Leibniz Institute for Baltic Sea Research Warnemünde

C r u i s e R e p o r t

r/v "POSEIDON"

Cruise- No. POS488

This report is based on preliminary data

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1. **Cruise No.:** POS488

2. **Dates of the cruise:** 17.08.2015 to 04.09.2015

3. **Particulars of the research vessel:**
   Name: RV POSEIDON
   Nationality: Germany
   Operating Authority: Helmholtz Centre for Ocean Research in Kiel GEOMAR

4. **Geographical area in which ship has operated:**
   Baltic Sea

5. **Dates and names of ports of call**
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6. **Purpose of the cruise**

   1) BLUEPRINT: The project aims at establishing indicators for the environmental status of the Baltic Sea, based on the biodiversity and genetic functional profiles of microbes in seawater samples. During the cruise POS488 seawater samples for microbial community, DNA and RNA analyses will be taken with CTD from (mainly coastal) stations. In combination with the regular CTD sampling, in situ fixed water samples will be taken using the Automatic Fixation - Injection Sampler (AFIS) to generate functional microbial fingerprints from anthropogenically impacted regions. Additional to the regular sampling campaign, incubation experiments will be carried out at different stations (cities, estuaries, pristine and agricultural areas) to analyze the reaction of microorganisms to stress as an indicator for organic pollutants.

   2) MIKROMIK: The coastal zones of the Baltic Sea are strongly influenced by anthropogenic activities, which suggests, among other impacts, an inflow of microplastics via rivers, harbors and sewage treatment plants. Distinct data on the abundance, distribution and polymer composition are missing for the Baltic Sea. Further, it is yet unclear whether microplastics serve as vector for microorganisms, including pathogenic bacteria. Therefore, we will sample surface water (Manta net) and sediment (Van Veen and box grab). Back in the laboratory, we will analyze the samples regarding abundance, composition and spatial distribution of microplastic.

   3) Seawater and sediment samples will be taken from all stations to generate a broad selection of metadata (pollutants, nutrients etc) for our own datasets and for other colleagues at the IOW.

7. **Crew:**
   Name of master: Matthias Günther
   Number of crew: 15

8. **Research staff:**
   Chief scientist:

   OBERBECKMANN, Sonja Biologie IOW

   Scientists:

   BENNKE, Christin Biologie IOW

KRÜGER, Siegfried	Meßtechnik	IOW
KOWALSKI, Nicole	Chemie	IOW
LAAS, Peeter	Biologie	Tallin University of Technology
MÜLLER, Andreas	Biologie	IOW
KESY, Katharina	Biologie	IOW
MOTHES, Stephanie	Biologie	IOW
HENSLER, Christina	Biologie	IOW
STOLLBERG, Nicole	Biologie	IOW
BREZNIKAR, Anne	Biologie	IOW

Co-operating institutions:
Tallinn University of Technology

9. **Scientific equipment**

IOW CTD system #7: standard vertical CTD (vCTD), including probe body SN 09P30704-0721

IOW CTD system #1: pump CTD (pCTD) with DSL telemetry system for SD/HD video, including probe body SN 09P7807-0306

AFIS bottles

Laboratory container 20 ft.

Box corer 15x15cm

Van Veen grab 25kg

Manta trawl

10. **General remarks and preliminary result** (ca. 2 pages)

The research cruise POS488 started August 17th at 09:30 a.m. and covered the coastal areas of the central Baltic Sea, the Gulf of Riga and the Gulf of Finland. Additional stations were sampled in the Gulf of Bothnia and the basins of the Baltic Sea. In total, 35 stations (34 different locations) were sampled (Appendix Figure 1). One station (MP3) was sampled twice due to bad weather during the first sampling. The first station (TF0046) served as test station where all equipment and devices were deployed and tested. The research cruise ended September 4th at 10:00 a.m.

Cruise POS488 is essential for the implementation of two projects:

(1) BONUS project “Biological lenses using gene prints” (BLUEPRINT)

Abstract:

Sustainable management practice of the Baltic Sea depends on a fundamental knowledge and definition of this ecosystem, enabling a prediction of its ecological status and balance for decades to come. Current descriptors in Baltic Sea monitoring to assess biologically driven processes are largely focusing on structural components and might not be fully suitable for this demand. A general understanding exists that new indicators representing distinct biogeochemical processes are necessary, but those indicators remain undeveloped. The complex aquatic nutrient biogeochemistry is mainly driven by bacterioplankton and it seems mandatory that microbial descriptors improve Baltic biogeochemistry models and environmental indicators applied by HELCOM. In consequence, through combined experimentation and in situ analyses, this project will advance accordant knowledge based on the identification of key functional genes or general genetic metagenomic/-transcriptomic fingerprints determining distinct pelagic nutrient fluxes. The overarching goal is to link distinct genetic BLUEPRINTs with specific environmental conditions in the Baltic Sea. On this basis, novel and sensitive indicators of environmental status will be developed and their practical applicability will be demonstrated.

During the cruise POS488 mainly coastal and highly anthropogenically impacted stations were sampled, while during the cruise AL439 (2014) mainly the centrally located stations along the salinity gradient were sampled for the project. In combination with the regular CTD sampling, in situ fixed water samples were successfully taken using the new version of the Automatic Fixation - Injection Sampler (AFIS). Additional incubation experiments were carried out at six stations (cities, estuaries, pristine and agricultural areas) to analyse the reaction of microorganisms to stress (addition of H_2O_2) as an indicator for organic pollutants. Samples were stored for further laboratory analyses (e.g. sequencing)

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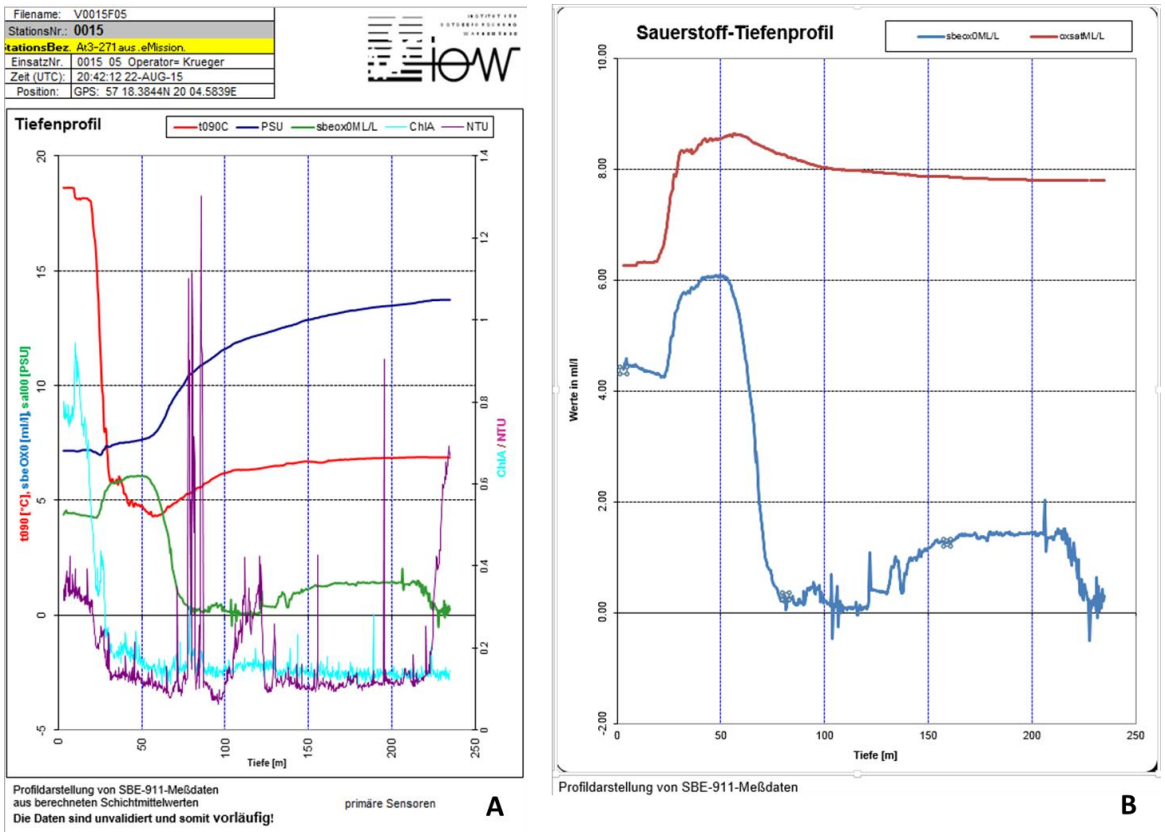

Figure 1. (**A**) CTD profile (preliminary, needs validation) from Gotland Basin (station At3-271) with special emphasis on (**B**) oxygen concentration.

The saltwater inflow in December 2014 brought oxygen even to the deeper layers of the Baltic Sea, which was displayed in the CTD profiles, e.g. at the sampling station in the Gotland Basin (At3-271, Figure 1). The Landsort Deep, however, was still measured to be anoxic during our sampling. At the Gotland Basin, besides the regular CTD sampling, a high-resolution profile for nutrient and flow cytometer analyses was taken using the pump function of the CTD.

The guest scientist Peeter Laas from Tallinn University of Technology was testing a new method for DNA extraction and did on-board flow cytometer analysis (Accuri C6, Becton Dickinson) from surface layer samples. The abundances of non-pigmented bacteria were determined by using Sybr Green I DNA stain. The resulting microbial abundances varied distinctly between stations (Figure 2).

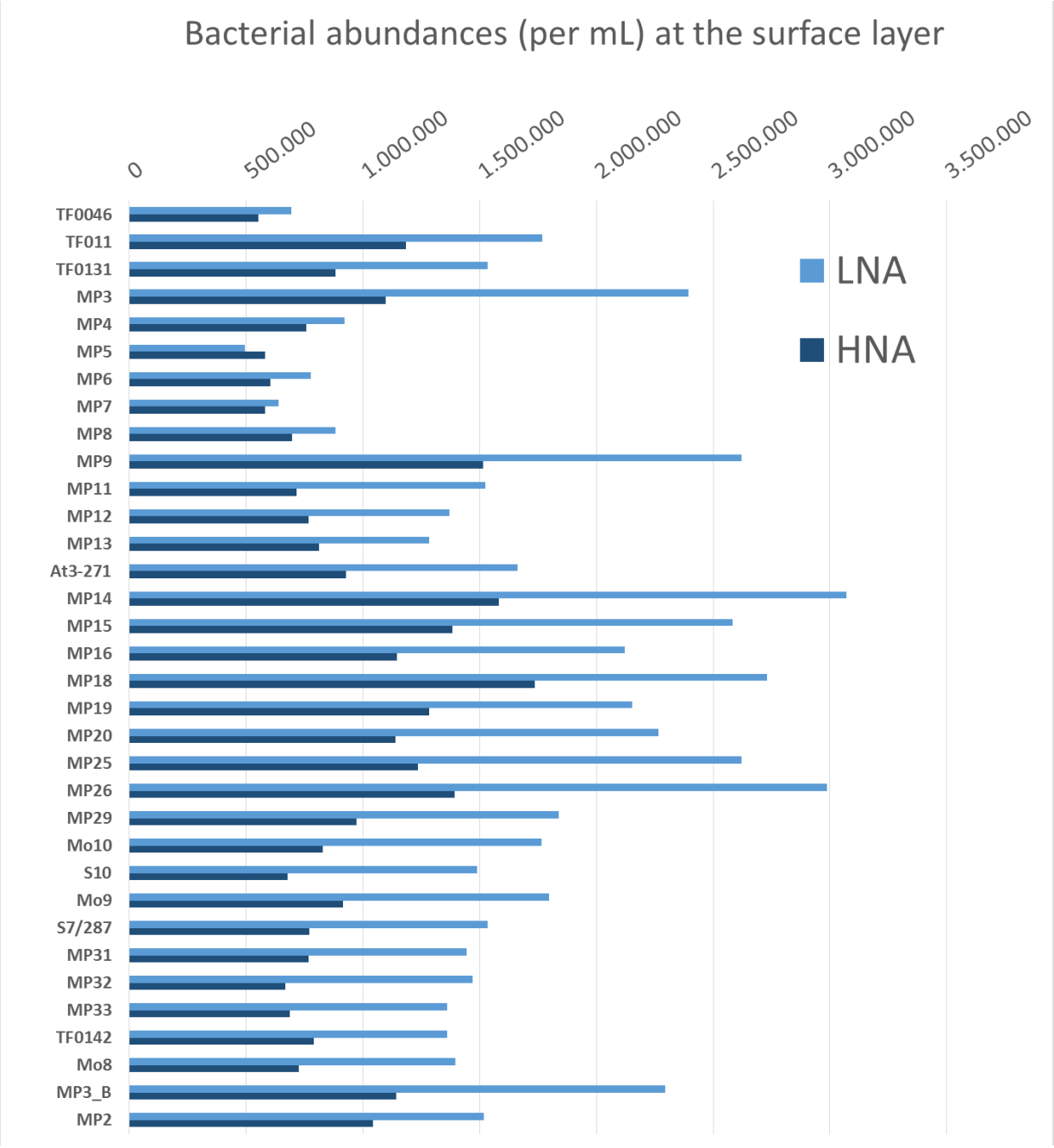

Figure 2. Abundances of bacteria determined via flow cytometer. Bacteria were discriminated into two groups based on their DNA content: low nucleic acid (LNA) and high nucleic acid (HNA). Displayed samples were collected from 1 - 3 m depth.

(2) Leibniz project "Microplastic as vector for microbial populations in the ecosystem of the Baltic Sea" (MikrOMIK)

Abstract:
The severe accumulation of microplastic (plastic particles <5mm) in the marine environment has been recognized by the scientific community, but its ecological consequences are not fully understood. Only rough estimations of the abundance and distribution of microplastic in the Baltic Sea exist, and nothing is known about the interaction between microplastic and microorganisms in this ecosystem. Our project is aiming at a comprehensive analysis of microplastic in the Baltic Sea, focusing on the microbial populations colonizing the plastic particles. MikrOMIK milestones are:

(I) A first-time analysis of the distribution, potential sources and sinks of microplastic in the Baltic Sea.

(II) The determination of the role of microplastic as substrate for specific microbial populations and their functions.

(III) The assessment of health risks for the littoral states of the Baltic Sea, emanating from microplastic as a vector for pathogenic microorganisms.

During POS488 surface water was sampled to identify potential sources for microplastic pollution (e.g. river mouths, harbours, cities). To get information on potential microplastic sinks, sediment was sampled as well. Most visible plastic particles and fibres were found close to large cities and river mouths, more pristine sampling sites did not display visible microplastic. Further spectroscopic analysis, however, will give more detailed information on abundance, distribution and composition of microplastic, including the smaller (<1mm) fractions.

Figure 3. Image from manta trawl catch at Kalmarsund (station MP32).

Besides microplastic detection, the microbial colonisation of plastic particles was a central research topic of the cruise. Particles and fibres from field sampling were collected and stored for further microbial analysis in order to identify and visualise the biofilm members. Further, an incubation experiment was carried with surface water as well as sediment from 10 sampling stations to investigate the biofilm formation under controlled conditions.

Appendix: Map and list of stations including measured nutrient concentrations

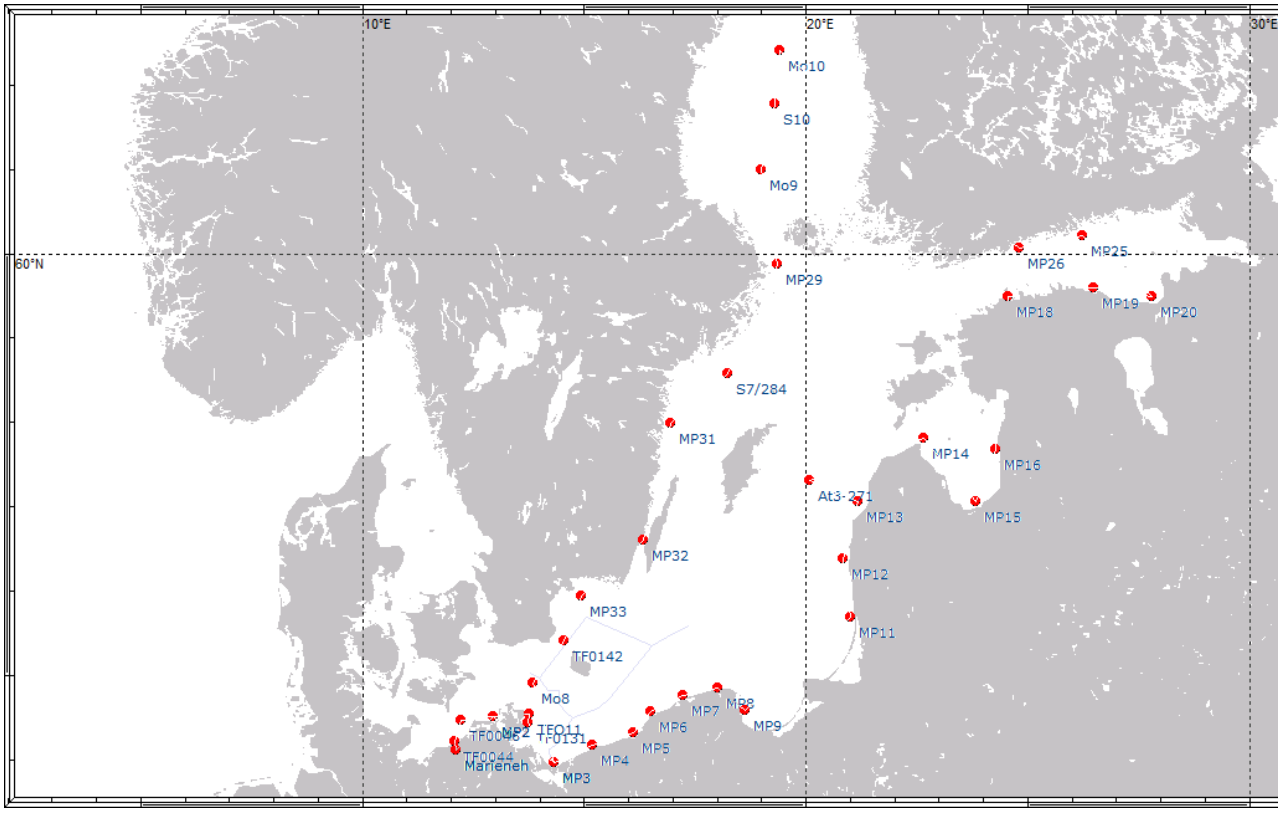

Figure 1. Cruise track of RV POSEIDON (POS488). The red dots indicate the sampling stations, with name label in blue. Marienehe was the start and end point, no sampling station. The circuit route started eastwards. Map was generated using the software eMission.

Table 1: List of stations and preliminary nutrient data

Datum	Station	CTD-Cast	Proben	Tiefe	PO_4	NO_2	NO_3	NH_4	O_2	O_2	Silikat
				m	µmol/ℓ	µmol/ℓ	µmol/ℓ	µmol/ℓ	ml/ℓ	µmol/ℓ	
17.08.2015	**TF0046**	V0002F02	Nährstoffe	3.2	0.14	0.05	0.07	0.12		0.00	10.98
				19.6	0.89	0.26	1.92	0.99		0.00	26.37
										0.00	
17.08.2015	**TF0046**	V0002F03	Kati	5.3	0.24	0.06	0.00	0.13		0.00	11.35
				18.5	0.69	0.28	2.33	1.00		0.00	27.58
										0.00	
18.08.2015	**TFO11**	V0003F01	Nährstoffe	4.4	0.29	0.08	0.42	-0.17	5.885	262.82	13.77
				13.1	0.71	0.14	0.49	0.00	5.388	240.63	14.93
				17.9	0.84	0.13	0.38	-0.28	5.328	237.95	13.63
18.08.2015	**TF0131**	V0004F01	Nährstoffe	3.3	0.45	0.08	0.00	-0.04	6.052	270.28	18.19
				19.8	0.71	0.24	0.22	-0.01	5.165	230.67	17.35
18.08.2015	**MP3**	V0005F01	Kati	2.9	0.64	0.16	0.00	0.17	5.893	263.18	21.26
				7.9	0.68	0.18	0.00	0.16	5.880	262.60	21.26
18.08.2015	**MP3**	V0005F02	Nährstoffe	3.0	0.57	0.16	0.00	0.12	5.746	256.62	21.07
19.08.2015	**MP4**	P0006F01	Nährstoffe	2.2	0.59	0.04	0.00	-0.02	6.306	281.63	14.47
19.08.2015	**MP5**	V0007F01	Kati	1.8	0.66	0.08	0.00	-0.02	6.257	279.44	14.37
				12.5	0.73	0.14	0.33	-0.07	6.015	268.63	14.60
19.08.2015	**MP5**	P0007F02	AFIS 1	1.8	0.63	0.07	0.00	-0.15	6.229	278.19	14.33
19.08.2015	**MP5**	P0007F03	AFIS 2	6.6	0.70	0.10	0.00	-0.11	6.136	274.03	14.47
				13.2	0.82	0.14	0.23	-0.12	5.961	266.22	14.84
19.08.2015	**MP6**	V0008F01	Kati	3.5	0.61	0.06	5.78	-0.01	6.524	291.36	14.79
				18.7	0.75	0.09	7.89	0.09	6.102	272.52	14.14
19.08.2015	**MP6**	P0008F02	AFIS	2.7	0.49	0.06	0.00	0.06	6.539	292.03	14.70
				18.5	0.78	0.10	0.58	0.03	6.133	273.90	14.09
20.08.2015	**MP7**	P0009F01	Sonja	1.9	0.75	0.09	0.35	0.07	6.626	295.92	14.51
20.08.2015	**MP7**	P0009F02	AFIS	1.6	0.63	0.09	0.30	0.07	6.619	295.60	14.56
				17.1	0.80	0.12	2.87	0.03	6.074	271.26	15.49
20.08.2015	**MP8**	P0010F01		1.9	0.38	0.05	0.00	0.16	7.205	321.78	13.58
20.08.2015	**MP8**	P0010F02	AFIS	1.7	0.35	0.06	0.00	0.03	7.250	323.79	13.44
				14.6	1.15	0.17	4.54	0.58	4.860	217.05	20.84
20.08.2015	**MP8**	P0010F03		7.0	0.87	0.18	1.71	0.07	6.072	271.18	16.51
20.08.2015	**MP9**	P0011F01	incubation	1.9	0.31	0.15	0.00	0.25	6.248	279.04	18.65
									6.276	280.29	
									6.246	278.95	
20.08.2015	**MP9**	V0011F02	Kati	2.1	0.35	0.13	0.00	0.18	6.223	277.92	18.79
				26.1	1.01	0.13	4.76	0.33	5.562	248.40	21.91
20.08.2015	**MP9**	P0011F03	AFIS	1.6	0.23	0.12	0.00	0.35	6.202	276.98	18.00
									6.214	277.52	
									6.203	277.03	
				21.2	0.96	0.18	3.65	3.10	4.440	198.29	27.95
									4.405	196.73	
									4.409	196.91	
				23.5	0.85	0.07	3.63	5.42	5.968	266.53	17.40
									5.972	266.71	
									5.967	266.49	
21.08.2015	**MP11**	V0012F01	Kati	1.4	0.12	0.06	0.02	0.17	6.486	289.66	8.79
				25.8	0.87	0.19	2.94	3.53	4.258	190.16	21.58
21.08.2015	**MP11**	P0012F02	AFIS 1	18.4	0.31	0.15	1.18	2.61	4.430	197.84	13.91
				23.5	0.87	0.17	2.53	3.13	4.454	198.92	20.23
21.08.2015	**MP11**	P0012F03	AFIS 2	1.8	0.31	0.11	0.00	0.13	6.571	293.46	8.47
				13.3	0.19	0.06	0.00	0.11	6.183	276.13	7.02
21.08.2015	**MP12**	P0013F01	AFIS 1	14.3	0.21	0.16	1.30	2.01	4.687	209.32	13.02
				19.4	0.52	0.28	2.68	4.49	3.916	174.89	17.12
21.08.2015	**MP12**	P0013F02	AFIS 2	2.1	0.12	0.08	0.00	0.08	6.461	288.55	8.09
22.08.2015	**MP13**	P0014F01	AFIS 1	12.0	0.66	0.12	1.43	-0.07	5.149	229.95	14.09
				27.7	0.85	0.19	2.98	0.35	5.591	249.69	14.88
22.08.2015	**MP13**	P0014F02	AFIS 2	2.0	0.16	0.05	0.00	0.04	6.821	304.63	14.14
				5.7	0.23	0.04	0.00	0.00	6.366	284.31	14.56
				28.4					5.540	247.42	
22.08.2015	**At3-271**	P0015F02	Pump-CTD	69.9	0.47	0.42	11.94	-0.08	1.322	59.04	38.42
				150.0	1.81	0.42	6.62	-0.07	0.990	44.21	42.14
		P0015F03		115.1	2.96	0.46	11.26		0.060	2.68	50.88
				179.9	1.67	0.43	11.68	-0.08	1.320	58.95	41.02
				232.0	2.18	0.47	15.88	0.08	0.400	17.86	47.77

Table 1 (continued): List of stations and preliminary nutrient data

Datum	Station	CTD-Cast	Proben	Tiefe	PO_4	NO_2	NO_3	NH_4	O_2	O_2	Silikat
				m	µmol/ℓ	µmol/ℓ	µmol/ℓ	µmol/ℓ	ml/ℓ	µmol/ℓ	
22.08.2015	At3-271	P0015F04	AFIS	1.7	0.14	0.04	1.50	-0.01	0.080	3.57	9.95
				44.9	0.75	0.11	2.20	-0.03		0.00	14.14
				70.1					1.200	53.59	
				80.2	2.63	0.10	1.75	2.51	0.080	3.57	48.56
22.08.2015	At3-271	V0015F05	Kati	2.0	0.21	0.04	1.50	-0.01	6.691	298.82	9.91
				234.7	2.58	0.07	13.58	0.04	0.380	16.97	47.53
23.08.2015	MP14	P0016F01	AFIS 1	13.1	0.02	0.06	0.00	0.17	5.078	226.78	17.12
				23.6	0.14	0.11	0.00	0.33	4.530	202.31	20.60
23.08.2015	MP14	P0016F02	AFIS 2	1.7	0.09	0.07	0.00	0.07	6.583	294.00	14.98
				9.7	0.12	0.07	0.00	0.24	5.169	230.85	19.53
				17.9	0.61	0.14	0.08	1.33	4.443	198.42	25.81
23.08.2015	MP15	P0017F01		1.9	0.14	0.09	0.00	0.65	6.762	301.99	10.14
									6.756	301.72	
									6.765	302.12	
24.08.2015	MP15	P0017F02	AFIS	1.7	0.02	0.08	0.00	0.06	6.572	293.51	10.14
									6.590	294.31	
									6.572	293.51	
				13.6	0.52	0.07	6.36	0.04	4.858	216.96	16.51
									4.884	218.12	
									4.878	217.85	
				22.3	1.36	0.24	12.67	0.18	2.763	123.40	47.16
									2.759	123.22	
									2.748	122.73	
24.08.2015	MP16	P0018F01	AFIS	1.4	0.12	0.10	0.00	0.06	6.019	268.81	13.91
				5.0	0.31	0.10	0.00	0.16	6.380	284.93	15.77
				15.8	1.17	0.32	9.90	0.69	2.041	91.15	46.60
24.08.2015	MP16	V0018F02	Kati	1.6	0.07	0.07	0.00	2.01	6.576	293.68	12.00
				16.4	1.20	0.30	10.00	2.59	1.998	89.23	47.02
25.08.2015	MP18	P0019F01	AFIS 1	29.8	0.98	0.13	5.12	1.82	6.561	293.01	17.65
				35.0	1.45	0.17	7.85	2.37	6.201	276.94	22.44
25.08.2015	MP18	P0019F02	AFIS 2	1.8	0.14	0.06	0.00	-0.08	6.796	303.51	6.29
				19.8	0.61	0.14	1.03	-0.07	6.083	271.67	14.79
26.08.2015	MP19	P0020F01	AFIS	2.1	0.05	0.07	0.00	-0.03	6.292	281.00	7.93
				18.8	1.07	0.20	3.00	3.28	4.691	209.50	19.39
26.08.2015	MP19	P0020F02		12.2	0.98	0.16	2.92	2.72	4.778	213.39	18.45
				14.6	1.07	0.17	3.10	3.01	4.723	210.93	19.86
26.08.2015	MP20	P0021F01	AFIS	2.3	-0.02	0.09	0.01	-0.07	6.635	296.32	4.41
									6.619	295.60	
									6.615	295.43	
26.08.2015	MP20	P0021F02	AFIS	19.3	0.23	2.09	0.00	1.81	5.280	235.80	8.69
				31.1	2.14	1.16	4.41	2.00	3.963	176.99	33.47
26.08.2015	MP20	V0021F03	Kati	2.4	0.05	0.84	0.00	-0.03	6.463	288.64	5.63
				30.8	1.72	1.06	4.00	1.98	4.131	184.49	30.85
26.08.2015	MP20	P0021F04	AFIS	1.9	0.07	0.83	0.00	0.16	6.347	283.46	5.26
				11.8	0.00	0.76	0.00	0.08	5.453	243.53	5.87
27.08.2015	MP25	P0022F01		1.7	0.09	0.06	0.00	-0.04	6.520	291.18	5.21
				26.2	0.65	0.13	0.69	1.37	5.126	228.93	13.90
27.08.2015	MP25	P0022F02		12.7	0.09	0.04	0.00	0.57	5.940	265.28	6.81
				17.4	0.12	0.06	0.03	0.97	5.580	249.20	8.69
27.08.2015	MP26	P0023F01		16.1	0.19	0.69	0.00	0.49	6.664	297.61	11.31
				29.7	1.14	1.07	0.00	4.74	2.778	124.07	28.31
27.08.2015	MP26	P0023F02		8.0	0.54	0.06	0.00	0.04	6.517	291.05	9.11
27.08.2015	MP26	V0023F03	Kati	1.8	0.65	0.10	0.00	0.01	7.133	318.56	9.01
				30.6	1.63	0.34	0.32	5.49	2.621	117.05	29.62
27.08.2015	MP26	P0023F04		2.1	0.68	0.10	0.00	0.11	7.122	318.07	9.20
28.08.2015	MP29	P0024F01		1.5	-0.02	0.05	0.00	-0.11	6.654	297.17	8.12
28.08.2015	MP29	P0024F02		1.3	-0.05	0.03	0.16	-0.01	6.582	293.95	7.84
				27.7	0.37	0.06	0.35	-0.05	6.675	298.11	12.11
				49.3	0.54	0.03	1.73	-0.08	7.662	342.18	14.69
29.08.2015	Mo10	P0025F01		1.6	-0.02	0.02	0.00	0.13	6.619	295.60	7.61
				54.8	0.14	0.00	0.66	0.24	8.407	375.46	10.19
				86.6	1.38	0.22	5.00	0.57	5.363	239.51	40.14

Table 1 (continued): List of stations and preliminary nutrient data

Datum	Station	CTD-Cast	Proben	Tiefe	PO_4	NO_2	NO_3	NH_4	O_2	O_2	Silikat
				m	µmol/ℓ	µmol/ℓ	µmol/ℓ	µmol/ℓ	ml/ℓ	µmol/ℓ	
30.08.2015	**S10**	P0026F01		1.5	0.00	0.02	0.00	0.08	6.521	291.23	8.26
				36.3	0.16	0.03	0.16	-0.12	7.964	355.67	8.17
				53.7	0.70	0.14	2.44	0.13	7.132	318.52	22.11
30.08.2015	**Mo9**	P0027F01		73.6	0.75	0.02	4.11	0.84	7.365	328.92	25.55
				86.3	1.19	0.13	5.52	1.33	6.181	276.04	36.35
30.08.2015	**Mo9**	P0027F02		39.9	0.19	0.02	4.37	0.95	8.372	373.89	6.16
				68.2	0.89	0.04	11.57	1.03	5.454	243.58	43.98
				1.3	0.07	0.04	3.91	1.12	6.633	296.23	7.58
31.08.2015	**S7/284**	V0028F01		1.6	0.14	0.04	0.00	0.01	6.666	297.70	7.63
				46.7	0.79	0.03	2.17	-0.07	7.630	340.76	16.64
				204.1	3.43	0.02		5.79	0.869	38.81	49.34
				68.5	2.52	0.03	4.05	-0.03	0.510	22.78	40.33
				279.9	3.53	0.01		5.89		0.00	29.91
				382.5	3.57	0.03		6.32		0.00	48.86
				434.5	3.69	0.04		6.38		0.00	50.76
										0.00	
31.08.2015	**S7/284**	P0028F02		68.6	2.24	0.05	8.02	-0.11	0.210	9.38	46.02
				280.0	3.41	0.03		5.81		0.00	50.47
				75.8	3.81	0.05		4.35		0.00	43.65
31.08.2015	**S7/284**	P0028F03		1.5	0.16	0.04	0.00	0.53	6.803	303.82	6.49
				6.3	0.14	0.06	0.00	0.47	6.745	301.23	7.54
				46.1	0.91	0.00	2.37	0.49	7.515	335.62	17.63
01.09.2015	**MP31**	P0029F01		1.9	0.05	0.04	0.00	-0.05	6.645	296.77	9.38
				26.1	0.40	0.22	0.00	-0.07	6.404	286.00	11.80
01.09.2015	**MP32**	P0030F01		1.7	0.35	0.07	0.00	0.08	6.356	283.86	11.23
01.09.2015	**MP32**	P0030F02		1.6	0.35	0.08	0.00	0.81	6.364	284.22	11.33
				11.7	0.35	0.07	0.00	0.95	6.162	275.19	11.85
02.09.2015	**MP33**	P0031F01		2.4	0.23	0.03	0.00	-0.01	6.379	284.89	11.90
				19.0	0.39	0.07	0.56	1.16	5.755	257.02	13.95
02.09.2015	**TF0142**	P0032F01		42.4	1.52	0.43	3.92	-0.05	4.297	191.90	20.90
				56.4	1.96	0.44	8.22	-0.01	1.377	61.50	50.00
02.09.2015	**TF0142**	P0032F02		2.3	0.18	0.04	0.00	0.05	6.419	286.67	11.71
				26.1	0.28	0.03	0.00	0.28	5.960	266.17	11.62
				36.0	0.67	0.46	0.75	0.28	5.691	254.16	14.81
02.09.2015	**Mo8**	P0033F01		6.9					6.380	284.93	
									6.381	284.98	
									6.404	286.00	
				40.1					4.247	189.67	
									4.196	187.39	
									4.285	191.37	
				37.8	1.64	0.29	1.45	2.01	3.955	176.63	21.57
				43.9	4.41	0.15	5.01	2.58	1.780	79.49	42.62
02.09.2015	**Mo8**	P0033F02		2.1	0.21	0.24	0.00	-0.11	6.371	284.53	12.14
				20.8	0.30	0.24	0.00	0.03	6.203	277.03	11.76
03.09.2015	**MP3/2**	P0034F01		1.8	0.95	0.08	0.00	0.07	5.940	265.28	34.24
				7.0	0.58	0.06	0.00	0.01	5.894	263.23	21.43
03.09.2015	**MP2**	P0035F01		3.0	0.44	0.04	0.00	0.01	6.441	287.66	9.95
				6.9	0.37	0.05	0.00	0.04	6.504	290.47	10.67

Table 2 Latitude and longitude of stations

Name	Latitude	Longitude
TF0044	54.215000	12.085000
TF0046	54.466667	12.216667
TFO11	54.535000	13.770000
TF0131	54.441667	13.726667
MP3	53.959413	14.321717
MP4	54.175990	15.178599
MP5	54.315963	16.117413
MP6	54.568598	16.487071
MP7	54.759781	17.238122
MP8	54.851959	18.000909
MP9	54.582254	18.628740
MP11	55.684971	21.012564
MP12	56.381424	20.833758
MP13	57.060807	21.159640
At3-271	57.305700	20.078200
MP14	57.811883	22.644150
MP15	57.053979	23.821663
MP16	57.682152	24.263514
MP18	59.491564	24.567290
MP19	59.590569	26.498973
MP20	59.494978	27.795674
MP25	60.218742	26.245966
MP26	60.065113	24.803262
Mo10	62.416700	19.416700
S10	61.783100	19.294000
Mo9	61.000000	19.000000
MP29	59.874270	19.359096
S7/284	58.583100	18.232900
MP31	57.987358	16.949195
MP32	56.597401	16.324512
MP33	55.938610	14.933174
TF0142	55.405000	14.536667
Mo8	54.913333	13.838333
MP3	53.959413	14.321717
MP2	54.507096	12.954820