



March 20, 2009

**Cruise Report
R/V “Oceania”, AREX 2008**

Ship: R/V “Oceania”

Cruise: AREX 2008

Dates: 08.06.2008 – 22.08.2008

Port Calls: Gdansk (Poland) – Longyearbyen (Spitsbergen)

Number of Scientist: 14

Chief Scientist (open sea part of cruise): Prof. Jan Piechura

Principal Project: DAMOCLES – WP3

Research Area: Greenland Sea, Barents Sea, Norwegian Sea

Open sea part of cruise – June 18 – July 23, 2008

Damocles - WP3. Oceans: Task 3.1 Input Function, Task 3.2 Shelf/Basin Exchange

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1. Observations in 2008

Although whole AREX 2008 cruise of the R/V Oceania was performed in the period of June 8 – August 22, 2008 main hydrological part concerning the open sea area took place between June 18 and July 23. During this time CTD (conductivity, temperature, depth) profiles along sections were done. As in previous years sections were perpendicular to the general direction of the Atlantic Water inflow according to the West Spitsbergen Current location, which is situated between the Barents Sea slope in the south-east area, the west Spitsbergen shelf-break/slope region on the north-east and system of underwater ridges: Mohns Ridge and Knipovich Ridge on the west. Because of convergence of the isobaths in the northern part, currents pattern and structure is complicated and forms wedge, wide in the southern part and narrower on the north. As before, our main effort was concentrated in the northern part of the Atlantic Domain where processes controlling the AW flow into Arctic Ocean through the Fram Strait and the westward recirculation occur.

All in all 197 CTD profiles were taken along 11 sections (Fig.1, Tab. 1). The Seabird CTD (SBE 911+) system with duplicate temperature and conductivity sensors (temperature sensors SBE3, SN 2937 and 4670, conductivity sensors SBE4, SN 2971 and 3342 and pressure sensor Digiquartz SN 100967) was used. Temperature and conductivity sensors were calibrated by the Sea-Bird Electronics service. Moreover, three high resolution CTD sections on the west Spitsbergen shelf-slope area with towed Seabird CTD (SBE49) system were obtained as well. In addition to that Water samples collected with the rosette water sampler SBE32 were analyzed as concerned nutrients contents.

Currents measurements were performed at the all CTD stations with the lowered Acoustic Doppler Current Profiler (LADCP) as well. The self-recording 300 kHz RDI device was used to profile entire water column during the standard CTD casts.

Moreover sustained currents measurements were performed during the whole cruise with the ship-mounted ADCP, RDI 150 kHz.

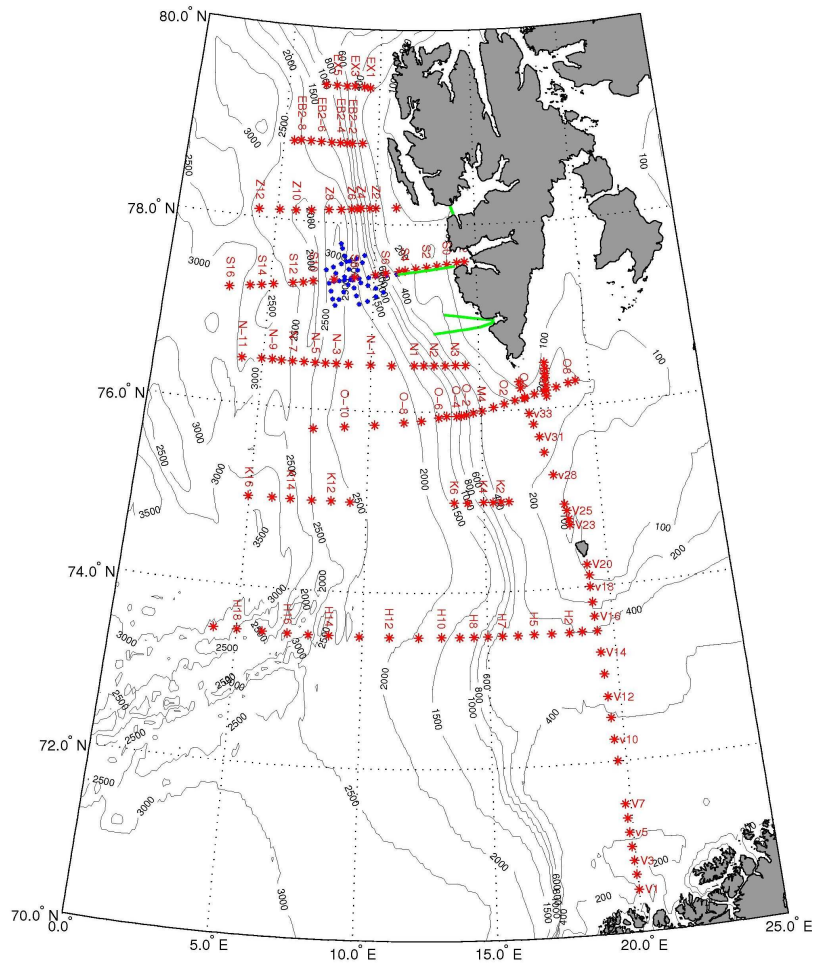


Fig. 1. CTD stations performed during Arex 2008 experiment.

2. Some preliminary results

As in previous years, 2008 cruise results show two branches of Atlantic Water in the Greenland Sea which flow northward. Main branch of the West Spitsbergen Current flows along the Barents Sea continental slope and west Spitsbergen shelf break. Colder and less saline branch continues along the Mohns and Knipovich Ridges as a jet stream of the Arctic Front. Moreover, merely a part of northward running AW moves into the Arctic Ocean, primarily along the Spitsbergen slope; western branch of AW mostly recirculates westward as Return Atlantic Current. Furthermore part of AW flowing along the Norwegian coast continues eastward into the Barents Sea.

The northern extension of the 5°C isotherm at 100 dbar (Fig.2) shows cooling of the AW layer in the Greenland Sea. After the northernmost extend in 2006, the 5°C isotherm moved back to the south close to the position from summer 2004.

After maximum in 2006, Atlantic Water salinity and temperature has decreased meaningful. At standard section 'N' along the 76°30'N (Fig.3a), between meridians 009-012°E, mean salinity at 200 dbar has changed from 35.112 in 2007 to 35.075 in summer 2008 (Fig.4a). Mean salinity at this standard section was still higher than 13 years mean (35.053). Changes of temperature were more

dramatic. Mean temperature at 200 dbar level has changed from 4.50°C in summer 2006, 3.84°C in summer 2007 to 3.08°C in summer 2008 and was lower than 13 years mean (3.14°C) (Fig.4b). Nevertheless the linear trends of AW temperature and salinity were still positive. Changes of temperature at standard section 'N' well represents temperature variability of AW layer of entire region.

Significant changes were observed in the Atlantic Water mass (AW): salinity and temperature maximum appeared in 2006. The Arctic Atlantic Water was characterized by slightly salinity increasing in 2008, which can be effect of mixing with more saline AW in previous years. Consequence of solarisation is clearly visible in the Warm Surface Water (WSW), especially in 2006. Small changes were noted in the Arctic Intermediate Water (AIW) and the Nordic Sea Deep Water (NDW) (Fig.5).

Interaction of two current systems: West Spitsbergen Current and Sørkapp Current occurs on the shelf and continental slope regions west of Spitsbergen. Both currents flow north and Arctic Costal Front forms between them. Towed CTD sections across the west Spitsbergen shelf near entrance to the Hornsund and Bellsund Fjord show interactions between the West Spitsbergen Current, Sørkapp Current and fjord outflow and intensive mixing processes (Fig.6).

In 2008 dense water plume cascading from the Storfjorden along the Strofjordrenna and shelf break was observed and, compared to the other years measurements in 2008, extreme values of main physical parameters were noted (Fig.7). In core of the plume near the bottom density reached 28.4kgm^{-3} , salinity 35.3 and potential temperature -1.77°C . Cross-section performed on the north bank of Storfjordrenna confirms that the pathway of this rotating gravity current initially proceeds across the north bank of Storfjordrenna in accordance with the shape of isobaths and location of underwater canyons.

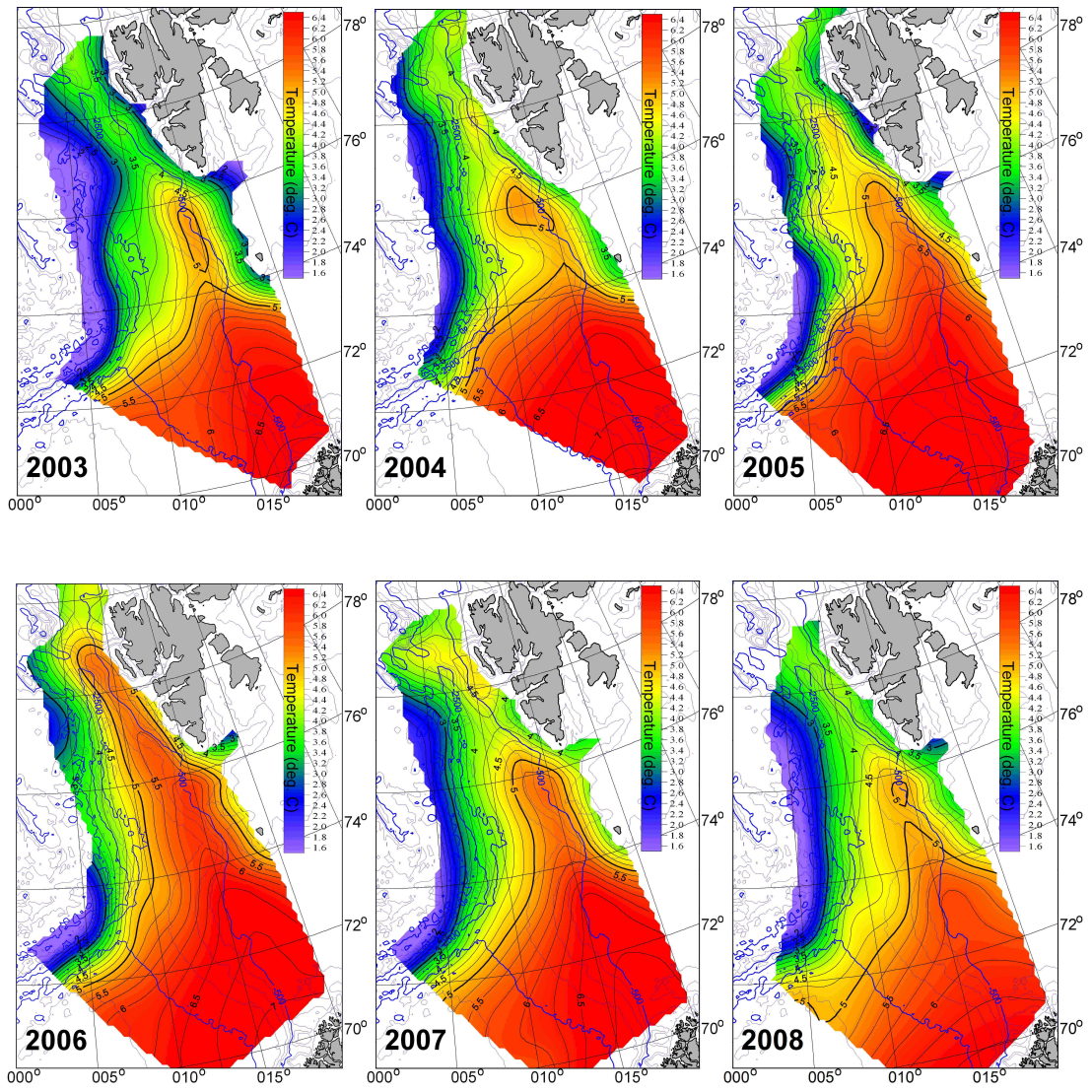


Fig. 2. Temperature (θ) and salinity distribution on the level of 100 dbar in June-July 2008. 5°C isotherm marked as a bold line.

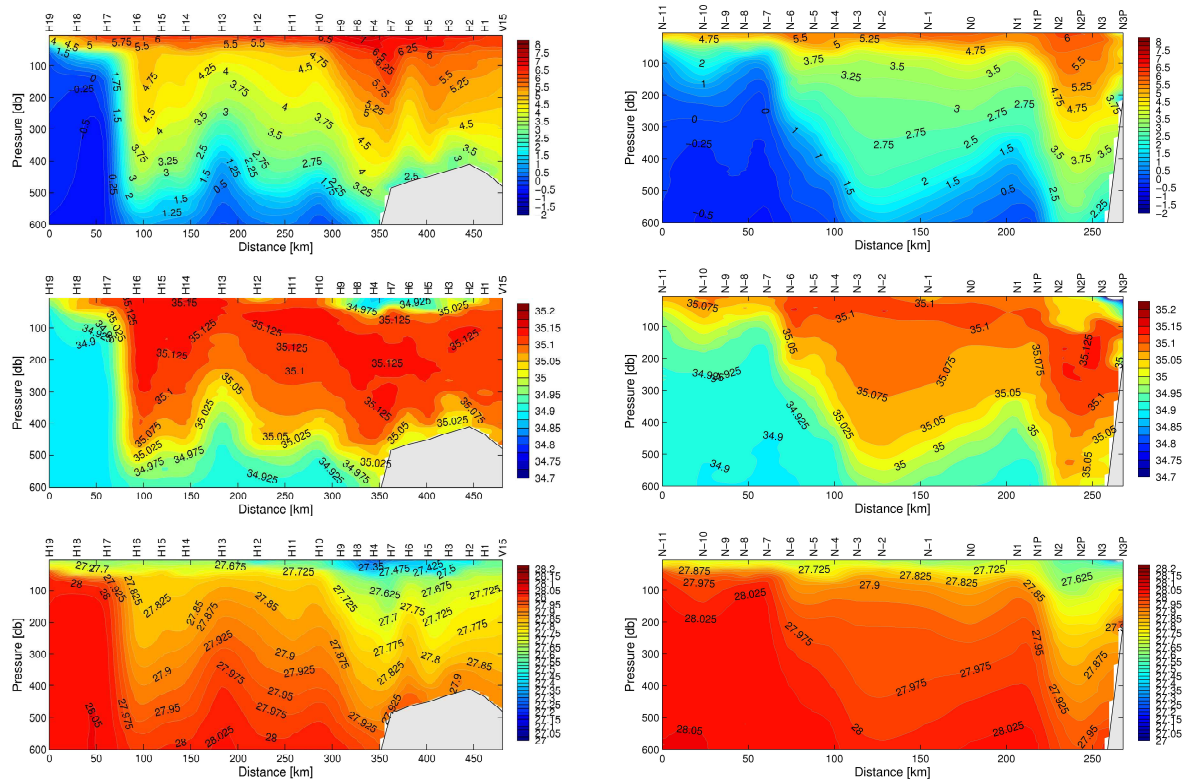


Fig. 3. Temperature (θ), salinity and density (σ_θ) distribution on the Section H (73°30'N) and Section N (76°30'N) in summer 2008.

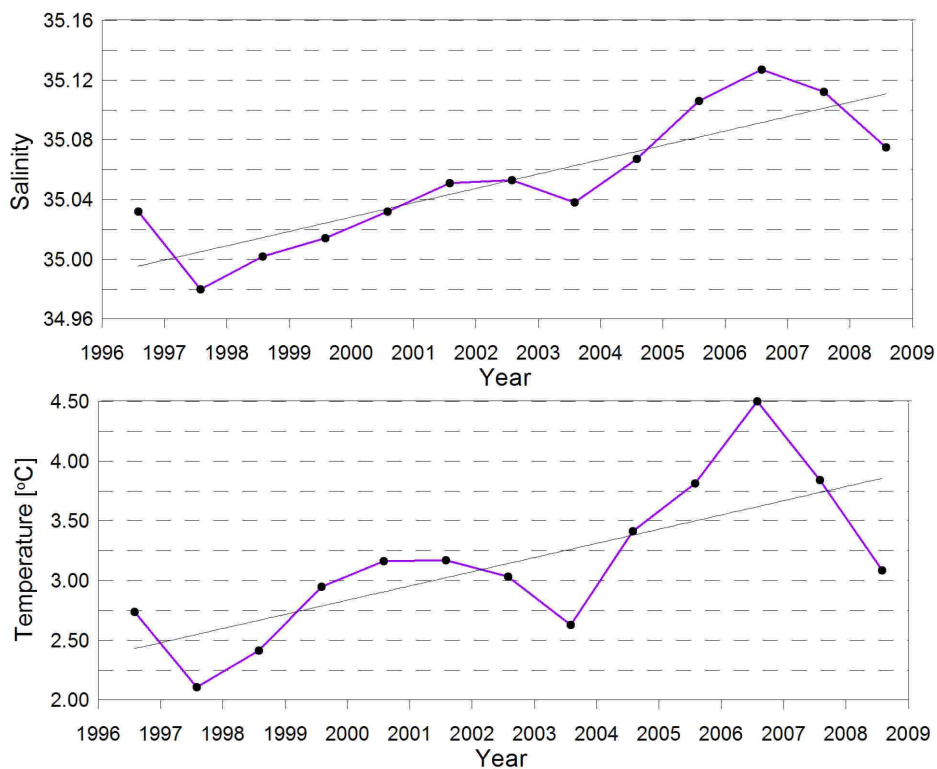


Fig. 4. Mean salinity (upper panel) and mean temperature in summer (July) at section 'N' (76°30' N) at 200 m, between 009°-012° E.

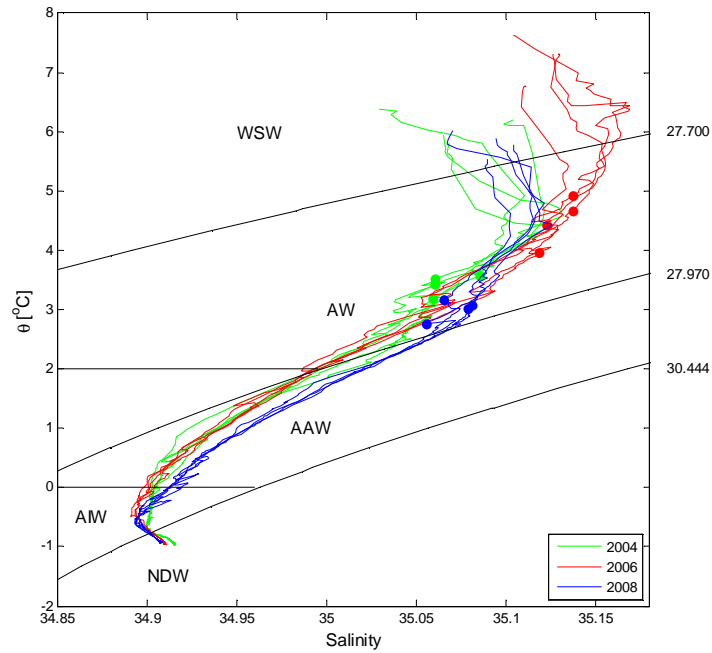


Fig. 5. TS diagram for CTD stations performed in 2004 (green lines), 2006 (red lines) and 2008 (blue lines) on the Section 'N' ($76^{\circ}30'$ N) between 009° - 012° E. Dots (green-2004, red-2006 and blue-2008) indicate level of 200 dbar.

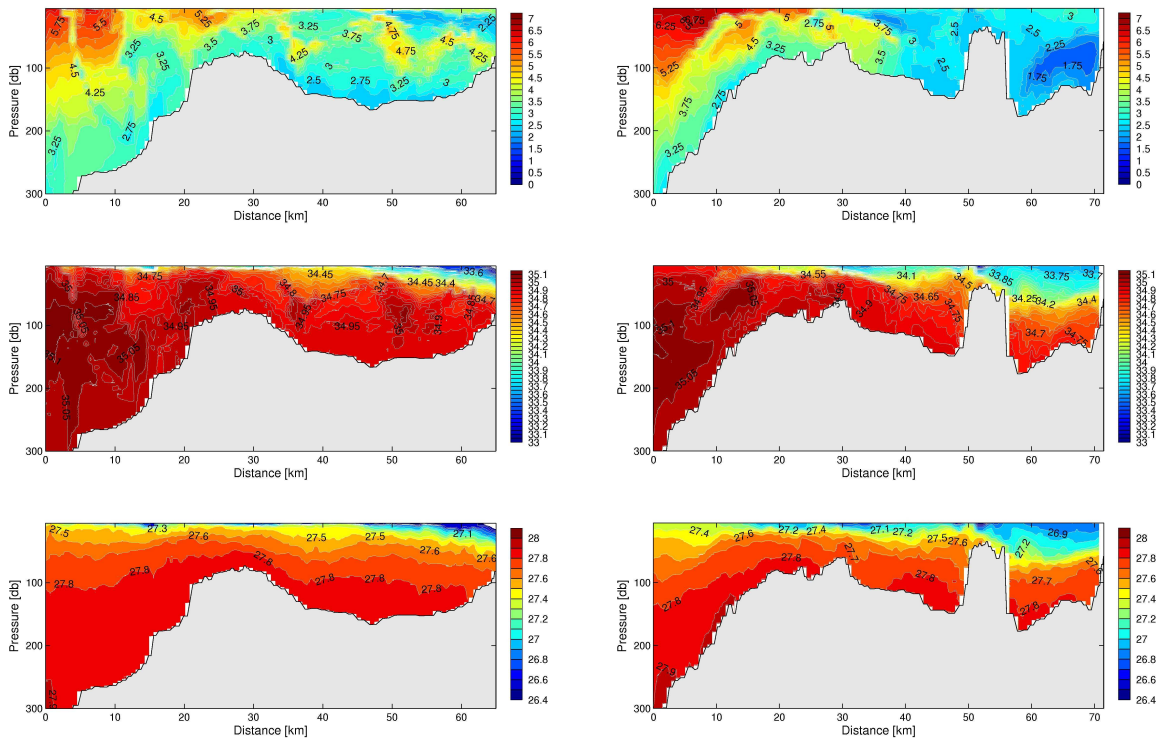


Fig. 6. Temperature (θ), salinity and density (σ_{θ}) distribution along the high resolution sections (marked as green lines on the Fig.1) across the west Spitsbergen shelf near: a) Hornsund and b) Bellsund Fjord in summer 2008. Warm and saline Atlantic water mixes with Arctic type water, a product of ice melting and river runoff is visible as a light, fresh, surface layer.

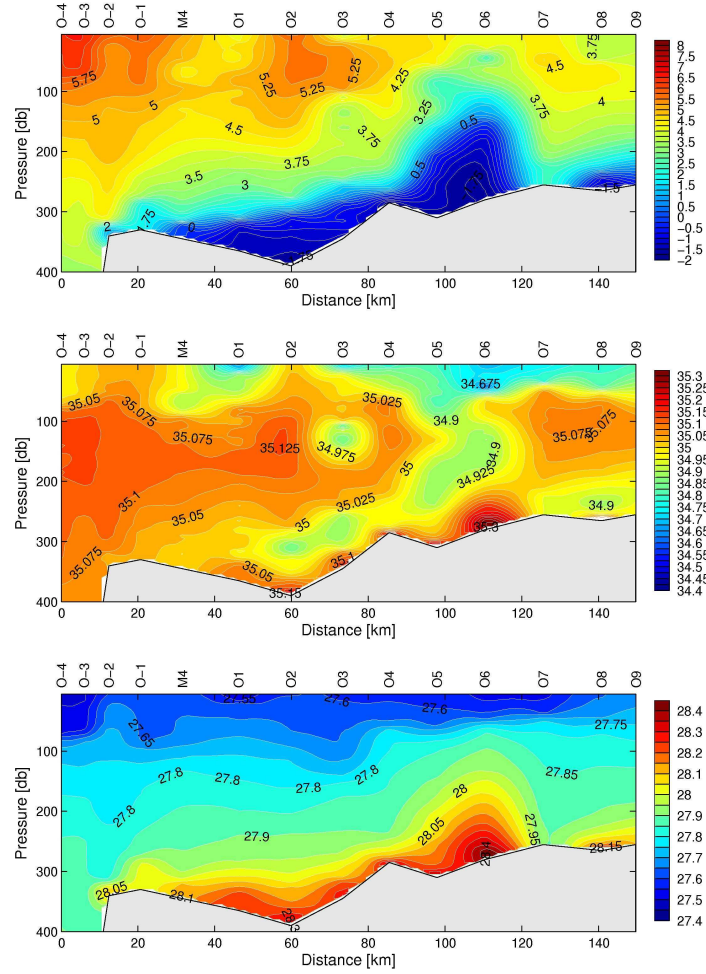


Fig. 7. Temperature (θ), salinity and density (σ_θ) distribution on the Section O along the Storfjordrenna in summer 2008. Dense water plume is visible as near-bottom cascade moving down to the shelf-break. Maximal values of physical parameters are equal to: -1.77°C (θ), 35.3 (S) and 28.4kgm^{-3} (σ_θ). Above the most dense layer intensive mixing and entrainment processes occur, which form plume shape.

Table 1: CTD stations and some of their main parameters. There were 11 regular sections performed in 2008.

No	Station	Latitude	Longitude	Date, Time	Depth	File
Section V1						
1	'V1'	70°29.82'N	019°59.97'E	21-Ju-2008 00:15:13	1 28	Ar08_001
2	'V2'	70°40.25'N	019°58.22'E	21-Ju-2008 02:20:14	1 56	Ar08_002
3	'V3'	70°50.03'N	019°55.71'E	21-Ju-2008 04:32:45	1 81	Ar08_003
4	'V4'	71°00.01'N	019°53.84'E	21-Ju-2008 06:41:30	1 86	Ar08_004
5	'v5'	71°09.98'N	019°51.91'E	21-Ju-2008 08:41:58	2 16	Ar08_005
6	'V6'	71°19.97'N	019°49.98'E	21-Ju-2008 10:44:49	2 08	Ar08_006
7	'V7'	71°29.98'N	019°48.03'E	21-Ju-2008 12:49:36	2 39	Ar08_007
8	'V9'	72°00.02'N	019°40.90'E	21-Ju-2008 18:37:09	3 13	Ar08_009
9	'V10'	72°14.97'N	019°37.08'E	21-Ju-2008 21:33:48	323	Ar08_010
10	'V11'	72°29.98'N	019°34.01'E	22-Ju-2008 00:28:53	391	Ar08_011

11	'V12'	72°44.56'N	019°31.56'E	22-Ju-2008 03:22:24	400	Ar08_012
12	'V13'	73°00.04'N	019°27.99'E	22-Ju-2008 06:23:15	411	Ar08_013
13	'V14'	73°15.04'N	019°24.12'E	22-Ju-2008 10:34:56	455	Ar08_014
14	'V15'	73°29.67'N	019°20.83'E	22-Ju-2008 13:37:32	482	Ar08_015
15	'V16'	73°39.60'N	019°17.42'E	22-Ju-2008 16:20:30	351	Ar08_016
16	'V17'	73°49.49'N	019°15.55'E	22-Ju-2008 18:11:03	233	Ar08_017
17	'V18'	73°59.94'N	019°12.87'E	22-Ju-2008 20:00:37	134	Ar08_018
18	'V19'	74°07.58'N	019°13.87'E	22-Ju-2008 21:48:47	69	Ar08_019
19	'V20'	74°15.01'N	019°09.91'E	22-Ju-2008 23:03:25	62	Ar08_020
Section H						
20	'H1'	73°29.98'N	018°45.01'E	23-Ju-2008 07:08:36	435	Ar08_021
21	'H2'	73°29.91'N	018°14.08'E	23-Ju-2008 09:32:06	413	Ar08_022
22	'H3'	73°29.95'N	017°31.86'E	23-Ju-2008 11:35:44	429	Ar08_023
23	'H5'	73°30.05'N	016°50.31'E	23-Ju-2008 14:01:05	448	Ar08_024
24	'H6'	73°29.93'N	016°11.45'E	23-Ju-2008 16:25:24	464	Ar08_025
25	'H7'	73°29.99'N	015°35.11'E	23-Ju-2008 18:39:41	486	Ar08_026
26	'H4'	73°29.92'N	015°00.35'E	23-Ju-2008 20:44:04	693	Ar08_027
27	'H8'	73°29.96'N	014°26.77'E	23-Ju-2008 22:56:11	1032	Ar08_028
28	'H9'	73°29.94'N	013°53.00'E	24-Ju-2008 01:14:46	1314	Ar08_029
29	'H10'	73°29.91'N	013°09.61'E	24-Ju-2008 04:16:01	1600	Ar08_030
30	'H11'	73°29.86'N	012°15.02'E	24-Ju-2008 07:44:24	1833	Ar08_031
31	'H12'	73°29.92'N	011°04.73'E	24-Ju-2008 12:20:01	2099	Ar08_032
32	'H13'	73°29.75'N	009°53.74'E	24-Ju-2008 16:41:01	2330	Ar08_033
33	'H14'	73°29.95'N	008°41.03'E	24-Ju-2008 21:17:41	2532	Ar08_034
34	'H15'	73°29.91'N	007°52.06'E	25-Ju-2008 01:03:07	3054	Ar08_035
35	'H16'	73°29.99'N	007°01.83'E	25-Ju-2008 05:28:38	2283	Ar08_036
36	'H17'	73°29.97'N	006°02.12'E	25-Ju-2008 09:49:57	1925	Ar08_037
37	'H18'	73°30.00'N	005°01.44'E	25-Ju-2008 13:50:37	2787	Ar08_038
38	'H19'	73°29.92'N	004°05.71'E	25-Ju-2008 18:12:26	2855	Ar08_039
Section K						
39	'K16'	74°59.75'N	004°57.85'E	26-Ju-2008 21:41:52	3207	Ar08_040
40	'K15'	75°00.02'N	005°58.24'E	27-Ju-2008 05:04:56	2897	Ar08_041
41	'K14'	74°59.96'N	006°45.50'E	27-Ju-2008 11:00:00	2133	Ar08_042
42	'K13'	74°59.99'N	007°39.85'E	27-Ju-2008 15:37:01	2267	Ar08_043
43	'K12'	75°00.00'N	008°29.99'E	27-Ju-2008 20:12:16	2914	Ar08_044
44	'K11'	74°59.93'N	009°18.04'E	28-Ju-2008 02:15:19	2606	Ar08_045
45	'K6'	74°59.95'N	013°45.01'E	29-Ju-2008 10:05:11	1834	Ar08_046
46	'K5'	74°59.95'N	014°19.36'E	29-Ju-2008 15:10:03	1573	Ar08_047
47	'K4'	75°00.00'N	014°59.86'E	29-Ju-2008 21:02:36	1140	Ar08_048
48	'K3'	74°59.97'N	015°24.49'E	30-Ju-2008 00:11:22	825	Ar08_049
49	'K2'	74°59.96'N	015°44.92'E	30-Ju-2008 02:30:33	376	Ar08_050
50	'K1'	74°59.90'N	016°04.74'E	30-Ju-2008 04:27:02	229	Ar08_051
Section V2						
51	'V23'	74°42.27'N	018°35.95'E	30-Ju-2008 13:00:24	96	Ar08_052
52	'V24'	74°46.27'N	018°34.32'E	30-Ju-2008 15:00:16	221	Ar08_053
53	'V25'	74°51.68'N	018°30.48'E	30-Ju-2008 16:35:43	207	Ar08_054
54	'V26'	74°56.07'N	018°25.85'E	30-Ju-2008 18:06:47	76	Ar08_055
55	'V28'	75°15.87'N	018°03.52'E	30-Ju-2008 21:18:57	62	Ar08_056
56	'V30'	75°31.11'N	017°43.89'E	01-Jul-2008 00:09:4 0	138	Ar08_057
57	'V31'	75°41.55'N	017°33.48'E	01-Jul-2008 02:07:3 5	216	Ar08_058
58	'V32'	75°49.93'N	017°19.90'E	01-Jul-2008 04:38:2 1	292	Ar08_059
59	'V33'	75°57.20'N	017°10.20'E	01-Jul-2008 06:42:4 5	326	Ar08_060

60	'V34'	76°07.19'N	017°00.42'E	01-Jul-2008 08:28:3 5	306	Ar08_061
61	'V35'	76°14.06'N	016°50.97'E	01-Jul-2008 10:22:1 3	215	Ar08_062
62	'V36'	76°18.14'N	016°47.33'E	01-Jul-2008 11:29:2 7	110	Ar08_063
Section O100						
63	'O101'	76°29.81'N	017°59.09'E	01-Jul-2008 15:36: 22	262	Ar08_064
64	'O102'	76°25.90'N	018°00.38'E	01-Jul-2008 16:54: 49	252	Ar08_065
65	'O103'	76°22.43'N	017°59.78'E	01-Jul-2008 17:44: 45	262	Ar08_066
66	'O104'	76°19.58'N	017°59.94'E	01-Jul-2008 18:34: 02	258	Ar08_067
67	'O105'	76°15.02'N	018°00.01'E	01-Jul-2008 19:30: 12	269	Ar08_068
68	'O106'	76°11.71'N	017°59.99'E	01-Jul-2008 20:30: 51	268	Ar08_069
69	'O107'	76°07.73'N	017°59.99'E	01-Jul-2008 21:30: 00	252	Ar08_070
Section O						
70	'O9'	76°16.51'N	019°21.51'E	02-Jul-2008 01:13:38	254	Ar08_071
71	'O8'	76°15.29'N	019°01.72'E	02-Jul-2008 03:10:39	268	Ar08_072
72	'O7'	76°13.20'N	018°28.44'E	02-Jul-2008 04:45:50	254	Ar08_073
73	'O6'	76°10.97'N	017°55.05'E	02-Jul-2008 06:16:31	281	Ar08_074
74	'O5'	76°09.50'N	017°27.81'E	02-Jul-2008 07:40:46	312	Ar08_075
75	'O4'	76°08.01'N	017°00.38'E	02-Jul-2008 09:00:40	287	Ar08_076
76	'O3'	76°06.24'N	016°34.08'E	02-Jul-2008 10:22:22	345	Ar08_077
77	'O2'	76°04.30'N	016°04.86'E	02-Jul-2008 11:50:04	388	Ar08_078
78	'O1'	76°02.36'N	015°35.30'E	02-Jul-2008 13:27:59	365	Ar08_079
79	'M4'	76°00.16'N	015°03.89'E	02-Jul-2008 15:03:23	346	Ar08_080
80	'O-1'	75°59.06'N	014°39.95'E	02-Jul-2008 16:45:2 5	328	Ar08_081
81	'O-2'	75°58.00'N	014°22.05'E	02-Jul-2008 18:04:3 0	341	Ar08_082
82	'O-3'	75°57.20'N	014°07.90'E	02-Jul-2008 19:20:3 4	603	Ar08_083
83	'O-4'	75°57.05'N	013°54.76'E	02-Jul-2008 20:50:1 3	902	Ar08_084
84	'O-5'	75°56.99'N	013°28.64'E	02-Jul-2008 22:41:3 6	1156	Ar08_085
85	'O-6'	75°56.05'N	013°06.94'E	03-Jul-2008 00:51:2 2	1377	Ar08_086
86	'O-7'	75°54.03'N	012°20.12'E	03-Jul-2008 05:40:3 0	1804	Ar08_087
87	'O-8'	75°52.91'N	011°33.34'E	03-Jul-2008 10:02:4 2	2093	Ar08_088
88	'O-9'	75°50.91'N	010°15.08'E	03-Jul-2008 15:35:1 3	2327	Ar08_089
89	'O-10'	75°49.17'N	008°54.81'E	03-Jul-2008 20:46: 15	2392	Ar08_090
90	'O-11'	75°47.08'N	007°32.17'E	04-Jul-2008 01:36: 04	2575	Ar08_091
Section N						
91	'N-11'	76°29.40'N	004°02.88'E	04-Jul-2008 13:43: 58	2606	Ar08_092
92	'N-10'	76°30.02'N	004°57.53'E	04-Jul-2008 17:24: 41	2404	Ar08_093
93	'N-9'	76°30.09'N	005°27.40'E	04-Jul-2008 19:44:3 0	2604	Ar08_094
94	'N-8'	76°30.04'N	005°52.77'E	04-Jul-2008 22:11:1 3	2551	Ar08_095
95	'N-7'	76°30.03'N	006°23.52'E	05-Jul-2008 00:41:2 0	2495	Ar08_096
96	'N-6'	76°30.07'N	006°54.75'E	05-Jul-2008 03:05:2 3	2894	Ar08_097
97	'N-5'	76°30.05'N	007°26.12'E	05-Jul-2008 05:50:1 9	2560	Ar08_098
98	'N-4'	76°30.09'N	007°54.65'E	05-Jul-2008 08:12:3 1	1917	Ar08_099
99	'N-3'	76°30.12'N	008°24.54'E	05-Jul-2008 10:22:5 8	2295	Ar08_100
100	'N-2'	76°30.13'N	008°57.91'E	05-Jul-2008 12:50: 39	2295	Ar08_101
101	'N-1'	76°29.99'N	009°59.93'E	05-Jul-2008 16:23: 06	2238	Ar08_102
102	'N0'	76°30.02'N	010°57.50'E	05-Jul-2008 19:40:4 5	2121	Ar08_103
103	'N1'	76°29.99'N	011°59.97'E	05-Jul-2008 23:05:5 8	1912	Ar08_104
104	'N1P'	76°30.04'N	012°27.21'E	06-Jul-2008 01:25: 56	1755	Ar08_105
105	'N2'	76°30.11'N	012°55.50'E	06-Jul-2008 03:39:0 5	1543	Ar08_106
106	'N2P'	76°30.10'N	013°25.87'E	06-Jul-2008 05:44: 30	1270	Ar08_107
107	'N3'	76°30.11'N	013°54.16'E	06-Jul-2008 07:32:1 8	742	Ar08_108
108	'N3P'	76°30.04'N	014°22.42'E	06-Jul-2008 09:07: 46	214	Ar08_109

Section S						
109	'S-2'	77°36.63'N	014°25.55'E	06-Jul-2008 22:57: 59	134	Ar08_110
110	'S-1'	77°36.10'N	014°04.04'E	07-Jul-2008 00:24: 16	140	Ar08_111
111	'S0'	77°35.10'N	013°34.56'E	07-Jul-2008 01:54:1 1	143	Ar08_112
112	'S1'	77°34.17'N	013°05.61'E	07-Jul-2008 03:12:0 6	135	Ar08_113
113	'S2'	77°33.11'N	012°34.39'E	07-Jul-2008 04:32:5 4	97	Ar08_114
114	'S3'	77°32.02'N	012°03.00'E	07-Jul-2008 05:45:2 6	174	Ar08_115
115	'S4'	77°31.05'N	011°31.76'E	07-Jul-2008 07:00:4 0	276	Ar08_116
116	'S5'	77°30.51'N	011°14.68'E	07-Jul-2008 08:15:3 3	723	Ar08_117
117	'S6'	77°29.14'N	010°34.54'E	07-Jul-2008 09:46:4 7	1256	Ar08_118
118	'S7'	77°28.17'N	010°04.74'E	07-Jul-2008 11:33:1 6	1621	Ar08_119
119	'S8'	77°26.13'N	009°04.69'E	07-Jul-2008 14:45:4 1	2080	Ar08_120
120	'S9'	77°24.12'N	008°05.57'E	07-Jul-2008 18:05:1 6	2333	Ar08_121
121	'S10'	77°22.15'N	007°04.57'E	07-Jul-2008 21:33: 03	2704	Ar08_122
122	'S11'	77°21.10'N	006°36.39'E	08-Jul-2008 00:12: 29	2125	Ar08_123
123	'S12'	77°20.13'N	006°06.34'E	08-Jul-2008 02:29: 15	2606	Ar08_124
124	'S13'	77°18.27'N	005°09.83'E	08-Jul-2008 06:23: 42	2410	Ar08_125
125	'S14'	77°17.17'N	004°35.64'E	08-Jul-2008 08:44: 48	2304	Ar08_126
126	'S15'	77°16.04'N	004°03.24'E	08-Jul-2008 11:11: 45	2600	Ar08_127
127	'S16'	77°14.05'N	003°04.86'E	08-Jul-2008 14:33: 11	2923	Ar08_128
Section Z						
128	'Z1'	78°10.54'N	011°02.76'E	12-Jul-2008 01:34:3 8	258	Ar08_129
129	'Z2'	78°10.01'N	010°00.01'E	12-Jul-2008 04:43:0 8	267	Ar08_130
130	'Z3'	78°09.87'N	009°41.29'E	12-Jul-2008 06:26:4 9	267	Ar08_131
131	'Z4'	78°09.63'N	009°15.28'E	12-Jul-2008 07:24:3 1	675	Ar08_132
132	'Z5'	78°09.48'N	009°02.85'E	12-Jul-2008 08:35:0 5	1092	Ar08_133
133	'Z6'	78°08.98'N	008°45.44'E	12-Jul-2008 09:58:2 9	1565	Ar08_134
134	'Z7'	78°08.45'N	008°14.44'E	12-Jul-2008 11:55:5 0	2205	Ar08_135
135	'Z8'	78°07.94'N	007°37.80'E	12-Jul-2008 14:34:3 2	3480	Ar08_136
136	'Z9'	78°06.95'N	006°43.71'E	12-Jul-2008 18:29:5 1	2370	Ar08_137
137	'Z10'	78°06.19'N	005°57.16'E	12-Jul-2008 21:32: 43	2524	Ar08_138
138	'Z11'	78°05.60'N	005°08.08'E	13-Jul-2008 00:25: 56	2532	Ar08_139
139	'Z12'	78°04.98'N	004°05.71'E	13-Jul-2008 03:42: 11	2875	Ar08_140
Section EB2						
140	'EB2-9''	78°49.40'N	005°33.87'E	13-Jul-2008 18 :43:25	1017	Ar08_141
141	'EB2-8'	78°50.00'N	005°55.19'E	13-Jul-2008 20:1 2:23	2451	Ar08_142
142	'EB2-7'	78°50.01'N	006°26.57'E	13-Jul-2008 22:4 0:58	1951	Ar08_143
143	'EB2-6'	78°50.06'N	006°59.81'E	14-Jul-2008 01:1 3:38	1396	Ar08_144
144	'EB2-5'	78°50.01'N	007°32.73'E	14-Jul-2008 03:1 6:52	1132	Ar08_145
145	'EB2-4'	78°50.05'N	008°00.43'E	14-Jul-2008 05:1 8:58	990	Ar08_146
146	'EB2-3'	78°49.95'N	008°21.72'E	14-Jul-2008 06:4 9:13	715	Ar08_147
147	'EB2-2'	78°49.95'N	008°38.91'E	14-Jul-2008 08:0 5:26	216	Ar08_148
148	'EB2-1'	78°50.17'N	009°11.72'E	14-Jul-2008 09:2 8:31	205	Ar08_149
Section EX						
149	'EX1'	79°24.47'N	009°29.92'E	14-Jul-2008 15:10: 51	127	Ar08_150
150	'EX2'	79°25.15'N	009°09.50'E	14-Jul-2008 16:36: 08	129	Ar08_151
151	'EX3'	79°25.14'N	008°37.32'E	14-Jul-2008 17:41: 36	190	Ar08_152
152	'EX4'	79°25.09'N	008°11.84'E	14-Jul-2008 18:51: 58	423	Ar08_153
153	'EX5'	79°25.20'N	007°38.97'E	14-Jul-2008 20:10: 01	910	Ar08_154
154	'EX6'	79°25.20'N	007°03.27'E	14-Jul-2008 22:37: 30	1208	Ar08_155
Section SA						
155	'S101'	77°46.99'N	008°20.02'E	15-Jul-2008 15:59 :41	2118	Ar08_156

156	'S102'	77°43.96'N	008°25.10'E	15-Jul-2008 18:00 :26	2128	Ar08_157
157	'S103'	77°39.06'N	008°32.78'E	15-Jul-2008 19:50 :54	2204	Ar08_158
158	'S104'	77°35.94'N	008°37.76'E	15-Jul-2008 21:41 :05	2239	Ar08_159
159	'S105'	77°30.92'N	008°46.09'E	15-Jul-2008 23:51 :49	2116	Ar08_160
160	'S106/8'''	77°25.40'N	008°54.78'E	16-Jul-2008 0 1:58:54	2074	Ar08_161
161	'S107'	77°19.16'N	009°04.48'E	16-Jul-2008 04:16 :53	2087	Ar08_162
162	'S108'	77°14.25'N	009°12.18'E	16-Jul-2008 06:35 :58	2141	Ar08_163
163	'S109'	77°09.02'N	009°21.02'E	16-Jul-2008 09:00 :29	2197	Ar08_164
164	'S110'	77°10.94'N	009°44.22'E	16-Jul-2008 11:27 :49	1988	Ar08_165
165	'S111'	77°14.23'N	010°08.07'E	16-Jul-2008 13:34 :30	1750	Ar08_166
Section SB						
166	'S112'	77°17.05'N	010°29.01'E	16-Jul-2008 15:46 :16	1434	Ar08_167
167	'S113'	77°19.50'N	010°07.81'E	16-Jul-2008 17:28 :37	1701	Ar08_168
168	'S114'	77°21.16'N	009°43.84'E	16-Jul-2008 19:28 :45	1915	Ar08_169
169	'S115'	77°22.68'N	009°23.48'E	16-Jul-2008 21:39 :49	2033	Ar08_170
170	'S116/8'''	77°24.18'N	008°59.83'E	16-Jul-2008 2 3:50:35	2076	Ar08_171
171	'S117'	77°25.98'N	008°34.65'E	17-Jul-2008 02:09 :40	1723	Ar08_172
172	'S118'	77°27.99'N	008°08.21'E	17-Jul-2008 04:03 :18	2285	Ar08_173
Section SAC						
173	'S119'	77°29.93'N	007°40.80'E	17-Jul-2008 06:20 :31	2888	Ar08_174
174	'S120'	77°31.89'N	008°00.91'E	17-Jul-2008 09:19 :41	2580	Ar08_175
175	'S121'	77°34.06'N	008°24.05'E	17-Jul-2008 12:00 :30	2289	Ar08_176
176	'S122'	77°36.30'N	008°48.71'E	17-Jul-2008 14:22 :55	2074	Ar08_177
177	'S123'	77°38.02'N	009°08.75'E	17-Jul-2008 16:30 :29	1681	Ar08_178
Section SC						
178	'S124'	77°40.17'N	009°31.45'E	17-Jul-2008 18:35 :32	1326	Ar08_179
179	'S125'	77°35.56'N	009°25.70'E	17-Jul-2008 20:19 :33	1714	Ar08_180
180	'S126'	77°30.57'N	009°12.55'E	17-Jul-2008 22:18 :15	2025	Ar08_181
181	'S127/8'''	77°25.36'N	008°58.83'E	18-Jul-2008 0 0:32:14	2076	Ar08_182
182	'S128'	77°20.94'N	008°46.27'E	18-Jul-2008 02:50 :09	2095	Ar08_183
183	'S129'	77°16.47'N	008°34.87'E	18-Jul-2008 05:13 :28	2056	Ar08_184
184	'S130'	77°11.40'N	008°21.84'E	18-Jul-2008 07:22 :50	2146	Ar08_185
185	'S131'	77°07.43'N	008°11.39'E	18-Jul-2008 09:30 :39	2513	Ar08_186
186	'S132'	77°11.57'N	008°04.04'E	18-Jul-2008 11:46 :00	2786	Ar08_187
187	'S133'	77°16.49'N	007°57.48'E	18-Jul-2008 14:21 :13	2304	Ar08_188
Section SD						
188	'S134'	77°21.47'N	007°50.95'E	18-Jul-2008 16:32 :41	2666	Ar08_189
189	'S135'	77°22.88'N	008°04.53'E	18-Jul-2008 18:53 :07	2048	Ar08_190
190	'S136'	77°23.31'N	008°19.91'E	18-Jul-2008 20:46 :58	1749	Ar08_191
191	'S137'	77°23.89'N	008°35.13'E	18-Jul-2008 22:35 :55	1711	Ar08_192
192	'S138/8'''	77°24.45'N	008°52.42'E	19-Jul-2008 0 0:26:50	2077	Ar08_193
193	'S139'	77°25.31'N	009°17.72'E	19-Jul-2008 02:37 :02	2008	Ar08_194
194	'S140'	77°26.14'N	009°45.58'E	19-Jul-2008 04:38 :37	1812	Ar08_195
195	'S141'	77°26.93'N	010°05.74'E	19-Jul-2008 06:34 :26	1508	Ar08_196
196	'S142'	77°27.68'N	010°37.31'E	19-Jul-2008 08:47 :36	1144	Ar08_197
197	'S143'	77°28.60'N	011°07.42'E	19-Jul-2008 10:39 :31	350	Ar08_198