REPORT BMM-Measuring service Ostend CAMPAIGN 2004/01

03.02.2004 till 06.02.2004

INHOUDSTAFEL

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03.01.2004 till 06.02.2004

1. Scienctist team:

1.1. Monitoring

E. Devreker BMM
D. Saudemont BMM

1.2. Endis-Risks
(period: 04-02-2004 tot 05-02-2004)

E. Monteyne
A. Ghekiere
K. Polfliet
H. Noppe
S. Poelmans
N. Fockedey
G. Desmet
B. Beuselinck

2. Objectives of the campaign

2.1 B.M.M. – ROOSE (Monitoring)

The project is part of the continuous surveillance and evaluation of the quality of the marine environment in the region of the Belgian continental shelf (BCP) and the Western Scheldt estuary in the framework of international (the Joint Assessment en Monitoring Programme (JAMP) and the Nutrient Monitoring Programme (NMP) of the OSPAR commission) and national programmes (e.g. impact of sand extraction and dredging activities).
MUMM is solely responsible for the sampling and determination of nutrients, salinity, suspended matter, dissolved Oxygen, TOC and POC, chlorophyll a, phaeophytine and optical parameters in the water column. Phytoplankton biomass and species composition as well as benthos species composition and biomass are also determined as part of the monitoring programme. For the determinants heavy metals (e.g. Hg, Cd, Pb) and organic contaminants (e.g. PCBs, PAHs, OCPs) in sediment and biota, MUMM collaborates with the Sea Fisheries department of the Centre for Agricultural Research both for sampling and analysis.

Quality assurance and quality control during sampling and in the laboratory receive a high priority within the project.

2.2 ENDIS-RISKS – Roose

The goal of the project is to get better insight into the distribution and the possible effects of hormone disrupting substances in the Scheldt Estuary. The components to be analysed are mentioned on the OSPAR list of priority substances or are mentioned as hormone disrupting components on the OSPAR list of candidate substances. Also the short and long term effects of these components will be evaluated in the laboratory and in the field. For the priority substances the fysico-chemical distribution (speciation between the different compartments: sediment, water, suspended particulate matter), their concentrations in biota (mysids and gobies) and geographical spreading will be measured. Possible toxicological effects will also be investigated on an ecological important group of endemic organisms (mysids). For this purpose acute as well as chronical effects are studied on individual and population level and compared to historical data.

3. Operations

3.1 Monitoring BMM-ROOSE

Local Time

Tuesday 03 February 2004

14h32 : Sampling station 150
15h28 : Sampling station S01
17h15 : Sampling station S04
18h46 : Sampling station S07
19h39 : Sampling station S09
20h43 : Sampling station S12
21h22 : Sampling station S15
21h50 : Sampling station S15b
22h08 : Sampling station S18
22h34 : Sampling station S18b
22h53 : Sampling station S20
23h35 : Sampling station S22

Thursday 05 February 2004

22h00 : Sampling station 700
22h50 : Sampling station 710

Friday 06 February 2004

00h35 : Sampling station 230
01h09 : Sampling station 130
01h44 : Sampling station 131
03h23 : Sampling station 120
03h57 : Sampling station 115
04h53 : Sampling station ZG03
06h00 : Sampling station 105
06h58 : Sampling station 215

Friday 06 February 2004

10h00 : Arrival Zeebrugge

3.2 ENDIS RISKS

Wednesday 4 February 2004

01h00 : Touch & Go in Antwerp: boarding of ENDIS-RISKS scientists

Station S22 Antwerp
08h27 : Passive sampling (Little hyperbentic sledge)
08h43 : Start centrifuge
09h21 : Passive sampling (Little hyperbentic sledge)
09h52 : CTD scan
09h52 : Water sampling (Niskin / Go Flo)
10h00 : Sediment sampling (Van Veen)
10h15 : Stop centrifuge

Station S12 Bath
11h30 : Start centrifuge
12h15 : CTD scan
12h15 : Water sampling (Nisking / Go Flo)
12h22 : Sediment sampling (Van Veen)
12h29 : Fish tracks (Hyperbentic sledge)
14h26 : Fish tracks (Beam thrawl)
14h57 : CTD scan
14h58 : Stop centrifuge

Station S09 Saeftinge
16h00 : CTD scan
16h07 : Start centrifuge
16h15 : Fish tracks (Beam thrawl)
16h45 : Fish tracks (Hyperbentic sledge)
17h50 : CTD scan
17h50 : Water sampling (Niskin / Go Flo)
18h14 : Sediment sampling (Van Veen)
18h30 : Stop centrifuge

20h00 : Er werd door de Boots Eric een additioneel experiment uitgevoerd met de multicorer op S15. De bodem was zanderig, de staalname met de multicorer is goed verlopen.

Thursday 5 February 2004

Station S15 Doel
08h00 : Start centrifuge
08h20 : CTD scan
08h20 : Water sampling (Nisking / Go Flo)
08h35 : Sediment sampling (Van Veen)
08h45 : Fish tracks (Hyperbentic sledge)
09h23 : Fish tracks (Beam thrawl)
09h41 : CTD scan
09h45 : Stop centrifuge

Station S07 Hansweert
11h40 : Start centrifuge
12h23 : CTD scan
12h23 : Water sampling (Nisking / Go Flo)
12h34 : Sediment sampling (Van Veen)
12h49 : Fish tracks (Beam thrawl)
13h22 : Fish tracks (Hyperbentic sledge)
14h16 : CTD scan
14h45 : Stop centrifuge

Station S04 Terneuzen
15h45 : Start centrifuge
15h48 : CTD scan
15h48 : Water sampling (Nisking / Go Flo)
15h55 : Sediment sampling (Van Veen)
16h18 : Fish tracks (Hyperbentic sledge)
17h20 : Fish tracks (Beam thrawl)
17h46 : CTD scan
17h53 : Stop centrifuge

4. Remarks regarding measurment instruments and the campaign in general (Dutch)

Wegens de slechte weersomstandigheden op zee (te veel wind) zijn slechts een aantal monitoring stations kunnen bemonsterd worden.

Er werd op woensdag en donderdag een alternatief programma op de Schelde voorzien. Gedurende deze twee dagen werden door in Antwerpen extra ingescheepte deelnemers, Samplingen uitgevoerd op de Schelde ten behoeve van het Endis Risks project.

Tijdens het vissen op de Schelde zijn volgende moeilijkheden voorgekomen:
- hyperbentische slede op S12 dichtgeslibt en schade aan de netten
- boomkor op S12 dichtgeslibt en schade aan de netten
- boomkor op S15 met stenen gelicht en schade aan de netten

Op S12 werd eerder nog geen probleem ondervonden om te vissen tijdens de ENDIS-RISKS campagnes. De netten zijn telkens hersteld geweest door bootsman Eric. Op S15 werd eerder al ondervonden dat vissen daar risico's oplevert, waardoor we dan ook de track hebben verlegd naar een minder risicovol gebied, zoals werd ondervonden op de vorige campagne met ENDIS-RISKS. Het vissen gebeurt telkens na overleg met de commandant en na overwegen van het risico.

Algemeen kan gesteld worden dat de campagne in een uistekende sfeer van samenwerking en coordinatie verlopen is, zoals tussen wetenschappelijk personeel en de commandant/bemanning, als tussen de wetenschappelijke ploegen onderling.

Further remarks are to be found in Annex B.

5. Executed sampling programme

5.1 Monitoring BMM-ROOSE

BKP Stations

STATION	POSITIE		ODAS	In situ metingen	Staalname H_2O NISKIN	WIV Sediment VV
	N.B.	O.L.				
105	51 11.00	2 28.50	X	X	X	
115	51 09.30	2 36.20	X	X	X	
120	51 11.10	2 42.07	X	X	X	
130	51 16.25	2 54.30	X	X	X	
131	51 17.03	2 58.09	X	X	X	
150	51 25.00	3 24.00	X	X	X	
215	51 16.60	2 36.80	X	X	X	
230	51 18.50	2 51.00	X	X	X	
250	51 31.00	3 19.00				
315	51 19.37	2 27.84				
330	51 26.00	2 48.50				
421	51 28.83	2 27.00				
435	51 34.84	2 47.42				
545	51 43.60	3 03.00				
700	51 22.60	3 13.20	X	X	X	
710	51 26.45	3 08.32	X	X	X	
800	51 50.83	2 52.00				
ZG01	51 20.00	2 42.00				
ZG02	51 20.00	2 30.00				
ZG03	51 15.70	2 40.00	X	X	X	

Scheldt - points

STATION	POSITIE		ODAS	In situ Metingen	Staalname H_2O NISKIN	Sediment Doorstroomcen trifuge
	N.B.	O.L.				
S01	51 25.00	3 34.20	X	X	X	
S04	51 20.70	3 49.50	X	X	X	
S07	51 26.20	4 00.00	X	X	X	
S09	51 22.20	4 04.70	X	X	X	
S12	51 21.90	4 13.50	X	X	X	
S15	51 18.80	4 16.40	X	X	X	
S15b	51 17.35	4 19.34	X	X	X	
S18	51 16.00	4 18.00	X	X	X	
S18b	51 15.29	4 19.05	X	X	X	
S20	51 14.45	4 21.00	X	X	X	
S22	51 13.13	4 23.50	X	X	X	

ODAS = automatische registratie van :
navigatie parameters en bathymetrie
meteoparameters (inclusief solarradiation)
saliniteit en temperatuur (thermosalinograaf Seabird SBE21)
fluorescentie (Turner Design fluorimeter model 10AU)
temperatuur (Rosemount temperatuurssensor)

5.2 ENDIS-RISKS

Scheldt River

STATION	POSITION		ODAS	SCTD	Water sampling	Sediment	Suspended particulate matter (SPM)	Fish tracks
	N.B.	O.L.						
S04	51 20.70	3 49.50	X	X	X	X	X	X
S07	51 26.20	4 00.00	X	X	X	X	X	X
S09	51 22.20	4 04.70	X	X	X	X	X	X
S12	51 21.90	4 13.50	X	X	X	X	X	X
S15	51 18.80	4 16.40	X	X	X	X	X	X
S22	51 13.13	4 23.50	X	X	X	X	X	X

ODAS = automatic registration of :
navigation parameters en bathymetry
meteo parameters (inclusive solar radiation)
salinity en temperature (thermosalinographe Seabird SBE21)
fluorescence (Turner Design fluorimeter model 10AU)
temperature (Rosemount temperatuurssensor)

CTD = Conductiviteit (Saliniteit), Temperatuur, Diepte gekoppeld met Densiteit, Turbiditeit met OBS-sensor, LiCor Quantameter (PAR).

6. Detailed overview sampling programme

6.1 Monitoring BMM-ROOSE

STATION	In situ metingen			WATER NISKIN (10 l)				WATER NISKIN (5 l)			SEDIMENT Centrifuge
	D.O. YSI-52	D.O. YSI-57	CTD Seacat	Saliniteit Guildline	PH Beckman	DOC	Nutriënten (NO_x – NO_2 – PO_4 – NH_4 – Si – Totaal N + P)	Chlorofyl	Suspended matter	POC PON	
105	X	X	X	X	X	X	X	X	X	X	
115	X	X	X	X	X	X	X	X	X	X	
120	X	X	X	X	X	X	X	X	X	X	
130	X	X	X	X	X	X	X	X	X	X	
131	X	X	X	X	X	X	X	X	X	X	
150	X	X	X	X	X	X	X	X	X	X	
215	X	X	X	X	X	X	X	X	X	X	
230	X	X	X	X	X	X	X	X	X	X	
700	X	X	X	X	X	X	X	X	X	X	
710	X	X	X	X	X	X	X	X	X	X	
ZG03	X	X	X	X	X	X	X	X	X	X	

Scheldt –programme

STATION	In situ metingen			WATER NISKIN (10 l)				WATER NISKIN (5 l)			SEDIMENT Centrifuge
	D.O. YSI-52	D.O. YSI-57	CTD Seacat	Saliniteit Guildline	PH Beckman	DOC	Nutriënten (NO_x – NO_2 – PO_4 – NH_4 – Si – Totaal N + P)	Chlorofyl	Suspended matter	POC PON	
S01	X	X	X	X	X	X	X	X	X	X	
S04	X	X	X	X	X	X	X	X	X	X	
S07	X	X	X	X	X	X	X	X	X	X	
S09	X	X	X	X	X	X	X	X	X	X	
S12	X	X	X	X	X	X	X	X	X	X	
S15	X	X	X	X	X	X	X	X	X	X	
S15B	X	X	X	X	X			X	X		
S18	X	X	X	X	X	X	X	X	X	X	
S18b	X	X	X	X	X			X	X		
S20	X	X	X	X	X	X	X	X	X	X	
S22	X	X	X	X	X	X	X	X	X	X	

CTD = Conductiviteit (Saliniteit), Temperatuur, Diepte gekoppeld met Densiteit, Turbiditeit met OBS-sensor, LiCor Quantameter (PAR).

6.2 ENDIS-RISKS

Scheldt River

STATION	WATER SAMPLING				SEDIMENT		SPM	FISH TRACKS	
	WATER NISKIN (5 l)		WATER GO FLO (10 l)	WATER NISKIN (10 l)	Van Veen	Reineck	Centrifuge	Beam trawl	Hyperbentic sledge
	SPM	DOC POC	Endocrine Disruptors	Radiotracer Incubation					
S01	X	X	X	X	X	X	X	X	X
S04	X	X	X	X	X	X	X	X	X
S07	X	X	X	X	X	X	X	X	X
S09	X	X	X	X	X	X	X	X	X
S12	X	X	X	X	X	X	X	X	X
S15	X	X	X	X	X	X	X	X	X
S22	X	X	X	X	X	X	X	X	

7. METEO PARAMETERS / SEASTATE

7.1 Monitoring BMM-ROOSE

Tabel : Wind Speed, Wind direction, Air temperature, Water depth, Barometric Pressure and seastate at the different sampling stations.
(B : No data, S : Suspected data)

Station	datum	Uur (gmt)	wind sp. (m/s)	Wind dir. (dg)	air temp. (°C)	water Depth (m)	bar. Press. (mBar)	Sea state (m)
105	06.02.04	04h59	7.9	182.1	14.1	20.13	1019	1
115	06.02.04	02h59	9.1	202.7	14.3	10.77	1021	1
120	06.02.04	02h23	8.1	204.1	14.4	14.31	1021	1
130	06.02.04	00h09	10.2	226.1	13.9	14.10	1022	1
131	06.02.04	00h43	10.4	219.2	14.1	11.76	1022	1
150	03.02.04	13h32	11.3	207.3	17.7	14.6	1023	1
215	06.02.04	05h58	7.8	192.6	19.5	25.19	1019	1
230	05.02.04	23h35	9.6	216.5	13.3	16.58	1023	1
250	B	B	B	B	B	B	B	B
315	B	B	B	B	B	B	B	B
330	B	B	B	B	B	B	B	B
421	B	B	B	B	B	B	B	B
435	B	B	B	B	B	B	B	B
545	B	B	B	B	B	B	B	B
700	05.02.04	21h00	12.0	232.8	13.8	11.81	1022	4
710	05.02.04	21h52	8.9	223.7	13.0	10.24	1022	4
800	B	B	B	B	B	B	B	B
ZG01	B	B	B	B	B	B	B	B
ZG02	B	B	B	B	B	B	B	B
ZG03	06.02.04	03h53	7.6	195.8	13.9	18.75	1020	1
S01	03.02.04	14h32	10.0	202.0	18.7	20.80	1023	-
S04	03.02.04	16h14	9.3	194.4	18.8	34.50	1023	-
S07	03.02.04	17h46	11.5	199.3	17.7	17.22	1023	-
S09	03.02.04	18h40	10.3	204.0	18.4	16.81	1024	-
S12	03.02.04	19h43	12.0	208.0	18.5	14.41	1024	-
S15	03.02.04	20h19	11.1	215.3	19.3	8.60	1024	-
S15B	03.02.04	20h50	7.8	215.0	18.7	13.59	1024	-
S18	03.02.04	21h09	12.9	211.4	18.2	14.60	1024	-
S18B	03.02.04	21h34	9.4	203.9	18.5	10.20	1025	-
S20	03.02.04	21h53	4.8	206.2	18.5	14.20	1025	-
S22	03.02.04	22h34	10.1	217.4	18.4	13.51	1025	-

7.1 ENDIS-RISKS-ROOSE

Tabel : Wind Speed, Wind direction, Air temperature, Water depth, Water temperature and salinity at the different sampling stations.
(B : No data, S : Suspected data)

Station	Datum	Uur (gmt)	Wind sp. (m/s)	Wind dir. (dg)	Air temp. (°C)	Water depth (m)	Water temp. (°C)	Salinity (PSU)
S022								
Sledge start	04.02.04	8h30	5.7	213.8	16.6	-8.49	11.04	0.0103
Centrifuge start	04.02.04	8h43	6.2	200.2	19.3	-8.29	11.06	0.0103
Sledge start 2	04.02.04	9h20	6.2	208.6	17.1	-11.91	6.90	0.453
Sledge stop 2	04.02.04	9h34	7.7	211.1	17.5	-12.41	7.02	0.449
CTD	04.02.04	9h52	9.5	209.5	17.9	-12.70	7.11	0.447
Water sampling	04.02.04	9h52	9.5	209.5	17.9	-12.70	7.11	0.447
Sediment	04.02.04	9h59	9.1	224.6	18.0	B	7.04	0.448
S12								
CTD	04.02.04	12h15	9.8	220.1	19.4	-16.90	7.14	3.99
Water sampling	04.02.04	12h17	9.1	215.5	19.3	-17.40	7.14	3.99
Sediment	04.02.04	12h21	11.1	217.5	19.3	-17.48	7.13	4.01
Sledge start	04.02.04	12h27	9.5	210.6	19.5	-13.20	7.15	3.95
Sledge stop	04.02.04	12h42	8.3	209.5	19.4	-14.79	7.07	3.65
Sledge start 2	04.02.04	13h50	10.5	196.1	20.5	-13.59	7.06	5.34
Sledge stop 2	04.02.04	14h04	10.6	206.8	20.5	-16.61	7.13	4.65
Beam trawl start	04.02.04	14h25	7.9	217.8	20.8	-20.11	7.06	5.66
Beam trawl stop	04.02.04	14h32	10.0	214.4	20.7	-19.50	7.09	5.17
CTD 2	04.02.04	14h52	8.7	212.3	20.0	-16.69	7.10	5.12
S09								
CTD	04.02.04	16h05	10.4	198.3	19.6	-16.92	6.36	12.3
Beam trawl start	04.02.04	16h14	12.9	207.0	19.9	-17.22	6.34	12.3
Beam trawl stop	04.02.04	16h25	9.3	210.8	19.6	-19.70	6.38	12.2
Sledge start	04.02.04	16h44	9.6	209.4	19.6	-17.39	6.48	11.8
Sledge start 2	04.02.04	17h14	9.4	203.2	19.2	-17.91	6.61	10.3
Sledge stop 2	04.02.04	17h30	8.7	205.0	19.0	-20.89	6.68	10.2
Water sampling	04.02.04	18h06	6.6	200.1	18.6	-15.80	6.68	9.02
Sediment	04.02.04	18h13	6.5	190.5	18.6	-15.81	6.72	8.89

Station	Datum	Uur (gmt)	Wind sp. (m/s)	Wind dir. (dg)	Air temp. (°C)	Water depth (m)	Water temp. (°C)	Salinity (PSU)
S15								
Centrifuge start	05.02.04	8h00	6.0	233.1	16.8	-16.90	7.49	2.78
CTD	05.02.04	8h19	5.4	243.4	16.8	-10.70	7.40	2.54
Water sampling	05.02.04	8h29	4.0	227.9	16.9	-11.70	7.04	2.05
Sediment	05.02.04	8h33	5.6	231.5	16.8	-13.31	7.05	2.08
Sledge start	05.02.04	8h43	5.9	235.1	16.9	-17.10	6.91	1.86
Sledge stop	05.02.04	8h56	7.0	239.0	16.8	-13.30	7.02	2.01
Beam trawl start	05.02.04	9h22	4.8	244.5	16.8	-16.11	6.85	1.71
Beam trawl stop	05.02.04	9h32	8.7	239.8	16.6	-13.49	6.87	1.81
CTD 2	05.02.04	9h39	8.2	233.2	16.7	-13.15	6.92	1.88
S07								
CTD	05.02.04	12h23	10.9	238.5	15.3	-10.21	6.64	12.8
Water sampling	05.02.04	12h26	11.1	232.6	15.7	-10.32	6.67	12.6
Sediment	05.02.04	12h34	B	B	B	B	B	B
Beam trawl start	05.02.04	12h49	B	B	B	B	B	B
Beam trawl stop	05.02.04	13h01	B	B	B	B	B	B
Sledge start	05.02.04	13h22	B	B	B	B	B	B
Sledge stop	05.02.04	13h38	B	B	B	B	B	B
Sledge start	05.02.04	14h00	B	B	B	B	B	B
Sledge stop	05.02.04	14h11	B	B	B	B	B	B
CTD 2	05.02.04	14h16	6.9	236.0	15.2	-20.61	6.54	14.7
S04								
CTD	05.02.04	15h49	8.4	203.0	17.0	-27.90	6.51	21.3
Water sampling	05.02.04	15h53	8.0	211.9	17.0	-30.15	6.54	20.9
Sediment	05.02.04	15h55	10.5	201.1	17.1	-29.01	6.43	20.9
Sledge start	05.02.04	16h18	7.6	213.4	17.1	-31.49	6.43	21.0
Sledge stop	05.02.04	16h31	13.0	221.5	17.7	-20.30	6.37	21.9
Sledge start	05.02.04	16h45	8.6	20.4	16.7	-18.20	6.36	22.3
Sledge stop	05.02.04	15h59	B	B	B	B	B	B
Beam trawl start	05.02.04	17h20	9.4	218.6	17.5	-18.21	6.40	21.58
Beam trawl stop	05.02.04	17h34	8.0	224.2	17.2	-15.31	6.41	21.62
CTD 2	05.02.04	17h46	5.8	207.4	16.8	-16.05	6.37	21.63

8. OPPERVLAKTE PARAMETERS (BMM-Roose)

Tabel : Dissolved Oxygen (ysi 52 & 57), pH with corresponding watertemperature Sampling Depth, Seatemperatue, Salinity, Turbidity and Density are measured with the SCTD-SYSTEM. (See tabel SCTD-Parameters)
(B : no data, S : Suspected data, M: data not acceptable)

Station	% SAT YSI-52 (%)	Diss.Ox. YSI-52 (mg/l)	Diss.Ox. YSI-57 (mg/l)	Acidity (pH)	
				PH	Temp.
105	86.6	8.21	B	7.84	10.1
115	85.4	8.08	B	7.76	9.4
120	85.5	8.05	B	8.02	10.6
130	85.3	8.16	B	7.72	11.2
131	86.1	8.23	B	B	B
150	100.4	10.12	B	7.77	8.3
215	86.1	8.19	B	7.95	10.0
230	86.3	8.34	B	7.84	10.3
250	B	B	B	B	B
315	B	B	B	B	B
330	B	B	B	B	B
421	B	B	B	B	B
435	B	B	B	B	B
545	B	B	B	B	B
700	84.9	8.20	B	7.85	11.5
710	83.9	7.96	B	7.68	10.3
800	B	B	B	B	B
ZG01	B	B	B	B	B
ZG02	B	B	B	B	B
ZG03	85.9	8.16	B	7.91	13.5
S01	101.0	10.50	11.6	7.79	7.9
S04	100.3	10.34	12.1	7.77	8.0
S07	83.5	9.53	B	7.80	7.5
S09	79.1	9.26	B	7.78	8.0
S12	69.7	8.26	B	7.66	8.6
S15	63.7	7.74	B	7.58	8.0
S15b	59.2	7.29	B	7.62	8.1
S18	58.0	7.17	B	7.54	7.4
S18b	56.3	6.97	B	7.6	8.2
S20	54.7	6.78	B	7.5	7.3
S22	53.8	6.67	B	7.46	7.6

B : No Data (1) Calibratie probleem, onstabiliteit, geen meeting mogelijk
(2) geen data

9. SCTD-PARAMETERS SEABIRD SBE 19 (Seacat)

9.1 Monitoring BMM-ROOSE

Tabel : Sampling Depth, Sea Temperature, Salinity, Turbidity, Oxygen and Density are measured In situ with the Seabird SCTD-model SBE19 (Seacat) (B: no data)

Op staalnamediepte

Station	Depth (m)	Temperature (°C)	Salinity (ppt)	Turbidity (FTU)
105	4.507	7.8687	34.4292	4.23
115	5.517	8.1764	34.0906	13.17
120	4.845	8.0951	34.1358	14.17
130	4.662	7.7301	33.8754	16.08
131	4.634	7.8041	33.8476	14.68
150	5.993	5.9715	31.2198	24.95
215	4.431	7.8812	34.5540	3.52
230	5.120	7.6820	34.1000	11.26
250	B	B	B	B
315	B	B	B	B
330	B	B	B	B
421	B	B	B	B
435	B	B	B	B
545	B	B	B	B
700	6.111	7.3788	32.4511	41.08
710	5.892	7.6393	34.6089	24.84
800	B	B	B	B
ZG01	B	B	B	B
ZG02	B	B	B	B
ZG03	4.561	7.8911	34.5546	4.45
S01	3.675	5.5947	28.4273	22.47
S04	3.697	5.7625	20.7286	25.00
S07	4.820	5.9504	12.7870	27.37
S09	4.355	6.6469	6.4756	25.57
S12	5.089	6.9608	3.5796	46.30
S15	4.861	6.4115	1.9077	18.76
S15B	6.192	6.0555	1.1225	14.23
S18	4.266	5.9638	0.9186	11.87
S18B	5.389	6.1981	0.8609	28.89
S20	5.868	5.9541	0.5451	23.20
S22	5.589	6.3704	0.4980	54.22

B : No Data

M : Staalname op het station werd uitgevoerd, verkregen data is foutief en niet bruikbaar

Tabel : Sampling Depth, Sea Temperature, Salinity, Turbidity and Density are measured in situ with the Seabird SCTD-model SBE19 (Seacat) (b: no data)

Op de bodem

Station	Depth (m)	Temperature (°C)	Salinity (ppt)	Turbidity (FTU)
105	18.275	7.8345	34.4292	8.83
115	9.797	8.1543	34.1044	21.87
120	13.873	8.1582	34.1809	20.25
130	12.870	7.7437	33.9484	18.75
131	9.842	7.8216	33.8853	15.17
150	14.028	6.2301	33.0923	134.73
215	23.992	7.9262	34.5711	16.28
230	14.587	7.6499	34.1965	11.07
250	B	B	B	B
315	B	B	B	B
330	B	B	B	B
421	B	B	B	B
435	B	B	B	B
545	B	B	B	B
700	10.871	7.5521	32.4750	37.08
710	9.023	7.6788	34.6366	23.55
800	B	B	B	B
ZG01	B	B	B	B
ZG02	B	B	B	B
ZG03	17.989	7.8843	34.5414	5.60
S01	17.346	5.5975	28.9754	125.61
S04	32.791	5.6749	21.6300	58.21
S07	18.717	5.8717	13.7884	36.25
S09	17.386	6.3298	8.7213	88.36
S12	11.688	6.9973	3.9238	60.95
S15	8.223	6.6548	2.0835	28.32
S15B	10.340	6.3247	1.1178	14.74
S18	11.634	6.0452	1.0646	60.44
S18B	9.446	6.3377	0.9108	103.43
S20	12.800	5.9956	0.5278	196.69
S22	12.696	6.4014	0.4934	55.38

9.2 ENDIS-RISKS BMM-ROOSE

Tabel : Sampling Depth, Sea Temperature, Salinity, Turbidity, Oxygen and Density are measured In situ with the Seabird SCTD-model SBE19 (Seacat) (B: no data)

Sample depth

Station	Depth (m)	Temperature (°C)	Salinity (ppt)	Oxygen (mg/L)	PAR	Turbidity (FTU)
S04 B	3.89	6.5240	21.064	9.09	0.060	25.51
S04 E	3.09	6.7032	21.833	8.31	0.046	36.08
S07 B	4.30	6.7291	12.801	10.08	0.150	13.96
S07 E	4.15	6.6111	16.361	9.52	0.057	22.77
S09 B	2.31	6.4000	12.777	7.87	2.240	20.07
S09 E	3.41	6.6423	9.3021	7.91	0.021	20.16
S12 B	3.28	7.1369	4.0037	8.45	0.050	49.48
S12 E	4.38	7.1058	5.1689	8.21	0.060	45.61
S15 B	4.36	7.5456	2.6187	11.19	0.047	61.02
S15 E	3.93	7.1671	2.0169	11.37	0.047	27.66
S22	10.89	7.2747	0.4514	6.38	0.052	79.25

B : No Data

M : Staalname op het station werd uitgevoerd, verkregen data is foutief en niet bruikbaar

Tabel : Sampling Depth, Sea Temperature, Salinity, Turbidity, Oxygen and Density are measured In situ with the Seabird SCTD-model SBE19 (Seacat) (B: no data)

At the bottom

Station	Depth (m)	Temperature (°C)	Salinity (ppt)	Oxygen (mg/L)	PAR	Turbidity (FTU)
S04 B	21.86	6.2457	23.648	7.417	0.043	129.11
S04 E	15.63	6.3872	21.802	7.487	0.046	37.38
S07 B	7.43	6.6546	13.272	9.595	0.045	27.39
S07 E	17.86	6.3963	16.435	8.489	0.041	47.41
S09 B	11.72	6.3339	13.135	7.629	0.049	23.64
S09 E	15.07	6.3499	11.744	7.527	0.051	49.58
S12 B	15.75	7.0715	4.874	8.715	0.049	113.27
S12 E	14.95	7.0737	5.424	8.568	0.060	45.93
S15 B	8.42	7.3976	2.578	12.617	0.047	200.00
S15 E	8.65	7.3347	2.034	12.442	0.045	69.93
S22	3.442	7.1601	0.450	6.474	0.079	28.64

B : No Data

M : Staalname op het station werd uitgevoerd, verkregen data is foutief en niet bruikbaar

4303 ROSCOP gegevens

BMM – Roose

H09	22
H10	22
H21	22
H22	20
H23	20
H24	20
H25	20
H75	20
H26	20
H76	20
H28	22
P01	22
B02	22
B71	22
B06	22
M06	22
H71	
H17	

ENDIS-RISKS

No.	Data Type	Description
6 stations	H09 H10 P01 P02 P03 P04 P05 P90	
6 stations	G04 P02 P03 P04 P05 P90	
6 stations	B18 B14 P13	

ANNEX A : Instrumentation and Data-acquisition

A.1. Used instrumentation.

A.1.1. Navigational instrumentation.

During this cruise, the data from the following navigational instruments connected to the ship born computer system were logged by the Oceanographic Data Acquisition System "ODASII":

- THALES NAVIGATION AQUARIUS-02 LRK DGPS positioning system with an accuracy of 2 to 10 cm using IALA beacons for the differential correction.
- MAGNAVOX 200MX DGPS positioning system with an accuracy of ca. 5 m using IALA beacons for the differential correction.
- ANSHUTZ STD20 Gyro Compass.
- RAYTHEON DSN450 Doppler speed log and bathymetric depth.
- ATLAS DESO 22 Scientific Echosounder.
  The Atlas Deso 22 is equipped with 2 transducers (33 kHz and 210 kHz).
- TSS 320B Heave Compensator.
  The data of the Atlas Deso 22 echosounder are corrected for the heave by the TSS 320B.
- FURUNO Echosounder FCV381.
  The Furuno is also equipped with 2 transducers (28 kHz and 88 kHz).

A.1.2. Oceanografical instrumentation.

The sea surface temperature was measured continuously with the remote temperature sensor of the Sea-Bird SBE21 thermosalinograph as well as with a Sea-Bird SBE38 temperature sensor, both installed at the inlet of the non-toxic seawater circuit situated at the bow of the vessel.

The Sea-Bird SBE21 thermosalinograph, installed in the wet lab, is also connected to the non-toxic seawater circuit. The salinity was measured continuously using a personal computer with a dedicated software package from Sea-Bird. The processed data were continuously (every 6 sec.) transmitted to the HP1000/A400 data acquisition computer. The specifications of this thermosalinograph are found in table 1.

Parameter	Units	Range	Accuracy
Temperature	°C	-5 - +35	0.01 °C /6 months
Conductivity	S/m	0 – 7	0.001 S/m/month

Tabel 1. Sea-Bird SBE21 thermosalinograph specifications.

Salinity and density are calculated from conductivity, temperature and depth, in accordance to the 1978 Practical Salinity Scale from the IEEE Journal of Oceanic Engineering, January 1980.

A Turner Designs 10-AU-005 fluorimeter, also connected to the non toxic seawater circuit, was used to measure chlorophyll concentrations during the full campaign. The data were also transmitted to the HP1000/A400 data acquisition computer.

A Sea-Bird SBE19 'SeaCat' CTD profiler measures different parameters where under depth, temperature, conductivity, turbidity, oxygen content and lightintensity. The CTD-system is connected to the hydrologic winch and hydrologic CTD-measurements coincide with the water sampling. The specifications of the sensors of the SeaCat are found in tabel 2.

Parameter	Units	Range	Accuracy
Depth	m	0 – 600	
Temperature	°C	-5 - +35	0,02 °C/ 6 maand
Conductivity	S/m	0 – 7	0,001 S/m/maand
Backscatterance (OBS)	FTU	0 – 2000	
Dissolved Oxygen	ml/L	0 – 15	0,02 ml/L
Irradiance	µEinstein s^{-1} m^{-2}	0,02 – 2000	

Tabel 2. Sea-Bird SBE19 'SeaCat' specifications.

A.1.3. Meteorological instrumentation.

Following parameters were measured by the Friedrichs meteorological station:

- wind speed
- wind direction
- air temperature
- air pressure
- solar radiation

Table 3 gives a summary of the specifications of the meteo sensors.

Parameter	Units	Range	Accuracy
Wind speed	m/s	0 – 41	0.2
Wind direction	degrees	0 – 360	2
Air pressure	mbar	950 – 1050	0.3
Air temperature	°C	-35 - +45	0.2
Solar radiation	watt/m^2	0 – 1000	10

Tabel 3. Specifications of the meteo sensors.

The meteo sensors are calibrated at least once a year.

A.2. Data Acquisition System.

A.2.1. ODASII data acquisition and processing system.

A Hewlett Packard HP1000 Model A400 real-time minicomputer system with 26 RS-232 interfaces and a Hewlett Packard HP3852A data acquisition system (for analogous signals) were used to acquire meteorological, hydrological and navigational data at a 10 seconds interval.

The HP1000/A400 minicomputer is implemented as a black box. All input devices are connected through RS232 type interfaces to this real-time computer. The data acquisition software collects the sensor data and delivers this raw data to the data processing software implemented on a HP9000/748I-100 UNIX workstation. This on-line data processing software converts the raw data from the different input devices into physical units and stores the data in an Informix relational database.

The data presentation software is based on a Client Server model. The oceanographic data in the Informix database on the UNIX workstation are obtained on personal computer through a local area network (thin Ethernet LAN). These personal computer presentation units are installed in the labs, in the computer room and on the bridge and are accessible by all scientists on board for the production of real-time listings, graphs and track plots.

A.5.2. Sea-Bird CTD system.

The acquisition of the data from the Sea-Bird CTD systems (SBE09, SBE19 en SBE21) is allowed by using PCs using the Sea-Bird software. The software allows the necessary configuration and data acquisition. The sea-bird CTD software allows you to make real-time data-plots and to make markings when water bottle samples are taken so that the CTD and related parameters are known at the exact sampling depth.

ANNEX B : Instrumentatie en Data-acquisitie

Campaign 2004-01 (vervangingscampagne Endis-Risks)

Date	Sampling	Remarks
4/2/04		
S22 – Antwerpen		
8h27	Bentic Sledge	Little Sledge for Passive sampling
8h43	Centrifuge start	
8h46	Stop Bentic Sledge	Geen biota, proberen verder van de kaai
9h21	Bentic Sledge 2	
9h38	Stop Bentic Sledge 2	Geen biota
9h52	SCTD	Scan 1 aan opp.
9h52	Niskin 10 L	
9h55	Go Flo	
9h57	Go Flo 2	
10h00	Van Veen	niet vol
10h03	Van Veen 2	niet vol
10H15	Centrifuge stop	2742 L
S12 – Bath		
11h30	Centrifuge start	
12h15	Niskin 10 L	
12H15	CTD	
12H18	Go flo	
12H19	Go flo 2	
12H22	Van Veen	
12H29	Hyperbenthic sledge start	netten dichtgeslibt en gescheurd
12H43	Hyperbenthic sledge end	netten door Erik hersteld
13h51	Hyperbenthic sledge 2 start	
14h04	Hyperbenthic sledge 2 end	
14h26	Boomkor start	net zit vast, grote modderklonter
14h33	Boomkor end	netten door Erik hersteld
14h57	CTD	
14h58	Centrifuge end	5443L
S09 – Saefthinge		
16h00	CTD	
16h07	Centrifuge start	
16h15	Boomkor start	
16h27	Boomkor end	
16h45	Hyperbenthic sledge 1 start	
16h57	Hyperbenthic sledge 1 end	
17h15	Hyperbenthic sledge 2 start	
17h30	Hyperbenthic sledge 2 end	
17h50	Niskin 10 L + CTD	
18h02	Niskin 1	BMM-staal (DS)
18h04	Niskin 2	BMM-staal (DS)
18h05	Niskin 3	BMM-staal (DS)
18h06	Go Flo	

18h11	Go Flo 2	
18h14	Van Veen	
18h16	Van Veen 2	
18h30	Stop centrifuge	4303 L

Proef uitgevoerd door Erik met de multicorer op S15
Bodem: zanderig
Staalname oké: 15 à 20 cm zand in cores, 1 core iets minder

5/2/04

S15 -
Doel

8h00	Centrifuge start	
8h19	CTD	
8h20	Niskin 10 L	
8h30	Go flo	
8h31	Go flo 2	
8h35	Van Veen	
8h45	Hyperbenthic sledge 1 start	Genoeg materiaal, 2e sleep niet nodig
8h57	Hyperbenthic sledge 1 end	
9h23	Boomkor start	Net gescheurd, door Erik hersteld
9h34	Boomkor end	Stenen in net, nieuwe positie OK
9h41	CTD	
9h45	Centrifuge stop	2780 L

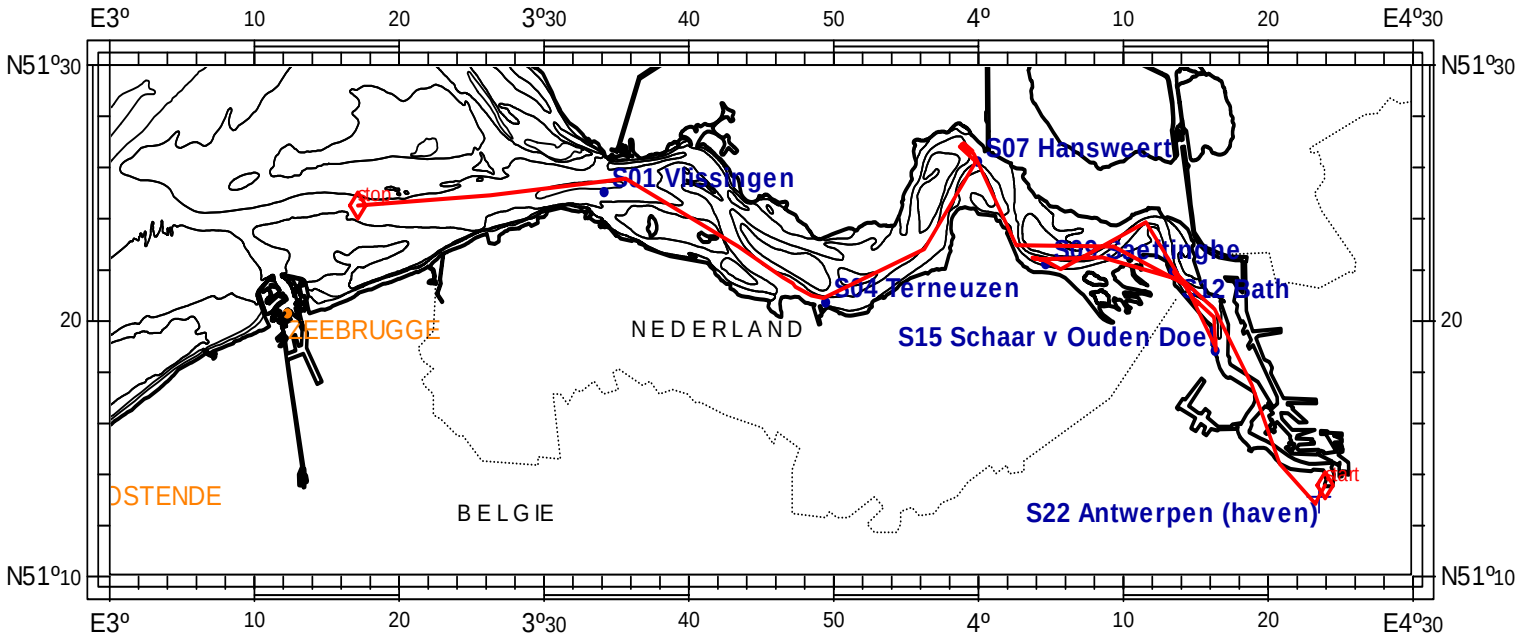
S07 - Hansweert

11h40	Centrifuge start	
12h23	CTD	
12h23	Niskin 10 L	
12h26	Go flo	failed
12h28	Go flo 2	lekte (kraantje open), maar toch nog voldoende water aanwezig
12h31	Go flo 3	
12h34	Van Veen	
12h49	Boomkor start	geen print
13h00	Boomkor end	Kleine vangst
13h22	Hyperbenthic sledge 1 start	onderste netten vol zand
13h37	Hyperbenthic sledge 1 end	
14h00	Hyperbenthic sledge 2 start	onderste netten vol zand
14h10	Hyperbenthic sledge 2 end	
14h16	CTD	
14h45	Centrifuge stop	4313 L

S04 - Terneuzen

15h45	Centrifuge start	
15h48	CTD	
15h48	Niskin 10 L	
15h50	Go flo	
15h53	Go flo 2	
15h55	Van Veen	Slijk met stenen
15h58	Van Veen 2	Meer zanderig staal (in ander recipiënt)
16h18	Hyperbenthic sledge 1 start	Door hoge saliniteit geen neomysis
16h31	Hyperbenthic sledge 1 end	maar schistomysis
16h45	Hyperbenthic sledge 2 start	Lage biomassa
16h59	Hyperbenthic sledge 2 end	
17h20	Boomkor start	
17h33	Boomkor end	
17h46	CTD	
17h53	Centrifuge stop	3430L

ANNEX C: Track-plot Endis-Risks Route

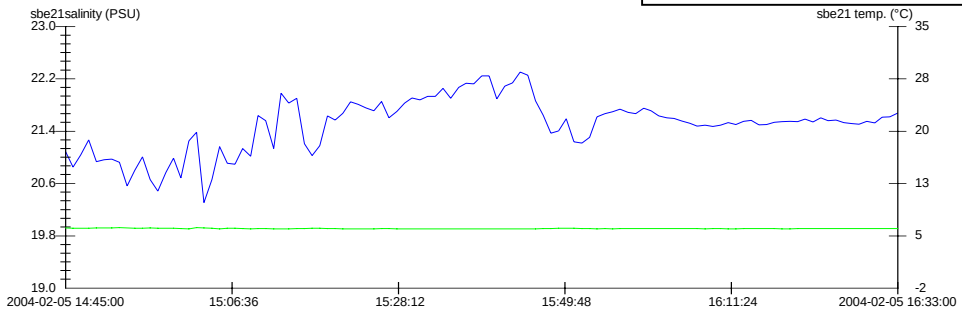


ANNEX D: Sea-Bird SBE21 thermosalinograph timeprofiles

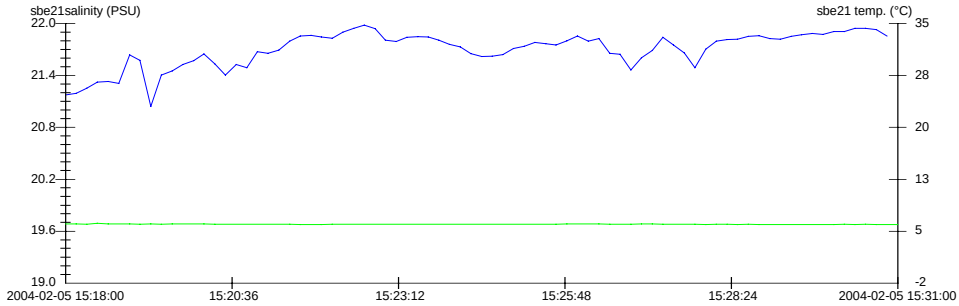
Graph legend
sbe21 salin (PSU) :
sbe21 temp (°C) :

S04 - Terneuzen

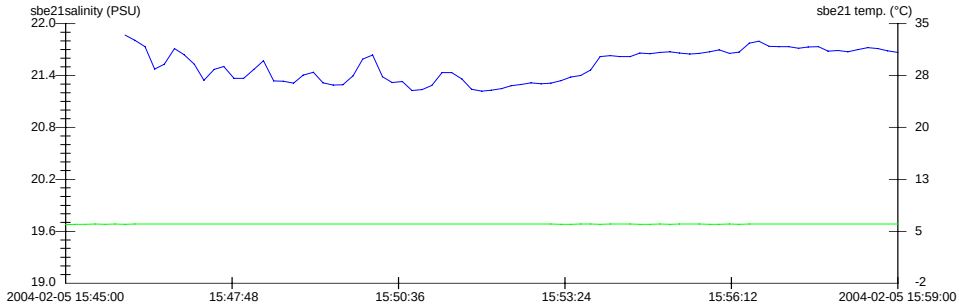
SPM-sampling



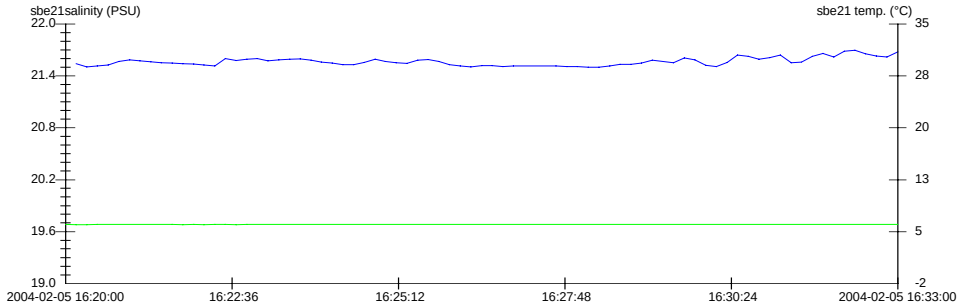
Fish track 1



Fish track 2

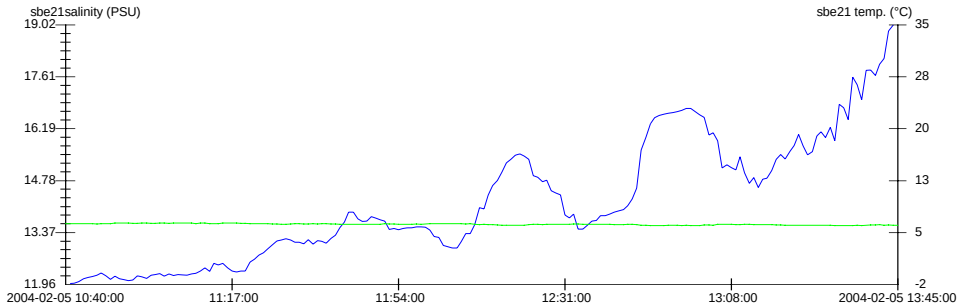


Fish track 3

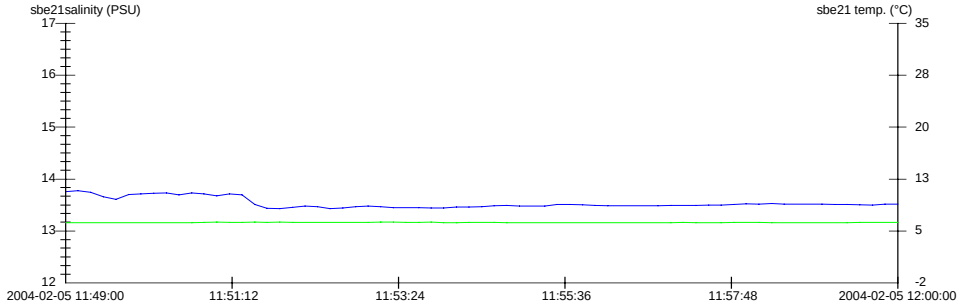


S07 - Hansweert

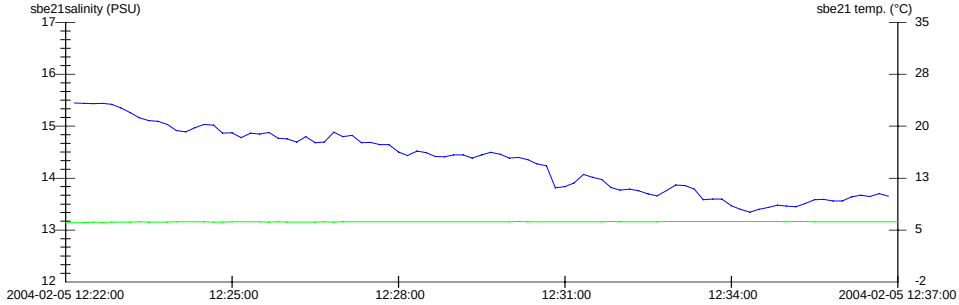
SPM sampling



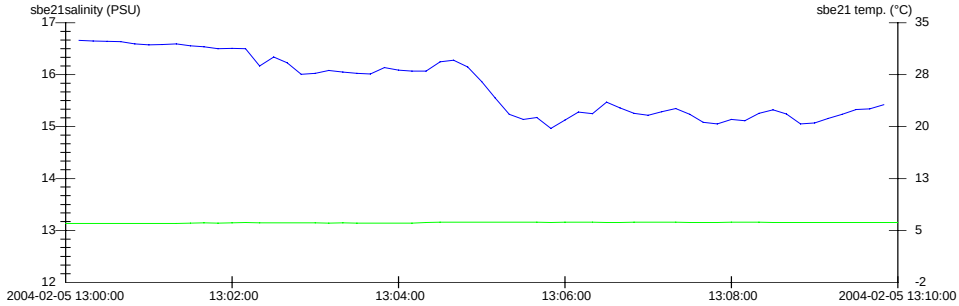
Fish track 1



Fish track 2

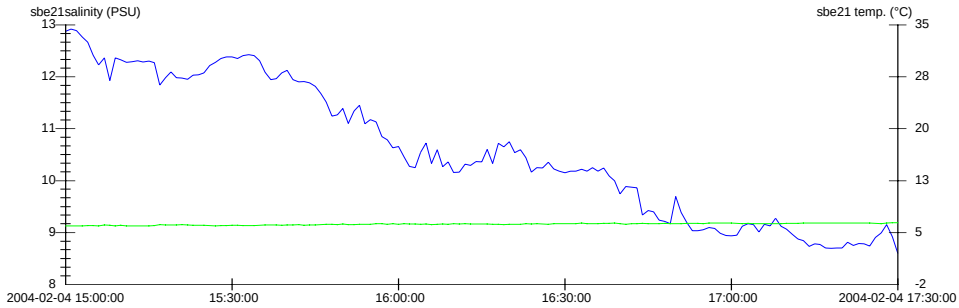


Fish track 3

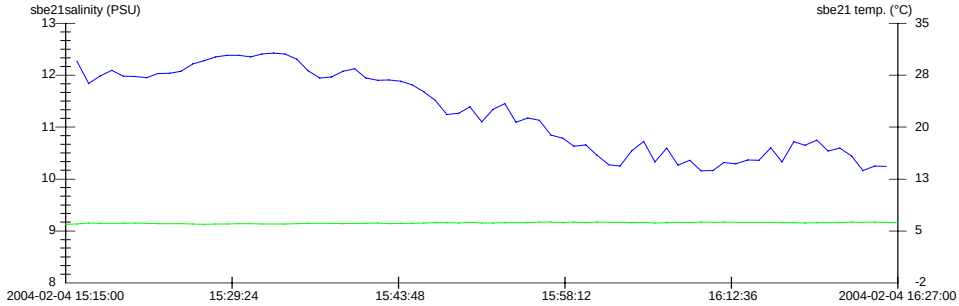


S09 - Saeftinghe

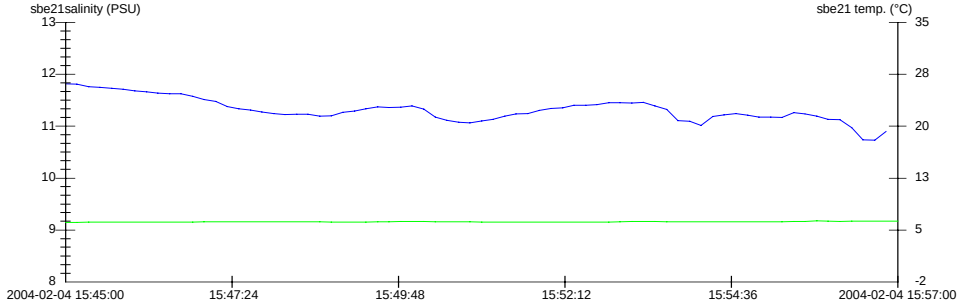
SPM-sampling



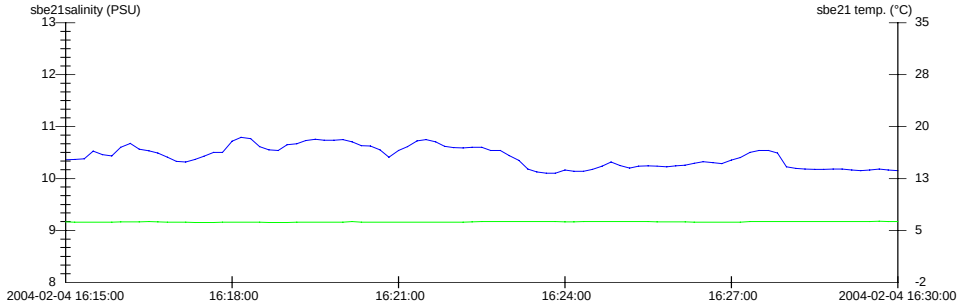
Fish track 1



Fish track 2

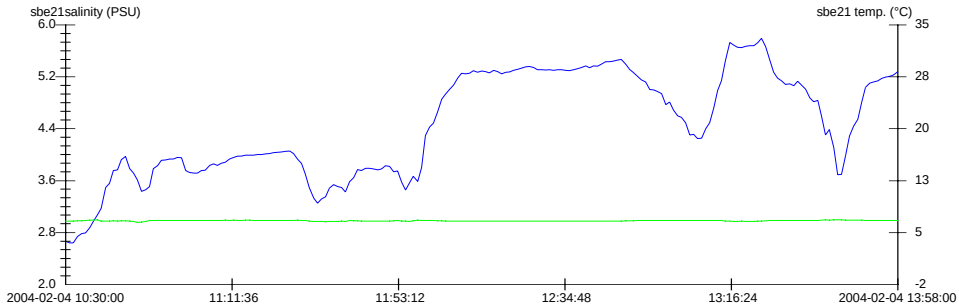


Fish track 3

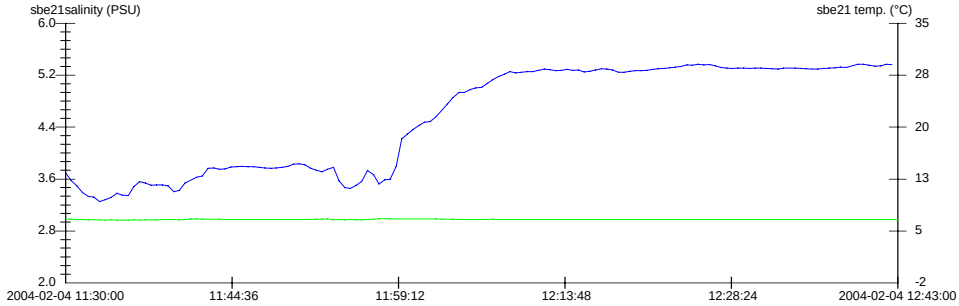


S12 – Bath

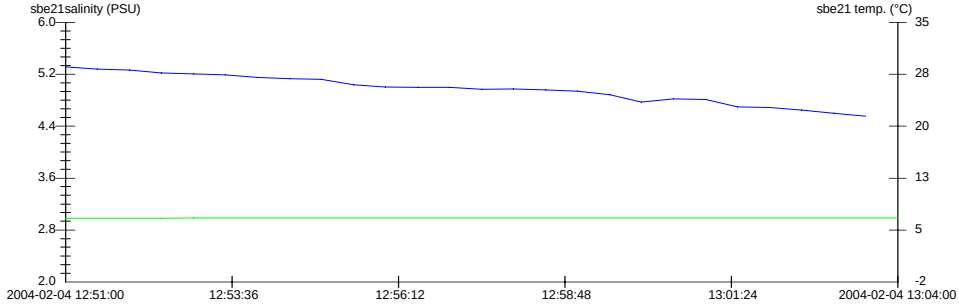
SPM-sampling



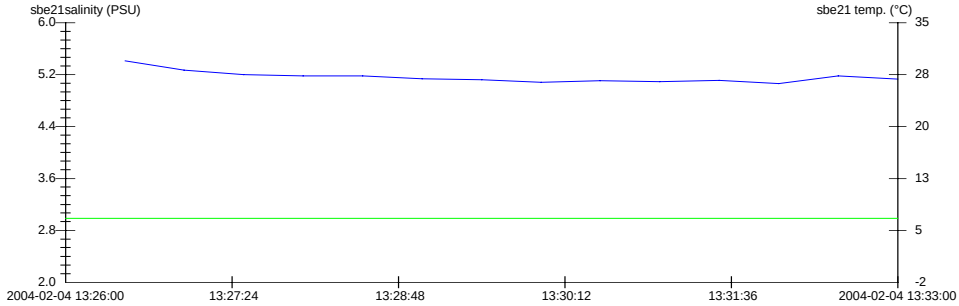
Fish track 1



Fish track 2

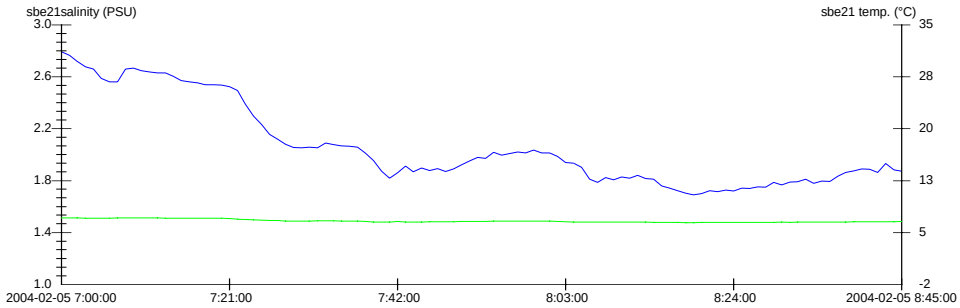


Fish track 3

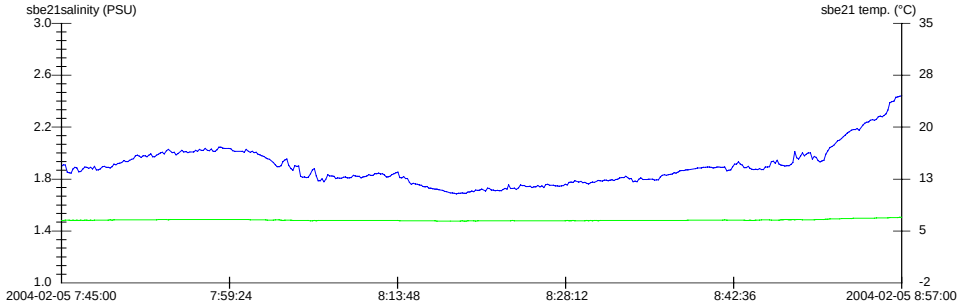


S15 – Doel

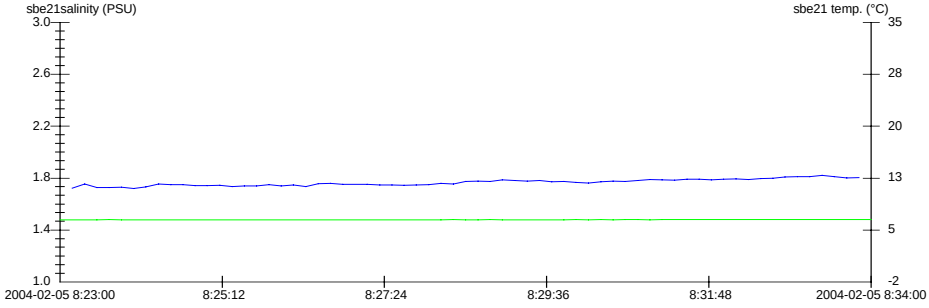
SPM-sampling



Fish track 1

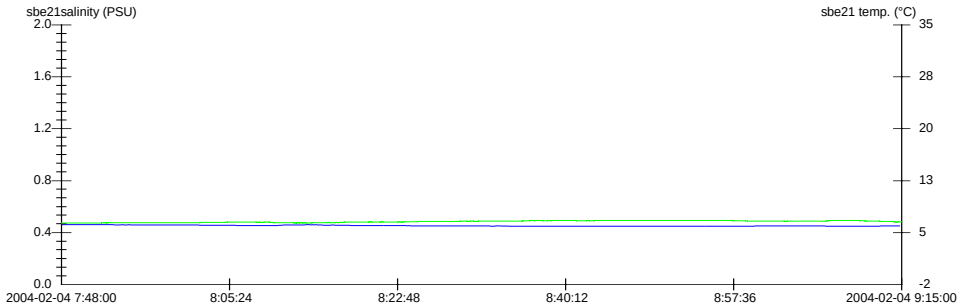


Fish track 2

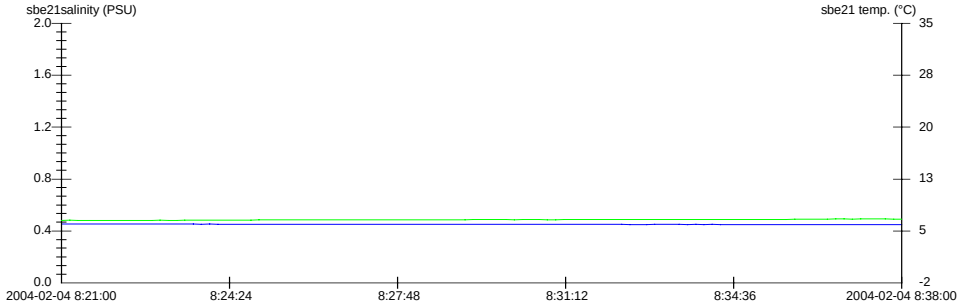


S22 – Antwerpen

SPM-sampling

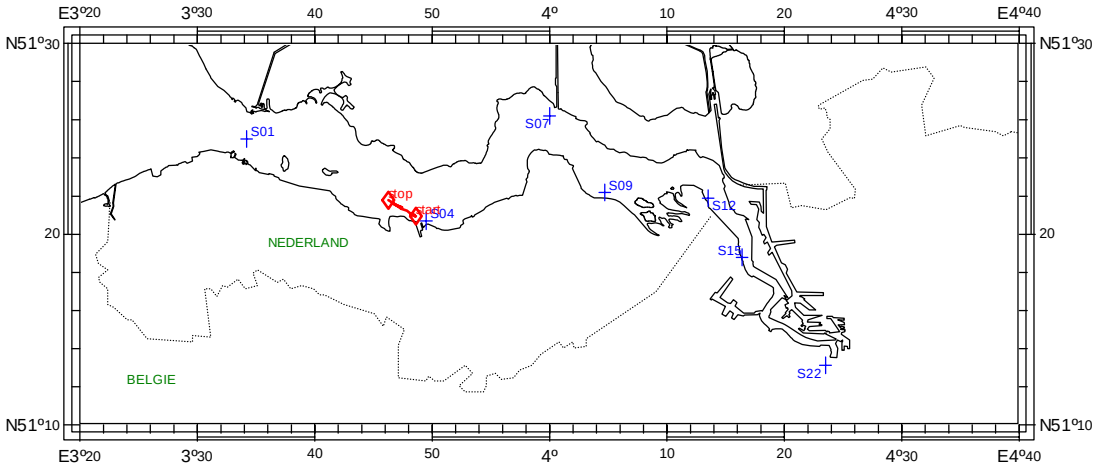


Fish track 1

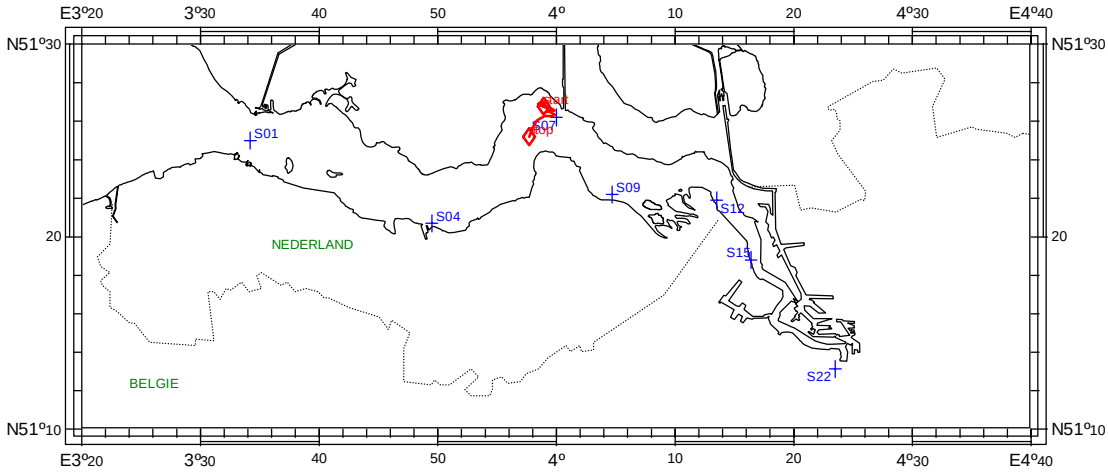


ANNEX E: Track-plots SPM-Sampling

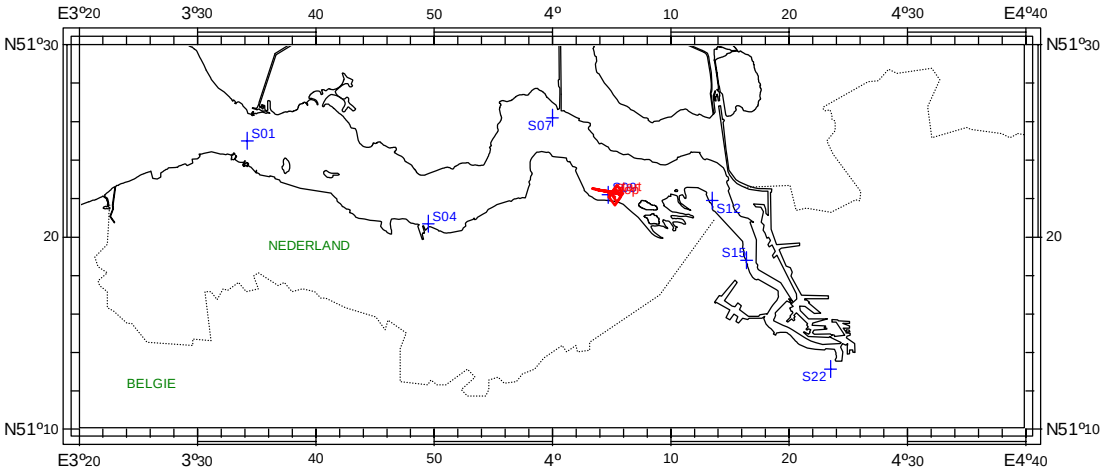
S04 – Terneuzen



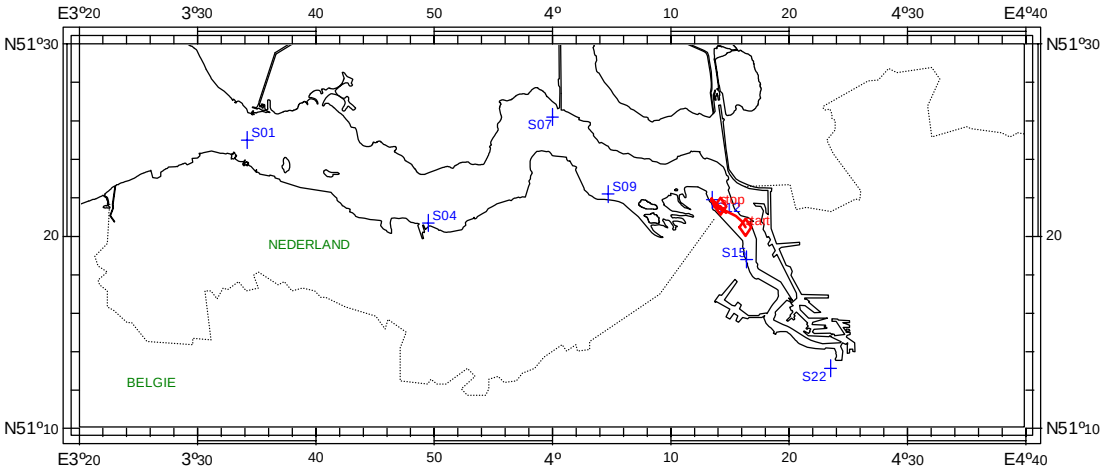
S07 – Hansweert



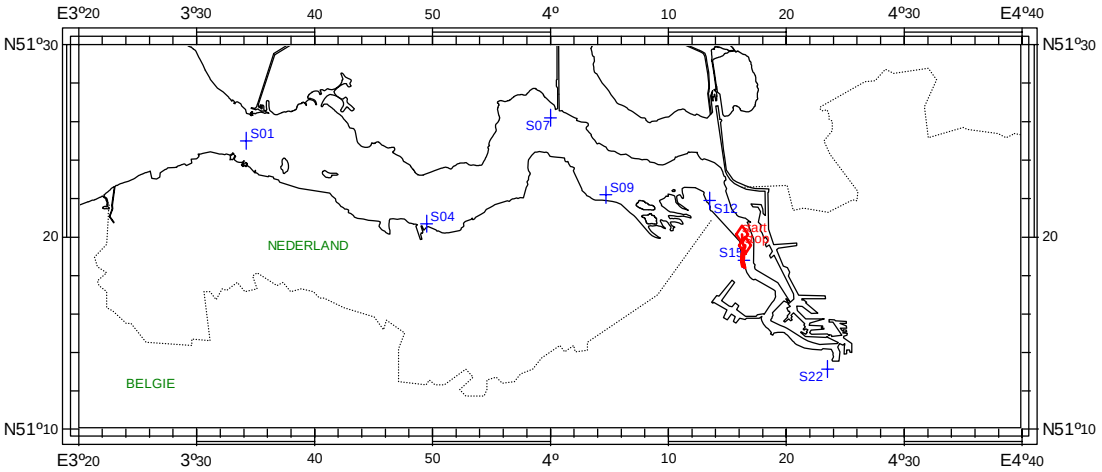
S09 – Saeftinghe



S12 – Bath



S15 – Doel



S22 – Doel