



Data Article

Abundance data of benthic peracarid crustaceans from the South Atlantic and Southern Ocean



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ABSTRACT

Peracarid data were collected in the Southern Ocean and South Atlantic Ocean. Sampling was performed during nine different expeditions on board of RRS *James Clark Ross* and RV *Polarstern*, using epibenthic sledges (EBS) at depth ranging between 160–6348 m at 109 locations. The correlation between environmental variables and peracarid abundance was investigated. Abundance data comprise a total of 128570 peracarids (52366 were amphipods, 28516 were cumaceans, 36142 isopods, 5676 mysidaceans and 5870 were tanaidaceans). The presented data are useful to investigate the composition and abundance patterns of peracarid orders at a wide depth range and spatial scale in the Southern

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Ocean. They can also be reused to compare their abundance with that of other taxa in broader ecological surveys.

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Specifications Table

Subject	Biodiversity
Specific subject area	Biogeography and benthic assemblage composition
Type of data	Table
How data were acquired	Abundance data were available with peer-reviewed articles and as unpublished material. Environmental variables were available from the “global environmental datasets for marine species distribution modelling” Bio-ORACLE [1,2].
Data format	Raw Analyzed
Parameters for data collection	For data collection, data had to include peracarid abundances from the Atlantic sector of the Southern Ocean and the Weddell Sea at a wide range of depth (from the continental shelf to the deep sea). Environmental variables had to be recorded at the maximum depth (benthic layers).
Description of data collection	Primary data – unpublished primary (raw) data were collected by the authors during the expedition JR144 (BIOPEARL I) [3]. Published secondary data were collected from peer-reviewed articles. When sampling locations presented standardised abundances to 1000 m haul only, raw abundances were calculated using the haul length recorded at each station. Environmental data were downloaded from Bio-ORACLE. The latter offers only data recorded at the maximum depth (benthic layers) and data recorded at the surface (surface layers); benthic layers were chosen for the study.
Data source location	Primary data sources: primary data are partly available on PANGAEA data repository (https://doi.org/10.1594/PANGAEA.811814) and on the cruise report of the expedition JR144 (BIOPEARL I) [4]. In total, BIOPEARL I comprised 26 sampling locations from depths ranging between 160 m and 1655 m, and latitudes ranging from 53° to 62° South (Table 1). Published secondary data are available in the following peer-reviewed articles: [4–9].
Data accessibility	Environmental data are available at http://www.bio-oracle.org/ .
Related research article	With the article D. Di Franco, K. Linse, H.J. Griffiths, A. Brandt, Drivers of abundance and spatial distribution in Southern Ocean peracarid Crustacea, Ecol. Indic. In Press.

Value of the Data

- Unpublished raw peracarid abundances reported in the present manuscript provide important and valuable data to the previous published datasets. These data are valuable because they come from remote areas (the Southern Ocean continental shelf and deep sea), difficult to access for logistic reasons.
- They can be useful to taxonomists and ecologists who investigate the Southern Ocean benthos and study geographical distribution patterns of benthic taxa in the Southern Hemisphere. They allow to better assess the assemblage structure and composition of peracarid orders and improve the knowledge on peracarid distribution in the Atlantic sector of the Southern Ocean.

- The comparison between peracarid abundance data and abundance data of other taxa can have further applications on broader ecological studies from the same area. Raw data from our results can also be used together with published data to investigate the influence of environmental variables on peracarid assemblage structure and composition through modelling, based on future climatic scenarios and on a larger geographic scale.

1. Data Description

The present study includes abundance data of peracarid crustaceans collected during nine different expeditions at a depth range between 160–6348 m (Table 1). Sampling was performed in the Southern Atlantic Ocean, north of the Polar Front, in the Polar Frontal Zone (the Eastern and Western Polar Front – PFE, PFW), on the continental shelf of the South Orkney Islands (SOI), off the South Sandwich Islands (SSI), in the deep Weddell Sea Abyssal Plain (DWS), on the eastern Weddell Sea continental shelf between the Filchner Trough and Kapp Norvegia (FT-KN), the East Antarctic Peninsula (EAP) on the western Weddell Sea shelf, and the West Antarctic Peninsula (WAP) in the Pacific SO sector (Table 1). The EAP includes a subdivision into the Prince Gustav Channel (PGC). A total of 109 stations were analysed, with latitudes ranging from 77° to 41° south (Table 1).

Twelve different environmental data from the Southern Ocean Weddell Sea (and South Atlantic Ocean) were obtained for each sampling location (Table 2): chlorophyll-a (mg/m³), current velocity (m·s⁻¹), oxygen concentration (mol/m³), iron (μmol/m³), nitrate (mol/m³), phosphate (mol/m³), phytoplankton biomass (μmol/m³), primary production (g/m³d⁻¹), salinity, silicate (mol/m³), temperature (°C), sea-ice concentration (expressed in fractions from 0.1 to 1, where 0.1 indicates very low concentration/absence of ice and 1 indicates a completely ice-covered area).

2. Experimental Design, Materials and Methods

Abundance data were collected from peer-reviewed articles and cruise reports of the expeditions that were performed in the Southern Ocean and South Atlantic Ocean. All acquired data are from peracarid crustaceans collected using epibenthic sledges (EBS) following the design by Brandt and Barthel [10]. The latter consists of a suprabenthic- and an epibenthic net with a mesh size of 500 mm (cod-ends of 300 mm). The sledge possesses an opening-closing mechanism, which only opens at bottom contact. Therefore, supra- and epibenthic samplers would immediately close once the gear was lifted [11].

Environmental data were downloaded as ASCII file from Bio-ORACLE. Files were loaded into the open-source software QGIS as layers and used to extract environmental data from each sampling point.

Table 1
Expeditions and stations of the analyzed EBS samples.

Area	Originalstation ID	Date	Depth	Latitude	Longitude	Amphipoda	Cumacea	Isopoda	Mysidacea	Tanaidacea
			(m)	Start - End	Start - End	Raw peracarid abundances				
Expedition JR275										
FT-KN	23	19/02/2012	654 – 656	77° 21.42'S – 77° 21.47'S	35° 21.64'W – 35° 21.90'W	285	759	372	105	16
FT-KN	40	21/02/2012	549 – 539	76° 10.01'S – 76° 09.94'S	27° 48.23'W – 27° 48.44'W	903	1057	489	328	195
FT-KN	45	22/02/2012	429 – 428	75° 45.72'S – 75° 45.85'S	30° 26.56'W – 30° 27.08'W	901	2751	1111	147	30
FT-KN	50	22/02/2012	583 – 587	75° 44.60'S – 75° 44.75'S	31° 14.77'W – 31° 15.21'W	861	2371	1224	409	120
FT-KN	78	26/02/2012	2021 – 2026	74° 24.28'S – 74° 24.39'S	28° 05.09'W – 28° 04.62'W	50	44	149	28	22
FT-KN	83	28/02/2012	1582 – 1580	74° 29.12'S – 74° 29.08'S	28° 46.48'W – 28° 47.08'W	431	1141	1076	63	410
FT-KN	89	29/02/2012	642 – 657	74° 40.30'S – 74° 40.24'S	29° 23.93'W – 29° 23.30'W	4344	318	2996	56	187
FT-KN	94	29/02/2012	478 – 491	74° 41.51'S – 74° 41.36'S	29° 29.27'W – 29° 29.05'W	1259	226	1314	14	70
FT-KN	99	01/03/2012	977 – 963	74° 38.05'S – 74° 38.14'S	29° 00.49'W – 28° 59.97'W	1218	929	1464	119	109
Expedition JR15005										
SOI	12	02/03/2016	516 – 519	61° 31.85'S – 61° 31.80'S	46° 55.89'W – 46° 56.20'W	129	39	94	7	22
SOI	18	03/03/2016	782 – 786	61° 32.20'S – 61° 32.08'S	47° 07.99'W – 47° 08.24'W	220	42	185	0	63
SOI	27	04/03/2016	1461 – 1471	61° 31.92'S – 61° 31.80'S	47° 23.49'W – 47° 23.68'W	38	4	16	0	2
SOI	34	06/03/2016	561 – 524	62° 09.61'S – 62° 09.45'S	44° 58.92'W – 44° 59.00'W	576	1	197	5	26
SOI	57	09/03/2016	798 – 835	60° 33.33'S – 60° 33.44'S	46° 30.92'W – 46° 31.12'W	2	3	2	0	2
SOI	86	12/03/2016	795 – 794	60° 13.07'S – 60° 13.11'S	46° 44.54'W – 46° 44.87'W	16	9	9	0	21
SOI	103	14/03/2016	788 – 817	60° 28.53'S – 60° 28.41'S	44° 25.38'W – 44° 25.61'W	728	90	621	16	21
SOI	115	15/03/2016	588 – 590	60° 45.16'S – 60° 45.14'S	42° 57.75'W – 42° 58.08'W	642	14	254	9	8
SOI	133	16/03/2016	527 – 521	60° 40.38'S – 60° 40.35'S	42° 30.74'W – 42° 31.02'W	1508	42	143	3	6
Expedition JR17003a										
PGC	5	01/03/2018	1079 – 1081	63° 34.47'S – 63° 34.51'S	57° 17.08'W – 57° 17.41'W	150	49	37	78	200
PGC	34	04/03/2018	843 – 850	64° 07.70'S – 64° 07.64'S	58° 30.31'W – 58° 29.96'W	345	586	71	164	43
PGC	35	05/03/2018	787 – 727	64° 02.86'S – 64° 02.95'S	58° 27.71'W – 58° 28.01'W	881	2745	612	174	99
PGC	47	06/03/2018	874 – 872	63° 48.44'S – 63° 48.57'S	58° 04.12'W – 58° 04.34'W	3606	2126	754	33	285
PGC	53	07/03/2018	470 – 445	63° 36.97'S – 63° 37.00'S	57° 30.23'W – 57° 30.40'W	255	79	89	234	107
Expedition PS118										
EAP	6-5	05/03/2019	432 – 433	64° 58.43'S – 64° 58.60'S	57° 47.20'W – 57° 48.24'W	230	157	259	64	58
EAP	6-6	05/03/2019	438 – 438	64° 58.25'S – 64° 58.35'S	57° 47.89'W – 57° 48.63'W	45	26	33	16	5

(continued on next page)

Table 1 (continued)

Area	Originalstation ID	Date	Depth	Latitude	Longitude	Amphipoda	Cumacea	Isopoda	Mysidacea	Tanaidacea
			(m)	Start - End	Start - End	Raw peracarid abundances				
EAP	9-5	12/03/2019	403 – 401	64° 01.18'S – 64° 01.35'S	55° 54.08'W – 55° 54.90'W	1291	661	1238	284	812
EAP	12-7	14/03/2019	445 – 444	63° 49.40'S – 63° 49.48'S	55° 40.67'W – 55° 40.21'W	742	3284	2617	204	69
EAP	38-9	22/03/2019	428 – 427	63° 03.79'S – 63° 03.92'S	54° 18.56'W – 54° 18.75'W	218	22	8	291	24
Expedition ANDEEP I										
WAP	41-3	26/01/2002	2370	59° 22.24'S – 59° 22.57'S	60° 04.06'W – 60° 04.05'W	108	34	217	10	10
WAP	42-2	27/01/2002	3689	59° 40.30'S – 59° 40.32'S	57° 35.42'W – 57° 35.64'W	548	477	906	19	110
WAP	43-8	03/02/2002	3962	60° 27.13'S – 60° 27.19'S	56° 05.12'W – 56° 04.81'W	225	77	196	0	29
WAP	46-7	30/01/2002	3894	60° 38.33'S – 60° 38.06'S	53° 57.38'W – 53° 57.51'W	3090	2707	1449	158	203
WAP	99-4	12/02/2002	5191	61° 06.40'S – 61° 06.40'S	59° 16.57'W – 59° 17.61'W	11	5	32	0	5
WAP	105-7	12/02/2002	2308	61° 24.16'S – 61° 24.25'S	58° 51.56'W – 58° 51.56'W	26	9	6	3	0
WAP	114-4	17/02/2002	2921	61° 43.54'S – 61° 43.51'S	60° 44.21'W – 60° 44.43'W	94	85	448	13	18
WAP	129-2	22/02/2002	3640	59° 52.21'S – 59° 52.20'S	59° 58.75'W – 59° 58.63'W	94	41	90	4	24
Expedition ANDEEP II										
EAP	131-3	05/03/2002	3053	65° 19.83'S – 65° 19.99'S	51° 31.61'W – 51° 31.23'W	419	64	917	36	25
EAP	132-2	06/03/2002	2086	65° 17.75'S – 65° 17.62'S	53° 22.81'W – 53° 22.86'W	33	3	33	15	0
EAP	133-3	07/02/2002	1121	65° 20.17'S – 65° 20.08'S	54° 14.30'W – 54° 14.34'W	321	547	742	13	75
DWS	134-3	09/03/2002	4069	65° 19.20'S – 65° 19.05'S	48° 03.77'W – 48° 02.92'W	23	14	50	0	5
DWS	135-4	10/03/2002	4678	65° 00.05'S – 65° 59.97'S	43° 03.02'W – 43° 00.82'W	31	11	413	3	8
DWS	136-4	12/03/2002	4747	64° 01.54'S – 64° 01.51'S	39° 06.88'W – 39° 06.88'W	5	5	37	0	5
DWS	137-4	14/03/2002	4976	63° 44.98'S – 63° 44.74'S	38° 47.75'W – 38° 48.23'W	18	5	69	0	9
DWS	138-6	17/03/2002	4542	62° 58.08'S – 62° 57.99'S	27° 54.10'W – 27° 54.28'W	75	8	191	0	17
SSI	139-6	20/03/2002	3950	58° 14.10'S – 58° 14.15'S	24° 21.20'W – 24° 21.21'W	19	26	65	0	6
SSI	140-8	21/03/2002	2970	58° 15.98'S – 58° 16.28'S	24° 53.73'W – 24° 54.09'W	92	71	138	0	54
SSI	141-10	23/03/2002	2312	58° 25.07'S – 58° 24.63'S	24° 00.78'W – 24° 00.74'W	229	93	37	37	28
SSI	142-6	24/03/2002	6348	58° 50.78'S – 58° 50.44'S	23° 57.75'W – 23° 57.59'W	0	0	0	0	0
SSI	143-1	25/03/2002	774	58° 44.69'S – 58° 44.45'S	25° 10.28'W – 25° 10.66'W	190	13	58	9	13
Expedition ANDEEP III										
SAO	16-10	26/01/2005	4720	41° 07.55'S – 41° 07.020S	09° 55.94'E – 09° 54.85'E	90	58	224	3	22
SAO	21-7	29/01/2005	4577	47° 39.87'S – 47° 38.520S	04° 15.79'E – 04° 14.94'E	15	12	70	0	6
FT-KN	74-6	20/02/2005	1032	71° 18.42'S – 71° 18.330S	13° 58 .21'W – 13° 57.65'W	1057	984	738	31	392

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Table 1 (continued)

Area	Originalstation ID	Date	Depth	Latitude	Longitude	Amphipoda	Cumacea	Isopoda	Mysidacea	Tanaidacea
			(m)	Start - End	Start - End	Raw peracarid abundances				
FT-KN	78-9	22/02/2005	2149	71° 09.52'S – 71° 09.340S	14° 00.76'W – 13° 58.85'W	416	642	411	19	78
FT-KN	80-9	23/02/2005	3100	70° 38.45'S – 70° 39.180S	14° 42.86'W – 14° 43.43'W	516	158	615	11	27
FT-KN	81-8	24/02/2005	4382	70° 31.08'S – 70° 32.230S	14° 34.82'W – 14° 34.90'W	194	50	376	3	94
DWS	88-8	27/02/2005	4931	68° 03.84'S – 68° 03.640S	20° 31.39'W – 20° 27.49'W	94	21	269	0	31
DWS	94-14	02/03/2005	4891	66° 39.08'S – 66° 37.160S	27° 09.26'W – 27° 10.13'W	70	7	90	0	3
DWS	102-3	06/03/2005	4801	65° 33.18'S – 65° 34.320S	36° 33.24'W – 36° 31.05'W	20	3	92	0	7
DWS	110-8	10/03/2005	4695	64° 59.20'S – 64° 00.910S	43° 02.05'W – 43° 02.10'W	55	15	499	3	23
EAP	121-11	14/03/2005	2659	63° 38.27'S – 63° 37.310S	50° 37.16'W – 50° 38.04'W	323	109	375	8	88
EAP	133-2	16/03/2005	1584	62° 46.73'S – 62° 46.330S	53° 02.57'W – 53° 04.14'W	7602	88	2842	7	196
EAP	142-5	18/03/2005	3405	62° 11.36'S – 62° 11.360S	49° 27.62'W – 49° 29.57'W	99	36	92	0	2
SOI	150-6	20/03/2005	1984	61° 49.13'S – 61° 48.520S	47° 27.51'W – 47° 28.16'W	270	113	312	24	28
SOI	151-7	21/03/2005	1183	61° 45.67'S – 61° 45.420S	47° 07.19'W – 47° 08.07'W	394	47	109	17	40
WAP	152-6	23/03/2005	1998	62° 20.64'S – 62° 19.910S	57° 53.12'W – 57° 53.68'W	2	0	6	0	2
WAP	153-7	29/03/2005	2096	63° 19.82'S – 63° 19.180S	64° 36.44'W – 64° 37.53'W	266	152	215	6	72
WAP	154-9	30/03/2005	3803	62° 32.52'S – 62° 31.310S	64° 39.45'W – 64° 38.66'W	109	53	25	0	20
Expedition BIOPEARL I										
PFW	FT-EBS-1	27/02/2006	193 – 194	54° 18.90'S – 54° 18.82'S	56° 40.92'W – 56° 41.17'W	9	0	5	0	0
WAP	LI-EBS-1	03/03/2006	1455 – 1502	62° 16.54'S – 62° 16.42'S	61° 35.82'W – 61° 36.06'W	0	2	0	0	0
WAP	LI-EBS-3	04/03/2006	557 – 624	62° 23.73'S – 62° 23.70'S	61° 46.25'W – 61° 46.60'W	12	4	6	0	6
WAP	LI-EBS-4	04/03/2006	189 – 191	62° 31.52'S – 62° 31.52'S	61° 49.86'W – 61° 50.21'W	63	14	20	5	6
WAP	DI-EBS-1	05/03/2006	160 – 160	62° 56.81'S – 62° 56.95'S	60° 39.38'W – 60° 39.18'W	1473	3	81	1644	0
WAP	EI-EBS-1	12/03/2006	1490 – 1503	61° 36.72'S – 61° 36.84'S	55° 13.05'W – 55° 13.31'W	100	21	161	10	93
WAP	EI-EBS-2	04/03/2006	1000 – 1000	61° 34.38'S – 61° 34.44'S	55° 14.55'W – 55° 14.88'W	216	98	219	12	43
WAP	EI-EBS-3	04/03/2006	493 – 491	61° 23.14'S – 61° 23.19'S	55° 11.66'W – 55° 11.99'W	80	0	8	2	0
WAP	EI-EBS-4	04/03/2006	199 – 204	61° 20.13'S – 61° 20.18'S	55° 12.23'W – 55° 12.54'W	2475	155	402	108	9
WAP	EI-EBS-5	14/03/2006	544 – 521	60° 58.20'S – 60° 58.34'S	55° 57.88'W – 55° 57.99'W	13	0	0	0	0
SOI	PB-EBS-1	17/03/2006	1638 – 1655	61° 02.06'S – 61° 01.89'S	46° 57.35'W – 46° 57.35'W	20	17	20	5	6
SOI	PB-EBS-2	17/03/2006	967 – 1027	61° 02.03'S – 61° 01.87'S	46° 52.01'W – 46° 52.00'W	2	0	0	0	0
SOI	PB-EBS-3	18/03/2006	505 – 506	60° 59.44'S – 60° 59.60'S	46° 49.91'W – 46° 49.91'W	486	132	608	35	97

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Table 1 (continued)

Area	Original station ID	Date	Depth	Latitude	Longitude	Amphipoda	Cumacea	Isopoda	Mysidacea	Tanaidacea
			(m)	Start - End	Start - End	Raw peracarid abundances				
SOI	PB-EBS-4	18/03/2006	201 – 211	60° 49.31'S – 60° 49.45'S	46° 29.10'W – 46° 28.94'W	750	95	250	91	27
SSI	ST-EBS-1	28/03/2006	1569 – 1580	59° 31.40'S – 59° 31.46'S	27° 27.97'W – 27° 28.25'W	3	1	2	0	5
SSI	ST-EBS-2	28/03/2006	1007 – 1040	59° 30.42'S – 59° 30.40'S	27° 18.16'W – 27° 18.47'W	0	0	5	0	16
SSI	ST-EBS-3a	27/03/2006	518 – 544	59° 28.85'S – 59° 28.85'S	27° 16.69'W – 27° 17.01'W	3	0	12	0	21
SSI	ST-EBS-3b	28/03/2006	501 – 507	59° 28.80'S – 59° 28.80'S	27° 17.35'W – 27° 17.67'W	11	1	12	0	55
SSI	ST-EBS-4	27/03/2006	294 – 305	59° 28.23'S – 59° 28.28'S	27° 16.57'W – 27° 16.88'W	1418	50	196	9	318
PFW	SG-EBS-2	06/04/2006	988 – 971	53° 34.59'S – 53° 34.59'S	37° 53.11'W – 37° 53.37'W	62	4	5	0	2
PFW	SG-EBS-3	05/04/2006	496 – 477	53° 35.85'S – 53° 35.85'S	37° 54.18'W – 37° 54.47'W	575	232	516	39	4
PFW	SG-EBS-4	05/04/2006	221 – 221	53° 36.66'S – 53° 36.66'S	37° 53.10'W – 37° 53.37'W	360	150	325	25	3
PFW	SG-EBS-5	09/04/2006	316 – 315	53° 47.37'S – 53° 47.27'S	37° 58.68'W – 37° 58.88'W	122	4	5	251	3
PFW	SR-EBS-4	11/04/2006	203 – 201	53° 37.68'S – 53° 37.60'S	40° 54.46'W – 40° 54.69'W	2279	13	600	0	31
PFW	SR-EBS-5	12/04/2006	501 – 505	53° 19.27'S – 53° 19.27'S	42° 14.05'W – 42° 13.79'W	293	6	222	16	31
PFW	SR-EBS-6	12/04/2006	1016 – 1027	53° 15.19'S – 53° 15.19'S	42° 08.63'W – 42° 08.89'W	22	0	14	0	7
Expedition ANT XV/3-EASIZ II										
FT-KN	48-171	12/02/1998	231 – 231	74° 31.72'S – 74° 31.87'S	27° 12.80'W – 27° 13.18'W	666	254	211	27	17
FT-KN	48-111	06/02/1998	397 – 397	73° 38.32'S – 73° 38.43'S	22° 11.61'W – 22° 12.23'W	476	89	194	44	19
FT-KN	48-107	06/02/1998	934 – 924	73° 34.77'S – 73° 34.92'S	22° 38.29'W – 22° 38.89'W	310	350	269	10	80
FT-KN	48-142	10/02/1998	1573 – 1535	74° 36.13'S – 74° 36.30'S	27° 16.13'W – 27° 15.50'W	140	45	276	4	11
FT-KN	48-089	04/02/1998	1639 – 1633	73° 27.26'S – 73° 27.27'S	22° 45.67'W – 22° 46.52'W	200	111	271	11	45
FT-KN	48-130	08/02/1998	1982 – 1973	73° 23.99'S – 73° 23.83'S	22° 08.24'W – 22° 08.65'W	349	98	35	13	2
FT-KN	48-272	26/02/1998	2076 – 2003	71° 28.8'S – 71° 29.0'S	15° 10.4'W – 15° 10.3'W	102	92	34	0	31
FT-KN	48-133	09/02/1998	2043 – 2029	74° 31.72'S – 74° 1.87'S	27° 12.80'W – 27° 13.18'W	56	9	40	8	2
Expedition SYSTCO										
PFE	81-17	20/01/2012	3744 – 3763	52° 0.18'S – 10° 0.72'E	51° 59.61'S – 9° 59.10'E	12	0	12	4	4
PFE	81-18	20/01/2012	3706 – 3757	52° 0.36'S – 10° 1.47'E	51° 59.89'S – 9° 59.55'E	24	0	81	0	24
PFE	84-25	23/01/2012	4327 – 4046	53° 0.89'S – 10° 3.55'E	53° 0.22'S – 10° 2.12'E	18	5	41	0	9
PFE	85-15	27/01/2012	2736 – 2732	52° 0.23'S – 8° 0.48'W	52° 0.56'S – 8° 0.55'W	18	8	26	0	10
PFE	86-20	31/01/2012	3935 – 3959	51° 59.83'S – 12° 3.17'W	51° 59.58'S – 12° 4.13'W	4	4	4	0	4
PFE	86-24	01/02/2012	3934 – 3994	52° 0.07'S – 12° 2.94'W	51° 59.21'S – 12° 4.52'W	22	26	48	0	13
PFE	86-25	01/02/2012	3936 – 3945	52° 0.49'S – 12° 2.05'W	51° 59.31'S – 12° 3.70'W	5	5	18	0	9

Table 2

Bio-ORACLE environmental variables for each station. Abbreviations: Chl-a = chlorophyll-a; Cv = current velocity; O2 = oxygen; Fe = iron; PO4 = phosphate; Phy = phytoplankton; PP = primary productivity; Sal = salinity; SiO4 = silicate; T = temperature; Ice = sea-ice concentration.

Area	OriginalstationID	Chl-a	Cv	O2	Fe	NO3	PO4	Phy	PP	Sal	SiO4	T	Ice
	Expedition JR275												
FT-KN	23	0.0231	0.0129	318.8007	0.0010	30.6439	2.1523	0.0618	0.0043	34.6804	90.6264	-1.3667	0.6986
FT-KN	40	0.0367	0.0490	281.5575	0.0005	31.7545	2.2068	0.1017	0.0078	34.5287	101.4170	-0.3774	0.4562
FT-KN	45	0.0323	0.0132	311.5363	0.0010	30.9466	2.1669	0.0866	0.0018	34.5439	92.7902	-1.2677	0.7664
FT-KN	50	0.0193	0.0068	315.8773	0.0013	30.7393	2.1630	0.0517	0.0017	34.6520	92.1030	-1.2402	0.8009
FT-KN	78	0.0139	0.0163	254.5854	0.0004	32.5347	2.2639	0.0412	0.0038	34.6659	117.3688	0.7451	0.7322
FT-KN	83	0.0156	0.0230	255.4485	0.0004	32.4478	2.2560	0.0456	0.0037	34.6706	115.7917	1.0104	0.7449
FT-KN	89	0.0334	0.0433	278.4321	0.0005	31.8212	2.2103	0.0927	0.0031	34.6300	102.5980	0.0482	0.7589
FT-KN	94	0.0335	0.0438	278.6671	0.0005	31.8162	2.2100	0.0930	0.0030	34.6050	102.3797	0.0321	0.7626
FT-KN	99	0.0207	0.0310	260.5658	0.0004	32.2475	2.2394	0.0592	0.0035	34.6821	111.3769	1.2234	0.7471
	Expedition JR15005												
SOI	12	0.0122	0.0098	258.6483	0.0005	32.1626	2.2369	0.0332	0.0021	34.6734	107.0041	1.0194	0.3336
SOI	18	0.0113	0.0090	258.6371	0.0005	32.2507	2.2443	0.0317	0.0021	34.6505	109.5758	0.9001	0.3295
SOI	27	0.0101	0.0524	257.2589	0.0005	32.4694	2.2636	0.0299	0.0022	34.6471	115.9241	0.1412	0.3309
SOI	34	0.0130	0.0100	262.7820	0.0006	32.1268	2.2351	0.0346	0.0018	34.6814	106.3767	1.0371	0.4087
SOI	57	0.0091	0.0453	243.4282	0.0005	32.4047	2.2535	0.0269	0.0032	34.6870	111.9271	0.8336	0.1995
SOI	86	0.0080	0.0325	240.5603	0.0004	32.5058	2.2629	0.0249	0.0028	34.6706	115.3983	0.5165	0.1515
SOI	103	0.0086	0.0539	250.5930	0.0004	32.5655	2.2705	0.0263	0.0027	34.6498	117.1581	0.2032	0.1683
SOI	115	0.0102	0.0872	250.3204	0.0005	32.3557	2.2505	0.0291	0.0019	34.6803	110.9865	0.8584	0.2691
SOI	133	0.0087	0.0532	253.3008	0.0004	32.5896	2.2733	0.0266	0.0020	34.6560	118.4082	-0.0109	0.2653
	Expedition JR17003a												
PGC	5	0.0094	0.0549	246.6989	0.0006	32.2379	2.2461	0.0274	0.0133	34.6823	114.6415	0.4620	0.2689
PGC	34	0.0084	0.0330	236.0333	0.0005	32.3353	2.2468	0.0259	0.0089	34.7072	113.2353	0.7026	0.4710
PGC	35	0.0078	0.0330	234.8699	0.0005	32.3618	2.2506	0.0247	0.0116	34.7023	116.4606	0.7496	0.3180
PGC	47	0.0087	0.0481	238.0963	0.0006	32.3144	2.2463	0.0263	0.0142	34.7043	113.6021	0.6495	0.2206
PGC	53	0.0099	0.0561	246.8897	0.0006	32.2209	2.2428	0.0284	0.0142	34.7005	112.6604	0.3966	0.2443

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Table 2 (continued)

Area	OriginalStationID	Chl-a	Cv	O2	Fe	NO3	PO4	Phy	PP	Sal	SiO4	T	Ice
Expedition PS118													
EAP	6-5	0.0157	0.0100	292.2677	0.0013	31.2400	2.2039	0.0398	0.0042	34.5444	97.0706	-1.5687	0.7043
EAP	6-6	0.0157	0.0100	292.2677	0.0013	31.2400	2.2039	0.0398	0.0042	34.5444	97.0706	-1.5687	0.7043
EAP	9-5	0.0150	0.0047	286.5737	0.0015	31.4308	2.2182	0.0384	0.0053	34.5671	98.8565	-1.5176	0.4828
EAP	12-7	0.0151	0.0354	285.9884	0.0012	31.4562	2.2105	0.0389	0.0064	34.5723	99.7628	-1.3941	0.4449
EAP	38-9	0.0149	0.0804	273.3957	0.0008	31.8974	2.2244	0.0394	0.0045	34.6166	104.2050	-0.9089	0.3370
Expedition ANDEEP I													
WAP	41-3	0.0060	0.0586	226.1177	0.0004	32.5007	2.2606	0.0215	0.0034	34.7073	122.0348	0.5823	0.0030
WAP	42-2	0.0069	0.0197	239.1510	0.0004	32.5526	2.2735	0.0227	0.0038	34.6834	121.8985	0.1728	0.0065
WAP	43-8	0.0069	0.0120	239.9987	0.0004	32.5546	2.2736	0.0229	0.0044	34.6757	121.9000	0.1168	0.0254
WAP	46-7	0.0076	0.0076	244.4984	0.0004	32.5340	2.2714	0.0242	0.0043	34.6672	119.6660	0.1648	0.0549
WAP	99-4	0.0044	0.0028	215.7537	0.0003	32.7394	2.2645	0.0200	0.0046	34.7036	145.6740	0.2468	0.0322
WAP	105-7	0.0067	0.0190	235.2405	0.0004	32.5086	2.2669	0.0226	0.0051	34.6929	121.2443	0.3758	0.0411
WAP	114-4	0.0064	0.0073	233.2873	0.0004	32.5215	2.2684	0.0221	0.0048	34.6940	122.5574	0.2964	0.0534
WAP	129-2	0.0064	0.0691	233.7844	0.0004	32.5295	2.2696	0.0220	0.0034	34.6942	122.5498	0.2889	0.0056
Expedition ANDEEP II													
EAP	131-3	0.0096	0.0278	257.0883	0.0004	32.6324	2.2782	0.0296	0.0017	34.6522	122.0541	-0.2998	0.7987
EAP	132-2	0.0112	0.0490	257.8369	0.0005	32.4189	2.2591	0.0328	0.0021	34.6526	117.3294	0.4782	0.7885
EAP	133-3	0.0133	0.0656	265.4427	0.0006	32.1028	2.2353	0.0371	0.0023	34.6689	110.9404	1.0531	0.7886
DWS	134-3	0.0102	0.0063	263.3558	0.0004	32.6704	2.2896	0.0319	0.0014	34.6520	124.4308	-0.6032	0.7388
DWS	135-4	0.0087	0.0008	265.8650	0.0004	32.8066	2.2952	0.0280	0.0013	34.6432	127.2823	-0.7887	0.6421
DWS	136-4	0.0092	0.0028	267.4208	0.0004	32.8170	2.2951	0.0291	0.0014	34.6468	126.3059	-0.7794	0.5727
DWS	137-4	0.0092	0.0028	267.4208	0.0004	32.8170	2.2951	0.0291	0.0014	34.6468	126.3061	-0.7794	0.5598
DWS	138-6	0.0094	0.0064	266.1975	0.0004	32.7739	2.2950	0.0293	0.0019	34.6463	124.7432	-0.7185	0.5242
SSI	139-6	0.0071	0.0104	257.5859	0.0004	32.7410	2.2982	0.0235	0.0021	34.6521	127.0629	-0.5132	0.1894
SSI	140-8	0.0078	0.0344	255.8512	0.0004	32.7286	2.2903	0.0249	0.0022	34.6561	122.8767	-0.3595	0.2244
SSI	141-10	0.0071	0.0064	258.0052	0.0004	32.7404	2.2986	0.0236	0.0020	34.6490	127.2817	-0.5241	0.1750
SSI	142-6	0.0072	0.0065	258.2807	0.0004	32.7379	2.2981	0.0238	0.0019	34.6490	127.2817	-0.5270	0.1915
SSI	143-1	0.0088	0.0374	250.5798	0.0004	32.6757	2.2802	0.0270	0.0022	34.6691	118.5745	0.0436	0.2719

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Table 2 (continued)

Area	OriginalstationID	Chl-a	Cv	O2	Fe	NO3	PO4	Phy	PP	Sal	SiO4	T	Ice
Expedition ANDEEP III													
SAO	16-10	0.0045	0.0079	214.9538	0.0006	29.8717	2.0303	0.0200	0.0052	34.7844	92.1891	1.2900	0.0000
SAO	21-7	0.0045	0.0120	217.1751	0.0005	31.7258	2.1529	0.0200	0.0027	34.6901	111.3773	0.6794	0.0000
FT-KN	74-6	0.0141	0.0463	253.2647	0.0004	32.5207	2.2619	0.0418	0.0029	34.6696	116.0030	0.9551	0.6513
FT-KN	78-9	0.0130	0.0376	254.8871	0.0004	32.6254	2.2727	0.0388	0.0025	34.6672	118.7248	0.5096	0.6598
FT-KN	80-9	0.0128	0.0117	265.0141	0.0004	32.7316	2.2901	0.0386	0.0019	34.6520	122.5455	-0.4113	0.6779
FT-KN	81-8	0.0128	0.0017	265.8060	0.0004	32.7250	2.2907	0.0386	0.0019	34.6520	122.8277	-0.4639	0.6762
DWS	88-8	0.0128	0.0042	273.5165	0.0004	32.7866	2.2965	0.0394	0.0014	34.6506	125.5550	-0.7124	0.6333
DWS	94-14	0.0121	0.0015	273.2635	0.0004	32.7970	2.2948	0.0373	0.0016	34.6511	125.4371	-0.7731	0.6221
DWS	102-3	0.0100	0.0020	268.6074	0.0004	32.7976	2.2933	0.0315	0.0015	34.6469	126.1360	-0.7844	0.6103
DWS	110-8	0.0087	0.0009	265.8363	0.0004	32.8067	2.2953	0.0279	0.0013	34.6429	127.2823	-0.7889	0.6390
EAP	121-11	0.0101	0.0460	257.0160	0.0004	32.5484	2.2697	0.0304	0.0025	34.6520	120.2742	-0.0437	0.6112
EAP	133-2	0.0110	0.0736	258.2803	0.0005	32.3834	2.2562	0.0319	0.0030	34.6458	115.1296	0.7103	0.4200
EAP	142-5	0.0089	0.0058	256.2522	0.0004	32.6069	2.2777	0.0274	0.0021	34.6520	120.9542	-0.2853	0.4609
SOI	150-6	0.0100	0.0704	257.3563	0.0005	32.4871	2.2651	0.0297	0.0022	34.6478	116.5540	0.0411	0.3673
SOI	151-7	0.0107	0.0482	257.9414	0.0005	32.3673	2.2547	0.0308	0.0021	34.6474	112.8308	0.5437	0.3706
WAP	152-6	0.0069	0.0634	233.8989	0.0004	32.4699	2.2604	0.0230	0.0068	34.7108	119.6696	0.7166	0.1224
WAP	153-7	0.0048	0.0098	215.1420	0.0003	32.5432	2.2555	0.0203	0.0042	34.7080	130.5275	0.6131	0.1130
WAP	154-9	0.0058	0.0156	226.3083	0.0004	32.5340	2.2654	0.0213	0.0031	34.6981	132.0427	0.3477	0.0602
Expedition BIOPEARL I													
PFW	FT-EBS-1	0.0897	0.1576	288.2635	0.0003	24.3944	1.7121	0.2711	0.0055	34.0882	29.4800	3.9502	0.0000
WAP	LI-EBS-1	0.0053	0.0479	215.6366	0.0004	32.5091	2.2527	0.0209	0.0057	34.7269	123.4480	0.8560	0.0759
WAP	LI-EBS-3	0.0052	0.0555	212.2230	0.0004	32.5109	2.2495	0.0208	0.0059	34.7402	120.2483	0.8847	0.0774
WAP	LI-EBS-4	0.0111	0.0694	227.3546	0.0007	32.2295	2.2375	0.0317	0.0065	34.6676	94.8744	-0.3831	0.0817
WAP	DI-EBS-1	0.0342	0.0473	266.0254	0.0009	31.5668	2.2132	0.0835	0.0082	34.1967	91.6641	-1.2254	0.0983
WAP	EI-EBS-1	0.0078	0.0529	242.0465	0.0005	32.4704	2.2630	0.0245	0.0040	34.6561	117.6464	0.5904	0.1220
WAP	EI-EBS-2	0.0106	0.0702	257.5303	0.0007	32.1398	2.2458	0.0292	0.0043	34.6424	113.3977	0.2268	0.1152
WAP	EI-EBS-3	0.0117	0.0501	261.9873	0.0007	32.0749	2.2381	0.0316	0.0051	34.6782	111.5524	0.0651	0.1086
WAP	EI-EBS-4	0.0117	0.0501	261.9873	0.0007	32.0749	2.2381	0.0316	0.0051	34.6782	111.5524	0.0651	0.1086
WAP	EI-EBS-5	0.0082	0.0932	235.4298	0.0005	32.3787	2.2490	0.0256	0.0050	34.7106	113.6474	0.9389	0.0528
SOI	PB-EBS-1	0.0099	0.0109	254.8230	0.0005	32.4319	2.2601	0.0292	0.0023	34.6537	114.8937	0.3831	0.2675

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Table 2 (continued)

Area	OriginalstationID	Chl-a	Cv	O2	Fe	NO3	PO4	Phy	PP	Sal	SiO4	T	Ice
SOI	PB-EBS-2	0.0103	0.0268	255.2434	0.0005	32.3602	2.2535	0.0299	0.0023	34.6566	112.8380	0.6576	0.2668
SOI	PB-EBS-3	0.0109	0.0229	251.0748	0.0005	32.2590	2.2431	0.0305	0.0024	34.6637	108.6968	0.9692	0.2583
SOI	PB-EBS-4	0.0180	0.0187	250.7584	0.0008	32.0988	2.2328	0.0447	0.0028	34.5184	102.1753	0.7513	0.2380
SSI	ST-EBS-1	0.0076	0.0161	241.6533	0.0004	32.6430	2.2804	0.0243	0.0019	34.6659	118.6256	0.1703	0.3306
SSI	ST-EBS-2	0.0085	0.0131	242.8239	0.0004	32.6253	2.2756	0.0260	0.0020	34.6676	116.6997	0.2514	0.3339
SSI	ST-EBS-3a	0.0097	0.0136	234.9417	0.0004	32.5286	2.2626	0.0280	0.0020	34.6780	111.6710	0.5506	0.3254
SSI	ST-EBS-3b	0.0097	0.0136	234.9417	0.0004	32.5286	2.2626	0.0280	0.0020	34.6780	111.6710	0.5506	0.3254
SSI	ST-EBS-4	0.0097	0.0136	234.9417	0.0004	32.5286	2.2626	0.0280	0.0020	34.6780	111.6710	0.5506	0.3254
PFW	SG-EBS-2	0.0058	0.0059	211.0450	0.0004	32.4687	2.2506	0.0211	0.0051	34.6995	109.6219	0.9906	0.0000
PFW	SG-EBS-3	0.0089	0.0125	212.8409	0.0004	32.3960	2.2381	0.0269	0.0052	34.7078	87.3191	1.4410	0.0000
PFW	SG-EBS-4	0.0089	0.0125	212.8409	0.0004	32.3960	2.2381	0.0269	0.0052	34.7078	87.3191	1.4410	0.0000
PFW	SG-EBS-5	0.0187	0.0219	239.0831	0.0005	31.0162	2.1414	0.0496	0.0057	34.4539	64.3489	1.6270	0.0000
PFW	SR-EBS-4	0.0062	0.0128	207.9209	0.0004	32.5871	2.2563	0.0218	0.0026	34.7263	104.0782	1.1853	0.0000
PFW	SR-EBS-5	0.0071	0.0077	206.7518	0.0004	32.6193	2.2550	0.0235	0.0028	34.6733	94.7574	1.4087	0.0000
PFW	SR-EBS-6	0.0070	0.0073	206.6150	0.0004	32.6208	2.2551	0.0234	0.0029	34.6854	94.8750	1.4049	0.0000
Expedition ANT XV/3-EASIZ II													
FT-KN	48-171	0.0483	0.0091	323.4557	0.0007	30.7678	2.1556	0.1290	0.0076	34.4659	90.9305	-1.6702	0.5499
FT-KN	48-111	0.0294	0.0827	269.0245	0.0005	32.0195	2.2226	0.0827	0.0042	34.6162	105.1463	0.3652	0.6565
FT-KN	48-107	0.0179	0.0598	256.8818	0.0004	32.3809	2.2499	0.0520	0.0040	34.6792	112.4451	1.2269	0.6748
FT-KN	48-142	0.0164	0.0226	256.0208	0.0004	32.4202	2.2534	0.0480	0.0056	34.6699	114.6458	1.1378	0.6930
FT-KN	48-089	0.0144	0.0425	254.7469	0.0004	32.5291	2.2631	0.0426	0.0039	34.6704	116.1008	0.9651	0.6834
FT-KN	48-130	0.0135	0.0329	254.9713	0.0004	32.5884	2.2690	0.0401	0.0042	34.6682	117.6414	0.7137	0.6702
FT-KN	48-272	0.0133	0.0384	254.2244	0.0004	32.5920	2.2692	0.0397	0.0024	34.6686	117.8511	0.6733	0.6698
FT-KN	48-133	0.0140	0.0137	254.6401	0.0004	32.5345	2.2638	0.0415	0.0054	34.6648	117.3599	0.7905	0.6960
Expedition SYSTCO													
PFE	81-17	0.0059	0.0135	225.9090	0.0004	32.4885	2.2476	0.0218	0.0022	34.6738	118.0993	0.3522	0.0000
PFE	81-18	0.0059	0.0135	225.9090	0.0004	32.4885	2.2476	0.0218	0.0022	34.6738	118.0993	0.3522	0.0000
PFE	84-25	0.0066	0.0287	253.7286	0.0004	32.8336	2.3099	0.0228	0.0027	34.6478	129.3201	-0.6160	0.0024
PFE	85-15	0.0062	0.0051	228.4755	0.0004	32.5836	2.2612	0.0223	0.0021	34.6776	123.5956	0.2052	0.0000
PFE	86-20	0.0059	0.0036	227.9028	0.0004	32.5057	2.2495	0.0220	0.0024	34.6801	117.4531	0.2445	0.0001
PFE	86-24	0.0054	0.0161	226.0687	0.0004	32.4675	2.2399	0.0211	0.0024	34.6722	117.4007	0.2727	0.0001
PFE	86-25	0.0054	0.0161	226.0687	0.0004	32.4675	2.2399	0.0211	0.0024	34.6722	117.4007	0.2727	0.0001

Ethics Statements

The authors declare that the present work did not include experiments on human subjects and/or animals.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships which have or could be perceived to have influenced the work reported in this article.

CRediT Author Statement

Davide Di Franco: Conceptualization, Formal analysis, Writing – original draft, Visualization; **Katrin Linse:** Conceptualization, Supervision, Funding acquisition, Writing – review & editing; **Huw J. Griffiths:** Conceptualization, Supervision, Funding acquisition, Writing – review & editing; **Angelika Brandt:** Conceptualization, Formal analysis, Writing – original draft, Visualization.

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