

POLISH POLAR RESEARCH (POLO POLARIRES.) POLSKIE PADANIA POLARNE	6	1—2	7—19	1985
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Stanisław RAKUSA-SUSZCZEWSKI¹⁾ and Maciej LIPSKI¹⁾

¹⁾ Department of Polar Research, Institute of Ecology, Polish Academy of Sciences, Dziekanów Leśny, 05-092 Łomianki, Poland.

Report on the r/v “Profesor Siedlecki” expedition to the Antarctic during the BIOMASS-SIBEX, in 1983/1984^{*)}.

Scientific expedition of the r/v “Profesor Siedlecki” to the Antarctic in the summer 1983/1984 was organized by the Polish Academy of Sciences on the basis of government Decision No 46/82 of 5 March 1982 “About the conuuation of polar research”.

The cruise was financed by the Institute of Ecology, Polish Academy of Sciences (PAS), and the r/v “Profesor Siedlecki” was chartered from the Sea Fisheries Institute. Mr. R. Ludwig was the captain of the vessel.

The main purpose of the expedition was to participate in the execution of the Antarctic BIOMASS-SIBEX programme and also to make of fisheries survey. Dr. P. Bykowski of the Sea Fisheries Institute in Gdynia was responsible for the fisheries survey.

The following people participated in the programme:

1. Prof. Dr. S. Rakusa-Suszewski — Institute of Ecology, PAS
2. H. Czykieta — Sea Fisheries Institute
3. Dr. M. Godlewska — Institute of Ecology, PAS
4. A. Grelowski — Sea Fisheries Institute
5. Dr. J. Kalinowski — Sea Fisheries Institute
6. Dr. W. Kittel — University of Łódź
7. Dr. Z. Klusek — Institute of Oceanology, PAS
8. Dr. E. Kopczyńska — Institute of Ecology, PAS
9. A. Kunicki — Sea Fisheries Institute
10. Dr. R. Ligowski — University of Łódź
11. M. Lipski — Institute of Ecology, PAS
12. Dr. A. Łukowski — University of Warsaw

* This research was a part of the MR-I-29A Project and was supported by a grant from the Polish Academy of Sciences.

13. T. Matuszak — Sea Fisheries Institute
14. W. Starck — Institute of Ecology, PAS
15. Dr. J. Szeliga — University of Gdańsk
16. W. Ślósarczyk — Sea Fisheries Institute
17. R. Tokarczyk — Institute of Ecology, PAS
18. Dr. Z. Witek — Sea Fisheries Institute
19. Dr. M. Zdanowski — Institute of Ecology, PAS
20. Dr. M. Żmijewska — University of Gdańsk

The general objectives of SIBEX for all countries participating in this research programme in the region of the West Antarctic have been prepared by the SCAR Group of Specialists on Southern Ocean Ecosystems and their Living Resources. Thus, the Polish expedition carried out a part of the international programme, the performance of which has been planned for two summer seasons 1983/84 and 1984/85. The investigations have been planned for all participants for one research area which included the Bransfield Strait and the southern part of the Drake Passage.

Detailed research proposals have been prepared by Prof. S. Rakusa-Suszczewski of the Institute of Ecology, PAS, Dziekanów Leśny, Poland and by Prof. G. Hempel of the Alfred Wegener Institut für Polarforschung, Bremerhaven, West Germany. Some modifications of the location of hydrology transects have been made by Dr. M. Stein of the Institut für Seefischerei, Hamburg.

Polish SIBEX works carried out on board of the r/v "Profesor Siedlecki" in December 1983—January 1984 were preceded directly in November 1983 by the German expedition of the r/v "Polarstern". After Poland's participation in SIBEX, the investigations were continued by the Brazilian r/v "Profesor Besnard". Dr. M. Godlewska of the Institute of Ecology PAS did hydroacoustic works with the Brazilians.

According to the adapted programme, the research was carried out in the Bransfield Strait east of the Anvers Island to 54°S (sector A, Fig. 1) and in the Drake Passage along the northern side of the South Shetland Islands (sector B). The works began on 21 December 1983 west of the Elephant Island (station 51, Table I). On 26 December 1983 they were continued in sector A east of the Anvers Island and were ended on 3 January 1984 with a transect along 54°S. In the days 4—7 January 1984 investigations were done on the only krill swarm found during the cruise in the area of the Elephant Island.

Generally all the works along the obligatory transects have been completed; in addition to that two non-obligatory transects were done as well as a number of stations not included in the BIOMASS-SIBEX programme (such as stations 147, 148, 149, 164). During the fisheries survey performed in the first part of the cruise additional investigations were carried out on 23 biologic and oceanographical stations. The most interesting locations

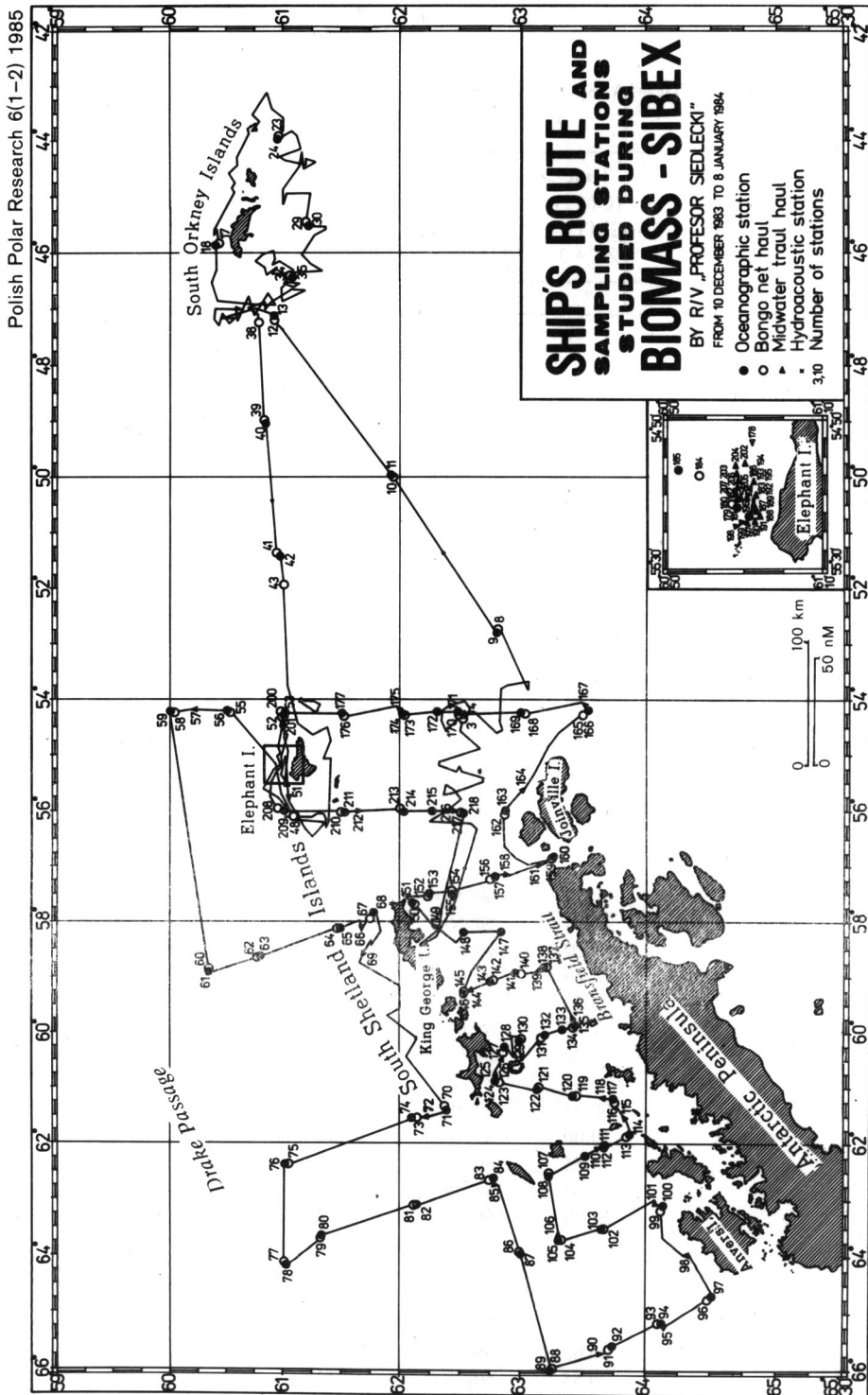


Table I.

Stations studied during BIOMASS-SIBEX expedition by the r/v "Profesor Siedlecki" (December 1983 — January 1984)

Station number	Date	Time (GMT) GMT = ZT + 3	Position		Depth (m)	Kind of activity
			Latitude S	Longitude W		
1	2	3	4	5	6	7
3.	10.12.83	11.20	62°30,3'	54°21,3'	371	Bongo haul — (BH)
4.	„	12.52	62°30,9'	54°16,2'	376	Oceanographic station — (OS)
8.	11.12.83	10.52	62°48,1'	52°46,1'	2000	BH
9.	„	11.20	62°47,4'	52°48,6'	2250	OS
10.	„	23.55	61°55,7'	50°00,7'	3430	BH
11.	12.12.83	01.35	61°54,7'	49°58,3'	3430	OS
12.	„	12.30	60°54,8'	47°12,2'	1100	BH
13.	„	13.40	60°54,2'	47°06,8'	678	OS
17.	13.12.83	20.02	60°26,0'	45°51,1'	250	BH
18.	„	22.10	60°24,5'	45°52,5'	333	OS
23.	14.12.83	23.40	60°57,0'	43°55,5'	270	BH
24.	15.12.83	00.30	60°56,5'	43°58,3'	260	OS
29.	„	23.10	61°11,1'	45°27,9'	271	BH
30.	16.12.83	00.30	61°12,0'	45°31,7'	276	OS
34.	17.12.83	00.50	61°03,3'	46°24,5'	243	BH
35.	„	01.28	61°04,4'	46°25,6'	248	OS
38.	„	15.45	60°46,9'	47°14,6'	1300	BH
39.	„	23.05	60°49,4'	48°59,9'	1160	BH
40.	18.12.83	00.10	60°50,4'	49°03,3'	1150	OS
41.	„	11.05	60°56,5'	51°22,4'	1350	BH
42.	„	14.20	60°58,3'	51°25,7'	1300	OS
43.	„	15.50	61°00,1'	51°46,5'	1100	BH
48.	19.12.83	23.20	61°04,5'	56°06,1'	520	BH
51.	21.12.83	01.45	61°02,8'	55°48,0'	110	Midwater trawl haul —
		02.30	61°02,8'	55°42,5'		MTH
52.	21.12.83	08.56	60°59,4'	54°18,8'	536	BH
53.	„	10.00	61°00,4'	54°14,3'	600	OS
54.	„	14.55	60°59,1'	55°13,0'	210	MTH
		16.35	60°59,9'	55°09,5'		MTH
55.	„	21.50	60°31,2'	54°14,2'	3080	BH
56.	„	22.30	60°30,5'	54°12,9'	3080	OS
57.	22.12.83	01.50	60°13,9'	54°12,0'	2800	MTH
		02.20	60°12,2'	54°12,5'		MTH
58.	„	04.10	60°01,5'	54°15,6'	3150	BH
59.	„	06.00	59°59,8'	54°14,3'	3080	OS
60.	„	20.55	60°20,0'	58°51,8'	3500	BH

1	2	3	4	5	6	7
61.	22.12.83	22.00	60°20,1'	58°55,5'	3500	OS
62.	23.12.83	02.33	60°46,3'	58°38,5'	3500	BH
63.	"	03.40	60°48,1'	58°37,8'	3500	OS
64.	"	09.20	61°27,6'	58°07,8'	800	BH
65.	"	10.20	61°29,0'	58°07,7'	718	OS
66.	"	14.05	61°39,5'	58°01,1'	310	MTH
		15.10	61°39,3'	58°09,4'		
67.	"	16.30	61°43,7'	57°57,1'	315	BH
68.	"	17.40	61°45,1'	57°50,6'	307	OS
69.	24.12.83	01.25	61°40,6'	58°33,0'	292	MTH
		02.20	61°39,9'	58°37,7'	342	
70.	"	14.50	62°21,4'	61°19,8'	453	BH
71.	"	15.56	62°22,6'	61°24,7'	343	OS
72.	"	17.50	62°13,1'	61°31,4'	1250	MTH
		18.20	62°11,4'	61°31,9'		
73.	"	19.00	62°07,8'	61°32,4'	2000	BH
74.	"	20.10	62°04,8'	61°32,2'	2350	OS
75.	25.12.83	06.35	61°02,5'	62°22,3'	3640	BH
76.	"	07.40	61°00,9'	62°23,1'	3500	OS
77.	25.12.83	14.30	61°00,3'	64°06,8'	3500	BH
78.	"	16.00	61°01,4'	64°10,0'	3500	OS
79.	"	19.15	61°19,0'	63°40,1'	3570	BH
80.	"	20.10	61°19,9'	63°39,1'	3500	OS
81.	26.12.83	03.30	62°06,8'	63°05,3'	3750	BH
82.	"	04.50	62°07,3'	63°05,9'	3700	OS
83.	"	09.55	62°44,9'	62°38,4'	418	BH
84.	"	10.40	62°46,4'	62°36,6'	418	OS
85.	"	11.55	62°46,1'	62°39,6'	410	MTH
		12.25	62°40,8'	62°43,1'	460	
86.	"	16.45	62°59,3'	63°54,9'	2250	BH
87.	"	17.30	62°59,6'	63°57,3'	2570	OS
88.	27.12.83	01.50	63°19,7'	65°58,5'	3150	BH
89.	"	03.30	63°19,2'	66°00,6'	3160	OS
90.	"	06.10	63°37,3'	65°43,1'	3100	MTH
		06.40	63°39,3'	65°42,6'		
91.	"	07.30	63°42,4'	65°37,4'	1460	BH
92.	"	08.20	63°44,2'	65°35,7'	423	OS
93.	"	12.35	64°05,5'	65°10,5'	525	BH
94.	"	13.30	64°07,4'	65°11,1'	530	OS
95.	"	15.45	64°08,3'	65°10,9'	520	MTH
		16.05	64°07,0'	65°12,3'		
96.	"	19.20	64°28,6'	64°45,3'	300	BH
97.	"	20.10	64°30,2'	64°42,9'	386	OS
98.	"	23.35	64°19,7'	63°58,4'	360	MTH
	28.12.83	00.05	64°17,9'	63°58,2'		
99.	"	03.30	64°06,4'	63°11,2'	742	BH
100.	"	04.50	64°07,9'	63°06,1'	560	OS
101.	"	06.20	64°04,1'	63°06,0'	540	MTH
		06.50	64°03,3'	63°02,0'		

1	2	3	4	5	6	7
102.	28.12.83	10.25	63°40,1'	63°31,0'	380	BH
103.		11.20	63°38,5'	63°31,3'	389	OS
104.	„	15.00	63°19,0'	63°43,2'	291	BH
105.	„	15.40	63°18,1'	63°43,6'	307	OS
106.	„	17.20	63°17,9'	63°38,0'	292	MTH
		17.40	63°17,9'	63°39,8'		
107.	29.12.83	01.50	63°13,1'	62°33,1'	176	BH
108.	„	02.40	63°13,1'	62°34,8'	190	OS
109.	„	05.30	63°30,8'	62°12,8'	150	OS
110.	„	06.25	63°36,2'	62°05,5'	450	MTH
		06.55	63°38,0'	62°03,7'		
111.	„	07.35	63°39,5'	62°03,1'	525	BH
112.	„	08.40	63°39,5'	62°04,0'	283	OS
113.	„	11.05	63°50,4'	61°51,9'	225	BH
114.	„	11.50	63°51,2'	61°50,2'	177	OS
115.	„	14.30	63°48,9'	61°31,3'	492	MTH
		15.15	63°50,2'	61°34,2'		
116.	„	16.55	63°44,4'	61°15,6'	180	BH
117.	„	17.30	63°43,9'	61°12,2'	108	OS
118.	„	19.20	63°37,6'	61°11,6'	280	MTH
		20.20	63°41,1'	61°12,8'	127	
119.	„	22.35	63°26,0'	61°08,6'	750	BH
120.	„	23.50	63°24,5'	61°09,1'	581	OS
121.	30.12.83	02.45	63°08,0'	61°00,8'	1000	BH
122.	„	03.30	63°07,0'	61°03,4'	900	OS
123.	„	06.55	62°48,5'	60°55,1'	173	BH
124.	„	08.00	62°46,6'	60°54,0'	109	OS
125.	„	08.35	62°47,0'	60°50,8'	191	MTH
		09.05	62°47,4'	60°43,8'		
126.	„	11.10	62°49,1'	60°32,8'	387	MTH
		12.00	62°50,0'	60°26,2'	449	
127.	„	12.25	62°50,3'	60°23,1'	690	BH
128.	„	13.20	62°50,7'	60°16,8'	837	OS
129.	„	18.00	62°59,5'	60°08,4'	1000	BH
130.	„	18.50	62°59,2'	60°09,6'	933	OS
131.	31.12.83	01.40	63°09,4'	60°06,7'	723	BH
132.	„	02.30	63°10,9'	60°03,7'	803	OS
133.	„	05.20	63°19,3'	59°56,8'	555	OS
134.	„	06.20	63°24,9'	59°54,6'	170	BH
135.	„	06.50	63°25,8'	59°52,9'	155	OS
136.	„	07.50	63°25,0'	59°47,0'	142	MTH
		08.20	63°24,4'	59°43,4'		
137.	„	11.50	63°11,4'	58°49,2'	103	BH
138.	„	12.20	63°10,8'	58°49,0'	106	OS
139.	„	13.10	63°09,9'	58°49,4'	120	MTH
		13.40	63°08,1'	58°51,8'	162	
140.	„	14.50	62°59,6'	58°56,7'	456	BH
141.	„	16.00	62°56,9'	58°55,6'	630	OS
142.	„	18.25	62°45,3'	59°04,8'	1480	BH
143.	„	19.40	62°44,2'	59°06,1'	1500	OS

1	2	3	4	5	6	7
144.	31.12.83	22.00	62°33,2'	59°16,0'	1050	MTH
		22.30	62°31,5'	59°16,8'	700	
145.	„	22.50	62°31,0'	59°17,5'	650	BH
146.	01.01.84	00.30	62°30,8'	59°18,9'	533	OS
147.	„	05.30	62°49,5'	58°12,5'	622	OS
148.	„	08.30	62°30,5'	58°11,5'	1850	OS
149.	„	12.40	62°18,0'	58°07,8'	1800	MTH
		13.40	62°15,5'	58°02,9'	1600	
150.	„	15.20	62°06,0'	57°41,1'	177	BH
151.	„	15.50	62°05,1'	57°40,0'	190	OS
152.	„	18.20	62°12,7'	57°32,4'	1810	BH
153.	„	20.10	62°13,8'	57°29,5'	2000	OS
154.	„	21.45	62°24,7'	57°27,0'	1450	BH
155.	„	23.00	62°25,0'	57°30,8'	1500	OS
156.	02.01.84	03.00	62°44,6'	57°14,7'	320	BH
157.	„	04.20	62°46,7'	57°12,1'	221	OS
158.	„	05.15	62°50,4'	57°09,0'	161	MTH
		05.50	62°53,0'	57°09,7'	126	
159.	„	08.30	63°14,1'	56°51,3'	120	BH
160.	„	09.00	63°14,9'	56°49,4'	120	OS
161.	„	11.20	63°06,5'	56°58,7'	420	MTH
		11.55	63°08,8'	56°58,3'	140	
162.	„	16.40	62°50,8'	56°03,9'	385	BH
163.	„	17.30	62°51,2'	55°59,9'	316	OS
164.	„	20.20	62°59,3'	55°39,6'	91	MTH
		20.50	63°00,3'	55°36,7'	184	
165.	03.01.84	02.30	63°29,5'	54°17,5'	244	BH
166.	„	03.30	63°32,0'	54°12,8'	258	OS -
167.	„	04.30	63°31,3'	54°09,0'	247	MTH
		05.00	63°29,6'	54°06,6'	253	
168.	„	08.30	63°01,2'	54°16,4'	244	BH
169.	„	09.25	62°59,1'	54°14,5'	244	OS
170.	„	13.05	62°29,5'	54°16,2'	356	BH
171.	„	14.50	62°28,5'	54°14,1'	430	OS
172.	„	16.50	62°17,6'	54°13,0'	522	OS
173.	„	18.55	62°01,4'	54°16,1'	608	BH
174.	„	20.00	62°00,4'	54°15,0'	578	OS
175.	„	22.20	62°01,5'	54°16,4'	602	MTH
		22.55	61°59,8'	54°13,3'	531	
176.	04.01.84	02.20	61°31,0'	54°18,6'	539	BH
177.	„	04.10	61°30,2'	54°15,2'	448	OS
178.	„	10.20	61°01,0'	54°58,2'	485	MTH
		11.00	61°01,1'	54°54,0'	572	
179.	„	13.10	60°59,0'	55°16,4'	381	MTH
		14.25	60°59,0'	55°07,5'	289	
180.	„	15.30	60°58,2'	55°12,6'	287	BH
181.	„	16.20	60°59,0'	55°13,3'	328	OS
182.	„	18.30	60°59,2'	55°17,2'	360	MTH
		19.50	60°58,7'	55°07,1'	293	

1	2	3	4	5	6	7
183.	4.01.84	21.55	61°01,3'	55°13,1'	98	MTH
		22.45	61°01,3'	55°07,8'	120	
184.	05.01.84	02.00	60°54,2'	55°04,9'	2000	BH
185.	"	03.40	60°51,4'	55°03,2'	1500	OS
186.	"	10.05	61°01,0'	55°11,6'	140	MTH
		11.15	61°01,0'	55°04,0'	127	
187.	"	12.55	61°01,0'	55°18,2'	223	MTH
		13.55	61°01,0'	55°11,2'	146	
188.	"	16.10	61°00,6'	55°15,9'	278	OS
189.	"	17.00	61°00,9'	55°15,8'	255	MTH
		18.00	61°01,0'	55°10,2'	97	
190.	"	20.15	61°01,1'	55°17,4'	133	MTH
		20.40	61°01,0'	55°14,6'	123	
191.	06.01.84	00.45	61°01,3'	55°19,0'	129	MTH
		01.40	61°02,0'	55°13,0'	80	
192.	"	04.10	61°01,0'	55°11,7'	145	Hydroacoustic station — HS
193.	"	08.15	61°00,3'	55°09,9'	160	HS
194.	"	09.20	61°00,3'	55°16,8'	283	MTH
		10.30	61°00,2'	55°10,1'	195	
195.	"	12.10	61°01,5'	55°17,5'	152	MTH
		13.10	61°01,2'	55°12,8'	140	
196.	"	15.40	61°01,3'	55°15,4'	127	OS
197.	"	17.00	60°59,7'	55°16,6'	318	MTH
		18.15	61°00,9'	55°18,5'	175	
198.	"	20.20	60°58,0'	55°19,1'	260	MTH
		21.20	61°01,0'	55°16,7'	272	
199.	"	22.35	60°58,8'	55°18,1'	281	MTH
		24.00	61°01,7'	55°17,0'	103	
200.	07.01.84	04.00	60°59,2'	54°14,2'	680	BH
201.	"	04.50	61°00,2'	54°18,3'	500	OS
202.	"	10.20	61°00,3'	55°05,1'	226	MTH
		11.25	60°59,7'	54°58,5'	543	
203.	"	12.40	60°59,0'	55°07,0'	295	MTH
		13.35	60°59,2'	55°02,0'	455	
204.	"	14.25	60°59,0'	55°06,5'	293	MTH
		15.35	60°58,9'	54°59,1'	528	
205.	"	17.25	60°59,9'	55°12,5'	288	MTH
		18.20	61°00,8'	55°07,2'	113	
206.	"	19.45	60°59,4'	55°10,0'	241	MTH
		20.50	60°59,2'	55°03,0'	309	
207.	"	22.10	60°59,1'	55°12,3'	245	MTH
		23.30	60°59,2'	55°04,0'	295	
208.	08.01.84	03.50	60°56,7'	55°58,4'	800	BH
209.	"	05.00	61°00,1'	56°00,5'	590	OS
210.	"	09.45	61°29,8'	56°01,5'	221	BH
211.	"	10.30	61°32,0'	56°02,3'	388	OS
212.	"	12.00	61°37,4'	56°00,4'	680	MTH
		12.30	61°38,9'	56°00,4'	699	

1	2	3	4	5	6	7
213.	8.01.83	15.50	61°59,4'	55°57,4'	1900	BH
214.	„	17.40	62°01,0'	56°01,3'	2200	OS
215.	„	19.50	62°14,4'	56°00,2'	550	OS
216.	„	21.40	62°26,3'	56°00,7'	339	MTH
		22.10	62°27,9'	56°01,3'	360	
217.	„	22.35	62°29,5'	56°02,0'	311	BH
218.	„	23.20	62°30,6'	56°02,7'	310	OS

Station numbers that does not appear in the table correspond to the stations on which bottom trawls was done for need of fishing reconnaissance.

were on the shelf around the South Orkney Islnads. Altogether 218 research stations have been completed during the entire cruise (10 December 83 — 8 January 84), Table I.

The cruise of the r/v "Profesor Siedlecki" lasted 122 days. The trip to the Antarctic had taken 44 days, 7 days stops in ports, 12 days fisheries survey. SIBEX investigations lasted 18 days. Unloading and fueling operations — 6 days and four hours. Trip back had taken 41 days including one day of fishing and four days in ports.

1. Hydroacoustics

Hydroacoustic sounding was done continuously at ships velocity up to 9 knots. The echosounder SIMRAD EK-120 with the analog echo integrator SIMRAD QM MK II installed on board of "Profesor Siedlecki" were used for this purpose. The echosounder SIMRAD EK-38 with the frequency of 38 kHz was used for the depths 100—225 m.

This two instruments enabled thus to estimate krill swarms in the 0—200 m stratum.

Altogether the sounding records for 2049 nautical miles have been obtained. It was ascertained that during SIBEX krill occurred in relatively small quantities, especially in the Bransfield Strait. Isolated larger swarms were found north of the South Shetland Islands, and also in the vicinity of the Anvers and Elephant Islands.

2. Meteorology

Observations were made at the synoptic hours at 0, 6, 12, 18 GMT and also at different hours at the oceanography stations. The range of observations included: air temperature, atmospheric pressure, wind velocity and direction, cloudiness, ice conditions, sea state. Generally it might be stated, that the meteorology conditions during SIBEX did not differ from the average conditions observed over many years in this area.

3. Hydrology

Temperature and salinity measurements in function of depth were made with the BISSETBERMAN TSDDO model 9040, on 73 oceanography stations. Additionally, temperature readings were made every hour and surface concentrations of silicates were analysed on ship positions given by the Redifon satellite navigation equipment.

The preliminary analysis of the results suggests, that during the period of investigation the waters of the Weddell Sea were present in the south-western part of the Bransfield Strait as far as the Deception and Trinity Islands. On the other hand the waters of the Bellingshausen Sea were found in the northern part of the Bransfield Strait along the South Shetland Islands.

4. Organic compounds

Chlorophyll *a* determinations were done with the spectrophotometric method of Jeffrey and Humphrey (1975)¹ at 62 oceanographic stations. At each station water samples were taken at eight standard depths between surface and 150 meters. In addition, chlorophyll: *a* content in the nanoplankton fraction (cell size up to 20 μm) was determined at six stations.

Generally very high chlorophyll values were found, three times as large as those observed during FIBEX. Areas with the highest concentrations occurred on the shelf around the South Orkney Islands, north and south from Clarence Island, on the shelf around the Anvers and Brabant Islands and also in the northern and eastern part of shelf of the Joinville Island including the waters of the Bransfield Strait opposite to the Antarctic Sound.

Samples for the content of organic carbon were taken at standard depths 0, 10, 30, 50, 100 and 150 m at seven stations chosen at random.

Analysis for DOC were done on filtered water and for POC on seston sedimented on fiber glass filteres (Menzel-Vaccaro method 1964²); CO₂ measurement in infrared). Dissolved free aminoacids (DFAA) were determined in 72 samples according to the fluorometric method of Dawson and Liebezeit (1980)³; dissolved combined aminoacids (DCAA)

¹) Jeffrey S. W., Humphrey G. F. 1975 — New spectrophotometric equations for determining chlorophylls *a*, *b*, *c*₁ and *c*₂ in higher plants, algae and natural phytoplankton — *Biochem. Physiol. Pflanzen* (BPP), 167: 191—194.

²) Menzell D. W., Vaccaro R. F. 1964 — The measurement of dissolved organic and particulate carbon in seawater — *Limnol. Oceanogr.*, 9: 138—142.

³) Dawson R., Liebezeit G. 1980 — Dissolved free amino acids (In: *Methods of seawater analysis* Ed. K. Grasshoff) — Verlag. Chemie, 3—13.

were measured in 40 samples and particulate combined aminoacids (PCAA) in 39 samples. It was found that the DFAA content varied between 0 to 1.896 $\mu\text{m}/\text{l}$, the DCAA between 0 and 2.936 and the PCAA ranged from 0 to 3.021 $\mu\text{m}/\text{l}$.

5. Microbiology

The contents of bacteria were analysed on 72 oceanographic stations. The epifluorescence microscopy method which employs polycarbonate filteres was used to determine the general number of bacteria (TC), and the plate method was used for the counting of saprophytic bacteria. The numbers of saprophytic bacteria ranged from 1×10^2 to $4.7 \times 10^4/\text{l}$; the average quantities for the 0—150 m water column were between 0.62— $27.7 \times 10^8/\text{m}^2$. Maximal values were found in an area rich in phytoplankton north-west of the Anvers Island and at the south coast of King George Island. In an area of krill occurrence close to Elephant Island, the number of bacteria were found to be at a medium level.

6. Phytoplankton

Vertical net phytoplankton samples were obtained from the 0—100 m water stratum at 63 stations. A Copenhagen type net (opening diameter 0.5 m; mesh size 60 μm) was used for the collections. Analyses were done for wet settling volume and dry weight of suspended particulate matter and also for quantity and quality of phytoplankton species.

Highest values of wet volume and dry weight were found west of the Anvers Island and south of King George Island, while the lowest values were observed in the central part of the Bransfield Strait.

In addition to the net collections, quantitative samples of phytoplankton were taken at 8 standard depths at each oceanographic station.

7. Zooplankton

The material for analysis was obtained with two methods. Mesozooplankton was taken with the Nansen net (mesh size 200 μm) for stratum: 0—100 m, 100—300 m and 300—500 m or to the bottom, while macro-zooplankton was collected with the double-ocular Bongo net (mesh size 333 μm and 505 μm) with hauls down to about 200 meters at the ship velocity of 3 knots. Altogether the Nansen net samples were taken at 62 stations and Bongo net samples at 70 stations. In addition, at 12 stations, samples were taken which included the whole plankton from the 0—200 m layer.

Preliminary results indicate that macro-zooplankton contained mainly *Salpae* and *Euphausiaceae* and also *Copepoda* and *Chaetognatha*. With the exception of a few stations in the eastern part of the Bransfield Strait no krill larvae were found.

8. Krill biology

Krill used for the analysis was obtained mainly from the catches of the industrial net trawls (SMT 16/41 × 4) and from Bongo net hauls (mesh size 333 µm and 505 µm) down to about 200 m depth.

From each catch about 100 individuals were taken for the identification of sex, degree of maturity (according to Denys-Makarov scale) body length and gut filling (five-step scale), 53 analyses were done including 38 from a trawl catch.

The results showed that during SIBEX investigations krill occurred in small quantities and was made up of rather small size individuals. Gravid females were found to include specimens as short as 32 mm. In waters surrounding the South Shetland Islands, immature krill was observed to dominate in the Bransfield Strait, while mature krill in the Drake Passage. The highest krill catch yields were obtained on the shelf of the Elephant Island and on the northern side of King George Island. No presence of *E. superba* was noted in the central and southern parts of the Bransfield Strait.

9. Ichthyology

Large quantities of *Pleurogramma antarcticum* were found in 49 pelagic trawls (trawl net SMT 16/41 × 4) made along the Antarctic Peninsula and in the area close of Joinville Island. Specimens of post-larval stages of fishes collected both by trawls and plankton nets were preserved for further analysis in Poland.

10. Ornithology

10-minutes bird counts according to the instruction of SCAR were performed every half an hour during the day time in an area stretching south of 50°S. Altogether 150 observations were made in the strip located between 50° and 60°S, and 420 observations south of 60°S including 23 counts at oceanographic stations.

The occurrence of 31 species of birds was noted south of the latitude 50°S and 26 species south of 60°S. Greatest quantities were found in the areas close to Elephant Island, South Orkney Islands, in the north-east part of the Bransfield Strait and close to Joinville Island, and also at Palmer's Archipelago. *Daption capense* also *Pygoscelidae* and *Oceanites oceanicus* were dominant among the avifauna.

The quantities of birds in the seas south of 60°S was nearly twice as high as that observed during FIBEX in February and March 1981.

11. Cartography

Four different scale maps of the research area have been prepared for the use of all SIBEX participants. These maps will make a background for the results of all the research teams; about 40 subject maps are planned to be drawn.

Nearly 2400 depth measurement points have been marked on a 1:500 000 scale map prepared during FIBEX; this was done for a new version of bathymetric map of that region.

12. Computer work

The computer installed on board of the r/v "Profesor Siedlecki" was used for analysis of the results obtained in oceanography (programmes OCEAN and DYNAMIC), hydroacoustics and biology (programmes ZACIĄG and PROBLEM) and ichthyology (programme SUMMAR). The plotter was used in cartography for the drawing of geographical coordinates and also for the graphic representation of oceanographic results (e.g. T-S diagrams).