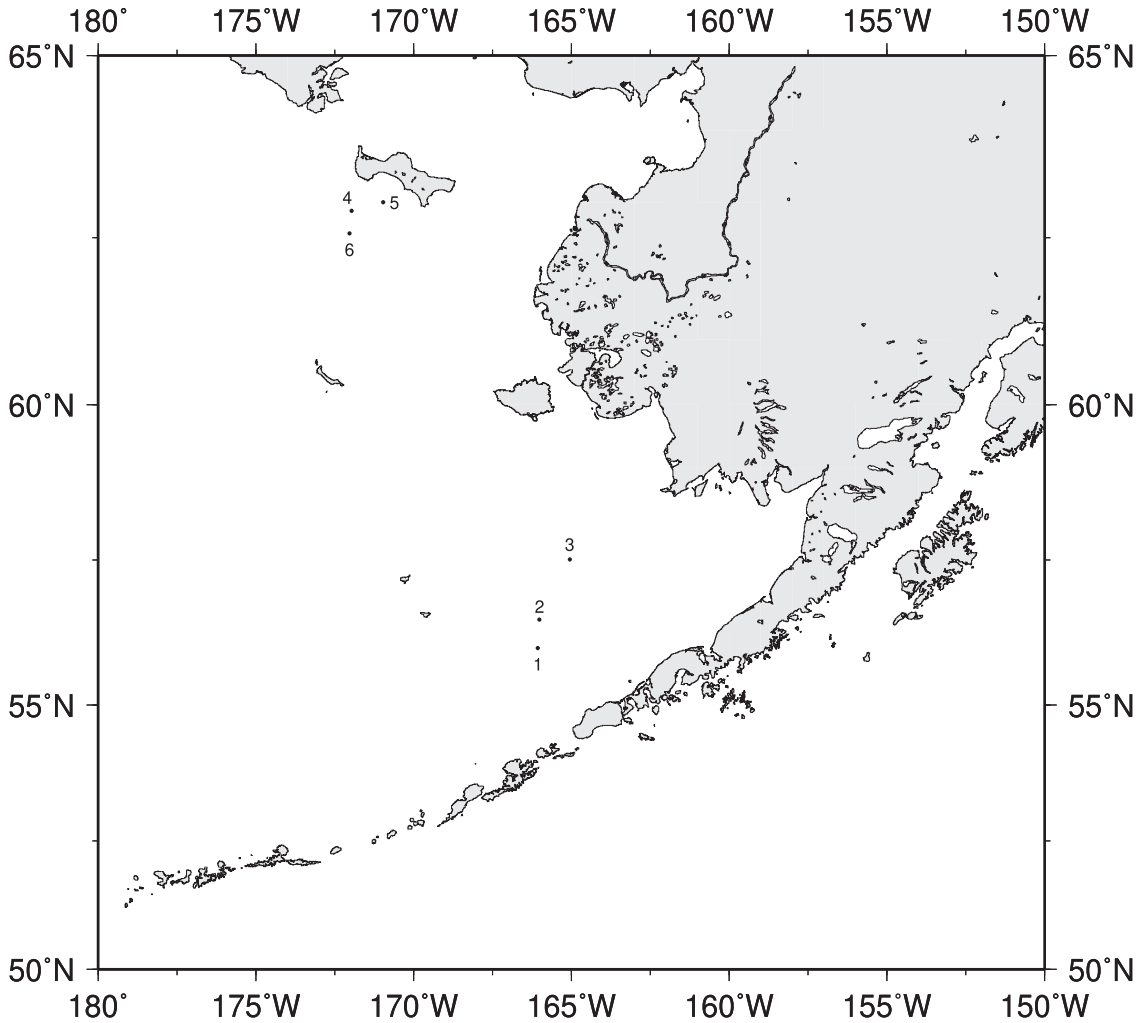


Figure 5: Locations of bottom trawl research

Table 12. Position and research conditions of bottom trawl sampling at each station during the Oshoro maru Cruise #202-Leg 3, 2009.

Station	Date and Time of net tow (*S.M.T.)		Position		Towing direction	Bottom depth (m)	**Wr	Wind (Force)
			Lat. (N)	Long. (W)				
Cruise #202 - Leg 3								
OST0901	July 9	10:25-10:55	55-59.9	167-55.7	260	136	o	ENE-4
OST0902	10	08:00-08:15	56-29.3	167-59.4	090	123	o	East-4
OST0903	11	09:54-10:24	57-30.8	166-57.0	090	70	f	SE-4
OST0904	13	08:51-09:16	62-53.0	172-01.9	320	50	d	SE-6
OST0905	14	07:17-07:47	63-00.3	171-01.6	330	71	f	SE-6
OST0906	14	13:00-13:20	62-33.6	173-58.5	180	67	d	South-7

*S.M.T. : Ship's Mean Time. (Time difference from Greenwich Mean Time is -8 hours.)

** Wr : Weather (c: over 75-99% clouded, o: 100% clouded, r: rain, d:drizzling rain, f: fog)

Table 13: Data on catches by bottom trawl research

Japanese name	Scientific Name	OST 0901		OST 0902		OST 0903		OST 0904		OST 0905		OST 0906	
		Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)
Sokogangiei-ru	<i>Bathyraxa</i> spp.	6	31	-	-	1	3.2	2	10	2	11.1	3	14
Nishin	<i>Clupea pallasii</i>	-	-	-	-	-	-	31	0.36	2	0.03	-	-
Karafutoshisyamo	<i>Mallotus villosus</i>	-	-	-	-	5	0.05	8	0.078	1	0.03	3	0.03
Lousokuo	<i>Thaleichthys pacificus</i>	3	0.05	-	-	-	-	-	-	-	-	-	-
Suketoudara	<i>Theragra chalcogramma</i>	132	184	-	-	21	0.4	35	Unmeasurable	22	0.2	80	0.4
Komai	<i>Eleginus gracilis</i>	-	-	-	-	1	0.1	-	-	-	-	-	-
Madara	<i>Gadus macrocephalus</i>	21	35	-	-	7	10.3	-	-	2	5.5	-	-
Hokkyokudara	<i>Boreogadus saida</i>	-	-	-	-	-	-	12	Unmeasurable	45	1.6	172	Unmeasurable
Arasukamenuke	<i>Sebastes altus</i>	1	1.0	-	-	-	-	-	-	-	-	-	-
Nomeyokosujikajika	<i>Hemilepidotus jordani</i>	-	-	-	-	-	-	-	-	3	0.13	5	0.19
Togekajika	<i>Myoxocephalus polycanthocephalus</i>	-	-	-	-	3	6.1	-	-	-	-	-	-
Ibogisukajika	<i>Myoxocephalus verrucosus</i>	-	-	-	-	1	0.8	-	-	-	-	-	-
Kourikajika-ru	<i>Icelus uncinalis</i>	-	-	-	-	-	-	-	-	1	0.02	-	-
Kemushikajikamodoki	<i>Hemirhamphus bolini</i>	2	12	1	4.9	-	-	-	-	-	-	-	-
Kitanotokubire	<i>Podotrichus accipenserinus</i>	-	-	-	-	4	0.4	-	-	-	-	-	-
Fujitokubire	<i>Ulsina olrikii</i>	-	-	-	-	-	-	6	0.017	-	-	-	-
Yasetengutokubire	<i>Sarritor frenatus</i>	-	-	1	0.04	-	-	-	-	-	-	-	-
Kusauo-ru	<i>Liparis</i> spp.	-	-	-	-	1	0.45	80	0.64	32	3.5	56	1.25
Mayugaji-ru	<i>Lycomes</i> spp.	-	-	-	-	-	-	21	1	166	25	146	7.0
Nisemedamagino	<i>Anisarchus medius</i>	-	-	-	-	-	-	14	0.08	442	9	16	0.14
Ohyo	<i>Hippoglossus stenolepis</i>	4	19	2	8.7	2	3.2	-	-	-	-	-	-
Arasukaaburagare	<i>Atheresthes stomias</i>	624	216	-	-	-	-	-	-	46	1.1	3	0.05
Akagarei-ru	<i>Hippoglossoides</i> spp.	191	48	3	1.6	3	1.6	193	4.0	435	28	121	4.3
Syumusugare	<i>Lepidopsetta bilineata</i>	2	2.3	27	5.5	27	5.5	-	-	-	-	-	-
Koganagare	<i>Limanda aspera</i>	-	-	237	96	237	96	13	2.0	2	0.2	1	0.2
Tsunogare	<i>Pleuronectes quadrituberculatus</i>	-	-	78	73.2	78	73.2	18	13	2	0.8	-	-
Hirenaganameta	<i>Glyptocephalus zachirus</i>	37	16	7	1.3	-	-	-	-	-	-	-	-
Tako-ru	Octopuses	2	0.05	-	-	-	-	-	-	1	0.04	-	-
Ika-ru	Squids	-	-	-	-	-	-	-	-	-	-	1	0.01
Zuwaigani	<i>Chionoectes opilio</i>	10	2.0	23	10.5	103	31	-	-	-	-	2689	63
Ozuwaigani	<i>Chionoectes bairdi</i>	-	-	-	-	-	-	12000	139	-	-	-	-
Hikigani-ru	<i>Hyas</i> spp.	-	-	-	-	40	1.1	-	-	-	-	-	-
Yadokari-ru	Hermit crabs	17	1.4	4	0.3	96	3.0	14	0.1	-	-	9	0.05
Jyakoebi-ru	Crangonidae spp.	-	-	-	-	-	-	318	1.8	390	2.4	294	1.0
Ezobai-ru	Neptune whelks	26	2.1	6	0.5	227	16	264	12	-	-	28	0.36
Makigai-ru	Conches	-	-	-	-	-	-	-	-	256	1.8	235	1.5
Nimaigai-ru	Bivalves	1	0.2	-	-	-	-	-	-	-	-	-	-
Kashipan-ru	Sand dollars	-	-	129	1.2	129	1.2	-	-	-	-	-	-
Hitode-ru	Starfishes	-	-	68	27.5	68	27.5	180	15	-	-	7	0.6
Kumohitode-ru	Ophiroids	-	-	-	-	Uncountable	5.8	174	0.4	-	-	-	-
Isoginchaku-ru	Actiniae	-	-	59	3.8	-	-	-	-	-	-	3	0.05
Hoya-ru	Sea squirts	-	-	2317	434	2317	434	164	12	-	-	-	-

8. Data on plankton collected by vertical hauls of a single or twin NORPAC net

Vertical hauls with a twin-NORPAC net were made at hydrographic stations. This net was composed of 45 cm mouth diameter and 180 cm long conical one which was made of GG54 and XX13 having 0.33 mm and 0.10 mm mesh, respectively. The net was lowered to the estimated depth of 150 m, 500 m or near the bottom when the bottom depth was shallower than 150 m, and immediately hauled to the surface at a speed about 1 m s⁻¹. A flowmeter was mounted at the center of mouth of the net to estimate the volume water filtered. Sampling was conducted by research staffs and measurement of wet weight of the samples were made by A. Yamaguchi, K. Ishii, K. Matsuno, R. Saito, K. Ohgi, Y. Onishi, T. Homma, R. Ohashi, C. Tsukazaki and K. Mishima (Laboratory of Marine Biology).

Table 14: Data on plankton collected by vertical hauls with a single or twin NORPAC net.

GG54:0.33mm mesh, XX13:0.10mm mesh.

Station no.	Position		S.M.T.		Length of wire (m)	Angle of wire (°)	Depth estimated by wire angle (m)	Kind of cloth	Flowmeter		Estimated volume of water filtered (m ³)	Wet weight (g)		Sample no.
	Lat. (N)	Lon.	Date	Hour					No.	Reading		per haul	per 1000 m ³	
OS09060 (Site H)	41-31	146-00 E	3-Jun	8:50	151	8	150	GG54	1858	1460	21.91	5.1	231	09201
								XX13	2555	1045	20.78			09202
				9:10	526	18	500	GG54	1858	5268	79.04	12.3	155	09203
								XX13	2555	3370	67.00			09204
OS09061 (St. KNOT)	44-00	155-00 E	5-Jun	11:10	156	16	150	GG54	1479	1598	25.35	9.2	362	09205
OS09063	47-00	160-00 E	6-Jun	17:06	162	22	150	XX13	2446	1399	19.39			09206
								GG54	1479	1928	30.59	25.8	842	3) 09207
OS09064	47-00	163-30 E	7-Jun	19:00	158	18	150	XX13	2446	1255	17.39			09208
								GG54	1479	1782	28.27	6.0	212	09209
OS09065	47-00	167-00 E	8-Jun	16:36	151	8	150	XX13	2446	1538	21.31			09210
								GG54	1479	1561	24.77	2.5	100	09211
OS09066	47-00	170-30 E	9-Jun	21:34	158	19	149	XX13	2446	1463	20.27			09212
								GG54	1479	1899	30.13	7.7	256	09213
OS09067	47-00	174-00 E	10-Jun	15:49	150	0	150	XX13	2446	1672	23.17			09214
								GG54	1479	1439	22.83	5.4	238	09215
OS09068	47-00	177-30 E	11-Jun	21:05	152	10	150	XX13	2446	1310	18.15			09216
								GG54	1479	1670	26.50	8.8	331	09217
OS09069	47-00	179-00 W	11-Jun	15:52	158	19	149	XX13	2446	1448	20.06			09218
								GG54	1479	1629	25.85	12.3	475	09219
OS09070	47-00	175-30 W	12-Jun	21:15	162	22	150	XX13	2446	1441	19.97			09220
								GG54	1479	1743	27.65	10.8	391	09221
OS09071 (Trap SA)	49-00	174-00 W	13-Jun	15:35	164	24	150	XX13	2446	1670	23.14			09222
								GG54	1479	1835	29.11	101.1	3473	1) 09223
OS09072 (Mooring station 1)	52-24	172-00 W	15-Jun	14:16	164	24	150	XX13	2446	1330	18.43			09224
								GG54	1479	1775	28.16	3.8	134	09225
OS09073	52-20	170-30 W	15-Jun	23:25	151	8	150	XX13	2446	1860	25.77			09226
								GG54	1479	1490	23.64	7.1	300	09227
OS09074	52-00	170-30 W	16-Jun	5:40	152	10	150	XX13	2446	1430	19.81			09228
								GG54	1479	1551	24.61	3.4	137	09229
OS09075	51-40	170-30 W	16-Jun	15:40	155	15	150	XX13	2446	1579	21.88			09230
								GG54	1479	1582	25.10	2.4	97	09231
OS09076	51-20	170-30 W	17-Jun	11:18	160	20	150	XX13	2446	1651	22.88			09232
								GG54	1479	1815	28.80	4.4	154	09233
OS09077	51-00	170-30 W	17-Jun	15:40	153	12	150	XX13	2446	1695	23.49			09234
								GG54	1479	1520	24.12	2.6	106	09235
OS09078	50-40	170-30 W	17-Jun	20:21	156	16	150	XX13	2446	1420	19.68			09236
								GG54	1479	1510	23.96	20.9	873	3) 09237
OS09089	52-40	166-00 W	18-Jun	18:50	160	20	150	XX13	2446	1420	19.68			09238
								GG54	1479	1848	29.32	36.7	1251	1) 09239
OS09090	53-00	166-00 W	18-Jun	21:05	167	26	150	XX13	2446	1151	15.95			09240
								GG54	1479	1780	28.24	31.4	1113	1) 09241

1) Exclusively phytoplankton

2) Including some fragments of medusae.

3) *Neocalanus* abundant.

4) Gelatinous zooplankton abundant.

5) *Salpida* abundant.

6) Chaetognaths abundant.

Table 14: Data on plankton collected by vertical hauls with a single or twin NORPAC net.

GG54:0.33mm mesh, XX13:0.10mm mesh.

Station no.	Position		S.M.T.		Length of wire (m)	Angle of wire (°)	Depth estimated by wire angle (m)	Kind of cloth	Flowmeter		Estimated volume of water filtered (m ³)	Wet weight (g)		Sample no.
	Lat. (N)	Lon.	Date	Hour					No.	Reading		per haul	per 1000 m ³	
OS09091	53-20	166-00 W	18-Jun	23:25	164	24	150	XX13	2446	1205	16.70	32.3	1050	09242
								GG54	1479	1941	30.80			09243
								XX13	2446	1505	20.85			09244
OS09093	53-40	174-00 W	23-Jun	8:33	156	17	149	GG54	1479	1628	24.84	15.6	627	09245
								XX13	2446	1305	19.90			09246
OS09094 (Trap AB)	53-27	176-57 W	23-Jun	23:20	155	13	151	GG54	1479	1548	23.62	122.4	5182	09247
OS09095	52-50	178-30 W	24-Jun	12:29	167	26	150	XX13	2446	1020	15.56	58.3	2135	09248
								GG54	1479	1788	27.28			09249
OS09096	51-10	179-43 W	24-Jun	22:27	158	18	150	XX13	2446	1230	18.76	7.8	284	09250
								GG54	1479	1800	27.46			09251
OS09097 (Mooring station 2)	51-30	180-00	25-Jun	5:21	164	24	150	XX13	2446	1630	24.86	32.1	924	09252
								GG54	1479	2275	34.71			09253
OS09098	50-50	179-46 W	25-Jun	10:27	155	14	150	XX13	2446	1131	17.25	2.9	113	09254
								GG54	1479	1678	25.60			09255
OS09099	50-25	179-50 W	25-Jun	17:41	150	1	150	XX13	2446	1349	20.57	18.0	917	09256
								GG54	1479	1290	19.68			09257
OS09100	50-05	179-55 W	25-Jun	23:50	161	21	150	XX13	2446	1685	25.70	29.7	1238	09258
								GG54	1479	1572	23.98			09259
OS09101	49-45	180-00	26-Jun	7:30	153	11	150	XX13	2446	1031	15.72	5.9	244	09260
								GG54	1479	1589	24.24			09261
OS09102	49-30	180-00	26-Jun	14:00	150	4	150	XX13	2446	1230	18.76	6.8	275	09262
								GG54	1479	1633	24.92			09263
OS09103	50-00	176-30 E	27-Jun	5:29	154	13	150	XX13	2446	1206	18.39	26.5	1257	09264
								GG54	1479	1380	21.06			09265
OS09104	50-20	176-30 E	27-Jun	10:28	166	25	150	XX13	2446	710	10.83	4.4	143	09266
								GG54	1479	2005	30.59			09267
OS09105	50-40	176-30 E	27-Jun	15:04	153	13	149	XX13	2446	1440	21.96	6.2	241	09268
								GG54	1479	1690	25.79			09269
OS09108	51-40	176-30 E	28-Jun	5:13	150	0	150	XX13	2446	1368	20.86	7.2	283	09270
								GG54	1479	1672	25.51			09271
OS09109 (Mooring station 3)	51-58	176-51 E	28-Jun	13:00	140	14	136	XX13	2446	1118	17.05	9.0	365	09272
								GG54	1479	1610	24.56			09273
OS09110 (Mooring station 4)	52-24	175-15 E	28-Jun	21:25	156	16	150	XX13	2446	901	13.74	20.4	824	09274
								GG54	1479	1623	24.76			09275
OS09111	53-00	177-00 E	29-Jun	4:38	155	15	150	XX13	2446	992	15.13	22.8	888	09276
								GG54	1479	1682	25.66			09277
OS09112	53-30	178-00 E	29-Jun	10:40	155	14	150	XX13	2446	993	15.14	23.5	1013	09278
								GG54	1479	1520	23.19			09279
OS09113	55-10	179-20 E	30-Jun	11:52	150	6	149	XX13	2446	724	11.04	41.8	2060	09280
								GG54	1479	1330	20.29			09281
OS09114	56-00	180-00	30-Jun	17:54	156	17	149	XX13	2446	860	13.12	12.9	502	09282
								GG54	1479	1690	25.79			09283
OS09115	56-30	179-00 E	1-Jul	9:45	153	12	150	XX13	2446	1361	20.76	21.1	784	09284
								GG54	1479	1760	26.85			09285
OS09116	57-00	178-00 E	1-Jul	15:28	152	11	149	XX13	2446	915	13.96	39.6	1875	09286
								GG54	1479	1385	21.13			09287
OS09117	56-30	177-00 E	2-Jul	10:20	152	10	150	XX13	2446	839	12.80	16.4	583	09288
								GG54	1479	1840	28.07			09289
OS09118	55-40	178-00 E	2-Jul	17:50	153	12	150	XX13	2446	980	14.95	33.3	1231	09290
								GG54	1479	1772	27.04			09291
OS09119	55-00	166-00 W	8-Jul	17:29	125	7	124	XX13	2446	1160	17.69	17.3	929	09292
								GG54	1479	1240	18.68			09293
OS09120	55-30	166-00 W	8-Jul	22:15	118	10	116	XX13	2446	1015	15.63	14.7	760	09294
								GG54	1479	1288	19.40			09295
OS09121	56-00	166-00 W	9-Jul	2:05	110	12	108	XX13	2446	1096	16.88	15.5	910	09296
								GG54	1479	1130	17.02			09297
								XX13	2446	968	14.91			09298

1) Exclusively phytoplankton

2) Including some fragments of medusae.

3) *Neocalanus* abundant.

4) Gelatinous zooplankton abundant.

5) Salpida abundant.

6) Chaetognaths abundant.

Table 14: Data on plankton collected by vertical hauls with a single or twin NORPAC net.

GG54:0.33mm mesh, XX13:0.10mm mesh.

Station no.	Position		S.M.T.		Length of wire (m)	Angle of wire (°)	Depth estimated by wire angle (m)	Kind of cloth	Flowmeter		Estimated volume of water filtered (m ³)	Wet weight (g)		Sample no.
	Lat. (N)	Lon.	Date	Hour					No.	Reading		per haul	per 1000 m ³	
OS09122	56-00	167-00 W	9-Jul	6:12	134	17	128	GG54	1479	1332	20.06	86.8	4327	1) 09299
								XX13	2446	1140	17.56			09300
OS09123	56-00	168-00 W	9-Jul	15:03	137	18	130	GG54	1479	1479	22.28	9.9	443	09301
								XX13	2446	1210	18.63			09302
OS09124	56-00	170-00 W	9-Jul	21:11	151	8	150	GG54	1479	1553	23.39	3.0	127	09303
								XX13	2446	1340	20.63			09304
OS09125	56-30	169-00 W	10-Jul	2:34	99	9	98	GG54	1479	1004	15.12	20.2	1338	1) 09305
								XX13	2446	814	12.53			09306
OS09126	56-30	168-00 W	10-Jul	7:02	118	19	112	GG54	1479	1220	18.37	68.5	3726	1) 09307
								XX13	2446	1076	16.57			09308
OS09127	56-30	166-00 W	10-Jul	15:35	79	1	79	GG54	1479	684	10.30	36.1	3503	1) 09309
								XX13	2446	492	7.58			09310
OS09128	57-00	166-00 W	10-Jul	19:36	65	5	65	GG54	1479	636	9.58	8.1	845	09311
								XX13	2446	340	5.24			09312
OS09129	57-00	167-00 W	10-Jul	23:49	70	0	70	GG54	1479	700	10.54	7.6	718	09313
								XX13	2446	578	8.90			09314
OS09130	57-00	168-00 W	11-Jul	3:55	72	1	72	GG54	1479	690	10.39	12.1	1169	1) 09315
								XX13	2446	492	7.58			09316
OS09131	57-30	167-00 W	11-Jul	9:12	66	9	65	GG54	1479	662	9.97	5.5	548	09317
								XX13	2446	410	6.31			09318
OS09132	57-30	166-00 W	11-Jul	14:26	59	0	59	GG54	1479	560	8.43	11.4	1352	1) 09319
								XX13	2446	350	5.39			09320
OS09133	58-00	166-00 W	11-Jul	18:10	50	13	49	GG54	1479	509	7.67	2.6	345	09321
								XX13	2446	410	6.31			09322
OS09134	58-30	168-00 W	11-Jul	22:50	40	4	40	GG54	1479	415	6.25	1.1	180	09323
								XX13	2446	344	5.30			09324
OS09135	61-00	172-00 W	12-Jul	21:50	50	14	49	GG54	1479	580	8.74	1.4	163	09325
								XX13	2446	292	4.50			09326
OS09136	62-30	172-00 W	13-Jul	1:45	40	15	39	GG54	1479	451	6.79	1.6	230	09327
								XX13	2446	319	4.91			09328
OS09137	63-00	172-00 W	13-Jul	13:45	49	17	47	GG54	1479	560	8.43	7.8	930	09329
								XX13	2446	168	2.59			09330
OS09139	63-00	174-00 W	13-Jul	22:15	71	14	69	GG54	1479	835	12.58	2.7	215	09331
								XX13	2446	435	6.70			09332
OS09141	58-41	170-19 W	15-Jul	14:45	65	5	65	GG54	1479	700	10.54	3.6	342	09333
								XX13	2446	280	4.31			09334
Extra station	54-31	170-46 W	20-Jul	23:01	164	24	150	GG54	1479	2160	31.87	10.9	343	09335
								XX13	2446	1863	26.69			09336
Extra station	53-15	177-36 E	22-Jul	22:55	156	16	150	GG54	1479	1551	22.88	11.8	518	09337
								XX13	2446	1462	20.95			09338
Extra station	52-24	170-30 E	24-Jul	22:20	151	8	150	GG54	1479	1448	21.36	14.1	662	09339
								XX13	2446	1340	19.20			09340
Extra station	49-35	164-51 E	25-Jul	22:38	150	5	149	GG54	1479	1442	21.27	15.1	709	09341
								XX13	2446	1248	17.88			09342
Extra station	46-38	159-18 E	26-Jul	21:45	164	24	150	GG54	1479	2422	35.73	6.3	176	09343
								XX13	2446	2305	33.03			09344
Extra station	43-53	154-24 E	27-Jul	21:38	151	7	150	GG54	1479	1412	20.83	11.4	547	09345
								XX13	2446	1290	18.48			09346
OS09143 (Site H)	41-30	145-47 E	29-Jul	12:46	161	21	150	GG54	1479	1911	28.19	5.4	192	09347
								XX13	2446	1830	26.22			09348
				12:58	577	30	500	GG54	1479	6848	101.03	16.1	159	09349
								XX13	2446	6137	87.93			09350
Extra station	41-36	144-35 E	29-Jul	21:03	152	10	150	GG54	1479	1648	24.31	10.6	435	09351
								XX13	2446	1540	22.07			09352

1) Exclusively phytoplankton

2) Including some fragments of medusae.

3) *Neocalanus* abundant.

4) Gelatinous zooplankton abundant.

5) Salpida abundant.

6) Chaetognaths abundant.

9. Calibration of Flowmeters

Flowmeters used for plankton nets were calibrated once in the cruise.

Table 15-1. Calibration data on flowmeters used for a twin or single NORPAC net and other kind of nets. 100-m wire out at St. OS09091 in 18 June 2009.

Flowmeter No.	Wire length (m)	Revolution							Mean
		1	2	3	4	5	6	7	
RG1479	100	1000	1011	978*	1010	1000	991	1078*	1002
RG2446	100	1157	1180*	1138	1168	1142	1130*	1134	1148
RG3023	100	1232	1268*	1232	1258	1218	1228	1210*	1234
RG3556	100	1030	1045*	1028*	1038	1037	1031	1031	1033

*: omitted from calculation

Table 15-2. Calibration data on flowmeters used for a twin NORPAC net and other kind of nets. 100-m wire out at 54°39'N, 171°45'W in 4 July 2009.

Flowmeter No.	Wire length (m)	Revolution							Mean
		1	2	3	4	5	6	7	
RG1479	100	1052	1025*	1029	1032	1032	1067	1078*	1042
RG2446	100	1045	1030*	1032	1041	1038	1058	1070*	1043
RG3023	100	1075*	1006	1002*	1010	1008	1032	1052	1022
RG3556	100	1019	982*	997	1102*	1100	1011	1069	1039

*: omitted from calculation

Table 15-3. Calibration data on flowmeters used for a twin NORPAC net and other kind of nets. 50-m wire out at St. OS09141 in 15 July 2009.

Flowmeter No.	Wire length (m)	Revolution							Mean
		1	2	3	4	5	6	7	
RG1479	50	539	521	510	540	505*	530	550*	528
RG2446	50	528	515	506	530*	505*	518	515	516
RG2856	50	680*	640	621	645	612*	645	635	637
RG3023	50	595*	578	560	581	561	580	560*	572
RG3556	50	578*	562	555	563	535*	560	555	559

*: omitted from calculation

Table 15-4. Calibration data on flowmeters used for a twin NORPAC net and other kind of nets. 50-m wire out at St. OS09143 in 29 July 2009.

Flowmeter No.	Wire length (m)	Revolution							Mean
		1	2	3	4	5	6	7	
RG1479	50	564*	542	542	535	531*	543	533	539
RG2446	50	565*	560	562	551	551*	551	551	555

*: omitted from calculation

10. Data on Nutrients

Seawater samples were collected with Niskin bottles on the CTD system. The samples for nutrient analysis were stored in polyethylene bottles and kept in a freezer at -20. Nutrients were analyzed in the laboratory with Technicon Auto-analyzer. The analyses of nutrients were conducted by K.Toya.

Table 16. Data on Nutrients

OS09060				OS09064				OS09066			
Depth (m)	6371			Depth (m)	5745			Depth (m)	6310		
Depth (m)	PO ₄ (μ M)	NO ₃ +NO ₂ (μ M)	NO ₂ (μ M)	Depth (m)	PO ₄ (μ M)	NO ₃ +NO ₂ (μ M)	NO ₂ (μ M)	Depth (m)	PO ₄ (μ M)	NO ₃ +NO ₂ (μ M)	NO ₂ (μ M)
0	0.61	5.82	0.22	0	1.52	14.87	0.30	0	1.45	16.81	0.27
10	0.60	5.80	0.21	5	1.51	14.74	0.28	5	1.51	16.80	0.26
30	0.60	5.77	0.36	10	1.52	14.77	0.28	10	1.46	16.79	0.26
50	0.68	7.03	0.48	20	1.51	14.87	0.30	20	1.50	16.80	0.26
100	0.98	11.41	0.10	30	1.58	15.90	0.35	30	1.49	18.00	0.27
150	1.29	15.50	0.09	50	1.66	17.83	0.62	50	1.58	21.56	0.37
200	1.25	15.12	0.09	75	1.70	19.15	0.44	75	1.76	22.52	0.41
300	1.60	20.38	0.09	100	1.69	18.61	0.22	100	1.81	23.48	0.25
500	2.73	36.54	0.08	150	1.68	18.61	0.08	150	2.17	37.34	0.08
750	3.07	42.77	0.09	200	2.17	26.17	0.08	200	2.85	43.39	0.08
1000	3.22	44.62	0.08	300	2.82	35.79	0.07	300	3.13	45.42	0.08
2000	3.04	43.17	0.06	500	3.19	41.30	0.07	500	3.16	45.48	0.08
				750	3.35	43.94	0.07	750	3.10	45.47	0.07
				1000	3.36	44.15	0.07	1000	3.20	45.21	0.08
				1250	3.35	43.97	0.08	1250	3.17	44.84	0.07
				1500	3.35	44.69	0.11	1500	3.11	43.88	0.07
				2000	3.22	42.31	0.08	2000	3.04	42.43	0.07
				2500	3.06	41.07	0.09	2500	3.00	40.66	0.07
				3000	2.92	38.90	0.08	3000	2.96	38.94	0.07
				3500	2.84	37.93	0.08	3500	2.89	37.99	0.07
				4000	2.78	37.26	0.08	4000	2.70	45.50	0.07
				4500	2.74	36.89	0.10	4500	2.73	36.84	0.07
				5000	2.72	36.77	0.08	5000	2.72	37.17	0.07

OS09068				OS09070				OS09112			
Depth (m)	5478			Depth (m)	5644			Depth (m)	3903		
Depth (m)	PO ₄ (μ M)	NO ₃ +NO ₂ (μ M)	NO ₂ (μ M)	Depth (m)	PO ₄ (μ M)	NO ₃ +NO ₂ (μ M)	NO ₂ (μ M)	Depth (m)	PO ₄ (μ M)	NO ₃ +NO ₂ (μ M)	NO ₂ (μ M)
0	1.56	15.68	0.24	0	1.39	13.22	0.24	0	1.52	15.80	0.44
5	1.59	16.36	0.25	5	1.42	13.24	0.22	5	1.57	15.99	0.42
10	1.59	15.80	0.23	10	1.39	13.22	0.23	10	1.58	16.20	0.42
20	1.61	15.82	0.23	20	1.41	13.60	0.20	20	1.70	16.12	0.43
30	1.54	15.30	0.22	30	1.36	13.66	0.20	30	1.80	17.99	0.44
50	1.63	16.82	0.30	50	1.51	14.91	0.25	50	2.25	24.55	0.50
75	1.66	18.65	0.40	75	1.60	16.36	0.38	75	2.39	29.05	0.22
100	1.83	21.70	0.08	100	1.75	20.16	0.18	100	2.43	29.72	0.12
150	2.41	31.12	0.07	150	2.53	33.24	0.08	150	2.50	30.42	0.16
200	2.78	36.32	0.08	200	2.80	37.11	0.08	200	2.76	34.66	0.14
300	3.09	40.69	0.07	300	3.05	41.47	0.08	300	3.12	41.44	0.13
500	3.16	41.33	0.07	500	3.22	44.25	0.08	500	3.22	42.03	0.12
750	3.26	44.71	0.07	750	3.14	44.17	0.08	750	3.39	45.74	0.09
1000	3.33	44.87	0.07	1000	3.30	45.27	0.08	1000	3.37	45.30	0.17
1250	3.29	44.60	0.08	1250	3.28	45.38	0.08	1250	3.39	44.92	0.10
1500	3.16	41.70	0.08	1500	3.24	44.70	0.09	1500	3.36	44.91	0.10
2000	3.14	43.40	0.10	2000	3.12	43.59	0.08	1750	3.22	42.45	0.15
2500	2.62	32.96	0.08	2500	3.01	41.66	0.09	2000	3.22	41.98	0.10
3000	2.91	39.73	0.08	3000	2.90	40.13	0.08	2250	3.27	41.54	0.08
3500	2.74	38.39	0.08	3500	2.81	38.90	0.08	2500	3.24	40.69	0.08
4000	2.75	37.87	0.09	4000	2.62	37.71	0.08	3000	3.18	39.44	0.09
4500	2.68	37.48	0.09	4500	2.66	37.85	0.08	3500	3.12	38.82	0.08
5000	2.66	37.43	0.08	5000	2.77	37.83	0.08	3750	3.05	37.65	0.15

OS09114				OS09116			
Depth (m)	3840			Depth (m)	3840		
Depth (m)	PO ₄ (μ M)	NO ₃ +NO ₂ (μ M)	NO ₂ (μ M)	Depth (m)	PO ₄ (μ M)	NO ₃ +NO ₂ (μ M)	NO ₂ (μ M)
0	1.78	17.09	0.35	5	1.16	13.88	0.28
5	1.75	17.48	0.33	10	1.23	13.91	0.28
10	1.81	17.42	0.33	20	1.24	14.22	0.29
20	1.77	17.11	0.33	30	1.69	17.56	0.32
30	1.81	17.89	0.33	50	2.01	22.14	0.33
50	2.24	25.03	0.34	75	2.34	28.68	0.35
75	2.40	29.14	0.69	100	2.35	28.87	0.12
100	2.39	29.52	0.21	150	2.36	29.12	0.12
150	2.41	29.88	0.13	200	2.37	29.08	0.10
200	2.67	34.67	0.11	300	3.01	40.74	0.09
300	3.08	40.84	0.14	500	3.29	44.78	0.10
500	3.36	44.81	0.08	750	3.31	44.87	0.09
750	3.37	45.56	0.08	1000	3.41	45.53	0.09
1000	3.39	45.71	0.09	1250	3.38	44.36	0.09
1250	3.39	45.19	0.08	1500	3.32	44.21	0.09
1500	3.34	35.84	0.09	1750	3.22	42.48	0.09
1750	3.33	43.46	0.08	2000	3.22	42.47	0.08
2000	3.22	42.87	0.10	2250	3.25	42.57	0.09
2250	3.27	42.03	0.12	2500	3.16	40.62	0.08
2500	3.16	40.56	0.09	3000	3.12	39.67	0.08
3000	3.15	39.34	0.10	3500	3.08	38.94	0.09
3500	3.13	38.93	0.08	3700	2.96	38.77	0.10
3700	3.12	38.68	0.08				

THE “OSHORU MARU” CRUISE 206
TO EAST OF TSUGARU STRAIT

IN SEPTEMBER TO OCTOBER 2009

1. Cruise Itinerary

Cruise 206

Departure from Hakodate	Sep. 28	,2009
Start bottom trawl research (OST0908)	29	
Start hydrographic research (OS09144)	29	
Start saury gillnet (OSSG0901)	Oct. 1	
Arrival at Hakodate and change cadets	3	
Departure from Hakodate	3	
Finish bottom trawl research (OST0915)	5	
Finish hydrographic research (OS09152)	5	
Finish saury gillnet (OSSG0902)	7	
Return to Hakodate	8	

Total coverage 1226.2 miles

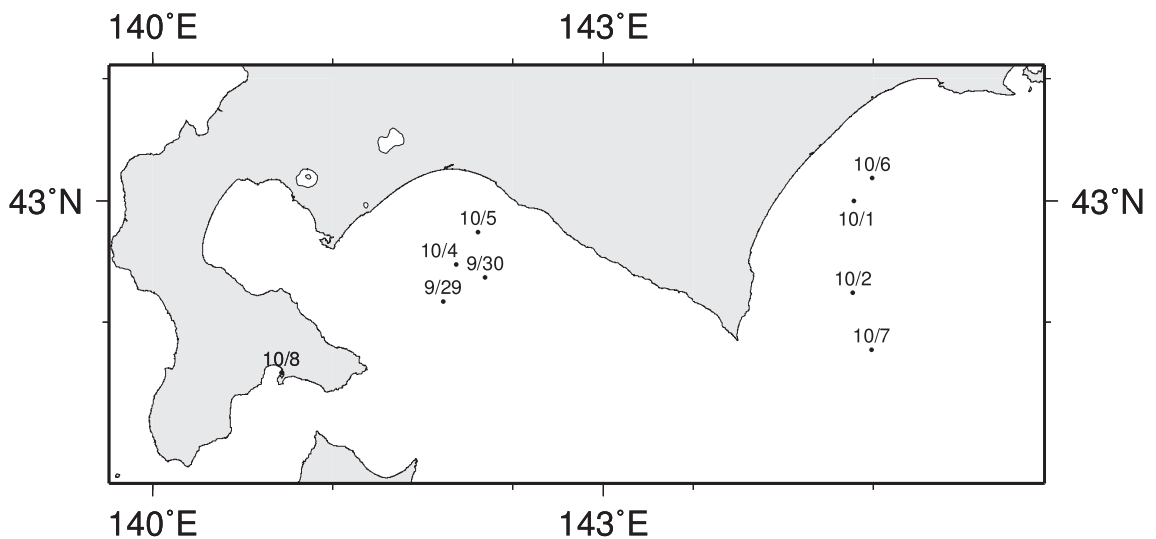


Figure 1: Noon position

2. Vessel Personnel

Captain:		Associate Professor	Shogo Takagi
Crew :	Chief Officer	Instructor	Yoshihiko Kamei
	First Officer	Instructor	Keiichiro Sakaoka
	Second Officer	Technical official	Naoki Hoshi
	Third Officer	Technical official	Takuzo Abe
	Chief Engineer	Instructor	Jyunichi Kimura
	And 25 men		
Cruise 206			
Research Staff:	Professor	(Laboratory of Marine Environmental Science)	Kenshi Kuma
	Professor	(Laboratory of Marine Biology and Biodiversity)	Mamoru Yabe
	Accosiate Professor	(Laboratory of Marine Bio-resources Science)	Yutaka Watanuki
	Accosiate Professor	(Laboratory of Marine Environmental Science)	Isao Kudo
	Accosiate Professor	(Laboratory of Marine Bio-resources Science)	Takashi Matsuishi
	Accosiate Professor	(Laboratory of Marine Bio-resources Science)	Tetsuya Takatsu
	Accosiate Professor	(Laboratory of Marine Biology and Biodiversity)	Hisashi Imamura
	Instructor	(Laboratory of Marine ecosystem Change Analysis)	Yoko Mitani
	Teaching Assistant:		15 persons
	Cadets:		81 Cadets
	Total		139 persons

3. Items of Research

A short cruise to conduct shipboard training in hydrographic observations, plankton samplings, sighting survey of marine mammals, and biological processing of trawl catch for undergraduate students in the Department of Marine Biological Science.

Hydrographic observations:	Fig. 2 Table 1,2
Bottom trawl observations:	Fig. 3 Table 3,4
Saury floating gillnet research	Fig. 4 Table 5

4. 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 “Oshoro Maru”.

Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19). Dynamic computations were made using a desk-top computer aboard the “Oshoro Maru”.

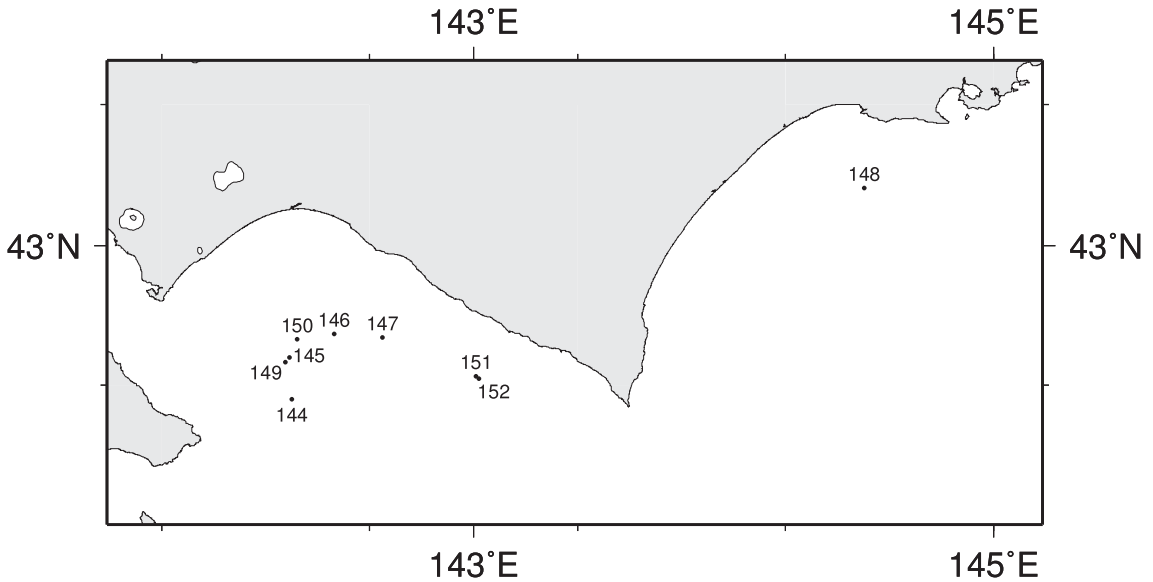


Figure 2: Oceanographic stations

Table 1: List of Oceanographic Stations

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS09144	41-57.0N	141-37.6E	9/29	1724	9	783	-	-	16.9	bc	9Plus-0769
OS09145	42-06.0N	141-37.0E	9/29	2051	9	719	-	-	16.3	-	9Plus-0769
OS09146	42-11.0N	141-49.8E	9/30	1100	9	813	5	14.4	16.4	bc	9Plus-0769
OS09147	42-10.4N	142-03.6E	9/30	1901	9	816	-	-	15.6	bc	9Plus-0769
OS09148	42-42.2N	144-22.7E	10/1	1735	9	598	-	-	-	bc	9Plus-0769
OS09149	42-05.0N	141-35.7E	10/4	1630	9	720	-	-	16.3	bc	9Plus-0769
OS09150	42-09.9N	141-39.1E	10/4	2100	9	718	-	-	15.1	-	9Plus-0769
OS09151	42-01.9N	142-30.7E	10/5	1610	9	730	-	-	16.5	-	9Plus-0769
OS09152	42-01.5N	142-31.6E	10/5	2000	9	730	-	-	16.1	-	9Plus-0769

(*):Fixed position by Global Positioning system

Table 2: Oceanographic data

Station		OS09144	
Longitude		41-57.0N	
Latitude		141-37.6E	
Depth(m)		783	
Press.	Temp.	Sal.	SIG-T
5	16.898	32.730	23.798
10	16.806	32.771	23.850
20	12.213	33.120	25.090
30	9.620	33.340	25.719
40	8.543	33.407	25.942
50	8.130	33.421	26.015
75	8.288	33.760	26.258
100	6.929	33.697	26.403
125	4.521	33.456	26.504
150	3.795	33.460	26.582
200	2.714	33.426	26.653
250	2.191	33.457	26.721
300	2.355	33.554	26.785
400	2.592	33.656	26.847
500	2.822	33.743	26.898

Station		OS09145	
Longitude		42-06.0N	
Latitude		141-37.0E	
Depth(m)		719	
Press.	Temp.	Sal.	SIG-T
5	16.531	33.063	24.138
10	16.530	33.063	24.138
20	14.688	33.043	24.532
30	11.233	33.123	25.273
40	10.948	33.246	25.420
50	10.258	33.352	25.622
75	7.662	33.416	26.079
100	6.367	33.422	26.259
125	5.177	33.458	26.433
150	4.001	33.397	26.511
200	3.144	33.418	26.609
250	2.566	33.469	26.700
300	2.362	33.530	26.766
400	2.647	33.688	26.868
500	2.990	33.856	26.973

Station		OS09146	
Longitude		42-11.0N	
Latitude		141-49.8E	
Depth(m)		813	
Press.	Temp.	Sal.	SIG-T
5	15.985	32.772	24.039
10	16.188	32.913	24.101
20	15.168	33.109	24.479
30	14.435	33.365	24.834
40	13.505	33.454	25.095
50	12.944	33.408	25.171
75	10.687	33.331	25.532
100	8.833	33.405	25.895
125	6.049	33.474	26.341
150	5.086	33.499	26.476
200	3.297	33.435	26.609
250	2.273	33.464	26.720
300	2.237	33.532	26.777
400	2.784	33.738	26.896
500	3.000	33.861	26.976

Station		OS09147	
Longitude		42-10.4N	
Latitude		142-03.6E	
Depth(m)		816	
Press.	Temp.	Sal.	SIG-T
5	17.093	33.108	24.042
10	16.541	33.044	24.121
20	14.686	33.207	24.658
30	13.407	33.456	25.116
40	13.197	33.481	25.178
50	13.022	33.492	25.221
75	12.432	33.500	25.342
100	8.107	33.484	26.068
125	5.636	33.485	26.401
150	4.009	33.416	26.525
200	2.377	33.373	26.639
250	2.307	33.468	26.721
300	2.385	33.549	26.779
400	2.691	33.719	26.890
500	2.973	33.849	26.969

Station		OS09148	
Longitude		42-42.2N	
Latitude		144-22.7E	
Depth(m)		598	
Press.	Temp.	Sal.	SIG-T
5	14.313	32.802	24.425
10	14.082	32.818	24.485
20	13.005	32.887	24.756
30	10.266	33.449	25.696
40	8.732	33.410	25.916
50	7.706	33.367	26.034
75	5.319	33.265	26.264
100	4.365	33.315	26.408
125	3.213	33.325	26.529
150	2.444	33.323	26.593
200	2.434	33.391	26.649
250	2.230	33.413	26.683
300	2.223	33.463	26.723
400	3.078	33.683	26.827
500	3.790	33.864	26.903

Station		OS09149	
Longitude		42-05.0N	
Latitude		141-35.7E	
Depth(m)		720	
Press.	Temp.	Sal.	SIG-T
5	16.127	32.843	24.061
10	15.791	33.069	24.310
20	15.282	33.153	24.487
30	14.100	33.247	24.812
40	11.054	33.483	25.585
50	9.931	33.473	25.772
75	10.245	33.967	26.104
100	9.038	33.835	26.200
125	5.808	33.514	26.402
150	4.465	33.461	26.514
200	2.851	33.378	26.603
250	2.544	33.425	26.667
300	2.377	33.482	26.726
400	2.485	33.623	26.830
500	2.921	33.802	26.936

Station OS09150				Station OS09151				Station OS09152			
Longitude 42-09.9N				Longitude 42-01.9N				Longitude 42-01.5N			
Latitude 141-39.1E				Latitude 142-30.7E				Latitude 142-31.6E			
Depth(m) 718				Depth(m) 730				Depth(m) 730			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	16.142	32.759	23.993	5	16.186	32.859	24.060	5	16.219	32.871	24.062
10	16.133	32.869	24.080	10	16.113	32.900	24.108	10	16.200	32.872	24.067
20	15.442	33.108	24.418	20	14.944	33.177	24.580	20	15.577	33.048	24.342
30	13.819	33.300	24.911	30	13.993	33.362	24.924	30	14.200	33.332	24.858
40	12.774	33.462	25.246	40	13.412	33.411	25.080	40	13.591	33.318	24.972
50	12.428	33.494	25.338	50	12.305	33.482	25.353	50	12.796	33.427	25.215
75	9.808	33.377	25.717	75	9.903	33.482	25.783	75	10.022	33.477	25.759
100	10.349	33.886	26.023	100	9.533	33.898	26.169	100	9.664	33.877	26.132
125	7.939	33.742	26.295	125	7.371	33.758	26.389	125	8.305	33.844	26.321
150	4.951	33.451	26.453	150	6.993	33.791	26.467	150	6.649	33.733	26.468
200	3.273	33.422	26.601	200	4.221	33.550	26.610	200	3.232	33.407	26.592
250	2.577	33.448	26.683	250	3.459	33.577	26.707	250	3.455	33.563	26.696
300	2.290	33.508	26.754	300	3.240	33.633	26.773	300	3.580	33.659	26.761
400	2.955	33.728	26.874	400	3.428	33.795	26.884	400	3.509	33.816	26.893
500	2.887	33.806	26.942	500	3.016	33.871	26.982	500	3.119	33.862	26.966

5. Data on bottom trawl research

Eight operations of the stern otter bottom trawl were carried out. These operations were supervised by the captain, and were conducted by deck officer, crew, research staff and cadets.

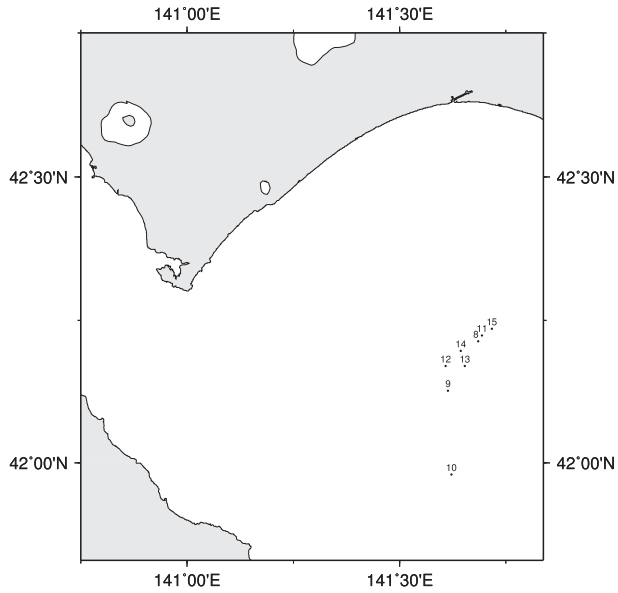


Figure 3: Locations of bottom trawl research

Table 3: Data on bottom trawl research during the "Oshoro Maru" Cruise#206

No. of research	Date and time of net tow (S.M.T.)		Position		Direction of tow	Speed of tow(K' t)	Bottom depth(m)	Wr	Wind (force)
			Lat.(N)	Long.(E)					
OST0908	29-Sep	0745-0845	42-12.8	141-41.1	300	3.5	800	bc	NNW-3
OST0909	29-Sep	1110-1210	42-07.6	141-36.8	160	3.0	650-750	bc	WNW-5
OST0910	29-Sep	1433-1533	41-58.8	141-37.3	170	3.5	750-790	bc	West-5
OST0911	30-Sep	0840-0940	42-13.4	141-41.6	110	-	580-760	b	WSW-3
OST0912	4-Oct	0725-0825	42-10.2	141-36.5	180	3.5	600	c	West-3
OST0913	4-Oct	1040-1140	42-10.2	141-39.2	010	-	725	c	SSE-2
OST0914	4-Oct	1400-1500	42-11.8	141-38.6	200	4.5	640-700	c	South-3
OST0915	5-Oct	0725-0825	42-14.1	141-43.0	270	3.5	740	bc	WSW-4

Wr.: Weather (b: 0-25% clouded, bc: 25-75% clouded, c:75-99% clouded)

Table 4: Data on catches by bottom trawl research

Japanese name	Scientific Name	OST 0908		OST 0909		OST 0910		OST 0911		OST 0912		OST 0913		OST 0914		OST 0915	
		Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)
Sokogangiei-rui	<i>Bathyraxa</i> sp.	2	0.45	11	1.0	118	0.9	3	1.0	2	0.7	-	-	-	-	3	0.75
Kurosokogisu	<i>Notacanthus chemnitzii</i>	1	1.0	7	5.5	1	0.7	3	2.1	1	0.1	2	1.3	-	-	1	0.8
Irakoaanago	<i>Synaphobranchus kaupii</i>	47	42.5	16	6.8	24	15.5	24	17.5	17	13.5	13	11	27	18.5	22	18.5
Kongouanago	<i>Simenchelys parasiticus</i>	-	-	1	0.2	-	-	1	0.1	-	-	8	0.41	-	-	-	-
Ryukyuhoraanago	<i>Ilyopis brunneus</i>	-	-	1	0.03	1	0.01	1	0.05	-	-	-	-	13	0.5	-	-
Shigiunagi	<i>Nemichthys scolopaceus</i>	1	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Togariichimonjiwashi	<i>Leuroglossus schmidti</i>	-	-	2	0.05	-	-	-	-	-	-	-	-	2	0.01	-	-
Sokoishashi	<i>Lipolagus ochotensis</i>	1	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kurosokoiwashi	<i>Pseudobathylagus milleri</i>	2	0.1	-	-	5	0.7	3	0.3	-	-	-	-	-	-	3	0.35
Yokooso	<i>Gonostoma gracile</i>	1	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Demeso	<i>Benthobella linguidens</i>	-	-	-	-	-	-	1	0.3	-	-	-	-	-	-	-	-
Mamehadaka	<i>Lampanyctus jordani</i>	5	0.3	8	0.1	12	0.3	23	0.8	18	0.9	17	0.5	49	1.3	16	0.35
Todohadaka	<i>Diaphus theta</i>	-	-	-	-	1	0.02	-	-	-	-	-	-	-	-	-	-
Mikadodhadaka	<i>Nannobrachium regale</i>	-	-	-	-	3	0.15	1	0.2	-	-	-	-	-	-	-	-
Suketoudara	<i>Theiragra chalcogramma</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	0.6	-	-
Munedara	<i>Coryphaenoides pectoralis</i>	4	6.5	2	4.6	-	-	48	155	2	7.5	5	11.5	-	-	-	-
Ibarahige	<i>Coryphaenoides acrolepis</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	0.74	-	-
Onihige	<i>Coelorrhinus gilberti</i>	1	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Karafutosokodara	<i>Coryphaenoides cinereus</i>	127	28.5	132	32.5	159	36.5	91	75	128	30.5	124	29.5	78	19.5	154	37.5
Karasudara	<i>Halargyreus johnsonii</i>	-	-	-	-	-	-	4	1.6	-	-	-	-	-	-	-	-
Kanadadara	<i>Antimora microlepis</i>	25	5.4	68	15.5	77	17.5	64	13.5	50	10	53	10.5	57	12.5	48	9.5
Itohikidara	<i>Laemonema longipes</i>	144	129.5	121	167.5	233	144	180	110	849	504	451	289.5	430	252	354	205.4
Sokodara-rui	Macrouridae sp.	-	-	1	1.5	-	-	-	-	-	-	1	0.9	-	-	-	-
Togerakudaankou	<i>Oncirodes thompsoni</i>	-	-	-	-	-	-	1	0.2	-	-	-	-	-	-	-	-
Osaga	<i>Sebastes iracundus</i>	2	10.0	-	-	-	-	-	-	-	-	-	-	3	5.8	-	-
kichiji	<i>Sebastolobus macrochir</i>	234	55.5	235	49.5	179	32.5	187	44	119	40	226	46.5	259	52.7	297	61.5
Uranaikajika	<i>Dasycottus setiger</i>	-	-	8	0.7	-	-	-	-	-	-	-	-	-	-	-	-
Kobushikajika	<i>Malacocottus zonurus</i>	1	0.1	-	-	-	-	-	-	1	0.1	-	-	-	-	-	-
Ganko	<i>Dasycottus setiger</i>	4	1.15	-	-	7	0.8	3	0.9	1	0.1	6	0.7	5	0.62	10	0.78
Nyudoukajika	<i>Psychrolutes phricus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.88
Hirainkiuo	<i>Paraliparis grandis</i>	-	-	-	-	-	-	3	1.5	-	-	4	2.25	-	-	-	-
Inkiuo-rui	<i>Paraliparis</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	3	1.66	6	6.45
Shirogenge	<i>Bothrocara molle</i>	187	112	1066	266.8	129	68.5	176	84	426	114.3	292	105	533	172	468	174.5
Kantengenge	<i>Bothrocara tanakae</i>	12	6.5	9	5.9	-	-	9	4.5	13	6.0	5	1.7	11	5.4	11	8.5
Yawaragenge	<i>Lycodapus microchir</i>	-	-	-	-	-	-	-	-	-	-	-	-	3	0.1	-	-
Nezumiginpo	<i>Lumpenella longirostris</i>	9	0.6	27	1.46	119	10	25	2.0	16	1.0	14	1.02	28	2.4	20	1.1
Ibodai-rui	Centrolophidae sp.	-	-	-	-	-	-	-	-	1	1.0	-	-	-	-	-	-
Aburagarei	<i>Atheresthes evermanni</i>	2	3.3	-	-	1	2.1	2	4.85	3	3.6	2	3.5	1	1.11	1	2.5
Benizuwagani	<i>Chionoecetes japonicus</i>	15	7.5	63	39.5	16	4.0	22	12	43	22	34	14.5	27	12	15	8.5
Ezobai-rui	Buccinidae spp.	34	3.7	14	1.3	93	3.3	11	1.12	10	0.5	43	4.0	-	-	53	4.7
Tako-rui	Octopuses	20	9.5	30	12.5	43	13.5	11	5.2	10	5.9	20	9.5	40	21	27	15.5
Mendako		1	1.82	5	3.7	4	3.3	2	3.3	2	1.5	1	2.0	1	1.6	-	-
Ika-rui	Squids	35	12.5	92	27.5	12	3.5	38	18.5	71	27	43	14.5	56	16.5	53	20.5

6. Data on floating gillnet research

Two gillnet researches were performed during this cruise. The operations were supervised by the captain, were conducted by deck officers, crew and research staff.

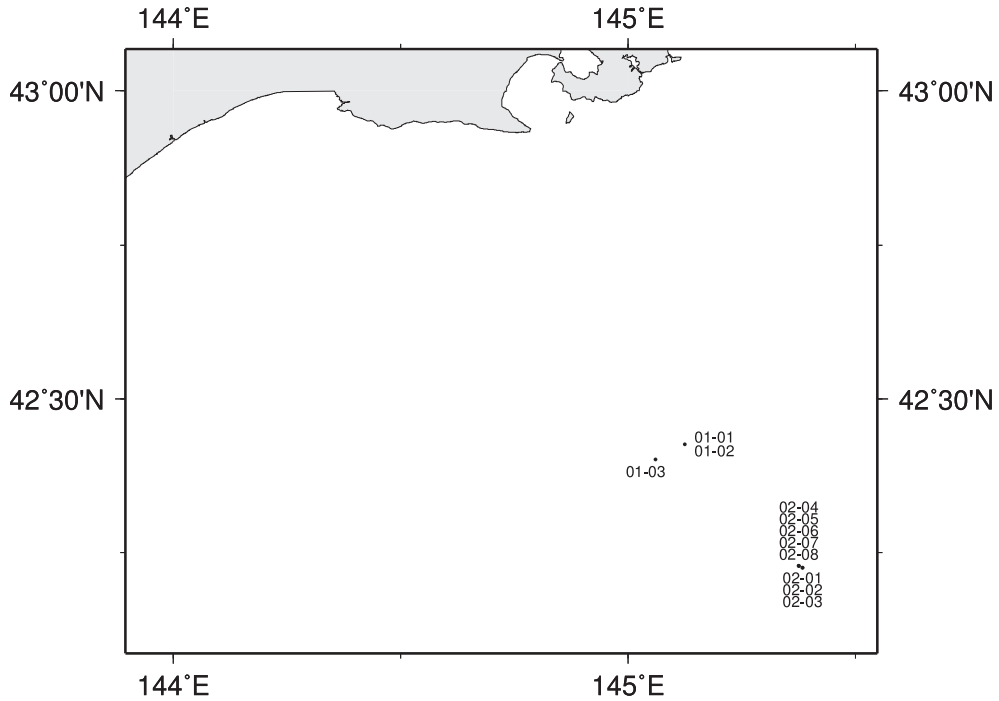


Figure 4: Locations of floating gillnet research

Table 5: Data on floating gill net research

No. of research	OSSG 0901-01	OSSG 0901-02	OSSG 0901-03	OSSG0902-01	OSSG0902-02	OSSG0902-03	OSSG0902-04	OSSG0902-05	OSSG0902-06	OSSG0902-07	OSSG0902-08
Date	1-Oct	1-Oct	2-Oct	6-Oct	6-Oct	6-Oct	6-Oct	7-Oct	7-Oct	7-Oct	7-Oct
position of net set	Lat. (N) 42-25.6 Long. (E) 145-07.5	42-25.6 145-07.5	42-24.1 145-03.6	42-13.5 145-23.0	42-13.5 145-23.0	42-13.5 145-23.0	42-13.7 145-22.5	42-13.7 145-22.5	42-13.7 145-22.5	42-13.7 145-22.5	42-13.7 145-22.5
Time(S.M.T.)	net set 2330	2330	0215	2100	2140	2215	2335	0030	0120	0225	0300
Mesh size(mm)	42	42	42	42	42	42	42	42	42	42	42
Surface temp. (°C)	13.1	13.1	13.3	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Weather	bc	bc	bc	bc	bc	bc	bc	bc	bc	bc	bc
Wind (force)	SSE-3	SSE-3	SSE-3	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm
<i>Pacific saury</i>	643	201	316	81	472	375	300	200	2160	360	400
<i>Japanese common squid</i>				1			2				
<i>Mackerels</i>											

Weather (bc: 25-75% clouded)

THE “OSHORO MARU” CRUISE 207
TO THE JAPAN SEA AND TO THE EAST CHINA SEA

IN OCTOBER-NOVEMBER 2009

1. Cruise Itinerary

Cruise 207

Departure from Hakodate	Oct. 22 , 2009
Start hydrographic research (OS09153)	22
Start bottom trawl research (OST0916)	29
Finish bottom trawl research (OST0918)	30
Finish hydrographic research (OS09170)	29
Arrival at Yeosu	31
Departure from Yeosu	Nov. 2
Return to Hakodate	6

Total coverage 2116.0miles

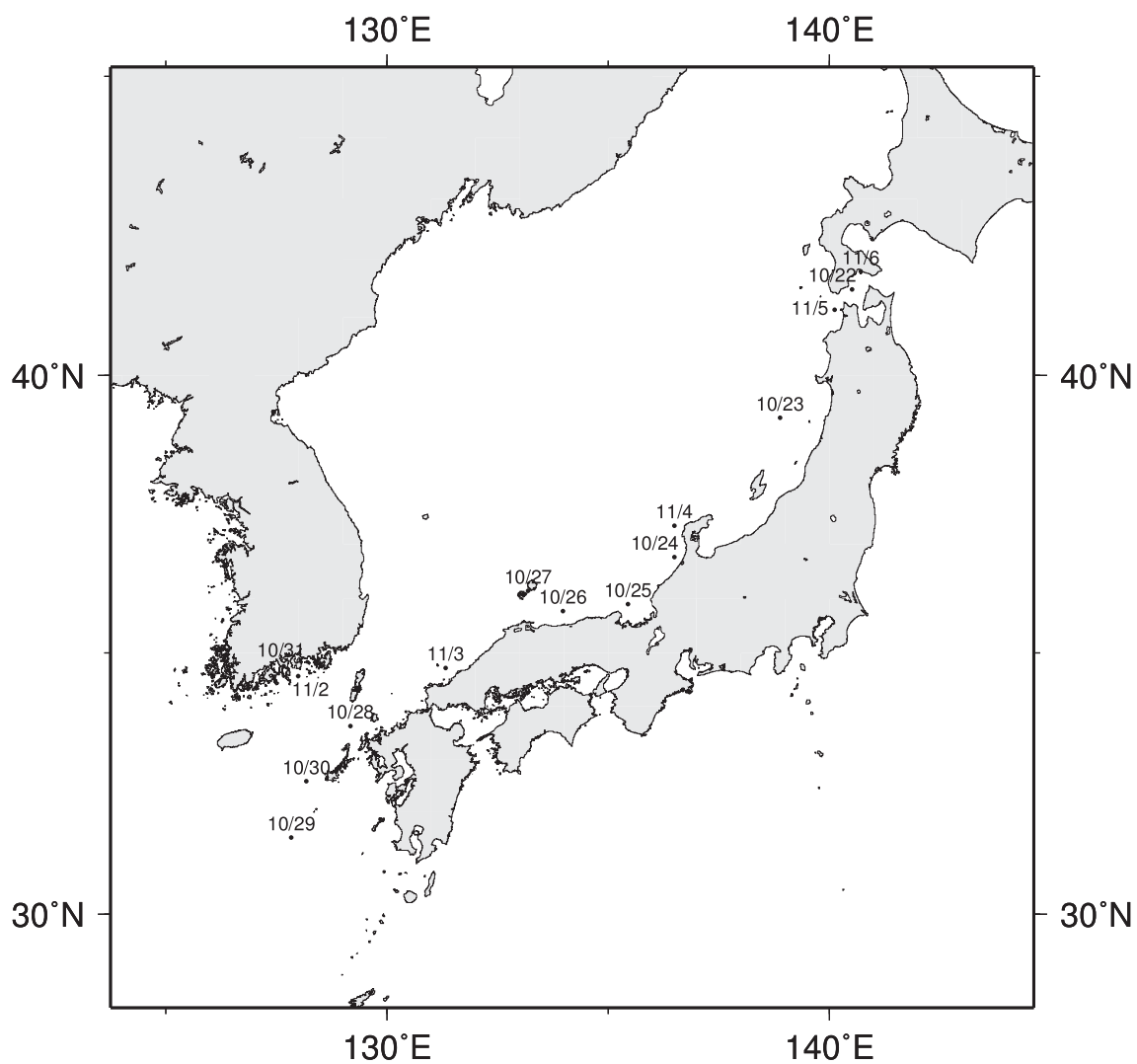


Figure 1: Noon position

2. Vessel Personnel

Captain:		Associate Professor	Shogo Takagi
Crew :	Chief Officer	Instructor	Yoshihiko Kamei
	First Officer	Instructor	Keiichiro Sakaoka
	Second Officer	Technical official	Naoki Hoshi
	Third Officer	Technical official	Takuzo Abe
	Chief Engineer	Instructor	Jyunichi Kimura
	And 24 men		

Cruise 207

Under Graduate instructor:	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing, Hokkaido University)	Toru Mukai
	Professor	(Laboratory of Marine Industrial Science and Technology, Hokkaido University)	Yasuzumi Fujimori
	Accosiate Professor	(Laboratory of Marine ecosystem Change Analysis, Hokkaido University)	Jun Yamamoto
Guest Scientist:	Professor	(Graduate School of Information Science and Technology, Hokkaido University)	Hidemi Watanabe
	Professor	(Graduate School of Information Science and Technology, Hokkaido University)	Hiroki Arimura
	Invitation professor	(faculty of fishing sciences, Chonnam National University)	Miyuki Hirose
	Science researcher	(Graduate School of Information Science and Technology, Hokkaido University)	Toshihiro Iwamori
	Teaching Assistant:		4 persons
	Graduate Students:		4 persons
	Under Graduate Students:		22 persons
	Total		67 persons

3. Items of Research

Hydrographic observations: Fig. 2 Table 1,2
 Biological research for fishes caught by bottom trawl research: Fig. 3 Table 3,4

4. 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 “Oshoro Maru”.

Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19).

Dynamic computations were made using a desk-top computer aboard the “Oshoro Maru”.

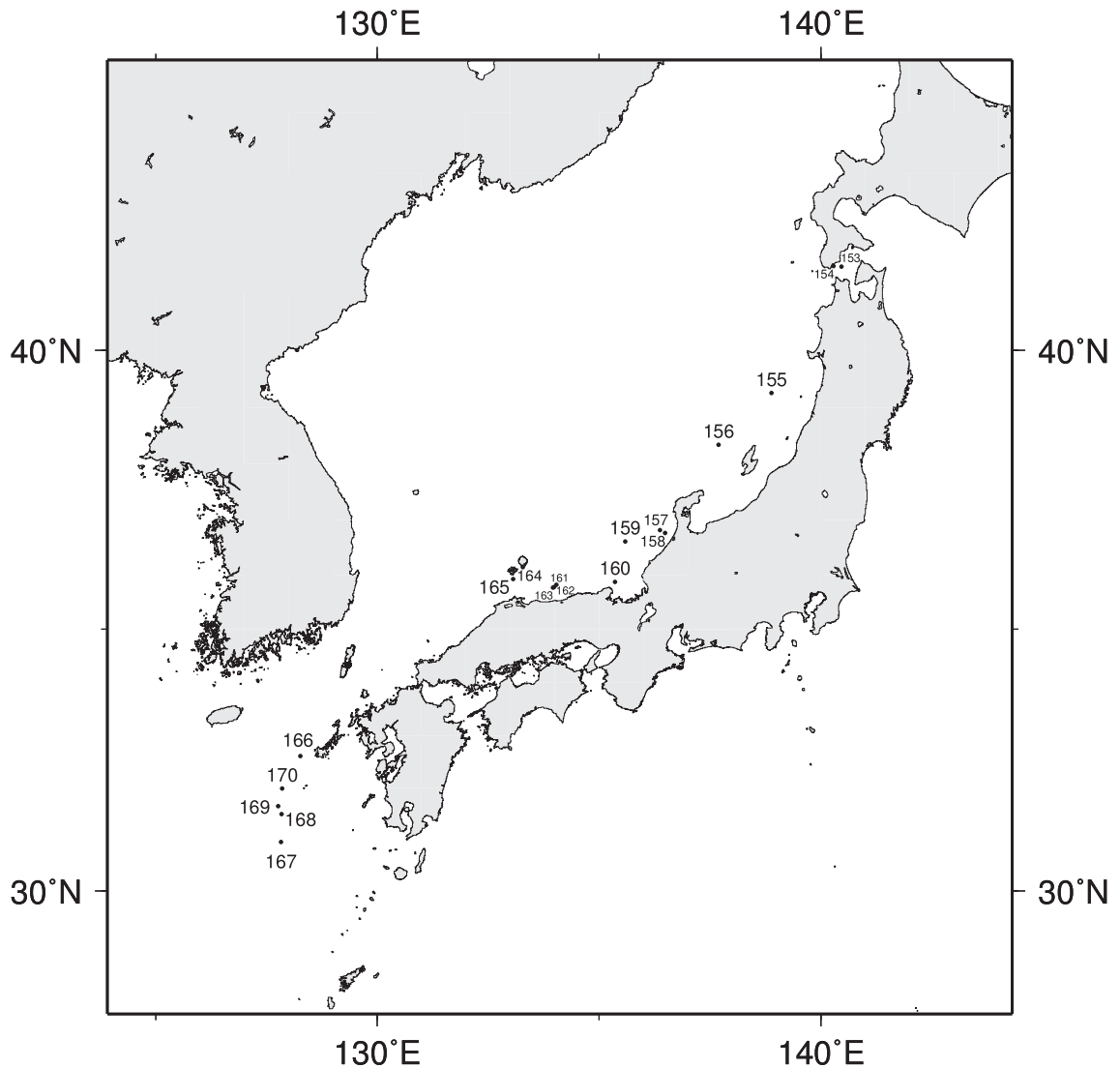


Figure 2: Oceanographic stations

Table 1: List of Oceanographic Stations

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS09153	41-26.3N	140-28.1E	10/22	1320	9	228	-	-	18.3	c	9Plus-0769
OS09154	41-27.0N	140-17.0E	10/22	1908	9	55	-	-	-	-	9Plus-0769
OS09155	39-15.7N	138-52.9E	10/23	1024	9	203	-	-	19.6	bc	9Plus-0769
OS09156	38-20.9N	137-41.8E	10/23	1945	9	1979	-	-	19	bc	9Plus-0769
OS09157	36-48.6N	136-22.2E	10/24	1006	9	203	-	-	20.6	c	9Plus-0769
OS09158	36-45.9N	136-29.4E	10/24	1208	9	76	-	-	-	c	9Plus-0769
OS09159	36-36.6N	135-35.0E	10/24	2006	9	390	-	-	20.1	c	9Plus-0769
OS09160	35-52.5N	135-21.4E	10/25	1006	9	205	-	-	21.3	c	9Plus-0769
OS09161	35-49.2N	134-02.4E	10/25	2016	9	250	-	-	20.9	c	9Plus-0769
OS09162	35-46.1N	133-57.6E	10/26	0804	9	254	-	-	20.9	c	9Plus-0769
OS09163	35-46.5N	133-58.7E	10/26	1211	9	254	-	-	20.8	c	9Plus-0769
OS09164	36-08.3N	133-17.1E	10/27	0624	9	63	-	-	20.5	bc	9Plus-0769
OS09165	35-55.5N	133-03.3E	10/27	1617	9	73	-	-	21.5	bc	9Plus-0769
OS09166	32-36.8N	128-16.1E	10/28	1945	9	300	-	-	23.5	bc	9Plus-0769
OS09167	30-57.6N	127-49.8E	10/29	0635	9	144	-	-	23.9	c	9Plus-0769
OS09168	31-30.1N	127-50.1E	10/29	1200	9	140	-	-	25	c	9Plus-0769
OS09169	31-39.1N	127-45.5E	10/29	1530	9	140	-	-	24.9	c	9Plus-0769
OS09170	31-59.4N	127-51.2E	10/29	1930	9	142	-	-	24.3	c	9Plus-0769

(*):Fixed position by Global Positioning system

Table 2: Oceanographic data

Station		OS09153	
Longitude		41-26.3N	
Latitude		140-28.1E	
Depth(m)		228	
Press.	Temp.	Sal.	SIG-T
5	18.375	33.517	24.045
10	18.369	33.519	24.049
20	18.373	33.516	24.045
30	18.438	33.547	24.053
40	18.454	33.579	24.073
50	18.411	33.589	24.092
75	17.044	33.909	24.667
100	16.022	34.013	24.984
125	13.423	34.196	25.686
150	12.167	34.204	25.940
200	9.954	34.167	26.310

Station		OS09156	
Longitude		38-20.9N	
Latitude		137-41.8E	
Depth(m)		1979	
Press.	Temp.	Sal.	SIG-T
5	19.473	33.677	23.891
10	19.467	33.676	23.891
20	19.445	33.683	23.903
30	19.424	33.691	23.914
40	19.405	33.693	23.920
50	15.570	34.012	25.086
75	10.573	34.194	26.224
100	7.160	34.140	26.719
125	5.342	34.117	26.936
150	3.859	34.088	27.075
200	2.355	34.072	27.200
250	1.608	34.071	27.257
300	1.180	34.071	27.286
400	0.778	34.072	27.313
500	0.624	34.073	27.323

Station		OS09159	
Longitude		36-36.6N	
Latitude		135-35.0E	
Depth(m)		390	
Press.	Temp.	Sal.	SIG-T
5	20.638	33.494	23.446
10	20.637	33.493	23.446
20	20.653	33.497	23.445
30	20.793	33.680	23.546
40	20.770	33.680	23.553
50	20.755	33.690	23.564
75	17.355	34.236	24.844
100	14.753	34.311	25.495
125	11.097	34.210	26.143
150	7.500	34.150	26.679
200	3.258	34.088	27.133
250	1.659	34.073	27.254
300	0.974	34.071	27.300

Station		OS09154	
Longitude		41-27.0N	
Latitude		140-17.0E	
Depth(m)		55	
Press.	Temp.	Sal.	SIG-T
5	15.521	33.762	24.904
10	15.492	33.768	24.915
20	15.505	33.764	24.909
30	15.484	33.769	24.917
40	15.481	33.770	24.919

Station		OS09157	
Longitude		36-48.6N	
Latitude		136-22.2E	
Depth(m)		203	
Press.	Temp.	Sal.	SIG-T
5	20.818	33.492	23.397
10	20.818	33.491	23.396
20	20.815	33.490	23.396
30	20.816	33.490	23.396
40	20.844	33.547	23.431
50	19.463	34.021	24.156
75	18.231	34.133	24.553
100	14.915	34.309	25.458
125	11.647	34.223	26.053
150	8.908	34.177	26.488

Station		OS09160	
Longitude		35-52.5N	
Latitude		135-21.4E	
Depth(m)		205	
Press.	Temp.	Sal.	SIG-T
5	21.218	33.544	23.328
10	21.215	33.543	23.328
20	21.206	33.542	23.330
30	21.204	33.542	23.331
40	21.206	33.542	23.330
50	21.208	33.542	23.330
75	21.209	33.542	23.329
100	18.768	34.129	24.415
125	12.210	34.244	25.962
150	7.333	34.151	26.703

Station		OS09155	
Longitude		39-15.7N	
Latitude		138-52.9E	
Depth(m)		203	
Press.	Temp.	Sal.	SIG-T
5	19.420	33.637	23.874
10	19.415	33.635	23.873
20	19.421	33.636	23.873
30	19.418	33.635	23.873
40	19.424	33.639	23.874
50	19.566	33.695	23.881
75	16.739	34.062	24.857
100	15.055	34.290	25.413
125	12.185	34.236	25.961
150	9.588	34.166	26.370
200	4.540	34.104	27.016

Station		OS09158	
Longitude		36-45.9N	
Latitude		136-29.4E	
Depth(m)		76	
Press.	Temp.	Sal.	SIG-T
5	20.895	29.617	20.430
10	20.974	33.583	23.424
20	20.975	33.472	23.339
30	20.910	33.508	23.384
40	20.845	33.516	23.407
50	20.800	33.503	23.410

Station		OS09161	
Longitude		35-49.2N	
Latitude		134-02.4E	
Depth(m)		250	
Press.	Temp.	Sal.	SIG-T
5	20.974	33.639	23.467
10	20.984	33.639	23.463
20	20.976	33.638	23.465
30	20.988	33.638	23.462
40	20.988	33.638	23.462
50	20.990	33.637	23.461
75	18.826	34.143	24.412
100	15.772	34.259	25.230
125	11.700	34.214	26.036
150	8.400	34.173	26.564
200	1.922	34.077	27.238

Station	OS09162		
Longitude	35-46.1N		
Latitude	133-57.6E		
Depth(m)	254		
Press.	Temp.	Sal.	SIG-T
5	21.099	33.674	23.459
10	21.100	33.673	23.459
20	21.100	33.674	23.459
30	21.102	33.673	23.458
40	21.105	33.673	23.457
50	21.106	33.673	23.457
75	21.080	33.685	23.473
100	17.126	34.239	24.901
125	12.394	34.270	25.947
150	3.496	34.085	27.108
200	1.146	34.072	27.289

Station	OS09163		
Longitude	35-46.5N		
Latitude	133-58.7E		
Depth(m)	254		
Press.	Temp.	Sal.	SIG-T
5	21.010	33.648	23.464
10	21.033	33.664	23.470
20	21.017	33.661	23.472
30	21.020	33.668	23.476
40	21.020	33.669	23.477
50	21.027	33.670	23.476
75	20.374	33.878	23.809
100	17.001	34.267	24.953
125	11.561	34.225	26.070
150	3.143	34.072	27.131
200	1.244	34.073	27.284

Station	OS09164		
Longitude	36-08.3N		
Latitude	133-17.1E		
Depth(m)	63		
Press.	Temp.	Sal.	SIG-T
5	20.925	33.736	23.553
10	20.925	33.737	23.554
20	20.927	33.735	23.552
30	20.927	33.734	23.552
40	20.926	33.734	23.552
50	20.928	33.734	23.551

Station	OS09165		
Longitude	35-55.5N		
Latitude	133-03.3E		
Depth(m)	73		
Press.	Temp.	Sal.	SIG-T
5	21.792	33.853	23.406
10	21.792	33.853	23.405
20	21.779	33.854	23.410
30	21.730	33.841	23.414
40	21.689	33.828	23.416
50	21.673	33.826	23.418

Station	OS09166		
Longitude	32-36.8N		
Latitude	128-16.1E		
Depth(m)	300		
Press.	Temp.	Sal.	SIG-T
5	23.650	34.235	23.167
10	23.556	34.226	23.188
20	23.100	34.196	23.297
30	23.058	34.199	23.311
40	23.012	34.204	23.328
50	22.535	34.260	23.507
75	20.851	34.438	24.108
100	18.484	34.491	24.764
125	17.379	34.560	25.087
150	15.818	34.557	25.449
200	14.118	34.516	25.789
250	12.193	34.461	26.134
300	11.695	34.449	26.219

Station	OS09167		
Longitude	30-57.6N		
Latitude	127-49.8E		
Depth(m)	144		
Press.	Temp.	Sal.	SIG-T
5	24.061	34.200	23.020
10	24.054	34.199	23.021
20	24.060	34.199	23.019
30	24.064	34.199	23.018
40	24.079	34.206	23.019
50	24.084	34.209	23.019
75	23.863	34.241	23.109
100	20.664	34.546	24.241
125	18.504	34.588	24.833

Station	OS09168		
Longitude	31-30.1N		
Latitude	127-50.1E		
Depth(m)	140		
Press.	Temp.	Sal.	SIG-T
5	24.236	34.163	22.940
10	24.217	34.165	22.947
20	24.208	34.172	22.955
30	24.186	34.177	22.965
40	24.186	34.186	22.972
50	24.176	34.202	22.987
75	23.626	34.288	23.214
100	21.062	34.533	24.123
125	18.567	34.587	24.816

Station	OS09169		
Longitude	31-39.1N		
Latitude	127-45.5E		
Depth(m)	140		
Press.	Temp.	Sal.	SIG-T
5	24.283	34.221	22.970
10	24.266	34.220	22.974
20	24.259	34.222	22.978
30	24.231	34.224	22.988
40	24.207	34.224	22.994
50	24.194	34.224	22.998
75	24.102	34.220	23.023
100	21.180	34.509	24.072
125	18.723	34.583	24.774

Station	OS09170		
Longitude	31-59.4N		
Latitude	127-51.2E		
Depth(m)	142		
Press.	Temp.	Sal.	SIG-T
5	24.213	34.188	22.965
10	24.210	34.188	22.966
20	24.082	34.209	23.020
30	24.069	34.214	23.028
40	24.022	34.234	23.057
50	24.005	34.237	23.064
75	23.966	34.245	23.082
100	19.184	34.537	24.622
125	16.592	34.576	25.286

5. Data on bottom trawl research

Three operations of the stern otter bottom trawl were carried out. These operations were supervised by the captain, were conducted by deck officer, crew, research staff and cadets of the "Oshoro Maru".

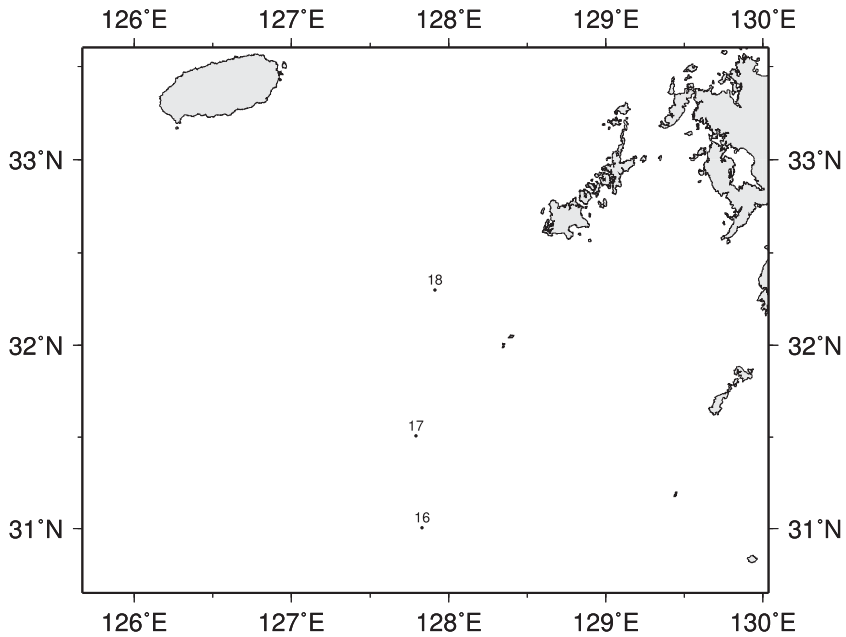


Figure 3: Locations of bottom trawl research

Table 3: Data on bottom trawl research during the "Oshoro Maru" Cruise #207

No. of research	Date and time of net tow (S.M.T.)		Position		Direction of tow	Speed of tow(K' t)	Bottom depth(m)	Wr	Wind (force)
			Lat.(N)	Long.(E)					
OST0916	29-Oct	0720-0920	31-00.3	127-49.8	000	3.9	149	bc	East-3
OST0917	29-Oct	1242-1445	31-30.4	127-47.6	270-000	4.0	138	bc	Calm
OST0918	30-Oct	0725-0804	32-17.9	127-54.8	178	3.5	150	bc	Calm

Wr.: Weather (bc: 25-75% clouded)

Table 4: Data on catches by bottom trawl research

Japanese name	Scientific Name	OST 0916		OST 0917		OST 0918	
		Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)
akaamadai	<i>Branchiostegus japonicus</i>	1	1.2				
akamutu	<i>Peristedion orientale</i>	10	1.2	1	0.1	5	0.4
anko	<i>Lophiomus setigerus</i>			1	0.2		
izukasago	<i>Scorpaena neglecta</i>	65	20.5	31	11.2		
ibodai	<i>Scorpaenoides</i>	6	1.1	1	0.1		
ukkarikasago	<i>Sebastiscus tertius</i>			2	0.3		
umazurahagi	<i>Thamnaconus modestus</i>					2	0.9
akagutu	<i>Halieutaea stellata</i>	1	0.2				
kaiwari	<i>Synagrops japonicus</i>	93	5.7			10	1.3
kagamidai	<i>Psenopsis anomala</i>	1	0.2				
kagokakidai	<i>Scorpaena onaria</i>	3	0.8				
kasago	<i>Sebastiscus marmoratus</i>	1	0.6				
onikanagashira	<i>Lepidotrigla kishinouyei</i>					11	1.1
kanagashira sp.	<i>Lepidotrigla</i> sp.			190	7.6		
kanado	<i>Loligo edulis</i>	327	14.5			9	0.4
kawaragarei	<i>Poecilopsetta plinthus</i>	1	0.1				
kidai	<i>Lepidotrigla microptera</i>	285	75	248	65	41	12.8
chikamekintoki	<i>Helicolenus hilgendorfi</i>	2	0.7	7	0.7	1	0.1
kochi sp.	<i>Platycephalus</i> sp.					1	0.1
sagifue	<i>Macroramphosus scolopax</i>	133	2.5	1	0.1		
sarasahagi	<i>Thamnaconus hypargyreus</i>			2	0.2		
shikishimahanadai	<i>Malakichthys wakiyae</i>					2	0.2
tachiuuo	<i>Navodon modestus</i>	1	0.6				
koubedarumagarei	<i>Crossorhombus kobensis</i>	1	0.1				
shitabirame sp	<i>Cynoglossus joyneri</i> sp.			1	0.1		
chikamedarumagarei	<i>Engyprosonon multisquama</i>	5	0.5				
natuharigochi	<i>Hoplichthys langsdorfii</i>			2	0.1		
hime	<i>Monocentris japonica</i>	134	8.2	23	1.9	4	0.5
himeji	<i>Hoplobrotula armata</i>			5	0.3		
beniteguri	<i>Rexea prometheoides</i>	1	0.1	1	0.1	1	0.1
hobo	<i>Chelidonichthys spinosus</i>	3	1				
maaji	<i>Antigonia capros</i>	890	41	320	15.2	6	0.2
maeso	<i>Saurida macrolepis</i>	1	0.5				
masaba	<i>Pleuronichthys comutus</i>	2	0.7				
matsukasauo	<i>Chelidoperca hirundinacea</i>					1	0.1
matodai	<i>Histiogaster typus</i>	54	10.4	18	2.2	2	0.2
midorifusaankou	<i>Upeneus bensasi</i>	1	0.1				
meitagarei	<i>Pleuronichthys cornutus</i>			1	0.1		
yatumedarumagarei	<i>Tosarhombus octoculatus</i>	1	0.2				
yoritofugu	<i>Sphoeroides pachygaster</i>	10	5.2	6	2.4		
kurosabafugu	<i>Lagocephalus gloveri</i>			1	0.7		
uchiwaebi	<i>Ibacus ciliatus</i>	3	0.4	8	0.9	3	0.4
hiratamegani	<i>Rajidae</i>	1930	143.8	1900	140.6	38	2.6
taiwangazami	<i>Coelorhynchus multispinulosus</i>			3	0.3		
kensakiika	<i>Loligo edulis edulis</i> Hoyle	23	2.3	53	4.1	16	0.9
surumeika	<i>Todarodes pacificus</i> Steenstrup	21	5.8	54	20.7	7	2.4
kouika	<i>Sepia (Platysepia) esculenta</i>					1	0.1
gangiei	<i>Dipturus kwangtungensis</i>	7	4.7	8	10.4		
komonnkasube sp.	<i>Okamejei kenojei</i> sp.					3	1.4
nekozame	<i>Heterodontus japonicus</i>					2	0.2
Suketoudara	<i>Theragra chalcogramma</i>	4017	349.9	2888	285.6	166	26.4

THE “OSHORO MARU” CRUISE 209
TO WATERS EAST OF HONSHU AND TO THE OGASAWARA ISLANDS

IN DECEMBER 2009

1. Cruise Itinerary

Cruise 209

Departure from Hakodate	Dec. 8, 2009
Arrival at Yokohama	10
Departure from Yokohama	13
Start hydrographic research (OS09171)	15
Finish hydrographic research (OS09174)	16
Arrival at Futami	17
Departure from Futami	19
Arrival at Ofunato	22

Total coverage 1922.3miles

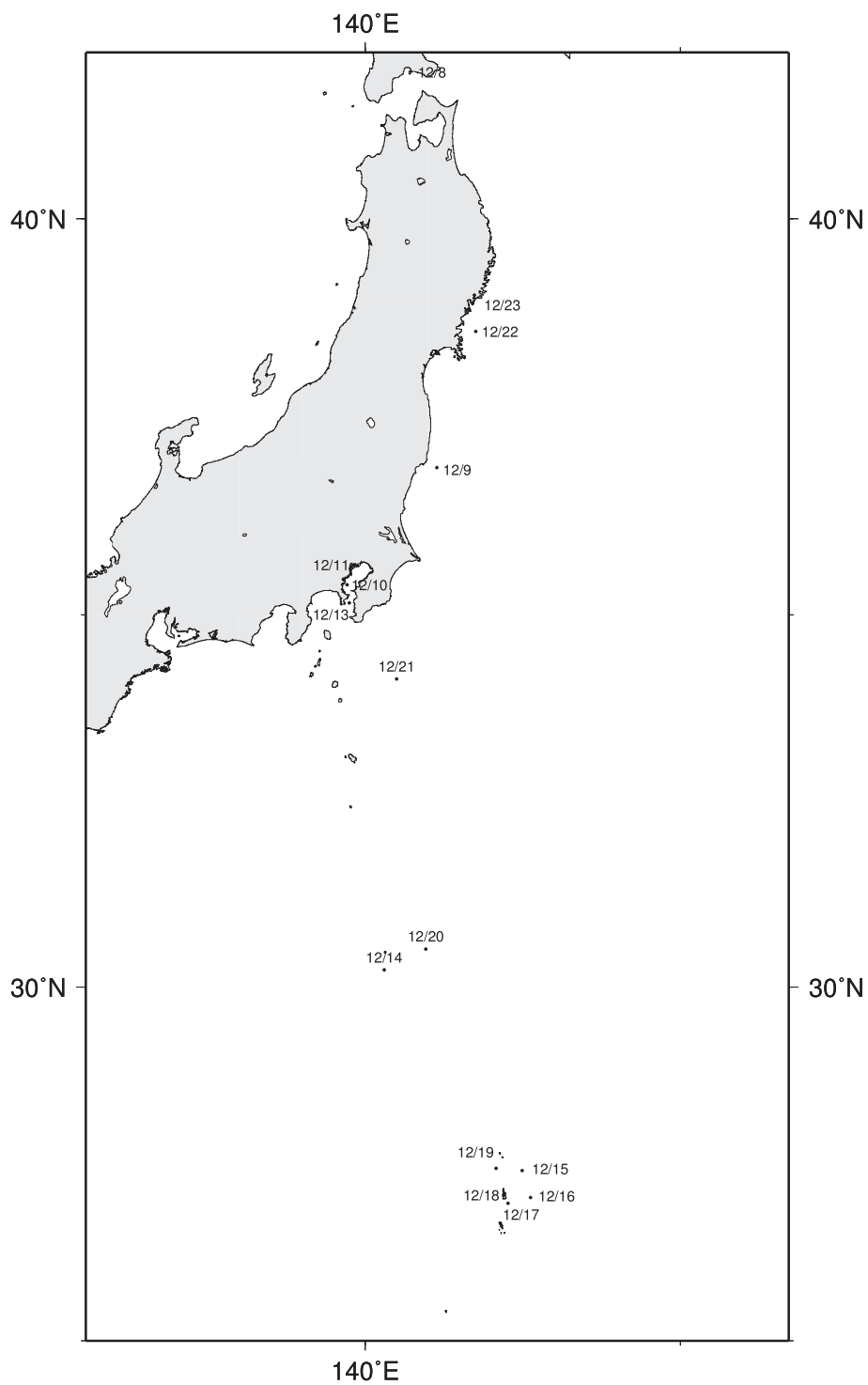


Figure 1: Noon position

2. Vessel Personnel

Captain:		Associate Professor	Shogo Takagi
Crew :	Chief Officer	Instructor	Yoshihiko Kamei
	First Officer	Instructor	Keiichiro Sakaoka
	Second Officer	Technical official	Naoki Hoshi
	Third Officer	Technical official	Takuzo Abe
	Chief Engineer	Instructor	Jyunichi Kimura
	And 24 men		

Cruise 209

Under Graduate instructor:	Associate Professor	(Department of Marine Science and Resources, Nihon University)	Takahito Kojima
	Associate Professor	(Teikyo University of Science and Technology)	Kyoichi Mori
	Associate Professor	(Trainig ship Oshoro maru, Hokkaido University)	Yoshiyuki Kajiware
	Lecturer	(Department of Marine Science and Resources, Nihon University)	Miwa Suzuki
Guest Scientist:	Professors emeritus	(Division of Marine Bioresource and Environmental Science, Hokkaido University)	Kazuhiro Nakaya
	Professor	(Loboratory of Marine Bioresources Chemistry, Hokkaido University)	Ryuichi Sakai
	Researcher	(National Museum of nature and Science)	Tsunemi Kubodera
	Post Doctor	(Department of Earth and Planetary Science, University of Tokyo)	Maki Nagasawa
	Post Doctor	(Department of Earth and Planetary Science, University of Tokyo)	Naoki Furuichi
	Technical Assistant	(Laboratory of Marine Bioresources Chemistry, Hokkaido University)	Satoko Matsunaga
	Teaching Assistant:		1 Person
	Graduate Students:		5 Persons
	Under Graduate Students:		24 Persons
		(Department of Marine Science and Resources, Nihon University)	20 Persons
		(Teikyo University of Science and Technology)	4 Persons
	Total		69 Persons

3. Items of Research

Hydrographic observations:	Fig. 2 Table 1,2
Biological research for fishes caught by vertical long-line:	Fig. 3 Table 3

4. 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 “Oshoro Maru”.

Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19).

Dynamic computations were made using a desk-top computer aboard the “Oshoro Maru”.

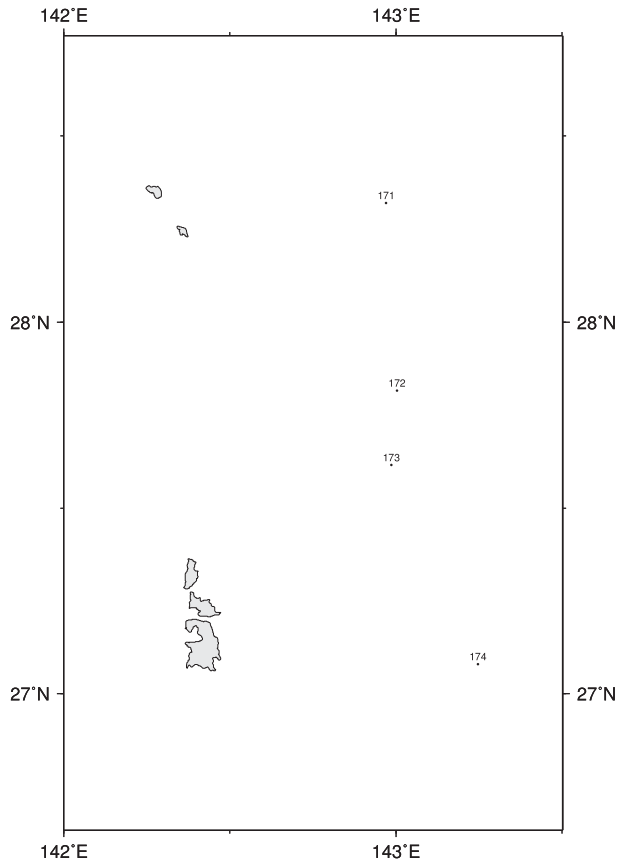


Figure 2: Oceanographic stations

Table 1: List of Oceanographic Stations

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS09171	27-39.6N	142-29.1E	12/15	0420	9	1335	-	-	23.2	bc	XBT
OS09172	27-24.5N	142-30.1E	12/15	0805	9	2030	2	37.8	22.6	bc	9Plus-0769
OS09173	27-18.5N	142-29.6E	12/15	1455	9	1760	-	-	-	c	XBT
OS09174	27-02.4N	142-37.4E	12/16	1040	9	2100	2	37.4	23.5	bc	XBT

(*):Fixed position by Global Positioning system

Table 2: Oceanographic data

Station OS09171				Station OS09172				Station OS09173			
Longitude 27-39.6N				Longitude 27-24.5N				Longitude 27-18.5N			
Latitude 142-29.1E				Latitude 142-30.1E				Latitude 142-29.6E			
Depth(m) 1335				Depth(m) 2030				Depth(m) 1760			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	23.591	-	-	5	23.604	34.675	23.514	5	23.770	-	-
10	23.590	-	-	10	23.603	34.675	23.514	10	23.770	-	-
20	23.572	-	-	20	23.605	34.675	23.513	20	23.760	-	-
30	23.570	-	-	30	23.603	34.675	23.514	30	23.750	-	-
40	23.570	-	-	40	23.601	34.675	23.514	40	23.750	-	-
50	23.580	-	-	50	23.603	34.674	23.513	50	23.740	-	-
75	23.580	-	-	75	21.628	34.707	24.100	75	23.710	-	-
100	21.472	-	-	100	20.447	34.743	24.448	100	22.359	-	-
125	20.060	-	-	125	19.327	34.740	24.739	125	20.490	-	-
150	19.018	-	-	150	18.897	34.747	24.855	150	19.520	-	-
200	17.981	-	-	200	18.193	34.748	25.032	200	18.350	-	-
250	17.151	-	-	250	17.667	34.748	25.161	250	17.720	-	-
300	16.490	-	-	300	16.894	34.722	25.327	300	16.643	-	-
400	13.663	-	-	400	14.768	34.573	25.694	400	14.173	-	-
500	10.500	-	-	500	11.435	34.335	26.179	500	11.439	-	-
600	7.779	-	-	600	9.186	34.190	26.455	600	8.409	-	-
700	6.164	-	-	700	6.356	34.114	26.807	700	6.330	-	-
				800	5.122	34.157	26.993				
				900	4.251	34.253	27.166				
				1000	3.632	34.342	27.300				

Station OS09174			
Longitude 27-02.4N			
Latitude 142-37.4E			
Depth(m) 2100			
Press.	Temp.	Sal.	SIG-T
5	23.710	-	-
10	23.710	-	-
20	23.710	-	-
30	23.700	-	-
40	23.700	-	-
50	23.702	-	-
75	23.710	-	-
100	23.062	-	-
125	20.570	-	-
150	19.872	-	-
200	18.601	-	-
250	17.431	-	-
300	16.730	-	-
400	14.113	-	-
500	11.079	-	-
600	8.600	-	-
700	6.800	-	-

5. Data on vertical long-line research

Three operations using a vertical long-line were performed. The gear was comprised of a main line, a weight which attached to end of the main line, a buoy which attached to another end of the main line, and six branch lines (18m-for tuna and 4 m-for squid) which attached to the main line. Seven types of main lines (220, 270, 400, 500, 600, 700 and 800 m) were used for the research. These operations were supervised by the captain, and were conducted by deck officers, crews, cadets, and research staff.

Group		A	B	C	D	E	F	E
Main line	(m)	220	270	400	500	600	700	800
Three branch line(for tuna)	(m)	18	18	18	18	18	18	18
Three branch line(for squid)	(m)	4	4	4	4	4	4	4

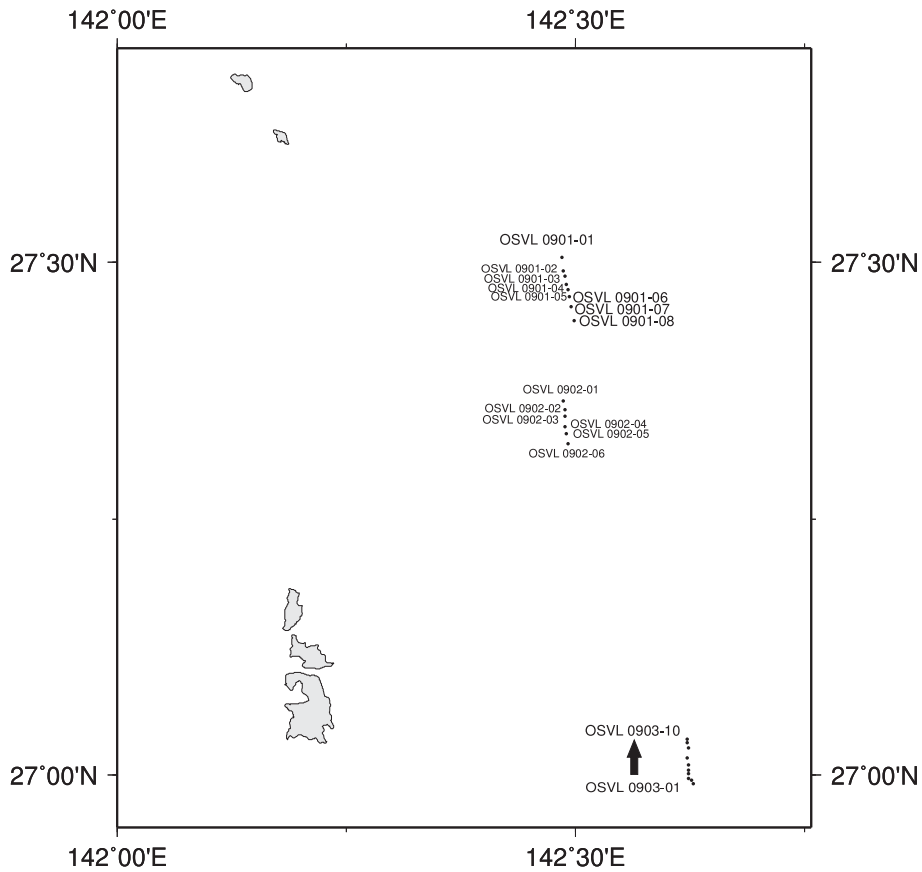


Figure 3: Locations of vertical long-line research

Table 3. Data on vertical long line research

No. of research		OSVL 0901-01	OSVL 0901-02	OSVL 0901-03	OSVL 0901-04	OSVL 0901-05	OSVL 0901-06	OSVL 0901-07	OSVL 0901-08
Date		15-Dec	15-Dec	15-Dec	15-Dec	15-Dec	15-Dec	15-Dec	15-Dec
position of	Lat. (N)	27-30.3	27-29.5	27-29.2	27-28.7	27-28.4	27-28.0	27-27.4	27-26.6
line set	Long. (E)	142-29.1	142-29.2	142-29.3	142-29.4	142-29.5	142-29.6	142-29.7	142-29.9
Time	Line set	0559-0605	0610-0614	0616-0620	0622-0625	0627-0630	0634-0640	0643-0650	0652-0658
(S.M.T.)	Line haul	1228-1240	1207-1217	1149-1158	1025-1030	1012-1017	1117-1140	1046-1106	0937-0958
Length of main line(m)		600	500	400	270	220	800	700	600
Depth(m)		1524	1564	1655	1780	1850	1897	1840	1794
Surface temp. (°C)		23.6	23.6	23.4	23.4	23.4	23.4	23.4	23.4
Wether		bc	bc	bc	bc	bc	bc	bc	bc
Wind		NNW4	NNW4	NNW4	NNW4	NNW4	NNW4	North4	North4
Flying squid		2		1					
Diamondback squid									
Sickle pomfret									
No. of research		OSVL 0902-01	OSVL 0902-02	OSVL 0902-03	OSVL 0902-04	OSVL 0902-05	OSVL 0902-06	OSVL 0903-01	OSVL 0903-02
Date		15-Dec	15-Dec	15-Dec	15-Dec	15-Dec	15-Dec	16-Dec	16-Dec
position of	Lat. (N)	27-21.9	27-21.4	27-21.0	27-20.4	27-20.0	27-19.4	26-59.5	26-59.7
line set	Long. (E)	142-29.2	142-29.3	142-29.3	142-29.3	142-29.4	142-29.5	142-37.7	142-37.6
Time	Line set	1309-1316	1319-1324	1325-1334	1325-1340	1342-1350	1351-1356	0907-0912	0913-0918
(S.M.T.)	Line haul	1830-1902	1805-1818	1725-1740	1656-1715	1617-1649	1537-1602	1633-1643	1614-1626
Length of main line(m)		500	500	400	400	700	600	400	400
Depth(m)		1840	1890	1760	1760	1780	1770	1988	1988
Surface temp. (°C)		23.4	23.6	23.4	23.6	23.5	23.5	23.6	23.6
Wether		c	c	c	bc	bc	bc	bc	bc
Wind		NNW3	NNW3	North2	North2	North3	North3	North5	SSE5
Flying squid		2	1	1	2				
Diamondback squid		1							
Sickle pomfret		1							
No. of research		OSVL 0903-03	OSVL 0903-04	OSVL 0903-05	OSVL 0903-06	OSVL 0903-07	OSVL 0903-08	OSVL 0903-09	OSVL 0903-10
Date		16-Dec	16-Dec	16-Dec	16-Dec	16-Dec	16-Dec	16-Dec	16-Dec
position of	Lat. (N)	26-59.8	27-00.1	27-00.3	27-00.6	27-01.0	27-01.6	27-01.9	27-02.1
line set	Long. (E)	142-37.4	142-37.4	142-37.4	142-37.4	142-37.3	142-37.4	142-37.3	142-37.3
Time	Line set	0919-0923	0924-0929	0929-0935	0935-0942	0943-1002	1005-1013	1015-1021	1024-1032
(S.M.T.)	Line haul	1555-1608	1534-1546	1459-1520	1431-1447	1400-1417	1711-1748	1316-1345	1228-1259
Length of main line(m)		400	500	500	500	600	700	600	800
Depth(m)		1988	1988	1950	1900	1880	1996	2020	2060
Surface temp. (°C)		23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6
Wether		bc	bc	bc	bc	bc	bc	bc	bc
Wind		SSE5	SSE5	SSE5	SSE5	SSE5	SSE5	SSE5	SSE5
Flying squid		1		3	2	2			
Diamondback squid									
Sickle pomfret									

THE “OSHORU MARU” CRUISE 210
TO THE COAST OF SANRIKU

IN DECEMBER 2009

1. Cruise Itinerary

Cruise 210

Departure from Ofunato	Dec. 23, 2009
Start hydrographic research (OS09175)	24
Finish hydrographic research (OS09178)	25
Return to Ofunato	26
Departure from Ofunato	26
Return to Hakodate	27

Total coverage 448.5 miles 5 days at sea

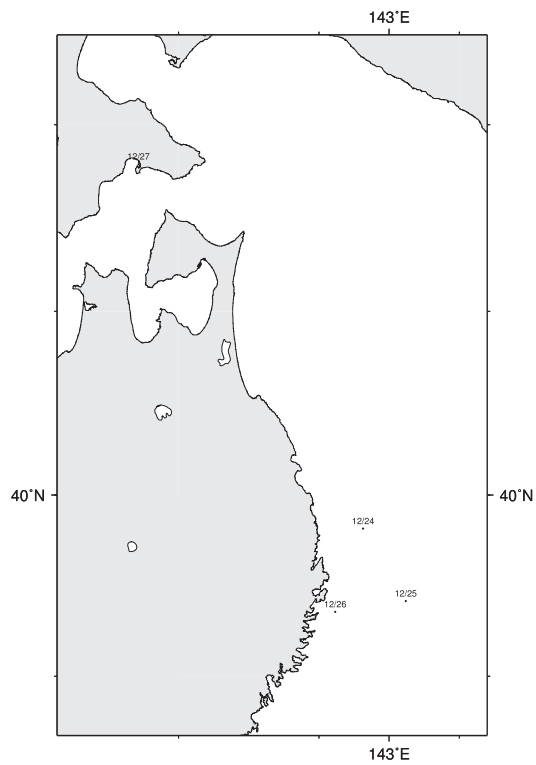


Figure 1: Noon position

2. Vessel Personnel

Captain:		Associate Professor	Shogo Takagi
Crew :	Chief Officer	Instructor	Yoshihiko Kamei
	First Officer	Instructor	Keiichi Sakaoka
	Second Officer	Technical official	Naoki Hoshi
	Third Officer	Technical official	Takuzo Abe
	Chief Engineer	Instructor	Jyunichi Kimura
	And 24 men		

Cruise 210

Under Graduate instructor:	Professor	(School of Marine Biosciences, Kitasato University)	
			Ryousuke Kado
	Lecturer	(School of Marine Biosciences, Kitasato University)	
			Yuichiro Yamada
	Associate Professor	(Trainig ship Oshoro maru, Hokkaido University)	
			Yoshiyuki Kajiware
	Teaching Assistant:		3 Person
	Under Graduate Students:		61 Persons
	Total		97 Persons

3. Items of Research

Hydrographic observations: Fig. 2 Table 1,2

4. 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 “Oshoro Maru”.

Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19).

Dynamic computations were made using a desk-top computer aboard the “Oshoro Maru”.

Table 1: List of Oceanographic Stations

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS09175	39-59.7N	143-00.4E	12/24	0357	9	1306	-	-	9.5	bc	9Plus-0769
OS09176	39-47.2N	142-19.5E	12/24	1405	9	506	-	-	-	bc	9Plus-0769
OS09177	39-31.1N	142-44.1E	12/25	0832	9	1370	3	12	12.1	c	9Plus-0769
OS09178	39-18.0N	142-26.5E	12/25	1258	9	995	3	14	11	c	9Plus-0769

(*):Fixed position by Global Positioning system

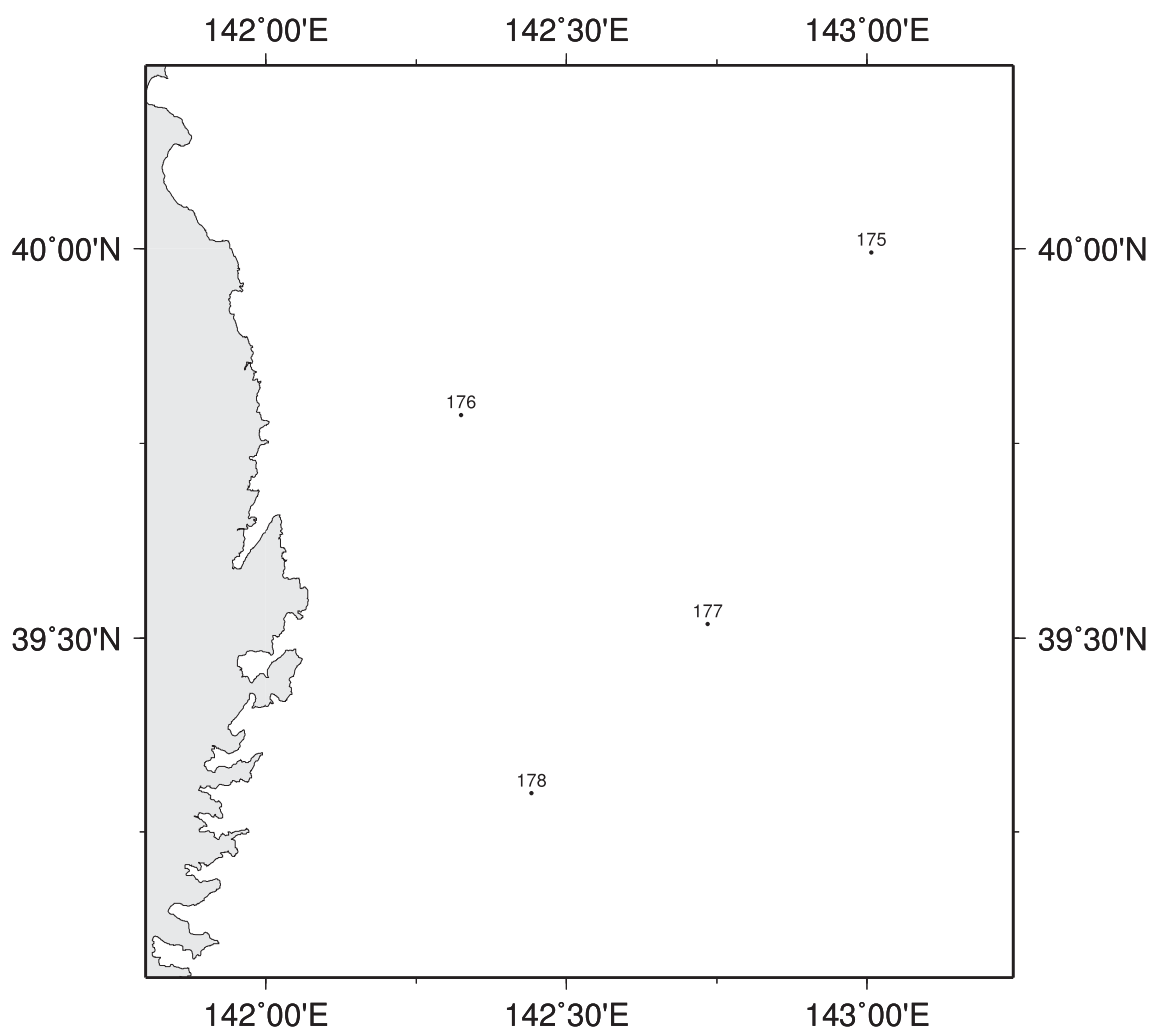


Figure 2: Oceanographic stations

Table 2: Oceanographic data

Station		OS09175	
Longitude		39-59.7N	
Latitude		143-00.4E	
Depth(m)		1306	
Press.	Temp.	Sal.	SIG-T
5	9.849	33.704	25.966
10	9.186	33.637	26.022
20	8.723	33.587	26.056
30	8.200	33.534	26.093
40	7.838	33.495	26.116
50	7.508	33.456	26.132
75	7.070	33.490	26.220
100	5.154	33.503	26.471
125	4.583	33.525	26.552
150	4.185	33.536	26.603
200	3.328	33.564	26.709
250	2.935	33.589	26.764
300	3.051	33.687	26.833
400	3.278	33.846	26.939
500	3.389	34.029	27.074

Station		OS09176	
Longitude		39-47.2N	
Latitude		142-19.5E	
Depth(m)		506	
Press.	Temp.	Sal.	SIG-T
5	9.998	33.815	26.027
10	9.999	33.815	26.027
20	9.868	33.792	26.032
30	9.541	33.746	26.049
40	9.257	33.700	26.059
50	9.090	33.673	26.065
75	8.003	33.509	26.103
100	7.887	33.494	26.108
125	7.699	33.464	26.112
150	7.278	33.412	26.130
200	6.258	33.550	26.375
250	4.452	33.531	26.571
300	3.619	33.555	26.674
400	3.078	33.716	26.853

Station		OS09177	
Longitude		39-31.1N	
Latitude		142-44.1E	
Depth(m)		1370	
Press.	Temp.	Sal.	SIG-T
5	12.556	33.964	25.679
10	12.569	33.964	25.676
20	12.579	33.964	25.674
30	12.580	33.964	25.674
40	12.576	33.964	25.674
50	12.570	33.962	25.674
75	12.554	33.961	25.676
100	10.957	33.809	25.856
125	9.540	33.841	26.124
150	7.587	33.764	26.364
200	7.231	33.961	26.569
250	3.567	33.580	26.699
300	3.313	33.631	26.764
400	3.222	33.788	26.897
500	3.430	33.942	27.001

Station		OS09178	
Longitude		39-18.0N	
Latitude		142-26.5E	
Depth(m)		995	
Press.	Temp.	Sal.	SIG-T
5	11.781	33.869	25.752
10	11.336	33.830	25.804
20	10.223	33.758	25.944
30	9.177	33.621	26.010
40	8.890	33.603	26.042
50	8.642	33.576	26.060
75	8.020	33.504	26.096
100	7.906	33.529	26.133
125	7.297	33.531	26.221
150	6.081	33.533	26.383
200	4.332	33.569	26.614
250	3.398	33.561	26.700
300	3.015	33.606	26.771
400	3.243	33.795	26.901
500	3.328	33.920	26.993

PART II

USHIO MARU CRUISES

FROM JANUARY TO DECEMBER 2009

I. Crew List

Captain:		Hidekazu Yamaguchi (Cruise 161 - 166) Toshimi Meguro (Cruise 167 -)
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 (Cruise 161-166) Nagahide Yamane (Cruise 167 -)
	Boatswain	Yoshitaka Yoshida
	Jr. Boatswain	Yukio Tabata
	Quartermaster	Yutaka Takeda
	Sailor	Daisuke Sasaki (Cruise 161 - 166) Takahiro Kanazawa (Cruise 167 -)
	No.1 Oiler	Nobuyuki Sawada
	No.2 Oiler	Konichi Tomosugi
	Oiler	Akira Sugihara
	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 161

CRUISE 162

CRUISE 163

IN JANUARY-FEBRUARY 2009

1. Cruise Itinerary

Cruise 161

Departure from Hakodate	Jan.	16	, 2009
Start hydrographic research (US09001)		17	
Finish hydrographic research (US09016)		17	
Return to Hakodate		18	
Total coverage 188.2 miles			

Cruise 162

Departure from Hakodate	Jan.	26	, 2009
Start hydrographic research (US09017)		26	
Arrival at Fukushima		28	
Departure from Fukushima		29	
Finish hydrographic research (US09047)		29	
Return to Hakodate		30	
Total coverage 302.3 miles			

Cruise 163

Departure from Hakodate	Feb.	9	, 2009
Arrival at Usujiri		9	
Departure from Usujiri		10	
Retrieval ADCP system		10	
Start hydrographic research (US09048)		10	
Start trawl net research		10	
Arrival at Mori		10	
Departure from Mori		11	
Set Sediment trap system		11	
Finish trawl net research		11	
Arrival at Usujiri		11	
Departure from Usujiri		12	
Finish hydrographic research (US09062)		12	
Return to Hakodate		12	
Total coverage 227.4 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 161

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

Graduate Students:	Chair of Marine Bioresource Science:	2 persons
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Under Graduate Students:	Department of Marine Biological Science:	1 person
	Department of Marine Biology (Third grade) :	1 person

Cruise 162

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

Graduate Students:	Chair of Marine Bioresource Science:	2 persons
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Under Graduate Students:	Department of Marine Biological Science:	3 persons
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Cruise 163

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

Graduate Students:	Chair of Marine Bioresource Science:	3 persons
	Chair of Marine Environmental Science:	1 person

Under Graduate Students:	Department of Marine Biological Science:	5 persons
	Department of Fisheries Oceanography and Marine Science:	2 persons

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

Hydrographic work on deck and the data processing were made by the deck officers, crews, research staff and cadets of the “Ushio Maru”.

Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19).

Dynamic computations were made using a desk-top computer aboard the “Ushio Maru”.

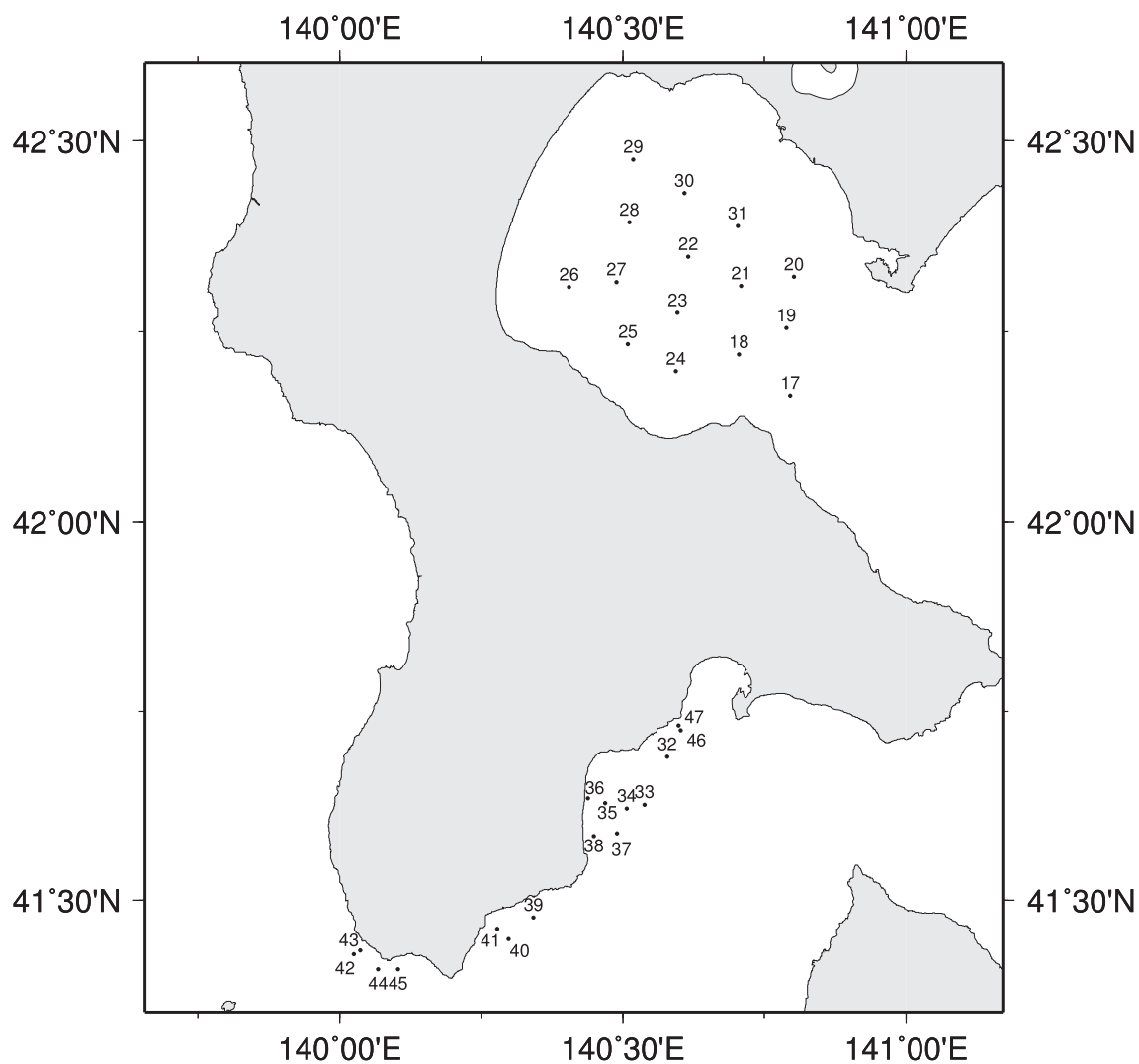


Figure 1: Oceanographic stations (Cruise 162)

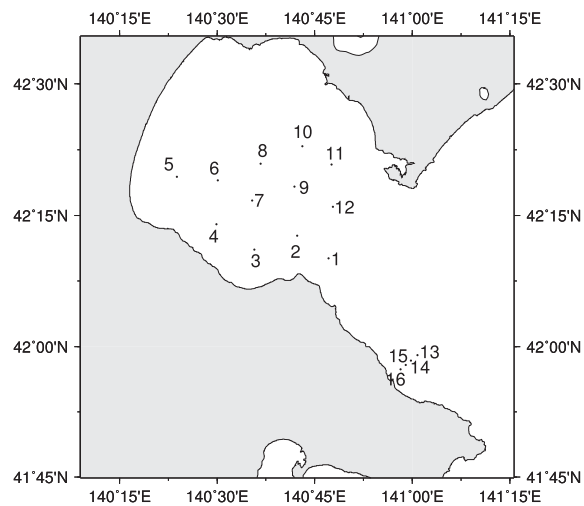


Figure 2: Oceanographic stations (Cruise 161)

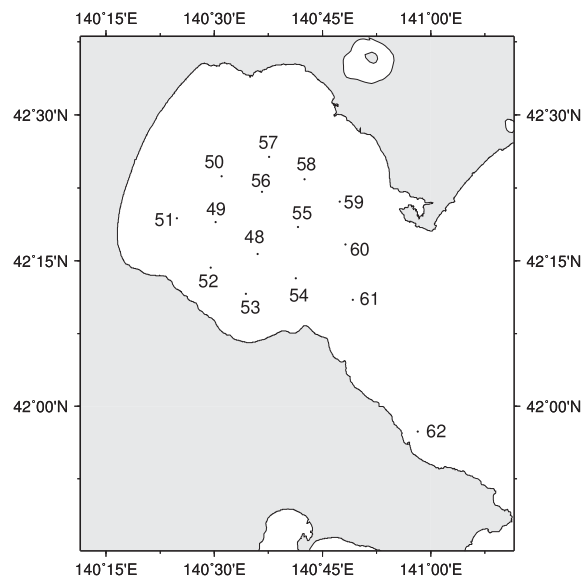


Figure 3: Oceanographic stations (Cruise 163)

Table 1: List of oceanographic stations

Cruise 161

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr. Bar. (hPa)
US09001	42-10.1	140-47.1	1/17	0708-0713	96	West-2	West-1	West-5	-0.4	4.6	bc 1020.5
US09002	42-12.7	140-42.3	1/17	0758-0803	93	NW -2	West-1	NW -4	-1.1	4.6	bc 1020.7
US09003	42-11.1	140-35.7	1/17	0902-0906	82	West-2	West-1	West-5	-0.7	5.4	bc 1021.4
US09004	42-14.0	140-29.9	1/17	0954-0958	79	West-2	West-1	West-5	0.3	5.2	bc 1022.2
US09005	42-19.4	140-23.8	1/17	1052-1056	59	West-2	West-1	West-5	1.0	5.7	bc 1022.5
US09006	42-19.0	140-30.1	1/17	1153-1158	93	West-2	West-1	West-5	0.1	5.4	bc 1022.6
US09007	42-16.7	140-35.4	1/17	1249-1254	92	WNW-2	West-1	WNW-5	0.8	5.6	bc 1022.5
US09008	42-20.9	140-36.7	1/17	1340-1344	88	West-3	West-1	West-5	1.4	5.3	bc 1022.2
US09009	42-18.3	140-41.9	1/17	1429-1433	66	WNW-3	West-1	WNW-5	0.5	5.4	bc 1022.6
US09010	42-22.9	140-43.1	1/17	1512-1516	60	West-3	West-1	West-5	1.5	5.7	bc 1022.8
US09011	42-20.8	140-47.6	1/17	1549-1553	53	WNW-3	West-1	WNW-5	0.3	4.8	bc 1023.6
US09012	42-16.0	140-47.8	1/17	1631-1635	70	West-3	West-1	West-5	0.8	5.7	bc 1023.7
US09013	41-59.0	141-00.8	1/17	1832-1837	96	West-2	NW -1	West-3	0.0	4.9	bc 1024.9
US09014	41-58.4	140-59.8	1/17	1843-1848	90	West-2	NW -1	West-3	-0.1	4.9	bc 1025.0
US09015	41-57.9	140-59.0	1/17	1853-1857	86	West-2	NW -1	West-4	-0.1	5.0	bc 1025.1
US09016	41-57.4	140-58.2	1/17	1903-1908	80	WNW-2	NW -1	WNW-4	-0.2	5.0	bc 1025.1

Cruise 162

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr. Bar. (hPa)
US09017	42-10.0	140-47.7	1/26	1406-1411	96	NW -1	ESE-1	NW -3	1.1	4.9	c 1016.6
US09018	42-13.2	140-42.3	1/26	1511-1515	91	NNW-1	ESE-1	NNW-3	-0.4	4.4	s 1017.0
US09019	42-15.3	140-47.3	1/26	1601-1605	74	NNW-1	ESE-1	NNW-3	-0.6	4.4	s 1017.6
US09020	42-19.3	140-48.1	1/26	1640-1644	60	NW -1	ESE-1	NW -3	-1.1	4.1	s 1018.1
US09021	42-18.6	140-42.5	1/27	0653-0657	64	NW -3	NW -1	NW -5	-2.4	4.7	c 1023.6
US09022	42-20.9	140-36.9	1/27	0738-0743	88	NNW-2	NW -1	NNW-4	-3.2	5.0	bc 1024.1
US09023	42-16.5	140-35.8	1/27	0834-0839	92	NW -1	NW -1	NW -3	-2.8	5.0	bc 1024.6
US09024	42-11.9	140-35.6	1/27	0942-0946	84	NW -2	NW -1	NW -4	-2.2	4.3	bc 1025.3
US09025	42-14.0	140-30.5	1/27	1040-1044	81	West-2	NW -1	West-4	-1.7	4.7	bc 1025.6
US09026	42-18.5	140-24.3	1/27	1133-1137	61	NW -1	NW -1	NW -3	-1.3	4.3	bc 1025.2
US09027	42-18.9	140-29.3	1/27	1224-1229	90	NW -3	NW -1	NW -6	-1.3	5.0	s 1025.1
US09028	42-23.6	140-30.7	1/27	1329-1334	96	West-2	NW -1	NW -5	-1.1	5.0	bc 1025.1
US09029	42-28.5	140-31.1	1/27	1442-1446	78	NNW-2	NW -1	NNW-4	-2.2	4.0	bc 1026.0
US09030	42-25.9	140-36.5	1/27	1525-1529	87	NW -1	SW -1	NW -3	-0.7	5.0	bc 1026.2
US09031	42-23.3	140-42.2	1/27	1608-1612	65	West-3	SW -1	West-6	-1.4	4.4	bc 1027.0
US09032	41-41.4	140-34.7	1/28	0657-0701	43	NNE-1	SSE-1	NNE-2	-1.3	9.4	bc 1033.4
US09033	41-37.6	140-32.3	1/28	0801-0805	48	NW -1	SW -1	NW -2	-0.4	10.3	bc 1033.4
US09034	41-37.3	140-30.4	1/28	0825-0828	34	NW -1	SE -1	NW -3	-1.0	10.2	bc 1033.0
US09035	41-37.7	140-28.1	1/28	0901-0903	21	NW -1	SE -1	NW -2	0.2	10.2	bc 1033.5
US09036	41-38.1	140-26.3	1/28	0921-0924	14	West-1	SE -1	West-2	0.2	9.6	bc 1033.5
US09037	41-35.3	140-29.4	1/28	0958-1001	33	NW -1	South-1	NW -2	1.3	9.8	bc 1033.2
US09038	41-35.1	140-26.9	1/28	1030-1032	15	Calm	South-1	Calm	2.3	10.2	bc 1033.5
US09039	41-28.6	140-20.5	1/28	1134-1138	62	SW -1	SW -1	SW -3	2.0	10.2	bc 1033.0
US09040	41-26.9	140-17.9	1/28	1213-1216	63	SW -2	SW -1	SW -4	3.2	10.1	bc 1032.7
US09041	41-27.7	140-16.7	1/28	1245-1248	36	SW -2	SW -1	SW -4	4.0	10.1	bc 1032.5
US09042	41-25.7	140-01.5	1/29	0826-0830	84	SW -3	SSW-1	SW -5	6.9	10.8	c 1027.5
US09043	41-26.0	140-02.2	1/29	0847-0851	45	SW -3	SSW-1	SW -5	6.8	10.9	c 1028.0
US09044	41-24.5	140-04.1	1/29	0920-0924	69	SW -3	SSW-1	SW -5	6.9	10.9	c 1027.7
US09045	41-24.5	140-06.2	1/29	0942-0946	56	SW -3	SSW-2	SW -5	6.5	10.7	c 1027.6
US09046	41-43.5	140-36.1	1/29	1301-1303	31	SW -1	South-1	SW -3	7.8	10.0	c 1026.4
US09047	41-43.9	140-35.9	1/29	1307-1309	14	SW -1	South-1	SW -3	7.1	7.8	c 1026.2

Cruise 163

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr. Bar. (hPa)
US09048	42-15.7	140-36.0	2/10	0822-0829	92	NNW-1	NW -1	NNW-2	2.0	3.4	bc 1009.1
US09049	42-19.0	140-30.2	2/10	1030-1037	94	NNW-3	NW -1	NNW-5	1.8	3.4	bc 1009.6
US09050	42-23.7	140-31.0	2/10	1201-1208	97	NNW-2	NW -1	NNW-4	2.4	3.3	bc 1010.1
US09051	42-19.4	140-24.8	2/10	1326-1330	68	NW -3	NW -1	NW -5	1.6	3.6	c 1009.7
US09052	42-14.3	140-29.5	2/10	1423-1427	78	NNW-3	NW -1	NNW-5	1.6	4.0	c 1010.0
US09053	42-11.6	140-34.4	2/10	1518-1522	83	NNW-3	NW -1	NNW-5	1.6	3.6	c 1010.1
US09054	42-13.2	140-41.3	2/11	0748-0753	91	East-2	East-1	East-4	0.3	3.7	c 1012.1
US09055	42-18.5	140-41.6	2/11	1049-1053	72	East-3	East-1	East-5	1.0	3.5	c 1010.1
US09056	42-22.1	140-36.6	2/11	1250-1254	89	East-3	East-1	East-5	1.8	3.5	o 1008.6
US09057	42-25.7	140-37.6	2/11	1351-1355	85	ESE-3	East-1	ESE-5	3.0	3.2	o 1007.9
US09058	42-23.4	140-42.5	2/11	1440-1443	65	ESE-3	ESE-1	ESE-5	3.4	3.0	o 1007.4
US09059	42-21.1	140-47.4	2/11	1525-1528	53	ESE-3	ESE-1	ESE-5	3.1	3.2	o 1007.1
US09060	42-16.7	140-48.2	2/11	1604-1607	69	ESE-3	ESE-1	ESE-5	3.4	2.9	o 1007.2
US09061	42-11.0	140-49.2	2/11	1646-1650	88	ESE-3	ESE-1	ESE-5	3.7	3.3	o 1006.4
US09062	41-57.4	140-58.2	2/12	1135-1139	80	NNW-3	North-1	NNW-5	4.3	3.9	bc 1013.5

(*) : Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US09001				STATION US09002				STATION US09003			
LATITUDE 42-10.1 N				LATITUDE 42-12.7 N				LATITUDE 42-11.1 N			
LONGITUDE 140-47.1 E				LONGITUDE 140-42.3 E				LONGITUDE 140-35.7 E			
DEPTH (m) 96				DEPTH (m) 93				DEPTH (m) 82			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	5.026	33.487	26.473	5	5.009	33.477	26.467	5	5.587	33.799	26.654
10	5.023	33.486	26.472	10	5.005	33.476	26.467	10	5.589	33.795	26.651
20	5.045	33.486	26.470	20	5.012	33.475	26.465	20	5.592	33.793	26.649
30	5.054	33.487	26.470	30	5.031	33.479	26.466	30	5.592	33.793	26.649
40	5.239	33.575	26.518	40	5.394	33.657	26.565	40	5.598	33.795	26.650
50	5.562	33.698	26.577	50	5.759	33.787	26.624	50	5.603	33.796	26.650
75	5.751	33.757	26.602	75	6.014	33.828	26.625	75	5.595	33.794	26.649
STATION US09004				STATION US09005				STATION US09006			
LATITUDE 42-14.0 N				LATITUDE 42-19.4 N				LATITUDE 42-19.0 N			
LONGITUDE 140-29.9 E				LONGITUDE 140-23.8 E				LONGITUDE 140-30.1 E			
DEPTH (m) 79				DEPTH (m) 59				DEPTH (m) 93			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	5.638	33.806	26.654	5	6.076	33.787	26.585	5	5.864	33.850	26.661
10	5.641	33.803	26.651	10	6.117	33.870	26.645	10	5.866	33.847	26.658
20	5.635	33.797	26.647	20	6.117	33.864	26.641	20	5.869	33.845	26.656
30	5.637	33.796	26.646	30	6.122	33.864	26.640	30	5.873	33.845	26.656
40	5.641	33.797	26.646	40	6.116	33.863	26.639	40	5.876	33.845	26.656
50	5.644	33.797	26.646	50	6.088	33.859	26.640	50	5.877	33.845	26.655
75	5.648	33.797	26.645					75	5.849	33.840	26.655
STATION US09007				STATION US09008				STATION US09009			
LATITUDE 42-16.7 N				LATITUDE 42-20.9 N				LATITUDE 42-18.3 N			
LONGITUDE 140-35.4 E				LONGITUDE 140-36.7 E				LONGITUDE 140-41.9 E			
DEPTH (m) 92				DEPTH (m) 88				DEPTH (m) 66			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.068	33.869	26.651	5	5.621	33.816	26.664	5	5.882	33.846	26.656
10	6.069	33.865	26.647	10	5.626	33.809	26.658	10	5.887	33.844	26.653
20	6.073	33.864	26.646	20	5.629	33.804	26.653	20	5.891	33.843	26.652
30	6.074	33.863	26.645	30	5.629	33.803	26.653	30	5.900	33.845	26.652
40	6.070	33.862	26.645	40	5.627	33.803	26.652	40	5.895	33.843	26.652
50	6.073	33.862	26.644	50	5.627	33.802	26.652	50	5.890	33.842	26.652
75	6.068	33.862	26.644	75	5.653	33.808	26.654				
STATION US09010				STATION US09011				STATION US09012			
LATITUDE 42-22.9 N				LATITUDE 42-20.8 N				LATITUDE 42-16.0 N			
LONGITUDE 140-43.1 E				LONGITUDE 140-47.6 E				LONGITUDE 140-47.8 E			
DEPTH (m) 60				DEPTH (m) 53				DEPTH (m) 70			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.112	33.875	26.650	5	4.901	33.642	26.610	5	6.116	33.889	26.661
10	6.110	33.872	26.647	10	4.952	33.653	26.613	10	6.124	33.883	26.654
20	6.111	33.870	26.646	20	5.056	33.670	26.615	20	6.131	33.880	26.651
30	6.114	33.870	26.646	30	5.372	33.735	26.630	30	6.131	33.879	26.651
40	6.093	33.867	26.646	40	5.950	33.846	26.647	40	6.136	33.879	26.650
50	6.090	33.867	26.646	50	5.999	33.849	26.644	50	6.137	33.880	26.650
STATION US09013				STATION US09014				STATION US09015			
LATITUDE 41-59.0 N				LATITUDE 41-58.4 N				LATITUDE 41-57.9 N			
LONGITUDE 141-00.8 E				LONGITUDE 140-59.8 E				LONGITUDE 140-59.0 E			
DEPTH (m) 96				DEPTH (m) 90				DEPTH (m) 86			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	5.337	33.421	26.385	5	5.383	33.436	26.391	5	5.420	33.440	26.391
10	5.345	33.419	26.382	10	5.395	33.429	26.384	10	5.426	33.435	26.386
20	5.345	33.418	26.382	20	5.402	33.425	26.381	20	5.424	33.433	26.384
30	5.354	33.418	26.381	30	5.401	33.425	26.381	30	5.461	33.439	26.385
40	5.359	33.418	26.380	40	5.390	33.424	26.381	40	5.543	33.453	26.386
50	5.358	33.418	26.380	50	5.379	33.424	26.383	50	5.552	33.469	26.397
75	5.073	33.403	26.401	75	5.179	33.442	26.419	75	5.229	33.467	26.434
STATION US09016				STATION US09017				STATION US09018			
LATITUDE 41-57.4 N				LATITUDE 42-10.0 N				LATITUDE 42-13.2 N			
LONGITUDE 140-58.2 E				LONGITUDE 140-47.7 E				LONGITUDE 140-42.3 E			
DEPTH (m) 80				DEPTH (m) 96				DEPTH (m) 91			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	5.434	33.449	26.396	5	5.345	33.778	26.667	5	4.913	33.637	26.605
10	5.436	33.443	26.391	10	5.341	33.780	26.669	10	5.017	33.673	26.621
20	5.448	33.442	26.388	20	5.329	33.783	26.672	20	5.166	33.715	26.638
30	5.441	33.454	26.399	30	5.327	33.784	26.674	30	5.227	33.727	26.640
40	5.324	33.467	26.423	40	5.340	33.788	26.675	40	5.283	33.742	26.646
50	5.215	33.480	26.445	50	5.343	33.789	26.675	50	5.346	33.758	26.651
75	5.540	33.727	26.603	75	5.354	33.791	26.676	75	5.397	33.775	26.658

STATION US09019				STATION US09020				STATION US09021			
LATITUDE 42-15.3		N		LATITUDE 42-19.3		N		LATITUDE 42-18.6		N	
LONGITUDE 140-47.3		E		LONGITUDE 140-48.1		E		LONGITUDE 140-42.5		E	
DEPTH (m) 74				DEPTH (m) 60				DEPTH (m) 64			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	4.847	33.528	26.525	5	4.583	33.457	26.498	5	5.122	33.717	26.644
10	4.849	33.523	26.522	10	4.667	33.469	26.499	10	5.135	33.715	26.641
20	4.845	33.521	26.520	20	4.681	33.470	26.498	20	5.144	33.718	26.642
30	4.962	33.582	26.556	30	4.674	33.487	26.512	30	5.145	33.717	26.642
40	5.378	33.755	26.645	40	4.722	33.507	26.523	40	5.174	33.724	26.644
50	5.524	33.796	26.659	50	5.419	33.740	26.628	50	5.240	33.742	26.651
STATION US09022				STATION US09023				STATION US09024			
LATITUDE 42-20.9		N		LATITUDE 42-16.5		N		LATITUDE 42-11.9		N	
LONGITUDE 140-36.9		E		LONGITUDE 140-35.8		E		LONGITUDE 140-35.6		E	
DEPTH (m) 88				DEPTH (m) 92				DEPTH (m) 84			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	5.420	33.841	26.708	5	5.398	33.825	26.698	5	4.676	33.641	26.634
10	5.428	33.838	26.704	10	5.396	33.821	26.695	10	4.685	33.631	26.625
20	5.432	33.835	26.701	20	5.405	33.818	26.691	20	4.869	33.669	26.635
30	5.431	33.834	26.701	30	5.407	33.818	26.691	30	4.888	33.677	26.639
40	5.432	33.834	26.701	40	5.407	33.818	26.691	40	4.931	33.685	26.641
50	5.433	33.834	26.700	50	5.408	33.817	26.690	50	4.969	33.691	26.641
75	5.442	33.834	26.699	75	5.409	33.817	26.690	75	5.058	33.707	26.644
STATION US09025				STATION US09026				STATION US09027			
LATITUDE 42-14.0		N		LATITUDE 42-18.5		N		LATITUDE 42-18.9		N	
LONGITUDE 140-30.5		E		LONGITUDE 140-24.3		E		LONGITUDE 140-29.3		E	
DEPTH (m) 81				DEPTH (m) 61				DEPTH (m) 90			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	5.159	33.703	26.629	5	4.807	33.670	26.642	5	5.302	33.804	26.692
10	5.160	33.702	26.628	10	5.065	33.737	26.666	10	5.314	33.800	26.688
20	5.170	33.703	26.627	20	5.286	33.777	26.673	20	5.316	33.797	26.685
30	5.178	33.716	26.637	30	5.376	33.791	26.673	30	5.333	33.800	26.686
40	5.167	33.718	26.639	40	5.410	33.799	26.675	40	5.340	33.801	26.685
50	5.178	33.729	26.647	50	5.491	33.819	26.681	50	5.391	33.813	26.689
75	5.361	33.798	26.681					75	5.411	33.817	26.689
STATION US09028				STATION US09029				STATION US09030			
LATITUDE 42-23.6		N		LATITUDE 42-28.5		N		LATITUDE 42-25.9		N	
LONGITUDE 140-30.7		E		LONGITUDE 140-31.1		E		LONGITUDE 140-36.5		E	
DEPTH (m) 96				DEPTH (m) 78				DEPTH (m) 87			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	5.450	33.835	26.699	5	4.480	33.556	26.587	5	5.352	33.794	26.679
10	5.452	33.830	26.695	10	4.837	33.678	26.646	10	5.372	33.816	26.693
20	5.448	33.825	26.691	20	5.158	33.751	26.667	20	5.375	33.813	26.690
30	5.450	33.825	26.691	30	5.448	33.820	26.688	30	5.377	33.813	26.691
40	5.451	33.825	26.691	40	5.474	33.820	26.685	40	5.374	33.813	26.691
50	5.455	33.825	26.691	50	5.464	33.821	26.686	50	5.366	33.812	26.691
75	5.457	33.825	26.691	75	5.506	33.834	26.692	75	5.367	33.813	26.692
STATION US09031				STATION US09032				STATION US09033			
LATITUDE 42-23.3		N		LATITUDE 41-41.4		N		LATITUDE 41-37.6		N	
LONGITUDE 140-42.2		E		LONGITUDE 140-34.7		E		LONGITUDE 140-32.3		E	
DEPTH (m) 65				DEPTH (m) 43				DEPTH (m) 48			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	4.772	33.622	26.608	5	9.770	33.946	26.168	5	10.598	34.090	26.139
10	4.806	33.623	26.606	10	9.775	33.960	26.178	10	10.593	34.075	26.127
20	4.904	33.649	26.615	20	9.764	33.963	26.182	20	10.610	34.064	26.116
30	5.228	33.738	26.649	30	9.690	33.954	26.187	30	10.588	34.062	26.119
40	5.154	33.740	26.659	40	9.653	33.953	26.192	40	10.458	34.061	26.140
50	5.191	33.762	26.672								
STATION US09034				STATION US09035				STATION US09036			
LATITUDE 41-37.3		N		LATITUDE 41-37.7		N		LATITUDE 41-38.1		N	
LONGITUDE 140-30.4		E		LONGITUDE 140-28.1		E		LONGITUDE 140-26.3		E	
DEPTH (m) 34				DEPTH (m) 21				DEPTH (m) 14			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	10.453	34.077	26.153	5	10.173	34.026	26.162	5	8.871	33.483	25.950
10	10.472	34.074	26.148	10	10.179	34.015	26.152	10	9.082	33.807	26.171
20	10.481	34.066	26.140	20	9.817	33.965	26.175				
30	10.409	34.063	26.150								
STATION US09037				STATION US09038				STATION US09039			
LATITUDE 41-35.3		N		LATITUDE 41-35.1		N		LATITUDE 41-28.6		N	
LONGITUDE 140-29.4		E		LONGITUDE 140-26.9		E		LONGITUDE 140-20.5		E	
DEPTH (m) 33				DEPTH (m) 15				DEPTH (m) 62			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	10.201	34.077	26.197	5	10.546	34.048	26.114	5	10.521	34.076	26.141
10	10.204	34.072	26.193	10	10.555	34.046	26.112	10	10.523	34.071	26.137
20	10.207	34.069	26.189					20	10.426	34.070	26.153
30	10.207	34.068	26.189					30	10.350	34.069	26.165
								40	10.151	34.070	26.200
								50	9.872	34.078	26.253

STATION US09040				STATION US09041				STATION US09042			
LATITUDE 41-26.9		N		LATITUDE 41-27.7		N		LATITUDE 41-25.7		N	
LONGITUDE 140-17.9		E		LONGITUDE 140-16.7		E		LONGITUDE 140-01.5		E	
DEPTH (m) 63				DEPTH (m) 36				DEPTH (m) 84			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	10.404	34.090	26.172	5	10.479	34.080	26.151	5	11.254	34.002	25.952
10	10.356	34.080	26.173	10	10.473	34.073	26.147	10	11.257	34.001	25.952
20	10.355	34.073	26.168	20	10.317	34.072	26.173	20	11.067	34.036	26.013
30	10.258	34.066	26.179	30	10.253	34.074	26.186	30	10.608	34.085	26.133
40	10.210	34.073	26.192					40	10.106	34.123	26.249
50	10.207	34.073	26.193					50	9.778	34.142	26.319
								75	9.692	34.140	26.332
STATION US09043				STATION US09044				STATION US09045			
LATITUDE 41-26.0		N		LATITUDE 41-24.5		N		LATITUDE 41-24.5		N	
LONGITUDE 140-02.2		E		LONGITUDE 140-04.1		E		LONGITUDE 140-06.2		E	
DEPTH (m) 45				DEPTH (m) 69				DEPTH (m) 56			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	11.263	33.997	25.947	5	11.286	34.004	25.948	5	10.990	34.037	26.027
10	11.272	33.995	25.944	10	11.278	34.003	25.949	10	10.986	34.029	26.022
20	11.155	33.999	25.968	20	11.013	34.050	26.034	20	10.968	34.023	26.021
30	10.758	34.054	26.082	30	10.811	34.090	26.101	30	10.984	34.027	26.021
40	10.544	34.074	26.135	40	10.549	34.115	26.166	40	10.872	34.013	26.030
				50	10.397	34.129	26.204	50	10.863	34.015	26.033
STATION US09046				STATION US09047				STATION US09048			
LATITUDE 41-43.5		N		LATITUDE 41-43.9		N		LATITUDE 42-15.7		N	
LONGITUDE 140-36.1		E		LONGITUDE 140-35.9		E		LONGITUDE 140-36.0		E	
DEPTH (m) 31				DEPTH (m) 14				DEPTH (m) 92			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	10.303	34.055	26.163	5	9.168	33.686	26.062	5	3.769	33.459	26.583
10	10.345	34.045	26.147	10	9.796	33.937	26.156	10	3.768	33.459	26.584
20	10.312	34.032	26.142					20	3.945	33.523	26.616
								30	4.293	33.614	26.654
								40	4.598	33.700	26.689
								50	4.715	33.727	26.698
								75	4.779	33.741	26.702
STATION US09049				STATION US09050				STATION US09051			
LATITUDE 42-19.0		N		LATITUDE 42-23.7		N		LATITUDE 42-19.4		N	
LONGITUDE 140-30.2		E		LONGITUDE 140-31.0		E		LONGITUDE 140-24.8		E	
DEPTH (m) 94				DEPTH (m) 97				DEPTH (m) 68			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.701	33.334	26.490	5	3.960	33.478	26.579	5	4.004	33.537	26.622
10	3.713	33.378	26.524	10	3.952	33.481	26.583	10	4.006	33.539	26.623
20	3.777	33.402	26.538	20	3.960	33.485	26.585	20	4.156	33.605	26.661
30	4.335	33.634	26.665	30	4.011	33.501	26.593	30	4.356	33.655	26.680
40	4.609	33.699	26.687	40	4.083	33.523	26.603	40	4.508	33.687	26.689
50	4.824	33.746	26.700	50	4.158	33.547	26.614	50	4.551	33.695	26.690
75	5.046	33.793	26.713	75	5.200	33.792	26.694				
STATION US09052				STATION US09053				STATION US09054			
LATITUDE 42-14.3		N		LATITUDE 42-11.6		N		LATITUDE 42-13.2		N	
LONGITUDE 140-29.5		E		LONGITUDE 140-34.4		E		LONGITUDE 140-41.3		E	
DEPTH (m) 78				DEPTH (m) 83				DEPTH (m) 91			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	4.468	33.684	26.691	5	4.182	33.601	26.655	5	4.098	33.585	26.650
10	4.473	33.683	26.689	10	4.187	33.600	26.654	10	4.095	33.586	26.652
20	4.452	33.678	26.687	20	4.262	33.622	26.663	20	4.104	33.586	26.651
30	4.467	33.683	26.690	30	4.575	33.698	26.690	30	4.135	33.592	26.652
40	4.471	33.685	26.691	40	4.594	33.702	26.692	40	4.369	33.648	26.672
50	4.467	33.688	26.694	50	4.604	33.704	26.692	50	4.395	33.650	26.672
				75	4.646	33.712	26.693	75	4.502	33.684	26.687
STATION US09055				STATION US09056				STATION US09057			
LATITUDE 42-18.5		N		LATITUDE 42-22.1		N		LATITUDE 42-25.7		N	
LONGITUDE 140-41.6		E		LONGITUDE 140-36.6		E		LONGITUDE 140-37.6		E	
DEPTH (m) 72				DEPTH (m) 89				DEPTH (m) 85			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.917	33.455	26.565	5	3.863	33.346	26.485	5	3.660	33.157	26.354
10	3.916	33.454	26.565	10	3.876	33.397	26.523	10	3.659	33.305	26.471
20	3.929	33.457	26.566	20	3.873	33.395	26.523	20	3.689	33.389	26.535
30	4.125	33.521	26.597	30	4.046	33.448	26.547	30	3.883	33.480	26.589
40	4.719	33.729	26.699	40	5.024	33.755	26.686	40	3.971	33.499	26.595
50	4.788	33.741	26.701	50	5.133	33.777	26.691	50	4.124	33.535	26.609
				75	5.137	33.788	26.699	75	4.886	33.720	26.674

STATION US09058				STATION US09059				STATION US09060			
LATITUDE 42-23.4 N				LATITUDE 42-21.1 N				LATITUDE 42-16.7 N			
LONGITUDE 140-42.5 E				LONGITUDE 140-47.4 E				LONGITUDE 140-48.2 E			
DEPTH (m) 65				DEPTH (m) 53				DEPTH (m) 69			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.438	33.267	26.462	5	3.638	33.333	26.496	5	3.364	33.156	26.380
10	3.434	33.267	26.462	10	3.639	33.334	26.496	10	3.363	33.230	26.439
20	3.433	33.268	26.463	20	3.635	33.333	26.496	20	3.364	33.230	26.440
30	3.447	33.270	26.464	30	3.636	33.333	26.496	30	3.367	33.230	26.440
40	3.468	33.275	26.466	40	3.637	33.333	26.496	40	3.368	33.231	26.440
50	3.894	33.379	26.507					50	3.371	33.232	26.440

STATION US09061				STATION US09062			
LATITUDE 42-11.0 N				LATITUDE 41-57.4 N			
LONGITUDE 140-49.2 E				LONGITUDE 140-58.2 E			
DEPTH (m) 88				DEPTH (m) 80			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.772	33.255	26.421	5	4.640	33.401	26.447
10	3.779	33.303	26.458	10	4.584	33.413	26.463
20	3.772	33.301	26.457	20	4.570	33.417	26.468
30	3.787	33.305	26.459	30	4.544	33.417	26.471
40	3.816	33.315	26.464	40	4.019	33.408	26.518
50	4.006	33.397	26.511	50	3.884	33.486	26.593
75	5.058	33.776	26.698				

THE “USHIO MARU”

CRUISE 164

CRUISE 165

CRUISE 166

IN FEBRUARY-MARCH 2009

1. Cruise Itinerary

Cruise 164

Departure from Hakodate	Feb.	23	, 2009
Start hydrographic research (US09063)		23	
Arrival at Muroran		23	
Departure from Muroran		24	
Arrival at and departure from Muroran		25	
Arrival at Hakodate		25	
Departure from Hakodate		26	
Arrival at Fukushima		26	
Departure from Fukushima		27	
Finish hydrographic research (US09102)		27	
Return to Hakodate		28	
Total coverage 383.5 miles			

Cruise 165

Departure from Hakodate	Mar.	9	, 2009
Arrival at and departure from Usujiri		9	
Start hydrographic research (US09103)		9	
Sampling by frame trawl net		9	
Arrival at Usujiri		10	
Departure from Usujiri		12	
Finish hydrographic research (US09107)		12	
Arrival at and departure from Usujiri		12	
Return to Hakodate		13	
Total coverage 209.0 miles			

Cruise 166

Cancellation of leaving port at Hakodate (for rough weather)	Mar.	23	, 2009
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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 164

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

Graduate Students:	Chair of Marine Bioresource Science:	3 persons
	Graduate School of Environmental Science:	6 persons

Under Graduate Students:	Department of Marine Biological Science:	5 persons
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Cruise 165

Research Staff:	Associate Professor	(Laboratory of Marine Environmental Science)	Isao Kudo
	Associate Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Tohru Mukai

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

Under Graduate Students:	Department of Marine Biological Science:	3 persons
	Department of Fisheries Oceanography and Marine Science:	2 persons
	Department of Marine Production System Science:	3 persons
	Department of Marine Biology (Third grade):	1 persons

Cruise 166

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
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Graduate Students:	Chair of Marine Bioresource Science:	1 person
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Under Graduate Students:	Department of Marine Biological Science:	4 persons
	Department of Marine Biology (Third grade):	1 person

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”.

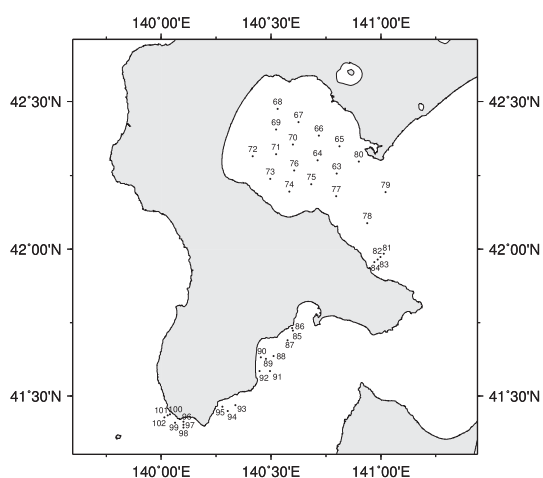


Figure 1: Oceanographic stations (Cruise 164)

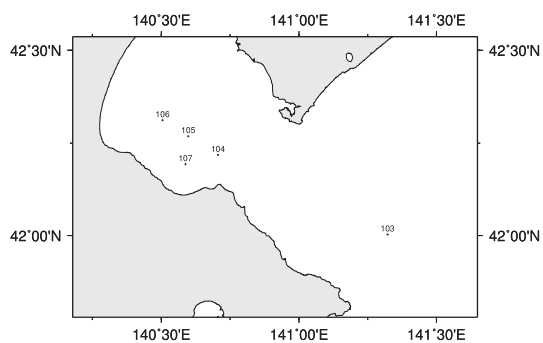


Figure 2: Oceanographic stations (Cruise 165)

Table 1: List of oceanographic stations

Cruise 164

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr. Bar. (hPa)
US09063	42-15.4	140-47.9	2/23	1432-1436	73	NW -2	NW -1	NW -4	-1.0	2.8	bc 1019.1
US09064	42-18.1	140-42.7	2/23	1515-1519	65	NNW-2	NW -1	NNW-4	-1.2	3.2	bc 1019.2
US09065	42-20.9	140-48.7	2/24	0648-0651	53	West-2	NW -1	West-4	-1.1	2.3	bc 1023.2
US09066	42-23.1	140-43.1	2/24	0735-0742	59	West-2	NW -1	West-4	-0.6	3.0	bc 1024.0
US09067	42-25.8	140-37.5	2/24	0819-0823	84	West-2	NW -1	West-3	-0.4	3.0	bc 1024.5
US09068	42-28.5	140-31.8	2/24	0905-0910	80	Calm	NW -1	Calm	-0.2	3.0	c 1024.6
US09069	42-24.3	140-31.4	2/24	1000-1005	96	Calm	NW -1	Calm	0.5	2.9	c 1024.2
US09070	42-21.3	140-36.0	2/24	1043-1047	91	Calm	NW -1	Calm	1.2	3.0	c 1023.6
US09071	42-19.3	140-31.4	2/24	1139-1147	96	SE -1	SE -1	SE-3	1.6	2.9	o 1023.2
US09072	42-18.9	140-25.0	2/24	1234-1238	67	ESE-1	SE -1	ESE-3	1.4	2.8	o 1021.6
US09073	42-14.3	140-29.8	2/24	1338-1343	79	SE -2	SE -1	SE -4	1.8	2.7	o 1020.8
US09074	42-11.7	140-35.0	2/24	1439-1449	84	SSE-2	SE -1	SSE-5	1.2	3.1	o 1020.4
US09075	42-13.2	140-41.0	2/24	1539-1545	91	SE -2	SE -1	SE -4	1.0	2.9	s 1019.5
US09076	42-16.0	140-36.3	2/24	1648-1656	92	SE -2	SE -1	SE -4	0.1	3.0	s 1019.6
US09077	42-10.8	140-47.8	2/25	0733-0738	95	West-2	SE -1	West-4	2.9	3.2	r 1011.0
US09078	42-05.3	140-56.3	2/25	0842-0847	86	West-2	SE -1	West-5	3.2	3.2	o 1010.6
US09079	42-11.6	141-01.3	2/25	0936-0943	79	NW -3	SE -1	NW -5	3.3	3.4	o 1010.1
US09080	42-17.8	140-54.0	2/25	1039-1046	57	NW -3	SE -1	NW -5	2.9	3.0	o 1010.2
US09081	41-59.1	141-00.8	2/25	1510-1515	97	NW -3	NW -2	NW -5	1.9	3.6	c 1009.2
US09082	41-58.4	140-59.9	2/25	1521-1526	91	NW -3	NW -2	NW -5	1.9	3.5	c 1009.7
US09083	41-57.9	140-59.1	2/25	1531-1536	87	NW -3	NW -2	NW -5	1.9	3.5	c 1009.7
US09084	41-57.4	140-58.2	2/25	1542-1547	81	NW -3	NW -2	NW -5	1.6	3.5	c 1010.0
US09085	41-43.4	140-36.0	2/26	0750-0753	30	WSW-1	SSW-1	WEW-2	-0.5	7.2	c 1019.5
US09086	41-43.9	140-35.8	2/26	0800-0802	15	West-2	SSW-1	West-3	-0.3	6.8	bc 1019.5
US09087	41-41.4	140-34.5	2/26	0837-0839	43	WNW-2	WSW-1	WNW-4	0.5	7.2	bc 1019.6
US09088	41-38.2	140-30.7	2/26	0923-0925	33	West-3	West-1	West-5	1.1	6.6	bc 1019.8
US09089	41-37.6	140-28.6	2/26	0957-0958	24	WNW-3	West-1	WNW-5	0.9	7.5	bc 1020.2
US09090	41-37.9	140-27.2	2/26	1015-1016	16	WNW-3	West-1	WNW-5	0.9	6.4	bc 1020.1
US09091	41-35.1	140-29.7	2/26	1050-1053	44	WNW-3	West-1	WNW-5	0.6	7.8	bc 1020.1
US09092	41-35.1	140-26.9	2/26	1125-1127	16	WNW-3	SE -1	WNW-5	1.7	7.5	bc 1020.6
US09093	41-28.1	140-20.3	2/26	1236-1240	66	West-3	SW -1	West-5	1.3	7.9	bc 1020.1
US09094	41-26.9	140-18.2	2/26	1312-1316	65	WNW-3	SW -1	WNW-5	1.6	7.9	bc 1019.9
US09095	41-27.8	140-16.7	2/26	1346-1349	38	NW -3	SW -1	NW -5	1.9	7.8	bc 1019.6
US09096	41-24.7	140-06.1	2/27	0806-0809	43	West-3	SW -1	West-5	3.1	6.3	bc 1022.1
US09097	41-24.1	140-06.1	2/27	0822-0826	73	West-3	SW -1	West-5	3.4	6.3	bc 1022.1
US09098	41-23.5	140-06.1	2/27	0841-0845	96	West-3	SW -1	West-5	3.6	6.7	bc 1021.6
US09099	41-24.5	140-03.8	2/27	0917-0921	74	West-3	West-1	West-5	3.7	6.3	bc 1021.6
US09100	41-26.2	140-02.4	2/27	0942-0945	36	West-2	West-1	West-4	4.1	5.8	bc 1021.2
US09101	41-26.0	140-01.8	2/27	0959-1002	58	West-2	West-1	West-4	4.2	5.5	bc 1021.2
US09102	41-25.6	140-00.9	2/27	1028-1033	102	WSW-3	West-1	WSW-5	4.3	6.2	bc 1021.1

Cruise 165

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr. Bar. (hPa)
US09103	42-00.2	141-19.3	3/9	1618-1630	309	SSE-3	ESE-1	SSE-5	5.4	2.1	bc 1016.7
US09104	42-13.1	140-42.4	3/12	1113-1117	90	NW -3	NW -1	NW -5	2.9	3.0	bc 1026.6
US09105	42-16.1	140-35.9	3/12	1240-1249	92	NW -3	NW -1	NW -4	3.0	3.0	bc 1026.7
US09106	42-18.7	140-30.3	3/12	1418-1426	94	West-2	NW -1	West-4	3.0	3.0	c 1027.0
US09107	42-11.6	140-35.3	3/12	1551-1558	84	WNW-3	NW -1	WNW-5	2.5	3.1	bc 1022.6

Cruise 166 No Data

(*) : Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US09063 LATITUDE 42-15.4 N LONGITUDE 140-47.9 E DEPTH (m) 73				STATION US09064 LATITUDE 42-18.1 N LONGITUDE 140-42.7 E DEPTH (m) 65				STATION US09065 LATITUDE 42-20.9 N LONGITUDE 140-48.7 E DEPTH (m) 53			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.202	33.281	26.495	5	3.633	33.380	26.534	5	2.905	33.321	26.553
10	3.199	33.283	26.496	10	3.616	33.372	26.529	10	2.909	33.318	26.551
20	3.209	33.290	26.502	20	3.554	33.364	26.529	20	2.914	33.319	26.551
30	3.201	33.291	26.503	30	3.553	33.365	26.530	30	2.922	33.320	26.551
40	3.231	33.296	26.505	40	3.560	33.367	26.530	40	3.191	33.380	26.575
50	3.279	33.304	26.506	50	3.583	33.373	26.533	50	3.192	33.377	26.573
STATION US09066 LATITUDE 42-23.1 N LONGITUDE 140-43.1 E DEPTH (m) 59				STATION US09067 LATITUDE 42-25.8 N LONGITUDE 140-37.5 E DEPTH (m) 84				STATION US09068 LATITUDE 42-28.5 N LONGITUDE 140-31.8 E DEPTH (m) 80			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.454	33.404	26.570	5	3.350	33.418	26.591	5	3.426	33.416	26.582
10	3.456	33.403	26.569	10	3.350	33.414	26.588	10	3.416	33.415	26.582
20	3.453	33.402	26.568	20	3.361	33.415	26.587	20	3.420	33.417	26.583
30	3.451	33.401	26.568	30	3.361	33.414	26.587	30	3.365	33.465	26.608
40	3.482	33.408	26.570	40	3.585	33.463	26.604	40	3.631	33.476	26.610
50	3.508	33.412	26.571	50	3.558	33.476	26.618	50	4.041	33.583	26.655
				75	4.898	33.768	26.710	75	4.676	33.709	26.688
STATION US09069 LATITUDE 42-24.3 N LONGITUDE 140-31.4 E DEPTH (m) 96				STATION US09070 LATITUDE 42-21.3 N LONGITUDE 140-36.0 E DEPTH (m) 91				STATION US09071 LATITUDE 42-19.3 N LONGITUDE 140-31.4 E DEPTH (m) 96			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.306	33.386	26.569	5	3.379	33.444	26.609	5	3.311	33.405	26.584
10	3.290	33.385	26.570	10	3.370	33.443	26.608	10	3.251	33.401	26.586
20	3.272	33.385	26.571	20	3.365	33.442	26.609	20	3.263	33.411	26.593
30	3.268	33.384	26.571	30	3.365	33.443	26.609	30	3.375	33.440	26.606
40	3.270	33.385	26.571	40	3.376	33.445	26.610	40	3.435	33.452	26.610
50	3.289	33.389	26.573	50	3.853	33.538	26.638	50	3.677	33.509	26.633
75	4.465	33.679	26.687	75	4.318	33.637	26.669	75	4.112	33.598	26.659
STATION US09072 LATITUDE 42-18.9 N LONGITUDE 140-25.0 E DEPTH (m) 67				STATION US09073 LATITUDE 42-14.3 N LONGITUDE 140-29.8 E DEPTH (m) 79				STATION US09074 LATITUDE 42-11.7 N LONGITUDE 140-35.0 E DEPTH (m) 84			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.211	33.366	26.562	5	3.363	33.430	26.599	5	3.483	33.467	26.618
10	3.145	33.361	26.564	10	3.495	33.458	26.609	10	3.485	33.468	26.618
20	3.142	33.362	26.565	20	3.523	33.463	26.610	20	3.484	33.470	26.619
30	3.164	33.369	26.568	30	3.559	33.475	26.616	30	3.483	33.470	26.620
40	3.462	33.453	26.608	40	3.588	33.482	26.620	40	3.486	33.471	26.620
50	3.581	33.481	26.619	50	3.697	33.504	26.626	50	3.486	33.471	26.620
				75	3.710	33.516	26.635	75	4.135	33.609	26.666
STATION US09075 LATITUDE 42-13.2 N LONGITUDE 140-41.0 E DEPTH (m) 91				STATION US09076 LATITUDE 42-16.0 N LONGITUDE 140-36.3 E DEPTH (m) 92				STATION US09077 LATITUDE 42-10.8 N LONGITUDE 140-47.8 E DEPTH (m) 95			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.304	33.399	26.580	5	3.404	33.434	26.598	5	3.656	33.348	26.506
10	3.313	33.399	26.579	10	3.423	33.440	26.601	10	3.669	33.353	26.509
20	3.348	33.416	26.589	20	3.452	33.450	26.606	20	3.695	33.359	26.511
30	3.379	33.426	26.594	30	3.467	33.458	26.612	30	3.672	33.361	26.515
40	3.402	33.433	26.598	40	3.470	33.461	26.614	40	3.671	33.373	26.525
50	3.419	33.436	26.599	50	3.468	33.462	26.615	50	3.595	33.393	26.548
75	3.448	33.442	26.600	75	3.472	33.468	26.619	75	3.600	33.466	26.605
STATION US09078 LATITUDE 42-05.3 N LONGITUDE 140-56.3 E DEPTH (m) 86				STATION US09079 LATITUDE 42-11.6 N LONGITUDE 141-01.3 E DEPTH (m) 79				STATION US09080 LATITUDE 42-17.8 N LONGITUDE 140-54.0 E DEPTH (m) 57			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.643	33.344	26.504	5	3.802	33.310	26.462	5	2.895	33.172	26.435
10	3.647	33.346	26.505	10	3.801	33.310	26.462	10	2.907	33.175	26.436
20	3.640	33.355	26.513	20	3.801	33.310	26.462	20	2.931	33.179	26.437
30	3.634	33.361	26.519	30	3.769	33.316	26.470	30	2.955	33.184	26.439
40	3.627	33.374	26.529	40	3.771	33.325	26.477	40	2.957	33.185	26.440
50	3.503	33.384	26.549	50	3.774	33.354	26.500	50	2.907	33.181	26.441
75	3.747	33.484	26.606	75	4.008	33.466	26.566				

STATION US09081 LATITUDE 41-59.1 N LONGITUDE 141-00.8 E DEPTH (m) 97				STATION US09082 LATITUDE 41-58.4 N LONGITUDE 140-59.9 E DEPTH (m) 91				STATION US09083 LATITUDE 41-57.9 N LONGITUDE 140-59.1 E DEPTH (m) 87			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.953	33.324	26.457	5	3.944	33.330	26.463	5	3.964	33.338	26.468
10	3.955	33.327	26.460	10	3.944	33.329	26.463	10	3.964	33.338	26.468
20	3.952	33.330	26.463	20	3.952	33.330	26.463	20	3.973	33.338	26.467
30	3.940	33.331	26.464	30	3.949	33.329	26.462	30	3.988	33.343	26.469
40	3.933	33.330	26.465	40	3.975	33.333	26.463	40	3.994	33.345	26.470
50	3.937	33.332	26.465	50	4.085	33.353	26.468	50	3.996	33.348	26.472
75	3.912	33.351	26.483	75	4.061	33.366	26.480	75	3.375	33.371	26.551
STATION US09084 LATITUDE 41-57.4 N LONGITUDE 140-58.2 E DEPTH (m) 81				STATION US09085 LATITUDE 41-43.4 N LONGITUDE 140-36.0 E DEPTH (m) 30				STATION US09086 LATITUDE 41-43.9 N LONGITUDE 140-35.8 E DEPTH (m) 15			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.876	33.330	26.470	5	7.510	34.005	26.564	5	7.290	33.731	26.379
10	3.877	33.329	26.469	10	7.535	34.005	26.560	10	7.515	33.992	26.553
20	3.878	33.329	26.469	20	7.696	34.046	26.569				
30	3.894	33.332	26.470								
40	3.917	33.335	26.470								
50	4.013	33.383	26.499								
75	3.365	33.372	26.553								
STATION US09087 LATITUDE 41-41.4 N LONGITUDE 140-34.5 E DEPTH (m) 43				STATION US09088 LATITUDE 41-38.2 N LONGITUDE 140-30.7 E DEPTH (m) 33				STATION US09089 LATITUDE 41-37.6 N LONGITUDE 140-28.6 E DEPTH (m) 24			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	7.597	33.974	26.526	5	7.182	33.954	26.570	5	7.467	33.881	26.472
10	7.647	33.998	26.539	10	7.199	33.952	26.565	10	7.486	33.986	26.552
20	7.647	33.993	26.534	20	7.187	33.950	26.566	20	7.469	33.982	26.551
30	7.618	34.005	26.548	30	6.973	33.953	26.597				
40	7.772	34.060	26.569								
STATION US09090 LATITUDE 41-37.9 N LONGITUDE 140-27.2 E DEPTH (m) 16				STATION US09091 LATITUDE 41-35.1 N LONGITUDE 140-29.7 E DEPTH (m) 44				STATION US09092 LATITUDE 41-35.1 N LONGITUDE 140-26.9 E DEPTH (m) 16			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.649	33.893	26.594	5	8.215	33.874	26.357	5	7.862	33.944	26.465
10	6.649	33.877	26.582	10	8.266	34.060	26.496	10	8.045	34.017	26.495
				20	8.257	34.056	26.494				
				30	8.236	34.059	26.500				
				40	8.146	34.062	26.515				
STATION US09093 LATITUDE 41-28.1 N LONGITUDE 140-20.3 E DEPTH (m) 66				STATION US09094 LATITUDE 41-26.9 N LONGITUDE 140-18.2 E DEPTH (m) 65				STATION US09095 LATITUDE 41-27.8 N LONGITUDE 140-16.7 E DEPTH (m) 38			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	8.311	34.077	26.502	5	8.274	34.069	26.502	5	8.254	34.049	26.489
10	8.319	34.068	26.494	10	8.275	34.064	26.498	10	8.250	34.045	26.487
20	8.314	34.062	26.490	20	8.248	34.059	26.497	20	8.172	34.040	26.494
30	8.176	34.060	26.509	30	8.177	34.054	26.504	30	8.098	34.041	26.506
40	8.028	34.057	26.529	40	8.117	34.050	26.510				
50	7.996	34.058	26.534	50	8.081	34.049	26.515				
STATION US09096 LATITUDE 41-24.7 N LONGITUDE 140-06.1 E DEPTH (m) 43				STATION US09097 LATITUDE 41-24.1 N LONGITUDE 140-06.1 E DEPTH (m) 73				STATION US09098 LATITUDE 41-23.5 N LONGITUDE 140-06.1 E DEPTH (m) 96			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.545	34.081	26.756	5	6.871	34.102	26.729	5	7.049	34.108	26.709
10	6.556	34.098	26.768	10	6.827	34.096	26.730	10	7.069	34.101	26.701
20	6.505	34.094	26.772	20	5.613	34.055	26.854	20	7.067	34.096	26.698
30	6.078	34.085	26.820	30	5.258	34.086	26.921	30	7.035	34.095	26.701
40	5.050	34.081	26.941	40	5.192	34.090	26.932	40	6.837	34.090	26.724
				50	5.138	34.091	26.939	50	5.753	34.075	26.853
								75	4.845	34.088	26.970

STATION US09099 LATITUDE 41-24.5 N LONGITUDE 140-03.8 E DEPTH (m) 74				STATION US09100 LATITUDE 41-26.2 N LONGITUDE 140-02.4 E DEPTH (m) 36				STATION US09101 LATITUDE 41-26.0 N LONGITUDE 140-01.8 E DEPTH (m) 58			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.257	34.091	26.802	5	5.946	34.081	26.833	5	5.766	34.091	26.864
10	6.155	34.091	26.814	10	5.894	34.080	26.839	10	5.796	34.092	26.861
20	5.600	34.086	26.880	20	5.619	34.077	26.870	20	5.787	34.090	26.860
30	5.318	34.086	26.913	30	4.586	34.075	26.988	30	5.749	34.087	26.863
40	4.927	34.086	26.959					40	5.542	34.087	26.888
50	4.834	34.089	26.972					50	5.325	34.089	26.915
STATION US09102 LATITUDE 41-25.6 N LONGITUDE 140-00.9 E DEPTH (m) 102				STATION US09103 LATITUDE 42-00.2 N LONGITUDE 141-19.3 E DEPTH (m) 309				STATION US09104 LATITUDE 42-13.1 N LONGITUDE 140-42.4 E DEPTH (m) 90			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.614	34.097	26.760	5	2.498	33.032	26.356	5	3.389	33.371	26.550
10	6.607	34.099	26.762	10	2.364	33.033	26.368	10	3.358	33.374	26.555
20	6.086	34.074	26.810	20	2.371	33.041	26.373	20	3.347	33.377	26.558
30	5.622	34.089	26.880	30	2.376	33.044	26.376	30	3.351	33.379	26.559
40	5.292	34.084	26.915	40	2.444	33.056	26.380	40	3.331	33.380	26.562
50	4.996	34.081	26.947	50	2.648	33.097	26.396	50	3.322	33.384	26.566
75	4.394	34.077	27.011	75	3.982	33.332	26.461	75	3.348	33.439	26.607
100	3.194	34.080	27.133	100	4.887	33.501	26.500				
				125	5.612	33.626	26.514				
				150	5.292	33.584	26.519				
				175	5.524	33.673	26.562				
				200	4.708	33.599	26.597				
				250	3.424	33.523	26.667				
STATION US09105 LATITUDE 42-16.1 N LONGITUDE 140-35.9 E DEPTH (m) 92				STATION US09106 LATITUDE 42-18.7 N LONGITUDE 140-30.3 E DEPTH (m) 94				STATION US09107 LATITUDE 42-11.6 N LONGITUDE 140-35.3 E DEPTH (m) 84			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	3.518	33.441	26.593	5	3.410	33.428	26.593	5	3.393	33.428	26.594
10	3.518	33.467	26.614	10	3.418	33.443	26.604	10	3.390	33.428	26.595
20	3.427	33.466	26.622	20	3.348	33.441	26.609	20	3.379	33.426	26.595
30	3.410	33.466	26.624	30	3.320	33.441	26.612	30	3.313	33.423	26.598
40	3.398	33.467	26.625	40	3.319	33.441	26.612	40	3.311	33.425	26.600
50	3.388	33.467	26.626	50	3.318	33.442	26.612	50	3.318	33.426	26.600
75	3.382	33.468	26.627	75	3.321	33.443	26.613	75	3.308	33.425	26.600

THE “USHIO MARU”

CRUISE 167

CRUISE 168

CRUISE 169

IN APRIL-JUNE 2009

1. Cruise Itinerary

Cruise 167			
Departure from Hakodate	Apr.	14	, 2009
Arrival at and departure from Usujiri		14	
Start hydrographic research (US09108)		14	
Start frame trawl net sampling		14	
Arrival at Usujiri		14	
Departure from Usujiri		16	
Finish frame trawl net sampling		17	
Arrival at Usujiri		17	
Departure from Usujiri		19	
Retrieval sediment trap system		19	
Arrival at Mori		19	
Departure from Mori		20	
Set sediment trap system		20	
Finish hydrographic research (US09129)		20	
Arrival at and departure from Usujiri		20	
Return to Hakodate		22	
Total coverage 296.4 miles			
Cruise 168			
Departure from Hakodate	May	8	, 2009
Arrival at Usujiri		8	
Departure from Usujiri		9	
Research by bottom long line		9	
Start hydrographic research (US09130)		9	
Arrival at Usujiri		9	
Departure from Usujiri		10	
Start sledge net		10	
Start trawl net research		10	
Arrival at Mori		10	
Departure from Mori		11	
Finish trawl net research		11	
Finish sledge net sampling		11	
Arrival at Muroran		11	
Departure from Muroran		12	
Start frame trawl net sampling		12	
Arrival at Usujiri		12	
Departure from Usujiri		14	
Arrival at Usujiri		14	
Departure from Usujiri		15	
Finish hydrographic research (US09149)		15	
Finish frame trawl net sampling		15	
Arrival at and departure from Usujiri		16	
Return to Hakodate		17	
Total coverage 386.9 miles			
Cruise 169			
Departure from Hakodate	May	22	, 2009
Arrival at Shiraoi		22	
Departure from Shiraoi		24	
Arrival at Hanasaki		25	
Departure from Hanasaki		26	
Start hydrographic research (US09150)		26	
Arrival at Nemuro		27	
Departure from Nemuro		28	
Research by R.O.V.		29	
Finish hydrographic research (US09181)		29	
Arrival at and departure from Rausu		29	
Arrival at and departure from Abashiri		30	
Arrival at Otaru		31	
Departure from Otaru	Jun.	1	
Return to Hakodate		3	
Total coverage 1148.5 miles			

2. Vessel Personnel

Captain: Crew :	Chief Officer Second Officer And 13 men	Professor Assistant Professor Assistant Professor	Toshimi Meguro Osamu Kimura Naoto Kobayashi
		Cruise 167	
Research Staff:	Associate Professor	(Laboratory of Marine Environmental Science)	Toshikuni Nakatani
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Tohru Mukai
	Associate Professor	(Laboratory of Marine Environmental Science)	Hiroji Onishi
Guest Scientist (Domestic):		(Ehime University)	Michinobu Kuwae
Graduate Students:	Chair of Marine Bioresource Science:		5 persons
	Chair of Marine Environmental Science:		3 persons
	Chair of Marine Bioresource and Environment Sensing:		5 persons
Under Graduate Students:	Department of Marine Biology:		2 persons
	Department of Applied Marine Science:		2 persons
		Cruise 168	
Research Staff:	Associate Professor	(Laboratory of Marine Environmental Science)	Toshikuni Nakatani
	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:		6 persons
	Chair of Marine Bioresource and Environment Sensing:		6 persons
Under Graduate Students:	Department of Marine Biology:		1 person
	Department of Applied Marine Science:		3 persons
	Department of Applied Marine Science (Third grade):		3 persons
	Department of Marine Production System Science (Third grade):		1 person
		Cruise 169	
Research Staff:	Professor	(Laboratory of Marine Environmental Science)	Shigeru Nontani
	Assistant Professor	(Field Science Center for Northern Biosphere)	Jun Yamamoto
	Research Associate	(Graduate School of Information Science and Technology)	Toshihiro Iwamori
Graduate Students:	Graduate School of Environmental Science:		2 persons
	Graduate School of Information Science and Technology:		1 person
Under Graduate Students:	Department of Marine Biology:		2 persons
Research Staff (Domestic):		(KOWA CORPORATION)	Yukihiro Saka
		(KOWA CORPORATION)	Osamu Numamoto

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”.

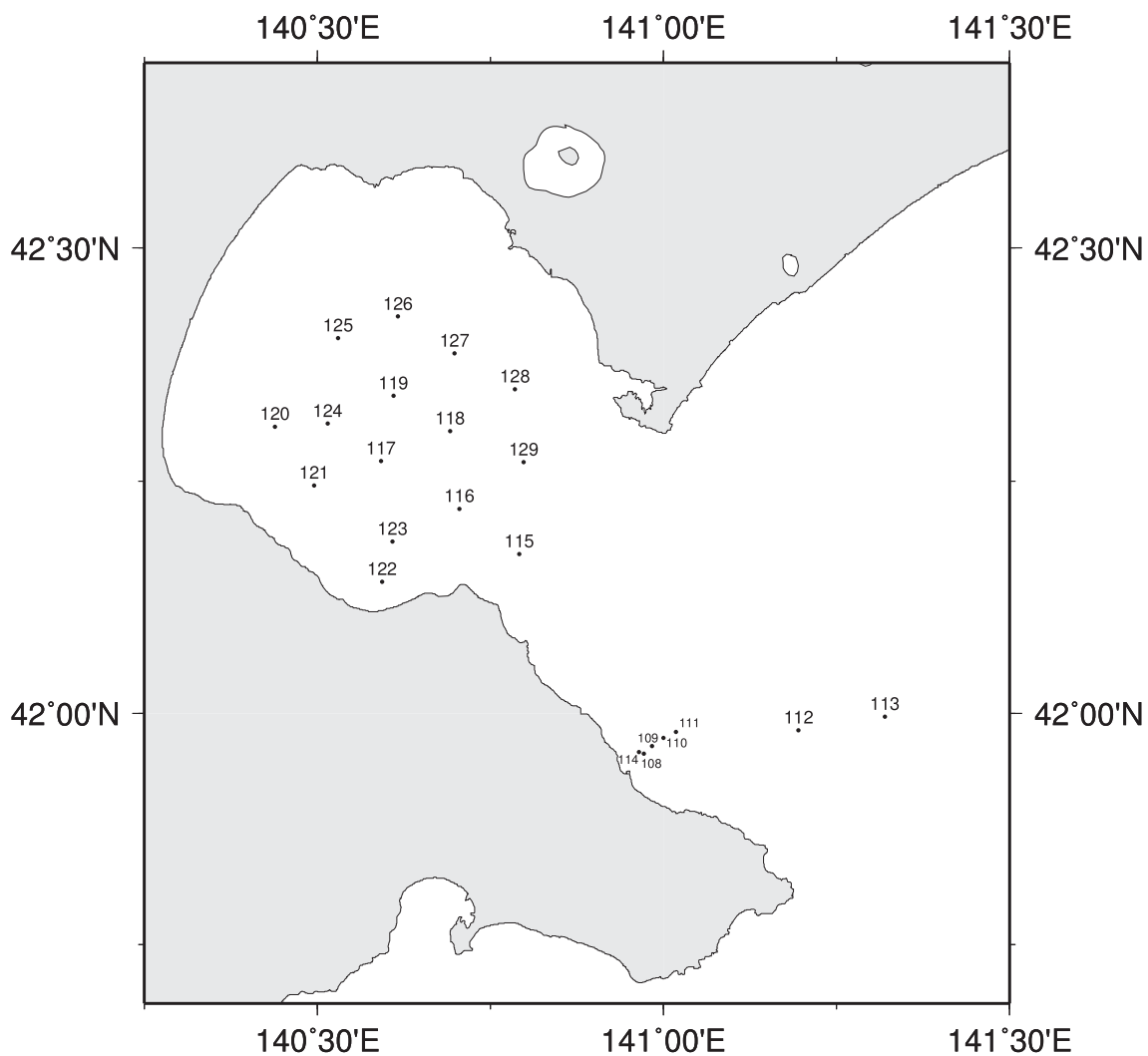


Figure 1: Oceanographic stations (Cruise 167)

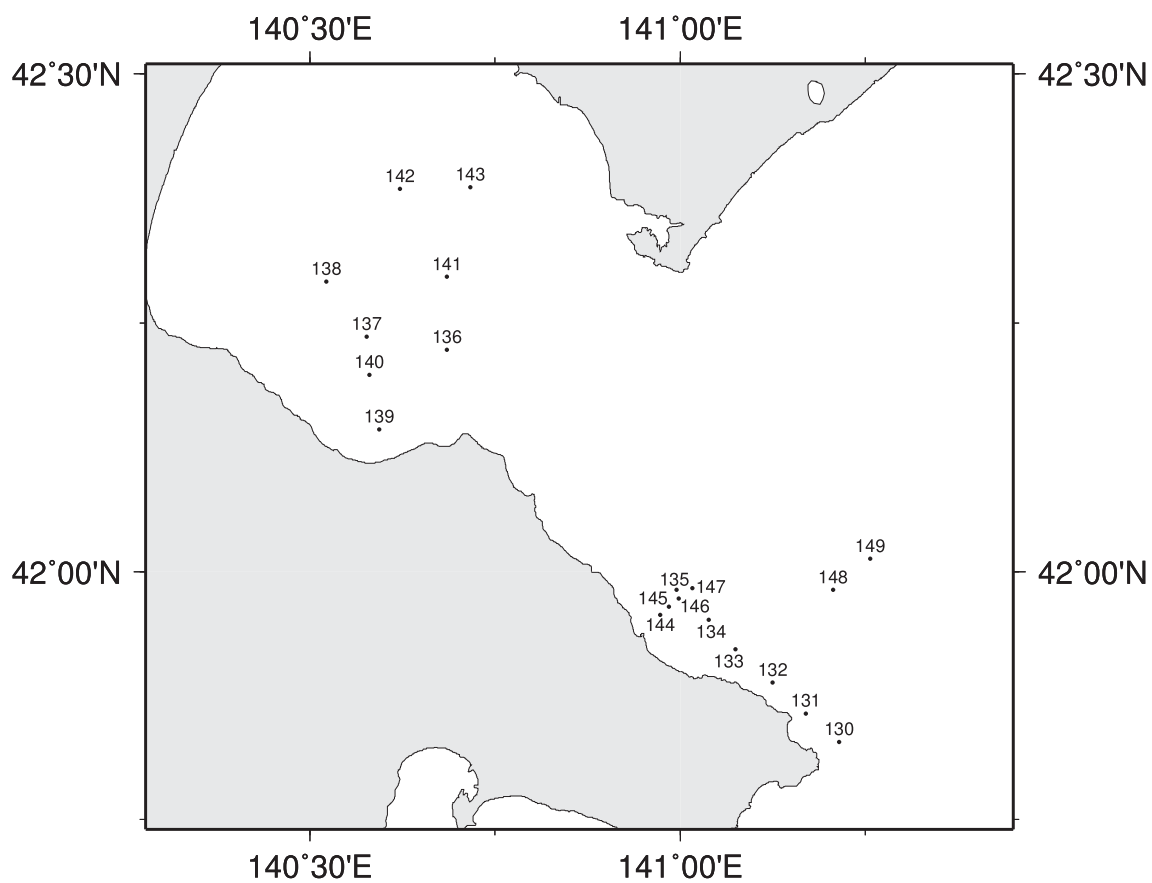


Figure 2: Oceanographic stations (Cruise 168)

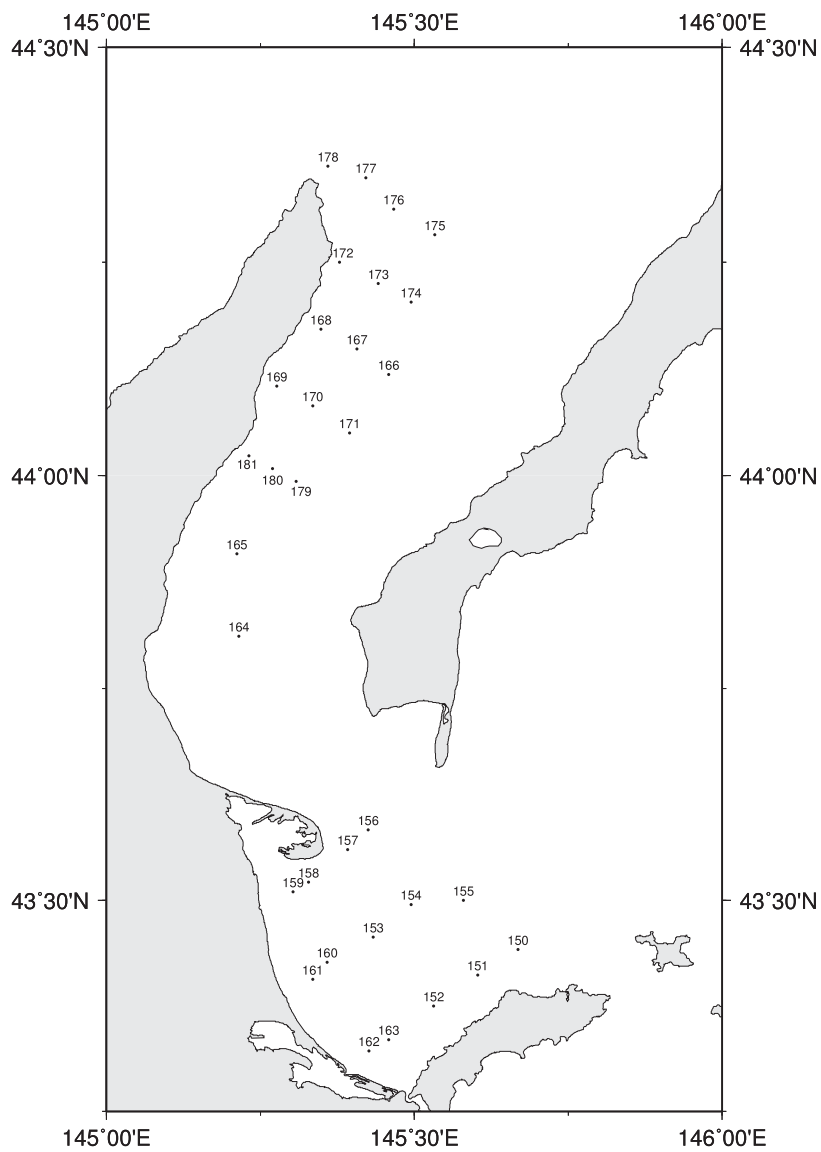


Figure 3: Oceanographic stations (Cruise 169)

Table 1: List of oceanographic stations

Cruise 167

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US09108	41-57.4	140-58.3	4/14	1455-1500	80	Calm	NE -1	Calm	7.8	5.1	o	1009.0
US09109	41-57.9	140-59.0	4/14	1506-1510	86	ESE-1	NW -1	ESE-1	6.9	4.0	o	1009.1
US09110	41-58.4	141-00.0	4/14	1517-1521	90	SE -1	NW -1	SE -2	6.2	4.0	o	1009.0
US09111	41-58.8	141-01.1	4/14	1528-1533	98	SSE-1	NW -1	SSE-3	6.2	4.0	o	1009.0
US09112	41-58.9	141-11.7	4/14	1622-1631	193	SW -1	NW -1	SW -2	6.1	4.0	o	1008.6
US09113	41-59.8	141-19.2	4/14	1720-1731	303	SW -1	NW -1	SW -2	6.2	4.6	o	1008.5
US09114	41-57.5	140-57.9	4/16	0717-0721	76	NW -3	NW -1	NW -5	4.8	4.0	bc	1009.2
US09115	42-10.3	140-47.5	4/19	0740-0744	94	West-2	ESE-1	West-4	7.0	5.2	bc	1020.1
US09116	42-13.2	140-42.3	4/19	0904-0908	90	West-1	ESE-1	West-3	8.1	5.2	bc	1020.6
US09117	42-16.3	140-35.5	4/19	1039-1043	93	WSW-1	ESE-1	WSW-2	10.6	6.0	bc	1020.8
US09118	42-18.2	140-41.5	4/19	1157-1201	71	NW -1	ESE-1	NW -3	10.7	5.9	bc	1020.6
US09119	42-20.5	140-36.6	4/19	1240-1244	87	NW -1	ESE-1	NW -3	9.8	6.3	bc	1020.0
US09120	42-18.5	140-26.3	4/19	1358-1402	74	North-2	ESE-1	North-4	9.3	6.0	bc	1020.1
US09121	42-14.7	140-29.7	4/19	1449-1453	82	North-2	ESE-1	North-4	10.6	6.4	bc	1020.1
US09122	42-08.5	140-35.6	4/19	1545-1548	64	North-1	NW -1	North-3	11.1	6.6	bc	1020.1
US09123	42-11.1	140-36.5	4/20	0657-0701	84	Calm	East-1	Calm	5.7	5.8	bc	1022.0
US09124	42-18.7	140-30.9	4/20	0918-0923	95	North-1	ESE-1	North-2	6.6	5.9	bc	1022.1
US09125	42-24.2	140-31.8	4/20	1038-1043	97	Calm	ESE-1	Calm	8.1	6.8	bc	1022.2
US09126	42-25.6	140-37.0	4/20	1137-1141	87	Calm	ESE-1	Calm	11.3	6.6	bc	1021.6
US09127	42-23.2	140-41.9	4/20	1225-1229	67	Calm	ESE-1	Calm	10.0	6.6	bc	1021.2
US09128	42-20.9	140-47.1	4/20	1307-1310	56	Calm	ESE-1	Calm	9.0	6.3	bc	1021.2
US09129	42-16.2	140-47.9	4/20	1353-1356	70	SE -1	ESE-1	SE -3	7.9	5.3	bc	1020.6

Cruise 168

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US09130	41-49.7	141-12.9	5/9	0730-0739	160	SW -2	SE -1	SW -4	11.2	6.3	bc	1010.1
US09131	41-51.4	141-10.2	5/9	0757-0802	109	SE -1	SE -1	SE -2	12.0	6.7	bc	1010.1
US09132	41-53.3	141-07.5	5/9	0821-0826	94	ESE-1	SE -1	ESE-3	11.7	7.0	bc	1009.7
US09133	41-55.3	141-04.5	5/9	0848-0853	111	ESE-1	SE -1	ESE-2	109.0	6.5	bc	1009.9
US09134	41-57.1	141-02.3	5/9	1250-1255	106	SW -2	SE -1	SW -4	16.9	7.8	bc	1008.0
US09135	41-58.9	140-59.7	5/9	1313-1317	88	South-2	SE -1	South-4	17.3	7.9	bc	1007.6
US09136	42-13.4	140-41.1	5/10	0827-0831	89	West-1	ESE-1	West-2	11.3	8.0	bc	1011.0
US09137	42-14.2	140-34.6	5/10	1110-1115	90	Calm	ESE-1	Calm	14.6	8.6	bc	1012.0
US09138	42-17.5	140-31.3	5/10	1309-1313	94	SE -1	ESE-1	SE -2	16.2	10.5	bc	1011.9
US09139	42-08.6	140-35.6	5/10	1534-1539	63	ESE-1	ESE-1	ESE-3	14.1	9.6	bc	1011.7
US09140	42-11.9	140-34.8	5/11	0626-0631	84	East-3	East-1	East-5	8.4	7.9	o	1016.3
US09141	42-17.8	140-41.1	5/11	0738-0742	70	East-3	East-1	East-5	8.0	7.3	o	1017.5
US09142	42-23.1	140-37.3	5/11	1016-1020	86	ESE-3	East-1	ESE-5	7.9	7.9	o	1017.1
US09143	42-23.2	140-43.0	5/11	1108-1112	60	ESE-4	ESE-1	ESE-6	7.7	7.2	o	1016.7
US09144	41-57.4	140-58.4	5/14	1145-1148	80	NW-1	NE -1	NW -2	7.0	7.2	r	1001.6
US09145	41-57.9	140-59.1	5/14	1154-1157	85	Calm	NE -1	Calm	7.5	7.0	r	1001.6
US09146	41-58.4	140-59.9	5/14	1203-1207	89	NW -1	NE -1	NW -2	7.9	7.0	o	1001.6
US09147	41-59.0	141-01.0	5/14	1215-1219	95	NW-1	NE -1	NW -3	8.2	7.0	c	1001.6
US09148	41-58.9	141-12.4	5/14	1310-1318	206	West-1	West-1	West-3	7.6	6.2	bc	1002.0
US09149	42-00.8	141-15.4	5/14	1447-1455	236	NW -2	NW -1	NW -4	9.0	6.6	bc	1003.0

Cruise 169

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US09150	43-26.5	145-40.1	5/26	2227-2230	31	North-3	NE -1	North-5	6.4	6.0	bc	1016.6
US09151	43-24.7	145-36.2	5/26	2254-2257	27	NNW-2	NE -1	NNW-4	7.0	7.7	bc	1016.6
US09152	43-22.5	145-31.9	5/26	2323-2326	19	North-2	NE -1	North-4	7.3	8.1	bc	1016.6
US09153	43-27.4	145-26.0	5/27	0008-0010	20	NNE-2	NE -1	NNE-4	7.2	7.4	bc	1017.0
US09154	43-29.7	145-29.7	5/27	0039-0042	24	North-2	NE -1	North-4	7.2	7.2	bc	1016.9
US09155	43-30.0	145-34.8	5/27	0109-0112	30	North-2	NE -1	North-4	6.9	7.6	bc	1016.8
US09156	43-35.0	145-25.5	5/27	0212-0214	14	NE -2	NE -1	NE -3	6.3	6.3	bc	1017.1
US09157	43-33.6	145-23.5	5/27	0228-0230	13	East-1	NE -1	East-3	6.6	6.9	bc	1017.2
US09158	43-31.3	145-19.7	5/27	0329-0330	7	NE -1	NE -1	NE -2	6.7	7.2	bc	1017.6
US09159	43-30.6	145-18.2	5/27	0340-0341	7	North-1	NE -1	North-2	6.8	7.2	bc	1017.9
US09160	43-25.6	145-21.5	5/27	0421-0422	12	NE -1	NE -1	NE -3	7.3	7.6	bc	1018.1
US09161	43-24.4	145-20.1	5/27	0433-0434	10	North-1	NE -1	North-2	7.1	8.0	bc	1018.2
US09162	43-19.3	145-25.6	5/27	0520-0521	12	NE -1	NE -1	NE -3	7.4	8.3	bc	1018.5
US09163	43-20.1	145-27.5	5/27	0532-0533	15	NE -1	NE -1	NE -3	7.3	8.8	bc	1018.8
US09164	43-48.7	145-12.9	5/28	1017-1020	41	South-3	South-1	South-5	11.0	6.4	c	1020.5
US09165	43-54.5	145-12.7	5/28	1141-1145	72	SSE-2	South-1	SSE-4	9.4	6.4	c	1020.0
US09166	44-07.1	145-27.5	5/28	1357-1437	1163	SSW-1	South-1	SSW-2	9.2	6.0	r	1019.6
US09167	44-08.9	145-24.4	5/28	1456-1530	1511	Calm	South-1	Calm	8.5	6.3	r	1019.6
US09168	44-10.3	145-20.9	5/28	1618-1626	272	SW-3	South-1	SW -3	8.6	6.1	o	1019.2
US09169	44-06.3	145-16.6	5/28	1704-1715	382	SSW-2	South-1	SSW-2	8.7	6.1	r	1019.3
US09170	44-04.9	145-20.1	5/28	1737-1803	781	SSW-3	South-1	SSW-3	8.1	6.0	r	1019.3
US09171	44-03.0	145-23.7	5/28	1828-1845	524	Calm	South-1	Calm	8.5	6.3	r	1019.3
US09172	44-15.0	145-22.7	5/28	2000-2012	340	SSW-1	South-1	SSW-2	7.7	6.1	o	1020.6
US09173	44-13.5	145-26.5	5/28	2033-2103	1640	South-1	South-1	South-3	7.4	6.0	o	1020.7
US09174	44-12.2	145-29.7	5/28	2122-2150	2070	South-1	South-1	South-2	7.5	6.1	o	1020.8
US09175	44-16.9	145-32.0	5/28	2225-2254	2054	Calm	South-1	Calm	7.6	6.3	f	1021.0
US09176	44-18.7	145-28.0	5/28	2322-2356	1585	North-1	South-1	North-3	7.0	6.3	f	1021.0
US09177	44-20.9	145-25.3	5/29	0024-0054	1078	West-2	South-1	West-4	6.8	7.4	f	1020.8
US09178	44-21.7	145-21.6	5/29	0120-0124	87	SW-3	West-1	SW -5	6.1	6.8	f	1020.6
US09179	43-59.6	145-18.5	5/29	1031-1042	283	NE -1	NE -1	NE -2	8.1	6.4	o	1023.0
US09180	44-00.5	145-16.2	5/29	1055-1112	483	NE -1	NE -1	NE -2	7.3	6.5	o	1022.7
US09181	44-01.4	145-13.9	5/29	1140-1149	253	NE -2	NE -1	NE -4	7.5	6.4	c	1022.6

(*):Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US09108 LATITUDE 41-57.4 N LONGITUDE 140-58.3 E DEPTH (m) 80				STATION US09109 LATITUDE 41-57.9 N LONGITUDE 140-59.0 E DEPTH (m) 86				STATION US09110 LATITUDE 41-58.4 N LONGITUDE 141-00.0 E DEPTH (m) 90			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	4.557	33.092	26.211	5	4.088	33.048	26.225	5	3.990	33.008	26.202
10	4.539	33.112	26.229	10	3.945	33.078	26.263	10	3.864	33.034	26.236
20	4.365	33.113	26.248	20	3.954	33.160	26.327	20	4.125	33.344	26.456
30	4.285	33.114	26.257	30	4.031	33.181	26.336	30	5.405	33.605	26.523
40	4.052	33.370	26.484	40	4.752	33.466	26.487	40	5.412	33.596	26.515
50	3.920	33.422	26.539	50	5.050	33.550	26.520	50	5.444	33.601	26.515
75	4.721	33.623	26.615	75	4.803	33.608	26.593	75	4.240	33.469	26.544
STATION US09111 LATITUDE 41-58.8 N LONGITUDE 141-01.1 E DEPTH (m) 98				STATION US09112 LATITUDE 41-58.9 N LONGITUDE 141-11.7 E DEPTH (m) 193				STATION US09113 LATITUDE 41-59.8 N LONGITUDE 141-19.2 E DEPTH (m) 303			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	4.333	32.928	26.104	5	3.837	32.839	26.083	5	5.085	33.155	26.203
10	3.948	32.927	26.142	10	3.634	32.841	26.104	10	5.605	33.444	26.371
20	4.100	33.357	26.469	20	3.355	32.861	26.146	20	5.081	33.409	26.405
30	4.748	33.483	26.501	30	2.658	32.971	26.295	30	5.478	33.563	26.481
40	5.271	33.579	26.518	40	2.340	33.083	26.410	40	5.934	33.655	26.498
50	5.179	33.561	26.514	50	2.630	33.152	26.442	50	5.654	33.623	26.507
75	5.093	33.559	26.522	75	5.319	33.591	26.522	75	5.581	33.635	26.526
				100	5.003	33.536	26.514	100	5.721	33.684	26.548
				125	4.399	33.466	26.525	125	5.234	33.613	26.549
				150	4.153	33.533	26.603	150	5.750	33.736	26.585
				175	4.207	33.604	26.654	175	4.926	33.657	26.619
								200	4.485	33.650	26.662
								250	3.606	33.602	26.713
STATION US09114 LATITUDE 41-57.5 N LONGITUDE 140-57.9 E DEPTH (m) 76				STATION US09115 LATITUDE 42-10.3 N LONGITUDE 140-47.5 E DEPTH (m) 94				STATION US09116 LATITUDE 42-13.2 N LONGITUDE 140-42.3 E DEPTH (m) 90			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	4.362	32.976	26.139	5	5.629	32.924	25.957	5	5.484	33.015	26.046
10	4.361	32.981	26.143	10	5.592	32.930	25.967	10	5.332	33.049	26.091
20	4.338	32.990	26.153	20	5.188	33.247	26.264	20	5.439	33.211	26.207
30	3.980	33.328	26.458	30	4.517	33.261	26.350	30	4.361	33.287	26.387
40	3.774	33.359	26.503	40	3.575	33.352	26.517	40	3.616	33.390	26.544
50	3.790	33.380	26.518	50	3.527	33.407	26.565	50	3.534	33.420	26.575
75	4.031	33.462	26.560	75	3.520	33.460	26.608	75	3.510	33.450	26.601
STATION US09117 LATITUDE 42-16.3 N LONGITUDE 140-35.5 E DEPTH (m) 93				STATION US09118 LATITUDE 42-18.2 N LONGITUDE 140-41.5 E DEPTH (m) 71				STATION US09119 LATITUDE 42-20.5 N LONGITUDE 140-36.6 E DEPTH (m) 87			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	5.891	33.087	26.054	5	5.993	33.112	26.062	5	6.256	33.207	26.104
10	5.824	33.108	26.079	10	5.636	33.144	26.130	10	5.885	33.219	26.160
20	5.604	33.183	26.165	20	5.384	33.174	26.184	20	5.769	33.231	26.183
30	4.197	33.305	26.418	30	4.993	33.235	26.277	30	4.964	33.275	26.312
40	3.503	33.395	26.558	40	3.921	33.249	26.401	40	4.521	33.317	26.394
50	3.502	33.420	26.578	50	4.023	33.406	26.516	50	3.772	33.422	26.553
75	3.494	33.447	26.601					75	3.468	33.436	26.594
STATION US09120 LATITUDE 42-18.5 N LONGITUDE 140-26.3 E DEPTH (m) 74				STATION US09121 LATITUDE 42-14.7 N LONGITUDE 140-29.7 E DEPTH (m) 82				STATION US09122 LATITUDE 42-08.5 N LONGITUDE 140-35.6 E DEPTH (m) 64			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.707	33.063	25.932	5	6.708	32.783	25.711	5	6.645	32.638	25.605
10	6.162	33.080	26.015	10	6.242	32.795	25.780	10	6.306	32.695	25.693
20	5.369	33.194	26.201	20	5.408	33.212	26.211	20	4.652	33.230	26.310
30	4.187	33.380	26.478	30	4.075	33.337	26.456	30	3.607	33.350	26.513
40	3.812	33.405	26.536	40	3.601	33.385	26.541	40	3.488	33.382	26.549
50	3.831	33.424	26.549	50	3.487	33.398	26.562	50	3.505	33.401	26.563
				75	3.472	33.436	26.593				

STATION US09123 LATITUDE 42-11.1 N LONGITUDE 140-36.5 E DEPTH (m) 84				STATION US09124 LATITUDE 42-18.7 N LONGITUDE 140-30.9 E DEPTH (m) 95				STATION US09125 LATITUDE 42-24.2 N LONGITUDE 140-31.8 E DEPTH (m) 97			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.005	33.073	26.030	5	6.128	33.217	26.128	5	6.487	32.913	25.842
10	5.766	33.126	26.101	10	6.008	33.215	26.141	10	6.434	33.080	25.981
20	4.539	33.258	26.344	20	5.656	33.233	26.198	20	4.709	33.274	26.339
30	3.570	33.378	26.538	30	4.884	33.285	26.329	30	3.574	33.374	26.534
40	3.519	33.401	26.561	40	3.776	33.349	26.495	40	3.471	33.399	26.564
50	3.542	33.419	26.574	50	3.482	33.392	26.558	50	3.436	33.412	26.578
75	3.488	33.443	26.597	75	3.464	33.435	26.594	75	3.536	33.460	26.607
STATION US09126 LATITUDE 42-25.6 N LONGITUDE 140-37.0 E DEPTH (m) 87				STATION US09127 LATITUDE 42-23.2 N LONGITUDE 140-41.9 E DEPTH (m) 67				STATION US09128 LATITUDE 42-20.9 N LONGITUDE 140-47.1 E DEPTH (m) 56			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.047	32.941	25.920	5	5.672	33.010	26.020	5	5.626	32.704	25.784
10	6.102	33.108	26.045	10	5.932	33.194	26.134	10	5.232	32.772	25.883
20	5.304	33.253	26.256	20	5.154	33.203	26.234	20	3.867	32.938	26.159
30	4.019	33.334	26.459	30	3.116	33.136	26.387	30	3.153	33.001	26.276
40	3.509	33.397	26.559	40	3.371	33.215	26.427	40	2.948	33.094	26.368
50	3.453	33.408	26.573	50	3.430	33.242	26.443	50	2.917	33.124	26.395
75	3.455	33.437	26.596								
STATION US09129 LATITUDE 42-16.2 N LONGITUDE 140-47.9 E DEPTH (m) 70				STATION US09130 LATITUDE 41-49.7 N LONGITUDE 141-12.9 E DEPTH (m) 160				STATION US09131 LATITUDE 41-51.4 N LONGITUDE 141-10.2 E DEPTH (m) 109			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	5.689	32.754	25.816	5	7.038	32.435	25.393	5	5.523	32.368	25.530
10	4.972	32.839	25.965	10	6.165	32.548	25.595	10	4.565	32.748	25.937
20	3.486	32.877	26.147	20	5.178	32.772	25.889	20	4.147	32.953	26.143
30	3.035	33.118	26.380	30	4.811	33.132	26.215	30	3.624	33.083	26.298
40	3.093	33.160	26.408	40	6.145	33.478	26.332	40	3.575	33.117	26.330
50	3.241	33.209	26.434	50	6.944	33.668	26.377	50	4.243	33.321	26.426
				75	5.052	33.479	26.464	75	4.622	33.477	26.510
				100	4.775	33.490	26.503	100	4.895	33.541	26.530
				125	4.755	33.548	26.551				
				150	4.674	33.547	26.560				
STATION US09132 LATITUDE 41-53.3 N LONGITUDE 141-07.5 E DEPTH (m) 94				STATION US09133 LATITUDE 41-55.3 N LONGITUDE 141-04.5 E DEPTH (m) 111				STATION US09134 LATITUDE 41-57.1 N LONGITUDE 141-02.3 E DEPTH (m) 106			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.229	32.271	25.369	5	6.470	32.359	25.408	5	7.018	32.590	25.518
10	5.370	32.521	25.669	10	6.363	32.638	25.642	10	5.577	32.758	25.832
20	4.299	32.942	26.119	20	5.302	32.973	26.035	20	4.357	32.997	26.157
30	4.579	33.083	26.202	30	5.094	33.140	26.190	30	5.041	33.240	26.275
40	4.432	33.084	26.218	40	5.279	33.259	26.264	40	6.072	33.460	26.327
50	3.442	33.025	26.269	50	6.309	33.527	26.350	50	7.135	33.693	26.371
75	4.356	33.380	26.461	75	4.796	33.464	26.480	75	6.047	33.553	26.403
				100	4.781	33.513	26.521	100	4.542	33.525	26.556
STATION US09135 LATITUDE 41-58.9 N LONGITUDE 140-59.7 E DEPTH (m) 88				STATION US09136 LATITUDE 42-13.4 N LONGITUDE 140-41.1 E DEPTH (m) 89				STATION US09137 LATITUDE 42-14.2 N LONGITUDE 140-34.6 E DEPTH (m) 90			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	8.238	32.198	25.039	5	8.406	32.316	25.107	5	8.733	32.651	25.320
10	7.409	32.302	25.239	10	7.817	32.333	25.206	10	7.334	32.339	25.278
20	5.580	32.815	25.877	20	5.131	32.615	25.770	20	5.414	32.721	25.821
30	4.293	32.964	26.137	30	4.660	32.944	26.083	30	5.547	32.938	25.978
40	3.821	33.000	26.213	40	3.934	33.012	26.212	40	4.332	32.895	26.078
50	3.731	33.123	26.320	50	2.870	32.993	26.294	50	4.159	33.065	26.231
75	4.421	33.348	26.428	75	3.882	33.360	26.493	75	3.583	33.411	26.563
STATION US09138 LATITUDE 42-17.5 N LONGITUDE 140-31.3 E DEPTH (m) 94				STATION US09139 LATITUDE 42-08.6 N LONGITUDE 140-35.6 E DEPTH (m) 63				STATION US09140 LATITUDE 42-11.9 N LONGITUDE 140-34.8 E DEPTH (m) 84			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	11.844	33.008	25.070	5	8.415	32.395	25.167	5	7.770	32.370	25.242
10	8.842	32.240	24.982	10	8.029	32.427	25.249	10	7.390	32.376	25.299
20	5.878	32.449	25.552	20	6.193	32.720	25.727	20	5.002	32.566	25.746
30	5.606	32.800	25.862	30	5.804	32.875	25.897	30	5.389	33.005	26.049
40	5.164	33.009	26.079	40	5.240	32.954	26.026	40	4.566	33.014	26.148
50	4.463	33.013	26.158	50	5.162	33.144	26.186	50	4.758	33.176	26.256
75	3.876	33.374	26.505					75	3.558	33.418	26.571

STATION US09141 LATITUDE 42-17.8 N LONGITUDE 140-41.1 E DEPTH (m) 70				STATION US09142 LATITUDE 42-23.1 N LONGITUDE 140-37.3 E DEPTH (m) 86				STATION US09143 LATITUDE 42-23.2 N LONGITUDE 140-43.0 E DEPTH (m) 60			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	7.672	32.378	25.262	5	8.331	32.346	25.141	5	7.461	32.335	25.257
10	7.595	32.432	25.315	10	8.281	32.350	25.152	10	7.430	32.346	25.270
20	5.467	32.799	25.877	20	6.449	32.682	25.665	20	5.653	32.866	25.908
30	4.274	32.939	26.119	30	5.402	32.928	25.987	30	5.371	32.991	26.041
40	3.572	32.965	26.209	40	5.169	33.122	26.168	40	5.390	33.060	26.093
50	2.852	33.002	26.303	50	3.404	33.052	26.294	50	5.335	33.108	26.137
				75	3.548	33.425	26.578				
STATION US09144 LATITUDE 41-57.4 N LONGITUDE 140-58.4 E DEPTH (m) 80				STATION US09145 LATITUDE 41-57.9 N LONGITUDE 140-59.1 E DEPTH (m) 85				STATION US09146 LATITUDE 41-58.4 N LONGITUDE 140-59.9 E DEPTH (m) 89			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	7.473	32.173	25.129	5	7.354	32.199	25.165	5	7.238	32.238	25.212
10	7.320	32.280	25.233	10	7.291	32.223	25.192	10	7.053	32.296	25.282
20	5.128	32.434	25.627	20	4.264	32.475	25.752	20	5.214	32.518	25.684
30	3.688	32.629	25.930	30	3.511	32.676	25.984	30	3.423	32.654	25.975
40	4.088	32.812	26.037	40	4.036	32.896	26.109	40	3.919	32.893	26.119
50	3.295	32.821	26.120	50	3.465	32.897	26.165	50	3.679	32.942	26.180
75	3.605	33.185	26.381	75	3.614	33.264	26.443	75	3.671	33.297	26.464
STATION US09147 LATITUDE 41-59.0 N LONGITUDE 141-01.0 E DEPTH (m) 95				STATION US09148 LATITUDE 41-58.9 N LONGITUDE 141-12.4 E DEPTH (m) 206				STATION US09149 LATITUDE 42-00.8 N LONGITUDE 141-15.4 E DEPTH (m) 236			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	7.130	32.320	25.291	5	6.243	32.187	25.300	5	6.724	32.190	25.242
10	6.944	32.380	25.363	10	6.092	32.202	25.331	10	5.943	32.315	25.438
20	4.946	32.733	25.884	20	5.770	32.264	25.419	20	3.557	32.393	25.755
30	4.294	32.872	26.064	30	8.036	33.165	25.828	30	2.643	32.536	25.948
40	4.137	32.975	26.161	40	5.103	33.102	26.159	40	2.539	32.595	26.004
50	3.666	33.002	26.229	50	6.053	33.436	26.310	50	2.573	32.690	26.077
75	3.886	33.317	26.459	75	5.610	33.469	26.391	75	4.641	33.201	26.288
				100	5.092	33.561	26.524	100	4.995	33.550	26.526
				125	5.005	33.586	26.554	125	4.964	33.596	26.567
				150	4.689	33.580	26.584	150	4.650	33.627	26.625
				175	4.944	33.669	26.626	175	4.151	33.601	26.658
								200	4.335	33.649	26.677
STATION US09150 LATITUDE 43-26.5 N LONGITUDE 145-40.1 E DEPTH (m) 31				STATION US09151 LATITUDE 43-24.7 N LONGITUDE 145-36.2 E DEPTH (m) 27				STATION US09152 LATITUDE 43-22.5 N LONGITUDE 145-31.9 E DEPTH (m) 19			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.827	32.235	25.264	5	8.141	31.711	24.672	5	8.491	30.909	23.992
10	6.777	32.238	25.273	10	8.094	31.744	24.705	10	8.443	31.619	24.555
20	6.724	32.247	25.287	20	7.950	31.790	24.761				
STATION US09153 LATITUDE 43-27.4 N LONGITUDE 145-26.0 E DEPTH (m) 20				STATION US09154 LATITUDE 43-29.7 N LONGITUDE 145-29.7 E DEPTH (m) 24				STATION US09155 LATITUDE 43-30.0 N LONGITUDE 145-34.8 E DEPTH (m) 30			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	7.435	31.771	24.818	5	7.371	32.001	25.007	5	7.484	31.911	24.921
10	7.427	31.791	24.835	10	7.149	32.060	25.084	10	6.929	32.059	25.112
				20	6.650	32.170	25.236	20	6.537	32.199	25.273
STATION US09156 LATITUDE 43-35.0 N LONGITUDE 145-25.5 E DEPTH (m) 14				STATION US09157 LATITUDE 43-33.6 N LONGITUDE 145-23.5 E DEPTH (m) 13				STATION US09158 LATITUDE 43-31.3 N LONGITUDE 145-19.7 E DEPTH (m) 7			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.829	32.173	25.215	5	7.424	31.445	24.563	5	8.160	31.464	24.475
10	6.802	32.179	25.223	10	7.788	31.916	24.883				
STATION US09159 LATITUDE 43-30.6 N LONGITUDE 145-18.2 E DEPTH (m) 7				STATION US09160 LATITUDE 43-25.6 N LONGITUDE 145-21.5 E DEPTH (m) 12				STATION US09161 LATITUDE 43-24.4 N LONGITUDE 145-20.1 E DEPTH (m) 10			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	8.317	31.422	24.419	5	8.051	31.509	24.526	5	8.564	31.428	24.388

STATION US09162 LATITUDE 43-19.3 N LONGITUDE 145-25.6 E DEPTH (m) 12				STATION US09163 LATITUDE 43-20.1 N LONGITUDE 145-27.5 E DEPTH (m) 15				STATION US09164 LATITUDE 43-48.7 N LONGITUDE 145-12.9 E DEPTH (m) 41			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	8.806	31.199	24.172	5	8.916	31.319	24.250	5	6.791	31.878	24.987
				10	8.837	31.624	24.501	10	6.504	31.894	25.037
								20	2.946	32.702	26.055
								30	2.287	32.780	26.172
STATION US09165 LATITUDE 43-54.5 N LONGITUDE 145-12.7 E DEPTH (m) 72				STATION US09166 LATITUDE 44-07.1 N LONGITUDE 145-27.5 E DEPTH (m) 1163				STATION US09167 LATITUDE 44-08.9 N LONGITUDE 145-24.4 E DEPTH (m) 1511			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.571	32.102	25.192	5	6.433	32.287	25.355	5	6.415	32.753	25.725
10	5.910	32.332	25.456	10	6.075	32.301	25.411	10	6.528	32.871	25.804
20	5.206	32.524	25.690	20	5.341	32.721	25.830	20	6.797	33.062	25.919
30	5.249	32.713	25.835	30	4.521	32.783	25.970	30	6.834	33.207	26.029
40	4.911	32.780	25.925	40	4.587	33.116	26.227	40	7.371	33.413	26.117
50	4.665	32.844	26.003	50	4.822	33.261	26.317	50	6.909	33.409	26.177
				75	4.543	33.324	26.397	75	6.482	33.489	26.297
				100	5.092	33.472	26.454	100	5.507	33.411	26.357
				125	4.477	33.478	26.526	125	3.515	33.296	26.478
				150	2.378	33.280	26.564	150	0.177	33.032	26.509
				175	1.921	33.284	26.603	175	0.382	33.139	26.585
				200	0.882	33.196	26.602	200	0.839	33.231	26.633
				250	0.991	33.293	26.673	250	0.721	33.308	26.702
				300	1.117	33.421	26.768	300	1.075	33.396	26.751
				400	1.480	33.533	26.834	400	1.290	33.513	26.831
				500	2.048	33.676	26.908	500	1.540	33.610	26.891
				600	2.161	33.747	26.955	600	1.941	33.742	26.969
				700	2.044	33.934	27.114	700	2.093	33.979	27.146
				800	2.240	34.124	27.251	800	2.245	34.135	27.259
				900	2.298	34.222	27.325	900	2.286	34.209	27.315
				1000	2.298	34.282	27.372	1000	2.289	34.286	27.377
STATION US09168 LATITUDE 44-10.3 N LONGITUDE 145-20.9 E DEPTH (m) 72				STATION US09169 LATITUDE 44-06.3 N LONGITUDE 145-16.6 E DEPTH (m) 382				STATION US09170 LATITUDE 44-04.9 N LONGITUDE 145-20.1 E DEPTH (m) 781			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.604	33.029	25.919	5	6.152	32.475	25.539	5	6.232	32.456	25.514
10	6.704	33.107	25.967	10	6.063	32.565	25.622	10	6.461	32.555	25.564
20	6.952	33.212	26.017	20	6.610	33.006	25.900	20	6.219	32.627	25.651
30	7.205	33.296	26.049	30	6.702	33.142	25.995	30	4.549	32.705	25.905
40	6.746	33.302	26.115	40	7.266	33.385	26.110	40	5.876	33.248	26.183
50	7.524	33.541	26.197	50	7.268	33.474	26.180	50	7.426	33.610	26.265
75	6.360	33.452	26.284	75	7.054	33.531	26.255	75	3.973	33.167	26.331
100	3.384	33.134	26.361	100	4.003	33.225	26.374	100	-0.133	32.960	26.466
125	0.801	33.063	26.500	125	3.111	33.237	26.468	125	1.415	33.175	26.551
150	0.375	33.177	26.615	150	0.460	33.104	26.552	150	0.824	33.150	26.569
175	0.540	33.257	26.671	175	0.314	33.204	26.641	175	0.054	33.146	26.607
				200	0.523	33.252	26.668	200	0.327	33.205	26.641
				250	1.051	33.388	26.746	250	0.686	33.299	26.697
				300	1.234	33.458	26.790	300	1.071	33.418	26.769
								400	1.365	33.532	26.841
								500	1.415	33.582	26.878
								600	1.724	33.705	26.955
								700	2.006	33.972	27.147
STATION US09171 LATITUDE 44-03.0 N LONGITUDE 145-23.7 E DEPTH (m) 524				STATION US09172 LATITUDE 44-15.0 N LONGITUDE 145-22.7 E DEPTH (m) 340				STATION US09173 LATITUDE 44-13.5 N LONGITUDE 145-26.5 E DEPTH (m) 1640			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.518	31.923	25.058	5	6.743	33.095	25.952	5	6.499	32.940	25.862
10	5.769	32.276	25.428	10	6.914	33.217	26.026	10	6.962	33.240	26.038
20	5.726	32.386	25.520	20	6.991	33.336	26.109	20	7.423	33.402	26.102
30	6.313	32.977	25.915	30	7.485	33.513	26.181	30	7.464	33.410	26.102
40	6.851	33.367	26.153	40	7.512	33.544	26.201	40	7.651	33.573	26.204
50	0.847	32.715	26.217	50	7.220	33.511	26.215	50	7.618	33.574	26.209
75	2.488	33.090	26.403	75	3.225	33.222	26.446	75	7.390	33.634	26.289
100	3.050	33.277	26.505	100	1.618	33.238	26.588	100	6.735	33.631	26.376
125	2.771	33.302	26.550	125	1.303	33.248	26.618	125	2.562	33.137	26.435
150	0.857	33.177	26.588	150	0.994	33.271	26.656	150	0.264	33.162	26.609
175	1.093	33.256	26.637	175	0.989	33.306	26.684	175	0.485	33.230	26.653
200	1.299	33.308	26.666	200	1.117	33.346	26.708	200	0.601	33.287	26.692
250	0.780	33.318	26.707	250	1.418	33.420	26.748	250	0.828	33.378	26.752
300	0.895	33.367	26.739	300	1.501	33.458	26.772	300	1.139	33.429	26.774
400	1.204	33.514	26.837					400	1.920	33.589	26.847
								500	1.838	33.645	26.899
								600	1.884	33.714	26.950
								700	1.999	33.905	27.094
								800	2.217	34.116	27.246
								900	2.301	34.211	27.316

STATION US09174 LATITUDE 44-12.2 N LONGITUDE 145-29.7 E DEPTH (m) 2070				STATION US09175 LATITUDE 44-16.9 N LONGITUDE 145-32.0 E DEPTH (m) 2054				STATION US09176 LATITUDE 44-18.7 N LONGITUDE 145-28.0 E DEPTH (m) 1585			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.907	33.207	26.019	5	5.207	32.672	25.807	5	8.900	33.549	25.998
10	7.324	33.319	26.051	10	6.133	33.083	26.021	10	8.481	33.522	26.041
20	7.375	33.326	26.049	20	7.015	33.227	26.020	20	7.964	33.474	26.081
30	7.439	33.342	26.052	30	7.188	33.263	26.025	30	7.817	33.466	26.096
40	7.383	33.334	26.054	40	7.346	33.331	26.057	40	7.681	33.458	26.109
50	7.477	33.446	26.129	50	4.295	32.946	26.123	50	7.451	33.525	26.194
75	7.739	33.619	26.227	75	2.976	33.117	26.384	75	7.643	33.571	26.203
100	3.727	33.339	26.492	100	1.586	33.155	26.523	100	6.778	33.502	26.269
125	2.361	33.177	26.484	125	0.932	33.092	26.515	125	3.957	33.360	26.486
150	-0.286	33.060	26.553	150	0.110	33.113	26.577	150	5.035	33.598	26.560
175	0.029	33.166	26.624	175	0.002	33.166	26.625	175	2.882	33.367	26.592
200	0.699	33.293	26.691	200	0.691	33.277	26.679	200	0.665	33.206	26.623
250	1.195	33.394	26.741	250	0.946	33.363	26.732	250	0.691	33.297	26.695
300	1.404	33.459	26.780	300	1.370	33.459	26.782	300	1.095	33.402	26.755
400	2.000	33.616	26.863	400	1.434	33.537	26.840	400	1.487	33.551	26.848
500	2.508	33.757	26.935	500	1.980	33.665	26.904	500	1.977	33.675	26.912
600	1.936	33.742	26.969	600	1.981	33.749	26.971	600	1.924	33.736	26.965
700	2.009	33.895	27.086	700	1.990	33.897	27.088	700	2.107	33.950	27.122
800	2.221	34.126	27.254	800	2.238	34.131	27.257	800	2.222	34.087	27.223
900	2.281	34.195	27.304	900	2.293	34.235	27.336	900	2.286	34.197	27.306
1000	2.298	34.278	27.369								

STATION US09177 LATITUDE 44-20.9 N LONGITUDE 145-25.3 E DEPTH (m) 1078				STATION US09178 LATITUDE 44-21.7 N LONGITUDE 145-21.6 E DEPTH (m) 87				STATION US09179 LATITUDE 43-59.6 N LONGITUDE 145-18.5 E DEPTH (m) 283			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	7.581	33.462	26.127	5	7.443	33.417	26.111	5	6.561	32.069	25.168
10	7.574	33.468	26.132	10	7.339	33.406	26.117	10	5.687	32.261	25.426
20	7.589	33.488	26.146	20	7.043	33.445	26.188	20	4.941	32.491	25.693
30	7.618	33.497	26.149	30	6.390	33.479	26.301	30	5.763	32.982	25.987
40	7.671	33.522	26.161	40	5.907	33.473	26.357	40	6.868	33.371	26.153
50	7.528	33.549	26.202	50	5.518	33.530	26.450	50	6.995	33.421	26.176
75	7.029	33.604	26.315					75	3.717	33.168	26.357
100	3.792	33.258	26.421					100	1.593	33.098	26.478
125	4.418	33.491	26.543					125	1.419	33.131	26.515
150	3.289	33.409	26.589					150	-0.123	33.072	26.556
175	1.691	33.249	26.592					175	-0.165	33.121	26.597
200	0.376	33.176	26.614					200	0.078	33.188	26.640
250	1.002	33.328	26.701					250	0.955	33.388	26.752
300	1.071	33.388	26.745								
400	2.242	33.597	26.829								
500	2.553	33.722	26.903								
600	2.371	33.771	26.958								
700	2.045	33.896	27.084								

STATION US09180 LATITUDE 44-00.5 N LONGITUDE 145-16.2 E DEPTH (m) 483				STATION US09181 LATITUDE 44-01.4 N LONGITUDE 145-13.9 E DEPTH (m) 253			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	6.008	32.217	25.353	5	6.446	32.002	25.129
10	5.608	32.463	25.596	10	5.945	32.446	25.542
20	5.326	32.641	25.768	20	5.391	32.576	25.710
30	4.492	32.854	26.029	30	4.970	32.824	25.954
40	6.901	33.348	26.131	40	5.603	33.014	26.031
50	6.890	33.432	26.199	50	6.272	33.243	26.130
75	3.282	33.095	26.339	75	5.534	33.231	26.212
100	3.102	33.171	26.416	100	1.869	32.914	26.310
125	1.336	33.115	26.509	125	0.596	33.044	26.496
150	0.206	33.089	26.553	150	0.054	33.114	26.581
175	0.082	33.124	26.588	175	0.146	33.148	26.604
200	0.338	33.218	26.650	200	0.180	33.191	26.637
250	0.859	33.350	26.727				
300	1.071	33.424	26.774				
400	1.219	33.504	26.828				

THE “USHIO MARU”

CRUISE 170

CRUISE 171

CRUISE 172

IN JUNE-JULY 2009

1. Cruise Itinerary

Cruise 170

Departure from Hakodate	Jun.	8	, 2009
Start trawl net research		8	
Start hydrographic research (US09182)		8	
Arrival at Aomori		8	
Departure from Aomori		9	
Arrival at Noheji		9	
Departure from Noheji		10	
Finish trawl net research		10	
Finish hydrographic research (US09204)		10	
Return to Hakodate		11	
Total coverage 199.0 miles			

Cruise 171

Departure from Hakodate	Jun.	16	, 2009
Arrival at Usujiri		16	
Departure from Usujiri		17	
Start hydrographic research (US09205) and frame trawl net sampling		17	
Arrival at Usujiri		19	
Departure from Usujiri		20	
Retrieval sediment trap system		20	
Finish hydrographic research (US09213) and frame trawl net sampling		20	
Set sediment trap system		20	
Arrival at Usujiri		20	
Departure from Usujiri		24	
Return to Hakodate		24	
Total coverage 314.8 miles			

Cruise 172

Departure from Hakodate	Jun.	29	, 2009
Arrival at and departure from Otaru		30	
Start hydrographic research (US09214)		30	
Arrival at Oniwaki	Jul.	1	
Departure from Oniwaki		2	
Arrival at Wakkanai		2	
Departure from Wakkanai		3	
Arrival at Nemuro		6	
Departure from Nemuro		7	
Finish hydrographic research (US09288)		9	
Arrival at Kushiro		9	
Departure from Kushiro		11	
Return to Hakodate		12	
Total coverage 1159.8 miles			

2. Vessel Personnel

Captain:		Professor	Toshimi Meguro
Crew :	Chief Officer	Assistant Professor	Osamu Kimura
	Second Officer	Assistant Professor	Naoto Kobayashi
	And 13 men		

Cruise 170

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:		5 persons

Cruise 171

Research Staff:	Associate Professor	(Laboratory of Marine Environmental Science)	Toshikuni Nakatani
	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Tohru Mukai
Graduate Students:	Chair of Marine Bioresource and Environmental Sensing:		5 persons
	Chair of Marine Bioresource Science:		3 persons
Under Graduate Students:	Department of Marine Biology:		1 person
	Department of Applied Marine Science:		2 persons

Cruise 172

Research Staff:	Professor	(Laboratory of Marine Environmental Science)	Shigeru Montani
	Assistant Professor	(Laboratory of Marine Environmental Science)	Isao Kudo
Guest Scientist (Domestic):	Professor	(University of Toyama)	Zhang Jing
Graduate Students:	Graduate School of Environmental Science:		6 persons
Graduate Students (Domestic):	University of Toyama:		2 person
Under Graduate Students:	Department of Marine Biology:		2 persons
Under Graduate Students (Domestic):	University of Toyama:		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”.

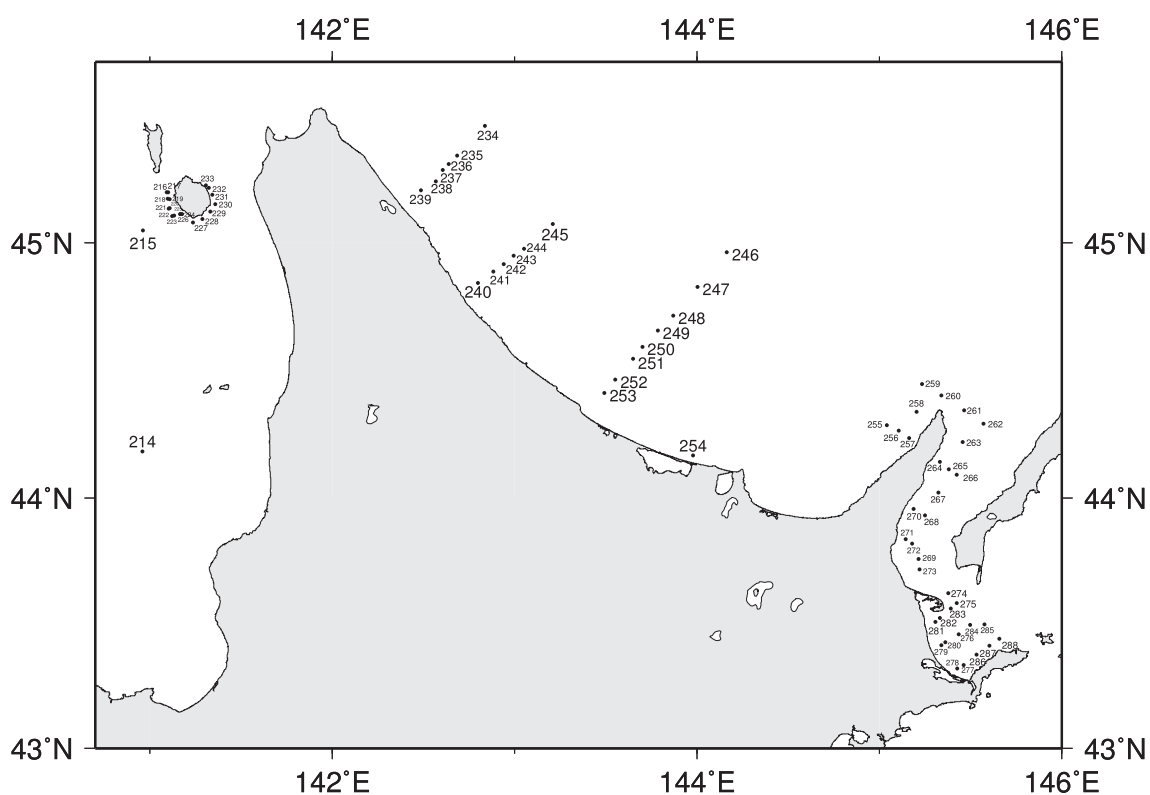


Figure 1: Oceanographic stations (Cruise 172)

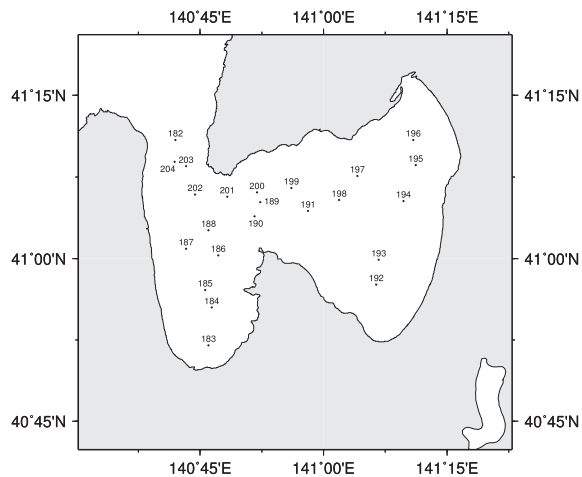


Figure 2: Oceanographic stations (Cruise 170)

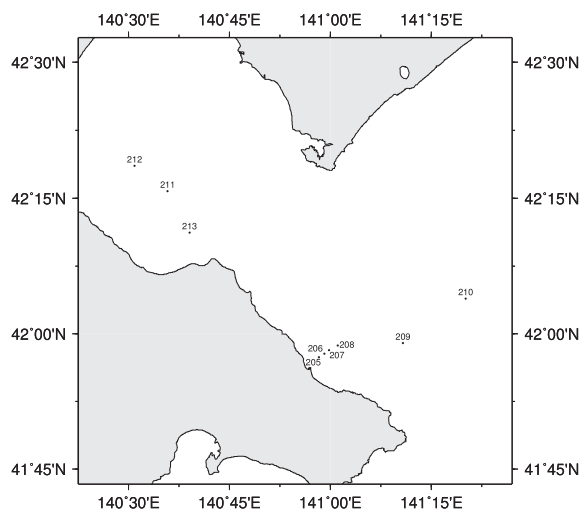


Figure 3: Oceanographic stations (Cruise 171)

Table 1: List of oceanographic stations

Cruise 170													
Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)	
US09182	41-10.9	140-42.0	6/8	1254-1257	73	East-2	South-1	East-4	15.2	13.4	c	1015.2	
US09183	40-52.0	140-46.0	6/9	0632-0634	28	WSW-1	North-1	WSW-2	14.8	13.7	c	1015.6	
US09184	40-55.5	140-46.4	6/9	0722-0725	43	West-2	SW-1	West-4	15.3	13.5	o	1016.1	
US09185	40-57.1	140-45.9	6/9	0813-0816	50	West-1	SW-1	West-3	15.8	13.4	o	1015.3	
US09186	41-00.3	140-47.2	6/9	0925-0928	52	SW-1	SW-1	SW-2	15.1	13.1	c	1016.0	
US09187	41-00.9	140-43.3	6/9	1047-1050	56	NE-1	South-1	NE-1	16.1	12.9	c	1015.7	
US09188	41-02.6	140-46.0	6/9	1121-1123	52	Calm	South-1	Calm	16.7	13.0	c	1015.1	
US09189	41-05.2	140-46.3	6/9	1224-1227	53	West-1	South-1	West-3	15.9	12.9	c	1015.2	
US09190	41-03.9	140-51.6	6/9	1337-1340	51	NW-1	South-1	NW-3	15.4	12.9	c	1015.2	
US09191	41-04.4	140-58.1	6/9	1422-1425	50	West-1	West-1	West-2	16.9	12.8	c	1014.2	
US09192	40-57.6	141-06.4	6/9	1553-1556	39	West-1	NW-1	West-2	16.0	14.3	bc	1014.1	
US09193	40-59.9	141-06.7	6/10	0712-0715	44	Calm	West-1	Calm	12.6	13.4	f	1011.0	
US09194	41-05.3	141-09.7	6/10	0925-0928	40	Calm	North-1	Calm	16.3	14.5	bc	1010.2	
US09195	41-08.6	141-11.2	6/10	1014-1017	35	Calm	North-1	Calm	17.4	14.8	bc	1009.7	
US09196	41-10.9	141-10.9	6/10	1047-1050	31	Calm	SW-1	Calm	19.1	15.2	bc	1009.6	
US09197	41-07.6	141-04.1	6/10	1227-1230	39	Calm	SW-1	Calm	20.7	15.6	bc	1008.5	
US09198	41-05.4	141-01.9	6/10	1335-1338	47	SE-2	SE-1	SE-4	17.5	14.5	bc	1007.7	
US09199	41-06.5	140-56.1	6/10	1420-1423	47	SE-3	SE-1	SE-5	16.3	14.2	o	1007.6	
US09200	41-06.1	140-51.9	6/10	1446-1449	53	East-3	SE-1	East-5	15.3	12.6	o	1007.2	
US09201	41-05.7	140-48.3	6/10	1510-1514	59	East-3	SE-1	East-5	15.3	13.2	o	1007.1	
US09202	41-05.9	140-44.4	6/10	1601-1605	62	East-3	SE-1	East-5	14.9	13.6	o	1007.0	
US09203	41-08.5	140-41.3	6/10	1639-1643	82	East-1	SE-1	East-2	13.6	13.9	o	1006.2	
US09204	41-08.9	140-41.9	6/10	1655-1700	56	SE-1	SE-1	SE-3	15.6	15.0	o	1006.2	
Cruise 171													
Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)	
US09205	41-57.4	140-58.3	6/17	1138-1142	79	East-1	East-1	East-3	11.1	11.6	o	1019.2	
US09206	41-57.8	140-59.1	6/17	1147-1151	85	East-1	East-1	East-3	10.9	11.6	o	1019.2	
US09207	41-58.2	140-58.8	6/17	1155-1159	89	East-1	East-1	East-3	11.2	12.1	o	1019.2	
US09208	41-58.7	141-01.1	6/17	1206-1210	96	East-1	East-1	East-3	11.1	12.3	o	1019.2	
US09209	41-59.0	141-10.8	6/17	1257-1303	168	East-1	East-1	East-3	11.6	12.3	o	1019.1	
US09210	42-03.9	141-20.1	6/17	1455-1506	325	East-1	East-1	East-3	11.5	11.3	o	1018.7	
US09211	42-15.8	140-35.8	6/20	0815-0823	92	East-4	East-2	East-6	12.0	12.3	o	1014.5	
US09212	42-18.6	140-30.9	6/20	0945-0952	93	East-3	East-2	East-5	11.9	12.5	o	1014.6	
US09213	42-11.2	140-39.1	6/20	1404-1409	87	ESE-3	SE-1	ESE-5	12.1	11.5	o	1012.6	
Cruise 172													
Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)	
US09214	44-11.0	140-57.5	6/30	2200-2228	301	NE-1	NE-1	NE-3	17.5	16.0	o	1006.1	
US09215	45-03.0	140-57.7	7/1	0349-0400	118	ENE-3	NE-1	ENE-5	14.4	14.3	r	1004.5	
US09216	45-11.8	141-05.5	7/1	0557-0604	75	NNE-3	NNE-1	NNE-5	13.5	14.1	r	1005.1	
US09217	45-06.3	141-06.0	7/1	0626-0633	64	NNE-3	NNE-1	NNE-5	13.5	14.1	r	1005.2	
US09218	45-10.3	141-05.8	7/1	0700-0708	76	NNE-3	NNE-1	NNE-5	13.7	14.0	c	1005.1	
US09219	45-10.2	141-06.4	7/1	0730-0741	67	NNE-3	NNE-1	NNE-4	14.1	14.0	c	1005.1	
US09220	45-08.1	141-06.4	7/1	0832-0840	67	NNW-2	NNW-1	NNW-3	15.7	14.2	c	1005.0	
US09221	45-08.0	141-06.1	7/1	0854-0903	76	NNW-2	NNW-1	NNW-4	14.1	14.0	c	1005.0	
US09222	45-06.3	141-07.3	7/1	0922-0930	71	East-2	NNW-1	East-4	16.5	14.2	o	1005.0	
US09223	45-06.4	141-07.9	7/1	0942-0951	64	East-2	NNW-1	East-4	16.4	14.3	c	1004.0	
US09224	45-06.8	141-10.5	7/1	1006-1013	39	ESE-2	ESE-1	ESE-4	16.7	14.3	c	1004.2	
US09225	45-06.8	141-09.9	7/1	1048-1059	49	ESE-2	ESE-1	ESE-4	18.1	14.5	c	1004.0	
US09226	45-06.8	141-10.1	7/1	1140-1148	74	ESE-2	ESE-1	ESE-4	16.8	14.2	c	1004.2	
US09227	45-04.8	141-14.2	7/1	1246-1256	74	ENE-2	ESE-1	ENE-4	17.5	14.6	r	1004.3	
US09228	45-05.6	141-17.3	7/1	1315-1323	74	NNE-1	ESE-1	NNE-4	17.2	14.4	o	1004.0	
US09229	45-07.3	141-19.9	7/1	1341-1348	69	NE-1	South-1	NE-3	16.9	14.5	r	1004.2	
US09230	45-09.1	141-21.4	7/1	1402-1412	72	NE-1	South-1	NE-3	15.9	14.7	r	1004.2	
US09231	45-11.2	141-20.5	7/1	1425-1436	60	ENE-1	North-1	ENE-3	15.3	14.7	r	1004.4	
US09232	45-12.9	141-19.3	7/1	1450-1459	55	East-1	North-1	East-2	15.1	15.2	r	1004.5	
US09233	45-13.5	141-18.4	7/1	1511-1514	42	East-1	North-1	East-3	15.3	14.7	r	1004.5	
US09234	45-27.2	142-50.2	7/3	1202-1211	119	NE-1	East-1	NE-3	9.6	8.3	o	1007.1	
US09235	45-19.5	142-41.1	7/3	1307-1315	96	NE-1	NE-1	NE-2	11.0	8.8	o	1006.2	
US09236	45-18.4	142-38.3	7/3	1333-1340	88	NE-1	East-1	NE-3	10.9	10.1	o	1007.1	
US09237	45-17.0	142-36.3	7/3	1354-1400	80	NE-1	East-1	NE-2	11.4	10.8	o	1007.1	
US09238	45-14.4	142-34.0	7/3	1416-1422	67	East-1	East-1	East-3	12.0	11.6	o	1007.2	
US09239	45-12.1	142-29.1	7/3	1452-1456	49	NE-1	East-1	NE-3	13.0	12.3	o	1007.2	
US09240	45-10.7	142-27.9	7/3	1706-1712	50	East-1	East-1	East-1	11.5	11.4	c	1007.2	
US09241	44-53.3	142-53.0	7/3	1744-1751	87	ENE-1	East-1	ENE-2	10.9	11.0	o	1008.6	
US09242	44-55.1	142-56.3	7/3	1815-1823	113	ENE-1	East-1	ENE-2	10.3	9.6	o	1008.6	
US09243	44-57.0	142-59.7	7/3	1844-1853	126	Calm	East-1	Calm	10.2	9.3	o	1008.9	
US09244	44-58.7	143-03.0	7/3	1915-1923	131	ENE-2	East-1	ENE-2	10.0	9.3	o	1009.1	
US09245	45-04.4	143-12.6	7/3	2018-2029	138	Calm	ENE-1	Calm	9.7	9.0	o	1009.7	
US09246	44-57.8	144-09.7	7/4	0554-0610	230	Calm	ENE-1	Calm	9.9	8.3	o	1011.9	
US09247	44-49.7	144-00.1	7/4	0726-0740	185	SE-1	ENE-1	SE-2	10.9	9.0	o	1012.3	
US09248	44-43.0	143-52.1	7/4	0844-0858	169	Calm	ENE-1	Calm	11.8	10.4	o	1012.6	
US09249	44-39.5	143-47.1	7/4	1054-1105	159	NE-1	East-1	NE-2	12.5	9.8	o	1012.6	
US09250	44-35.7	143-42.1	7/4	1140-1151	148	NE-1	East-1	NE-2	14.2	12.0	c	1012.8	
US09251	44-32.9	143-38.9	7/4	1217-1226	135	ENE-2	East-1	ENE-4	13.8	9.2	bc	1012.6	
US09252	44-28.0	143-33.1	7/4	1407-1411	83	NE-1	East-1	NE-2	14.6	13.4	bc	1012.5	
US09253	44-24.8	143-29.4	7/4	1443-1448	58	East-1	East-1	East-2	16.8	14.6	bc	1012.5	
US09254	44-10.1	143-58.7	7/4	1713-1711	38	ENE-1	East-1	ENE-2	15.0	15.2	bc	1011.4	
US09255	44-17.2	145-02.5	7/5	0709-0727	769	Calm	NE-1	Calm	14.0	12.4	c	1014.2	
US09256	44-15.9	145-06.3	7/5	0746-0803	776	WSW-1	NE-1	WSW-2	14.5	14.5	c	1014.3	
US09257	44-14.2	145-09.8	7/5	0823-0838	280	Calm	NE-1	Calm	15.3	14.5	bc	1014.4	
US09258	44-20.4	145-12.2	7/5	0910-0928	931	SSW-1	North-1	SSW-3	17.6	14.6	bc	1013.9	
US09259	44-26.9	145-14.0	7/5	1001-1017	1692	Calm	North-1	Calm	15.5	12.7	c	1013.9	
US09260	44-24.2	145-20.4	7/5	1052-1109	575	SSW-1	North-1	SSW-3	16.6	14.1	c	1013.9	
US09261	44-20.7	145-27.8	7/5	1151-1206	1738	SSW-1	South-1	SSW-3	13.1	11.4	bc	1014.0	
US09262	44-17.6	145-34.3	7/5	1243-1259	2327	SSW-1	South-1	SSW-2	11.2	11.2	bc	1014.0	
US09263	44-13.2	145-27.4	7/5	1337-1352	1512	SSW-1	South-1	SSW-2	15.2	11.8	bc	1013.8	
US09264	44-08.5	145-19.9	7/5	1436-1453	437	Calm	South-1	Calm	16.5	12.4	bc	1013.7	
US09265	44-06.8	145-22.8	7/5	1510-1527	785	Calm	South-1	Calm	16.3	12.4	bc</		

Table 2: Oceanographic data

STATION US09182				STATION US09183				STATION US09184			
LATITUDE 41-10.9 N				LATITUDE 40-52.0 N				LATITUDE 40-55.5 N			
LONGITUDE 140-42.0 E				LONGITUDE 140-46.0 E				LONGITUDE 140-46.4 E			
DEPTH (m) 73				DEPTH (m) 28				DEPTH (m) 43			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.186	33.109	24.892	5	13.561	33.140	24.840	5	13.689	33.280	24.922
10	13.055	33.162	24.959	10	12.890	33.366	25.149	10	12.815	33.334	25.139
20	13.126	33.801	25.439	20	12.286	33.568	25.423	20	11.689	33.554	25.524
30	13.170	33.947	25.543					30	11.095	33.502	25.592
40	12.561	33.997	25.702					40	11.508	33.787	25.739
50	11.789	34.030	25.876								
STATION US09185				STATION US09186				STATION US09187			
LATITUDE 40-57.1 N				LATITUDE 41-00.3 N				LATITUDE 140-43.3 E			
LONGITUDE 140-45.6 E				LONGITUDE 140-47.2 E				LONGITUDE 140-46.3 E			
DEPTH (m) 50				DEPTH (m) 52				DEPTH (m) 56			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.184	33.260	25.009	5	13.325	33.306	25.016	5	13.035	33.144	24.948
10	12.865	33.307	25.108	10	13.066	33.288	25.054	10	12.905	33.247	25.054
20	12.685	33.821	25.541	20	12.659	33.812	25.540	20	12.837	33.641	25.372
30	12.526	33.874	25.614	30	11.977	33.891	25.732	30	12.210	34.002	25.774
40	11.417	33.792	25.759	40	11.302	33.904	25.867	40	11.867	34.019	25.852
				50	10.694	33.884	25.960	50	11.263	34.005	25.953
STATION US09188				STATION US09189				STATION US09190			
LATITUDE 41-02.6 N				LATITUDE 41-05.2 N				LATITUDE 41-03.9 N			
LONGITUDE 140-46.0 E				LONGITUDE 140-52.3 E				LONGITUDE 140-51.6 E			
DEPTH (m) 52				DEPTH (m) 53				DEPTH (m) 51			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.196	33.295	25.034	5	12.080	33.235	25.203	5	12.026	33.438	25.371
10	12.911	33.310	25.102	10	11.974	33.396	25.348	10	11.879	33.358	25.337
20	12.608	33.689	25.454	20	11.661	33.414	25.421	20	11.472	33.429	25.467
30	11.888	33.932	25.781	30	11.707	33.761	25.682	30	11.643	33.632	25.593
40	11.242	33.990	25.945	40	11.135	33.748	25.776	40	10.999	33.663	25.735
50	11.016	34.071	26.049	50	10.512	33.785	25.916	50	10.455	33.693	25.853
STATION US09191				STATION US09192				STATION US09193			
LATITUDE 41-04.4 N				LATITUDE 40-57.6 N				LATITUDE 40-59.9 N			
LONGITUDE 140-58.1 E				LONGITUDE 141-06.4 E				LONGITUDE 141-06.7 E			
DEPTH (m) 50				DEPTH (m) 39				DEPTH (m) 44			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.593	33.055	24.768	5	13.709	32.887	24.615	5	13.571	33.057	24.774
10	13.083	33.027	24.849	10	13.318	32.986	24.770	10	12.833	33.048	24.913
20	11.890	33.164	25.184	20	11.129	33.311	25.437	20	12.122	33.158	25.135
30	11.351	33.744	25.734	30	10.584	33.641	25.791	30	10.176	33.410	25.681
40	10.812	33.741	25.829					40	10.180	33.764	25.957
50	10.516	33.837	25.956								
STATION US09194				STATION US09195				STATION US09196			
LATITUDE 41-05.3 N				LATITUDE 41-08.6 N				LATITUDE 41-10.9 N			
LONGITUDE 141-09.7 E				LONGITUDE 141-11.2 E				LONGITUDE 141-10.9 E			
DEPTH (m) 40				DEPTH (m) 35				DEPTH (m) 31			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.490	33.270	24.955	5	13.266	33.164	24.918	5	13.690	33.186	24.849
10	13.124	33.195	24.970	10	12.861	33.067	24.923	10	12.818	33.027	24.901
20	11.857	33.085	25.129	20	11.326	33.287	25.383	20	11.273	33.334	25.429
30	10.709	33.409	25.588	30	9.247	33.455	25.869	30	9.171	33.438	25.868
STATION US09197				STATION US09198				STATION US09199			
LATITUDE 41-07.6 N				LATITUDE 41-05.4 N				LATITUDE 41-06.5 N			
LONGITUDE 141-04.1 E				LONGITUDE 141-01.9 E				LONGITUDE 140-56.1 E			
DEPTH (m) 39				DEPTH (m) 47				DEPTH (m) 47			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.120	33.133	24.720	5	13.999	33.093	24.714	5	14.142	32.944	24.569
10	13.302	33.114	24.872	10	13.697	33.030	24.727	10	13.782	33.058	24.732
20	12.684	33.090	24.976	20	12.922	33.069	24.913	20	11.154	33.245	25.382
30	11.661	33.524	25.506	30	11.213	33.338	25.444	30	11.112	33.729	25.766
				40	11.136	33.856	25.860	40	10.492	33.667	25.827
STATION US09200				STATION US09201				STATION US09202			
LATITUDE 41-06.1 N				LATITUDE 41-05.7 N				LATITUDE 41-05.9 N			
LONGITUDE 140-51.9 E				LONGITUDE 140-48.3 E				LONGITUDE 140-44.4 E			
DEPTH (m) 53				DEPTH (m) 59				DEPTH (m) 62			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	12.190	33.041	25.032	5	13.283	33.270	24.997	5	14.101	33.254	24.817
10	11.782	33.164	25.204	10	12.653	33.333	25.170	10	12.633	33.321	25.164
20	11.773	33.422	25.406	20	12.476	33.750	25.527	20	12.219	33.554	25.424
30	11.743	33.672	25.606	30	11.421	33.755	25.730	30	12.081	33.888	25.710
40	11.180	33.754	25.773	40	11.088	33.756	25.791	40	11.542	33.912	25.829
				50	10.622	33.736	25.858	50	10.718	33.936	25.997

STATION US09203 LATITUDE 41-08.5 N LONGITUDE 140-43.3 E DEPTH (m) 82				STATION US09204 LATITUDE 41-08.9 N LONGITUDE 140-41.9 E DEPTH (m) 56				STATION US09205 LATITUDE 41-57.4 N LONGITUDE 140-58.3 E DEPTH (m) 79			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.743	33.077	24.545	5	13.877	33.058	24.712	5	11.609	32.060	24.379
10	13.578	33.121	24.822	10	13.269	33.210	24.953	10	11.394	32.096	24.445
20	13.108	33.623	25.305	20	13.055	33.512	25.229	20	10.001	32.276	24.825
30	13.080	33.837	25.476	30	12.984	33.861	25.514	30	9.002	32.412	25.092
40	12.670	33.956	25.649	40	12.536	33.984	25.697	40	7.353	32.606	25.485
50	11.879	33.994	25.8 30	50	12.491	34.003	25.721	50	5.278	32.893	25.974
75	10.624	34.109	26.149					75	4.124	33.175	26.322

STATION US09206 LATITUDE 41-57.8 N LONGITUDE 140-59.1 E DEPTH (m) 85				STATION US09207 LATITUDE 41-58.2 N LONGITUDE 140-59.8 E DEPTH (m) 89				STATION US09208 LATITUDE 41-58.7 N LONGITUDE 141-01.1 E DEPTH (m) 96			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	11.953	32.036	24.296	5	12.424	32.025	24.200	5	12.748	32.014	24.130
10	11.955	32.036	24.296	10	12.227	32.049	24.256	10	12.616	32.061	24.191
20	9.972	32.263	24.820	20	9.802	32.305	24.880	20	8.815	32.474	25.169
30	8.370	32.486	25.246	30	7.318	32.621	25.502	30	9.761	33.409	25.750
40	6.293	32.716	25.712	40	6.721	33.004	25.884	40	8.035	33.406	26.017
50	4.937	32.954	26.060	50	6.190	33.103	26.030	50	7.158	33.444	26.171
75	5.532	33.413	26.355	75	5.612	33.412	26.345	75	5.746	33.464	26.370

STATION US09209 LATITUDE 41-59.0 N LONGITUDE 141-10.8 E DEPTH (m) 168				STATION US09210 LATITUDE 42-03.9 N LONGITUDE 141-20.1 E DEPTH (m) 325				STATION US09211 LATITUDE 42-15.8 N LONGITUDE 140-35.8 E DEPTH (m) 92			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	12.566	32.161	24.278	5	11.574	33.104	25.196	5	12.513	32.056	24.207
10	11.913	32.382	24.573	10	11.446	33.356	25.415	10	12.515	32.075	24.221
20	10.115	33.155	25.492	20	11.276	33.490	25.551	20	10.790	32.433	24.814
30	9.528	33.639	25.967	30	10.859	33.766	25.840	30	9.832	33.189	25.566
40	9.383	33.846	26.153	40	9.981	33.781	26.003	40	5.408	32.909	25.971
50	8.937	33.837	26.217	50	9.342	33.837	26.153	50	4.473	33.010	26.155
75	7.765	33.731	26.312	75	8.207	33.810	26.309	75	3.882	33.328	26.468
100	6.931	33.674	26.384	100	6.757	33.660	26.396				
125	6.553	33.716	26.467	125	6.688	33.716	26.449				
150	5.904	33.645	26.494	150	6.383	33.730	26.500				
				175	5.021	33.573	26.542				
				200	4.547	33.593	26.610				
				250	3.324	33.527	26.680				

STATION US09212 LATITUDE 42-18.6 N LONGITUDE 140-30.9 E DEPTH (m) 93				STATION US09213 LATITUDE 42-11.2 N LONGITUDE 140-39.1 E DEPTH (m) 87				STATION US09214 LATITUDE 44-11.0 N LONGITUDE 140-57.5 E DEPTH (m) 301			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	12.801	32.035	24.135	5	12.079	32.183	24.388	5	16.410	34.047	24.921
10	12.800	32.057	24.153	10	12.096	32.194	24.393	10	16.397	34.049	24.925
20	10.571	32.479	24.888	20	11.197	32.563	24.843	20	15.617	34.044	25.099
30	6.991	32.735	25.636	30	9.183	32.842	25.399	30	14.377	34.040	25.366
40	5.219	32.923	26.004	40	5.363	32.860	25.937	40	13.566	34.074	25.561
50	4.423	33.018	26.166	50	4.744	32.969	26.093	50	12.001	34.113	25.900
75	3.945	33.353	26.482	75	3.959	33.261	26.407	75	9.491	34.125	26.353
								100	7.952	34.109	26.581
								125	6.902	34.103	26.725
								150	6.197	34.099	26.816
								175	5.115	34.097	26.946
								200	4.500	34.106	27.022
								250	3.789	34.102	27.093

STATION US09215 LATITUDE 45-03.0 N LONGITUDE 140-57.7 E DEPTH (m) 118				STATION US09216 LATITUDE 45-11.8 N LONGITUDE 141-05.5 E DEPTH (m) 75				STATION US09217 LATITUDE 45-11.8 N LONGITUDE 141-06.0 E DEPTH (m) 64			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.541	33.766	25.120	5	14.388	33.798	25.176	5	14.476	33.762	25.130
10	14.540	33.770	25.123	10	14.385	33.806	25.183	10	14.385	33.796	25.176
20	14.269	33.776	25.185	20	13.785	33.798	25.303	20	13.844	33.807	25.298
30	12.127	33.890	25.703	30	12.534	33.869	25.609	30	12.512	33.879	25.620
40	10.015	33.973	26.147	40	10.221	34.012	26.143	40	10.051	34.003	26.165
50	9.396	34.024	26.290	50	9.589	34.016	26.252	50	9.752	34.009	26.220
75	7.949	34.064	26.547								
100	6.798	34.086	26.726								

STATION US09218 LATITUDE 45-10.3 N LONGITUDE 141-05.8 E DEPTH (m) 76				STATION US09219 LATITUDE 45-10.2 N LONGITUDE 141-06.4 E DEPTH (m) 67				STATION US09220 LATITUDE 45-08.1 N LONGITUDE 141-06.4 E DEPTH (m) 67			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.277	33.804	25.205	5	14.533	33.774	25.128	5	14.369	33.822	25.200
10	14.273	33.805	25.206	10	14.331	33.798	25.189	10	14.318	33.825	25.212
20	14.183	33.828	25.243	20	14.142	33.822	25.247	20	14.137	33.832	25.256
30	11.529	33.926	25.843	30	11.390	33.923	25.866	30	11.387	33.941	25.881
40	10.347	34.015	26.123	40	10.189	34.024	26.157	40	10.384	34.016	26.118
50	9.693	34.027	26.243	50	9.486	34.036	26.285	50	9.612	34.016	26.249
STATION US09221 LATITUDE 45-08.0 N LONGITUDE 141-06.1 E DEPTH (m) 76				STATION US09222 LATITUDE 45-06.3 N LONGITUDE 141-07.3 E DEPTH (m) 71				STATION US09223 LATITUDE 45-06.4 N LONGITUDE 141-07.9 E DEPTH (m) 64			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.330	33.818	25.205	5	14.511	33.837	25.181	5	14.540	33.838	25.176
10	14.342	33.833	25.213	10	14.419	33.841	25.204	10	14.424	33.842	25.203
20	14.132	33.834	25.259	20	14.274	33.845	25.237	20	14.257	33.844	25.240
30	11.107	33.951	25.940	30	12.047	33.851	25.688	30	11.333	33.908	25.865
40	10.742	34.019	26.058	40	10.339	34.005	26.117	40	10.129	34.011	26.158
50	9.935	34.040	26.213	50	9.747	34.032	26.239	50	9.726	34.033	26.242
STATION US09224 LATITUDE 45-06.8 N LONGITUDE 141-10.5 E DEPTH (m) 39				STATION US09225 LATITUDE 45-06.8 N LONGITUDE 141-09.9 E DEPTH (m) 49				STATION US09226 LATITUDE 45-06.8 N LONGITUDE 141-10.1 E DEPTH (m) 44			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.483	33.813	25.168	5	14.583	33.803	25.139	5	14.731	33.788	25.096
10	14.432	33.823	25.187	10	14.433	33.816	25.181	10	14.447	33.804	25.169
20	14.306	33.837	25.224	20	14.161	33.831	25.250	20	14.210	33.831	25.240
30	11.391	33.889	25.839	30	10.693	33.951	26.013	30	11.209	33.936	25.909
				40	9.769	34.011	26.219	40	9.792	34.016	26.219
STATION US09227 LATITUDE 45-04.8 N LONGITUDE 141-14.2 E DEPTH (m) 74				STATION US09228 LATITUDE 45-05.6 N LONGITUDE 141-17.3 E DEPTH (m) 74				STATION US09229 LATITUDE 45-07.3 N LONGITUDE 141-19.9 E DEPTH (m) 69			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.917	33.763	25.037	5	14.619	33.814	25.140	5	14.675	33.824	25.136
10	14.562	33.812	25.151	10	14.552	33.809	25.150	10	14.663	33.823	25.137
20	13.712	33.832	25.344	20	13.703	33.828	25.343	20	14.568	33.814	25.151
30	11.386	33.930	25.872	30	11.405	33.940	25.877	30	13.976	33.830	25.288
40	10.006	34.007	26.175	40	10.003	34.003	26.173	40	9.034	33.992	26.323
50	9.498	34.001	26.255	50	9.188	34.023	26.323	50	8.679	34.037	26.415
STATION US09230 LATITUDE 45-09.1 N LONGITUDE 141-21.4 E DEPTH (m) 72				STATION US09231 LATITUDE 45-11.2 N LONGITUDE 141-20.5 E DEPTH (m) 60				STATION US09232 LATITUDE 45-12.9 N LONGITUDE 141-19.3 E DEPTH (m) 55			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.823	33.794	25.080	5	14.882	33.773	25.052	5	13.609	33.830	25.363
10	14.790	33.793	25.087	10	14.485	33.786	25.147	10	12.754	33.869	25.566
20	14.576	33.829	25.161	20	12.545	33.871	25.608	20	11.480	33.925	25.851
30	11.317	33.882	25.847	30	10.858	33.947	25.981	30	10.851	33.962	25.994
40	10.152	33.976	26.127	40	9.789	33.991	26.199	40	10.377	33.985	26.095
50	9.266	34.007	26.298	50	8.410	34.042	26.460	50	9.582	34.013	26.251
STATION US09233 LATITUDE 45-13.5 N LONGITUDE 141-18.4 E DEPTH (m) 42				STATION US09234 LATITUDE 45-27.2 N LONGITUDE 142-50.2 E DEPTH (m) 119				STATION US09235 LATITUDE 45-20.4 N LONGITUDE 142-41.1 E DEPTH (m) 96			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.227	33.654	25.099	5	8.707	32.150	24.932	5	7.470	33.229	25.959
10	13.286	33.779	25.390	10	8.453	32.131	24.955	10	6.816	33.171	26.003
20	12.130	33.884	25.698	20	4.039	32.573	25.852	20	6.326	33.225	26.109
30	11.664	33.926	25.818	30	1.399	32.650	26.131	30	5.673	33.444	26.363
				40	-0.707	32.787	26.350	40	5.823	33.762	26.596
				50	-0.875	32.878	26.429	50	6.404	33.912	26.641
				75	-1.228	33.023	26.558	75	6.466	33.920	26.639
				100	-0.433	33.134	26.619				
STATION US09236 LATITUDE 45-18.4 N LONGITUDE 142-38.3 E DEPTH (m) 88				STATION US09237 LATITUDE 45-17.0 N LONGITUDE 142-36.3 E DEPTH (m) 80				STATION US09238 LATITUDE 45-14.4 N LONGITUDE 142-34.0 E DEPTH (m) 67			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	9.386	33.652	26.001	5	11.055	33.711	25.762	5	11.845	33.856	25.730
10	9.116	33.698	26.080	10	10.615	33.703	25.834	10	11.247	33.876	25.856
20	9.334	33.961	26.251	20	10.163	33.908	26.072	20	10.874	33.895	25.937
30	9.272	33.962	26.262	30	10.156	33.924	26.086	30	10.861	33.902	25.945
40	9.218	33.963	26.271	40	10.139	33.930	26.093	40	10.869	33.902	25.944
50	9.194	33.964	26.276	50	10.083	33.933	26.105	50	10.840	33.902	25.949
75	8.906	33.970	26.326	75	10.014	33.937	26.119				

STATION		US09239		
LATITUDE		45-12.3	N	
LONGITUDE		142-29.1	E	
DEPTH (m)		49		
Press.	Temp.	Salinity	Sigma-T	
5	12.222	33.813	25.625	
10	11.993	33.838	25.688	
20	11.858	33.852	25.724	
30	11.796	33.857	25.740	
40	11.780	33.859	25.744	

STATION		US09242		
LATITUDE		44-55.1	N	
LONGITUDE		142-56.3	E	
DEPTH (m)		113		
Press.	Temp.	Salinity	Sigma-T	
5	8.994	32.586	25.229	
10	8.645	32.876	25.510	
20	8.996	33.450	25.905	
30	4.113	32.914	26.116	
40	5.438	33.362	26.327	
50	5.518	33.419	26.362	
75	5.925	33.635	26.484	
100	6.898	33.921	26.582	

STATION		US09245		
LATITUDE		45-04.4	N	
LONGITUDE		143-12.6	E	
DEPTH (m)		138		
Press.	Temp.	Salinity	Sigma-T	
5	7.490	32.728	25.563	
10	3.396	32.683	26.000	
20	0.180	32.767	26.295	
30	2.976	33.229	26.473	
40	1.229	33.109	26.510	
50	-0.830	33.033	26.553	
75	-0.726	33.088	26.594	
100	-0.359	33.172	26.647	
125	2.430	33.627	26.838	

STATION		US09248		
LATITUDE		44-43.0	N	
LONGITUDE		143-52.1	E	
DEPTH (m)		169		
Press.	Temp.	Salinity	Sigma-T	
5	8.750	32.406	25.126	
10	7.864	32.544	25.365	
20	2.327	32.569	26.000	
30	0.687	32.730	26.239	
40	-0.069	32.869	26.389	
50	-0.324	32.927	26.447	
75	-0.438	33.136	26.621	
100	-0.030	33.213	26.665	
125	2.355	33.505	26.747	
150	4.447	33.912	26.874	

STATION		US09251		
LATITUDE		44-32.9	N	
LONGITUDE		143-38.9	E	
DEPTH (m)		135		
Press.	Temp.	Salinity	Sigma-T	
5	7.218	33.033	25.840	
10	6.700	33.127	25.984	
20	6.790	33.805	26.506	
30	6.845	33.827	26.516	
40	6.774	33.845	26.540	
50	6.850	33.861	26.542	
75	6.709	33.866	26.565	
100	6.700	33.877	26.574	
125	6.736	33.900	26.588	

STATION		US09254		
LATITUDE		44-10.1	N	
LONGITUDE		143-58.7	E	
DEPTH (m)		38		
Press.	Temp.	Salinity	Sigma-T	
5	15.031	33.447	24.768	
10	14.400	33.557	24.989	
20	13.542	33.652	25.240	
30	13.270	33.716	25.344	

STATION		US09240		
LATITUDE		44-50.7	N	
LONGITUDE		142-47.9	E	
DEPTH (m)		50		
Press.	Temp.	Salinity	Sigma-T	
5	13.270	33.698	25.330	
10	13.096	33.713	25.377	
20	12.799	33.738	25.455	
30	12.693	33.749	25.485	
40	12.598	33.760	25.512	

STATION		US09243		
LATITUDE		44-57.0	N	
LONGITUDE		142-59.7	E	
DEPTH (m)		126		
Press.	Temp.	Salinity	Sigma-T	
5	9.356	32.095	24.789	
10	8.789	32.094	24.875	
20	3.987	32.325	25.660	
30	2.835	32.794	26.138	
40	4.068	33.125	26.288	
50	5.620	33.529	26.437	
75	5.361	33.673	26.581	
100	6.133	33.995	26.742	

STATION		US09246		
LATITUDE		44-57.8	N	
LONGITUDE		144-09.7	E	
DEPTH (m)		230		
Press.	Temp.	Salinity	Sigma-T	
5	8.067	32.392	25.217	
10	6.406	32.422	25.466	
20	3.136	32.558	25.925	
30	1.645	32.681	26.140	
40	0.424	32.813	26.320	
50	0.005	32.945	26.447	
75	-0.112	33.079	26.561	
100	-0.117	33.146	26.615	
125	-0.033	33.185	26.642	
150	-0.045	33.228	26.678	
175	0.083	33.281	26.715	
200	0.006	33.319	26.749	

STATION		US09249		
LATITUDE		44-39.5	N	
LONGITUDE		143-47.1	E	
DEPTH (m)		159		
Press.	Temp.	Salinity	Sigma-T	
5	9.245	32.796	25.354	
10	7.334	32.757	25.606	
20	5.218	33.174	26.203	
30	5.700	33.568	26.458	
40	2.474	33.211	26.502	
50	1.486	33.127	26.508	
75	1.406	33.263	26.622	
100	0.882	33.238	26.636	
125	3.821	33.672	26.748	
150	4.213	33.941	26.922	

STATION		US09252		
LATITUDE		44-28.0	N	
LONGITUDE		143-33.1	E	
DEPTH (m)		83		
Press.	Temp.	Salinity	Sigma-T	
5	13.400	33.719	25.320	
10	11.596	33.585	25.565	
20	9.911	33.904	26.111	
30	9.738	33.940	26.168	
40	9.121	33.870	26.214	
50	8.998	33.953	26.298	
75	7.166	33.772	26.428	

STATION		US09255		
LATITUDE		44-17.2	N	
LONGITUDE		145-02.5	E	
DEPTH (m)		769		
Press.	Temp.	Salinity	Sigma-T	
5	11.956	32.336	24.529	
10	9.688	32.393	24.968	
20	3.632	32.558	25.879	
30	0.820	32.719	26.222	
40	0.281	32.788	26.307	
50	0.137	32.865	26.376	
75	3.521	33.422	26.578	
100	2.869	33.445	26.655	
125	2.682	33.490	26.707	
150	3.425	33.622	26.746	
175	3.940	33.693	26.753	
200	3.690	33.689	26.774	
250	3.811	33.750	26.811	
300	3.784	33.767	26.827	

STATION		US09241		
LATITUDE		44-53.3	N	
LONGITUDE		142-53.0	E	
DEPTH (m)		87		
Press.	Temp.	Salinity	Sigma-T	
5	11.811	33.795	25.689	
10	11.246	33.799	25.796	
20	11.304	33.864	25.836	
30	10.638	33.845	25.941	
40	10.086	33.900	26.078	
50	9.633	33.899	26.154	
75	9.225	33.907	26.226	

STATION		US09244		
LATITUDE		44-58.7	N	
LONGITUDE		143-03.0	E	
DEPTH (m)		131		
Press.	Temp.	Salinity	Sigma-T	
5	9.395	32.116	24.799	
10	8.449	32.150	24.971	
20	5.011	32.377	25.595	
30	0.618	32.610	26.145	
40	-0.143	32.769	26.312	
50	-0.764	32.876	26.424	
75	-0.387	33.162	26.640	
100	4.795	33.856	26.792	
125	5.561	33.934	26.764	

STATION		US09247	
LATITUDE		44-49.7	N
LONGITUDE		144-00.1	E
DEPTH (m)		185	
Press.	Temp.	Salinity	Sigma-T
5	9.119	32.471	25.120
10	8.473	32.468	25.216
20	3.464	32.539	25.880
30	1.159	32.668	26.161
40	0.416	32.798	26.308
50	0.413	32.919	26.406
75	-0.473	33.011	26.522
100	-0.313	33.124	26.606
125	-0.409	33.173	26.650
150	1.361	33.419	26.750
175	1.356	33.543	26.851

STATION US09257 LATITUDE 44-14.2 N LONGITUDE 145-09.8 E DEPTH (m) 280				STATION US09258 LATITUDE 44-20.4 N LONGITUDE 145-12.2 E DEPTH (m) 931				STATION US09259 LATITUDE 44-26.9 N LONGITUDE 145-14.0 E DEPTH (m) 1692			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.361	33.683	25.094	5	14.531	33.682	25.057	5	9.903	32.703	25.175
10	14.097	33.693	25.157	10	13.467	33.692	25.286	10	8.531	32.815	25.480
20	13.037	33.739	25.409	20	12.502	33.755	25.526	20	5.578	32.870	25.921
30	12.430	33.779	25.559	30	11.224	33.771	25.778	30	2.879	32.799	26.139
40	11.617	33.797	25.726	40	9.550	33.683	25.998	40	2.382	33.000	26.340
50	10.828	33.817	25.885	50	5.044	32.832	25.951	50	5.091	33.530	26.499
75	10.229	33.838	26.005	75	6.812	33.689	26.411	75	2.340	33.327	26.605
100	9.653	33.833	26.098	100	6.045	33.672	26.498	100	2.844	33.490	26.693
125	6.463	33.564	26.359	125	0.789	33.162	26.580	125	3.150	33.583	26.740
150	6.835	33.722	26.434	150	0.258	33.205	26.645	150	3.189	33.622	26.768
175	5.832	33.659	26.514	175	3.184	33.571	26.728	175	3.527	33.677	26.780
200	5.499	33.636	26.536	200	2.539	33.516	26.740	200	3.398	33.689	26.802
250	4.041	33.558	26.635	250	1.574	33.497	26.798	250	3.324	33.709	26.825
				300	3.922	33.803	26.842	300	3.511	33.787	26.870

STATION US09260 LATITUDE 44-24.2 N LONGITUDE 145-20.4 E DEPTH (m) 575				STATION US09261 LATITUDE 44-20.7 N LONGITUDE 145-27.8 E DEPTH (m) 1738				STATION US09262 LATITUDE 44-17.6 N LONGITUDE 145-34.3 E DEPTH (m) 2327			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.156	33.565	25.250	5	11.301	32.923	25.105	5	11.219	33.060	25.226
10	12.656	33.632	25.401	10	10.641	33.108	25.366	10	10.574	33.138	25.401
20	12.333	33.671	25.494	20	9.888	33.240	25.597	20	10.535	33.515	25.701
30	11.864	33.716	25.617	30	9.492	33.472	25.843	30	10.462	33.625	25.800
40	11.304	33.748	25.746	40	8.992	33.528	25.967	40	10.418	33.708	25.872
50	10.606	33.777	25.893	50	8.413	33.511	26.043	50	10.233	33.769	25.951
75	9.089	33.636	26.036	75	9.113	33.801	26.161	75	9.244	33.783	26.126
100	5.924	33.593	26.450	100	7.011	33.488	26.226	100	7.497	33.567	26.221
125	4.389	33.477	26.534	125	6.287	33.642	26.443	125	8.210	33.822	26.317
150	2.733	33.454	26.674	150	3.362	33.336	26.524	150	7.042	33.714	26.400
175	3.059	33.512	26.692	175	1.696	33.229	26.575	175	4.831	33.545	26.541
200	1.862	33.410	26.708	200	0.708	33.205	26.619	200	2.416	33.406	26.662
250	1.353	33.442	26.770	250	0.822	33.327	26.711	250	1.488	33.400	26.727
300	3.024	33.645	26.801	300	1.737	33.477	26.771	300	1.676	33.510	26.802

STATION US09263 LATITUDE 44-13.2 N LONGITUDE 145-27.4 E DEPTH (m) 1512				STATION US09264 LATITUDE 44-08.5 N LONGITUDE 145-19.9 E DEPTH (m) 437				STATION US09265 LATITUDE 44-06.8 N LONGITUDE 145-22.8 E DEPTH (m) 785			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	11.967	32.904	24.968	5	11.808	33.240	25.258	5	11.374	32.724	24.937
10	11.283	32.886	25.079	10	11.596	33.597	25.575	10	11.481	33.569	25.575
20	8.725	33.032	25.620	20	10.819	33.600	25.718	20	9.730	33.345	25.704
30	6.159	32.937	25.903	30	10.694	33.630	25.763	30	9.312	33.567	25.947
40	6.030	33.115	26.060	40	9.931	33.547	25.829	40	9.255	33.644	26.016
50	5.792	33.218	26.170	50	9.137	33.555	25.965	50	8.662	33.574	26.054
75	3.485	33.175	26.385	75	8.571	33.694	26.162	75	6.832	33.419	26.196
100	4.237	33.380	26.473	100	4.871	33.380	26.405	100	6.410	33.561	26.363
125	2.755	33.284	26.537	125	2.671	33.311	26.565	125	3.226	33.314	26.519
150	1.391	33.233	26.599	150	1.280	33.250	26.621	150	2.141	33.258	26.565
175	0.760	33.241	26.645	175	0.878	33.253	26.648	175	0.821	33.226	26.630
200	0.738	33.296	26.691	200	0.620	33.267	26.674	200	0.609	33.250	26.662
250	1.031	33.403	26.759	250	0.949	33.376	26.742	250	1.021	33.356	26.722
300	1.155	33.449	26.789	300	1.101	33.434	26.780	300	1.233	33.443	26.779

STATION US09266 LATITUDE 44-05.5 N LONGITUDE 145-25.4 E DEPTH (m) 1023				STATION US09267 LATITUDE 44-01.2 N LONGITUDE 145-19.4 E DEPTH (m) 347				STATION US09268 LATITUDE 43-55.8 N LONGITUDE 145-15.0 E DEPTH (m) 89			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	11.033	33.030	25.236	5	11.637	33.145	25.216	5	12.842	32.194	24.251
10	9.637	33.173	25.586	10	10.888	33.254	25.436	10	9.594	32.773	25.280
20	9.532	33.443	25.814	20	10.272	33.639	25.843	20	10.433	33.550	25.746
30	9.125	33.571	25.979	30	10.229	33.665	25.871	30	10.300	33.610	25.816
40	9.111	33.656	26.048	40	10.096	33.699	25.920	40	10.159	33.618	25.846
50	8.904	33.707	26.121	50	9.746	33.703	25.982	50	9.629	33.585	25.909
75	8.212	33.726	26.242	75	9.034	33.710	26.103	75	8.672	33.658	26.119
100	7.400	33.704	26.343	100	8.467	33.701	26.184				
125	4.933	33.426	26.435	125	5.286	33.385	26.362				
150	2.591	33.262	26.532	150	4.612	33.427	26.471				
175	0.793	33.158	26.577	175	1.428	33.227	26.592				
200	0.736	33.231	26.639	200	0.697	33.237	26.646				
250	0.845	33.327	26.710	250	0.918	33.336	26.713				
300	0.970	33.392	26.754	300	1.113	33.441	26.785				

STATION US09269 LATITUDE 43-45.4 N LONGITUDE 145-12.9 E DEPTH (m) 86				STATION US09270 LATITUDE 43-57.4 N LONGITUDE 145-11.3 E DEPTH (m) 91				STATION US09271 LATITUDE 43-50.2 N LONGITUDE 145-08.7 E DEPTH (m) 34			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	11.897	32.463	24.638	5	10.819	32.775	25.075	5	11.306	31.890	24.301
10	10.529	32.945	25.258	10	10.607	33.377	25.581	10	9.185	32.843	25.400
20	10.313	33.564	25.778	20	10.475	33.574	25.757	20	9.951	33.401	25.712
30	10.270	33.618	25.827	30	10.485	33.643	25.810				
40	10.135	33.641	25.868	40	10.278	33.652	25.853				
50	9.923	33.639	25.902	50	9.934	33.673	25.927				
75	8.852	33.617	26.059	75	8.750	33.610	26.069				
STATION US09272 LATITUDE 43-49.1 N LONGITUDE 145-10.8 E DEPTH (m) 41				STATION US09273 LATITUDE 43-42.9 N LONGITUDE 145-13.2 E DEPTH (m) 17				STATION US09274 LATITUDE 43-37.3 N LONGITUDE 145-22.7 E DEPTH (m) 9			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	10.084	32.476	24.967	5	10.582	31.594	24.196	5	9.816	32.242	24.829
10	9.145	32.810	25.381	10	8.160	32.867	25.576				
20	8.830	33.155	25.700								
30	9.259	33.396	25.821								
STATION US09275 LATITUDE 43-34.9 N LONGITUDE 145-25.4 E DEPTH (m) 10				STATION US09276 LATITUDE 43-27.4 N LONGITUDE 145-26.1 E DEPTH (m) 19				STATION US09277 LATITUDE 43-20.0 N LONGITUDE 145-27.7 E DEPTH (m) 15			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	9.574	32.196	24.833	5	11.103	31.629	24.134	5	11.135	31.666	24.156
				10	9.881	31.961	24.600	10	9.644	31.857	24.556
STATION US09278 LATITUDE 43-19.2 N LONGITUDE 145-25.6 E DEPTH (m) 12				STATION US09279 LATITUDE 43-24.8 N LONGITUDE 145-20.3 E DEPTH (m) 10				STATION US09280 LATITUDE 43-25.5 N LONGITUDE 145-21.7 E DEPTH (m) 11			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	11.309	31.535	24.024	5	12.106	31.413	23.785	5	11.567	31.616	24.041
10	9.686	31.858	24.551								
STATION US09281 LATITUDE 43-30.4 N LONGITUDE 145-18.4 E DEPTH (m) 7				STATION US09282 LATITUDE 43-31.3 N LONGITUDE 145-19.9 E DEPTH (m) 7				STATION US09283 LATITUDE 43-33.6 N LONGITUDE 145-23.5 E DEPTH (m) 12			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
4	11.239	31.828	24.265	4	11.003	31.988	24.430	5	11.117	31.834	24.291
								10	11.122	31.843	24.296
STATION US09284 LATITUDE 43-29.7 N LONGITUDE 145-29.8 E DEPTH (m) 24				STATION US09285 LATITUDE 43-29.8 N LONGITUDE 145-34.6 E DEPTH (m) 30				STATION US09286 LATITUDE 43-22.6 N LONGITUDE 145-31.9 E DEPTH (m) 19			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	10.187	32.032	24.603	5	10.289	32.084	24.628	5	12.443	31.295	23.631
10	8.831	32.215	24.964	10	8.361	32.205	25.027	10	11.122	31.706	24.190
20	7.363	32.411	25.331	20	6.749	32.480	25.467				
STATION US09287 LATITUDE 43-24.7 N LONGITUDE 145-36.2 E DEPTH (m) 27				STATION US09288 LATITUDE 43-26.3 N LONGITUDE 145-39.5 E DEPTH (m) 31							
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T				
5	12.294	31.331	23.687	5	12.243	31.331	23.696				
10	9.655	31.977	24.648	10	11.701	31.496	23.924				
20	6.990	32.437	25.401	20	7.343	32.445	25.360				

THE “USHIO MARU”

CRUISE 173

CRUISE 174

CRUISE 175

IN JULY-AUGUST 2009

1. Cruise Itinerary

Cruise 173		
Departure from Hakodate	Jul.	16 , 2009
Start hydrographic research (US09289)		16
Arrival at and departure from Usujiri		16
Start frame trawl net sampling		16
Finish frame trawl net sampling		18
Arrival at Usujiri		18
Departure from Usujiri		20
Start trawl net research		20
Arrival at Usujiri		20
Departure from Usujiri		21
Finish hydrographic research (US09303) and trawl net research		21
Arrival at Usujiri		21
Departure from Usujiri		22
Return to Hakodate		23
Total coverage 283.4 miles		
Cruise 174		
Departure from Hakodate	Aug.	1 , 2009
Start hydrographic research (US09304) and trawl net research		1
Arrival at Wakinosawa		1
Departure from Wakinosawa		2
Finish hydrographic research (US09317) and trawl net research		2
Arrival at Aomori		2
Departure from Aomori		3
Return to Hakodate		3
Total coverage 140.2 miles		
Cruise 175		
Departure from Hakodate	Aug.	18 , 2009
Start hydrographic research (US09318)		18
Arrival at Usujiri		18
Departure from Usujiri		19
Retrieval sediment trap system		19
Start trawl net research		19
Set sediment trap system		19
Arrival at Usujiri		19
Departure from Usujiri		20
Arrival at Muroran		20
Departure from Muroran		21
Finish trawl net research		21
Arrival at Usujiri		21
Departure from Usujiri		22
Research by bottom long line		22
Finish hydrographic research (US09343)		22
Arrival at Hakodate		23
Departure from Hakodate		24
Sampling by squid jigging		24
Return to Hakodate		25
Total coverage 339.4 miles		

2. Vessel Personnel

Captain:		Professor	Toshimi Meguro
Crew :	Chief Officer	Assistant Professor	Osamu Kimura
	Second Officer	Assistant Professor	Naoto Kobayashi
	And 13 men		
		Cruise 173	
Research Staff:	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Tohru Mukai
	Associate Professor	(Laboratory of Marine Industrial Science and Technology)	Yasuzumi Fujimori
	Associate Professor	(Laboratory of Marine Environmental Science)	Toshikuni Nakatani
Graduate Students:	Chair of Marine Bioresource and Environment Sensing:		4 persons
	Chair of Marine Industrial Science and Technology:		1 person
	Chair of Marine Bioresource Science:		5 persons
Under Graduate Students:	Department of Marine Biology:		2 persons
	Department of Applied Marine Science:		1 person
	Department of Applied Marine Science (Third grade):		1 person
		Cruise 174	
Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
Practice Assistant (Graduate Students):		Chair of Marine Bioresource Science:	3 persons
Practice Assistant (Under Graduate Students):		Department of Marine Biological Science:	1 person
Student:	Teacher of Yokohama Senior High School		Akio Yasuda
	Teacher of Hokkaido Hakodate Fisheries High School		Jun Muraoka
	Teacher of Hokkaido Otaru Fisheries High School		Masahiro Umezaki
	Teacher of Hokkaido Otaru Fisheries High School		Takeshi Murakami
	Teacher of Hokkaido Akkeshi Syouyou High School		Satoshi Ishizawa
		Cruise 175	
Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	Shigeru Montani
	Associate Professor	(Laboratory of Marine Industrial Science and Technology)	Isao Kudo
	Assistant Professor	(Laboratory of Marine Environmental Science)	Hiroji Onishi
Guest Scientist (Domestic):		(Ehime University)	Michinobu Kuwae
Graduate Students:	Chair of Marine Bioresource Science:		5 persons
	Chair of Marine Environmental Science:		3 persons
Under Graduate Students:	Department of Marine Biological Science:		2 persons
	Department of Applied Marine Science:		5 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”.

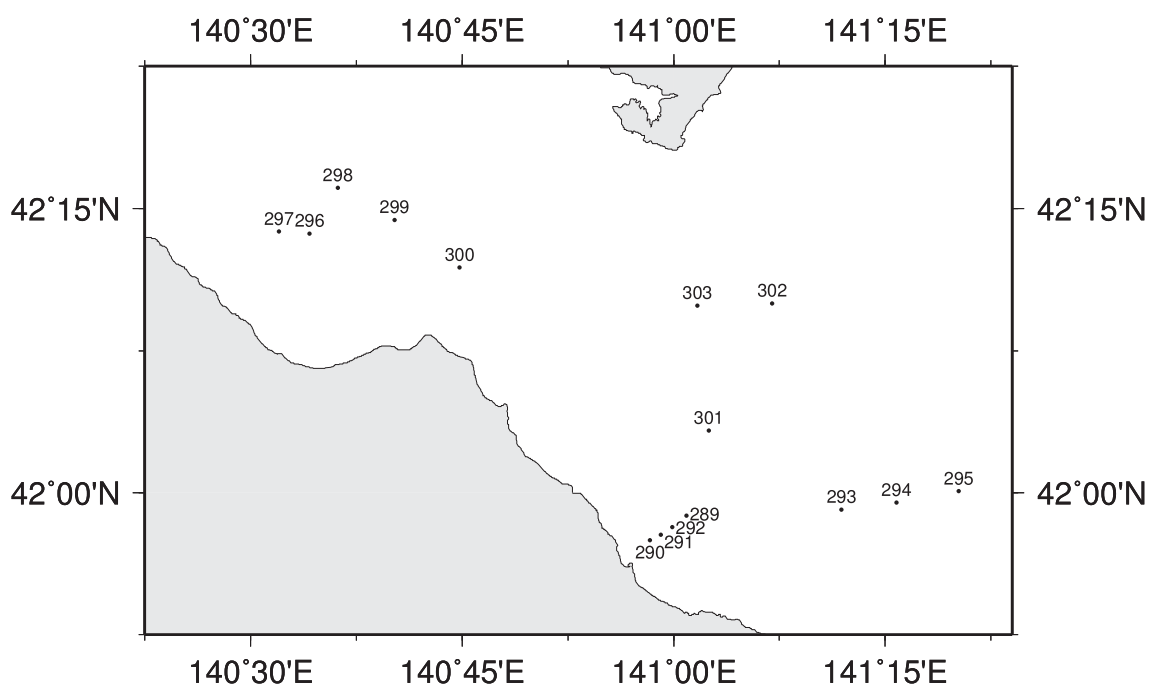


Figure 1: Oceanographic stations (Cruise 173)

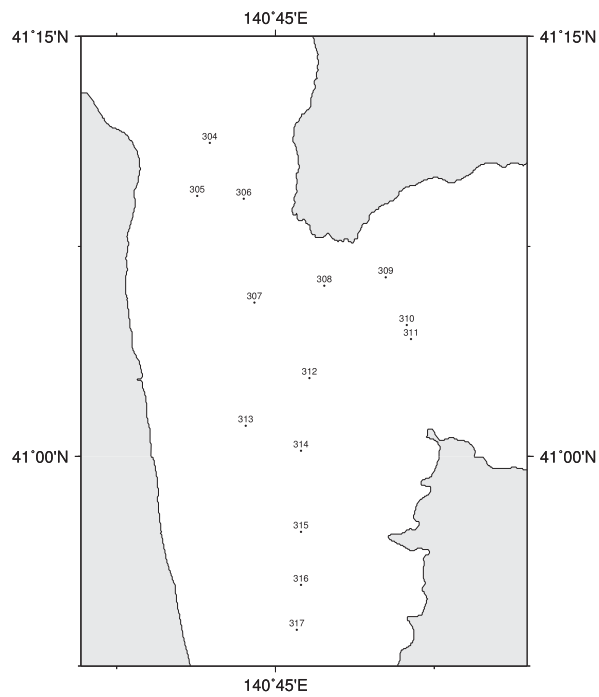


Figure 2: Oceanographic stations (Cruise 174)

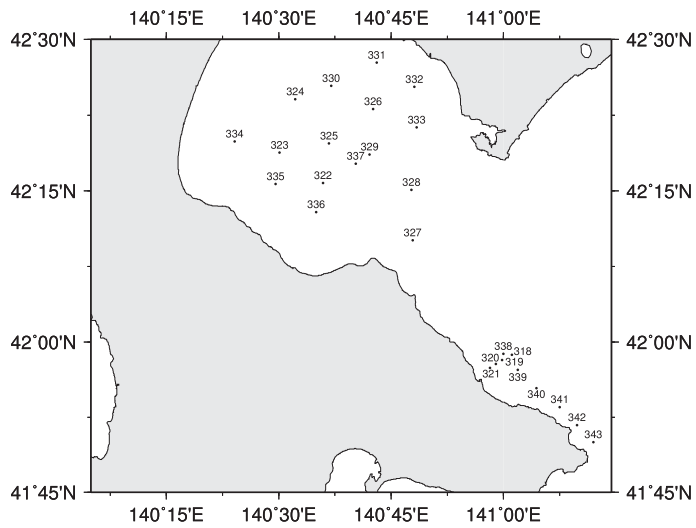


Figure 3: Oceanographic stations (Cruise 175)

Table 1: List of oceanographic stations

Cruise 173

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr. Bar. (hPa)
US09289	41-58.8	141-00.9	7/16	1339-1344	96	NW -1	NW -1	NW -2	21.8	16.5	bc 1003.9
US09290	41-57.5	140-58.3	7/16	1526-1530	80	Calm	NW -1	Calm	21.8	16.9	c 1004.2
US09291	41-57.8	140-59.1	7/16	1536-1540	85	Calm	NW -1	Calm	21.5	16.9	c 1004.3
US09292	41-58.2	140-59.9	7/16	1546-1551	89	Calm	NW -1	Calm	21.9	16.4	c 1004.5
US09293	41-59.1	141-11.9	7/16	1647-1650	194	SE -1	NW -1	SE -3	18.2	15.2	c 1005.5
US09294	41-59.5	141-15.8	7/16	1817-1827	253	SE -1	NW -1	SE -2	18.3	15.7	c 1006.5
US09295	42-00.1	141-20.2	7/17	1727-1740	317	SE -1	SE -1	SE -3	17.2	16.3	bc 1010.2
US09296	42-13.7	140-34.2	7/20	1059-1103	87	NNW-2	NW -1	NNW-4	18.6	17.0	bc 1008.6
US09297	42-13.8	140-32.0	7/20	1115-1119	85	NNW-2	NW -1	NNW-4	18.6	17.1	bc 1008.7
US09298	42-16.1	140-36.2	7/20	1236-1240	91	NNW-2	NW -1	NNW-4	21.0	17.3	bc 1008.6
US09299	42-14.4	140-40.2	7/20	1325-1329	87	NNW-1	NW -1	NNW-3	22.9	17.3	bc 1008.6
US09300	42-11.9	140-44.8	7/20	1415-1420	93	WNW-1	NW -1	WNW-2	21.5	17.9	bc 1008.5
US09301	42-03.3	141-02.5	7/21	0734-0739	95	East-2	ENE-1	East-4	16.5	15.7	o 1008.6
US09302	42-10.0	141-07.0	7/21	0844-0849	98	East-3	ENE-1	East-5	16.1	16.1	r 1008.5
US09303	42-09.9	141-01.7	7/21	0934-0938	82	ESE-3	East-1	ESE-5	16.2	16.2	r 1008.4

Cruise 174

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr. Bar. (hPa)
US09304	41-11.2	140-41.9	8/1	1252-1256	70	NW -1	South-1	NW -2	24.0	21.1	bc 1010.7
US09305	41-09.3	140-41.3	8/1	1319-1322	53	SE -2	South-1	SE -4	24.2	21.1	bc 1010.6
US09306	41-09.2	140-43.5	8/1	1334-1337	58	SE -2	SE -1	SE -4	22.9	20.9	bc 1010.5
US09307	41-05.5	140-44.0	8/1	1432-1436	62	East-3	East-1	East-5	21.5	20.7	c 1010.2
US09308	41-06.1	140-47.3	8/1	1454-1457	61	East-3	East-1	East-5	20.2	20.7	c 1010.1
US09309	41-06.4	140-50.2	8/1	1520-1523	52	East-3	East-1	East-5	19.7	20.0	c 1010.1
US09310	41-04.7	140-51.2	8/2	0649-0652	53	ENE-3	East-1	ENE-5	19.0	19.6	o 1009.6
US09311	41-04.2	140-51.4	8/2	0706-0709	52	ENE-3	East-1	ENE-5	18.5	19.7	o 1009.6
US09312	41-02.8	140-46.6	8/2	0735-0741	51	ENE-3	East-1	ENE-5	18.5	20.3	o 1009.7
US09313	41-01.1	140-43.6	8/2	0803-0807	56	ENE-3	East-1	ENE-5	18.7	20.3	o 1009.6
US09314	41-00.2	140-46.2	8/2	0852-0855	53	East-3	East-1	East-5	19.1	20.4	c 1009.6
US09315	40-57.3	140-46.2	8/2	0958-1001	50	ENE-3	East-1	ENE-5	19.4	20.7	c 1009.3
US09316	40-55.4	140-46.2	8/2	1020-1023	42	East-3	East-1	East-5	20.2	20.4	c 1009.1
US09317	40-53.8	140-46.0	8/2	1039-1042	36	East-3	East-1	East-5	20.5	21.0	c 1009.0

Cruise 175

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr. Bar. (hPa)
US09318	41-58.7	141-01.1	8/18	1307-1311	97	ESE-3	East-1	ESE-5	20.0	20.5	c 1019.6
US09319	41-58.2	140-59.8	8/18	1318-1322	88	SE -3	East-1	SE-5	20.3	20.3	c 1019.5
US09320	41-57.8	140-59.0	8/18	1329-1333	84	SE -3	East-1	SE-5	20.2	20.1	c 1019.4
US09321	41-57.4	140-58.2	8/18	1339-1344	78	ESE-3	East-1	ESE-5	20.2	19.6	c 1019.2
US09322	42-15.8	140-35.9	8/19	0857-0906	90	SE -3	East-1	SE-5	19.8	20.2	r 1017.1
US09323	42-18.8	140-30.1	8/19	1103-1111	91	SE -3	East-1	SE-5	20.1	20.2	o 1017.0
US09324	42-24.1	140-32.2	8/19	1234-1243	95	ESE-3	East-1	ESE-5	19.8	20.4	o 1016.2
US09325	42-19.7	140-36.7	8/19	1422-1427	88	East-3	East-1	East-5	19.9	19.9	o 1015.6
US09326	42-23.1	140-42.6	8/19	1520-1524	61	ESE-3	East-1	ESE-5	19.4	20.2	o 1015.1
US09327	42-10.1	140-47.9	8/20	0732-0736	91	ESE-2	East-1	ESE-4	19.8	20.1	f 1012.1
US09328	42-15.1	140-47.7	8/20	0816-0820	71	East-3	East-1	East-5	19.5	18.3	f 1012.1
US09329	42-18.6	140-42.1	8/20	0928-0932	66	East-3	East-1	East-5	19.6	20.0	f 1011.6
US09330	42-25.4	140-37.0	8/20	1036-1040	84	East-3	East-1	East-5	19.4	20.2	f 1011.2
US09331	42-27.7	140-43.1	8/20	1148-1151	61	ESE-3	ESE-1	ESE-5	19.7	20.1	o 1010.6
US09332	42-25.3	140-48.1	8/20	1226-1229	45	ESE-4	ESE-1	ESE-6	20.2	20.7	o 1010.2
US09333	42-21.3	140-48.4	8/20	1259-1302	51	ESE-3	ESE-1	ESE-5	20.3	20.4	r 1009.8
US09334	42-19.9	140-24.1	8/21	1452-1455	61	WSW-3	ESE-1	WSW-5	25.0	20.9	bc 998.2
US09335	42-15.7	140-29.6	8/21	1610-1614	84	SW -2	ESE-1	SW -4	24.0	21.1	bc 998.5
US09336	42-12.9	140-35.0	8/21	1724-1728	87	SW -2	ESE-1	SW -3	23.2	21.0	bc 999.1
US09337	42-17.7	140-40.3	8/21	1812-1817	90	South-1	ESE-1	South-3	22.8	20.4	bc 999.1
US09338	41-58.8	141-00.0	8/22	0908-0912	88	SW -2	ESE-1	SW -4	25.2	20.1	bc 999.6
US09339	41-57.2	141-01.9	8/22	0926-0931	101	SW -2	ESE-1	SW -4	24.2	20.0	bc 999.6
US09340	41-55.4	141-04.4	8/22	0947-0952	111	SW -2	ESE-1	SW -4	24.3	20.2	bc 999.7
US09341	41-53.5	141-07.5	8/22	1057-1102	96	SW -3	ESS	SW -5	25.5	20.0	bc 999.6
US09342	41-51.7	141-09.8	8/22	1118-1124	105	WSW-2	ESE-1	WSW-4	25.7	19.9	bc 999.2
US09343	41-50.0	141-12.0	8/22	1141-1147	127	SW -2	ESE-1	SW -4	25.1	19.9	bc 999.5

(*) : Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US09289 LATITUDE 41-58.8 N LONGITUDE 141-00.9 E DEPTH (m) 96				STATION US09290 LATITUDE 41-57.5 N LONGITUDE 140-58.3 E DEPTH (m) 80				STATION US09291 LATITUDE 41-57.8 N LONGITUDE 140-59.1 E DEPTH (m) 85			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	16.287	32.260	23.576	5	16.523	32.135	23.427	5	15.938	32.294	23.681
10	15.598	32.383	23.825	10	16.109	32.232	23.595	10	15.743	32.362	23.777
20	13.426	32.981	24.744	20	15.549	32.467	23.900	20	14.069	32.514	24.252
30	10.458	33.478	25.685	30	10.849	33.104	25.326	30	10.878	33.360	25.521
40	10.700	33.761	25.864	40	8.720	33.273	25.810	40	9.394	33.265	25.697
50	10.432	33.817	25.955	50	7.631	33.328	26.014	50	9.515	33.473	25.840
75	8.786	33.762	26.182	75	5.070	33.158	26.207	75	4.952	33.205	26.258
STATION US09292 LATITUDE 41-58.2 N LONGITUDE 140-59.9 E DEPTH (m) 89				STATION US09293 LATITUDE 41-59.1 N LONGITUDE 141-11.9 E DEPTH (m) 194				STATION US09294 LATITUDE 41-59.5 N LONGITUDE 141-15.8 E DEPTH (m) 253			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	16.342	32.280	23.579	5	15.115	32.652	24.137	5	15.115	32.524	24.039
10	16.036	32.309	23.670	10	14.834	32.681	24.220	10	15.039	32.536	24.065
20	15.624	32.400	23.832	20	10.951	33.179	25.367	20	13.695	32.842	24.582
30	14.641	32.731	24.300	30	10.040	33.565	25.825	30	10.191	33.431	25.695
40	10.743	33.397	25.572	40	9.417	33.658	26.000	40	9.637	33.543	25.875
50	9.979	33.574	25.842	50	9.876	33.920	26.129	50	9.139	33.602	26.001
75	7.639	33.552	26.189	75	8.531	33.826	26.272	75	8.876	33.806	26.203
				100	6.542	33.605	26.381	100	7.143	33.642	26.330
				125	6.898	33.752	26.450	125	6.127	33.583	26.417
				150	5.716	33.643	26.515	150	6.225	33.697	26.495
				175	5.485	33.634	26.536	175	4.657	33.558	26.570
								200	4.244	33.580	26.631
STATION US09295 LATITUDE 42-00.1 N LONGITUDE 141-20.2 E DEPTH (m) 317				STATION US09296 LATITUDE 42-13.7 N LONGITUDE 140-34.2 E DEPTH (m) 87				STATION US09297 LATITUDE 42-13.8 N LONGITUDE 140-32.0 E DEPTH (m) 85			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	16.343	32.643	23.857	5	17.353	31.762	22.948	5	17.288	31.696	22.913
10	14.930	32.634	24.163	10	16.982	31.680	22.972	10	16.824	31.785	23.089
20	11.117	33.255	25.396	20	16.137	31.883	23.320	20	16.173	31.822	23.266
30	11.346	33.861	25.826	30	12.567	32.994	24.924	30	12.479	32.679	24.697
40	10.974	33.995	25.998	40	10.366	33.222	25.501	40	9.931	33.002	25.404
50	10.396	33.965	26.076	50	7.160	33.019	25.837	50	7.540	32.974	25.749
75	8.530	33.781	26.237	75	4.006	33.201	26.355	75	4.057	33.154	26.312
100	7.102	33.691	26.374								
125	6.728	33.703	26.433								
150	6.066	33.660	26.486								
175	4.655	33.514	26.535								
200	4.493	33.547	26.579								
250	2.847	33.488	26.692								
300	2.865	33.591	26.772								
STATION US09298 LATITUDE 42-16.1 N LONGITUDE 140-36.2 E DEPTH (m) 91				STATION US09299 LATITUDE 42-14.4 N LONGITUDE 140-40.2 E DEPTH (m) 87				STATION US09300 LATITUDE 42-11.9 N LONGITUDE 140-44.8 E DEPTH (m) 93			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	18.202	31.973	22.906	5	17.479	31.666	22.845	5	17.784	31.168	22.392
10	17.298	31.603	22.839	10	17.147	31.569	22.848	10	16.891	31.619	22.946
20	16.889	31.734	23.035	20	16.818	31.708	23.031	20	16.138	31.972	23.389
30	14.799	32.720	24.258	30	14.766	32.769	24.303	30	14.092	32.880	24.530
40	11.084	33.311	25.445	40	11.255	33.309	25.413	40	11.211	33.271	25.392
50	8.675	33.195	25.755	50	9.744	33.587	25.891	50	11.149	33.693	25.731
75	4.024	33.254	26.395	75	4.982	33.382	26.394	75	4.339	33.246	26.356
STATION US09301 LATITUDE 42-03.3 N LONGITUDE 141-02.5 E DEPTH (m) 95				STATION US09302 LATITUDE 42-10.0 N LONGITUDE 141-07.0 E DEPTH (m) 98				STATION US09303 LATITUDE 42-09.9 N LONGITUDE 141-01.7 E DEPTH (m) 82			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	15.964	32.556	23.876	5	16.433	32.465	23.700	5	16.429	32.471	23.706
10	15.900	32.534	23.874	10	16.429	32.481	23.714	10	16.372	32.486	23.730
20	12.649	33.364	25.194	20	11.197	33.399	25.493	20	11.085	33.117	25.295
30	10.419	33.581	25.773	30	10.300	33.722	25.903	30	9.937	33.347	25.672
40	10.388	33.764	25.920	40	10.402	33.890	26.016	40	10.178	33.720	25.922
50	9.759	33.758	26.022	50	10.167	33.927	26.086	50	9.805	33.811	26.056
75	7.938	33.691	26.255	75	8.707	33.833	26.250	75	8.527	33.750	26.213

STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)			
US09304 41-11.2 140-41.9 70				US09305 41-09.3 140-41.3 53				US09306 41-09.2 140-43.5 58			
		N	E			N	E			N	E
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	21.277	32.939	22.851	5	21.206	32.922	22.857	5	21.191	32.530	22.564
10	21.101	33.445	23.283	10	20.615	33.458	23.424	10	21.248	33.152	23.021
20	20.778	33.682	23.550	20	20.387	33.709	23.675	20	20.378	33.492	23.512
30	19.105	33.647	23.961	30	17.687	33.788	24.421	30	19.224	33.643	23.927
40	17.369	33.871	24.560	40	16.267	33.921	24.857	40	17.179	33.837	24.580
50	14.186	34.062	25.423	50	14.940	34.048	25.251	50	16.454	33.918	24.812
STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)			
US09307 41-05.5 140-44.0 62				US09308 41-06.1 140-47.3 61				US09309 41-06.4 140-50.2 52			
		N	E			N	E			N	E
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	20.931	32.569	22.663	5	20.718	32.814	22.906	5	20.143	32.962	23.171
10	20.701	32.867	22.951	10	20.571	33.046	23.122	10	20.138	33.029	23.223
20	20.055	33.496	23.601	20	19.827	33.483	23.650	20	20.147	33.130	23.297
30	19.777	33.549	23.714	30	18.969	33.649	23.997	30	18.373	33.557	24.076
40	18.168	33.628	24.181	40	17.670	33.608	24.287	40	17.811	33.683	24.310
50	16.640	33.611	24.533	50	16.504	33.635	24.582	50	15.235	33.455	24.730
STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)			
US09310 41-04.7 140-51.2 53				US09311 41-04.2 140-51.4 52				US09312 41-02.8 140-46.6 51			
		N	E			N	E			N	E
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	19.838	33.040	23.310	5	19.726	33.247	23.496	5	20.480	32.886	23.024
10	19.754	33.116	23.390	10	19.543	33.319	23.599	10	19.439	33.343	23.644
20	19.082	33.249	23.663	20	19.185	33.322	23.692	20	18.728	33.594	24.015
30	18.965	33.491	23.877	30	18.878	33.538	23.935	30	18.081	33.695	24.253
40	18.545	33.656	24.109	40	18.526	33.630	24.094	40	16.859	33.667	24.524
50	14.937	33.595	24.902	50	15.089	33.554	24.838				
STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)			
US09313 41-01.1 140-43.6 56				US09314 41-00.2 140-46.2 53				US09315 40-57.3 140-46.2 50			
		N	E			N	E			N	E
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	20.220	32.987	23.169	5	20.602	32.878	22.986	5	20.921	32.725	22.784
10	20.215	32.989	23.172	10	19.655	33.262	23.526	10	19.939	33.384	23.545
20	18.966	33.470	23.860	20	18.454	33.645	24.123	20	18.899	33.493	23.895
30	17.439	33.736	24.440	30	17.809	33.753	24.364	30	18.304	33.658	24.170
40	15.266	33.586	24.823	40	16.777	33.781	24.631	40	17.075	33.667	24.474
50	14.920	34.011	25.226	50	15.475	33.858	24.987				
STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)			
US09316 40-55.4 140-46.2 42				US09317 40-53.8 140-46.0 36				US09318 41-58.7 141-01.1 97			
		N	E			N	E			N	E
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	20.873	32.584	22.690	5	20.548	33.210	23.253	5	20.892	31.056	21.523
10	20.426	33.005	23.129	10	20.152	33.417	23.515	10	18.342	31.311	22.366
20	18.959	33.411	23.818	20	19.380	33.414	23.712	20	12.839	32.389	24.402
30	18.362	33.713	24.198	30	18.481	33.631	24.106	30	9.893	32.418	24.954
40	16.890	33.821	24.635					40	9.318	32.682	25.253
								50	10.587	33.512	25.690
								75	9.902	33.804	26.034
STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)			
US09319 41-58.2 140-59.8 88				US09320 41-57.8 140-59.0 84				US09321 41-57.4 140-58.2 78			
		N	E			N	E			N	E
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	20.187	31.397	21.967	5	20.055	31.467	22.055	5	19.094	31.588	22.392
10	16.759	31.838	23.145	10	16.701	31.796	23.126	10	16.596	32.057	23.351
20	13.710	32.567	24.366	20	12.590	32.126	24.247	20	14.351	32.812	24.424
30	11.811	32.623	24.778	30	12.574	32.886	24.839	30	12.316	32.973	24.956
40	10.310	32.961	25.308	40	10.833	33.305	25.485	40	10.548	33.168	25.429
50	9.558	33.242	25.653	50	10.822	33.670	25.772	50	9.882	33.358	25.690
75	9.707	33.730	26.009	75	7.091	33.313	26.078	75	7.417	33.309	26.030

STATION US09322 LATITUDE 42-15.8 N LONGITUDE 140-35.9 E DEPTH (m) 90				STATION US09323 LATITUDE 42-18.8 N LONGITUDE 140-30.1 E DEPTH (m) 91				STATION US09324 LATITUDE 42-24.1 N LONGITUDE 140-32.2 E DEPTH (m) 95			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	20.288	31.176	21.773	5	20.386	31.173	21.746	5	20.509	31.190	21.726
10	20.284	31.177	21.775	10	20.306	31.188	21.778	10	20.503	31.190	21.728
20	18.245	31.450	22.496	20	18.204	31.470	22.521	20	18.716	31.404	22.346
30	14.381	32.293	24.017	30	15.476	32.095	23.630	30	16.438	32.053	23.383
40	12.081	33.168	25.151	40	12.077	32.990	25.014	40	12.113	32.878	24.920
50	10.151	33.409	25.685	50	10.142	33.306	25.605	50	10.181	33.210	25.524
75	5.550	33.189	26.176	75	5.963	33.252	26.176	75	5.605	33.262	26.227
STATION US09325 LATITUDE 42-19.7 N LONGITUDE 140-36.7 E DEPTH (m) 88				STATION US09326 LATITUDE 42-23.1 N LONGITUDE 140-42.6 E DEPTH (m) 61				STATION US09327 LATITUDE 42-10.1 N LONGITUDE 140-47.9 E DEPTH (m) 91			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	20.083	31.262	21.892	5	20.407	31.254	21.801	5	19.118	31.374	22.221
10	20.073	31.262	21.894	10	20.398	31.255	21.805	10	16.507	32.357	23.601
20	20.001	31.276	21.923	20	17.911	31.508	22.621	20	13.798	32.700	24.452
30	15.510	32.050	23.588	30	14.513	32.474	24.129	30	12.132	33.021	25.027
40	11.899	32.871	24.955	40	12.510	32.990	24.931	40	10.606	33.115	25.377
50	10.362	33.153	25.448	50	11.066	33.227	25.383	50	9.965	33.316	25.643
75	5.536	33.228	26.209					75	6.105	33.221	26.134
STATION US09328 LATITUDE 42-15.1 N LONGITUDE 140-47.7 E DEPTH (m) 71				STATION US09329 LATITUDE 42-18.6 N LONGITUDE 140-42.1 E DEPTH (m) 66				STATION US09330 LATITUDE 42-25.4 N LONGITUDE 140-37.0 E DEPTH (m) 84			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	18.602	31.695	22.596	5	20.179	31.273	21.875	5	20.285	31.239	21.822
10	17.271	32.099	23.225	10	20.147	31.296	21.901	10	20.284	31.239	21.822
20	13.904	32.478	24.259	20	16.931	32.730	23.788	20	20.167	31.255	21.865
30	12.255	32.505	24.604	30	13.698	32.742	24.504	30	17.035	31.827	23.073
40	10.871	32.626	24.950	40	9.929	32.707	25.173	40	12.659	32.640	24.632
50	10.174	33.164	25.489	50	10.349	33.300	25.565	50	10.159	33.076	25.423
								75	5.081	33.225	26.259
STATION US09331 LATITUDE 42-27.7 N LONGITUDE 140-43.1 E DEPTH (m) 61				STATION US09332 LATITUDE 42-25.3 N LONGITUDE 140-48.1 E DEPTH (m) 45				STATION US09333 LATITUDE 42-21.3 N LONGITUDE 140-48.4 E DEPTH (m) 51			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	20.236	31.256	21.847	5	20.830	31.024	21.515	5	20.496	31.448	21.926
10	20.233	31.255	21.848	10	20.789	31.036	21.535	10	20.481	31.456	21.936
20	19.502	31.346	22.105	20	17.705	31.637	22.767	20	15.631	32.250	23.715
30	14.638	32.504	24.126	30	13.543	32.647	24.463	30	12.170	32.396	24.535
40	12.262	32.924	24.927	40	12.389	33.086	25.029	40	11.732	32.937	25.037
50	11.098	33.283	25.421								
STATION US09334 LATITUDE 42-19.9 N LONGITUDE 140-24.1 E DEPTH (m) 61				STATION US09335 LATITUDE 42-15.7 N LONGITUDE 140-29.6 E DEPTH (m) 84				STATION US09336 LATITUDE 42-12.9 N LONGITUDE 140-35.0 E DEPTH (m) 87			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	21.105	31.035	21.451	5	20.956	31.041	21.495	5	21.114	31.077	21.480
10	20.757	31.146	21.627	10	20.364	31.361	21.894	10	20.312	31.415	21.948
20	18.164	31.476	22.536	20	17.339	31.635	22.854	20	16.493	31.879	23.237
30	14.266	32.338	24.075	30	14.043	32.411	24.178	30	13.007	32.802	24.689
40	12.615	32.906	24.846	40	11.399	32.903	25.072	40	10.933	32.934	25.179
50	11.523	33.099	25.201	50	10.201	33.232	25.537	50	9.864	33.326	25.667
				75	5.635	33.162	26.145	75	4.898	33.153	26.223

STATION US09337 LATITUDE 42-17.7 N LONGITUDE 140-40.3 E DEPTH (m) 90				STATION US09338 LATITUDE 41-58.8 N LONGITUDE 141-00.0 E DEPTH (m) 88				STATION US09339 LATITUDE 41-57.2 N LONGITUDE 141-01.9 E DEPTH (m) 101			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	20.197	31.395	21.964	5	20.029	31.338	21.964	5	19.871	31.385	22.040
10	19.505	31.527	22.241	10	18.915	31.662	22.493	10	17.683	31.659	22.791
20	14.809	32.450	24.048	20	14.396	32.157	23.909	20	15.295	32.274	23.807
30	13.032	32.847	24.719	30	12.893	32.898	24.786	30	12.204	32.804	24.846
40	11.414	33.272	25.356	40	11.302	33.033	25.190	40	11.084	32.990	25.195
50	10.059	33.352	25.656	50	10.489	33.207	25.469	50	10.317	33.214	25.504
75	6.016	33.363	26.257	75	6.925	33.370	26.144	75	9.990	33.771	25.994

STATION US09340 LATITUDE 41-55.4 N LONGITUDE 141-04.4 E DEPTH (m) 111				STATION US09341 LATITUDE 41-53.5 N LONGITUDE 141-07.5 E DEPTH (m) 96				STATION US09342 LATITUDE 41-51.7 N LONGITUDE 141-09.8 E DEPTH (m) 105			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	19.914	31.345	21.998	5	19.831	31.347	22.022	5	18.872	31.486	22.369
10	17.452	31.733	22.903	10	17.398	31.728	22.911	10	17.310	31.788	22.978
20	15.295	32.276	23.809	20	14.328	32.434	24.137	20	15.258	32.256	23.801
30	12.744	32.719	24.676	30	11.748	32.963	25.055	30	11.691	32.929	25.038
40	11.132	32.986	25.184	40	10.161	33.126	25.462	40	10.723	33.043	25.300
50	10.463	33.299	25.545	50	9.691	33.379	25.738	50	9.774	33.276	25.643
75	10.394	33.788	25.938	75	9.474	33.673	26.003	75	7.858	33.523	26.135
100	6.159	33.285	26.178								

STATION US09343 LATITUDE 41-50.0 N LONGITUDE 141-12.0 E DEPTH (m) 127			
Press.	Temp.	Salinity	Sigma-T
5	17.477	31.752	22.911
10	16.056	32.004	23.432
20	13.885	32.564	24.329
30	12.255	32.831	24.857
40	11.467	32.974	25.114
50	10.154	33.214	25.532
75	7.383	33.447	26.143
100	7.077	33.475	26.207

THE “USHIO MARU”

CRUISE 176

CRUISE 177

CRUISE 178

IN AUGUST-SEPTEMBER 2009

1. Cruise Itinerary

Cruise 176

Departure from Hakodate	Aug.	29	, 2009
Start hydrographic research (US09344) and trawl net research		29	
Arrival at Wakinosawa		29	
Departure from Wakinosawa		30	
Finish hydrographic research (US09356) and trawl net research		30	
Return to Hakodate		31	
Total coverage 173.1 miles			

Cruise 177

Departure from Hakodate	Sep.	5	, 2009
Arrival at Rausu		6	
Departure from Rausu		8	
Start hydrographic research (US09358)		8	
Arrival at Rausu		8	
Departure from Rausu		9	
Arrival at Rausu		10	
Departure from Rausu		11	
Arrival at and departure from Rausu		11	
Arrival at Kushiro		12	
Departure from Kushiro		14	
Finish hydrographic research (US09407)		17	
Return to Hakodate		18	
Total coverage 1468.3 miles			

Cruise 178

Departure from Hakodate	Sep.	24	, 2009
Hydrographic research (US09408-US09410)		24	
Practical training in tuna long line		25	
Return to Hakodate		27	
Total coverage 303.0 miles			

2. Vessel Personnel

Captain:		Professor	Toshimi Meguro
Crew :	Chief Officer	Assistant Professor	Osamu Kimura
	Second Officer	Assistant Professor	Naoto Kobayashi
	And 13 men		

Cruise 176

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
Graduate Students:	Chair of Marine Bioresource Science:		6 persons

Cruise 177

Research Staff:	Assistant Professor	(Field Science Center for Northern Biosphere)	Yoko Mitani
Guest Scientist (Domestic):	Professor	(Tokyo University of Agriculture)	Akihiro Shiimoto
Graduate Students:	Chair of Marine Bioresource and environment Sensing:		4 persons
	Chair of Marine Bioresource Science:		1 person
	Graduate School of Environmental Science:		2 persons
Under Graduate Students:	Department of Marine Biology:		3 persons
	Department of Applied Marine Science:		2 persons
	Department of Marine Biology (Third grade):		1 person
	Department of Applied Marine Science (Third grade):		1 person

Cruise 178

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	Susumu Shimizu
Graduate Students:	Chair of Marine Bioresource and Environment Sensing:		2 persons
Under Graduate Students:	Department of Applied Marine Science:		1 person
	Department of Applied Marine Science (Third grade):		6 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”.

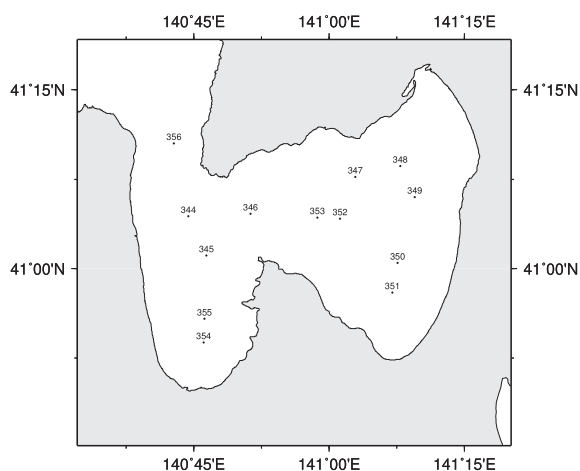


Figure 1: Oceanographic stations (Cruise 176)

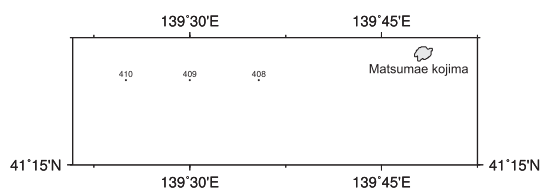


Figure 2: Oceanographic stations (Cruise 178)

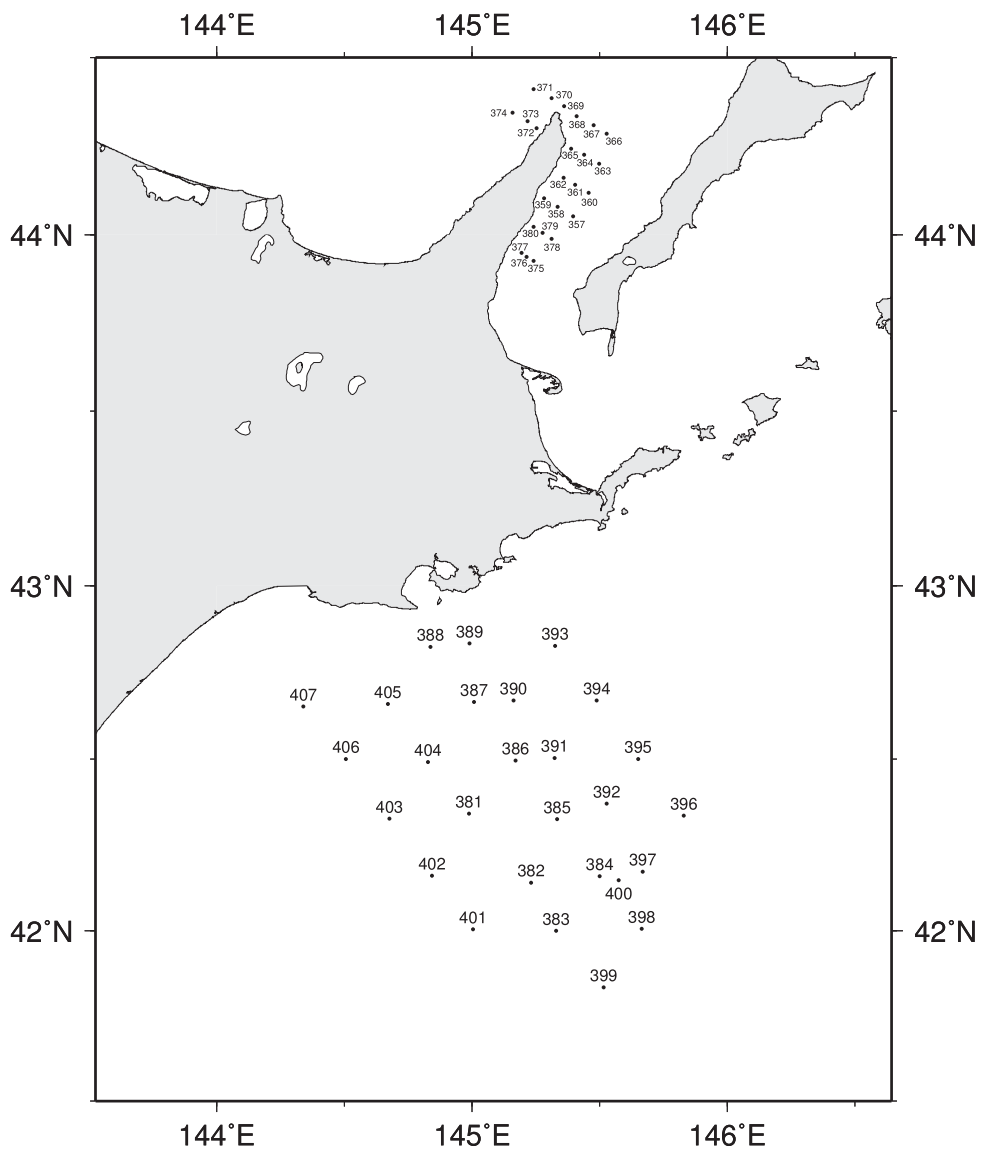


Figure 3: Oceanographic stations (Cruise 177)

Table 1: List of oceanographic stations

Cruise 176

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US09344	41-04.4	140-44.4	8/29	1316-1321	58	West-3	West-1	West-5	21.3	20.8	bc	1011.0
US09345	41-01.1	140-46.4	8/29	1418-1423	52	West-3	West-1	West-5	21.2	21.5	bc	1011.2
US09346	41-04.6	140-51.3	8/29	1550-1554	53	West-3	West-1	West-5	20.9	21.7	bc	1011.6
US09347	41-07.7	141-02.9	8/30	0652-0654	38	NW -1	West-1	NW -3	18.2	21.6	c	1019.0
US09348	41-08.6	141-07.9	8/30	0753-0757	37	West-1	West-1	West-2	19.6	21.5	c	1019.0
US09349	41-06.0	141-09.5	8/30	0831-0834	39	West-1	West-1	West-2	19.1	21.6	c	1019.2
US09350	41-00.5	141-07.6	8/30	0945-0948	42	Calm	West-1	Calm	21.2	21.8	c	1019.6
US09351	40-58.0	141-07.0	8/30	1019-1022	39	Calm	West-1	Calm	20.0	21.7	c	1019.7
US09352	41-04.2	141-01.2	8/30	1207-1210	48	Calm	West-1	Calm	22.2	21.9	c	1019.6
US09353	41-04.3	140-58.7	8/30	1247-1251	49	Calm	West-1	Calm	23.3	22.1	c	1019.6
US09354	40-53.8	140-46.1	8/30	1443-1446	37	NE -2	NE -1	NE -4	22.3	21.4	c	1019.0
US09355	40-55.8	140-46.2	8/30	1512-1514	44	NE -3	NE -1	NE -5	21.3	21.4	c	1018.6
US09356	41-10.5	140-42.8	8/30	1700-1703	66	East-1	East-1	East-3	20.2	22.2	c	1019.1

Cruise 177

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US09357	44-03.2	145-23.7	9/8	1117-1135	509	NW -2	ENE-1	NW -4	15.9	17.0	r	1000.0
US09358	44-04.8	145-20.1	9/8	1204-1222	813	NW -1	ENE-1	NW -3	15.7	16.9	r	999.5
US09359	44-06.2	145-16.9	9/8	1249-1303	475	NNW-1	ENE-1	NNW-2	15.9	16.4	r	999.0
US09360	44-07.2	145-27.4	9/8	1356-1413	1100	NW -3	ENE-1	NW -5	17.8	16.8	bc	997.5
US09361	44-08.5	145-24.2	9/8	1442-1500	1487	NW -4	NW -1	NW -6	17.2	16.9	bc	997.8
US09362	44-09.7	145-21.5	9/8	1518-1534	616	North-1	NW -1	North-4	18.1	16.7	bc	997.6
US09363	44-12.1	145-29.9	9/9	0803-0820	2026	West-2	NW -1	West-4	18.2	16.5	bc	998.4
US09364	44-13.6	145-26.3	9/9	0848-0905	1554	WNW-2	NW -1	WNW-4	18.2	16.7	bc	998.5
US09365	44-14.6	145-23.3	9/9	0930-0947	706	Calm	SSE-1	Calm	18.3	16.9	bc	998.3
US09366	44-17.2	145-31.7	9/9	1040-1057	2031	NW -1	NW -1	NW -2	19.5	16.8	bc	998.1
US09367	44-18.6	145-28.6	9/9	1123-1139	1496	West-3	NW -1	West-5	18.4	16.8	bc	997.7
US09368	44-20.1	145-24.6	9/9	1207-1225	821	West-4	NW -1	West-4	17.2	16.9	bc	997.7
US09369	44-21.8	145-21.6	9/9	1253-1256	89	WSW-2	NW -1	WSW-5	18.1	16.8	bc	997.4
US09370	44-23.2	145-18.7	9/9	1319-1332	603	West-2	NW -1	West-4	17.6	17.8	bc	996.7
US09371	44-24.7	145-14.4	9/9	1406-1424	1400	WSW-1	West-1	WSW-3	17.6	17.0	bc	996.7
US09372	44-18.1	145-15.2	9/9	1526-1531	160	SW -1	NW -1	SW -3	18.8	18.4	bc	996.1
US09373	44-19.3	145-13.0	9/9	1552-1609	701	SSW-1	NW -1	SSW-3	19.4	18.4	bc	996.0
US09374	44-20.7	145-09.5	9/9	1647-1704	1116	WSW-1	NW -1	WSW-2	18.3	18.0	bc	995.6
US09375	43-55.6	145-14.5	9/11	0732-0736	80	WSW-2	NE -1	WSW-4	16.1	16.8	c	1004.0
US09376	43-56.3	145-12.8	9/11	0750-0754	84	West-2	NE -1	West-4	16.1	16.7	bc	1004.1
US09377	43-57.0	145-11.6	9/11	0805-0809	82	SW -1	NE -1	SW -3	16.1	16.7	bc	1004.2
US09378	43-59.4	145-18.7	9/11	0847-0856	255	SW -1	NE -1	SW -3	18.1	16.8	bc	1004.2
US09379	44-00.4	145-16.6	9/11	0915-0929	400	West-1	NE -1	West-3	17.4	16.8	bc	1004.5
US09380	44-01.4	145-14.5	9/11	0946-1000	410	SW -2	NW -1	SW -5	17.8	16.9	bc	1004.4
US09381	42-20.5	144-59.3	9/14	1511-1532	2762	SW -1	SSE-2	SW -3	18.1	17.5	bc	1013.4
US09382	42-08.4	145-13.9	9/14	1826-1850	3323	SSW-1	SSE-2	SSW-2	16.3	14.9	bc	1014.3
US09383	42-00.0	145-19.8	9/15	0308-0333	3888	South-1	SSE-1	South-2	17.2	16.3	bc	1013.7
US09384	42-09.5	145-30.0	9/15	0453-0519	3824	SSE-1	SSE-1	SSE-2	15.4	14.6	bc	1014.1
US09385	42-19.5	145-20.0	9/15	0638-0700	3047	SSE-1	SSE-1	SSE-3	16.1	14.7	c	1014.1
US09386	42-29.7	145-10.2	9/15	0813-0845	1972	SSE-1	SSE-1	SSE-3	17.2	14.8	c	1014.7
US09387	42-39.9	145-00.4	9/15	0954-1019	740	SSE-1	SE -1	SSE-4	17.8	16.3	o	1014.0
US09388	42-49.4	144-50.2	9/15	1127-1135	103	SSW-2	South-1	SSW-3	17.2	15.2	f	1013.6
US09389	42-50.0	144-59.4	9/15	1234-1245	104	South-2	South-1	South-4	16.6	14.9	o	1013.2
US09390	42-40.1	145-09.8	9/15	1408-1432	1292	SE -1	SSE-1	SE -2	16.8	16.0	c	1012.2
US09391	42-30.1	145-19.4	9/15	1546-1610	2239	SE -1	SSE-1	SE -2	16.6	14.9	c	1012.1
US09392	42-22.2	145-31.7	9/15	1820-1843	3229	SE -1	SSE-1	SE -3	16.2	14.7	c	1012.4
US09393	42-49.6	145-19.5	9/15	0459-0516	408	SSE-2	SSE-1	SSE-4	15.5	14.6	c	1010.1
US09394	42-40.1	145-29.3	9/16	0635-0654	2041	SSE-3	SSE-1	SSE-5	14.7	12.4	c	1010.4
US09395	42-30.0	145-39.1	9/16	0805-0826	2350	SE -1	SE -1	SE -3	15.7	14.2	o	1010.8
US09396	42-20.1	145-49.8	9/16	0935-0957	3158	East-1	SE -1	East-3	14.6	14.6	c	1011.0
US09397	42-10.3	145-40.1	9/16	1111-1140	4250	ESE-1	SE -1	ESE-3	17.1	15.0	c	1010.6
US09398	42-00.3	145-39.9	9/16	1243-1305	5028	South-1	SE -1	South-3	19.2	17.8	c	1009.4
US09399	41-50.0	145-30.9	9/16	1424-1445	5287	SSW-1	SE -1	SSW-2	19.2	18.0	c	1008.6
US09400	42-08.8	145-34.5	9/16	1819-1840	4377	West-1	SE -1	West-2	15.6	14.3	c	1009.3
US09401	42-00.2	145-00.2	9/17	0053-0114	3040	WSW-2	SSE-1	WSW-4	15.9	17.1	bc	1010.0
US09402	42-09.6	144-50.6	9/17	0227-0250	2270	North-2	SSE-1	North-4	16.1	17.0	bc	1010.6
US09403	42-19.6	144-40.6	9/17	0407-0431	1815	NNW-1	SSE-1	NNW-3	15.4	17.2	bc	1011.9
US09404	42-29.4	144-49.6	9/17	0547-0609	1862	NNW-1	SSE-1	NNW-3	14.6	15.0	c	1013.1
US09405	42-39.5	144-40.2	9/17	0719-0740	509	NNW-1	East-1	NNW-2	15.8	16.0	bc	1013.9
US09406	42-30.0	144-30.3	9/17	0848-0910	1261	NW -1	SW -1	NW -3	16.6	17.1	bc	1015.2
US09407	42-39.1	144-20.3	9/17	1018-1040	995	Calm	East-1	Calm	17.4	16.5	bc	1015.5

Cruise 178

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US09408	41-20.0	139-35.4	9/24	1624-1632	734	Calm	SW -1	Calm	21.2	21.7	c	1019.1
US09409	41-20.0	139-30.0	9/24	1700-1707	1561	Calm	SW -1	Calm	21.7	21.0	c	1019.1
US09410	41-20.0	139-25.0	9/24	1732-1741	2530	Calm	SW -1	Calm	20.8	21.6	c	1019.1

(*):Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US09344 LATITUDE 41-04.4 N LONGITUDE 140-44.4 E DEPTH (m) 58				STATION US09345 LATITUDE 41-01.1 N LONGITUDE 140-46.4 E DEPTH (m) 52				STATION US09346 LATITUDE 41-04.6 N LONGITUDE 140-51.3 E DEPTH (m) 53			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	21.882	32.923	22.673	5	21.726	33.136	22.878	5	21.810	33.132	22.852
10	21.737	33.056	22.814	10	21.661	33.290	23.013	10	21.785	33.185	22.899
20	21.451	33.519	23.245	20	21.325	33.610	23.348	20	21.519	33.643	23.320
30	20.377	33.570	23.572	30	20.877	33.687	23.528	30	20.572	33.550	23.505
40	18.973	33.574	23.938	40	19.400	33.518	23.787	40	19.093	33.776	24.062
50	17.454	33.832	24.510					50	17.655	33.839	24.467
STATION US09347 LATITUDE 41-07.7 N LONGITUDE 141-02.9 E DEPTH (m) 38				STATION US09348 LATITUDE 41-08.6 N LONGITUDE 141-07.9 E DEPTH (m) 37				STATION US09349 LATITUDE 41-06.0 N LONGITUDE 141-09.5 E DEPTH (m) 39			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	21.838	32.506	22.369	5	21.668	32.727	22.583	5	21.822	32.617	22.457
10	21.939	32.604	22.415	10	21.711	32.834	22.653	10	21.812	32.615	22.459
20	21.497	33.531	23.241	20	21.577	33.112	22.900	20	21.228	32.744	22.715
30	18.579	33.337	23.856	30	18.738	33.273	23.767	30	18.856	33.313	23.768
STATION US09350 LATITUDE 41-00.5 N LONGITUDE 141-07.6 E DEPTH (m) 42				STATION US09351 LATITUDE 40-58.0 N LONGITUDE 141-07.0 E DEPTH (m) 39				STATION US09352 LATITUDE 41-04.2 N LONGITUDE 141-01.2 E DEPTH (m) 48			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	21.754	32.743	22.572	5	21.956	32.656	22.450	5	21.829	32.564	22.415
10	21.768	32.772	22.590	10	21.945	32.666	22.460	10	21.824	32.662	22.491
20	21.687	32.927	22.730	20	21.811	32.851	22.638	20	21.423	33.020	22.873
30	19.733	33.222	23.476	30	20.721	33.329	23.297	30	19.094	33.281	23.684
								40	18.259	33.548	24.097
STATION US09353 LATITUDE 41-04.3 N LONGITUDE 140-58.7 E DEPTH (m) 49				STATION US09354 LATITUDE 40-53.8 N LONGITUDE 140-46.1 E DEPTH (m) 37				STATION US09355 LATITUDE 40-55.8 N LONGITUDE 140-46.2 E DEPTH (m) 44			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	21.975	32.588	22.393	5	21.561	33.027	22.841	5	21.560	33.043	22.853
10	21.871	32.607	22.436	10	21.554	33.039	22.851	10	21.566	33.070	22.871
20	21.634	33.346	23.063	20	21.564	33.632	23.299	20	21.346	33.533	23.283
30	20.245	33.516	23.566	30	20.986	33.613	23.442	30	20.946	33.559	23.412
40	18.282	33.553	24.095					40	20.529	33.587	23.545
STATION US09356 LATITUDE 41-10.5 N LONGITUDE 140-42.8 E DEPTH (m) 66				STATION US09357 LATITUDE 44-03.2 N LONGITUDE 145-23.7 E DEPTH (m) 509				STATION US09358 LATITUDE 44-04.8 N LONGITUDE 145-20.1 E DEPTH (m) 813			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	22.364	33.677	23.111	5	17.197	33.121	24.026	5	16.770	32.128	23.364
10	22.357	33.674	23.111	10	16.930	33.429	24.325	10	16.892	33.085	24.070
20	22.260	33.665	23.131	20	16.760	33.710	24.580	20	16.576	33.632	24.563
30	22.152	33.657	23.155	30	16.658	33.701	24.598	30	16.581	33.726	24.635
40	22.076	33.651	23.172	40	16.466	33.710	24.649	40	16.339	33.730	24.694
50	21.865	33.646	23.227	50	15.757	33.666	24.776	50	16.018	33.729	24.766
				75	13.323	33.782	25.385	75	13.957	33.787	25.259
				100	11.097	33.777	25.806	100	10.808	33.777	25.858
				125	9.197	33.744	26.104	125	8.854	33.735	26.151
				150	6.860	33.625	26.355	150	6.628	33.652	26.407
				175	4.728	33.515	26.528	175	3.764	33.441	26.569
				200	2.214	33.333	26.620	200	2.450	33.376	26.635
				250	1.757	33.379	26.691	250	-0.033	33.248	26.693
				300	0.748	33.358	26.741	300	1.328	33.410	26.746
				400	1.531	33.539	26.835	400	1.547	33.512	26.812
								500	1.881	33.673	26.918

STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)			
US09359 44-06.2 145-16.9 475				US09360 44-07.2 145-27.4 1100				US09361 44-08.5 145-24.2 1487			
N E				N E				N E			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	16.631	33.421	24.237	5	17.070	32.999	23.963	5	16.941	32.943	23.950
10	16.477	33.421	24.424	10	17.042	33.234	24.149	10	17.061	33.187	24.109
20	16.623	33.674	24.585	20	16.964	33.380	24.280	20	17.036	33.410	24.286
30	16.395	33.716	24.670	30	15.508	33.616	24.794	30	16.358	33.648	24.626
40	15.918	33.710	24.774	40	13.863	33.758	25.256	40	15.707	33.700	24.814
50	15.566	33.668	24.820	50	12.285	33.771	25.581	50	13.782	33.741	25.260
75	12.861	33.780	25.475	75	10.418	33.795	25.939	75	11.158	33.793	25.807
100	10.958	33.776	25.830	100	9.437	33.776	26.090	100	9.587	33.778	26.066
125	8.875	33.766	26.172	125	8.504	33.730	26.201	125	8.175	33.714	26.238
150	5.834	33.528	26.410	150	5.784	33.544	26.429	150	7.074	33.708	26.391
175	3.210	33.405	26.593	175	4.300	33.465	26.535	175	2.001	33.217	26.543
200	1.401	33.292	26.646	200	2.868	33.398	26.618	200	0.831	33.204	26.612
250	1.125	33.343	26.705	250	1.331	33.323	26.676	250	0.003	33.246	26.690
300	1.310	33.414	26.750	300	0.785	33.348	26.730	300	1.030	33.381	26.742
400	1.654	33.541	26.829	400	1.605	33.551	26.840	400	1.759	33.633	26.839
				500	1.939	33.724	26.954	500	1.950	33.708	26.940
STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)			
US09362 44-09.7 145-21.5 616				US09363 44-12.1 145-29.9 2026				US09364 44-13.6 145-26.3 1554			
N E				N E				N E			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	16.960	33.295	24.215	5	16.778	33.293	24.256	5	16.848	33.379	24.306
10	17.018	33.449	24.320	10	16.774	33.301	24.263	10	16.791	33.380	24.320
20	16.773	33.590	24.485	20	16.734	33.321	24.288	20	16.764	33.386	24.331
30	16.454	33.677	24.626	30	14.674	33.676	25.022	30	16.408	33.464	24.473
40	16.322	33.743	24.707	40	13.121	33.797	25.437	40	14.718	33.677	25.013
50	14.860	33.720	25.011	50	12.268	33.792	25.600	50	13.740	33.789	25.305
75	12.621	33.792	25.532	75	10.809	33.804	25.879	75	11.299	33.810	25.795
100	10.371	33.816	25.964	100	9.360	33.789	26.112	100	10.014	33.793	26.007
125	7.972	33.682	26.243	125	8.507	33.781	26.240	125	8.131	33.751	26.273
150	4.874	33.493	26.495	150	7.105	33.722	26.398	150	7.269	33.704	26.361
175	2.816	33.391	26.616	175	4.804	33.508	26.515	175	4.830	33.605	26.589
200	1.603	33.350	26.671	200	3.172	33.410	26.608	200	3.518	33.478	26.676
250	1.167	33.357	26.714	250	1.974	33.386	26.680	250	0.995	33.321	26.696
300	1.402	33.404	26.736	300	1.454	33.416	26.742	300	0.954	33.376	26.742
400	1.460	33.499	26.809	400	1.652	33.547	26.834	400	1.561	33.523	26.821
500	1.933	33.665	26.907	500	1.974	33.703	26.935	500	1.936	33.674	26.914
STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)			
US09365 44-14.6 145-23.3 706				US09366 44-17.2 145-31.7 2031				US09367 44-18.6 145-28.6 1496			
N E				N E				N E			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	17.030	33.454	24.321	5	17.167	33.539	24.354	5	17.191	33.451	24.281
10	17.021	33.476	24.340	10	17.054	33.521	24.367	10	17.129	33.540	24.364
20	17.015	33.540	24.390	20	17.053	33.564	24.400	20	17.034	33.552	24.395
30	16.346	33.621	24.608	30	16.491	33.641	24.590	30	16.954	33.574	24.430
40	16.043	33.687	24.728	40	15.625	33.780	24.893	40	15.891	33.640	24.726
50	14.839	33.734	25.031	50	14.410	33.763	25.145	50	15.382	33.739	24.916
75	12.391	33.802	25.584	75	12.849	33.857	25.538	75	13.201	33.816	25.436
100	10.491	33.797	25.928	100	11.654	33.843	25.755	100	11.707	33.797	25.710
125	9.418	33.792	26.105	125	9.824	33.809	26.051	125	9.637	33.776	26.056
150	7.206	33.695	26.362	150	7.746	33.692	26.284	150	7.319	33.702	26.353
175	5.651	33.621	26.506	175	6.035	33.632	26.467	175	4.614	33.490	26.521
200	3.599	33.493	26.627	200	3.433	33.426	26.589	200	3.553	33.432	26.583
250	1.778	33.403	26.709	250	1.914	33.387	26.686	250	0.225	33.227	26.664
300	1.500	33.411	26.735	300	1.374	33.405	26.739	300	0.771	33.338	26.723
400	1.657	33.533	26.821	400	1.679	33.533	26.820	400	1.651	33.531	26.820
				500	1.953	33.695	26.930				
STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)			
US09368 44-20.1 145-24.6 821				US09369 44-21.8 145-21.6 89				US09370 44-23.2 145-18.7 603			
N E				N E				N E			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	17.082	33.227	24.135	5	17.037	33.441	24.309	5	18.110	33.530	24.119
10	17.137	33.418	24.268	10	17.028	33.467	24.331	10	17.747	33.701	24.339
20	17.017	33.489	24.351	20	16.886	33.523	24.408	20	17.105	33.793	24.563
30	17.023	33.522	24.375	30	16.770	33.601	24.495	30	16.287	33.826	24.779
40	16.486	33.600	24.560	40	15.648	33.782	24.890	40	16.002	33.851	24.864
50	15.503	33.705	24.863	50	15.543	33.796	24.924	50	15.161	33.857	25.056
75	13.543	33.844	25.388	75	14.175	33.781	25.208	75	12.344	33.912	25.679
100	11.693	33.840	25.746					100	11.143	33.896	25.890
125	9.959	33.810	26.030					125	8.362	33.861	26.325
150	7.246	33.710	26.369					150	5.761	33.684	26.542
175	5.175	33.540	26.498					175	4.943	33.642	26.605
200	2.982	33.380	26.594					200	4.120	33.599	26.660
250	0.955	33.301	26.682					250	3.171	33.560	26.720
300	0.888	33.352	26.727					300	2.689	33.536	26.743
400	1.520	33.512	26.814								
500	1.775	33.662	26.917								
STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)				STATION LATITUDE LONGITUDE DEPTH (m)			
US09371 44-24.7 145-14.4 1400				US09372 44-18.1 145-15.2 160				US09373 44-19.3 145-13.0 701			
N E				N E				N E			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	16.953	33.576	24.432	5	18.331	33.674	24.176	5	18.457	33.700	24.164
10	16.839	33.643	24.511	10	17.186	33.758	24.517	10	17.466	33.732	24.430
20	14.284	33.741	25.155	20	16.263	33.831	24.789	20	16.489	33.827	24.733
30	13.147	33.881	25.496	30	16.193	33.846	24.816	30	15.284	33.859	25.030
40	11.826	33.863	25.738	40	16.108	33.851	24.839	40	14.788	33.890	25.162
50	9.555	33.490	25.847	50	15.539	33.861	24.975	50	14.698	33.897	25.187
75	10.063	33.961	26.130	75	13.899	33.875	25.339	75	12.404	33.884	25.645
100	7.991	33.844	26.367	100	11.546	33.871	25.797	100	9.500	33.950	26.216
125	1.995	33.228	26.552					125	7.292	33.822	26.451
150	0.860	33.211	26.615					150	3.870	33.403	26.529
175	2.620	33.427	26.662					175	1.386	33.288	26.644
200	3.142	33.543	26.709					200	2.059	33.489	26.757
250	2.572	33.511	26.733					250	2.635	33.531	26.744
300	2.008	33.500	26.769					300	1.993	33.484	26.758
								400	1.894	33.551	26.819

STATION		US09374		
LATITUDE		44-20.7	N	
LONGITUDE		145-09.5	E	
DEPTH (m)		1116		
Press.	Temp.	Salinity	Sigma-T	
5	17.887	33.708	24.310	
10	17.753	33.714	24.347	
20	15.817	33.698	24.788	
30	13.294	33.807	25.410	
40	11.726	33.698	25.630	
50	9.013	33.485	25.930	
75	8.500	33.760	26.225	
100	3.226	33.175	26.409	
125	2.710	33.277	26.535	
150	4.170	33.568	26.630	
175	3.681	33.545	26.660	
200	2.899	33.521	26.713	
250	2.107	33.498	26.760	
300	1.587	33.482	26.785	

STATION		US09375		
LATITUDE		43-55.6	N	
LONGITUDE		145-14.5	E	
DEPTH (m)		80		
Press.	Temp.	Salinity	Sigma-T	
5	16.938	33.233	24.173	
10	16.938	33.234	24.174	
20	16.916	33.322	24.247	
30	16.074	33.615	24.666	
40	15.462	33.673	24.847	
50	15.270	33.759	24.956	

STATION		US09376		
LATITUDE		43-56.3	N	
LONGITUDE		145-12.8	E	
DEPTH (m)		84		
Press.	Temp.	Salinity	Sigma-T	
5	17.095	33.171	24.089	
10	17.104	33.191	24.102	
20	17.021	33.219	24.143	
30	16.575	33.564	24.512	
40	15.616	33.702	24.835	
50	15.176	33.714	24.943	
75	13.216	33.769	25.396	

STATION		US09377		
LATITUDE		43-57.0	N	
LONGITUDE		145-11.6	E	
DEPTH (m)		82		
Press.	Temp.	Salinity	Sigma-T	
5	17.072	33.139	24.069	
10	17.059	33.137	24.071	
20	16.921	33.148	24.112	
30	16.599	33.524	24.475	
40	15.807	33.653	24.755	
50	15.367	33.734	24.916	

STATION		US09378		
LATITUDE		43-59.4	N	
LONGITUDE		145-18.7	E	
DEPTH (m)		255		
Press.	Temp.	Salinity	Sigma-T	
5	17.070	33.377	24.252	
10	17.047	33.353	24.239	
20	17.003	33.367	24.261	
30	16.887	33.508	24.396	
40	16.698	33.661	24.557	
50	16.190	33.664	24.677	
75	13.733	33.700	25.238	
100	11.865	33.792	25.677	
125	10.287	33.777	25.948	
150	7.112	33.596	26.298	
175	4.684	33.487	26.511	
200	3.277	33.421	26.600	

STATION		US09379		
LATITUDE		44-00.4	N	
LONGITUDE		145-16.6	E	
DEPTH (m)		400		
Press.	Temp.	Salinity	Sigma-T	
5	17.061	33.260	24.164	
10	17.046	33.268	24.174	
20	17.021	33.357	24.248	
30	16.891	33.496	24.386	
40	16.820	33.576	24.464	
50	16.506	33.618	24.569	
75	13.651	33.700	25.254	
100	12.075	33.787	25.633	
125	9.818	33.751	26.007	
150	7.389	33.613	26.272	
175	4.441	33.469	26.523	
200	2.898	33.408	26.623	
250	1.652	33.351	26.676	
300	1.551	33.412	26.732	

STATION		US09380		
LATITUDE		44-01.4	N	
LONGITUDE		145-14.5	E	
DEPTH (m)		410		
Press.	Temp.	Salinity	Sigma-T	
5	17.055	33.240	24.151	
10	17.034	33.288	24.193	
20	16.974	33.300	24.216	
30	16.952	33.351	24.260	
40	16.811	33.471	24.386	
50	15.854	33.656	24.747	
75	14.583	33.771	25.115	
100	11.744	33.795	25.701	
125	10.117	33.789	25.986	
150	7.960	33.666	26.232	
175	4.445	33.473	26.526	
200	2.765	33.401	26.629	
250	1.529	33.352	26.686	
300	1.374	33.407	26.740	

STATION		US09381		
LATITUDE		42-20.5	N	
LONGITUDE		144-59.3	E	
DEPTH (m)		2762		
Press.	Temp.	Salinity	Sigma-T	
5	16.715	32.770	23.869	
10	15.080	32.677	24.164	
20	11.569	32.511	24.736	
30	8.692	32.670	25.341	
40	6.296	32.896	25.853	
50	4.618	33.002	26.134	
75	2.787	33.124	26.406	
100	2.525	33.275	26.548	
125	2.610	33.373	26.620	
150	2.218	33.359	26.640	
175	2.167	33.392	26.671	
200	2.491	33.480	26.715	
250	2.807	33.582	26.770	
300	2.564	33.599	26.805	
400	2.649	33.726	26.899	
500	2.832	33.837	26.972	

STATION		US09382		
LATITUDE		42-08.4	N	
LONGITUDE		145-13.9	E	
DEPTH (m)		3323		
Press.	Temp.	Salinity	Sigma-T	
5	15.185	32.889	24.305	
10	15.127	33.171	24.535	
20	14.703	33.208	24.654	
30	11.429	33.340	25.406	
40	9.838	33.462	25.778	
50	9.339	33.483	25.876	
75	5.347	33.336	26.316	
100	4.171	33.419	26.511	
125	4.286	33.490	26.556	
150	3.615	33.506	26.635	
175	2.293	33.411	26.676	
200	2.087	33.442	26.717	
250	2.092	33.517	26.776	
300	2.289	33.610	26.835	
400	2.623	33.763	26.930	
500	3.050	33.925	27.022	

STATION		US09383		
LATITUDE		42-00.0	N	
LONGITUDE		145-19.8	E	
DEPTH (m)		3888		
Press.	Temp.	Salinity	Sigma-T	
5	18.012	33.065	23.788	
10	18.023	33.069	23.788	
20	17.953	33.089	23.820	
30	12.224	32.935	24.943	
40	5.847	33.012	26.000	
50	4.477	33.083	26.212	
75	2.407	33.092	26.412	
100	2.513	33.208	26.496	
125	2.436	33.264	26.547	
150	2.176	33.343	26.631	
175	2.160	33.417	26.692	
200	3.123	33.605	26.760	
250	3.190	33.674	26.809	
300	3.113	33.756	26.882	
400	3.450	33.918	26.980	
500	3.340	34.012	27.065	

STATION		US09384	
LATITUDE		42-09.5	N
LONGITUDE		145-30.0	E
DEPTH (m)		3824	
Press.	Temp.	Salinity	Sigma-T
5	14.288	33.195	24.732
10	13.841	33.219	24.844
20	13.291	33.347	25.055
30	12.092	33.493	25.401
40	8.344	33.329	25.910
50	9.239	33.976	26.278
75	7.609	33.810	26.396
100	3.945	33.422	26.537
125	2.302	33.318	26.601
150	2.079	33.366	26.656
175	2.048	33.406	26.691
200	2.017	33.455	26.733
250	2.089	33.523	26.782
300	2.181	33.581	26.821
400	2.495	33.710	26.898
500	2.830	33.868	26.997

STATION US09386 LATITUDE 42-29.7 N LONGITUDE 145-10.2 E DEPTH (m) 1972				STATION US09387 LATITUDE 42-39.9 N LONGITUDE 145-00.4 E DEPTH (m) 740				STATION US09388 LATITUDE 42-49.4 N LONGITUDE 144-50.2 E DEPTH (m) 103			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	15.422	32.704	24.110	5	16.051	32.739	23.997	5	15.352	33.456	24.705
10	14.125	32.789	24.453	10	15.989	32.733	24.007	10	15.191	33.460	24.743
20	11.921	33.543	25.473	20	13.569	32.693	24.493	20	14.706	33.451	24.841
30	10.951	33.566	25.667	30	10.051	32.799	25.225	30	13.973	33.434	24.983
40	9.649	33.477	25.821	40	8.664	33.390	25.910	40	13.160	33.473	25.178
50	6.951	33.409	26.172	50	7.980	33.418	26.034	50	12.759	33.517	25.291
75	4.504	33.318	26.396	75	4.800	33.306	26.354	75	10.569	33.458	25.651
100	3.014	33.274	26.506	100	3.531	33.292	26.473				
125	3.877	33.473	26.584	125	2.176	33.263	26.566				
150	2.899	33.409	26.624	150	2.403	33.338	26.609				
175	2.816	33.472	26.682	175	2.073	33.366	26.657				
200	2.138	33.420	26.695	200	2.074	33.393	26.678				
250	2.143	33.481	26.744	250	2.046	33.459	26.734				
300	2.209	33.535	26.782	300	2.104	33.505	26.766				
400	2.464	33.644	26.849	400	2.296	33.620	26.843				
500	2.619	33.755	26.924	500	3.168	33.842	26.946				

STATION US09389 LATITUDE 42-50.0 N LONGITUDE 144-59.4 E DEPTH (m) 104				STATION US09390 LATITUDE 42-40.1 N LONGITUDE 145-09.8 E DEPTH (m) 1292				STATION US09391 LATITUDE 42-30.1 N LONGITUDE 145-19.4 E DEPTH (m) 2239			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	15.365	33.449	24.697	5	15.906	32.683	23.987	5	14.442	32.821	24.412
10	15.048	33.454	24.770	10	15.663	32.682	24.040	10	13.927	32.760	24.471
20	14.586	33.459	24.873	20	13.037	32.627	24.548	20	11.775	33.098	25.154
30	13.578	33.489	25.107	30	9.584	33.195	25.611	30	10.576	33.388	25.595
40	12.701	33.491	25.283	40	8.680	33.455	25.958	40	9.200	33.364	25.805
50	12.078	33.498	25.408	50	8.024	33.463	26.063	50	7.226	33.354	26.091
75	11.195	33.470	25.549	75	5.182	33.323	26.325	75	3.715	33.283	26.449
100	8.107	33.418	26.016	100	3.880	33.375	26.505	100	3.388	33.395	26.569
				125	2.523	33.322	26.586	125	2.160	33.325	26.618
				150	2.294	33.365	26.639	150	1.702	33.334	26.658
				175	2.080	33.387	26.673	175	1.718	33.358	26.677
				200	1.911	33.407	26.702	200	1.737	33.381	26.694
				250	2.036	33.471	26.744	250	1.794	33.421	26.722
				300	2.053	33.519	26.781	300	2.029	33.514	26.779
				400	2.921	33.712	26.864	400	2.303	33.640	26.858
				500	3.267	33.864	26.954	500	2.700	33.801	26.954

STATION US09392 LATITUDE 42-22.2 N LONGITUDE 145-31.7 E DEPTH (m) 3229				STATION US09393 LATITUDE 42-49.6 N LONGITUDE 145-19.5 E DEPTH (m) 408				STATION US09394 LATITUDE 42-40.1 N LONGITUDE 145-29.3 E DEPTH (m) 2041			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.954	32.898	24.362	5	14.869	33.398	24.765	5	12.775	32.570	24.555
10	14.767	32.901	24.405	10	14.677	33.400	24.808	10	12.126	32.617	24.715
20	11.349	33.466	25.518	20	13.917	33.448	25.005	20	11.707	32.684	24.845
30	9.683	33.495	25.830	30	12.906	33.474	25.229	30	10.359	32.818	25.188
40	9.077	33.493	25.926	40	12.639	33.490	25.294	40	7.814	32.977	25.712
50	9.465	33.892	26.176	50	12.173	33.491	25.385	50	5.780	33.079	26.062
75	7.683	33.763	26.348	75	9.800	33.445	25.771	75	3.032	33.183	26.432
100	3.718	33.381	26.527	100	8.384	33.422	25.978	100	2.509	33.277	26.552
125	2.992	33.417	26.622	125	6.622	33.353	26.172	125	2.544	33.356	26.612
150	2.082	33.375	26.663	150	4.062	33.325	26.447	150	2.411	33.395	26.653
175	1.888	33.402	26.700	175	2.306	33.373	26.644	175	2.245	33.422	26.688
200	2.083	33.460	26.731	200	2.102	33.392	26.676	200	2.051	33.431	26.711
250	2.069	33.504	26.768	250	2.053	33.464	26.737	250	2.014	33.484	26.756
300	2.148	33.552	26.800	300	2.107	33.493	26.757	300	2.121	33.538	26.791
400	2.458	33.684	26.881					400	2.469	33.686	26.882
500	2.828	33.859	26.989					500	2.713	33.804	26.955

STATION US09395 LATITUDE 42-30.0 N LONGITUDE 145-39.1 E DEPTH (m) 2350				STATION US09396 LATITUDE 42-20.1 N LONGITUDE 145-49.8 E DEPTH (m) 3158				STATION US09397 LATITUDE 42-10.3 N LONGITUDE 145-40.1 E DEPTH (m) 4250			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.510	32.626	24.247	5	14.056	32.952	24.593	5	14.497	33.346	24.805
10	13.978	33.293	24.873	10	13.870	33.077	24.728	10	14.183	33.405	24.916
20	12.136	33.266	25.217	20	10.320	32.745	25.138	20	12.163	33.325	25.257
30	10.610	33.359	25.566	30	8.528	33.084	25.691	30	10.151	33.491	25.749
40	7.760	33.325	25.993	40	7.825	33.371	26.020	40	8.355	33.426	25.985
50	5.371	33.185	26.194	50	6.877	33.404	26.179	50	5.419	33.250	26.240
75	2.794	33.170	26.442	75	3.164	33.234	26.461	75	2.714	33.214	26.484
100	2.291	33.277	26.569	100	2.294	33.277	26.569	100	2.147	33.334	26.626
125	2.079	33.343	26.638	125	2.169	33.321	26.614	125	2.054	33.359	26.653
150	2.019	33.383	26.675	150	2.209	33.393	26.668	150	1.955	33.384	26.680
175	1.968	33.410	26.700	175	2.225	33.436	26.701	175	1.989	33.422	26.709
200	1.966	33.431	26.718	200	2.177	33.468	26.731	200	2.099	33.477	26.744
250	2.084	33.494	26.759	250	2.068	33.504	26.768	250	2.147	33.540	26.791
300	2.181	33.547	26.793	300	2.099	33.547	26.800	300	2.218	33.581	26.818
400	2.460	33.688	26.884	400	2.459	33.691	26.887	400	2.524	33.710	26.896
500	2.896	33.858	26.982	500	2.836	33.852	26.983	500	2.843	33.870	26.997

STATION US09398 LATITUDE 42-00.3 N LONGITUDE 145-39.9 E DEPTH (m) 5028				STATION US09399 LATITUDE 41-50.0 N LONGITUDE 145-30.9 E DEPTH (m) 5287				STATION US09400 LATITUDE 42-08.8 N LONGITUDE 145-34.5 E DEPTH (m) 4377			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	17.848	32.924	23.720	5	17.976	32.936	23.698	5	15.140	33.291	24.624
10	17.868	32.963	23.745	10	17.351	32.839	23.773	10	14.970	33.408	24.751
20	17.229	32.926	23.869	20	15.459	32.808	24.182	20	12.551	33.423	25.259
30	10.252	32.914	25.281	30	11.905	33.273	25.266	30	9.607	33.410	25.776
40	7.323	33.216	25.969	40	11.980	33.946	25.775	40	8.237	33.414	25.993
50	6.045	33.221	26.142	50	11.050	33.933	25.936	50	6.385	33.297	26.159
75	3.071	33.167	26.416	75	7.883	33.747	26.307	75	2.839	33.203	26.465
100	4.386	33.481	26.538	100	8.233	33.996	26.451	100	2.367	33.302	26.583
125	3.516	33.433	26.587	125	4.556	33.493	26.530	125	2.113	33.343	26.635
150	2.231	33.362	26.642	150	4.803	33.647	26.625	150	1.953	33.373	26.672
175	2.804	33.463	26.675	175	4.551	33.645	26.651	175	1.976	33.419	26.707
200	2.599	33.489	26.714	200	4.126	33.647	26.697	200	2.105	33.459	26.729
250	2.892	33.606	26.782	250	3.167	33.619	26.768	250	2.095	33.530	26.787
300	2.742	33.655	26.834	300	2.478	33.632	26.838	300	2.198	33.575	26.814
400	3.021	33.818	26.940	400	2.794	33.787	26.935	400	2.623	33.731	26.905
500	3.006	33.940	27.039	500	3.264	33.976	27.043	500	2.837	33.870	26.998

STATION US09401 LATITUDE 42-00.2 N LONGITUDE 145-00.2 E DEPTH (m) 3040				STATION US09402 LATITUDE 42-09.6 N LONGITUDE 144-50.6 E DEPTH (m) 2270				STATION US09403 LATITUDE 42-19.6 N LONGITUDE 144-40.6 E DEPTH (m) 1815			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	17.502	32.704	23.635	5	17.838	32.784	23.615	5	17.470	32.775	23.696
10	17.464	32.884	23.782	10	16.895	32.733	23.799	10	17.020	32.821	23.838
20	13.901	32.806	24.511	20	14.841	32.715	24.245	20	14.157	32.745	24.412
30	9.914	33.466	25.768	30	8.486	32.901	25.553	30	9.925	33.344	25.671
40	8.658	33.540	26.028	40	5.429	33.044	26.076	40	8.094	33.406	26.008
50	9.047	33.782	26.157	50	4.239	33.110	26.259	50	5.371	33.169	26.181
75	4.662	33.370	26.420	75	2.662	33.143	26.431	75	4.468	33.354	26.429
100	3.615	33.366	26.524	100	2.257	33.173	26.489	100	3.474	33.316	26.498
125	3.026	33.393	26.600	125	2.022	33.233	26.554	125	2.864	33.331	26.565
150	2.589	33.419	26.658	150	2.522	33.402	26.650	150	1.989	33.304	26.614
175	2.413	33.446	26.695	175	2.332	33.458	26.711	175	2.218	33.415	26.685
200	3.911	33.700	26.761	200	2.474	33.539	26.764	200	2.260	33.482	26.736
250	3.294	33.668	26.795	250	2.692	33.662	26.844	250	2.587	33.612	26.813
300	3.184	33.723	26.849	300	2.891	33.755	26.901	300	2.899	33.726	26.877
400	3.056	33.835	26.950	400	3.102	33.898	26.996	400	3.085	33.862	26.969
500	2.980	33.966	27.062	500	3.147	34.023	27.092	500	3.305	33.998	27.057

STATION US09404 LATITUDE 42-29.4 N LONGITUDE 144-49.6 E DEPTH (m) 1862				STATION US09405 LATITUDE 42-39.5 N LONGITUDE 144-40.2 E DEPTH (m) 509				STATION US09406 LATITUDE 42-30.0 N LONGITUDE 144-30.3 E DEPTH (m) 1261			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	15.011	33.180	24.566	5	16.222	32.714	23.940	5	17.278	32.869	23.814
10	13.865	33.195	24.820	10	16.164	32.709	23.949	10	15.477	32.806	24.177
20	13.044	33.333	25.093	20	14.054	32.739	24.429	20	11.758	32.914	25.014
30	12.060	33.469	25.389	30	8.017	32.903	25.625	30	10.879	33.831	25.887
40	11.083	33.492	25.586	40	6.298	33.241	26.126	40	9.245	33.696	26.058
50	9.020	33.426	25.883	50	5.917	33.329	26.243	50	5.653	33.238	26.203
75	6.304	33.618	26.422	75	3.546	33.202	26.400	75	3.512	33.232	26.427
100	4.786	33.428	26.453	100	3.228	33.328	26.530	100	2.657	33.273	26.536
125	2.713	33.289	26.544	125	2.284	33.275	26.568	125	2.415	33.346	26.614
150	2.050	33.317	26.619	150	2.117	33.354	26.644	150	2.129	33.360	26.648
175	1.942	33.369	26.670	175	2.068	33.393	26.679	175	3.670	33.611	26.714
200	2.005	33.422	26.707	200	2.027	33.411	26.696	200	2.103	33.429	26.705
250	1.956	33.471	26.750	250	2.086	33.467	26.737	250	2.085	33.493	26.758
300	2.193	33.547	26.793	300	2.125	33.524	26.780	300	2.200	33.553	26.797
400	2.557	33.700	26.886	400	2.843	33.707	26.866	400	3.211	33.821	26.925
500	2.922	33.870	26.990					500	2.888	33.899	27.016

STATION US09407				STATION US09408				STATION US09409			
LATITUDE 42-39.1 N				LATITUDE 41-20.0 N				LATITUDE 41-20.0 N			
LONGITUDE 144-20.3 E				LONGITUDE 139-35.4 E				LONGITUDE 139-30.0 E			
DEPTH (m) 995				DEPTH (m) 734				DEPTH (m) 1561			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	16.333	32.776	23.963	5	21.970	33.369	22.988	5	21.855	33.256	22.933
10	15.421	32.776	24.166	10	22.003	33.424	23.020	10	21.797	33.297	22.981
20	11.670	32.738	24.894	20	22.092	33.513	23.063	20	21.815	33.322	22.995
30	8.347	32.809	25.502	30	18.706	33.839	24.208	30	18.169	33.532	24.106
40	7.338	33.208	25.961	40	15.747	33.892	24.952	40	15.633	33.948	25.021
50	6.817	33.435	26.211	50	14.777	34.172	25.382	50	14.407	34.105	25.409
75	3.585	33.232	26.420	75	12.313	34.226	25.928	75	10.414	33.951	26.062
100	2.749	33.259	26.517	100	9.692	34.167	26.353	100	8.618	34.128	26.495
125	2.568	33.329	26.588	125	7.453	34.121	26.663	125	5.159	34.031	26.889
150	2.304	33.359	26.634	150	5.134	34.074	26.925	150	2.736	34.055	27.154
175	2.203	33.399	26.674	175	3.006	34.057	27.131	175	2.182	34.063	27.207
200	2.065	33.416	26.698	200	2.283	34.059	27.195	200	1.882	34.074	27.238
250	1.994	33.473	26.749								
300	2.207	33.536	26.783								
400	2.370	33.653	26.863								
500	2.891	33.846	26.973								

STATION US09410			
LATITUDE 41-20.0 N			
LONGITUDE 139-25.0 E			
DEPTH (m) 2530			
Press.	Temp.	Salinity	Sigma-T
5	21.728	33.256	22.968
10	21.655	33.273	23.001
20	21.613	33.289	23.025
30	20.337	33.497	23.527
40	15.507	33.928	25.034
50	13.706	34.122	25.569
75	9.217	33.932	26.247
100	4.399	34.020	26.965
125	2.854	34.062	27.149
150	2.293	34.065	27.199
175	1.949	34.072	27.232

THE “USHIO MARU”

CRUISE 179

CRUISE 180

CRUISE 181

IN OCTOBER 2009

1. Cruise Itinerary

Cruise 179

Departure from Hakodate	Oct.	1	, 2009
Start hydrographic research (US09411)		2	
Arrival at Rausu		2	
Departure from Rausu		3	
Photography of the R.O.V.		3	
Arrival at and departure from Rausu		4	
Finish hydrographic research (US09436)		5	
Arrival at Rausu		5	
Departure from Rausu		6	
Return to Rausu		8	
Total coverage 990.5 miles			

Cruise 180

Departure from Hakodate	Oct.	14	, 2009
Start hydrographic research (US09437)		14	
Arrival at Usujiri		14	
Departure from Usujiri		15	
Retrieval sediment trap system		15	
Start trawl net research		15	
Set sediment trap system		16	
Finish hydrographic research (US09450) and trawl net research		16	
Arrival at and departure from Usujiri		16	
Return to Hakodate		17	
Total coverage 215.9 miles			

Cruise 181

Departure from Hakodate	Oct.	22	, 2009
Hydrographic research (US09451-US09453)		23	
Practical training in tuna long line		23	
Return to Hakodate		24	
Total coverage 222.0 miles			

2. Vessel Personnel

Captain:		Professor	Toshimi Meguro
Crew :	Chief Officer	Assistant Professor	Osamu Kimura
	Second Officer	Assistant Professor	Naoto Kobayashi
	And 13 men		

Cruise 179

Research Staff:	Assistant Professor	(Field Science Center for Northern Biosphere)	
			Jun Yamamoto
	Research Associate	(Graduate School of Information Science and Technology)	
			Toshihiro Iwamori
Graduate Students:	Chair of Marine Bioresource Science:		2 persons
	Graduate School of Environmental Science:		2 persons
Under Graduate Students:	Department of Marine Biology:		4 persons

Cruise 180

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	
			Tetsuya Takatsu
	Assistant Professor	(Laboratory of Marine Environmental Science)	
			Hiroji Onishi
Guest Scientist (Domestic):		(Ehime University)	
			Michinobu Kuwae
Graduate Students:	Chair of Marine Bioresource Science:		6 persons
	Chair of Marine Environmental Science:		2 persons
Under Graduate Students:	Department of Marine Biological Science:		1 person
	Department of Applied Marine Science:		3 persons

Cruise 181

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource and Environment Sensing)	
			Susumu Shimizu
Graduate Students:	Chair of Marine Bioresource and Environment Sensing:		2 persons
Under Graduate Students:	Department of Applied Marine Science:		1 person
	Department of Marine Biological Science:		1 person

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”.

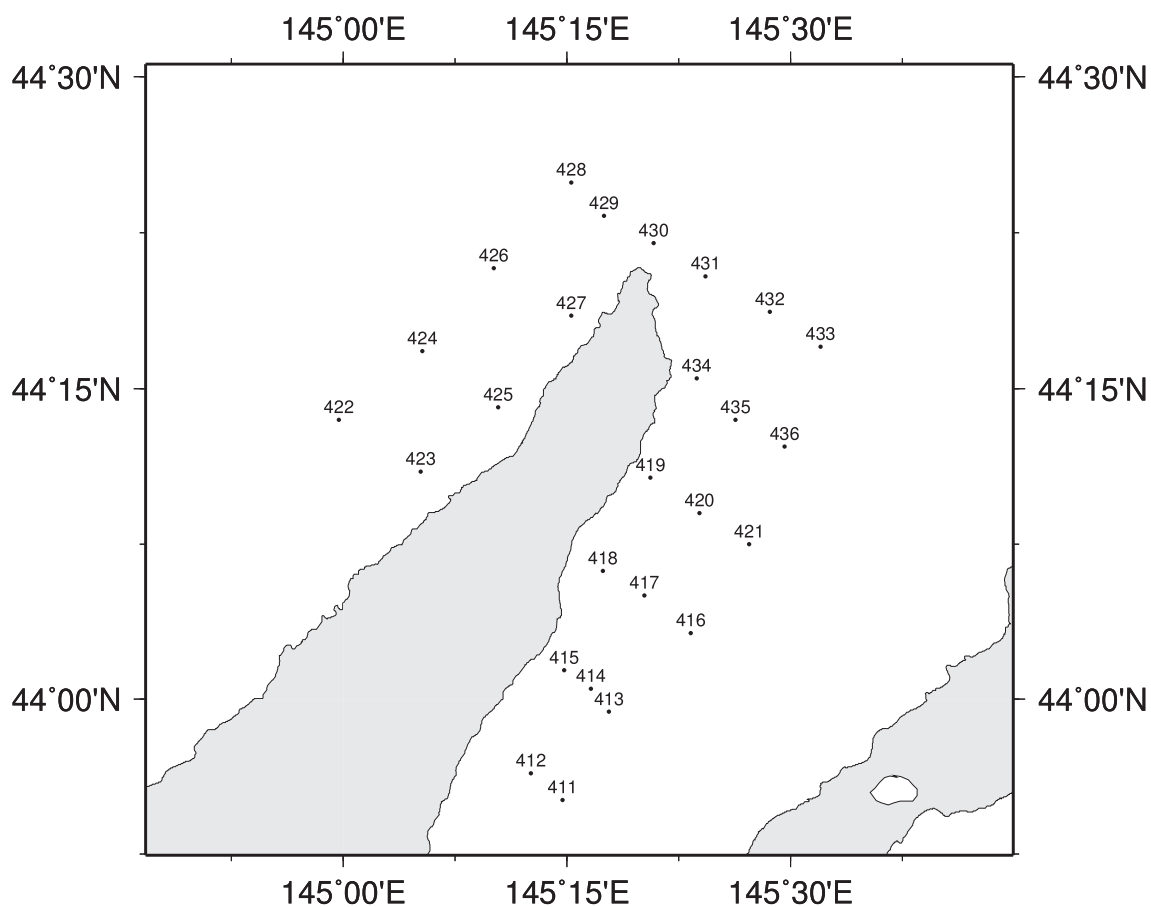


Figure 1: Oceanographic stations (Cruise 179)

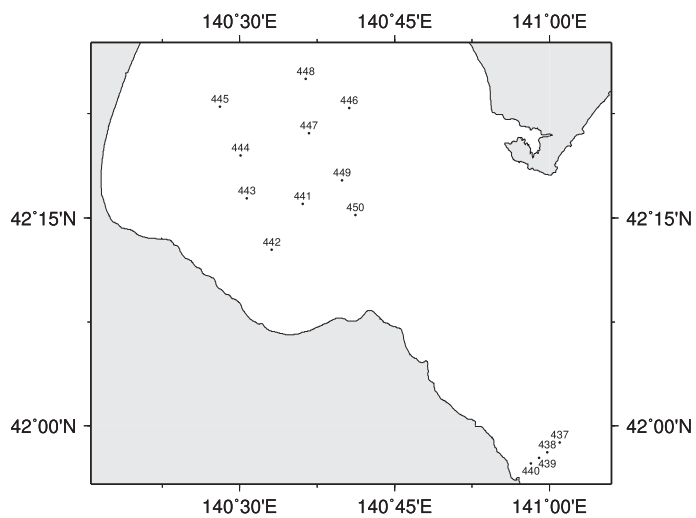


Figure 2: Oceanographic stations (Cruise 180)

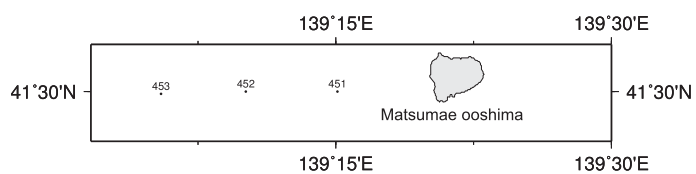


Figure 3: Oceanographic stations (Cruise 181)

Table 1: List of oceanographic stations

Cruise 179

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr. Bar. (hPa)
US09411	43-55.1	145-14.7	10/2	1357-1401	79	SSE-3	South-2	SSE-5	16.7	16.5	o 1012.1
US09412	43-56.4	145-12.6	10/2	1422-1426	83	SSE-4	South-2	SSE-6	16.9	16.5	o 1011.6
US09413	43-59.4	145-17.8	10/3	0730-0738	258	SSW-2	SSE-1	SSW-3	16.9	16.4	bc 998.0
US09414	44-00.5	145-16.6	10/3	0805-0819	424	SSW-1	SSE-1	SSW-2	17.0	16.3	c 998.0
US09415	44-01.4	145-14.8	10/3	0833-0847	470	Calm	SSE-1	Calm	17.0	16.2	c 998.2
US09416	44-03.2	145-23.3	10/3	0941-0959	504	SSW-1	SSE-1	SSW-3	16.9	16.6	c 998.9
US09417	44-05.0	145-20.2	10/3	1019-1037	878	SW -1	SSE-1	SW -2	16.6	16.6	o 998.6
US09418	44-06.2	145-17.4	10/3	1107-1125	530	Calm	SSE-1	Calm	17.0	16.6	f 998.4
US09419	44-10.7	145-20.6	10/3	1425-1428	91	NE -1	SSE-1	NE -3	17.3	17.1	c 999.0
US09420	44-09.0	145-23.9	10/3	1456-1515	1420	North-1	SSE-1	North-3	10.5	16.7	c 999.5
US09421	44-07.5	145-27.2	10/3	1536-1552	1225	NNE-2	SSE-1	NNE-4	16.5	16.7	r 1000.0
US09422	44-13.5	144-59.7	10/4	1204-1220	680	SSW-1	West-1	SSW-3	17.5	14.5	bc 1009.2
US09423	44-11.0	145-05.2	10/4	1300-1311	350	West-1	West-1	West-2	19.1	16.1	bc 1009.1
US09424	44-16.8	145-05.3	10/4	1347-1403	842	NW -1	West-1	NW -2	17.2	14.9	bc 1009.1
US09425	44-14.1	145-10.4	10/4	1444-1451	211	Calm	West-1	Calm	17.4	14.7	bc 1009.1
US09426	44-20.8	145-10.1	10/4	1531-1548	1048	Calm	West-1	Calm	18.1	14.5	bc 1009.4
US09427	44-18.5	145-15.3	10/4	1630-1642	375	Calm	West-1	Calm	16.5	14.6	bc 1009.2
US09428	44-24.9	145-15.3	10/5	0550-0600	1330	SW -3	West-1	SW -5	13.7	13.7	bc 1011.8
US09429	44-23.3	145-17.5	10/5	0634-0645	825	SW -3	West-1	SW -5	13.5	13.9	bc 1012.6
US09430	44-22.0	145-20.8	10/5	0704-0708	108	SW -3	West-1	SW -5	14.5	15.4	bc 1012.8
US09431	44-20.4	145-24.3	10/5	0742-0800	880	SW -3	NW -1	SW -5	14.8	15.4	bc 1012.8
US09432	44-18.7	145-28.6	10/5	0821-0838	1540	SW -2	NW -1	WSW-4	15.8	15.3	bc 1013.6
US09433	44-17.0	145-32.0	10/5	0908-0925	2021	SW -1	NW -1	SW -3	16.3	15.2	bc 1013.6
US09434	44-15.5	145-23.7	10/5	1007-1012	105	South-2	South-1	South-4	16.9	15.6	bc 1013.5
US09435	44-13.5	145-26.3	10/5	1040-1058	1562	SW -2	South-1	SW -4	16.7	15.4	bc 1013.5
US09436	44-12.2	145-29.6	10/5	1125-1145	2011	South-2	South-1	South-4	16.1	15.3	bc 1013.8

Cruise 180

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr. Bar. (hPa)
US09437	41-58.8	141-01.0	10/14	1320-1324	96	West-1	NW -1	West-3	15.8	14.1	c 1010.8
US09438	41-58.1	140-59.8	10/14	1333-1337	87	West-2	NW -1	West-4	15.0	14.2	c 1010.7
US09439	41-57.7	140-59.0	10/14	1342-1346	84	West-1	NW -1	West-2	15.2	14.4	c 1010.7
US09440	41-57.3	140-58.2	10/14	1352-1355	78	West-2	NW -1	West-4	15.6	14.8	c 1010.7
US09441	42-16.0	140-36.1	10/15	0835-0842	91	WSW-1	East-1	WSW-2	16.1	15.2	bc 1013.6
US09442	42-12.7	140-33.1	10/15	1045-1050	83	West-1	East-1	West-3	17.0	15.4	bc 1013.4
US09443	42-16.4	140-30.7	10/15	1207-1213	90	West-3	West-1	West-5	17.7	15.2	bc 1012.8
US09444	42-19.5	140-30.1	10/15	1517-1525	92	West-3	West-1	West-5	16.7	15.2	bc 1012.6
US09445	42-23.0	140-28.1	10/15	1649-1655	89	West-3	West-1	West-5	16.1	15.2	bc 1013.0
US09446	42-22.9	140-40.6	10/16	0427-0432	71	NE -1	ESE-1	NE -2	11.9	15.1	bc 1016.0
US09447	42-21.1	140-36.7	10/16	0523-0527	87	NE -1	ESE-1	NE -3	11.7	15.2	bc 1016.0
US09448	42-25.0	140-36.4	10/16	0835-0841	87	South-1	ESE-1	South-1	13.6	15.2	bc 1015.8
US09449	42-17.7	140-39.9	10/16	1020-1025	79	ESE-2	ESE-1	ESE-4	14.6	15.2	bc 1015.1
US09450	42-15.2	140-41.2	10/16	1101-1106	83	East-3	ESE-1	East-5	15.0	15.1	bc 1014.6

Cruise 181

Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr. Bar. (hPa)
US09451	41-30.0	139-15.1	10/23	1015-1025	1132	WSW-3	West-1	WSW-5	14.2	16.1	r 1020.7
US09452	41-30.0	139-10.1	10/23	1050-1100	1183	SW -3	West-1	SW -5	13.9	15.3	o 1020.6
US09453	41-29.9	139-05.5	10/23	1126-1135	1140	SW -3	West-1	SW -5	13.9	16.0	o 1020.0

(*):Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US09411				STATION US09412				STATION US09413			
LATITUDE 43-55.1 N				LATITUDE 43-56.4 N				LATITUDE 43-59.4 N			
LONGITUDE 145-14.7 E				LONGITUDE 145-12.6 E				LONGITUDE 145-17.8 E			
DEPTH (m) 79				DEPTH (m) 83				DEPTH (m) 258			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	16.732	33.372	24.328	5	16.737	33.371	24.326	5	16.691	33.250	24.244
10	16.730	33.374	24.330	10	16.738	33.372	24.326	10	16.672	33.267	24.261
20	16.730	33.376	24.331	20	16.720	33.378	24.335	20	16.682	33.327	24.305
30	16.411	33.362	24.548	30	16.054	33.623	24.676	30	16.260	33.575	24.592
40	15.195	33.708	24.933	40	15.288	33.710	24.914	40	14.640	33.741	25.079
50	14.298	33.763	25.169	50	14.227	33.768	25.188	50	13.889	33.777	25.265
75	10.826	33.806	25.877	75	11.374	33.814	25.784	75	11.080	33.783	25.814
								100	8.869	33.740	26.152
								125	7.865	33.748	26.311
								150	6.980	33.733	26.423
								175	4.632	33.503	26.529
								200	3.057	33.449	26.642
STATION US09414				STATION US09415				STATION US09416			
LATITUDE 44-00.5 N				LATITUDE 44-01.4 N				LATITUDE 44-03.2 N			
LONGITUDE 145-16.6 E				LONGITUDE 145-14.8 E				LONGITUDE 145-23.3 E			
DEPTH (m) 424				DEPTH (m) 470				DEPTH (m) 504			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	16.492	33.160	24.221	5	16.381	33.244	24.310	5	16.858	33.278	24.226
10	16.474	33.184	24.243	10	16.355	33.529	24.535	10	16.701	33.330	24.303
20	16.359	33.497	24.510	20	15.571	33.700	24.844	20	16.592	33.482	24.445
30	15.432	33.697	24.873	30	15.121	33.753	24.984	30	16.553	33.569	24.521
40	14.414	33.745	25.131	40	14.076	33.785	25.232	40	16.303	33.636	24.630
50	13.387	33.797	25.383	50	13.185	33.813	25.436	50	14.403	33.758	25.143
75	10.828	33.799	25.871	75	11.309	33.843	25.819	75	11.379	33.812	25.782
100	8.868	33.737	26.149	100	10.021	33.848	26.049	100	9.258	33.808	26.143
125	8.490	33.852	26.298	125	7.545	33.708	26.325	125	6.989	33.689	26.387
150	6.942	33.741	26.435	150	6.635	33.706	26.449	150	4.901	33.513	26.508
175	4.768	33.585	26.579	175	4.950	33.587	26.561	175	4.096	33.533	26.609
200	4.403	33.595	26.627	200	2.901	33.414	26.627	200	2.442	33.384	26.643
250	2.003	33.395	26.686	250	1.601	33.364	26.690	250	1.421	33.368	26.706
300	1.240	33.379	26.726	300	1.319	33.390	26.730	300	1.198	33.394	26.741
400	1.523	33.515	26.817	400	1.454	33.493	26.804	400	1.460	33.503	26.811
STATION US09417				STATION US09418				STATION US09419			
LATITUDE 44-05.0 N				LATITUDE 44-06.2 N				LATITUDE 44-10.7 N			
LONGITUDE 145-20.2 E				LONGITUDE 145-17.4 E				LONGITUDE 145-20.6 E			
DEPTH (m) 878				DEPTH (m) 530				DEPTH (m) 91			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	16.751	33.186	24.180	5	16.463	33.321	24.351	5	16.586	33.137	24.181
10	16.695	33.192	24.199	10	16.555	33.389	24.382	10	16.434	33.473	24.474
20	16.658	33.373	24.346	20	15.857	33.674	24.760	20	15.567	33.659	24.813
30	15.843	33.663	24.755	30	14.665	33.769	25.095	30	15.133	33.715	24.953
40	14.210	33.775	25.196	40	13.853	33.806	25.295	40	14.571	33.749	25.100
50	13.152	33.766	25.407	50	12.854	33.834	25.518	50	13.756	33.773	25.290
75	11.243	33.813	25.807	75	10.963	33.848	25.885	75	10.843	33.817	25.882
100	8.985	33.770	26.157	100	8.795	33.771	26.188				
125	6.820	33.724	26.438	125	7.393	33.801	26.420				
150	6.053	33.728	26.541	150	6.297	33.727	26.509				
175	4.430	33.531	26.573	175	3.212	33.444	26.624				
200	2.586	33.386	26.632	200	2.789	33.434	26.654				
250	1.462	33.356	26.693	250	1.423	33.364	26.702				
300	1.126	33.371	26.727	300	1.278	33.387	26.731				
400	1.467	33.499	26.808	400	1.502	33.516	26.819				
500	1.911	33.720	26.953								
STATION US09420				STATION US09421				STATION US09422			
LATITUDE 44-09.0 N				LATITUDE 44-07.5 N				LATITUDE 44-13.5 N			
LONGITUDE 145-23.9 E				LONGITUDE 145-27.2 E				LONGITUDE 144-59.7 E			
DEPTH (m) 1420				DEPTH (m) 1225				DEPTH (m) 680			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	16.747	33.296	24.266	5	16.841	33.332	24.272	5	14.250	32.955	24.555
10	16.730	33.369	24.326	10	16.741	33.388	24.338	10	14.625	33.604	24.977
20	16.608	33.585	24.520	20	16.625	33.537	24.479	20	13.516	33.736	25.310
30	16.585	33.602	24.538	30	16.603	33.582	24.519	30	13.092	33.714	25.378
40	15.444	33.720	24.888	40	16.072	33.676	24.713	40	12.672	33.799	25.527
50	14.103	33.787	25.228	50	14.507	33.749	25.114	50	12.461	33.793	25.563
75	10.880	33.823	25.880	75	11.468	33.820	25.772	75	9.499	33.828	26.120
100	8.716	33.826	26.243	100	8.895	33.826	26.216	100	6.927	33.607	26.331
125	7.009	33.768	26.447	125	6.724	33.707	26.437	125	5.143	33.629	26.572
150	5.362	33.651	26.564	150	4.884	33.541	26.532	150	3.694	33.500	26.623
175	4.127	33.599	26.659	175	3.660	33.458	26.593	175	3.140	33.475	26.656
200	3.440	33.534	26.675	200	3.780	33.557	26.661	200	-0.271	33.219	26.681
250	2.684	33.484	26.702	250	2.270	33.405	26.673	250	2.968	33.627	26.792
300	1.751	33.406	26.713	300	1.170	33.369	26.724	300	2.820	33.623	26.802
400	1.354	33.472	26.794	400	1.385	33.483	26.801	400	1.664	33.576	26.855
500	1.882	33.645	26.895								

STATION US09423 LATITUDE 44-11.0 N LONGITUDE 145-05.2 E DEPTH (m) 350				STATION US09424 LATITUDE 44-16.8 N LONGITUDE 145-05.3 E DEPTH (m) 842				STATION US09425 LATITUDE 44-14.1 N LONGITUDE 145-10.4 E DEPTH (m) 211			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	16.703	33.562	24.480	5	14.726	33.042	24.522	5	16.097	33.211	24.350
10	16.191	33.590	24.620	10	15.092	33.554	24.837	10	16.238	33.591	24.610
20	15.696	33.749	24.854	20	13.625	33.608	25.189	20	15.722	33.783	24.874
30	14.919	33.768	25.040	30	13.225	33.662	25.312	30	15.683	33.784	24.884
40	14.553	33.822	25.160	40	12.706	33.793	25.516	40	15.298	33.784	24.969
50	14.364	33.825	25.203	50	12.326	33.836	25.623	50	14.611	33.768	25.106
75	13.891	33.806	25.287	75	9.644	33.737	26.025	75	13.821	33.801	25.298
100	12.109	33.788	25.627	100	8.941	33.808	26.194	100	12.772	33.842	25.541
125	11.731	33.809	25.714	125	4.110	33.248	26.382	125	11.303	33.843	25.820
150	6.347	33.680	26.466	150	1.711	33.209	26.558	150	7.368	33.683	26.331
175	3.923	33.549	26.639	175	-0.175	33.172	26.639	175	4.036	33.537	26.619
200	3.015	33.486	26.675	200	2.011	33.463	26.739				
250	2.693	33.557	26.760	250	2.496	33.525	26.751				
				300	3.186	33.630	26.775				
				400	2.142	33.624	26.858				

STATION US09426 LATITUDE 44-20.8 N LONGITUDE 145-10.1 E DEPTH (m) 1048				STATION US09427 LATITUDE 44-18.5 N LONGITUDE 145-15.3 E DEPTH (m) 375				STATION US09428 LATITUDE 44-24.9 N LONGITUDE 145-15.3 E DEPTH (m) 1330			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.770	32.517	24.108	5	15.923	33.543	24.645	5	14.320	33.228	24.752
10	14.344	33.180	24.709	10	16.129	33.630	24.665	10	14.917	33.806	25.069
20	13.746	33.544	25.115	20	15.904	33.678	24.753	20	14.741	33.823	25.121
30	13.198	33.747	25.382	30	15.457	33.786	24.935	30	13.514	33.756	25.326
40	12.696	33.800	25.523	40	14.554	33.780	25.128	40	12.206	33.677	25.523
50	12.477	33.815	25.577	50	13.855	33.819	25.305	50	10.962	33.681	25.755
75	10.571	33.779	25.900	75	13.231	33.840	25.448	75	8.725	33.777	26.204
100	8.956	33.727	26.128	100	12.246	33.838	25.640	100	5.303	33.357	26.338
125	-0.263	33.020	26.520	125	10.157	33.841	26.021	125	-0.248	33.071	26.561
150	1.324	33.316	26.670	150	6.384	33.637	26.427	150	0.915	33.267	26.657
175	2.630	33.578	26.782	175	4.861	33.562	26.551	175	0.928	33.324	26.702
200	3.213	33.576	26.729	200	3.953	33.532	26.623	200	2.284	33.516	26.760
250	2.625	33.538	26.750	250	3.136	33.534	26.703	250	2.713	33.551	26.753
300	2.522	33.558	26.775	300	2.606	33.533	26.748				
400	1.359	33.531	26.840								

STATION US09429 LATITUDE 44-23.3 N LONGITUDE 145-17.5 E DEPTH (m) 825				STATION US09430 LATITUDE 44-22.0 N LONGITUDE 145-20.8 E DEPTH (m) 108				STATION US09431 LATITUDE 44-20.4 N LONGITUDE 145-24.3 E DEPTH (m) 880			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.104	33.140	24.728	5	15.634	33.575	24.734	5	15.606	33.527	24.703
10	14.837	33.792	25.076	10	15.636	33.572	24.731	10	15.610	33.524	24.700
20	14.815	33.794	25.083	20	15.702	33.596	24.735	20	15.595	33.528	24.706
30	14.398	33.821	25.192	30	15.816	33.681	24.775	30	14.542	33.659	25.037
40	13.987	33.834	25.289	40	15.214	33.785	24.989	40	14.468	33.691	25.078
50	13.449	33.823	25.391	50	14.526	33.809	25.156	50	14.033	33.718	25.190
75	10.344	33.810	25.964	75	12.617	33.823	25.556	75	11.885	33.765	25.652
100	8.224	33.760	26.266					100	10.897	33.795	25.856
125	5.779	33.600	26.474					125	9.400	33.744	26.070
150	1.375	33.235	26.602					150	6.801	33.670	26.398
175	2.838	33.514	26.713					175	5.890	33.695	26.535
200	2.763	33.528	26.731					200	3.774	33.472	26.593
250	2.618	33.542	26.755					250	2.306	33.429	26.689
								300	1.489	33.409	26.734
								400	1.350	33.474	26.796

STATION US09432 LATITUDE 44-18.7 N LONGITUDE 145-28.6 E DEPTH (m) 1540				STATION US09433 LATITUDE 44-17.0 N LONGITUDE 145-32.0 E DEPTH (m) 2021				STATION US09434 LATITUDE 44-15.5 N LONGITUDE 145-23.7 E DEPTH (m) 105			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	15.591	33.581	24.748	5	15.528	33.576	24.758	5	15.840	33.535	24.657
10	15.588	33.578	24.747	10	15.513	33.573	24.759	10	15.787	33.529	24.664
20	15.592	33.583	24.749	20	15.378	33.584	24.797	20	15.441	33.575	24.777
30	15.451	33.600	24.794	30	15.323	33.595	24.818	30	15.043	33.658	24.928
40	14.992	33.649	24.932	40	15.273	33.610	24.841	40	14.864	33.684	24.987
50	14.227	33.678	25.118	50	15.199	33.628	24.871	50	14.603	33.739	25.085
75	13.660	33.805	25.334	75	13.906	33.724	25.221	75	12.862	33.807	25.496
100	12.887	33.812	25.495	100	10.434	33.809	25.947				
125	9.624	33.844	26.112	125	8.353	33.789	26.270				
150	7.160	33.743	26.406	150	6.613	33.674	26.426				
175	4.287	33.481	26.549	175	4.675	33.529	26.545				
200	2.856	33.419	26.636	200	3.011	33.388	26.597				
250	1.277	33.337	26.690	250	1.705	33.382	26.697				
300	1.570	33.401	26.722	300	1.032	33.380	26.741				
400	1.444	33.500	26.810	400	1.602	33.546	26.836				

STATION US09435 LATITUDE 44-13.5 N LONGITUDE 145-26.3 E DEPTH (m) 1562				STATION US09436 LATITUDE 44-12.2 N LONGITUDE 145-29.6 E DEPTH (m) 2011				STATION US09437 LATITUDE 41-58.8 N LONGITUDE 141-01.0 E DEPTH (m) 96			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	15.473	33.405	24.638	5	15.650	33.421	24.612	5	14.417	32.964	24.527
10	15.429	33.523	24.739	10	15.673	33.515	24.679	10	14.399	32.964	24.531
20	15.392	33.533	24.755	20	15.572	33.537	24.718	20	14.305	32.973	24.557
30	15.325	33.553	24.786	30	15.420	33.522	24.741	30	13.993	33.075	24.701
40	15.277	33.608	24.838	40	15.336	33.545	24.777	40	13.127	33.364	25.101
50	15.268	33.602	24.836	50	15.281	33.569	24.807	50	12.021	33.442	25.376
75	14.560	33.698	25.063	75	14.051	33.685	25.161	75	10.383	33.485	25.704
100	10.966	33.801	25.848	100	10.338	33.806	25.962				
125	8.855	33.810	26.210	125	8.057	33.777	26.305				
150	5.998	33.633	26.473	150	5.186	33.535	26.493				
175	5.374	33.630	26.546	175	3.807	33.519	26.627				
200	4.814	33.589	26.577	200	2.808	33.459	26.671				
250	3.438	33.511	26.657	250	2.148	33.435	26.707				
300	1.795	33.396	26.702	300	2.015	33.459	26.736				
400	1.373	33.480	26.799	400	1.658	33.486	26.784				
				500	1.843	33.661	26.911				

STATION US09438 LATITUDE 41-58.1 N LONGITUDE 140-59.8 E DEPTH (m) 87				STATION US09439 LATITUDE 41-57.7 N LONGITUDE 140-59.0 E DEPTH (m) 84				STATION US09440 LATITUDE 41-57.3 N LONGITUDE 140-58.2 E DEPTH (m) 78			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.569	32.903	24.448	5	14.937	32.629	24.158	5	15.111	32.452	23.985
10	14.573	32.902	24.446	10	14.936	32.633	24.162	10	15.095	32.488	24.016
20	14.554	32.945	24.484	20	14.934	32.694	24.209	20	15.090	32.508	24.032
30	14.048	33.049	24.670	30	14.424	32.964	24.526	30	14.942	32.872	24.344
40	12.829	33.351	25.149	40	12.728	33.355	25.172	40	13.415	33.088	24.829
50	12.113	33.549	25.441	50	11.697	33.485	25.469	50	10.817	33.410	25.570
75	9.522	33.478	25.843	75	8.789	33.473	25.956	75	8.787	33.494	25.973

STATION US09441 LATITUDE 42-16.0 N LONGITUDE 140-36.1 E DEPTH (m) 91				STATION US09442 LATITUDE 42-12.7 N LONGITUDE 140-33.1 E DEPTH (m) 83				STATION US09443 LATITUDE 42-16.4 N LONGITUDE 140-30.7 E DEPTH (m) 90			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	15.465	32.443	23.900	5	15.356	32.405	23.895	5	15.392	32.434	23.909
10	15.467	32.445	23.901	10	15.317	32.406	23.905	10	15.334	32.433	23.921
20	15.474	32.453	23.906	20	15.303	32.439	23.932	20	15.284	32.441	23.938
30	15.279	32.735	24.165	30	14.042	32.842	24.511	30	13.877	32.859	24.558
40	13.335	33.126	24.875	40	12.207	33.148	25.112	40	12.316	33.096	25.051
50	12.066	33.272	25.235	50	11.146	33.193	25.343	50	10.315	33.043	25.371
75	8.574	33.372	25.910	75	7.803	33.367	26.020	75	8.030	33.365	25.986

STATION US09444 LATITUDE 42-19.5 N LONGITUDE 140-30.1 E DEPTH (m) 92				STATION US09445 LATITUDE 42-23.0 N LONGITUDE 140-28.1 E DEPTH (m) 89				STATION US09446 LATITUDE 42-22.9 N LONGITUDE 140-40.6 E DEPTH (m) 71			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	15.397	32.439	23.912	5	15.271	32.387	23.900	5	15.168	32.393	23.927
10	15.399	32.442	23.914	10	15.282	32.421	23.923	10	15.170	32.390	23.924
20	15.384	32.444	23.919	20	15.289	32.422	23.923	20	15.137	32.471	23.993
30	13.889	32.899	24.586	30	12.785	32.907	24.814	30	13.296	32.931	24.732
40	12.236	33.123	25.087	40	11.659	33.132	25.202	40	12.208	33.152	25.115
50	11.328	33.212	25.325	50	10.256	33.123	25.443	50	10.692	33.130	25.373
75	8.738	33.352	25.869	75	8.058	33.307	25.936				

STATION US09447 LATITUDE 42-21.1 N LONGITUDE 140-36.7 E DEPTH (m) 87				STATION US09448 LATITUDE 42-25.0 N LONGITUDE 140-36.4 E DEPTH (m) 87				STATION US09449 LATITUDE 42-17.7 N LONGITUDE 140-39.9 E DEPTH (m) 79			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	15.442	32.466	23.923	5	15.110	32.392	23.938	5	15.349	32.431	23.916
10	15.445	32.465	23.922	10	15.103	32.393	23.941	10	15.295	32.428	23.926
20	15.449	32.465	23.921	20	15.170	32.436	23.959	20	15.193	32.416	23.939
30	15.119	32.744	24.207	30	13.381	32.919	24.705	30	13.773	33.029	24.711
40	13.164	33.146	24.925	40	12.515	33.123	25.034	40	12.669	33.164	25.035
50	11.934	33.177	25.186	50	11.123	33.177	25.335	50	11.588	33.195	25.264
75	7.478	33.329	26.037	75	7.542	33.317	26.018	75	8.752	33.356	25.869
STATION US09450 LATITUDE 42-15.2 N LONGITUDE 140-41.2 E DEPTH (m) 83				STATION US09451 LATITUDE 41-30.0 N LONGITUDE 139-15.1 E DEPTH (m) 1132				STATION US09452 LATITUDE 41-30.0 N LONGITUDE 139-10.1 E DEPTH (m) 1183			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	15.290	32.419	23.920	5	16.094	33.514	24.584	5	15.629	33.538	24.706
10	15.262	32.421	23.928	10	15.983	33.523	24.616	10	15.623	33.539	24.709
20	15.248	32.431	23.939	20	15.946	33.531	24.630	20	15.608	33.545	24.717
30	13.798	33.011	24.692	30	14.876	33.639	24.950	30	15.593	33.550	24.724
40	12.392	33.165	25.090	40	9.153	33.986	26.300	40	8.719	33.911	26.309
50	11.372	33.239	25.338	50	7.088	34.065	26.670	50	6.395	34.044	26.747
75	8.917	33.363	25.850	75	4.704	34.082	26.981	75	4.181	34.070	27.028
				100	3.247	34.052	27.106	100	3.096	34.060	27.126
				125	2.564	34.065	27.177	125	2.349	34.068	27.197
				150	2.049	34.066	27.220	150	2.003	34.069	27.225
				175	1.710	34.069	27.248	175	1.745	34.070	27.246
				200	1.443	34.066	27.265	200	1.501	34.066	27.261
STATION US09453 LATITUDE 41-29.9 N LONGITUDE 139-05.5 E DEPTH (m) 1140											
Press.	Temp.	Salinity	Sigma-T								
5	16.296	33.453	24.491								
10	16.300	33.451	24.488								
20	16.247	33.462	24.509								
30	16.149	33.473	24.539								
40	10.015	33.919	26.105								
50	6.594	34.024	26.704								
75	4.638	34.073	26.981								
100	3.242	34.069	27.120								
125	2.433	34.067	27.190								
150	1.959	34.068	27.228								
175	1.701	34.069	27.248								
200	1.426	34.066	27.266								

THE “USHIO MARU”

CRUISE 182

CRUISE 183

CRUISE 184

IN NOVEMBER-DECEMBER 2009

1. Cruise Itinerary

Cruise 182

Departure from Hakodate	Nov.	25	, 2009
Start hydrographic research (US09454)		25	
Arrival at Hakodate		29	
Departure from Hakodate		30	
Arrival at Fukushima		30	
Departure from Fukushima	Dec.	1	
Finish hydrographic research (US09497)		1	
Return to Hakodate		2	
Total coverage 564.1 miles			

Cruise 183

Departure from Hakodate	Dec.	8	, 2009
Start hydrographic research (US09498)		8	
Arrival at Usujiri		8	
Departure from Usujiri		9	
Retrieval sediment trap system		9	
Arrival at Muroran		9	
Departure from Muroran		10	
Set sediment trap system		10	
Research by trawl net		10	
Arrival at and departure from Usujiri		10	
Finish hydrographic research (US09517)		11	
Return to Hakodate		12	
Total coverage 239.7 miles			

Cruise 184

Departure from Hakodate	Dec.	21	, 2009
Start hydrographic research (US09518)		21	
Arrival at Fukushima		21	
Departure from Fukushima		22	
Finish hydrographic research (US09535)		22	
Return to Hakodate		23	
Total coverage 107.0 miles			

2. Vessel Personnel

Captain:		Professor	Toshimi Meguro
Crew :	Chief Officer	Assistant Professor	Osamu Kimura
	Second Officer	Assistant Professor	Naoto Kobayashi
	And 13 men		

Cruise 182

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
Guest Scientist (Domestic):		(JAMSTEC)	Yasushi Yoshikawa
		(JAMSTEC)	Kenichi Sasaki
Graduate Students:	Chair of Marine Bioresource Science:		3 persons
Under Graduate Students:	Department of Marine Biological Science:		2 persons

Cruise 183

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
	Assistant Professor	(Laboratory of Marine Environmental Science)	Hiromichi Ueno
Guest Scientist (Domestic):		(Ehime University)	Michinobu Kuwae
Graduate Students:	Chair of Marine Bioresource Science:		6 persons
	Chair of Marine Environmental Science:		4 persons
Under Graduate Students:	Department of Applied Marine Science:		2 persons

Cruise 184

Research Staff:	Associate Professor	(Laboratory of Marine Bioresource Science)	Tetsuya Takatsu
Graduate Students:	Chair of Marine Bioresource Science:		3 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”.

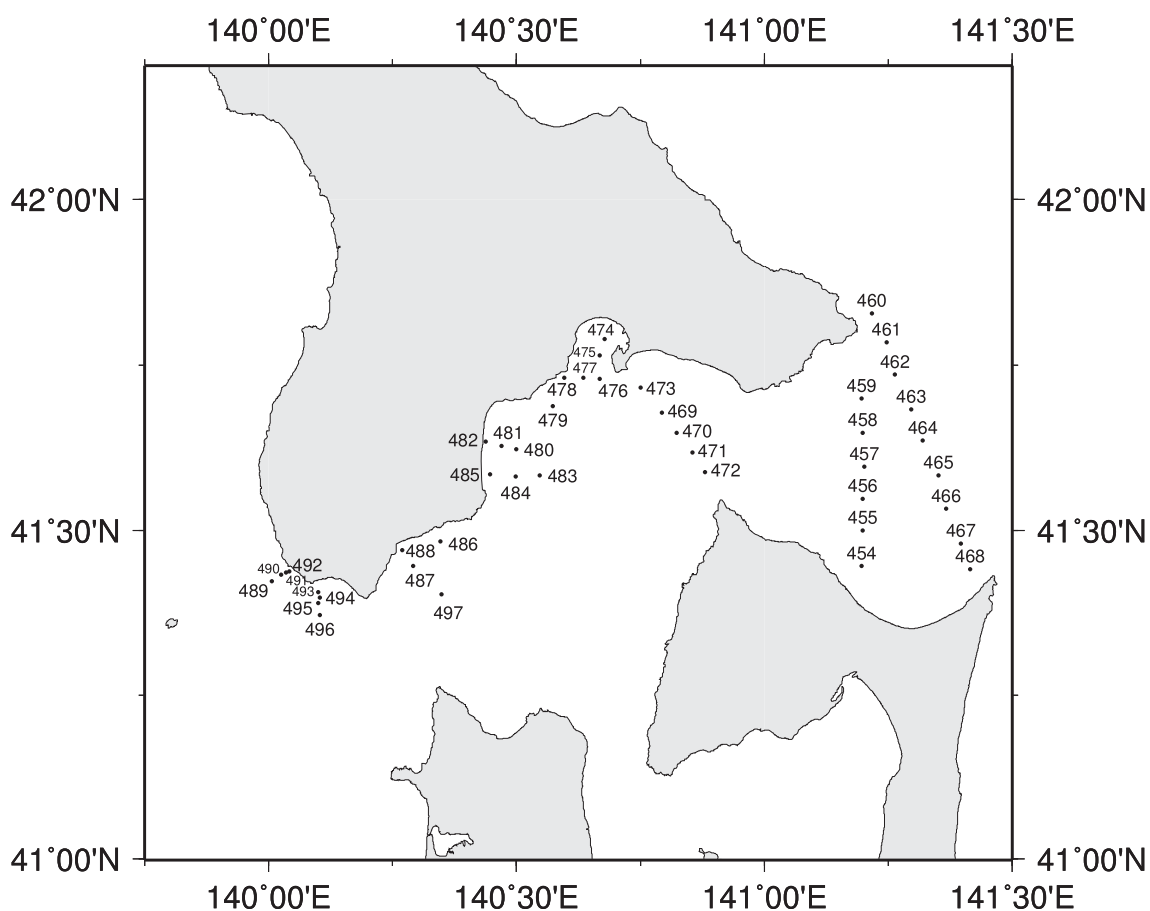


Figure 1: Oceanographic stations (Cruise 182)

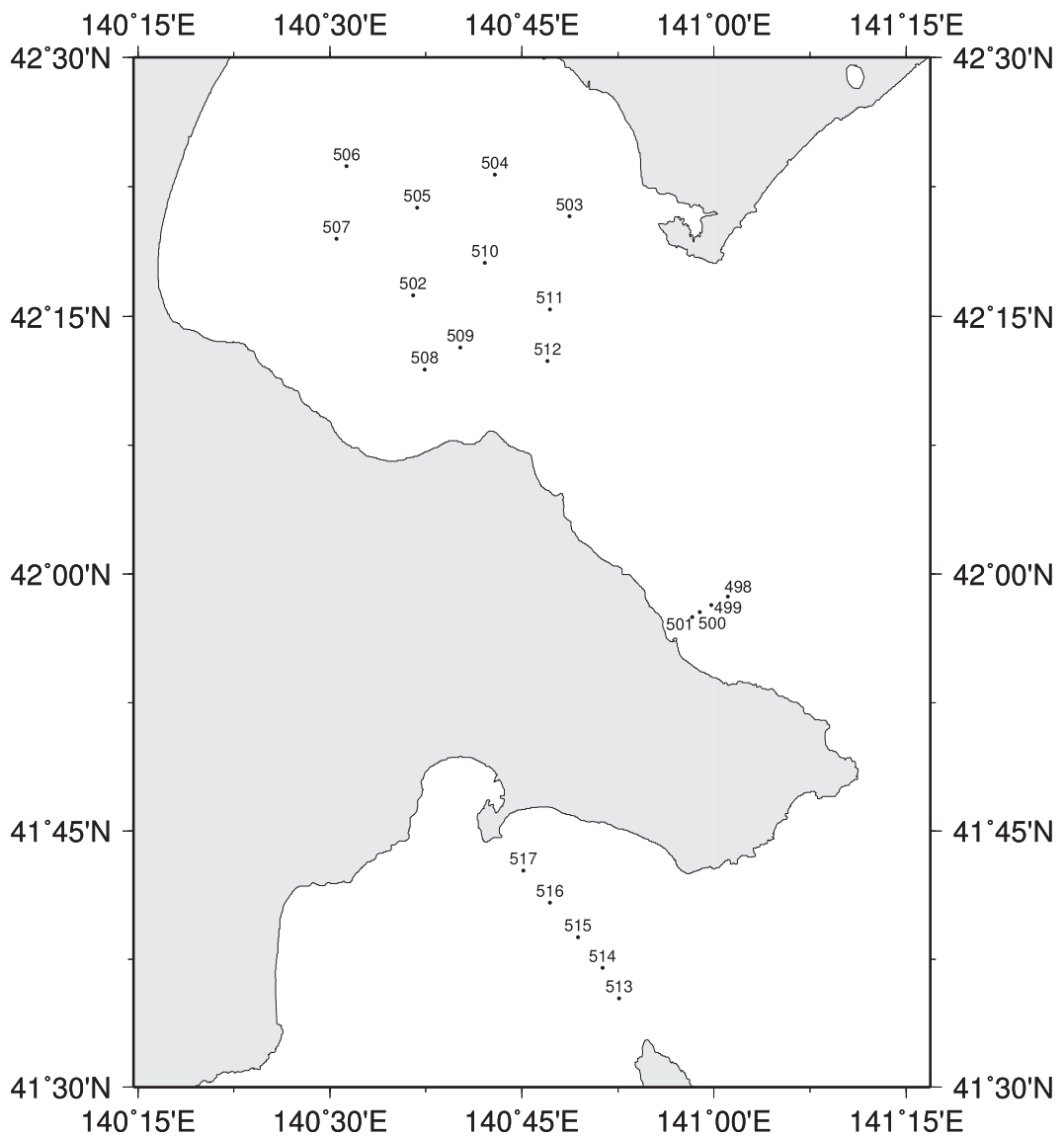


Figure 2: Oceanographic stations (Cruise 183)

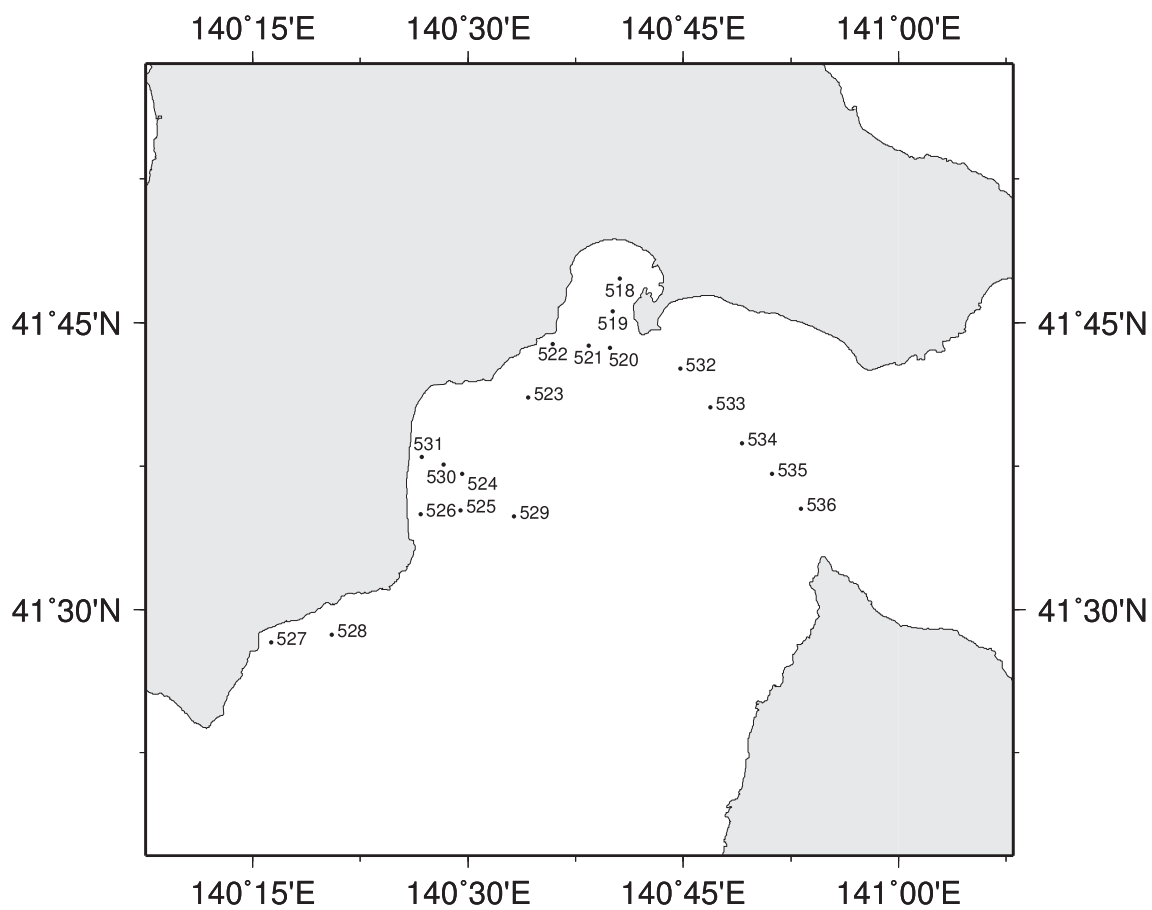


Figure 3: Oceanographic stations (Cruise 184)

Table 1: List of oceanographic stations

Cruise 182												
Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US09454	41-26.8	141-11.8	11/25	1245-1248	75	NNE-1	NNE-1	NNE-3	12.7	14.4	bc	1017.6
US09455	41-30.0	141-11.9	11/25	1309-1320	268	North-2	North-1	North-4	11.8	14.9	bc	1017.2
US09456	41-32.9	141-11.9	11/25	1338-1350	308	NNE-2	NNE-1	NNE-4	11.1	14.7	bc	1016.9
US09457	41-35.8	141-12.1	11/25	1414-1423	225	NNE-3	NNE-1	NNE-5	10.7	15.1	bc	1016.6
US09458	41-38.9	141-11.9	11/25	1448-1457	204	NNE-2	NNE-1	NNE-5	10.1	13.4	bc	1016.7
US09459	41-42.0	141-11.8	11/25	1520-1529	205	NNE-2	NNE-1	NNE-5	9.9	14.0	bc	1017.0
US09460	41-49.7	141-13.0	11/25	1624-1631	171	NNW-1	NNE-1	NNW-3	9.4	10.5	bc	1017.4
US09461	41-47.1	141-14.8	11/25	1652-1700	205	NNW-1	NNE-1	NNW-3	9.1	10.7	c	1017.6
US09462	41-44.2	141-15.8	11/25	1720-1729	226	North-1	NNE-1	North-3	10.2	14.6	c	1017.8
US09463	41-41.0	141-17.8	11/25	1754-1803	233	NNE-1	NNE-1	NNE-3	10.2	14.0	c	1018.0
US09464	41-38.2	141-19.2	11/25	1824-1833	216	NNE-1	NNE-1	NNE-3	10.5	15.0	c	1018.0
US09465	41-35.0	141-21.1	11/25	1902-1914	321	NNE-1	NNE-1	NNE-3	10.5	14.7	c	1018.2
US09466	41-32.0	141-22.0	11/25	1939-1948	257	NNE-1	NNE-1	NNE-3	10.5	14.7	c	1018.2
US09467	41-28.8	141-23.8	11/25	2010-2013	83	North-1	NNE-1	North-3	11.2	14.7	c	1018.5
US09468	41-26.5	141-24.9	11/26	0734-0736	40	NNE-2	NNE-1	NNE-5	9.2	14.8	o	1023.6
US09469	41-40.7	140-47.6	11/27	0641-0650	234	East-1	NE-1	East-3	10.2	15.4	r	1022.2
US09470	41-38.9	140-49.4	11/27	0710-0720	287	ESE-2	NE-1	ESE-4	10.0	15.4	r	1022.2
US09471	41-37.1	140-51.3	11/27	0742-0748	130	SSE-1	NE-1	SSE-3	9.9	15.6	r	1022.2
US09472	41-35.3	140-52.8	11/27	0807-0810	37	SE-1	NE-1	SE-3	9.5	15.4	r	1022.2
US09473	41-43.0	140-45.0	11/27	0908-0913	83	East-1	NE-1	East-2	9.6	14.7	r	1021.7
US09474	41-47.4	140-40.7	11/30	0848-0851	19	NNW-1	SSW-1	NNW-2	3.8	13.0	bc	1022.6
US09475	41-45.9	140-40.1	11/30	0912-0914	29	Calm	South-1	Calm	6.0	13.5	bc	1022.6
US09476	41-43.8	140-40.1	11/30	0949-0952	63	Calm	South-1	Calm	6.9	14.7	bc	1022.6
US09477	41-43.9	140-38.1	11/30	1012-1015	56	SSW-1	South-1	SSW-2	7.7	14.7	bc	1022.6
US09478	41-43.9	140-35.8	11/30	1036-1038	13	SSW-1	South-1	SSW-2	8.3	12.6	bc	1022.6
US09479	41-41.3	140-34.4	11/30	1106-1108	42	West-1	NE-1	West-3	7.7	14.1	bc	1022.1
US09480	41-37.4	140-30.0	11/30	1147-1149	31	NW-1	SW-1	NW-3	8.3	13.7	bc	1021.2
US09481	41-37.7	140-28.2	11/30	1206-1207	22	South-1	SW-1	South-2	9.0	13.6	bc	1021.0
US09482	41-38.1	140-26.3	11/30	1228-1229	14	West-2	South-1	West-4	8.7	13.0	bc	1020.6
US09483	41-35.0	140-32.8	11/30	1313-1306	57	West-1	SSW-1	West-3	8.6	13.9	c	1020.5
US09484	41-34.9	140-29.9	11/30	1340-1343	45	NW-1	SSW-1	NW-3	8.3	13.7	c	1020.5
US09485	41-35.1	140-26.8	11/30	1418-1419	14	NW-1	South-1	NW-3	8.2	13.5	bc	1020.5
US09486	41-29.0	140-20.8	11/30	1511-1514	61	WSW-1	WSW-1	WSW-3	8.2	13.9	c	1020.6
US09487	41-26.8	140-17.5	11/30	1540-1543	62	West-2	WSW-1	West-4	8.2	13.7	o	1020.6
US09488	41-28.2	140-16.2	12/1	0707-0708	20	NW-1	South-1	NW-3	0.2	12.3	bc	1022.2
US09489	41-25.4	140-00.4	12/1	0848-0852	103	West-1	WNW-1	West-3	7.6	14.3	bc	1022.6
US09490	41-26.0	140-01.5	12/1	0907-0910	66	West-1	WNW-1	West-3	8.0	14.7	bc	1022.6
US09491	41-26.2	140-02.1	12/1	0923-0925	42	West-1	WNW-1	West-3	7.7	14.7	bc	1022.6
US09492	41-26.3	140-02.5	12/1	0941-0943	33	West-1	WNW-1	West-3	7.6	14.6	bc	1022.7
US09493	41-24.4	140-06.0	12/1	1024-1027	56	NW-1	WSW-1	NW-3	8.4	14.6	bc	1022.7
US09494	41-23.9	140-06.2	12/1	1040-1044	85	West-1	WSW-1	West-3	8.2	14.1	bc	1022.7
US09495	41-23.4	140-06.0	12/1	1057-1102	97	WSW-1	WSW-1	WSW-3	8.3	15.0	bc	1022.6
US09496	41-22.3	140-06.2	12/1	1118-1123	116	WSW-1	WSW-1	WSW-3	8.4	15.5	bc	1022.6
US09497	41-24.2	140-20.9	12/1	1230-1234	99	WSW-2	WSW-1	WSW-4	8.7	15.5	bc	1021.6
Cruise 183												
Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US09498	41-58.7	141-01.1	12/8	1235-1239	96	NW-3	NW-1	NW-5	5.5	10.3	bc	1023.1
US09499	41-58.2	140-59.8	12/8	1247-1251	88	NW-3	NW-1	NW-5	5.2	10.3	bc	1023.1
US09500	41-57.8	140-58.9	12/8	1257-1300	84	NW-3	NW-1	NW-5	5.3	9.9	bc	1023.1
US09501	41-57.5	140-58.3	12/8	1304-1309	80	NW-3	NW-1	NW-5	5.5	9.9	bc	1023.1
US09502	42-16.2	140-36.5	12/9	0910-0919	91	West-4	NW-1	West-6	6.0	9.0	bc	1021.1
US09503	42-20.8	140-48.7	12/10	0644-0647	52	NNW-2	NW-1	NNW-4	2.7	8.8	bc	1026.2
US09504	42-23.2	140-42.9	12/10	0720-0724	61	NNW-2	NW-1	NNW-4	2.9	8.9	bc	1026.6
US09505	42-21.3	140-36.8	12/10	0820-0825	87	NNW-2	NW-1	NNW-4	2.9	8.9	bc	1027.0
US09506	42-23.7	140-31.3	12/10	0927-0935	96	NNE-1	NW-1	NNE-3	2.8	8.8	bc	1028.1
US09507	42-19.5	140-30.5	12/10	1034-1041	94	NNW-1	NW-1	NNW-3	3.9	8.9	bc	1028.1
US09508	42-11.9	140-37.4	12/10	1352-1357	86	North-1	NW-1	North-2	5.9	8.8	bc	1028.0
US09509	42-13.2	140-40.2	12/10	1528-1534	89	NW-1	NW-1	NW-2	5.5	8.9	bc	1028.1
US09510	42-18.1	140-42.1	12/10	1652-1656	64	Calm	NW-1	Calm	4.8	8.8	bc	1028.6
US09511	42-15.4	140-47.2	12/10	1752-1756	72	Calm	NW-1	Calm	4.5	8.9	bc	1028.8
US09512	42-12.4	140-47.0	12/10	1817-1821	88	Calm	NW-1	Calm	4.7	8.7	bc	1029.1
US09513	41-35.2	140-52.6	12/11	0838-0840	38	East-3	NE-1	East-5	6.2	14.2	bc	1027.6
US09514	41-37.0	140-51.3	12/11	0855-0859	100	East-3	NE-1	East-5	6.6	14.2	bc	1027.6
US09515	41-38.8	140-49.4	12/11	0914-0925	300	East-3	NE-1	East-5	6.5	13.9	bc	1027.6
US09516	41-40.8	140-47.2	12/11	0941-0950	220	East-3	NE-1	East-5	7.5	13.8	bc	1027.6
US09517	41-42.7	140-45.1	12/11	1003-1008	87	East-3	NE-1	East-5	7.6	13.5	bc	1027.1
Cruise 184												
Station	Lat. (N)*	Long. (E)*	Date	S.M.T.	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US09518	41-47.3	140-40.6	12/21	0852-0854	19	WNW-2	SW-1	WNW-4	-4.1	10.1	c	1006.7
US09519	41-45.6	140-40.1	12/21	0915-0917	36	West-2	SW-1	West-4	-4.4	10.8	bc	1007.1
US09520	41-43.7	140-39.9	12/21	0948-0951	64	West-1	SW-1	West-3	-4.2	11.3	bc	1007.1
US09521	41-43.8	140-38.4	12/21	1010-1013	58	West-1	SW-1	West-3	-4.0	11.4	bc	1007.2
US09522	41-43.9	140-35.9	12/21	1026-1028	15	WNW-2	SW-1	WNW-5	-3.7	10.1	bc	1007.2
US09523	41-41.1	140-34.2	12/21	1105-1107	43	West-3	SW-1	West-5	-2.1	11.5	bc	1007.2
US09524	41-37.1	140-29.6	12/21	1147-1149	28	NNW-3	SW-1	WNW-5	-1.2	11.0	c	1007.8
US09525	41-35.2	140-29.5	12/21	1210-1212	40	West-3	SSW-2	West-5	-1.4	10.6	s	1007.7
US09526	41-35.0	140-26.7	12/21	1246-1248	13	WNW-2	South-1	WNW-5	-1.2	10.7	s	1012.2
US09527	41-28.3	140-16.3	12/22	0805-0807	20	West-2	South-1	West-4	1.3	10.7	s	1012.2
US09528	41-28.7	140-20.5	12/22	0848-0851	63	West-3	South-2	West-5	2.8	12.2	s	1012.1
US09529	41-34.9	140-33.2	12/22	1003-1006	60	NW-3	SSW-2	NW-6	2.8	11.4	bc	1012.4
US09530	41-37.6	140-28.3	12/22	1100-1102	22	WNW-3	South-1	WNW-5	1.3	11.4	bc	1012.2
US09531	41-38.0	140-26.8	12/22	1118-1120	17	WNW-1	South-1	WNW-3	2.1	10.4	bc	1012.2
US09532	41-42.6	140-44.8	12/22	1306-1310	89	NW-1	South-1	NW-4	2.9	12.3	c	1012.5
US09533	41-40.6	140-46.9	12/22	1329-1338	221	West-2	WSW-1	West-5	2.3	12.8	c	1012.6
US09534	41-38.7	140-49.1	12/22	1357-1410	342	West-3	WSW-1	West-5	3.1	12.8	s	1012.6
US09535	41-37.1	140-51.2	12/22	1427-1431	100	West-4	West-1	West-6	3.1	12.8	s	1012.6
US09536	41-35.3	140-53.2	12/22	1448-1450	43	West-3	West-1	West-5	3.1	12.9	bc	1013.2

(*):Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US09454 LATITUDE 41-26.8 N LONGITUDE 141-11.8 E DEPTH (m) 75				STATION US09455 LATITUDE 41-30.0 N LONGITUDE 141-11.9 E DEPTH (m) 268				STATION US09456 LATITUDE 41-32.9 N LONGITUDE 141-11.9 E DEPTH (m) 308			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.537	33.803	25.149	5	15.092	33.882	25.090	5	14.876	33.871	25.128
10	14.555	33.801	25.144	10	15.061	33.886	25.100	10	14.882	33.891	25.143
20	14.460	33.807	25.168	20	14.975	33.890	25.121	20	14.887	33.891	25.142
30	14.597	33.874	25.191	30	14.849	33.900	25.157	30	14.888	33.891	25.141
40	14.551	33.866	25.195	40	14.771	33.896	25.171	40	14.891	33.891	25.141
50	14.485	33.854	25.199	50	14.567	33.868	25.192	50	14.892	33.891	25.140
				75	14.202	33.925	25.314	75	14.867	33.893	25.147
				100	13.803	33.970	25.432	100	14.559	33.910	25.227
				125	13.389	33.990	25.533	125	14.076	33.951	25.360
				150	12.952	34.020	25.643	150	13.931	33.963	25.400
				175	12.495	34.070	25.772	175	12.796	33.978	25.642
				200	11.430	34.058	25.964	200	11.698	34.011	25.878
								250	5.824	33.608	26.475

STATION US09457 LATITUDE 41-35.8 N LONGITUDE 141-12.1 E DEPTH (m) 225				STATION US09458 LATITUDE 41-38.9 N LONGITUDE 141-11.9 E DEPTH (m) 204				STATION US09459 LATITUDE 41-42.0 N LONGITUDE 141-11.8 E DEPTH (m) 205			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	15.255	33.879	25.052	5	13.566	33.969	25.480	5	14.498	33.934	25.258
10	15.203	33.886	25.069	10	13.568	33.999	25.503	10	14.456	33.935	25.268
20	14.863	33.900	25.154	20	13.496	34.003	25.521	20	14.238	33.942	25.320
30	14.625	33.919	25.220	30	13.466	34.001	25.525	30	14.156	33.948	25.342
40	14.474	33.923	25.255	40	13.346	34.012	25.558	40	14.056	33.959	25.371
50	14.404	33.939	25.282	50	13.315	34.014	25.566	50	13.838	33.962	25.419
75	13.977	33.971	25.396	75	13.093	34.028	25.621	75	13.446	33.942	25.483
100	13.699	33.999	25.476	100	10.760	33.737	25.835	100	10.085	33.676	25.903
125	12.324	33.929	25.695	125	4.716	33.601	26.598	125	7.893	33.650	26.229
150	7.706	33.659	26.263	150	4.483	33.624	26.641	150	6.289	33.642	26.443
175	4.611	33.642	26.642	175	4.467	33.632	26.650	175	4.889	33.556	26.543
200	4.384	33.598	26.631	200	4.410	33.625	26.650	200	3.931	33.505	26.604

STATION US09460 LATITUDE 41-49.7 N LONGITUDE 141-13.0 E DEPTH (m) 171				STATION US09461 LATITUDE 41-47.1 N LONGITUDE 141-14.8 E DEPTH (m) 205				STATION US09462 LATITUDE 41-44.2 N LONGITUDE 141-15.8 E DEPTH (m) 226			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	10.653	33.152	25.398	5	11.029	33.367	25.499	5	14.829	33.848	25.121
10	10.653	33.204	25.438	10	11.072	33.409	25.524	10	14.688	33.897	25.189
20	10.564	33.310	25.536	20	11.094	33.418	25.527	20	12.715	33.570	25.341
30	10.529	33.306	25.539	30	11.096	33.422	25.530	30	11.866	33.502	25.451
40	10.828	33.469	25.614	40	11.093	33.420	25.529	40	11.733	33.503	25.476
50	11.422	33.691	25.680	50	11.079	33.421	25.532	50	11.402	33.392	25.451
75	9.657	33.662	25.964	75	11.175	33.605	25.658	75	10.878	33.551	25.669
100	8.136	33.571	26.131	100	10.220	33.590	25.814	100	9.724	33.666	25.957
125	7.130	33.581	26.283	125	8.276	33.630	26.157	125	9.069	33.738	26.119
150	7.108	33.593	26.296	150	7.080	33.564	26.276	150	7.299	33.617	26.288
				175	6.298	33.563	26.380	175	6.116	33.577	26.414
				200	4.357	33.507	26.562	200	4.801	33.533	26.534

STATION US09463 LATITUDE 41-41.0 N LONGITUDE 141-17.8 E DEPTH (m) 233				STATION US09464 LATITUDE 41-38.2 N LONGITUDE 141-19.2 E DEPTH (m) 216				STATION US09465 LATITUDE 41-35.0 N LONGITUDE 141-21.1 E DEPTH (m) 321			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.122	33.013	24.626	5	15.199	33.889	25.072	5	14.963	33.892	25.126
10	14.216	33.938	25.321	10	15.196	33.888	25.072	10	14.971	33.893	25.125
20	13.872	33.940	25.395	20	14.976	33.912	25.138	20	14.969	33.894	25.126
30	13.277	33.991	25.556	30	14.583	33.922	25.231	30	14.972	33.894	25.125
40	13.147	34.005	25.593	40	14.161	33.946	25.339	40	14.965	33.894	25.127
50	13.017	34.011	25.624	50	14.043	33.947	25.365	50	14.870	33.898	25.151
75	12.882	34.013	25.652	75	13.674	33.967	25.456	75	14.701	33.900	25.189
100	10.921	33.805	25.859	100	10.250	33.414	25.670	100	14.578	33.902	25.217
125	7.488	33.683	26.313	125	7.049	33.660	26.356	125	14.538	33.908	25.229
150	5.082	33.506	26.482	150	5.461	33.616	26.525	150	11.643	33.851	25.764
175	3.542	33.485	26.626					175	6.938	33.684	26.390
200	3.085	33.487	26.670					200	5.952	33.695	26.528
								250	4.270	33.615	26.657

STATION US09466 LATITUDE 41-32.0 N LONGITUDE 141-22.0 E DEPTH (m) 257				STATION US09467 LATITUDE 41-28.8 N LONGITUDE 141-23.8 E DEPTH (m) 83				STATION US09468 LATITUDE 41-26.5 N LONGITUDE 141-24.9 E DEPTH (m) 40			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.946	33.842	25.091	5	14.920	33.904	25.145	5	15.004	33.911	25.132
10	14.949	33.899	25.134	10	14.928	33.904	25.142	10	14.958	33.909	25.140
20	14.949	33.897	25.133	20	14.819	33.912	25.172	20	14.967	33.911	25.140
30	14.895	33.896	25.144	30	14.734	33.928	25.203	30	14.783	33.906	25.176
40	14.510	33.917	25.243	40	14.459	33.927	25.262				
50	14.270	33.927	25.301	50	13.372	33.886	25.455				
75	13.975	33.956	25.385	75	12.896	34.015	25.651				
100	13.928	33.957	25.396								
125	13.819	33.958	25.420								
150	12.312	34.015	25.765								
175	11.549	34.006	25.902								
200	9.933	33.858	26.071								
250	8.423	33.842	26.301								
STATION US09469 LATITUDE 41-40.7 N LONGITUDE 140-47.6 E DEPTH (m) 234				STATION US09470 LATITUDE 41-38.9 N LONGITUDE 140-49.4 E DEPTH (m) 287				STATION US09471 LATITUDE 41-37.1 N LONGITUDE 140-51.3 E DEPTH (m) 130			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	15.621	33.850	24.948	5	15.648	33.790	24.897	5	15.742	33.756	24.849
10	15.597	33.855	24.957	10	15.407	33.873	25.014	10	15.673	33.783	24.885
20	15.324	33.863	25.024	20	15.083	33.905	25.109	20	15.537	33.825	24.948
30	14.713	33.907	25.191	30	14.763	33.931	25.199	30	15.187	33.863	25.054
40	14.380	33.960	25.304	40	14.680	33.939	25.223	40	15.216	33.869	25.053
50	14.217	33.988	25.359	50	14.654	33.941	25.230	50	15.261	33.845	25.025
75	13.564	33.988	25.495	75	14.211	33.991	25.363	75	15.050	33.884	25.100
100	12.931	34.032	25.657	100	13.343	34.006	25.554	100	13.998	33.992	25.409
125	12.861	34.016	25.658	125	12.425	34.069	25.784				
150	12.321	34.070	25.806	150	12.272	34.072	25.817				
175	12.042	34.077	25.864	175	11.849	34.091	25.912				
				200	11.536	34.079	25.961				
STATION US09472 LATITUDE 41-35.3 N LONGITUDE 140-52.8 E DEPTH (m) 37				STATION US09473 LATITUDE 41-43.0 N LONGITUDE 140-45.0 E DEPTH (m) 83				STATION US09474 LATITUDE 41-47.4 N LONGITUDE 140-40.7 E DEPTH (m) 19			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	15.602	33.820	24.929	5	14.466	33.924	25.257	5	13.313	33.684	25.311
10	15.566	33.824	24.941	10	14.493	33.935	25.260	10	13.331	33.713	25.330
20	15.518	33.828	24.954	20	14.487	33.936	25.263				
30	15.542	33.829	24.950	30	14.473	33.938	25.267				
				40	14.352	33.939	25.293				
				50	14.203	33.942	25.327				
				75	13.130	34.009	25.599				
STATION US09475 LATITUDE 41-45.9 N LONGITUDE 140-40.1 E DEPTH (m) 29				STATION US09476 LATITUDE 41-43.8 N LONGITUDE 140-40.1 E DEPTH (m) 63				STATION US09477 LATITUDE 41-43.9 N LONGITUDE 140-38.1 E DEPTH (m) 56			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.643	33.879	25.394	5	14.901	33.886	25.135	5	14.760	33.878	25.159
10	13.640	33.882	25.397	10	14.898	33.887	25.136	10	14.448	33.893	25.237
20	13.683	33.893	25.397	20	14.860	33.888	25.145	20	14.247	33.917	25.298
				30	14.628	33.898	25.203	30	14.139	33.917	25.321
				40	14.599	33.902	25.212	40	14.036	33.928	25.351
				50	14.577	33.902	25.216	50	13.913	33.930	25.378
STATION US09478 LATITUDE 41-43.9 N LONGITUDE 140-35.8 E DEPTH (m) 13				STATION US09479 LATITUDE 41-41.3 N LONGITUDE 140-34.4 E DEPTH (m) 42				STATION US09480 LATITUDE 41-37.4 N LONGITUDE 140-30.0 E DEPTH (m) 31			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.404	33.782	25.369	5	14.202	33.900	25.295	5	13.901	33.869	25.334
10	13.445	33.780	25.359	10	14.126	33.913	25.321	10	13.897	33.915	25.370
				20	13.922	33.908	25.360	20	13.890	33.914	25.371
				30	13.757	33.910	25.395				
				40	13.648	33.944	25.444				
STATION US09481 LATITUDE 41-37.7 N LONGITUDE 140-28.2 E DEPTH (m) 22				STATION US09482 LATITUDE 41-38.1 N LONGITUDE 140-26.3 E DEPTH (m) 14				STATION US09483 LATITUDE 41-35.0 N LONGITUDE 140-32.8 E DEPTH (m) 57			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.527	33.814	25.368	5	13.080	33.630	25.316	5	14.180	33.879	25.283
10	13.523	33.818	25.372	10	13.022	33.639	25.334	10	14.191	33.916	25.309
20	13.534	33.828	25.378					20	14.140	33.913	25.318
								30	13.750	33.945	25.424
								40	13.745	33.947	25.426
								50	13.727	33.942	25.426

STATION US09484 LATITUDE 41-34.9 N LONGITUDE 140-29.9 E DEPTH (m) 45				STATION US09485 LATITUDE 41-35.1 N LONGITUDE 140-26.8 E DEPTH (m) 14				STATION US09486 LATITUDE 41-29.0 N LONGITUDE 140-20.8 E DEPTH (m) 61			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.921	33.896	25.350	5	13.157	33.326	25.065	5	14.090	33.867	25.293
10	13.918	33.912	25.364	10	13.427	33.824	25.396	10	14.094	33.897	25.315
20	13.913	33.912	25.365					20	13.975	33.909	25.349
30	13.906	33.911	25.365					30	13.752	33.928	25.411
40	13.877	33.910	25.370					40	13.502	33.941	25.471
								50	13.383	33.949	25.502
STATION US09487 LATITUDE 41-26.8 N LONGITUDE 140-17.5 E DEPTH (m) 62				STATION US09488 LATITUDE 41-28.2 N LONGITUDE 140-16.2 E DEPTH (m) 20				STATION US09489 LATITUDE 41-25.4 N LONGITUDE 140-00.4 E DEPTH (m) 103			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.745	33.916	25.402	5	13.821	33.884	25.362	5	13.526	33.896	25.432
10	13.523	33.925	25.454	10	13.811	33.883	25.363	10	13.272	33.930	25.510
20	13.018	33.958	25.582					20	13.258	33.934	25.516
30	12.756	33.977	25.649					30	13.227	33.928	25.517
40	12.646	33.984	25.676					40	13.064	33.934	25.555
50	12.590	33.993	25.694					50	12.786	33.944	25.617
								75	8.481	34.169	26.549
								100	7.537	34.110	26.642
STATION US09490 LATITUDE 41-26.0 N LONGITUDE 140-01.5 E DEPTH (m) 66				STATION US09491 LATITUDE 41-26.2 N LONGITUDE 140-02.1 E DEPTH (m) 42				STATION US09492 LATITUDE 41-26.3 N LONGITUDE 140-02.5 E DEPTH (m) 33			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.980	33.868	25.104	5	14.718	33.897	25.182	5	14.720	33.887	25.174
10	14.957	33.870	25.110	10	14.770	33.896	25.170	10	14.738	33.884	25.168
20	14.334	33.887	25.257	20	14.597	33.891	25.204	20	14.489	33.893	25.229
30	13.671	33.910	25.413	30	14.544	33.890	25.215				
40	13.648	33.916	25.422	40	13.977	33.933	25.368				
50	13.634	33.933	25.439								
STATION US09493 LATITUDE 41-24.4 N LONGITUDE 140-06.0 E DEPTH (m) 56				STATION US09494 LATITUDE 41-23.9 N LONGITUDE 140-06.2 E DEPTH (m) 85				STATION US09495 LATITUDE 41-23.4 N LONGITUDE 140-06.0 E DEPTH (m) 97			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.234	33.906	25.293	5	15.115	33.230	24.583	5	15.468	33.815	24.955
10	14.214	33.911	25.301	10	15.181	33.822	25.024	10	15.470	33.816	24.956
20	14.193	33.913	25.306	20	14.794	33.878	25.151	20	14.920	33.833	25.089
30	14.095	33.914	25.328	30	14.756	33.882	25.163	30	14.516	33.889	25.220
40	14.004	33.903	25.338	40	14.569	33.892	25.211	40	14.497	33.895	25.228
50	13.980	33.902	25.343	50	14.405	33.891	25.245	50	14.467	33.896	25.235
				75	13.795	33.901	25.380	75	13.557	33.937	25.457
STATION US09496 LATITUDE 41-22.3 N LONGITUDE 140-06.2 E DEPTH (m) 116				STATION US09497 LATITUDE 41-24.2 N LONGITUDE 140-20.9 E DEPTH (m) 99				STATION US09498 LATITUDE 41-58.7 N LONGITUDE 141-01.1 E DEPTH (m) 96			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	15.760	33.775	24.859	5	15.651	33.805	24.907	5	10.609	33.645	25.790
10	15.758	33.801	24.880	10	15.639	33.803	24.908	10	10.608	33.648	25.792
20	15.757	33.838	24.909	20	14.985	33.836	25.078	20	10.609	33.643	25.788
30	14.958	33.847	25.092	30	14.573	33.864	25.188	30	10.607	33.642	25.787
40	14.795	33.854	25.133	40	13.885	33.898	25.359	40	10.602	33.642	25.788
50	14.413	33.879	25.234	50	13.549	33.908	25.436	50	10.594	33.637	25.786
75	13.776	33.943	25.417	75	12.898	33.961	25.608	75	10.365	33.598	25.795
100	13.024	33.974	25.593								
STATION US09499 LATITUDE 41-58.2 N LONGITUDE 140-59.8 E DEPTH (m) 88				STATION US09500 LATITUDE 41-57.8 N LONGITUDE 140-58.9 E DEPTH (m) 84				STATION US09501 LATITUDE 41-57.5 N LONGITUDE 140-58.3 E DEPTH (m) 80			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	10.222	33.555	25.786	5	10.190	33.542	25.781	5	9.892	33.488	25.790
10	10.216	33.559	25.790	10	10.190	33.557	25.793	10	9.892	33.488	25.790
20	10.199	33.555	25.790	20	10.192	33.555	25.791	20	9.895	33.488	25.789
30	10.199	33.554	25.789	30	10.185	33.554	25.791	30	9.895	33.487	25.788
40	10.190	33.554	25.790	40	10.107	33.538	25.793	40	9.953	33.513	25.799
50	10.125	33.537	25.788	50	10.017	33.522	25.795	50	9.965	33.514	25.797
75	9.965	33.514	25.797	75	9.409	33.575	25.937	75	9.357	33.604	25.968

STATION US09502 LATITUDE 42-16.2 N LONGITUDE 140-36.5 E DEPTH (m) 91				STATION US09503 LATITUDE 42-20.8 N LONGITUDE 140-48.7 E DEPTH (m) 52				STATION US09504 LATITUDE 42-23.2 N LONGITUDE 140-42.9 E DEPTH (m) 61			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	9.159	33.172	25.662	5	9.176	33.181	25.666	5	9.199	33.173	25.657
10	9.160	33.171	25.661	10	9.183	33.180	25.664	10	9.210	33.167	25.650
20	9.159	33.177	25.666	20	9.188	33.179	25.662	20	9.212	33.162	25.646
30	9.133	33.222	25.705	30	9.189	33.180	25.663	30	9.214	33.162	25.645
40	9.135	33.240	25.719	40	9.187	33.181	25.665	40	9.215	33.163	25.646
50	9.174	33.253	25.723					50	9.213	33.166	25.649
75	9.179	33.302	25.760								
STATION US09505 LATITUDE 42-21.3 N LONGITUDE 140-36.8 E DEPTH (m) 87				STATION US09506 LATITUDE 42-23.7 N LONGITUDE 140-31.3 E DEPTH (m) 96				STATION US09507 LATITUDE 42-19.5 N LONGITUDE 140-30.5 E DEPTH (m) 94			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	9.115	33.180	25.675	5	9.080	33.080	25.602	5	9.166	33.154	25.647
10	9.114	33.177	25.673	10	9.153	33.172	25.663	10	9.171	33.154	25.646
20	9.134	33.175	25.668	20	9.159	33.169	25.660	20	9.164	33.151	25.645
30	9.138	33.175	25.668	30	9.164	33.168	25.658	30	9.180	33.158	25.647
40	9.136	33.175	25.668	40	9.167	33.168	25.657	40	9.155	33.174	25.664
50	9.141	33.176	25.668	50	9.168	33.168	25.658	50	9.129	33.178	25.671
75	9.200	33.268	25.731	75	8.700	33.389	25.904	75	8.454	33.491	26.021
STATION US09508 LATITUDE 42-11.9 N LONGITUDE 140-37.4 E DEPTH (m) 86				STATION US09509 LATITUDE 42-13.2 N LONGITUDE 140-40.2 E DEPTH (m) 89				STATION US09510 LATITUDE 42-18.1 N LONGITUDE 140-42.1 E DEPTH (m) 64			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	9.105	33.142	25.647	5	9.117	33.230	25.714	5	9.056	33.069	25.597
10	9.115	33.139	25.643	10	9.122	33.221	25.706	10	9.126	33.165	25.662
20	9.102	33.173	25.671	20	9.145	33.230	25.709	20	9.113	33.169	25.667
30	9.110	33.197	25.689	30	9.185	33.238	25.709	30	9.118	33.180	25.674
40	9.186	33.226	25.700	40	9.587	33.387	25.761	40	9.101	33.179	25.677
50	9.180	33.240	25.711	50	9.790	33.479	25.800	50	9.121	33.186	25.679
75	9.557	33.411	25.784	75	9.806	33.533	25.839				
STATION US09511 LATITUDE 42-15.4 N LONGITUDE 140-47.2 E DEPTH (m) 72				STATION US09512 LATITUDE 42-12.4 N LONGITUDE 140-47.0 E DEPTH (m) 88				STATION US09513 LATITUDE 41-35.2 N LONGITUDE 140-52.6 E DEPTH (m) 38			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	9.068	32.971	25.519	5	9.407	33.350	25.761	5	14.515	33.827	25.172
10	9.150	33.165	25.658	10	9.463	33.421	25.808	10	14.505	33.816	25.166
20	9.167	33.179	25.666	20	9.499	33.441	25.818	20	14.519	33.815	25.162
30	9.213	33.218	25.689	30	9.504	33.442	25.817	30	14.497	33.818	25.169
40	9.235	33.227	25.692	40	9.678	33.538	25.864				
50	9.752	33.449	25.782	50	9.571	33.531	25.876				
				75	9.433	33.589	25.944				
STATION US09514 LATITUDE 41-37.0 N LONGITUDE 140-51.3 E DEPTH (m) 100				STATION US09515 LATITUDE 41-38.8 N LONGITUDE 140-49.4 E DEPTH (m) 300				STATION US09516 LATITUDE 41-40.8 N LONGITUDE 140-47.2 E DEPTH (m) 220			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	14.430	33.893	25.241	5	14.150	33.921	25.322	5	13.944	33.947	25.385
10	14.431	33.893	25.241	10	14.140	33.929	25.330	10	13.929	33.948	25.389
20	14.435	33.897	25.243	20	14.083	33.928	25.342	20	13.847	33.947	25.405
30	14.436	33.899	25.244	30	14.064	33.929	25.346	30	13.658	33.949	25.446
40	14.440	33.902	25.246	40	14.048	33.931	25.351	40	13.201	33.955	25.543
50	14.441	33.904	25.248	50	13.496	33.928	25.463	50	13.325	33.976	25.535
75	14.441	33.911	25.252	75	13.074	33.964	25.576	75	13.000	34.016	25.630
				100	12.866	33.942	25.600	100	12.907	33.973	25.616
				125	12.473	33.972	25.700	125	12.933	33.965	25.604
				150	12.260	33.987	25.753	150	12.756	33.975	25.647
				175	11.894	33.999	25.832	175	12.737	33.983	25.657
STATION US09517 LATITUDE 41-42.7 N LONGITUDE 140-45.1 E DEPTH (m) 87				STATION US09518 LATITUDE 41-47.3 N LONGITUDE 140-40.6 E DEPTH (m) 19				STATION US09519 LATITUDE 41-45.6 N LONGITUDE 140-40.1 E DEPTH (m) 36			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	13.503	33.944	25.473	5	10.822	33.594	25.712	5	11.323	33.746	25.741
10	13.516	33.970	25.491	10	10.966	33.666	25.743	10	11.366	33.821	25.791
20	13.530	33.973	25.490					20	11.574	33.903	25.817
30	13.534	33.972	25.489					30	11.796	33.959	25.819
40	13.506	33.968	25.492								
50	13.349	33.973	25.527								
75	12.656	33.974	25.666								

STATION US09520 LATITUDE 41-43.7 N LONGITUDE 140-39.9 E DEPTH (m) 64				STATION US09521 LATITUDE 41-43.8 N LONGITUDE 140-38.4 E DEPTH (m) 58				STATION US09522 LATITUDE 41-43.9 N LONGITUDE 140-35.9 E DEPTH (m) 15			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	11.888	33.996	25.830	5	11.630	33.920	25.819	5	11.328	33.725	25.723
10	11.893	33.997	25.830	10	11.635	33.924	25.822	10	11.138	33.793	25.811
20	11.894	33.997	25.830	20	11.638	33.924	25.822				
30	11.894	33.997	25.830	30	11.640	33.924	25.821				
40	11.856	33.996	25.836	40	11.643	33.928	25.823				
50	11.844	33.997	25.840	50	11.721	33.956	25.830				
STATION US09523 LATITUDE 41-41.1 N LONGITUDE 140-34.2 E DEPTH (m) 43				STATION US09524 LATITUDE 41-37.1 N LONGITUDE 140-29.6 E DEPTH (m) 28				STATION US09525 LATITUDE 41-35.2 N LONGITUDE 140-29.5 E DEPTH (m) 40			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	11.785	33.974	25.833	5	11.281	33.936	25.896	5	11.603	33.745	25.688
10	11.782	33.975	25.834	10	11.282	33.935	25.895	10	11.618	33.965	25.857
20	11.744	33.965	25.834	20	11.297	33.936	25.893	20	11.625	33.967	25.857
30	11.685	33.957	25.838					30	11.613	33.968	25.860
40	11.633	33.950	25.843								
STATION US09526 LATITUDE 41-35.0 N LONGITUDE 140-26.7 E DEPTH (m) 13				STATION US09527 LATITUDE 41-28.3 N LONGITUDE 140-16.3 E DEPTH (m) 20				STATION US09528 LATITUDE 41-28.7 N LONGITUDE 140-20.5 E DEPTH (m) 63			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	10.875	33.784	25.851	5	12.450	33.942	25.681	5	12.457	33.991	25.718
				10	12.384	33.970	25.716	10	12.479	33.985	25.709
								20	12.026	33.961	25.777
								30	11.968	33.967	25.793
								40	11.896	33.966	25.806
								50	11.581	33.958	25.858
STATION US09529 LATITUDE 41-34.9 N LONGITUDE 140-33.2 E DEPTH (m) 60				STATION US09530 LATITUDE 41-37.6 N LONGITUDE 140-28.3 E DEPTH (m) 22				STATION US09531 LATITUDE 41-38.0 N LONGITUDE 140-26.8 E DEPTH (m) 17			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	11.932	33.970	25.802	5	11.168	33.899	25.888	5	10.690	33.865	25.947
10	11.959	33.968	25.796	10	11.168	33.944	25.923	10	10.694	33.869	25.949
20	11.914	33.969	25.805	20	11.169	33.944	25.923				
30	11.870	33.969	25.813								
40	11.693	33.972	25.848								
50	11.436	33.972	25.896								
STATION US09532 LATITUDE 41-42.6 N LONGITUDE 140-44.8 E DEPTH (m) 89				STATION US09533 LATITUDE 41-40.6 N LONGITUDE 140-46.9 E DEPTH (m) 221				STATION US09534 LATITUDE 41-38.7 N LONGITUDE 140-49.1 E DEPTH (m) 342			
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T
5	12.652	33.947	25.646	5	13.073	33.949	25.565	5	13.084	33.933	25.550
10	12.572	33.963	25.674	10	13.075	33.946	25.561	10	13.093	33.938	25.551
20	12.497	33.965	25.690	20	13.067	33.949	25.565	20	13.094	33.937	25.551
30	12.490	33.969	25.694	30	13.033	33.953	25.575	30	13.093	33.938	25.551
40	12.475	33.969	25.697	40	12.972	33.955	25.589	40	13.086	33.938	25.553
50	12.425	33.971	25.708	50	12.888	33.969	25.616	50	13.088	33.937	25.552
75	12.181	33.977	25.760	75	12.489	33.977	25.701	75	13.002	33.943	25.574
				100	12.309	33.978	25.736	100	12.613	33.968	25.669
				125	12.226	33.980	25.754	125	12.419	33.986	25.721
				150	12.175	33.977	25.761	150	11.992	33.982	25.800
				175	12.142	33.975	25.766	175	12.045	33.977	25.786
				200	11.923	33.981	25.812	200	11.895	33.983	25.819
								250	11.694	33.985	25.858
								300	11.169	33.979	25.950
STATION US09535 LATITUDE 41-37.1 N LONGITUDE 140-51.2 E DEPTH (m) 100				STATION US09536 LATITUDE 41-35.3 N LONGITUDE 140-53.2 E DEPTH (m) 43							
Press.	Temp.	Salinity	Sigma-T	Press.	Temp.	Salinity	Sigma-T				
5	13.120	33.905	25.520	5	13.191	33.899	25.502				
10	13.113	33.940	25.549	10	13.196	33.936	25.530				
20	13.122	33.941	25.548	20	13.197	33.937	25.530				
30	13.143	33.938	25.542	30	13.197	33.937	25.530				
40	13.155	33.938	25.539	40	13.200	33.938	25.530				
50	13.157	33.939	25.539								
75	13.167	33.937	25.536								

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