Fram Strait September 2004 Cruise on R/V Lance

Cruise report

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1. General information

The 2004 Fram Strait cruise was performed in the period 31/8-19/9 2004 on R/V Lance. The purpose of the cruise was to maintain the NPI mooring array in the western Fram Strait and to acquire CTD and ADCP data at the standard monitoring lines, plus performing in situ sea ice work in the vicinity of the moored upward looking sonars. The main monitoring lines run across the Fram Strait along the 78° 50´ parallel, along the Fram Strait along the 0° meridian, and across the two branches of Atlantic Water where the West Spitsbergen Current splits at the Yermak Plateau.

In addition the purpose was to deploy the first NABOS mooring northeast of Svalbard. A hydrographic section should also be performed across the branch of Atlantic Water at the site of this mooring.

Scientific cruise participants:
Edmond Hansen, NPI (cruise leader, oceanography, data responsible)
Jürgen Holfort, NPI (oceanography)
Kristen Fossan, NPI (oceanography, technician)
Terje Brinck Løyning, NPI (oceanography)
Vladimir Ivanov, IARC (oceanography, NABOS representative)
Sebastian Gerland, NPI (sea ice)
Richard Hall, NPI (sea ice, IceCam)

Lance captain was Frits Johansen.

2. Cruise activity log

Date	**Activity** (UTC time)
Tue 31/8	0400 departure LYB to Billefjorden/Brucebyen for field equipment pickup. 1125 RADNOR water sampling outside Adventfjorden. 1130 steaming toward F11-6.
Wed 1/9	1030 arrival F11-6. Mooring on deck 1215. CTD no 1-4.
Thu 2/9	0630 arrival F12-6. Remnants of F12 on deck 0720. 0840 arrival F13-6. Mooring on deck 1135. 1250 arrival F14-6. Mooring on deck 1315. 1845 arrival F17-1. Mooring on deck 1900. 1915 arrival F18-1. F18-1 does not respond or release. Engine maintenance, drifting for two hours. CTD no 5-13.
Fri 3/9	0800 arrival F19-1. Ice cover to dense, can not release. Sea ice work. 1200 retrying F19-1 recovery. Mooring under very large ice floe, can not release. CTD no 13-14.
Sat 4/9	0615 releasing F19-1. Mooring on deck 0700. Dismantling F19-1 (tube). Assembling F19-2 (new tube with RDCP600). CTD no 15.

Sun 5/9	Bad weather, not possible to work on deck, to much wind for CTDs because of fast drift of ship and ice. Waiting. 1500: Trying to do CTDs westward, but reaches the fast ice edge after one station. Can not penetrate further. CTD no 16.
Mon 6/9	0950 deploying F19-2 at N 78°49.832´ W 012°30.074´, depth 192 m. Assembling F17-2 (ADCP) and F18-2 (tube). Sea ice work.
Tue 7/9	07-0800 dredging for F18-1. Mooring not found. 1000 deploying F18-2 at N 78°49.981´ W 008°04.646´, depth 226 m. 1215 deploying F17-2 at N 78°49.888´ W 007°59.274´, depth 215 m. Assembling F14-7. 1725 deploying F14-7 at N 78°48.992´ W 006°26.834´, depth 282 m. CTD no 17-20.
Wed 8/9	Assembling F13-7 (deep mooring with tube and iceberg protecting cone around ULS, very time consuming). 1745 deploying F13-7 at N 78°50.700´ W 005°00.926´, depth 1028 m. CTD no 21-27.
Thu 9/9	Assembling F12-7. 1210 deploying F12-7 at N 78°49.765´ W 004°01.528´, depth 1855 m. Assembling F11-7. Sea ice work. 1850 deploying F11-7 at N 78°49.917´ W 003°15.415´, depth 2378 m. CTD no 28-30.
Fri 10/9	CTDs toward Ny-Ålesund. CTD no 31-40.
Sat 11/9	CTDs toward Ny-Ålesund. CTD no 41-50. Arrival Ny-Ålesund 1000. Offloading/loading. Departure Ny-Ålesund 1600. Steaming toward NABOS M4 mooring.
Sun 12/9	2000 arrival first M4 CTD station. CTD section and depth survey. CTD no 51-54.
Mon 13/9	CTD no 55-58, finishing section. 1145 deploying NABOS M4 mooring at N 81°33.761´ E 030°55.391´depth 1012 m. Steaming toward Yermak plateau.
Tue 14/9	1000 arrival Virgohamna. Dismantling equipment and tools from mooring work while in lee, packing. 1610 starting on the Yermak plateau sections. CTD no 59-63.
Wed 15/9	CTD no 54-73.
Thu 16/9	CTD no 74-79. 2030 starting steaming toward Tromsø
Fri 17/9	Steaming toward Tromsø
Sat 18/9	Steaming toward Tromsø
Sun 19/9	0900 arrival Tromsø

Table 1. Cruise log.

3. Moorings

3.1 Recovered moorings

Mooring F11-6, F13-6, F14-6, F17-1 and F19-1 were recovered in good shape. The upper two thirds of F12-6 were lost, while all of F18-1 was gone.

The details of the recovered moorings are summarized in Table 2. Lost instruments are highlighted with a red font. A visual impression and overview of the setup of the recovered moorings is given in Appendix 1, where drawings of the mooring configurations are provided.

Table 2: Recovered moorings (deployed in 2003)

Mooring	Latitude Longitude	Water depth (m)	Date and time of deployment	Instrument type	Serial number	Instrument depth (m)
F11-6	78° 49.921 N 03° 16.077 W	2376	14.09.2003 15:40	ES300 DCM12 SBE16 RCM9 RCM7 RCM11 RCM8	19 190 4321 1046 11475 228 10071	65 65 73 74 259 1462 2365
F12-6	78° 49.770 N 04° 02.868 W	1841	14.09.2003 10:50	ES300[1] SBE37[1] RCM7[1] RCM7[1] RCM11[1] RCM8S	52 2963 11854 10349 234 11625	70 72 91 325 1528 1831
F13-6	78° 50.728 N 05° 00.994 W	980	13.09.2003 16:00	ES300 DCM12 SBE37 RCM7 RCM11 RCM8	51 17 2962 7718 235 12733	47 47 48 57 227 1014
F14-6	78° 48.996 N 06° 26.915 W	282	12.09.2003 07:15	ES300 SBE16 RCM9 RCM8	37 4322 834 12644	88 98 99 273
F17-1 (FnyA)	78° 49.818 N 08° 59.251 W	238	11.09.2003 12:20	ADCP	727	122
F18-1 (FnyB)	78° 49.953 N 08° 54.146 W	246	11.09.2003 14:40	SBE37[1] SBE37[1]	2813 2814	
F19-1[2]	78° 49.821 N 12° 29.876 W	189	11.09.2003 05:00	SBE37 SBE37 AWI releaser	2967 2942 207	Upper Lower

As in the years 2002 and 2003, moorings were fully or partially lost. F12-6 was a relatively deep mooring on 1841 meters depth, see illustration in Appendix 1. F18-1 was a test tube

[1] Lost instrument

[2] Joint IfM Hamburg/NPI/AWI tube mooring. The mooring is not illustrated in the appendix with mooring drawings, but contains a microcat in the upper and lower end of the tube

with only two microcats inside, and is also illustrated in Appendix 1. On F12-6 only the releaser and lowest RCM was intact, along with the lowest flotation. The losses and approximate costs are summarized in the following list:

- 1 ES300 270.000 NOK
- 3 SBE37 150.000 NOK
- 3 RCM 300.000 NOK
- 1 Releaser 80.000 NOK
- Kevlar ropes 80.000 NOK
- Flotation 70.000 NOK

This sums up to 800.000 NOK, a substantial amount for this project. The exact reasons for the losses are impossible to point at, but iceberg collisions and/or corrosion are two likely candidates. Corrosion on stainless steel parts have increasingly become a problem, although the providers ensure that they deliver products of top quality. Heavily corroded shackles have been observed even on some of the recovered moorings. We speculate that the material contains impurities, leading to very aggressive corrosion at the location of the impurity. The issue has been raised with the local provider, and alternatives must be sought.

3.2 Deployed moorings

Seven new ASOF-N moorings were deployed to replace the recovered ones. F11-7 to F14-7 were deployed over the EGC and continental shelf break, using the setup that has been used since the start of VEINS in 1997. In addition a second year of observations on the shelf was initiated, by deploying F17-2, F18-2 and F19-2. F17-2 is only an ADCP measuring the currents to combine with TS measurements performed by the tube mooring F18-2 close by. F19-2 is a tube mooring with a RDCP600 below the tube. The mooring details are provided in Table 3, and graphically illustrated in Appendix 2.

In addition a NABOS mooring was deployed in the boundary current northeast of Svalbard, mooring M4. The details and drawings of this mooring are given along with the ASOF-N moorings in the tables and appendices. For further information about NABOS and the M4 mooring, consult NABOS websites and publications.

Table 3: Deployed moorings

Mooring	Latitude Longitude	Water depth (m)	Date and time of deployment	Instrument type	Serial number	Nominal instrument depth (m)
F11-7	78° 49.917 N 03° 15.415 W	2378	09.09.2004 18:50 UTC	ES300 RDCP600 SBE37 RCM9 RCM11 RCM8 AR861	55 28 3554 1175 117 10069 287	60 60 65 261 1465 2368 2371
F12-7	78° 49.765 N 04° 01.528 W	1855	09.09.2004 12:10 UTC	ES300 DCM12 SBE37 RCM7 RCM7 RCM11 RCM11 AR861	48 190 3553 12643 12464 372 377 288	66 66 71 75 338 1541 1845 1848
F13-7	78° 50.700 N	1028	08.09.2004	ES300	54	52

	05° 00.926 W		17:45 UTC	RDCP600 SBE37 RCM7 RCM11 AR661	29 3489 11059 384 577	52 53 245 1018 1021
F14-7	78° 48.992 N 06° 26.834 W	282	07.09.2004 16:40 UTC	ES300 DCM12 SBE37 RCM9 RCM9 AR661	17 17 2158 836 1049 290	51 51 56 60 274 275
F17-2	78° 49.888 N 07° 59.274 W	215	07.09.2004 12:15 UTC	ADCP AR661	727 291	103 211
F18-2	78° 49.981 N 08° 04.646 W	226	07.09.2004 10:00 UTC	SBE37 SBE37 AR661	3490 3491 110	21 62 218
F19-2	78° 49.832 N 12° 30.074 W	192	06.09.2004 09:50 UTC	SBE37 SBE37 RDCP600 AR861	3492 2445 26 303	22 63 69 185
M4 (NABOS)	81° 33.761 N 30° 55.391 W	1012	13.09.2004 11:45 UTC	XT6000 RCM9 SBE37 SBE37 SBE37 RCM9 SBE37 SBE37 RCM9 8242XS	71012 1149 3380 3441 3647 1148 3524 3638 1147 30540	53 62 64 105 214 216 442 1000 1002 1007

4. CTD work

79 CTD stations were taken. All CTD stations are plotted in figure 1. A complete CTD station list is enclosed in appendix 3. The measurements were taken with a Seabird SBE9 CTD with an SBE11+ deck unit. The temperature and conductivity sensors came directly from calibration. There were no problems with the equipment during the cruise. One to three salinity samples were taken on each station for calibration purposes.

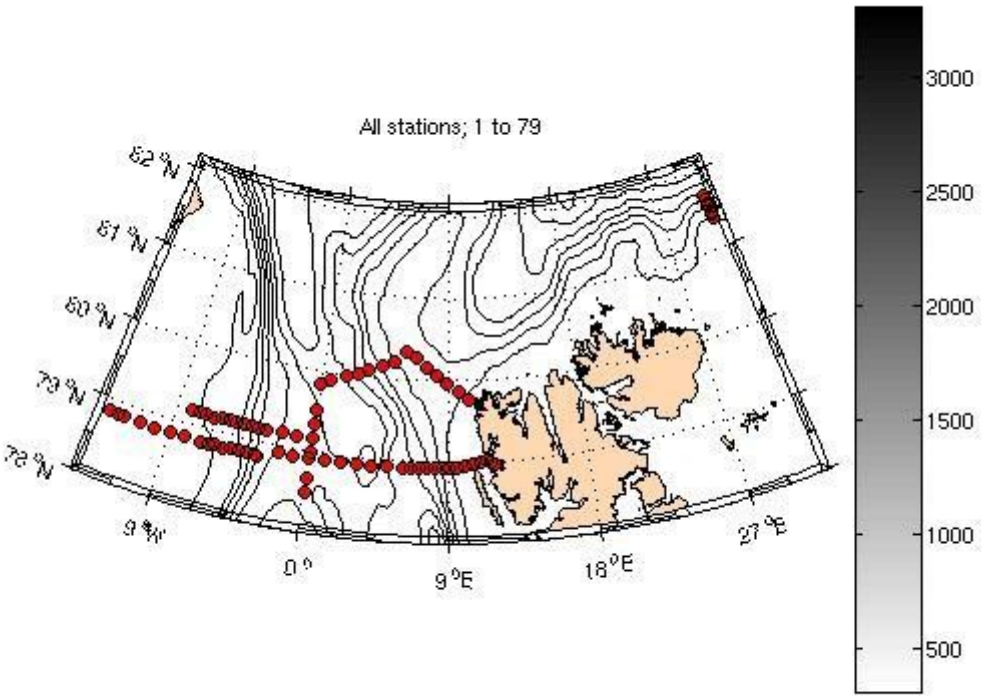


Figure 1. All CTD stations taken during the cruise.

5. Vessel mounted ADCP

The VM ADCP was kept running throughout the cruise, with configuration files adjusted according to shallow/deep and underway/on station conditions. No processing or analysis of the data was performed during the cruise.

Appendix 1: Drawings of recovered and lost moorings

Rigg F11-6

78 49,921N
003 16,077W

Settes ut 14 SEP 2003 15:40

			Dyp:	Fra bunn:	Ut:
ES300	SNR. 19		65	2311	13:21
DCM12	SNR. 190				
ARGOS	SNR. 23050	ID041			
Kevlar	5 m				
Stålkule 37	SNR.596				
Svivel					
1 m Kjetting rustfri					
SEACAT	SNR. 4321		73	2303	13:16
RCM9	SNR.1046		74	2302	13:16
0,5 m Kjetting rustfri					
40 m Kevlar					
40 m Kevlar					
100 m Kevlar					
3 Glasskuler					
4 m Kjetting galvanisert					
RCM7	SNR.11475		259	2117	13:03
0,5 m Kjetting rustfri					
200 m Kevlar					
500 m Kevlar					
500 m Kevlar					
3 Glasskuler					
2 m Kjetting rustfri					
RCM11	SNR.228		1462	914	12:40
0,5 m Kjetting rustfri					
500 m Kevlar					
200 m Kevlar					
200 m Kevlar					
4 Glasskuler					
2 m Kjetting rustfri					
RCM8	SNR.10071		2365	11	12:23
0,5 m Kjetting rustfri					
Svivel					
AR861	SNR. 053	Pinger på: Pinger av: Release: Release m/ping:			
7 m Kjetting galvanisert					
ANKER 1110/(960) kg			2376	0	

Rigg F12-6

78 49,770N

Settes ut 14 SEP 2003, 10:48

004 02.868W

			Dyp:	Fra bunn:	Ned i vann:
ES300	SNR. 52		70	1771	10:48
Microcat	SNR.2963		72	1769	10:48
5 m Kevlar					
Stålkule 37	SNR.602				
2 m Kjetting rustfri					
RCM7	SNR.11854		91	1760	10:48
0,5 m Kjetting rustfri					
40 m Kevlar					
200 m Kevlar					
3 Glasskuler					
3 m Kjetting galvanisert					
RCM7	SNR10349.		325	1516	07:52
0,5 m Kjetting rustfri					
500 m Kevlar					
500 m Kevlar					
200 m Kevlar					
2 Glasskuler					
2 m Kjetting galvanisert					
RCM11	SNR. 234		1528	313	07:27
0,5 m Kjetting rustfri					
200 m Kevlar					
100 m Kevlar					
4 Glasskuler					
2 m Kjetting rustfri					
RCM8S	SNR.11625		1831	10	07:7
0,5 m Kjetting rustfri					
Svivel					
AR861	SNR. 182	Ping på: Ping av: Release: Release m/ping:			
7 m Kjetting					
ANKER 1110/(960) kg			1841	0	

Rigg F13-6

Satt ut 13 SEP 2003, 16:04

78 50,728N
005 00,994W

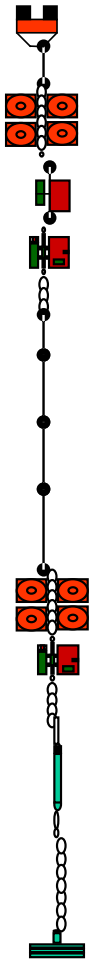
			Dyp:	Fra bunn:	Ned i vann:
ES300	SNR. 51		47	977	14:04
DCM12	SNR.17		47	977	14:04
Microcat	SNR. 2962				
Kevlar	5 m				
Stålkule 37	SNR.McLane				
Svivel					
2 m Kjetting					
RCM7	SNR.7718		57	965	14:04
50 m Kevlar					
100 m Kevlar					
10 mKevlar					
5 m Kevlar					
4 Glasskuler					
RCM11	SNR.235		227	795	13:38
500 m Kevlar					
200 m Kevlar					
10 m Kevlar					
20 m Kevlar					
40 m Kevlar					
10 m Kevlar					
4 Glasskuler					
RCM8	SNR. 12733		1014	8	13:16
Svivel					
AR661	SNR.30	Int Range: Release:			
5 m Kevlar					
ANKER 1020/(900) kg			1022	0	

Rigg F14-6

Satt ut 12 SEP 2003, 07:14

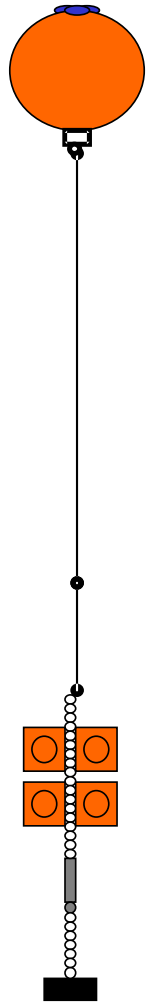
78 48,996N
006 26,915W

	Dyp:	Fra bunn:	Ned i vann:



ES300	SNR. 37		88	203	07:10
Kevlar	5 m				
4 Glasskuler					
SEACAT	SNR.4322		98	193	07:04
RCM9	SNR. 834		99	192	07:04
20 m Kevlar					
50 m Kevlar					
50 m Kevlar					
50 m Kevlar					
4 Glasskuler					
RCM7	SNR. 12644		273	9	06:52
Svivel					
AR661	SNR. 291	Int Range: Release:			
7 m Kjetting					
ANKER 610/(530) kg			282	0	

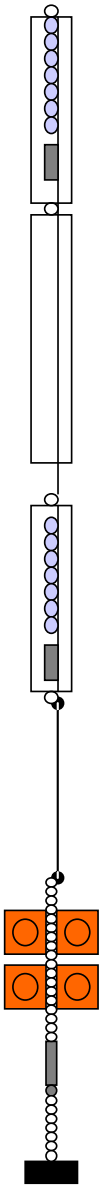
Rigg F17-1 (FnyA) 78 49.818N Dyp: Fra bunn: Ned i vann:
Satt ut 11 SEP 2003, 12:21 008 59.251W



ADCP	SNR.727	122		110
100 m Kevlar				
10 m Kevlar				
4 GLASSKULER			10	222
AR661	SNR. 110	Int Range: Release:		
ANKER	630/(520)kg		0	

Rigg F18-1 (FnyB) 78 49.953N Dyp: Fra bunn: Ned i vann:
Satt ut 11 SEP 2003, 14:40 008 54.146W

Toppen av denne riggen ble i farten montert opp ned slik at Microcat'en ble øverst og ikke slik nederst figuren viser og der den skulle ha vært.

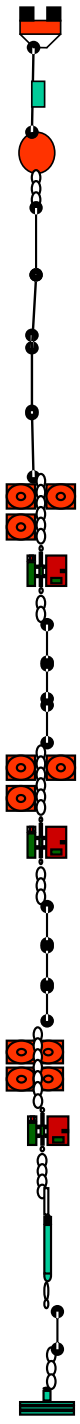


5 m SLANGE/ OPPDRIFT				
MICROCAT	SNR. 2814	14	226	10
10 m Slange				
5 m SLANGE/ OPPDRIFT				
MICROCAT	SNR. 2813	29	211	
200 m Kevlar				
4 GLASSKULER		232	8	
AR661	SNR. 77	Int Range: Release:		
ANKER	630/(520)	240	0	

Appendix 2: Drawings of deployed moorings

Rigg F11-7 78 49,917N

Satt ut 9 SEP 2004, 18:50 003 15,415W



			Dyp:	Fra bunn:	Ut:
ES300 RDCP 600	SNR. 55 SNR. 28		60	2307	18:40
Kevlar	5 m				
SBE37	SNR. 3554		65	2312	18:40
Stålkule 37	SNR.603				
0,5 m Kjetting rustfri					
40 m Kevlar					
40 m Kevlar					
100 m Kevlar					
10 m Kevlar					
3 Glasskuler 3 m Kjetting galvanisert					
RCM9	SNR.1175		261	2116	18:30
0,5 m Kjetting rustfri					
200 m Kevlar					
500 m Kevlar					
500 m Kevlar					
3 Glasskuler 3 m Kjetting galvanisert					
RCM11	SNR.117		1465	913	18:10
0,5 m Kjetting rustfri					
500 m Kevlar					
200 m Kevlar					
200 m Kevlar					
4 Glasskuler 3 m Kjetting galvanisert					
RCM8	SNR.10069		2368	10	17:50
0,5 m Kjetting rustfri					
Svivel					
AR861	SNR. 287	Pinger på: Pinger av: Release: Release m/ping:			
5 m Kevlar					
2 m Kjetting galvanisert					
ANKER 1110/(960) kg			2378	0	

Rigg F12-7

78 49,765N

Satt ut 9 SEP 2004

004 01.528W

			Dyp:	Fra bunn:	Ned i vann:
ES300	SNR. 48		66	1769	11:45
DCM12	SNR. 190				
SBE37	SNR. 3553		71	1774	11:45
5 m Kevlar					
Stålkule 37	SNR.605				
2 m Kjetting galvanisert					
RCM7	SNR.12643		75	1770	11:45
0,5 m Kjetting rustfri					
40 m Kevlar					
200 m Kevlar					
20 m Kevlar					
3 Glasskuler					
3 m Kjetting galvanisert					
RCM7	SNR. 12464		338	1517	11:30
0,5 m Kjetting rustfri					
500 m Kevlar					
500 m Kevlar					
200 m Kevlar					
3 Glasskuler					
3 m Kjetting galvanisert					
RCM11	SNR. 372		1541	314	11:02
0,5 m Kjetting rustfri					
200 m Kevlar					
100 m Kevlar					
4 Glasskuler					
5 m Kevlar					
RCM11	SNR. 377		1845	10	10:53
0,5 m Kjetting rustfri					
Svivel					
AR861	SNR. 288	Ping på: Ping av: Release: Release m/ping:			
5 m Kevlar					
2 m Kjetting galvanisert					
ANKER 1110/(960) kg			1855	0	

Rigg F13-7

Settes ut 8 SEP 2004, 16:04

78 50,700N
005 00,926W

			Dyp:	Fra bunn:	Ned i vann:
ES300	SNR. 54		52	976	17:40
RDCP 600	SNR. 29		52	976	17:20
SBE37	SNR. 3489			973	
Plastrør	18 m				
Kevlar	5 m				
Stålkule 37	SNR.McLane				
Svivel					
0,5 m Kjetting rustfri					
50 m Kevlar					
100 m Kevlar					
10 mKevlar					
5 m Kevlar					
4 Glasskuler					
3 m Kjetting Galv.					
RCM7	SNR.11059		245	783	17:00
0,5 m Kjetting rustfri					
500 m Kevlar					
200 m Kevlar					
50 m Kevlar					
10 m Kevlar					
10 m Kevlar					
4 Glasskuler					
3 m Kjetting Galv.					
RCM11	SNR. 384		1018	10	16:38
0,5 m Kjetting rustfri					
Svivel					
AR661	SNR.577	Int Range: Release:			
5 m Kevlar					
2 m Kjetting galvanisert					
ANKER 1020/(900) kg			1028	0	

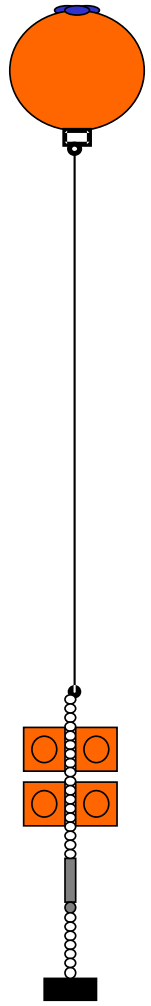
Rigg F14-7

Satt ut 7 SEP 2004, 17:25

78 48,992N
006 26,834W

			Dyp:	Fra bunn:	Ned i vann:
ES300	SNR. 17		51	233	17:25
ARGOS	SNR. 23050	ID 041			
DCM12	SNR.17				
5 M Kevlar					
SBE37	SNR: 2158		56	228	17:25
4 Glasskuler					
3 m Kjetting Galv.					
RCM9	SNR. 836		60	224	17:25
0,5 m Kjetting rustfri					
10 m Kevlar					
200 m Kevlar					
4 Glasskuler					
3 m Kjetting Galv.					
RCM9	SNR. 1049		274	10	16:52
Svivel					
AR661	SNR. 290	Int Range: Release:			
5 m Kevlar					
2 m Kjetting					
ANKER 640/(530) kg			284	0	

Rigg F17-2 78 49.888N Dyp: Fra bunn: Ned i vann:
Satt ut 7 SEP 2004, 12:10 007 59.274W

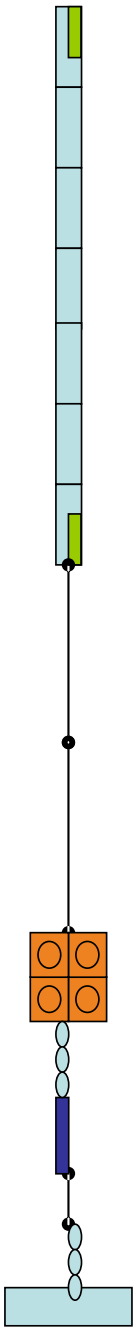


ADCP	SNR.727		112	103
100 m Kevlar				
3 m Kjetting galv.				
4 GLASSKULER			10	205
AR661	SNR. 291	Int Range: Release:		
ANKER	630/(520)kg		0	215

Rigg F18-2
Satt ut 7 SEP 2004, 10:00

78 49.981 N
008 04.646 W

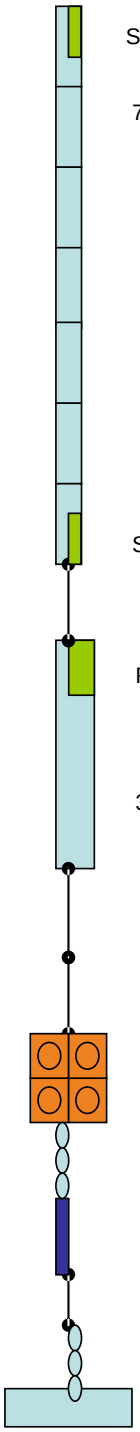
Dyp: Fra bunn: Ned i vann:



SBE37	Snr. 3490		21	204
7 x 6 m rør				
SBE37	Snr. 3491		62	163
100 m Kevlar				
50 m Kevlar				
4 Glasskuler				
5 m Kevlar				
AR661	Snr. 110		Int. Release	
5 m Kevlar				
2 m Kjetting				
Anker	640 Kg		225	0

Rigg F19-2 78 49.832N Dyp: Fra bunn: Ned i vann:

Satt ut 6 SEP 2004, 09:50 012 30.074W



SBE37 Snr. 3492 171 22

7 x 6 m rør

SBE37 Snr. 2445 130 63

5 m Stålstang

RDCP600 Snr. 26 124 69

3 m rør

100 m Kevlar

10 m Kevlar

4 Glasskuler

5 m Kevlar

AR861 Snr. 303

5 m Kevlar

2 m Kjetting Galv.

Anker 620 Kg 0 193

Rigg M4A

Satt ut 13 SEP 2004, 13:48

81 33,761N
030 55,391W

				Dyp:	Fra bunn:	Ut:
Stålkule 30				53	959	
1 m Kjetting galv.						
Stålkule 30						
XT-6000	SNR. 71012	Int.	10 kHz			
		Reply	12 kHz			
4 m Kjetting galv.						
1,5 m Tau						
RCM9	SNR.1149			62	950	11:45
1,5 m Tau						
SBE37	SNR. 3380			64	948	11:45
150 m Kevlar						
SBE37	SNR. 3441			105	907	11:24
SBE37	SNR. 3647			214	798	11:18
1,5 m Tau						
RCM9	SNR.1148			216	796	11:18
1,5 m Tau						
SBE37	SNR. 3524			442	554	11:03
500 m Kevlar						
283 m Kevlar						
SBE37	SNR. 3638			1000	12	10:50
1,5 m Tau						
RCM9	SNR.1147			1002	10	10:50
1,5 m Tau						
Svivel						
8242XS		SNR.	30540	30541.		
		Enable:				
		Release:				
		Disable:				
5 m Kjetting galvanisert						
ANKER 1000/(900) kg				1012	0	

Appendix 3: CTD station list

Station	YYYY	MM	DD	HH(UTC)	MIN	Lat	Lon	Depth
1	2004	9	1	12	44	78.832	-3.268	2348
2	2004	9	1	16	47	79.168	-1.999	2516
3	2004	9	1	20	8	79.168	-2.999	2282
4	2004	9	1	22	13	79.167	-3.500	2124
5	2004	9	2	0	21	79.167	-4.000	1920
6	2004	9	2	2	20	79.167	-4.500	1681
7	2004	9	2	10	0	78.845	-5.017	1016
8	2004	9	2	13	37	78.815	-6.445	284
9	2004	9	2	14	44	78.833	-7.000	250
10	2004	9	2	16	25	78.832	-8.005	191
11	2004	9	2	22	13	78.828	-9.000	213
12	2004	9	2	23	45	78.833	-10.000	278
13	2004	9	3	2	25	78.833	-11.000	320
14	2004	9	3	6	11	78.830	-11.997	207
15	2004	9	4	7	23	78.830	-12.498	197
16	2004	9	5	15	5	78.833	-12.992	201
17	2004	9	7	18	28	78.837	-6.008	348
18	2004	9	7	21	51	79.168	-8.003	210
19	2004	9	7	22	43	79.167	-7.500	216
20	2004	9	7	23	37	79.167	-7.000	246
21	2004	9	8	0	30	79.167	-6.500	328
22	2004	9	8	1	35	79.167	-6.000	754
23	2004	9	8	2	50	79.167	-5.500	1100
24	2004	9	8	4	28	79.167	-5.003	1420
25	2004	9	8	7	19	78.835	-5.497	537
26	2004	9	8	20	45	78.835	-4.497	1500
27	2004	9	8	22	33	78.833	-4.000	1877
28	2004	9	9	0	32	78.833	-3.500	2244
29	2004	9	9	3	51	78.917	-2.000	2616
30	2004	9	9	21	44	78.915	-1.022	2618
31	2004	9	10	0	39	78.917	0.000	2487
32	2004	9	10	3	39	78.917	1.000	2506
33	2004	9	10	6	49	78.917	1.998	2481
34	2004	9	10	9	43	78.917	3.002	2481
35	2004	9	10	12	25	78.917	4.000	2475
36	2004	9	10	15	6	78.917	5.000	2578
37	2004	9	10	18	8	78.918	5.997	2306
38	2004	9	10	20	29	78.918	6.505	1741
39	2004	9	10	22	7	78.917	7.000	1319
40	2004	9	10	23	38	78.917	7.500	1166
41	2004	9	11	1	3	78.917	8.000	1029
42	2004	9	11	2	27	78.917	8.500	437
43	2004	9	11	3	30	78.917	9.000	221
44	2004	9	11	4	35	78.918	9.503	202
45	2004	9	11	5	37	78.948	10.005	220
46	2004	9	11	6	32	78.972	10.507	229
47	2004	9	11	7	27	78.987	10.988	164
48	2004	9	11	8	19	79.017	11.430	323
49	2004	9	11	8	59	78.982	11.698	320
50	2004	9	11	9	39	78.960	11.932	341
51	2004	9	12	20	13	81.373	30.963	184
52	2004	9	12	21	17	81.428	31.003	300
53	2004	9	12	22	41	81.445	31.000	400
54	2004	9	12	23	22	81.455	31.000	501
55	2004	9	13	0	18	81.535	31.000	809
56	2004	9	13	1	19	81.562	31.000	1000
57	2004	9	13	2	24	81.617	31.000	2038

58	2004	9	13	4	16	81.663	31.000	2500
59	2004	9	14	16	15	79.753	10.337	122
60	2004	9	14	17	37	79.850	9.577	459
61	2004	9	14	19	18	79.950	8.830	484
62	2004	9	14	21	1	80.057	8.098	511
63	2004	9	14	22	37	80.157	7.342	550
64	2004	9	15	0	12	80.257	6.558	566
65	2004	9	15	1	41	80.340	5.875	566
66	2004	9	15	3	22	80.217	5.050	846
67	2004	9	15	5	6	80.140	4.218	1269
68	2004	9	15	7	5	80.088	3.277	2210
69	2004	9	15	9	43	80.027	2.560	2577
70	2004	9	15	12	21	79.970	1.772	3013
71	2004	9	15	15	35	79.893	0.620	2446
72	2004	9	15	18	30	79.843	-0.047	2713
73	2004	9	15	22	13	79.500	0.000	2763
74	2004	9	16	0	55	79.333	0.000	2853
75	2004	9	16	3	32	79.167	0.000	2670
76	2004	9	16	6	29	79.167	-1.005	2251
77	2004	9	16	12	16	78.988	-0.005	2534
78	2004	9	16	16	3	78.667	0.002	1755
79	2004	9	16	18	9	78.498	0.007	2720