The following supplement accompanies the article

Landfast sea ice–benthic coupling during spring and potential impacts of system changes on food web dynamics in Eclipse Sound, Canadian Arctic

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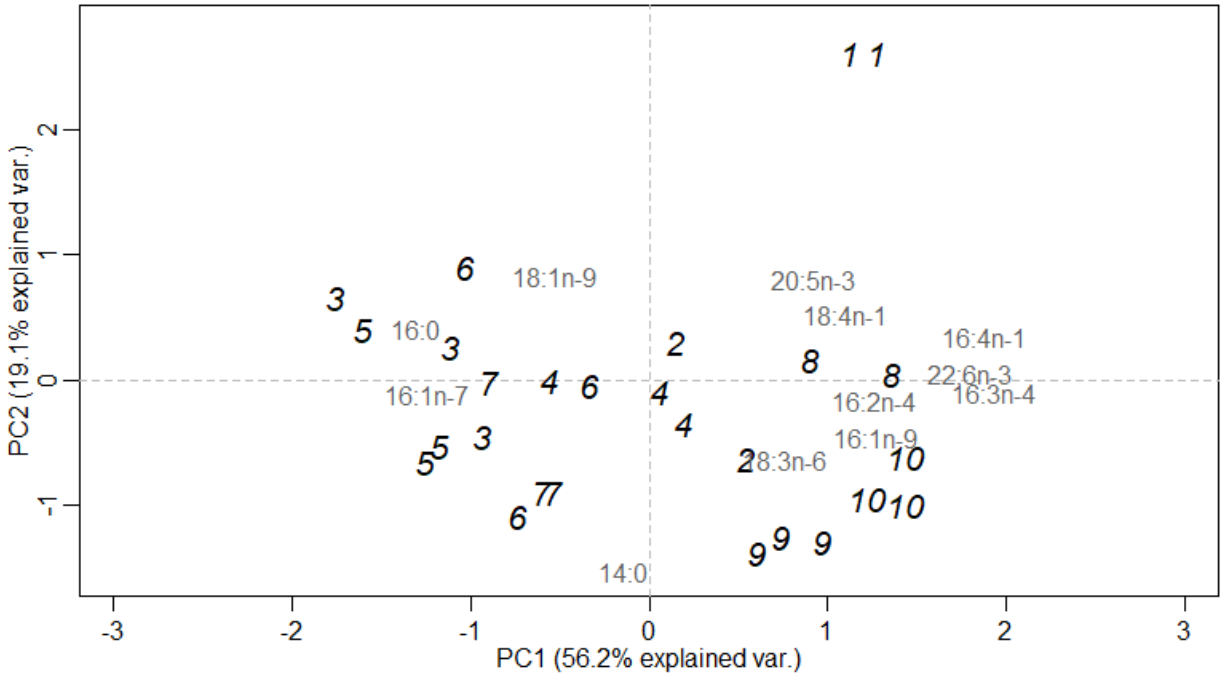

Figure S1. Principal component analysis of fatty acids with a proportional contribution ≥ 1 % to the total fatty acid content in the bottom ice collected during May 2018 in Eclipse Sound, representing in-site variability at stations 1 to 10.

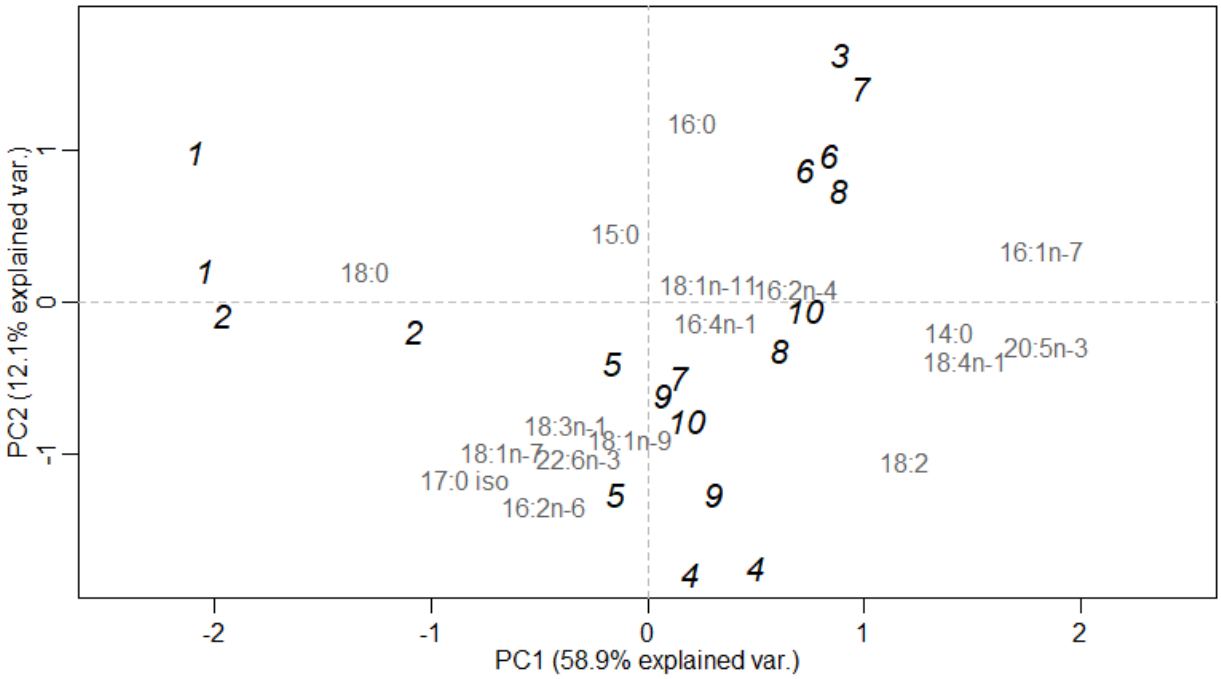

Figure S2. Principal component analysis of fatty acids with a proportional contribution ≥ 1 % to the total fatty acid content in surface waters collected during May 2018 in Eclipse Sound, representing in-site variability at stations 1 to 10.

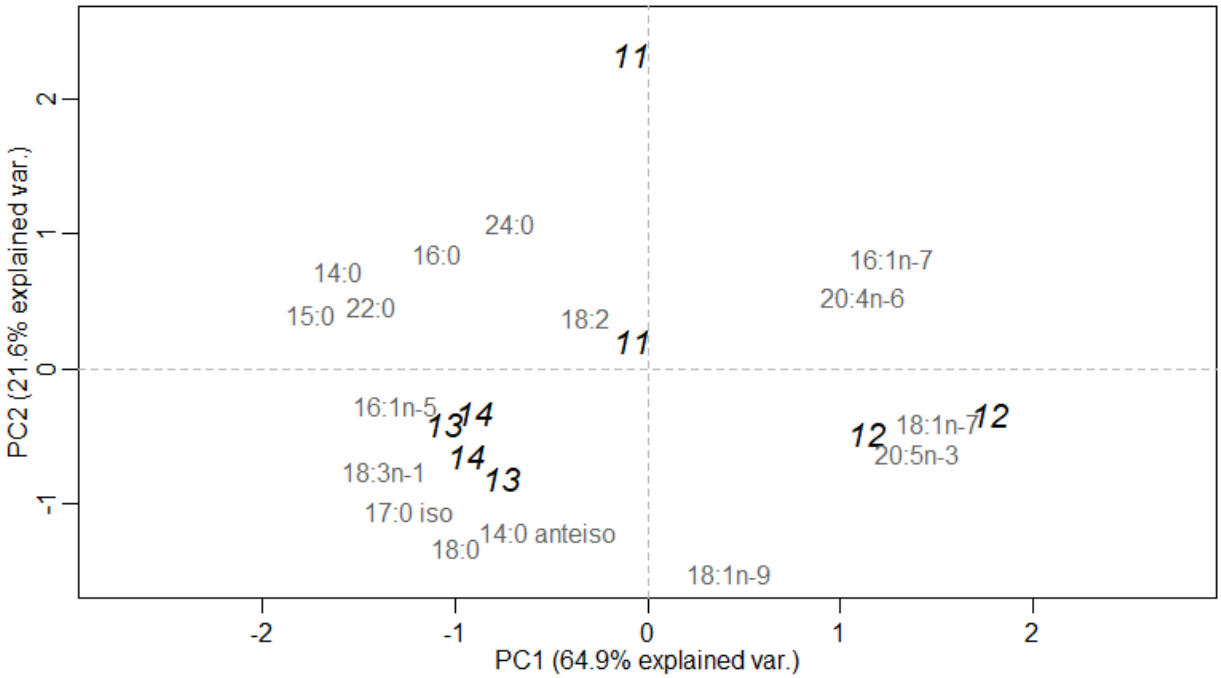

Figure S3. Principal component analysis of fatty acids with a proportional contribution ≥ 1 % to the total fatty acid content in sediments collected during May 2018 in Eclipse Sound, representing in-site variability at stations 11 to 14.

Table S1. Relative proportions of fatty acids (FAs) (mean ± 1 SD %) with mean contributions ≥ 1% to the total FA content in the bottom ice, marker FA ratios (mean ± 1 SD), and proportions of saturated (SFAs), monounsaturated (MUFAs) and polyunsaturated FAs (PUFAs) (mean ± 1 SD %) in bottom ice samples collected during May 2018 in Eclipse Sound.

Fatty acid	**Fatty acid relative contribution (%)**									
	Stn 1	**Stn 2**	**Stn 3**	**Stn 4**	**Stn 5**	**Stn 6**	**Stn 7**	**Stn 8**	**Stn 9**	**Stn 10**
	(*n* = 2)	(*n* = 2)	(*n* = 3)	(*n* = 3)	(*n* = 3)	(*n* = 3)	(*n* = 3)	(*n* = 2)	(*n* = 3)	(*n* = 3)
14:0	6.20 ± 0.25	9.65 ± 0.04	10.72 ± 0.44	10.95 ± 0.58	10.76 ± 0.60	10.66 ± 0.75	10.94 ± 0.60	10.94 ± 0.13	12.78 ± 0.17	12.91 ± 0.56
16:0	17.65 ± 0.57	18.95 ± 0.20	20.07 ± 1.03	20.18 ± 2.28	20.33 ± 1.10	19.00 ± 1.00	19.91 ± 1.01	18.82 ± 0.82	17.99 ± 0.33	17.43 ± 0.32
16:1n-7	36.66 ± 0.48	42.60 ± 0.59	47.31 ± 1.71	42.07 ± 1.45	48.71 ± 0.51	45.23 ± 1.63	47.00 ± 0.62	37.60 ± 1.16	40.98 ± 0.83	34.71 ± 0.50
16:2n-4	2.96 ± 0.02	2.60 ± 0.03	2.01 ± 0.09	2.44 ± 0.16	1.85 ± 0.03	1.90 ± 0.06	2.06 ± 0.06	3.07 ± 0.16	3.15 ± 0.10	3.18 ± 0.05
16:3n-4	1.45 ± 0.04	1.22 ± 0.02	0.74 ± 0.03	1.03 ± 0.15	0.66 ± 0.01	0.79 ± 0.01	0.87 ± 0.03	1.53 ± 0.12	1.60 ± 0.21	1.63 ± 0.10
16:4n-1	4.16 ± 0.09	3.68 ± 0.18	2.47 ± 0.14	3.32 ± 0.37	2.34 ± 0.09	2.86 ± 0.11	2.86 ± 0.13	4.29 ± 0.31	3.30 ± 0.32	3.88 ± 0.27
18:1n-9	1.47 ± 0.04	0.67 ± 0.58	1.35 ± 0.15	0.98 ± 0.18	1.21 ± 0.12	1.28 ± 0.27	0.84 ± 0.06	1.11 ± 0.09	0.85 ± 0.04	0.93 ± 0.03
18:3n-6	0.69 ± 0.08	0.92 ± 0.01	0.82 ± 0.73	1.33 ± 0.08	0.96 ± 0.83	1.10 ± 0.95	1.12 ± 0.97	0.82 ± 0.05	1.11 ± 0.05	0.82 ± 0.12
18:4n-1	2.38 ± 0.15	1.64 ± 0.01	1.26 ± 0.12	1.73 ± 0.11	1.27 ± 0.98	1.06 ± 0.65	1,36 ± 0.08	2.12 ± 0.03	1.66 ± 0.14	1.81 ± 0.03
20:5n-3	13.66 ± 1.00	10.15 ± 0.83	7.84 ± 0.43	9.22 ± 1.48	6.74 ± 0.45	9.18 ± 1.13	7.75 ± 0.59	10.30 ± 0.36	8.72 ± 0.65	9.58 ± 0.22
22:6n-3	2.09 ± 0.03	1.08 ± 0.07	0.49 ± 0.43	0.94 ± 0.18	0.61 ± 0.10	0.95 ± 0.17	0.87 ± 0.09	1.70 ± 0.31	1.44 ± 0.11	2.00 ± 0.21
16:1n-7/16:0	2.08 ± 0.04	2.25 ± 0.01	2.36 ± 0.09	2.11 ± 0.29	2.40 ± 0.11	2.38 ± 0.06	2.36 ± 0.09	2.00 ± 0.03	2.28 ± 0.02	1.99 ± 0.01
ΣC16/ΣC18	7.86 ± 0.82	12.59 ± 0.11	13.94 ± 1.94	12.05 ± 2.41	14.28 ± 1.27	13.13 ± 2.05	14.52 ± 0.60	11.03 ± 0.11	13.80 ± 1.33	10.52 ± 1.93
20:5n-3/22:6n-3	6.53 ± 0.38	9.36 ± 0.21	9.77 ± 2.01	9.89 ± 0.34	11.27 ± 1.44	9.80 ± 0.80	8.92 ± 0.32	6.15 ± 0.93	6.12 ± 0.89	4.82 ± 0.42
Bacterial FAs	1.26 ± 0.25	0.60 ± 0.35	0.65 ± 0.12	0.90 ± 0.56	0.62 ± 0.12	0.66 ± 0.15	0.58 ± 0.09	0.96 ± 0.12	0.86 ± 0.16	1.79 ± 0.31
Terrestrial FAs	0.69 ± 0.06	0.59 ± 0.01	0.67 ± 0.19	0.56 ± 0.01	0.60 ± 0.19	0.61 ± 0.02	0.54 ± 0.03	0.66 ± 0.03	0.53 ± 0.02	0.73 ± 0.21
SFAs	26.32 ± 0.26	29.80 ± 0.53	32.04 ± 0.48	32.79 ± 2.60	32.22 ± 0.55	31.22 ± 0.91	31.66 ± 0.56	31.72 ± 0.96	32.34 ± 0.15	32.79 ± 0.18
MUFAs	41.51 ± 0.32	45.80 ± 0.13	52.57 ± 1.23	48.23 ± 1.44	53.48 ± 0.25	51.58 ± 1.24	52.25 ± 0.37	45.81 ± 0.31	48.00 ± 0.77	43.87 ± 0.46
PUFAs	32.79 ± 0.81	24.48 ± 1.30	15.23 ± 1.31	18.98 ± 1.18	14.11 ± 0.69	17.07 ± 2.07	16.06 ± 0.91	22.47 ± 1.28	19.42 ± 0.69	22.78 ± 0.19

Table S2. Relative proportions of fatty acids (FAs) (mean ± 1 SD %) with mean contributions ≥ 1 % to the total FA content in surface waters, marker FA ratios (mean ± 1 SD), and proportions of saturated (SFAs), monounsaturated (MUFAs) and polyunsaturated FAs (PUFAs) (mean ± 1 SD %) in surface water samples collected during May 2018 in Eclipse Sound. Not determined: '–'.

Fatty acid	**Fatty acid relative contribution (%)**									
	Stn 1	**Stn 2**	**Stn 3**	**Stn 4**	**Stn 5**	**Stn 6**	**Stn 7**	**Stn 8**	**Stn 9**	**Stn 10**
	(*n* = 2)	(*n* = 2)	(*n* = 1)	(*n* = 2)	(*n* = 2)	(*n* = 2)	(*n* = 2)	(*n* = 2)	(*n* = 2)	(*n* = 2)
14:0	4.28 ± 0.43	4.92 ± 2.02	9.72	9.87 ± 0.55	9.23 ± 0.12	10.12 ± 0.51	10.77 ± 0.56	10.95 ± 0.55	9.40 ± 0.87	11.33 ± 0.09
15:0	1.84 ± 0.64	0.51 ± 0.72	–	–	1.21 ± 0.04	0.89 ± 0.26	1.86 ± 1.03	1.44 ± 0.54	1.11 ± 0.33	1.49 ± 0.61
16:0	20.95 ± 1.28	14.97 ± 2.48	22.01	16.60 ± 2.02	17.39 ± 0.33	19.50 ± 0.05	18.34 ± 3.27	18.04 ± 1.57	16.87 ± 1.36	18.16 ± 1.28
16:1n-7	6.28 ± 0.85	11.48 ± 4.41	33.48	20.34 ± 0.53	21.52 ± 0.73	37.69 ± 0.01	29.08 ± 6.07	26.59 ± 2.09	22.28 ± 2.34	28.20 ± 1.39
16:2n-4	0.91 ± 0.31	0.85 ± 0.41	1.87	2.08 ± 0.21	1.82 ± 0.78	1.28 ± 0.90	2.01 ± 0.20	2.04 ± 0.06	1.58 ± 0.31	1.21 ± 1.70
16:2n-6	1.26 ± 1.78	1.28 ± 0.42	–	2.17 ± 0.36	2.00 ± 0.32	0.90 ± 0.04	1.19 ± 1.69	0.83 ± 1.17	1.60 ± 0.96	1.61 ± 0.63
16:4n-1	0.35 ± 0.03	0.99 ± 0.40	2.18	2.66 ± 0.11	1.23 ± 0.10	2.77 ± 0.20	3.08 ± 0.96	2.58 ± 0.28	1.94 ± 0.05	1.82 ± 2.57
17:0 iso	1.99 ± 0.72	0.78 ± 0.17	–	1.76 ± 0.30	1.94 ± 0.38	–	0.39 ± 0.55	0.59 ± 0.84	0.73 ± 1.03	0.86 ± 1.21
18:0	30.30 ± 0.98	40.40 ± 16.15	8.76	7.75 ± 1.05	11.42 ± 1.36	3.51 ± 0.27	4.80 ± 0.14	7.15 ± 0.18	5.38 ± 1.71	3.83 ± 0.94
18:1n-9	2.15 ± 0.57	2.54 ± 0.68	2.22	3.60 ± 0.72	2.16 ± 0.11	1.97 ± 0.06	1.96 ± 0.24	2.82 ± 0.01	3.10 ± 0.96	2.31 ± 0.17
18:1n-7	1.62 ± 0.09	1.82 ± 0.51	0.70	2.60 ± 0.56	2.16± 0.98	0.87 ± 0.10	1.52 ± 0.37	0.85 ± 0.97	2.30 ± 0.02	1.73 ± 0.07
18:2	–	0.26 ± 0.37	2.62	7.78 ± 0.61	6.50 ± 1.90	1.98 ± 1.01	3.60 ± 0.06	4.56 ± 0.92	4.23 ± 1.28	3.23 ± 0.03
18:3n-1	3.20 ± 0.44	2.06 ± 0.17	1.53	4.46 ± 1.23	4.22 ± 0.70	1.46 ± 0.12	1.49 ± 2.11	1.51 ± 2.13	2.36 ± 0.32	2.08 ± 0.15
18:4n-1	0.59 ± 0.03	1.25 ± 0.27	1.87	1.84 ± 0.16	1.39 ± 0.10	1.70 ± 0.03	1.51 ± 0.22	1.68 ± 0.16	1.44 ± 0.17	1.67 ± 0.12
20:5n-3	3.70 ± 0.21	4.01 ± 0.68	7.19	8.45 ± 0.01	6.50 ± 0.40	8.41 ± 0.87	8.08 ± 0.62	7.61 ± 0.35	6.85 ± 0.97	7.95 ± 0.69
22:6n-3	2.41 ± 0.07	1.29 ± 0.09	–	2.03 ± 0.26	1.23 ± 0.17	1.73 ± 0.20	1.24 ± 1.76	2.35 ± 0.06	3.33 ± 0.14	2.82 ± 0.45
16:1n-7/16:0	0.30 ± 0.06	0.75 ± 0.17	1.52	1.24 ± 0.18	1.24 ± 0.07	1.93 ± 0.01	1.58 ± 0.05	1.47 ± 0.01	1,33 ± 0.25	1.55 ± 0.03
ΣC16/ΣC18	0.72 ± 0.03	0.60 ± 0.31	2.91	1.42 ± 0.05	1.41 ± 0.02	4.48 ± 0.60	2.98 ± 0.58	2.25 ± 0.32	1.92 ± 0.01	2.93 ± 0.26
20:5n-3/22:6n-3	1.53 ± 0.04	3.10 ± 0.31	7.19	4.19 ± 0.54	5.30 ± 0.41	4.91 ± 1.07	5.53 ± 2.98	3.25 ± 0.23	2.06 ± 0.21	2.83 ± 0.21
Bacterial FAs	4.43 ± 0.93	1.49 ± 0.61	–	2.07 ± 0.15	3.53 ± 0.13	0.89 ± 0.26	3.40 ± 3.21	2.37 ± 0.76	2.71 ± 0.18	2.59 ± 2.17
Terrestrial FAs	0.63 ± 0.17	0.63 ± 0.08	0.96	1.31 ± 0.53	0.66 ± 0.05	0.69 ± 0.01	0.76 ± 0.07	0.92 ± 0.17	0.67 ± 0.09	0.77 ± 0.05
SFAs	59.96 ± 1.06	61.98 ± 11.33	41.02	36.29 ± 2.38	41.57 ± 1.95	34.01 ± 0.03	37.97 ± 0.16	38.89 ± 0.98	37.64 ± 4.30	35.91 ± 0.14
MUFAs	20.16 ± 3.96	20.39 ± 8.39	38.93	30.30 ± 3.04	31.57 ± 1.24	41.94 ± 0.27	36.70 ± 2.48	34.57 ± 1.51	33.64 ± 0.21	36.04 ± 0.22
PUFAs	19.88 ± 5.02	17.63 ± 2.94	20.05	33.41 ± 0.67	26.86 ± 3.19	24.04 ± 0.30	25.34 ± 2.32	26.54 ± 2.49	28.72 ± 4.09	28.05 ± 0.36

Table S3. Relative proportions of fatty acids (FAs) (mean ± 1 SD %) with mean contributions ≥ 1 % to the total FA content in benthic invertebrates and/or sediments, marker FA ratios (mean ± 1 SD), and proportions of saturated (SFAs), monounsaturated (MUFAs) and polyunsaturated FAs (PUFAs) in benthic invertebrates and sediments collected during May 2018 in Eclipse Sound. Not determined: '–'.

Fatty acid %	**Fatty acid relative contribution (%)**							
	Ophiuroids		**Polychaetes**		**Sediments**			
	Stn 11 (*n* = 3)	**Stn 14** (*n* = 1)	**Stn 12** (*n* = 2)	**Stn 13** (*n* = 1)	**Stn 11** (*n* = 2)	**Stn 12** (*n* = 2)	**Stn 13** (*n* = 2)	**Stn 14** (*n* = 2)
14:0	7.58 ± 0.50	7.08	4.12 ± 0.18	4.94	7.25 ± 0.67	4.84 ± 0.06	7.02 ± 0.10	6.91 ± 0.37
14:0 anteiso	–	–	–	–	1.36 ± 1.93	1.54 ± 0.19	3.07 ± 0.60	2.92 ± 0.77
15:0	0.43 ± 0.04	0.38	0.59 ± 0.00	0.61	1.74 ± 0.21	0.84 ± 0.08	1.85 ± 0.12	1.87 ± 0.03
16:0	12.14 ± 0.17	11.39	10.44 ± 1.04	8.30	20.39 ± 3.12	13.85 ± 0.12	19.05 ± 0.39	19.87 ± 0.68
16:1n-7	25.63 ± 5.30	15.33	11.63 ± 2.76	14.14	28.08 ± 0.8	30.17 ± 2.54	23.50 ± 0.54	18.66 ± 0.44
16:1n-5	0.12 ± 0.11	–	1.42 ± 0.18	0.16	0.99 ± 0.13	0.90 ± 0.01	1.50 ± 0.09	1.39 ± 0.13
17:0 iso	1.92 ± 1.57	1.19	3.19 ± 0.38	0.85	–	0.27 ± 0.02	2.59 ± 0.21	2.42 ± 0.31
18:0	3.59 ± 1.07	3.51	3.17 ± 0.14	2.96	2.91 ± 4.11	3.01 ± 0.68	8.84 ± 0.30	8.57 ± 0.45
18:1n-9	2.58 ± 0.58	2.74	1.17 ± 0.08	3.42	1.58 ± 2.23	4.10 ± 0.39	4.16 ± 0.42	3.55 ± 0.08
18:1n-7	6.22 ± 1.0	5.47	11.83 ± 0.51	3.76	3.81 ± 0.34	5.70 ± 0.39	3.03 ± 0.06	3.75 ± 0.14
18:2	–	–	–	0.72	4.51 ± 0.65	3.81 ± 2.64	2.29 ± 0.15	5.06 ± 2.32
18:3n-1	0.35 ± 0.16	0.50	0.12 ± 0.17	0.15	1.33 ± 0.19	1.32 ± 0.68	1.96 ± 0.34	2.23 ± 0.53
20:1n-11	3.18 ± 1.93	2.26	6.48 ± 0.17	8.24	0.93 ± 0.52	0.51 ± 0.03	–	–
20:1n-9	1.29 ± 0.52	1.21	0.91 ± 0.38	4.18	–	0.33 ± 0.02	–	–
20:4n-6	–	6.19	0.93 ± 1.31	1.12	1.83 ± 0.47	2.08 ± 0.21	1.54 ± 0.10	1.63 ± 0.32
20:5n-3	17.26 ± 2.09	19.73	22.99 ±	8.07	7.15 ±	10.36 ±	6.93 ±	7.98 ±

Fatty acid %	Fatty acid relative contribution (%)							
	Ophiuroids		**Polychaetes**		**Sediments**			
	Stn 11	**Stn 14**	**Stn 12**	**Stn 13**	**Stn 11**	**Stn 12**	**Stn 13**	**Stn 14**
	(*n* = 3)	(*n* = 1)	(*n* = 2)	(*n* = 1)	(*n* = 2)	(*n* = 2)	(*n* = 2)	(*n* = 2)
22:1n-11	3.43 ± 1.35	4.03	0.62 1.39 ± 0.47	10.10	0.05 –	1.28 –	0.51 –	0.10 –
22:1n-9	1.15 ± 0.23	1.10	–	1.65	0.58 ± 0.82	0.86 ± 0.18	0.61 ± 0.86	1.85 ± 0.92
22:6n-3	0.56 ± 0.25	–	7.47 ± 0.03	4.29	0.80 ± 1.13	2.89 ± 0.23	–	–
24:0	–	–	–	–	4.09 ± 0.33	1.56 ± 0.02	2.79 ± 1.11	2.67 ± 0.04
16:1n-7/16:0	2.11 ± 0.16	1.35	1.11 ± 0.15	1.70	1.39 ± 0.17	2.18 ± 0.16	1.23 ± 0.01	0.94 ± 0.01
ΣC16/ΣC18	2.29 ± 0.62	1.58	1.40 ± 0.27	1.31	2.30 ± 0.35	2.14 ± 0.55	2.04 ± 0.05	1.64 ± 0.22
20:5n-3/22:6n-3	33.76 ± 9.33	19.73	3.08 ± 0.07	1.88	5.82 ± 1.93	3.57 ± 0.16	6.93 ± 0.51	7.98 ± 0.10
Bacterial FAs	3.12 ± 2.38	5.56	4.86 ± 0.54	2.72	1.74 ± 0.21	1.63 ± 0.16	4.44 ± 0.09	5.57 ± 0.38
Terrestrial FAs	0.45 ± 0.07	0.27	0.57 ± 0.07	0.58	2.02 ± 1.26	1.09 ± 0.04	1.02 ± 0.01	–
SFAs	26.60 ± 0.97	27.29	22.59 ± 0.47	18.15	40.29 ± 1.86	27.59 ± 0.70	48.11 ± 0.86	49.79 ± 1.90
MUFAs	50.43 ± 1.07	36.69	37.03 ± 2.79	55.88	39.97 ± 1.58	46.77 ± 2.59	35.72 ± 1.88	32.18 ± 0.88
PUFAs	22.97 ± 0.83	32.52	40.37 ± 3.24	25.98	19.74 ± 0.29	25.64 ± 1.89	16.17 ± 2.74	18.03 ± 1.02