**Short cruise report of cruise METEOR M50/1**

The first leg of RV Meteor's fiftieth research cruise, M50/1, began in Halifax on May 8. 2001. The scientific work on this cruise is embedded in the »Sonderforschungsbereich 460« of the »Institut fuer Meereskunde, Kiel«. M50/1 is a contribution to investigating the deep water circulation of the subpolar North Atlantic and its variability in response to the annually and longer term varying forcing fields. CTD/LADCP work and the recovery and redeployment of deep ocean current meter moorings were the main activities during M50/1.

After leaving Halifax, Canada, on May 8. »METEOR« headed eastwards towards the tail of the Grand Banks, where a first boundary current section across the Deep Western Boundary Current and the adjacent North Atlantic Current was performed. This section (FIG. 1), the dogleg of the former basinwide WOCE A2 section, roughly marks the boundary between the subpolar and subtropical regime and is a favourable place to measure the deep water export. A moored array, that was deployed two years earlier was recovered and redeployed (Tables 2) in the first week of M50/1. The mooring recovery was carried out over the side of the ship without any problems; deployment was over the stern using »METEOR's« A-Frame for save instrument deployment. The time between the mooring work was filled by CTD/LADCP stations 2 to 19 (Table 1). One profiling ALACE float was launched in the cold water regime with the intention to follow the deep water export southward (Float positions are summarized in Table 3).

Wide station spacing (about 60 nm, stations 20 to 30) led the Meteor thereafter to the Mid Atlantic Ridge where 5 APEX floats of Dr. Koltermann (BSH) were launched and two BSH moorings (Tables 2) were exchanged. All floats are designed to drift within the Labrador Sea Water layer and profile on a 10 day schedule.

On our way to the second boundary current section north of Flemish Cap »METEOR« ran into a heavy storm and that led to a short delay which had to be compensated by reduced station time. However, there was time enough for a reasonable station coverage; stations 31 to 40, FIG 1. Again two APEX floats were launched near the 2000 m isobath (Table 3) in the cold water outflow of the Labrador Sea.

The third boundary current section was located at the exit of the Labrador Sea near 53 N. On this section a long term current meter array is established since 1997 and part of the work along the 53N section was to recover three moorings (the redeployment then should take place during M50/2) that were deployed two years earlier. The recovery of the first two moorings (K27 and K28) was without problems. Unfortunately mooring K29 could not be recovered, and after intense but unsuccessful release operations we had to carry on with the station work. Dense station spacing from the interior recirculation across the boundary current (stations 41 to 56) was the last activity during M50/1 before »METEOR« headed southward to St. John's where we arrived on May 31 with an excellent data set of the circulation and water mass charcteristics of the western subpolar North Atlantic obtained.

Besides the work described above, water samples were taken at all stations for measuring CFC's, nutrients and components for investigating the CO2 budget of the subpolar North Atlantic.
We had the pleasure to be the first users of »METEOR's« new shipboard ADCP, a 75 kHz Ocean Surveyor (OS). Although it took some time and the joint effort of the ships electronic department and our group to get the system running, the performance of the OS was excellent and we were able to continuously measure currents in the upper 600 m (FIG. 2)

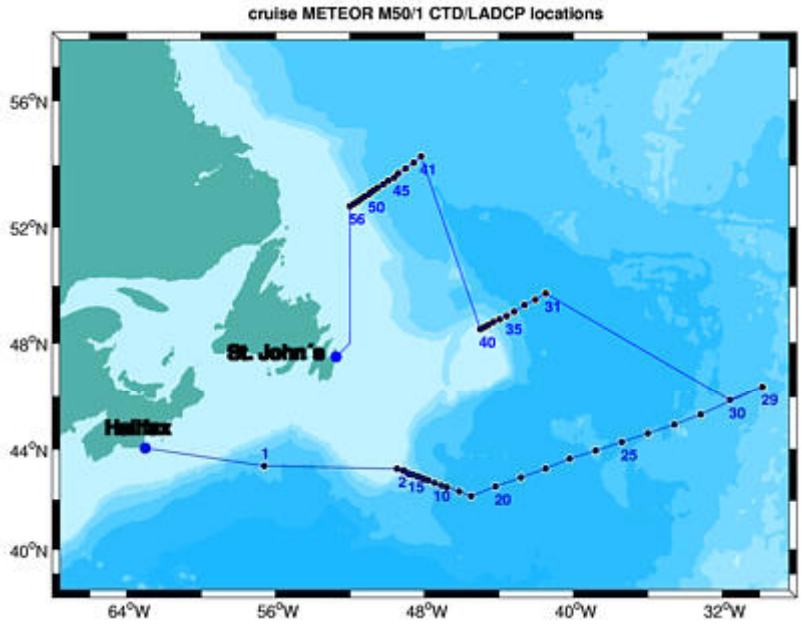


*Figure 1: CTD/LADCP stations during Meteor cruise M50/1*

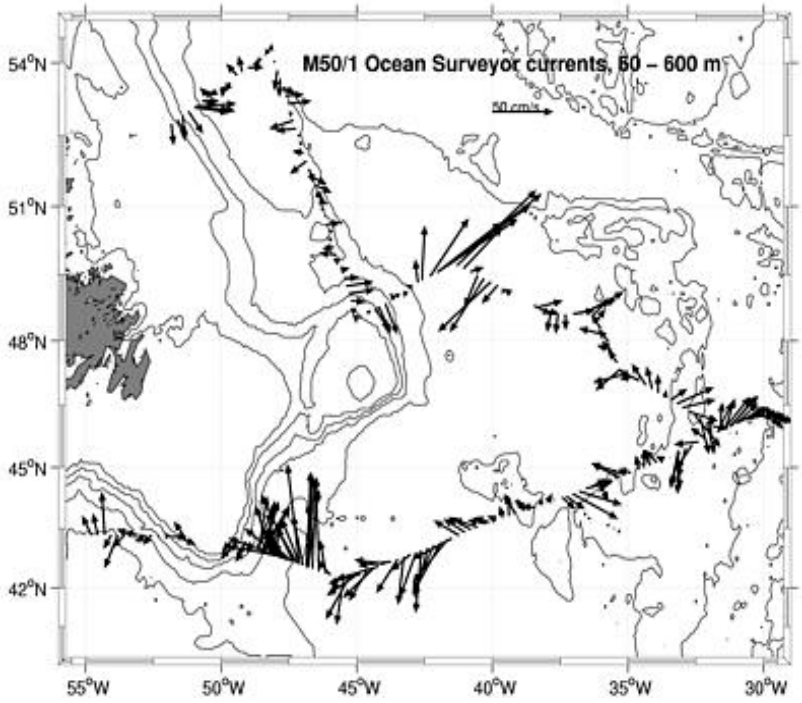

*Figure 2: Upper ocean current vectors from Ocean Surveyor measurements*

***Table 2 M50/1 Mooring recovery and deployment***

| MOORING | DATE OF RECOVERY | START (UTC) | END (UTC) | COMMENTS |
|---|---|---|---|---|
| K101_1 | May 11. 2001 | 11:46 | 12:46 | low visibility |
| K102_1 | May 11. 2001 | 17:20 | 19:24 | |
| K103_1 | May 12. 2001 | 10:09 | 11:53 | |
| K104_1 | May 12. 2001 | 16:45 | 18:41 | |
| BSH K3 | May 19. 2001 | 09:20 | 13:30 | |
| BSH K1 | May 20. 2001 | 11:04 | 14:15 | radio defect |
| K27 | May 27. 2001 | | | |
| K28 | May 28. 2001 | 08:46 | 10:36 | radio defect |
| K29 | | | | not found |

| MOORING | DEPLOYMENT | UTC | LATITUDE | LONGITUDE | WATER DEPTH |
|---|---|---|---|---|---|
| K101_2 | May 14. 2001 | 11:05 | 43° 04.0' N | 48° 52.5' W | 2016 m (corr.) |
| K102_2 | May 14. 2001 | 19:21 | 42° 57.0' N | 48° 23.5' W | 3001 m (corr.) |
| K103_2 | May 13. 2001 | 18:51 | 42° 46.8' N | 47° 45.2' W | 3600 m (corr.) |
| K104_2 | May 15. 2001 | 14:20 | 42° 31.8' N | 46° 47.35' W | 4310 m (corr.) |
| BSH 3 2001 | May 19. 2001 | 20:34 | 45° 21.67' N | 33° 09.40' W | 3640 m (uncorr.) |
| BSH 1 2001 | May 20. 2001 | 21:32 | 46° 24.26' N | 29° 54.60' W | 3220 m (corr.) |

***Table 3: M50/1 Float Deployments***

| S/N | Dec-Argos-ID | Hex-Argos-ID | Start time UTC | Launched UTC | Position | Remarks |
|---|---|---|---|---|---|---|
| **IFM** | | | | | | |
| 283 | 03836 | 3BF23 | 14.05.01 / 12:07 | 14.05.01 / 13:38 | 43°N3,44 / 48°W50,63 | touched the ship during launch |
| 288 | 13811 | D7CD1 | 24.05.01 / 17:16 | 24.05.01 / 21:45 | 48°N49,85 / 43°W58,16 | WD 2300m |
| 289 | 13812 | D7D3B | 24.05.01 / 19:10 | 24.05.01 / 22:40 | 48°N47,06 / 44°W08,92 | WD 2000 m |
| **BSH** | | | | | | |
| 298 | 21612 | 51B29 | 18.05.01 / 22:15 | 19.05.01 / 01:15 | 44°N56,92 / 34°W34,51 | |
| 299 | 22005 | 57D64 | 20.05.01 / 02:16 | 20.05.01 / 03:38 | 45°N53,09 / 31°W34,95 | |
| 300 | 22335 | 5CFF7 | 20.05.01 / 17:55 | 20.05.01 / 22:00 | 46°N24,28 / 29°W53,62 | |
| 301 | 15396 | F0933 | 21.05.01 / 10:02 | 21.05.01 / 15:21 | 46°N30,19 / 33°W09,90 | |
| 302 | 15398 | F0995 | 19.05.01 / 13:40 | 19.05.01 / 16:30 | 45°N18,78 / 33°W09,00 | |