4

THE "OSHORO MARU" CRUISE 040
TO JAPAN SEA, AND
THE NORTHWEST PACIFIC OCEAN, THEBERING SEA and CHUKCHI SEA

IN JUNE TO AUGUST 2017

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 27th		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 25th		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.)

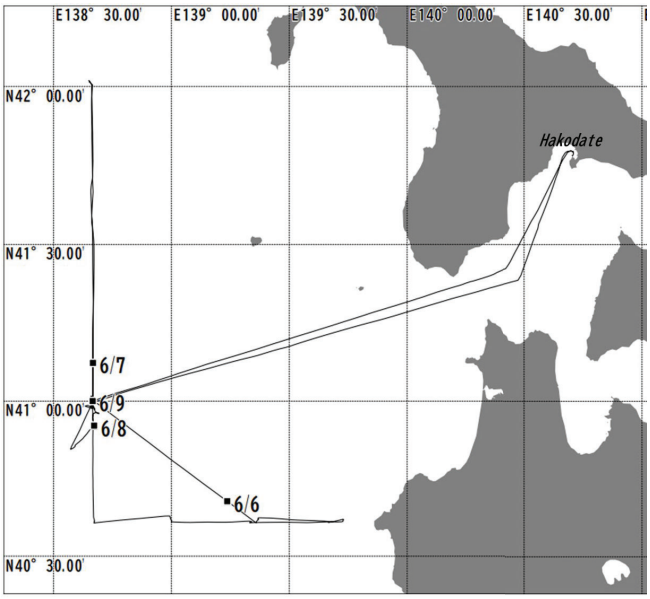

Fig. 1-1: Noon Position

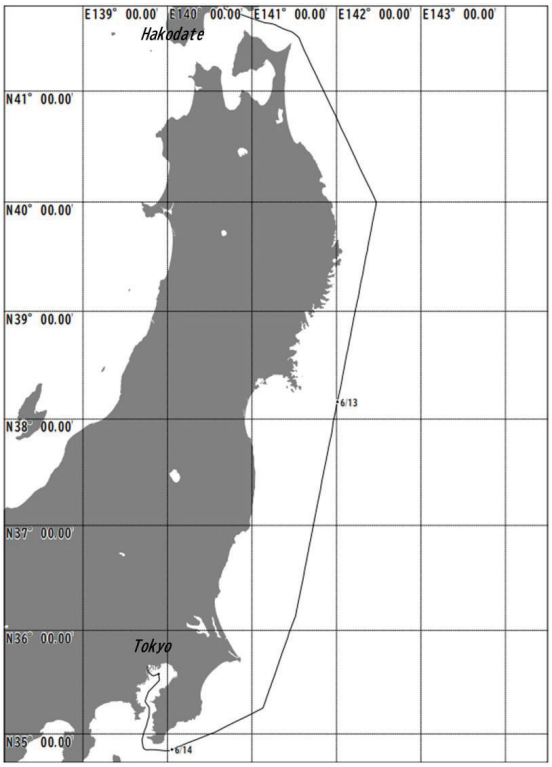

Fig. 1-2: Noon Position

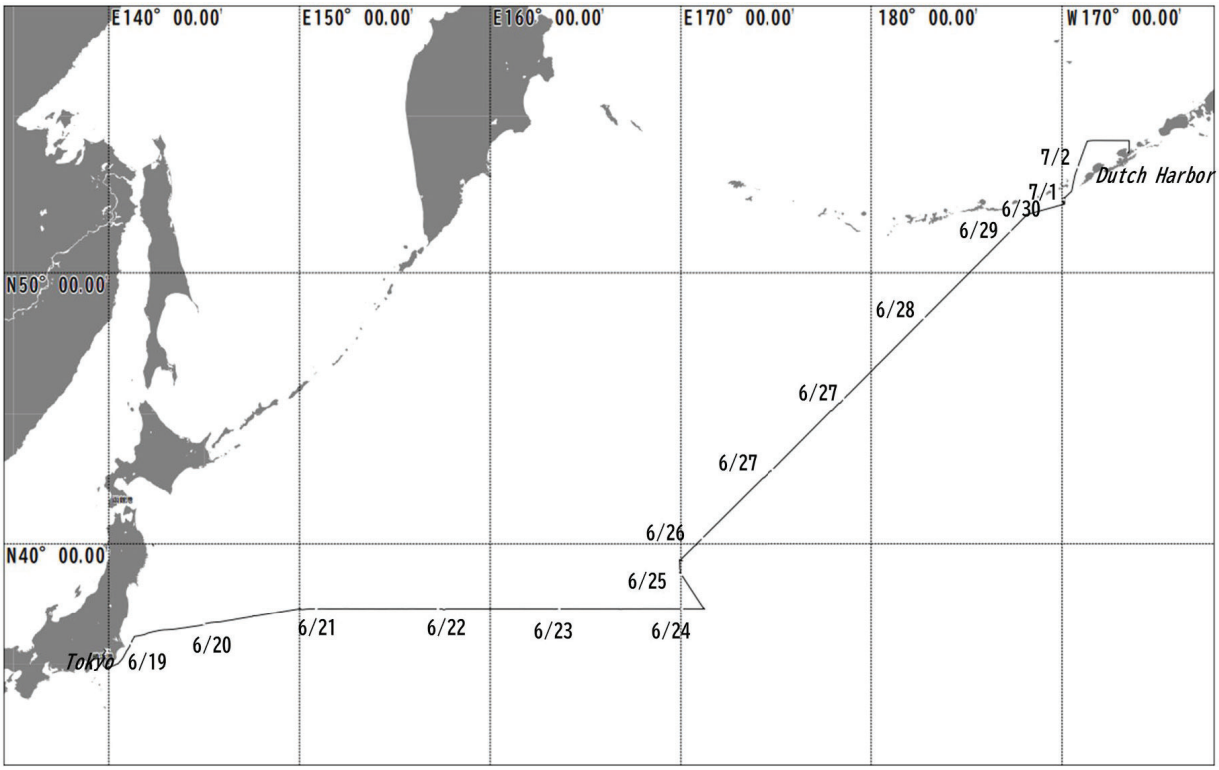

Fig. 1-3: Noon Position

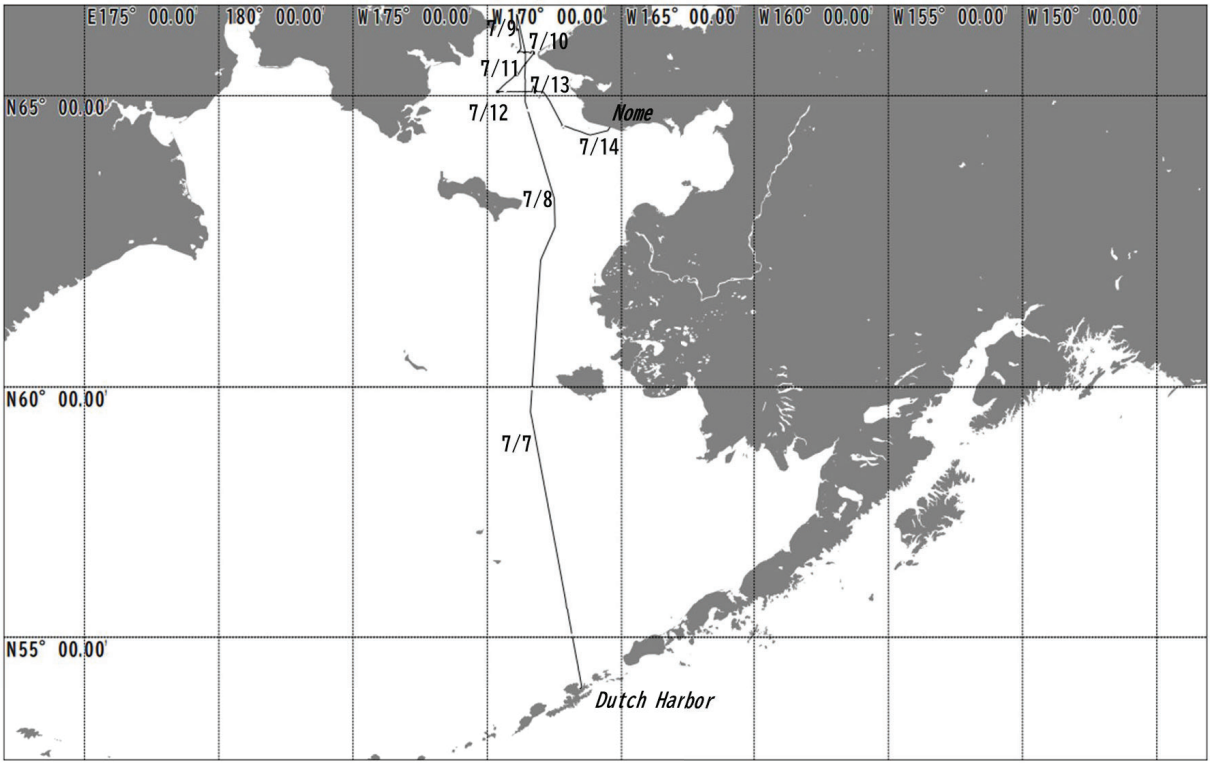

Fig. 1-4: Noon Position

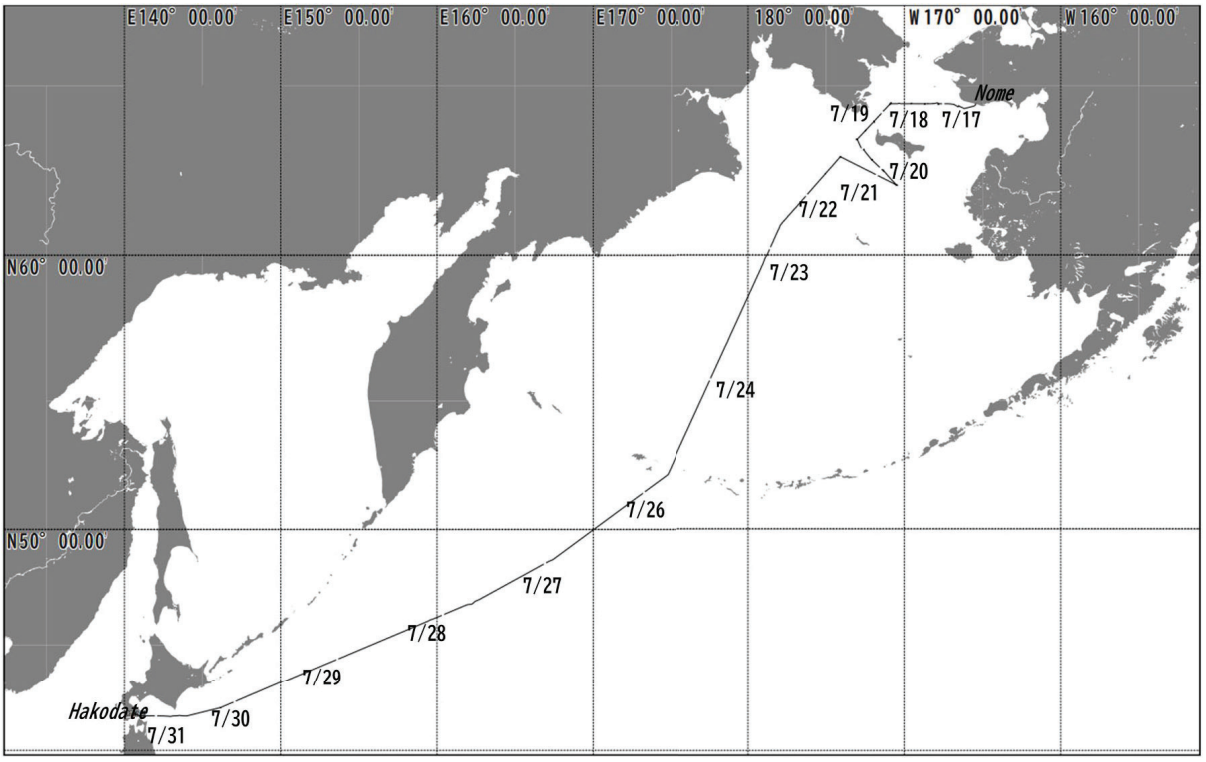

Fig. 1-5: Noon Position

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 Senjyu

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 Marin 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	bottom	Wr*4	Wind	S.T.*5
	Line set	Line haul		Lat.	Long.		of baskets	depth(m)		(Force)	(℃)
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)
HL05	O000	498	1260	1	11
		494	1520	1	37
		502	1610	1	36
HL06	O000	576	2450	1	210
		442	1110	2	34
		576	2300	2	33
		574	2150	1	98
		586	2150	2	13
		578	2040	1	93
		604	2750	2	28
		582	2380	1	85
		540	1880	1	88
SL02	B000	550	2050	1	195
		474	1250	2	1
		513	1460	2	1
		536	1740	2	1
		572	2360	1	195
		481	1330	1	16
		516	1530	2	1
		482	1360	1	15
		569	2380	1	200

Chum salmon

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

Pink salmon

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

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