



30 May, 2011

# Cruise Report

## r/v “Oceania”, AREX2009

|                     |  |
|---------------------|--|
| Ship                | r/v “Oceania”  |
| Cruise              | AREX2009   |
| Dates               | 8.06.2009 – 19.07.2009                                       |
| Port Calls          | Gdansk (Poland), Tromsø (Norway), Longyearbyen (Spitsbergen) |
| Number of Scientist | 10   |
| Chief Scientist     | dr Waldemar Walczowski                                       |
| Principal Project   | DAMOCLES, EURO-ARGO, ALKEKONGE                               |
| Research Area       | the Norwegian, Greenland and Barents Seas                    |

## Hydrographic conditions in the Atlantic Domain of the Nordic Seas

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### 1. Observations in 2009

AREX2009 cruise of Institute of Oceanology Polish Academy of Sciences (IOPAS) vessel R.V Oceania was performed in period of 8 June 2009 – 19 July, 2009. 204 CTD casts along 11 sections in the Norwegian and Greenland Sea were done (Fig.1, Tab.1). The advection of Atlantic Water (AW), heat content and transport by the West Spitsbergen Current were mainly investigated.

The SBE 9/11 device was used. Measurements of currents were done by means of two (upper and down looking) lowered Acoustic Doppler Current Profiler (LADCP). The self-recording 300 kHz RDI devices were used to profile entire water column during the standard CTD casts. During the whole cruise continuous currents measurements by the vessel-mounted ADCP, RDI 150 kHz were conducted.

Towed CTD sections were performed close to Hornsund, Bellsund, Magdalenefjord and a single section south-west of the Prins Karls Forland island (with towed Seabird FastCAT SBE49 CTD system). Four ARGO floats, two belonging to the IOPAS, two to the Alfred Wegener Institute (AWI) in Bremerhaven were launched under the EURO-ARGO Project. A mooring system (RDCP + CTD) was deployed in the entrance to Hornsund, in connection to the ALKEKONGE Project.

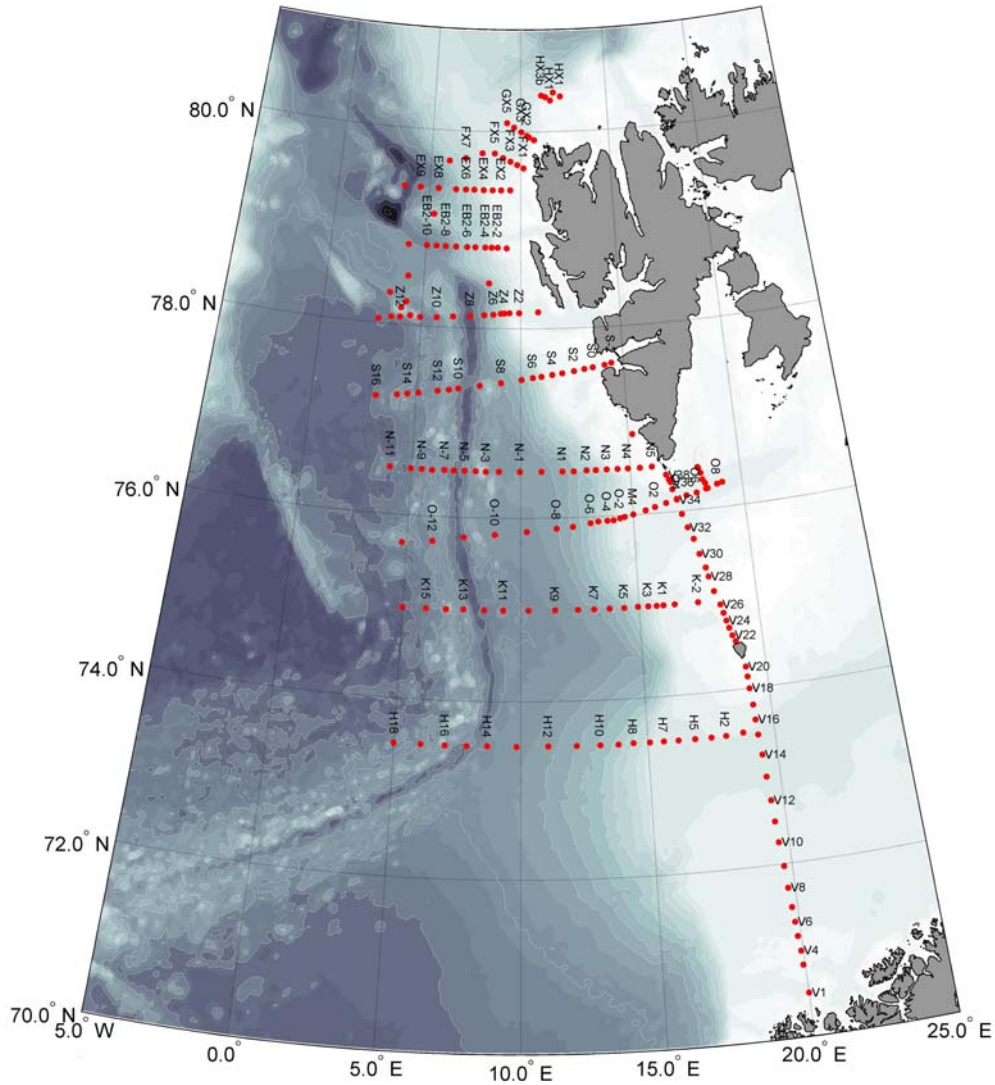


Figure 1: Geographical locations of CTD stations performed during IOPAS Arctic Experiment AREX2010 aboard RV Oceania in summer 2009.

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Tabel 1. CTD stations and some of their main parameters. All in all 11 regular sections were performed during the oceanic part of 2009 cruise.

| No         | Station | Depth | Latitude   | Longitude   | Date, Time           | File/Cast |
|------------|---------|-------|------------|-------------|----------------------|-----------|
| Section V1 |         |       |            |             |                      |           |
| 1          | V1      | 135   | 70°30.06'N | 020°00.24'E | 20-Jun-2009 08:41:48 | ar09_001  |
| 2          | V3      | 190   | 70°49.81'N | 019°55.80'E | 20-Jun-2009 13:01:58 | ar09_003  |
| 3          | V4      | 190   | 70°59.54'N | 019°54.99'E | 20-Jun-2009 15:35:44 | ar09_004  |
| 4          | V5      | 205   | 71°09.90'N | 019°51.96'E | 20-Jun-2009 18:27:31 | ar09_005  |
| 5          | V6      | 210   | 71°19.73'N | 019°50.31'E | 20-Jun-2009 21:11:46 | ar09_006  |
| 6          | V7      | 240   | 71°29.98'N | 019°47.96'E | 21-Jun-2009 00:16:01 | ar09_007  |
| 7          | V8      | 265   | 71°43.43'N | 019°44.73'E | 21-Jun-2009 04:41:33 | ar09_008  |
| 8          | V9      | 310   | 71°58.47'N | 019°41.90'E | 21-Jun-2009 09:03:49 | ar09_009  |
| 9          | V10     | 320   | 72°14.99'N | 019°37.15'E | 21-Jun-2009 14:03:35 | ar09_010  |
| 10         | V11     | 390   | 72°29.27'N | 019°34.15'E | 21-Jun-2009 17:41:42 | ar09_011  |
| 11         | V12     | 400   | 72°43.69'N | 019°31.47'E | 21-Jun-2009 20:42:04 | ar09_012  |
| 12         | V13     | 415   | 72°59.89'N | 019°27.79'E | 21-Jun-2009 23:36:44 | ar09_013  |
| 13         | V14     | 455   | 73°15.03'N | 019°24.37'E | 22-Jun-2009 02:39:20 | ar09_014  |
| 14         | V15     | 480   | 73°28.72'N | 019°20.43'E | 22-Jun-2009 05:50:08 | ar09_015  |
| 15         | V16     | 350   | 73°38.82'N | 019°18.56'E | 22-Jun-2009 08:05:53 | ar09_016  |
| 16         | V17     | 235   | 73°48.88'N | 019°16.71'E | 22-Jun-2009 09:57:46 | ar09_017  |
| 17         | V18     | 135   | 74°00.01'N | 019°13.18'E | 22-Jun-2009 11:47:17 | ar09_018  |
| 18         | V19     | 70    | 74°07.93'N | 019°11.99'E | 22-Jun-2009 13:28:20 | ar09_019  |
| 19         | V20     | 60    | 74°14.42'N | 019°10.63'E | 22-Jun-2009 14:29:55 | ar09_020  |
| Section H  |         |       |            |             |                      |           |
| 20         | H1      | 430   | 73°31.05'N | 018°45.79'E | 22-Jun-2009 21:15:01 | ar09_021  |
| 21         | H2      | 415   | 73°30.07'N | 018°05.01'E | 22-Jun-2009 23:17:50 | ar09_022  |
| 22         | H3      | 425   | 73°29.95'N | 017°30.13'E | 23-Jun-2009 01:14:20 | ar09_023  |
| 23         | H5      | 445   | 73°30.01'N | 016°51.42'E | 23-Jun-2009 03:27:02 | ar09_024  |
| 24         | H6      | 460   | 73°30.00'N | 016°12.20'E | 23-Jun-2009 05:37:34 | ar09_025  |
| 25         | H7      | 480   | 73°30.11'N | 015°37.84'E | 23-Jun-2009 07:21:24 | ar09_026  |
| 26         | H4      | 700   | 73°30.18'N | 015°04.86'E | 23-Jun-2009 09:05:53 | ar09_027  |

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|           |     |      |            |             |                      |          |
|-----------|-----|------|------------|-------------|----------------------|----------|
| 27        | H8  | 1035 | 73°30.34'N | 014°26.14'E | 23-Jun-2009 11:10:22 | ar09_028 |
| 28        | H9  | 1305 | 73°30.03'N | 013°50.03'E | 23-Jun-2009 13:55:32 | ar09_029 |
| 29        | H10 | 1595 | 73°30.03'N | 013°07.43'E | 23-Jun-2009 17:38:54 | ar09_030 |
| 30        | H11 | 1830 | 73°30.01'N | 012°12.08'E | 23-Jun-2009 21:21:35 | ar09_031 |
| 31        | H12 | 2085 | 73°30.15'N | 011°04.83'E | 24-Jun-2009 02:11:41 | ar09_032 |
| 32        | H13 | 2330 | 73°30.00'N | 009°49.93'E | 24-Jun-2009 07:08:44 | ar09_033 |
| 33        | H14 | 2525 | 73°30.20'N | 008°40.62'E | 24-Jun-2009 12:20:15 | ar09_034 |
| 34        | H15 | 3025 | 73°30.08'N | 007°52.13'E | 24-Jun-2009 16:26:35 | ar09_035 |
| 35        | H16 | 2350 | 73°30.08'N | 007°00.38'E | 24-Jun-2009 21:44:45 | ar09_036 |
| 36        | H17 | 1880 | 73°30.13'N | 006°03.42'E | 25-Jun-2009 02:22:56 | ar09_037 |
| 37        | H18 | 2520 | 73°30.02'N | 005°00.02'E | 25-Jun-2009 07:48:08 | ar09_038 |
| Section K |     |      |            |             |                      |          |
| 38        | K16 | 3070 | 75°00.03'N | 005°00.21'E | 26-Jun-2009 09:53:30 | ar09_039 |
| 39        | K15 | 2885 | 75°00.14'N | 005°59.19'E | 26-Jun-2009 13:41:52 | ar09_040 |
| 40        | K14 | 2015 | 75°00.06'N | 006°50.39'E | 26-Jun-2009 17:16:46 | ar09_041 |
| 41        | K13 | 2235 | 75°00.38'N | 007°34.56'E | 26-Jun-2009 20:12:34 | ar09_042 |
| 42        | K12 | 2840 | 75°00.05'N | 008°27.30'E | 26-Jun-2009 23:30:19 | ar09_043 |
| 43        | K11 | 2585 | 75°00.03'N | 009°15.41'E | 27-Jun-2009 03:12:07 | ar09_044 |
| 44        | K10 | 2540 | 75°00.06'N | 010°19.48'E | 27-Jun-2009 06:46:35 | ar09_045 |
| 45        | K9  | 2415 | 75°00.09'N | 011°27.24'E | 27-Jun-2009 10:21:40 | ar09_046 |
| 46        | K8  | 2180 | 75°00.07'N | 012°24.85'E | 27-Jun-2009 13:47:39 | ar09_047 |
| 47        | K7  | 2010 | 75°00.03'N | 013°06.08'E | 27-Jun-2009 16:40:07 | ar09_048 |
| 48        | K6  | 1810 | 75°00.02'N | 013°44.89'E | 27-Jun-2009 19:03:27 | ar09_049 |
| 49        | K5  | 1535 | 75°00.01'N | 014°21.97'E | 27-Jun-2009 21:25:14 | ar09_050 |
| 50        | K4  | 1110 | 75°00.21'N | 014°57.18'E | 27-Jun-2009 23:48:52 | ar09_051 |
| 51        | K3  | 820  | 75°00.07'N | 015°22.85'E | 28-Jun-2009 01:40:06 | ar09_052 |
| 52        | K2  | 325  | 75°00.03'N | 015°44.46'E | 28-Jun-2009 03:13:31 | ar09_053 |
| 53        | K1  | 220  | 75°00.02'N | 016°01.37'E | 28-Jun-2009 04:13:32 | ar09_054 |
| 54        | K0  | 205  | 74°59.93'N | 016°30.01'E | 28-Jun-2009 05:23:51 | ar09_055 |
| 55        | K-2 | 115  | 75°00.07'N | 017°29.64'E | 28-Jun-2009 07:23:42 | ar09_056 |

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| Section V2      |      |     |            |             |                      |          |
|-----------------|------|-----|------------|-------------|----------------------|----------|
| 56              | V21  | 25  | 74°32.09'N | 018°53.46'E | 28-Jun-2009 13:47:09 | ar09_057 |
| 57              | V22  | 65  | 74°36.13'N | 018°46.59'E | 28-Jun-2009 14:40:15 | ar09_058 |
| 58              | V23  | 100 | 74°41.15'N | 018°41.06'E | 28-Jun-2009 15:31:29 | ar09_059 |
| 59              | V24  | 230 | 74°46.10'N | 018°35.72'E | 28-Jun-2009 16:37:39 | ar09_060 |
| 60              | V25  | 200 | 74°51.36'N | 018°30.90'E | 28-Jun-2009 17:43:24 | ar09_061 |
| 61              | V26  | 70  | 74°57.00'N | 018°25.13'E | 28-Jun-2009 18:41:25 | ar09_062 |
| 62              | V27  | 65  | 75°06.08'N | 018°12.86'E | 28-Jun-2009 20:22:25 | ar09_063 |
| 63              | V28  | 60  | 75°16.02'N | 018°03.22'E | 28-Jun-2009 21:51:28 | ar09_064 |
| 64              | V29  | 105 | 75°22.03'N | 017°58.35'E | 28-Jun-2009 23:13:51 | ar09_065 |
| 65              | V30  | 130 | 75°31.31'N | 017°45.51'E | 29-Jun-2009 00:46:34 | ar09_066 |
| 66              | V31  | 215 | 75°41.36'N | 017°34.79'E | 29-Jun-2009 02:21:31 | ar09_067 |
| 67              | V32  | 295 | 75°49.08'N | 017°21.68'E | 29-Jun-2009 04:14:04 | ar09_068 |
| 68              | V33  | 320 | 75°58.02'N | 017°09.57'E | 29-Jun-2009 05:58:03 | ar09_069 |
| 69              | V34  | 290 | 76°07.51'N | 017°00.06'E | 29-Jun-2009 07:23:58 | ar09_070 |
| 70              | V35  | 220 | 76°14.48'N | 016°50.10'E | 29-Jun-2009 08:43:44 | ar09_071 |
| 71              | V36  | 105 | 76°18.98'N | 016°47.33'E | 29-Jun-2009 09:39:11 | ar09_072 |
| 72              | V37  | 50  | 76°20.90'N | 016°43.59'E | 29-Jun-2009 10:12:03 | ar09_073 |
| 73              | V38  | 30  | 76°23.99'N | 016°36.98'E | 29-Jun-2009 10:53:36 | ar09_074 |
| Section O       |      |     |            |             |                      |          |
| 74              | O5   | 305 | 76°09.78'N | 017°26.69'E | 29-Jun-2009 13:17:35 | ar09_075 |
| 75              | O6   | 280 | 76°10.89'N | 017°54.78'E | 29-Jun-2009 14:35:37 | ar09_076 |
| 76              | O7   | 250 | 76°12.83'N | 018°20.91'E | 29-Jun-2009 16:02:49 | ar09_077 |
| 77              | O8   | 265 | 76°15.11'N | 018°52.23'E | 29-Jun-2009 17:56:30 | ar09_078 |
| 78              | O8p  | 260 | 76°15.86'N | 019°05.99'E | 29-Jun-2009 19:01:00 | ar09_079 |
| Section O cross |      |     |            |             |                      |          |
| 79              | O7_2 | 255 | 76°13.01'N | 018°25.32'E | 29-Jun-2009 21:14:47 | ar09_080 |
| 80              | O7a  | 245 | 76°16.38'N | 018°20.15'E | 29-Jun-2009 22:04:03 | ar09_081 |
| 81              | O7b  | 230 | 76°18.82'N | 018°13.68'E | 29-Jun-2009 22:59:05 | ar09_082 |
| 82              | O7c  | 240 | 76°23.10'N | 018°10.19'E | 29-Jun-2009 23:49:32 | ar09_083 |

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|              |      |      |            |             |                      |          |
|--------------|------|------|------------|-------------|----------------------|----------|
| 83           | O7d  | 245  | 76°26.37'N | 018°05.30'E | 30-Jun-2009 00:41:44 | ar09_084 |
| 84           | O7e  | 245  | 76°27.03'N | 018°03.95'E | 30-Jun-2009 01:10:47 | ar09_085 |
| Section O cd |      |      |            |             |                      |          |
| 85           | O4   | 285  | 76°08.00'N | 017°00.16'E | 30-Jun-2009 04:52:04 | ar09_086 |
| 86           | O3   | 345  | 76°05.98'N | 016°29.92'E | 30-Jun-2009 06:38:30 | ar09_087 |
| 87           | O2   | 385  | 76°04.02'N | 015°59.94'E | 30-Jun-2009 08:07:50 | ar09_088 |
| 88           | O1   | 365  | 76°02.30'N | 015°33.76'E | 30-Jun-2009 09:41:10 | ar09_089 |
| 89           | M4   | 340  | 76°00.23'N | 015°00.90'E | 30-Jun-2009 11:11:22 | ar09_090 |
| 90           | O-1  | 320  | 75°59.02'N | 014°37.01'E | 30-Jun-2009 12:39:40 | ar09_091 |
| 91           | O-2  | 335  | 75°58.29'N | 014°24.63'E | 30-Jun-2009 13:41:21 | ar09_092 |
| 92           | O-3  | 605  | 75°57.19'N | 014°07.15'E | 30-Jun-2009 14:58:26 | ar09_093 |
| 93           | O-4  | 905  | 75°57.08'N | 013°50.35'E | 30-Jun-2009 16:16:35 | ar09_094 |
| 94           | O-5  | 1165 | 75°57.01'N | 013°26.18'E | 30-Jun-2009 17:50:23 | ar09_095 |
| 95           | O-6  | 1385 | 75°56.04'N | 013°05.36'E | 30-Jun-2009 19:36:05 | ar09_096 |
| 96           | O-7  | 1795 | 75°54.11'N | 012°18.63'E | 30-Jun-2009 23:25:21 | ar09_097 |
| 97           | O-8  | 2090 | 75°53.09'N | 011°35.20'E | 01-Jul-2009 03:39:24 | ar09_098 |
| 98           | O-9  | 2330 | 75°51.22'N | 010°16.02'E | 01-Jul-2009 09:08:31 | ar09_099 |
| 99           | O-10 | 2395 | 75°49.17'N | 008°51.44'E | 01-Jul-2009 13:56:17 | ar09_100 |
| 100          | O-11 | 2565 | 75°47.22'N | 007°29.92'E | 01-Jul-2009 18:34:03 | ar09_101 |
| 101          | O-12 | 2540 | 75°44.24'N | 006°07.13'E | 01-Jul-2009 22:44:10 | ar09_102 |
| 102          | O-13 | 2930 | 75°42.19'N | 004°47.06'E | 02-Jul-2009 02:46:58 | ar09_103 |
| Section N    |      |      |            |             |                      |          |
| 103          | N-11 | 2550 | 76°30.13'N | 004°00.02'E | 02-Jul-2009 10:06:58 | ar09_104 |
| 104          | N-10 | 2430 | 76°29.95'N | 004°57.62'E | 02-Jul-2009 13:35:23 | ar09_105 |
| 105          | N-9  | 2580 | 76°29.95'N | 005°27.80'E | 02-Jul-2009 16:12:13 | ar09_106 |
| 106          | N-8  | 2600 | 76°29.65'N | 005°56.52'E | 02-Jul-2009 18:59:48 | ar09_107 |
| 107          | N-7  | 2475 | 76°30.00'N | 006°29.87'E | 02-Jul-2009 21:33:11 | ar09_108 |
| 108          | N-6  | 2865 | 76°30.06'N | 006°56.78'E | 03-Jul-2009 00:16:36 | ar09_109 |
| 109          | N-5  | 2525 | 76°30.06'N | 007°25.70'E | 03-Jul-2009 02:51:37 | ar09_110 |
| 110          | N-4  | 2075 | 76°30.00'N | 007°56.06'E | 03-Jul-2009 05:27:22 | ar09_111 |

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|                   |     |      |            |             |                      |          |
|-------------------|-----|------|------------|-------------|----------------------|----------|
| 111               | N-3 | 2295 | 76°29.71'N | 008°23.91'E | 03-Jul-2009 07:53:53 | ar09_112 |
| 112               | N-2 | 2295 | 76°29.85'N | 009°00.29'E | 03-Jul-2009 10:13:44 | ar09_113 |
| 113               | N-1 | 2270 | 76°29.73'N | 009°57.34'E | 03-Jul-2009 13:31:34 | ar09_114 |
| 114               | N0  | 2120 | 76°29.86'N | 010°56.51'E | 03-Jul-2009 16:46:21 | ar09_115 |
| 115               | N1  | 1915 | 7629.81'N  | 011°53.78'E | 03-Jul-2009 19:41:56 | ar09_116 |
| 116               | N1P | 1755 | 76°29.77'N | 012°25.05'E | 03-Jul-2009 21:45:27 | ar09_117 |
| 117               | N2  | 1545 | 76°29.99'N | 013°00.03'E | 03-Jul-2009 23:57:08 | ar09_118 |
| 118               | N2P | 1260 | 76°29.93'N | 013°25.81'E | 04-Jul-2009 02:06:03 | ar09_119 |
| 119               | N3  | 735  | 76°30.02'N | 013°55.62'E | 04-Jul-2009 04:20:21 | ar09_120 |
| 120               | N3p | 215  | 76°29.95'N | 014°25.54'E | 04-Jul-2009 05:47:50 | ar09_121 |
| 121               | N4  | 160  | 76°29.86'N | 014°53.39'E | 04-Jul-2009 06:54:09 | ar09_122 |
| 122               | N4P | 140  | 76°29.87'N | 015°26.64'E | 04-Jul-2009 08:17:04 | ar09_123 |
| 123               | N5  | 40   | 76°29.97'N | 015°59.97'E | 04-Jul-2009 09:40:59 | ar09_124 |
| Mooring Alkekonge |     |      |            |             |                      |          |
| 124               | HM1 | 85   | 76°51.61'N | 015°11.81'E | 04-Jul-2009 12:30:59 | ar09_125 |
| Section S         |     |      |            |             |                      |          |
| 125               | S-2 | 130  | 77°37.30'N | 014°25.02'E | 08-Jul-2009 06:09:09 | ar09_126 |
| 126               | S-1 | 140  | 77°36.26'N | 014°04.72'E | 08-Jul-2009 07:17:12 | ar09_127 |
| 127               | S0  | 140  | 77°35.02'N | 013°30.18'E | 08-Jul-2009 08:40:32 | ar09_128 |
| 128               | S1  | 135  | 77°34.27'N | 013°05.50'E | 08-Jul-2009 09:59:04 | ar09_129 |
| 129               | S2  | 95   | 77°33.10'N | 012°35.01'E | 08-Jul-2009 11:20:38 | ar09_130 |
| 130               | S3  | 175  | 77°31.97'N | 012°00.21'E | 08-Jul-2009 13:05:23 | ar09_131 |
| 131               | S4  | 280  | 77°31.09'N | 011°31.67'E | 08-Jul-2009 15:09:32 | ar09_132 |
| 132               | S5  | 690  | 77°30.01'N | 011°00.20'E | 08-Jul-2009 17:51:22 | ar09_133 |
| 133               | S6  | 1260 | 77°29.28'N | 010°34.61'E | 08-Jul-2009 20:04:41 | ar09_134 |
| 134               | S7  | 1625 | 77°28.11'N | 010°02.16'E | 08-Jul-2009 22:19:08 | ar09_135 |
| 135               | S8  | 2085 | 77°26.10'N | 009°02.71'E | 09-Jul-2009 02:34:44 | ar09_136 |
| 136               | S9  | 2360 | 77°24.14'N | 008°01.30'E | 09-Jul-2009 08:03:27 | ar09_137 |
| 137               | S10 | 2705 | 77°22.00'N | 006°59.98'E | 09-Jul-2009 13:20:03 | ar09_138 |
| 138               | S11 | 2165 | 77°21.03'N | 006°32.55'E | 09-Jul-2009 17:03:55 | ar09_139 |



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|               |            |      |            |             |                      |          |
|---------------|------------|------|------------|-------------|----------------------|----------|
| 139           | S12        | 2610 | 77°20.05'N | 006°00.20'E | 09-Jul-2009 19:57:35 | ar09_140 |
| 140           | S13        | 2470 | 77°18.11'N | 005°05.34'E | 09-Jul-2009 23:36:45 | ar09_141 |
| 141           | S14        | 2360 | 77°17.11'N | 004°33.74'E | 10-Jul-2009 02:18:43 | ar09_142 |
| 142           | S15        | 2530 | 77°16.09'N | 004°04.85'E | 10-Jul-2009 04:59:53 | ar09_143 |
| 143           | S16        | 2930 | 77°14.61'N | 003°04.60'E | 10-Jul-2009 08:42:54 | ar09_144 |
| Section Z     |            |      |            |             |                      |          |
| 144           | Z13        | 3070 | 78°02.76'N | 002°51.24'E | 10-Jul-2009 16:28:08 | ar09_145 |
| 145           | Z12        | 2870 | 78°04.83'N | 003°56.15'E | 10-Jul-2009 20:06:32 | ar09_146 |
| 146           | Z11        | 2455 | 78°05.46'N | 004°55.91'E | 10-Jul-2009 23:29:05 | ar09_147 |
| 147           | Z10        | 2520 | 78°05.93'N | 005°46.08'E | 11-Jul-2009 02:23:16 | ar09_148 |
| 148           | Z9         | 2310 | 78°06.89'N | 006°35.14'E | 11-Jul-2009 05:17:56 | ar09_149 |
| 149           | Z8         | 3495 | 78°07.57'N | 007°25.67'E | 11-Jul-2009 07:55:57 | ar09_150 |
| 150           | Z7         | 2185 | 78°08.33'N | 008°09.51'E | 11-Jul-2009 11:25:28 | ar09_151 |
| 151           | Z6         | 1570 | 78°08.73'N | 008°37.12'E | 11-Jul-2009 13:34:26 | ar09_152 |
| 152           | Z5         | 1120 | 78°09.44'N | 008°59.82'E | 11-Jul-2009 15:11:28 | ar09_153 |
| 153           | Z4         | 710  | 78°09.55'N | 009°09.60'E | 11-Jul-2009 16:23:47 | ar09_154 |
| 154           | Z3         | 265  | 78°09.70'N | 009°25.81'E | 11-Jul-2009 17:24:33 | ar09_155 |
| 155           | Z2         | 265  | 78°09.80'N | 009°55.24'E | 11-Jul-2009 18:38:49 | ar09_156 |
| 156           | Z1         | 260  | 78°10.27'N | 010°52.81'E | 11-Jul-2009 20:36:20 | ar09_157 |
| Mooring IOPAS |            |      |            |             |                      |          |
| 157           | Moor_IOPAS | 1610 | 78°28.07'N | 008°22.27'E | 12-Jul-2009 03:38:34 | ar09_158 |
| Section EB2   |            |      |            |             |                      |          |
| 158           | EB2-1      | 200  | 78°49.60'N | 009°15.21'E | 12-Jul-2009 10:55:10 | ar09_159 |
| 159           | EB2-2      | 220  | 78°49.97'N | 008°46.82'E | 12-Jul-2009 12:38:01 | ar09_160 |
| 160           | EB2-3      | 710  | 78°49.95'N | 008°27.67'E | 12-Jul-2009 13:35:34 | ar09_161 |
| 161           | EB2-4      | 985  | 78°49.96'N | 008°07.23'E | 12-Jul-2009 15:00:24 | ar09_162 |
| 162           | EB2-5      | 1140 | 78°49.95'N | 007°36.52'E | 12-Jul-2009 16:46:51 | ar09_163 |
| 163           | EB2-6      | 1405 | 78°49.89'N | 007°09.94'E | 12-Jul-2009 18:30:30 | ar09_164 |
| 164           | EB2-7      | 1985 | 78°49.98'N | 006°35.44'E | 12-Jul-2009 20:35:03 | ar09_165 |
| 165           | EB2-8      | 2455 | 78°50.00'N | 006°02.71'E | 12-Jul-2009 22:50:34 | ar09_166 |

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|            |        |      |            |             |                      |          |
|------------|--------|------|------------|-------------|----------------------|----------|
| 166        | EB2-9  | 2595 | 78°49.94'N | 005°33.40'E | 13-Jul-2009 01:31:17 | ar09_167 |
| 167        | EB2-10 | 2695 | 78°49.95'N | 005°03.06'E | 13-Jul-2009 04:13:39 | ar09_168 |
| 168        | EB2-11 | 2350 | 78°49.88'N | 004°04.97'E | 13-Jul-2009 07:36:59 | ar09_169 |
| Section EX |        |      |            |             |                      |          |
| 169        | EX9    | 2555 | 79°25.02'N | 004°29.92'E | 13-Jul-2009 16:23:46 | ar09_170 |
| 170        | EX10   | 3000 | 79°25.07'N | 003°37.46'E | 13-Jul-2009 19:19:31 | ar09_171 |
| 171        | EX8    | 2250 | 79°24.93'N | 005°29.56'E | 14-Jul-2009 00:06:20 | ar09_172 |
| 172        | EX7    | 1490 | 79°24.76'N | 006°26.81'E | 14-Jul-2009 04:18:14 | ar09_173 |
| 173        | EX6    | 1215 | 79°24.95'N | 006°59.27'E | 14-Jul-2009 07:24:50 | ar09_174 |
| 174        | EX5    | 925  | 79°24.96'N | 007°27.28'E | 14-Jul-2009 10:07:20 | ar09_175 |
| 175        | EX4    | 445  | 79°24.87'N | 007°57.94'E | 14-Jul-2009 12:35:36 | ar09_176 |
| 176        | EX3    | 195  | 79°24.83'N | 008°27.21'E | 14-Jul-2009 14:52:10 | ar09_177 |
| 177        | EX2    | 130  | 79°24.83'N | 008°55.13'E | 14-Jul-2009 19:35:39 | ar09_178 |
| 178        | EX1    | 130  | 79°24.92'N | 009°25.17'E | 14-Jul-2009 20:49:39 | ar09_179 |
| Section FX |        |      |            |             |                      |          |
| 179        | FX1    | 60   | 79°38.19'N | 010°08.63'E | 15-Jul-2009 00:08:12 | ar09_180 |
| 180        | FX2    | 290  | 79°40.20'N | 009°48.10'E | 15-Jul-2009 01:05:20 | ar09_181 |
| 181        | FX3    | 380  | 79°42.23'N | 009°25.18'E | 15-Jul-2009 02:08:43 | ar09_182 |
| 182        | FX4    | 440  | 79°44.35'N | 008°59.94'E | 15-Jul-2009 03:33:55 | ar09_183 |
| 183        | FX5    | 525  | 79°46.99'N | 008°31.95'E | 15-Jul-2009 04:48:54 | ar09_184 |
| Section GX |        |      |            |             |                      |          |
| 184        | GX1    | 75   | 79°54.97'N | 010°45.23'E | 15-Jul-2009 09:45:43 | ar09_185 |
| 185        | GX2    | 430  | 79°57.67'N | 010°20.89'E | 15-Jul-2009 11:47:31 | ar09_186 |
| 186        | GX1a   | 235  | 79°56.66'N | 010°27.75'E | 15-Jul-2009 12:55:18 | ar09_187 |
| 187        | GX3    | 490  | 79°59.86'N | 010°01.46'E | 15-Jul-2009 14:33:38 | ar09_188 |
| 188        | GX4    | 505  | 80°02.54'N | 009°37.13'E | 15-Jul-2009 15:44:30 | ar09_189 |
| 189        | GX5    | 515  | 80°05.19'N | 009°12.59'E | 15-Jul-2009 17:07:35 | ar09_190 |
| Section HX |        |      |            |             |                      |          |
| 190        | HX1a   | 170  | 80°20.79'N | 012°17.46'E | 15-Jul-2009 21:55:05 | ar09_191 |
| 191        | HX2a   | 210  | 80°23.17'N | 011°53.30'E | 15-Jul-2009 23:13:30 | ar09_192 |

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|               |      |      |            |             |                      |          |
|---------------|------|------|------------|-------------|----------------------|----------|
| 192           | HX1  | 185  | 80°18.48'N | 011°42.53'E | 16-Jul-2009 00:42:17 | ar09_193 |
| 193           | HX2b | 220  | 80°20.47'N | 011°25.43'E | 16-Jul-2009 01:46:08 | ar09_194 |
| 194           | HX3b | 405  | 80°21.45'N | 011°11.05'E | 16-Jul-2009 02:39:06 | ar09_195 |
| Section FX cd |      |      |            |             |                      |          |
| 195           | FX6  | 725  | 79°46.98'N | 007°50.77'E | 16-Jul-2009 09:47:56 | ar09_196 |
| 196           | FX7  | 925  | 79°43.67'N | 006°55.35'E | 16-Jul-2009 12:09:50 | ar09_197 |
| 197           | FX8a | 1320 | 79°41.80'N | 006°01.11'E | 16-Jul-2009 14:24:04 | ar09_198 |
| Eddy          |      |      |            |             |                      |          |
| 198           | Kn1  | 1350 | 79°09.16'N | 005°19.61'E | 16-Jul-2009 20:10:10 | ar09_199 |
| 199           | Kn2  | 2305 | 78°30.44'N | 004°11.28'E | 17-Jul-2009 01:04:45 | ar09_200 |
| 200           | Kn3  | 2540 | 78°19.56'N | 003°19.28'E | 17-Jul-2009 04:34:53 | ar09_201 |
| 201           | Kn4  | 2370 | 78°14.54'N | 004°11.08'E | 17-Jul-2009 08:36:45 | ar09_202 |
| 202           | Kn5  | 1425 | 78°10.51'N | 003°56.63'E | 17-Jul-2009 11:10:56 | ar09_203 |
| 203           | Kn6  | 2220 | 78°06.01'N | 004°26.07'E | 17-Jul-2009 13:40:42 | ar09_204 |
| 204           | Kn7  | 3025 | 78°04.53'N | 003°29.26'E | 17-Jul-2009 17:51:36 | ar09_205 |

## 2. Hydrographic conditions

After the record high temperature of the Atlantic Water in summer 2006, rapid decreasing of temperature in 2007 and 2008 has occurred. In summer 2009 Atlantic Water temperature has raised again, warm AW tongue shifted northward (Fig 2).

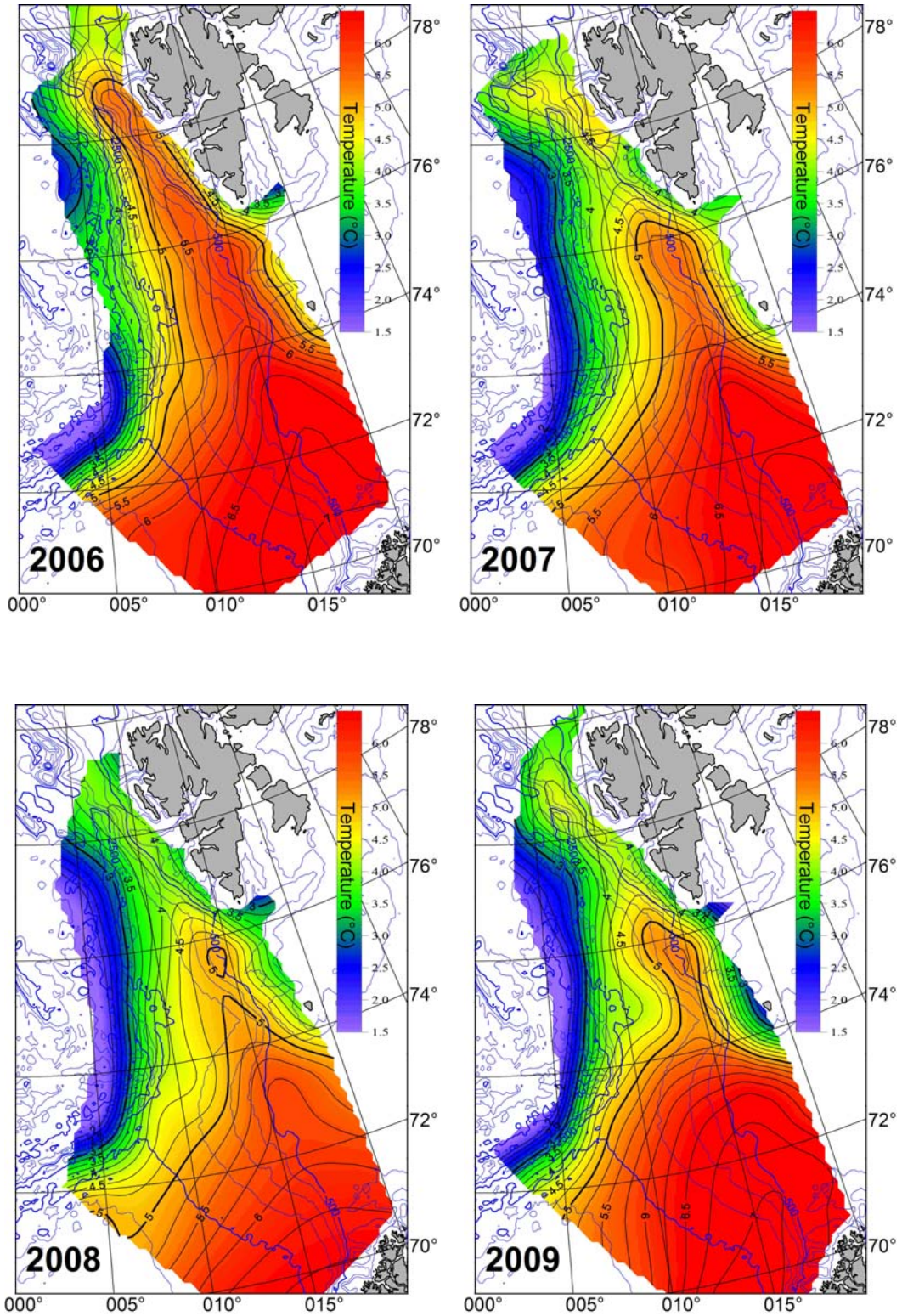


Figure 2: Temperature at 100 dbar in June-July 2006-2009.

At standard section 'N' along the 76°30'N, in July 2009 temperature at 200 dbar was 3.53°C (Fig 3), 0.36 higher than 1996-2009 mean. Salinity at 200 dbar was 35.09, 0.031 higher than 1996-2009 mean. The temperature and salinity trends are positive, 1.06°C/10 years, 0.086/10 years respectively.

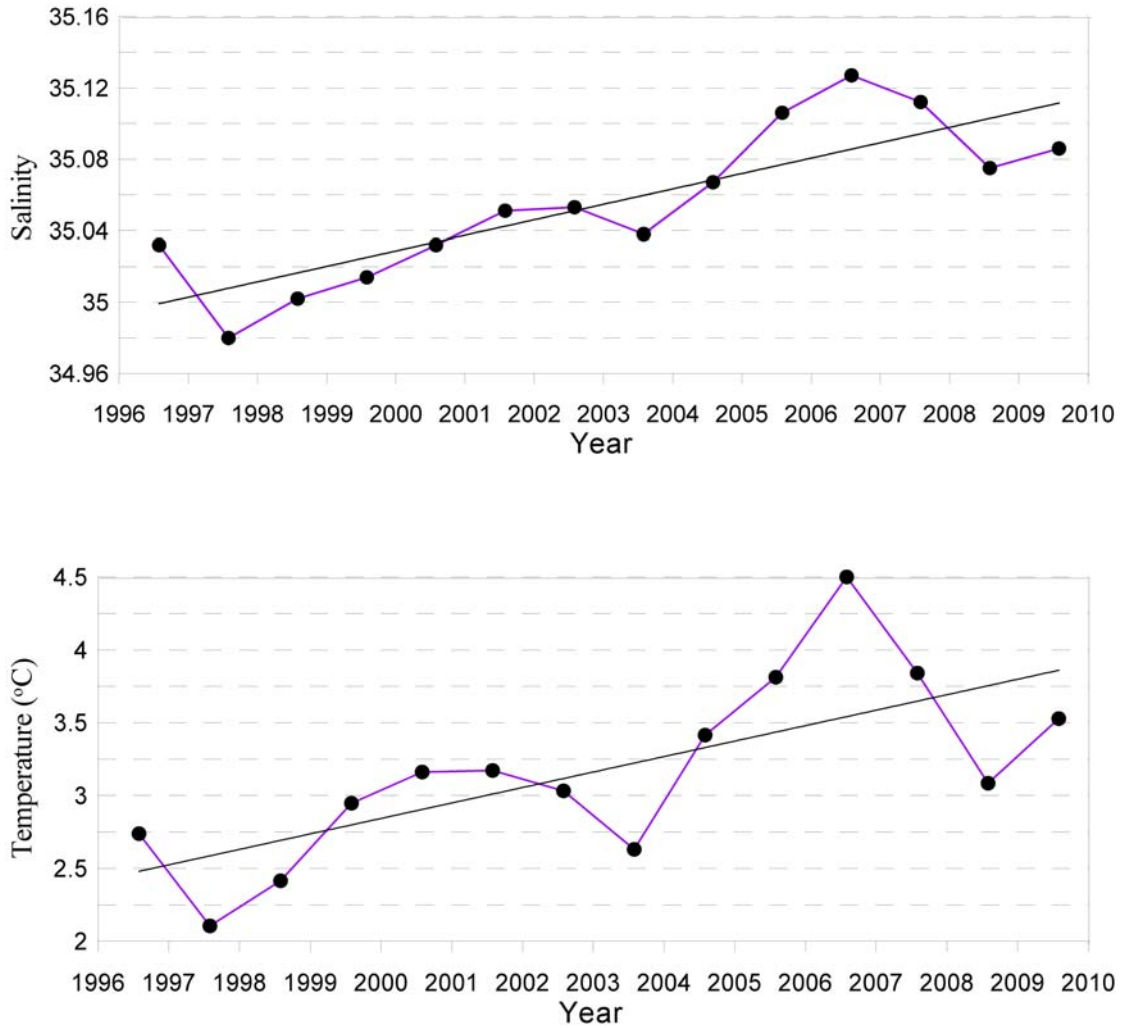


Figure 3: Mean salinity (upper panel) and mean temperature in summer (July) at section 'N' (76°30' N ) at 200 m, between longitudes 009°-012° E. Linear trends are marked.

### 3. Dynamics

Fig.4 presents the distribution of baroclinic currents (arrows) and baroclinic flow kinetic energy at 100 dbar (calculated for the reference level of 1000 m.). Baroclinic flow into the Barents Sea is weak, more intensive inflow into the Fram Strait exists. Both branches of the West Spitsbergen Current are well visible. Convergence of the branch flowing over the Mohna Ridge and WSC core at 78° N is pronounced.

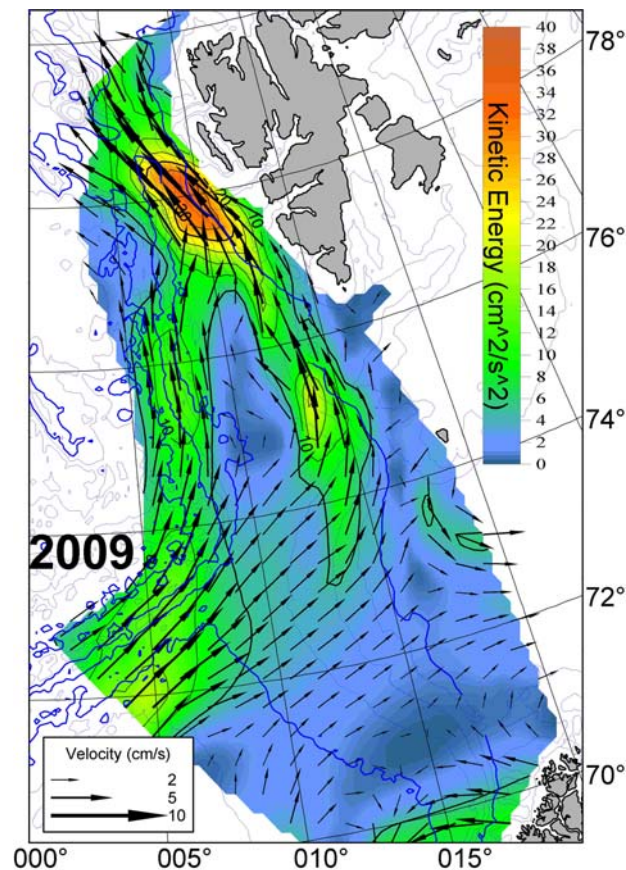


Figure 4: June-July 2009. Baroclinic currents kinetic energy distribution (colour scale), and baroclinic currents at 100 dbar. Reference level 1000 dbar. Data from Gimsøy section provided by the Institute of Marine Research, Bergen were used.