Baltic Sea Research Institute

Warnemünde

Report

Cruise No. 44/97/16

R/V "A.v.Humboldt"

Monitoring Cruise
23 October to 9 November 1997

Kiel Bight to northern Gotland Basin

This report is based on preliminary data

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Warnemünde, 11.11.1997

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R/V "A.v.Humboldt"

The fifth monitoring cruise in the frame of HELCOM/BMP/CMP performed by the Baltic Sea Research Institute Warnemünde in 1997 was carried out with r/v "A.v.Humboldt" between October 23rd and November 9th, 1997.

Scientific staff participating:

Chief scientist:	R.Feistel
Participants:	G.Schenkel
	W.Hub
	H.Will
	B.Wachs
	A.-M.Welz
	K.Ziervogel
	C.Küchenmeister
	B.Schneider (30.10.-9.11.)
	I.Peterson (30.10.-9.11.)
	G.Lehnert
	C.Peters (23.10.-30.10.)
	P.Martin (23.10.-30.10.)
Master:	G.Herzig
Port of call:	Saßnitz (29.-30.10.)

The area under investigation covered the Baltic Sea between Kiel Bight and the northern Gotland Basin as shown in the station maps attached. Marine meteorological, hydrographic, marine chemical and biological investigations were performed according to both the Baltic Monitoring (BMP) and the Coastal Monitoring Programmes (CMP) of HELCOM. Additionally, measurements of the CO2 budget have been done by water sampling in the eastern Gotland region.

In the first part of the cruise, from Kiel Bight to Bornholm Basin, an extended high was located over central Europe and lows were slowly passing over northern Scandinavia. Correspondingly, westerly winds prevailed with speeds between 7 and 15 m/s and mostly cloudy skies. Surface water temperature was between 10 and 8°C, air temperature dropped from 10°C to 3°C. Over the second part, from Gdansk Bight to north of Gotland, alternating high and low pressure influence caused winds of 12-17 m/s from North East over West to South West. Surface water was between 8 and 6°C, air had temperatures between 1 and 4°C with temporary snow showers. Two typical weather maps showing these situations, from October 29th and November 5th respectively, are attached to this report.

The hydrographic, hydrochemical and hydrobiological parameters which have been observed during the cruise near to surface and near to sea floor in the area under investigation are listed

in the table attached. Hydrographic overview sections of temperature, salinity and oxygen from Kiel Bight to NE Gotland basin are attached as well.

In the eastern Gotland Basin, all stations show H_2S already below 130 m depth. Thus anoxic conditions have extended compared to measurements in August, where the oxic/anoxic interface was at about 150 m depth. This continuous trend already observed on 1996 monitoring cruises is maintained this way.

A remarkable structure was observed in the Bornholm Basin. The section looks like a circulating current with warm, saline, oxygen-rich cores (12°C, 17 PSU, 2ml/l) at the NW and SE flanks, and a colder, fresher, and anoxic "dome" of central water at station BMP 200 (6°C,16 PSU, H_2S smell). Comparison with previous monitoring observations shows that the Bornholm Basin reveals anoxic properties with high variability in distribution and intensity.

The Landsort Deep exhibits constant conditions, almost no oxygen, but also no trace of H_2S.

Dr.R.Feistel
Scientist in charge

Physical and chemical properties observed near surface and near bottom

Station Date	Label Number	Press dbar	Temp °C	Salin PSU	NO_{23} µmol/l	PO_4 µmol/l	SiO_4 µmol/l	O_2 ml/l
Kiel Bight	361	1	11.18	17.88	0.81	0.58	12.74	6.28
24.10.97	0007	25	12.62	21.25	1.99	0.93	19.59	4.94
Mecklenburg Bight	012	1	10.28	14.13	0.09	0.23	9.98	7.05
24.10.97	0010	23	12.98	19.49	1.32	1.28	25.59	4.30
Lübeck Bight	023	2	10.96	17.14	0.16	0.33	9.58	6.97
23.10.97	0002	21	13.13	19.04	1.10	1.69	28.23	4.06
Arkona Basin	113	2	9.94	8.09	0.16	0.24	10.06	7.26
25.10.97	0031	46	14.49	18.81	7.45	1.82	31.82	3.21
Pomeranian Bight	162	2	9.03	8.54	0.84	0.17	12.41	7.43
27.10.97	0053	14	9.22	8.64	0.74	0.14	11.57	7.33
Bornholm Deep	213	4	9.61	7.43	0.36	0.25	9.28	7.24
26.10.97	0041	88	10.64	15.28	10.59	2.27	37.90	2.04
Stolpe Furrow	222	3	11.51	7.60	0.67	0.05	10.50	6.98
26.10.97	0044	87	10.40	14.35	8.42	1.34	29.67	2.85
Gdansk Basin	233	1	8.48	10.05	0.55	0.15	8.28	7.40
31.10.97	0072	106	5.70	10.42	10.03	1.82	36.24	2.24
SE Gotland Basin	259	2	8.80	7.08	0.20	0.11	7.35	7.49
31.10.97	0074	88	5.64	10.91	10.40	2.16	35.15	2.11
Gotland Deep	271	2	7.87	6.93	0.74	0.18	7.47	7.67
03.11.97	0094	234	5.29	12.10	0.00	6.60	68.85	-2.19
Farö Deep	286	1	7.47	6.68	0.95	0.19	7.14	7.76
04.11.97	0112	175	5.04	11.48	0.00	4.15	57.20	-1.02
NE Gotland Basin	280	1	6.30	6.60	0.72	0.23	6.14	8.01
05.11.97	0116	115	4.31	9.89	11.25	4.25	46.93	0.44
Landsort Deep	284	2	6.89	6.42	1.01	0.26	7.34	7.88
06.11.97	0119	432	4.59	10.38	12.65	3.45	44.81	0.40
Karlsö Deep	245	1	6.78	6.79	0.23	0.20	7.76	7.84
06.11.97	0122	109	4.35	9.42	11.47	3.40	50.09	0.25