

Table S1: Average stable nitrogen ( $\delta^{15}\text{N}$ ) and carbon ( $\delta^{13}\text{C}$ ) isotope values and C:N ratios (including standard deviation [SD]) of macroalgal taxa, also including benthic diatoms and particulate organic matter (POM), at each site. N = number of replicates measured at each site.

Site	Taxonomic group	Taxon	Sample type	$\delta^{15}\text{N} \pm \text{SD}$		$\delta^{13}\text{C} \pm \text{SD}$		C:N $\pm \text{SD}$		N
A	microalgae	POM	filter	0.49	0.31	-25.77	0.02	5.08	0.04	2
	Phaeophyceae	<i>Desmarestia anceps</i>	thallus	0.29	0.29	-32.13	0.69	12.86	1.10	2
		<i>Desmarestia antarctica</i>	thallus	2.49		-25.12		12.99		1
		<i>Desmarestia menziesii</i>	thallus	4.15	1.84	-25.91	1.96	13.61	1.80	4
		<i>Himantothallus grandifolius</i>	thallus	3.13	2.01	-27.34	0.09	17.12	9.82	3
	Rhodophyta	<i>Iridaea cordata</i>	thallus	4.22		-23.16		17.81		1
		<i>Plocamium cartilagineum</i>	thallus	2.00	0.70	-35.11	0.83	7.29	0.45	2
		<i>Trematocarpus antarcticus</i>	thallus	3.85	0.45	-23.78	1.87	7.14	0.20	3
B	microalgae	benthic diatoms	whole	0.42	0.54	-24.22	2.08	6.90	0.38	3
		POM	filter	1.78	0.75	-24.76	0.35	6.28	0.92	3
	Phaeophyceae	<i>Desmarestia anceps</i>	thallus	0.01	1.45	-34.08	0.66	12.50	0.18	3
		<i>Desmarestia menziesii</i>	thallus	3.12	1.37	-25.10	1.59	15.01	0.42	3
		<i>Himantothallus grandifolius</i>	thallus	1.08	0.59	-26.95	3.67	18.60	1.88	3
	Rhodophyta	<i>Hymenocladopsis sp.</i>	thallus	1.90	0.80	-33.18	1.32	6.49	0.56	3
		<i>Iridaea cordata</i>	thallus	3.39	0.40	-22.88	0.72	12.82	0.51	3
		<i>Myriogramme mangini</i>	thallus	2.45	0.35	-35.28	0.68	7.97	1.06	4
		<i>Phyllophora antarctica</i>	thallus	1.97	0.51	-36.13	1.53	6.91	0.52	3
		<i>Plocamium cartilagineum</i>	thallus	2.74	0.64	-33.99	0.93	9.84	2.00	4
	<i>Trematocarpus antarcticus</i>	thallus	3.38	0.47	-26.04	2.10	6.33	0.38	2	
C	microalgae	POM	filter	1.56	0.48	-24.71	0.23	5.17	0.28	3
	Phaeophyceae	<i>Desmarestia antarctica</i>	thallus	2.17		-25.80		12.90		1
		<i>Desmarestia menziesii</i>	thallus	3.68	0.75	-25.11	2.06	14.14	0.33	3
		<i>Himantothallus grandifolius</i>	thallus	2.38	1.25	-21.41	3.35	19.96	2.67	3
	Rhodophyta	<i>Iridaea cordata</i>	thallus	4.18	0.33	-23.09	1.82	13.19	1.52	2
		<i>Myriogramme mangini</i>	thallus	3.06	0.41	-34.44	0.49	7.72	0.81	4
		<i>Plocamium cartilagineum</i>	thallus	2.68	0.54	-34.57	0.46	8.22	0.56	3
<i>Trematocarpus antarcticus</i>		thallus	4.15	0.31	-20.59	1.85	6.42	1.31	3	
D	microalgae	POM	filter	3.26	1.73	-23.31	0.03	5.65	0.22	3
	Phaeophyceae	<i>Desmarestia menziesii</i>	thallus	5.03		-27.85		13.85		1
		<i>Himantothallus grandifolius</i>	thallus	1.87	0.53	-25.07	2.17	19.24	0.61	3
		<i>Hymenocladopsis sp.</i>	thallus	2.82	0.51	-32.94	0.78	6.27	0.41	3
	Rhodophyta	<i>Iridaea cordata</i>	thallus	4.00	0.04	-14.57	2.73	8.81	2.17	3
		<i>Myriogramme mangini</i>	thallus	1.35	0.78	-34.94	0.14	6.99	0.70	3
		<i>Plocamium cartilagineum</i>	thallus	3.59	0.68	-33.15	0.69	7.30	0.20	3
<i>Trematocarpus antarcticus</i>		thallus	4.88		-20.50		6.18		1	
E	microalgae	benthic diatoms	whole	2.29	0.87	-21.36	0.97	7.26	0.35	3
		POM	filter	1.97	0.11	-25.22	0.60	5.44	0.26	3
	Phaeophyceae	<i>Desmarestia menziesii</i>	thallus	4.60	0.79	-24.55	2.57	14.61	0.36	5
		<i>Himantothallus grandifolius</i>	thallus	1.57	1.08	-22.72	0.59	18.03	1.99	3
	Rhodophyta	<i>Hymenocladopsis sp.</i>	thallus	0.96	0.48	-32.84	0.59	7.12	1.17	2
		<i>Iridaea cordata</i>	thallus	4.90	0.39	-20.07	1.12	12.07	1.41	3
		<i>Myriogramme mangini</i>	thallus	3.41	0.39	-32.53	0.83	7.29	0.33	3
		<i>Phyllophora antarctica</i>	thallus	2.58	1.21	-33.42	0.90	6.75	0.34	3
	<i>Plocamium cartilagineum</i>	thallus	3.52	0.59	-32.07	0.47	7.04	0.72	3	

Table S1 cont.:

Site	Taxonomic group	Taxon	Sample type	$\delta^{15}\text{N} \pm \text{SD}$		$\delta^{13}\text{C} \pm \text{SD}$		C:N $\pm \text{SD}$		N
F	microalgae	POM	filter	1.15	1.16	-27.14	0.37	5.12	0.55	3
	Phaeophyceae	<i>Desmarestia menziesii</i>	thallus	2.65	0.67	-26.43	1.69	15.54	2.28	3
		<i>Himantothallus grandifolius</i>	thallus	2.96		-22.03		20.45		1
		Rhodophyta	<i>Iridaea cordata</i>	thallus	4.21	0.08	-23.18	0.66	13.27	1.13
		<i>Myriogramme mangini</i>	thallus	3.35		-33.42		8.01		1
		<i>Plocamium cartilagineum</i>	thallus	3.71	0.97	-32.51	1.04	7.50	1.36	3
		<i>Trematocarpus antarcticus</i>	thallus	4.20	1.22	-21.52	3.16	6.53	0.97	3
G	microalgae	benthic diatoms	whole	1.46	2.02	-22.08	1.28	6.05	0.61	3
		POM	filter	1.52	0.52	-26.97	1.03	5.35	0.47	4
	Phaeophyceae	<i>Desmarestia menziesii</i>	thallus	5.83	0.57	-28.09	1.92	13.91	1.77	6
	Rhodophyta	<i>Hymenocladopsis sp.</i>	thallus	1.70	1.98	-35.34	0.79	6.72	0.89	3
		<i>Iridaea cordata</i>	thallus	5.46	0.19	-23.20	0.44	16.15	0.93	3
		<i>Myriogramme mangini</i>	thallus	4.03	1.68	-35.04	0.68	7.32	0.41	3
		<i>Phyllophora antarctica</i>	thallus	3.00	0.80	-34.27	2.46	7.53	0.51	3
		<i>Plocamium cartilagineum</i>	thallus	2.96	0.31	-33.55	0.13	8.23	0.70	3
H	Phaeophyceae	<i>Desmarestia menziesii</i>	thallus	3.77	0.64	-26.49	0.01	13.38	0.56	2
		<i>Himantothallus grandifolius</i>	thallus	1.64	0.83	-24.95	2.22	20.08	1.86	3
	Rhodophyta	<i>Iridaea cordata</i>	thallus	5.56	0.33	-20.39	1.56	11.75	0.93	3
		<i>Myriogramme mangini</i>	thallus	5.73	1.57	-33.71	2.50	9.46	2.93	3
		<i>Plocamium cartilagineum</i>	thallus	3.66	1.43	-32.68	0.86	7.68	0.24	3
		<i>Trematocarpus antarcticus</i>	thallus	2.46		-28.07		6.42		1
I	microalgae	benthic diatoms	whole	-0.10	0.07	-22.62	0.88	6.11	1.48	2
		POM	filter	2.17	0.48	-26.09	0.13	7.69	2.83	3
	Phaeophyceae	<i>Desmarestia menziesii</i>	thallus	3.29	0.40	-23.74	0.34	14.97	2.12	2
		<i>Himantothallus grandifolius</i>	thallus	0.30		-26.93		15.08		1
	Rhodophyta	<i>Callophyllis atrosanguinea</i>	thallus	3.64	0.47	-22.02	3.36	6.52	0.40	3
		<i>Iridaea cordata</i>	thallus	5.81		-20.11		11.92		1
		<i>Trematocarpus antarcticus</i>	thallus	3.85	0.34	-21.33	1.11	6.57	0.15	2
J	microalgae	POM	filter	1.54	0.42	-25.75	0.07	5.40	0.60	3
	Phaeophyceae	<i>Desmarestia antarctica</i>	thallus	3.14	0.42	-25.89	1.73	11.95	1.12	3
		<i>Desmarestia menziesii</i>	thallus	2.30	1.01	-28.02	1.29	12.52	1.23	3
		<i>Himantothallus grandifolius</i>	thallus	-0.44	0.64	-26.53	1.15	18.62	2.74	3
		Rhodophyta	<i>Hymenocladopsis sp.</i>	thallus	2.98	0.60	-32.16	1.35	6.60	0.70
		<i>Iridaea cordata</i>	thallus	4.22	0.52	-22.14	2.57	12.76	1.49	3
		<i>Myriogramme mangini</i>	thallus	3.17	1.38	-34.49	1.53	8.66	0.05	3
		<i>Plocamium cartilagineum</i>	thallus	2.61	1.04	-34.03	0.68	7.56	0.37	3
K	microalgae	POM	filter	1.17	1.47	-25.32	1.27	6.16	0.63	2
L	Phaeophyceae	<i>Desmarestia menziesii</i>	thallus	2.04	1.15	-26.86	1.87	13.43	0.18	2
	Rhodophyta	<i>Hymenocladopsis sp.</i>	thallus	0.96	1.16	-33.88	0.41	6.38	0.20	3
		<i>Phyllophora antarctica</i>	thallus	0.14	0.73	-33.86	0.36	6.47	0.31	3
X	microalgae	POM	filter	-0.31	0.66	-25.84	0.00	5.13	0.26	2
	Rhodophyta	<i>Callophyllis atrosanguinea</i>	thallus	4.90	1.54	-20.53	4.19	6.50	0.36	3
M	microalgae	POM	filter	0.90	0.05	-23.33	0.34	5.66	0.35	3
	Phaeophyceae	<i>Desmarestia menziesii</i>	thallus	3.82	0.24	-26.24	0.90	14.09	1.03	3
	Rhodophyta	<i>Callophyllis atrosanguinea</i>	thallus	3.90	0.97	-21.01	2.13	6.22	0.40	3
		<i>Iridaea cordata</i>	thallus	5.02		-23.67		11.79		1
N	microalgae	POM	filter	0.03	0.40	-26.35	0.53	5.36	0.81	3
	Phaeophyceae	<i>Desmarestia menziesii</i>	thallus	2.13	0.58	-24.20	1.23	9.91	1.57	3
	Rhodophyta	<i>Phyllophora antarctica</i>	thallus	-1.02	0.66	-34.84	1.13	7.14	0.25	3

Table S2: Average stable nitrogen ( $\delta^{15}\text{N}$ ) and carbon ( $\delta^{13}\text{C}$ ) isotope values and C:N ratios (including standard deviation [SD]) of invertebrate taxa at each site. N = number of replicates measured at each site.

Site	Phylum	Class/Order	Taxon	Tissue type	$\delta^{15}\text{N} \pm \text{SD}$	$\delta^{13}\text{C} \pm \text{SD}$	C:N $\pm \text{SD}$	N		
A	Porifera	Demospongiae	<i>Dendrilla antarctica</i>	whole	5.57 0.78	-32.17 0.86	4.05 0.10	3		
	Cnidaria	Octocorallia	Octocorallia	whole	4.84 0.76	-21.21 2.17	5.03 0.42	3		
	Bryozoa	n/a	Bryozoa lobed	whole	3.12 0.43	-25.47 0.62	3.21 0.11	3		
	Mollusca	Gastropoda	<i>Austrodoris kerguelenensis</i>	muscle	5.43 0.56	-19.68 0.65	4.69 0.11	3		
			<i>Margarella antarctica</i>	muscle	5.66 0.49	-20.26 1.75	3.73 0.11	3		
	Gastropoda	<i>Nacella concinna</i>	muscle	5.87 0.58	-13.78 4.25	3.83 0.17	3			
		Arthropoda	Amphipoda	<i>Bovallia gigantea</i>	muscle/whole	3.51 8.65	-19.37 0.45	2.26 2.33	4	
	Amphipoda		<i>Gondogeneia antarctica</i>	whole	4.72	-16.10	5.65	1		
	Amphipoda		<i>Metaleptamphopus pectinatus</i>	whole	4.77 1.00	-21.71 0.27	5.95 1.62	3		
	Amphipoda		<i>Oradarea bidentata</i>	whole	5.02 0.36	-21.64 1.43	4.97 0.15	3		
	Amphipoda		<i>Paradexamine fissicauda</i>	whole	6.20 0.66	-31.06 0.32	4.26 0.65	3		
	Amphipoda		<i>Paraphimedia integricauda</i>	whole	5.61 1.13	-24.52 0.82	5.20 0.25	2		
	Amphipoda		<i>Prostebbingia gracilis</i>	whole	3.10 0.94	-23.36 0.47	12.86 10.87	2		
	Echinodermata	Asteroidea	<i>Diplasterias brandti</i>	tube feet	7.68 1.11	-21.29 0.41	3.83 0.02	2		
			<i>Neosmilaster georgianus</i>	tube feet	10.19 0.72	-16.97 1.76	4.08 0.10	3		
			<i>Odontaster validus</i>	tube feet	10.94 0.40	-15.79 1.90	3.95 0.03	3		
			<i>Perknaster aurorae</i>	tube feet	11.31 0.70	-18.75 1.28	4.07 0.44	2		
			Echinoidea	<i>Sterechinus neumayeri</i>	peristomial memb.	7.45 0.25	-17.63 0.79	3.77 0.23	3	
	Chordata	Holothuroidea	Holothuroidea pink	muscle	4.61	-19.68	7.58	1		
			<i>Cnemidocarpa</i> sp.	muscle	4.45 1.55	-25.82 0.23	3.78 0.20	3		
B	Porifera	Demospongiae	<i>Dendrilla antarctica</i>	whole	3.37	-24.76	4.65	1		
	Bryozoa	n/a	Bryozoa lobed	whole	3.26 0.19	-24.69 0.02	3.48 0.13	3		
	Cnidaria	Octocorallia	Octocorallia	whole	5.88 0.65	-22.34 0.84	4.30 0.02	2		
	Mollusca	Gastropoda	<i>Margarella antarctica</i>	muscle	7.10 0.30	-17.32 1.85	3.61 0.02	3		
			<i>Nacella concinna</i>	muscle	5.50 0.28	-15.21 1.46	3.81 0.10	3		
	Arthropoda	Amphipoda	<i>Bovallia gigantea</i>	whole	6.69 0.27	-22.1 1.37	5.01 0.04	2		
			<i>Gondogeneia antarctica</i>	whole	6.23 0.33	-16.29 1.97	4.09 0.14	3		
			<i>Metaleptamphopus pectinatus</i>	whole	6.20 0.27	-22.36 0.37	3.83 0.12	2		
			<i>Oradarea bidentata</i>	whole	5.69 0.47	-18.37 1.27	4.67 0.27	3		
			<i>Paradexamine fissicauda</i>	whole	4.51 0.10	-31.07 0.12	4.37 0.23	2		
			<i>Prostebbingia gracilis</i>	whole	5.76 0.66	-20.99 2.50	4.94 0.37	3		
			Echinodermata	Asteroidea	<i>Diplasterias brandti</i>	tube feet	7.52 0.75	-20.50 0.68	3.86 0.20	4
	<i>Neosmilaster georgianus</i>	tube feet			9.29 0.34	-16.84 4.14	4.08 0.36	3		
	<i>Odontaster validus</i>	tube feet			9.55 0.57	-18.23 1.09	3.86 0.08	3		
	<i>Perknaster aurorae</i>	tube feet			10.97 0.85	-18.09 2.41	3.94 0.20	2		
	Chordata	Acidiacea	<i>Cnemidocarpa</i> sp.	muscle	4.67 0.43	-24.86 0.71	3.67 0.18	3		
	C	Porifera	Demospongiae	<i>Dendrilla antarctica</i>	whole	2.82 0.17	-24.84 0.53	4.49 0.52	3	
		Bryozoa	n/a	Bryozoa lobed	whole	2.96 0.21	-24.02 1.71	3.69 0.51	3	
		Mollusca	Gastropoda	<i>Margarella antarctica</i>	muscle	7.48 0.25	-15.37 0.68	3.58 0.04	3	
		Annelida	Polychaeta	Polynoidae	pharynx	10.02 0.33	-17.16 1.99	3.11 0.07	3	
Arthropoda		Amphipoda	<i>Bovallia gigantea</i>	muscle	8.66 1.89	-16.52 1.43	3.69 0.53	3		
			<i>Eusirus bouvieri</i>	whole	6.98 1.29	-21.49 0.78	4.85 0.64	3		
			<i>Gondogeneia antarctica</i>	whole	6.09	-16.78	3.31	1		
			<i>Oradarea bidentata</i>	whole	5.78 0.19	-21.05 1.66	4.67 0.77	3		
			<i>Paradexamine fissicauda</i>	whole	5.57 0.78	-32.17 0.86	4.05 0.10	3		
			<i>Paraphimedia integricauda</i>	whole	6.47 0.97	-22.92 2.69	5.81 1.78	3		
			Isopoda	<i>Glyptonotus antarcticus</i>	muscle	11.14	-18.84	3.05	1	
			Gastropoda	<i>Nacella concinna</i>	muscle	5.98 0.20	-11.51 0.75	3.74 0.07	3	
			Echinodermata	Asteroidea	<i>Diplasterias brandti</i>	tube feet	7.70 0.40	-21.69 0.36	3.80 0.21	4
					<i>Labidiaster annulatus</i>	tube feet	11.39 0.36	-19.60 0.69	3.65 0.20	3
<i>Neosmilaster georgianus</i>		tube feet			9.48 0.86	-17.81 2.02	4.02 0.14	3		
<i>Odontaster validus</i>		tube feet			9.34 1.66	-15.29 2.72	3.78 0.16	3		
Asteroidea		<i>Perknaster aurorae</i>	tube feet	11.13 0.50	-19.01 0.38	4.17 0.45	3			
Chordata		Acidiacea	<i>Cnemidocarpa</i> sp.	muscle	4.41 0.64	-25.24 0.13	3.64 0.16	3		

Table S2 cont.:

Site	Phylum	Class/Order	Taxon	Tissue type	$\delta^{15}\text{N} \pm \text{SD}$	$\delta^{13}\text{C} \pm \text{SD}$	C:N $\pm \text{SD}$	N	
D	Porifera	Demospongiae	<i>Dendrilla antarctica</i>	whole	3.30 0.26	-23.91 1.52	4.06 0.06	3	
	Cnidaria	Octocorallia	Octocorallia	whole	6.33 0.20	-23.58 0.36	4.15 0.38	3	
		Actiniaria	<i>Isotealia antarctica</i>	tentacle	8.61 0.41	-18.70 0.58	3.99 0.08	3	
	Mollusca	Gastropoda	<i>Austrodoris kerguelensis</i>	muscle	8.16 1.33	-18.24 2.12	4.90 0.26	4	
		Gastropoda	<i>Margarella antarctica</i>	muscle	7.08 0.33	-13.76 0.70	3.64 0.08	3	
		Gastropoda	<i>Nacella concinna</i>	muscle	5.88	-12.30	3.84	1	
	Annelida	Polychaeta	Polynoidae	pharynx	10.22 1.45	-16.80 2.01	3.18 0.21	3	
	Arthropoda	Amphipoda	<i>Bovallia gigantea</i>	muscle	9.24 0.37	-13.87 0.35	3.59 0.76	5	
		Amphipoda	<i>Eusirus bouvieri</i>	whole	7.96 0.54	-17.56 1.19	4.16 0.66	3	
		Amphipoda	<i>Gondogeneia antarctica</i>	whole	5.95 0.73	-13.48 2.37	4.07 0.08	3	
		Amphipoda	<i>Oradarea bidentata</i>	whole	5.23 1.24	-14.75 0.56	4.96 0.71	3	
		Amphipoda	<i>Paraphimedia integricauda</i>	whole	8.05 0.53	-15.55 0.99	4.83 0.52	3	
		Amphipoda	<i>Pontogeneilla brevicornis</i>	whole	2.69 0.65	-17.29 2.90	5.66 0.66	3	
		Echinodermata	Asteroidea	<i>Diplasterias brandti</i>	tube feet	8.07 1.86	-19.32 2.47	3.86 0.34	3
			Asteroidea	<i>Labidaster annulatus</i>	tube feet	12.87 1.78	-18.19 0.85	3.76 0.16	3
			Asteroidea	<i>Neosmilaster georgianus</i>	tube feet	8.99 1.21	-15.91 4.45	4.10 0.33	3
			Asteroidea	<i>Odontaster validus</i>	tube feet	9.92 0.94	-15.03 2.63	3.95 0.32	3
	Asteroidea		<i>Perknaster aurorae</i>	tube feet	10.34 1.22	-15.05 1.35	4.01 0.35	3	
	Holothuroidea		<i>Heterocucumis cucumaris</i>	muscle	8.32 1.17	-21.06 1.68	3.85 0.09	2	
	Holothuroidea		muscle	6.03	-23.63	3.91	1		
	Chordata	Acidiacea	<i>Cnemidocarpa</i> sp.	muscle	4.93 0.53	-25.35 0.20	3.91 0.09	4	
	E	Porifera	Demospongiae	<i>Dendrilla antarctica</i>	whole	2.47 0.78	-23.74 0.34	3.44 0.42	2
		Cnidaria	Actiniaria	<i>Isotealia antarctica</i>	tentacle	9.26 0.85	-15.52 0.88	4.44 0.08	3
Mollusca		Gastropoda	<i>Austrodoris kerguelensis</i>	muscle	7.35 0.68	-14.97 1.31	5.31 0.42	3	
		Gastropoda	<i>Margarella antarctica</i>	muscle	7.11 0.40	-15.20 0.50	3.66 0.39	3	
		Gastropoda	<i>Nacella concinna</i>	muscle	7.04 0.26	-15.13 0.24	3.93 0.03	3	
Annelida		Polychaeta	Polynoidae	pharynx	9.80 0.89	-16.25 1.47	3.08 0.06	3	
		Polychaeta	Terebellida	body wall	6.80 1.09	-17.63 1.17	3.77 0.28	4	
Arthropoda		Amphipoda	<i>Bovallia gigantea</i>	muscle	9.97 0.24	-15.51 0.75	3.34 0.20	3	
		Amphipoda	<i>Gondogeneia antarctica</i>	whole	6.24 0.54	-16.17 0.47	5.76 1.04	3	
		Amphipoda	<i>Paradexamine fissicauda</i>	whole	5.32 0.86	-27.17 0.53	3.91 0.42	2	
		Amphipoda	<i>Pontogeneilla brevicornis</i>	whole	4.25 1.35	-18.33 1.09	6.22 1.11	4	
		Amphipoda	<i>Prostebbingia gracilis</i>	whole	5.41 0.35	-17.81 0.74	8.27 1.99	3	
		Isopoda	<i>Glyptonotus antarcticus</i>	muscle	10.66 0.41	-15.31 1.02	3.17 0.06	3	
		Echinodermata	Asteroidea	<i>Diplasterias brandti</i>	tube feet	10.26	-21.99	3.67	1
Asteroidea			<i>Neosmilaster georgianus</i>	tube feet	9.90 0.53	-12.82 0.82	3.82 0.08	3	
Asteroidea			<i>Odontaster validus</i>	tube feet	11.10 1.19	-15.41 1.64	3.92 0.10	3	
Asteroidea			<i>Perknaster aurorae</i>	tube feet	11.53	-16.35	3.93	1	
Echinoidea			<i>Sterechnus neumayeri</i>	peristomial memb.	7.31 0.64	-17.00 0.36	3.82 0.67	3	
Chordata			Acidiacea	<i>Cnemidocarpa</i> sp.	muscle	5.42 0.38	-25.03 0.98	3.74 0.37	3
F		Porifera	Demospongiae	<i>Dendrilla antarctica</i>	whole	3.43 0.11	-23.61 0.55	4.64 0.12	3
		Cnidaria	Actiniaria	<i>Isotealia antarctica</i>	tentacle	9.25 1.08	-17.61 0.57	4.29 0.19	3
		Mollusca	Gastropoda	<i>Austrodoris kerguelensis</i>	muscle	6.63	-18.13	4.61	1
			Gastropoda	<i>Margarella antarctica</i>	muscle	6.64 0.58	-17.55 0.87	3.56 0.04	3
	Gastropoda		<i>Nacella concinna</i>	muscle	4.50 0.70	-15.10 0.31	3.90 0.19	3	
	Annelida	Polychaeta	Polynoidae	pharynx	9.26 0.15	-17.34 0.80	3.19 0.31	3	
		Polychaeta	Terebellida	body wall	7.93 0.05	-18.31 0.11	3.92 0.11	2	
	Arthropoda	Amphipoda	<i>Bovallia gigantea</i>	whole	8.20 0.32	-17.88 0.48	3.91 0.49	4	
		Amphipoda	<i>Gondogeneia antarctica</i>	whole	6.39 0.12	-18.85 0.57	5.57 0.33	3	
		Amphipoda	<i>Metaleptamphopus pectinatus</i>	whole	5.88 0.37	-19.90 0.52	8.41 0.90	3	
		Amphipoda	<i>Oradarea bidentata</i>	whole	6.11 0.69	-18.72 1.21	4.64 0.69	3	
		Amphipoda	<i>Paradexamine fissicauda</i>	whole	5.23	-26.07	3.65	1	
		Amphipoda	<i>Pontogeneilla brevicornis</i>	whole	5.43 1.12	-19.71 0.74	4.64 0.66	3	
		Amphipoda	<i>Prostebbingia gracilis</i>	whole	6.68 0.49	-20.67 1.33	5.24 0.43	3	
		Isopoda	<i>Glyptonotus antarcticus</i>	muscle	9.85 0.95	-17.15 0.80	3.23 0.15	3	
		Echinodermata	Asteroidea	<i>Diplasterias brandti</i>	tube feet	8.20 1.10	-19.86 1.46	3.92 0.08	3
			Asteroidea	<i>Neosmilaster georgianus</i>	tube feet	9.41 0.50	-13.72 0.51	4.50 0.23	3
	Asteroidea		<i>Odontaster validus</i>	tube feet	9.98 0.38	-16.60 0.41	4.02 0.10	3	
	Echinoidea		<i>Sterechnus neumayeri</i>	peristomial memb.	8.16 0.04	-16.02 0.35	4.25 0.09	2	
	Chordata	Acidiacea	<i>Cnemidocarpa</i> sp.	muscle	5.03 1.21	-24.55 1.24	3.77 0.11	3	

Table S2 cont.:

Site	Phylum	Class/Order	Taxon	Tissue type	$\delta^{15}\text{N}$ $\pm$ SD	$\delta^{13}\text{C}$ $\pm$ SD	C:N $\pm$ SD	N	
G	Porifera	Demospongiae	<i>Dendrilla antarctica</i>	whole	3.42 0.88	-22.93 0.56	3.70 0.81	3	
	Cnidaria	Octocorallia	Octocorallia	whole	6.34 0.60	-23.09 0.71	4.27 0.08	3	
		Actiniaria	<i>Isotealia antarctica</i>	tentacle	8.16 0.67	-18.15 1.06	4.46 0.13	3	
	Mollusca	Gastropoda	<i>Austrodoris kerguelenensis</i>	muscle	8.25 0.48	-11.67 0.65	5.87 0.16	3	
		Gastropoda	<i>Nacella concinna</i>	muscle	6.42 0.24	-15.83 1.36	3.93 0.09	3	
	Annelida	Polychaeta	<i>Flabegraviera mundata</i>	body wall	3.20	-14.39	3.92	1	
		Polychaeta	Polynoidea	pharynx	9.60 0.39	-16.67 0.44	3.09 0.01	2	
	Arthropoda	Amphipoda	<i>Gondogeneia antarctica</i>	whole	6.49 0.75	-18.72 0.55	5.66 1.30	3	
		Amphipoda	<i>Paradexamine fissicauda</i>	whole	3.14 0.55	-20.10 0.57	6.04 2.55	2	
		Amphipoda	<i>Pontogeneilla brevicornis</i>	whole	4.33 1.37	-17.58 0.35	6.53 1.80	3	
		Amphipoda	<i>Prostebbingia gracilis</i>	whole	6.38 0.24	-21.06 1.30	8.83 4.10	3	
	Echinodermata	Asteroidea	<i>Cuenotaster involutus</i>	tube feet	11.27 0.85	-15.38 0.82	4.47 0.35	3	
		Asteroidea	<i>Diplasterias brandti</i>	tube feet	7.23 0.24	-21.34 0.59	3.78 0.11	3	
		Asteroidea	<i>Glabraster antarctica</i>	tube feet	8.23	-18.46	4.03	1	
		Asteroidea	<i>Labidiaster annulatus</i>	tube feet	11.83 0.31	-18.51 0.86	3.97 0.14	3	
		Asteroidea	<i>Neosmilaster georgianus</i>	tube feet	9.48 0.66	-15.61 1.32	4.02 0.15	3	
		Asteroidea	<i>Odontaster validus</i>	tube feet	10.31 0.97	-20.42 0.70	3.89 0.12	3	
		Echinoidea	<i>Sterechinus neumayeri</i>	peristomial memb.	6.51 0.49	-16.79 1.37	3.56 0.57	3	
	Chordata	Acidiacea	<i>Cnemidocarpa</i> sp.	muscle	5.51 0.31	-24.70 0.23	3.90 0.14	3	
	H	Porifera	Demospongiae	<i>Dendrilla antarctica</i>	whole	2.96 0.82	-23.72 0.85	4.03 0.85	3
		Cnidaria	Actiniaria	<i>Isotealia antarctica</i>	tentacle	9.83 0.18	-19.13 0.08	4.24 0.13	2
Mollusca		Gastropoda	<i>Nacella concinna</i>	muscle	6.89 0.90	-18.07 0.18	3.84 0.03	2	
Annelida		Polychaeta	Terebellida	body wall	7.60 0.45	-20.26 0.29	4.41 0.26	3	
Arthropoda		Amphipoda	<i>Eusirus bouvieri</i>	whole	6.37 0.02	-19.19 0.94	4.73 0.74	2	
		Isopoda	<i>Glyptonotus antarcticus</i>	muscle	10.32	-18.64	2.96	1	
Echinodermata		Asteroidea	<i>Neosmilaster georgianus</i>	tube feet	9.21 0.12	-18.59 0.85	4.36 0.13	2	
		Asteroidea	<i>Odontaster validus</i>	tube feet	11.10 0.76	-18.25 0.60	4.08 0.06	3	
		Echinoidea	<i>Sterechinus neumayeri</i>	peristomial memb.	9.09 1.04	-20.42 1.31	3.96 0.53	3	
Chordata		Acidiacea	<i>Cnemidocarpa</i> sp.	pharynx	6.11 1.32	-22.51 0.17	3.47 0.17	2	
I	Mollusca	Gastropoda	<i>Austrodoris kerguelenensis</i>	muscle	8.26	-18.05	4.41	1	
		Gastropoda	<i>Margarella antarctica</i>	muscle	6.90	-14.73	3.56	1	
		Gastropoda	<i>Nacella concinna</i>	muscle	7.12 0.24	-13.72 0.72	3.91 0.05	3	
	Annelida	Polychaeta	<i>Flabegraviera mundata</i>	body wall	5.07 0.20	-14.69 0.33	4.34 0.19	3	
		Polychaeta	Polynoidea	pharynx	9.11	-17.84	3.10	1	
	Arthropoda	Amphipoda	<i>Eusirus bouvieri</i>	whole	7.65 0.22	-18.70 0.72	4.57 0.82	3	
	Echinodermata	Asteroidea	<i>Cuenotaster involutus</i>	tube feet	10.85 1.01	-14.12 0.34	4.35 0.09	3	
		Asteroidea	<i>Glabraster antarctica</i>	tube feet	10.53 0.08	-16.35 0.41	4.13 0.10	3	
		Asteroidea	<i>Labidiaster annulatus</i>	tube feet	13.71	-17.39	3.97	1	
		Asteroidea	<i>Neosmilaster georgianus</i>	tube feet	9.34	-14.08	4.55	1	
		Asteroidea	<i>Odontaster validus</i>	tube feet	12.16 0.88	-13.21 0.45	4.15 0.46	2	
	Echinoidea	<i>Sterechinus neumayeri</i>	peristomial memb.	7.29 0.71	-14.07 0.09	3.80 0.62	3		
J	Porifera	Demospongiae	<i>Dendrilla antarctica</i>	whole	3.76 0.07	-22.62 0.42	3.66 0.51	3	
	Cnidaria	Octocorallia	Octocorallia	whole	6.63 0.46	-22.31 0.78	4.15 0.13	4	
		Actiniaria	<i>Isotealia antarctica</i>	tentacle	9.37 1.17	-18.33 0.34	4.43 0.31	2	
	Mollusca	Gastropoda	<i>Austrodoris kerguelenensis</i>	muscle	6.66 0.28	-16.79 0.17	4.98 0.24	3	
		Gastropoda	<i>Margarella antarctica</i>	muscle	6.15 0.22	-17.38 0.77	3.63 0.10	3	
		Gastropoda	<i>Marseniopsis mollis</i>	muscle	7.95	-23.01	3.72	1	
		Gastropoda	<i>Nacella concinna</i>	muscle	6.48 0.20	-13.84 0.50	3.84 0.10	3	
	Annelida	Polychaeta	Polynoidea	pharynx	8.93 0.17	-16.17 1.39	3.64 0.49	2	
	Arthropoda	Amphipoda	<i>Bovallia gigantea</i>	whole	6.48 0.40	-18.23 0.41	5.10 0.93	3	
		Amphipoda	<i>Gondogeneia antarctica</i>	whole	4.39 0.76	-18.40 0.36	7.67 2.00	3	
		Amphipoda	<i>Metaleptamphopus pectinatus</i>	whole	4.89 0.33	-20.45 0.19	10.98 1.48	3	
		Amphipoda	<i>Paradexamine fissicauda</i>	whole	3.64 0.09	-25.89 0.38	4.57 0.04	3	
		Amphipoda	<i>Paraphimedia integricauda</i>	whole	7.11 1.21	-19.95 3.03	5.22 0.75	3	
		Amphipoda	<i>Prostebbingia gracilis</i>	whole	5.72 0.48	-18.69 0.83	6.43 0.92	3	
		Isopoda	<i>Glyptonotus antarcticus</i>	muscle	9.51 0.40	-18.66 1.08	3.10 0.11	3	
	Echinodermata	Asteroidea	<i>Diplasterias brandti</i>	tube feet	9.79 1.21	-12.88 1.16	3.84 0.11	3	
		Asteroidea	<i>Neosmilaster georgianus</i>	tube feet	9.19 0.11	-15.49 1.30	4.50 0.06	3	
		Asteroidea	<i>Odontaster validus</i>	tube feet	9.70 0.40	-17.90 0.59	4.09 0.07	3	
		Echinoidea	<i>Sterechinus neumayeri</i>	peristomial memb.	7.69 0.46	-16.64 1.90	3.84 0.42	3	
	Chordata	Acidiacea	<i>Cnemidocarpa</i> sp.	muscle	5.59 0.54	-23.43 0.36	3.83 0.16	3	

Table S2 cont.:

Site	Phylum	Class/Order	Taxon	Tissue type	$\delta^{15}\text{N} \pm \text{SD}$	$\delta^{13}\text{C} \pm \text{SD}$	C:N $\pm \text{SD}$	N	
K	Cnidaria	Actiniaria	<i>Isotealia antarctica</i>	tentacle	11.31 2.51	-19.49 0.94	4.21 0.00	3	
	Mollusca	Gastropoda	<i>Marseniopsis mollis</i>	muscle	8.02 0.49	-20.58 0.92	3.78 0.04	2	
		Gastropoda	<i>Nacella concinna</i>	muscle	7.39 0.38	-15.21 0.83	3.87 0.14	3	
	Annelida	Polychaeta	<i>Flabegraviera mundata</i>	body wall	7.37 0.43	-17.96 0.51	4.42 0.06	3	
		Polychaeta	Polynoidea	pharynx	9.61 0.56	-17.27 1.36	3.06 0.09	2	
	Chordata	Acidiacea	<i>Cnemidocarpa</i> sp.	muscle	7.35 0.90	-21.65 0.60	3.81 0.16	3	
	Echinodermata	Asteroidea	<i>Cuenotaster involutus</i>	tube feet	11.77 0.62	-14.81 0.52	4.62 0.45	3	
		Asteroidea	<i>Glabraster antarctica</i>	tube feet	9.91 0.37	-16.49 0.99	3.91 0.00	3	
		Asteroidea	<i>Labidiaster annulatus</i>	tube feet	11.18 0.38	-18.04 1.14	4.03 0.05	3	
		Asteroidea	<i>Odontaster validus</i>	tube feet	10.47 0.20	-14.72 0.43	4.03 0.08	3	
		Echinoidea	<i>Sterechnus neumayeri</i>	peristomial memb.	8.32 0.58	-14.37 1.34	4.00 0.18	3	
	L	Porifera	Demospongiae	<i>Dendrilla antarctica</i>	whole	4.17 0.28	-21.54 0.22	4.28 0.45	3
Cnidaria		Octocorallia	Octocorallia	whole	7.50 0.73	-20.42 0.95	4.24 0.32	6	
Cnidaria		Actiniaria	<i>Isotealia antarctica</i>	tentacle	10.98 1.17	-16.52 0.27	4.35 0.15	2	
		Gastropoda	<i>Marseniopsis mollis</i>	muscle	8.73 0.64	-21.08 0.75	3.81 0.11	3	
Mollusca		Gastropoda	<i>Nacella concinna</i>	muscle	7.15 0.43	-15.12 1.17	3.82 0.08	3	
		Polychaeta	Polynoidea	pharynx	11.28	-17.42	3.06	1	
Annelida		Polychaeta	Terebellida	body wall	8.02 0.13	-18.41 0.70	3.92 0.25	3	
		Amphipoda	<i>Gondogeneia antarctica</i>	whole	4.59 0.09	-19.36 0.68	6.28 0.52	3	
Arthropoda		Amphipoda	<i>Metaleptamphopus pectinatus</i>	whole	6.11 1.67	-20.62 2.04	7.33 3.17	3	
		Amphipoda	<i>Oradarea bidentata</i>	whole	5.99 0.25	-20.21 0.71	5.52 0.58	3	
Arthropoda		Amphipoda	<i>Pontogeneilla brevicornis</i>	whole	4.48	-18.22	6.14	1	
		Echinodermata	Asteroidea	<i>Diplasterias brandti</i>	tube feet	9.91 0.19	-18.43 1.24	3.74 0.31	3
Echinodermata		Asteroidea	<i>Glabraster antarctica</i>	tube feet	11.28 0.90	-15.27 0.32	4.03 0.11	3	
		Asteroidea	<i>Labidiaster annulatus</i>	tube feet	15.34	-17.39	3.83	1	
Echinodermata		Asteroidea	<i>Odontaster validus</i>	tube feet	11.13 1.39	-17.85 1.52	4.03 0.06	3	
		Asteroidea	<i>Perknaster aurorae</i>	tube feet	10.96 1.30	-19.39 0.63	4.00 0.45	3	
Echinodermata		Echinoidea	<i>Sterechnus neumayeri</i>	peristomial memb.	8.04 0.26	-16.06 0.57	4.30 0.15	3	
		Holothuroidea	<i>Heterocucumis cucumaris</i>	muscle	6.47 0.39	-20.84 0.06	3.73 0.15	3	
Chordata		Acidiacea	<i>Cnemidocarpa</i> sp.	muscle	6.84 1.69	-21.54 0.59	4.86 2.25	3	
X		Porifera	Demospongiae	<i>Dendrilla antarctica</i>	whole	8.03	-21.64	5.51	1
		Cnidaria	Actiniaria	<i>Isotealia antarctica</i>	tentacle	10.77 1.43	-17.90 0.66	4.44 0.26	2
		Mollusca	Gastropoda	<i>Margarella antarctica</i>	muscle	8.39 0.33	-14.02 0.64	4.12 0.82	3
			Gastropoda	<i>Nacella concinna</i>	muscle	7.14 0.29	-16.49 1.10	3.89 0.11	3
		Annelida	Polychaeta	Polynoidea	pharynx	10.33 0.98	-14.98 0.17	3.23 0.14	3
		Arthropoda	Amphipoda	<i>Oradarea bidentata</i>	whole	6.49 0.95	-15.90 1.02	7.96 1.60	3
			Amphipoda	<i>Pontogeneilla brevicornis</i>	whole	7.69 0.90	-15.45 1.24	4.74 0.33	3
		Arthropoda	Amphipoda	<i>Prostebbingia gracilis</i>	whole	7.86 0.42	-14.11 1.06	6.77 1.95	3
	Amphipoda		<i>Cuenotaster involutus</i>	tube feet	12.68 0.90	-12.15 0.42	4.17 0.61	2	
	Echinodermata	Asteroidea	<i>Diplasterias brandti</i>	tube feet	8.60 0.77	-18.41 0.41	3.68 0.22	3	
		Asteroidea	<i>Glabraster antarctica</i>	tube feet	10.42 0.45	-13.95 0.43	3.80 0.39	3	
	Echinodermata	Asteroidea	<i>Odontaster validus</i>	tube feet	11.50 0.23	-11.23 0.19	3.87 0.49	3	
		Echinoidea	<i>Sterechnus neumayeri</i>	peristomial memb.	8.82 0.13	-12.35 1.20	3.77 0.56	3	
	Echinodermata	Holothuroidea	<i>Heterocucumis cucumaris</i>	muscle	9.11 0.15	-21.58 0.36	3.72 0.07	3	
		Chordata	Acidiacea	<i>Cnemidocarpa</i> sp.	pharynx	4.39 0.37	-23.04 0.28	3.87 0.10	3
	M	Porifera	Demospongiae	<i>Dendrilla antarctica</i>	whole	6.11 1.18	-21.24 0.59	5.66 0.17	3
		Cnidaria	Octocorallia	Octocorallia	whole	7.62 0.33	-20.74 0.19	3.94 0.16	3
			Actiniaria	<i>Isotealia antarctica</i>	tentacle	10.14 0.30	-16.31 0.22	4.40 0.22	3
Mollusca		Gastropoda	<i>Marseniopsis mollis</i>	muscle	8.25 0.68	-20.45 0.21	4.34 0.27	3	
		Gastropoda	<i>Nacella concinna</i>	muscle	6.91 0.41	-13.36 0.69	3.92 0.05	3	
Annelida		Polychaeta	<i>Flabegraviera mundata</i>	body wall	7.05 0.54	-15.41 0.76	3.96 0.21	3	
		Polychaeta	Terebellida	body wall	7.69 0.50	-18.78 0.29	4.50 0.24	3	
Arthropoda		Amphipoda	<i>Gondogeneia antarctica</i>	whole	6.12 0.35	-18.42 0.10	5.09 0.94	3	
Echinodermata		Asteroidea	<i>Cuenotaster involutus</i>	tube feet	11.77 0.46	-17.48 0.70	4.55 0.55	2	
		Asteroidea	<i>Diplasterias brandti</i>	tube feet	9.86 0.16	-19.10 0.24	3.73 0.10	3	
Echinodermata		Asteroidea	<i>Neosmilaster georgianus</i>	tube feet	9.67 0.67	-13.49 0.25	4.25 0.32	3	
		Asteroidea	<i>Odontaster validus</i>	tube feet	10.54 0.50	-17.90 0.73	4.11 0.10	3	
Echinodermata		Asteroidea	<i>Perknaster aurorae</i>	tube feet	11.50	-19.92	3.77	1	
		Echinoidea	<i>Sterechnus neumayeri</i>	peristomial memb.	7.26 0.73	-14.88 0.52	4.14 0.30	3	
Echinodermata		Holothuroidea	<i>Heterocucumis cucumaris</i>	muscle	8.12 0.75	-21.67 0.93	3.52 0.02	3	
		Holothuroidea	Holothuroidea pink	muscle	7.71 0.08	-22.91 0.22	3.72 0.03	3	
Chordata		Acidiacea	<i>Cnemidocarpa</i> sp.	muscle	5.25 1.81	-21.46 1.20	3.73 0.21	3	

Table S2 cont.:

Site	Phylum	Class/Order	Taxon	Tissue type	$\delta^{15}\text{N}$ $\pm$ SD	$\delta^{13}\text{C}$ $\pm$ SD	C:N $\pm$ SD	N
N	Porifera	Demospongiae	<i>Dendrilla antarctica</i>	whole	6.77 1.36	-18.94 0.92	3.83 1.21	3
	Cnidaria	Octocorallia	Octocorallia	whole	8.50 0.67	-21.39 0.43	4.33 0.12	5
	Mollusca	Gastropoda	<i>Nacella concinna</i>	muscle	6.72 0.36	-14.89 1.16	4.06 0.03	3
	Annelida	Polychaeta	Polynoidae	pharynx	11.31 1.85	-16.92 0.92	2.99 0.30	3
		Polychaeta	Terebellida	body wall	6.85	-18.90	3.95	1
	Arthropoda	Amphipoda	<i>Bovallia gigantea</i>	whole	9.24 0.13	-16.92 0.64	5.63 0.68	3
		Amphipoda	<i>Pontogeneilla brevicornis</i>	whole	5.34 1.12	-16.33 0.74	6.53 1.98	3
	Echinodermata	Asteroidea	<i>Odontaster validus</i>	tube feet	10.14 0.51	-15.47 2.04	3.87 0.06	3
		Echinoidea	<i>Sterechinus neumayeri</i>	peristomial memb.	7.55 0.28	-14.96 0.89	4.13 0.13	3
		Holothuroidea	<i>Heterocucumis cucumaris</i>	muscle	8.08 0.35	-23.67 0.41	3.75 0.07	3
	Chordata	Acidiacea	<i>Cnemidocarpa</i> sp.	muscle	7.71 0.68	-21.89 0.71	3.70 0.17	3

Table S3: P-values and adjusted R<sup>2</sup> values of regressions between the chemically-extracted and the mathematically corrected  $\delta^{13}\text{C}$  values of benthic Antarctic invertebrates. Mathematical extraction was performed according to Alexander et al. 1996 (see text for details). N is the number of paired  $\delta^{13}\text{C}$  values per taxon.

Invertebrate taxon			p-value	R <sup>2</sup>	N
Porifera	Demospongiae	<i>Dendrilla antarctica</i>	0.0083	0.452	12
Cnidaria	Octocorallia	Octocorallia	0.0338	0.869	11
	Actiniaria	<i>Isotealia antarctica</i>	<0.0001	0.956	10
Bryozoa	n/a	Bryozoa lobed	0.3900	0.117	3
Mollusca	Gastropoda	<i>Austrodoris kerguelenensis</i>	0.0304	0.538	7
	Gastropoda	<i>Margarella antarctica</i>	<0.0001	0.956	8
	Gastropoda	<i>Marseniopsis mollis</i>	0.0158	0.998	3
	Gastropoda	<i>Nacella concinna</i>	<0.0001	0.945	14
Annelida	Polychaeta	<i>Flabegaviera mundata</i>	0.0155	0.939	9
	Polychaeta	Polynoidae	<0.0001	0.904	9
	Polychaeta	Terebellida	0.0260	0.766	5
Arthropoda	Amphipoda	<i>Bovallia gigantea</i>	<0.0001	0.944	11
	Amphipoda	<i>Eusirus bouvieri</i>	0.0018	0.959	5
	Amphipoda	<i>Gondogeneia antarctica</i>	0.0003	0.827	9
	Amphipoda	<i>Metaleptamphopus pectinatus</i>	0.0225	0.786	5
	Amphipoda	<i>Oradarea bidentata</i>	0.0241	0.575	7
	Amphipoda	<i>Paradexamine fissicauda</i>	<0.0001	0.989	6
	Amphipoda	<i>Paraphimedia integricauda</i>	0.0134	0.947	4
	Amphipoda	<i>Pontogeneilla brevicornis</i>	0.0053	0.836	6
	Amphipoda	<i>Prostebbingia gracilis</i>	0.0029	0.810	7
	Amphipoda	Isopoda	<i>Glyptonotus antarcticus</i>	0.0001	0.994
Echinodermata	Asteroidea	<i>Cuenotaster involutus</i>	0.0018	0.902	6
	Asteroidea	<i>Diplasterias brandti</i>	<0.0001	0.872	14
	Asteroidea	<i>Glabraster antarctica</i>	0.1243	0.563	4
	Asteroidea	<i>Labidiaster annulatus</i>	0.0026	0.885	6
	Asteroidea	<i>Neosmilaster georgianus</i>	<0.0001	0.947	10
	Asteroidea	<i>Odontaster validus</i>	<0.0001	0.931	16
	Asteroidea	<i>Perknaster aurorae</i>	0.0041	0.930	5
	Echinoidea	<i>Sterechinus neumayeri</i>	0.0002	0.759	11
	Holothuroidea	<i>Heterocucumis cucumaris</i>	0.0003	0.926	7
	Holothuroidea	Holothuroidea pink	0.1190	0.418	5
Chordata	Acidiacea	<i>Cnemidocarpa</i> sp.	<0.0001	0.902	19



Table S4: Results of a mixed effects model with a random station effect to test for the relationship between producer stable isotope values ( $\delta^{15}\text{N}$  and  $\delta^{13}\text{C}$ ) and the average annual sea ice cover from National Ice Center (NIC) ice charts at each station. Given are the parameter estimates, p-values for the slope, and the marginal  $R^2$  values that provide the proportion of the overall variability in the response to the fixed effects, ice cover.

Taxon	$\delta^{15}\text{N}$			$\delta^{13}\text{C}$				
	estimate	p-value	$R^2$	estimate	p-value	$R^2$		
<b>Phaeophyceae</b>	<i>Desmarestia antarctica</i>	0.04	0.274	0.543	-0.02	0.778	0.032	
	<i>Desmarestia menziesii</i>	-0.01	0.507	0.024	0.01	0.799	0.003	
	<i>Himantothallus grandifolius</i>	-0.05	0.126	0.132	0.00	0.963	0.000	
<b>Rhodophyta</b>	<i>Callophyllis atrosanguinea</i>	-0.06	0.716	0.027	-0.14	0.660	0.027	
	<i>Hymenocladopsis</i> sp.	-0.02	0.500	0.043	-0.05	0.139	0.220	
	<i>Iridaea cordata</i>	0.04	<b>0.003</b>	<b>0.444</b>	-0.06	0.336	0.064	
	<i>Myriogramme mangini</i>	0.06	0.064	0.241	0.02	0.617	0.018	
	<i>Phyllophora antarctica</i>	-0.04	0.367	0.142	0.01	0.713	0.015	
	<i>Plocamium cartilagineum</i>	0.01	0.423	0.030	0.03	0.206	0.121	
	<i>Sarcopeltis antarctica</i>	0.01	0.834	0.009	0.10	0.295	0.210	
	<i>Trematocarpus antarcticus</i>	0.00	0.832	0.003	0.02	0.792	0.008	
	<b>Microalgae</b>	POM	-0.02	0.082	0.136	-0.03	0.090	0.168
		benthic diatoms	-0.01	0.849	0.007	0.04	0.460	-0.088

Table S5: Results of a mixed effects model with a random station effect to test for the relationship between invertebrate stable isotope values ( $\delta^{15}\text{N}$  and  $\delta^{13}\text{C}$ ) and the average annual sea ice cover from National Ice Center (NIC) ice charts at each station. Given are the parameter estimates, p-values for the slope, and the marginal  $R^2$  values that provide the proportion of the overall variability in the response to the fixed effects, ice cover.

Phylum	Taxon	$\delta^{15}\text{N}$			$\delta^{13}\text{C}$		
		estimate	p-value	$R^2$	estimate	p-value	$R^2$
<b>Porifera</b>	<i>Dendrilla antarctica</i>	0.06	<b>0.052</b>	<b>0.226</b>	0.15	<b>0.001</b>	<b>0.498</b>
<b>Cnidaria</b>	Octocorallia	0.05	<b>0.004</b>	<b>0.467</b>	0.02	0.526	0.035
	<i>Isotealia antarctica</i>	0.04	0.160	0.111	-0.02	0.668	0.018
<b>Bryozoa</b>	Bryozoa lobed	0.00	0.963	0.000	0.29	0.181	0.232
<b>Annelida</b>	<i>Flabegraviera mundata</i>	0.06	0.809	0.020	-0.18	0.249	0.327
	Polynoidae	0.01	0.613	0.012	0.00	0.913	0.001
	Terebellida	-0.01	0.804	0.005	-0.01	0.816	0.005
<b>Mollusca</b>	<i>Austrodoris kerguelenensis</i>	0.03	0.300	0.118	0.10	0.148	0.234
	<i>Marseniopsis mollis</i>	-0.02	0.340	0.122	0.06	0.334	0.199
	<i>Margarella antarctica</i>	0.02	0.404	0.060	0.04	0.401	0.060
	<i>Nacella concinna</i>	0.02	<b>0.044</b>	<b>0.192</b>	-0.03	0.181	0.072
<b>Arthropoda</b>	<i>Bovallia gigantea</i>	0.01	0.826	0.004	0.01	0.854	0.004
	<i>Eusirus bouvieri</i>	0.00	0.943	0.001	0.01	0.863	0.008
	<i>Gondogeneia antarctica</i>	0.01	0.645	0.018	-0.11	<b>0.001</b>	<b>0.496</b>
	<i>Metaleptamphopus pectinatus</i>	0.02	0.608	0.028	0.08	<b>0.010</b>	<b>0.438</b>
	<i>Oradarea bidentata</i>	0.03	<b>0.006</b>	<b>0.327</b>	0.04	0.617	0.034
	<i>Paradexamine fissicauda</i>	-0.06	<b>0.022</b>	<b>0.437</b>	0.30	<b>&lt;0.001</b>	<b>0.919</b>
	<i>Paraphimedia integricauda</i>	0.01	0.899	0.004	0.00	0.987	0.000
	<i>Pontogeneilla brevicornis</i>	0.06	0.095	0.254	0.03	0.398	0.069
	<i>Prostebbingia gracilis</i>	0.08	<b>0.007</b>	<b>0.528</b>	0.03	0.398	0.069
	<i>Glyptonotus antarcticus</i>	-0.07	0.066	0.336	0.04	0.727	0.018
<b>Echinodermata</b>	<i>Cuenotaster involutus</i>	-0.03	0.639	0.028	0.08	0.695	0.032
	<i>Diplasterias brandti</i>	0.02	0.316	0.065	0.04	0.455	0.048
	<i>Glabraster antarctica</i>	-0.06	0.323	0.186	-0.07	0.498	0.103
	<i>Labidiaster annulatus</i>	-0.01	0.820	0.009	0.02	0.331	0.106
	<i>Neosmilaster georgianus</i>	0.00	0.926	0.000	0.07	0.073	0.130
	<i>Odontaster validus</i>	0.02	0.217	0.055	0.04	0.243	0.066
	<i>Perknaster aurorae</i>	0.02	0.457	0.041	-0.07	0.225	0.148
	<i>Sterechinus neumayeri</i>	0.00	0.853	0.002	0.09	<b>0.020</b>	<b>0.297</b>
	<i>Heterocucumis cucumaris</i>	0.01	0.783	0.013	-0.05	<b>0.037</b>	<b>0.409</b>
	Holothuroidea pink	0.07	0.323	0.593	-0.04	0.795	0.048
<b>Chordata</b>	<i>Cnemidocarpa</i> sp.	0.04	<b>0.003</b>	<b>0.281</b>	0.07	<b>0.001</b>	<b>0.443</b>

Table S6: Results of a mixed effects model with a random station effect to test for the relationship between invertebrate stable isotope values ( $\delta^{15}\text{N}$  and  $\delta^{13}\text{C}$ ) and the average macroalgal cover at each station. Given are the parameter estimate, p-values for the slope, and the marginal  $R^2$  values that provide the proportion of the overall variability in the response to the fixed effects, macroalgal cover.

Phylum	Taxon	$\delta^{15}\text{N}$			$\delta^{13}\text{C}$		
		estimate	p-value	marginal $R^2$	estimate	p-value	marginal $R^2$
Porifera	<i>Dendrilla antarctica</i>	-0.02	0.235	0.093	-0.08	<b>0.002</b>	<b>0.459</b>
Cnidaria	Octocorallia	-0.03	<b>0.003</b>	<b>0.453</b>	-0.01	0.420	0.049
	<i>Isotealia antarctica</i>	-0.03	0.107	0.150	0.00	0.859	0.003
Bryozoa	Bryozoa lobed	0.02	0.541	0.053	0.09	0.633	0.049
Annelida	Flabegraviera mundata	-0.24	0.267	0.214	0.19	0.319	0.174
	Polynoidae	0.00	0.764	0.005	0.00	0.802	0.003
	Terebellida	0.00	0.880	0.002	0.00	0.892	0.002
Arthropoda	<i>Bovallia gigantea</i>	0.00	0.871	0.002	-0.02	0.425	0.065
	<i>Eusirus bouvieri</i>	0.00	0.907	0.003	-0.02	0.486	0.120
	<i>Gondogeneia antarctica</i>	0.01	0.431	0.048	0.04	<b>0.046</b>	<b>0.252</b>
	<i>Metaleptamphopus pectinatus</i>	0.00	0.957	0.000	-0.02	0.176	0.193
	<i>Oradarea bidentata</i>	-0.01	0.354	0.062	0.00	0.960	0.000
	<i>Paradexamine fissicauda</i>	0.03	<b>0.037</b>	<b>0.416</b>	-0.11	<b>0.004</b>	<b>0.673</b>
	<i>Paraphimedia integricauda</i>	-0.01	0.553	0.070	-0.05	0.585	0.074
	<i>Pontogeneilla brevicornis</i>	-0.02	0.387	0.073	-0.03	0.212	0.127
	<i>Prostebbingia gracilis</i>	-0.02	0.367	0.121	-0.04	0.134	0.235
	<i>Glyptonotus antarcticus</i>	0.01	0.275	0.162	-0.01	0.874	0.005
Mollusca	<i>Austrodoris kerguelensis</i>	-0.02	0.214	0.161	-0.06	0.129	0.25
	<i>Marseniopsis mollis</i>	0.06	0.457	0.075	-0.14	0.560	0.081
	<i>Margarella antarctica</i>	0.00	0.720	0.012	-0.02	0.460	0.053
	<i>Nacella concinna</i>	-0.02	<b>&lt;0.001</b>	<b>0.454</b>	0.01	0.323	0.044
Echinodermata	<i>Cuenotaster involutus</i>	0.00	0.986	0.000	-0.12	0.492	0.124
	<i>Diplasterias brandti</i>	-0.03	<b>0.010</b>	<b>0.329</b>	-0.04	0.112	0.210
	<i>Glabraster antarctica</i>	-0.13	0.403	0.125	-0.13	0.408	0.121
	<i>Labidiaster annulatus</i>	-0.01	0.546	0.060	-0.02	0.062	0.276
	<i>Neosmilaster georgianus</i>	0.00	0.799	0.002	-0.03	0.083	0.123
	<i>Odontaster validus</i>	-0.01	0.090	0.095	0.00	0.749	0.005
	<i>Perknaster aurorae</i>	0.00	0.859	0.002	0.01	0.620	0.031
	<i>Sterechinus neumayeri</i>	0.00	0.708	0.009	-0.04	0.072	0.200
	<i>Heterocucumis cucumaris</i>	0.01	0.578	0.057	0.02	0.470	0.097
	Holothuroidea pink	-0.04	0.149	0.884	0.03	0.622	0.166
Chordata	<i>Cnemidocarpa</i> sp.	-0.03	<b>&lt;0.001</b>	<b>0.380</b>	-0.04	<b>&lt;0.001</b>	<b>0.545</b>