



HOKKAIDO UNIVERSITY

Title	PART I OSHORO MARU CRUISES FROM FEBRUARY TO DECEMBER 2017
Citation	海洋調査漁業試験要報, 61, 1-55
Issue Date	2021-03-31
Doc URL	https://hdl.handle.net/2115/80756
Type	dataset
File Information	Data.Rec.Oceanogr.Obs.Expl.Fish.61.1.pdf



PART I

**OSHORO MARU CRUISE
FROM FEBRURY TO DECEMBER 2017**

I. Crew list

Captain:		Shogo Takagi
Crew:	Chief Officer	Keiichiro Sakaoka
	First Officer	Yoshiyuki Kajiwara
	Second Officer	Naoki Hoshi
	Jr. Second Officer	Maki Ohwada
	Third Officer	Taichi Sato
	Deck Cadet	Inagaki Yusuke
	Chief Engineer	Kazuya Sawanaka
	First Engineer	Kenichi Shindoh (- C038)
	First Engineer	Jyunpei Shimura (C039 -)
	Second Engineer	Akira Sugihara
	Third Engineer	Hiroyuki Uno
	Chief Radio Operator	Satoshi Ishigaki
	Science Officer	Keiri Imai
	Boatswain	Yoshitaka Yoshida
	Jr. Boatswain	Yoshihiro Onodera
	Quartermaster	Naoyuki Eda
	Quartermaster	Daisuke Sasaki
	Quartermaster	Takahiro Kanazawa
	Sailor	Yukio Tabata
	Sailor	Kohta Idomukai
	No.1 Oiler	Kohya Nakamura
	Jr. No.1 Oiler	Konichi Tomosugi
	Oiler	Tohru Murakami
	Fireman	Takuya Murata
	Fireman	Toshiki Nohsho (C038-)
	Chief Steward	Hajime Morihira
	Jr. Chief Steward	Hiroshi Nakamura
	Steward	Hiroshi Tamagawa
	Mess Man	Tsutomu Takahashi
	Mess Man	Ryoma Aki
	Mess Man	Toshiki Nohsho (- C037)
	Mess Man	Teruki Tomita (C039-)
	Marine Technician	Kenji Oguma
	Marine Technician	Kohki Sawada

II. Particulars

Length (o.a.)	78.27m
Length (p.p.)	70.00m
Breadth (mid)	13.00m
Depth(mid)	5.80m
Gross tonnage	1598 tons
International gross tonnage	1998 tons
Main engine(Three-Phase induction motor ×2)	1000kw×88.5min ⁻¹ , 300kw×88.5min ⁻¹
Call sign	7JRM

**THE "OSHORO MARU" CRUISE 036
TO SANRIKU OFF
IN FEBRUARY 2017**

1. Cruise Itinerary

Cruise 036

Departure from Hakodate	Feb.	22, 2017
Start hydrographic research		23
Finish hydrographic research		26
Return to Hakodate		27

Total coverage 498.1 miles



Fig. 1: Noon Position

2. Vessel Personnel

Crew: Captain: Associate Professor Shogo Takagi

And 31 persons

Undergraduate instructor:

Associate Professor (Laboratory of Marine Environmental Science, Hokkaido University)

Yutaka Isoda

Associate Professor (Laboratory of Marine Environment and Resource Sensing, Hokkaido University)

Toru Hirawake

Assistant Professor (Laboratory of Marine Environmental Science, Hokkaido University)

Hiroji Onishi

Instructor (Department of Marine Science, Faculty of Fisheries, Kasetsart University)

Charuay Sukhsangchan

Instructor (Department of Marine Science, Faculty of Fisheries, Kasetsart University)

Yaowaluk Monthum

Teaching Assistant: 4 persons

Undergraduate Student: 28 persons

3. Items of Research

A short cruise to conduct shipboard training in hydrographic observations for undergraduate students in the department of marine bioresource and environmental science.

Hydrographic observations: Temperature and salinity were measured by CTD (Seabird SBE-9Plus and SBE-19Plus).

Dynamic computations were made using a desk-top computer aboard the “*Oshoromaru*”.

**THE "OSHORO MARU" CRUISE 038
TO SEA OF JAPAN and TSURUGA-WAN**

IN APRIL 2017

1. Cruise Itinerary

Cruise 038

Departure from Yura and arrival at Kobe	Apr.	14, 2017
Departure from Kobe		16
Arrival at Fukui		20
Departure from Fukui and start hydrographic research (Leg2)		21
Finish hydrographic research		22
Return to Fukui and departure from Fukui (Leg3)		23
Return to Fukui and departure from Fukui		24
Return to Hakodate		26

Total coverage 1161.7 miles

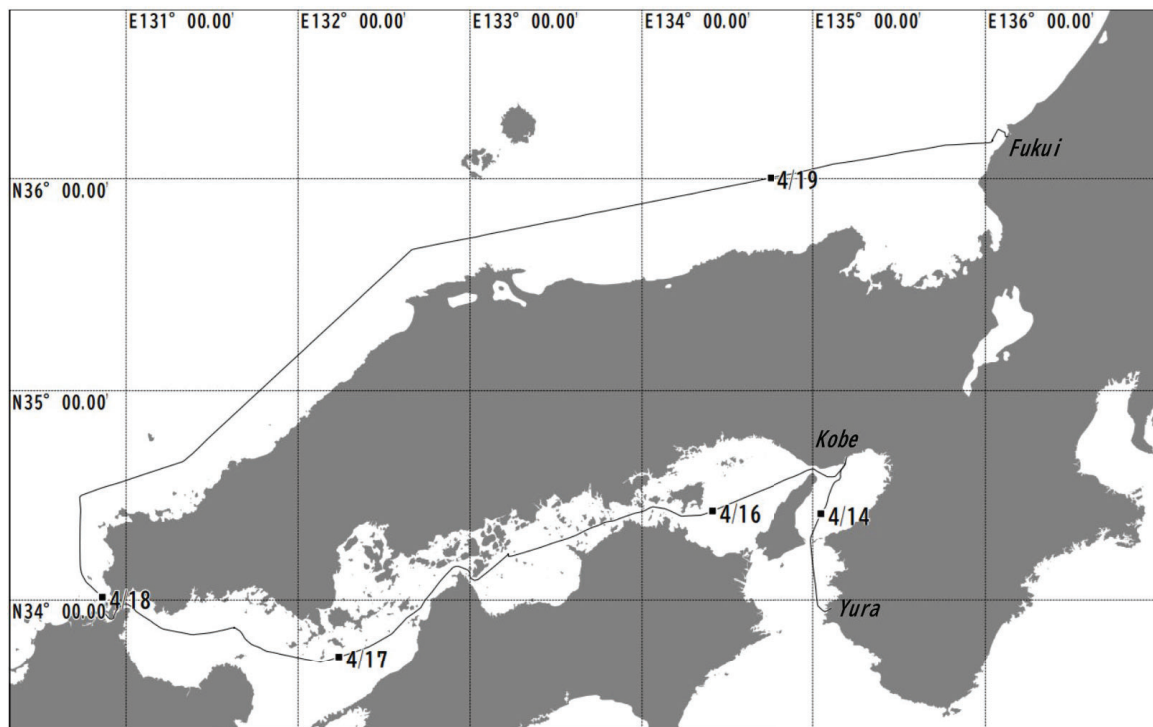


Fig. 1-1: Noon Position

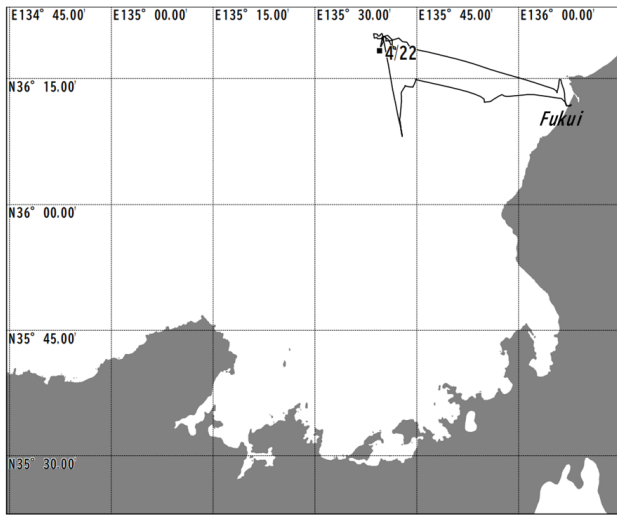


Fig. 1-2: Noon Position

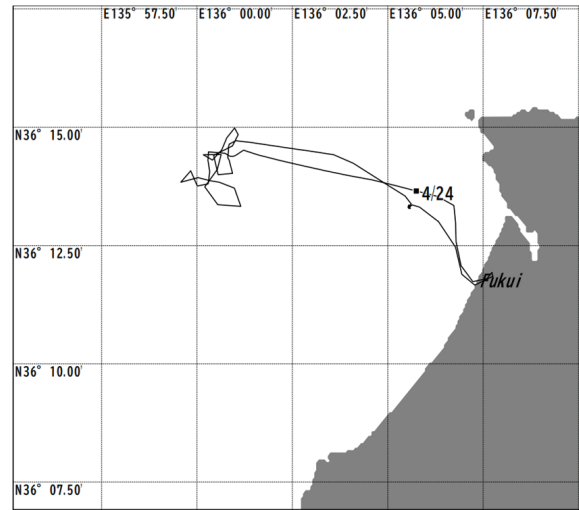


Fig. 1-3: Noon Position

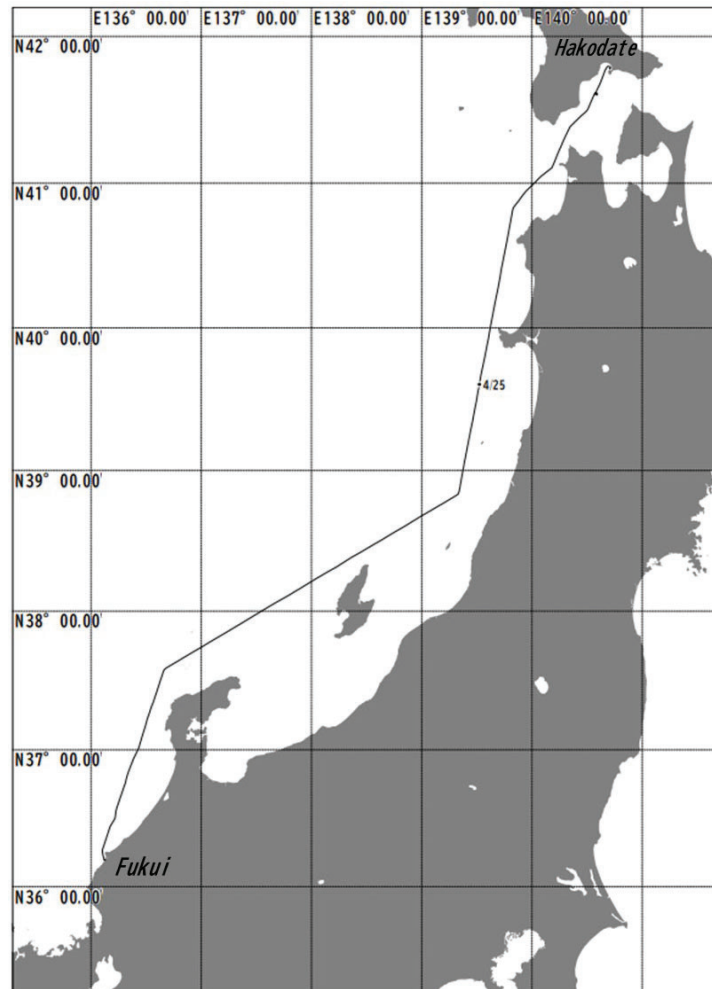


Fig. 1-4: Noon Position

2. Vessel Personnel

Crew: Captain: Associate Professor Shogo Takagi

And 32 persons

(Leg2)

Undergraduate instructor:

Professor (Faculty of Marine Bioscience, Fukui Prefectural University)

Ryuji Kondo

Professor (Faculty of Marine Bioscience, Fukui Prefectural University)

Tooru Ooizumi

Associate Professor (Faculty of Marine Bioscience, Fukui Prefectural University)

Atsushi Kaneda

Associate Professor (Faculty of Marine Bioscience, Fukui Prefectural University)

Yoshitake Takao

Associate Professor (Faculty of Marine Bioscience, Fukui Prefectural University)

Hiroaki Shuetake

Instructor (Faculty of Marine Bioscience, Fukui Prefectural University)

Takafumi Kataoka

Teaching Assistant: 4 persons

Undergraduate Student: 50 persons

(Leg3)

Undergraduate instructor:

Emeritus Professor (Faculty of Marine Bioscience, Fukui Prefectural University)

Tadahisa Seikai

Professor (Faculty of Marine Bioscience, Fukui Prefectural University)

Osamu Tominaga

Associate Professor (Faculty of Marine Bioscience, Fukui Prefectural University)

Yoko Shimizu

Lecturer (Faculty of Marine Bioscience, Fukui Prefectural University)

Sayaka Matsumoto

Teaching staff (Faculty of Marine Bioscience, Fukui Prefectural University)

Kazuhiko Sugimura

Researcher (Faculty of Marine Bioscience, Fukui Prefectural University)

Yasushi Miyamoto

Teaching Assistant: 6 persons

Undergraduate Student: 28 persons

**THE "OSHORO MARU" CRUISE 039
TO THE WESTERN NORTH PACIFIC OCEAN**

IN MAY 2017

1. Cruise Itinerary

Cruise 039

Departure from Hakodate	May.	12, 2017
Start hydrographic research and gillnet research (OSG1701)		15
Finish hydrographic research		18
Finish gillnet research (OSG1704)		19
Return to Hakodate		22

Total coverage .1599.4miles

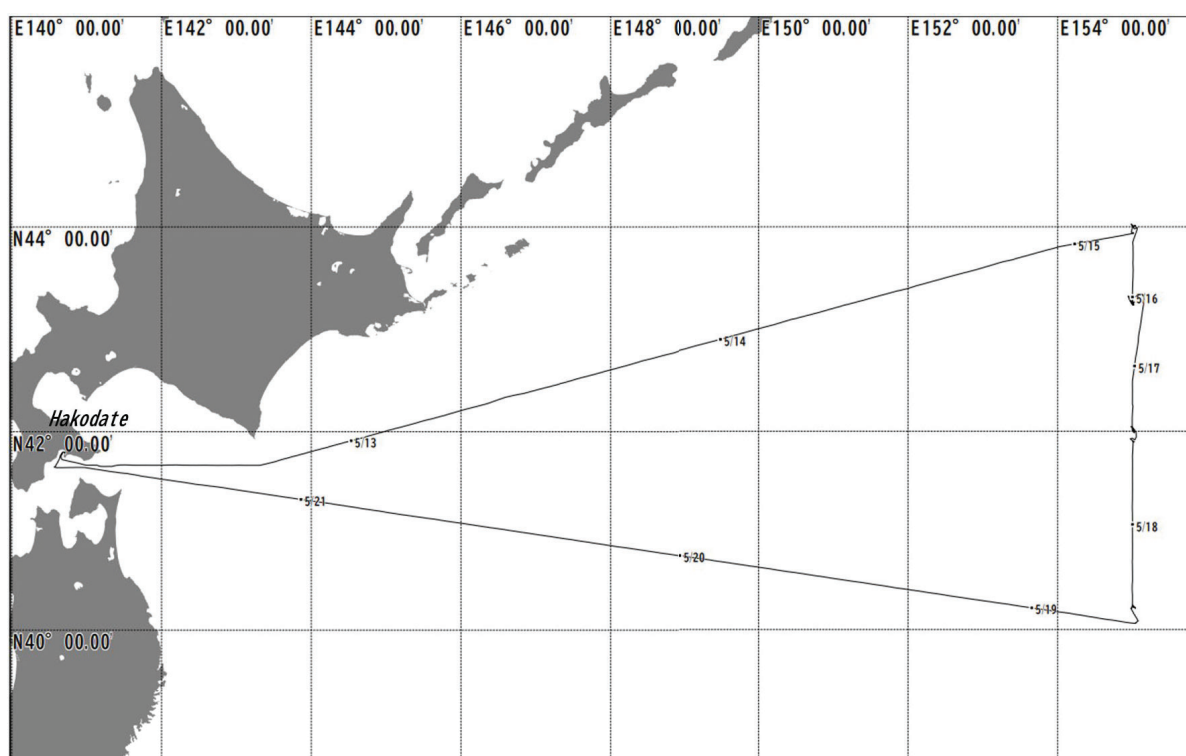


Fig. 1 Noon Position

2. Vessel Personnel

Crew: Captain: Associate Professor Shogo Takagi
And 33 persons

Undergraduate instructor:

Associate Professor (Laboratory of Marine Bioresource and Environmental Science, Hokkaido University)

Hideaki Kudo

Associate Professor (Laboratory of Marine Bioresource Science, Hokkaido University)

Orio Yamamura

Assistant Professor (Field Science Center for Northern Biosphere, Hokkaido University)

Daiki Nomura

Research stuff:

Associate Professor (Laboratory of Marine Biodiversity, Hokkaido University)

Atsushi Yamaguchi

Postdoctoral Researcher (Laboratory of Marine Environmental Science, Hokkaido University)

Bungo Nishizawa

Graduate Student: 5 persons

Undergraduate Student: 51 persons

3. Items of Research

Hydrographic observations: Hydrographic work on deck and the data processing were made by Science officer, the deck officers, crews, research staff and cadets of the “*Oshoromaru*”. Temperature and salinity were measured by CTD (Seabird SBE-9Plus, SBE-19Plus and XCTD). Dynamic computations were made using a desk-top computer aboard the “*Oshoromaru*”.

Water sampling were also carried out at almost every hydrographic stations. Table 1, 2

Biological research for fishes caught by non-selective drift gillnets, surface longline and Hook-and-Line, those were performed during this cruise. The gillnet was composed of different mesh size, and extended from the surface to 6 meters depth. The operations were supervised by the captain, and were conducted by deck officers, crews, research staff and cadets. Table 3-9

4. Data on temperature, salinity and computed dynamic depth anomaly

Table 1. List of Oceanographic station

Station	Lat.	Long.	Date (GMT)	Hour (GMT)	T.Z.	Depth	Col.	Tr.	SST	Wr.	Gear
OS17020	44-00.02N	155-00.14E	5/15	8:48	10	5300	-	-	4.0	o	Sea-Bird SBE9
OS17021	44-00.00N	155-00.04E	5/15	13:41	10	5300	-	-	4.0	o	Sea-Bird SBE9
OS17022	43-15.01N	154-59.98E	5/16	5:06	10	5400	-	-	7.0	o	Sea-Bird SBE9
OS17023	42-30.00N	154-49.99E	5/17	4:22	10	5200	-	-	7.4	o	XCTD-4
OS17024	42-00.70N	155-00.61E	5/17	8:55	10	5400	-	-	6.9	o	Sea-Bird SBE9
OS17025	41-45.12N	154-59.99E	5/17	22:51	10	5500	-	-	7.5	o	XCTD-4
OS17026	40-59.98N	154-59.98E	5/18	3:30	10	5500	-	-	8.6	bc	XCTD-4
OS17027	40-14.83N	155-00.03E	5/18	8:55	10	5550	-	-	13.0	o	Sea-Bird SBE9

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

Col.: Water color in Forel-Ule scale

Tr.: Transparency in meters with Secchi disc

SST: Sea Surface temperature

Wr.: Weather in WMO Code 4501

Table 2. Oceanographic data

Station OS17020				Station OS17021				Station OS17022			
Latitude 44-00.20 N				Latitude 44-00.00 N				Latitude 43-15.01 N			
Longitude 155-00.14 E				Longitude 155-00.04 E				Longitude 154-59.98 E			
Depth(m) 5300				Depth(m) 5300				Depth(m) 5400			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	4.020	33.028	26.216	5	3.963	33.027	26.220	5	7.115	33.716	26.391
10	4.013	33.028	26.216	10	3.963	33.027	26.220	10	7.119	33.715	26.390
20	3.881	33.027	26.228	20	3.848	33.022	26.228	20	7.089	33.718	26.397
30	3.840	33.024	26.230	30	3.808	33.021	26.231	30	7.072	33.718	26.399
40	3.784	33.021	26.233	40	2.492	33.032	26.357	40	7.052	33.717	26.401
50	2.779	33.062	26.357	50	2.226	33.085	26.420	50	7.014	33.711	26.402
75	3.063	33.194	26.438	75	2.063	33.089	26.436	75	6.989	33.708	26.402
100	3.138	33.258	26.482	100	1.690	33.083	26.459	100	6.987	33.781	26.460
125	2.297	33.292	26.581	125	1.502	33.153	26.528	125	7.064	33.846	26.501
150	2.318	33.407	26.671	150	2.030	33.359	26.655	150	7.301	33.901	26.512
175	3.207	33.583	26.735	175	2.829	33.539	26.734	175	7.174	33.894	26.524
200	2.817	33.607	26.789	200	3.715	33.713	26.790	200	7.081	33.883	26.528
250	3.354	33.793	26.889					250	6.140	33.794	26.582
300	3.486	33.892	26.955					300	5.002	33.784	26.711
400	3.464	34.038	27.074					400	4.309	33.880	26.863
500	3.611	34.172	27.166					500	3.977	33.986	26.982
600	3.282	34.225	27.241					600	3.912	34.123	27.098
700	3.151	34.296	27.309					700	3.665	34.206	27.189
800	3.034	34.346	27.360					800	3.433	34.282	27.271
900	2.770	34.362	27.396					900	3.121	34.320	27.331
1000	2.595	34.400	27.442					1000	2.928	34.364	27.384
1200	2.480	34.464	27.503								
1500	2.227	34.530	27.577								
2000	1.895	34.600	27.659								
2500	1.661	34.642	27.711								
3000	1.543	34.663	27.737								
3500	1.487	34.675	27.750								
4000	1.465	34.683	27.758								
4500	1.477	34.688	27.761								
5000	1.517	34.690	27.760								

Station OS17023				Station OS17024				Station OS17025			
Latitude 42-30.00 N				Latitude 42-00.70 N				Latitude 41-45.12 N			
Longitude 154-49.99 E				Longitude 155-00.61 E				Longitude 154-59.99 E			
Depth(m) 5200				Depth(m) 5400				Depth(m) 5500			
Depth	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Depth	Temp.	Sal.	SIG-T
5	7.466	33.691	-	5	6.996	33.628	26.338	5	7.607	33.670	-
10	7.476	33.701	-	10	7.006	33.629	26.338	10	7.597	33.679	-
20	7.457	33.708	-	20	6.907	33.640	26.360	20	7.597	33.690	-
30	7.438	33.709	-	30	6.826	33.648	26.377	30	7.597	33.701	-
40	7.332	33.712	-	40	6.759	33.651	26.389	40	7.616	33.707	-
50	7.312	33.726	-	50	6.466	33.651	26.428	50	7.576	33.715	-
75	6.548	33.731	-	75	5.844	33.660	26.513	75	7.407	33.849	-
100	7.225	33.863	-	100	5.764	33.664	26.526	100	5.909	33.659	-
125	7.274	33.886	-	125	5.717	33.672	26.538	125	5.936	33.681	-
150	6.994	33.853	-	150	5.677	33.677	26.547	150	5.723	33.666	-
175	7.090	33.871	-	175	5.588	33.683	26.562	175	5.645	33.678	-
200	6.761	33.822	-	200	5.341	33.691	26.598	200	5.331	33.653	-
250	5.710	33.679	-	250	4.607	33.734	26.716	250	4.897	33.739	-
300	5.543	33.737	-	300	4.378	33.798	26.791	300	4.702	33.837	-
400	5.229	33.962	-	400	4.266	33.944	26.918	400	4.352	33.953	-
500	4.220	34.007	-	500	3.981	34.053	27.035	500	4.114	34.074	-
600	4.063	34.135	-	600	3.730	34.150	27.138	600	3.724	34.163	-
700	3.611	34.193	-	700	3.522	34.229	27.221	700	3.553	34.252	-
800	3.420	34.271	-	800	3.346	34.284	27.282	800	3.318	34.304	-
900	3.175	34.332	-	900	3.129	34.335	27.343	900	3.080	34.354	-
1000	2.896	34.366	-	1000	2.952	34.376	27.391	1000	2.888	34.401	-
1200	2.612	34.455	-					1200	2.604	34.468	-
1500	2.317	34.524	-					1500	2.302	34.541	-

Station OS17026				Station OS17027			
Latitude 40-59.98 N				Latitude 40-14.83 N			
Longitude 154-59.98 E				Longitude 155-00.03 E			
Depth(m) 5500				Depth(m) 5550			
Depth	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	8.658	33.853	-	5	13.068	34.463	25.963
10	8.572	33.864	-	10	13.057	34.469	25.970
20	8.524	33.868	-	20	13.019	34.503	26.004
30	8.429	33.863	-	30	12.936	34.568	26.071
40	8.343	33.881	-	40	12.918	34.567	26.074
50	8.314	33.884	-	50	12.568	34.440	26.045
75	7.605	33.857	-	75	11.527	34.359	26.180
100	7.243	33.842	-	100	11.254	34.357	26.228
125	6.409	33.733	-	125	11.029	34.342	26.258
150	6.074	33.710	-	150	10.800	34.322	26.283
175	5.900	33.713	-	175	10.335	34.253	26.311
200	5.871	33.723	-	200	9.626	34.146	26.348
250	5.235	33.744	-	250	7.316	33.800	26.430
300	4.900	33.800	-	300	6.523	33.750	26.498
400	4.405	33.945	-	400	3.985	33.669	26.729
500	4.097	34.039	-	500	4.885	34.017	26.909
600	3.741	34.150	-	600	4.338	34.096	27.032
700	3.508	34.223	-	700	3.915	34.163	27.129
800	3.317	34.290	-	800	3.682	34.230	27.206
900	3.166	34.339	-	900	3.484	34.306	27.286
1000	2.965	34.390	-	1000	3.263	34.348	27.340
1200	2.651	34.443	-				
1500	2.336	34.510	-				

5. Data on drift gillnet research

Table 3. Position and research conditions of surface drift gillnet sampling at each station during the Oshoro maru Cruise #039 2017.

Station	Date and Time (S.M.T.*1)				T.D.*2	Set Position		D.S.*3	bottom depth(m)	Wr*4	Wind (Force)	S.T.*5 (°C)
	Net set		Net haul			Lat.	Long.					
OSG 1701	May 15	1750-1812	May 16	0457-0601	+10h	43-56.0N	155-00.0 E	300	5329	o	NE-4	5.6
OSG 1702	May 16	1755-1820	May 17	0500-0627	+10h	43-15.0N	155-00.4 E	030	5465	o	SE-6	7.0
OSG 1703	May 17	1800-1823	May 18	0458-0609	+10h	42-00.3N	155-00.1 E	140	5407	o	WNW-5	6.9
OSG 1704	May 18	1752-1813	May 19	0456-0552	+10h	40-14.2N	155-00.2 E	115	5545	o	WNW-4	12.9

*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).

*5 S.T. : Surface temperature

Table 4. The gillnet configuration

Stations	net	A-Gear		C-gear										Total
	Mesh size (mm)	112	115	48	55	63	72	82	93	106	121	138	157	
OSG1701-04	Number of tan	6	6	3	3	3	5	6	5	3	3	3	3	49

Table 5. The number of organisms caught by drift gillnet during the Oshoro maru Cruise # 039, in May 2017. CPUE and (%)

indicate numerical catch per tan and percentage of total catch by C-gear gillnet at the station, respectively.

Station		OSG 1701				OSG 1702				OSG 1703				OSG 1704			
Common name	Scientific name	C		A	Total	C		A	Total	C		A	Total	C		A	Total
		CPUE	(%)			CPUE	(%)			CPUE	(%)			CPUE	(%)		
Sockeye salmon	<i>Oncorhynchus nerka</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 (0.0)	0	0
Chum salmon	<i>Oncorhynchus keta</i>	12	0.4 (1.6)	3	15	8	0.3 (1.5)	5	13	12	0.4 (1.9)	5	17	1	0.0 (0.3)	3	4
Pink salmon	<i>Oncorhynchus gorbuscha</i>	736	24.5 (97.9)	6	742	541	18.0 (98.2)	1	542	611	20.4 (97.4)	1	612	0	0.0 (0.0)	0	0
Coho salmon	<i>Oncorhynchus kisutch</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 (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	0.0 (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 (0.0)	0	0
Tufted Puffin	<i>Fratercula cirrhata</i>	0	0.0 (0.0)	1	1	1	0.0 (0.2)	0	1	2	0.1 (0.3)	0	2	0	0.0 (0.0)	0	0
Boreal clubhook squid	<i>Onychoteuthis borealijaponica</i>	0	0.0 (0.0)	0	0	1	0.0 (0.2)	0	1	0	0.0 (0.0)	0	0	23	0.8 (7.7)	0	23
Boreopacific gonate squid	<i>Gonatopsis borealis</i>	4	0.133 (0.5)	0	4	0	0.0 (0.0)	0	0	0	0.0 (0.0)	0	0	2	0.1 (0.7)	0	2
Neon flying squid	<i>Ommastrephes bartramii</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 (0.0)	1	1
Pacific pomfret	<i>Brama japonica</i>	0	0.0 (0.0)	0	0	0	0.0 (0.0)	0	0	0	0.0 (0.0)	0	0	29	0.967 (9.7)	2	31
Albacore tuna	<i>Thunnus alalunga</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 (0.0)	0	0
Blue shark	<i>Prionace glauca</i>	0	0.0 (0.0)	0	0	0	0.0 (0.0)	0	0	0	0.0 (0.0)	0	0	1	0.033 (0.3)	0	1
Shortfin mako shark	<i>Isurus paucus</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 (0.0)	0	0
Salmon shark	<i>Lamna ditropis</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 (0.0)	1	1
Club mackerel	<i>Scomber japonicus</i>	0	0.0 (0.0)	0	0	0	0.0 (0.0)	0	0	2	0.067 (0.3)	0	2	240	8.0 (80.5)	5	245
Spotline sardine	<i>Sardinops melanostictus</i>	0	0.0 (0.0)	0	0	0	0.0 (0.0)	0	0	0	0.0 (0.0)	0	0	2	0.067 (0.7)	0	2

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

Chum salmon											
St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)	St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)
G01	A115	510	1580	2	4	G02	A112	520	1610	1	40
G01	A118	493	1240			G02	A112	512	1570	1	20
G01	A121	495	1540	1	29	G02	A115	528	1740	2	6
G01	C72	442	880	2		G02	A115	481	1205	1	10
G01	C82	443	930	2	3	G02	A118	538	1780	1	23
G01	C93	445	990	2	3	G03	C93	468	1120	1	22
G01	C121	547	1640	1	16	G03	C93	495	1390	1	14
G01	C121	523	1680	2	6	G03	C93	500	1310	1	22
G01	C106	476	1120	2	7	G03	C93	496	1340	2	3
G01	C106	522	1680	1	8	G03	C93	526	1470	1	14
G01	C106	456	1080	1	13	G03	C93	504	1550	2	7
G01	C106	505	1280	2	1	G03	C93	524	1580	1	24
G01	C106	455	980	1	12	G03	C93	431	920	2	5
G01	C106	482	1205	1	7	G03	C93	485	1220	1	11
G01	C106	450	980	2	3	G03	A112	519	1460	1	17
G02	C63	272	202	2	1	G03	A112	489	1380	1	24
G02	C93	448	980	1	8	G03	A115	506	1670	2	4
G02	C93	500	1520	1	24	G03	A115	506	1540	1	30
G02	C93	532	1690	2	7	G03	A115	465	1320	2	10
G02	C93	470	1080	2	4	G04	C106	551	2050	2	16
G02	C93	466	1130	1	10	G04	A115	559	2200	2	35
G02	C106	470	1060	1	10	G04	A115	587	2420	2	4
G02	C106	476	1070	1	11	G04	A115	-	-	-	-

Pink salmon											
St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)	St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)
G01	A112	455	990	2	6	G01	C72	423	730	1	21
G01	A112	430	920	2	3	G01	C72	375	570	1	15
G01	A112	409	820	2	6	G01	C72	415	760	2	5
G01	A112	407	830	2	11	G01	C72	390	590	1	11
G01	A115	460	1160	2	4	G01	C72	384	650	2	2
G01	A118	432	1060	2	6	G01	C72	404	690	2	5
G01	C48	414	820	1	35	G01	C72	386	560	1	5
G01	C48	408	710	1	11	G01	C72	408	730	2	4
G01	C63	380	580	2	6	G01	C72	389	570	1	13
G01	C63	388	640	2	7	G01	C72	409	740	2	6
G01	C63	394	670	1	5	G01	C72	391	580	2	2
G01	C63	392	680	1	13	G01	C72	387	560	2	3
G01	C63	384	560	2	4	G01	C72	402	730	1	18
G01	C63	400	690	2	6	G01	C72	369	530	1	10
G01	C63	410	650	1	21	G01	C72	404	690	1	13
G01	C63	374	570	1	5	G01	C72	406	690	1	8
G01	C63	390	670	1	21	G01	C72	387	605	1	17
G01	C63	412	690	2	3	G01	C72	391	590	1	17
G01	C63	393	580	1	16	G01	C72	395	670	1	22
G01	C63	412	730	2	6	G01	C72	392	615	2	6
G01	C63	383	-	2	3	G01	C72	397	640	2	4
G01	C63	392	600	1	18	G01	C72	399	700	2	4
G01	C63	376	-	1	12	G01	C72	395	690	2	4
G01	C63	379	630	1	20	G01	C72	396	640	2	3
G01	C63	372	550	2	2	G01	C72	402	690	2	3
G01	C63	378	510	1	7	G01	C72	408	640	1	21
G01	C72	424	760	2	2	G01	C72	415	760	2	4
G01	C72	418	690	2	4	G01	C72	395	710	-	-
G01	C72	400	680	1	17	G01	C72	389	690	1	10
G01	C72	394	570	2	3	G01	C72	391	680	1	27
G01	C72	375	590	1	18	G01	C72	388	560	1	12
G01	C72	400	660	1	18	G01	C72	401	640	2	4

Pink salmon

St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)	St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)
G01	C72	384	640	1	15	G01	C93	412	740	2	6
G01	C72	412	700	1	24	G01	C93	444	880	2	4
G01	C72	405	690	2	5	G01	C93	420	680	2	2
G01	C72	394	670	2	6	G01	C93	371	540	2	2
G01	C72	409	680	1	28	G01	C93	488	620	2	3
G01	C72	394	620	1	14	G01	C93	380	610	1	10
G01	C72	355	440	2	2	G01	C93	388	610	1	11
G01	C72	392	620	1	18	G01	C93	384	600	2	4
G01	C72	394	680	1	10	G01	C93	406	680	2	2
G01	C72	400	660	2	3	G01	C93	390	610	2	3
G01	C72	408	680	1	23	G01	C93	410	740	2	6
G01	C72	386	640	1	13	G01	C93	420	710	2	2
G01	C72	490	680	2	7	G01	C93	379	560	1	11
G01	C72	495	650	1	19	G01	C93	406	710	2	1
G01	C72	382	-	1	5	G01	C93	420	760	2	5
G01	C72	386	620	2	6	G01	C93	437	820	1	7
G01	C72	384	630	2	9	G01	C93	409	680	2	2
G01	C72	374	560	1	6	G01	C93	406	710	2	4
G01	C72	396	630	1	16	G01	C93	455	1020	2	4
G01	C72	429	980	2	8	G01	C93	396	680	2	4
G01	C72	385	-	1	7	G01	C93	400	660	2	3
G01	C72	396	710	2	4	G01	C93	419	810	1	8
G01	C72	388	650	2	3	G01	C93	386	680	2	2
G01	C72	393	640	1	13	G01	C93	409	715	1	8
G01	C72	388	605	2	5	G01	C93	410	680	2	6
G01	C72	405	710	1	25	G01	C93	431	880	1	26
G01	C72	374	530	2	3	G01	C93	401	700	2	4
G01	C72	392	610	2	4	G01	C93	394	680	1	15
G01	C72	354	490	2	2	G01	C93	324	910	2	3
G01	C72	395	690	2	3	G01	C93	385	580	2	4
G01	C72	393	610	2	2	G01	C93	401	720	2	2
G01	C72	390	615	2	3	G01	C93	389	620	2	5
G01	C72	388	610	1	18	G01	C93	402	710	2	9
G01	C72	396	650	2	3	G01	C93	445	940	2	1
G01	C72	394	640	2	5	G01	C93	416	720	2	2
G01	C72	408	750	1	22	G01	C93	411	740	2	2
G01	C72	364	515	1	8	G01	C93	399	640	2	3
G01	C72	404	690	1	17	G01	C93	444	910	2	5
G01	C72	406	680	1	23	G01	C93	412	770	1	10
G01	C72	406	580	2	5	G01	C93	401	650	2	5
G01	C72	390	590	2	3	G01	C93	465	1040	2	6
G01	C72	385	605	2	4	G01	C93	441	860	1	7
G01	C72	391	660	1	22	G01	C93	416	740	1	32
G01	C72	394	610	2	5	G01	C93	412	780	1	18
G01	C72	387	650	1	9	G01	C93	409	750	2	4
G01	C72	385	630	1	14	G01	C93	407	760	2	4
G01	C72	370	550	1	18	G01	C93	412	690	2	4
G01	C72	403	690	2	3	G01	C93	442	830	1	28
G01	C72	398	690	1	20	G01	C93	417	780	1	26
G01	C72	400	690	2	8	G01	C93	414	770	2	3
G01	C72	380	-	1	7	G01	C93	403	690	2	2
G01	C72	404	640	2	3	G01	C93	424	770	1	27
G01	C72	392	630	2	3	G01	C93	404	750	1	22
G01	C72	410	720	2	4	G01	C93	403	715	2	2
G01	C72	391	670	2	3	G01	C93	399	680	1	14
G01	C72	396	680	1	6	G01	C93	391	720	2	4
G01	C72	390	660	1	17	G01	C93	432	815	2	4
G01	C72	412	690	1	7	G01	C93	406	715	2	4
G01	C93	409	740	2	7	G01	C93	385	610	2	4
G01	C93	440	880	2	5	G01	C93	416	720	1	17
G01	C93	410	820	2	3	G01	C93	410	690	2	2
G01	C93	439	880	1	13	G01	C93	412	810	2	5
G01	C93	408	800	2	4	G01	C93	428	805	1	27
G01	C93	418	760	2	1	G01	C93	412	715	1	20
G01	C93	411	740	1	22	G01	C93	393	630	2	3
G01	C93	404	720	2	2	G01	C93	408	715	2	2

Pink salmon

St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)	St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)
G01	C93	408	700	1	17	G01	C106	437	930	2	20
G01	C93	396	690	2	4	G01	C106	438	980	2	6
G01	C93	327	850	2	5	G01	C121	459	1180	2	16
G01	C93	412	740	1	13	G02	C63	388	680	1	26
G01	C93	421	830	2	7	G02	C63	374	540	1	16
G01	C93	420	780	1	17	G02	C63	390	630	2	2
G01	C93	403	770	1	31	G02	C63	392	615	1	22
G01	C93	404	730	2	4	G02	C63	400	960	2	2
G01	C93	397	650	1	7	G02	C63	388	580	2	5
G01	C93	394	710	2	4	G02	C63	396	605	1	14
G01	C93	418	720	1	25	G02	C63	386	640	1	15
G01	C93	415	770	1	7	G02	C63	384	590	1	12
G01	C93	406	760	2	3	G02	C63	392	570	1	18
G01	C93	418	805	2	3	G02	C63	386	590	2	3
G01	C93	425	860	2	5	G02	C63	384	605	2	4
G01	C93	415	780	2	5	G02	C63	376	540	1	16
G01	C93	402	730	-	-	G02	C63	380	540	2	4
G01	C93	415	750	2	10	G02	C63	380	-	1	19
G01	C93	429	780	2	8	G02	C63	412	640	1	21
G01	C93	416	805	1	25	G02	C63	400	605	2	4
G01	C93	414	790	2	4	G02	C63	398	650	1	8
G01	C93	420	770	1	28	G02	C63	396	660	2	6
G01	C93	401	750	2	4	G02	C63	396	670	2	6
G01	C93	416	800	1	34	G02	C63	378	570	1	16
G01	C93	392	690	1	16	G02	C63	380	570	1	24
G01	C93	393	630	1	18	G02	C63	396	580	1	18
G01	C93	392	670	1	32	G02	C72	386	640	1	11
G01	C93	422	830	1	34	G02	C72	386	605	1	26
G01	C93	402	710	2	4	G02	C72	400	660	2	8
G01	C93	400	670	1	17	G02	C72	410	650	2	6
G01	C93	414	715	1	8	G02	C72	390	630	2	2
G01	C93	404	705	2	5	G02	C72	366	560	1	12
G01	C93	418	750	2	2	G02	C72	392	570	1	5
G01	C93	433	850	2	10	G02	C72	395	620	1	21
G01	C93	394	650	1	25	G02	C72	368	540	1	5
G01	C93	419	805	2	3	G02	C72	396	580	2	1
G01	C93	416	715	1	27	G02	C72	438	770	2	2
G01	C93	402	715	2	5	G02	C72	390	615	1	16
G01	C93	392	630	1	20	G02	C72	388	570	1	17
G01	C93	373	580	1	7	G02	C72	396	610	1	16
G01	C93	420	790	2	4	G02	C72	398	625	2	3
G01	C93	422	830	2	6	G02	C72	350	470	2	2
G01	C93	393	690	1	19	G02	C72	374	560	2	2
G01	C93	428	805	2	10	G02	C72	410	720	1	20
G01	C93	429	890	2	4	G02	C72	394	610	1	21
G01	C93	433	900	1	11	G02	C72	398	620	2	1
G01	C93	408	750	2	4	G02	C72	380	560	1	13
G01	C93	389	680	1	7	G02	C72	382	630	1	20
G01	C93	390	650	2	2	G02	C72	402	640	1	18
G01	C106	412	840	2	6	G02	C72	392	605	1	11
G01	C106	425	840	2	3	G02	C72	404	660	1	8
G01	C106	421	830	2	8	G02	C72	396	680	1	5
G01	C106	427	860	2	6	G02	C72	382	560	1	7
G01	C106	439	920	2	4	G02	C72	394	630	1	18
G01	C106	437	970	1	28	G02	C72	400	620	2	4
G01	C106	445	930	2	4	G02	C72	370	540	2	2
G01	C106	435	980	2	6	G02	C72	404	740	1	22
G01	C106	439	890	2	4	G02	C72	402	660	2	2
G01	C106	404	690	1	32	G02	C72	440	840	2	2
G01	C106	436	915	1	11	G02	C72	398	610	2	4
G01	C106	437	930	2	3	G02	C72	402	690	1	20
G01	C106	388	720	2	3	G02	C72	400	690	1	23
G01	C106	423	930	1	38	G02	C72	380	615	1	18
G01	C106	421	850	1	28	G02	C72	400	590	1	15
G01	C106	430	760	2	6	G02	C72	410	680	2	3
G01	C106	450	910	2	4	G02	C72	388	615	1	15

Pink salmon

St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)	St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)
G02	C72	390	590	1	7	G02	C82	414	680	2	4
G02	C72	406	670	1	25	G02	C82	400	630	1	11
G02	C72	380	530	1	23	G02	C82	410	670	2	2
G02	C72	404	615	1	8	G02	C82	384	550	2	3
G02	C72	376	680	2	5	G02	C82	420	695	2	4
G02	C72	408	690	2	5	G02	C82	394	605	1	17
G02	C72	386	590	2	8	G02	C82	380	590	1	22
G02	C72	388	580	1	28	G02	C82	406	650	2	2
G02	C72	392	630	1	26	G02	C82	390	640	1	19
G02	C72	412	705	1	19	G02	C82	388	610	1	16
G02	C72	382	580	2	4	G02	C82	380	620	1	17
G02	C72	406	760	2	6	G02	C82	412	720	2	4
G02	C72	402	660	2	2	G02	C82	420	690	2	8
G02	C72	388	600	1	15	G02	C82	372	540	1	20
G02	C72	378	610	1	15	G02	C93	404	710	1	26
G02	C72	396	610	1	20	G02	C93	414	780	1	16
G02	C72	372	570	2	2	G02	C93	406	680	1	37
G02	C72	410	730	1	27	G02	C93	412	700	1	14
G02	C72	372	550	1	21	G02	C93	444	780	2	6
G02	C72	352	480	1	12	G02	C93	406	710	2	3
G02	C82	414	750	1	44	G02	C93	412	705	2	3
G02	C82	416	690	2	3	G02	C93	412	690	2	5
G02	C82	400	605	1	12	G02	C93	424	790	2	3
G02	C82	402	590	1	9	G02	C93	442	930	2	5
G02	C82	398	695	2	6	G02	C93	404	670	2	2
G02	C82	374	610	1	9	G02	C93	410	790	1	17
G02	C82	400	670	2	5	G02	C93	404	740	2	3
G02	C82	380	595	2	4	G02	C93	406	680	2	4
G02	C82	396	630	2	3	G02	C93	398	660	1	17
G02	C82	422	740	2	7	G02	C93	394	660	1	21
G02	C82	388	615	2	2	G02	C93	400	650	2	3
G02	C82	390	590	2	7	G02	C93	408	700	2	4
G02	C82	408	680	2	3	G02	C93	388	690	1	22
G02	C82	390	615	2	3	G02	C93	424	730	2	5
G02	C82	392	615	1	12	G02	C93	422	810	2	3
G02	C82	400	650	1	21	G02	C93	398	690	1	21
G02	C82	388	630	1	17	G02	C93	426	770	2	10
G02	C82	398	715	2	6	G02	C93	412	750	2	6
G02	C82	382	605	1	21	G02	C93	478	1080	2	6
G02	C82	388	680	1	36	G02	C93	380	640	2	4
G02	C82	380	550	2	3	G02	C93	414	740	1	28
G02	C82	382	560	1	8	G02	C93	408	710	2	4
G02	C82	424	840	2	5	G02	C93	412	680	1	15
G02	C82	414	710	1	24	G02	C93	426	805	2	5
G02	C82	396	620	2	3	G02	C93	414	750	2	5
G02	C82	392	590	2	2	G02	C93	432	780	2	4
G02	C82	410	710	1	14	G02	C93	402	730	1	17
G02	C82	404	670	2	5	G02	C93	420	740	1	13
G02	C82	408	715	2	5	G02	C93	416	730	1	30
G02	C82	432	770	2	5	G02	C93	416	740	1	23
G02	C82	406	710	2	3	G02	C93	414	730	1	33
G02	C82	388	595	2	5	G02	C93	392	630	1	16
G02	C82	396	605	1	7	G02	C93	396	615	1	20
G02	C82	426	720	2	2	G02	C93	404	610	1	13
G02	C82	386	640	1	13	G02	C93	442	780	2	3
G02	C82	392	595	1	22	G02	C93	418	715	1	13
G02	C82	394	570	1	20	G02	C93	408	740	2	4
G02	C82	380	580	1	9	G02	C93	416	715	1	32
G02	C82	396	615	1	13	G02	C93	440	660	2	3
G02	C82	400	605	2	4	G02	C93	412	680	1	8
G02	C82	384	590	2	3	G02	C93	410	730	2	3
G02	C82	392	625	2	7	G02	C93	406	690	2	3
G02	C82	384	570	2	3	G02	C93	406	705	2	4
G02	C82	388	610	1	14	G02	C93	412	730	1	33
G02	C82	372	590	1	18	G02	C93	400	690	2	5
G02	C82	378	550	1	7	G02	C93	408	750	2	5

Pink salmon

St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)	St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)
G02	C93	404	670	1	6	G03	C72	406	610	1	17
G02	C93	414	705	1	21	G03	C72	397	620	1	15
G02	C93	396	670	1	26	G03	C72	384	550	1	13
G02	C93	420	760	2	5	G03	C72	380	530	1	13
G02	C93	406	690	2	5	G03	C72	396	600	2	2
G02	C93	428	780	2	6	G03	C72	390	580	1	5
G02	C93	422	760	2	3	G03	C72	396	610	1	9
G02	C93	400	680	2	5	G03	C72	405	620	1	7
G02	C106	438	940	2	2	G03	C72	368	510	1	9
G02	C106	440	940	2	8	G03	C72	384	570	1	14
G02	C106	430	860	2	2	G03	C72	368	505	2	3
G02	A121	412	710	1	9	G03	C72	374	515	2	2
G03	C63	391	605	2	3	G03	C72	409	670	1	14
G03	C63	392	610	1	14	G03	C72	368	560	1	10
G03	C63	371	550	1	27	G03	C72	402	640	2	5
G03	C63	370	590	1	14	G03	C72	429	780	1	11
G03	C63	370	550	1	6	G03	C72	391	630	1	30
G03	C63	353	470	1	11	G03	C72	356	460	2	2
G03	C63	370	490	1	12	G03	C72	381	490	1	4
G03	C63	347	470	2	4	G03	C72	388	520	1	6
G03	C63	375	510	2	2	G03	C72	386	580	2	1
G03	C63	388	570	1	6	G03	C72	400	620	2	3
G03	C63	376	550	1	7	G03	C72	382	550	2	2
G03	C63	370	525	1	5	G03	C72	382	590	2	3
G03	C63	403	660	1	12	G03	C72	409	620	2	4
G03	C63	394	610	2	4	G03	C72	388	590	2	3
G03	C63	422	750	2	6	G03	C72	395	610	1	16
G03	C63	384	570	2	3	G03	C72	379	490	1	6
G03	C63	388	560	1	18	G03	C72	391	640	2	4
G03	C63	389	580	1	7	G03	C72	389	520	1	6
G03	C63	395	590	2	2	G03	C72	402	620	2	4
G03	C63	421	740	2	2	G03	C72	392	580	1	5
G03	C63	388	610	1	18	G03	C72	382	510	1	6
G03	C63	382	560	2	3	G03	C72	377	570	2	4
G03	C63	382	555	1	12	G03	C72	376	540	2	3
G03	C63	394	640	2	5	G03	C72	401	650	2	2
G03	C63	382	540	2	2	G03	C72	380	590	2	1
G03	C63	366	515	2	6	G03	C72	364	550	1	16
G03	C63	375	570	1	8	G03	C72	396	595	2	4
G03	C63	400	615	1	19	G03	C72	386	590	1	19
G03	C63	375	530	1	13	G03	C72	394	550	1	18
G03	C63	390	640	1	12	G03	C72	392	640	1	13
G03	C63	423	760	2	3	G03	C72	402	630	2	3
G03	C63	407	630	1	8	G03	C72	377	540	1	5
G03	C63	398	620	1	11	G03	C72	348	440	2	2
G03	C63	387	520	2	2	G03	C72	376	580	1	17
G03	C63	367	490	1	11	G03	C82	495	1380	2	6
G03	C63	365	540	2	2	G03	C82	385	640	1	23
G03	C63	382	515	1	6	G03	C82	400	705	1	15
G03	C63	380	510	1	5	G03	C82	384	625	2	3
G03	C63	400	640	1	15	G03	C82	404	690	2	5
G03	C63	388	610	1	19	G03	C82	392	580	1	14
G03	C72	374	560	2	2	G03	C82	385	580	2	6
G03	C72	403	630	2	2	G03	C82	398	610	1	23
G03	C72	418	720	2	2	G03	C82	357	480	1	8
G03	C72	400	610	2	3	G03	C82	375	550	1	15
G03	C72	362	470	2	2	G03	C82	412	670	1	13
G03	C72	370	480	2	2	G03	C82	402	650	2	4
G03	C72	390	515	2	3	G03	C82	385	560	1	18
G03	C72	416	660	1	5	G03	C82	393	660	2	3
G03	C72	390	630	1	6	G03	C82	385	530	1	7
G03	C72	380	540	1	5	G03	C82	396	630	2	5
G03	C72	361	510	1	18	G03	C82	387	540	1	12
G03	C72	398	580	2	3	G03	C82	376	570	2	2
G03	C72	400	610	2	4	G03	C82	400	650	1	12
G03	C72	366	540	1	17	G03	C82	375	570	1	14

Pink salmon											
St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)	St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)
G03	C82	382	540	1	6	G03	C93	396	640	1	11
G03	C82	401	570	2	3	G03	C93	428	760	2	2
G03	C82	400	580	2	4	G03	C93	437	830	2	2
G03	C82	386	550	2	3	G03	C93	412	710	2	3
G03	C82	393	590	2	3	G03	C93	452	880	2	3
G03	C82	410	670	2	6	G03	C93	394	710	2	2
G03	C82	396	560	1	7	G03	C93	416	730	1	18
G03	C82	402	630	1	26	G03	C93	392	660	2	8
G03	C82	387	590	1	7	G03	C93	413	705	2	4
G03	C82	375	530	1	12	G03	C93	415	740	2	3
G03	C82	374	495	1	6	G03	C93	397	640	2	3
G03	C82	400	730	1	20	G03	C93	396	670	1	32
G03	C82	417	670	2	5	G03	C93	322	770	2	4
G03	C82	391	610	1	15	G03	C93	415	720	1	15
G03	C82	377	570	1	8	G03	C93	400	680	2	2
G03	C82	387	560	1	14	G03	C93	402	760	1	30
G03	C82	389	560	2	6	G03	C93	409	690	1	15
G03	C82	410	680	2	4	G03	C93	412	670	2	3
G03	C82	394	605	1	6	G03	C93	417	705	2	2
G03	C82	387	570	1	25	G03	C93	406	630	2	3
G03	C82	369	495	2	3	G03	C93	402	680	2	4
G03	C82	373	555	1	12	G03	C93	391	630	2	3
G03	C82	394	620	1	23	G03	C93	392	620	1	19
G03	C82	392	610	1	6	G03	C93	391	690	1	13
G03	C82	420	750	1	19	G03	C93	417	640	2	6
G03	C82	390	620	1	12	G03	C93	439	840	1	35
G03	C82	375	515	2	4	G03	C93	400	660	1	16
G03	C82	369	540	2	3	G03	C93	411	690	2	4
G03	C82	403	650	1	9	G03	C93	427	850	2	6
G03	C82	372	505	1	11	G03	C93	411	670	2	8
G03	C82	371	560	2	4	G03	C93	408	685	2	3
G03	C82	406	630	1	12	G03	C93	402	750	1	11
G03	C82	385	630	1	27	G03	C93	409	690	1	11
G03	C82	368	490	2	3	G03	C93	413	740	1	8
G03	C82	378	500	1	7	G03	C93	410	710	1	31
G03	C82	397	590	2	3	G03	C93	398	680	2	5
G03	C82	397	610	2	4	G03	C93	426	750	1	13
G03	C82	399	640	2	7	G03	C93	412	715	1	15
G03	C82	378	590	1	21	G03	C93	396	620	2	2
G03	C82	394	580	1	25	G03	C93	403	650	1	22
G03	C82	405	690	1	14	G03	C93	412	715	1	13
G03	C93	420	740	1	14	G03	C93	415	710	1	30
G03	C93	436	750	2	4	G03	C93	437	830	2	3
G03	C93	370	615	1	20	G03	C93	406	710	1	10
G03	C93	430	860	1	12	G03	C93	404	650	2	3
G03	C93	400	720	2	2	G03	C93	411	740	2	9
G03	C93	429	840	2	1	G03	C93	346	630	2	4
G03	C93	403	690	1	9	G03	C93	407	690	2	5
G03	C93	423	760	2	1	G03	C93	385	560	1	13
G03	C93	428	770	2	6	G03	C93	411	670	2	3
G03	C93	466	1040	2	2	G03	A121	476	1330	2	8

6. Data on salmon longline and hook-and-line research

Table 7. Position and research conditions of surface longline and hook-and-line sampling at each station.

Station	Date and Time (S.M.T.*1)				T.D.*2	Set Position		D.S.*3	Number of baskets	bottom depth(m)	Wr*4	Wind (Force)	S.T.*5 (°C)
	Line set		Line haul			Lat.	Long.						
OSSL1701	May 18	0400-0430	May 18	0632-0746	+10h	41-55.0N	155-01.6E	310	20	5425	o	NW-5	6.8
OSHL1701	May 15	2000	May 16	0300	+10h	44-00.0N	155-00.0E	-	-	5285	o	ESE-2	4.0
OSHL1702	May 16	2055	May 17	0400	+10h	43-14.7N	155-00.3E	-	-	5469	r	ESE-6	7.1
OSHL1703	May 17	2200	May 18	0300	+10h	42-02.8N	154-59.2E	-	-	5507	o	WNW-5	6.8
OSHL1704	May 18	2000	May 19	0400	+11h	40-14.2N	155-00.4E	-	-	5545	o	NW-4	13.0

*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 (f: fog, o: 100% clouded, r: rain).

*5 S.T. : Surface temperature

Table 8. The catch number of each salmonid at each station where salmonids were collected by hook-and-line gear and surface longline.

Station Name	Sampling gear	Species name						Total
		Sockeye	Chum	Pink	Coho	Chinook	Stellhead	
OSSL 1701	Surface longline	0	4	77	0	0	0	81
OSHL 1701	Hook-and-line	0	1	12	0	0	0	13
OSHL 1702	Hook-and-line	0	0	29	0	0	0	29
OSHL 1703	Hook-and-line	0	9	285	0	0	0	294
OSHL 1704	Hook-and-line	0	5	0	0	0	0	5
Total		0	19	403	0	0	0	422

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

Chum salmon

St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)	St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)
HL01	O000	542	1800	1	21	HL03	O000	489	1140	2	2
SL01	B000	526	1960			HL03	O000	549	1810	1	38
SL01	B000	540	2000	1	49	HL03	O000	485	1260	2	1
SL01	B000	503	1500	1	12	HL03	O000	430	815	1	17
SL01	B000	635	2900	2	5	HL04	O000	474	1240	1	11
HL03	O000	475	1240	1	9	HL04	O000	538	1770	2	1
HL03	O000	524	1550	1	17	HL04	O000	518	1420	2	4
HL03	O000	548	2000	2	12	HL04	O000	519	1560	1	55
HL03	O000	435	980	1	8	HL04	O000	512	1600	2	2
HL03	O000	520	1280	2	4						

Pink salmon

St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)	St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)
HL01	O000	398	700	-	-	HL02	O000	380	610	-	-
HL01	O000	418	860	-	-	HL02	O000	407	660	-	-
HL01	O000	410	710	-	-	HL02	O000	422	780	-	-
HL01	O000	410	760	-	-	HL02	O000	390	690	-	-
HL01	O000	412	810	-	-	HL02	O000	391	670	-	-
HL01	O000	414	780	-	-	HL02	O000	400	670	-	-
HL01	O000	422	810	-	-	HL02	O000	430	1050	-	-
HL01	O000	392	710	-	-	HL02	O000	418	730	-	-
HL01	O000	420	740	-	-	HL02	O000	390	605	-	-
HL01	O000	416	710	-	-	HL02	O000	389	590	-	-
HL01	O000	406	700	-	-	HL02	O000	411	690	-	-
HL01	O000	400	710	-	-	HL02	O000	391	650	-	-
HL02	O000	398	630	-	-	HL02	O000	385	640	-	-
HL02	O000	372	550	-	-	HL02	O000	397	620	-	-
HL02	O000	378	605	-	-	HL02	O000	431	790	-	-

Pink salmon

St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)	St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)
HL02	O000	443	950	-	-	SL01	B000	417	740	2	2
HL02	O000	389	630	-	-	SL01	B000	419	710	2	3
HL02	O000	409	670	-	-	SL01	B000	390	580	1	9
HL02	O000	419	830	1	32	SL01	B000	394	620	2	5
HL02	O000	407	770	2	3	SL01	B000	393	590	2	3
HL02	O000	404	720	1	31	HL03	O000	392	620	2	4
HL02	O000	456	1190	2	7	HL03	O000	383	625	1	15
HL02	O000	406	660	2	6	HL03	O000	432	850	1	25
HL02	O000	414	680	1	9	HL03	O000	402	660	1	15
HL02	O000	402	630	2	1	HL03	O000	400	630	1	7
HL02	O000	420	830	1	23	HL03	O000	411	710	2	1
SL01	B000	358	490	1	6	HL03	O000	399	700	2	3
SL01	B000	393	680	1	16	HL03	O000	400	670	2	2
SL01	B000	374	570	2	4	HL03	O000	408	680	2	1
SL01	B000	407	650	2	3	HL03	O000	398	660	2	1
SL01	B000	412	680	2	4	HL03	O000	408	685	1	6
SL01	B000	381	540	1	7	HL03	O000	365	550	1	7
SL01	B000	381	570	2	3	HL03	O000	394	690	1	6
SL01	B000	406	650	1	26	HL03	O000	395	700	1	7
SL01	B000	380	530	2	4	HL03	O000	405	710	1	22
SL01	B000	416	640	2	5	HL03	O000	374	525	2	1
SL01	B000	398	630	2	3	HL03	O000	394	610	1	20
SL01	B000	389	580	2	3	HL03	O000	353	475	2	2
SL01	B000	384	550	1	13	HL03	O000	388	650	1	8
SL01	B000	418	660	2	5	HL03	O000	395	620	2	1
SL01	B000	394	630	1	10	HL03	O000	384	650	1	6
SL01	B000	405	650	1	8	HL03	O000	389	570	1	13
SL01	B000	391	595	1	8	HL03	O000	393	610	1	18
SL01	B000	388	580	1	15	HL03	O000	458	1180	2	14
SL01	B000	368	530	2	3	HL03	O000	395	590	2	1
SL01	B000	358	460	2	3	HL03	O000	392	610	2	2
SL01	B000	401	640	1	30	HL03	O000	383	550	2	7
SL01	B000	398	610	1	25	HL03	O000	460	960	2	4
SL01	B000	420	710	2	8	HL03	O000	392	550	1	6
SL01	B000	399	640	1	12	HL03	O000	363	440	1	2
SL01	B000	395	680	1	15	HL03	O000	405	700	2	3
SL01	B000	379	590	2	7	HL03	O000	398	650	2	3
SL01	B000	397	640	1	10	HL03	O000	414	710	1	8
SL01	B000	393	630	1	14	HL03	O000	394	610	1	7
SL01	B000	384	495	1	7	HL03	O000	386	560	1	9
SL01	B000	407	640	2	3	HL03	O000	402	700	1	14
SL01	B000	400	640	2	4	HL03	O000	413	700	1	28
SL01	B000	388	540	2	4	HL03	O000	360	465	1	5
SL01	B000	391	570	1	10	HL03	O000	379	580	1	27
SL01	B000	393	605	1	6	HL03	O000	377	580	1	12
SL01	B000	415	630	2	2	HL03	O000	396	570	2	2
SL01	B000	374	540	1	12	HL03	O000	383	540	2	1
SL01	B000	376	515	1	6	HL03	O000	357	470	1	10
SL01	B000	394	640	1	27	HL03	O000	419	680	1	7
SL01	B000	391	580	1	12	HL03	O000	369	550	1	17
SL01	B000	387	560	2	2	HL03	O000	356	530	2	3
SL01	B000	425	850	2	6	HL03	O000	406	660	2	2
SL01	B000	413	740	1	13	HL03	O000	405	680	2	5
SL01	B000	366	510	2	3	HL03	O000	382	580	1	14
SL01	B000	416	670	2	3	HL03	O000	375	520	2	1
SL01	B000	435	950	2	6	HL03	O000	400	650	1	7
SL01	B000	423	750	2	3	HL03	O000	367	515	1	9
SL01	B000	391	630	1	14	HL03	O000	381	590	1	12
SL01	B000	396	640	1	10	HL03	O000	390	580	1	5
SL01	B000	343	430	2	3	HL03	O000	383	520	1	4
SL01	B000	374	530	2	6	HL03	O000	398	680	2	3
SL01	B000	412	710	1	15	HL03	O000	396	640	2	3
SL01	B000	395	620	1	16	HL03	O000	397	660	2	3
SL01	B000	402	630	1	8	HL03	O000	382	550	1	6
SL01	B000	393	610	1	10	HL03	O000	400	670	1	6
SL01	B000	406	690	2	4						

**THE "OSHORO MARU" CRUISE 040
TO JAPAN SEA, AND
THE NORTHWEST PACIFIC OCEAN, THE BERING SEA and CHUKCHI SEA
IN JUNE TO AUGUST 2017**

1. Cruise Itinerary

Cruise 040

Departure from Hakodate (Leg1)	June.	05, 2017
Start hydrographic research		06
Finish hydrographic research		09
Return to Hakodate		10
Departure from Hakodate (Leg2)		12
Arrival at Tokyo		15
Departure from Tokyo (Leg3)		18
Start hydrographic research		24
Date change, repeat June 27 th		27
Finish hydrographic research	July,	02
Arrival at Dutch Harbor		03
Departure from Dutch Harbor (Leg4)		06
Start hydrographic research		09
Finish hydrographic research and arrival at Nome		14
Departure from Nome and start hydrographic research (Leg5)		16
Date change, skip July 25 th		25
Finish hydrographic research		30
Return to Hakodate	August,	01

Total coverage 8487.7miles

(Leg1: 530.5n.m., Leg2: 672.8n.m., Leg3: 3382.5n.m., Leg4: 1053.4n.m., Leg5: 2848.5n.m.)

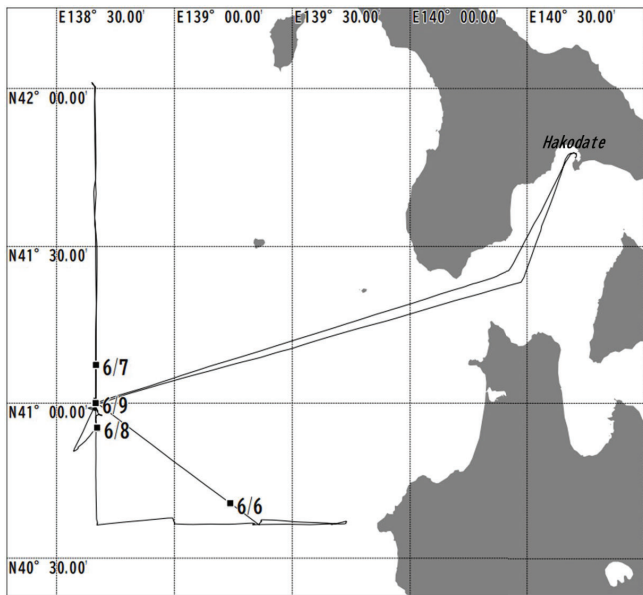


Fig. 1-1: Noon Position

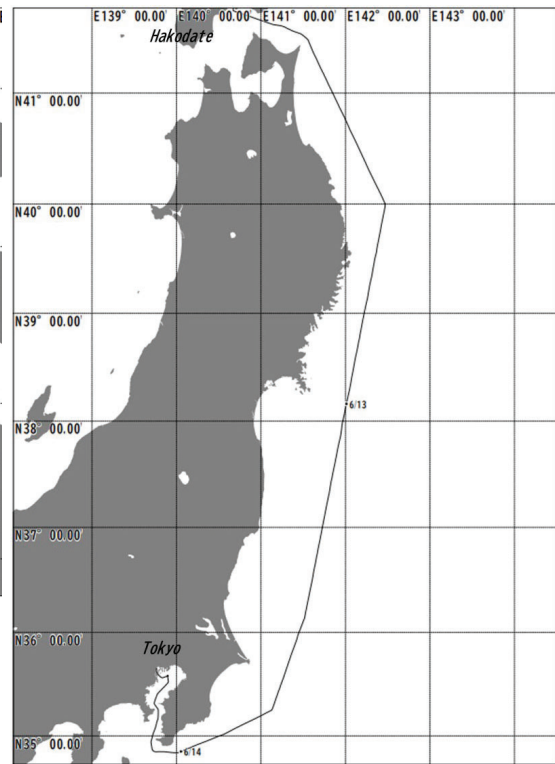


Fig. 1-2: Noon Position

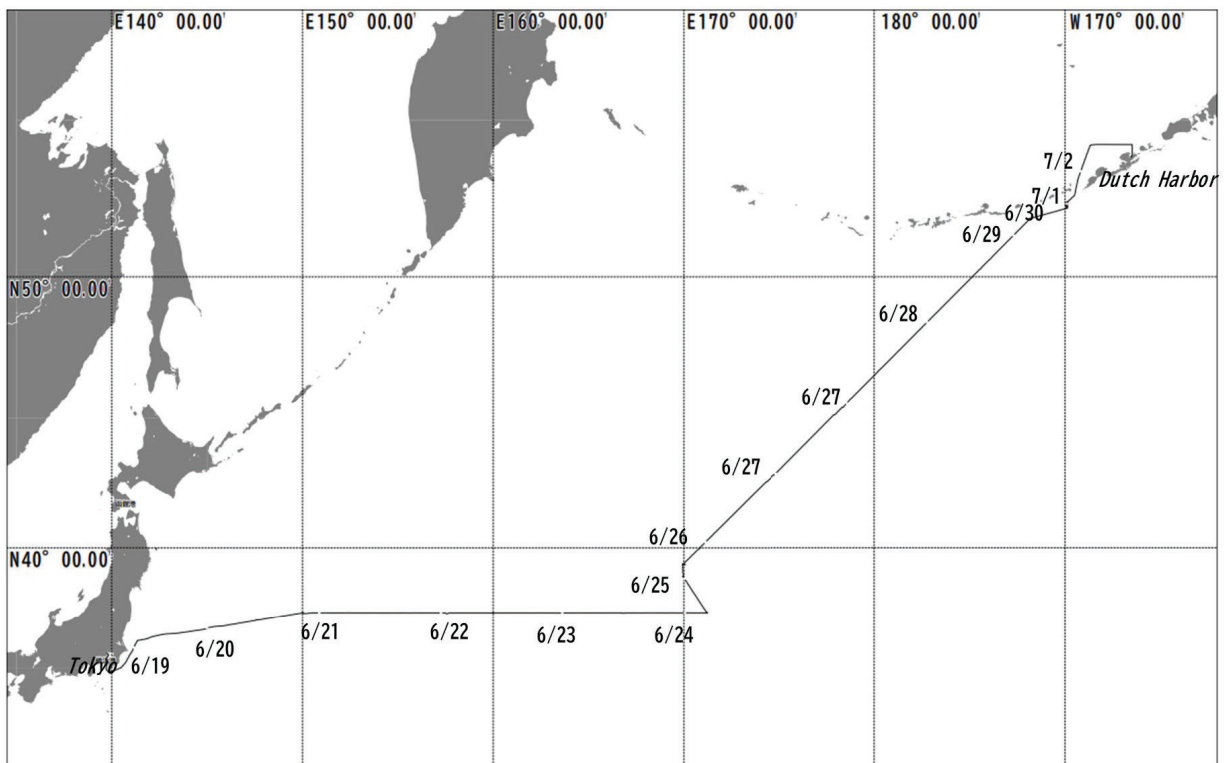


Fig. 1-3: Noon Position

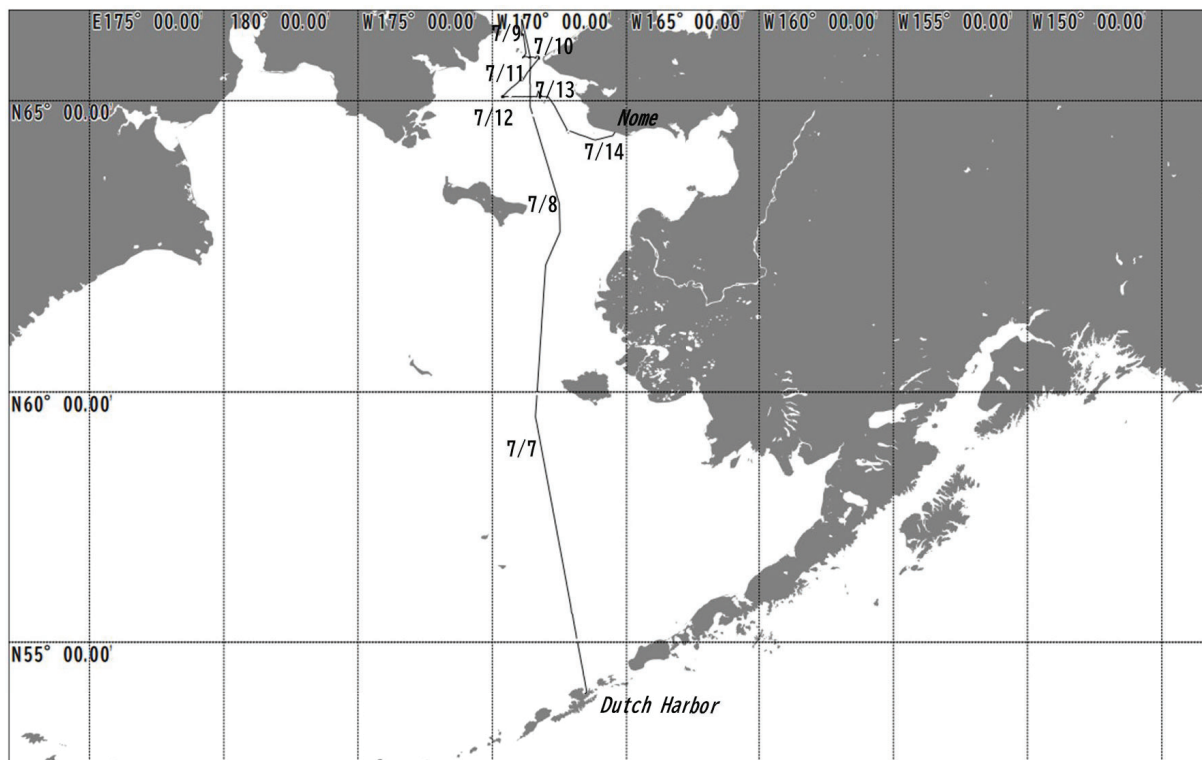


Fig. 1-4: Noon Position

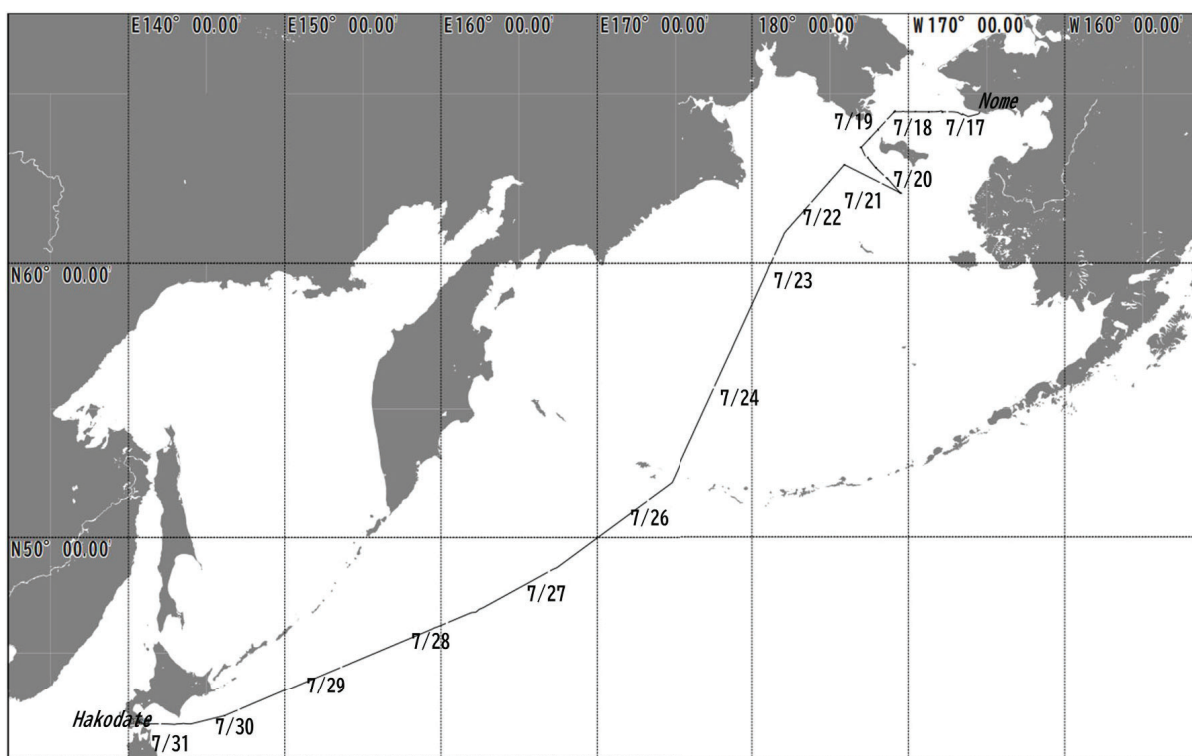


Fig. 1-5: Noon Position

2. Vessel Personnel

Crew: Captain: Associate Professor Shogo Takagi
And 31 persons

(Leg1)

Research Staff:

Associate Professor (Laboratory of Marine Environmental Science, Hokkaido University)

Hakodate -Hakodate Yutaka Isoda

Associate Professor (Earth Environment Dynamics Research Institute for Applied Mechanics, Kyushu University)

Hakodate -Hakodate Tomoharu Senju

Research Fellow (Earth Environment Dynamics Research Institute for Applied Mechanics, Kyushu University)

Hakodate - Hakodate Tsutsumi Eisuke

Technical Support Staff (Earth Environment Dynamics Research Institute for Applied Mechanics, Kyushu University)

Hakodate - Hakodate Ryosuke Sakemi

Associate Professor (Faculty of Science, Department of Environmental Science, Niigata University)

Hakodate - Hakodate Kazuhiro Norisuye

Assistant Professor (Institute of Nature and Environmental Technology, Kanazawa University)

Hakodate - Hakodate Shinya Ochiai

Assistant Professor (Hydrospheric Atmospheric Science, Nagoya University)

Hakodate - Hakodate Masanori Ito

Senior Researcher (Center for Global Environmental Research, National Institute for Environmental Studies)

Hakodate - Hakodate Takafumi Aramaki

Other:

Cameraman (National Institute for Environmental Studies)

Hakodate - Hakodate Seizi Narita

Senior Researcher (Global Ocean Observation Research Center, JMSTEC)

Hakodate - Hakodate Yuichiro Kumamoto

Research Technician (Global Ocean Observation Research Center, JMSTEC)

Hakodate - Hakodate Kazuhiko Matsumoto

Research Technician (Earth Surface System Research Center, JMSTEC)

Hakodate - Hakodate Sasaoka Kosei

Director (NHK) Hakodate - Hakodate Syunsuke Maeda

Cameraman (NHK) Hakodate - Hakodate Tomohiro Kawasaki

Technician (Sanyo Techno Marine) Hakodate - Hakodate Yu Takabayashi

Graduate Student: 5 persons

Undergraduate Student: 4 persons

(Leg3 – Leg5)

Research Staff:

Associate Professor (Laboratory of Marine Environmental Science, Hokkaido University)		
	Tokyo - Hakodate	Atsushi Ooki
Lecturer (Pan-Okhotsk Research Center, Institute of Low Temperature Science, Hokkaido University)		
	Tokyo - Dutch Harbor	Tomohiro Nakamura
Associate Professor (Field Science Center for Northern Biosphere, Hokkaido University)		
	Tokyo - Nome	Yoko Mitani
Assistant Professor (Ocean Circulation Group, Atmosphere and Ocean Research Institute)		
	Tokyo - Dutch Harbor	Daigo Yanagimoto
Senior Researcher (Research Institute for Global Change Global Ocean Observation Research Center, JAMSTEC)		
	Tokyo - Dutch Harbor	Yoshimi Kawai
Professor (Field Science Center for Northern Biosphere, Hokkaido University)		
	Dutch Harbor - Nome	Masahiro Nakaoka
Associate Professor (Laboratory of Marine Environmental Science, Hokkaido University)		
	Dutch Harbor - Nome	Hiromichi Ueno
Associate Professor (Laboratory of Marine Biology and Marine Biodiversity, Hokkaido University)		
	Dutch Harbor - Hakodate	Atsushi Yamaguchi
Associate Professor (Laboratory of Marine Environment and Resource Sensing, Hokkaido University)		
	Dutch Harbor - Nome	Toru Hirawake
Specially Appointed Assistant Professor (Faculty of Fisheries Sciences, Hokkaido University)		
	Dutch Harbor - Hakodate	Makoto Sampei
Associate Professor (Laboratory of Marine Bioresource Science, Hokkaido University)		
	Nome - Hakodate	Orio Yamamura
Postdoctoral Researcher (Laboratory of Marine Environmental Science, Hokkaido University)		
	Nome - Hakodate	Bungo Nishizawa
Graduate Student:	9 persons	
Undergraduate Student:	10 persons	

3. Items of Research

Hydrographic observations: Temperature and salinity were measured by CTD (Seabird SBE-9Plus, SBE-19Plus, XCTD and XBT). Dynamic computations were made using a desk-top computer aboard the “*Oshoromaru*”. Water sampling were also carried out at almost every hydrographic stations.

Net sampling by MOHT, LARVA NET, CLOSING NET and BONGO NET for plankton collection, and NEUSTON NET for floating trash collection.

Bottom sampling by SEDIMENT MULTIPLE CORER and SMITH-MACINTYRE BOTTOM SAMPLER.

Upper-air observation using radiosondes

Set and retrieve the sediment trap mooring

4. Data on salmon longline and hook-and-line research

Table 1. Position and research conditions of surface longline and hook-and-line sampling at each station.

Station	Date and Time (S.M.T.*1)				T.D.*2	Set Position		D.S.*3	Number of baskets	bottom depth(m)	Wr*4	Wind (Force)	S.T.*5 (°C)
	Line set		Line haul			Lat.	Long.						
OSHL1705	Jun. 29	2230	Jun. 30	0230	-12h, -11h	51-56.1N	171-45.9W	-	-		d	South-2	6.7
OSHL1706	Jul. 02	0100	Jul. 02	0505	-10h	52-25.1N	169-53.9W	-	-		o	SW-4	8.9
OSHL1707	Jul. 21	0000	Jul. 21	0300	-11h	62-10.0N	170-30.2W	-	-	47	f	West-2	9.7
OSSL1702	Jul. 21	0350-0420	Jul. 21	0550-0715	-11h	62-09.9N	170-31.3W	110	30	47	f	West-2	9.7

*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 (d: drizzle or fine rain, f: fog, o: 100% clouded).

*5 S.T. : Surface temperature

Table 2. The catch number of each salmonid at each station where salmonids were collected by hook-and-line gear, surface longline .

Station Name	Sampling gear	Species name						Total
		Sockeye	Chum	Pink	Coho	Chinook	Stellhead	
OSHL 1705	Hook-and-line	3	0	16	0	0	0	19
OSHL 1706	Hook-and-line	9	3	28	1	0	0	41
OSHL 1707	Hook-and-line	0	0	4	0	0	0	4
OSSL 1702	Surface longline	9	3	9	2	1	0	24
Total		21	6	57	3	1	0	88

Table 3. Biological characteristics of salmonids caught by hook-and-line gear and surface longline research

Sockeye salmon											
St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)	St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)
HL05	O000	498	1260	1	11	SL02	B000	550	2050	1	195
		494	1520	1	37			474	1250	2	1
		502	1610	1	36			513	1460	2	1
		576	2450	1	210			536	1740	2	1
HL06	O000	442	1110	2	34			572	2360	1	195
		576	2300	2	33			481	1330	1	16
		574	2150	1	98			516	1530	2	1
		586	2150	2	13			482	1360	1	15
		578	2040	1	93			569	2380	1	200
		604	2750	2	28						
		582	2380	1	85						
		540	1880	1	88						

Chum salmon

St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)	St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)
HL06	O000	410	660	1	5	SL02	B000	635	3400	2	255
		416	800	1	8			624	3260	1	280
		433	840	1	12			604	2850	2	1

Pink salmon

St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)	St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)
HL05	O000	516	1640	1	110	HL06	O000	496	1580	1	35
		430	880	1	30			494	1340	1	150
		468	1180	2	53			508	1400	2	50
		466	1180	1	88			468	1210	1	65
		450	1260	2	66			476	1220	1	85
		460	1310	1	75			448	980	1	30
		473	1260	1	63			491	1340	2	30
		474	1350	2	50			434	870	2	10
		480	1340	1	78			473	1170	2	45
		488	1410	2	56			476	1260	2	25
		428	1240	2	14			458	1350	2	40
		416	810	1	70			452	1130	1	50
		461	1220	1	73			475	1230	2	25
		480	1420	2	37			461	1170	1	70
		442	1040	1	75			443	1090	1	75
HL06	O000	421	920	2	32	HL07 SL02	O000 B000	482	1540	2	155
		503	1650	1	85			428	920	2	24
		448	958	1	45			450	1140	1	130
		470	1180	1	55			442	1150	1	125
		466	1110	2	10			592	2250	2	190
		442	1070	2	75			500	1480	2	150
		493	1380	2	15			504	1490	1	185
		450	1130	2	20			444	1020	1	126
		480	1300	2	10			459	1330	2	109
		486	1290	1	100			455	1220	2	89
		437	1040	2	70			510	1540	2	125
		431	920	1	80			518	1580	2	110
		536	1750	2	40			487	1320	2	135
		452	1070	1	40						

Coho salmon

St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)
HL06	O000	596	2420	1	40
SL02	B000	590	2640	1	265
SL02	B000	619	3200	2	215

Chinook salmon

St.	Gear	F.L. (mm)	B.W. (g)	Sex	G.W. (g)
SL02	B000	678	3150	2	1

**THE "OSHOROMARU" CRUISE 044
TO EAST OF THE TSUGARU STRAIT
(IBURI / HIDAKA OFFING)**

11N SEPTEMBER 2017

1. Cruise Itinerary

Cruise 044

Departure from Hakodate and start hydrographic research	Sep.	25, 2017
Finish hydrographic research		28
Return to Hakodate		29

Total coverage 511.0 miles

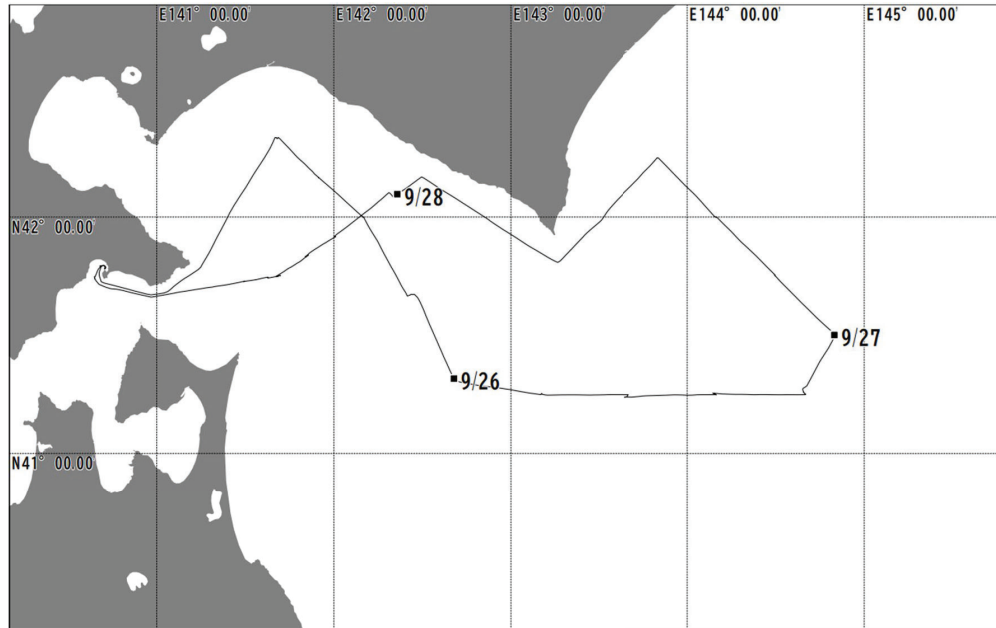


Fig.-1: Noon Position

2. Vessel Personnel

Crew:	Captain:	Associate Professor	Shogo Takagi
			And 32 persons

Undergraduate instructor:

Associate Professor (Laboratory of Marine Environmental Science, Hokkaido University)

Yutaka Isoda

Associate Professor (Laboratory of Marine Environment and Resource Sensing, Hokkaido University)

Tohru Hirawake

Teaching Assistant: 4 persons

Undergraduate Student: 29 persons

Research assistant: 3 persons

3. Items of Research

A short cruise to conduct shipboard training in hydrographic observations and floating marine debris research for undergraduate students in the department of marine bioresource and environmental science.

Hydrographic observations: Temperature and salinity were measured by CTD (Seabird SBE-9Plus). Dynamic computations were made using a desk-top computer aboard the "*Oshoromaru*". Water sampling were also carried out at almost every hydrographic stations.

Floating marine debris research: Sighting survey and collection using neuston net

**THE "OSHORO MARU" CRUISE 045
TO EAST OF THE TSUGARU STRAIT
(IBURI / HIDAKA OFFING)**

IN OCTOBER 2017

1. Cruise Itinerary

Cruise 045

Departure from Hakodate	Oct.	17, 2017
Start hydrographic research and bottom trawl research (OST1701)		18
Finish hydrographic research		21
Return to Hakodate		22

Total coverage 634.1nm

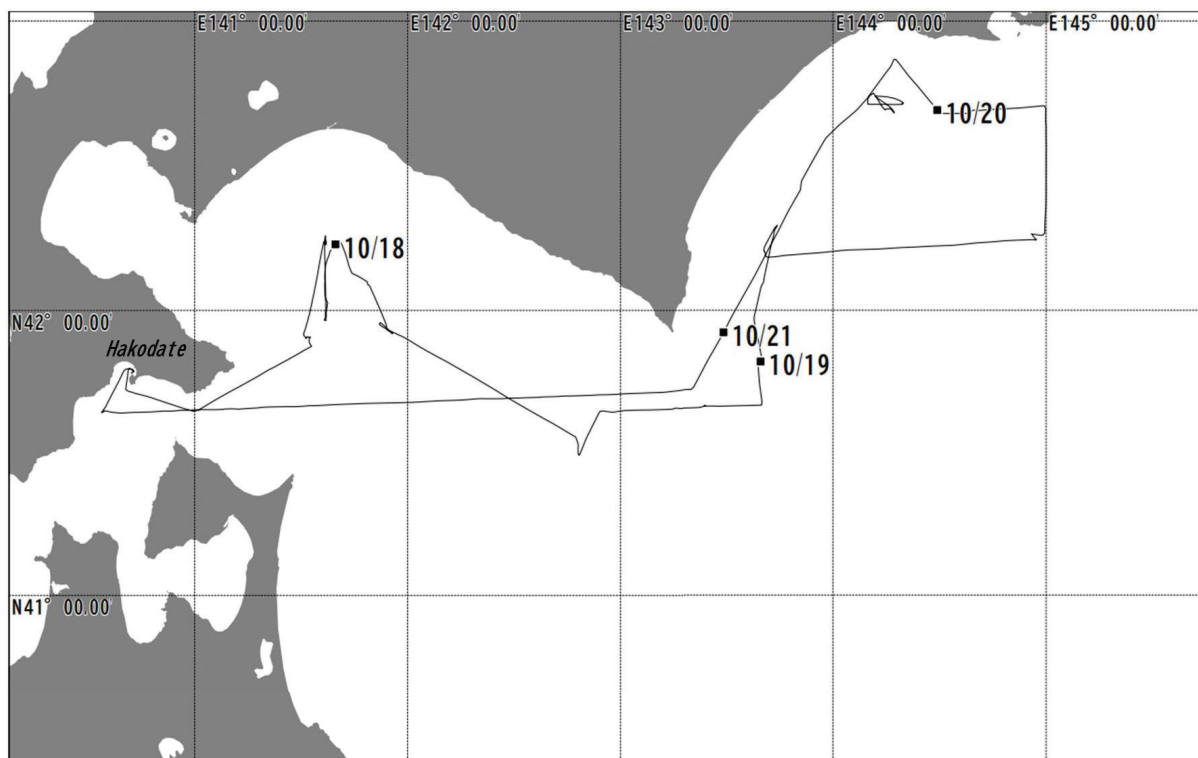


Fig. 1 Noon Position

2. Vessel Personnel

Crew: Captain: Associate Professor Shogo Takagi
And 32 persons

Undergraduate instructor:

Professor (Laboratory of Marine Biology and Biodiversity, Hokkaido University)

Hisashi Imamura

Professor (Laboratory of Marine Bio-resource science, Hokkaido University)

Takashi Matsuishi

Associate Professor (Laboratory of Marine Environmental Science, Hokkaido University)

Atsushi Ooki

Associate Professor (Laboratory of Marine Bio-resource science, Hokkaido University)

Orio Yamamura

Teaching Assistant: 6 persons

Undergraduate Student: 48 persons

Research assistant: 3 persons

3. Items of Research

A short cruise to conduct shipboard training in hydrographic observations, net samplings, sighting survey of marine mammals and floating marine debris, and biological processing of trawl for undergraduate students in the department of marine biological science. Hydrographic observations: Temperature and salinity were measured by CTD (Seabird SBE-9Plus). Dynamic computations were made using a desk-top computer aboard the “*Oshoromaru*”. Water sampling were also carried out at almost every hydrographic stations.

Table 1, 2

Bottom trawl observations: One operations of the stern otter bottom trawl were carried out. These operations were supervised by the captain, Deck officer, Science officer, crew, research staff, and cadets were engaged in the work.

Table 3, 4

Net sampling: MOHT, and NNORPAC NET for plankton collection, and NEUSTON NET for floating trash collection

4. Data on temperature, salinity and computed dynamic depth anomaly

Table 1. List of Oceanographic station

Station	Lat.	Long.	Date (GMT)	Hour (GMT)	T.Z.	Depth	Col.	Tr.	SST	Wr.	Gear
OS17311	41-55.25N	141-55.69E	10/18	7:53	9		-	-	15.9	bc	Sea-Bird SBE9
OS17312	41-40.08N	143-24.06E	10/18	23:44	9	182	-	-	13.6	bc	Sea-Bird SBE9
OS17313	42-17.61N	143-44.2E	10/19	7:24	9	374	-	-	13.8	bc	Sea-Bird SBE9
OS17314	42-42.85N	144-19.5E	10/20	7:04	9	897	-	-	14.0	c	Sea-Bird SBE9

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

Col.: Water color in Forel-Ule scale

Tr.: Transparency in meters with Secchi disc

SST: Sea Surface temperature

Wr.: Weather in WMO Code 4501

Table 2. Oceanographic data

Station OS17311				Station OS17312				Station OS17313			
Latitude 41-55.25 N				Latitude 41-40.08 N				Latitude 42-17.61 N			
Longitude 41-55.69 E				Longitude 43-24.06 E				Longitude 43-44.20 E			
Depth(m)				Depth(m) 182				Depth(m) 374			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	15.961	33.912	24.920	5	13.658	32.990	24.704	5	13.794	32.850	24.568
10	15.974	33.911	24.916	10	13.651	32.990	24.706	10	13.789	32.877	24.590
20	15.949	33.913	24.923	20	13.612	32.994	24.717	20	13.647	32.918	24.651
30	15.951	33.912	24.922	30	12.234	33.118	25.084	30	11.322	33.063	25.210
40	15.970	33.912	24.918	40	10.670	33.175	25.412	40	7.656	33.148	25.869
50	15.929	33.918	24.932	50	8.629	33.619	26.095	50	4.985	33.136	26.199
75	13.923	34.132	25.532	75	4.239	33.327	26.431	75	4.140	33.192	26.334
100	12.296	34.113	25.844	100	4.176	33.397	26.493	100	3.122	33.205	26.441
125	11.029	34.049	26.030	125	2.855	33.285	26.529	125	2.435	33.238	26.527
150	9.643	33.934	26.179	150	2.337	33.313	26.594	150	2.649	33.345	26.594
175	8.224	33.842	26.331					175	2.506	33.336	26.599
200	6.850	33.690	26.407					200	2.450	33.371	26.632
250	3.547	33.402	26.559					250	2.574	33.472	26.702
300	2.712	33.528	26.735					300	2.622	33.506	26.725
400	3.424	33.873	26.946								
500	3.567	34.036	27.063								
600	3.442	34.138	27.155								
700	3.419	34.234	27.235								
800	3.196	34.310	27.316								
900	3.007	34.358	27.372								

Station OS17314			
Latitude 42-42.85 N			
Longitude 44-19.50 E			
Depth(m) 897			
Press.	Temp.	Sal.	SIG-T
5	14.008	33.038	24.670
10	13.987	33.035	24.672
20	13.001	33.123	24.939
30	12.467	33.188	25.093
40	10.542	33.467	25.662
50	9.313	33.405	25.820
75	9.738	33.989	26.207
100	8.382	33.855	26.318
125	6.991	33.732	26.421
150	5.790	33.603	26.475
175	5.523	33.604	26.508
200	4.947	33.562	26.541
250	2.936	33.376	26.595
300	2.772	33.420	26.643
400	2.969	33.615	26.782
500	3.560	33.857	26.921
600	3.653	34.020	27.041
700	3.522	34.123	27.136
800	3.269	34.208	27.228

5. Data on bottom trawl research

Table 3. Data on Bottom trawl research during the Oshoromaru Cruise#045

No. of research	Date and time of net tow (S.M.T*1)		Position		T.D.*2	D.S.*3	Speed of tow (Kt)	Bottom depth (m)	Wr.*4	Wind	SST*5 (°C)
			Lat. (N)	Long. (E)							
OST1701	Oct. 10	0819-1119	42-01.6	141-37.5	+9h	000°	3.3	716	bc	N6-3	16.7

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

*2 T.D.: Time difference between Greenwich Mean Time (G.M.T.) and S.M.T.

*3 D.S.: Direction of tow

*4 Wr.: Weather in WMO Code 4501(bc: 25-75% clouded, o: 100% clouded)

*5 SST: Sea Surface temperature

Table 4. Data on catches by Bottom trawl research

Japanese name	Scientific name	OST1701	
		Number	Weight (kg)
Kichiji	<i>Sebastolobus macrochir</i>	89	20.4
Osaga	<i>Sebastes iracundus</i>	1	4.7
Sokoganpiei spp.	<i>Bathyrja spp.</i>	3	1.497
Munedara	<i>Coryphaenoides pectoralis</i>	1	0.53
Karafutosokodara	<i>Coryphaenoides cinereus</i>	4	0.78
Kurosokoiwashi	<i>Pseudobathylagus milleri</i>	2	0.12
Yasesokoiwashi	<i>Bathylagus pacificus</i>	6	0.185
Ika	Squids	59	6.81
Kobushikazika	<i>Malacocottus zonurus</i>	1	0.07
Ganko	<i>Dasycottus setiger</i>	3	0.3
Kanadadara	<i>Antimora microlepis</i>	11	1.6
Karasudara	<i>Halargyreus johnsonii</i>	6	1.55
Hadakahoteieso	<i>Tactostoma macropus</i>	2	0.185
Hadakaeso sp.	<i>Paralepididae sp.</i>	1	0.045
Togariochimonziwashi	<i>Leuroglossus schmidtii</i>	2	0.02
Norogenge	<i>Bothrocara hollandi</i>	1	0.02
Mamehadaka	<i>Lampanyctus jordani</i>	16	0.33
Ookuchiiwashi	<i>Notoscopelus japonicus</i>	7	0.155
Higashihouraesio	<i>Chauliodus macouni</i>	5	0.03
Yokoeso	<i>Sigmops gracile</i>	2	0.01
Tako	Octopuses	38	11.5
Kai	Shellfish	114	5
Yukihoraanago	<i>Ilyopsis nigeli</i>	3	0.09
Kohirehadaka	<i>Stenobrachius leucopsarus</i>	2	0.015
Hadakaiwashi sp	<i>Myctophidae sp.</i>	3	0.03
Ishoginntyaku	<i>Sea anemones</i>	25	2.55
Benizuwaigani	<i>Chionoecetes japonicus</i>	1	0.74
Irakoanago	<i>Synaphobranchus kaupii</i>	7	0.7
Shirogenge	<i>Bothrocara zestum</i>	146	51.25
Kantengenngge	<i>Bothrocara tanakae</i>	2	1.55
Nezumiginpo	<i>Lumpenella longirostris</i>	22	1.37
Itohikidara	<i>Laemonema longipes</i>	23	9.25
Yadokari	<i>Paguroidea</i>	10	0.17

**THE "OSHORO MARU" CRUISE 046
TO TOKACHI OFF, PACIFIC OCEAN**

IN NOVEMBER 2017

1. Cruise Itinerary

Cruise 046

Departure from Hakodate	Nov.	6, 2017
Arrival at Kushiro		7
Departure from Kushiro and start hydrographic research		8
Finish hydrographic research and arrival at Kushiro		10

Total coverage 551.7miles

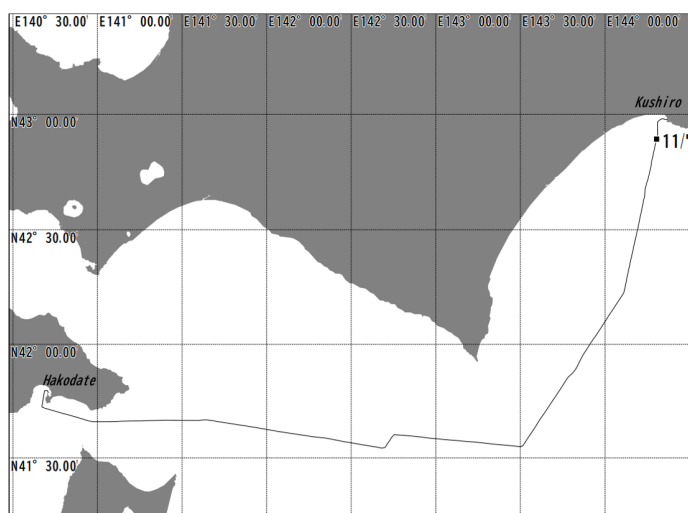


Fig. 1-1: Noon Position

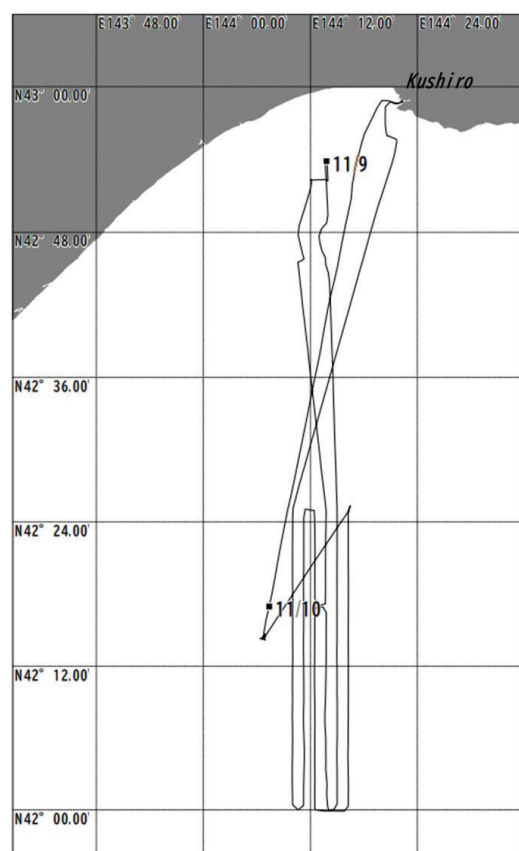


Fig. 1-2: Noon Position

2. Vessel Personnel

Crew: Captain:

Associate Professor Shogo Takagi

And 32 persons

Research Staff:

Professor (Civil and Environmental Engineering, Kitami Institute of Technology)

Satoshi Yamashita

Professor (Environmental and Energy Resource Research center, Kitami Institute of Technology)

Akihiro Hachikubo

Associate Professor (Biotechnology and Environmental Chemistry, Kitami Institute of Technology)

Masaaki Konishi

Associate Professor (Civil and Environmental Engineering, Kitami Institute of Technology)

Kazutaka Tateyama

Assistant Professor (Materials Science and Engineering, Kitami Institute of Technology)

Hirotooshi Sakagami

Assistant Professor (Civil and Environmental Engineering, Kitami Institute of Technology)

Shintaro Yamasaki

Technical Staff (New Energy Resources Research Center, Kitami Institute of Technology)

Kinji Hyakutake

Assistant Professor (Department of Civil Engineering, Kobe University)

Satuki Kataoka

Assistant Professor (Graduate School of Advanced Science of Matter, Hiroshima University)

Takahisa Tajima

Graduate Student: 8 persons

Undergraduate Student: 34 persons

3. Items of Research

A short cruise to conduct shipboard training in hydrographic observations and research of methane hydrate for undergraduate students in Kitami Institute of Technology.

Hydrographic observations: Temperature and salinity were measured by CTD (Seabird SBE-9Plus and XCTD). Dynamic computations were made using a desk-top computer aboard the “*Oshoromaru*”. Water sampling were also carried out at almost every hydrographic stations.

Methane hydrate research: Bottom sampling by SEDIMENT MULTIPLE CORER and PISTONE CORE SAMPLER, and bottom survey using quantitative echo sounder and narrow multi beam echo sounder.

**THE "OSHORO MARU" CRUISE 047
TO KUSHIRO OFF**

IN NOVEMBER 2017

1. Cruise Itinerary

Cruise 047

Departure from Kushiro	Nov.	12, 2017
Do hydrographic research after Return to Kushiro		13

Total coverage 31.8 miles

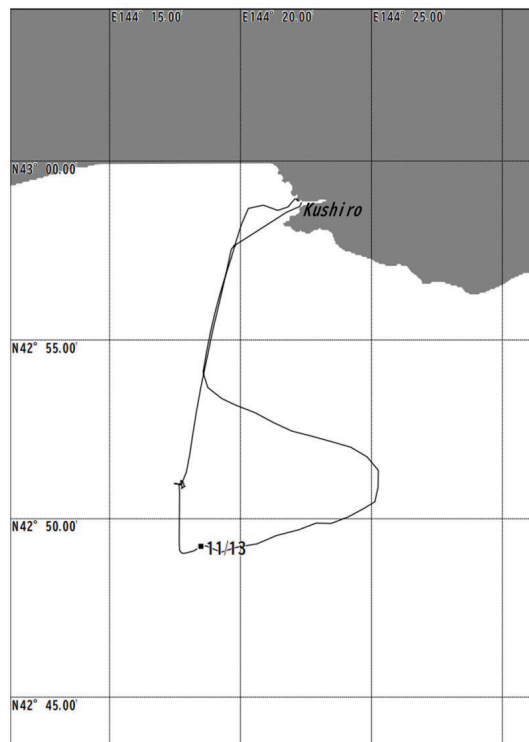


Fig. 1: Noon Position

2. Vessel Personnel

Crew: Captain:	Associate Professor	Shogo Takagi
----------------	---------------------	--------------

And 33 persons

Undergraduate instructor:

Professor (Aqua Bioscience and Industry, Tokyo University of Agriculture)

Kushiro-Kushiro	Akihiro Shiimoto
-----------------	------------------

Specially Appointed Assistant Professor (School of Fisheries Sciences, Hokkaido University)

Kushiro-Kushiro	Mitsuhiro Nakaya
-----------------	------------------

Undergraduate Student: 25 persons

**THE "OSHORO MARU" CRUISE 048
TO SANRIKU OFF
IN NOVEMBER 2017**

1. Cruise Itinerary

Cruise 048

Departure from Kushiro and start survey	Nov.	14, 2017
Finish survey after arrival at Miyako		15
Departure from Miyako		17
Start hydrographic research		18
Finish hydrographic research and Arrival at Kamaishi		19
Departure from Kamaishi		20
Return to Hakodate		21

Total coverage 547 miles

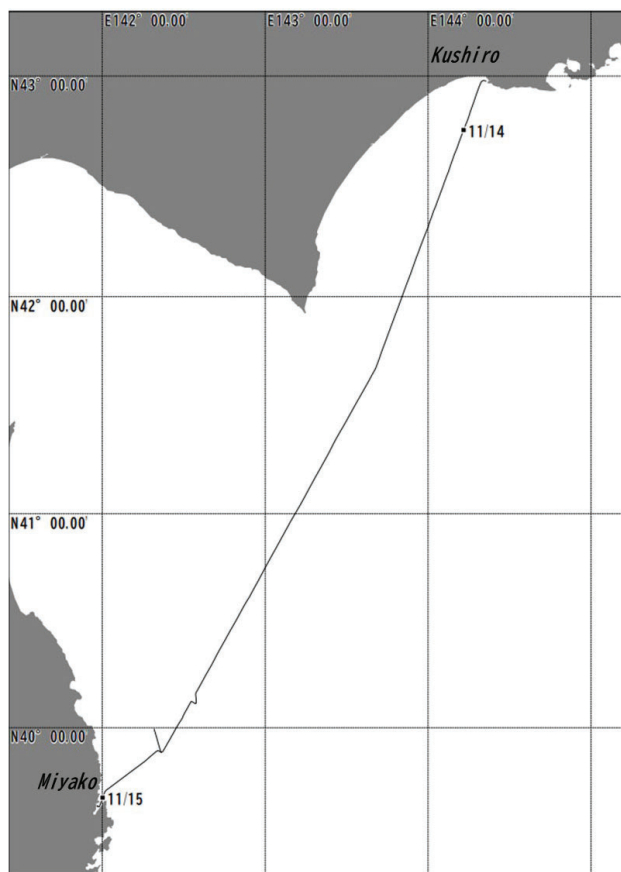


Fig. 1-1: Noon Position

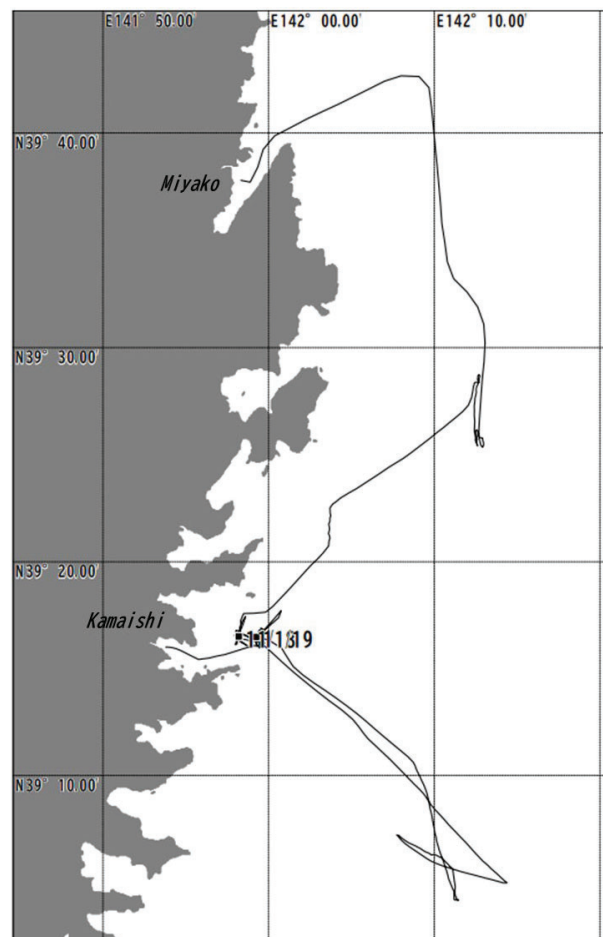


Fig. 1-2: Noon Position

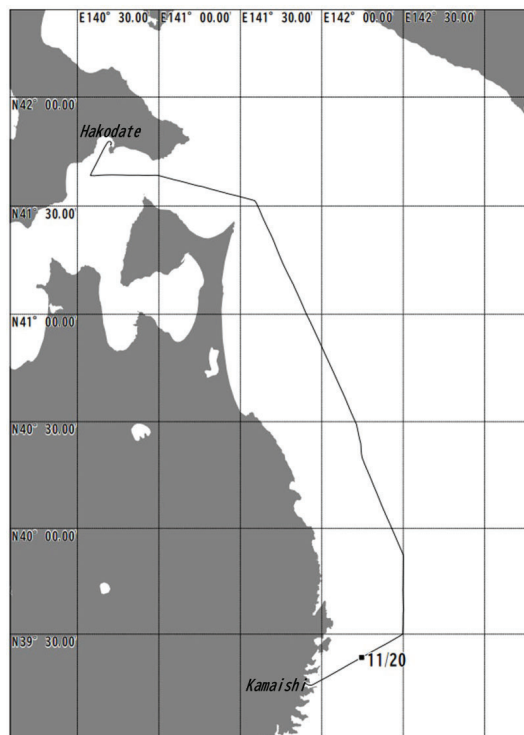


Fig. 1-3: Noon Position

2. Vessel Personnel

Crew: Captain: Associate Professor Shogo Takagi
And 31 persons

Research staff:

Technical Assistant (Tokyo University of Marine Science and Technology)
Kushiro-Miyako Chika Namaizawa

Undergraduate instructor:

Professor (Sanriku Fisheries Research Center, Iwate University)
Miyako-Kamaishi Niri-yuki Tanaka

Assistant Professor (Sanriku Fisheries Research Center, Iwate University)
Miyako-Kamaishi Tomoaki Goto

Associate Professor (Sanriku Fisheries Research center, Iwate University)
Miyako-Kamaishi Hideharu Tukagoshi

Specially Appointed Assistant Professor (School of Fisheries Sciences, Hokkaido University)
Miyako-Hakodate Mitsuhiro Nakaya

Teaching Assistant: 2 persons

Undergraduate Student: 22 persons

**THE "OSHORO MARU" CRUISE 049
TO THE NANPO SHOTO**

IN DECEMBER 2017

1. Cruise Itinerary

Cruise 049

Departure from Hakodate (Leg1)	Dec. 01, 2017
Arrival at Tokyo	04
Departure from Tokyo (Leg2)	07
Start vertical long-line research (OSVL1701) and hydrographic research	09
Finish vertical long-line research (OSVL1705) and hydrographic research	11
Arrival at Yokohama	13

Total coverage 1417.7 miles

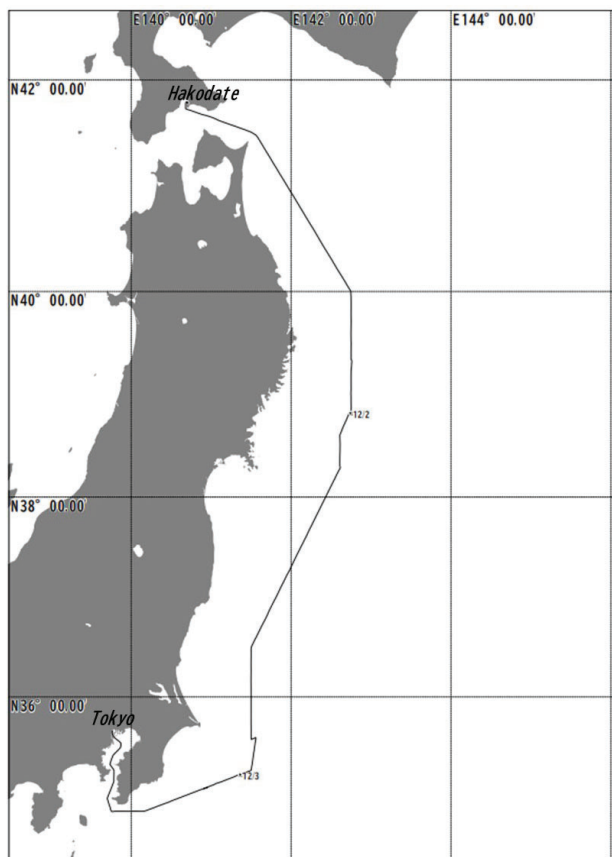


Fig. 1-1: Noon Position

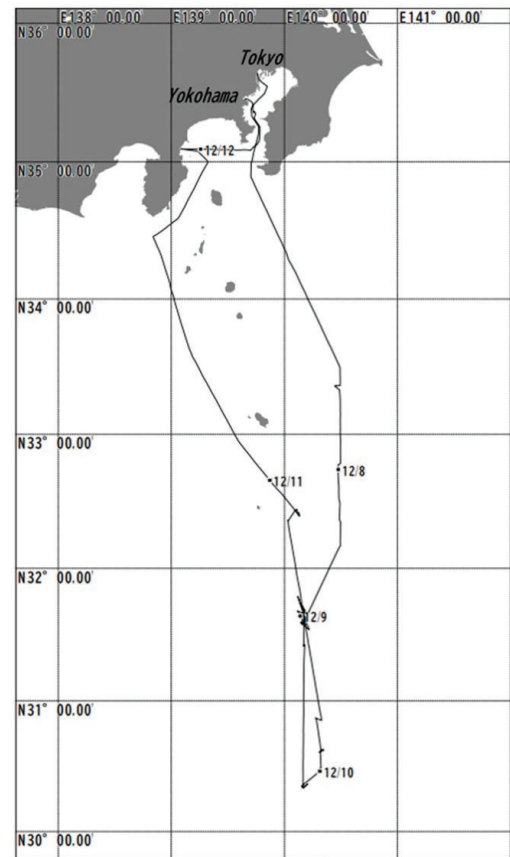


Fig. 1-2: Noon Position

2. Vessel Personnel

Crew: Captain: Associate Professor Shogo Takagi
And 31 persons

Undergraduate instructor:

Professor (Department of Marine Science and Resources, Nihon University)

Tokyo-Yokohama Takahito Kojima

Assistant Professor (Department of Marine Science and Resources, Nihon University)

Tokyo-Yokohama Yuya Makiguchi

Professor (Teikyo University of Science and Technology)

Tokyo-Yokohama Kyoichi Mori

Teaching Assistant: 1 person

Undergraduate Student: 44 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 vertical long-line for undergraduate students in Nihon University and Teikyo University of Science and Technology.

Hydrographic observations:

Hydrographic work on deck and the data processing were made by Science officer, the deck officers, crews, research staff and cadets of the “*Oshoromaru*”. Temperature and salinity were measured by CTD (Seabird SBE-9Plus and SBE-19Plus). Dynamic computations were made using a desk-top computer aboard the “*Oshoromaru*”. Water sampling were also carried out at almost every hydrographic stations.

Table 1, 2

Biological research for fishes caught by vertical long-line:

Six operations using a vertical long-line were performed. The gear comprised by two types of main line (500, 600m) with a weight attached to one end, a buoy attached to the other end, and six branch lines (18m for tuna and 4m for squid) attached to main line.

Table 3

4. Data on temperature, salinity and computed dynamic depth anomaly

Table 1 List of Oceanographic station

Station	Lat.	Long.	Date (GMT)	Hour (GMT)	T.Z.	Depth (m)	Col.	Tr.	SST	Wr.	Gear
OS17322	31-34.31N	140-10.62E	12/8	22:16	9	1254	-	-	22.8	c	Sea-Bird SBE19p
OS17323	31-35.81N	140-09.53E	12/9	2:07	9	1372	-	-	22.7	bc	Sea-Bird SBE9
OS17324	31-40.77N	140-10.27E	12/9	13:44	9	1654	-	-	22.6	bc	Sea-Bird SBE19p
OS17325	30-20.50N	140-10.31E	12/9	22:04	9	1649	-	-	21.8	o	Sea-Bird SBE9
OS17326	30-37.52N	140-20.78E	12/10	4:42	9	949	-	-	22.4	c	Sea-Bird SBE9
OS17327	32-25.86N	140-05.65E	12/10	20:33	9	1345	-	-	22.7	c	Sea-Bird SBE9

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

Col.: Water color in Forel-Ule scale

Tr.: Transparency in meters with Secchi disc

SST: Sea Surface temperature

Wr.: Weather in WMO Code 4501

Table 2 Oceanographic data

Station OS17322				Station OS17323				Station OS17324			
Latitude 31-34.31 N				Latitude 31-35.81 N				Latitude 31-40.77 N			
Longitude 140-10.62 E				Longitude 140-09.53 E				Longitude 140-10.27 E			
Depth(m) 1254				Depth(m) 1372				Depth(m) 1654			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	22.831	34.686	23.744	20	22.768	34.675	23.753	5	22.619	34.633	23.765
10	22.849	34.709	23.756	30	22.780	34.672	23.748	10	22.620	34.633	23.764
20	22.856	34.710	23.755	40	22.781	34.672	23.748	20	22.623	34.634	23.764
30	22.858	34.710	23.755	50	22.781	34.671	23.747	30	22.625	34.634	23.763
50	22.857	34.711	23.756	75	22.795	34.675	23.746	50	22.622	34.631	23.762
75	22.866	34.712	23.754	100	22.799	34.676	23.746	75	22.610	34.626	23.762
100	22.862	34.712	23.755	125	21.558	34.876	24.247	100	22.600	34.623	23.762
150	21.445	34.871	24.274	150	20.751	34.846	24.444	150	22.568	34.631	23.777
200	19.075	34.859	24.894	175	20.166	34.820	24.580	200	19.717	34.790	24.676
300	16.622	34.697	25.371	200	19.434	34.842	24.789	300	17.352	34.734	25.226
400	13.359	34.471	25.911					400	12.994	34.461	25.976
500	10.410	34.341	26.367					500	10.192	34.333	26.398
600	8.672	34.279	26.606					600	7.854	34.257	26.712
700	6.001	34.258	26.966					700	5.960	34.231	26.950
800	4.854	34.263	27.108					800	4.765	34.295	27.143
900	3.835	34.353	27.288					900	3.896	34.336	27.268

Station OS17325				Station OS17326				Station OS17327			
Latitude 30-20.50 N				Latitude 30-37.52 N				Latitude 32-25.86 N			
Longitude 140-10.31 E				Longitude 140-20.78 E				Longitude 140-05.65 E			
Depth(m) 1649				Depth(m) 949				Depth(m) 1345			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	21.866	34.728	24.048	5	22.460	34.762	23.908	5	22.775	34.796	23.844
10	21.868	34.728	24.048	10	22.468	34.762	23.905	10	22.771	34.796	23.845
20	21.875	34.728	24.046	20	22.460	34.760	23.906	20	22.777	34.793	23.841
30	21.880	34.728	24.044	30	22.400	34.749	23.914	30	22.726	34.786	23.850
40	21.846	34.730	24.056	40	22.185	34.721	23.954	40	22.666	34.777	23.860
50	21.836	34.729	24.058	50	22.141	34.718	23.964	50	22.506	34.752	23.887
75	21.840	34.728	24.056	75	22.060	34.711	23.982	75	22.318	34.728	23.922
100	21.826	34.725	24.058	100	21.882	34.699	24.022	100	22.294	34.720	23.922
125	21.821	34.733	24.065	125	21.852	34.700	24.031	125	22.249	34.706	23.924
150	20.689	34.873	24.481	150	21.819	34.714	24.051	150	21.759	34.644	24.014
175	19.461	34.894	24.822	175	20.483	34.895	24.553	175	20.421	34.768	24.473
200	18.562	34.842	25.011	200	19.102	34.876	24.901	200	19.229	34.779	24.794
250	17.392	34.773	25.246	250	17.074	34.760	25.312	250	17.185	34.700	25.240
300	16.488	34.715	25.416	300	16.579	34.734	25.409	300	15.726	34.626	25.522
400	13.802	34.482	25.828	400	14.343	34.528	25.750	400	12.157	34.426	26.113
500	10.988	34.294	26.228	500	11.600	34.339	26.151	500	9.314	34.325	26.539
600	8.250	34.195	26.604	600	8.847	34.190	26.508	600	7.123	34.277	26.832
700	5.815	34.122	26.882	700	6.780	34.160	26.787	700	5.375	34.271	27.054
800	4.934	34.184	27.036	800	5.766	34.190	26.942	800	4.775	34.302	27.148
900	4.283	34.248	27.159	900	4.865	34.235	27.084	900	3.815	34.367	27.302
1000	3.882	34.292	27.235					1000	3.345	34.410	27.382

5. Data on vertical long line research

Table 3 Data on vertical long line research

No. of research		OSVL 1701-01		OSVL 1701-02		OSVL 1701-03		OSVL 1701-04					
Date		9-Dec											
position of	Lat. (N)	31-35.4	31-55.1	31-34.8	31-34.6								
line set	Long. (E)	140-08.8	140-09.2	140-09.5	140-09.9								
Time	Line set	0627	0633	0638	0643								
(S.M.T.)	Line haul	0905-1042											
Length of main line(m)		500	500	500	600								
Depth(m)		1260-1374											
Surface temp. (°C)		22.6											
Wether		bc											
Wind		NW-5											
Sickle pomfret		1											
No. of research		OSVL 1702-01		OSVL 1702-02		OSVL 1702-03		OSVL 1702-04		OSVL 1702-05		OSVL 1702-06	
Date		9-Dec											
position of	Lat. (N)	31-40.6	31-40.4	31-40.2	31-40.0	31-39.9	31-39.7						
line set	Long. (E)	140-07.3	140-07.7	140-08.2	140-08.8	140-09.3	140-09.8						
Time	Line set	1227	1232	1237	1241	1246	1251						
(S.M.T.)	Line haul	1445-1654											
Length of main line(m)		400	400	500	500	500	500						
Depth(m)		1646-1656											
Surface temp. (°C)		22.5											
Wether		bc											
Wind		WNW-5											
Flying squid		1										1	
Swordfish												1	
No. of research		OSVL 1703-01		OSVL 1703-02		OSVL 1703-03		OSVL 1703-04		OSVL 1703-05			
Date		10-Dec											
position of	Lat. (N)	30-21.8	30-21.5	30-21.3	30-21.0	30-20.7							
line set	Long. (E)	140-12.1	140-11.7	140-11.3	140-10.9	140-10.5							
Time	Line set	0624	0629	0634	0639	0643							
(S.M.T.)	Line haul	0903-1046											
Length of main line(m)		400	400	400	500	500							
Depth(m)		1420-1569											
Surface temp. (°C)		21.7											
Wether		c											
Wind		NE-3											
Flying squid												1	
Sickle pomfret		2											
No. of research		OSVL 1704-01		OSVL 1704-02		OSVL 1704-03		OSVL 1704-04					
Date		10-Dec											
position of	Lat. (N)	30-36.5	30-36.7	30-37.1	30-37.5								
line set	Long. (E)	140-19.2	140-19.3	140-19.5	140-19.7								
Time	Line set	1255	1259	1303	1308								
(S.M.T.)	Line haul	1506-1612											
Length of main line(m)		400	400	500	500								
Depth(m)		923-988											
Surface temp. (°C)		21.7											
Wether		c											
Wind		SE-3											
Flying squid												1	
Sickle pomfret												1	
No. of research		OSVL 1705-01		OSVL 1705-02		OSVL 1705-03		OSVL 1705-04		OSVL 1705-05		OSVL 1705-06	
Date		11-Dec											
position of	Lat. (N)	32-22.0	32-22.2	32-22.7	32-23.4	32-23.4	32-23.8						
line set	Long. (E)	140-02.6	140-02.7	140-03.1	140-03.4	14-03.7	140-03.9						
Time	Line set	0421	0427	0432	0437	0441	0445						
(S.M.T.)	Line haul	0757-0952											
Length of main line(m)		300	500	500	400	400	300						
Depth(m)		1295-1463											
Surface temp. (°C)		22.7											
Wether		bc											
Wind		SW-5											
Flying squid		1											
Escolra		1											
Atlantic mako shark												1	

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

Weather (bc: 25-75% clouded, c: over 75-99% clouded).

**THE "OSHORO MARU" CRUISE 050
TO TATEYAMA-BAY and SAGAMI-NADA**

IN DECEMBER 2017

1. Cruise Itinerary

Cruise 050

Departure from Yokohama and start hydrographic research	Dec.	15,2017
Finish hydrographic research		16
Arrival at Yokohama		17
Departure from Yokohama		18
Return to Hakodate		21

Total coverage 714.7 miles

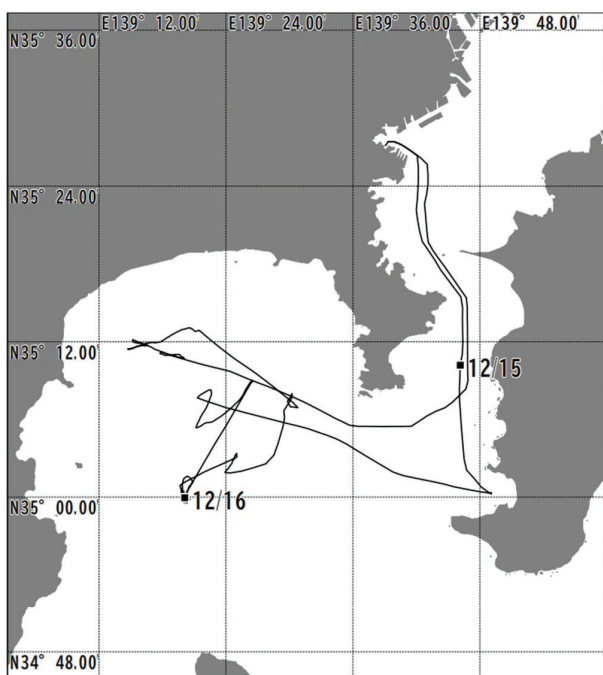


Fig. 1-1: Noon Position

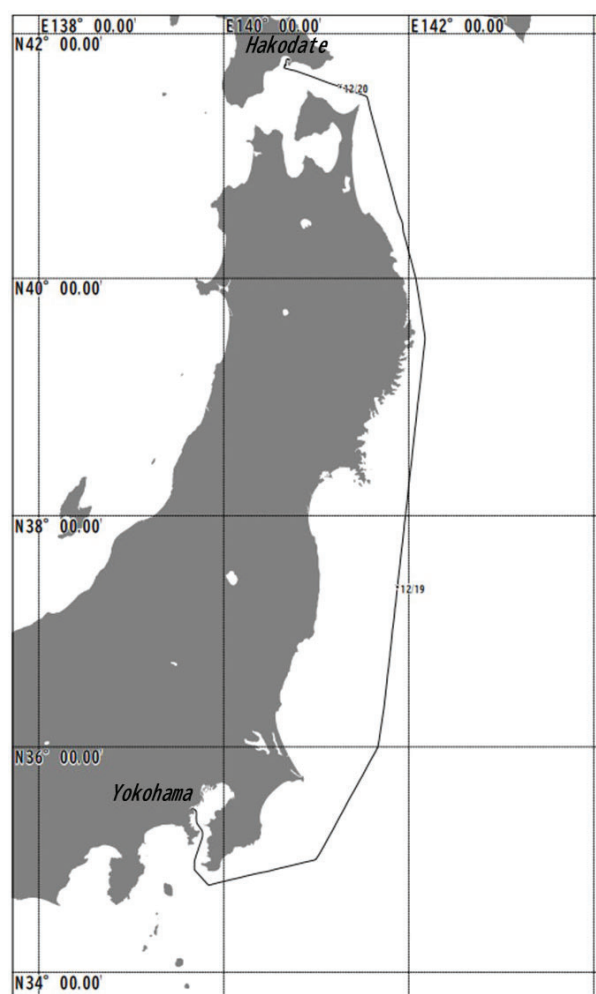


Fig. 1-2: Noon Position

2. Vessel Personnel

Crew:	Captain:	Associate Professor	Shogo Takagi
			And 31 persons

Undergraduate instructor:

Junior Associate Professor (School of Marine Bioscience, Kitasato University)

Noriko Amiya

Assistant Professor (School of Marine Bioscience, Kitasato University)

Masaya Furukawa

Specially Appointed Assistant Professor (School of Fisheries Sciences, Hokkaido University)

Mitsuhiro Nakaya

Teaching Assistant:	4 persons
---------------------	-----------

Undergraduate Student:	39persons
------------------------	-----------