Preliminary Report
of
The Hakuho Maru Cruise KH-94-2
(Leg 1 & 2)

May 17, 1994 – June 11, 1994

Studies on reproduction and recruitment processes of pelagic fish

Ocean Research Institute
University of Tokyo
2002

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By

The Scientific Members of the Cruise

Edited by

Takashige SUGIMOTO

PREFACE

The Mmain purpose of this cruise is to clarify spawning ecology and larval survival strategy of pelagic fish, particularly sardine, jack mackerel and anchovy. This cruise is the 4th time, followed by cruises around Tosa Bay in December 1988, around Satsunan off Shikou in February-March 1991 and around Tosa Bay-off Bousou in February-March 1994.

In first part of 1990s, sardine stock rapidly decreased. Anchovy and saury was taking over sardine. This period is corresponding to a period that jack mackerel stock does not show strong recovery. As mechanism of these dominant changes of species, sardine abundance leading hypothesis, three-species interaction hypothesis and zooplankton grazing trigger hypothesis are arisen. However, statistical data verifying these hypotheses is not provided and this issue is one of scope for GLOBEC (Global Ocean Ecosystem Dynamics) studies.

First and second legs were focused on the Ensu-nada Sea and off shore region of Izu, and offshore region of Izu and the Kuroshio Extension – the Kuroshio-Oyashio transition regions, respectively. The former leg was focused, firstly, on movement of the Kuroshio water into coastal regions, larval transport associated with the movement, and structure and its fluctuation of survival environment for the fish larvae (ex. Distributions of chlorophyll and copepod), and secondly on spawning behavior and physiological ecology of adult jack mackerel in the northern part of the Izu Islands. The latter leg was focused on distribution of zooplankton, phytoplankton and fish larvae, vertical migration, larval transport and feeding environment in fronts of the Kuroshio Extension, warm streamers and warm core rings.

We had some accidents such as nets breaking associated with large blooming of diatom in the first leg and with high concentration of small Thaliacea in the second leg. An Argos buoy deployed in the warm streamer located in the front was entrained into the warm core ring off Kinkazan after northward movement. Current velocity and particle transporting function of the warm streamer detected by floating buoys and ADCP were considerably larger than our previous estimates.

Fortunately, since we had very good weather condition and enthusiastic cooperation by ship crews, 100% of scheduled observation had been conducted. We would like to express our deep appreciation to the crews.

Takashige Sugimoto
Chief Scientist

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Scientists aboard

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YAMAZAKI Hidekatsu	Tokyo University of Fisheries
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NAKATA Hideaki	Ocean Research Institute, the University of Tokyo
KOMATSU Teruhisa	Ocean Research Institute, the University of Tokyo
KIMURA Shingo	Ocean Research Institute, the University of Tokyo
KISHI Michio	Ocean Research Institute, the University of Tokyo
INAGAKI Tadashi	Ocean Research Institute, the University of Tokyo
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IGARASHI Chiaki	Ocean Research Institute, the University of Tokyo
NAGAE Hideo	Ocean Research Institute, the University of Tokyo
OKAZAKI Yuji	Faculty of Agriculture, Miyazaki University
OBARA Masahiro	Tokyo University of Fisheries
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OTA Takashi	Faculty of Agriculture, Tohoku University
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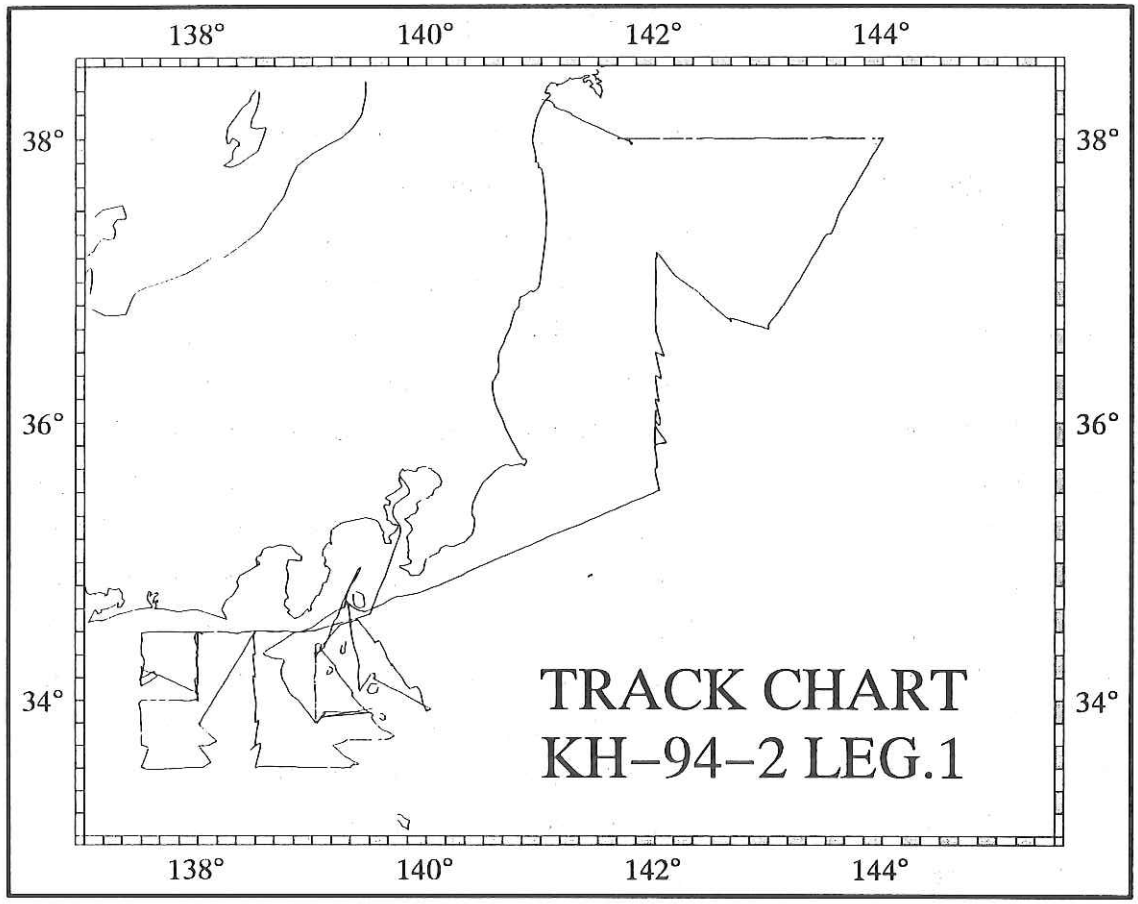
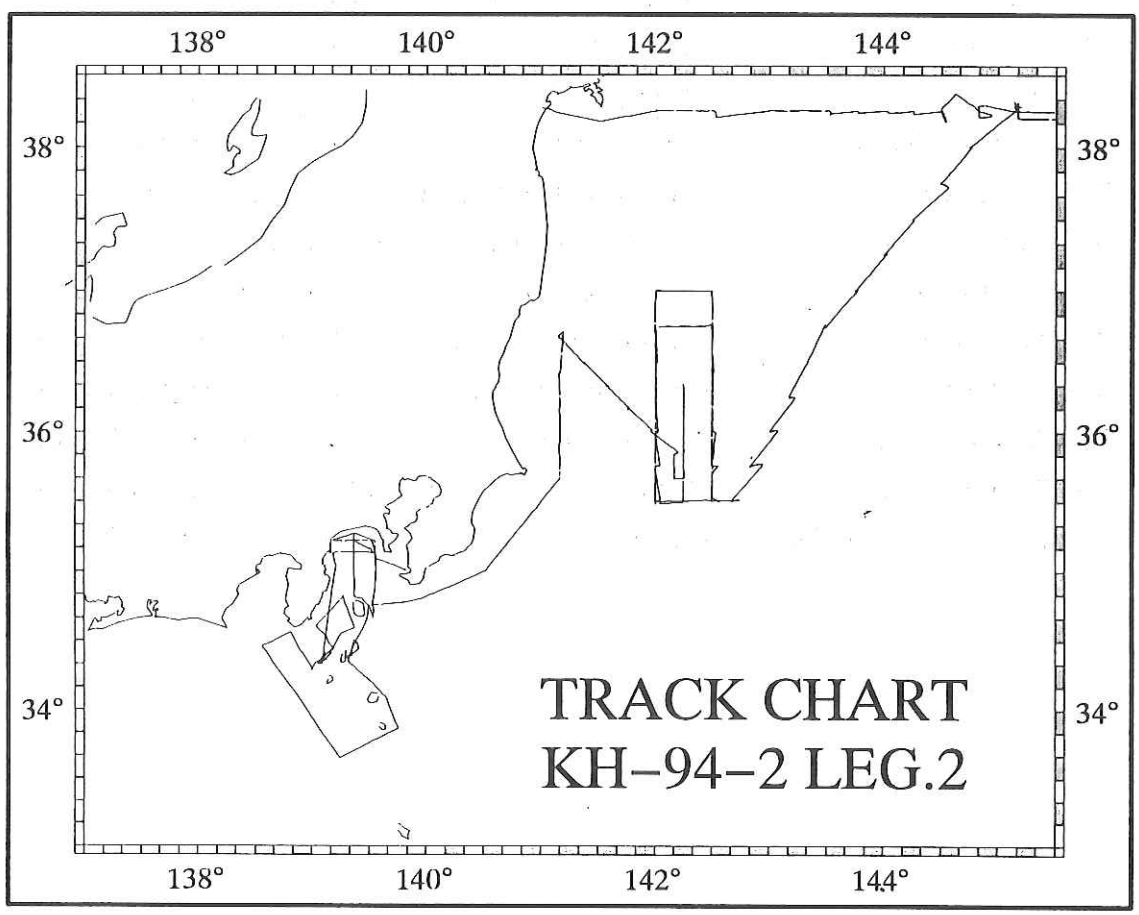
Susana SAINZ-TRAPAGA	Ocean Research Institute, the University of Tokyo


138°
140°
142°
144°
38°
36°
34°
TRACK CHART
KH–94–2 LEG.1


138°
140°
142°
144°
38°
36°
34°
TRACK CHART
KH–94–2 LEG.2

KH94-2 LEG-1 (Position Log) No.1

St. No.	Lat.	Long.	Day	Time	Dep. (m)	CTD	XBT	Ros.	W.S.(0)	Chl.(0)	ORI-S	ORI-O	ORI-H	Norp.	MTD	IKPT	Chl. t.
K-1	34°29.24N	137°30.18E	18.May.94	1:47	204	○		○		○							
K-2	34°19.98N	137°30.00E	18.May.94	3:11	111	○		○									
K-3	34°09.60N	137°29.80E	18.May.94	5:18	400	○		○									
K-8	34°29.89N	137°59.66E	18.May.94	18:23	535	○		○			○				○		
K-9	34°19.91N	138°00.04E	18.May.94	21:25	609	○		○			○				○		
K-10	34°09.89N	138°00.05E	19.May.94	0:31	1721	○		○			○				○		
K-11	34°00.38N	137°58.32E	19.May.94	4:39	1529	○		○			○				○		
K-4	33°59.69N	137°30.05E	19.May.94	7:25	1725	○		○									
K-5	33°49.58N	137°30.04E	19.May.94	9:14	1837	○		○									
K-6	33°39.88N	137°30.95E	19.May.94	10:55	2788	○		○									
K-7	33°30.08N	137°30.42E	19.May.94	12:46	3640	○		○									
K-14	33°30.25N	138°00.07E	19.May.94	18:00	2963	○		○			○				○		
K-13	33°39.85N	138°00.52E	19.May.94	21:21	3867	○		○			○				○		
K-12	33°49.74N	138°00.49E	19.May.94	21:59	3923	○		○			○				○		
K-15	34°30.03N	138°30.05E	20.May.94	6:31	2261	○		○									
K-16	34°19.97N	138°29.79E	20.May.94	8:19	2811	○		○									
K-17	34°09.96N	138°29.99E	20.May.94	10:10	3637	○		○									
K-18	34°00.17N	138°30.08E	20.May.94	12:30	3578	○		○									
K-19	33°50.00N	138°30.09E	20.May.94	14:30	2312	○		○									
K-20	33°40.26N	138°31.03E	20.May.94	16:45	2394	○		○									
K-21	33°30.10N	138°30.57E	20.May.94	18:49	3471	○		○									
K-27	33°30.06N	139°19.98E	20.May.94	22:22	1962	○		○			○	○			○		○
K-26	33°41.44N	139°16.47E	21.May.94	3:55	1560	○		○			○				○		○
K-33	33°42.58N	139°40.29E	21.May.94	6:18	1458	○		○				○					○
K-32	33°52.63N	139°31.37E	21.May.94	9:12	1079	○		○									○
K-31	34°02.67N	139°21.12E	21.May.94	11:33	175	○		○				○					○
X9401	34°05.46N	139°19.46E	21.May.94	12:40	336		○										
X9402	34°06.77N	139°18.26E	21.May.94	12:50	391		○										
X9403	34°08.02N	139°17.03E	21.May.94	13:00	395		○										
X9404	34°09.30N	139°15.77E	21.May.94	13:10	430		○										
X9405	34°10.71N	139°14.58E	21.May.94	13:20	384		○										
K-30	34°12.76N	139°13.11E	21.May.94	13:39	140	○		○									○
X9406	34°14.92N	139°12.26E	21.May.94	14:20	110		○										
X9407	34°16.44N	139°10.79E	21.May.94	14:30	82		○										
X9408	34°17.75N	139°09.26E	21.May.94	14:40	260		○										
X9409	34°19.07N	139°07.89E	21.May.94	14:50	424		○										
X9410	34°20.34N	139°06.49E	21.May.94	15:00	482		○										
X9411	34°21.60N	139°05.15E	21.May.94	15:10	138		○										
K-29	34°22.60N	139°04.08E	21.May.94	15:23	270	○		○				○					○
X9412	34°24.34N	139°02.16E	21.May.94	16:40	850		○										
X9413	34°23.01N	139°01.87E	21.May.94	16:50	748		○										
X9414	34°21.59N	139°01.94E	21.May.94	17:00	344		○										

KH94-2 LEG-1 (Position Log) No.2

St. No.	Lat.	Long.	Day	Time	Dep. (m)	CTD	XBT	Ros.	W.S.(0)	Chl.(0)	ORI-S	ORI-O	ORI-H	Norp.	MTD	IKPT	Chl. t.
X9415	34°20.12N	139°01.94E	21.May.94	17:10	122		○										
X9416	34°18.83N	139°01.93E	21.May.94	17:20	343		○										
X9417	34°17.02N	139°01.95E	21.May.94	17:30	705		○										
X9418	34°15.23N	139°01.95E	21.May.94	17:40	567		○										
X9419	34°13.50N	139°01.91E	21.May.94	17:50	391		○										
X9420	34°11.80N	139°01.80E	21.May.94	18:00	118		○										
X9421	34°10.14N	139°01.38E	21.May.94	18:10	58		○										
X9422	34°08.45N	139°01.37E	21.May.94	18:20	164		○										
X9423	34°06.64N	139°01.47E	21.May.94	18:30	520		○										
X9424	34°04.86N	139°01.58E	21.May.94	18:40	554		○										
X9425	34°03.10N	139°01.74E	21.May.94	18:50	652		○										
X9426	34°01.50N	139°01.99E	21.May.94	19:00	830		○										
X9427	33°59.91N	139°02.05E	21.May.94	19:10	1909		○										
X9428	33°58.22N	139°02.09E	21.May.94	19:20	2373		○										
X9429	33°56.58N	139°02.09E	21.May.94	19:30	3007		○										
X9430	33°54.91N	139°02.05E	21.May.94	19:40	3007		○										
X9431	33°53.26N	139°02.02E	21.May.94	19:50	3007		○										
X9432	33°51.51N	139°02.07E	21.May.94	20:00	3007		○										
K-25	33°50.11N	139°02.18E	21.May.94	20:51	1336	○		○			○				○		○
X9433	33°51.65N	139°00.07E	21.May.94	23:40	1358		○										
X9434	33°53.03N	138°59.26E	21.May.94	23:50	2055		○										
X9435	33°54.42N	138°57.95E	24.May.94	0:00	3007		○										
X9436	33°55.83N	138°56.62E	24.May.94	0:10	3007		○										
X9437	33°57.30N	138°55.27E	24.May.94	0:20	3007		○										
X9438	33°58.80N	138°53.88E	24.May.94	0:30	3007		○										
K-24	34°00.18N	138°52.47E	22.May.94	0:49	112	○		○			○	○			○		○
X9439	34°03.74N	138°47.77E	22.May.94	2:20	280		○										
X9440	34°05.38N	138°46.92E	22.May.94	2:28	550		○										
X9441	34°06.48N	138°46.20E	22.May.94	2:35	1057		○										
X9442	34°08.04N	138°45.19E	22.May.94	2:45	1487		○										
X9443	34°09.62N	138°44.26E	22.May.94	2:55	1683	○	○										
K-23	34°10.48N	138°43.98E	22.May.94	3:08	1791	○		○			○				○		○
K-22	34°20.06N	138°34.70E	22.May.94	6:24	1607	○		○			○	○			○		○
K-28	34°30.26N	138°55.19E	22.May.94	9:20	644	○		○				○					○
K-34	34°39.90N	139°15.02E	22.May.94	11:20	444	○		○				○					○
S-1	34°24.95N	139°06.41E	23.May.94	0:00	670	○		○									
K-35	34°35.03N	139°23.57E	23.May.94	2:50	226	○		○				○					○
K-36	34°24.94N	139°33.05E	23.May.94	4:40	642	○		○									○
K-37	34°15.05N	139°41.89E	23.May.94	6:40	879	○		○				○					○
K-38	34°05.13N	139°51.84E	23.May.94	9:00	1111	○		○									○
K-39	33°55.26N	140°00.47E	23.May.94	11:07	1042	○		○				○					○
K-40	35°30.02N	142°00.11E	24.May.94	8:30	4607	○			○		○	○					

KH94-2 LEG-1 (Position Log) No.3

St. No.	Lat.	Long.	Day	Time	Dep. (m)	CTD	XBT	Ros.	W.S.(0)	Chl.(0)	ORI-S	ORI-O	ORI-H	Norp.	MTD	IKPT	Chl. t.
K-41	35°40.18N	142°00.35E	24.May.94	10:39	3719	○			○		○	○					
K-42	35°50.00N	142°00.15E	24.May.94	12:20	3247	○			○		○	○					
K-43	36°00.23N	142°00.09E	24.May.94	18:24	3343	○			○		○	○					
K-44	36°10.01N	142°00.08E	24.May.94	20:38	6016	○			○		○	○					
K-45	36°19.93N	142°00.26E	24.May.94	22:55	6017	○			○		○	○					
K-46	36°30.00N	142°00.10E	25.May.94	1:05	6686	○			○		○	○					
K-47	36°40.02N	142°00.02E	25.May.94	3:25	2512	○			○		○	○					
K-48	36°49.09N	142°00.14E	25.May.94	5:18	2505	○			○		○	○					
K-49	36°59.90N	142°00.14E	25.May.94	7:14	1356	○			○		○	○					
K-50	37°09.97N	142°00.14E	25.May.94	9:37	1021	○			○		○	○					
K-52	37°02.94N	142°10.07E	25.May.94	11:56	1916		○										
K-53	36°57.15N	142°19.97E	25.May.94	12:44	2556	○		○									
K-54	36°50.02N	142°30.00E	25.May.94	14:09	3794		○										
K-55	36°43.38N	142°39.99E	25.May.94	14:59	5400	○		○									
K-56	36°42.00N	142°50.35E	25.May.94	16:14	5591		○										
K-57	36°39.90N	143°00.14E	25.May.94	17:00	5940	○		○									
K-58	36°50.00N	143°07.60E	25.May.94	18:14	6419		○										
K-59	36°59.91N	143°15.18E	25.May.94	19:00	6744	○			○								
K-60	37°10.00N	143°22.65E	25.May.94	20:09	7040		○										
K-61	37°20.00N	143°30.51E	25.May.94	20:55	7038	○			○								
K-62	37°30.12N	143°37.61E	25.May.94	22:09	6650		○										
K-63	37°39.91N	143°45.35E	25.May.94	22:55	7205	○			○								
K-64	37°50.13N	143°52.55E	26.May.94	0:13	6945		○										
K-65	38°00.00N	144°00.10E	26.May.94	1:03	7443	○			○		○	○					
K-66	38°00.03N	143°45.00E	26.May.94	3:20	5858		○										
K-67	38°00.19N	143°33.41E	26.May.94	4:26	4543	○			○								
K-68	37°59.96N	143°15.09E	26.May.94	5:49	2870		○										
K-69	37°59.90N	143°00.03E	26.May.94	6:35	1867	○			○		○	○					
K-70	38°00.00N	142°45.00E	26.May.94	8:11	1484		○										
K-71	38°00.03N	142°30.32E	26.May.94	9:00	1125	○			○								
K-72	37°59.96N	142°14.46E	26.May.94	10:19	720		○										
K-73	37°59.98N	141°59.85E	26.May.94	11:02	363		○										
K-74	37°59.05N	144°46.20E	26.May.94	12:30	220	○			○			○			○		

KH94-2 LEG-2 (Position Log) No.1

St. No.	Lat.	Long.	Day	Time	Dep. (m)	CTD	XBT	Ros.	W.S(0)	Chl.(0)	ORI-S	ORI-O	ORI-H	Norp.	MTD	IKPT	Chl. t.
K-75	38°15.05N	142°00.16E	31.May.94	12:04	317	○				○	○	○		○			
K-76	38°15.03N	142°30.04E	31.May.94	15:26	1172	○				○	○	○		○	○		
K-77	38°15.12N	142°59.71E	31.May.94	20:13	1575	○				○	○	○		○			
K-78	38°15.13N	143°15.06E	31.May.94	22:47	2606	○				○	○	○		○			
K-79	38°15.21N	143°30.36E	1.Jun.94	1:10	3307	○				○	○	○		○	○		
K-80	38°15.10N	143°45.42E	1.Jun.94	4:45	5978	○				○	○	○		○			
K-81	38°15.16N	144°00.38E	1.Jun.94	6:45	7200	○				○	○	○		○			
K-82	38°15.14N	144°15.13E	1.Jun.94	9:20	6410	○				○	○	○		○			
K-83-1	38°15.06N	144°30.01E	1.Jun.94	11:25	5787	○		○		○	○	○		○	○	○	
M-5	38°15.06N	144°30.01E	1.Jun.94												○	○	
K-83-2	38°14.96N	144°29.96E	1.Jun.94	19:58	6300	○		○		○	○	○		○	○	○	
M-6	38°14.96N	144°29.96E	1.Jun.94												○	○	
K-84	38°15.66N	144°49.80E	2.Jun.94	6:08		○				○	○	○		○			
K-85-1	38°15.29N	145°09.91E	2.Jun.94	8:58		○		○		○	○	○		○	○	○	
M-7	38°15.29N	145°09.91E	2.Jun.94			○				○					○	○	
E-1	38°14.94N	145°25.92E	2.Jun.94	16:05			○										
E-2	38°14.98N	145°41.75E	2.Jun.94	16:53	5264		○										
K-85-2	38°15.34N	145°09.82E	2.Jun.94	20:02	5321	○				○	○	○		○	○		
M-8	38°15.34N	145°09.82E	2.Jun.94												○	○	
K-86	37°59.83N	144°44.86E	3.Jun.94	4:21	5494	○				○	○	○		○			
K-87	37°44.93N	144°29.83E	3.Jun.94	7:34	5953	○				○	○	○		○			
K-88	37°30.09N	144°15.18E	3.Jun.94	10:50	6032	○				○	○	○		○			
K-89	37°15.15N	144°00.22E	3.Jun.94	13:48	6377	○				○	○	○		○			
K-90	37°00.08N	143°45.15E	3.Jun.94	16:37	6836	○				○	○	○		○			
K-91	36°44.67N	143°29.33E	3.Jun.94	19:22	7025	○		○		○	○	○		○			
K-92	36°30.12N	143°20.17E	3.Jun.94	22:14	6821	○		○		○	○	○		○			
K-93	36°14.69N	143°10.69E	4.Jun.92	0:56	6801	○		○		○	○	○		○			
K-94	36°00.11N	143°00.76E	4.Jun.92	3:45	6092	○		○		○	○	○		○			
K-95	35°45.20N	142°49.29E	4.Jun.92	6:48	5838	○				○	○	○		○			
K-96	35°30.18N	142°40.68E	4.Jun.92	9:57	6391	○				○	○	○		○			
K-98	35°30.11N	142°00.50E	4.Jun.92	14:16	4760	○				○							
K-99	35°45.19N	142°00.50E	4.Jun.92	16:53	4131	○				○							
K-100	36°00.00N	142°00.00E	4.Jun.92	17:36	3458	○				○							
K-101	36°15.13N	142°59.81E	4.Jun.92	19:19	2899	○				○							
K-102	36°29.84N	142°00.13E	4.Jun.92	21:07	2776	○				○							
K-103	36°45.02N	141°59.89E	4.Jun.92	23:03	2525	○				○							
K-104	37°00.01N	142°00.12E	5.Jun.94	0:53	1370	○				○							
K-105	37°00.06N	142°29.97E	5.Jun.94	3:01	2891	○		○		○				○			
K-106	36°44.92N	142°29.90E	5.Jun.94	5:16	4191	○		○		○				○			
K-107	36°29.77N	142°30.20E	5.Jun.94	7:18	4350	○		○		○				○			
K-108	36°15.02N	142°30.11E	5.Jun.94	9:19	5607	○		○		○				○			
K-109	36°00.09N	142°30.53E	5.Jun.94	11:28	5405	○				○							

KH94-2 LEG-2 (Position Log) No.2

St. No.	Lat.	Long.	Day	Time	Dep. (m)	CTD	XBT	Ros.	W.S(0)	Chl.(0)	ORI-S	ORI-O	ORI-H	Norp.	MTD	IKPT	Chl. t.
K-110	35°45.24N	142°31.72E	5.Jun.94	13:18	5808	○				○							
K-111	35°30.19N	142°30.44E	5.Jun.94	15:22	6855	○				○							
E-3	35°45.00N	142°30.04E	5.Jun.94	17:27	5728		○										
E-4	36°00.00N	142°29.98E	5.Jun.94	18:21	5629		○										
E-5	36°14.95N	142°29.98E	5.Jun.94	19:17	9795		○										
E-6	36°29.95N	142°30.01E	5.Jun.94	20:12	5661		○										
E-7	36°45.17N	142°30.07E	5.Jun.94	21:08	7029		○										
E-10	36°44.99N	141°59.97E	5.Jun.94	22:35	2524		○										
E-11	36°29.77N	142°00.02E	5.Jun.94	23:30	2775		○										
E-12	36°14.88N	142°00.05E	6.Jun.94	0:22	2900		○										
E-13	36°59.94N	141°59.98E	6.Jun.94	1:14	3407		○										
E-14	35°45.03N	142°00.14E	6.Jun.94	2:11	4124		○										
E-15	35°30.00N	142°00.05E	6.Jun.94	3:11	4621		○										
E-16	35°30.07N	142°15.03E	6.Jun.94	3:54	7235		○										
E-17	35°45.80N	142°15.02E	6.Jun.94	4:48	4668		○										
E-18	35°59.92N	142°14.90E	6.Jun.94	5:40	4299		○										
E-19	36°14.97N	142°14.96E	6.Jun.94	6:35	3893		○										
K-112	35°50.30N	142°10.29E	6.Jun.94	10:33	3972	○				○	○	○					
K-113	35°59.81N	141°57.72E	6.Jun.94	13:05	2997	○				○	○	○					
K-114	36°09.79N	141°45.89E	6.Jun.94	15:20	1969	○		○		○	○	○		○			
K-115	36°19.89N	141°34.07E	6.Jun.94	18:05	171	○		○		○	○	○		○			
K-116	36°29.93N	141°22.08E	6.Jun.94	20:44	987	○		○		○	○	○		○			
K-117	36°39.90N	141°09.89E	6.Jun.94	23:26	261	○				○	○	○			○		
K-118	36°24.97N	141°09.88E	7.Jun.94	3:25	757	○				○							
K-119	36°09.90N	141°09.91E	7.Jun.94	4:51	717	○				○							
K-120	35°55.02N	141°09.84E	7.Jun.94	6:30	477	○	○	○		○				○			

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Biological productivity of meso-scale eddies caused by frontal disturbances in the Kuroshio

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Temporal and spatial changes in nutrient and chlorophyll distributions caused by frontal disturbances of the Kuroshio, a western boundary current in the Pacific Ocean, are presented. The regions of high nitrate and phosphate concentrations are associated with an eddy of positive vorticity which separates from the Kuroshio front within a few days of generation. The nutrients supplied to the euphotic layer by upwelling and mixing in the cyclonic eddy accelerate primary production in the frontal region. The specific growth rate calculated from temporal changes in chlorophyll and nitrate concentrations, of 0.8 d^{-1} is considerably larger in the offshore region. According to a numerical simulation made using a turbulent closure model a chlorophyll maximum occurs during the fifth day after the generation of the eddy and the growth rate in the euphotic layer is in good agreement with that estimated from observations. After the peak production the growth becomes nutrient limited. Since the frontal disturbances occur in association with short-term fluctuations in the Kuroshio frontal meander, which has a period of a few weeks, the biological production enhancement by this kind of eddy is expected to occur with similar frequency. It is estimated that the total annual nitrogen input to the region via the eddies could result in a carbon production rate of 40 gC m^{-2} y^{-1}.

Key words: Kuroshio, eddy, frontal disturbance, primary production, physical-biological model.

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Introduction

Cyclonic circulations in frontal eddies associated with the wave-like meander of the western boundary current have been well described from satellite imagery and hydrographic observations, particularly in the Gulf Stream front between the Florida Straits and Cape Hatteras. In this region, meanders of several hundred kilometres wavelength and amplitudes of a few tens of kilometres propagate to the north-west. The southward movements of the tongue-like extrusions of the Gulf Stream derived from the wave crest generate a cold upwelled core in the wave trough about every two weeks (Lee *et al.*, 1981). The phase velocity of the wave is estimated to be 40–50 cm s^{-1} (Legeckis, 1979; Lee *et al.*, 1981), although the horizontal scales are dependent on bottom topography (Legeckis, 1979; Bane and Brooks, 1979). The eddies travel northward with the same phase velocity as the wave and contribute to a rapid shelf–Gulf Stream water exchange. Cross-stream horizontal scales of the eddy are in the order of a few tens of kilometres and the along-stream scales are larger than the cross-stream scales. In the cyclonic eddy, nutrients are supplied to the euphotic layer by upwelling and accelerate primary production in the frontal region (Lee *et al.*, 1981; Yoder *et al.*, 1981). Since eddies are frequently generated there is considerable enhancement of biological productivity in the coastal water. According to a calculation by Lee *et al.* (1981), the annual carbon production by phytoplankton in the Gulf Stream front is in the range 32–64 gC m^{-2} y^{-1}.

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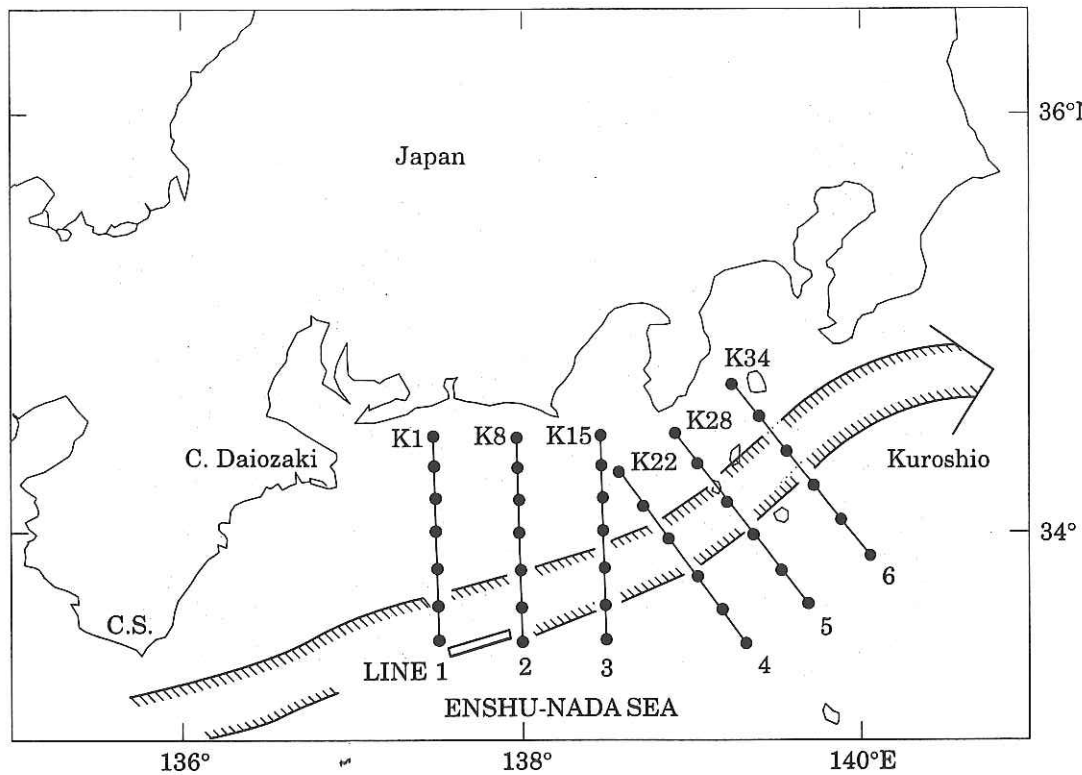

Figure 1. Observational locations. Solid circles indicate the stations (K1–39).

Similar frontal disturbances are also recognized in the Kuroshio region off the Japanese coast, a well known counterpart of the Gulf Stream in the Pacific Ocean. In the Kuroshio region, wave-like meanders with wavelengths of 100, 200, 400 km occur with periods of 5–8, 10–12 and 17–19 days respectively, west of Cape Shionomisaki in the Enshu-nada Sea (Kimura and Sugimoto, 1993) and generate frontal cyclonic eddies. Given the results in the Gulf Stream, it would seem likely that these eddies will enhance the biological productivity in the sea. In fact the coastal regions are well known as nursery grounds of the Japanese sardine and anchovy larvae. However, no adequate explanation of the high biological productivity has previously been given despite many studies on coastal upwelling by wind and topography. In this paper we describe the vertical and horizontal structure of a cyclonic eddy caused by frontal disturbances in the Kuroshio and its contribution to primary production in the coastal area.

Observations

Hydrographic observations with a conductivity–temperature–depth profiler (CTD) and water sampling were carried out at 39 stations in the Enshu-nada Sea along six sections during 18–23 May, 1994, as shown in Figure 1. The CTD locations were determined after detection of a target eddy using satellite imagery. It was important that the CTD lines passed through the centre of the eddy for analysis of primary production. An AVHRR satellite image on 17 May 1994 (Fig. 2) shows the target eddy in a frontal disturbance of the north wall of the Kuroshio off Cape Daiozaki at 137°E. The eddy is characterized by an 80 km diameter, cyclonic cold region accompanied by westward movement of a tongue-like streamer.

During the observational period the Kuroshio took a "non-large" meander path, termed "N-type" by Japanese scientists, located close to the Japanese coast with small scale meandering. The eddy is situated in the trough of the meander with 150 km horizontal wavelength. According to successive satellite images the crest and trough of the meander moved downstream with a phase velocity of 60 cm s^{-1}, which is almost the same as the current speed around the eddy measured using a ship-mounted, acoustic Doppler current profiler (ADCP). Apparently, the eddy moves downstream with the wave trough and the properties of the water mass in the trough conserved. The observational lines were designed to be located in the centre of the trough assuming the eddy was moving at 60 cm s^{-1} along the trough. During the observational period, the eddy, shown in Figure 2, lies on Line 1 on 18 May and on Line 3 on 20 May. However, since the observations on Line 2 were done on two separate days because of other observations in the region, the line was not located in the centre of the eddy.

Water samples were taken at selected depths with Niskin bottles mounted on a rosette sampler coupled to the CTD. Concentrations of phosphate, nitrate and

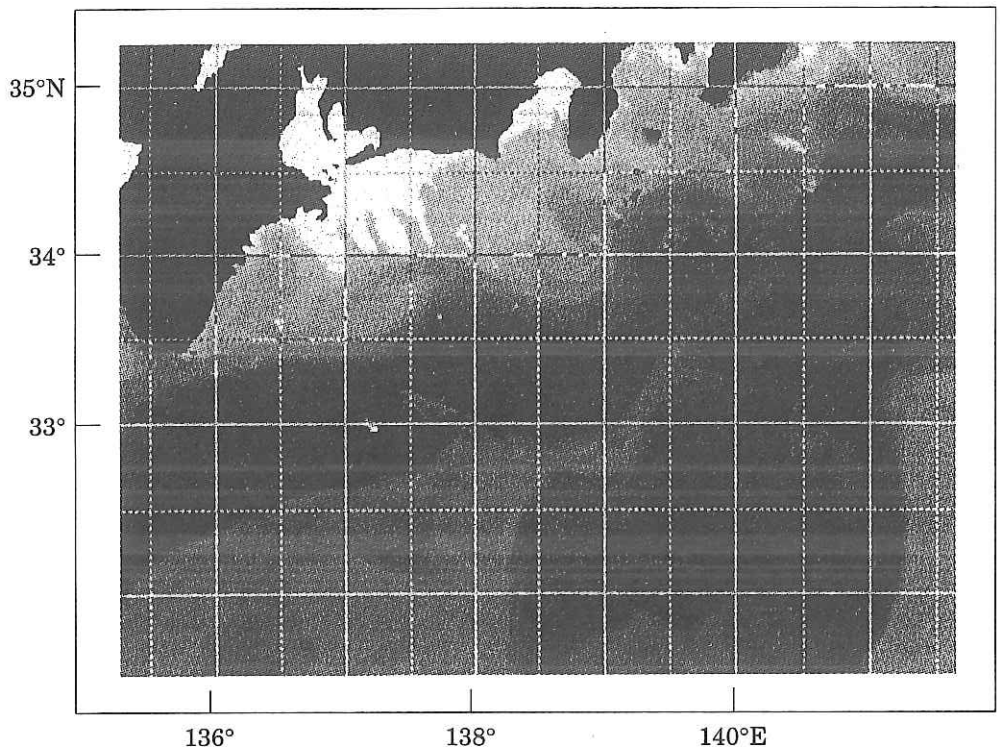

Figure 2. Satellite image of the Kuroshio on 17 May, 1994.

chlorophyll were obtained at depths of 0, 30, 50, 100, 200, 300, 500 and 1000 m on Line 2, and 0 m on other lines.

Numerical model

In order to obtain a description of the vertical structure of the eddy, we have utilized a one-dimensional model of vertical structure which includes turbulence closure. In the model, we simulated physical and biological variation in the isolated eddy which has detached from the Kuroshio frontal system, assuming a constant horizontal eddy diffusivity estimated from the observations. The model aims to provide, in particular, a value of the chlorophyll concentration when the nutrients are exhausted and changes of time-dependent growth rates of phytoplankton. These values are compared with those estimated from the observations. All the physical and biological symbols used in the equations are defined in Table 1.

Physical structure

The water column between the centre and the edge of the eddy is subject to the equations of motion in the x and y directions (x positive from the centre toward the edge of the eddy, y positive along flow direction in the eddy) depending on time t, depth z (increasing positively from the bottom layer of the eddy) and horizontal pressure gradients:

$$\frac{\partial u}{\partial t} = -\frac{1}{\rho}\frac{\partial P}{\partial x} + fv + \frac{\partial}{\partial z}\left(N_z \frac{\partial u}{\partial z}\right) \tag{1}$$

$$\frac{\partial v}{\partial t} = -fu + \frac{\partial}{\partial z}\left(N_z \frac{\partial v}{\partial z}\right) \tag{2}$$

$$\frac{1}{\rho}\frac{\partial P}{\partial x} = \frac{g}{\rho}(h-z)\frac{\partial \rho}{\partial x} + g\frac{\partial \bar{\eta}}{\partial x} \tag{3}$$

where u and v are current velocities in the x and y directions and f is the Coriolis parameter. In this case the horizontal pressure gradient in the y direction and the centrifugal force are neglected. For estimations of horizontal gradients (x direction) of physical and biological factors, the radius of the eddy is assumed to be 40 km. The horizontal pressure gradient term in Equation (1) is given by Equation (3) which is composed of a horizontal density gradient and a mean slope.

Horizontal advection and vertical diffusion of salinity and temperature at each level are given by

$$\frac{\partial (S,T)}{\partial t} = -u\frac{\partial (S,T)}{\partial x} + \frac{\partial}{\partial z}\left(K_z \frac{\partial (S,T)}{\partial z}\right) + \frac{\partial}{\partial x}\left(K_h \frac{\partial (S,T)}{\partial x}\right) \tag{4}$$

N_z in Equations (1) and (2), and K_z in Equation (4) are coefficients of vertical eddy viscosity and vertical eddy diffusivity respectively. K_h in Equation (4) is an

Table 1. Definitions, values and units of symbols used in the model.

Symbol	Definition	Value	Units
Physical variables and parameters			
u	current velocity in x-direction	—	$m\ s^{-1}$
v	current velocity in y-direction	—	$m\ s^{-1}$
P	pressure	—	
ρ	density	—	$kg\ m^{-3}$
η	vertical displacement of water surface	—	m
f	Coriolis parameter	—	s^{-1}
S	salinity	—	no units
T	temperature	—	°C
E	kinematic energy	—	$m^2\ s^2$
q	turbulent intensity	—	$m\ s^{-1}$
N_z	coefficient of vertical eddy viscosity	—	$m^2\ s^{-1}$
K_z	coefficient of vertical eddy diffusivity	—	$m^2\ s^{-1}$
K_h	coefficient of horizontal eddy diffusivity	2.0E4	$m^2\ s^{-1}$
ws	wind speed	5	$m\ s^{-1}$
Biological variables and parameters			
C	concentration of chlorophyll	—	$\mu g\ l^{-1}$
F	concentration of nitrogen in plankton	—	μM
D	concentration of dissolved inorganic nitrogen	—	μM
μ	phytoplankton specific growth rate	—	day^{-1}
γ	phytoplankton nitrogen uptake rate	—	$\mu MN(\mu g\ l^{-1}\ chl)^{-1}\ day^{-1}$
κ	grazing rate by zooplankton	0.54	day^{-1}
ε	excreted proportion of grazed nutrient	0.50	—
γ_m	maximum DIN uptake rate	2.0	$\mu M\ N\ day^{-1}$
D_h	half saturation constant for DIN uptake	0.3	μM
μ_{light}	light related growth rate	—	day^{-1}
$\mu_{nitrogen}$	nitrogen related growth rate	—	day^{-1}
I	layer mean irradiance	—	Wm^{-2}
μ'	maximum growth rate	1.2	day^{-1}
α	gross photosynthesis per unit irradiance at low illumination	4.1	$\mu gC(\mu g\ chl)^{-1}\ day^{-1}(Wm^{-2})^{-1}$
β	biomass related respiration rate	3.0	$\mu gC(\mu g\ chl)^{-1}\ day^{-1}$
R	chlorophyll:carbon ratio	0.033	$\mu g\ chl\ (\mu gC)^{-1}$
Q	phytoplankton nitrogen quota	—	$\mu MN(\mu g\ l^{-1}\ chl)^{-1}$
k_Q	minimum nitrogen quota	0.2	$\mu MN(\mu g\ l^{-1}\ chl)^{-1}$
I_0	daily-averaged surface irradiance	80.0	Wm^{-2}
D_{input}	DIN input from bottom	—	$\mu M\ (m^{-2}\ s^{-1})^{-1}$
$K_{z_{bottom}}$	diffusivity in bottom boundary layer	—	$m^2\ s^{-1}$
D_{flux}	difference of concentration of DIN at bottom	—	μM
Observational data			
$1/\rho\ \partial\rho/\partial x$	horizontal gradient of density	−3.0E-8	m^{-1}
$\partial S/\partial x$	horizontal gradient of salinity	2.5E-6	m^{-1}
$\partial T/\partial x$	horizontal gradient of temperature	5.0E-5	$°C\ m^{-1}$
$\partial C/\partial x$	horizontal gradient of chlorophyll con.	0.0	$\mu g\ l^{-1}\ m^{-1}$
$\partial F/\partial x$	horizontal gradient of nit. in plan. con.	0.0	$\mu M\ m^{-1}$
$\partial D/\partial x$	horizontal gradient of DIN con.	−1.0E-4	$\mu M\ m^{-1}$
Differential scale			
Δt	simulation time step	0.002	day^{-1}
Δz	simulation depth increment	5.0	m

horizontal eddy diffusivity. This value is estimated to be $2 \times 10^3\ m^2\ s^{-1}$ from the eddy evolution of area on Lines 1 and 3. A level 2.2 turbulence closure scheme is used to calculate vertical profiles of N_z and K_z as functions of local stability (Mellor and Yamada, 1982; Simpson *et al.*, 1996) via

$$N_z=S_M lq;\ K_z=S_H lq \quad (5)$$

where S_M and S_H are stability functions depending on the local gradient Richardson number, q is the turbulent intensity and l is the turbulent length-scale given by

$$l=kz(1-z/h)^{1/2} \quad (6)$$

where z is the height above the bottom of the eddy, h is the water depth and k is von Karman's constant. The

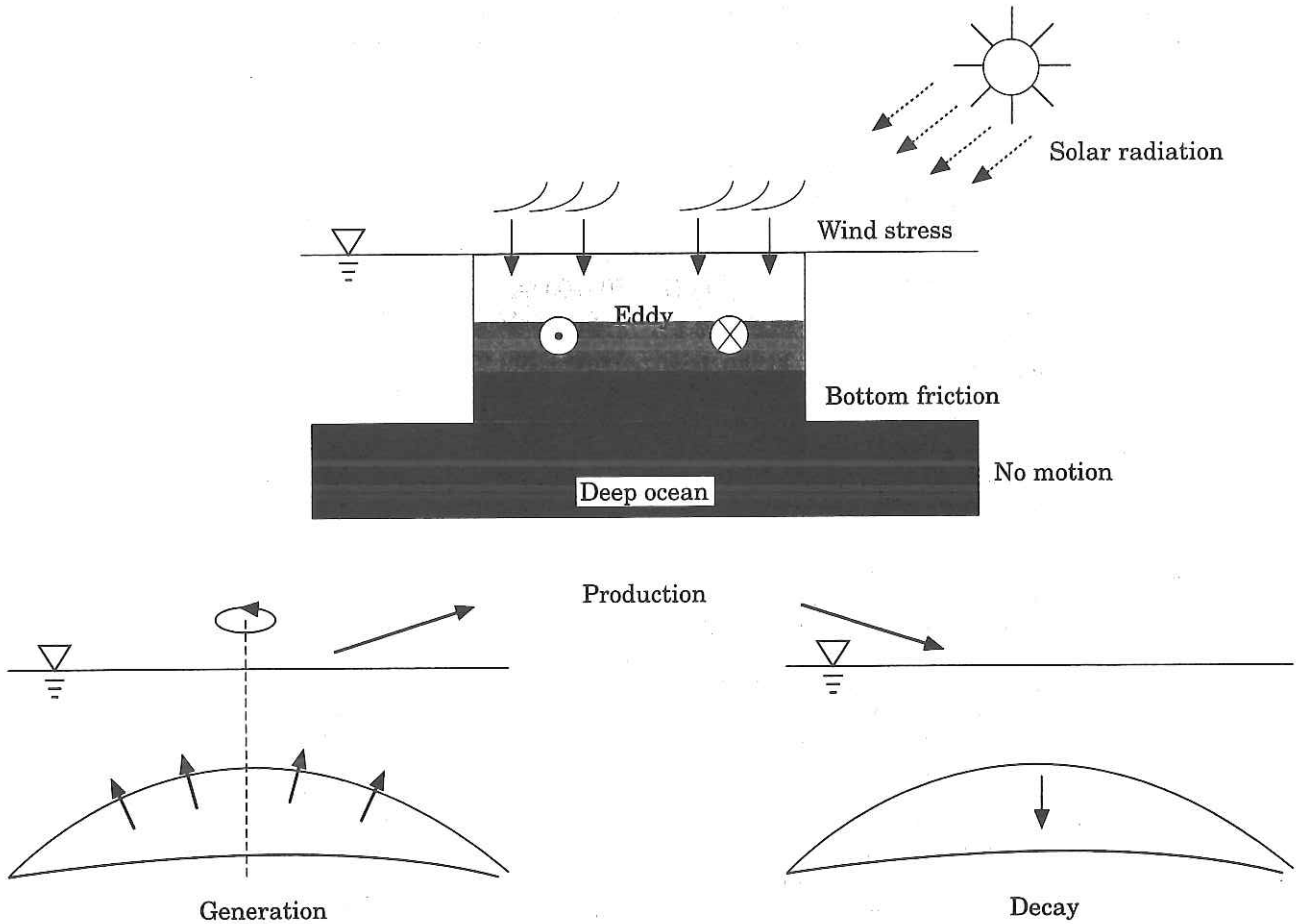

Figure 3. Schematic view of the eddy. Darker shade at the production stage indicates high concentration of nutrients and cold temperature. The generation and decay stages show movements of the eddy bottom.

turbulent intensity is calculated in the turbulent energy equation as follows:

$$\frac{\partial E}{\partial t}=\frac{\partial}{\partial z}\left(N_z\frac{\partial E}{\partial z}\right)+N_z\left[\left(\frac{\partial u}{\partial z}\right)^2+\left(\frac{\partial v}{\partial z}\right)^2\right]+K_z\left(\frac{g}{\rho}\frac{\partial \rho}{\partial z}\right)-\frac{q^3}{B_1 l} \quad (7)$$

where E is the turbulent kinetic energy (TKE) calculated by $E=q^2/2$. The first term on the right of Equation (7) is vertical diffusion of turbulent kinetic energy. The second and third terms are shear and buoyancy production of TKE. The fourth term is dissipation.

As boundary conditions, we use a quadratic stress law for both the bottom stress at the bottom of the eddy and wind stress at the sea surface. The wind velocity is taken as 5 m s^{-1}, which was the mean observed by the research vessel during the observational period. Surface heating is controlled by the formulation of Edinger *et al.* (1968) described in Simpson and Bowers (1984). After generation, the eddy disappeared in a week. In this model all horizontal gradients given in the initial condition decrease linearly with time and an initial velocity in the y direction is assumed to be 30 cm s^{-1}. Figure 3 shows a schematic view of the developed eddy. The eddy causes an uplift of cooled nutrient-rich water to the euphotic layer at the generation stage. Vertical mixing supplies nutrients for growth of phytoplankton to the surface layer (production stage). The supply is gradually terminated associated with eddy spin down (decay stage). Physical structures at the generation and decay stages are not reproduced in this model.

Biological structure

The biological scheme is described by three non-linearly coupled differential equations:

$$\frac{\partial C}{\partial t}=-u\frac{\partial C}{\partial x}+\frac{\partial}{\partial z}\left(K_z\frac{\partial C}{\partial z}\right)+\frac{\partial}{\partial x}\left(K_h\frac{\partial C}{\partial x}\right)+\mu C-\kappa C \quad (8)$$

$$\frac{\partial F}{\partial t}=-u\frac{\partial F}{\partial x}+\frac{\partial}{\partial z}\left(K_z\frac{\partial F}{\partial z}\right)+\frac{\partial}{\partial x}\left(K_h\frac{\partial F}{\partial x}\right)+\gamma C-\kappa F \quad (9)$$

$$\frac{\partial D}{\partial t}=-u\frac{\partial D}{\partial x}+\frac{\partial}{\partial z}\left(K_z\frac{\partial D}{\partial z}\right)+\frac{\partial}{\partial x}\left(K_h\frac{\partial D}{\partial x}\right)+\gamma C-\varepsilon\kappa F \quad (10)$$

where C is the concentration of phytoplankton chlorophyll, F, the concentration of the phytoplankton nitrogen and D, the dissolved inorganic nitrogen in the eddy.

Vertical turbulent diffusivity, K_z, is the same value estimated in the physical model.

The phytoplankton growth rate, μ, is determined by light and nutrient-controlled phytoplankton growth as follows (Tett *et al.*, 1986).

$$\mu = \min(\mu_{light}, \mu_{nitrogen}) \tag{11}$$

$$\mu_{light} = (\alpha 1 - \beta)R \tag{12}$$

$$\mu_{nitrogen} = \mu' \left(1 - \frac{k_Q}{Q}\right) \tag{13}$$

$$I = I_0 e^{-\lambda z} \tag{14}$$

$$Q = \frac{F}{C} \tag{15}$$

According to the threshold hypothesis only one factor is in control at any instant of time; the smaller growth rate is taken into the algorithm (Equation 11). Light-controlled growth rate is dependent on light intensity in each layer (Equation 12), which decreases exponentially with water depth (Equation 14). The daily mean light intensity at the sea surface in the observational region is estimated to be 80 W m^{-2} from the coastal regional meteorological stations. The nutrient-controlled growth rate (Equation 13) is determined by a function of the nutrient content in phytoplankton (Equation 15).

Nutrient uptake rate, c, is determined as independent of the factor controlling growth and given by

$$\gamma = \frac{\gamma_m D}{D_h + D} \tag{16}$$

This equation is a saturation function of the dissolved inorganic nitrogen.

The grazing rate, κ, and excretion rate, ε, are constant. To provide an input of new nutrient from upper layer of deep ocean to the bottom of the eddy, the flux is assumed by:

$$D_{input} = \frac{K_{z_{bottom}}}{\Delta z} D_{flux} \tag{17}$$

D_{flux} is a balance of the concentrations of dissolved inorganic nitrogen between the bottom layer of the eddy and the deep ocean. The concentration in the deep ocean is assumed to be 20 μM.

Results

Hydrographic structure

Figure 4 shows the surface temperature and salinity distribution during the observational period. Temperature and salinity minimums along the Kuroshio front suggest the existence of upwelled water in the surface layer. The vertical structure shown in Figure 5 indicates the eddy location most obviously by a cold water uplift at K11 shallower than 150 m. The location of the uplift corresponds to the location of the cyclonic eddy observed by the satellite and it is different from a peak at K12 deeper than 150 m associated with the Kuroshio front. This result indicates that the vertical scale of the upwelling caused by the eddy is of the order of 50–100 m.

Since the observations were spread over 6 days, the horizontal distributions will not represent the instantaneous hydrographic structure around the front. In addition, the small vertical scale of the eddy and surface heating make it difficult to identify a shape of the eddy from these figures. However, roughly estimated horizontal differences of temperature and salinity between the eddy region and surrounding water are about 2°C and 0.1 respectively. These values are used for the model.

Biological structure

Figure 6(a–c) shows the distribution of nitrate, phosphate and chlorophyll concentrations in the surface layer. Regions of high nutrient and chlorophyll concentrations are evident along the Kuroshio front. For convenience of further analysis, we put numerals on the cores of high nitrate concentration (Fig. 6a). The highest concentration of phosphate is in Core 1, slightly north of the high concentration of chlorophyll. Since the location of Core 1 corresponds to the location of the eddy, which has travelled half of a day from the eddy seen in Figure 2, it suggests that the high nutrients are supplied by upwelling within the eddy. According to the hydrographic observations, the water mass at Line 1 reaches Line 3 in two days. Temperature and salinity profiles at the centre of Core 1 (K4) correspond well to that at Core 2 (K17), particularly at depths less than 200 m, although those at the other stations on Line 1 and 3 spread over a wider range (Fig. 7). These results indicate that Core 2 water was that at Core 1 two days previously. In these two days the concentration of nitrate decreased from 6 to 3 μM and phosphate from 0.15 to 0.05 μM, with the chlorophyll concentration increasing from 1.5 to 2.5 $\mu g\ l^{-1}$ at the sea surface. We infer that phytoplankton growth has resulted in the consumption of 3 μM of nitrate and 0.1 μM phosphate. The nitrogen:phosphate ratio taken by the phytoplankton, 30:1, is slightly larger than the Redfield number.

Figure 8 shows vertical sections of nutrients and chlorophyll along Line 2. Nutrient structure along Line 2 is very similar to the hydrographic structure; peaks of both nutrients at K12 are recognized at depths greater than 200 m and those peaks at K11 are seen at depths less than 200 m. The location of K11 corresponds to the eddy location and it indicates that regional upwelling occurs inshore of the Kuroshio front. The location of

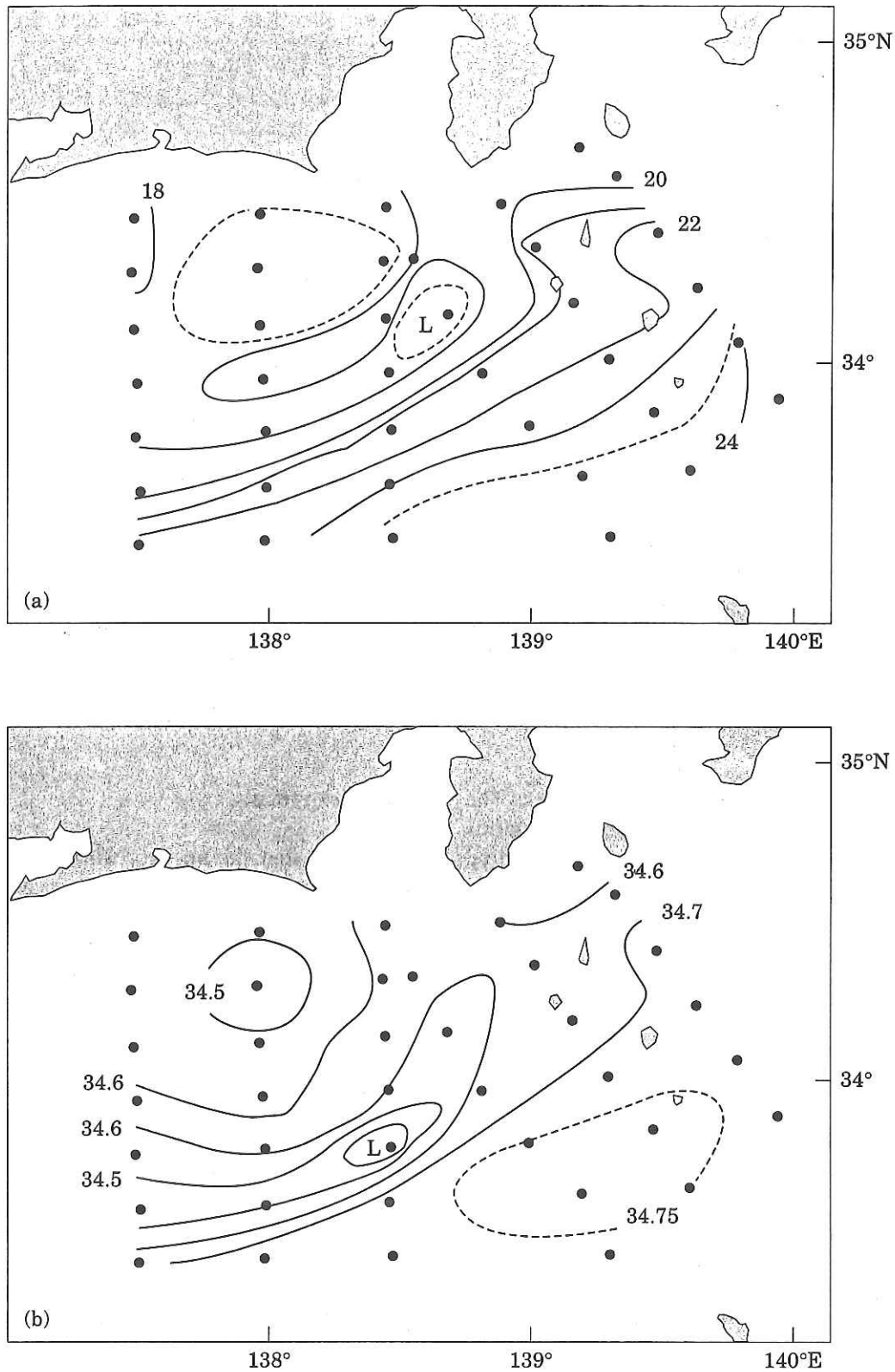

Figure 4. (a) Surface temperature (°C) and (b) salinity distributions on 18–23 May, 1994.

high chlorophyll concentrations does not exactly correspond to that of high nutrients. However, considering that the contour of 1.0 μg l^{-1} is spread over neighbouring stations and that there is a time lag between the nutrient supply and consumption, the high concentrations are most probably associated. The vertical scale of the high concentration of chlorophyll is about 50 m with a maximum at a depth of 30 m.

Primary production

In the cyclonic eddy, 3 μM of nitrate was consumed for production of phytoplankton, which is equivalent to

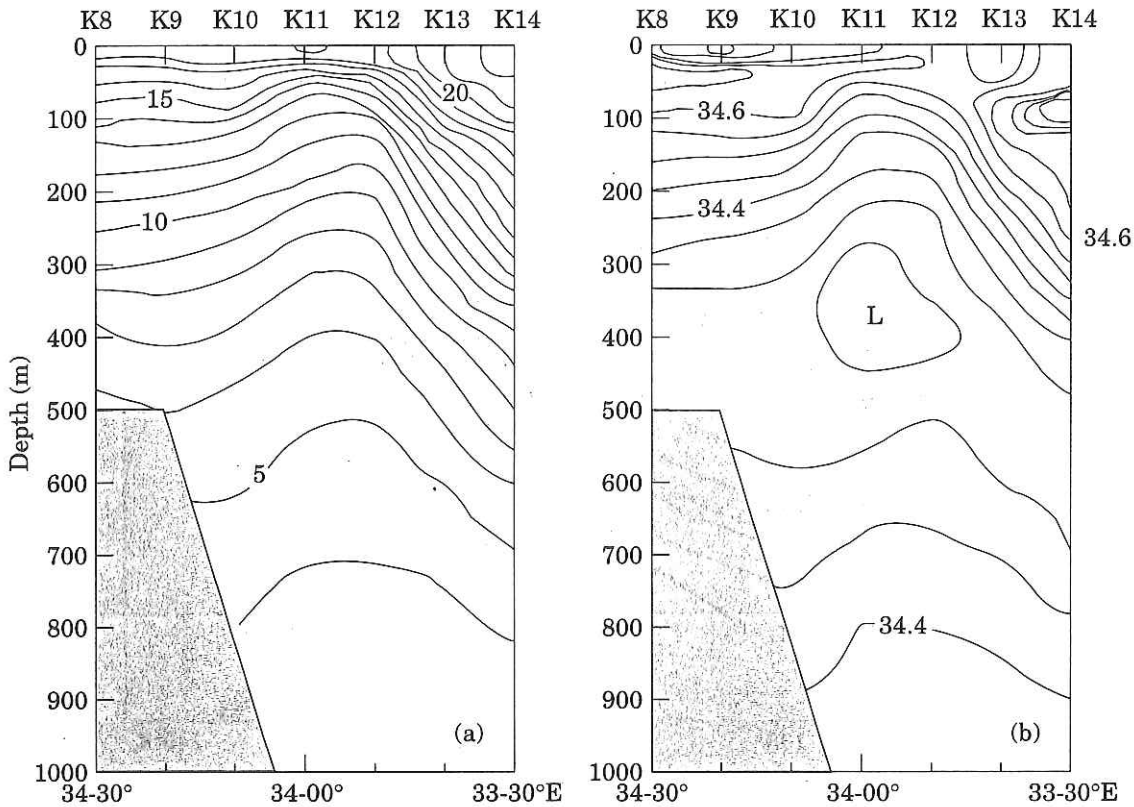

Figure 5. (a) Vertical temperature (°C) and (b) salinity sections along Line 2.

1.0 μg l^{-1} of chlorophyll during the two days. The apparent specific growth rate of phytoplankton in terms of chlorophyll was calculated assuming an exponential change, i.e.:

$$\mu' = 1/(t_2 - t_1) \ln c_2/c_1, \quad (18)$$

where c_1 and c_2 are the concentrations of chlorophyll at times t_1 and t_2 respectively. The apparent specific growth rate is estimated to be 0.26 d^{-1}. Supposing the chlorophyll:nitrogen ratio equals 0.7 (Ishizaka *et al.*, 1986), 3 μM decrease of nitrate indicates 4.3 μg l^{-1} chlorophyll production by phytoplankton. Since the chlorophyll concentration increased by only 1.0 μg l^{-1}, we deduce that 3.3 μg l^{-1} chlorophyll was lost by sinking and zooplankton grazing during the two days.

Eddy vorticities on each observational line estimated from current velocity measured via the ADCP decrease with time: Line 1 2.0×10^{-5} s^{-1}, Line 2 1.5×10^{-5} s^{-1}, Line 3 1.0×10^{-5} s^{-1}. Since the eddy diameter is 80 km and the velocity difference between the centre of the eddy and the Kuroshio front is about 150 cm s^{-1}, the initial vorticity of the eddy is estimated to be 3.5×10^{-5} s^{-1}. According to this estimation, the eddy is generated two days before Core 1. Supposing the initial concentration of surface nitrate is 8 μM, because the vertical scale of the upwelling is 50–100 m, variation of nitrate can be explained by the following equation with t in days.

$$y = 12 - 4\exp(0.2t) \quad (19)$$

This implies that the nutrient will be consumed within 3–4 days from the Core 1. These paths are illustrated in Figure 9. This daily loss of the nutrients contributes towards the total primary production. The daily total chlorophyll concentration and the specific growth rate of phytoplankton, including grazing and sinking effects, can be estimated from the nutrient consumption and the apparent chlorophyll concentration. For instance, the apparent concentration of chlorophyll on the second day, 1.5 μg l^{-1}, increases by 0.45 μg l^{-1} to 1.95 μg l^{-1} on the third day. However, since the nitrate concentration decreases by 1.33 μM, corresponding to 1.9 μg l^{-1} chlorophyll concentration, actual concentration on the third day is estimated to be 3.40 μg l^{-1}. The balance, 1.45 μg l^{-1}, is lost by grazing and sinking in one day and the specific growth rate, 0.82 d^{-1}, is estimated. The average of the specific growth rate during the five days is 0.8 d^{-1}.

Modelling

According to the observations, the average temperature in the surface layer of the eddy is 2–3°C higher than the surrounding water. Surface temperature in the model is increased by about 2°C in 7 days as shown in Figure 10(a). This modelled increase of the temperature agrees well with the observations. Wind stress at the sea surface and bottom friction between the eddy bottom and upper

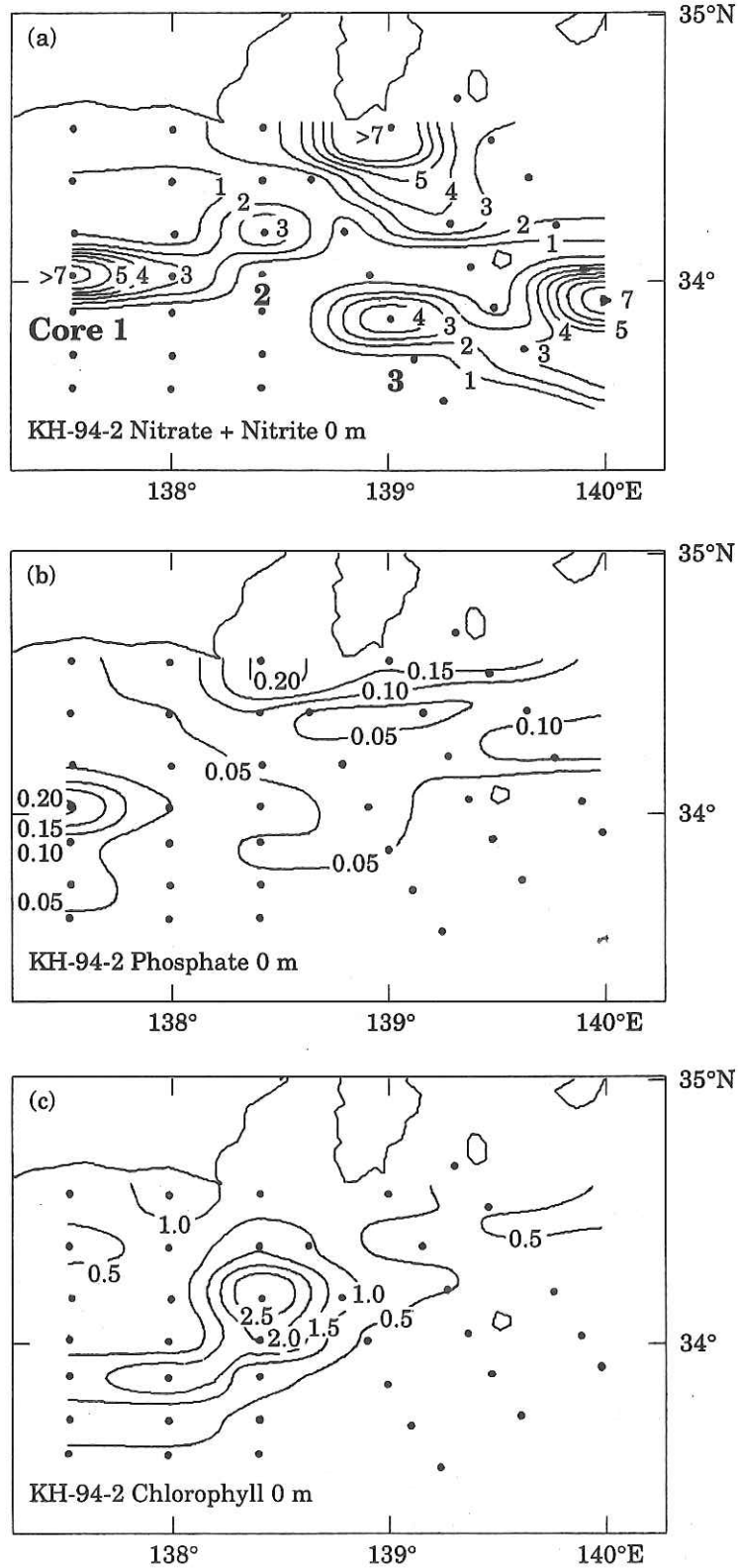

Figure 6. Surface distributions of nitrate (a), phosphate (b) and chlorophyll (c) concentrations. Units of nutrients and chlorophyll are μM and μg l^{-1}, respectively. Large figures in (a) indicate core number.

layer of the deep ocean cause vertical mixing. The modelled turbulent intensity is shown in Figure 10(b). The vertical mixing is dominant in the top 15 m of the sea surface and a 30 m layer at the eddy bottom. The combination of mixing and surface heating produce weak stratification at a depth of 50 m.

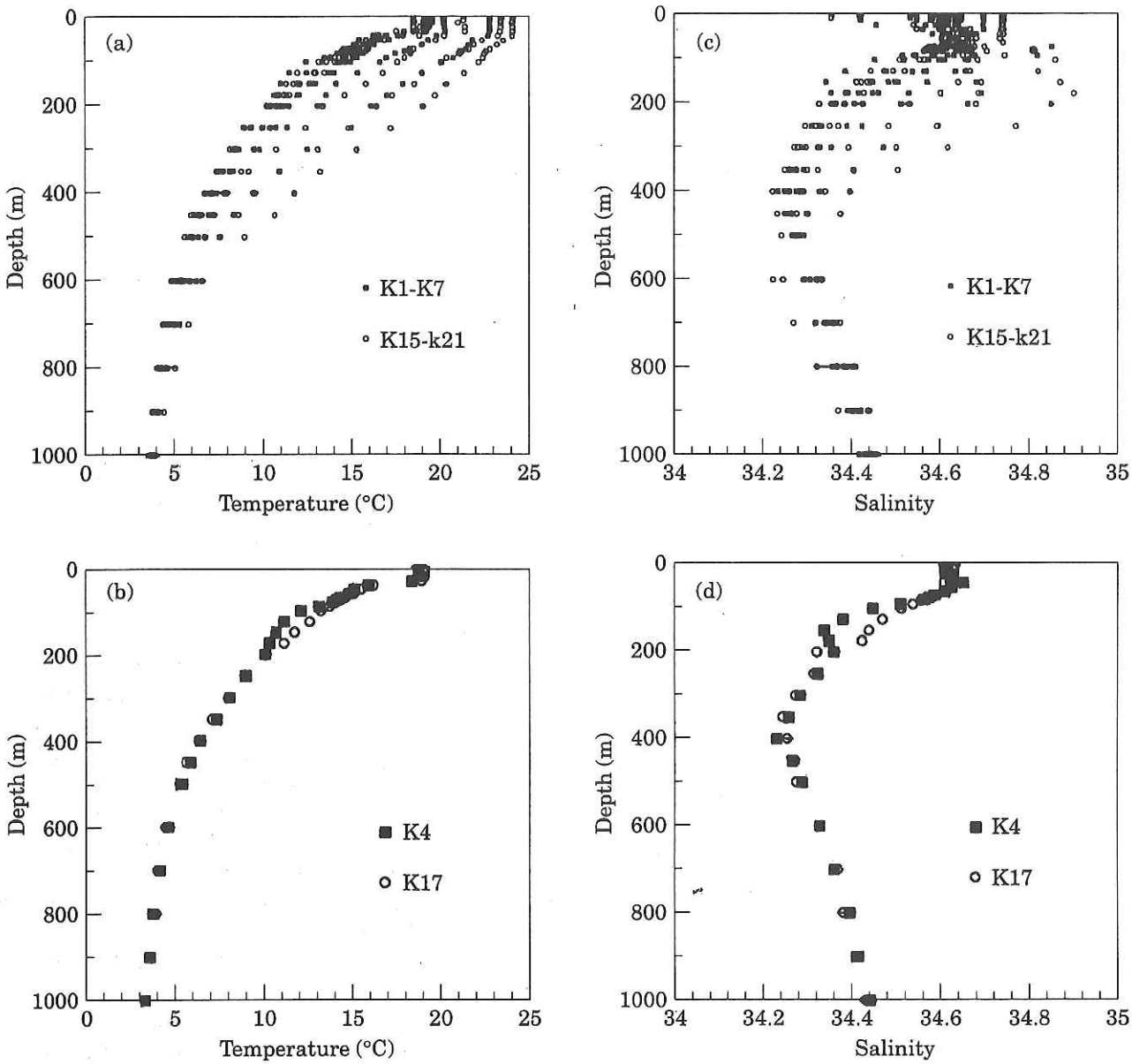

Figure 7. Temperature and salinity vertical profiles along Line 1 and 3.

Biological predictions from the model are shown in Figure 10(c–f). The concentration of chlorophyll reaches a maximum of 3.6 $\mu g\ l^{-1}$ on the fifth day after the generation, when the dissolved inorganic nitrogen is almost exhausted. The time when the nutrients are exhausted and the chlorophyll concentration peaks correspond quite well to those shown in Figure 9. After the fifth day, the concentration of chlorophyll decreases rapidly because of the lack of nutrients. However, the nitrogen-in-plankton is at a maximum on the fourth day prior to the maximum of chlorophyll and the value has already decreased when the chlorophyll concentration is maximum.

A contour of 1.0 $\mu g\ l^{-1}$ in the chlorophyll concentration always exists at a depth of 32 m throughout the calculation and its changes are restricted to depths shallower than 30 m. Because it is associated with growth of phytoplankton the concentration of the dissolved inorganic nitrogen decreases markedly at depths shallower than 60 m. A concentration of 8.0 μM which existed in the sea surface at day 0 is found at a depth of 65 m on the seventh day. By this stage the surface concentration of dissolved inorganic nitrogen has reverted to what would be expected without the presence of the eddy.

The modelled growth rate shown in Figure 10(f) is similar to the specific growth rate estimated from the observational results. The high growth rates in excess of 0.8 d^{-1} are limited to depths less than 30 m until the fourth day. However, the depth of the maximum increases after that with decreases of the nitrogen-in-plankton.

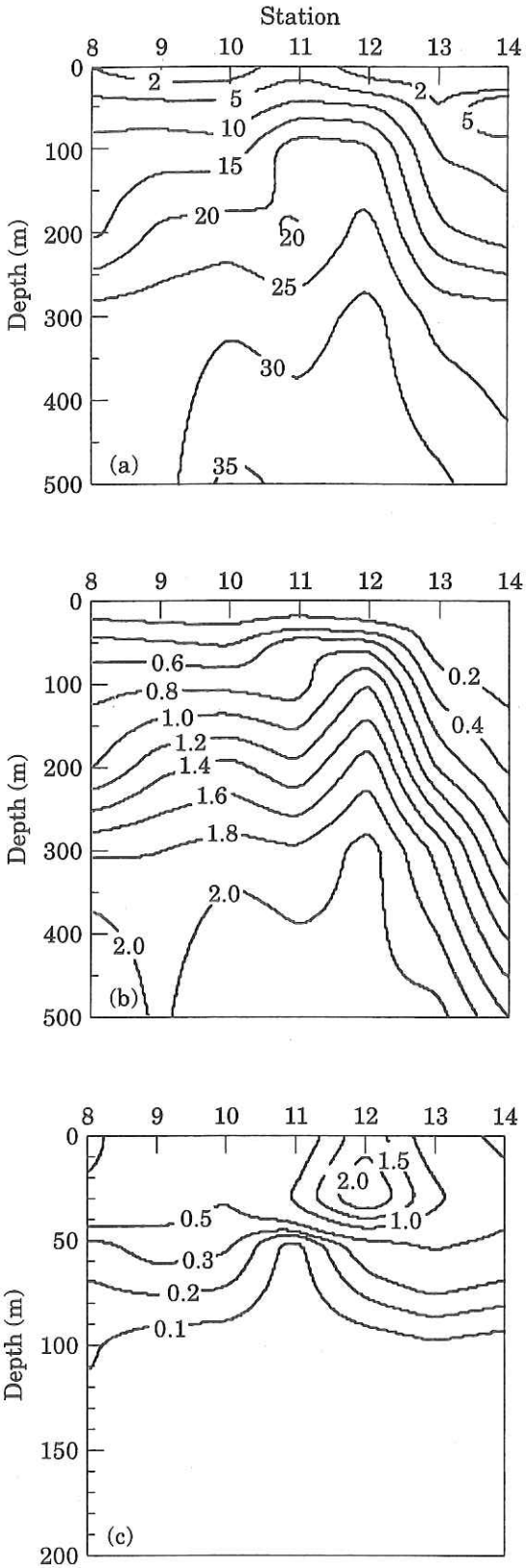

Figure 8. Vertical sections of nitrate (a), phosphate (b) and chlorophyll (c) concentrations along Line 2. Units of nutrients and chlorophyll are μM and μg l^{-1}, respectively.

Discussion

In this paper, we describe increased primary production caused by an eddy associated with frontal disturbances

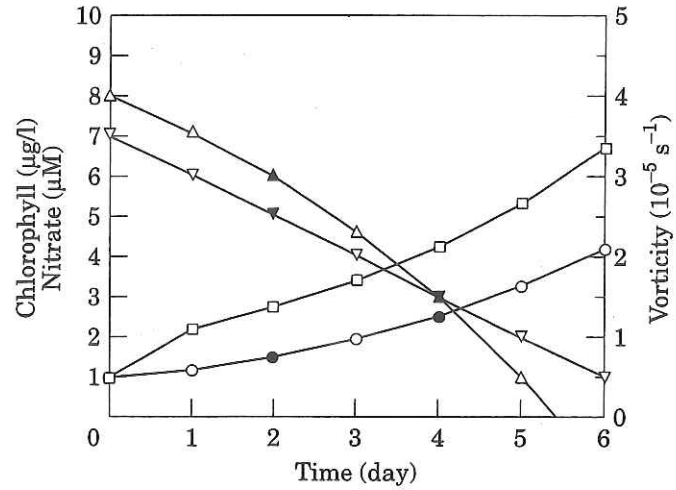

Figure 9. Variations of estimated physical and biological factors in the cyclonic eddy. The calculation is started from eddy generation. Data in Core 1 and 2 observed on the second and fourth day are indicated by solid symbols. (—△— nitrate, —○— apparent chl., —□— total chl., —▽— vorticity).

of the Kuroshio. After its generation the nutrient-enriched eddy detaches from the Kuroshio front and intrudes into the coastal area of the Enshu-nada Sea. According to our calculations the life span of the eddy is estimated to be 7 days from vorticity changes and 6 days from nutrient consumption. During this period, the apparent chlorophyll concentration in the eddy reached 3.3 μg l^{-1} on the fifth day after the generation, when the nutrient was exhausted and the vorticity of the eddy became less than 1×10^{-5} s^{-1}. According to the model results, the specific growth rate of phytoplankton decreased rapidly after the maximum chlorophyll concentration was reached but was constant before the maximum. These results indicate that new production by upwelling in the eddy spread over the Enshu-nada Sea and contributed to the coastal primary production within about a week. The estimated values from observations correspond well to those from the numerical simulation.

A high concentration of chlorophyll is observed at depths less than 50 m with a maximum at 30 m. The high concentration calculated by the simulation is found at depths shallower than 30 m. The depth in the simulation is largely prescribed by the light-dependent growth rate, although stratification, resulting from mixing and heating, also contributes. In the model, a maximum in stratification at a depth of 50 m makes nutrient supply to the euphotic layer difficult. This is a reason why the chlorophyll maximum at the depth of 30 m was not reproduced in the model. A high growth rate is, however, modelled at depths of 30 m after the fourth day. This maximum is prescribed by a balance between light and nutrient dependent growth rates because the high concentration of nutrient has already been exhausted in the surface layer.

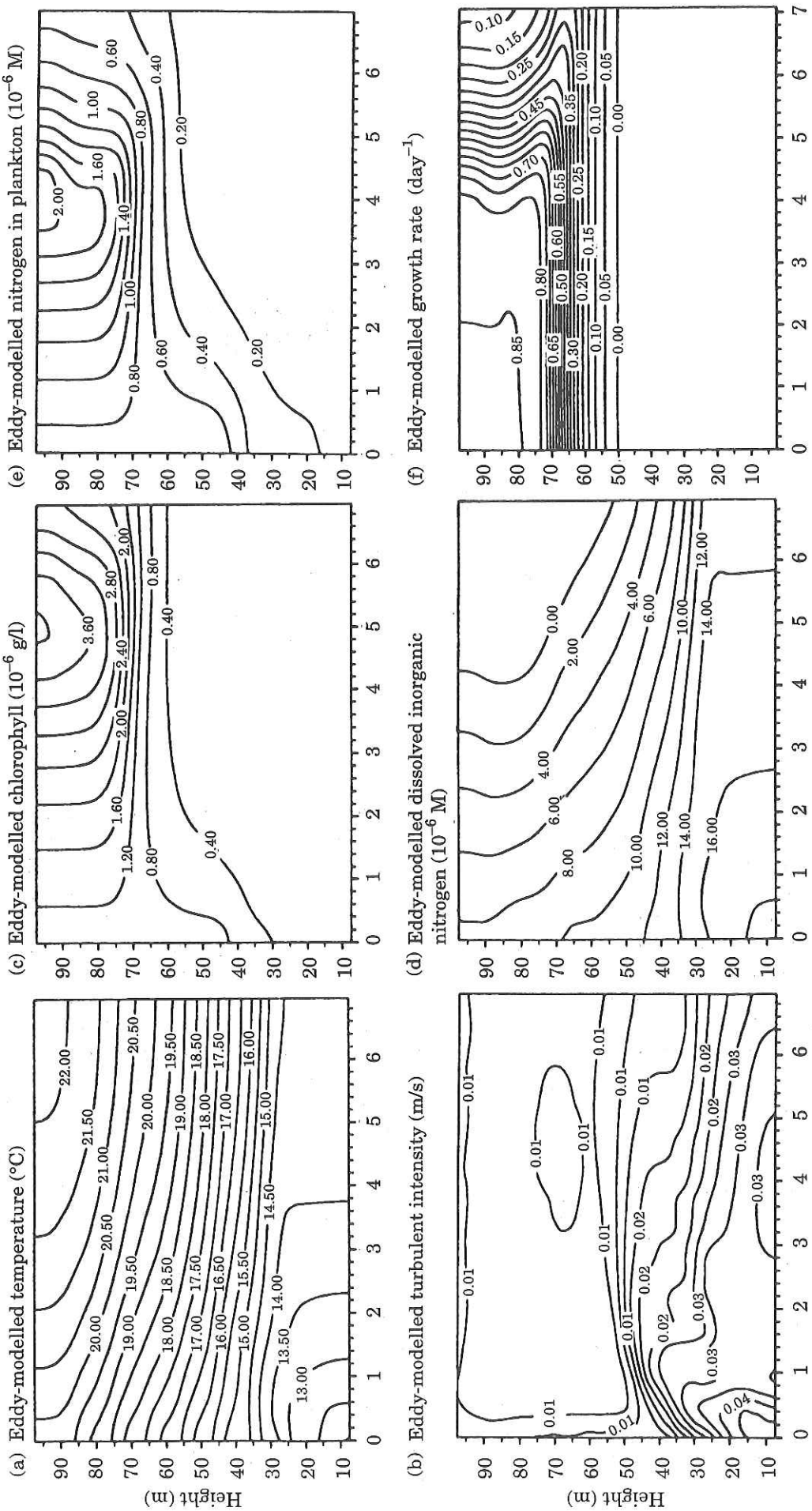

Figure 10. Modelled variations of (a) temperature, (b) turbulent intensity, (c) chlorophyll concentration, (d) concentration of dissolved inorganic nitrogen, (e) concentration of nitrogen in plankton and (f) growth rate of phytoplankton.

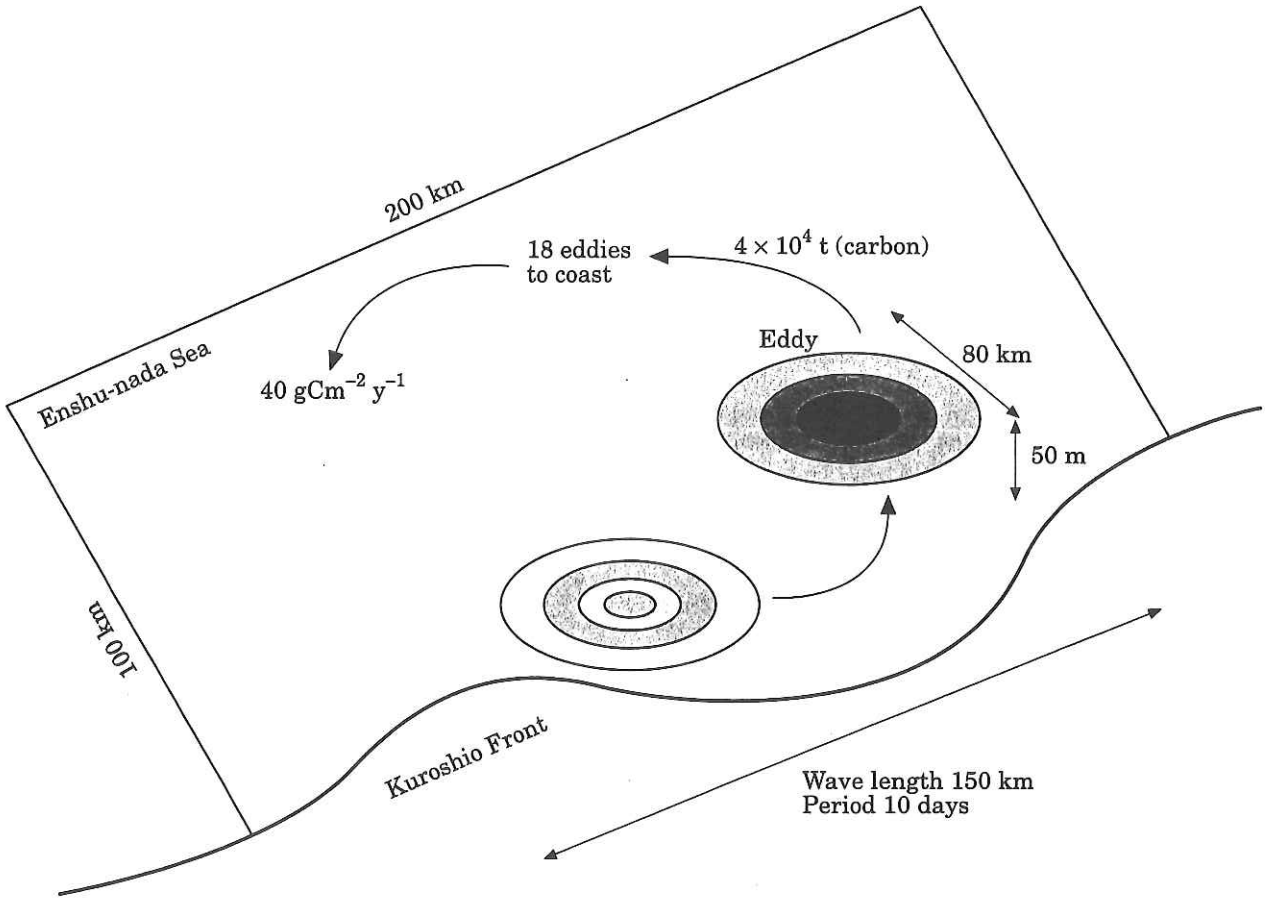

Figure 11. Schematic view of the Kuroshio front with diagrams of primary production.

The net primary production per litre in the eddy, including losses by grazing and sinking, is estimated to be 12.3 μg of chlorophyll over 6 days which is the period of the life of the eddy based on the initial surface nitrate concentration. Assuming the eddy has 80 km diameter and 50 m depth, and that the concentration becomes lower linearly from the centre of the eddy to the edge, the input of chlorophyll to the coast by one eddy would be 1.4×10^9 g. Using a value of 30 for the carbon:chlorophyll ratio (Parsons *et al.*, 1984), we find a net production of 4.2×10^{10} gC. From satellite imagery, the frontal disturbance has a wavelength of about 150 km. In the Kuroshio region east of Cape Shionomisaki, a disturbance with this wavelength occurs every 10 days (Kimura and Sugimoto, 1993): 36 eddies a year. The impact of the net onshore flux of nitrate on phytoplankton production can, therefore, be estimated knowing the area influenced by the disturbances. However, since vertical mixing in winter enhances the nutrient supply to the euphotic layer, only the 18 eddies in summer, when stratification is developed, should be considered. Assuming 18 eddies intrude into the Enshu-nada Sea, which has an area of 100 km × 200 km, this perturbation could result in a carbon production rate of 40 gC m^{-2} y^{-1} (Fig. 11).

No precise estimation of primary production in the Enshu-nada Sea has ever been made. However, according to a rough estimation by Ichimura (1965), primary production in the coastal area and in an area between the coastal area and the Kuroshio front are 110–180 and 40–70 gC m^{-2} y^{-1} respectively. The primary production by the frontal disturbance, therefore, appears to account for a large part of coastal primary production. In fact, high densities of copepod nauplii seem to correspond with high chlorophyll concentration in the eddy, suggesting that it is important to understand the survival processes of the higher food web. Moreover this estimate is similar to an estimate of production at the Gulf Stream front; 32–64 gC m^{-2} y^{-1} (Lee *et al.*, 1981) and we believe this to be the first time a comparison between the Kuroshio and the Gulf Stream has been made in regard to primary production caused by frontal disturbances.

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Implications of meso-scale eddies caused by frontal disturbances of the Kuroshio Current for anchovy recruitment

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This paper discusses the implications of the meso-scale eddies, which are caused by frontal disturbances of the Kuroshio Current, for larval transport, distribution and food availability for Japanese anchovy, *Engraulis japonicus* (Houttuyn). It is a ubiquitous feature of the Kuroshio Front that wave-like meanders, with wavelengths of 100–400 km, generate cyclonic frontal eddies off the Pacific coast of the island of Japan. These eddies are likely to affect larval transport and the survival of the coastal spawning fish such as anchovy in the Kuroshio region by possibly moving coastal water offshore to the frontal region.

With this in mind, a frontal eddy was tracked from 18–23 May 1994 in the Enshu-nada Sea, where one of large spawning grounds of anchovy was found. Intensive transect surveys across the eddy were made to collect anchovy eggs and larvae simultaneously with prey organisms e.g. naupliar and copepodite copepods. These surveys showed that anchovy eggs and larvae hatched in the coastal water of the Enshu-nada Sea were entrained into the frontal eddy and transported along the Kuroshio Front, possibly recruiting to coastal nurseries in the Enshu-nada Sea. In addition, the upwelling of nutrient-rich water in the vicinity of this cyclonic eddy enhanced primary production and subsequent copepod production, providing potentially favourable conditions for the feeding and growth of the anchovy larvae entrained in the eddy.

Key words: anchovy recruitment, egg and larval entrainment, frontal eddy, Kuroshio Current.

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Introduction

Most small pelagic fishes such as sardine and anchovy in and around Japan have their spawning grounds in the Kuroshio and its coastal water. Consequently, whether or not eggs and larvae are transported to the nurseries by the Kuroshio Current has been seen as a critical factor affecting larval survival and subsequent recruitment. In fact it was suggested that a large-scale meander of the Kuroshio Current could be related to marked fluctuation of the fish stocks (Watanabe, 1982), although the cause–effect relationship has not yet been clarified. In recent years, on the other hand, it has been revealed by detailed analyses of ocean fine-structure using satellite imagery that meso-scale eddies caused by frontal disturbances ("frontal eddies" hereafter) are a ubiquitus feature along the coastal edge of the Kuroshio Current. It has also been suggested that those frontal eddies could play an important role in primary production due to the upwelling of nutrient-rich deep water to the surface euphotic zone, as a result of the cyclonic motion of the eddy (Lee *et al.*, 1981; Yoder *et al.*, 1981; Sasaki *et al.*, 1985; Kimura *et al.*, 1997). According to Kimura *et al.* (1997), total annual nitrogen input to the Enshu-nada Sea by the frontal eddies could result in a carbon production rate of 40 $gCm^{-2}\ y^{-1}$, which is almost equivalent to the production rate estimated for the Gulf Stream frontal eddy (Lee *et al.*, 1981). This enrichment process possibly intensifies trophic level interactions (Haney, 1986; Bakun, 1996) and may affect

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larval feeding and growth in the offshore frontal regions. To date, however, there has been only very limited information on this aspect.

In addition, Nakata (1992) suggested the possibility of entraining coastal low-salinity water by a frontal eddy to the Kuroshio Front in the southern continental shelf of the East China Sea. This entrainment could function as a mechanism of egg and larval transport from coastal spawning grounds offshore. Kidachi (1997), in fact, reported that aggregations of some inshore and coastal species of copepods such as *Acartia omorii* and *Calanus sinicus* were often observed in the vicinity of Kuroshio Front as narrow bands, suggesting that they accumulated at the Kuroshio Front under the influence of a frontal eddy. However any clear evidence for the egg and larval entrainment has not yet been demonstrated and there has been almost no consideration of the implication of the entrainment for the recruitment of coastal spawners.

In this paper we describe an intensive transect survey on the distribution and food availability of anchovy larvae in relation to the formation and development of a frontal eddy observed in the Enshu-nada Sea. This is one of the major spawning grounds of the Pacific subpopulation of Japanese anchovy, *E. japonicus* (Houttuyn). Part of the data on the nutrients and chlorophyll *a* concentrations obtained from this survey have already been presented in Kimura *et al.* (1997): in this paper more attention is given to the data on anchovy larvae and their prey organisms (mainly naupliar copepods). The implication of the coastal water entrainment by the frontal eddy for anchovy recruitment is also discussed in relation to the larval transport and survival processes.

Description of the transect survey in the Enshu-nada Sea

In addition to hydrographic observations with a conductivity–temperature–depth profiler (CTD), which were carried out at 39 stations in the Enshu-nada Sea along six transects during 18–23 May 1994 (see Fig. 1 of Kimura *et al.*, 1997), fish eggs and larvae were collected by 3–5 min. horizontal tows with the Ocean Research Institute (ORI) net, made of 0.33 mm mesh filtering cloth (1.6 m in diameter), and by a 15-minute multi-layer tow at six depths (0, 20, 40, 60, 100, 200 m) with the Motoda (MTD) net, made of the same filtering cloth (0.56 m in diameter) at night along two of the six transects. Naupliar and copepodite copepods were also collected from the surface water (1 l) using a bucket simultaneously with the net tows. Fish eggs and larvae collected were immediately fixed in 2.5% seawater (v/v) gultaraldehyde, and copepod samples were fixed in 5% (v/v) seawater formalin after being concentrated by a plankton net with 0.020 mm mesh. Water samples for determining chlorophyll *a* concentration were taken

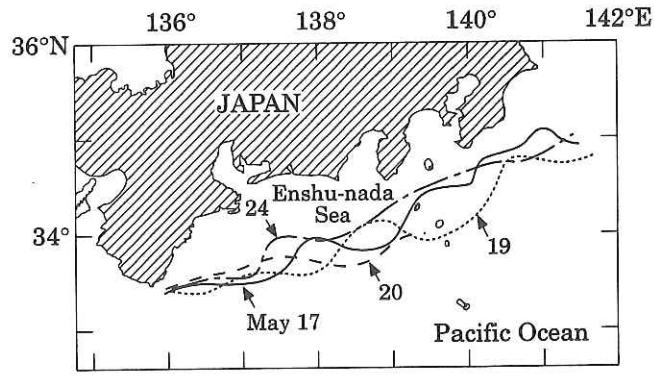


Figure 1. Variation in the Kuroshio Front during the period of observation (18–23 May 1994) in the Enshu-nada Sea off the central Pacific coast of Japan. The locations of the Kuroshio Front were detected using satellite images.

from 0, 30, 50 and 100 m depths along the same transects with Niskin bottles mounted on a rosette sampler attached to the CTD. The 200 cm^3 of each water sample was filtered onto a Whatman GF/F glass microfibre filter and the filter soaked in 10 ml of dimethylformamide. The chlorophyll fluorescence in the dimethylformamide was later measured in the laboratory.

Since anchovy were predominant over the other fish species in the samples, the numbers of anchovy eggs and larvae were counted. In addition, for small catches (<50), all the anchovy larvae were measured to the nearest mm for total length (TL), and a random subsample was measured if the catch was larger than 50. These larvae were further grouped into 1 mm size classes, and ten individuals from each size class were homogenized for RNA and DNA analyses. The RNA and DNA contents were determined for each size class using a modification of the Schmidt-Thannhauser method (Buckley, 1979).

During the survey period, the Kuroshio Current took a straight path flowing close to the Japanese Pacific coast with small-scale meanders (Fig. 1). From the satellite image taken on 17 May 1994, a frontal eddy was clearly detected in the trough of the meander with 150 km horizontal wavelength, and apparently moved downstream of the Kuroshio Current at a speed of 60 cm s^{-1} (Kimura *et al.*, 1997). The time-series of satellite images also showed that the intensity of the frontal eddy gradually decayed as it moved downstream. The horizontal distribution of sea surface temperature and salinity are shown together with the transects for egg and larval collection (SEC. I and SEC. II) in Figure 2. The main axis of the Kuroshio Current is indicated empirically by the 15°C isotherm at the depth of 200 m (Kawai, 1969), and the Kuroshio Front, which is marked with strong horizontal density gradient, forms a coastal boundary of the Kuroshio, being seen at the surface as the 20–21 isotherms and 34.6–34.7 isohalines in this survey. The elongated low temperature zone in

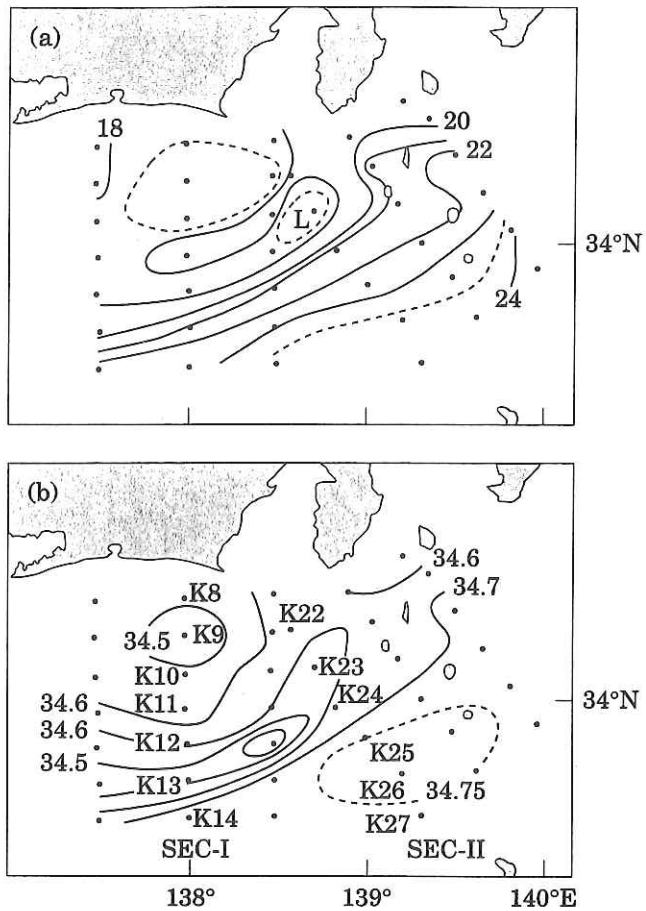


Figure 2. Distribution of sea surface temperature (°C) (a) and salinity (b) obtained from a CTD survey in the Enshu-nada Sea. Transects for egg and larval collection and water sampling are shown in the lower figure together with the salinity distribution (SEC. I: Stns. K8–K14, SEC. II: Stns. K22–K27).

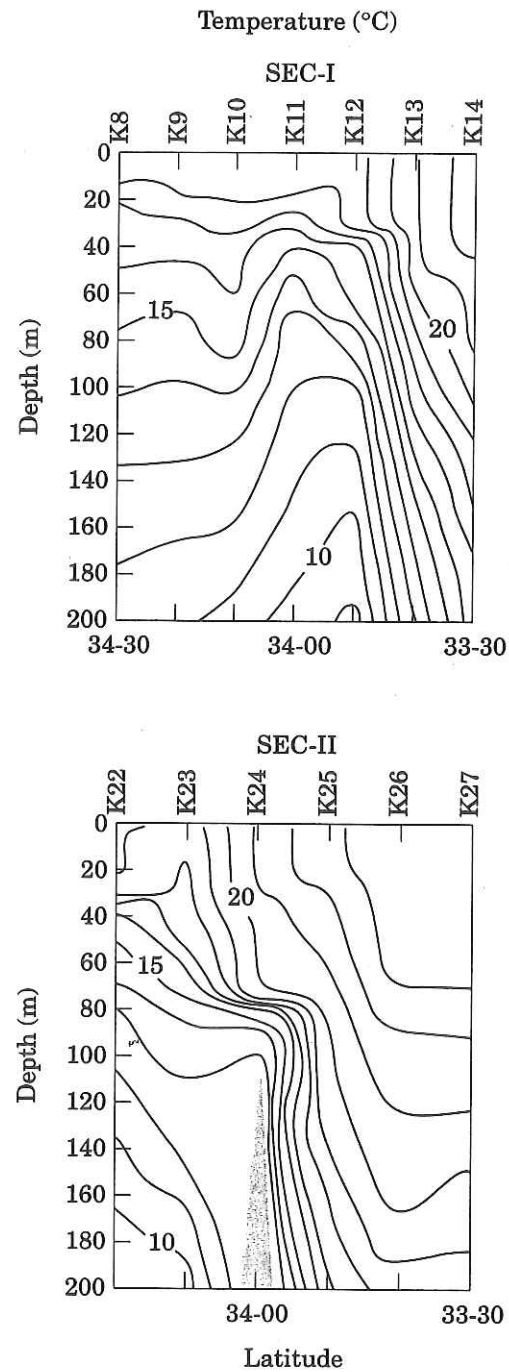


Figure 3. Vertical sections of temperature along SEC. I (top) and SEC. II (bottom) in the upper water of the Enshu-nada Sea.

the northern edge of the Kuroshio Front as seen in Figure 2 indicates the existence of a cyclonic eddy and its eastward movement. Figure 3 further shows vertical temperature structure along SEC. I (K8–K14) and SEC. II (K22–K27). The Kuroshio Front was located between K12 and K13 in SEC. I and around K24 in SEC. II, and the frontal eddy was clearly indicated by convexed pattern of isotherms around K11–K12, corresponding with upwelling induced by the cyclonic eddy. The upwelling feature could not be seen in SEC. II, probably because, on the one hand, this transect did not pass through the centre of the eddy and, on the other, because of its decay with time (SEC. II was observed about 3 d after the transect survey along SEC. I). Nonetheless, we believe that Station K23 was located in the vicinity of the eddy centre.

Figure 4 shows the near-surface current field measured by a ship-board ADCP during the transect survey. Although this is a composite picture based on the data taken for several days (18–23 May 1994), it is evident that a cyclonic eddy was generated on the northern, colder edge of the Kuroshio Front. The maximum speed of the Kuroshio reached about 150 cm s^{-1}, while the eastward current velocities near the cyclonic eddy were of the order of 50–70 cm s^{-1}.

Results

Spatial distribution of fish larvae collected by a surface horizontal tow with the ORI net along SEC. I and SEC. II are shown together with spatial changes in the surface seawater temperature in Figure 5. Japanese anchovy with a size range of 2–20 mm TL predominated in the larval collection. Anchovy larvae were abundant in the

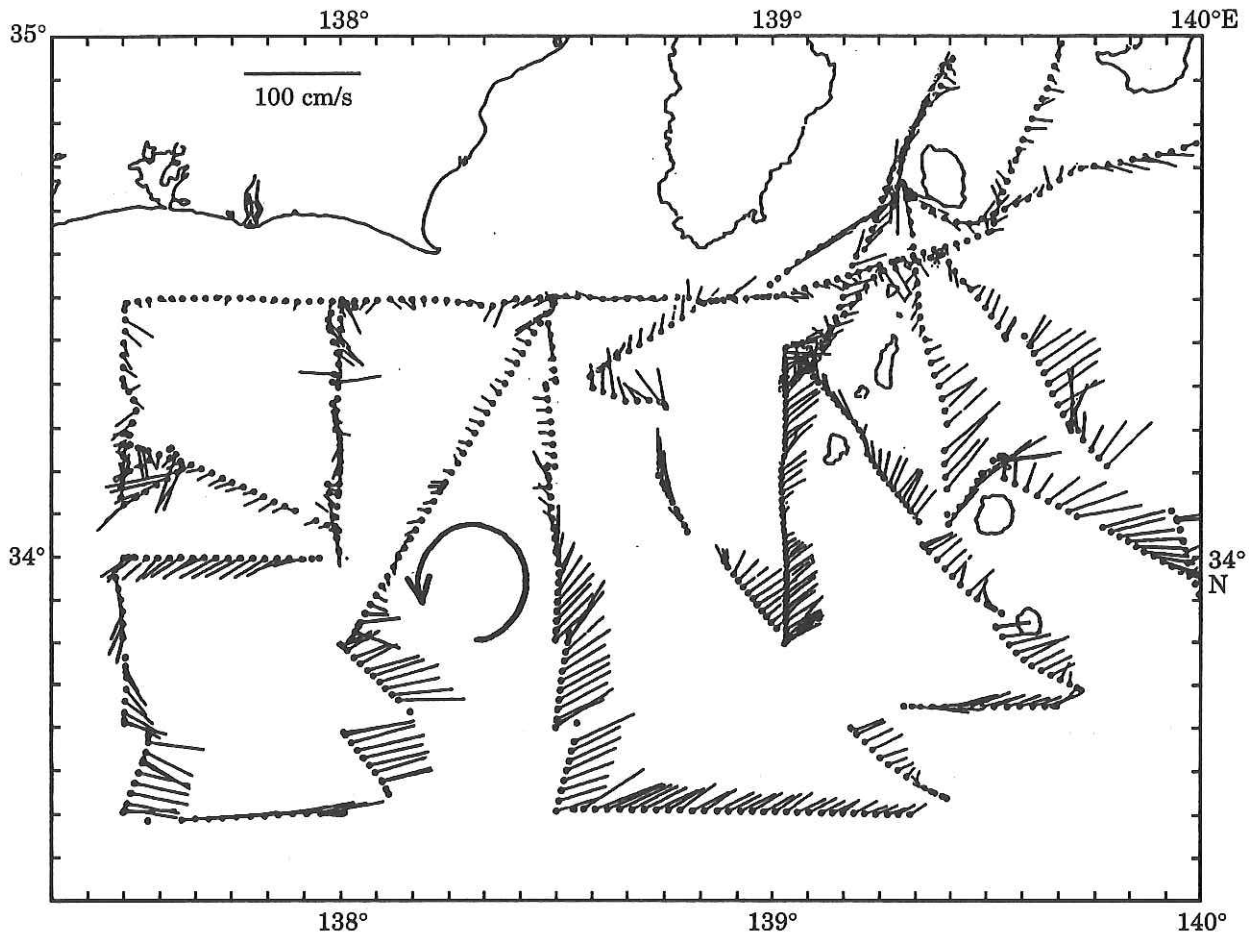


Figure 4. Distribution of the surface current measured by a ship-board ADCP during the survey period (18–23 May 1994).

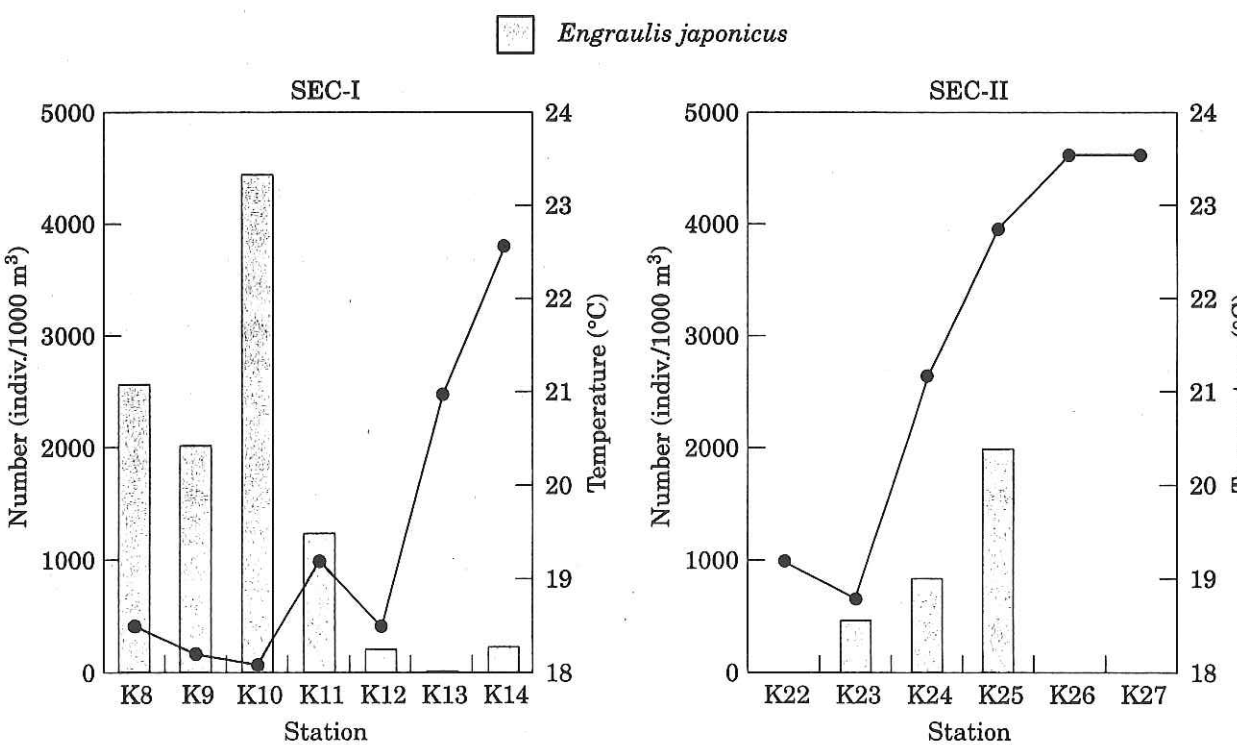
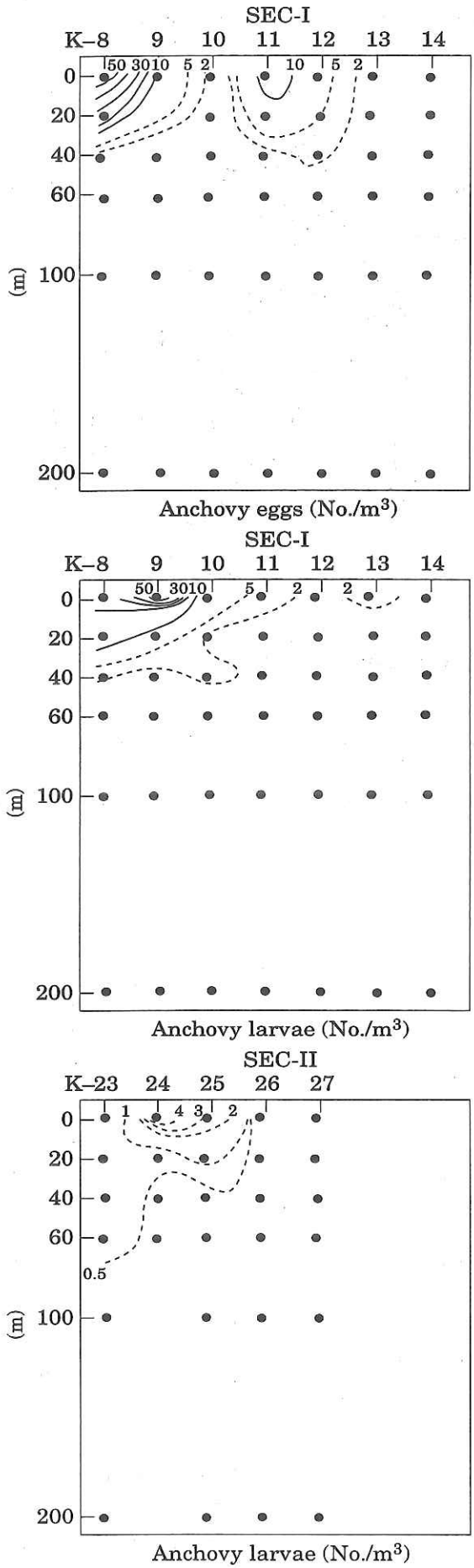


Figure 5. Spatial changes in the abundance of anchovy larvae (shadowed sticks) and sea surface temperature (solid lines) along SEC. I and SEC. II.



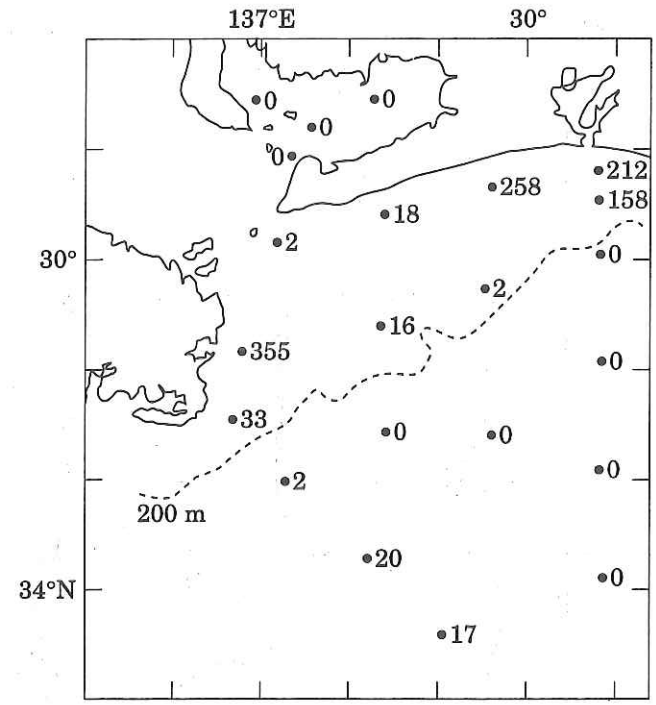


Figure 7. Horizontal distribution of anchovy eggs in the western Enshu-nada Sea on 10–11 May 1994. Numerals indicate the number of eggs per haul. Data from the Aichi Fisheries Research Institute.

coastal water just north to the Kuroshio Front along SEC. I, while they were more abundant in the Kuroshio Front itself along SEC. II. The same spatial distribution patterns were obtained from the larval collection with the MTD net as shown in Figure 6, although there was no sampling at Stn. K22 because of strong winds. It can also be seen from the vertical sections that most of anchovy larvae were vertically distributed in the surface layers (0–40 m). On the other hand, as shown in the top panel of Figure 6, anchovy eggs were most abundant in the surface water of the coastal station (K8) consistent with horizontal egg distribution in the surface water of the western Enshu-nada Sea on 10–11 May (Fig. 7). In addition a small peak of the egg density was observed at the eddy site (K11–K12 of SEC. I) near the Kuroshio Front. These imply that anchovy eggs and larvae originating from the coastal water were possibly entrained and moved to the offshore frontal region under the influence of the frontal eddy.

Most of the anchovy larvae collected in the coastal stations (K8 and K9) of SEC. I were less than 5 mm in length, while the 5 mm length class predominated at the eddy station (K23) of SEC. II. The upper panel of Figure 8 shows the frequency distribution of total length

Figure 6. Distributions of anchovy eggs along SEC. I (top), anchovy larvae along SEC. I (center), and anchovy larvae along SEC. II (bottom). The eggs and larvae were collected by a multi-layer tows with the MTD net (see the text for details).

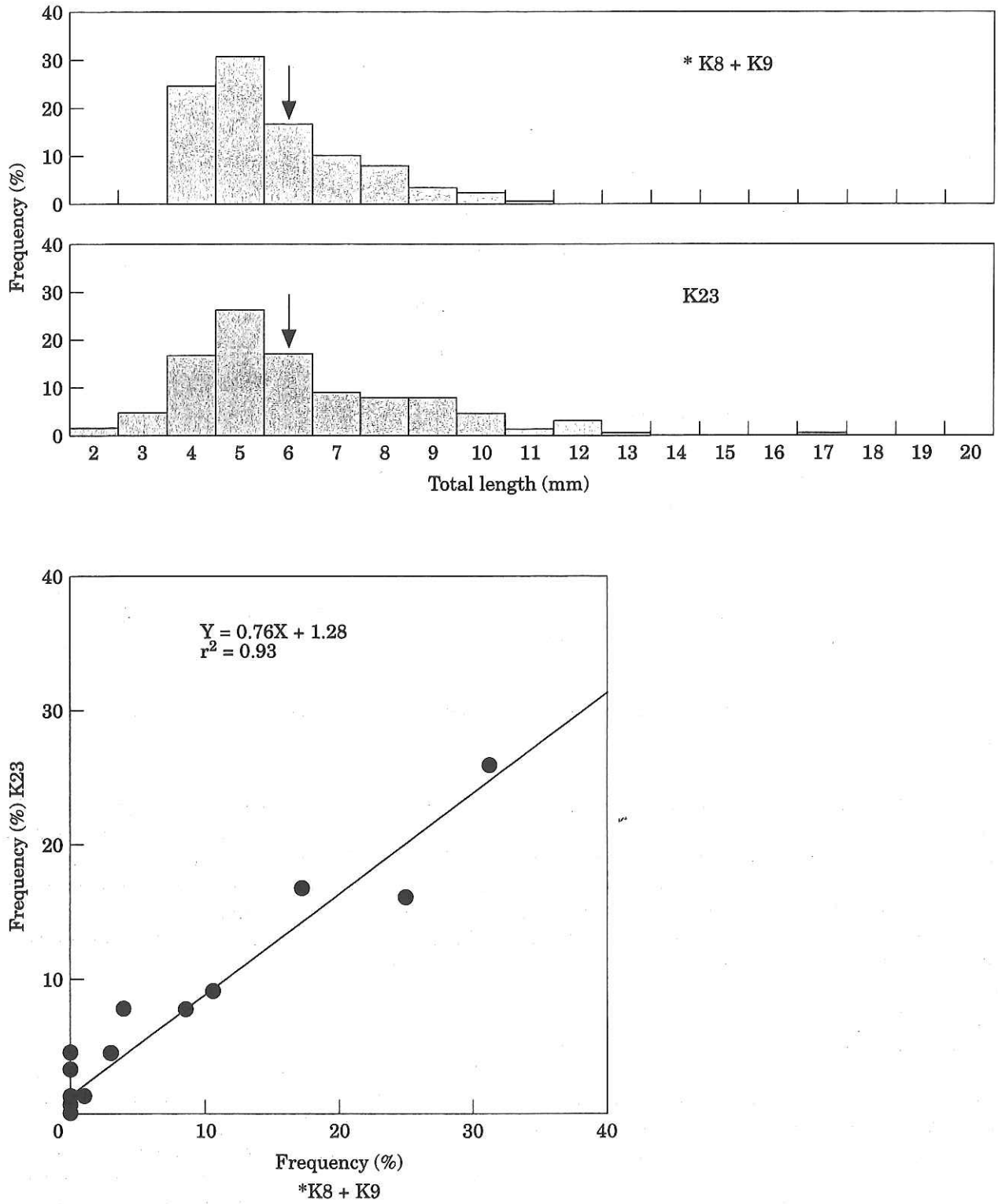


Figure 8. Correlation between the length frequency distributions of the anchovy larvae collected at Stn. K23 of SEC. II and Stns. K8 and K9 of SEC. I (lower panel). The upper panel shows the length frequency distributions at these stations. *The lengths of the larvae collected at Stns. K8 and K9 were transformed to those at three days after the collection, taking daily growth into account.

of anchovy larvae collected at K23 of SEC. II compared with that collected at K8 and K9 of SEC. I, after transformation of the latter to the probable distribution at three days after the collection, assuming a daily growth rate of the larvae in the coastal stations of 0.69 mm d^{-1} (Tsuji, 1985). As shown in the lower panel of Figure 8, the size composition of the eddy station in SEC. II apparently has a significant positive correlation with that of the coastal stations (K8 and K9) in SEC. I. This again supports the idea that the frontal eddy could

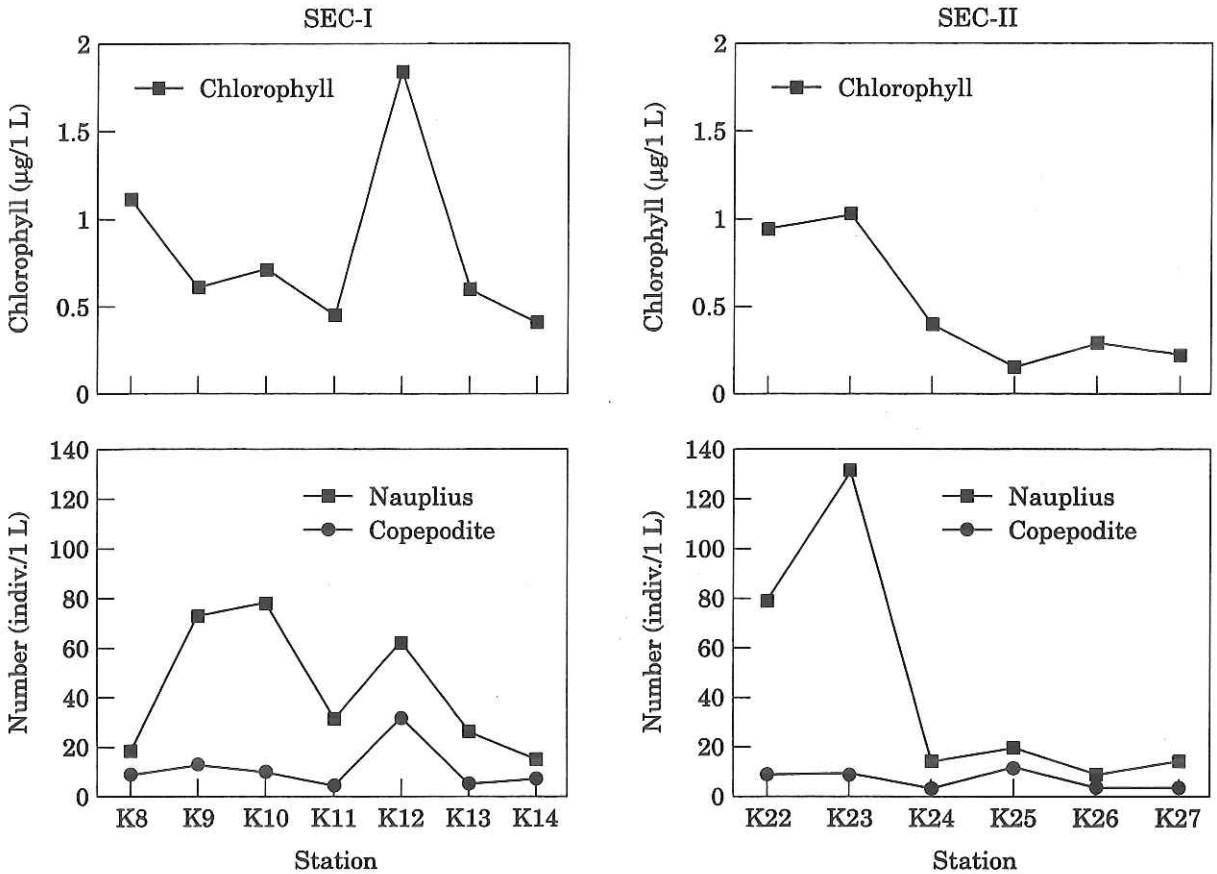


Figure 9. Spatial changes in the chlorophyll concentration and abundance of naupliar and copepodite copepods along SEC. I (left) and SEC. II (right).

entrain coastal anchovy larvae and carry them to the offshore frontal region trapped in an eddy.

Figure 9 further shows the spatial changes in chlorophyll *a* concentration and copepod abundance in the surface water along SEC. I and SEC. II. It is noticeable that a higher concentration of chlorophyll *a* was found at eddy station (K12) in SEC. I, while a marked increase in nauplius abundance was subsequently observed at eddy station (K23) in SEC. II. In the Kuroshio Front and its offshore stations, on the other hand, chlorophyll *a* concentration and copepod abundance were quite low. This suggests that the high chlorophyll *a* concentration at the eddy station may have stemmed from the upwelling associated with the eddy (Kimura *et al.*, 1997) promoting copepod production and leading to potentially enhanced food availability for the entrained anchovy larvae.

Regarding Stn. K12 in the SEC. I and Stn. K23 in the SEC. II as a region under the strong influence of the frontal eddy, all the stations were divided into three regions: inshore, frontal eddy and offshore, and the spatial difference in the RNA/DNA ratios of anchovy larvae for the size classes of 6–8 mm and for those of 9–11 mm in these three regions were studied. A significant increase (3.04 ± 0.24) was found in the frontal eddy compared to the inshore (2.51 ± 0.19) and offshore (2.61 ± 0.22) for smaller size classes (6–8 mm) (Scheffe Test, $p<0.05$), indicating that the overall nutritional condition of the early-stage larvae collected from the eddy site was better than those collected from the surrounding water. This difference between the frontal eddy and the other regions was not found with the larger size classes.

Discussion

One of the major spawning grounds of anchovy during the survey period was located in the coastal water of the Enshu-nada Sea, for example around K8 in SEC. I (Fig. 6). It is evident from this study that some of the anchovy larvae originating from the coastal water are entrained in the offshore frontal region when they encounter a frontal eddy during the period of offshore drift and dispersion. Although there is not necessarily a strong case of larval entrainment, this does give support to numerical simulation of shelf water entrainment into the Kuroshio Front by a topographic eddy, which is produced in association with onshore–offshore movement of the Kuroshio (Awaji *et al.*, 1991). Lagrangian measurement of the entraining process using drifter tracking in conjunction with egg and larval collection in the vicinity of the Kuroshio Front would be a way

of studying the eddy entrainment function of larval transport in more detail.

What are the implications of such an entrainment process for anchovy recruitment in the Enshu-nada Sea? Firstly there is enhanced food availability due to upwelling of nutrient-rich deep water in the vicinity of the frontal eddy and subsequent acceleration of primary production. As was shown in Figure 9, the abundance of copepod nauplii was doubled at the eddy site from the first to the second set of observations. Toda (1989) shows from a case study of regional upwelling near Izu Islands located in the east of the Enshu-nada Sea, that an increase in copepod egg production took place within a few days of the increase in food concentration. For the smaller copepods like *Paracalanus parvus*, one of the dominant copepod species in the Enshu-nada Sea (Kidachi, 1997; Nakata, unpublished data), the response time could be shorter (12–24 h at 18°C, Checkley, 1980a). Since nauplii generally hatch from the eggs within one day at around 20°C (Toda, 1989; Checkley, 1980b), marked increase in the abundance of copepod nauplii in the eddy site of SEC. II (Fig. 9) could be explained in this way.

Since sea surface temperature showed only a slight change at the eddy site (Stns. K12 and K23), copepod egg production was largely dependent of food concentration. According to Kimura *et al.* (1997), the maximum increase in chlorophyll *a* concentration estimated from the consumption rate of nitrate at the eddy site (Eq. 19 of Kimura *et al.* (1997)) could be 6.9 mgm^{-3} (from 1.5 mgm^{-3} on Day-2, when the first survey was made along the SEC. I, to 8.4 mgm^{-3} on Day-5, when the second survey was made along the SEC. II). Assuming that the egg production rate has a Michaelis–Menten relationship with the food concentration (Prestidge *et al.*, 1995), this increase in the chlorophyll *a* concentration from Day-2 to Day-5 could double the egg production rate, depending on the threshold and half-saturation phytoplankton concentrations for copepod grazing. Taking the case of *C. pacificus*, which has a threshold and half-saturation at 1.6 $mgChlm^{-3}$ and 4.0 $mgChlm^{-3}$, respectively (Runge, 1984), the egg production rate at Day-5 would be 1.7 times as large as that at Day-2.

Furthermore, a preliminary analysis of the nutritional condition of anchovy larvae showed that RNA/DNA ratios were appreciably higher for the larvae collected from the eddy stations compared to those collected from the surrounding stations. The spatial difference, however, was prominent only in the smaller size classes of less than 8 mm TL. This could result from the difference in morphological development, because anchovy larvae up to 8 mm TL after hatching have no fin-ray (Mitani, 1990). The development of the fin-rays must be indispensable to feeding and other active movements. It is obviously necessary in the future to track the same eddy for a longer period (presumably for about one week according to Kimura *et al.*, 1997) to study in more detail the change with time in the nutritional condition of the larvae corresponding to elevated copepod production.

In addition, it should be noted in the macroplankton composition obtained simultaneously from the MTD net tows that the density of *Sagitta nagae*, that is well known as a predator of fish larvae (Funakoshi, 1992) was markedly high in the coastal water of SEC. I (Nakata, unpublished data), where anchovy eggs and small-sized larvae were concentrated. This suggests that entrainment by the frontal eddy may reduce the predation pressure from *S. nagae* and other coastal carnivorous plankton. This in itself will be beneficial to the anchovy recruitment if food availability is guaranteed.

In the coastal region of Enshu-nada Sea a westward current often develops whilst a cyclonic water circulation dominates the Sea overall. Kasai *et al.* (1993) for example, indicated that warm water intruded into the coastal region of Enshu-nada Sea intermittently with periods of about 50 and 20 days, both in association with the disturbances of the Kuroshio Current. Kimura and Sugimoto (1993), on the other hand, recognized 17–19-day period and 10–12-day period fluctuations in the small-scale meander of the Kuroshio Current, corresponding to the meander with a wavelength of 400 km and 200 km, respectively. This 10–20-day period is associated with the frontal disturbances of the Kuroshio and is closely related to the meso-scale feature described here, while the 50-day period is associated with a larger scale disturbance, such as local meandering of the Kuroshio path. The latter may drive the cyclonic circulation on the basin scale described above. Consequently, anchovy larvae once entrained by the frontal eddy would be transported downstream of the Kuroshio along the Kuroshio Front and then possibly move into the coastal region again in an intrusion of warm water with a larger temporal and spatial scale. This entrainment–intrusion cycle may contribute to sustaining anchovy recruitment in the Enshu-nada Sea. In other words, the recruitment may depend on the extent of any deviation from this sustained situation brought about by a large-scale meander of the Kuroshio Current.

Acknowledgements

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Studies on the lower trophic levels in the sea area off east coast of Honshu in spring of 1994

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Lower trophic levels in the sea area off east coast of Honshu were investigated in spring of 1994. Oceanographic observations were made with CTD systems at 45 stations. Water samples were collected with Niskin bottles attached to the CTD systems from the surface to 1000 m depth at 2 stations and to 200 m depth at 28 stations (Fig. 1). Chlorophyll *a* and nutrients were analyzed on those water samples. The twin Norpac net (110 μm and 330 μm mesh aperture) was hauled from 150 m depth to the surface to collect micro-phytoplankton and zooplankton at 30 stations. MTD nets were towed simultaneously at 12 different depth layers from the surface to 800 m at 3 stations. Chlorophyll *a* concentrations were determined by fluorometric method for total chlorophyll and chlorophyll >10 μm. Nutrient concentrations were determined with a BRAN+RUEBBE Autoanalyzer (TRAACS 800) of Tohoku National Fisheries Research Institute.

By examining T-S diagrams and NOAA images on surface water temperature, stations were judged to belong to the following water types:

Stns. K95 and 96; Kuroshio Extension
Stns. K75,76,83 and 107; Oyashio area
Stns. K87-92; warm-core ring 93A
Stns. K77-82,85; another warm-core ring
Stns. K120; the Warm Water Tongue
Other stations; Mixed water area

Stns. K75 and 76 were located at the southern tip of the First Oyashio branch. Stns. K83 and K107 were thought to be isolated cold water areas.

Nutrients (NO_3-N, PO_4-P and Si) increased from the surface to 200 m depth at Stn. K83 in the Oyashio area. Total chlorophyll *a* concentration had a maximum of 1.5 $\mu g\ l^{-1}$ at 15 m depth and decreased at deeper depths, less than 0.1 $\mu g\ l^{-1}$ from 75 m to 200 m depth. Chlorophyll *a* >10 μm was very low, less than 0.1 $\mu g\ l^{-1}$ throughout the sampling depths. Similar vertical distribution of chlorophyll *a* was found at Stn. K107, an isolated cold water area. Water samples were not collected at 2 stations located at the southern tip of the First Oyashio branch.

In warm-core ring 93A nutrients gradually increased from the surface to the depths as in the Oyashio area. The maximum chlorophyll *a* concentrations were found at 10-20 m depth with 0.9 μg l^{-1} or less. Chlorophyll *a* > 10μm was as high as about half that of total chlorophyll *a*. In another warm-core ring nutrients increased from 40 m to 75 m depth to some extent but were stable at deeper depth until 300 m depth with NO_3-N concentration of about 8 μg-at. l^{-1} . Maximum chlorophyll *a* concentration was 0.88 μg l^{-1} at 10 m depth.

At the Warm Water Tongue nutrient concentrations had a peak at 100 m depth with NO_3-N concentration of 23 μg-at. l^{-1}. Chlorophyll *a* concentration was very high, reaching 4.7 μg l^{-1} at 10 m depth. Chlorophyll *a* > 10 μm was about half that of total Chlorophyll *a* concentration.

In this study, micro-phytoplankton includes diatoms, silicoflagellates and dinoflagellates which were collected with Norpac net with 110 μm mesh aperture. Microzooplankton includes tintinnids, foraminiferans, radiolarians, and copepod nauplii which were also collected with Norpac net with 110 μm mesh aperture. Although microzooplankton were also collected with 330 μm mesh net, their abundance was generally 3-4 orders of magnitude, 1-2 orders of magnitude, and 2 orders of magnitude lower than that collected with finer mesh net. Therefore, macrozooplankton in this study includes total plankton collected with 330 μm mesh net minus microzooplankton.

Cell number of total phytoplankton was least, 0.4×10^3 cells m^{-3}, at Stn. K75 and maximum, 2.2×10^7 cells m^{-3}, at Stn. K115 (Fig. 2). Stns. K105, K106 and K107 were unique in that the phytoplankton cell number was fairly smaller than the other stations, and the percentage of dinoflagellates was high. Dinoflagellates represented 48 % of total phytoplankton cell number at Stn. K107.

In cell number, cold neritic species dominated total diatom assemblage especially at northern stations (Stns. K75-77, 79, 81, 82, 85 and 86), occupying more than 59 %, and at Stns. K89, 90, 92-94, 105-107, 116 and 120, occupying 31-55 %. These cold neritic diatoms consisted mainly of *Coscinodiscus wailesii* and *Chaetoceros decipiens* in northern stations and of *Chaetoceros debile* and *Ch. decipiens* in the other stations. The percentage of cold oceanic species decreased from April (KT-94-4 cruise of Tansei Maru) to June, but was still high at Stn. K83, 84 and 107, occupying 27 %, 21 % and 12 %, respectively of total diatom cell number. The percentage of warm water diatom species increased from April to June in the central-southern survey area, especially so at the Kuroshio Extension (Stn. K96) attaining 57 %. In the coastal area (Stns. K114-116, and120), neritic species predominated, occupying more than 85 % of warm-water diatom species.

Among dinoflagellates, neritic-oceanic cold water species, *Ceratium tripos*, dominated, occupying up to 98 % of total dinoflagellates at the northern stations (Stns. K76-87 and K105-107). Warm neritic species such as *Ceratium fusus* dominated at the southern stations.

The indicator species of Kuroshio increased both in species number and cell number from April to June in the southern survey area, indicating strong effect of the Kuroshio Current in June.

Distribution of microzooplankton was similar to that of micro-phytoplankton (Fig. 3). At those stations where microzooplankton were abundant, tintinnids were dominant. Copepods dominated microzooplankton at 21 out of 30 stations, with maximum abundance of 11,640 indiv. m^{-3} at Stn. K94.

Total macrozooplankton were distributed more or less evenly in the survey area (Fig. 4). The minimum abundance was observed at Stn. K75 (100 indiv. m^{-3}) and the maximum at Stn. K77 (1,443 indiv. m^{-3}). Copepods represented 18.9-93.3 % of total macrozooplankton with the mean value of 63 %. Copepod contribution was least at Stn. K108 where copepod abundance was only 70 indiv. m^{-3} and euphausiid eggs were abundant (215 indiv. m^{-3}). A warm-water copepod genus, *Corycaeus* were abundant at Stns. K77-82, 88 and 106, with maximum numerical density of 208 indiv. m^{-3} at Stn. K106. A cold-water copepod, *Eucalanus bungii bungii* was abundant at northern stations (Stns. K76, 77, 80, 83 and 84) with the maximum density of 95 indiv. m^{-3} at Stn. K84. Doliolids were abundant in warm-core ring 93A and at Stns. K105 and 114 with the maximum abundance of 236 indiv. m^{-3} at Stn. K89.

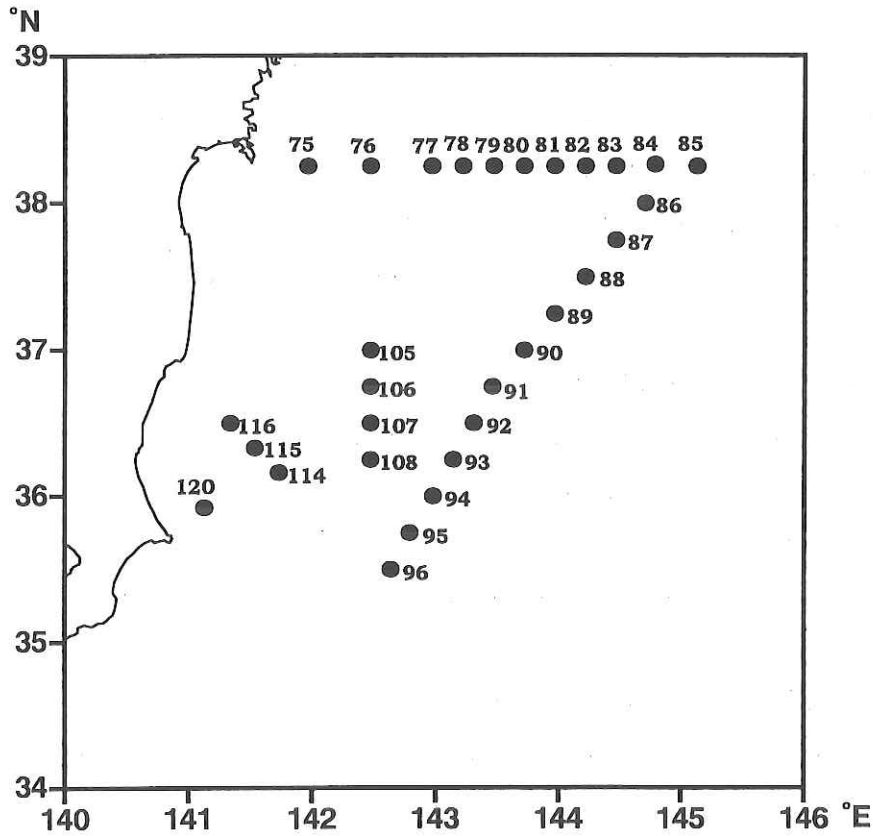

Fig. 1. Locations of sampling stations during KH-94-2 cruise of Hakuho Maru.

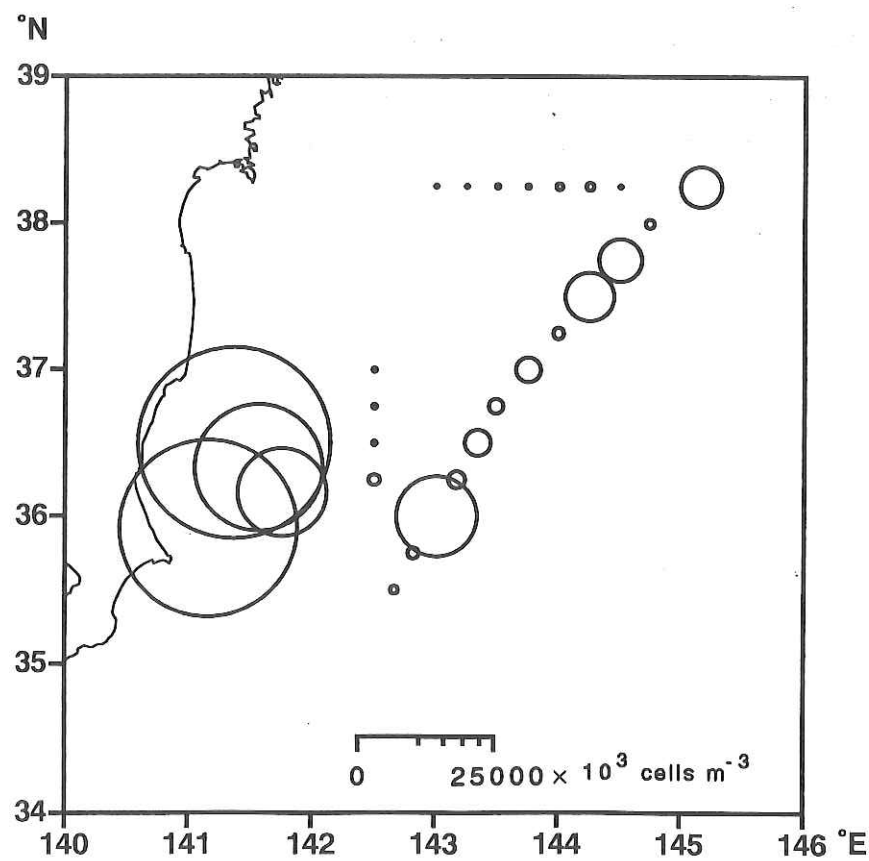

Fig. 2. Distribution in abundance of micro-phytoplankton cell number ($\times 10^3$ cells m^{-3}) which were collected with 110 μm mesh of the twin Norpac net.

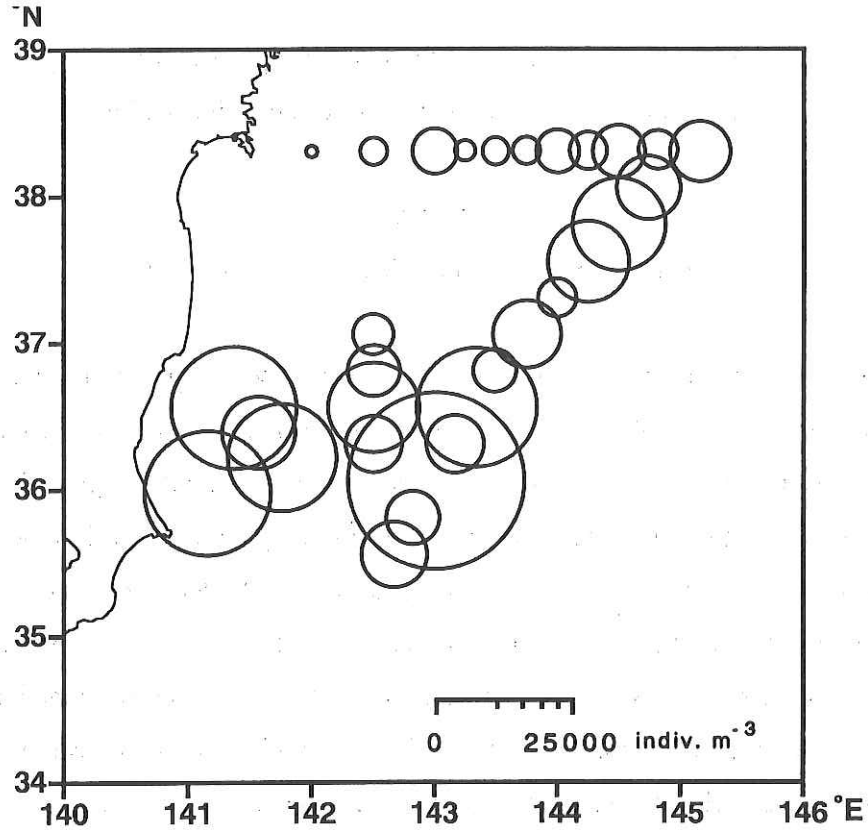

Fig. 3. Distribution in abundance of microzooplankton (indiv. m^{-3}) which were collected with 110 μm mesh of the twin Norpac net.

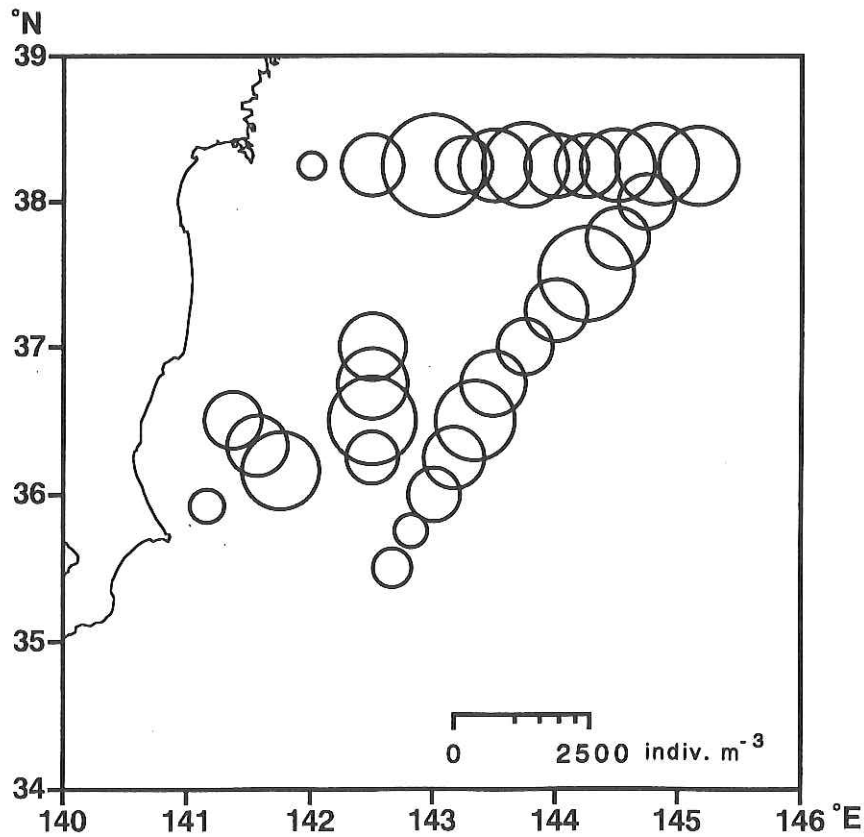

Fig. 4. Distribution in abundance of macrozooplankton (indiv. m^{-3}) which were collected with 330 μm mesh of the twin Norpac net.

Preliminary experiment for the application of the FDC (frequency of dividing cells) technique to determine *in situ* growth rates of oligotrichous ciliates

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Onboard culture experiments were conducted to determine the diel pattern of cell division and to measure the time duration of one cell division (Td). Surface water was collected by the acid-cleaned bucket at stations K-83 and K-108. The water was filtered through a 330 mm mesh net into 20-l plastic bag, which was incubated in a constant temperature aquarium at ambient sea surface temperatures under the 8000 lux light intensity on a 14:10 light: dark cycle. A 500 ml of sample was taken from the bag at 2 hr intervals over 24 hr, then organisms were preserved with a modified Bouin's fixative at final concentration of 5 %. On return to the laboratory, samples were stained using a Protargol method for observation of the nuclear events during asexual reproductive cycle of ciliates. Individual ciliates were examined under a microscopy at 400 x or 1000 x magnification. The analyses are now underway.

Maturation and spawning of Japanese chub mackerel *Scomber japonicus* and sardine *Sardinops melanostictus*

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Introduction

Spawning pattern is a fundamental element in understanding fish-stock variability in the context of life-history strategies in which individuals reproduce. The area around Izu Islands is one of the main spawning grounds of small pelagic fishes such as chub mackerel and sardine.

This study investigated distribution and spawning pattern of sardine and mackerel in relation to water temperature, chlorophyl and zooplankton distributions in the spawning grounds.

Methods

The surveys consisted of grid surveys with wide areal coverage around Izu Islands. Acoustic observations were made with 50kHz echo sounder, a Furuno FQ71, mounted on the RV 'Hakuho Maru' to quantify fish and zooplankton. The acoustic system processed echoes and output the mean volume backscattering strength (SV in dB) in real time for nine 10 m depth strata from 10 to 100m at horizontal integration intervals of 0.5 nautical miles (nm). Each 0.5 nm $\times$ 10 m segment was classified by observing echograms: one (fish echo) where echotraces of pelagic schooling fish occurred, and the other (plankton echo) where only weak diffuse scattering layers due to plankton appeared.

Surface temperature, salinity and chl-a concentration were measured along tracklines throughout the surveys. CTD and XBT casts were also made to determine oceanographic structure in the survey area. Sardine and mackerel were sampled with gill nets and fishing lines. The scaled body length and body weight of collected fish were measured and used for calculations of target strength and biomass. Maturity data were also obtained from the samples.

For chub mackerel, plasma levels of sex steroid hormones were measured. As soon as the fish were released from the net or angles, blood was collected from some females. Blood samples were taken from the caudal vasculature with a syringe and needle. After centrifugation, the plasma samples were frozen and kept at -20°C. The plasma levels of estradiol - 17β (E_2) and 17α, 20β - dihydroxy 4 - pregnen - 3 - on (diOH) were measured according to Kagawa et al. (1981, 1982) and Young et al. (1983), respectively.

Results and Discussion

(1) *Distribution of chl-a concentration*

Chl-a distribution is illustrated in Fig. 1, and SST is shown in Fig. 2. At the time of the survey, the Kuroshio flowed northeastward north of Miyake-jima Island. The chl-a concentration was 0.5-1 $\mu g / l$ as a whole in the coastal side of the Kuroshio, and very low in the Kuroshio waters. A high concentration area occurred off Suruga Bay.

(2) *Distribution of zooplankton abundance*

Fig. 2 shows SST and 5 nm mean SV excluding fish echoes for 10-50 m depth which indicates zooplankton abundance. The zooplankton biomass were distributed in accordance with the SST and Kuroshio current: it was high in the waters between 21℃ and 23℃ corresponding to the Kuroshio front and low in the coastal region. The zooplankton abundance increased with water temperature, and showed an inverse distribution pattern against that of chl-a concentration.

(3) *Distribution of pelagic fish schools*

Fish schools occurred in the coastal waters, and fish sampling indicated that they were sardine, chub mackerel and jack mackerel. Fish schools that occurred in the depth < 50 m were sardine (Fig. 3) and those in the depth > 50 m were chub mackerel and/or jack mackerel (Fig. 4).

Fig. 5 shows 5 nm mean SV from fish echoes in the 10-50 m depth. Fish schools were concentrated in the coastal side of the line drawn between Omurodashi and Zenisu shoals where SST < 21℃. The concentration area corresponded with the area of high chl-a abundance, but did not with zooplankton abundance. Mean area backscattering strengths of the survey area were -60.5 dB for the 10-50m depth and -65.2 dB for the 50 - 100 m depth. Given that all fish echoes in the 10-50m depth were due to sardine, fish abundance was calculated to be 27,000 ton.

(4) *Spawning of chub mackerel and sardine*

For histological observations of ovaries, paraffin sections of ovary portions were prepared, stained by HE, and checked for the presence of postovulatory follicles.

Sardine

GSIs (Gonad Somatic Index = gonad weight / body weight × 100) of females and males were very low in May compared with those in March and April (Fig. 6). Ovarian histological examinations showed that sardine females were at the yolk vesicle stage and that no postovulatory follicle was found in the ovaries. Sardine had terminated spawning in this area in May. In contrast, condition factor (CF = body weight without gonad / cube of body length × 1000) increased in May (Fig. 7), which showed that sardine entered the feeding period after spawning season.

Chub mackerel

Sex steroid hormones, E_2 and diOH were measured for 33 females and 34 females, respectively. Plasma E_2 was lowest at the perinucleolar stage, increased along with the yolk accumulation, and reached the highest value at the tertiary yolk globule stage, but decreased afterwards (Fig. 8). One female that had hydrated oocytes (HO) was at a low level of E_2, and its oocytes except hydrated ones were at the primary yolk globule stage. Another female in the act of spawning ($HO+PO^a$) showed a relatively high E_2 concentration (5 ng/ml). This female had the tertiary yolk globule oocytes. Females that had postovulatory follicles within 1 day (PO^a) and 2 days (PO^b) after ovulation were at the tertiary yolk globule stage. These females exhibited high levels of E_2 comparable to females at the secondary and tertiary yolk globule stages. On the other hand, diOH

remained at low levels at all maturity stages (Fig. 8).

Plasma levels of E_2 and diOH in chub mackerel were measured for the first time in the present study. Changes in E_2 levels of chub mackerel are in agreement with the notion that E2 promotes vitellogenin synthesis as reported in many other fishes (e.g. Wingfield and Grimm, 1977; Fostier et al., 1983; Whitehead et al., 1983). Our results also indicate that the oocytes that had completed yolk accumulation did not produced E_2. High E_2 levels in the females with postovulatory follicles show that yolk accumulation starts again immediately after spawning. This E_2 profile may reflect short intervals in spawning of chub mackerel.

It has been reported in many fish species that diOH is secreted during final maturation and ovulation (e.g. Stacey et al. 1983; Kagawa et al. 1984; Kobayashi et al. 1987). In wild Japanese sardine, high levels of diOH were observed during final maturation (Murayama et al. 1994). However, peak of diOH concentration was not observed in chub mackerel in this study. Our female samples were captured between 1900 and 2400 hours. Measure of diOH level is likely to vary depending on diurnal maturation cycle and sampling time. It is necessary to do a lot more sampling over a longer period of time of day. Alternatively, maturation-inducing steroid (MIS) in chub mackerel may be differed from diOH. There is no study on MIS in chub mackerel. Some other steroids such as 17α-hydroxy-5β-pregnen-3,20-dione (Hirose et al. unpublished) function as MIS in other species. It is necessary to measure the plasma level of some kinds of steroids in order to clarify their roles during ovarian maturation.

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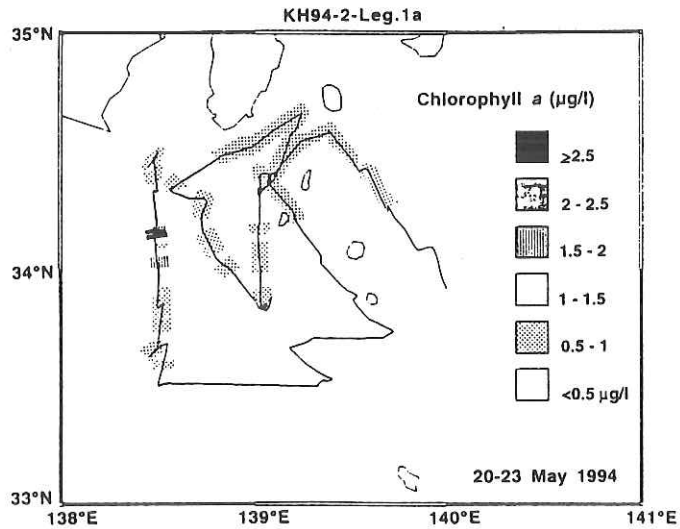

Fig. 1. Distribution of chlorophyl-a

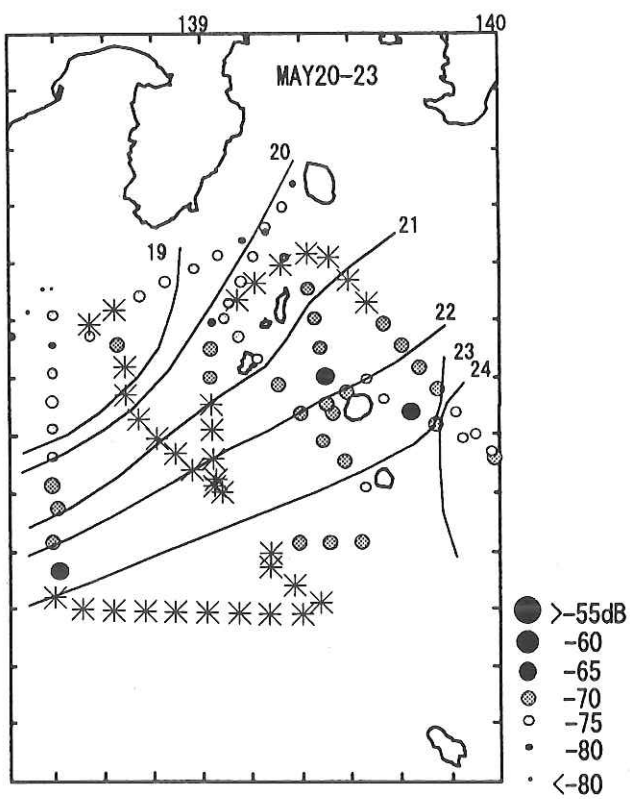

Fig. 2. Distribution of SV from zooplankton (10-50m depth, 5nm segment). SV values in daytime segments are shown and asterisks indicate nighttime segments excluded in analysis.

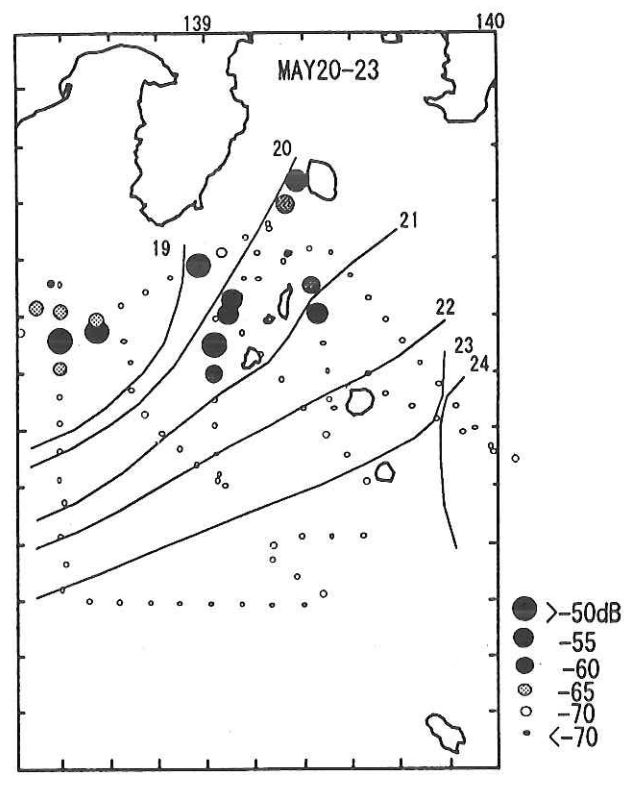

Fig. 5. Distribution of area backscattering strength (SA) from fish schools (10-50 m depth, 5nm segment).

Fig. 3. Ecotrace of sardine schools at 50 kHz in the 200 m depth range. At Hyotan-se, west of Nii-jima, May 21, 1994.

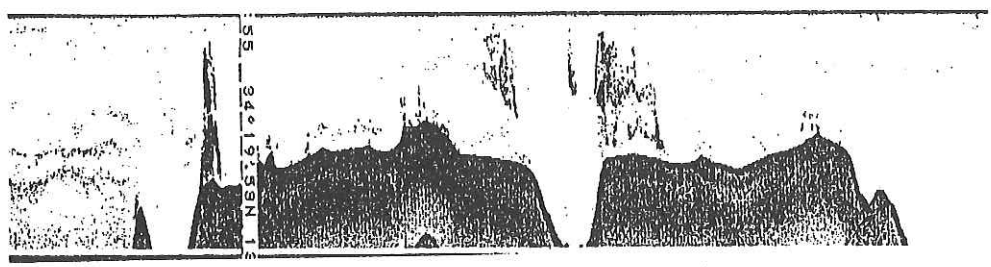

Fig. 4. Ecotrace of chub mackerel and/or jack mackerel schools at 50 kHz in the 200 m depth range. At Hyotan-se, west of Nii-jima, June 8, 1994.

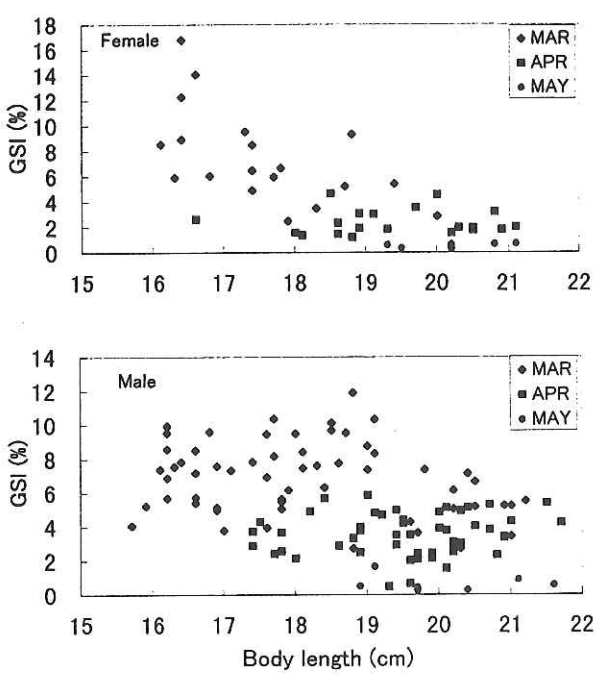

Fig. 6. GSI in individuals plotted against body length in March (KH-94-1), April (KT-94-5) and May (this cruise).

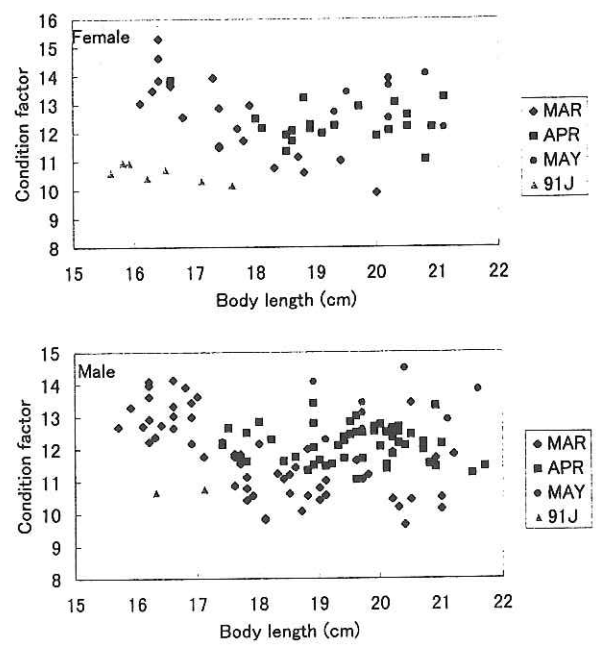

Fig. 7. Condition factor in individuals plotted against body length in March (KH-94-1), April (KT-94-5) and May (this cruise).

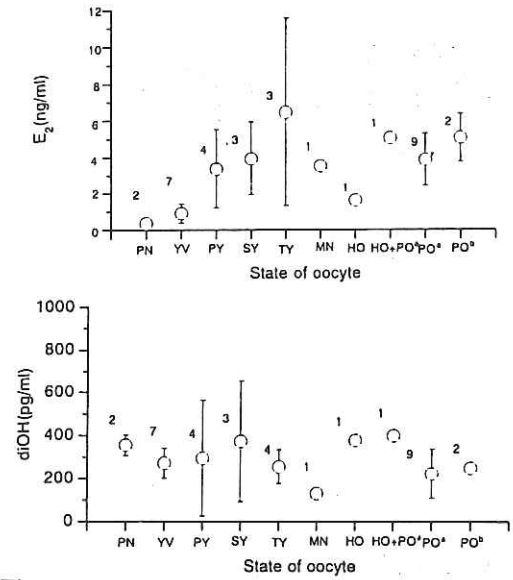

Fig. 8. Relation between state of oocyte, postovulatory follicles and change of the levels of E_2 (estradiol-17β) and diOH (17α, 20β-dihydroxy 4-pregnen-3-one).

PN: perinucleolar stage
YV: yolk vesicle stage
PY: primary yolk globule stage
SY: secondary yolk globule stage
TY: tertiary yolk globule stage
MN: migratory nucleus stage
HO: hydrated oocytes
HO+PO^a: hydrated oocytes and postovulatory follicles within 1day after ovulation
PO^a: postovulatory follicles within 1day after ovulation
PO^b: postovulatory follicles 1 day to 2day after ovulation

Station: K-10d
latitude: 34-09.89N Longtitude: 138-00.05E Depth: 1721m
Date: 1994-05-18 Time: 00:05

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	18.122	34.526	2.96	0.00	24.880	18.121	1515.62
5	18.122	34.526	2.94	0.00	24.880	18.121	1515.67
10	18.124	34.526	2.94	0.00	24.880	18.122	1515.77
20	18.058	34.542	2.92	0.00	24.908	18.055	1515.76
30	17.617	34.622	2.80	0.00	25.077	17.612	1514.72
40	16.400	34.639	2.72	0.00	25.378	16.394	1511.25
50	16.262	34.636	2.69	0.00	25.409	16.254	1510.99
60	16.006	34.642	2.68	0.00	25.472	15.996	1510.38
70	15.730	34.643	2.64	0.00	25.535	15.719	1509.69
75	15.635	34.641	2.63	0.00	25.555	15.624	1509.48
80	15.469	34.637	2.61	0.00	25.589	15.457	1509.04
90	14.951	34.626	2.59	0.00	25.695	14.938	1507.56
100	14.096	34.594	2.53	0.00	25.854	14.081	1504.95
125	12.804	34.524	2.34	0.00	26.064	12.788	1501.03
150	12.245	34.492	2.28	0.00	26.148	12.226	1499.52
175	11.374	34.447	2.18	0.00	26.277	11.352	1496.89
200	10.566	34.403	2.07	0.00	26.388	10.542	1494.41
250	9.427	34.349	1.94	0.00	26.540	9.400	1491.07
300	8.430	34.313	1.84	0.00	26.670	8.399	1488.17
350	7.705	34.289	1.72	0.00	26.759	7.670	1486.22
400	6.926	34.277	1.60	0.00	26.859	6.889	1484.03
450	6.237	34.275	1.45	0.00	26.950	6.197	1482.15
500	5.666	34.284	1.33	0.00	27.029	5.623	1480.71
600	5.144	34.305	1.21	0.00	27.108	5.095	1480.28
700	4.507	34.334	1.09	0.00	27.203	4.454	1479.36
800	4.002	34.366	1.00	0.00	27.282	3.943	1478.95

Station: K-1D
latitude: 34-29.19N Longtitude: 137-30.25E Depth: 206 m
Date: 1994-05-18 Time: 01:45

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/scc]
2	19.042	34.527	3.27	0.00	24.650	19.042	1518.28
5	19.040	34.527	3.25	0.00	24.651	19.039	1518.32
10	19.017	34.541	3.21	0.00	24.668	19.015	1518.35
20	18.833	34.584	3.16	0.00	24.747	18.830	1518.05
30	17.606	34.653	3.05	0.00	25.103	17.601	1514.72
40	16.568	34.667	2.90	0.00	25.361	16.562	1511.80
50	16.114	34.659	2.75	0.00	25.460	16.106	1510.57
60	15.774	34.653	2.68	0.00	25.533	15.765	1509.68
70	15.537	34.641	2.67	0.00	25.577	15.527	1509.09
75	15.425	34.638	2.67	0.00	25.600	15.414	1508.82
80	15.131	34.635	2.74	0.00	25.662	15.119	1507.98
90	14.921	34.625	2.73	0.00	25.701	14.908	1507.47
100	14.552	34.604	2.65	0.00	25.764	14.537	1506.43
125	13.597	34.563	2.55	0.00	25.934	13.579	1503.70
150	12.312	34.493	2.37	0.00	26.136	12.292	1499.75

Station: K-2D
latitude: 34-20.07N Longtitude: 137-30.01E Depth: 1112m
Date: 1994-05-18 Time: 03:09

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/scc]
2	19.224	34.572	2.75	0.00	24.638	19.223	1518.84
5	19.224	34.572	2.75	0.00	24.638	19.223	1518.89
10	19.221	34.572	2.76	0.00	24.639	19.219	1518.97
20	19.008	34.561	2.79	0.00	24.685	19.004	1518.52
30	18.878	34.555	2.80	0.00	24.713	18.872	1518.30
40	17.245	34.602	2.85	0.00	25.152	17.238	1513.76
50	16.758	34.629	2.77	0.00	25.288	16.749	1512.49
60	15.913	34.641	2.67	0.00	25.492	15.904	1510.09
70	15.587	34.639	2.62	0.00	25.564	15.576	1509.24
75	15.423	34.636	2.61	0.00	25.599	15.412	1508.81
80	15.270	34.631	2.59	0.00	25.629	15.258	1508.41
90	14.701	34.612	2.54	0.00	25.738	14.688	1506.75
100	14.231	34.592	2.51	0.00	25.824	14.217	1505.39
125	13.498	34.557	2.42	0.00	25.949	13.481	1503.37
150	12.547	34.500	2.31	0.00	26.096	12.527	1500.55
175	11.622	34.455	2.22	0.00	26.238	11.600	1497.75
200	11.041	34.419	2.13	0.00	26.316	11.016	1496.10
250	10.285	34.382	2.05	0.00	26.421	10.256	1494.21
300	9.096	34.321	1.92	0.00	26.571	9.063	1490.65
350	7.903	34.283	1.79	0.00	26.725	7.868	1486.97
400	7.476	34.276	1.68	0.00	26.782	7.437	1486.15
450	6.788	34.250	1.58	0.00	26.857	6.746	1484.28
500	6.345	34.276	1.47	0.00	26.936	6.301	1483.40
600	5.385	34.287	1.25	0.00	27.065	5.336	1481.23
700	4.478	34.331	1.07	0.00	27.203	4.424	1479.23
800	4.078	34.361	1.01	0.00	27.270	4.019	1479.26
900	3.837	34.385	0.99	0.00	27.314	3.771	1479.94
1000	3.464	34.423	0.99	0.00	27.381	3.393	1480.07

Station: K-3d
latitude: 34-09.60N Longtitude: 137-29.76E Depth: 4008m
Date: 1994-05-18 Time: 05:15

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	18.773	34.576	2.81	0.00	24.756	18.772	1517.56
5	18.811	34.579	2.80	0.00	24.749	18.810	1517.73
10	18.774	34.575	2.81	0.00	24.755	18.773	1517.70
20	18.818	34.605	2.79	0.00	24.767	18.815	1518.03
30	18.183	34.645	2.75	0.00	24.956	18.178	1516.40
40	16.614	34.666	2.63	0.00	25.350	16.607	1511.93
50	16.292	34.656	2.56	0.00	25.417	16.284	1511.11
60	15.665	34.642	2.48	0.00	25.549	15.655	1509.32
70	15.070	34.625	2.44	0.00	25.668	15.060	1507.61
75	14.737	34.609	2.42	0.00	25.729	14.725	1506.61
80	14.501	34.598	2.40	0.00	25.771	14.489	1505.93
90	14.190	34.582	2.41	0.00	25.825	14.177	1505.08
100	13.921	34.567	2.38	0.00	25.870	13.907	1504.35
125	13.320	34.531	2.30	0.00	25.966	13.303	1502.75
150	12.218	34.478	2.24	0.00	26.142	12.198	1499.41
175	11.540	34.441	2.17	0.00	26.242	11.518	1497.45
200	10.738	34.399	2.13	0.00	26.355	10.714	1495.01
250	9.541	34.324	2.03	0.00	26.501	9.513	1491.46
300	8.218	34.284	1.92	0.00	26.679	8.187	1487.33
350	7.235	34.265	1.74	0.00	26.807	7.201	1484.39
400	6.680	34.253	1.61	0.00	26.874	6.643	1483.04
450	5.951	34.241	1.49	0.00	26.959	5.912	1480.97
500	5.459	34.279	1.34	0.00	27.050	5.417	1479.87
600	4.744	34.313	1.17	0.00	27.160	4.697	1478.66
700	4.153	34.360	1.08	0.00	27.261	4.101	1477.92
800	3.873	34.382	1.03	0.00	27.307	3.814	1478.43
900	3.692	34.399	1.02	0.00	27.339	3.627	1479.35
1000	3.474	34.422	1.02	0.00	27.379	3.402	1480.11

Station: K-8D
latitude: 34-29.93N Longtitude: 137-59.97E Depth: 535 m
Date: 1994-05-18 Time: 18:18

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	18.535	34.510	3.25	0.00	24.765	18.535	1516.80
5	18.544	34.510	3.03	0.00	24.763	18.544	1516.88
10	18.540	34.513	3.07	0.00	24.766	18.538	1516.96
20	17.101	34.670	3.15	0.00	25.238	17.098	1513.07
30	16.493	34.664	3.00	0.00	25.376	16.489	1511.40
40	16.274	34.662	2.88	0.00	25.426	16.268	1510.89
50	15.992	34.667	2.62	0.00	25.494	15.984	1510.20
60	15.625	34.648	2.66	0.00	25.563	15.616	1509.21
70	15.333	34.638	2.57	0.00	25.620	15.322	1508.45
75	14.988	34.627	2.58	0.00	25.688	14.977	1507.43
80	14.787	34.616	2.62	0.00	25.723	14.775	1506.87
90	14.470	34.601	2.58	0.00	25.780	14.456	1506.00
100	14.179	34.588	2.56	0.00	25.832	14.165	1505.22
125	13.198	34.541	2.45	0.00	25.998	13.181	1502.36
150	12.632	34.511	2.38	0.00	26.088	12.612	1500.85
175	12.030	34.479	2.31	0.00	26.179	12.007	1499.18
200	11.429	34.445	2.22	0.00	26.265	11.404	1497.49
250	9.986	34.374	2.06	0.00	26.466	9.957	1493.13
300	9.117	34.335	1.96	0.00	26.579	9.084	1490.74
350	7.512	34.280	1.76	0.00	26.780	7.478	1485.47
400	6.686	34.275	1.59	0.00	26.891	6.649	1483.09
450	6.200	34.284	1.49	0.00	26.962	6.160	1482.02

Station: K-11u
latitude: 34-00.37N Longtitude: 137-58.42E Depth: 1521m
Date: 1994-05-18 Time: 19:30

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
989	3.339	34.435	0.98	0.00	27.403	3.270	1479.37
900	3.453	34.421	0.96	0.00	27.380	3.389	1478.36
800	3.619	34.402	0.94	0.00	27.349	3.562	1477.39
700	4.060	34.362	0.96	0.00	27.273	4.008	1477.54
600	4.661	34.317	1.01	0.00	27.172	4.614	1478.32
500	5.160	34.272	1.11	0.00	27.079	5.120	1478.65
450	5.672	34.251	1.21	0.00	27.002	5.634	1479.87
400	5.997	34.236	1.28	0.00	26.950	5.962	1480.33
350	6.409	34.213	1.41	0.00	26.878	6.378	1481.11
300	7.265	34.223	1.59	0.00	26.770	7.237	1483.63
250	8.196	34.270	1.68	0.00	26.671	8.170	1486.41
200	9.586	34.328	1.84	0.00	26.497	9.564	1490.80
175	10.236	34.358	1.87	0.00	26.411	10.215	1492.77
150	10.928	34.362	2.05	0.00	26.292	10.909	1494.81
125	11.212	34.381	2.10	0.00	26.255	11.197	1495.42
100	12.037	34.434	2.13	0.00	26.143	12.024	1497.92
90	12.099	34.438	2.13	0.00	26.135	12.087	1497.97
80	12.224	34.449	2.14	0.00	26.119	12.214	1498.24
75	12.668	34.469	2.13	0.00	26.048	12.658	1499.68
70	12.811	34.478	2.14	0.00	26.027	12.801	1500.09
60	13.079	34.499	2.16	0.00	25.990	13.071	1500.84
50	14.214	34.572	2.30	0.00	25.812	14.207	1504.48
40	14.907	34.588	2.28	0.00	25.676	14.901	1506.55
30	16.344	34.626	2.45	0.00	25.382	16.339	1510.90
20	17.379	34.616	2.53	0.00	25.130	17.376	1513.84
10	19.097	34.527	2.74	0.00	24.637	19.095	1518.56
5	19.194	34.539	2.77	0.00	24.620	19.193	1518.77
2	19.171	34.535	2.79	0.00	24.623	19.171	1518.65

Station: K-4d
latitude: 33-59.68N Longtitude: 137-30.05E Depth: 1721m
Date: 1994-05-18 Time: :22:2

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	18.693	34.613	2.97	0.00	24.805	18.693	1517.38
5	18.689	34.614	2.85	0.00	24.806	18.688	1517.42
10	18.692	34.614	2.81	0.00	24.805	18.690	1517.51
20	18.687	34.613	2.75	0.00	24.806	18.683	1517.66
30	18.308	34.623	2.69	0.00	24.909	18.303	1516.74
40	15.856	34.651	2.50	0.00	25.513	15.850	1509.60
50	15.051	34.624	2.42	0.00	25.671	15.044	1507.21
60	14.727	34.610	2.42	0.00	25.731	14.718	1506.34
70	14.252	34.584	2.33	0.00	25.813	14.241	1504.95
75	14.017	34.572	2.32	0.00	25.853	14.007	1504.26
80	13.797	34.562	2.32	0.00	25.892	13.785	1503.61
90	13.046	34.509	2.25	0.00	26.004	13.033	1501.24
100	12.021	34.446	2.20	0.00	26.155	12.008	1497.88
125	11.075	34.378	2.16	0.00	26.278	11.060	1494.94
150	10.584	34.335	2.19	0.00	26.332	10.566	1493.57
175	10.215	34.346	2.14	0.00	26.405	10.195	1492.68
200	9.980	34.357	2.02	0.00	26.454	9.957	1492.26
250	8.916	34.320	1.89	0.00	26.600	8.889	1489.16
300	7.999	34.280	1.77	0.00	26.709	7.969	1486.50
350	7.257	34.255	1.68	0.00	26.797	7.224	1484.46
400	6.338	34.227	1.54	0.00	26.899	6.303	1481.67
450	5.801	34.263	1.39	0.00	26.996	5.762	1480.40
500	5.342	34.285	1.27	0.00	27.068	5.301	1479.41
600	4.544	34.326	1.08	0.00	27.193	4.498	1477.85
700	4.074	34.359	1.01	0.00	27.269	4.022	1477.59
800	3.688	34.395	0.98	0.00	27.336	3.630	1477.67
900	3.512	34.415	0.98	0.00	27.370	3.448	1478.61
1000	3.290	34.442	1.01	0.00	27.413	3.220	1479.36

Station: K-9D
latitude: 34-20.10N Longtitude: 137-59.70E Depth: 608 m
Date: 1994-05-18 Time: 21:25

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	18.226	34.435	3.04	0.00	24.784	18.226	1515.83
5	18.229	34.433	3.00	0.00	24.783	18.229	1515.88
10	18.229	34.434	2.99	0.00	24.783	18.228	1515.97
20	17.915	34.481	3.00	0.00	24.897	17.911	1515.27
30	16.844	34.645	2.83	0.00	25.280	16.839	1512.44
40	16.148	34.664	2.62	0.00	25.457	16.142	1510.51
50	15.916	34.653	2.61	0.00	25.501	15.908	1509.95
60	15.387	34.638	2.57	0.00	25.608	15.378	1508.45
70	14.820	34.617	2.55	0.00	25.717	14.809	1506.80
75	14.676	34.610	2.53	0.00	25.742	14.665	1506.42
80	14.541	34.604	2.52	0.00	25.767	14.529	1506.07
90	14.264	34.592	2.50	0.00	25.817	14.251	1505.33
100	13.928	34.578	2.48	0.00	25.877	13.914	1504.39
125	13.330	34.553	2.42	0.00	25.981	13.313	1502.81
150	12.349	34.499	2.30	0.00	26.133	12.330	1499.88
175	11.699	34.459	2.19	0.00	26.226	11.677	1498.02
200	11.179	34.431	2.13	0.00	26.301	11.154	1496.60
250	9.674	34.355	1.96	0.00	26.504	9.646	1491.98
300	8.852	34.321	1.87	0.00	26.610	8.820	1489.75
350	7.835	34.289	1.75	0.00	26.740	7.801	1486.72
400	7.262	34.276	1.64	0.00	26.812	7.223	1485.33
450	6.613	34.281	1.52	0.00	26.905	6.572	1483.64
500	6.035	34.289	1.42	0.00	26.987	5.991	1482.19

Station: K-5D
latitude: 33-49.80N Longtitude: 137-30.00E Depth: 1846m
Date: 1994-05-19 Time: :09:1

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	18.900	34.592	2.86	0.00	24.736	18.899	1517.94
5	18.901	34.593	2.83	0.00	24.736	18.900	1518.00
10	18.901	34.593	2.84	0.00	24.736	18.899	1518.08
20	18.894	34.592	2.83	0.00	24.738	18.891	1518.23
30	18.797	34.593	2.83	0.00	24.763	18.792	1518.12
40	17.556	34.617	2.75	0.00	25.088	17.549	1514.70
50	15.887	34.619	2.48	0.00	25.481	15.879	1509.82
60	14.888	34.602	2.37	0.00	25.691	14.879	1506.84
70	14.142	34.570	2.27	0.00	25.826	14.131	1504.58
75	14.025	34.562	2.25	0.00	25.844	14.014	1504.27
80	13.937	34.558	2.25	0.00	25.859	13.925	1504.06
90	13.385	34.534	2.25	0.00	25.955	13.373	1502.39
100	12.905	34.513	2.23	0.00	26.035	12.891	1500.94
125	12.046	34.474	2.22	0.00	26.173	12.030	1498.41
150	11.530	34.443	2.16	0.00	26.245	11.511	1497.01
175	10.920	34.409	2.10	0.00	26.330	10.899	1495.25
200	10.279	34.376	2.05	0.00	26.417	10.256	1493.36
250	8.460	34.302	1.84	0.00	26.656	8.434	1487.44
300	7.892	34.284	1.76	0.00	26.728	7.862	1486.10
350	6.994	34.265	1.61	0.00	26.841	6.961	1483.46
400	6.485	34.241	1.57	0.00	26.891	6.449	1482.26
450	5.707	34.244	1.40	0.00	26.992	5.669	1480.00
500	5.424	34.265	1.27	0.00	27.043	5.383	1479.71
600	4.632	34.316	1.10	0.00	27.174	4.586	1478.20
700	4.092	34.358	1.01	0.00	27.266	4.040	1477.66
800	3.640	34.403	0.99	0.00	27.347	3.583	1477.48
900	3.335	34.435	1.00	0.00	27.403	3.273	1477.89
1000	3.185	34.453	1.02	0.00	27.431	3.116	1478.92

Station: K-6D
latitude: 33-39.96N Longtitude: 137-30.66E Depth: 2851m
Date: 1994-05-19 Time: :10:5

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.823	34.567	2.52	0.00	24.479	19.822	1520.52
5	19.828	34.413	2.50	0.00	24.361	19.827	1520.41
10	19.822	34.414	2.58	0.00	24.363	19.821	1520.48
20	19.890	34.450	2.66	0.00	24.372	19.886	1520.87
30	19.970	34.641	2.55	0.00	24.497	19.965	1521.48
40	19.470	34.577	2.58	0.00	24.579	19.463	1520.18
50	18.958	34.616	2.56	0.00	24.739	18.949	1518.94
60	18.607	34.634	2.51	0.00	24.842	18.597	1518.12
70	17.929	34.657	2.46	0.00	25.028	17.917	1516.34
75	17.602	34.647	2.44	0.00	25.100	17.590	1515.45
80	17.079	34.657	2.50	0.00	25.233	17.066	1513.99
90	16.580	34.668	2.65	0.00	25.359	16.565	1512.66
100	16.207	34.652	2.63	0.00	25.434	16.191	1511.67
125	14.949	34.629	2.56	0.00	25.698	14.930	1508.14
150	13.720	34.565	2.43	0.00	25.910	13.699	1504.52
175	13.149	34.523	2.25	0.00	25.994	13.125	1503.00
200	12.685	34.506	2.26	0.00	26.073	12.658	1501.85
250	10.941	34.415	2.11	0.00	26.331	10.910	1496.57
300	9.445	34.346	1.94	0.00	26.535	9.411	1491.96
350	7.716	34.262	1.76	0.00	26.736	7.681	1486.23
400	6.941	34.268	1.61	0.00	26.850	6.904	1484.08
450	6.540	34.264	1.52	0.00	26.901	6.499	1483.33
500	5.937	34.268	1.41	0.00	26.982	5.894	1481.77
600	5.017	34.300	1.18	0.00	27.118	4.969	1479.76
700	4.261	34.344	1.04	0.00	27.237	4.209	1478.35
800	3.893	34.375	0.98	0.00	27.300	3.834	1478.51
900	3.498	34.415	0.97	0.00	27.371	3.434	1478.55
1000	3.285	34.441	1.00	0.00	27.412	3.215	1479.33

Station: K-7d
latitude: 33-30.16N Longtitude: 137-30.00E Depth: 3659m
Date: 1994-05-19 Time: :13:4

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	22.488	34.692	2.48	0.00	23.848	22.487	1527.81
5	22.496	34.692	2.48	0.00	23.846	22.495	1527.89
10	22.497	34.693	2.48	0.00	23.846	22.495	1527.97
20	22.499	34.692	2.47	0.00	23.845	22.495	1528.14
30	22.500	34.693	2.48	0.00	23.845	22.494	1528.32
40	22.391	34.676	2.49	0.00	23.863	22.383	1528.18
50	21.492	34.598	2.55	0.00	24.055	21.482	1525.90
60	21.280	34.648	2.44	0.00	24.151	21.269	1525.56
70	21.131	34.847	2.30	0.00	24.343	21.118	1525.55
75	20.799	34.805	2.25	0.00	24.401	20.785	1524.68
80	20.684	34.809	2.23	0.00	24.435	20.669	1524.46
90	20.384	34.814	2.28	0.00	24.520	20.367	1523.81
100	19.724	34.658	2.29	0.00	24.575	19.706	1521.98
125	18.639	34.652	2.37	0.00	24.848	18.617	1519.31
150	17.527	34.676	2.43	0.00	25.140	17.502	1516.51
175	16.624	34.687	2.45	0.00	25.363	16.596	1514.23
200	15.734	34.657	2.42	0.00	25.545	15.703	1511.88
250	14.581	34.597	2.36	0.00	25.753	14.544	1509.00
300	12.111	34.466	2.21	0.00	26.153	12.072	1501.51
350	10.539	34.398	2.09	0.00	26.389	10.497	1496.78
400	9.126	34.321	1.94	0.00	26.566	9.082	1492.41
450	7.935	34.291	1.78	0.00	26.727	7.889	1488.74
500	7.123	34.274	1.65	0.00	26.830	7.075	1486.44
600	5.826	34.285	1.37	0.00	27.010	5.774	1483.00
700	4.801	34.313	1.14	0.00	27.153	4.746	1480.54
800	4.211	34.350	1.04	0.00	27.247	4.150	1479.80
900	3.666	34.398	0.97	0.00	27.341	3.601	1479.24
1000	3.367	34.433	1.00	0.00	27.398	3.296	1479.67

Station: K-13d
latitude: 33-39.75N Longtitude: 138-01.15E Depth: 3911m
Date: 1994-05-19 Time: :12:0

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	20.952	34.491	2.81	0.00	24.121	20.952	1523.53
5	20.948	34.492	2.77	0.00	24.122	20.947	1523.57
10	20.965	34.491	2.72	0.00	24.117	20.964	1523.70
20	20.957	34.491	2.67	0.00	24.119	20.953	1523.84
30	20.973	34.493	2.65	0.00	24.116	20.968	1524.06
40	20.980	34.499	2.64	0.00	24.120	20.972	1524.25
50	20.799	34.518	2.62	0.00	24.182	20.790	1523.95
60	19.857	34.586	2.65	0.00	24.485	19.846	1521.60
70	19.426	34.643	2.56	0.00	24.640	19.414	1520.63
75	19.160	34.677	2.49	0.00	24.735	19.147	1520.00
80	18.815	34.680	2.49	0.00	24.825	18.801	1519.10
90	18.448	34.681	2.46	0.00	24.918	18.433	1518.21
100	17.781	34.646	2.47	0.00	25.056	17.764	1516.39
125	16.367	34.662	2.66	0.00	25.404	16.347	1512.59
150	14.975	34.633	2.59	0.00	25.695	14.952	1508.64
175	13.984	34.580	2.47	0.00	25.867	13.959	1505.82
200	13.151	34.534	2.33	0.00	26.003	13.123	1503.44
250	11.674	34.437	2.19	0.00	26.214	11.642	1499.15
300	10.001	34.365	2.04	0.00	26.457	9.966	1493.99
350	8.890	34.315	1.90	0.00	26.599	8.852	1490.70
400	7.772	34.278	1.76	0.00	26.741	7.732	1487.28
450	6.682	34.263	1.59	0.00	26.882	6.640	1483.88
500	6.072	34.266	1.45	0.00	26.964	6.028	1482.31
600	4.982	34.292	1.18	0.00	27.116	4.935	1479.60
700	4.157	34.352	1.01	0.00	27.255	4.105	1477.93
800	3.739	34.389	0.93	0.00	27.327	3.681	1477.88
900	3.484	34.417	0.95	0.00	27.374	3.420	1478.49
1000	3.246	34.446	0.99	0.00	27.420	3.176	1479.17

Station: K-14D
latitude: 33-30.25N Longtitude: 138-00.07E Depth: 2963m
Date: 1994-05-19 Time: :18:0

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	22.632	34.716	2.77	0.00	23.825	22.631	1528.21
5	22.632	34.716	2.74	0.00	23.826	22.631	1528.26
10	22.643	34.716	2.72	0.00	23.822	22.641	1528.38
20	22.652	34.716	2.67	0.00	23.820	22.648	1528.57
30	22.640	34.717	2.64	0.00	23.824	22.634	1528.70
40	22.276	34.700	2.59	0.00	23.914	22.268	1527.91
50	21.569	34.599	2.65	0.00	24.034	21.560	1526.11
60	21.382	34.600	2.62	0.00	24.086	21.370	1525.78
70	21.149	34.582	2.63	0.00	24.136	21.135	1525.30
75	21.343	34.736	2.48	0.00	24.200	21.329	1526.07
80	21.246	34.861	2.35	0.00	24.322	21.230	1526.03
90	20.786	34.852	2.32	0.00	24.440	20.769	1524.95
100	20.494	34.858	2.37	0.00	24.524	20.475	1524.33
125	18.763	34.649	2.44	0.00	24.814	18.741	1519.67
150	18.022	34.696	2.46	0.00	25.035	17.996	1517.99
175	16.997	34.692	2.46	0.00	25.279	16.968	1515.36
200	16.487	34.669	2.47	0.00	25.382	16.455	1514.21
250	15.491	34.638	2.40	0.00	25.585	15.453	1511.93
300	13.641	34.544	2.34	0.00	25.910	13.598	1506.72
350	11.221	34.439	2.16	0.00	26.299	11.177	1499.23
400	9.514	34.352	2.00	0.00	26.528	9.469	1493.86
450	8.718	34.314	1.88	0.00	26.626	8.670	1491.71
500	7.871	34.283	1.79	0.00	26.730	7.820	1489.31
600	6.049	34.276	1.45	0.00	26.975	5.996	1483.88
700	4.915	34.300	1.17	0.00	27.130	4.859	1480.99
800	4.105	34.358	1.02	0.00	27.265	4.045	1479.37
900	3.631	34.401	0.97	0.00	27.347	3.566	1479.09
1000	3.386	34.429	0.98	0.00	27.393	3.315	1479.75

Station: K-12D
latitude: 33-49.80N Longtitude: 138-00.36E Depth: 3564m
Date: 1994-05-20 Time: :01:0

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	18.509	34.596	3.13	0.00	24.837	18.509	1516.83
5	18.520	34.595	3.09	0.00	24.834	18.519	1516.91
10	18.525	34.596	3.04	0.00	24.833	18.523	1517.01
20	18.519	34.595	3.00	0.00	24.834	18.516	1517.15
30	18.469	34.596	2.97	0.00	24.848	18.464	1517.18
40	15.791	34.599	2.52	0.00	25.487	15.785	1509.34
50	14.928	34.590	2.38	0.00	25.672	14.921	1506.79
60	14.616	34.581	2.32	0.00	25.733	14.607	1505.95
70	13.771	34.547	2.26	0.00	25.885	13.761	1503.34
75	13.643	34.541	2.25	0.00	25.907	13.633	1503.00
80	13.365	34.536	2.27	0.00	25.961	13.354	1502.17
90	12.743	34.503	2.23	0.00	26.060	12.731	1500.22
100	11.945	34.466	2.15	0.00	26.186	11.932	1497.64
125	10.904	34.413	2.04	0.00	26.336	10.888	1494.38
150	10.078	34.371	1.98	0.00	26.448	10.061	1491.81
175	9.495	34.344	1.93	0.00	26.524	9.475	1490.08
200	8.763	34.313	1.87	0.00	26.618	8.741	1487.76
250	7.949	34.284	1.76	0.00	26.719	7.924	1485.50
300	7.326	34.275	1.68	0.00	26.802	7.297	1483.93
350	6.446	34.251	1.51	0.00	26.904	6.415	1481.30
400	5.773	34.220	1.40	0.00	26.965	5.739	1479.41
450	5.414	34.280	1.29	0.00	27.056	5.377	1478.87
500	5.015	34.302	1.18	0.00	27.120	4.975	1478.10
600	4.360	34.334	1.04	0.00	27.219	4.315	1477.10
700	4.038	34.362	0.99	0.00	27.275	3.987	1477.45
800	3.669	34.399	0.99	0.00	27.342	3.612	1477.60
900	3.414	34.429	1.01	0.00	27.391	3.351	1478.21
1000	3.199	34.451	1.03	0.00	27.429	3.130	1478.98

Station: K-16D
latitude: 34-19.92N Longtitude: 138-29.81E Depth: 2801m
Date: 1994-05-20 Time: :08:1

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/scc]
2	18.131	34.614	2.59	0.00	24.945	18.130	1515.75
5	18.131	34.603	2.42	0.00	24.937	18.130	1515.79
10	18.132	34.605	2.46	0.00	24.938	18.130	1515.88
20	18.126	34.602	2.77	0.00	24.937	18.122	1516.02
30	18.114	34.602	2.78	0.00	24.940	18.108	1516.15
40	16.044	34.647	2.59	0.00	25.467	16.038	1510.17
50	15.820	34.627	2.48	0.00	25.502	15.812	1509.62
60	15.424	34.616	2.44	0.00	25.583	15.415	1508.54
70	14.977	34.600	2.40	0.00	25.669	14.966	1507.28
75	14.814	34.592	2.38	0.00	25.699	14.803	1506.84
80	14.615	34.588	2.38	0.00	25.739	14.603	1506.28
90	14.136	34.580	2.43	0.00	25.834	14.123	1504.90
100	13.811	34.558	2.37	0.00	25.886	13.797	1503.98
125	13.031	34.514	2.26	0.00	26.011	13.014	1501.77
150	11.298	34.430	2.13	0.00	26.278	11.279	1496.19
175	10.371	34.379	2.04	0.00	26.404	10.350	1493.27
200	9.773	34.348	1.98	0.00	26.482	9.750	1491.50
250	8.533	34.287	1.88	0.00	26.633	8.507	1487.70
300	7.734	34.264	1.78	0.00	26.735	7.704	1485.48
350	6.964	34.252	1.66	0.00	26.835	6.931	1483.32
400	6.667	34.252	1.56	0.00	26.875	6.631	1482.99
450	6.012	34.257	1.43	0.00	26.964	5.973	1481.23
500	5.569	34.258	1.33	0.00	27.020	5.527	1480.29
600	4.816	34.299	1.15	0.00	27.141	4.769	1478.93
700	4.350	34.336	1.05	0.00	27.221	4.297	1478.71
800	3.935	34.377	1.02	0.00	27.297	3.876	1478.68
900	3.595	34.409	1.01	0.00	27.357	3.531	1478.95
1000	3.324	34.439	1.03	0.00	27.407	3.253	1479.50

Station: K-15d
latitude: 34-30.01N Longtitude: 138-30.01E Depth: 2258m
Date: 1994-05-20 Time: :06:3

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/scc]
2	18.892	34.641	3.05	0.00	24.776	18.891	1517.98
5	18.895	34.641	3.00	0.00	24.775	18.894	1518.04
10	18.887	34.642	2.97	0.00	24.778	18.885	1518.10
20	18.493	34.635	2.98	0.00	24.871	18.489	1517.12
30	17.139	34.663	2.81	0.00	25.223	17.134	1513.35
40	16.183	34.650	2.59	0.00	25.437	16.176	1510.60
50	15.791	34.636	2.53	0.00	25.516	15.783	1509.54
60	15.313	34.622	2.49	0.00	25.612	15.304	1508.20
70	14.802	34.598	2.40	0.00	25.706	14.792	1506.73
75	14.489	34.585	2.37	0.00	25.763	14.478	1505.79
80	14.268	34.574	2.35	0.00	25.802	14.256	1505.15
90	13.385	34.538	2.30	0.00	25.958	13.372	1502.40
100	12.737	34.503	2.24	0.00	26.061	12.724	1500.37
125	11.534	34.438	2.13	0.00	26.240	11.518	1496.61
150	10.871	34.406	2.09	0.00	26.336	10.853	1494.67
175	10.478	34.385	2.04	0.00	26.390	10.457	1493.66
200	10.352	34.378	2.04	0.00	26.406	10.328	1493.62
250	9.952	34.362	1.99	0.00	26.462	9.923	1492.99
300	9.091	34.317	1.94	0.00	26.569	9.058	1490.62
350	8.362	34.292	1.84	0.00	26.664	8.325	1488.71
400	7.546	34.284	1.70	0.00	26.778	7.507	1486.43
450	6.842	34.259	1.60	0.00	26.857	6.800	1484.50
500	6.298	34.277	1.47	0.00	26.944	6.254	1483.22
600	5.116	34.316	1.22	0.00	27.120	5.067	1480.18
700	4.601	34.335	1.12	0.00	27.193	4.547	1479.75
800	4.170	34.361	1.06	0.00	27.260	4.110	1479.65
900	3.741	34.396	1.02	0.00	27.332	3.675	1479.55
1000	3.432	34.428	1.03	0.00	27.388	3.361	1479.94

Station: K-18D
latitude: 34.00.19N Longtitude: 138.30.06E Depth: 3578m
Date: 1994-05-20 Time: 12:19

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/scc]
2	18.786	34.598	2.92	1517.63			
5	18.788	34.603	2.92	1517.69			
10	18.789	34.603	2.91	1517.78			
20	18.786	34.603	2.91	1517.93			
30	18.760	34.601	2.90	1518.02			
40	18.466	34.604	2.84	1517.34			
50	16.499	34.634	2.57	1511.71			
60	15.459	34.605	2.44	1508.63			
70	14.872	34.602	2.36	1506.94			
75	14.792	34.601	2.34	1506.76			
80	14.664	34.601	2.33	1506.44			
90	14.258	34.577	2.32	1505.27			
100	13.669	34.548	2.29	1503.48			
125	12.486	34.488	2.20	1499.88			
150	11.543	34.416	2.20	1496.97			
175	10.771	34.380	2.16	1494.63			
200	10.532	34.356	2.13	1494.16			
250	9.506	34.343	1.99	1491.26			
300	8.087	34.289	1.80	1486.72			
350	7.335	34.268	1.69	1484.63			
400	6.285	34.214	1.58	1481.28			
450	5.880	34.269	1.41	1480.54			
500	5.511	34.271	1.30	1479.88			
600	4.700	34.299	1.13	1478.23			
700	4.183	34.350	1.02	1477.78			
800	3.661	34.402	1.00	1477.29			
900	3.362	34.431	0.99	1477.70			
1000	3.217	34.450	1.03	1478.74			

Station: K-19D
latitude: 33-50.00N Longtitude: 138-30.09E Depth: 2312m
Date: 1994-05-20 Time: 14:30

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
4	20.959	34.321	6.83	0.00	23.989	20.959	1523.40
5	20.970	34.347	5.44	0.00	24.007	20.969	1523.47
10	20.673	33.677	4.11	0.00	23.576	20.671	1522.00
20	21.077	34.534	2.68	0.00	24.120	21.073	1524.22
30	21.077	34.541	2.66	0.00	24.125	21.071	1524.39
40	19.890	34.666	2.60	0.00	24.537	19.883	1521.45
50	19.408	34.676	2.50	0.00	24.670	19.399	1520.28
60	18.622	34.668	2.39	0.00	24.864	18.611	1518.20
70	18.138	34.672	2.43	0.00	24.988	18.126	1516.97
75	17.971	34.662	2.43	0.00	25.021	17.959	1516.55
80	17.961	34.660	2.42	0.00	25.022	17.948	1516.61
90	17.626	34.646	2.43	0.00	25.093	17.611	1515.77
100	17.208	34.659	2.45	0.00	25.204	17.192	1514.71
125	16.395	34.662	2.47	0.00	25.397	16.375	1512.68
150	15.424	34.635	2.62	0.00	25.598	15.401	1510.06
175	14.201	34.595	2.53	0.00	25.833	14.175	1506.53
200	12.953	34.524	2.34	0.00	26.034	12.925	1502.77
250	11.989	34.477	2.26	0.00	26.186	11.956	1500.28
300	10.316	34.386	2.07	0.00	26.418	10.281	1495.15
350	8.780	34.316	1.90	0.00	26.617	8.742	1490.30
400	7.390	34.277	1.74	0.00	26.795	7.351	1485.82
450	6.129	34.224	1.54	0.00	26.923	6.089	1481.66
500	5.641	34.234	1.42	0.00	26.992	5.599	1480.55
600	4.793	34.314	1.19	0.00	27.155	4.746	1478.86
700	4.083	34.355	1.03	0.00	27.265	4.032	1477.63
800	3.795	34.384	0.99	0.00	27.317	3.737	1478.11
900	3.502	34.415	0.99	0.00	27.371	3.438	1478.56
1000	3.347	34.434	1.00	0.00	27.401	3.276	1479.59

Station: K-21D
latitude: 33-30.05N Longtitude: 138-30.44E Depth: 3481m
Date: 1994-05-20 Time: 18:50

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
5	23.727	34.737	2.42	0.00	23.524	23.726	1531.07
5	23.727	34.737	2.42	0.00	23.524	23.726	1531.07
10	23.725	34.738	2.36	0.00	23.525	23.723	1531.15
20	23.740	34.737	2.36	0.00	23.521	23.735	1531.35
30	23.747	34.738	2.36	0.00	23.519	23.740	1531.54
40	23.737	34.738	2.36	0.00	23.522	23.729	1531.68
50	23.241	34.730	2.31	0.00	23.661	23.230	1530.59
60	22.894	34.737	2.28	0.00	23.767	22.881	1529.88
70	22.498	34.695	2.30	0.00	23.848	22.484	1528.98
75	22.279	34.663	2.34	0.00	23.885	22.264	1528.46
80	22.179	34.665	2.36	0.00	23.915	22.163	1528.29
90	22.083	34.740	2.33	0.00	23.999	22.066	1528.29
100	21.837	34.855	2.33	0.00	24.155	21.817	1527.93
125	21.024	34.816	2.27	0.00	24.349	21.000	1526.14
150	19.988	34.866	2.30	0.00	24.664	19.960	1523.78
175	19.368	34.897	2.47	0.00	24.849	19.336	1522.50
200	18.648	34.844	2.44	0.00	24.992	18.613	1520.80
250	16.843	34.765	2.49	0.00	25.372	16.802	1516.23
300	14.906	34.611	2.41	0.00	25.693	14.860	1510.88
350	12.816	34.498	2.31	0.00	26.041	12.768	1504.76
400	11.376	34.389	2.28	0.00	26.231	11.326	1500.54
450	10.246	34.367	2.16	0.00	26.416	10.193	1497.35
500	8.561	34.262	2.03	0.00	26.609	8.508	1491.89
600	6.163	34.214	1.64	0.00	26.911	6.110	1484.25
700	5.415	34.262	1.34	0.00	27.041	5.357	1482.97
800	4.641	34.315	1.16	0.00	27.173	4.578	1481.53
900	4.047	34.364	1.03	0.00	27.276	3.979	1480.79
1000	3.532	34.411	1.00	0.00	27.365	3.460	1480.34

Station: K-20D
latitude: 33-40.14N Longtitude: 138-30.74E Depth: 2429m
Date: 1994-05-20 Time: 16:40

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
4	23.103	34.735	2.58	0.00	23.705	23.102	1529.47
5	23.098	34.736	2.55	0.00	23.706	23.097	1529.48
10	23.107	34.735	2.54	0.00	23.703	23.105	1529.59
20	23.106	34.735	2.52	0.00	23.703	23.102	1529.75
30	23.074	34.734	2.51	0.00	23.712	23.068	1529.83
40	22.938	34.730	2.50	0.00	23.748	22.930	1529.65
50	22.036	34.635	2.56	0.00	23.932	22.026	1527.38
60	21.577	34.624	2.57	0.00	24.051	21.565	1526.32
70	21.287	34.613	2.60	0.00	24.123	21.273	1525.70
75	20.884	34.667	2.55	0.00	24.273	20.870	1524.76
80	20.798	34.701	2.47	0.00	24.322	20.782	1524.65
90	20.011	34.672	2.49	0.00	24.510	19.994	1522.62
100	19.701	34.679	2.44	0.00	24.596	19.683	1521.94
125	18.614	34.653	2.33	0.00	24.855	18.592	1519.24
150	18.176	34.687	2.31	0.00	24.990	18.150	1518.43
175	16.916	34.681	2.47	0.00	25.290	16.888	1515.11
200	16.039	34.675	2.46	0.00	25.489	16.008	1512.84
250	14.440	34.587	2.36	0.00	25.775	14.404	1508.54
300	12.687	34.495	2.29	0.00	26.064	12.647	1503.49
350	10.511	34.397	2.12	0.00	26.393	10.469	1496.68
400	9.059	34.333	1.95	0.00	26.587	9.016	1492.18
450	8.226	34.293	1.87	0.00	26.685	8.179	1489.85
500	7.182	34.268	1.70	0.00	26.817	7.134	1486.66
600	5.497	34.238	1.38	0.00	27.013	5.447	1481.62
700	4.699	34.311	1.15	0.00	27.163	4.644	1480.12
800	4.050	34.360	1.03	0.00	27.272	3.990	1479.14
900	3.682	34.395	0.99	0.00	27.338	3.617	1479.30
1000	3.362	34.431	1.00	0.00	27.397	3.291	1479.65

Station: K-27d
latitude: 33-30.05N Longtitude: 139-19.93E Depth: 1962m
Date: 1994-05-20 Time: 22:20

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
5	23.645	34.743	2.39	0.00	23.553	23.644	1530.87
5	23.645	34.743	2.39	0.00	23.553	23.644	1530.87
10	23.670	34.742	2.38	0.00	23.545	23.668	1531.01
20	23.679	34.743	2.37	0.00	23.543	23.675	1531.20
30	23.678	34.743	2.37	0.00	23.543	23.671	1531.37
40	23.672	34.742	2.37	0.00	23.545	23.663	1531.52
50	23.673	34.742	2.37	0.00	23.544	23.662	1531.69
60	23.617	34.738	2.38	0.00	23.557	23.604	1531.71
70	22.952	34.791	2.35	0.00	23.790	22.938	1530.26
75	22.694	34.796	2.29	0.00	23.868	22.679	1529.68
80	22.481	34.835	2.33	0.00	23.958	22.465	1529.26
90	22.040	34.873	2.33	0.00	24.111	22.022	1528.32
100	21.678	34.877	2.37	0.00	24.215	21.659	1527.54
125	20.903	34.901	2.43	0.00	24.446	20.880	1525.91
150	19.954	34.906	2.44	0.00	24.703	19.927	1523.73
175	19.213	34.873	2.47	0.00	24.871	19.182	1522.03
200	18.564	34.816	2.36	0.00	24.992	18.529	1520.53
250	17.460	34.762	2.47	0.00	25.222	17.418	1518.07
300	16.852	34.758	2.51	0.00	25.365	16.802	1517.07
350	15.543	34.668	2.46	0.00	25.596	15.489	1513.78
400	14.466	34.587	2.42	0.00	25.770	14.407	1511.10
450	13.019	34.486	2.38	0.00	25.991	12.957	1507.08
500	11.530	34.391	2.35	0.00	26.205	11.466	1502.73
600	8.717	34.312	1.98	0.00	26.624	8.652	1494.18
700	6.617	34.273	1.61	0.00	26.899	6.552	1487.76
800	5.477	34.275	1.34	0.00	27.044	5.409	1484.89
900	4.293	34.335	1.09	0.00	27.227	4.224	1481.78
1000	3.815	34.384	1.03	0.00	27.315	3.741	1481.50

Station: K-26D
latitude: 33-41.43N Longtitude: 139-16.46E Depth: 1560m
Date: 1994-05-21 Time: 03:52

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	23.584	34.678	2.42	0.00	23.522	23.583	1530.59
5	23.584	34.769	2.40	0.00	23.591	23.583	1530.74
10	23.584	34.769	2.39	0.00	23.591	23.582	1530.83
20	23.596	34.769	2.39	0.00	23.587	23.592	1531.02
30	23.604	34.769	2.39	0.00	23.584	23.598	1531.21
40	23.600	34.769	2.38	0.00	23.586	23.591	1531.37
50	23.603	34.769	2.39	0.00	23.585	23.593	1531.55
60	23.436	34.783	2.36	0.00	23.644	23.424	1531.31
70	22.931	34.817	2.32	0.00	23.816	22.917	1530.23
75	22.627	34.771	2.32	0.00	23.869	22.612	1529.48
80	22.492	34.783	2.30	0.00	23.916	22.476	1529.23
90	21.886	34.702	2.34	0.00	24.024	21.869	1527.73
100	21.634	34.703	2.33	0.00	24.095	21.615	1527.23
125	20.972	34.774	2.37	0.00	24.331	20.949	1525.95
150	20.487	34.903	2.44	0.00	24.560	20.459	1525.20
175	19.886	34.904	2.45	0.00	24.720	19.853	1523.95
200	18.322	34.700	2.40	0.00	24.963	18.288	1519.70
250	17.369	34.764	2.37	0.00	25.246	17.327	1517.80
300	15.599	34.664	2.36	0.00	25.581	15.552	1513.12
350	14.414	34.589	2.38	0.00	25.783	14.362	1510.11
400	13.108	34.501	2.39	0.00	25.986	13.053	1506.56
450	11.067	34.367	2.32	0.00	26.271	11.011	1500.26
500	9.609	34.282	2.23	0.00	26.458	9.552	1495.78
600	7.405	34.276	1.76	0.00	26.792	7.346	1489.18
700	5.694	34.253	1.44	0.00	27.001	5.633	1484.08
800	4.570	34.319	1.12	0.00	27.184	4.507	1481.25
900	3.970	34.365	1.02	0.00	27.284	3.903	1480.47
1000	3.637	34.401	0.99	0.00	27.346	3.564	1480.77

Station: K-33d
latitude: 33-42.58N Longtitude: 139-40.29E Depth: 1458m
Date: 1994-05-21 Time: 06:20

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	23.637	34.751	2.36	0.00	23.561	23.637	1530.81
5	23.656	34.750	2.32	0.00	23.555	23.654	1530.90
10	23.658	34.750	2.32	0.00	23.555	23.656	1530.99
20	23.668	34.750	2.33	0.00	23.551	23.664	1531.18
30	23.668	34.749	2.33	0.00	23.551	23.662	1531.35
40	23.667	34.749	2.34	0.00	23.551	23.658	1531.52
50	23.667	34.750	2.34	0.00	23.552	23.656	1531.68
60	23.654	34.750	2.34	0.00	23.556	23.642	1531.82
70	23.301	34.757	2.34	0.00	23.664	23.287	1531.11
75	22.753	34.770	2.33	0.00	23.832	22.738	1529.81
80	22.653	34.757	2.32	0.00	23.851	22.637	1529.62
90	22.464	34.773	2.31	0.00	23.916	22.446	1529.32
100	22.125	34.791	2.29	0.00	24.026	22.105	1528.62
125	21.093	34.939	2.51	0.00	24.423	21.070	1526.46
150	20.306	34.914	2.52	0.00	24.616	20.278	1524.71
175	19.853	34.854	2.36	0.00	24.690	19.820	1523.81
200	18.692	34.836	2.35	0.00	24.975	18.657	1520.92
250	17.621	34.791	2.38	0.00	25.205	17.579	1518.58
300	16.170	34.666	2.40	0.00	25.453	16.122	1514.89
350	14.458	34.588	2.40	0.00	25.773	14.406	1510.25
400	13.482	34.518	2.43	0.00	25.923	13.425	1507.82
450	11.322	34.398	2.37	0.00	26.249	11.265	1501.19
500	9.899	34.360	2.15	0.00	26.470	9.841	1496.92
600	7.396	34.265	1.82	0.00	26.785	7.337	1489.13
700	5.663	34.271	1.44	0.00	27.019	5.603	1483.98
800	4.581	34.310	1.17	0.00	27.175	4.519	1481.28
900	4.095	34.359	1.06	0.00	27.267	4.027	1480.98
1000	3.750	34.391	1.01	0.00	27.327	3.677	1481.24

Station: K-32D
latitude: 33-52.62N Longtitude: 139-31.28E Depth: 1102m
Date: 1994-05-21 Time: 09:10

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	23.432	34.760	2.41	0.00	23.628	23.432	1530.30
5	23.433	34.760	2.41	0.00	23.628	23.432	1530.35
10	23.435	34.760	2.41	0.00	23.627	23.433	1530.44
20	23.433	34.759	2.41	0.00	23.627	23.429	1530.61
30	23.430	34.759	2.41	0.00	23.628	23.424	1530.76
40	23.357	34.759	2.41	0.00	23.649	23.348	1530.75
50	23.244	34.760	2.41	0.00	23.683	23.233	1530.63
60	23.106	34.755	2.42	0.00	23.718	23.094	1530.44
70	22.815	34.811	2.37	0.00	23.845	22.801	1529.93
75	22.441	34.824	2.32	0.00	23.961	22.426	1529.06
80	22.066	34.794	2.31	0.00	24.044	22.050	1528.13
90	21.407	34.815	2.30	0.00	24.243	21.389	1526.58
100	20.622	34.661	2.38	0.00	24.339	20.604	1524.46
125	20.433	34.896	2.42	0.00	24.569	20.409	1524.62
150	19.597	34.882	2.43	0.00	24.779	19.569	1522.71
175	18.148	34.693	2.36	0.00	25.002	18.117	1518.77
200	17.471	34.762	2.37	0.00	25.219	17.438	1517.27
250	15.824	34.656	2.38	0.00	25.524	15.785	1512.98
300	14.984	34.624	2.35	0.00	25.687	14.939	1511.14
350	13.912	34.552	2.33	0.00	25.860	13.862	1508.44
400	12.481	34.454	2.39	0.00	26.073	12.427	1504.40
450	11.283	34.410	2.21	0.00	26.265	11.227	1501.07
500	9.970	34.345	2.10	0.00	26.446	9.912	1497.16
600	7.163	34.261	1.70	0.00	26.815	7.105	1488.23
700	5.302	34.279	1.34	0.00	27.069	5.244	1482.54
800	4.429	34.324	1.13	0.00	27.203	4.367	1480.67
900	3.936	34.371	1.04	0.00	27.293	3.869	1480.34

Station: K-31D
latitude: 34-02.57N Longtitude: 139-21.23E Depth: 180 m
Date: 1994-05-21 Time: 11:30

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	22.545	34.724	2.47	0.00	23.856	22.545	1528.00
5	22.525	34.723	2.47	0.00	23.861	22.524	1528.00
10	22.521	34.722	2.47	0.00	23.861	22.519	1528.07
20	22.512	34.720	2.47	0.00	23.862	22.508	1528.21
30	22.494	34.720	2.48	0.00	23.867	22.488	1528.33
40	22.454	34.716	2.48	0.00	23.876	22.446	1528.39
50	22.202	34.753	2.41	0.00	23.975	22.192	1527.94
60	21.349	34.625	2.51	0.00	24.114	21.337	1525.71
70	20.646	34.637	2.53	0.00	24.315	20.633	1524.00
75	20.134	34.628	2.51	0.00	24.444	20.120	1522.67
80	19.692	34.656	2.44	0.00	24.581	19.677	1521.55
90	19.139	34.669	2.44	0.00	24.734	19.123	1520.18
100	19.030	34.668	2.41	0.00	24.761	19.012	1520.03

Station: K-30d
latitude: 34-12.56N Longtitude: 139-13.11E Depth: 140 m
Date: 1994-05-21 Time: 13:40

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
4	21.312	34.653	2.51	0.00	24.146	21.311	1524.71
5	21.317	34.654	2.51	0.00	24.145	21.316	1524.74
10	21.261	34.653	2.52	0.00	24.160	21.259	1524.68
20	20.855	34.622	2.53	0.00	24.247	20.851	1523.71
30	20.585	34.595	2.54	0.00	24.299	20.580	1523.12
40	20.133	34.586	2.53	0.00	24.412	20.126	1522.04
50	19.861	34.567	2.52	0.00	24.469	19.852	1521.43
60	19.567	34.591	2.50	0.00	24.564	19.556	1520.80
70	18.342	34.631	2.48	0.00	24.906	18.330	1517.52
75	17.911	34.634	2.45	0.00	25.015	17.898	1516.35
80	17.684	34.633	2.44	0.00	25.069	17.670	1515.76
90	17.367	34.631	2.44	0.00	25.145	17.352	1514.99
100	16.863	34.625	2.44	0.00	25.260	16.847	1513.64

Station: K-29d
latitude: 34-22.48N Longtitude: 139-04.03E Depth: 270 m
Date: 1994-05-21 Time: 15:20

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	21.279	34.604	2.52	0.00	24.118	21.279	1524.54
5	21.285	34.602	2.53	0.00	24.115	21.284	1524.60
10	21.238	34.613	2.54	0.00	24.136	21.236	1524.57
20	19.023	34.591	2.61	0.00	24.704	19.020	1518.60
30	18.542	34.608	2.53	0.00	24.838	18.536	1517.40
40	18.094	34.630	2.49	0.00	24.966	18.087	1516.29
50	17.635	34.649	2.45	0.00	25.094	17.627	1515.14
60	16.675	34.645	2.39	0.00	25.319	16.665	1512.43
70	16.352	34.629	2.37	0.00	25.382	16.341	1511.59
75	16.327	34.627	2.37	0.00	25.386	16.315	1511.60
80	16.278	34.625	2.37	0.00	25.396	16.265	1511.53
90	15.867	34.618	2.38	0.00	25.485	15.853	1510.42
100	15.683	34.620	2.38	0.00	25.528	15.668	1510.02
125	15.167	34.616	2.42	0.00	25.640	15.148	1508.82
150	14.914	34.608	2.47	0.00	25.690	14.891	1508.42
175	14.811	34.603	2.49	0.00	25.708	14.784	1508.50
200	13.825	34.563	2.49	0.00	25.886	13.797	1505.69
250	12.133	34.469	2.30	0.00	26.152	12.101	1500.76

Station: K-25d
latitude: 33-50.10N Longtitude: 139-02.14E Depth: 1423m
Date: 1994-05-21 Time: 20:20

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	22.795	34.744	2.43	0.00	23.800	22.795	1528.66
5	22.792	34.745	2.44	0.00	23.801	22.791	1528.71
10	22.796	34.745	2.44	0.00	23.800	22.794	1528.80
20	22.757	34.740	2.45	0.00	23.808	22.753	1528.86
30	21.745	34.632	2.52	0.00	24.011	21.740	1526.28
40	21.786	34.838	2.30	0.00	24.156	21.779	1526.78
50	21.372	34.814	2.25	0.00	24.252	21.363	1525.82
60	20.840	34.725	2.31	0.00	24.329	20.829	1524.46
70	20.634	34.680	2.33	0.00	24.351	20.621	1524.01
75	20.529	34.661	2.35	0.00	24.364	20.515	1523.79
80	20.487	34.660	2.36	0.00	24.375	20.472	1523.76
90	20.082	34.653	2.35	0.00	24.476	20.066	1522.80
100	19.717	34.642	2.38	0.00	24.564	19.699	1521.94
125	19.553	34.838	2.34	0.00	24.756	19.530	1522.12
150	18.276	34.688	2.34	0.00	24.966	18.250	1518.72
175	17.586	34.658	2.41	0.00	25.112	17.556	1517.08
200	16.710	34.664	2.43	0.00	25.326	16.678	1514.88
250	14.893	34.617	2.38	0.00	25.701	14.856	1510.02
300	13.196	34.515	2.31	0.00	25.978	13.155	1505.22
350	11.188	34.420	2.19	0.00	26.291	11.145	1499.10
400	9.436	34.348	2.02	0.00	26.538	9.391	1493.57
450	7.329	34.261	1.80	0.00	26.791	7.285	1486.39
500	6.350	34.221	1.64	0.00	26.893	6.305	1483.35
600	5.440	34.275	1.38	0.00	27.049	5.390	1481.44
700	4.756	34.314	1.19	0.00	27.159	4.700	1480.35
800	4.103	34.359	1.03	0.00	27.266	4.043	1479.36
900	3.644	34.402	1.00	0.00	27.347	3.579	1479.15
1000	3.420	34.425	1.00	0.00	27.387	3.349	1479.89

Station: K-24D
latitude: 34-00.11N Longtitude: 138-52.62E Depth: 111 m
Date: 1994-05-22 Time: 00:51

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	21.193	34.651	2.57	0.00	24.177	21.193	1524.36
5	21.205	34.651	2.56	0.00	24.174	21.204	1524.44
10	21.160	34.645	2.56	0.00	24.181	21.158	1524.40
20	21.124	34.648	2.56	0.00	24.194	21.120	1524.47
30	21.002	34.657	2.55	0.00	24.233	20.996	1524.32
40	20.219	34.654	2.54	0.00	24.441	20.212	1522.35
50	20.164	34.650	2.52	0.00	24.452	20.155	1522.36
60	20.195	34.653	2.52	0.00	24.446	20.184	1522.61
70	19.998	34.650	2.52	0.00	24.497	19.985	1522.23
75	19.348	34.655	2.52	0.00	24.669	19.334	1520.50
80	15.017	34.650	2.55	0.00	25.699	15.005	1507.64
90	13.982	34.569	2.35	0.00	25.859	13.969	1504.39
100	13.179	34.525	2.25	0.00	25.989	13.165	1501.86

Station: K-23D
latitude: 34-10.35N Longtitude: 138-43.99E Depth: 1784m
Date: 1994-05-22 Time: 03:07

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	18.750	34.569	2.83	0.00	24.756	18.750	1517.49
5	18.146	34.584	2.86	0.00	24.919	18.145	1515.81
10	18.145	34.579	2.85	0.00	24.915	18.144	1515.89
20	17.896	34.588	2.85	0.00	24.983	17.893	1515.34
30	17.846	34.604	2.83	0.00	25.008	17.841	1515.37
40	17.714	34.606	2.82	0.00	25.041	17.707	1515.15
50	17.013	34.603	2.67	0.00	25.208	17.005	1513.23
60	16.404	34.620	2.58	0.00	25.363	16.395	1511.58
70	15.371	34.620	2.49	0.00	25.598	15.360	1508.55
75	14.869	34.603	2.43	0.00	25.695	14.858	1507.03
80	14.309	34.579	2.39	0.00	25.797	14.297	1505.29
90	13.873	34.558	2.34	0.00	25.873	13.861	1504.02
100	13.723	34.547	2.31	0.00	25.896	13.709	1503.68
125	12.802	34.506	2.28	0.00	26.050	12.785	1501.00
150	11.815	34.458	2.24	0.00	26.204	11.796	1498.01
175	10.359	34.364	2.23	0.00	26.394	10.338	1493.21
200	9.581	34.276	2.19	0.00	26.457	9.558	1490.72
250	9.386	34.335	1.98	0.00	26.536	9.358	1490.90
300	8.914	34.320	1.91	0.00	26.599	8.882	1489.98
350	7.466	34.272	1.76	0.00	26.780	7.432	1485.29
400	6.541	34.252	1.59	0.00	26.892	6.505	1482.50
450	6.047	34.234	1.51	0.00	26.942	6.007	1481.34
500	5.735	34.242	1.44	0.00	26.987	5.693	1480.93
600	4.915	34.298	1.22	0.00	27.128	4.867	1479.33
700	4.427	34.334	1.11	0.00	27.211	4.374	1479.03
800	3.988	34.368	1.04	0.00	27.285	3.929	1478.90
900	3.544	34.414	1.03	0.00	27.366	3.480	1478.74
1000	3.325	34.438	1.04	0.00	27.406	3.255	1479.50

Station: K-22d
latitude: 34-20.01N Longtitude: 138-35.00E Depth: 3000m
Date: 1994-05-22 Time: 06:20

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.164	34.615	2.82	0.00	24.686	19.163	1518.72
5	19.138	34.621	2.82	0.00	24.698	19.138	1518.71
10	19.128	34.622	2.83	0.00	24.701	19.126	1518.76
20	19.141	34.620	2.84	0.00	24.696	19.137	1518.96
30	18.578	34.625	2.80	0.00	24.842	18.573	1517.52
40	15.749	34.617	2.55	0.00	25.511	15.743	1509.22
50	15.166	34.597	2.40	0.00	25.625	15.158	1507.55
60	14.381	34.574	2.34	0.00	25.778	14.372	1505.19
70	13.863	34.562	2.33	0.00	25.878	13.853	1503.66
75	13.241	34.534	2.31	0.00	25.984	13.230	1501.67
80	12.893	34.512	2.26	0.00	26.037	12.882	1500.57
90	12.551	34.490	2.20	0.00	26.087	12.540	1499.56
100	12.228	34.482	2.19	0.00	26.143	12.215	1498.62
125	11.329	34.407	2.19	0.00	26.254	11.313	1495.86
150	10.507	34.389	2.09	0.00	26.388	10.489	1493.36
175	9.725	34.348	2.03	0.00	26.490	9.705	1490.92
200	9.180	34.329	1.96	0.00	26.565	9.158	1489.32
250	7.958	34.285	1.81	0.00	26.719	7.933	1485.53
300	7.232	34.260	1.72	0.00	26.804	7.204	1483.55
350	6.642	34.233	1.67	0.00	26.863	6.610	1482.04
400	5.990	34.258	1.49	0.00	26.968	5.955	1480.32
450	5.643	34.263	1.40	0.00	27.015	5.605	1479.77
500	5.351	34.275	1.33	0.00	27.059	5.310	1479.43
600	4.827	34.298	1.19	0.00	27.138	4.779	1478.97
700	4.299	34.341	1.10	0.00	27.231	4.246	1478.50
800	3.899	34.375	1.04	0.00	27.299	3.840	1478.53
900	3.577	34.408	1.01	0.00	27.358	3.513	1478.87
1000	3.364	34.434	1.04	0.00	27.399	3.293	1479.66

Station: K-28D
latitude: 34-30.26N Longtitude: 138-55.19E Depth: 644 m
Date: 1994-05-22 Time: 09:20

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.735	34.604	2.70	0.00	24.530	19.734	1520.31
5	19.735	34.603	2.70	0.00	24.529	19.734	1520.36
10	19.613	34.604	2.69	0.00	24.562	19.611	1520.11
20	18.039	34.595	2.83	0.00	24.954	18.035	1515.76
30	17.825	34.605	2.73	0.00	25.014	17.820	1515.31
40	17.818	34.606	2.68	0.00	25.016	17.811	1515.46
50	17.568	34.616	2.61	0.00	25.084	17.560	1514.90
60	17.244	34.617	2.62	0.00	25.163	17.234	1514.10
70	15.558	34.628	2.56	0.00	25.563	15.547	1509.14
75	15.356	34.623	2.51	0.00	25.604	15.345	1508.59
80	15.181	34.620	2.49	0.00	25.640	15.169	1508.12
90	14.796	34.603	2.48	0.00	25.711	14.783	1507.05
100	14.396	34.575	2.40	0.00	25.775	14.382	1505.90
125	13.643	34.539	2.36	0.00	25.906	13.625	1503.82
150	12.970	34.509	2.34	0.00	26.019	12.950	1501.98
175	12.774	34.502	2.32	0.00	26.053	12.750	1501.73
200	12.401	34.479	2.31	0.00	26.108	12.374	1500.86
250	11.574	34.434	2.26	0.00	26.230	11.542	1498.80
300	8.161	34.293	1.92	0.00	26.694	8.131	1487.13

Station: K-34D
latitude: 34-39.93N Longtitude: 139-15.02E Depth: 444mm
Date: 1994-05-22 Time: 11:20

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	20.297	34.552	2.69	0.00	24.343	20.296	1521.81
5	20.301	34.552	2.69	0.00	24.342	20.300	1521.88
10	20.202	34.556	2.70	0.00	24.371	20.200	1521.69
20	19.190	34.567	2.77	0.00	24.643	19.187	1519.04
30	18.232	34.610	2.69	0.00	24.917	18.227	1516.51
40	17.158	34.634	2.56	0.00	25.197	17.151	1513.53
50	17.041	34.625	2.50	0.00	25.218	17.033	1513.34
60	16.658	34.627	2.47	0.00	25.310	16.648	1512.36
70	16.167	34.623	2.46	0.00	25.421	16.155	1511.02
75	16.076	34.620	2.44	0.00	25.439	16.064	1510.82
80	15.987	34.618	2.44	0.00	25.458	15.974	1510.62
90	15.809	34.614	2.44	0.00	25.495	15.795	1510.24
100	15.460	34.621	2.48	0.00	25.578	15.445	1509.32
125	14.483	34.602	2.52	0.00	25.778	14.465	1506.62
150	13.801	34.566	2.47	0.00	25.894	13.779	1504.79
175	13.035	34.524	2.39	0.00	26.018	13.011	1502.63
200	12.043	34.478	2.34	0.00	26.176	12.017	1499.64
250	11.506	34.434	2.24	0.00	26.243	11.475	1498.57
300	11.442	34.428	2.23	0.00	26.250	11.404	1499.16
350	9.510	34.358	2.13	0.00	26.533	9.471	1493.03

Station: S-1D
latitude: 34-24.94N Longtitude: 139-06.41E Depth: 669mm
Date: 1994-05-23 Time: 00:00

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	20.599	34.642	2.83	0.00	24.331	20.598	1522.74
5	20.606	34.641	2.82	0.00	24.328	20.605	1522.81
10	20.222	34.631	2.81	0.00	24.423	20.220	1521.83
20	19.480	34.619	2.78	0.00	24.608	19.476	1519.92
30	18.224	34.617	2.72	0.00	24.924	18.218	1516.49
40	17.898	34.621	2.67	0.00	25.008	17.891	1515.71
50	17.874	34.618	2.66	0.00	25.011	17.865	1515.80
60	17.733	34.629	2.64	0.00	25.055	17.723	1515.57
70	16.401	34.637	2.61	0.00	25.377	16.390	1511.75
75	16.185	34.629	2.58	0.00	25.420	16.174	1511.16
80	15.630	34.624	2.60	0.00	25.543	15.617	1509.53
90	15.428	34.606	2.58	0.00	25.574	15.415	1509.04
100	14.990	34.594	2.56	0.00	25.662	14.974	1507.81
125	13.974	34.558	2.49	0.00	25.851	13.956	1504.93
150	12.544	34.489	2.41	0.00	26.088	12.524	1500.53
175	11.712	34.448	2.38	0.00	26.215	11.689	1498.05
200	11.458	34.427	2.33	0.00	26.246	11.433	1497.56
250	11.122	34.412	2.33	0.00	26.296	11.091	1497.20
300	9.165	34.324	2.13	0.00	26.563	9.132	1490.91
350	8.099	34.288	1.97	0.00	26.700	8.063	1487.71
400	8.003	34.279	1.89	0.00	26.707	7.962	1488.16
450	7.817	34.277	1.87	0.00	26.733	7.771	1488.28
500	7.665	34.276	1.85	0.00	26.755	7.615	1488.52
600	7.199	34.275	1.75	0.00	26.821	7.141	1488.38

Station: K-35D
latitude: 34-35.13N Longtitude: 139-23.57E Depth: 226 m
Date: 1994-05-23 Time: 02:50

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.349	34.612	2.87	0.00	24.637	19.349	1519.24
5	19.353	34.612	2.85	0.00	24.636	19.352	1519.30
10	19.353	34.613	2.84	0.00	24.636	19.351	1519.39
20	19.353	34.613	2.83	0.00	24.636	19.349	1519.55
30	19.361	34.612	2.82	0.00	24.634	19.355	1519.74
40	18.946	34.622	2.77	0.00	24.747	18.939	1518.74
50	18.669	34.622	2.73	0.00	24.818	18.660	1518.12
60	18.482	34.621	2.72	0.00	24.863	18.472	1517.74
70	18.347	34.618	2.71	0.00	24.895	18.335	1517.51
75	18.305	34.617	2.71	0.00	24.905	18.292	1517.47
80	18.278	34.617	2.70	0.00	24.911	18.264	1517.48
90	18.086	34.619	2.70	0.00	24.960	18.070	1517.09
100	17.076	34.620	2.66	0.00	25.205	17.059	1514.27
125	16.557	34.612	2.62	0.00	25.322	16.537	1513.11
150	15.729	34.604	2.59	0.00	25.506	15.706	1510.97
175	15.584	34.603	2.58	0.00	25.537	15.557	1510.93
200	14.879	34.589	2.57	0.00	25.682	14.849	1509.11

Station: K-36d
latitude: 34-24.93N Longtitude: 139-33.05E Depth: 640 m
Date: 1994-05-23 Time: 04:50

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	22.294	34.727	2.68	0.00	23.929	22.294	1527.35
5	22.360	34.728	2.66	0.00	23.912	22.359	1527.58
10	22.071	34.721	2.66	0.00	23.987	22.069	1526.90
20	21.346	34.694	2.68	0.00	24.168	21.342	1525.12
30	21.254	34.688	2.68	0.00	24.188	21.248	1525.03
40	20.999	34.680	2.69	0.00	24.252	20.992	1524.50
50	20.694	34.668	2.72	0.00	24.325	20.685	1523.83
60	19.762	34.657	2.63	0.00	24.564	19.751	1521.42
70	19.432	34.661	2.60	0.00	24.652	19.419	1520.66
75	19.025	34.691	2.58	0.00	24.780	19.012	1519.63
80	18.267	34.680	2.58	0.00	24.962	18.253	1517.52
90	17.338	34.661	2.56	0.00	25.174	17.323	1514.93
100	16.797	34.651	2.56	0.00	25.295	16.781	1513.47
125	16.292	34.630	2.53	0.00	25.397	16.272	1512.32
150	15.106	34.599	2.51	0.00	25.641	15.083	1509.01
175	14.345	34.565	2.48	0.00	25.778	14.319	1506.96
200	13.612	34.539	2.45	0.00	25.912	13.584	1504.96
250	10.757	34.420	2.26	0.00	26.368	10.727	1495.93
300	8.814	34.320	2.04	0.00	26.615	8.782	1489.60
350	8.212	34.297	1.94	0.00	26.691	8.176	1488.15
400	7.638	34.278	1.90	0.00	26.760	7.599	1486.78
450	7.093	34.252	1.81	0.00	26.817	7.050	1485.47
500	6.465	34.236	1.73	0.00	26.889	6.419	1483.82
600	5.406	34.250	1.41	0.00	27.033	5.356	1481.27

Station: K-37d
latitude: 34-14.90N Longtitude: 139-41.90E Depth: 880 m
Date: 1994-05-23 Time: 06:40

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	21.825	34.721	2.55	0.00	24.056	21.825	1526.12
5	22.198	34.716	2.54	0.00	23.948	22.197	1527.14
10	20.722	34.744	2.52	0.00	24.376	20.720	1523.32
20	19.666	34.648	2.52	0.00	24.582	19.662	1520.47
30	19.213	34.736	2.48	0.00	24.766	19.208	1519.46
40	18.801	34.716	2.47	0.00	24.856	18.794	1518.43
50	18.126	34.689	2.48	0.00	25.004	18.118	1516.62
60	17.748	34.676	2.50	0.00	25.086	17.738	1515.66
70	17.535	34.671	2.49	0.00	25.134	17.523	1515.20
75	17.547	34.670	2.50	0.00	25.131	17.534	1515.31
80	17.534	34.669	2.50	0.00	25.133	17.521	1515.36
90	17.507	34.667	2.51	0.00	25.138	17.492	1515.44
100	17.495	34.666	2.51	0.00	25.140	17.478	1515.57
125	17.305	34.663	2.53	0.00	25.184	17.284	1515.42
150	17.050	34.657	2.53	0.00	25.240	17.025	1515.06
175	16.960	34.655	2.53	0.00	25.260	16.931	1515.21
200	16.971	34.655	2.54	0.00	25.257	16.938	1515.65
250	15.561	34.620	2.52	0.00	25.555	15.522	1512.12
300	14.203	34.571	2.48	0.00	25.814	14.160	1508.58
350	10.365	34.359	2.28	0.00	26.389	10.323	1496.12
400	7.976	34.289	1.94	0.00	26.720	7.935	1488.07
450	6.737	34.253	1.75	0.00	26.867	6.696	1484.09
500	6.136	34.258	1.60	0.00	26.949	6.092	1482.55
600	4.904	34.276	1.28	0.00	27.112	4.857	1479.26
700	4.469	34.316	1.17	0.00	27.193	4.415	1479.18
800	4.237	34.334	1.08	0.00	27.232	4.177	1479.89

Station: K-38D
latitude: 34-05.13N Longtitude: 139-51.80E Depth: 1098m
Date: 1994-05-23 Time: 09:00

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	24.020	34.738	2.44	0.00	23.439	24.019	1531.75
5	24.016	34.737	2.44	0.00	23.439	24.015	1531.79
10	24.003	34.736	2.44	0.00	23.442	24.001	1531.84
20	23.994	34.735	2.45	0.00	23.444	23.990	1531.98
30	23.943	34.739	2.45	0.00	23.462	23.937	1532.03
40	23.166	34.795	2.40	0.00	23.732	23.158	1530.30
50	22.370	34.829	2.40	0.00	23.985	22.360	1528.46
60	21.717	34.815	2.38	0.00	24.158	21.705	1526.90
70	21.430	34.794	2.40	0.00	24.221	21.417	1526.29
75	21.290	34.787	2.41	0.00	24.254	21.276	1525.99
80	21.209	34.781	2.42	0.00	24.272	21.193	1525.85
90	21.124	34.774	2.43	0.00	24.290	21.107	1525.78
100	21.060	34.769	2.45	0.00	24.303	21.041	1525.77
125	19.402	34.748	2.48	0.00	24.727	19.379	1521.59
150	18.973	34.737	2.48	0.00	24.828	18.946	1520.78
175	18.188	34.741	2.48	0.00	25.028	18.157	1518.94
200	16.820	34.749	2.50	0.00	25.365	16.787	1515.31
250	15.351	34.624	2.51	0.00	25.605	15.312	1511.47
300	13.561	34.544	2.44	0.00	25.927	13.519	1506.46
350	13.039	34.505	2.39	0.00	26.002	12.991	1505.51
400	10.666	34.365	2.32	0.00	26.341	10.617	1498.02
450	8.908	34.301	2.21	0.00	26.586	8.859	1492.40
500	6.595	34.262	1.77	0.00	26.893	6.549	1484.37
600	5.986	34.265	1.53	0.00	26.973	5.933	1483.61
700	4.700	34.311	1.24	0.00	27.163	4.645	1480.12
800	4.460	34.329	1.17	0.00	27.204	4.398	1480.81
900	4.064	34.360	1.10	0.00	27.270	3.996	1480.85
1000	3.601	34.408	1.08	0.00	27.356	3.529	1480.63

Station: K-39D
latitude: 33-55.18N Longtitude: 140-00.33E Depth: 750 m
Date: 1994-05-23 Time: 11:05

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	24.139	34.737	2.16	0.00	23.403	24.139	1532.04
5	24.122	34.739	2.14	0.00	23.409	24.121	1532.05
10	24.124	34.744	2.21	0.00	23.413	24.121	1532.14
20	23.954	34.730	2.39	0.00	23.452	23.950	1531.88
30	23.955	34.729	2.43	0.00	23.451	23.949	1532.05
40	23.956	34.729	2.43	0.00	23.451	23.947	1532.21
50	23.951	34.729	2.44	0.00	23.453	23.941	1532.37
60	23.931	34.729	2.44	0.00	23.459	23.918	1532.49
70	23.371	34.782	2.41	0.00	23.662	23.357	1531.31
75	23.255	34.788	2.40	0.00	23.701	23.239	1531.11
80	23.036	34.804	2.39	0.00	23.776	23.019	1530.65
90	22.608	34.822	2.39	0.00	23.912	22.590	1529.74
100	22.559	34.825	2.38	0.00	23.929	22.539	1529.78
125	21.510	34.900	2.42	0.00	24.279	21.486	1527.53
150	19.859	34.837	2.42	0.00	24.676	19.831	1523.39
175	17.880	34.780	2.44	0.00	25.134	17.850	1518.08
200	16.370	34.696	2.46	0.00	25.430	16.338	1513.88
250	14.821	34.611	2.42	0.00	25.712	14.783	1509.78
300	13.681	34.538	2.40	0.00	25.897	13.638	1506.84
350	13.112	34.502	2.44	0.00	25.985	13.063	1505.75
400	12.326	34.460	2.43	0.00	26.107	12.272	1503.88
450	10.431	34.367	2.33	0.00	26.384	10.377	1498.01
500	9.692	34.339	2.23	0.00	26.488	9.634	1496.15
600	7.347	34.279	1.93	0.00	26.803	7.288	1488.96
700	6.285	34.250	1.64	0.00	26.924	6.221	1486.43

Station: K-40D
latitude: 35-30.02N Longtitude: 142-00.11E Depth: 4607m
Date: 1994-05-24 Time: 08:30

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	23.610	34.769	2.73	0.00	23.583	23.610	1530.76
5	23.607	34.768	2.72	0.00	23.583	23.606	1530.80
10	23.596	34.768	2.70	0.00	23.586	23.594	1530.86
20	23.600	34.768	2.67	0.00	23.585	23.596	1531.04
30	23.053	34.736	2.67	0.00	23.719	23.047	1529.78
40	21.899	34.753	2.61	0.00	24.059	21.892	1526.98
50	21.324	34.699	2.63	0.00	24.178	21.314	1525.56
60	21.116	34.729	2.57	0.00	24.258	21.104	1525.21
70	20.834	34.699	2.58	0.00	24.311	20.821	1524.58
75	20.778	34.683	2.60	0.00	24.314	20.764	1524.49
80	20.765	34.678	2.61	0.00	24.314	20.750	1524.53
90	20.668	34.667	2.62	0.00	24.331	20.651	1524.42
100	20.586	34.658	2.63	0.00	24.347	20.567	1524.36
125	18.913	34.747	2.56	0.00	24.851	18.890	1520.20
150	17.773	34.776	2.49	0.00	25.158	17.747	1517.35
175	16.696	34.723	2.53	0.00	25.374	16.668	1514.49
200	16.049	34.699	2.53	0.00	25.506	16.017	1512.90
250	14.628	34.606	2.50	0.00	25.750	14.591	1509.16
300	13.316	34.522	2.49	0.00	25.959	13.274	1505.62
350	11.179	34.390	2.39	0.00	26.269	11.136	1499.03
400	10.375	34.363	2.27	0.00	26.391	10.328	1496.98
450	8.962	34.319	2.11	0.00	26.591	8.913	1492.62
500	7.273	34.260	1.84	0.00	26.798	7.225	1487.00

Station: K-41D
latitude: 35-40.00N Longtitude: 142-00.11E Depth: 3669m
Date: 1994-05-24 Time: 10:35

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	23.420	34.773	2.81	0.00	23.642	23.419	1530.29
5	23.464	34.774	2.76	0.00	23.629	23.463	1530.45
10	23.203	34.763	2.74	0.00	23.697	23.201	1529.86
20	22.982	34.760	2.70	0.00	23.758	22.978	1529.46
30	22.396	34.712	2.72	0.00	23.889	22.390	1528.07
40	21.513	34.699	2.64	0.00	24.126	21.506	1525.90
50	21.031	34.697	2.58	0.00	24.256	21.021	1524.77
60	20.742	34.673	2.61	0.00	24.316	20.730	1524.13
70	20.440	34.616	2.67	0.00	24.354	20.427	1523.41
75	20.325	34.603	2.70	0.00	24.374	20.311	1523.17
80	20.185	34.660	2.64	0.00	24.455	20.170	1522.93
90	19.659	34.685	2.59	0.00	24.612	19.643	1521.66
100	18.879	34.679	2.54	0.00	24.808	18.861	1519.61
125	17.740	34.718	2.51	0.00	25.121	17.719	1516.77
150	16.868	34.730	2.53	0.00	25.339	16.844	1514.60
175	16.228	34.713	2.54	0.00	25.475	16.200	1513.05
200	15.038	34.635	2.52	0.00	25.683	15.008	1509.67
250	13.177	34.526	2.41	0.00	25.990	13.142	1504.34
300	11.845	34.437	2.35	0.00	26.182	11.806	1500.56
350	10.605	34.389	2.21	0.00	26.371	10.563	1497.00
400	9.090	34.310	2.09	0.00	26.564	9.046	1492.26
450	6.977	34.138	2.09	0.00	26.743	6.934	1484.88
500	5.869	34.063	2.17	0.00	26.829	5.826	1481.24

Station: K-42D
latitude: 35-50.00N Longtitude: 142-00.13E Depth: 3247m
Date: 1994-05-24 Time: 12:20

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
4	22.271	34.717	2.96	0.00	23.928	22.270	1527.31
5	22.109	34.709	2.95	0.00	23.968	22.108	1526.90
10	21.973	34.694	2.93	0.00	23.995	21.971	1526.61
20	21.162	34.640	2.91	0.00	24.177	21.158	1524.56
30	20.827	34.684	2.77	0.00	24.301	20.821	1523.87
40	20.441	34.710	2.71	0.00	24.425	20.434	1523.02
50	20.182	34.761	2.63	0.00	24.532	20.173	1522.53
60	19.453	34.621	2.80	0.00	24.616	19.442	1520.51
70	18.779	34.616	2.92	0.00	24.784	18.767	1518.76
75	18.546	34.616	2.89	0.00	24.843	18.532	1518.17
80	18.240	34.629	2.90	0.00	24.930	18.226	1517.38
90	17.990	34.622	2.83	0.00	24.986	17.975	1516.81
100	17.569	34.644	2.74	0.00	25.105	17.552	1515.77
125	16.678	34.693	2.56	0.00	25.355	16.657	1513.57
150	15.863	34.647	2.50	0.00	25.508	15.839	1511.44
175	14.907	34.602	2.48	0.00	25.686	14.881	1508.80
200	13.689	34.547	2.45	0.00	25.902	13.661	1505.23
250	12.147	34.466	2.36	0.00	26.147	12.114	1500.81
300	9.739	34.244	2.61	0.00	26.406	9.704	1492.90
350	8.160	34.091	2.88	0.00	26.537	8.124	1487.70
400	8.393	34.274	2.15	0.00	26.644	8.351	1489.62
450	7.730	34.257	1.91	0.00	26.731	7.685	1487.92
500	7.020	34.231	1.82	0.00	26.810	6.972	1485.98

Station: K-43D
latitude: 36-00.21N Longtitude: 142-00.03E Depth: 3343m
Date: 1994-05-24 Time: 18:20

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	21.246	34.700	3.19	0.00	24.200	21.245	1524.55
5	21.183	34.708	3.12	0.00	24.223	21.183	1524.45
10	19.810	34.734	3.21	0.00	24.610	19.808	1520.80
20	19.132	34.729	3.20	0.00	24.781	19.129	1519.06
30	18.804	34.721	3.15	0.00	24.859	18.799	1518.28
40	18.389	34.707	3.07	0.00	24.952	18.382	1517.24
50	17.825	34.703	2.97	0.00	25.089	17.817	1515.76
60	17.618	34.708	2.88	0.00	25.143	17.608	1515.32
70	17.055	34.711	2.76	0.00	25.281	17.044	1513.81
75	16.718	34.687	2.76	0.00	25.342	16.706	1512.86
80	16.555	34.687	2.72	0.00	25.380	16.542	1512.44
90	16.181	34.669	2.70	0.00	25.452	16.167	1511.45
100	15.587	34.635	2.76	0.00	25.561	15.571	1509.74
125	15.008	34.622	2.62	0.00	25.679	14.989	1508.32
150	13.774	34.563	2.59	0.00	25.897	13.753	1504.70
175	12.504	34.467	2.54	0.00	26.078	12.481	1500.78
200	11.872	34.433	2.52	0.00	26.173	11.847	1499.00
250	10.411	34.344	2.48	0.00	26.369	10.381	1494.61
300	6.524	33.790	4.27	0.00	26.529	6.498	1480.20
350	5.523	33.707	4.18	0.00	26.589	5.494	1476.93
400	3.672	33.534	4.40	0.00	26.653	3.645	1469.90
450	3.351	33.588	3.85	0.00	26.726	3.322	1469.43
500	2.524	33.558	3.40	0.00	26.775	2.494	1466.66

Station: K-44
latitude: 36-09.90N Longtitude: 142-00.12E Depth: 5932m
Date: 1994-05-24 Time: 20:35

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.701	34.712	2.93	0.00	24.621	19.700	1520.34
5	19.748	34.715	2.92	0.00	24.611	19.747	1520.53
10	19.444	34.703	2.93	0.00	24.681	19.442	1519.74
20	19.070	34.701	2.96	0.00	24.776	19.066	1518.85
30	18.982	34.699	2.96	0.00	24.797	18.977	1518.77
40	18.892	34.695	2.91	0.00	24.817	18.885	1518.67
50	18.569	34.697	2.83	0.00	24.900	18.560	1517.91
60	17.916	34.705	2.72	0.00	25.068	17.906	1516.19
70	17.577	34.717	2.61	0.00	25.160	17.566	1515.38
75	17.330	34.716	2.60	0.00	25.219	17.317	1514.72
80	16.983	34.700	2.58	0.00	25.289	16.970	1513.75
90	16.212	34.657	2.67	0.00	25.436	16.198	1511.53
100	15.734	34.660	2.55	0.00	25.547	15.718	1510.22
125	14.446	34.593	2.49	0.00	25.779	14.427	1506.49
150	13.090	34.494	2.47	0.00	25.984	13.069	1502.36
175	10.435	34.225	2.51	0.00	26.272	10.414	1493.32
200	8.029	33.941	3.46	0.00	26.438	8.009	1484.55
250	5.957	33.706	4.19	0.00	26.536	5.936	1477.03
300	5.879	33.721	4.30	0.00	26.557	5.853	1477.56
350	5.456	33.689	4.33	0.00	26.583	5.428	1476.64
400	4.042	33.551	4.39	0.00	26.630	4.014	1471.47
450	3.934	33.616	4.08	0.00	26.692	3.902	1471.93
500	3.049	33.580	3.86	0.00	26.747	3.017	1468.95

Station: K-45
latitude: 36-20.00N Longtitude: 142-00.04E Depth: 5318m
Date: 1994-05-24 Time: 22:55

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.756	34.726	2.92	0.00	24.618	19.756	1520.51
5	19.987	34.731	2.90	0.00	24.561	19.986	1521.21
10	19.291	34.717	2.93	0.00	24.732	19.289	1519.33
20	19.058	34.720	2.98	0.00	24.794	19.054	1518.84
30	18.940	34.721	2.89	0.00	24.824	18.935	1518.67
40	18.484	34.710	2.82	0.00	24.931	18.477	1517.52
50	17.747	34.698	2.76	0.00	25.104	17.738	1515.52
60	16.926	34.690	2.70	0.00	25.295	16.916	1513.24
70	16.689	34.708	2.59	0.00	25.364	16.677	1512.71
75	16.404	34.686	2.60	0.00	25.414	16.392	1511.90
80	16.165	34.680	2.59	0.00	25.465	16.152	1511.24
90	15.909	34.669	2.54	0.00	25.515	15.894	1510.61
100	15.153	34.631	2.51	0.00	25.655	15.138	1508.37
125	13.991	34.565	2.44	0.00	25.853	13.973	1504.99
150	13.298	34.533	2.38	0.00	25.971	13.277	1503.10
175	11.866	34.424	2.45	0.00	26.167	11.843	1498.55
200	11.020	34.362	2.46	0.00	26.275	10.996	1495.96
250	6.685	33.798	3.84	0.00	26.515	6.662	1480.02
300	6.442	33.800	4.14	0.00	26.548	6.416	1479.89
350	4.756	33.664	4.12	0.00	26.644	4.730	1473.76
400	2.751	33.510	4.08	0.00	26.717	2.727	1465.94
450	4.636	33.864	2.92	0.00	26.815	4.602	1475.16
500	3.974	33.942	1.97	0.00	26.947	3.939	1473.34

Station: K-46
latitude: 36-30.00N Longtitude: 142-00.10E Depth: 6686m
Date: 1994-05-25 Time: 01:05

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	20.426	34.694	2.87	0.00	24.417	20.426	1522.33
5	20.393	34.693	2.86	0.00	24.425	20.392	1522.28
10	20.454	34.694	2.85	0.00	24.409	20.452	1522.54
20	19.854	34.676	2.88	0.00	24.554	19.850	1521.03
30	17.822	34.605	2.94	0.00	25.014	17.817	1515.31
40	16.673	34.641	2.69	0.00	25.317	16.666	1512.08
50	15.961	34.632	2.57	0.00	25.474	15.953	1510.06
60	15.515	34.620	2.53	0.00	25.566	15.506	1508.83
70	14.601	34.588	2.52	0.00	25.741	14.591	1506.07
75	14.120	34.577	2.50	0.00	25.836	14.109	1504.60
80	13.901	34.562	2.42	0.00	25.870	13.889	1503.95
90	13.698	34.549	2.36	0.00	25.902	13.685	1503.44
100	13.518	34.539	2.38	0.00	25.931	13.504	1503.00
125	11.767	34.401	2.55	0.00	26.168	11.751	1497.36
150	9.830	34.168	2.98	0.00	26.332	9.813	1490.66
175	7.817	33.915	3.50	0.00	26.449	7.800	1483.30
200	7.172	33.857	3.80	0.00	26.495	7.153	1481.17
250	7.429	34.060	2.53	0.00	26.618	7.405	1483.23
300	7.227	34.119	2.33	0.00	26.694	7.198	1483.35
350	5.104	33.900	2.55	0.00	26.792	5.077	1475.49
400	4.587	33.894	2.36	0.00	26.844	4.557	1474.18
450	3.928	33.854	2.29	0.00	26.882	3.896	1472.21
500	3.955	33.919	2.00	0.00	26.931	3.920	1473.23

Station: K-47
latitude: 36-40.02N Longtitude: 142-00.02E Depth: 2514m
Date: 1994-05-25 Time: 03:25

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	16.171	34.416	3.51	0.00	25.261	16.171	1509.66
5	16.426	34.426	3.50	0.00	25.209	16.425	1510.50
10	15.539	34.469	3.50	0.00	25.444	15.538	1507.90
20	15.526	34.457	3.45	0.00	25.438	15.522	1508.01
30	14.470	34.436	3.29	0.00	25.652	14.466	1504.81
40	14.072	34.525	2.78	0.00	25.806	14.066	1503.80
50	13.282	34.444	2.65	0.00	25.906	13.275	1501.29
60	12.451	34.428	2.74	0.00	26.058	12.443	1498.65
70	12.475	34.471	2.47	0.00	26.087	12.466	1498.95
75	12.073	34.413	2.51	0.00	26.120	12.063	1497.60
80	11.264	34.278	2.76	0.00	26.166	11.254	1494.73
90	10.019	34.130	3.18	0.00	26.270	10.008	1490.31
100	10.334	34.228	2.93	0.00	26.292	10.323	1491.73
125	9.312	34.135	2.90	0.00	26.391	9.298	1488.33
150	7.536	33.878	3.87	0.00	26.460	7.522	1481.77
175	9.024	34.233	2.70	0.00	26.514	9.005	1488.21
200	9.281	34.319	2.25	0.00	26.540	9.259	1489.68
250	7.594	34.084	2.56	0.00	26.614	7.570	1483.90
300	4.097	33.645	3.64	0.00	26.699	4.077	1470.19
350	3.536	33.741	2.88	0.00	26.831	3.513	1468.77
400	3.597	33.822	2.36	0.00	26.890	3.571	1469.96
450	3.956	33.950	1.90	0.00	26.956	3.924	1472.45
500	3.268	33.912	1.59	0.00	26.992	3.235	1470.32

Station: K-48
latitude: 36-49.99N Longtitude: 142-00.13E Depth: 2503m
Date: 1994-05-25 Time: 05:15

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	17.239	34.643	3.13	0.00	25.184	17.238	1513.15
5	17.237	34.640	3.12	0.00	25.183	17.236	1513.20
10	17.197	34.643	3.12	0.00	25.194	17.196	1513.16
20	16.595	34.644	3.04	0.00	25.337	16.592	1511.52
30	15.373	34.635	2.69	0.00	25.609	15.368	1507.91
40	15.122	34.625	2.59	0.00	25.657	15.116	1507.27
50	14.649	34.605	2.55	0.00	25.744	14.641	1505.91
60	13.489	34.539	2.50	0.00	25.938	13.481	1502.25
70	11.740	34.372	2.62	0.00	26.151	11.731	1496.33
75	11.494	34.315	2.73	0.00	26.152	11.485	1495.49
80	10.776	34.218	2.88	0.00	26.207	10.767	1492.95
90	9.749	34.139	3.09	0.00	26.323	9.739	1489.35
100	9.132	34.113	3.03	0.00	26.403	9.121	1487.23
125	7.442	33.908	3.99	0.00	26.497	7.430	1481.04
150	7.164	33.892	4.08	0.00	26.523	7.150	1480.36
175	7.065	33.891	4.13	0.00	26.537	7.048	1480.38
200	6.850	33.870	4.14	0.00	26.549	6.832	1479.94
250	4.377	33.601	4.32	0.00	26.635	4.359	1470.47
300	3.040	33.493	4.25	0.00	26.679	3.022	1465.52
350	2.672	33.547	3.64	0.00	26.753	2.652	1464.83
400	2.749	33.656	2.95	0.00	26.835	2.725	1466.12
450	4.208	33.936	2.25	0.00	26.918	4.176	1473.49
500	3.965	33.978	1.72	0.00	26.977	3.930	1473.35

Station: K-53d
latitude: 36-57.06N Longtitude: 142-19.95E Depth: 3015m
Date: 1994-05-25 Time: 12:40

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.887	34.661	2.90	0.00	24.534	19.886	1520.80
5	19.909	34.667	2.88	0.00	24.533	19.908	1520.92
10	18.740	34.665	2.96	0.00	24.832	18.738	1517.70
20	18.231	34.672	2.94	0.00	24.965	18.228	1516.41
30	16.377	34.675	2.74	0.00	25.412	16.372	1511.06
40	15.743	34.653	2.62	0.00	25.540	15.736	1509.25
50	15.083	34.627	2.55	0.00	25.667	15.076	1507.32
60	14.826	34.614	2.47	0.00	25.713	14.817	1506.66
70	14.465	34.595	2.51	0.00	25.777	14.455	1505.65
75	14.090	34.578	2.51	0.00	25.843	14.079	1504.50
80	13.920	34.565	2.48	0.00	25.868	13.909	1504.02
90	13.479	34.539	2.45	0.00	25.940	13.467	1502.71
100	13.253	34.528	2.42	0.00	25.977	13.239	1502.11
125	12.520	34.491	2.38	0.00	26.094	12.503	1500.04
150	12.032	34.463	2.34	0.00	26.166	12.013	1498.76
175	11.193	34.421	2.29	0.00	26.290	11.171	1496.22
200	10.227	34.365	2.20	0.00	26.418	10.204	1493.16
250	8.842	34.301	2.02	0.00	26.596	8.815	1488.86
300	7.811	34.272	1.89	0.00	26.731	7.782	1485.78
350	6.586	34.178	1.87	0.00	26.827	6.554	1481.75
400	5.565	34.098	1.85	0.00	26.894	5.532	1478.42
450	4.943	34.076	1.71	0.00	26.949	4.907	1476.69
500	4.733	34.116	1.51	0.00	27.005	4.695	1476.71

Station: K-49
latitude: 36-59.93N Longtitude: 142-00.19E Depth: 1350m
Date: 1994-05-25 Time: 07:15

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	12.669	33.760	4.00	0.00	25.498	12.669	1497.64
5	13.078	33.775	3.94	0.00	25.429	13.077	1499.07
10	12.500	33.778	3.96	0.00	25.545	12.498	1497.22
20	9.770	33.688	4.27	0.00	25.966	9.768	1487.72
30	9.526	33.722	4.26	0.00	26.033	9.523	1487.04
40	8.160	33.743	4.31	0.00	26.263	8.156	1482.17
50	9.329	34.024	3.76	0.00	26.301	9.324	1487.02
60	10.211	34.273	2.89	0.00	26.348	10.204	1490.68
70	9.907	34.245	2.72	0.00	26.379	9.899	1489.72
75	9.684	34.208	2.80	0.00	26.387	9.676	1488.95
80	9.199	34.129	2.98	0.00	26.405	9.190	1487.17
90	7.935	33.949	3.58	0.00	26.459	7.926	1482.40
100	7.995	33.970	3.71	0.00	26.465	7.986	1482.81
125	7.052	33.882	3.90	0.00	26.531	7.041	1479.51
150	6.607	33.824	4.04	0.00	26.545	6.594	1478.11
175	5.961	33.759	4.09	0.00	26.577	5.947	1475.89
200	5.446	33.724	3.99	0.00	26.612	5.430	1474.18
250	3.372	33.519	4.22	0.00	26.669	3.356	1466.15
300	2.971	33.503	4.16	0.00	26.693	2.953	1465.24
350	3.725	33.694	3.36	0.00	26.775	3.702	1469.51
400	2.278	33.619	2.87	0.00	26.844	2.256	1464.03
450	2.598	33.732	2.34	0.00	26.907	2.571	1466.38
500	2.793	33.817	1.86	0.00	26.959	2.762	1468.16

Station: K-55d
latitude: 36-43.29N Longtitude: 142-40.05E Depth: 5412m
Date: 1994-05-25 Time: 15:00

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	20.092	34.673	2.88	0.00	24.490	20.091	1521.38
5	19.902	34.664	2.89	0.00	24.533	19.901	1520.90
10	19.447	34.673	2.92	0.00	24.658	19.445	1519.72
20	18.991	34.666	2.93	0.00	24.769	18.987	1518.59
30	18.667	34.682	2.94	0.00	24.863	18.662	1517.85
40	18.260	34.685	2.88	0.00	24.968	18.253	1516.84
50	17.438	34.679	2.82	0.00	25.164	17.430	1514.59
60	16.661	34.655	2.72	0.00	25.330	16.652	1512.40
70	16.040	34.651	2.69	0.00	25.471	16.029	1510.66
75	15.918	34.647	2.68	0.00	25.495	15.907	1510.36
80	15.729	34.641	2.69	0.00	25.534	15.716	1509.85
90	15.373	34.629	2.64	0.00	25.604	15.359	1508.90
100	15.019	34.611	2.61	0.00	25.669	15.004	1507.93
125	14.130	34.570	2.53	0.00	25.828	14.112	1505.45
150	13.569	34.547	2.49	0.00	25.927	13.548	1504.00
175	13.129	34.527	2.46	0.00	26.001	13.105	1502.94
200	12.315	34.481	2.40	0.00	26.126	12.289	1500.57
250	10.883	34.404	2.27	0.00	26.333	10.852	1496.35
300	9.699	34.343	2.13	0.00	26.490	9.665	1492.88
350	7.891	34.286	1.95	0.00	26.730	7.856	1486.93
400	6.557	34.257	1.72	0.00	26.893	6.521	1482.57
450	5.216	34.184	1.54	0.00	27.003	5.180	1477.95
500	5.100	34.250	1.36	0.00	27.069	5.060	1478.38

Station: K-50
latitude: 37-09.96N Longtitude: 142-00.08E Depth: 1020m
Date: 1994-05-25 Time: 09:35

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	10.744	33.577	4.36	0.00	25.713	10.743	1490.78
5	10.722	33.578	4.36	0.00	25.718	10.722	1490.75
10	10.191	33.563	4.43	0.00	25.798	10.190	1488.92
20	8.986	33.667	4.51	0.00	26.077	8.984	1484.83
30	6.681	33.599	4.56	0.00	26.358	6.678	1476.15
40	5.814	33.565	4.52	0.00	26.442	5.811	1472.84
50	5.753	33.607	4.43	0.00	26.483	5.749	1472.81
60	5.239	33.581	4.43	0.00	26.523	5.234	1470.87
70	5.130	33.581	4.41	0.00	26.536	5.124	1470.59
75	5.124	33.591	4.40	0.00	26.545	5.118	1470.66
80	5.047	33.593	4.39	0.00	26.555	5.041	1470.43
90	4.942	33.589	4.38	0.00	26.563	4.936	1470.17
100	4.758	33.578	4.38	0.00	26.575	4.750	1469.56
125	4.245	33.542	4.40	0.00	26.602	4.236	1467.80
150	3.303	33.459	4.51	0.00	26.628	3.294	1464.15
175	2.874	33.434	4.52	0.00	26.646	2.864	1462.69
200	3.071	33.466	4.41	0.00	26.654	3.059	1463.98
250	2.667	33.500	3.92	0.00	26.717	2.652	1463.10
300	2.927	33.624	3.20	0.00	26.793	2.909	1465.21
350	3.039	33.695	2.68	0.00	26.840	3.018	1466.60
400	2.463	33.703	2.26	0.00	26.896	2.440	1464.94
450	3.756	33.932	1.75	0.00	26.961	3.725	1471.59
500	2.961	33.899	1.38	0.00	27.009	2.930	1468.99

Station: K-57D
latitude: 36-40.12N Longtitude: 143-00.12E Depth: 6007m
Date: 1994-05-25 Time: 17:00

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	21.628	34.797	2.59	0.00	24.168	21.628	1525.68
5	21.533	34.796	2.60	0.00	24.194	21.532	1525.48
10	21.271	34.770	2.63	0.00	24.246	21.269	1524.83
20	21.033	34.764	2.65	0.00	24.306	21.029	1524.35
30	20.634	34.794	2.67	0.00	24.437	20.629	1523.47
40	20.156	34.818	2.70	0.00	24.583	20.149	1522.36
50	19.617	34.835	2.69	0.00	24.738	19.608	1521.05
60	18.981	34.853	2.64	0.00	24.915	18.971	1519.44
70	18.876	34.882	2.70	0.00	24.964	18.864	1519.34
75	18.598	34.883	2.70	0.00	25.035	18.585	1518.62
80	18.532	34.886	2.70	0.00	25.053	18.518	1518.52
90	18.261	34.890	2.71	0.00	25.124	18.246	1517.91
100	17.997	34.876	2.72	0.00	25.179	17.979	1517.29
125	17.369	34.838	2.70	0.00	25.302	17.348	1515.81
150	16.946	34.788	2.67	0.00	25.366	16.922	1514.90
175	15.774	34.685	2.53	0.00	25.557	15.747	1511.62
200	14.852	34.621	2.46	0.00	25.713	14.822	1509.06
250	13.627	34.545	2.42	0.00	25.914	13.591	1505.85
300	11.456	34.406	2.34	0.00	26.230	11.418	1499.18
350	9.864	34.297	2.37	0.00	26.427	9.823	1494.24
400	6.118	33.744	3.67	0.00	26.546	6.083	1480.18
450	7.358	34.097	2.92	0.00	26.657	7.315	1486.30
500	4.520	33.802	3.08	0.00	26.779	4.483	1475.43

Station: K-59D
latitude: 36-59.91N Longtitude: 143-15.18E Depth: 6744m
Date: 1994-05-25 Time: 19:00

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	21.646	34.763	2.53	0.00	24.138	21.645	1525.69
5	21.689	34.765	2.55	0.00	24.127	21.688	1525.86
10	21.376	34.756	2.57	0.00	24.207	21.374	1525.10
20	21.255	34.753	2.59	0.00	24.238	21.251	1524.94
30	21.202	34.764	2.60	0.00	24.260	21.196	1524.97
40	21.057	34.779	2.61	0.00	24.311	21.050	1524.77
50	19.768	34.776	2.56	0.00	24.653	19.759	1521.40
60	19.176	34.868	2.64	0.00	24.876	19.165	1520.01
70	18.635	34.902	2.68	0.00	25.040	18.623	1518.67
75	18.599	34.901	2.68	0.00	25.048	18.585	1518.65
80	18.581	34.901	2.68	0.00	25.053	18.567	1518.68
90	18.493	34.908	2.68	0.00	25.080	18.477	1518.60
100	18.322	34.900	2.67	0.00	25.117	18.304	1518.26
125	17.748	34.866	2.67	0.00	25.232	17.727	1516.96
150	17.420	34.849	2.74	0.00	25.299	17.395	1516.39
175	16.923	34.789	2.64	0.00	25.372	16.894	1515.25
200	16.224	34.726	2.59	0.00	25.487	16.192	1513.47
250	14.136	34.575	2.46	0.00	25.831	14.100	1507.54
300	12.148	34.450	2.44	0.00	26.134	12.109	1501.62
350	10.476	34.333	2.39	0.00	26.349	10.435	1496.48
400	8.114	34.105	2.54	0.00	26.554	8.073	1488.37
450	8.170	34.277	2.06	0.00	26.681	8.124	1489.62
500	7.428	34.254	1.86	0.00	26.771	7.380	1487.59

Station: K-61D
latitude: 37-20.00N Longtitude: 143-30.50E Depth: 7088m
Date: 1994-05-25 Time: 20:55

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	21.012	34.752	2.62	0.00	24.303	21.012	1523.98
5	21.003	34.752	2.63	0.00	24.306	21.002	1524.01
10	20.967	34.752	2.64	0.00	24.315	20.965	1524.00
20	20.638	34.754	2.65	0.00	24.406	20.634	1523.27
30	19.185	34.684	2.70	0.00	24.733	19.180	1519.33
40	18.540	34.675	2.81	0.00	24.890	18.533	1517.64
50	18.419	34.673	2.85	0.00	24.919	18.410	1517.45
60	16.938	34.688	2.71	0.00	25.291	16.929	1513.27
70	16.178	34.669	2.64	0.00	25.453	16.166	1511.10
75	15.963	34.654	2.63	0.00	25.491	15.951	1510.51
80	15.624	34.656	2.53	0.00	25.569	15.612	1509.54
90	15.089	34.628	2.53	0.00	25.667	15.076	1508.00
100	14.453	34.597	2.54	0.00	25.780	14.439	1506.11
125	13.599	34.550	2.47	0.00	25.923	13.582	1503.70
150	12.371	34.477	2.36	0.00	26.112	12.351	1499.93
175	11.273	34.422	2.30	0.00	26.276	11.251	1496.50
200	10.322	34.345	2.25	0.00	26.386	10.299	1493.47
250	6.810	33.834	3.68	0.00	26.526	6.788	1480.56
300	4.530	33.598	4.15	0.00	26.616	4.508	1471.92
350	2.391	33.419	4.37	0.00	26.675	2.371	1463.44
400	2.455	33.491	3.96	0.00	26.727	2.432	1464.63
450	2.033	33.523	3.44	0.00	26.786	2.009	1463.65
500	2.442	33.663	2.66	0.00	26.865	2.413	1466.44

Station: K-63D
latitude: 37-39.91N Longtitude: 143-45.32E Depth: 7212m
Date: 1994-05-25 Time: 22:55

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	10.958	33.271	4.20	0.00	25.437	10.957	1491.16
5	10.780	33.267	4.25	0.00	25.466	10.779	1490.58
10	10.884	33.258	4.25	0.00	25.440	10.882	1491.02
20	7.393	33.265	4.87	0.00	25.998	7.391	1478.33
30	6.117	33.334	4.96	0.00	26.222	6.114	1473.59
40	4.752	33.324	4.89	0.00	26.374	4.750	1468.23
50	4.569	33.392	4.71	0.00	26.448	4.565	1467.73
60	4.382	33.408	4.58	0.00	26.480	4.378	1467.14
70	4.299	33.450	4.49	0.00	26.522	4.295	1467.01
75	4.310	33.473	4.43	0.00	26.540	4.305	1467.17
80	4.282	33.472	4.40	0.00	26.542	4.277	1467.13
90	4.121	33.480	4.38	0.00	26.565	4.114	1466.63
100	4.113	33.490	4.35	0.00	26.574	4.106	1466.78
125	3.484	33.454	4.38	0.00	26.607	3.476	1464.50
150	3.250	33.448	4.37	0.00	26.624	3.241	1463.91
175	2.789	33.434	4.38	0.00	26.653	2.779	1462.32
200	2.549	33.442	4.28	0.00	26.680	2.538	1461.70
250	2.590	33.509	3.90	0.00	26.731	2.575	1462.78
300	2.604	33.576	3.32	0.00	26.783	2.587	1463.75
350	2.479	33.634	2.83	0.00	26.840	2.459	1464.10
400	3.260	33.789	2.36	0.00	26.895	3.234	1468.48
450	2.932	33.805	2.00	0.00	26.937	2.904	1467.92
500	3.000	33.878	1.62	0.00	26.989	2.968	1469.13

Station: K-65D
latitude: 37-59.96N Longtitude: 144-00.04E Depth: 7442m
Date: 1994-05-26 Time: 01:01

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	17.093	34.386	3.13	0.00	25.022	17.093	1512.43
5	16.745	34.441	3.15	0.00	25.146	16.744	1511.49
10	14.245	34.227	3.34	0.00	25.539	14.244	1503.52
20	12.471	34.119	3.39	0.00	25.815	12.469	1497.69
30	11.482	34.128	3.25	0.00	26.009	11.478	1494.48
40	10.116	33.993	3.37	0.00	26.147	10.111	1489.67
50	10.426	34.158	3.24	0.00	26.222	10.420	1491.14
60	10.832	34.318	2.98	0.00	26.275	10.824	1492.94
70	10.421	34.269	2.97	0.00	26.309	10.412	1491.59
75	10.084	34.216	3.02	0.00	26.326	10.075	1490.40
80	9.679	34.157	3.11	0.00	26.348	9.670	1488.95
90	8.875	34.065	3.22	0.00	26.406	8.865	1486.06
100	8.697	34.064	3.17	0.00	26.433	8.686	1485.56
125	8.680	34.108	2.99	0.00	26.470	8.667	1485.97
150	7.737	34.038	2.85	0.00	26.557	7.723	1482.74
175	5.923	33.802	3.22	0.00	26.616	5.908	1475.78
200	6.863	33.994	2.88	0.00	26.645	6.845	1480.14
250	6.253	34.032	2.44	0.00	26.755	6.231	1478.62
300	5.529	34.001	2.29	0.00	26.821	5.505	1476.51
350	5.233	34.046	1.97	0.00	26.892	5.205	1476.19
400	4.302	33.979	1.83	0.00	26.943	4.273	1473.11
450	3.987	33.985	1.63	0.00	26.980	3.956	1472.63
500	3.942	34.039	1.41	0.00	27.028	3.906	1473.33
600	4.343	34.255	1.16	0.00	27.158	4.298	1476.93
700	3.818	34.297	0.95	0.00	27.246	3.768	1476.44
800	3.508	34.339	0.83	0.00	27.310	3.452	1476.84
900	3.229	34.373	0.75	0.00	27.364	3.167	1477.35
1000	3.008	34.416	0.76	0.00	27.419	2.940	1478.12

Station: K-67
latitude: 38-00.00N Longtitude: 143-33.48E Depth: 4577m
Date: 1994-05-26 Time: 04:25

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	16.669	34.262	3.28	0.00	25.027	16.669	1511.01
5	16.356	34.265	3.30	0.00	25.102	16.355	1510.11
10	15.236	34.287	3.41	0.00	25.371	15.235	1506.74
20	13.906	34.292	3.31	0.00	25.660	13.903	1502.66
30	12.957	34.375	2.96	0.00	25.918	12.952	1499.79
40	10.313	34.016	3.35	0.00	26.130	10.309	1490.40
50	9.145	33.869	3.71	0.00	26.209	9.140	1486.16
60	6.125	33.536	4.04	0.00	26.381	6.120	1474.37
70	3.711	33.224	4.64	0.00	26.402	3.706	1464.26
75	4.815	33.393	4.51	0.00	26.422	4.810	1469.15
80	4.807	33.435	4.48	0.00	26.456	4.801	1469.25
90	5.505	33.571	4.24	0.00	26.484	5.498	1472.43
100	5.604	33.614	4.13	0.00	26.506	5.596	1473.04
125	4.936	33.573	4.20	0.00	26.551	4.927	1470.69
150	4.614	33.571	4.22	0.00	26.585	4.603	1469.78
175	4.035	33.536	4.24	0.00	26.618	4.023	1467.74
200	4.362	33.648	3.94	0.00	26.673	4.348	1469.65
250	2.634	33.559	3.51	0.00	26.767	2.620	1463.04
300	3.364	33.681	3.13	0.00	26.799	3.345	1467.15
350	2.551	33.697	2.59	0.00	26.884	2.530	1464.50
400	2.938	33.784	2.10	0.00	26.920	2.914	1467.10
450	3.530	33.919	1.72	0.00	26.973	3.500	1470.62
500	4.423	34.139	1.39	0.00	27.057	4.386	1475.46

Station: K-69
latitude: 38-00.00N Longtitude: 143-00.32E Depth: 1877m
Date: 1994-05-26 Time: 06:35

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	17.506	34.513	3.19	0.00	25.020	17.506	1513.80
5	17.432	34.518	3.20	0.00	25.042	17.431	1513.64
10	16.287	34.480	3.31	0.00	25.283	16.286	1510.23
20	14.387	34.338	3.27	0.00	25.595	14.384	1504.27
30	11.914	34.059	3.34	0.00	25.875	11.910	1495.89
40	8.774	33.657	3.93	0.00	26.102	8.770	1484.36
50	10.164	34.093	3.30	0.00	26.216	10.158	1490.13
60	8.262	33.868	3.55	0.00	26.346	8.256	1483.04
70	7.108	33.719	4.03	0.00	26.395	7.102	1478.61
75	7.132	33.757	4.04	0.00	26.421	7.125	1478.84
80	7.030	33.760	4.04	0.00	26.438	7.023	1478.53
90	7.035	33.785	4.02	0.00	26.457	7.027	1478.74
100	6.977	33.787	4.01	0.00	26.467	6.968	1478.68
125	7.444	33.982	3.10	0.00	26.555	7.432	1481.14
150	6.050	33.814	3.36	0.00	26.609	6.038	1475.90
175	5.534	33.777	3.43	0.00	26.643	5.520	1474.20
200	5.912	33.895	3.11	0.00	26.690	5.896	1476.27
250	5.991	34.026	2.41	0.00	26.784	5.970	1477.57
300	5.515	34.061	2.07	0.00	26.871	5.490	1476.53
350	4.504	33.995	1.87	0.00	26.933	4.478	1473.15
400	4.369	34.047	1.61	0.00	26.989	4.340	1473.48
450	3.639	34.024	1.32	0.00	27.046	3.608	1471.22
500	3.689	34.102	1.15	0.00	27.103	3.655	1472.35

Station: K-71
latitude: 38-00.02N Longtitude: 142-30.09E Depth: 1123m
Date: 1994-05-26 Time: 09:00

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	10.745	33.137	4.32	0.00	25.370	10.745	1490.25
5	10.197	33.159	4.42	0.00	25.482	10.197	1488.37
10	9.659	33.226	4.52	0.00	25.624	9.658	1486.59
20	8.749	33.394	4.64	0.00	25.900	8.747	1483.62
30	7.253	33.476	4.73	0.00	26.184	7.250	1478.21
40	5.990	33.531	4.77	0.00	26.393	5.987	1473.50
50	6.223	33.680	4.39	0.00	26.482	6.219	1474.78
60	5.458	33.590	4.41	0.00	26.505	5.454	1471.77
70	5.649	33.653	4.29	0.00	26.531	5.644	1472.78
75	5.317	33.635	4.27	0.00	26.556	5.311	1471.50
80	5.163	33.614	4.28	0.00	26.558	5.157	1470.93
90	3.930	33.502	4.45	0.00	26.601	3.924	1465.87
100	3.200	33.426	4.58	0.00	26.611	3.194	1462.85
125	3.071	33.433	4.59	0.00	26.628	3.064	1462.71
150	2.480	33.427	4.47	0.00	26.674	2.471	1460.56
175	2.363	33.437	4.36	0.00	26.691	2.354	1460.48
200	1.669	33.414	4.15	0.00	26.725	1.660	1457.81
250	2.485	33.588	3.25	0.00	26.802	2.471	1462.43
300	3.033	33.738	2.53	0.00	26.874	3.014	1465.81
350	3.371	33.844	2.07	0.00	26.928	3.348	1468.21
400	3.519	33.914	1.76	0.00	26.970	3.493	1469.75
450	3.250	33.956	1.40	0.00	27.029	3.221	1469.48
500	3.422	34.044	1.12	0.00	27.083	3.389	1471.15

Station: K-75
latitude: 38-15.03N Longtitude: 142-00.06E Depth: 310mm
Date: 1994-05-31 Time: 12:10

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	11.457	33.588	4.61	0.00	25.594	11.456	1493.29
5	11.475	33.592	4.58	0.00	25.594	11.474	1493.41
10	10.649	33.623	4.66	0.00	25.765	10.648	1490.63
20	9.282	33.638	4.71	0.00	26.007	9.280	1485.88
30	8.384	33.625	4.69	0.00	26.137	8.381	1482.70
40	8.761	33.868	4.43	0.00	26.270	8.757	1484.57
50	7.766	33.794	4.42	0.00	26.361	7.761	1480.91
60	7.678	33.878	4.29	0.00	26.440	7.672	1480.84
70	7.353	33.894	4.22	0.00	26.499	7.347	1479.78
75	7.302	33.892	4.23	0.00	26.504	7.295	1479.66
80	7.206	33.888	4.24	0.00	26.515	7.198	1479.37
90	7.028	33.877	4.28	0.00	26.531	7.020	1478.83
100	6.851	33.858	4.29	0.00	26.540	6.842	1478.28
125	-0.000	-0.000	-0.00	-0.00	-0.000	-0.000	-0.00
150	4.138	33.556	4.42	0.00	26.624	4.127	1467.79
175	4.026	33.569	4.30	0.00	26.645	4.014	1467.74
200	3.017	33.477	4.39	0.00	26.668	3.005	1463.77
250	2.832	33.475	4.27	0.00	26.682	2.817	1463.78

Station: K-76
latitude: 38-15.03N Longtitude: 142-29.99E Depth: 1166m
Date: 1994-05-31 Time: 15:20

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	11.724	33.462	4.67	0.00	25.447	11.723	1494.06
5	11.991	33.667	4.59	0.00	25.556	11.990	1495.27
10	11.588	33.760	4.59	0.00	25.703	11.587	1494.08
20	11.455	33.651	4.56	0.00	25.643	11.452	1493.65
30	10.127	33.946	4.43	0.00	26.108	10.123	1489.49
40	8.340	33.917	4.38	0.00	26.373	8.336	1483.06
50	7.339	33.829	4.40	0.00	26.449	7.334	1479.31
60	6.668	33.761	4.39	0.00	26.488	6.663	1476.79
70	6.455	33.740	4.39	0.00	26.499	6.449	1476.09
75	6.453	33.764	4.44	0.00	26.518	6.446	1476.20
80	6.330	33.755	4.48	0.00	26.527	6.323	1475.78
90	6.029	33.725	4.50	0.00	26.542	6.022	1474.72
100	5.469	33.672	4.52	0.00	26.568	5.462	1472.57
125	4.639	33.596	4.55	0.00	26.603	4.630	1469.51
150	3.943	33.558	4.60	0.01	26.645	3.933	1466.97
175	3.045	33.489	4.56	0.00	26.675	3.035	1463.49
200	2.375	33.449	4.50	0.00	26.700	2.364	1460.95
250	3.675	33.671	3.53	0.00	26.761	3.658	1467.63
300	3.310	33.733	2.75	0.00	26.846	3.291	1466.98
350	3.652	33.856	2.13	0.00	26.911	3.629	1469.41
400	3.789	33.948	1.69	0.00	26.970	3.761	1470.93
450	3.881	34.055	1.33	0.00	27.047	3.849	1472.27
500	3.744	34.095	1.10	0.00	27.092	3.710	1472.57

Station: K-77
latitude: 38-15.00N Longtitude: 143-00.00E Depth: 1544m
Date: 1994-05-31 Time: 20:10

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
3	15.508	33.953	4.04	0.00	25.054	15.508	1507.09
5	15.586	33.972	3.99	0.00	25.051	15.585	1507.39
10	14.576	33.877	4.08	0.00	25.199	14.575	1504.17
20	12.752	33.865	4.22	0.00	25.563	12.749	1498.34
30	10.745	33.925	4.11	0.00	25.984	10.742	1491.66
40	11.232	34.229	3.58	0.00	26.134	11.227	1493.90
50	10.488	34.280	3.27	0.00	26.306	10.482	1491.51
60	10.164	34.244	3.21	0.00	26.334	10.157	1490.48
70	9.702	34.189	3.27	0.00	26.369	9.694	1488.91
75	9.644	34.187	3.24	0.00	26.377	9.636	1488.78
80	9.401	34.147	3.30	0.00	26.386	9.392	1487.93
90	9.196	34.126	3.34	0.00	26.402	9.186	1487.32
100	9.057	34.107	3.35	0.00	26.410	9.046	1486.95
125	7.722	33.949	3.46	0.00	26.490	7.709	1482.16
150	6.275	33.769	4.20	0.00	26.545	6.262	1476.73
175	5.655	33.695	4.15	0.00	26.564	5.641	1474.58
200	3.896	33.509	4.45	0.00	26.610	3.883	1467.53
250	6.158	33.998	2.48	0.00	26.741	6.136	1478.20
300	5.734	34.060	2.01	0.00	26.843	5.709	1477.41
350	2.904	33.753	2.09	0.00	26.898	2.883	1466.09
400	3.083	33.835	1.67	0.00	26.948	3.058	1467.79
450	3.036	33.909	1.35	0.00	27.011	3.008	1468.50
500	3.317	34.004	1.05	0.00	27.061	3.285	1470.65

Station: K-78D
latitude: 38-15.00N Longtitude: 143-15.00E Depth: 2549m
Date: 1994-05-31 Time: 22:45

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
6	17.571	34.480	3.60	0.00	24.980	17.570	1514.02
10	17.275	34.489	3.58	0.00	25.058	17.273	1513.22
20	16.961	34.527	3.56	0.00	25.162	16.958	1512.49
30	14.481	34.554	3.42	0.00	25.741	14.477	1504.99
40	12.653	34.498	3.23	0.00	26.073	12.648	1499.09
50	12.195	34.462	3.18	0.00	26.134	12.188	1497.66
60	11.254	34.378	3.12	0.00	26.245	11.247	1494.49
70	10.667	34.314	3.07	0.00	26.301	10.659	1492.52
75	10.449	34.285	3.06	0.00	26.317	10.440	1491.79
80	10.322	34.270	3.04	0.00	26.327	10.313	1491.40
90	10.016	34.234	3.08	0.00	26.352	10.005	1490.43
100	9.364	34.154	3.12	0.00	26.398	9.353	1488.13
125	7.749	33.951	3.48	0.00	26.487	7.737	1482.27
150	6.633	33.818	3.75	0.00	26.538	6.620	1478.20
175	5.927	33.743	3.98	0.00	26.569	5.913	1475.73
200	5.672	33.733	4.01	0.00	26.592	5.656	1475.10
250	3.869	33.557	4.25	0.00	26.652	3.852	1468.30
300	6.100	33.980	2.77	0.00	26.734	6.074	1478.77
350	5.190	33.962	2.15	0.00	26.831	5.162	1475.91
400	5.200	34.060	1.73	0.00	26.907	5.169	1476.90
450	4.811	34.129	1.38	0.00	27.006	4.776	1476.22
500	4.879	34.224	1.20	0.00	27.074	4.840	1477.45

Station: K-79D
latitude: 38-15.15N Longtitude: 143-30.26E Depth: 3303m
Date: 1994-06-01 Time: 01:10

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	17.435	34.509	3.54	0.00	25.034	17.435	1513.59
5	17.432	34.510	3.51	0.00	25.036	17.431	1513.63
10	17.384	34.513	3.49	0.00	25.050	17.383	1513.57
20	16.463	34.518	3.56	0.00	25.271	16.460	1510.97
30	16.246	34.524	3.49	0.00	25.326	16.241	1510.48
40	15.408	34.499	3.37	0.00	25.496	15.402	1508.03
50	13.553	34.474	3.07	0.00	25.874	13.546	1502.22
60	12.468	34.480	3.19	0.00	26.095	12.460	1498.77
70	11.851	34.422	3.09	0.00	26.169	11.842	1496.77
75	11.530	34.388	3.09	0.00	26.203	11.520	1495.70
80	11.259	34.357	3.11	0.00	26.229	11.249	1494.81
90	10.967	34.336	3.03	0.00	26.265	10.956	1493.93
100	10.550	34.302	2.93	0.00	26.312	10.538	1492.58
125	9.540	34.178	3.06	0.00	26.388	9.526	1489.22
150	8.376	34.053	3.18	0.00	26.474	8.360	1485.17
175	7.841	34.041	2.91	0.00	26.545	7.823	1483.55
200	7.618	34.069	2.76	0.00	26.599	7.599	1483.15
250	5.970	33.919	2.83	0.00	26.703	5.949	1477.35
300	5.991	34.027	2.30	0.00	26.785	5.965	1478.39
350	4.955	33.951	2.16	0.00	26.849	4.928	1474.94
400	4.988	34.042	1.81	0.00	26.918	4.957	1476.01
450	4.810	34.104	1.51	0.00	26.987	4.775	1476.19
500	4.491	34.147	1.24	0.00	27.056	4.453	1475.75

Station: K-80D
latitude: 38-15.00N Longtitude: 143-45.00E Depth: 7725m
Date: 1994-06-01 Time: 04:30

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	16.930	34.464	3.41	0.00	25.120	16.929	1512.03
5	16.822	34.451	3.40	0.00	25.136	16.821	1511.74
10	16.877	34.458	3.37	0.00	25.128	16.875	1511.99
20	13.019	33.971	3.77	0.00	25.593	13.016	1499.36
30	12.885	34.022	3.58	0.00	25.659	12.881	1499.14
40	13.525	34.415	2.97	0.00	25.834	13.519	1501.89
50	12.767	34.385	2.79	0.00	25.963	12.760	1499.50
60	12.782	34.462	2.56	0.00	26.020	12.774	1499.81
70	12.018	34.373	2.63	0.00	26.100	12.009	1497.28
75	11.160	34.247	2.83	0.00	26.161	11.151	1494.25
80	10.710	34.207	2.89	0.00	26.210	10.700	1492.70
90	9.921	34.095	3.09	0.00	26.259	9.911	1489.92
100	10.221	34.208	3.02	0.00	26.297	10.209	1491.30
125	9.182	34.137	3.06	0.00	26.413	9.168	1487.85
150	7.886	33.986	3.18	0.00	26.494	7.871	1483.24
175	7.293	33.948	3.17	0.00	26.550	7.276	1481.34
200	6.977	33.972	2.89	0.00	26.612	6.959	1480.56
250	6.448	34.014	2.49	0.00	26.716	6.426	1479.36
300	5.177	33.901	2.54	0.00	26.784	5.153	1474.96
350	5.540	34.068	2.01	0.00	26.873	5.511	1477.46
400	5.418	34.135	1.63	0.00	26.941	5.386	1477.88
450	4.804	34.129	1.44	0.00	27.007	4.769	1476.20
500	4.593	34.172	1.24	0.00	27.064	4.555	1476.21

Station: K-81D
latitude: 38-15.00N Longtitude: 144-00.00E Depth: 6200m
Date: 1994-06-01 Time: 06:45

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	17.406	34.490	3.35	0.00	25.027	17.406	1513.48
5	17.399	34.490	3.34	0.00	25.029	17.398	1513.51
10	17.362	34.491	3.32	0.00	25.039	17.360	1513.48
20	16.333	34.496	3.34	0.00	25.284	16.330	1510.55
30	13.964	34.465	3.23	0.00	25.782	13.959	1503.21
40	13.113	34.489	3.15	0.00	25.975	13.108	1500.61
50	12.424	34.471	3.12	0.00	26.098	12.417	1498.45
60	11.703	34.410	3.06	0.00	26.187	11.695	1496.08
70	11.422	34.386	2.92	0.00	26.221	11.413	1495.25
75	11.026	34.342	2.92	0.00	26.259	11.017	1493.90
80	10.439	34.268	3.02	0.00	26.305	10.430	1491.82
90	9.944	34.240	2.88	0.00	26.368	9.933	1490.17
100	9.532	34.184	2.92	0.00	26.394	9.520	1488.78
125	8.277	34.011	3.29	0.00	26.456	8.264	1484.34
150	7.310	33.934	3.28	0.00	26.536	7.296	1480.98
175	7.234	33.973	3.05	0.00	26.577	7.217	1481.14
200	7.528	34.119	2.44	0.00	26.651	7.509	1482.87
250	6.035	33.993	2.38	0.00	26.753	6.013	1477.70
300	5.571	34.016	2.22	0.00	26.828	5.546	1476.70
350	5.574	34.126	1.75	0.00	26.915	5.545	1477.67
400	5.111	34.138	1.50	0.00	26.979	5.079	1476.64
450	4.346	34.087	1.34	0.00	27.024	4.313	1474.25
500	4.309	34.144	1.19	0.00	27.073	4.272	1475.00

Station: K-82D
latitude: 38-15.00N Longtitude: 144-15.00E Depth: 6410m
Date: 1994-06-01 Time: 09:18

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	16.773	34.405	3.65	0.00	25.112	16.773	1511.49
5	16.773	34.406	3.62	0.00	25.113	16.772	1511.54
10	16.746	34.402	3.60	0.00	25.116	16.744	1511.53
20	15.142	34.137	3.70	0.00	25.276	15.139	1506.44
30	13.305	34.211	3.51	0.00	25.721	13.300	1500.75
40	12.211	34.431	3.36	0.00	26.107	12.206	1497.51
50	11.474	34.356	3.26	0.00	26.188	11.468	1495.06
60	10.267	34.182	3.10	0.00	26.268	10.260	1490.77
70	10.223	34.238	3.25	0.00	26.320	10.215	1490.85
75	9.850	34.190	3.27	0.00	26.345	9.842	1489.53
80	9.756	34.177	3.20	0.00	26.351	9.747	1489.26
90	9.622	34.190	3.08	0.00	26.383	9.612	1488.95
100	9.570	34.204	2.96	0.00	26.403	9.559	1488.94
125	8.729	34.133	2.93	0.00	26.482	8.716	1486.18
150	8.109	34.114	2.73	0.00	26.562	8.094	1484.24
175	7.486	34.112	2.46	0.00	26.651	7.469	1482.28
200	5.738	33.871	2.95	0.00	26.694	5.722	1475.54
250	6.162	34.046	2.43	0.00	26.778	6.141	1478.28
300	5.412	34.015	2.10	0.00	26.847	5.388	1476.06
350	2.775	33.722	2.30	0.00	26.885	2.754	1465.50
400	2.931	33.813	1.82	0.00	26.944	2.906	1467.11
450	3.113	33.919	1.39	0.00	27.012	3.084	1468.84
500	3.212	33.993	1.06	0.00	27.062	3.180	1470.19

Station: K-83D
latitude: 38-15.00N Longtitude: 144-30.00E Depth: 5798m
Date: 1994-06-01 Time: 11:25

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	12.128	33.353	4.50	0.00	25.286	12.128	1495.32
5	12.625	33.327	4.41	0.00	25.171	12.625	1497.02
10	10.779	33.494	4.62	0.00	25.642	10.777	1490.93
20	8.776	33.420	4.84	0.00	25.916	8.774	1483.75
30	7.326	33.425	4.90	0.00	26.134	7.323	1478.43
40	6.537	33.626	4.61	0.00	26.399	6.534	1475.78
50	6.091	33.659	4.43	0.00	26.482	6.087	1474.22
60	5.856	33.673	4.29	0.00	26.522	5.851	1473.47
70	5.326	33.622	4.28	0.00	26.546	5.321	1471.44
75	5.291	33.635	4.25	0.00	26.560	5.285	1471.40
80	5.359	33.652	4.20	0.00	26.565	5.353	1471.78
90	5.123	33.637	4.14	0.00	26.581	5.116	1470.96
100	4.464	33.572	4.18	0.00	26.602	4.457	1468.34
125	3.702	33.543	4.07	0.00	26.656	3.694	1465.53
150	2.999	33.491	4.13	0.00	26.681	2.990	1462.89
175	2.900	33.496	4.01	0.00	26.694	2.890	1462.88
200	2.325	33.501	3.75	0.00	26.746	2.314	1460.80
250	2.248	33.536	3.30	0.00	26.780	2.234	1461.33
300	2.617	33.661	2.59	0.00	26.850	2.599	1463.92
350	2.929	33.778	1.97	0.00	26.916	2.908	1466.24
400	2.883	33.828	1.64	0.00	26.960	2.859	1466.92
450	2.941	33.874	1.40	0.00	26.992	2.913	1468.05
500	3.188	33.983	1.12	0.00	27.056	3.156	1470.07
600	3.323	34.117	0.76	0.00	27.151	3.283	1472.47
700	3.170	34.200	0.60	0.00	27.231	3.123	1473.57
800	3.076	34.261	0.54	0.00	27.288	3.023	1474.90
900	3.261	34.373	0.67	0.00	27.360	3.199	1477.49
1000	3.052	34.408	0.69	0.00	27.408	2.983	1478.30

Station: K-83-2D
latitude: 38-15.00N Longtitude: 144-30.00E Depth: 5782m
Date: 1994-06-01 Time: 19:55

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	13.646	33.227	3.99	0.00	24.891	13.646	1500.26
5	12.879	33.247	4.09	0.00	25.059	12.878	1497.78
10	12.697	33.237	4.14	0.00	25.088	12.696	1497.24
20	10.909	33.495	4.35	0.00	25.620	10.907	1491.56
30	7.916	33.491	4.64	0.00	26.101	7.913	1480.77
40	7.200	33.718	4.34	0.00	26.381	7.197	1478.48
50	6.688	33.731	4.10	0.00	26.462	6.683	1476.67
60	6.162	33.694	4.09	0.00	26.500	6.157	1474.72
70	5.807	33.669	4.09	0.00	26.525	5.801	1473.43
75	5.702	33.670	4.05	0.00	26.538	5.696	1473.10
80	5.633	33.668	3.99	0.00	26.545	5.627	1472.90
90	4.965	33.599	4.08	0.00	26.569	4.959	1470.27
100	4.882	33.613	4.11	0.00	26.589	4.874	1470.11
125	4.928	33.681	3.91	0.00	26.637	4.919	1470.80
150	3.299	33.516	3.96	0.00	26.674	3.289	1464.20
175	2.629	33.446	4.19	0.00	26.677	2.619	1461.65
200	2.428	33.451	4.08	0.00	26.697	2.417	1461.19
250	2.226	33.496	3.72	0.00	26.749	2.213	1461.18
300	2.514	33.586	3.09	0.00	26.798	2.497	1463.38
350	2.673	33.682	2.49	0.00	26.861	2.653	1465.01
400	2.931	33.795	1.96	0.00	26.929	2.906	1467.08
450	3.024	33.885	1.49	0.00	26.993	2.996	1468.42
500	3.575	34.033	1.14	0.00	27.059	3.541	1471.78
600	3.181	34.101	0.79	0.00	27.151	3.142	1471.84
700	3.155	34.210	0.61	0.00	27.240	3.108	1473.52
800	3.096	34.289	0.55	0.00	27.309	3.042	1475.02
900	3.115	34.369	0.63	0.00	27.371	3.054	1476.86
1000	2.951	34.420	0.68	0.00	27.426	2.884	1477.88

Station: K-84D
latitude: 38-15.00N Longtitude: 144-45.00E Depth: ????m
Date: 1994-06-02 Time: 06:00

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	16.750	34.253	3.49	0.00	25.001	16.750	1511.24
5	16.394	34.232	3.52	0.00	25.067	16.394	1510.19
10	15.946	34.184	3.56	0.00	25.133	15.945	1508.84
20	12.369	33.833	3.91	0.00	25.613	12.366	1497.01
30	11.508	33.821	3.94	0.00	25.765	11.504	1494.21
40	10.386	33.840	3.89	0.00	25.981	10.381	1490.45
50	9.526	33.852	3.79	0.00	26.135	9.521	1487.53
60	8.500	33.747	3.93	0.00	26.215	8.494	1483.78
70	7.658	33.779	3.95	0.00	26.365	7.651	1480.80
75	7.702	33.811	3.81	0.00	26.384	7.695	1481.09
80	7.512	33.810	3.85	0.00	26.410	7.505	1480.45
90	8.230	33.981	3.47	0.00	26.439	8.221	1483.55
100	7.861	33.946	3.36	0.00	26.467	7.851	1482.27
125	5.679	33.655	3.91	0.00	26.529	5.669	1473.80
150	4.106	33.493	4.28	0.00	26.576	4.096	1467.57
175	3.618	33.462	4.34	0.00	26.601	3.607	1465.89
200	3.097	33.436	4.35	0.00	26.628	3.085	1464.05
250	3.921	33.630	3.68	0.00	26.704	3.904	1468.61
300	5.284	33.882	3.02	0.00	26.756	5.260	1475.37
350	5.246	33.993	2.06	0.00	26.848	5.218	1476.18
400	2.404	33.672	2.38	0.00	26.876	2.381	1464.64
450	2.631	33.745	1.96	0.00	26.915	2.604	1466.54
500	2.938	33.842	1.60	0.00	26.966	2.906	1468.82

Station: K-85-1D
latitude: 38-15.20N Longtitude: 145-09.90E Depth: ????m
Date: 1994-06-02 Time: 08:55

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	17.853	34.664	3.24	0.00	25.052	17.853	1515.00
5	17.816	34.664	3.23	0.00	25.061	17.815	1514.94
10	17.582	34.704	3.23	0.00	25.148	17.580	1514.38
20	17.290	34.738	3.22	0.00	25.245	17.286	1513.71
30	17.162	34.750	3.14	0.00	25.285	17.157	1513.52
40	16.504	34.708	3.03	0.00	25.408	16.498	1511.65
50	15.776	34.685	2.84	0.00	25.557	15.769	1509.55
60	15.284	34.664	2.74	0.00	25.651	15.274	1508.16
70	14.419	34.597	2.81	0.00	25.788	14.409	1505.50
75	14.003	34.584	2.83	0.00	25.865	13.992	1504.22
80	13.742	34.572	2.81	0.00	25.911	13.731	1503.45
90	13.298	34.553	2.76	0.00	25.987	13.286	1502.13
100	12.820	34.525	2.73	0.00	26.061	12.806	1500.67
125	11.478	34.409	2.77	0.00	26.228	11.463	1496.38
150	10.679	34.317	3.43	0.00	26.301	10.661	1493.88
175	10.535	34.300	3.50	0.00	26.314	10.514	1493.76
200	10.468	34.290	3.53	0.00	26.317	10.444	1493.92
250	10.083	34.228	3.55	0.00	26.336	10.054	1493.30
300	8.555	34.006	3.58	0.00	26.410	8.523	1488.25
350	8.013	34.010	3.20	0.00	26.495	7.977	1487.04
400	5.283	33.685	3.58	0.00	26.600	5.251	1476.76
450	6.201	34.012	2.55	0.00	26.746	6.162	1481.68
500	5.769	34.066	1.96	0.00	26.844	5.726	1480.85
600	4.077	33.995	1.52	0.00	26.979	4.034	1475.49
700	3.776	34.105	1.01	0.00	27.097	3.726	1476.01
800	3.464	34.183	0.71	0.00	27.190	3.408	1476.45
900	3.489	34.309	0.70	0.00	27.288	3.426	1478.37
1000	3.225	34.368	0.69	0.00	27.360	3.156	1478.99

Station: K-85-2D
latitude: 38-15.27N Longtitude: 145-09.88E Depth: 5318m
Date: 1994-06-02 Time: 20:00

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	18.369	34.648	3.30	0.00	24.912	18.369	1516.48
5	18.456	34.649	3.27	0.00	24.891	18.456	1516.79
10	17.877	34.653	3.30	0.00	25.038	17.876	1515.19
20	17.277	34.672	3.31	0.00	25.197	17.274	1513.60
30	17.047	34.681	3.24	0.00	25.260	17.042	1513.09
40	16.769	34.698	3.10	0.00	25.338	16.762	1512.44
50	16.253	34.689	3.02	0.00	25.452	16.245	1511.03
60	15.450	34.658	2.90	0.00	25.609	15.441	1508.67
70	15.004	34.646	2.75	0.00	25.699	14.994	1507.42
75	14.572	34.630	2.73	0.00	25.780	14.561	1506.11
80	14.328	34.613	2.70	0.00	25.820	14.316	1505.39
90	13.965	34.592	2.71	0.00	25.880	13.952	1504.36
100	13.460	34.566	2.73	0.00	25.964	13.446	1502.84
125	12.523	34.499	2.69	0.00	26.100	12.507	1500.06
150	12.075	34.465	2.89	0.00	26.160	12.055	1498.91
175	11.428	34.408	2.85	0.00	26.237	11.406	1497.03
200	10.658	34.312	3.16	0.00	26.301	10.634	1494.63
250	10.255	34.256	3.45	0.00	26.328	10.226	1493.95
300	8.459	33.989	3.50	0.00	26.411	8.428	1487.87
350	7.688	33.949	3.23	0.00	26.494	7.654	1485.73
400	4.948	33.676	3.41	0.00	26.631	4.917	1475.38
450	6.150	34.028	2.31	0.00	26.765	6.111	1481.49
500	5.353	34.043	1.81	0.00	26.876	5.312	1479.14
600	3.913	33.970	1.44	0.00	26.976	3.871	1474.77
700	3.776	34.135	0.90	0.00	27.121	3.726	1476.05
800	3.429	34.209	0.66	0.00	27.214	3.373	1476.33
900	3.544	34.311	0.70	0.00	27.284	3.480	1478.61
1000	3.259	34.361	0.66	0.00	27.351	3.189	1479.12

Station: K-86
latitude: 38-00.00N Longtitude: 144-45.00E Depth: 5491m
Date: 1994-06-03 Time: 04:20

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	17.542	34.430	3.24	0.00	24.948	17.542	1513.81
5	17.542	34.429	3.23	0.00	24.947	17.541	1513.86
10	17.255	34.421	3.24	0.00	25.011	17.253	1513.08
20	16.984	34.473	3.25	0.00	25.115	16.981	1512.50
30	16.287	34.478	3.23	0.00	25.281	16.282	1510.56
40	14.136	34.322	3.18	0.00	25.635	14.130	1503.77
50	12.826	34.378	2.97	0.00	25.946	12.820	1499.69
60	12.854	34.499	2.99	0.00	26.034	12.846	1500.09
70	12.465	34.467	2.99	0.00	26.086	12.456	1498.91
75	12.085	34.445	2.97	0.00	26.142	12.076	1497.68
80	11.866	34.432	2.85	0.00	26.174	11.856	1497.00
90	11.448	34.386	2.84	0.00	26.216	11.437	1495.67
100	11.103	34.356	2.80	0.00	26.256	11.091	1494.59
125	10.329	34.281	2.69	0.00	26.335	10.314	1492.18
150	9.143	34.143	2.81	0.00	26.424	9.126	1488.13
175	7.590	33.947	3.10	0.00	26.507	7.573	1482.47
200	7.160	33.910	3.11	0.00	26.538	7.141	1481.19
250	5.794	33.832	3.00	0.00	26.656	5.774	1476.54
300	6.390	34.022	2.52	0.00	26.730	6.364	1479.97
350	5.664	34.007	2.15	0.00	26.810	5.635	1477.88
400	3.797	33.840	2.15	0.00	26.884	3.770	1470.82
450	2.761	33.755	2.01	0.00	26.912	2.734	1467.12
500	3.112	33.884	1.50	0.00	26.984	3.080	1469.62

Station: K-87
latitude: 37-45.00N Longtitude: 144-30.00E Depth: 5989m
Date: 1994-06-03 Time: 07:35

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	18.227	34.682	3.13	0.00	24.974	18.226	1516.11
5	18.144	34.699	3.11	0.00	25.007	18.143	1515.94
10	18.067	34.709	3.09	0.00	25.033	18.066	1515.81
20	17.668	34.757	3.09	0.00	25.168	17.664	1514.86
30	17.567	34.755	3.03	0.00	25.191	17.562	1514.72
40	17.433	34.769	2.98	0.00	25.234	17.426	1514.51
50	17.141	34.788	2.95	0.00	25.319	17.133	1513.83
60	17.066	34.807	2.92	0.00	25.351	17.056	1513.79
70	17.019	34.810	2.88	0.00	25.365	17.008	1513.82
75	17.007	34.809	2.87	0.00	25.367	16.995	1513.87
80	16.973	34.807	2.85	0.00	25.374	16.960	1513.84
90	16.788	34.790	2.81	0.00	25.404	16.774	1513.43
100	16.469	34.764	2.67	0.00	25.459	16.453	1512.60
125	15.768	34.701	2.50	0.00	25.571	15.749	1510.79
150	14.440	34.619	2.41	0.00	25.800	14.418	1506.92
175	13.335	34.552	2.62	0.00	25.979	13.310	1503.65
200	12.635	34.517	2.76	0.00	26.092	12.608	1501.69
250	10.885	34.356	3.00	0.00	26.295	10.854	1496.30
300	8.823	34.151	2.45	0.00	26.482	8.791	1489.43
350	7.192	34.116	2.40	0.00	26.696	7.159	1484.04
400	2.270	33.459	3.69	0.00	26.716	2.248	1463.78
450	2.267	33.521	3.27	0.00	26.766	2.242	1464.67
500	3.122	33.698	2.56	0.00	26.835	3.090	1469.42

Station: K-88D
latitude: 37-30.00N Longtitude: 144-15.00E Depth: 6032m
Date: 1994-06-03 Time: 10:50

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	18.634	34.691	3.09	0.00	24.879	18.633	1517.29
5	18.641	34.691	3.06	0.00	24.877	18.640	1517.36
10	18.177	34.699	3.08	0.00	24.999	18.176	1516.12
20	17.605	34.704	3.10	0.00	25.143	17.601	1514.61
30	17.571	34.706	3.09	0.00	25.153	17.566	1514.68
40	17.519	34.720	3.05	0.00	25.176	17.513	1514.71
50	17.381	34.750	3.00	0.00	25.232	17.373	1514.50
60	17.365	34.771	2.97	0.00	25.252	17.355	1514.64
70	17.334	34.779	2.96	0.00	25.266	17.322	1514.72
75	17.291	34.781	2.96	0.00	25.278	17.278	1514.68
80	17.219	34.785	2.95	0.00	25.298	17.206	1514.56
90	16.905	34.766	2.91	0.00	25.358	16.891	1513.76
100	16.683	34.759	2.86	0.00	25.405	16.666	1513.24
125	16.021	34.696	2.72	0.00	25.510	16.001	1511.57
150	15.234	34.633	2.65	0.00	25.638	15.211	1509.46
175	14.255	34.597	2.36	0.00	25.823	14.230	1506.71
200	13.570	34.563	2.40	0.00	25.939	13.542	1504.86
250	12.566	34.504	2.83	0.00	26.095	12.533	1502.27
300	10.949	34.351	2.68	0.00	26.280	10.912	1497.35
350	9.095	34.106	2.90	0.00	26.403	9.057	1491.20
400	8.414	34.163	2.50	0.00	26.555	8.373	1489.57
450	4.728	33.633	3.73	0.00	26.622	4.694	1475.25
500	5.564	33.873	2.88	0.00	26.716	5.522	1479.78

Station: K-89D
latitude: 37-15.24N Longtitude: 144-15.22E Depth: 6390m
Date: 1994-06-03 Time: 13:40

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	21.026	34.615	2.82	0.00	24.195	21.026	1523.87
5	20.853	34.612	2.82	0.00	24.240	20.852	1523.45
10	20.842	34.612	2.80	0.00	24.242	20.840	1523.50
20	20.286	34.604	2.82	0.00	24.385	20.283	1522.14
30	20.011	34.658	2.77	0.00	24.499	20.006	1521.61
40	19.522	34.779	2.48	0.00	24.719	19.515	1520.55
50	18.821	34.784	2.37	0.00	24.902	18.813	1518.74
60	18.400	34.744	2.36	0.00	24.978	18.390	1517.65
70	18.081	34.702	2.37	0.00	25.025	18.069	1516.84
75	17.406	34.664	2.43	0.00	25.160	17.393	1514.89
80	17.141	34.643	2.46	0.00	25.208	17.128	1514.16
90	16.487	34.637	2.42	0.00	25.357	16.473	1512.35
100	15.885	34.630	2.33	0.00	25.490	15.870	1510.66
125	15.282	34.625	2.27	0.00	25.621	15.263	1509.19
150	14.547	34.595	2.25	0.00	25.759	14.524	1507.23
175	13.754	34.552	2.21	0.00	25.893	13.729	1505.03
200	13.126	34.513	2.15	0.00	25.991	13.098	1503.33
250	11.548	34.431	2.03	0.00	26.233	11.516	1498.71
300	9.619	34.258	2.15	0.00	26.437	9.585	1492.48
350	6.370	33.789	3.46	0.00	26.549	6.340	1480.42
400	6.668	33.947	2.70	0.00	26.635	6.632	1482.61
450	6.154	34.000	2.19	0.00	26.743	6.114	1481.47
500	5.694	34.021	1.92	0.00	26.818	5.652	1480.49

Station: K-90D
latitude: 37-00.01N Longtitude: 143-45.07E Depth: 6839m
Date: 1994-06-03 Time: 16:35

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	22.631	34.695	2.63	0.00	23.810	22.631	1528.19
5	22.649	34.695	2.60	0.00	23.805	22.648	1528.29
10	22.222	34.677	2.59	0.00	23.912	22.220	1527.24
20	21.665	34.658	2.58	0.00	24.053	21.661	1525.92
30	20.270	34.655	2.46	0.00	24.428	20.265	1522.32
40	19.628	34.726	2.28	0.00	24.651	19.620	1520.79
50	19.450	34.724	2.25	0.00	24.696	19.441	1520.45
60	19.425	34.721	2.23	0.00	24.700	19.415	1520.55
70	19.256	34.717	2.21	0.00	24.741	19.243	1520.23
75	19.126	34.717	2.20	0.00	24.774	19.113	1519.94
80	19.034	34.711	2.20	0.00	24.793	19.020	1519.76
90	17.310	34.594	2.33	0.00	25.129	17.295	1514.77
100	17.100	34.632	2.27	0.00	25.209	17.084	1514.36
125	16.068	34.644	2.23	0.00	25.459	16.049	1511.65
150	15.066	34.603	2.20	0.00	25.652	15.043	1508.89
175	14.521	34.581	2.21	0.00	25.754	14.495	1507.55
200	13.829	34.556	2.16	0.00	25.880	13.801	1505.70
250	11.505	34.348	2.30	0.00	26.176	11.474	1498.46
300	8.062	33.968	3.02	0.00	26.455	8.031	1486.35
350	8.624	34.288	2.01	0.00	26.620	8.587	1489.68
400	7.896	34.269	1.70	0.00	26.715	7.856	1487.74
450	6.942	34.252	1.58	0.00	26.838	6.900	1484.88
500	5.244	34.092	1.55	0.00	26.927	5.204	1478.77

Station: K-91D
latitude: 36-44.55N Longtitude: 143-29.41E Depth: 7017m
Date: 1994-06-03 Time: 19:20

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	21.912	34.658	2.73	0.00	23.984	21.911	1526.27
5	21.866	34.657	2.66	0.00	23.996	21.865	1526.20
10	21.543	34.652	2.67	0.00	24.082	21.541	1525.43
20	20.851	34.627	2.66	0.00	24.252	20.847	1523.71
30	20.148	34.733	2.37	0.00	24.520	20.142	1522.07
40	19.189	34.738	2.33	0.00	24.774	19.182	1519.56
50	18.007	34.629	2.33	0.00	24.987	17.998	1516.21
60	17.186	34.594	2.39	0.00	25.159	17.176	1513.91
70	16.646	34.615	2.28	0.00	25.303	16.635	1512.47
75	16.124	34.626	2.23	0.00	25.432	16.112	1510.97
80	15.935	34.627	2.20	0.00	25.476	15.923	1510.48
90	15.421	34.604	2.22	0.00	25.574	15.407	1509.02
100	14.865	34.597	2.19	0.00	25.692	14.850	1507.42
125	14.405	34.555	2.19	0.00	25.758	14.387	1506.32
150	13.274	34.528	2.14	0.00	25.972	13.254	1503.01
175	12.161	34.454	2.10	0.00	26.135	12.138	1499.60
200	11.520	34.419	2.09	0.00	26.228	11.495	1497.77
250	9.651	34.201	2.50	0.00	26.387	9.623	1491.70
300	7.260	33.900	3.06	0.00	26.516	7.232	1483.21
350	6.637	33.891	3.11	0.00	26.594	6.605	1481.59
400	7.520	34.234	1.86	0.00	26.743	7.481	1486.27
450	6.440	34.231	1.55	0.00	26.889	6.400	1482.90
500	3.999	33.950	1.63	0.00	26.951	3.964	1473.45

Station: K-92d
latitude: 36-30.00N Longtitude: 143-20.00E Depth: 6777m
Date: 1994-06-03 Time: 22:10

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.609	34.549	2.90	0.00	24.521	19.609	1519.90
5	19.594	34.547	2.88	0.00	24.524	19.593	1519.91
10	19.549	34.550	2.86	0.00	24.538	19.547	1519.87
20	19.048	34.577	2.87	0.00	24.687	19.044	1518.65
30	17.006	34.590	2.58	0.00	25.199	17.001	1512.86
40	16.252	34.578	2.37	0.00	25.366	16.245	1510.73
50	15.405	34.563	2.33	0.00	25.546	15.398	1508.26
60	14.111	34.532	2.24	0.00	25.802	14.103	1504.27
70	13.611	34.526	2.16	0.00	25.902	13.601	1502.80
75	13.143	34.507	2.13	0.00	25.983	13.132	1501.31
80	13.020	34.497	2.11	0.00	26.000	13.009	1500.97
90	12.461	34.484	2.07	0.00	26.100	12.449	1499.25
100	12.150	34.467	2.05	0.00	26.147	12.136	1498.34
125	11.391	34.430	1.97	0.00	26.261	11.375	1496.10
150	10.641	34.396	1.93	0.00	26.370	10.623	1493.84
175	9.905	34.344	1.88	0.00	26.456	9.885	1491.56
200	9.379	34.312	1.93	0.00	26.519	9.357	1490.03
250	7.074	33.994	2.55	0.00	26.616	7.051	1481.78
300	5.986	33.899	2.62	0.00	26.685	5.961	1478.21
350	4.247	33.726	2.99	0.00	26.747	4.222	1471.73
400	4.657	33.906	2.29	0.00	26.846	4.627	1474.48
450	3.630	33.843	2.00	0.00	26.903	3.600	1470.95
500	5.397	34.212	1.37	0.00	27.004	5.356	1479.54

Station: K-93D
latitude: 36-15.00N Longtitude: 143-10.00E Depth: 6805m
Date: 1994-06-04 Time: 00:55

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.475	34.580	2.79	0.00	24.580	19.475	1519.56
5	19.360	34.584	2.77	0.00	24.612	19.359	1519.29
10	18.822	34.603	2.75	0.00	24.764	18.821	1517.87
20	17.997	34.621	2.67	0.00	24.983	17.994	1515.67
30	17.030	34.632	2.45	0.00	25.225	17.025	1512.98
40	16.609	34.622	2.38	0.00	25.317	16.603	1511.87
50	16.022	34.621	2.28	0.00	25.452	16.014	1510.24
60	15.542	34.612	2.24	0.00	25.554	15.533	1508.91
70	14.883	34.596	2.19	0.00	25.687	14.872	1506.98
75	14.808	34.591	2.17	0.00	25.699	14.797	1506.82
80	14.678	34.585	2.16	0.00	25.723	14.666	1506.48
90	14.471	34.576	2.14	0.00	25.760	14.458	1505.97
100	13.951	34.555	2.13	0.00	25.854	13.937	1504.44
125	12.232	34.460	2.09	0.00	26.125	12.216	1499.02
150	10.311	34.274	2.42	0.00	26.332	10.294	1492.52
175	8.386	34.021	2.70	0.00	26.448	8.368	1485.58
200	7.000	33.827	3.20	0.00	26.495	6.981	1480.46
250	6.181	33.788	3.40	0.00	26.572	6.159	1478.02
300	5.148	33.684	3.65	0.00	26.615	5.125	1474.57
350	4.643	33.690	3.40	0.00	26.677	4.617	1473.33
400	4.113	33.673	3.15	0.00	26.719	4.085	1471.93
450	2.695	33.607	2.82	0.00	26.800	2.668	1466.64
500	2.836	33.689	2.39	0.00	26.853	2.805	1468.18

Station: K-94D
latitude: 36-00.00N Longtitude: 143-00.00E Depth: 6115m
Date: 1994-06-04 Time: 03:45

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	20.537	34.607	2.91	0.00	24.320	20.537	1522.53
5	20.597	34.606	2.84	0.00	24.304	20.596	1522.75
10	19.807	34.597	2.83	0.00	24.506	19.805	1520.64
20	18.907	34.605	2.54	0.00	24.744	18.903	1518.28
30	17.941	34.594	2.42	0.00	24.976	17.936	1515.64
40	17.636	34.620	2.30	0.00	25.071	17.630	1514.94
50	17.168	34.588	2.29	0.00	25.159	17.159	1513.68
60	16.341	34.563	2.35	0.00	25.334	16.331	1511.32
70	15.792	34.600	2.22	0.00	25.488	15.781	1509.84
75	15.718	34.592	2.21	0.00	25.499	15.706	1509.68
80	15.500	34.594	2.19	0.00	25.549	15.487	1509.09
90	15.187	34.575	2.24	0.00	25.604	15.174	1508.25
100	14.518	34.549	2.23	0.00	25.730	14.503	1506.26
125	13.363	34.518	2.11	0.00	25.947	13.346	1502.88
150	12.292	34.461	2.07	0.00	26.115	12.272	1499.64
175	11.099	34.372	2.10	0.00	26.269	11.077	1495.84
200	10.231	34.309	2.12	0.00	26.373	10.207	1493.10
250	8.927	34.188	2.35	0.00	26.494	8.900	1489.04
300	8.726	34.251	2.05	0.00	26.575	8.694	1489.19
350	7.384	34.083	2.18	0.00	26.643	7.350	1484.73
400	6.318	33.994	2.28	0.00	26.717	6.283	1481.29
450	6.740	34.205	1.70	0.00	26.828	6.698	1484.04
500	5.459	34.076	1.73	0.00	26.889	5.417	1479.61

Station: K-95D
latitude: 35-45.18N Longtitude: 142-49.78E Depth: 5746m
Date: 1994-06-04 Time: 06:48

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	23.759	34.688	2.35	0.00	23.478	23.759	1531.04
5	23.754	34.688	2.25	0.00	23.479	23.753	1531.08
10	23.754	34.688	2.21	0.00	23.480	23.752	1531.16
20	23.614	34.685	2.20	0.00	23.518	23.609	1530.98
30	22.915	34.680	2.21	0.00	23.717	22.908	1529.37
40	21.956	34.665	2.26	0.00	23.977	21.948	1527.03
50	21.265	34.729	2.18	0.00	24.217	21.255	1525.44
60	20.763	34.842	2.14	0.00	24.439	20.752	1524.38
70	20.716	34.855	2.15	0.00	24.462	20.702	1524.43
75	20.678	34.855	2.15	0.00	24.472	20.664	1524.41
80	20.631	34.854	2.15	0.00	24.484	20.616	1524.37
90	20.549	34.843	2.15	0.00	24.497	20.533	1524.30
100	20.101	34.763	2.14	0.00	24.555	20.082	1523.14
125	18.326	34.670	2.16	0.00	24.939	18.304	1518.43
150	17.176	34.703	2.15	0.00	25.245	17.151	1515.49
175	16.020	34.663	2.14	0.00	25.484	15.993	1512.36
200	15.110	34.626	2.13	0.00	25.660	15.080	1509.89
250	13.344	34.525	2.10	0.00	25.956	13.309	1504.89
300	11.850	34.433	2.05	0.00	26.178	11.811	1500.58
350	10.554	34.388	1.91	0.00	26.379	10.512	1496.82
400	9.211	34.326	1.80	0.00	26.557	9.167	1492.72
450	7.951	34.264	1.71	0.00	26.704	7.905	1488.77
500	6.364	34.126	1.73	0.00	26.816	6.320	1483.29

Station: K-96D
latitude: 35-30.14N Longtitude: 142-40.33E Depth: 6515m
Date: 1994-06-04 Time: 09:55

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	24.119	34.714	2.37	0.00	23.391	24.119	1531.97
5	24.120	34.714	2.29	0.00	23.391	24.119	1532.02
10	24.111	34.714	2.25	0.00	23.393	24.109	1532.08
20	24.016	34.709	2.22	0.00	23.418	24.012	1532.01
30	23.930	34.702	2.21	0.00	23.438	23.923	1531.95
40	23.830	34.701	2.20	0.00	23.467	23.822	1531.87
50	23.434	34.730	2.20	0.00	23.605	23.423	1531.08
60	22.977	34.741	2.16	0.00	23.745	22.965	1530.10
70	22.917	34.741	2.15	0.00	23.762	22.902	1530.11
75	22.844	34.742	2.15	0.00	23.784	22.829	1530.01
80	22.826	34.741	2.14	0.00	23.789	22.809	1530.04
90	22.661	34.748	2.13	0.00	23.841	22.643	1529.80
100	22.489	34.742	2.13	0.00	23.886	22.469	1529.51
125	21.156	34.748	2.15	0.00	24.261	21.132	1526.42
150	20.418	34.763	2.13	0.00	24.472	20.390	1524.85
175	19.391	34.743	2.12	0.00	24.726	19.359	1522.39
200	18.766	34.718	2.13	0.00	24.867	18.730	1521.00
250	17.419	34.745	2.16	0.00	25.220	17.377	1517.93
300	14.423	34.594	2.13	0.00	25.785	14.379	1509.32
350	13.263	34.507	2.15	0.00	25.959	13.214	1506.26
400	11.266	34.419	2.04	0.00	26.275	11.215	1500.19
450	9.233	34.275	1.94	0.00	26.513	9.183	1493.57
500	8.511	34.268	1.79	0.00	26.622	8.459	1491.71

Station: K-98
latitude: 35-30.00N Longtitude: 142-00.00E Depth: 4611m
Date: 1994-06-04 Time: 14:15

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	23.503	34.703	2.50	0.00	23.565	23.502	1530.42
5	23.523	34.705	2.43	0.00	23.560	23.522	1530.52
10	23.503	34.703	2.40	0.00	23.564	23.501	1530.55
20	22.967	34.681	2.37	0.00	23.703	22.963	1529.34
30	22.609	34.680	2.31	0.00	23.804	22.603	1528.58
40	22.232	34.686	2.26	0.00	23.916	22.224	1527.78
50	21.859	34.716	2.23	0.00	24.043	21.849	1527.00
60	21.620	34.717	2.22	0.00	24.110	21.608	1526.54
70	21.375	34.751	2.22	0.00	24.203	21.362	1526.09
75	21.201	34.802	2.22	0.00	24.290	21.187	1525.77
80	21.131	34.812	2.22	0.00	24.317	21.115	1525.67
90	21.043	34.824	2.22	0.00	24.350	21.026	1525.62
100	20.798	34.837	2.21	0.00	24.426	20.779	1525.13
125	20.480	34.812	2.21	0.00	24.492	20.457	1524.66
150	19.041	34.635	2.26	0.00	24.733	19.014	1520.86
175	18.423	34.639	2.25	0.00	24.892	18.393	1519.51
200	16.993	34.684	2.16	0.00	25.274	16.960	1515.75
250	14.090	34.573	2.10	0.00	25.839	14.054	1507.39
300	11.823	34.451	2.01	0.00	26.197	11.784	1500.50
350	10.210	34.352	1.95	0.00	26.411	10.168	1495.55
400	9.008	34.294	1.83	0.00	26.565	8.965	1491.94
450	8.554	34.289	1.76	0.00	26.632	8.507	1491.07
500	7.373	34.257	1.60	0.00	26.781	7.324	1487.38

Station: K-99
latitude: 35-45.00N Longtitude: 142-00.00E Depth: 4200m
Date: 1994-06-04 Time: 15:50

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	21.306	34.570	2.96	0.00	24.085	21.306	1524.57
5	21.332	34.572	2.80	0.00	24.079	21.331	1524.69
10	21.037	34.571	2.73	0.00	24.159	21.035	1523.98
20	19.013	34.629	2.35	0.00	24.735	19.010	1518.61
30	18.689	34.702	2.17	0.00	24.874	18.683	1517.93
40	18.098	34.674	2.18	0.00	24.999	18.092	1516.36
50	17.894	34.672	2.18	0.00	25.048	17.885	1515.92
60	17.655	34.667	2.18	0.00	25.102	17.645	1515.38
70	17.564	34.665	2.18	0.00	25.123	17.553	1515.28
75	17.516	34.658	2.18	0.00	25.129	17.503	1515.21
80	17.229	34.665	2.17	0.00	25.203	17.216	1514.45
90	16.800	34.659	2.14	0.00	25.301	16.786	1513.32
100	16.295	34.637	2.14	0.00	25.402	16.279	1511.92
125	15.743	34.614	2.14	0.00	25.510	15.724	1510.61
150	15.179	34.586	2.15	0.00	25.614	15.156	1509.23
175	14.072	34.557	2.10	0.00	25.830	14.047	1506.07
200	12.713	34.498	2.03	0.00	26.061	12.686	1501.93
250	11.525	34.437	1.94	0.00	26.241	11.493	1498.63
300	10.038	34.317	2.01	0.00	26.413	10.003	1494.07
350	8.187	34.166	2.05	0.00	26.591	8.151	1487.89
400	6.652	34.041	2.20	0.00	26.711	6.616	1482.67
450	4.286	33.775	2.56	0.00	26.782	4.253	1473.60
500	6.519	34.247	1.50	0.00	26.891	6.474	1484.05

Station: K-100D
latitude: 36-00.00N Longtitude: 142-00.00E Depth: 3445m
Date: 1994-06-04 Time: 17:35

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.796	34.555	2.70	0.00	24.477	19.795	1520.43
5	19.835	34.555	2.67	0.00	24.467	19.834	1520.59
10	19.734	34.556	2.66	0.00	24.494	19.732	1520.39
20	19.092	34.559	2.71	0.00	24.662	19.089	1518.76
30	17.393	34.587	2.71	0.00	25.105	17.388	1514.02
40	16.708	34.627	2.51	0.00	25.298	16.702	1512.18
50	15.817	34.655	2.22	0.00	25.525	15.810	1509.65
60	15.380	34.631	2.11	0.00	25.604	15.371	1508.42
70	14.884	34.609	2.08	0.00	25.697	14.874	1507.00
75	14.632	34.593	2.08	0.00	25.739	14.621	1506.26
80	14.360	34.577	2.09	0.00	25.785	14.348	1505.45
90	14.159	34.566	2.11	0.00	25.819	14.146	1504.96
100	13.926	34.557	2.12	0.00	25.861	13.911	1504.36
125	12.569	34.487	2.05	0.00	26.081	12.552	1500.19
150	11.107	34.357	2.12	0.00	26.256	11.089	1495.44
175	7.685	33.866	3.03	0.00	26.430	7.668	1482.74
200	8.055	34.016	2.81	0.00	26.493	8.035	1484.74
250	6.965	33.883	3.22	0.00	26.544	6.942	1481.22
300	5.707	33.760	3.40	0.00	26.609	5.682	1476.92
350	6.968	34.080	2.33	0.00	26.699	6.935	1483.12
400	3.729	33.653	2.99	0.00	26.742	3.702	1470.29
450	4.446	33.839	2.51	0.00	26.816	4.413	1474.35
500	3.954	33.881	1.91	0.00	26.901	3.918	1473.18

Station: K-101D
latitude: 36-15.13N Longtitude: 141-59.81E Depth: 2900m
Date: 1994-06-04 Time: 19:20

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
3	18.674	34.311	2.82	0.00	24.578	18.673	1517.00
5	18.674	34.312	2.79	0.00	24.579	18.673	1517.03
10	18.657	34.350	2.78	0.00	24.612	18.656	1517.11
20	17.935	34.488	2.74	0.00	24.897	17.931	1515.33
30	14.839	34.411	2.71	0.00	25.553	14.834	1505.96
40	14.306	34.525	2.34	0.00	25.756	14.301	1504.56
50	13.471	34.500	2.20	0.00	25.911	13.464	1501.97
60	13.026	34.491	2.13	0.00	25.994	13.017	1500.66
70	12.285	34.435	2.14	0.00	26.096	12.276	1498.27
75	12.168	34.424	2.15	0.00	26.110	12.158	1497.94
80	11.803	34.383	2.17	0.00	26.147	11.793	1496.72
90	8.421	33.784	3.07	0.00	26.256	8.412	1484.02
100	7.938	33.840	3.33	0.00	26.372	7.928	1482.43
125	7.507	33.892	3.42	0.00	26.475	7.495	1481.27
150	7.008	33.846	3.45	0.00	26.509	6.994	1479.70
175	6.698	33.828	3.45	0.00	26.537	6.683	1478.88
200	5.546	33.705	3.56	0.00	26.585	5.529	1474.56
250	4.242	33.631	3.51	0.00	26.672	4.224	1469.95
300	2.751	33.516	3.53	0.00	26.722	2.733	1464.31
350	2.490	33.526	3.24	0.00	26.752	2.470	1464.01
400	2.552	33.575	2.98	0.00	26.787	2.529	1465.16
450	2.867	33.715	2.32	0.00	26.871	2.839	1467.52
500	2.983	33.784	1.90	0.00	26.916	2.952	1468.93

Station: K-102D
latitude: 36-30.00N Longtitude: 142-00.00E Depth: 2774m
Date: 1994-06-04 Time: 21:05

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.216	34.292	2.76	0.00	24.426	19.216	1518.51
5	19.216	34.292	2.72	0.00	24.426	19.215	1518.56
10	18.987	34.242	2.71	0.00	24.447	18.985	1517.93
20	15.815	33.972	3.02	0.00	25.000	15.812	1508.35
30	14.116	33.915	3.16	0.00	25.325	14.112	1503.06
40	13.790	34.219	2.96	0.00	25.628	13.784	1502.52
50	13.540	34.388	2.57	0.00	25.810	13.533	1502.07
60	12.844	34.319	2.49	0.00	25.897	12.835	1499.84
70	11.815	34.224	2.58	0.00	26.021	11.807	1496.41
75	11.648	34.246	2.55	0.00	26.070	11.638	1495.94
80	11.418	34.253	2.50	0.00	26.118	11.408	1495.24
90	11.040	34.294	2.40	0.00	26.219	11.029	1494.13
100	11.105	34.353	2.21	0.00	26.253	11.093	1494.60
125	10.812	34.389	1.96	0.00	26.334	10.797	1494.03
150	9.892	34.319	1.97	0.00	26.439	9.875	1491.07
175	9.596	34.335	1.83	0.00	26.501	9.576	1490.43
200	8.813	34.301	1.75	0.00	26.601	8.792	1487.93
250	7.457	34.259	1.57	0.00	26.771	7.432	1483.59
300	6.404	34.225	1.44	0.00	26.889	6.377	1480.28
350	5.749	34.249	1.30	0.00	26.991	5.719	1478.53
400	3.736	34.020	1.14	0.00	27.033	3.708	1470.80
450	3.165	33.975	0.95	0.00	27.052	3.136	1469.14
500	3.171	34.028	0.80	0.00	27.093	3.139	1470.06

Station: K-103D
latitude: 36-45.00N Longtitude: 142-00.00E Depth: 2518m
Date: 1994-06-04 Time: 23:00

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.460	34.515	2.73	0.00	24.534	19.460	1519.44
5	19.505	34.514	2.65	0.00	24.521	19.504	1519.62
10	18.890	34.531	2.67	0.00	24.692	18.888	1517.98
20	17.079	34.556	2.85	0.00	25.156	17.076	1512.88
30	16.340	34.570	2.91	0.00	25.340	16.336	1510.83
40	15.382	34.581	2.78	0.00	25.565	15.376	1508.04
50	14.825	34.579	2.58	0.00	25.686	14.817	1506.45
60	13.844	34.541	2.57	0.00	25.866	13.836	1503.41
70	13.097	34.500	2.58	0.00	25.986	13.087	1501.07
75	12.971	34.499	2.60	0.00	26.011	12.961	1500.73
80	12.825	34.513	2.68	0.00	26.051	12.814	1500.34
90	12.452	34.490	2.72	0.00	26.106	12.440	1499.23
100	12.215	34.470	2.66	0.00	26.137	12.202	1498.57
125	11.608	34.430	2.69	0.00	26.220	11.592	1496.85
150	10.520	34.301	2.34	0.00	26.316	10.503	1493.30
175	10.063	34.292	2.23	0.00	26.389	10.042	1492.07
200	9.963	34.347	1.89	0.00	26.449	9.940	1492.19
250	8.617	34.295	1.75	0.00	26.627	8.591	1488.02
300	7.263	34.256	1.57	0.00	26.796	7.234	1483.66
350	6.267	34.237	1.40	0.00	26.915	6.236	1480.57
400	5.198	34.215	1.23	0.00	27.030	5.166	1477.09
450	4.935	34.237	1.10	0.00	27.078	4.900	1476.87
500	4.634	34.260	1.02	0.00	27.130	4.596	1476.49

Station: K-104D
latitude: 36-59.97N Longtitude: 142-00.11E Depth: 1369m
Date: 1994-06-05 Time: 00:55

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.870	34.556	2.68	0.00	24.458	19.870	1520.64
5	19.870	34.560	2.57	0.00	24.461	19.869	1520.69
10	19.867	34.560	2.55	0.00	24.462	19.865	1520.77
20	18.610	34.537	2.66	0.00	24.767	18.607	1517.35
30	16.883	34.594	2.79	0.00	25.231	16.879	1512.50
40	15.596	34.604	2.81	0.00	25.536	15.590	1508.73
50	14.415	34.576	2.69	0.00	25.772	14.407	1505.13
60	13.444	34.546	2.65	0.00	25.952	13.436	1502.11
70	12.159	34.418	2.68	0.00	26.108	12.150	1497.82
75	11.886	34.382	2.66	0.00	26.131	11.876	1496.92
80	11.753	34.403	2.65	0.00	26.173	11.743	1496.58
90	11.427	34.407	2.75	0.00	26.236	11.415	1495.62
100	11.231	34.386	2.81	0.00	26.256	11.219	1495.08
125	10.437	34.294	2.87	0.00	26.326	10.422	1492.58
150	9.886	34.234	2.76	0.00	26.373	9.869	1490.95
175	8.608	34.071	2.90	0.00	26.453	8.590	1486.47
200	8.027	34.003	2.97	0.00	26.487	8.007	1484.62
250	6.019	33.836	2.92	0.00	26.631	5.997	1477.44
300	2.981	33.544	3.26	0.00	26.725	2.963	1465.33
350	3.401	33.628	3.13	0.00	26.754	3.378	1468.05
400	4.902	33.961	2.14	0.00	26.863	4.871	1475.56
450	5.433	34.140	1.60	0.00	26.943	5.396	1478.77
500	4.511	34.079	1.38	0.00	27.000	4.473	1475.75

Station: K-105D
latitude: 37-00.03N Longtitude: 142-29.96E Depth: 2892m
Date: 1994-06-05 Time: 03:05

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.202	34.465	2.71	0.00	24.562	19.202	1518.66
5	19.232	34.465	2.65	0.00	24.554	19.231	1518.79
10	18.947	34.470	2.66	0.00	24.631	18.945	1518.07
20	17.272	34.465	2.80	0.00	25.040	17.269	1513.35
30	16.159	34.463	2.82	0.00	25.299	16.154	1510.15
40	15.201	34.505	2.80	0.00	25.547	15.195	1507.38
50	14.181	34.478	2.74	0.00	25.746	14.174	1504.27
60	13.354	34.517	2.65	0.00	25.948	13.346	1501.78
70	12.333	34.411	2.63	0.00	26.069	12.323	1498.40
75	11.857	34.335	2.65	0.00	26.100	11.847	1496.77
80	11.353	34.272	2.70	0.00	26.145	11.343	1495.03
90	10.580	34.206	2.69	0.00	26.232	10.569	1492.41
100	10.138	34.169	2.66	0.00	26.280	10.127	1490.95
125	9.629	34.175	2.80	0.00	26.370	9.615	1489.53
150	8.110	34.005	2.90	0.00	26.476	8.095	1484.11
175	8.090	34.048	2.79	0.00	26.513	8.072	1484.50
200	7.615	34.047	2.53	0.00	26.582	7.596	1483.11
250	6.184	33.962	2.54	0.00	26.709	6.162	1478.26
300	5.982	34.037	2.12	0.00	26.794	5.957	1478.37
350	3.980	33.846	2.01	0.00	26.870	3.955	1470.78
400	4.944	34.038	1.69	0.00	26.919	4.913	1475.83
450	4.553	34.063	1.45	0.00	26.982	4.519	1475.08
500	3.783	34.031	1.21	0.00	27.038	3.748	1472.65

Station: K-106D
latitude: 36-45.00N Longtitude: 142-30.00E Depth: 4200m
Date: 1994-06-05 Time: 05:05

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.747	34.562	2.50	0.00	24.495	19.746	1520.30
5	19.747	34.562	2.50	0.00	24.495	19.746	1520.35
10	19.735	34.561	2.50	0.00	24.497	19.733	1520.40
20	17.419	34.531	2.72	0.00	25.055	17.416	1513.86
30	15.219	34.417	2.84	0.00	25.475	15.214	1507.17
40	13.797	34.386	2.72	0.00	25.756	13.791	1502.74
50	13.041	34.420	2.55	0.00	25.936	13.034	1500.46
60	12.698	34.406	2.53	0.00	25.993	12.690	1499.46
70	11.868	34.393	2.60	0.00	26.143	11.859	1496.79
75	11.695	34.416	2.60	0.00	26.193	11.685	1496.31
80	11.676	34.420	2.62	0.00	26.200	11.666	1496.33
90	11.389	34.402	2.68	0.00	26.239	11.378	1495.48
100	11.229	34.396	2.75	0.00	26.264	11.217	1495.08
125	10.170	34.276	2.79	0.00	26.358	10.155	1491.61
150	9.115	34.161	2.81	0.00	26.443	9.099	1488.05
175	7.660	33.976	2.88	0.00	26.519	7.643	1482.78
200	7.091	33.950	2.87	0.00	26.580	7.072	1480.97
250	6.638	34.060	2.34	0.00	26.728	6.616	1480.17
300	5.887	34.023	2.07	0.00	26.795	5.861	1477.97
350	2.722	33.662	2.36	0.00	26.842	2.701	1465.19
400	3.515	33.818	2.05	0.00	26.894	3.489	1469.60
450	4.978	34.114	1.54	0.00	26.975	4.943	1476.89
500	4.437	34.116	1.31	0.00	27.037	4.400	1475.49

Station: K-107D
latitude: 36-30.00N Longtitude: 142-30.00E Depth: 4260m
Date: 1994-06-05 Time: 07:15

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	15.834	33.816	3.07	0.00	24.875	15.834	1507.93
5	15.950	33.812	3.06	0.00	24.846	15.949	1508.34
10	14.621	33.862	3.18	0.00	25.177	14.619	1504.30
20	12.732	33.876	3.39	0.00	25.576	12.729	1498.28
30	9.954	33.727	3.45	0.00	25.966	9.950	1488.60
40	8.325	33.596	3.67	0.00	26.123	8.321	1482.61
50	7.829	33.682	3.59	0.00	26.264	7.824	1481.00
60	7.469	33.764	3.50	0.00	26.380	7.463	1479.90
70	7.133	33.836	3.30	0.00	26.483	7.127	1478.86
75	6.576	33.773	3.36	0.00	26.509	6.569	1476.69
80	6.310	33.731	3.43	0.00	26.511	6.303	1475.67
90	5.283	33.594	3.64	0.00	26.528	5.276	1471.56
100	4.878	33.558	3.75	0.00	26.546	4.870	1470.03
125	4.599	33.556	3.78	0.00	26.575	4.590	1469.29
150	4.532	33.605	3.71	0.00	26.621	4.521	1469.48
175	3.661	33.534	3.76	0.00	26.653	3.649	1466.17
200	3.142	33.502	3.76	0.00	26.677	3.130	1464.33
250	3.707	33.652	3.21	0.00	26.743	3.690	1467.74
300	3.539	33.711	2.72	0.00	26.806	3.519	1467.92
350	4.312	33.905	2.15	0.00	26.883	4.287	1472.24
400	4.117	33.959	1.80	0.00	26.946	4.089	1472.32
450	3.601	33.941	1.53	0.00	26.983	3.570	1470.95
500	3.104	33.948	1.20	0.00	27.036	3.072	1469.67

Station: K-108D
latitude: 36-15.02N Longtitude: 142-30.11E Depth: 5607m
Date: 1994-06-05 Time: 09:20

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.314	34.432	2.74	0.00	24.508	19.313	1518.94
5	19.083	34.447	2.68	0.00	24.579	19.082	1518.35
10	17.877	34.394	2.80	0.00	24.839	17.875	1514.89
20	16.461	34.640	2.62	0.00	25.365	16.458	1511.11
30	14.799	34.599	2.25	0.00	25.708	14.794	1506.05
40	13.912	34.561	2.12	0.00	25.867	13.906	1503.32
50	12.851	34.517	2.09	0.00	26.049	12.844	1499.94
60	12.537	34.490	2.03	0.00	26.090	12.529	1499.02
70	12.060	34.457	2.02	0.00	26.156	12.051	1497.53
75	12.006	34.458	2.02	0.00	26.167	11.996	1497.43
80	11.470	34.434	1.99	0.00	26.249	11.460	1495.64
90	11.188	34.414	1.96	0.00	26.286	11.177	1494.80
100	10.515	34.359	1.97	0.00	26.363	10.503	1492.53
125	7.295	33.892	3.05	0.00	26.505	7.283	1480.46
150	6.939	33.871	3.37	0.00	26.538	6.925	1479.46
175	6.556	33.830	3.41	0.00	26.557	6.541	1478.32
200	6.067	33.782	3.48	0.00	26.582	6.050	1476.74
250	3.865	33.575	3.72	0.00	26.666	3.849	1468.31
300	3.067	33.527	3.62	0.00	26.704	3.049	1465.68
350	2.664	33.551	3.21	0.00	26.758	2.643	1464.80
400	3.342	33.731	2.58	0.00	26.841	3.316	1468.76
450	3.039	33.791	2.00	0.00	26.917	3.011	1468.36
500	3.037	33.868	1.53	0.00	26.978	3.006	1469.28

Station: K-109D
latitude: 36-00.13N Longtitude: 142-30.06E Depth: 5418m
Date: 1994-06-05 Time: 11:28

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	20.137	34.554	2.61	0.00	24.387	20.136	1521.37
5	20.154	34.553	2.61	0.00	24.382	20.153	1521.47
10	20.036	34.554	2.61	0.00	24.413	20.034	1521.23
20	19.407	34.543	2.68	0.00	24.569	19.404	1519.63
30	18.393	34.529	2.82	0.00	24.815	18.388	1516.88
40	15.861	34.584	2.61	0.00	25.460	15.855	1509.53
50	15.604	34.599	2.36	0.00	25.530	15.596	1508.92
60	14.973	34.591	2.23	0.00	25.663	14.964	1507.09
70	14.688	34.581	2.17	0.00	25.717	14.677	1506.34
75	14.627	34.577	2.16	0.00	25.727	14.615	1506.22
80	14.495	34.574	2.15	0.00	25.754	14.484	1505.89
90	14.156	34.563	2.12	0.00	25.817	14.143	1504.94
100	14.094	34.560	2.13	0.00	25.828	14.080	1504.91
125	12.396	34.484	2.06	0.00	26.113	12.380	1499.61
150	11.444	34.430	1.99	0.00	26.251	11.425	1496.70
175	10.862	34.407	1.92	0.00	26.339	10.840	1495.05
200	10.231	34.372	1.87	0.00	26.422	10.208	1493.18
250	8.068	34.139	2.18	0.00	26.588	8.042	1485.76
300	7.485	34.146	2.03	0.00	26.678	7.456	1484.38
350	5.884	33.969	2.19	0.00	26.753	5.854	1478.71
400	6.782	34.206	1.86	0.00	26.824	6.745	1483.38
450	5.525	34.090	1.69	0.00	26.892	5.488	1479.07
500	5.128	34.130	1.45	0.00	26.971	5.088	1478.34

Station: K-110D
latitude: 35-45.00N Longtitude: 142-30.00E Depth: 5808m
Date: 1994-06-05 Time: 13:15

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	22.151	34.723	2.49	0.00	23.966	22.150	1526.97
5	22.143	34.723	2.47	0.00	23.969	22.142	1527.00
10	22.016	34.721	2.47	0.00	24.003	22.014	1526.75
20	21.154	34.697	2.31	0.00	24.222	21.151	1524.61
30	20.367	34.646	2.25	0.00	24.396	20.361	1522.58
40	20.172	34.627	2.27	0.00	24.433	20.164	1522.19
50	20.139	34.638	2.26	0.00	24.451	20.130	1522.28
60	20.231	34.847	2.20	0.00	24.585	20.220	1522.93
70	19.499	34.796	2.18	0.00	24.738	19.486	1521.00
75	19.303	34.822	2.17	0.00	24.809	19.289	1520.56
80	19.171	34.811	2.16	0.00	24.835	19.156	1520.26
90	18.767	34.806	2.17	0.00	24.933	18.751	1519.27
100	18.715	34.795	2.17	0.00	24.938	18.698	1519.28
125	18.164	34.769	2.18	0.00	25.055	18.142	1518.07
150	17.106	34.669	2.16	0.00	25.236	17.081	1515.25
175	16.418	34.654	2.14	0.00	25.386	16.390	1513.56
200	14.861	34.595	2.11	0.00	25.691	14.831	1509.06
250	12.527	34.482	2.06	0.00	26.086	12.494	1502.11
300	11.931	34.454	2.00	0.00	26.179	11.892	1500.88
350	9.987	34.282	2.08	0.00	26.394	9.947	1494.67
400	8.360	34.212	1.99	0.00	26.601	8.318	1489.42
450	7.565	34.208	1.90	0.00	26.716	7.520	1487.23
500	5.959	34.122	1.61	0.00	26.864	5.916	1481.68

Station: K-111D
latitude: 35-30.15N Longtitude: 142-30.26E Depth: 6849m
Date: 1994-06-05 Time: 15:20

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	24.151	34.714	2.19	0.00	23.382	24.151	1532.05
5	24.151	34.714	2.17	0.00	23.382	24.150	1532.10
10	24.154	34.714	2.16	0.00	23.381	24.152	1532.19
20	24.086	34.711	2.15	0.00	23.399	24.082	1532.19
30	24.021	34.713	2.15	0.00	23.420	24.015	1532.19
40	23.934	34.711	2.15	0.00	23.444	23.926	1532.14
50	23.563	34.719	2.15	0.00	23.559	23.552	1531.39
60	23.529	34.721	2.14	0.00	23.570	23.517	1531.47
70	23.267	34.702	2.13	0.00	23.632	23.253	1530.96
75	23.185	34.704	2.13	0.00	23.657	23.170	1530.84
80	23.140	34.707	2.13	0.00	23.673	23.123	1530.81
90	22.912	34.729	2.13	0.00	23.755	22.894	1530.42
100	22.572	34.752	2.13	0.00	23.870	22.552	1529.74
125	21.352	34.735	2.12	0.00	24.197	21.328	1526.93
150	20.020	34.852	2.20	0.00	24.645	19.992	1523.85
175	18.821	34.819	2.17	0.00	24.930	18.790	1520.85
200	17.706	34.805	2.19	0.00	25.196	17.672	1518.02
250	16.165	34.706	2.18	0.00	25.485	16.125	1514.09
300	14.298	34.583	2.15	0.00	25.802	14.254	1508.90
350	12.688	34.480	2.08	0.00	26.053	12.641	1504.31
400	11.769	34.428	2.04	0.00	26.189	11.717	1501.94
450	10.175	34.337	1.95	0.00	26.405	10.122	1497.06
500	8.999	34.299	1.82	0.00	26.570	8.945	1493.56

Station: K-112D
latitude: 35-50.24N Longtitude: 142-10.15E Depth: 3938m
Date: 1994-06-06 Time: 10:30

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	20.601	34.589	2.90	0.00	24.290	20.600	1522.69
5	20.643	34.589	2.89	0.00	24.278	20.642	1522.85
10	20.600	34.590	2.88	0.00	24.291	20.598	1522.82
20	18.851	34.609	2.69	0.00	24.762	18.847	1518.12
30	18.546	34.677	2.50	0.00	24.890	18.541	1517.49
40	17.866	34.643	2.47	0.00	25.033	17.859	1515.64
50	17.783	34.667	2.44	0.00	25.071	17.775	1515.59
60	17.708	34.668	2.42	0.00	25.090	17.698	1515.54
70	17.625	34.665	2.41	0.00	25.108	17.613	1515.46
75	17.601	34.666	2.40	0.00	25.114	17.589	1515.47
80	17.457	34.653	2.40	0.00	25.140	17.443	1515.11
90	16.551	34.584	2.39	0.00	25.301	16.536	1512.48
100	15.617	34.565	2.34	0.00	25.501	15.602	1509.75
125	14.855	34.573	2.19	0.00	25.675	14.836	1507.78
150	14.093	34.558	2.15	0.00	25.827	14.071	1505.73
175	13.439	34.527	2.10	0.00	25.938	13.415	1503.97
200	12.874	34.500	2.08	0.00	26.031	12.846	1502.47
250	11.409	34.433	1.99	0.00	26.260	11.378	1498.23
300	9.638	34.319	1.91	0.00	26.482	9.604	1492.63
350	8.415	34.185	2.20	0.00	26.572	8.378	1488.77
400	6.733	34.054	2.17	0.00	26.710	6.696	1483.00
450	6.209	34.045	2.09	0.00	26.772	6.170	1481.75
500	4.147	33.825	2.23	0.00	26.837	4.111	1473.91

Station: K-113D
latitude: 36-00.00N Longtitude: 141-57.80E Depth: 3000m
Date: 1994-06-06 Time: 13:05

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.977	34.544	3.05	0.00	24.421	19.976	1520.92
5	19.971	34.544	3.04	0.00	24.423	19.970	1520.96
10	19.053	34.571	2.99	0.00	24.681	19.051	1518.49
20	16.943	34.591	2.53	0.00	25.214	16.940	1512.51
30	16.429	34.595	2.39	0.00	25.338	16.424	1511.12
40	15.651	34.595	2.30	0.00	25.516	15.645	1508.90
50	15.439	34.601	2.26	0.00	25.568	15.431	1508.41
60	14.626	34.575	2.21	0.00	25.726	14.617	1505.97
70	14.307	34.571	2.17	0.00	25.791	14.296	1505.11
75	13.882	34.552	2.15	0.00	25.866	13.871	1503.79
80	13.620	34.538	2.13	0.00	25.910	13.609	1503.01
90	13.594	34.534	2.11	0.00	25.912	13.582	1503.08
100	13.549	34.531	2.11	0.00	25.919	13.535	1503.10
125	12.693	34.491	2.08	0.00	26.060	12.676	1500.62
150	11.740	34.451	2.03	0.00	26.212	11.721	1497.74
175	11.183	34.414	1.99	0.00	26.287	11.162	1496.18
200	8.725	34.073	2.57	0.00	26.436	8.704	1487.32
250	6.930	33.835	3.54	0.00	26.511	6.907	1481.03
300	6.560	33.828	3.50	0.00	26.555	6.533	1480.39
350	5.175	33.714	3.58	0.00	26.636	5.147	1475.53
400	4.536	33.757	3.05	0.00	26.741	4.506	1473.79
450	4.105	33.794	2.51	0.00	26.816	4.073	1472.87
500	3.759	33.829	2.17	0.00	26.879	3.725	1472.29

Station: K-114D
latitude: 36-10.00N Longtitude: 141-46.00E Depth: 1972m
Date: 1994-06-06 Time: 15:15

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.588	34.563	2.90	0.00	24.537	19.588	1519.86
5	19.593	34.563	2.88	0.00	24.536	19.592	1519.92
10	19.599	34.563	2.84	0.00	24.534	19.597	1520.02
20	19.560	34.566	2.80	0.00	24.547	19.556	1520.08
30	17.909	34.680	2.62	0.00	25.050	17.904	1515.65
40	16.812	34.665	2.35	0.00	25.302	16.806	1512.53
50	16.114	34.618	2.28	0.00	25.429	16.106	1510.52
60	15.702	34.606	2.22	0.00	25.513	15.692	1509.40
70	15.157	34.594	2.21	0.00	25.625	15.146	1507.84
75	14.971	34.589	2.20	0.00	25.662	14.959	1507.33
80	14.662	34.585	2.19	0.00	25.726	14.650	1506.43
90	14.118	34.564	2.16	0.00	25.826	14.105	1504.82
100	13.789	34.550	2.14	0.00	25.884	13.775	1503.90
125	12.769	34.502	2.09	0.00	26.054	12.752	1500.89
150	10.992	34.384	2.03	0.00	26.298	10.974	1495.06
175	9.857	34.254	2.17	0.00	26.394	9.837	1491.28
200	7.194	33.868	3.15	0.00	26.501	7.176	1481.27
250	6.313	33.777	3.63	0.00	26.547	6.292	1478.53
300	5.335	33.691	3.76	0.00	26.599	5.311	1475.33
350	3.922	33.555	3.91	0.00	26.645	3.898	1470.16
400	3.220	33.539	3.76	0.00	26.699	3.194	1467.99
450	3.305	33.621	3.25	0.00	26.757	3.276	1469.28
500	3.725	33.773	2.52	0.00	26.838	3.691	1472.07

Station: K-115D
latitude: 36-20.00N Longtitude: 141-34.00E Depth: 1710m
Date: 1994-06-06 Time: 18:05

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	18.486	34.579	2.95	0.00	24.830	18.486	1516.74
5	18.493	34.580	2.85	0.00	24.829	18.492	1516.81
10	18.493	34.580	2.78	0.00	24.829	18.491	1516.90
20	17.928	34.613	2.61	0.00	24.995	17.924	1515.46
30	16.228	34.621	2.24	0.00	25.405	16.223	1510.54
40	15.698	34.606	2.17	0.00	25.514	15.691	1509.05
50	15.296	34.597	2.15	0.00	25.596	15.289	1507.96
60	14.953	34.585	2.14	0.00	25.663	14.944	1507.03
70	14.404	34.573	2.11	0.00	25.772	14.394	1505.43
75	14.240	34.563	2.10	0.00	25.800	14.229	1504.97
80	13.864	34.551	2.09	0.00	25.869	13.852	1503.82
90	13.357	34.527	2.06	0.00	25.955	13.344	1502.29
100	12.822	34.500	2.05	0.00	26.042	12.809	1500.65
125	11.722	34.453	1.96	0.00	26.217	11.706	1497.27
150	10.751	34.401	1.90	0.00	26.354	10.733	1494.24
175	10.344	34.378	1.87	0.00	26.408	10.323	1493.18
200	9.673	34.329	1.86	0.00	26.483	9.651	1491.12
250	6.669	33.898	2.89	0.00	26.596	6.647	1480.09
300	5.833	33.883	2.86	0.00	26.691	5.808	1477.58
350	6.209	34.005	2.30	0.00	26.740	6.179	1480.05
400	4.165	33.808	2.38	0.00	26.821	4.136	1472.32
450	3.926	33.859	2.09	0.00	26.886	3.895	1472.21
500	3.967	33.919	1.74	0.00	26.930	3.932	1473.28

Station: K-116D
latitude: 36-30.00N Longtitude: 141-22.12E Depth: 989 m
Date: 1994-06-06 Time: 20:45

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	18.125	34.536	2.84	0.00	24.887	18.124	1515.65
5	18.126	34.537	2.78	0.00	24.887	18.126	1515.70
10	18.126	34.535	2.76	0.00	24.886	18.124	1515.78
20	17.562	34.565	2.70	0.00	25.047	17.558	1514.32
30	15.430	34.590	2.38	0.00	25.562	15.426	1508.04
40	15.276	34.587	2.17	0.00	25.593	15.270	1507.71
50	14.969	34.584	2.10	0.00	25.658	14.962	1506.91
60	14.071	34.539	2.15	0.00	25.817	14.062	1504.14
70	13.680	34.543	2.05	0.00	25.901	13.670	1503.04
75	13.304	34.527	2.05	0.00	25.965	13.293	1501.87
80	12.940	34.507	2.03	0.00	26.023	12.929	1500.72
90	12.285	34.456	2.01	0.00	26.113	12.273	1498.62
100	10.348	34.184	2.31	0.00	26.256	10.336	1491.72
125	7.700	33.813	3.35	0.00	26.386	7.688	1481.91
150	9.445	34.243	2.14	0.00	26.454	9.428	1489.36
175	8.156	34.077	2.46	0.00	26.526	8.138	1484.79
200	7.816	34.054	2.60	0.00	26.558	7.796	1483.88
250	4.154	33.626	3.31	0.00	26.677	4.137	1469.58
300	2.671	33.505	3.44	0.00	26.720	2.654	1463.95
350	2.683	33.589	2.87	0.00	26.786	2.663	1464.93
400	2.375	33.609	2.52	0.00	26.828	2.353	1464.44
450	2.810	33.726	2.02	0.00	26.885	2.783	1467.30
500	2.859	33.784	1.74	0.00	26.927	2.828	1468.40

Station: K-117D
latitude: 36-40.00N Longtitude: 141-10.00E Depth: 262 m
Date: 1994-06-06 Time: 23:15

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	18.615	34.534	2.61	0.00	24.763	18.615	1517.06
5	18.616	34.534	2.59	0.00	24.763	18.615	1517.11
10	18.605	34.532	2.58	0.00	24.765	18.603	1517.16
20	18.600	34.531	2.58	0.00	24.765	18.596	1517.32
30	18.056	34.550	2.60	0.00	24.915	18.051	1515.93
40	15.428	34.611	2.60	0.00	25.578	15.422	1508.22
50	14.568	34.588	2.44	0.00	25.749	14.561	1505.64
60	12.958	34.511	2.43	0.00	26.023	12.949	1500.45
70	12.619	34.465	2.20	0.00	26.054	12.609	1499.43
75	12.050	34.406	2.19	0.00	26.118	12.041	1497.51
80	11.981	34.400	2.17	0.00	26.127	11.971	1497.35
90	11.208	34.336	2.20	0.00	26.221	11.196	1494.77
100	9.469	34.090	2.58	0.00	26.330	9.458	1488.44
125	7.842	33.910	3.02	0.00	26.441	7.830	1482.57
150	7.302	33.887	3.36	0.00	26.501	7.288	1480.89
175	7.257	33.883	3.44	0.00	26.504	7.241	1481.12
200	7.195	33.884	3.49	0.00	26.513	7.176	1481.29

Station: K-118D
latitude: 36-24.98N Longtitude: 141-09.90E Depth: 754 m
Date: 1994-06-07 Time: 03:25

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.436	34.581	2.55	0.00	24.591	19.435	1519.45
5	19.444	34.581	2.55	0.00	24.589	19.443	1519.52
10	19.433	34.582	2.53	0.00	24.592	19.431	1519.58
20	18.939	34.555	2.56	0.00	24.698	18.936	1518.31
30	15.897	34.590	2.28	0.00	25.456	15.893	1509.49
40	14.989	34.589	2.08	0.00	25.658	14.983	1506.81
50	14.566	34.571	2.06	0.00	25.736	14.559	1505.61
60	13.996	34.553	2.04	0.00	25.843	13.988	1503.92
70	13.696	34.542	2.02	0.00	25.897	13.686	1503.09
75	13.526	34.536	2.02	0.00	25.927	13.515	1502.61
80	13.065	34.512	2.02	0.00	26.003	13.054	1501.14
90	12.422	34.478	1.99	0.00	26.103	12.410	1499.11
100	11.739	34.424	2.01	0.00	26.192	11.726	1496.88
125	10.833	34.383	1.94	0.00	26.326	10.818	1494.09
150	9.875	34.321	1.91	0.00	26.443	9.858	1491.01
175	9.247	34.272	1.94	0.00	26.509	9.228	1489.08
200	7.392	33.963	2.77	0.00	26.547	7.373	1482.15
250	6.878	33.967	2.74	0.00	26.622	6.855	1480.99
300	4.804	33.748	3.03	0.00	26.705	4.782	1473.25
350	3.763	33.689	2.89	0.00	26.767	3.739	1469.66
400	4.028	33.783	2.54	0.00	26.816	4.000	1471.72
450	4.168	33.912	1.98	0.00	26.904	4.136	1473.29
500	4.750	34.097	1.46	0.00	26.987	4.712	1476.76

Station: K-119D
latitude: 36-10.00N Longtitude: 141-09.90E Depth: 600 m
Date: 1994-06-07 Time: 04:50

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.422	34.614	2.44	0.00	24.619	19.422	1519.45
5	19.431	34.614	2.43	0.00	24.617	19.430	1519.52
10	19.426	34.614	2.44	0.00	24.618	19.425	1519.60
20	19.349	34.613	2.44	0.00	24.637	19.345	1519.54
30	18.096	34.629	2.40	0.00	24.965	18.091	1516.13
40	16.379	34.687	2.10	0.00	25.420	16.373	1511.24
50	15.761	34.640	2.06	0.00	25.526	15.753	1509.45
60	14.998	34.599	2.04	0.00	25.664	14.989	1507.18
70	14.334	34.569	2.01	0.00	25.784	14.324	1505.19
75	13.892	34.547	2.02	0.00	25.861	13.881	1503.82
80	13.559	34.535	2.01	0.00	25.920	13.547	1502.80
90	12.885	34.509	1.98	0.00	26.036	12.872	1500.70
100	12.028	34.430	1.98	0.00	26.142	12.015	1497.88
125	7.771	33.884	3.16	0.00	26.431	7.758	1482.27
150	7.058	33.804	3.50	0.00	26.469	7.044	1479.84
175	7.219	33.860	3.47	0.00	26.491	7.202	1480.94
200	6.678	33.788	3.45	0.00	26.508	6.661	1479.16
250	6.407	33.826	3.32	0.00	26.573	6.385	1478.97
300	7.907	34.208	2.24	0.00	26.666	7.877	1486.06
350	5.015	33.859	2.38	0.00	26.769	4.988	1475.07
400	5.166	33.929	2.28	0.00	26.807	5.134	1476.59
450	4.456	33.952	1.76	0.00	26.905	4.423	1474.54
500	4.010	33.978	1.50	0.00	26.972	3.974	1473.54

Station: K-120D
latitude: 35-55.00N Longtitude: 141-09.90E Depth: 500 m
Date: 1994-06-07 Time: 06:30

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	18.935	34.572	2.59	0.00	24.712	18.935	1518.02
5	18.900	34.573	2.59	0.00	24.721	18.899	1517.97
10	18.887	34.573	2.59	0.00	24.724	18.886	1518.02
20	16.952	34.616	2.50	0.00	25.232	16.949	1512.57
30	15.881	34.654	2.14	0.00	25.509	15.876	1509.51
40	14.856	34.620	2.09	0.00	25.711	14.850	1506.43
50	14.448	34.593	2.08	0.00	25.778	14.440	1505.26
60	14.019	34.569	2.08	0.00	25.851	14.010	1504.01
70	13.261	34.528	2.03	0.00	25.975	13.251	1501.64
75	13.099	34.514	2.03	0.00	25.997	13.089	1501.18
80	12.918	34.502	2.03	0.00	26.024	12.907	1500.64
90	12.304	34.473	2.00	0.00	26.122	12.293	1498.71
100	11.823	34.435	1.99	0.00	26.184	11.810	1497.18
125	9.072	34.073	2.44	0.00	26.381	9.059	1487.37
150	7.230	33.825	3.02	0.00	26.462	7.216	1480.53
175	7.119	33.810	3.06	0.00	26.465	7.103	1480.49
200	6.967	33.787	3.12	0.00	26.468	6.949	1480.29
250	6.578	33.737	3.32	0.00	26.481	6.556	1479.53
300	6.264	33.765	3.50	0.00	26.543	6.238	1479.14
350	5.182	33.770	3.16	0.00	26.679	5.155	1475.64
400	4.494	33.777	2.81	0.00	26.762	4.465	1473.65

Station: S-2D
latitude: 34-29.13N Longtitude: 139-23.05E Depth: 185 m
Date: 1994-06-08 Time: 00:00

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	22.150	34.630	2.58	0.00	23.896	22.149	1526.87
5	22.149	34.630	2.56	0.00	23.896	22.148	1526.92
10	22.123	34.630	2.54	0.00	23.904	22.121	1526.93
20	21.509	34.635	2.51	0.00	24.078	21.505	1525.48
30	21.236	34.647	2.47	0.00	24.162	21.230	1524.94
40	21.148	34.645	2.45	0.00	24.185	21.141	1524.87
50	20.184	34.640	2.41	0.00	24.440	20.175	1522.40
60	20.127	34.635	2.39	0.00	24.451	20.116	1522.41
70	20.095	34.632	2.38	0.00	24.457	20.082	1522.48
75	20.021	34.631	2.37	0.00	24.476	20.007	1522.36
80	19.117	34.656	2.34	0.00	24.730	19.102	1519.93
90	17.129	34.652	2.26	0.00	25.218	17.114	1514.30
100	17.104	34.643	2.25	0.00	25.217	17.088	1514.38
125	16.733	34.630	2.23	0.00	25.294	16.713	1513.66
150	16.227	34.621	2.21	0.00	25.405	16.203	1512.53

Station: S-3D
latitude: 34-24.29N Longtitude: 139-07.19E Depth: 614 m
Date: 1994-06-08 Time: 22:30

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	22.333	34.627	2.60	0.00	23.843	22.332	1527.34
5	22.147	34.628	2.59	0.00	23.896	22.146	1526.91
10	21.500	34.632	2.57	0.00	24.078	21.498	1525.29
20	21.058	34.630	2.54	0.00	24.198	21.054	1524.27
30	20.792	34.656	2.50	0.00	24.290	20.786	1523.75
40	19.827	34.595	2.45	0.00	24.500	19.819	1521.19
50	19.652	34.708	2.40	0.00	24.631	19.643	1521.00
60	18.812	34.771	2.33	0.00	24.895	18.802	1518.86
70	17.481	34.653	2.35	0.00	25.134	17.469	1515.02
75	16.762	34.614	2.34	0.00	25.275	16.749	1512.90
80	16.618	34.603	2.33	0.00	25.301	16.605	1512.54
90	16.281	34.608	2.32	0.00	25.382	16.267	1511.68
100	15.819	34.605	2.29	0.00	25.486	15.803	1510.42
125	14.973	34.585	2.25	0.00	25.659	14.954	1508.16
150	14.623	34.567	2.23	0.00	25.721	14.601	1507.45
175	14.448	34.565	2.21	0.00	25.757	14.423	1507.30
200	14.030	34.552	2.18	0.00	25.835	14.002	1506.35
250	11.693	34.421	2.06	0.00	26.198	11.661	1499.20
300	11.523	34.412	2.01	0.00	26.223	11.485	1499.42
350	10.378	34.373	1.88	0.00	26.398	10.336	1496.18
400	9.800	34.345	1.81	0.00	26.474	9.754	1494.89
450	8.741	34.312	1.71	0.00	26.621	8.692	1491.79

Station: S-4D
latitude: 35-13.10N Longtitude: 139-32.61E Depth: 089 m
Date: 1994-06-09 Time: 22:00

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	20.849	33.386	2.86	0.00	23.308	20.848	1522.03
5	20.868	33.428	2.83	0.00	23.335	20.867	1522.17
10	20.963	33.641	2.79	0.00	23.471	20.961	1522.75
20	19.865	34.355	2.75	0.00	24.306	19.861	1520.70
30	17.583	34.550	2.52	0.00	25.030	17.578	1514.54
40	17.014	34.579	2.41	0.00	25.189	17.007	1513.04
50	16.353	34.585	2.37	0.00	25.348	16.345	1511.21
60	15.615	34.580	2.29	0.00	25.513	15.606	1509.10
70	15.365	34.575	2.26	0.00	25.565	15.354	1508.48

Station: K-17D
latitude: 34.09.96N Longtitude: 138.29.99E Depth: 3637m
Date: 1994-06-20 Time: 10:10

Press [dBar]	Temp [°C]	Sal [PSU]	Oxy [ml/L]	Trans [%]	Sig.-t [Kg/m^3]	P.temp [°C]	sound V [m/sec]
2	19.051	34.629	2.84	1518.42			
5	19.058	34.629	2.84	1518.49			
10	19.052	34.630	2.82	1518.56			
20	19.039	34.629	2.82	1518.68			
30	18.882	34.629	2.78	1518.40			
40	16.135	34.634	2.44	1510.43			
50	15.429	34.623	2.36	1508.40			
60	15.037	34.610	2.32	1507.31			
70	14.491	34.582	2.29	1505.70			
75	14.287	34.574	2.28	1505.11			
80	14.023	34.557	2.27	1504.32			
90	13.646	34.537	2.26	1503.23			
100	13.154	34.511	2.25	1501.74			
125	12.543	34.469	2.25	1500.05			
150	11.672	34.438	2.20	1497.44			
175	11.068	34.422	2.12	1495.73			
200	9.986	34.319	2.15	1492.15			
250	8.869	34.312	1.93	1488.87			
300	7.942	34.271	1.82	1486.15			
350	7.030	34.241	1.69	1483.42			
400	6.274	34.252	1.53	1481.28			
450	5.544	34.269	1.35	1479.19			
500	5.186	34.273	1.25	1478.56			
600	4.419	34.326	1.08	1477.11			
700	3.968	34.368	1.01	1476.91			
800	3.845	34.380	0.99	1478.04			
900	3.544	34.412	0.97	1478.45			
1000	3.370	34.432	1.00	1479.37			