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THE " USHIO MARU "

CRUISE 203

CRUISE 204

CRUISE 205

IN SEPTEMBER 2010

1. Cruise Itinerary

Cruise 203			
Departure from Hakodate	Sep.	14 ,	2010
Start practical training in scuba		14	
Arrival at Matsumae		14	
Departure from Matsumae		15	
Finish practical training in scuba		15	
Arrival at Kojima		15	
Departure from Kojima		16	
Return to Hakodate		16	

Total coverage 154.1 miles

Cruise 204			
Departure from Hakodate	Sep.	20 ,	2010
Hydrographic research (US10479, US10480)		21	
Research by tuna long-line		21	
Return to Hakodate		23	

Total coverage 193.8 miles

Cruise 205			
Departure from Hakodate	Sep.	27 ,	2010
Start hydrographic research (US10481)		27	
Arrival at Aomori		27	
Departure from Aomori		28	
Finish hydrographic research (US10489)		28	
Arrival at Ominato		28	
Departure from Ominato		30	
Return to Hakodate		30	

Total coverage 185.3 miles

2. Vessel Personnel

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

Cruise 203

Research Staff:	Professor	(Laboratory of Marine Bioresource Chemistry) Ryuichi Sakai	
	Research Associate	(Laboratory of Marine Bioresource Chemistry) Satoko Matsunaga	
Associate staff (Foreign):		(SOUTHERN MARINE LABORATORY)	Jiro Sakagami
Graduate Students:	Chair of Marine Bioresource Chemistry:		1 person
Under Graduate Students:	Department of Marine Bioresources Chemistry:		3 persons

Cruise 204

Teaching Assistant:	Chair of Marine Bioresource and Environment Sensing:	1 person
Under Graduate Students:	Department of Marine Production System Science:	1 person
	Department of Applied Marine Science (Third grade):	7 persons

Cruise 205

Research Staff:	Associate Professor	(Laboratory of Marine Environmental Science)	Isao Kudo
Graduate Students:	Graduate School of Environmental Science:		1 person
Under Graduate Students:	Department of Marine Biology:		3 persons

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

Hydrographic work on deck and the data processing were made by the deck officers, crews, research staff and cadets of the “Ushio Maru”. Temperature and salinity were measured by CTD (Seabird SBE9Plus and SBE-19). Dynamic computations were made using a desk-top computer aboard the “Ushio Maru”.

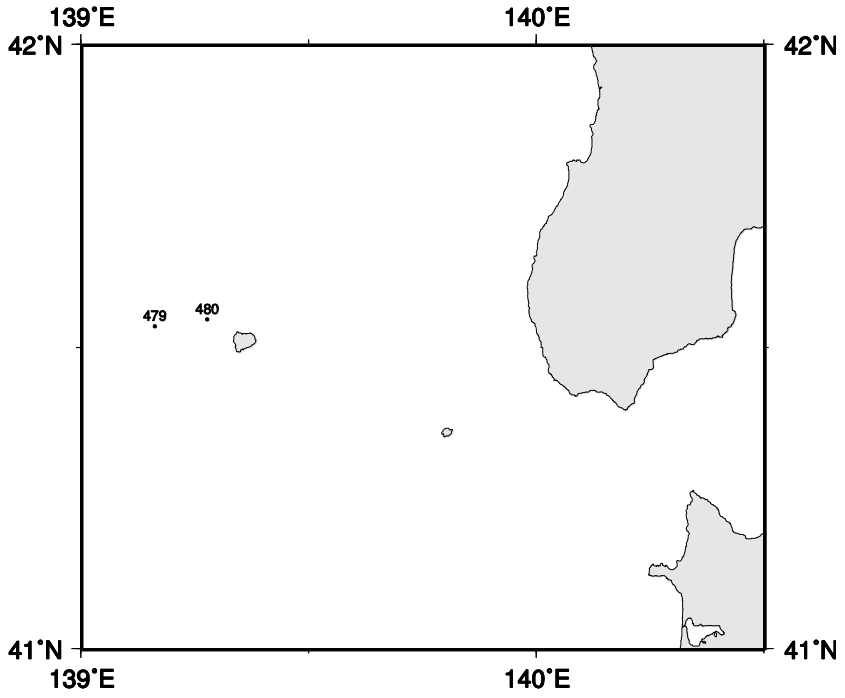

Figure 1: Oceanographic stations (Cruise 204)

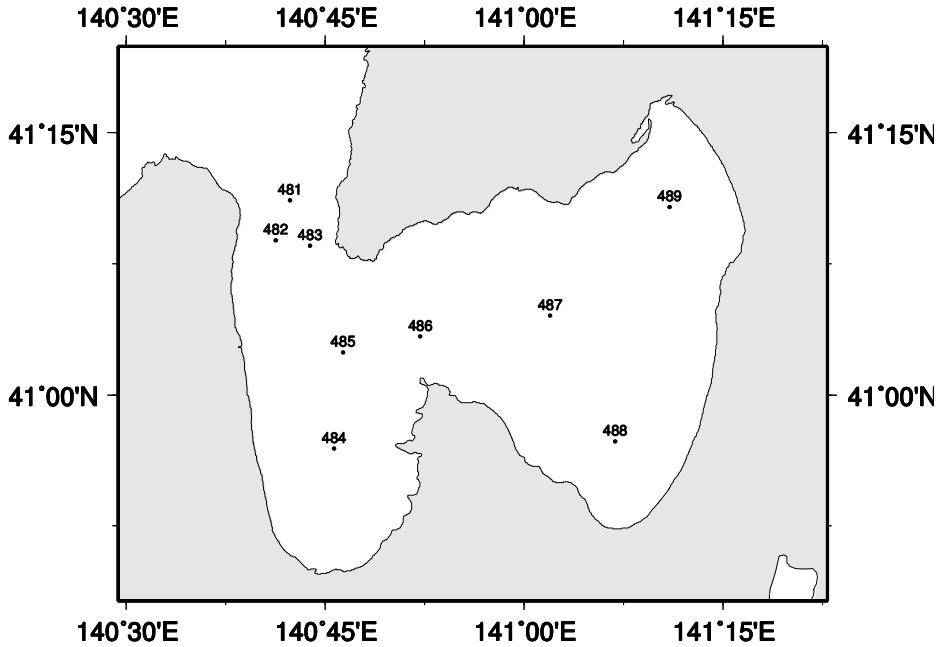

Figure 2: Oceanographic stations (Cruise 205)

Table 1: List of oceanographic stations

Cruise 203 No data

Cruise 204

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10479	41-32.2	139-09.6	9/21	0254-0305	1012	WNW-2	NW -1	WNW-4	23.4	24.8	o	1007.6
US10480	41-32.9	139-16.5	9/21	0428-0439	1260	WNW-2	NW -1	WNW-4	23.3	24.9	o	1008.3

Cruise 205

Station	Lat. (N)*	Long (E)*	Date	S.M.T	Depth	Wave	Swell	Wind	Air Temp.	Sea Temp.	Wr.	Bar. (hPa)
US10481	41-11.2	140-42.3	9/27	1213-1223	69	SSE-1	SSE-1	SSE-3	21.7	23.7	bc	1020.1
US10482	41-08.9	140-41.2	9/27	1243-1249	47	East-2	SE-1	East-4	22.0	23.7	bc	1019.9
US10483	41-08.6	140-43.8	9/27	1313-1320	59	East-2	SE-1	East-4	22.5	23.5	bc	1019.6
US10484	40-57.0	140-45.6	9/27	1430-1437	49	Calm	NE -1	Calm	24.4	24.0	bc	1018.9
US10485	41-02.5	140-46.3	9/28	0741-0746	51	Calm	NE -1	Calm	20.9	23.2	c	1012.6
US10486	41-03.4	140-52.1	9/28	0818-0825	50	ESE-3	ESE-1	ESE-5	20.4	23.4	o	1012.2
US10487	41-04.6	141-01.9	9/28	0919-0925	47	ESE-3	ESE-1	ESE-5	19.3	23.2	c	1011.7
US10488	40-57.4	141-06.8	9/28	1040-1045	37	SE -4	SE-1	SE -6	20.4	23.1	c	1011.1
US10489	41-10.8	141-10.9	9/28	1205-1210	30	SE -3	SE-1	SE -5	20.7	23.0	r	1010.1

(*): Fixed position by Global Positioning System

Table 2: Oceanographic data

STATION US10479
LATITUDE 41-32.2 N
LONGITUDE 139-09.6 E
DEPTH (m) 1012

Press.	Temp.	Salinity	Sigma-T
5	24.790	33.627	22.367
10	24.828	33.646	22.370
20	22.317	34.031	23.392
30	16.694	34.220	24.988
40	15.977	34.298	25.213
50	15.086	34.340	25.444
75	11.177	34.206	26.125
100	9.016	34.146	26.447
125	6.618	34.083	26.748
150	4.736	34.050	26.952
175	3.157	34.064	27.123
200	2.550	34.066	27.179
250	1.692	34.056	27.239
300	1.305	34.069	27.276

STATION US10480
LATITUDE 41-32.9 N
LONGITUDE 139-16.5 E
DEPTH (m) 1260

Press.	Temp.	Salinity	Sigma-T
5	24.788	33.598	22.346
10	24.620	33.664	22.446
20	23.863	33.953	22.889
30	17.598	34.198	24.755
40	15.460	34.311	25.339
50	14.277	34.342	25.620
75	10.975	34.222	26.174
100	8.642	34.127	26.491
125	7.385	34.112	26.665
150	5.500	34.072	26.881
175	4.264	34.072	27.020
200	2.642	34.060	27.166
250	1.669	34.068	27.250
300	1.165	34.070	27.287

STATION US10481
LATITUDE 41-11.2 N
LONGITUDE 140-42.3 E
DEPTH (m) 69

Press.	Temp.	Salinity	Sigma-T
5	23.669	33.106	22.305
10	23.636	33.100	22.310
20	23.588	33.106	22.328
30	23.599	33.117	22.334
40	23.574	33.125	22.347
50	23.239	33.281	22.562

STATION US10482
LATITUDE 41-08.9 N
LONGITUDE 140-41.2 E
DEPTH (m) 47

Press.	Temp.	Salinity	Sigma-T
5	23.584	33.036	22.277
10	23.574	33.036	22.280
20	23.557	33.053	22.298
30	23.589	33.090	22.316
40	23.573	33.106	22.333

STATION US10483
LATITUDE 41-08.6 N
LONGITUDE 140-43.8 E
DEPTH (m) 59

Press.	Temp.	Salinity	Sigma-T
5	23.633	33.092	22.305
10	23.623	33.091	22.307
20	23.582	33.087	22.316
30	23.571	33.091	22.322
40	23.564	33.097	22.328
50	22.756	33.335	22.741

STATION US10484
LATITUDE 40-57.0 N
LONGITUDE 140-45.6 E
DEPTH (m) 49

Press.	Temp.	Salinity	Sigma-T
5	24.040	32.929	22.063
10	23.900	32.946	22.117
20	23.907	32.996	22.152
30	23.825	33.056	22.222
40	21.565	33.542	23.230
50	18.769	33.896	24.235

STATION US10485
LATITUDE 41-02.5 N
LONGITUDE 140-46.3 E
DEPTH (m) 51

Press.	Temp.	Salinity	Sigma-T
5	23.392	33.040	22.335
10	23.378	33.040	22.339
20	23.375	33.042	22.342
30	23.464	33.114	22.371
40	21.487	33.548	23.257

STATION US10486
LATITUDE 41-03.4 N
LONGITUDE 140-52.1 E
DEPTH (m) 50

Press.	Temp.	Salinity	Sigma-T
5	23.452	33.012	22.296
10	23.447	33.010	22.297
20	23.445	33.005	22.294
30	23.472	33.017	22.295
40	22.362	33.519	22.992

STATION US10487
LATITUDE 41-04.6 N
LONGITUDE 141-01.9 E
DEPTH (m) 47

Press.	Temp.	Salinity	Sigma-T
5	23.350	32.957	22.285
10	23.350	32.957	22.285
20	23.351	32.957	22.284
30	23.350	32.956	22.283
40	23.244	33.017	22.360

STATION US10488
LATITUDE 40-57.4 N
LONGITUDE 141-06.8 E
DEPTH (m) 37

Press.	Temp.	Salinity	Sigma-T
5	23.003	32.761	22.235
10	23.006	32.800	22.264
20	23.076	32.839	22.274
30	23.048	32.827	22.273

STATION US10489
LATITUDE 41-10.8 N
LONGITUDE 141-10.9 E
DEPTH (m) 30

Press.	Temp.	Salinity	Sigma-T
5	22.998	32.701	22.192
10	23.024	32.808	22.266
20	23.039	32.864	22.303