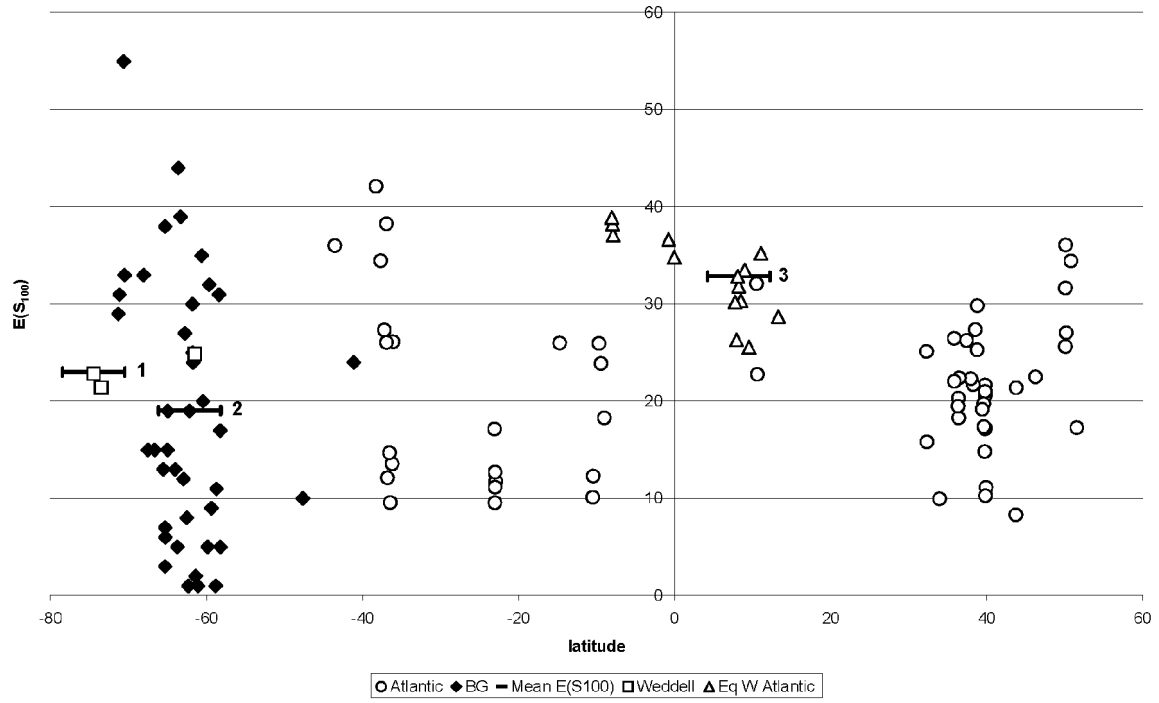

Fig. 1. (**A**) $E(S_{100})$ from BG and for the entire Atlantic Ocean[9] by latitude shows considerable variation in the Weddell Sea region, but in general lower than the EWA. The horizontal bars are placed at the mean of the previous SO values (1), for those from BG (2) and for the EWA (3).

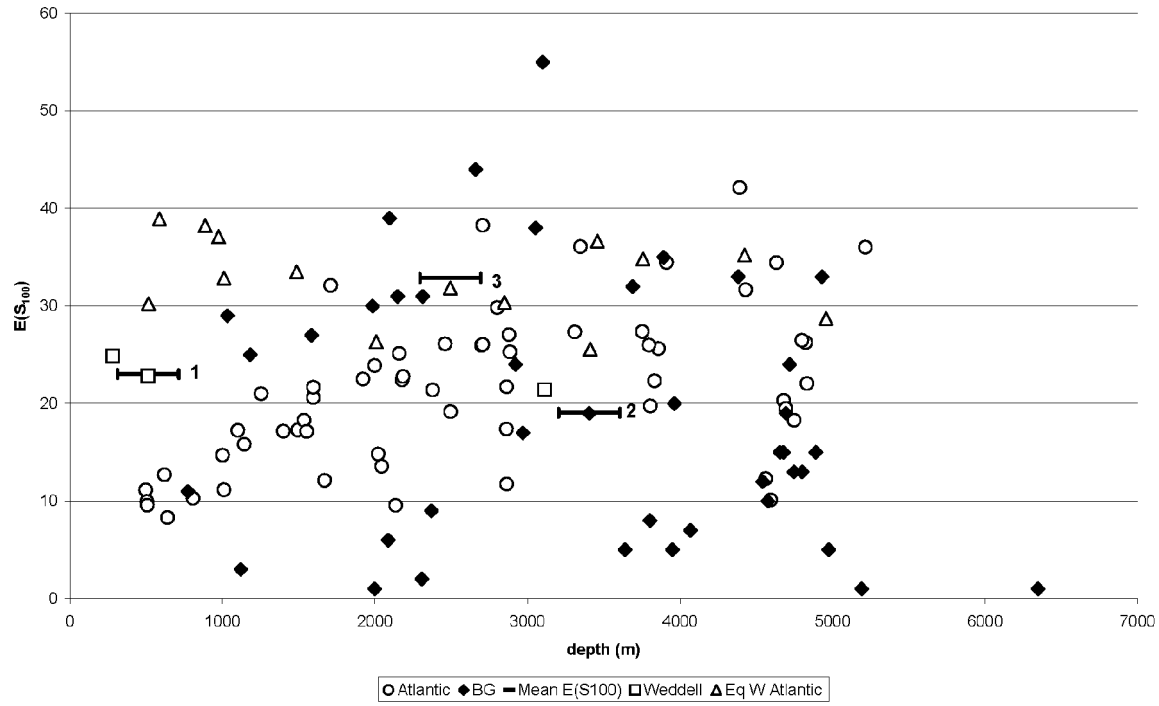

Fig. 1. (**B**) $E(S_{100})$ by depth, horizontal bars numbered as in A, shows a positive trend between diversity and depth, with the exception that the Weddell Sea may have depressed diversity at greatest depths, and EWA has high diversity at all depths.

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Text Note 9. Citations and methods for the evaluation of the data presented in Brandt et al. (2007) in comparison to previous data from the Weddell Sea and elsewhere in the Atlantic Ocean.

The original report of the data on Isopoda from the Atlantic Ocean was:

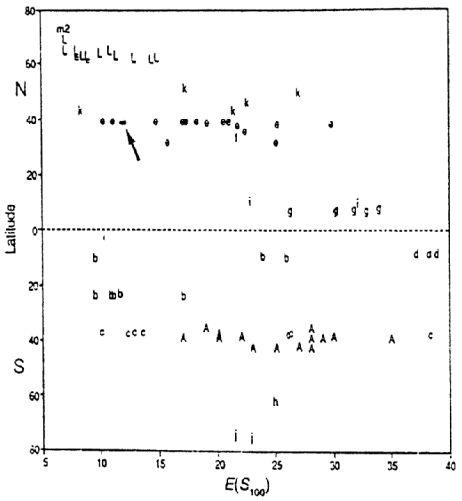
Hessler & Wilson (The origin and biogeography of malacostracan crustaceans in the deep sea. In *Evolution, Time and Space: The Emergence of the Biosphere* (eds. Sims, R. W., Price, J. H. & Whalley, P. E. S.) 227-254 (Academic Press, London and New York, 1983). This article calculated $E(S_n)$ to 500 individuals.

These data were subsequently used in the articles:

> Poore, G. C. B. & Wilson, G. D. F. Marine species richness. *Nature* **361**, 597-598 (1993). This article calculated $E(S_n)$ to 100 individuals - shown below.
>
> Rex, M. A. *et al*. Global-scale latitudinal patterns of species diversity in the deep-sea benthos. *Nature* **365**, 636-639 (1993). This article calculated $E(S_n)$ to 200 individuals.

The Expected species algorithm, $E(S_n)$, based on equations in Hurlbert, S.N. The nonconcept of species diversity: a critique and alternative parameters. *Ecol.* **52**, 577 (1971), which were implemented by the author as either a Fortran77 or PASCAL program for calculating $E(S_n)$ for single samples. The program *Biodiversity Pro* (McAleece, N., Lambshead, P. J. D. & Patterson, G. L. J., Natural History Museum, London, 1997) also calculates $E(S_n)$ values for an entire species by sample matrix. Both were used for the calculation of the values in Figure 1.

The use of this diversity measure is further discussed in Wilson (Historical influences on deep-sea isopod diversity in the Atlantic Ocean. *Deep-Sea Res.* **45**, 279-301, 1998), which also used the same data.



Expected number of species in 100 individuals ($E(S_{100})$) versus latitude. A, Southeastern Australia[5]; b, Angola Basin; c, Argentine Basin; d, Brazil Basin; e, Gay Head–Bermuda transect; f, Mediterranean Sea; g, Guiana Basin; h, Scotia Basin; i, Sierra Leone Basin; j, Weddell Sea; k, West European Basin[4]; L, Norwegian Basin; m, Greenland Basin[3]; asterisk, off New Jersey and Delaware (arrow, United States[1]).

Text Note 3. A few examples of errors or inconsistencies in Brandt, Gooday et al. (2007; abbreviated “BG”) and in "Supplementary Information" (doi: 10.1038/nature05827).

1. In Table 1, a calculation of specimen numbers in each sample indicates that 17 samples had fewer than 100 individuals, as shown in Table A. This calculation of N in the sample was done by simply using BG's reported haul-length divided by their reported number of individuals per thousand metres (N/1000m). Why N/1000m was reported instead of the more explicit N is not clear. For those samples that had fewer than 100 specimens, the reported values cannot be $E(S_{100})$ for those samples because the expected species $E(S_n)$ is a rarefaction index, so that $N_{sample} \geq N_{rarefied}$. The "knot" value, or $N_{rarefied}$, in this case is 100, so the sample size, N_{sample}, cannot be less than 100. Nevertheless, these values were used directly in Figure 1A-B for lack of alternative values. Another interpretation of BG Supplementary Information Table 1 is that the authors did not report the N/1000m accurately. Correspondence with Brandt was not able to clarify these discrepancies.
2. Distances travelled in Table 1 do not agree with those calculated from the start and stop locations. See Table B (below) that recalculates the great circle distances from the positions. Two samples in BG Table 1 have incorrectly reported start and stop positions; these are corrected, using assumed positions. Table A shows that the deviation between great circle distances and the reported haul length is considerable in some cases. Correspondence with Brandt was not able to clarify this discrepancy. Ultimately, the haul length is uninformative for benthic samplers that are towed because they will sample the seafloor area differentially on bottom in an unknown fashion. If quantitative samples (i.e., those that give accurate estimates of densities) are desired, then either a grab or coring device must be used. The density estimates in BG and earlier papers that they cite are neither consistent or accurate, as can be seen by the extreme variance in the diversity values in Figure 1.
3. *Munnopsoides* sp. (BG fig. 2g) is misidentified as "*Munnopsis*" and *Stylomesus* sp. (BG fig. 2h) is misidentified as "*Ischnomesus*."
4. *Eurycope complanata* complex is reported from the Southern Ocean, but it does not occur in this region. As discussed in Wilson (1983, *Bull. Scripps Inst. Oceanogr.* **25**), the Southern Ocean has a relatived species, but not the *E. complanata* complex itself as defined.

Table A. The calculated haul length is obtained from the great circle distances: see table B. The calculated N (number of individuals) uses BG's reported haul-length divided by N/1000m. The "Species per Sample" values were supplied by Brandt subsequent to the publication of BG. Two of these values appear to be in error because they have more species than individuals in the sample. The BG's species by sample matrix has not been released, so the $E(S_{100})$ calculations cannot be replicated.

BG stations	depth (m)	BG Table 1 haul-length (m)	calculated haul length (Table B)	deviation	BG Table 1 N/1000m	Calculated N from Haul-length /(N/1000m)	Species per sample (Brandt, *in litt.*)	BG Table 1 $E(S_{100})$	BG Table 1 [Not] $E(S_{100})$
041-3	2370	4928	611.2	806%	43.83	216	47	9	
042-2	3689	4766	209	2280%	189.89	905	77	32	
046-7	3894	5639	513.8	1098%	256.63	1447	78	35	
043-8	3962	4782	304.1	1573%	41.2	197	53	20	
133-3	1121	1314	169.5	775%	564.69	742	69	3	
099-4	5191	5336	930.6	573%	5.6	30	13		1
105-7	2308	2881	166.7	1728%	2.34	7	7		2
114-4	2921	4482	200.8	2232%	99.73	447	57	24	
129-2	3640	4076	113.1	3604%	21.59	88	35		5
131-3	3053	3553	417.2	852%	258.09	917	85	38	
132-2	2086	2523	243.9	1034%	13.48	34	19		6
134-3	4069	4553	713.6	638%	11.2	51	24		7
135-4	4678	2773	1728	160%	149.3	414	35	15	
136-4	4747	5306	55.6	9543%	6.97	37	29		13
137-4	4976	4581	593.4	772%	15.28	70	21		5
138-6	4542	4147	225.3	1841%	46.06	191	34	12	
139-6	3950	6464	93.1	6943%	9.9	64	20		5
140-8	2970	4183	657	637%	32.99	138	50	17	
141-10	2312	3094	815.8	379%	11.83	37	45		31
142-6	6348	4221	648.1	651%	0.47	2	8		1
143-1	774	1441	575.2	251%	40.25	58	11		11
016-10	4720	3198	1810	177%	70.36	225	44	24	
021-7	4577	2923	2715.8	108%	23.61	69	22		10
059-5	4655	2878	2322.7	124%	37.53	108	34	15	
074-6	1032	711	371.9	191%	1037.97	738	64	29	
078-9	2149	2376	1190.1	200%	172.56	410	47	31	
080-9	3100	1778	1396.5	127%	346.46	616	92	55	
081-8	4382	2935	2130.4	138%	128.45	377	45	33	
088-8	4931	3488	2723.7	128%	76.83	268	50	33	
094-14	4891	3476	3612.8	96%	26.47	92	30		15
102-3	4801	3283	2696.8	122%	28.33	93	33		13
110-8	4695	2904	3167	92%	172.18	500	50	19	
121-11	2659	1945	1919.6	101%	192.8	375	63	44	
133-2	1584	1164	1522.6	76%	2441.58	2842	84	27	
142-5	3405	2251	1684.9	134%	41.31	93	42		19
150-6	1984	1567	1264.7	124%	199.11	312	48	30	
151-7	1183	1383	899.5	154%	78.81	109	25	25	
152-6	1998	2113	1435.1	147%	2.84	6	2		1
153-7	2096	1954	1492	131%	110.03	215	42	39	
154-9	3803	2525	2340.3	108%	10.3	26	21		8

TABLE B. Ship distances travelled based on BG supplementary information Table 1. These values are the Great Circle distances calculated from the ship start and stop positions. Two of the positions were found to be reported inaccurately.

Station	Start	Stop	Km	km corr	assumed correction data	haul-length based on gt.circle distances (m)	BG Table 1 reported haul-length (m)
41-3	59 22.24 S 60 4.06 W	59 22.57 S 60 4.05 W	0.6112	0.6112		611	4928
42-2	59 40.3 S 57 35.42 W	59 40.32 S 57 35.64 W	0.209	0.209		209	4766
43-8	60 27.13 S 56 5.12 W	60 27.19 S 56 4.81 W	0.3041	0.3041		304	5639
46-7	60 38.33 S 53 57.38 W	60 38.06 S 53 57.51 W	0.5138	0.5138		514	4782
99-4	61 6.4 S 59 16.57 W	61 6.4 S 59 17.61 W	0.9306	0.9306		931	1314
105-7	61 24.16 S 58 51.56 W	61 24.25 S 58 51.56 W	0.1667	0.1667		167	5336
114-4	61 43.54 S 60 44.21 W	61 43.51 S 60 44.43 W	0.2008	0.2008		201	2881
129-2	59 52.21 S 59 58.75 W	59 52.2 S 59 58.63 W	0.1131	0.1131		113	4482
131-3	65 19.83 S 51 31.61 W	65 19.99 S 51 31.23 W	0.4172	0.4172		417	4076
132-2	65 17.75 S 53 22.81 W	65 17.62 S 53 22.86 W	0.2439	0.2439		244	3553
133-3	65 20.17 S 54 14.3 W	65 20.08 S 54 14.34 W	0.1695	0.1695		170	2523
134-3	65 19.2 S 48 3.77 W	65 19.05 S 48 2.92 W	0.7136	0.7136		714	4553
135-4	65 0.05 S 43 3.02 W	65 59.97 S 43 0.82 W	110.9851	1.728	-65.0005 43.0302 -64.5997 43.0082	1728	2773
136-4	64 1.54 S 39 6.88 W	64 1.51 S 39 6.88 W	0.0556	0.0556		56	5306
137-4	63 44.98 S 38 47.75 W	63 44.74 S 38 48.23 W	0.5934	0.5934		593	4581
138-6	62 58.08 S 27 54.1 W	62 57.99 S 27 54.28 W	0.2253	0.2253		225	4147
139-6	58 14.1 S 24 21.2 W	58 14.15 S 24 21.21 W	0.0931	0.0931		93	6464
140-8	58 15.98 S 24 53.73 W	58 16.28 S 24 54.09 W	0.657	0.657		657	4183
141-10	58 25.07 S 24 0.78 W	58 24.63 S 24 0.74 W	0.8158	0.8158		816	3094
142-6	58 50.78 S 23 57.75 W	58 50.44 S 23 57.59 W	0.6481	0.6481		648	4221
143-1	58 44.69 S 25 10.28 W	58 44.45 S 25 10.66 W	0.5752	0.5752		575	1441
16-10	41 7.55 S 9 55.94 E	41 7.02 S 9 54.85 E	1.81	1.81		1810	3198
21-7	47 39.87 S 4 15.79 E	47 38.52 S 4 14.94 E	2.7158	2.7158		2716	2923
59-5	67 30.75 S 0 0.23 W	67 29.81 S 0 1.94 E	2.3227	2.3227		2323	2878
74-6	71 18.42 S 13 58.21 W	71 18.33 S 13 57.65 W	0.3719	0.3719		372	711
78-9	71 9.52 S 14 0.76 W	71 9.34 S 13 58.85 W	1.1901	1.1901		1190	2376
80-9	70 38.45 S 14 42.86 W	70 39.18 S 14 43.43 W	1.3965	1.3965		1397	1778
81-8	70 31.08 S 14 34.82 W	70 32.23 S 14 34.9 W	2.1304	2.1304		2130	2935
88-8	68 3.84 S 20 31.39 W	68 3.64 S 20 27.49 W	2.7237	2.7237		2724	3488
94-14	66 39.08 S 27 9.26 W	66 37.16 S 27 10.13 W	3.6128	3.6128		3613	3476
102-3	65 33.18 S 36 33.24 W	65 34.32 S 36 31.05 W	2.6968	2.6968		2697	3283
110-8	64 59.2 S 43 2.05 W	64 0.91 S 43 2.1 W	107.9535	3.167	-64.5920 43.0205 -65.0091 43.02.10	3167	2904
121-11	63 38.27 S 50 37.16 W	63 37.31 S 50 38.04 W	1.9196	1.9196		1920	1945
133-2	62 46.73 S 53 2.57 W	62 46.33 S 53 4.14 W	1.5226	1.5226		1523	1164
142-5	62 11.36 S 49 27.62 W	62 11.36 S 49 29.57 W	1.6849	1.6849		1685	2251
150-6	61 49.13 S 47 27.51 W	61 48.52 S 47 28.16 W	1.2647	1.2647		1265	1567
151-7	61 45.67 S 47 7.19 W	61 45.42 S 47 8.07 W	0.8995	0.8995		900	1383
152-6	62 20.64 S 57 53.12 W	62 19.91 S 57 53.68 W	1.4351	1.4351		1435	2113
153-7	63 19.82 S 64 36.44 W	63 19.18 S 64 37.53 W	1.492	1.492		1492	1954
154-9	62 32.52 S 64 39.45 W	62 31.31 S 64 38.66 W	2.3403	2.3403		2340	2525

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Text note 6. The title of BG "First insights into the biodiversity and biogeography of the Southern Ocean deep sea" is perpelexing when one realises that Southern Ocean and the deep sea has been studied for over a century and a half. Below is an ad hoc selection of literature from my own database, which has mostly references concering Isopoda, but also includes references on deep sea benthic ecology and biogeography. Although many of the early articles are taxonomic in nature, most dealt with animals below 200m (nominally deep-sea) and included many observations on biology and distribution, and are part of the knowledge that has built up over the period. Brandt, Gooday et al. have been actively publishing on Antarctic faunas for over a decade so by their own action, BG is not "first insights". More than quibbling about words, this observation indicates that the authors have ignored many papers that have covered most of the same issues claimed in their paper as their own.

This list is organised by date, and alphabetical within years. It is not comprehensive, and is only a sampling of the total literature on the Antarctic Benthos.

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