INSTITUTE OF OCEANOLOGY
POLISH ACADEMY OF SCIENCES

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November 16. 2004

Cruise Report
R.V. „Oceania", AREX2004

Ship:	R.V. "Oceania"
Cruise:	Arex2004
Dates:	08.06.2004 – 19.07.2004
Port Calls:	Sopot (Poland) – Longyearbyen (Spitsbergen)
Number of Scientist	11
Chief Scientist	prof. Jan Piechura
Principal Project	ASOF-N, WP1
Research Area	Greenland Sea

WP1. Atlantic Water pathways in the Greenland Sea

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1. Introduction

Institute Oceanology Polish Academy of Sciences is doing oceanographic research in the Norwegian, Greenland and Barents Seas since 1987. During summer cruises hydrographic data were collected, some at the same permanent stations and transects. Since 1993 the ADCP data has been collected, since 2003 the lowered ADCP measurements have been introduced.

Measurements were conducted within the Atlantic Domain. In the Greenland Sea domain is situated between Barents Sea slope and underwater ridges system – Mohns Ridge and Knipovich Ridge. Due to convergence of the isobaths in the northern part, AW domain forms wedge, wide in southern part and narrow in the northern end. Specific bottom topography meaningfully influences the currents pattern and structure. Coverage in the southern part of investigated area is spare in comparison to the northern one. This causes less accurate horizontal distribution of properties in the region south of the Bear Island. Our main afford was concentrated in the northern part of Atlantic Domain, where processes controlling the AW inflow into Arctic Ocean through the Fram Strait and the westward recirculation take place.

2. Observations 2004

AREX2004 cruise of the R.V Oceania was performed in period of June 08 2004 – July 197 2004. 214 CTD (conductivity, temperature, depth) profiles along 12 sections were done (Fig 1, Tab.1). Sections were situated perpendicular to the supposed direction of the Atlantic Water flow. Some transects were repeated two or even three times (section EB2) to observe the short-term variability of hydrological fields and currents.

For CTD measurements the Seabird SBI9/11plus probe was used. The probe was serviced before the cruise. Temperature and conductivity sensors were calibrated by the Sea-Bird Electronics service. Water samples collected by means of the rosette water sampler SBE32 were analysed at the ship and in IOPAS laboratory with the Guildline Autosal 8400A.

Measurements of currents were performed by means of lowered Acoustic Doppler Current Profiler (LADCP). The self-recording 300 kHz RDI device was used to profile entire water column during the standard CTD casts.

During the whole cruise continuous currents measurements by the ship-mounted ADCP, RDI 150 kHz were conducted.

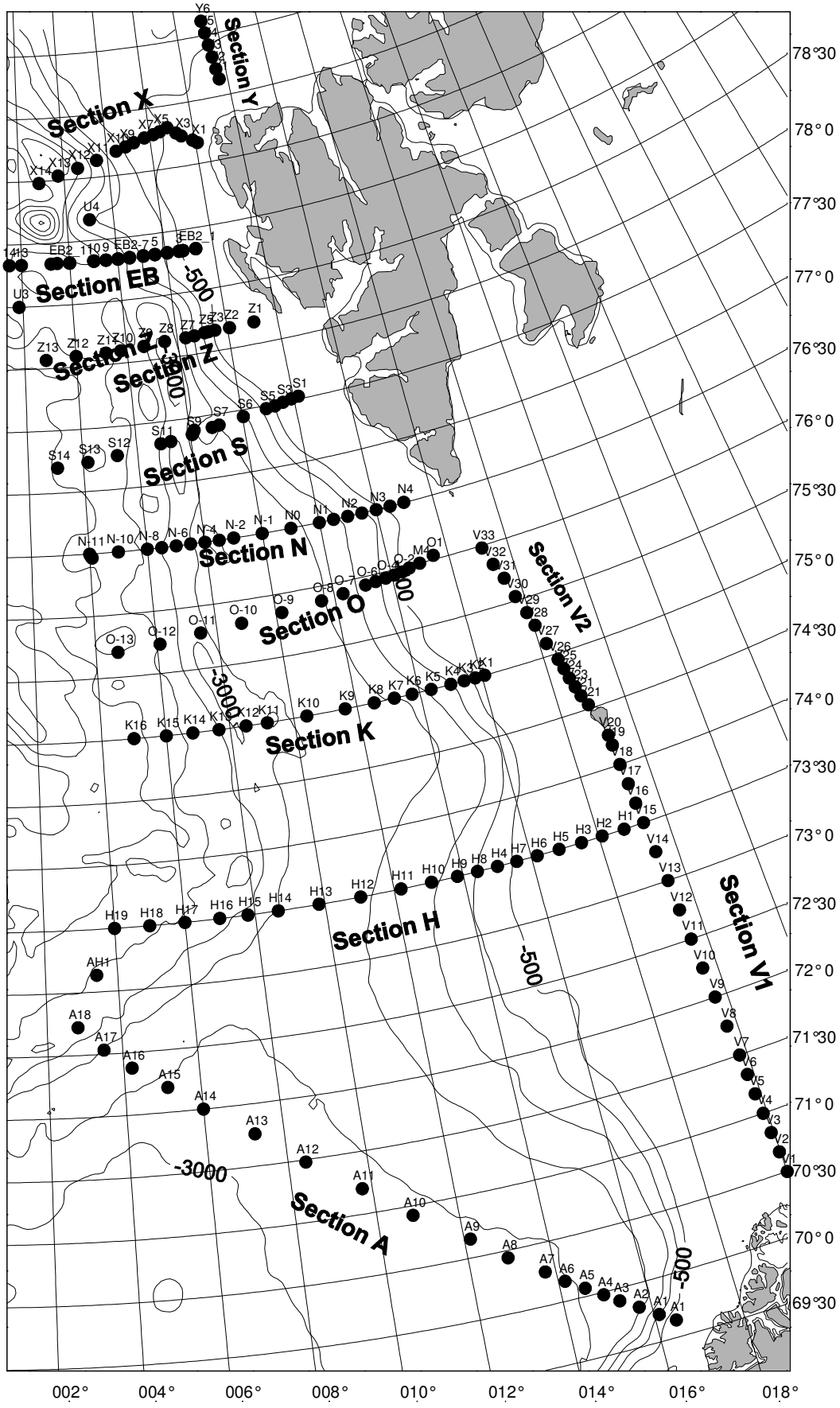

Fig. 1. Stations grid performed during R.V 'Oceania' cruise, summer 2004.

Table 1. CTD stations carried out during Arec2004 cruise.

Running No.	CTD-Station No.	Cast No.	Data	Time (UTC)	Latitude	Longitude	Water depth Corrected [m]
1	A1	1	20-06-04	03:03:04	69° 38.13' N	016° 27.87' E	70
2	A1	1	20-06-04	04:30:13	69° 42.85' N	016° 06.83' E	1135
3	A2	1	20-06-04	06:54:03	69° 48.72' N	015° 42.36' E	2270
4	A3	1	20-06-04	09:40:08	69° 53.99' N	015° 18.11' E	2345
5	A4	1	20-06-04	12:31:37	69° 58.73' N	014° 58.21' E	2445
6	A5	1	20-06-04	15:32:25	70° 03.93' N	014° 34.91' E	2550
7	A6	1	20-06-04	19:42:24	70° 09.47' N	014° 09.39' E	2590
8	A7	1	20-06-04	23:16:01	70° 15.97' N	013° 44.79' E	2665
9	A8	1	21-06-04	04:01:07	70° 26.52' N	012° 56.92' E	2660
10	A9	1	21-06-04	08:29:01	70° 39.02' N	012° 08.94' E	2655
11	A10	1	21-06-04	14:00:39	70° 55.45' N	010° 52.73' E	2655
12	A11	1	21-06-04	18:55:39	71° 12.15' N	009° 44.99' E	2670
13	A12	1	22-06-04	00:27:57	71° 28.89' N	008° 26.67' E	2780
14	A13	1	22-06-04	05:40:24	71° 45.47' N	007° 15.01' E	2860
15	A14	1	22-06-04	11:05:36	72° 00.01' N	005° 59.81' E	2890
16	A15	1	22-06-04	15:41:51	72° 11.96' N	005° 07.08' E	2820
17	A16	1	22-06-04	20:02:35	72° 22.52' N	004° 13.04' E	2480
18	A17	1	22-06-04	23:52:45	72° 32.00' N	003° 29.97' E	2290
19	A18	1	23-06-04	03:39:08	72° 43.38' N	002° 49.93' E	1530
20	AH1	1	23-06-04	08:56:21	73° 08.05' N	003° 25.11' E	2730
21	H19	1	23-06-04	14:20:09	73° 29.97' N	003° 59.85' E	2850
22	H18	1	23-06-04	18:35:16	73° 29.97' N	004° 59.87' E	2800
23	H17	1	23-06-04	22:39:25	73° 30.01' N	005° 59.84' E	1925
24	H16	1	24-06-04	02:19:17	73° 30.11' N	006° 59.50' E	2215
25	H15	1	24-06-04	05:47:28	73° 30.02' N	007° 47.73' E	3125
26	H14	1	24-06-04	09:50:41	73° 29.99' N	008° 39.75' E	2525
27	H13	1	24-06-04	14:04:00	73° 30.10' N	009° 49.86' E	2330
28	H12	1	24-06-04	18:27:14	73° 30.01' N	011° 01.80' E	2090
29	H11	1	24-06-04	22:17:36	73° 30.03' N	012° 11.80' E	1830
30	H10	1	25-06-04	01:24:32	73° 30.05' N	013° 04.82' E	1600
31	H9	1	25-06-04	04:03:02	73° 30.02' N	013° 50.01' E	1310
32	H8	1	25-06-04	06:13:28	73° 30.04' N	014° 25.13' E	1025
33	H4	1	25-06-04	08:14:14	73° 30.03' N	015° 00.26' E	685
34	H7	1	25-06-04	10:15:20	73° 29.96' N	015° 34.07' E	480
35	H6	1	25-06-04	12:08:29	73° 29.98' N	016° 10.22' E	460
36	H5	1	25-06-04	13:56:52	73° 30.04' N	016° 49.13' E	450
37	H3	1	25-06-04	16:01:58	73° 30.01' N	017° 28.92' E	430
38	H2	1	25-06-04	17:48:16	73° 30.12' N	018° 05.89' E	410
39	H1	1	25-06-04	19:43:15	73° 30.00' N	018° 44.96' E	430
40	V1	1	26-06-04	17:07:34	70° 29.93' N	020° 00.08' E	135
41	V2	1	26-06-04	18:57:33	70° 40.01' N	019° 58.41' E	155
42	V3	1	26-06-04	20:51:54	70° 49.99' N	019° 56.00' E	180
43	V4	1	26-06-04	22:57:06	70° 59.95' N	019° 53.85' E	190
44	V5	1	27-06-04	01:06:30	71° 10.00' N	019° 51.71' E	215
45	V6	1	27-06-04	03:07:23	71° 19.98' N	019° 49.94' E	210
46	V7	1	27-06-04	04:56:00	71° 29.95' N	019° 48.14' E	240
47	V8	1	27-06-04	07:28:32	71° 45.01' N	019° 43.89' E	265
48	V9	1	27-06-04	10:02:30	72° 00.00' N	019° 40.78' E	315
49	V10	1	27-06-04	12:15:33	72° 15.06' N	019° 36.73' E	325
50	V11	1	27-06-04	14:29:08	72° 29.91' N	019° 33.85' E	385
51	V12	1	27-06-04	16:47:11	72° 44.95' N	019° 30.97' E	400
52	V13	1	27-06-04	18:57:18	73° 00.00' N	019° 28.17' E	415
53	V14	1	27-06-04	21:17:54	73° 14.98' N	019° 24.04' E	450
54	V15	1	27-06-04	23:39:53	73° 30.01' N	019° 19.94' E	480

55	V16	1	28-06-04	01:33:46	73° 40.04' N	019° 17.64' E	350
56	V17	1	28-06-04	03:07:06	73° 49.99' N	019° 16.07' E	235
57	V18	1	28-06-04	04:38:18	74° 00.01' N	019° 12.76' E	135
58	V19	1	28-06-04	06:01:39	74° 10.00' N	019° 10.90' E	65
59	V20	1	28-06-04	06:50:47	74° 15.04' N	019° 09.54' E	55
60	V21	1	28-06-04	15:06:29	74° 31.95' N	018° 52.59' E	20
61	V21	1	28-06-04	15:54:15	74° 37.11' N	018° 44.92' E	65
62	V23	1	28-06-04	16:43:03	74° 42.04' N	018° 39.65' E	100
63	V24	1	28-06-04	17:33:28	74° 46.95' N	018° 34.25' E	225
64	V25	1	28-06-04	18:30:34	74° 52.06' N	018° 30.03' E	205
65	V26	1	28-06-04	19:24:12	74° 57.11' N	018° 24.99' E	70
66	V27	1	28-06-04	20:44:39	75° 06.04' N	018° 13.01' E	65
67	V28	1	28-06-04	22:17:55	75° 16.02' N	018° 02.96' E	60
68	V29	1	28-06-04	23:32:05	75° 23.00' N	017° 55.09' E	105
69	V30	1	29-06-04	01:05:53	75° 31.99' N	017° 43.12' E	130
70	V31	1	29-06-04	02:46:39	75° 41.93' N	017° 32.72' E	210
71	V32	1	29-06-04	04:21:49	75° 49.86' N	017° 19.89' E	285
72	V33	1	29-06-04	05:58:14	75° 58.91' N	017° 07.72' E	320
73	O1	1	29-06-04	14:53:03	76° 01.95' N	015° 30.11' E	365
74	M4	1	29-06-04	16:30:17	76° 00.00' N	014° 59.96' E	335
75	O-1	1	29-06-04	18:50:10	75° 59.01' N	014° 37.16' E	320
76	O-2	1	29-06-04	19:42:36	75° 58.00' N	014° 22.14' E	335
77	O-3	1	29-06-04	20:40:00	75° 57.47' N	014° 05.14' E	615
78	O-4	1	29-06-04	21:52:04	75° 57.03' N	013° 47.12' E	900
79	O-5	1	29-06-04	23:33:04	75° 56.52' N	013° 26.11' E	1160
80	O-6	1	30-06-04	01:20:10	75° 55.99' N	013° 05.02' E	1385
81	O-7	1	30-06-04	03:56:10	75° 54.28' N	012° 17.69' E	1810
82	O-8	1	30-06-04	06:26:43	75° 52.95' N	011° 33.09' E	2090
83	O-9	1	30-06-04	09:56:43	75° 50.98' N	010° 11.69' E	2330
84	O-10	1	30-06-04	13:33:16	75° 49.02' N	008° 50.06' E	2385
85	O-11	1	30-06-04	17:33:11	75° 47.11' N	007° 27.66' E	2645
86	O-12	1	30-06-04	21:56:01	75° 44.05' N	006° 05.90' E	2620
87	O-13	1	01-07-04	02:02:52	75° 42.00' N	004° 42.66' E	2850
88	K16	1	01-07-04	09:55:57	75° 00.08' N	004° 59.74' E	3160
89	K15	1	01-07-04	14:49:16	74° 59.96' N	006° 00.25' E	2885
90	K14	1	01-07-04	18:43:27	74° 59.96' N	006° 49.90' E	2130
91	K13	1	01-07-04	22:23:47	74° 59.99' N	007° 39.04' E	2255
92	K12	1	02-07-04	02:08:07	75° 00.01' N	008° 29.93' E	2950
93	K11	1	02-07-04	06:23:51	74° 59.96' N	009° 09.98' E	2650
94	K10	1	02-07-04	11:44:56	75° 00.03' N	010° 24.81' E	2540
95	K9	1	02-07-04	16:36:21	74° 59.98' N	011° 37.51' E	2395
96	K8	1	02-07-04	21:14:03	74° 59.96' N	012° 32.89' E	2175
97	K7	1	03-07-04	00:11:04	75° 00.06' N	013° 11.33' E	1985
98	K6	1	03-07-04	03:16:46	74° 59.97' N	013° 45.38' E	1805
99	K5	1	03-07-04	05:58:00	75° 00.04' N	014° 22.07' E	1510
100	K4	1	03-07-04	08:29:22	75° 00.07' N	014° 59.93' E	1110
101	K3	1	03-07-04	10:23:04	75° 00.07' N	015° 25.77' E	810
102	K2	1	03-07-04	11:43:29	75° 00.01' N	015° 47.07' E	335
103	K1	1	03-07-04	12:39:01	74° 59.99' N	016° 05.33' E	220
104	N4	1	03-07-04	23:59:12	76° 30.15' N	014° 59.59' E	170
105	N3P	1	04-07-04	01:09:20	76° 30.00' N	014° 29.93' E	215
106	N3	1	04-07-04	02:43:14	76° 29.98' N	014° 00.47' E	750
107	N2P	1	04-07-04	04:19:52	76° 30.00' N	013° 30.00' E	1270
108	N2	1	04-07-04	06:10:54	76° 30.03' N	012° 59.96' E	1545
109	N1P	1	04-07-04	08:15:14	76° 30.07' N	012° 30.06' E	1755
110	N1	1	04-07-04	10:21:54	76° 29.96' N	011° 59.91' E	1920
111	N0	1	04-07-04	13:21:52	76° 29.94' N	010° 59.94' E	2120
112	N-1	1	04-07-04	16:47:36	76° 29.96' N	009° 59.67' E	2280

113	N-2	1	04-07-04	20:16:22	76° 30.05' N	008° 59.97' E	2290
114	N-3	1	04-07-04	22:40:08	76° 30.00' N	008° 29.79' E	2290
115	N-4	1	05-07-04	00:57:26	76° 29.97' N	007° 59.87' E	2085
116	N-5	1	05-07-04	03:11:32	76° 30.11' N	007° 30.04' E	2510
117	N-6	1	05-07-04	05:38:38	76° 30.05' N	007° 00.04' E	2895
118	N-7	1	05-07-04	08:18:50	76° 29.96' N	006° 29.93' E	2445
119	N-8	1	05-07-04	10:52:17	76° 29.96' N	006° 00.02' E	2580
120	N-10	1	05-07-04	14:35:40	76° 29.96' N	004° 59.87' E	2430
121	N-11	1	05-07-04	18:22:41	76° 29.95' N	004° 00.22' E	2630
122	N-11_2	1	05-07-04	20:18:29	76° 28.95' N	004° 02.17' E	3065
123	N-11_3	1	05-07-04	22:29:15	76° 28.02' N	004° 04.89' E	3140
124	S14	1	06-07-04	06:46:53	77° 12.06' N	003° 03.28' E	2835
125	S13	1	06-07-04	10:20:02	77° 13.98' N	004° 10.12' E	2230
126	S12	1	06-07-04	13:25:26	77° 16.09' N	005° 15.32' E	2530
127	S11	1	06-07-04	17:34:41	77° 19.52' N	006° 53.16' E	2545
128	S10	1	06-07-04	19:45:05	77° 20.02' N	007° 15.34' E	2910
129	S9	1	06-07-04	22:52:00	77° 22.04' N	008° 04.08' E	2075
130	S9_2	1	07-07-04	00:29:27	77° 23.02' N	008° 07.09' E	2130
131	S9_3	1	07-07-04	02:09:31	77° 23.94' N	008° 09.66' E	2130
132	S8	1	07-07-04	04:55:27	77° 24.02' N	008° 49.99' E	2075
133	S7	1	07-07-04	06:50:49	77° 24.62' N	009° 06.05' E	2060
134	S6	1	07-07-04	09:36:29	77° 26.76' N	010° 01.91' E	1625
135	S5	1	07-07-04	11:56:11	77° 28.53' N	010° 55.21' E	895
136	S4	1	07-07-04	13:04:39	77° 29.02' N	011° 15.42' E	325
137	S3	1	07-07-04	13:50:11	77° 29.99' N	011° 34.30' E	265
138	S2	1	07-07-04	14:35:27	77° 30.80' N	011° 54.20' E	210
139	S1	1	07-07-04	15:19:02	77° 31.34' N	012° 10.79' E	105
140	Z1	1	07-07-04	20:26:44	78° 10.51' N	011° 04.26' E	260
141	Z2	1	07-07-04	22:25:52	78° 09.90' N	010° 05.34' E	265
142	Z3	1	07-07-04	23:44:06	78° 09.88' N	009° 30.40' E	270
143	Z4	1	08-07-04	00:31:28	78° 09.71' N	009° 15.34' E	665
144	Z5	1	08-07-04	01:30:38	78° 09.48' N	009° 05.19' E	985
145	Z6	1	08-07-04	02:56:22	78° 08.77' N	008° 40.47' E	1565
146	Z7	1	08-07-04	04:35:04	78° 08.42' N	008° 20.02' E	1965
147	Z8	1	08-07-04	07:08:26	78° 08.01' N	007° 29.81' E	3040
148	Z9	1	08-07-04	10:25:46	78° 06.92' N	006° 40.05' E	2330
149	Z10	1	08-07-04	13:25:14	78° 05.96' N	005° 45.08' E	2530
150	Z11	1	08-07-04	15:58:09	78° 05.53' N	005° 10.25' E	2700
151	Z12	1	08-07-04	19:41:08	78° 05.07' N	004° 00.02' E	2800
152	Z13	1	09-07-04	00:15:23	78° 04.01' N	002° 49.85' E	3050
153	U3	1	09-07-04	05:38:02	78° 29.96' N	001° 50.59' E	2445
154	EB2-14	1	09-07-04	09:30:32	78° 50.03' N	001° 29.47' E	2525
155	EB2-13	1	09-07-04	11:49:17	78° 50.01' N	001° 59.55' E	2540
156	Eb12a	1	09-07-04	15:44:50	78° 50.05' N	003° 13.28' E	2405
157	EB2_11	1	09-07-04	18:19:49	78° 49.96' N	003° 59.59' E	2320
158	EB2_10	1	09-07-04	21:12:18	78° 50.07' N	004° 59.94' E	2695
159	EB2-09	1	09-07-04	23:36:47	78° 50.00' N	005° 30.25' E	2595
160	EB2_08	1	10-07-04	02:13:55	78° 49.89' N	006° 00.31' E	2455
161	EB2-7	1	10-07-04	04:46:38	78° 49.90' N	006° 29.61' E	1980
162	EB2_6	1	10-07-04	06:50:41	78° 49.99' N	007° 04.24' E	1390
163	EB2_5	1	10-07-04	08:23:21	78° 50.06' N	007° 33.11' E	1130
164	EB2_4	1	10-07-04	09:51:23	78° 50.04' N	008° 04.12' E	980
165	EB2_3	1	10-07-04	11:16:23	78° 50.00' N	008° 33.86' E	480
166	EB2_2	1	10-07-04	12:01:48	78° 50.02' N	008° 43.55' E	230
167	EB2_1	1	10-07-04	13:08:22	78° 49.99' N	009° 15.88' E	200
168	EB2_21	1	13-07-04	00:11:23	78° 49.98' N	009° 16.21' E	200
169	EB2_22	1	13-07-04	01:17:56	78° 49.98' N	008° 44.11' E	215
170	EB2_23	1	13-07-04	01:53:31	78° 49.98' N	008° 34.24' E	455

171	EB	1	13-07-04	03:08:26	78° 49.96' N	008° 04.56' E	975
172	EB2_25	1	13-07-04	04:41:12	78° 49.93' N	007° 33.38' E	1130
173	EB2_26	1	13-07-04	06:10:48	78° 49.96' N	007° 04.01' E	1390
174	EB2-07	1	13-07-04	07:47:11	78° 49.92' N	006° 29.92' E	1960
175	EB2-8	1	13-07-04	09:32:04	78° 49.93' N	006° 00.97' E	2445
176	EB2-9	1	13-07-04	11:39:43	78° 49.97' N	005° 30.83' E	2595
177	EB2-10	1	13-07-04	13:55:33	78° 50.09' N	004° 59.99' E	2695
178	EB2_211	1	13-07-04	17:09:55	78° 49.99' N	004° 00.29' E	2330
179	EB2_212b	1	13-07-04	19:40:45	78° 50.17' N	003° 28.69' E	2330
180	U4	1	14-07-04	02:18:11	79° 09.97' N	004° 58.31' E	1395
181	X14	1	14-07-04	07:28:44	79° 28.95' N	002° 53.00' E	3160
182	X13	1	14-07-04	10:45:50	79° 32.04' N	003° 44.68' E	3100
183	X12	1	14-07-04	13:54:13	79° 35.05' N	004° 38.19' E	3005
184	X11	1	14-07-04	17:02:51	79° 38.04' N	005° 30.31' E	2135
185	X10	1	14-07-04	19:27:11	79° 41.47' N	006° 25.05' E	1105
186	X9	1	14-07-04	20:42:18	79° 42.99' N	006° 51.77' E	920
187	X8	1	14-07-04	21:46:41	79° 44.54' N	007° 15.32' E	825
188	X7	1	14-07-04	22:56:50	79° 46.11' N	007° 45.30' E	715
189	X6	1	14-07-04	23:57:51	79° 47.11' N	008° 10.31' E	590
190	X5	1	15-07-04	00:43:34	79° 48.01' N	008° 28.23' E	525
191	X4	1	15-07-04	01:35:11	79° 49.49' N	008° 50.32' E	450
192	X3a	1	15-07-04	02:32:10	79° 46.29' N	009° 11.96' E	420
193	X3	1	15-07-04	03:16:53	79° 44.47' N	009° 25.11' E	400
194	X2	1	15-07-04	04:21:38	79° 41.59' N	009° 53.39' E	275
195	X1	1	15-07-04	04:58:36	79° 40.06' N	010° 05.14' E	110
196	Y1	1	15-07-04	08:59:35	80° 08.07' N	011° 36.67' E	105
197	Y2	1	15-07-04	09:44:55	80° 13.08' N	011° 32.79' E	165
198	Y3	1	15-07-04	10:39:17	80° 19.12' N	011° 28.95' E	200
199	Y4	1	15-07-04	11:35:43	80° 25.10' N	011° 25.09' E	510
200	Y5	1	15-07-04	12:47:18	80° 31.09' N	011° 21.23' E	835
201	Y6	1	15-07-04	14:00:00	80° 36.97' N	011° 17.21' E	1070
202	Y7	1	15-07-04	15:28:51	80° 43.00' N	011° 12.69' E	1315
203	Y8	1	15-07-04	17:03:29	80° 49.10' N	011° 08.80' E	1530
204	EB2-1	1	16-07-04	23:26:52	78° 49.98' N	009° 15.93' E	200
205	EB2-2	1	17-07-04	00:36:24	78° 49.99' N	008° 43.77' E	220
206	EB2-3	1	17-07-04	01:10:47	78° 49.98' N	008° 33.90' E	475
207	EB2-4	1	17-07-04	02:19:47	78° 50.09' N	008° 04.08' E	985
208	EB2-5	1	17-07-04	03:44:59	78° 50.03' N	007° 33.12' E	1130
209	EB2-6	1	17-07-04	05:20:07	78° 50.14' N	007° 04.06' E	1400
210	EB2-7	1	17-07-04	07:31:28	78° 50.09' N	006° 29.64' E	1975
211	EB2-8	1	17-07-04	10:18:15	78° 49.97' N	006° 00.94' E	2445
212	EB2-9	1	17-07-04	12:38:12	78° 49.99' N	005° 30.90' E	2595
213	EB2-10	1	17-07-04	15:06:36	78° 49.93' N	005° 00.50' E	2690
214	EB2-11	1	17-07-04	18:26:09	78° 50.04' N	003° 59.93' E	2315

3. Some preliminary results

As in earlier cruises, during 2004 cruise two northward flowing branches of Atlantic Water in the Greenland Sea were observed. The main branch of the West Spitsbergen Current flows along the Barents Sea continental slope and Spitsbergen shelf break. The second, colder and less saline branch continues along the Mohns and Knipovich Ridges as a jet stream of the Arctic Front. Due to the bottom topography, both branches of AW converge west of the southern Spitsbergen coast.

Figure 2 presents the distribution of temperature and baroclinic currents at depth 100 m (calculated for the reference level of 1000 m.) during summer 2004. To reduce effect of non-uniform data spacing, temperature and HD fields were smoothed

and filtered. Finally, the picture of general currents pattern was obtained, rather then synoptic snapshot. Considerable part of AW flowing along the Norwegian coast proceeds eastward into the Barents Sea, the rest continue northward as two separated branches. One branch is related to the Barents Sea slope. Even after data smoothing and filtrating, the mesoscale activity, especially along the Spitsbergen's shelf is pronounced. Separated warm eddy inflows into the Arctic Ocean. This effect may be partly caused by the non-uniform data distribution, but mesoscale activity has been also observed. Jet streams of the Arctic Front form the second branch of AW. This branch recirculates westward between 78º-79ºN.

The general flow structure cross the section, obtained from baroclinic calculations, ADCP and LADCP measurements was similar (Fig.3), however baroclinic transports calculated from hydrological data and total transports from LADCP measurements differ a lot. Table 2 presents transports across selected sections, calculated from detided LADCP data. It confirms the importance of barotropic fraction of the flows.

Measurements performed by means of LADCP show that the structure of the flow is much more complicated (Fig 4, Fig 5) than this presented at Fig.2.

The high temporal currents variability was observed directly this year. Currents changes seem to be relating to wind direction and induced by barotropic flows. The possible mechanism is that winds blowing along the Spitsbergen coast, due to the Ekman flow causes rising or lowering sea level. The sea tilt induces geostrophic barotropic current along the Spitsbergen coast. Measurements at the section EB2 were repeated 3 times (Fig 6). The structure and amount of the transport has changed considerably during 3 days between the first and second pass. During this time the wind direction has changed from the southern to northern one.

Table 2
Volume transports cross the selected sections.
Positive transport indicates northward flow. Atlantic Water calculated against salinity S>34.90 psu, Temperature 3º C. Detaided data from LADCP were used.

Section	Net Vol. transport (Sv)	North-ward Vol (+)	South-ward Vol (-)	**AW Vol.** (Sv)	AW+	AW-	AW Heat (TW)
K (75°00'N)	37.7	41.0	-3.3	**8.0**	8.5	-0.5	43.6
N (76°30'N)	14.0	23.8	-9.8	**5.5**	6.7	-1.2	35.8
S (77- 78°N)	7.7	19.1	-11.4	**3.7**	4.6	-0.9	22.5
Z (78-78°20')	15.5	21.9	-6.4	**3.3**	3.6	-0.3	18.4
EB2 (78°50'N)	6.0	12.2	-6.2	**3.1**	4.0	-0.9	14.0

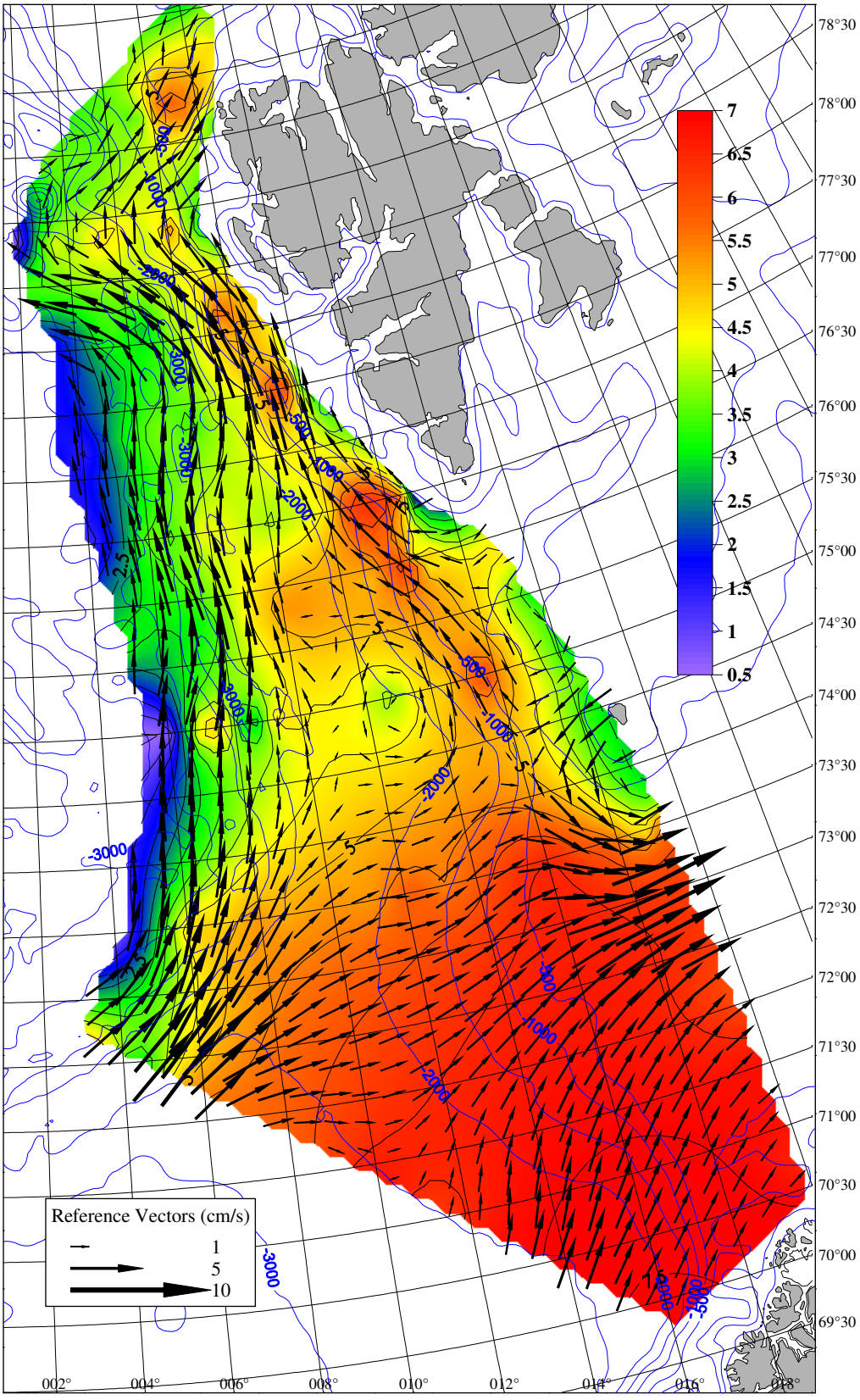

Fig. 2. June-July 2004. Smoothed temperature distribution and baroclinic currents at 100 m. Reference level 1000 m.

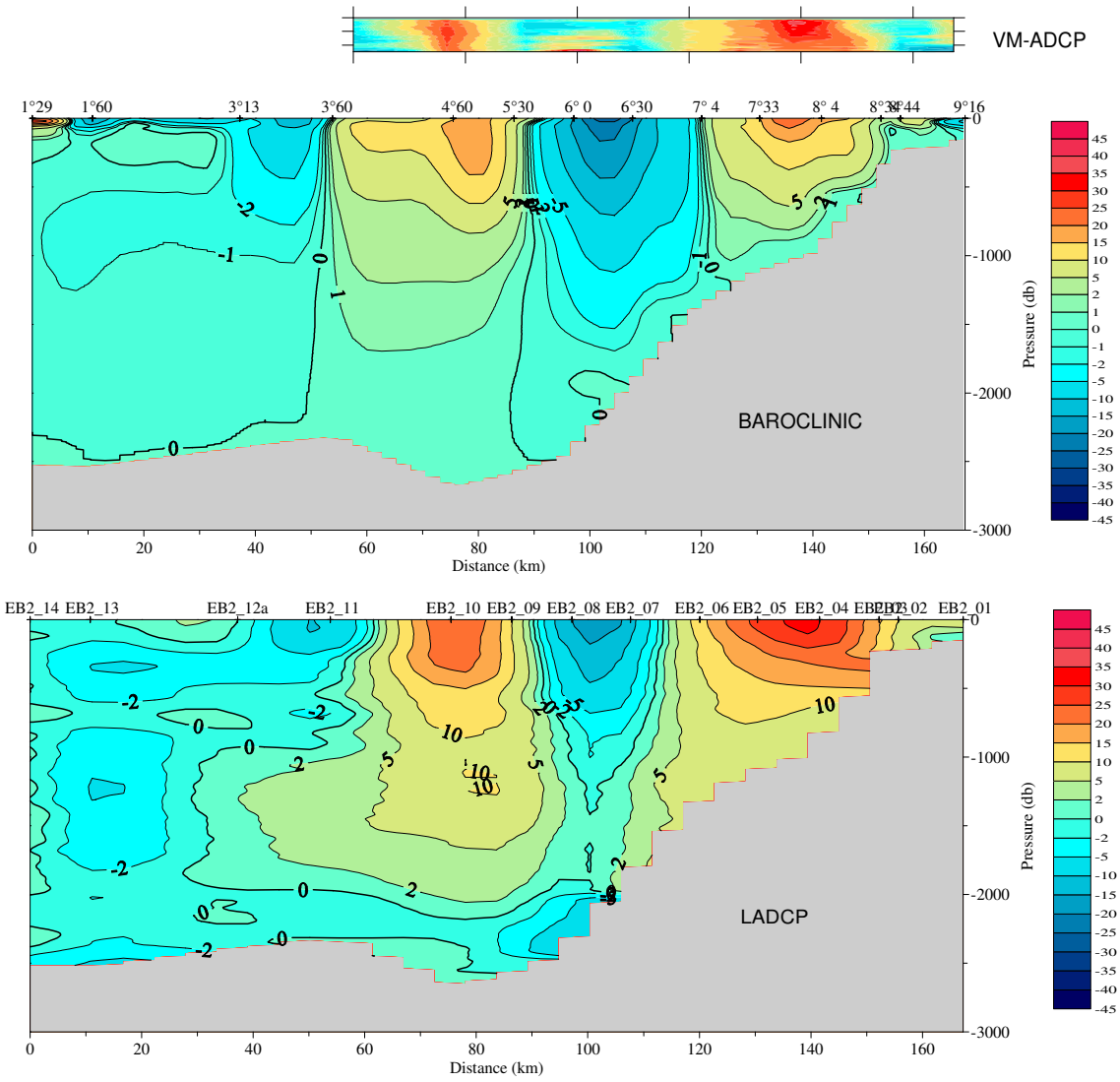

Fig. 3. VM-ADCP currents (upper bar), geostrophic baroclinic currents and LADCP measured flows cross the West Spitsbergen Current. Section EB2 along the 78º 50'N. R.V. 'Oceania', June 2004.

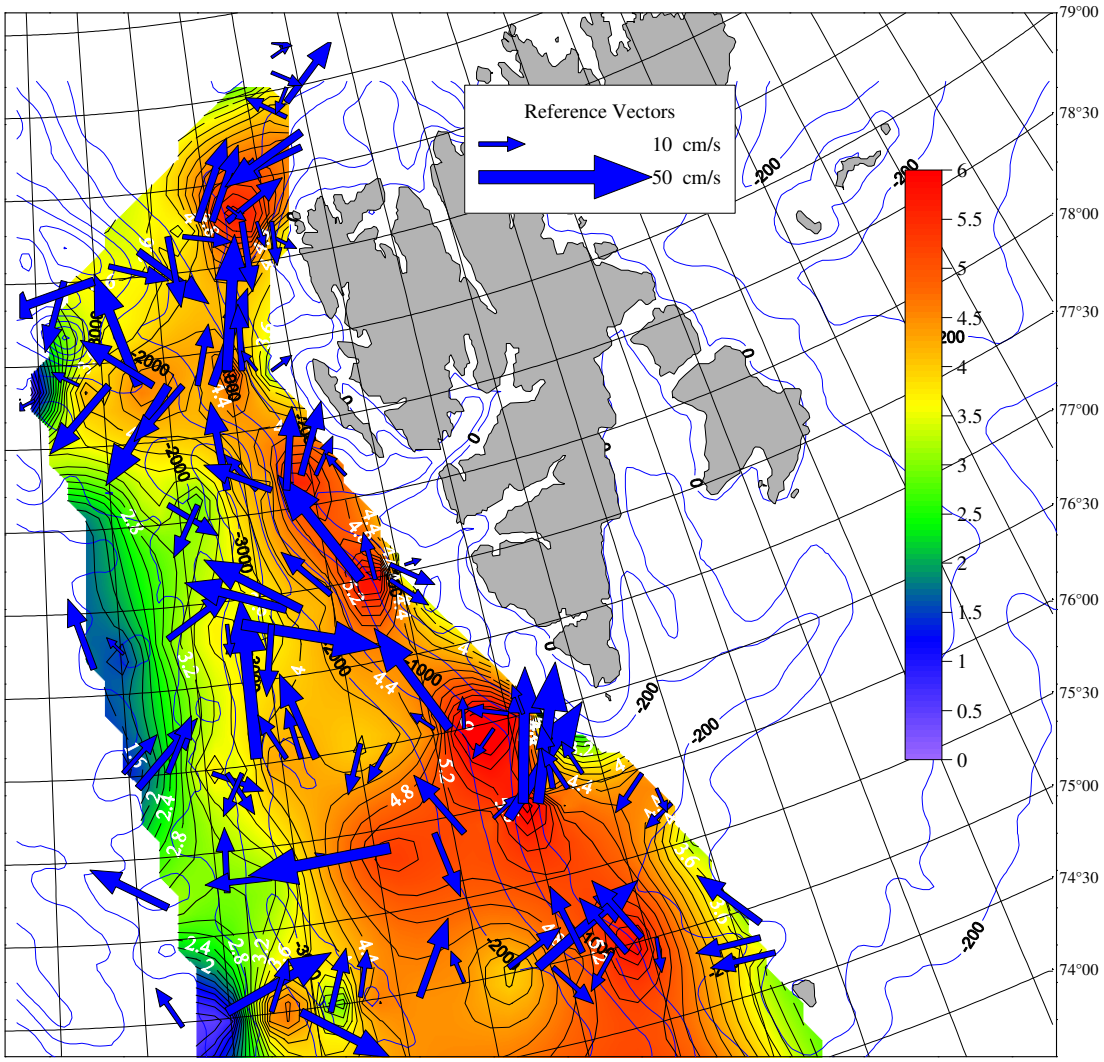

Fig. 4. Water temperature and LADCP measured currents at 100 m. R.V 'Oceania', summer 2004.

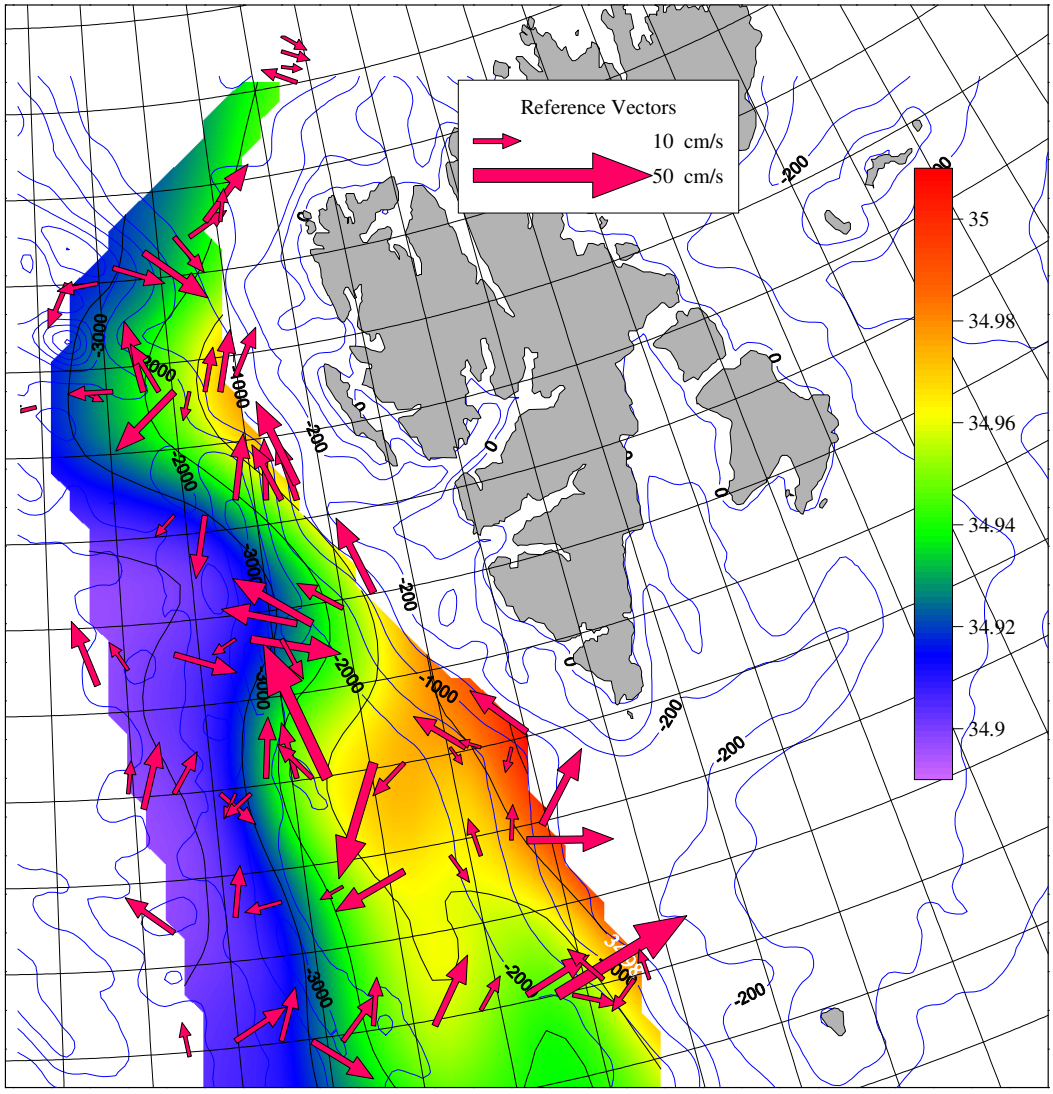

Fig. 5. Water salinity and LADCP measured currents at 600 m. R.V. 'Oceania', summer 2004.

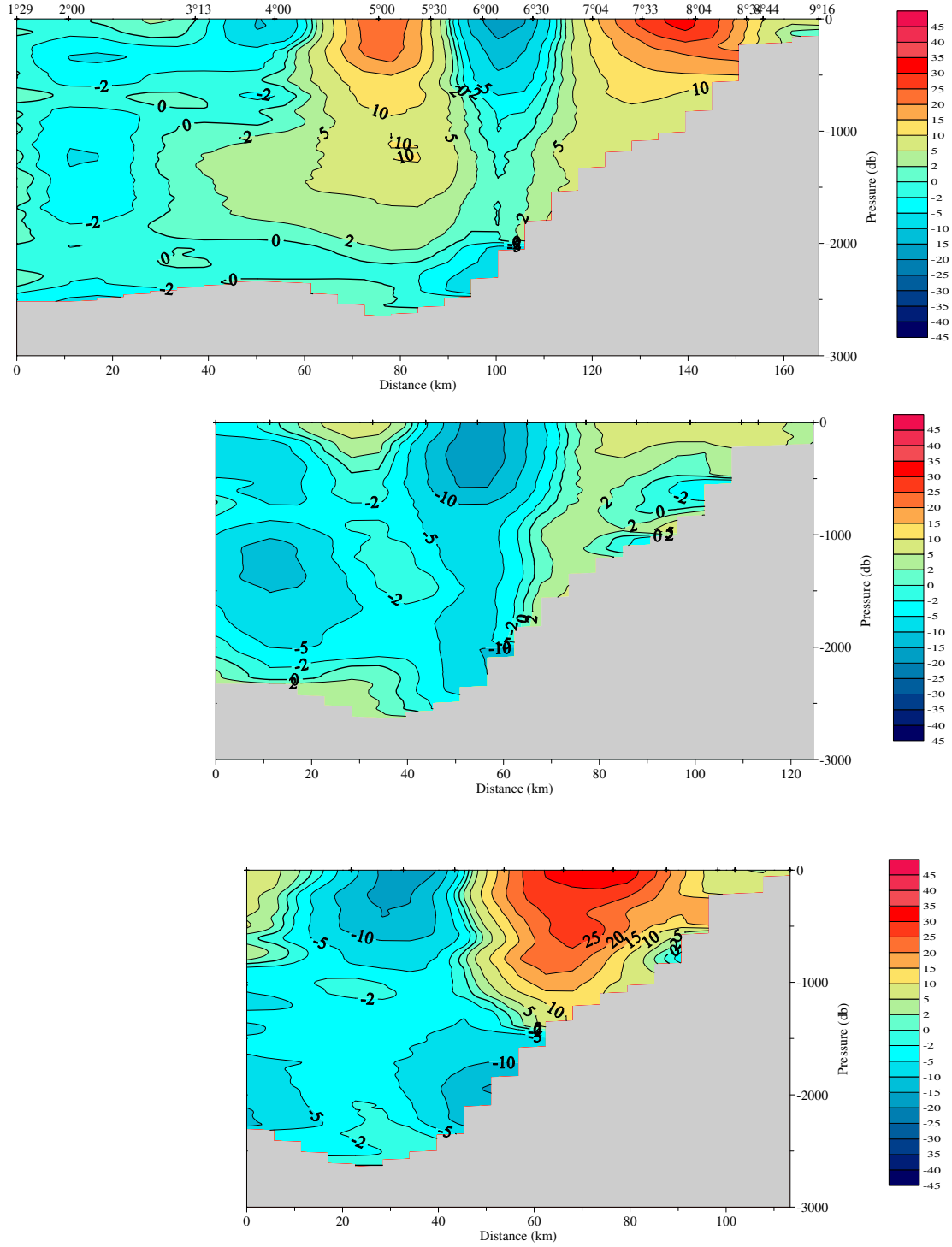

Fig. 6. LADCP measured currents cross section EB2. R.V 'Oceania', summer 2004.