Supporting Information. Alfaro-Lucas, J.M., F. Pradillon, D. Zeppilli, L.N. Michel, P. Martínez-Arbizu, H. Tanaka, M. Foviaux, and J. Sarrazin. 2020. High environmental stress and productivity increase functional diversity along a deep-sea hydrothermal vent gradient. Ecology.

Appendix S4

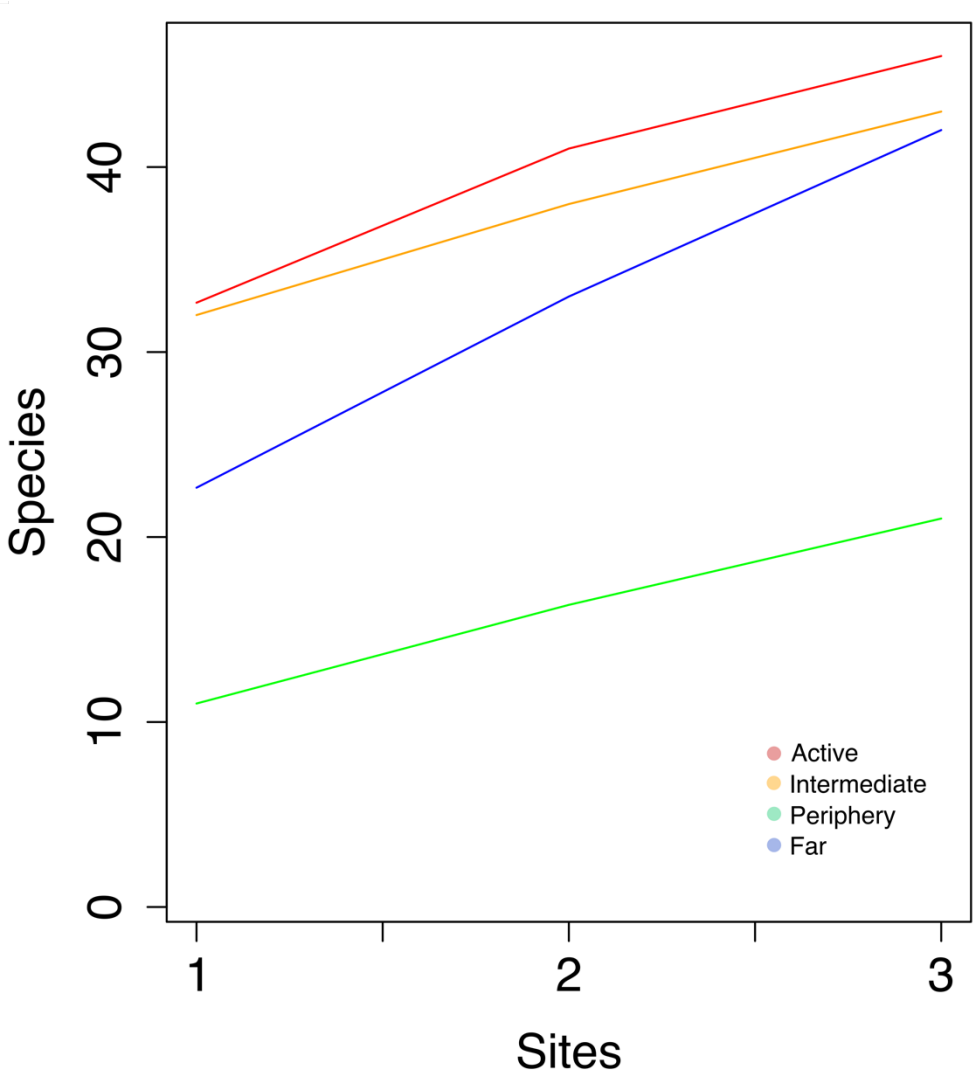

Figure S1. Species accumulation curves for the study sites.

Table S1. Mean abundance (± standard deviation) of taxa on the slate blocks at the four sites. Abundances of *Bathymodiolus azoricus* are shown, although this species was not included in statistical analyses (see Materials and Methods).

Phylum	Class	Order	Species	Active	Intermediate	Periphery	Far
Annelida	Polychaeta	Terebellida	*Amphisamytha lutzi*	196,71±247,79	166,78±59,95	0	0
			Acrocirridae sp.	0	0,33±0,58	0	0,67±0,58
			Flabelligeridae sp.	0	3,56±6,16	0	5,44±7,70
		Phyllodocida	*Glycera tesselata*	4,33±6,66	15,67±10,02	6,78±3,27	0,33±0,58
			Branchipolynoe seepensis	4,33±2,31	29,33±28,92	0	0
			Branchinotogluma sp. 1	0	1,33±2,31	0	0
			Bathykermadeca sp.	0	0	0	0,67±1,15
			Lepidonotopodium sp.	0,33±0,58	0	0	0,33±0,58
			Macellicephala sp.	0,33±0,58	0	0	0
			Polynoidae sp. 1	0	0,67±1,15	0	0
			Phyllodocidae sp.	0	0	0	0,33±0,58
			Tomopteris sp. 1	0,33±0,58	0	0	0
			Tomopteris sp. 2	0,33±0,58	0	0	0
			Opheliidae sp.	0	0	0	0,33±0,58
			Nereididae sp.	0	0	0,33±0,58	0,33±0,58
		Spionida	*Prionospio unilamellata*	1,67±2,89	0,33±0,58	0	0
			Laonice athecata	0	0,33±0,58	0	0
		Eunicia	*Ophryotrocha* cf. *platykephale*	0	13,00±22,52	0	0
			Ophryotrocha fabriae	93,47±57,77	271,22±108,93	0	0
		Not assigned	*Capitella* sp. 1	10,00±17,32	0	0	0
Arthropoda	Hexanauplia	Cyclopoida	*Heptnerina confusa*	120,99±58,07	106,25±69,26	0,33±0,58	41,87±35,19
			cf. *Ambilimbus* sp.	0	0	0	5,50±9,52
			cf. Kelliridae sp.	0	0	0	35,73±33,35
			Cyclopina sp.	0	0	0	0,33±0,58
			Cyclopoida sp.	1,00±0,0	0,33±0,58	0	0
		Calanoida	Calanoida sp.	3,92±6,80	0	0	0
		Harpacticoida	*Smacigastes micheli*	429,88±134,50	16,42±25,88	0	0
			Tegastidae sp.	163,11±164,81	0	7,41±12,83	12,35±21,39
			Bathylaophonte azorica	95,81±111,49	0,33±0,58	0,33±0,58	36,70±33,27
			Tisbe sp. 1	83,84±140,02	8,78±7,61	0	3,05±5,28
			Tisbe sp. 2	4,67±8,08	0	0	0,67±0,58
			Donsiellinae sp.	1,30±2,25	4,77±7,41	0	0
			Miraciidae sp.	95,12±64,16	17,98±7,15	3,40±5,89	0,33±0,58
			Haifameira sp.	0	0	0	0,33±0,58
			Ameiridae sp. 1	37,30±49,32	4,44±7,68	65,01±7,33	99,37±43,54
			Ameiridae sp. 2	0	8,87±15,36	0,33±0,58	0
			Ameiridae sp. 3	11,77±20,39	0	0	147,79±181,14
			Ameiridae sp. 4	3,92±6,80	0	51,07±4,45	33,18±20,16
			Ectinosomatidae sp. 1	44,78±45,73	4,44±7,68	9,33±16,17	15,02±5,87

			Ectinosomatidae sp. 2	0	0	0	3,09±5,35
			Archesola typhlops	15,69±27,18	20,34±12,42	0	0
			Lobopleura sp.	9,67±16,74	0,67±1,15	0,33±0,58	0
			Mesochra sp.	4,03±6,98	0	0	41,16±28,77
		Siphonostomatoida	*Aphotopontius* sp.	84,35±127,30	44,06±59,64	0,67±0,58	0
			Rimipontius sp.	11,51±11,25	1,67±0,58	0	0
	Malacostraca	Amphipoda	*Luckia striki*	3,33±2,89	31,33±12,34	0,33±0,58	3,33±0,58
			Liljeborgiidae sp.	0	0	2,67±2,89	0,67±1,15
			Stegocephalidae sp.	0	0	0	0,33±0,58
		Isopoda	cf. *Storthyngura* sp.	0	0	0	1,33±1,53
			Heteromesus sp.	0	0	0	0,67±1,15
			Asellota sp. 2	0	0	1,00±1,00	1,33±1,53
			Asellota sp. 4	0	0	0,33±0,58	0
		Tanaidacea	*Obesutanais sigridae*	0	0	0,33± 0,58	0
			cf. *Typhlotanais incognitus*	0	0	0	0,33±0,58
	Ostracoda	Podocopia	*Thomontocypris excussa*	71,44±69,23	57,78±1,58	0	47,11±40,90
			Xylocythere sp.	0	3,22±5,58	0	0
	Arachnida	Trombidiformes	Halacaridae sp.	134,16±113,86	44,67±31,22	2,22±3,85	0,33±0,58
Chaetognatha			Chaetognatha sp.	0	0	0,67±1,15	0
Cnidaria			Cnidaria sp.	0	0	0	3,33±5,77
Echinodermata			Ophiuroidea sp.	0	0	0	0,33±0,58
Mollusca	Bivalvia	Mytilida	*Bathymodiolus azoricus*	78,00±57,58	776,33±179,63	0	0
	Gastropoda	Lepetellida	*Lepetodrilus atlanticus*	10,33±11,93	40,33±14,64	0	0
			Pseudorimula midatlantica	8,67±10,02	22,00±8,89	0	0
		Trochida	*Protolira valvatoides*	21,00±17,09	124,00±14,00	0	0
			Lurifax vitreus	0,67±0,58	3,33±4,04	5,67±3,51	0,67±1,15
			Xylodiscula analoga	0	3,33±1,53	0	0
			Lirapex costellatus	1,33±0,58	1,00±1,73	0	0
		Cycloneritida	*Divia briandi*	1,67±2,08	0	0	0
		Littorinimorpha	*Laeviphitus desbruyeresi*	0	6,33±4,93	0	0
Nematoda	Chromadorea	Monhysterida	*Halomonhystera* sp.	53,16±46,14	0	0	0
			Theristus sp.	0	0	2,22±3,85	4,44±7,70
		Chromadorida	*Paracanthonchus* sp.	5511,22±4090,52	145,12±147,56	0	0
			Chromadorita sp.	153,40±265,69	813,39±577,09	0	10,00±17,32
			Microlaimus sp.	600,18±658,07	2220,75±1874,65	0	3,33±5,77
			Cephalochaetosoma sp.	1970,28±1591,57	1464,39±140,89	0	0
			Epsilonema sp.	0	0	0	9,56±16,55
		Desmodorida	*Desmodora* sp.	0	0	0	0,33±0,58
	Enoplea	Enoplida	*Oncholaimus dyvae*	1528,55±1313,24	648,47±236,03	0	0
Nemertea			Nemertea sp.	3,33±2,89	9,00±6,08	0	0,67±1,15

Table S2. Tukey multiple comparisons of means (95% family-wise confidence level of variances) and Dunn tests after significant analyses of variances (ANOVAs or Kruskal-Wallis rank-sum) test between sites for species and functional indices. Significant p-values ($P<0.05$) in bold.

Species diversity	
Mean species richness (S)	*P*
Intermediate - Active	0.91
Periphery - Active	**0.008**
Far - Active	0.11
Periphery - Intermediate	**0.01**
Far - Intermediate	0.13
Far - Periphery	0.3
Mean abundance (N)	*P*
Intermediate - Active	0.31
Periphery - Active	**0.002**
Far - Active	**0.04**
Periphery - Intermediate	**0.04**
Far - Intermediate	0.3
Far - Periphery	0.3
Functional diversity	
Mean functional richness (FRic)	*P*
Intermediate - Active	0.36
Periphery - Active	**0.0002**
Far - Active	**0.0006**
Periphery - Intermediate	**0.001**
Far - Intermediate	**0.004**
Far - Periphery	0.68
Mean functional entities (FE)	*P*
Intermediate - Active	0.87
Periphery - Active	**0.0001**
Far - Active	**0.001**
Periphery - Intermediate	**0.00006**
Far - Intermediate	**0.006**
Far - Periphery	0.11
Mean expected functional entities ($EFE_{(158)}$)	*P*
Intermediate - Active	0.12
Periphery - Active	0.5
Far - Active	0.81
Periphery - Intermediate	**0.01**
Far - Intermediate	**0.03**
Far - Periphery	0.9
Mean log(Quadratic entropy)	*P*

(RaoQ)	
Intermediate - Active	0.57
Periphery - Active	0.18
Far - Active	**0.006**
Periphery - Intermediate	**0.03**
Far - Intermediate	**0.001**
Far - Periphery	**0.03**
Mean functional evenness (FEve)	*P*
Intermediate - Active	0.2
Periphery - Active	**0.02**
Far - Active	0.84
Periphery - Intermediate	0.48
Far - Intermediate	0.54
Far - Periphery	0.08