



Title	9.THE "OSHORO MARU" CRUISE 209 TO WATERS EAST OF HONSHU AND TO THE OGASAWARA ISLANDS IN DECEMBER 2009
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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

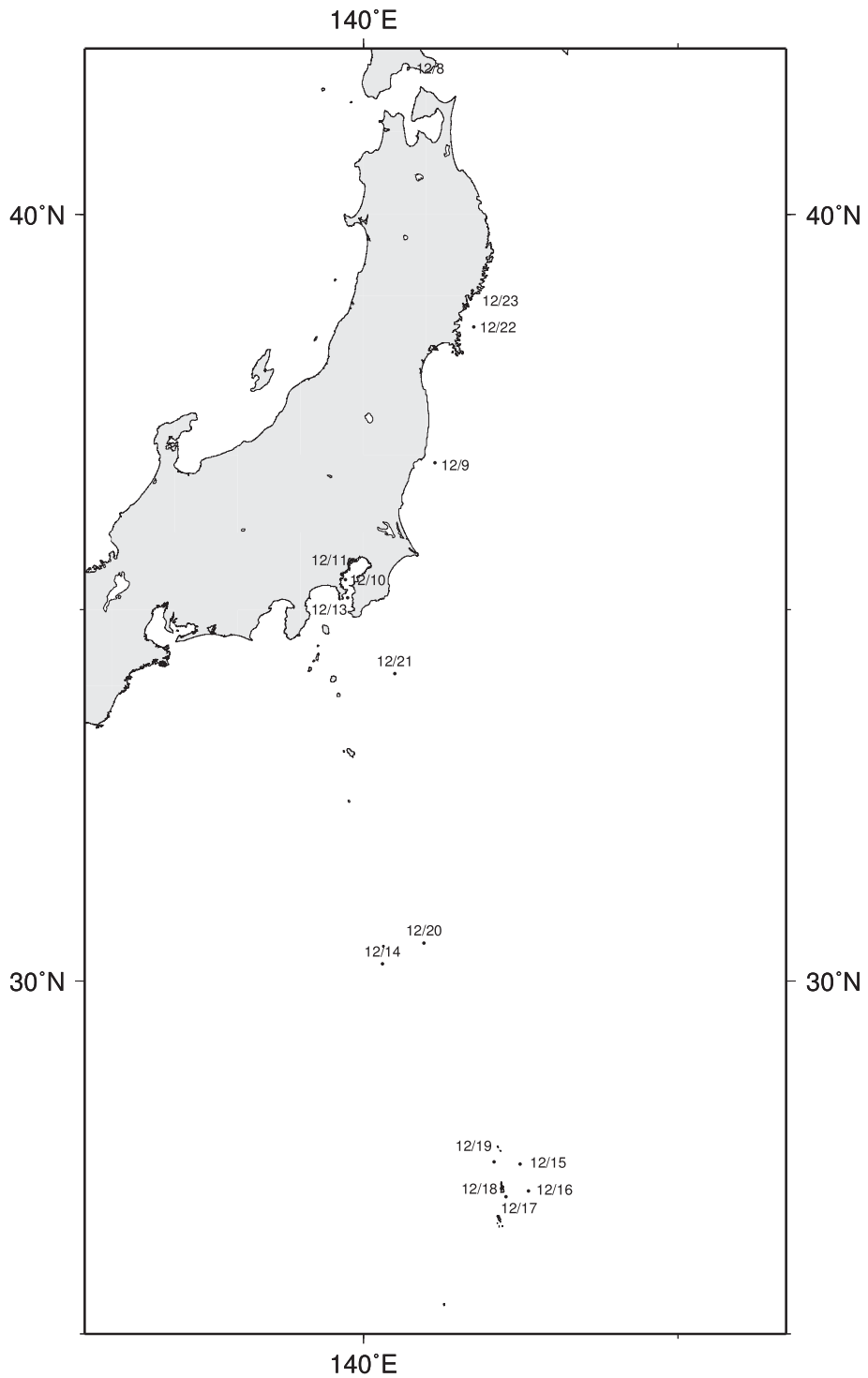


Figure 1: Noon position

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 Kajiwara
	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”.

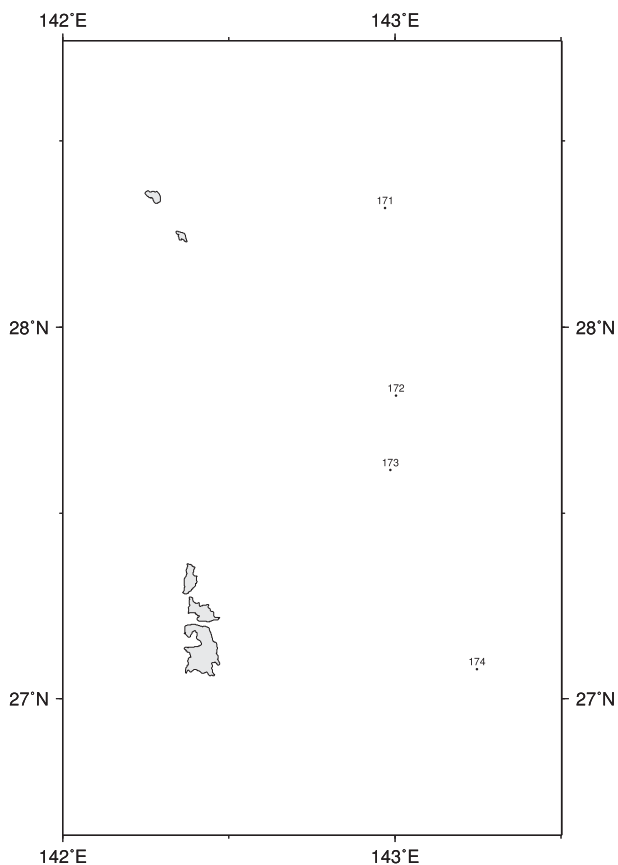


Figure 2: Oceanographic stations

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

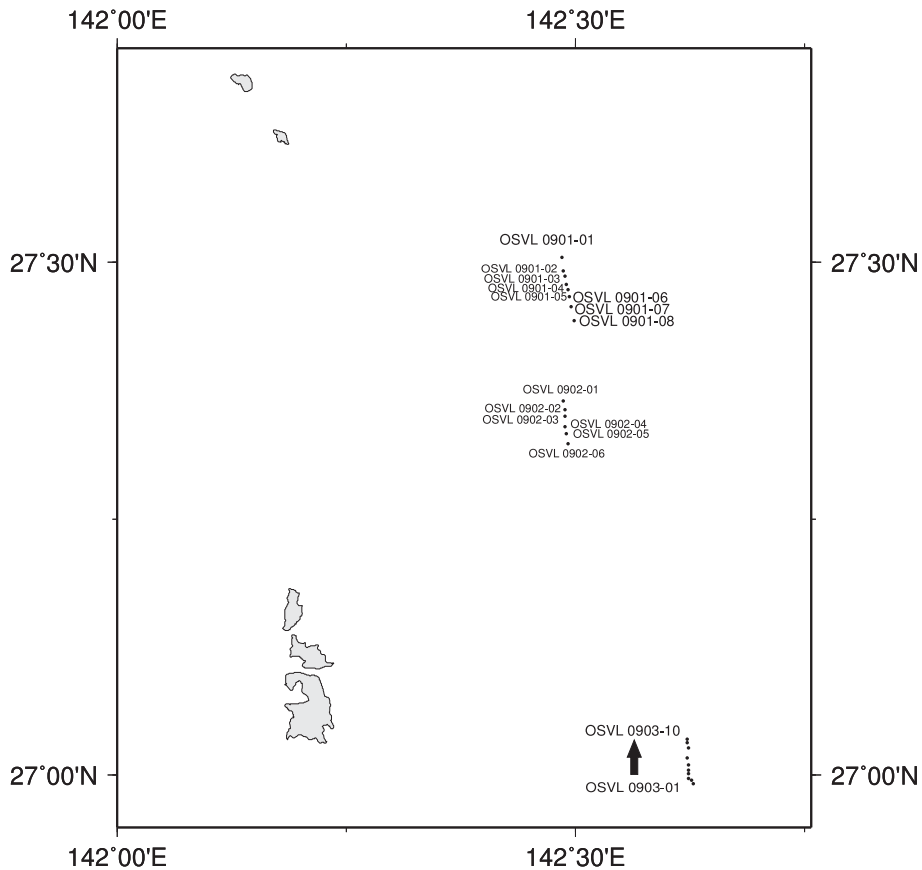


Figure 3: Locations of vertical long-line research

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									