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**THE " OSHORO MARU " CRUISE 223 TO WATERS EAST OF HONSHU
AND TO THE OGASAWARA ISLANDS**

IN DECEMBER 2010

1. Cruise Itinerary

Cruise 223

Departure from Hakodate	Dec. 6, 2010
Start hydrographic research (OS10191)	6
Arrival at Yokohama	9
Departure from Yokohama	12
Start vertical long-line research (OSVL1001)	14
Start mid-water trawl research (OSMT1006)	14
Arrival at Futami	16
Departure from Futami	18
Finish mid-water trawl research (OSMT1009)	19
Finish vertical long-line research (OSVL1006)	19
Finish hydrographic research (OS10200)	19
Arrival at Shioyama	21

Total coverage 1984.5miles 14days at sea and three days in port

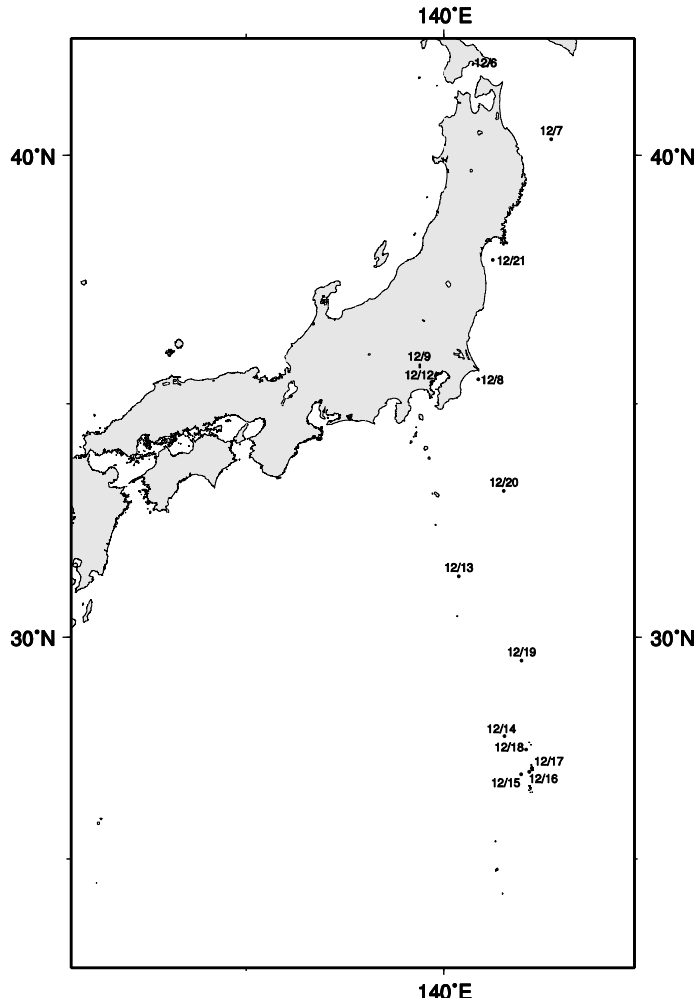


Figure 1. Noon position

2. Vessel Personnel

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

Cruise 223

Under Graduate instructor:

Associate Professor	(Department of Marine Science and Resources, Nihon University)	
Yokohama - Shiogama		Takahito Kojima
Associate Professor	(Teikyo University of Science and Technology)	
Yokohama - Shiogama		Kyoichi Mori
Technical official	(Department of Marine Science and Resources, Nihon University)	
Yokohama - Shiogama		Yuya Makiguchi
Research Worker	(Plant Research Department, National Museum of nature and Science)	
Yokohama - Shiogama		Kaoru Ohgane

Guest Scientist:

Professors emeritus	(Division of Marine Bioresource and Environmental Science, Hokkaido University)	
Hakodate - Shiogama		Kazuhiro Nakaya
Professor	(Division of Bioengineering and Bioinformatics, Hokkaido University)	
Hakodate - Yokohama		Hidemi Watanabe
Professor	(Division of Bioengineering and Bioinformatics, Hokkaido University)	
Hakodate - Yokohama		Kazuhisa Sueoka
Instructor	(Field Science Center for Northern Biosphere, Hokkaido University)	
Hakodate - Yokohama		Jun Yamamoto
Research Worker	(Teikyo University of Science and Technology)	
Yokohama - Shiogama		Saeko Kumagai
Research Worker	(Graduate school of arts and sciences, International Christian University)	
Yokohama - Shiogama		Keiko Sekiguchi
Research Fellow	(Graduate School of Information and Technology GCOE)	
Hakodate - Shiogama		Toshiro Iwamori
Technical Staff:	Technical assistant	(KOWA Corporation)
	Hakodate - Yokohama	Hiroyuki Saka, Osamu Numamoto, Takayuki Uemura

Teaching Assistant:

3 Person

Graduate Students:

2 Persons

Under Graduate Students:

31 Persons

(Hokkaido University)

3 Persons

(Department of Marine Science and Resources, Nihon University)

21 Persons

(Teikyo University of Science and Technology)

4 Persons

(Faculty of Science, Tohoku University)

1 Person

(Faculty of Agriculture, Utsunomiya University)

2 Persons

Total 50 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

Biological research for fishes caught by mid-water trawl observations:

Fig. 4 Table 4,5

Sediment sampling and observation by ROV and Smith-McIntyre Grab:

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

Hydrographic work on deck and the data processing were made by the deck officers, Science officer, crews, research staff and cadets of the “Oshoromaru”. Temperature and salinity were measured by CTD (Seabird SBE-9Plus, SBE-19Plus and XCTD2). Dynamic computations were made using a desk-top computer aboard the “Oshoromaru”. Water and Plankton sampling were also carried out at almost hydrographic stations.

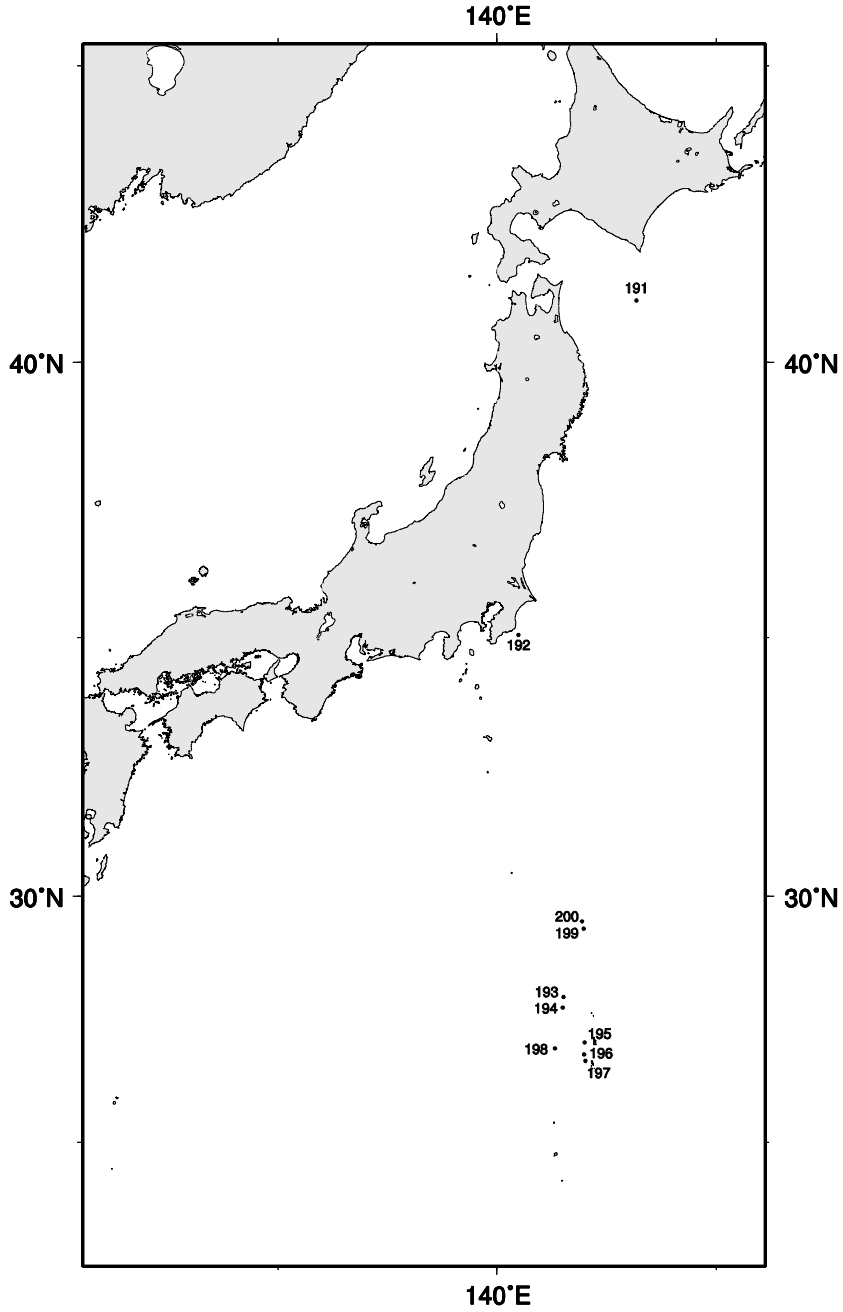


Figure 2. Oceanographic station

Table 1. List of Oceanographic Station

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS10191	41-05.6N	143-09.7E	12/6	2104	9	2017	-	-	8.8	c	19Plus-4636
OS10192	35-04.1N	140-28.0E	12/7	0546	9	121	-	-	20.1	bc	19Plus-4636
OS10193	28-00.1N	141-30.0E	12/13	2143	9	4150	-	-	24.9	bc	XCTD-2
OS10194	27-47.2N	141-28.8E	12/14	0000	9	4140	2	26	24.4	bc	9Plus-0769
OS10195	27-04.7N	141-58.7E	12/14	2204	9	1170	2	24	23	c	9Plus-0769
OS10196	26-79.9N	141-57.8E	12/15	0421	9	1985	2	33.8	24.5	c	9Plus-0769
OS10197	26-41.9N	141-59.6E	12/15	1053	9	1131	-	-	-	c	XCTD-2
OS10198	26-57.4N	141-18.2E	12/15	2216	9	1210	2	28	22.6	c	9Plus-0769
OS10199	29-22.3N	141-57.2E	12/18	2120	9	3105	-	-	-	bc	XCTD-2
OS10200	29-31.2N	141-55.3E	12/19	0415	9	4320	2	25.7	21.6	c	9Plus-0769

(*): Fixed position by Global Positioning System

Table 2. Oceanographic data

Station OS10191 Longitude 143-09.7E Latitude 41-05.6N Depth(m) 2017				Station OS10192 Longitude 140-28.0E Latitude 35-04.1N Depth(m) 121				Station OS10193 Longitude 141-30.0E Latitude 28-00.1N Depth(m) 4150				Station OS10194 Longitude 141-28.8E Latitude 27-47.2N Depth(m) 4140			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	7.860	33.276	25.941	5	19.600	34.496	24.482	5	24.238	34.656	23.312	5	24.300	34.714	23.335
10	7.861	33.277	25.941	10	19.605	34.496	24.481	10	24.234	34.666	23.321	10	24.252	34.714	23.350
20	7.857	33.279	25.943	20	19.440	34.487	24.518	20	24.229	34.666	23.322	20	24.253	34.714	23.350
30	7.856	33.279	25.943	30	19.323	34.502	24.562	30	24.224	34.666	23.324	30	24.247	34.713	23.351
40	7.822	33.287	25.938	40	18.750	34.502	24.691	40	24.009	34.659	23.367	40	24.177	34.708	23.388
50	7.750	33.264	25.947	50	18.784	34.504	24.697	50	23.288	34.611	23.557	50	24.132	34.708	23.382
75	7.741	33.262	25.946	75	18.608	34.511	24.747	75	22.841	34.587	23.668	75	23.885	34.715	23.460
100	5.059	33.281	26.305	100	18.419	34.511	24.794	100	22.319	34.621	23.842	100	21.523	34.761	24.169
125	3.508	33.260	26.449					125	20.915	34.640	24.244	125	20.271	34.753	24.502
150	3.024	33.337	26.555					150	19.872	34.654	24.533	150	19.193	34.722	24.759
175	2.755	33.382	26.616					200	18.613	34.635	24.841	175	18.430	34.708	24.942
200	2.221	33.353	26.635					250	17.954	34.624	24.996	200	18.130	34.702	25.012
250	2.262	33.425	26.689					300	17.428	34.621	25.122	250	17.600	34.692	25.134
300	2.431	33.496	26.733					400	14.729	34.484	25.634	300	17.174	34.690	25.255
400	2.800	33.693	26.800					500	11.119	34.256	26.175	400	14.738	34.561	25.690
500	2.900	33.847	26.974					600	7.697	34.050	26.572	500	11.441	34.336	26.178
600	3.219	34.009	27.074					700	5.734	34.054	26.838	600	8.650	34.173	26.526
700	3.230	34.115	27.157					800	5.066	34.139	26.985	700	6.259	34.171	26.865
800	3.168	34.199	27.230					900	4.174	34.222	27.149	800	5.279	34.217	27.022
900	3.097	34.300	27.317					1000	3.775	34.295	27.248	900	4.361	34.264	27.163
1000	2.933	34.344	27.367					1200	3.172	34.397	27.388	1000	3.893	34.315	27.252
1200	2.669	34.429	27.458					1500	2.494	34.508	27.537	1200	3.224	34.406	27.391
1500	2.374	34.503	27.543									1500	2.511	34.514	27.540
Station OS10195 Longitude 141-58.7E Latitude 27-04.7N Depth(m) 1170				Station OS10196 Longitude 141-57.8E Latitude 26-79.9N Depth(m) 1985				Station OS10197 Longitude 141-59.6E Latitude 26-41.9N Depth(m) 1131				Station OS10198 Longitude 141-18.2E Latitude 26-57.4N Depth(m) 1210			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	22.901	34.660	23.704	5	24.634	34.723	23.242	5	24.283	34.659	23.301	5	22.609	34.594	23.738
10	22.887	34.659	23.707	10	24.612	34.723	23.249	10	24.273	34.669	23.311	10	22.613	34.595	23.737
20	22.778	34.654	23.735	20	24.492	34.722	23.284	20	24.155	34.677	23.353	20	22.610	34.598	23.741
30	22.654	34.647	23.771	30	24.317	34.721	23.336	30	24.136	34.680	23.361	30	22.525	34.632	23.790
40	22.778	34.639	23.837	40	24.021	34.728	23.430	40	24.116	34.686	23.371	40	22.306	34.645	23.862
50	22.308	34.639	23.857	50	23.779	34.721	23.495	50	24.087	34.685	23.379	50	22.242	34.650	23.884
75	22.049	34.685	23.964	75	22.813	34.723	23.777	75	23.257	34.682	23.620	75	22.104	34.677	23.944
100	21.294	34.743	24.218	100	21.267	34.755	24.235	100	20.943	34.695	24.279	100	20.177	34.699	24.244
125	19.860	34.746	24.605	125	20.338	34.765	24.493	125	19.965	34.688	24.534	125	20.509	34.693	24.393
150	18.999	34.735	24.819	150	19.547	34.750	24.689	150	19.456	34.662	24.647	150	19.623	34.699	24.631
175	18.615	34.726	24.909	175	18.865	34.731	24.850	200	18.033	34.667	25.010	175	18.728	34.704	24.864
200	18.325	34.716	24.974	200	18.466	34.722	24.943	250	17.242	34.644	25.184	200	18.101	34.701	25.018
250	17.475	34.700	25.170	250	17.884	34.711	25.079	300	16.373	34.612	25.364	250	17.427	34.692	25.176
300	16.898	34.683	25.295	300	17.015	34.687	25.271	400	14.552	34.504	25.687	300	16.717	34.668	25.326
400	15.021	34.578	25.642	400	14.748	34.552	25.682	500	11.578	34.296	26.122	400	14.823	34.561	25.672
500	11.691	34.357	26.148	500	11.759	34.365	26.142	600	8.824	34.170	26.496	500	11.530	34.352	26.174
600	8.997	34.206	26.497	600	9.132	34.223	26.488	700	6.579	34.108	26.773	600	8.511	34.207	26.627
700	6.463	34.144	26.816	700	6.943	34.152	26.758	800	5.249	34.135	26.961	700	6.383	34.156	26.837
800	5.357	34.174	26.979	800	5.390	34.148	26.954	900	4.338	34.227	27.136	800	4.985	34.187	27.033
900	4.336	34.250	27.154	900	4.392	34.236	27.138	1000	3.750	34.316	27.268	900	4.174	34.263	27.182
1000	3.644	34.342	27.299	1000	3.820	34.320	27.264	1200	3.710	34.696	12.479	1000	3.753	34.324	27.274
								1500	5.130	15.787	12.471				
Station OS10199 Longitude 141-57.2E Latitude 29-22.3N Depth(m) 3105				Station OS10200 Longitude 141-55.3E Latitude 29-31.2N Depth(m) 4320											
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T								
5	22.613	34.558	23.711	5	21.683	34.660	24.048								
10	22.614	34.569	23.719	10	21.679	34.661	24.049								
20	22.613	34.581	23.728	20	21.666	34.659	24.052								
30	22.617	34.586	23.731	30	21.637	34.659	24.060								
40	22.615	34.584	23.730	40	21.627	34.659	24.063								
50	22.578	34.588	23.743	50	21.624	34.662	24.065								
75	22.288	34.595	23.831	75	21.625	34.662	24.066								
100	21.509	34.671	24.106	100	21.383	34.708	24.167								
125	20.355	34.671	24.418	125	19.505	34.726	24.682								
150	19.282	34.667	24.696	150	18.998	34.719	24.807								
200	18.544	34.669	24.885	175	18.576	34.711	24.908								
250	17.702	34.645	25.074	200	18.208	34.703	24.993								
300	17.326	34.643	25.163	250	17.597	34.700	25.140								
400	15.287	34.550	25.563	300	16.783	34.686	25.324								
500	12.161	34.347	26.052	400	14.551	34.552	25.724								
600	8.986	34.171	26.472	500	11.436	34.356	26.194								
700	6.684	34.119	26.768	600	8.197	34.159	26.584								
800	5.681	34.153	26.923	700	5.931	34.086	26.839								
900	4.678	34.202	27.079	800	4.881	34.137	27.004								
1000	4.001	34.269	27.205	900	4.244	34.224	27.144								
1200	3.172	34.394	27.386												
1500	2.484	34.501	27.532												

5. Data on vertical long line research

Six operations using a vertical long-line were performed. The gear comprised by four types of main line (270,400,500,600m) 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 the main line. These operations were supervised by the captain, Deck officers, Science officer, crews, cadets, and research staffs were engaged in the work.

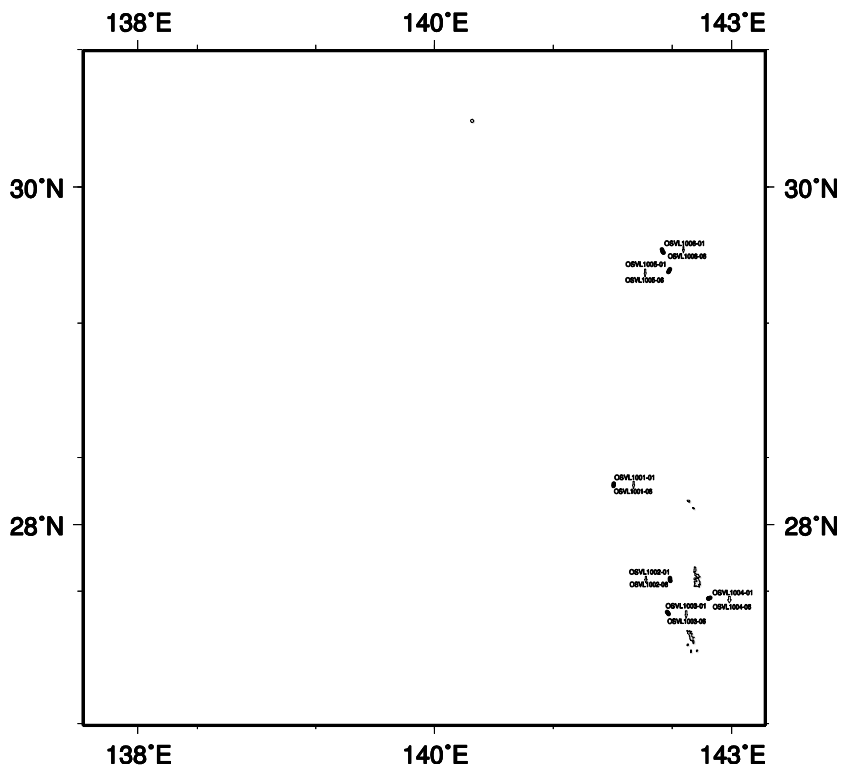


Figure 3. Locations of vertical long line research

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

Table 3. Data on vertical long line research

No. of research		OSVL 1001-01	OSVL 1001-02	OSVL 1001-03	OSVL 1001-04	OSVL 1001-05	OSVL 1001-06
Date		14-Dec					
position of	Lat. (N)	27-48.9	27-48.7	27-48.6	27-48.3	27-48.1	27-47.8
line set	Long. (E)	141-30.0	141-30.0	141-30.0	141-30.0	141-30.0	141-29.8
Time	Line set	0806	0816	0826	0830	0836	0843
(S.M.T.)	Line haul	1156-1344					
Length of main line(m)		270	400	500	600	400	500
Depth(m)		4143					
Surface temp. (°C)		24.2					
Wether		bc					
Wind		SSW5					
Flying squid			1	1			1
<hr/>							
No. of research		OSVL 1002-01	OSVL 1002-02	OSVL 1002-03	OSVL 1002-04	OSVL 1002-05	OSVL 1002-06
Date		15-Dec					
position of	Lat. (N)	27-06.3	27-06.1	27-05.7	27-05.5	27-05.2	27-05.0
line set	Long. (E)	141-58.3	141-58.4	141-58.4	141-58.5	141-58.5	141-58.6
Time	Line set	0630	0635	0643	0648	0654	0656
(S.M.T.)	Line haul	0924-1123					
Length of main line(m)		500	400	600	500	400	500
Depth(m)		1150					
Surface temp. (°C)		23.7					
Wether		c					
Wind		NNW3					
Flying squid				1			
Bigeye tuna		1					
<hr/>							
No. of research		OSVL 1003-01	OSVL 1003-02	OSVL 1003-03	OSVL 1003-04	OSVL 1003-05	OSVL 1003-06
Date		15-Dec					
position of	Lat. (N)	26-51.1	26-50.9	26-50.7	26-50.4	26-50.2	26-50.1
line set	Long. (E)	141-56.9	141-57.1	141-57.3	141-57.4	141-57.6	141-57.7
Time	Line set	1248	1255	1300	1306	1311	1316
(S.M.T.)	Line haul	1433-1628					
Length of main line(m)		600	600	500	500	400	400
Depth(m)		2430					
Surface temp. (°C)		22.4					
Wether		o					
Wind		NW3					
Diamondback squid			1				
Bigeye tuna					2		
Sickle pomfret		1					
<hr/>							
No. of research		OSVL 1004-01	OSVL 1004-02	OSVL 1004-03	OSVL 1004-04	OSVL 1004-05	OSVL 1004-06
Date		16-Dec					
position of	Lat. (N)	26-57.0	26-57.1	26-57.2	26-57.2	26-57.3	26-57.5
line set	Long. (E)	142-17.6	142-17.8	142-18.0	142-18.2	142-18.4	142-18.7
Time	Line set	0636	0642	0647	0653	0659	0705
(S.M.T.)	Line haul	0855-1047					
Length of main line(m)		400	400	500	500	600	600
Depth(m)		1283					
Surface temp. (°C)		22.5					
Wether		o					
Wind		ENE3					
Flying squid				2			
Bigeye tuna							
Sickle pomfret							1
<hr/>							
No. of research		OSVL 1005-01	OSVL 1005-02	OSVL 1005-03	OSVL 1005-04	OSVL 1005-05	OSVL 1005-06
Date		19-Dec					
position of	Lat. (N)	29-23.0	29-23.2	29-23.5	29-23.7	29-23.9	29-24.2
line set	Long. (E)	141-57.6	141-57.8	141-57.9	141-58.0	141-58.2	141-58.3
Time	Line set	0636	0642	0648	0653	0659	0705
(S.M.T.)	Line haul	0925-1107					
Length of main line(m)		400	400	500	500	600	600
Depth(m)		3300					
Surface temp. (°C)		22.5					
Wether		bc					
Wind		North3					
Flying squid						1	1
Diamondback squid							1
Sickle pomfret					2		
<hr/>							
No. of research		OSVL 1006-01	OSVL 1006-02	OSVL 1006-03	OSVL 1006-04	OSVL 1006-05	OSVL 1006-06
Date		19-Dec					
position of	Lat. (N)	29-32.9	29-32.6	29-32.3	29-31.9	29-31.6	29-31.4
line set	Long. (E)	141-54.3	141-54.5	141-54.6	141-54.8	141-54.9	141-55.1
Time	Line set	1240	1247	1255	1259	1301	1310
(S.M.T.)	Line haul	1440-1655					
Length of main line(m)		500	500	600	600	500	500
Depth(m)		4280					
Surface temp. (°C)		21.6					
Wether		bc					
Wind		North4					
Flying squid							
Oil fish					1		
Sickle pomfret		1		1	1		

6. Data on mid-water trawl research

Four 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 research staff.

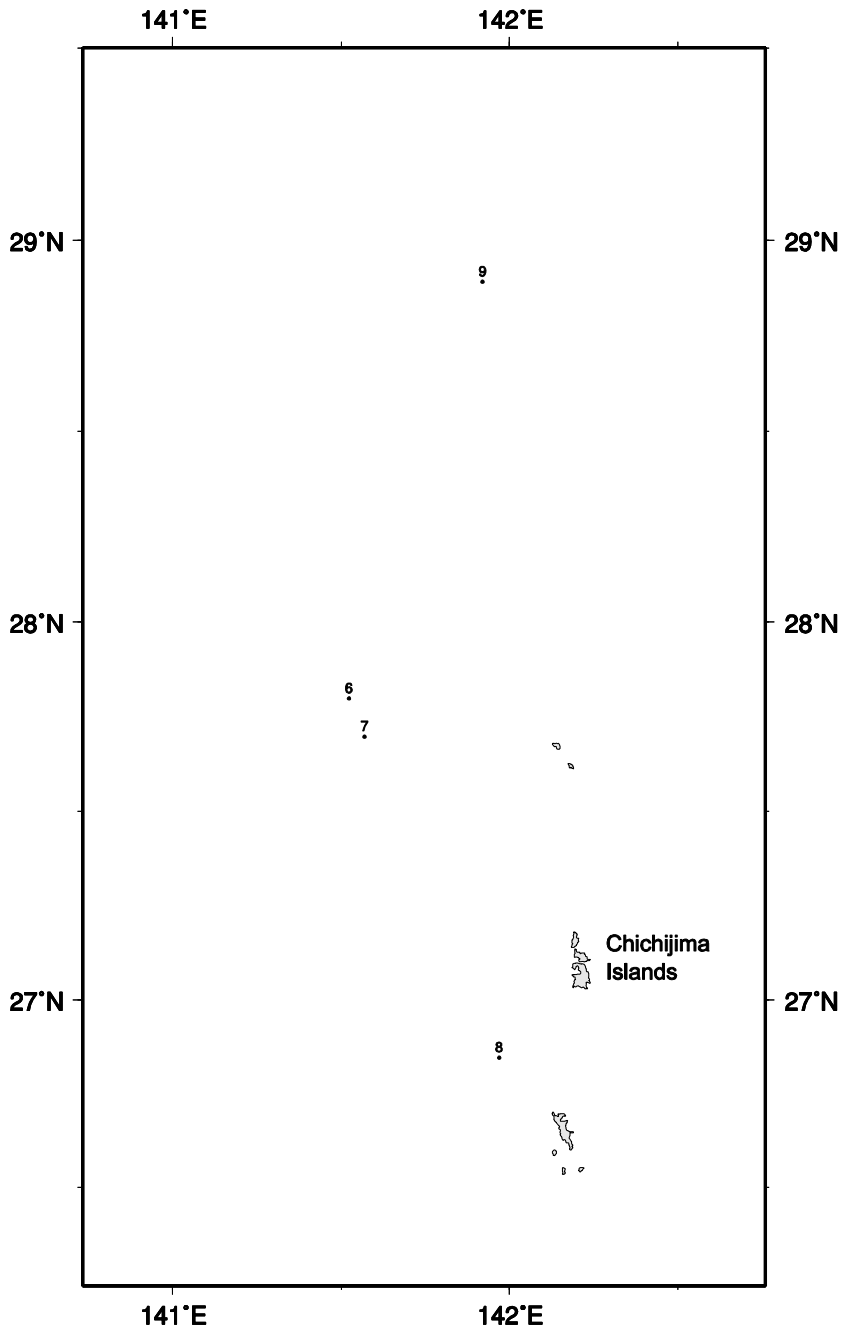


Figure 4. Locations of bottom trawl research

Table 4. Data on bottom trawl research during the “Oshoro Maru” Cruise#223

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
	Lat.(N)	Long.(E)							
OSMT1006	14-Dec	1408-1450	27-48.0	141-31.2	-	4.2	4144	bc	sw-5
OSMT1007	14-Dec	1614-1738	27-42.0	141-34.0	185~125	3.0	4143	bc	sw-5
OSMT1008	15-Dec	1641-1753	26-50.9	141-58.0	200	3.5	1670	c	nnw-3
OSMT1009	18-Dec	2000-2120	28-53.7	141-55.0	350	3.0	2117	bc	nnw-4

S.T. : Surface temperature

Wr.: Weather (r: rain, o: 100% clouded, d: drizzling rain, f fog, bc: 25-75% clouded)

Table 5. Data on catches by bottom trawl research

Japanese name	Scientific Name	OSMT 1006		OSMT 1007		OSMT 1008		OSMT 1009	
		Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)
Darumazame	<i>Isistius brasiliensis</i>	-	-	1	0.64	-	-	1	0.30
Kohiredarumazame	<i>Isistius plutodus</i>	-	-	-	-	-	-	1	0.14
Unagi-ru	Anguilliformes spp.	7	0.01	-	-	-	-	-	-
Shigiunagi	<i>Nemichthys scolopaceus</i>	-	-	6	0.03	1	0.001	1	0.003
Nokobaunagi	<i>Serrivomer sector</i>	-	-	15	1.58	7	0.1	27	0.47
Sokoiwashi-ru	Bathylagidae spp.	-	-	3	0.05	1	0.02	8	0.18
Demengisu-ru	Opisthoproctidae sp.	-	-	-	-	-	-	2	0.02
Sekitoriwashi-ru	Alepocephalidae sp.	-	-	2	0.1	-	-	-	-
Yokoeso-ru	Gonostomatidae spp.	10	0.14	107	0.6	4	0.05	36	0.27
Muneeso-ru	Sternopychidae spp.	1	0.003	32	0.08	35	0.07	51	0.23
Horaieso-ru	Chauliodontidae spp.	-	-	47	0.99	9	0.12	97	1.63
Tokagehadaka-ru	Astronesthidae spp.	-	-	7	0.69	1	0.49	-	-
Hoteieso-ru	Melanostomiidae spp.	-	-	9	0.84	13	0.84	40	1.63
Hokiboshieso-ru	Malacosteiidae spp.	-	-	-	-	10	0.2	5	0.07
Mitsumatayariuo-ru	Idiacanthidae spp.	-	-	6	0.02	11	0.09	2	0.04
Hudeeso-ru	Notosudidae sp.	-	-	-	-	-	-	3	0.02
Hadakaiwashi-ru	Myctophidae spp.	1	0.004	1055	4.14	373	1.12	917	4.07
Hadakaeso-ru	Paralepididae sp.	-	-	-	-	1	0.003	-	-
Kibahadaka	<i>Omosudis lowei</i>	-	-	2	0.02	-	-	-	-
Yarieso-ru	Evermannellidae sp.	-	-	-	-	-	-	6	0.21
Kawarhiredara	<i>Melanonus zugmayeri</i>	-	-	-	-	-	-	1	0.07
Saiuo-ru	Bregmacerotidae sp.	-	-	5	0.01	-	-	30	0.08
Sokodara-ru	Macrouridae sp.	-	-	-	-	4	0.26	-	-
Chochinanko-ru	Ceratioidei spp.	-	-	1	0.18	-	-	2	0.09
Chochinanko	<i>Himantolophus groenlandicus</i>	-	-	-	-	1	0.32	-	-
Onikinme	<i>Anoplogaster cornuta</i>	-	-	3	0.07	-	-	3	0.16
Kabutouo-ru	Melamphidae sp.	-	-	27	0.27	9	0.05	80	0.58
Akakujirauodamashi	<i>Barbourisia rufa</i>	-	-	1	0.01	-	-	1	0.08
Hurisodeuo-ru	Trachipteridae sp.	-	-	-	-	-	-	1	0.30
Kushisumikiuio	<i>Howella parini</i>	-	-	3	0.05	-	-	18	0.19
Yaegisu	<i>Caristius macropus</i>	-	-	4	0.60	-	-	6	2.62
Kurobozugisu-ru	Chiasmodontidae sp.	1	0.003	-	-	1	0.04	3	0.04
Kurotachikamasu-ru	Gempylidae sp.	1	0.01	6	0.06	1	0.01	4	0.71
Kurokasago	<i>Ectreposebastes imus</i>	-	-	-	-	-	-	1	0.04
Shirokasago	<i>Pleurogrammus monopterygius</i>	-	-	-	-	1	0.20	2	0.17
Hakohugu-ru	Ostraciidae sp.	-	-	-	-	-	-	1	0.01
Ebi-ru	Decapoda spp.	-	-	97	0.50	42	0.25	304	1.18
Tosoku-ru	Cephalopoda spp.	-	-	83	2.94	30	0.53	38	1.86
Kurage-ru	Cnidaria spp.	-	-	33	0.38	-	-	59	3.66