

Mesoscale variability in oceanographic retention sets the abiotic stage for subtidal benthic diversity

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Supplement. Abiotic and biotic characteristics of sites and seascapes, details on the current stations, and results of statistical analyses

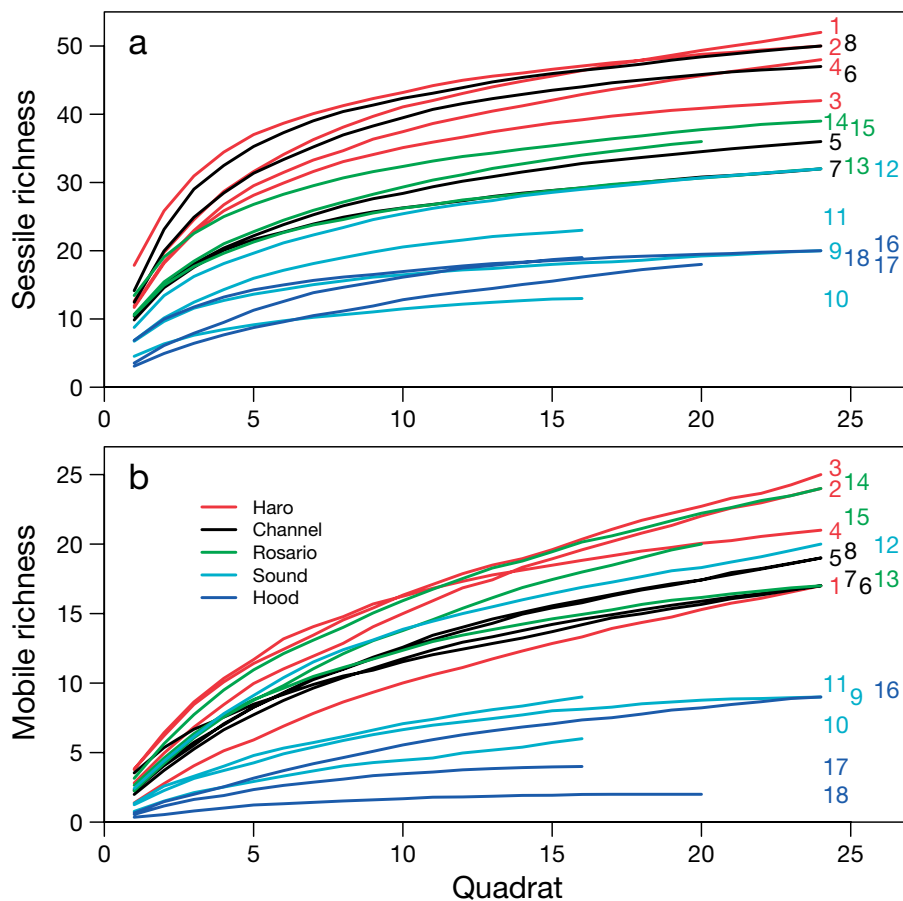


Fig. S1. Species accumulation curves for the number of (a) sessile and (b) mobile taxa in quadrats. Numbers beside curves correspond to sites in Fig. 1 and Table S1.

Table S1. Summary of site locations and abiotic correlates of water retention (mean \pm SD)

Site number	Site name	Site code	Region	Transects (n)	Depth (m)	Latitude (N)	Longitude (W)	Sediment cover (%)	Dissolution ($\text{mg cm}^{-2} \text{d}^{-1}$)	Temperature ($^{\circ}\text{C}$)
1	Turn Point	TP	Haro	6	15.5 \pm 2.6	48 $^{\circ}$ 41'11"	123 $^{\circ}$ 14'14"	0 \pm 0	NA	NA
2	Kellet Bluff	KB	Haro	6	14.4 \pm 1.3	48 $^{\circ}$ 35'19"	123 $^{\circ}$ 12'09"	0 \pm 0	NA	NA
3	Lime Kiln	LK	Haro	6	15.1 \pm 2	48 $^{\circ}$ 30'58"	123 $^{\circ}$ 09'11"	0 \pm 0	NA	NA
4	Long Island	LI	Haro	6	15.6 \pm 1.7	48 $^{\circ}$ 26'30"	122 $^{\circ}$ 55'53"	0 \pm 0	NA	NA
5	O'Neal Island	ON	Channel	6	15 \pm 1.5	48 $^{\circ}$ 36'17"	123 $^{\circ}$ 05'34"	2.5 \pm 3.8	0.91 \pm 0.1	11.23 \pm 0.81
6	Shady Cove	SC	Channel	6	13.7 \pm 1.2	48 $^{\circ}$ 33'08"	123 $^{\circ}$ 00'20"	0 \pm 0	1.12 \pm 0.14	10.77 \pm 0.52
7	Point George	PG	Channel	6	15 \pm 0.7	48 $^{\circ}$ 33'33"	122 $^{\circ}$ 59'18"	0 \pm 0	1.40 \pm 0.07	10.79 \pm 0.47
8	Turn Island	TI	Channel	6	14.6 \pm 1.7	48 $^{\circ}$ 32'05"	122 $^{\circ}$ 58'10"	0 \pm 0	1.16 \pm 0.1	10.65 \pm 0.4
9	Rosario Wall	RW	Sound	6	13.7 \pm 1.4	48 $^{\circ}$ 38'41"	122 $^{\circ}$ 52'30"	37.4 \pm 23.9	0.62 \pm 0.05	11.46 \pm 0.81
10	Humphrey Head	HH	Sound	4	15 \pm 2.3	48 $^{\circ}$ 33'58"	122 $^{\circ}$ 52'12"	59.1 \pm 28.5	0.72 \pm 0.02	11.38 \pm 0.42
11	Frost Island	FI	Sound	4	14.6 \pm 1.8	48 $^{\circ}$ 32'25"	122 $^{\circ}$ 50'34"	37.5 \pm 18.5	0.92 \pm 0.07	11.13 \pm 0.37
12	Willow Island	WI	Sound	6	15.4 \pm 1.8	48 $^{\circ}$ 32'23"	122 $^{\circ}$ 49'24"	23.3 \pm 14.7	0.77 \pm 0.06	11.24 \pm 0.44
13	Lawson Bluff	LB	Rosario	6	16.7 \pm 1.7	48 $^{\circ}$ 45'59"	122 $^{\circ}$ 55'09"	2.6 \pm 2.5	NA	NA
14	Lawrence Point	LP	Rosario	6	14.6 \pm 1.7	48 $^{\circ}$ 39'41"	122 $^{\circ}$ 44'32"	3.2 \pm 5.4	NA	NA
15	Strawberry Island	SI	Rosario	5	15.3 \pm 1.6	48 $^{\circ}$ 33'48"	122 $^{\circ}$ 44'12"	5.2 \pm 6.3	NA	NA
16	Pulali Point	PP	Hood	6	14.4 \pm 1.3	47 $^{\circ}$ 44'15"	122 $^{\circ}$ 51'05"	24.5 \pm 20.7	NA	NA
17	Private Wall	PW	Hood	4	15 \pm 2.6	47 $^{\circ}$ 33'43"	123 $^{\circ}$ 01'07"	61.3 \pm 23.6	NA	NA
18	Sund Rock	SR	Hood	5	15.7 \pm 2.6	47 $^{\circ}$ 26'07"	123 $^{\circ}$ 07'14"	99.3 \pm 1.2	NA	NA

Table S2. Summary of oceanographic stations used in this study to compare daily predictions of average and maximum current. The National Oceanic and Atmospheric Administration (NOAA) publishes full daily predictions for reference stations, and predictions for subordinate stations are obtained by applying specific differences to the speeds predicted for a given reference station. All but 2 subordinate stations are listed by NOAA; predictions for Hazel Point and The Great Bend in Hood Canal are from the West Marine tide book for Puget Sound (August Hahn). The current data used in this study were compiled from the following websites: <http://tidesandcurrents.noaa.gov/currents12/tab2pc2.html>, <http://tbone.biol.sc.edu/tide>

Station letter	Current station	Latitude (N)	Longitude (W)	Region	Reference Station	Closest site(s)
A	Turn Point, Boundary Pass	48°41'43"	123°14'08"	Haro	Admiralty Inlet	1
B	Kellett Bluff, west of	48°35'21"	123°13'30"	Haro	Admiralty Inlet	2
C	Discovery Island, 3.3 mi NE of	48°27'00"	123°09'00"	Haro	Admiralty Inlet	3
D	Cattle Point, 1.2 mi SE of	48°26'11"	122°56'49"	Haro	San Juan Channel, South Entrance	4
E	Spring Passage, south entrance	48°36'41"	123°02'03"	Channel	San Juan Channel, South Entrance	5
F	Turn Rock Light, 1.9 mi NW of	48°33'24"	122°59'54"	Channel	San Juan Channel, South Entrance	6,7
G	Pear Point, 1.1 mi E of	48°30'41"	122°57'10"	Channel	San Juan Channel, South Entrance	8
H	Sucia I, 0.5 WNW of Lawson Bluff	48°46'00"	122°55'60"	Rosario	Active Pass, BC	13
I	Lawrence Point, 1.3 mi NE of	48°40'42"	122°42'52"	Rosario	Rosario Strait	14
J	Strawberry I., 0.8 mi W of	48°33'40"	122°45'15"	Rosario	Rosario Strait	15
K	Harney Channel	48°35'27"	122°55'14"	Sound	San Juan Channel, South Entrance	9,10
L	Frost-Willow Island, between	48°32'21"	122°49'51"	Sound	Rosario Strait	11,12
M	Hazel Point	47°49'00"	122°40'60"	Hood	Admiralty Inlet	16
N	The Great Bend	47°42'00"	122°46'00"	Hood	Admiralty Inlet	18

Table S3. Diversity of sessile and mobile taxa in quadrats at each site, as well as the density (mean \pm SD) of red urchins (*Strongylocentrotus franciscanus*)

Site number	Region	Sessile	Mobile					Urchin density (no. m ⁻²)
		S_{obs}	$S_{Chao2} (\pm SE)$	Richness (mean \pm SD)	S_{obs}	$S_{Chao2} (\pm SE)$	Richness (mean \pm SD)	
1	Haro	61	98.5 \pm 29.7	12.7 \pm 14.8	27	52 \pm 24.2	1.6 \pm 2.3	0.03 \pm 0.08
2	Haro	59	69.7 \pm 10.3	16.8 \pm 9.4	34	52 \pm 14.4	2.9 \pm 4.8	0.87 \pm 0.99
3	Haro	51	54 \pm 3.2	10.9 \pm 5.6	36	164 \pm 143.6	3.6 \pm 2.7	0.23 \pm 0.39
4	Haro	57	71.4 \pm 11.2	11.3 \pm 16.9	31	35.2 \pm 4.9	3.9 \pm 6	0.27 \pm 0.47
5	Channel	45	53.1 \pm 7.1	10.2 \pm 4.7	28	44 \pm 16.5	2.1 \pm 3.2	0.77 \pm 0.75
6	Channel	56	58.3 \pm 2.5	12.4 \pm 10.4	27	39.3 \pm 13.2	2.2 \pm 1.7	0 \pm 0
7	Channel	41	73 \pm 39.6	9.2 \pm 8.5	28	44 \pm 16.5	3.5 \pm 3.5	0.4 \pm 0.25
8	Channel	59	63 \pm 3.7	15.3 \pm 10.1	28	48.3 \pm 20.2	2.3 \pm 2.3	0.3 \pm 0.56
9	Sound	29	35.3 \pm 7.6	6.4 \pm 3.8	20	20.4 \pm 0.9	1.2 \pm 1.3	0 \pm 0
10	Sound	22	23.5 \pm 2.3	4.4 \pm 3.5	17	23.3 \pm 7.6	0.8 \pm 0.5	0 \pm 0
11	Sound	32	35.1 \pm 3.7	6.5 \pm 3.7	21	25.2 \pm 4.9	1.3 \pm 1	0 \pm 0
12	Sound	41	45.9 \pm 4.8	8.8 \pm 4.6	30	30 \pm 0	2.4 \pm 2.2	0 \pm 0
13	Rosario	41	65.5 \pm 31.1	10.1 \pm 6.1	27	30.1 \pm 3.7	2.7 \pm 1.9	0.1 \pm 0.17
14	Rosario	48	52.9 \pm 4.8	13.4 \pm 2.7	35	47.1 \pm 9.7	3.3 \pm 2.2	0.07 \pm 0.1
15	Rosario	45	55 \pm 8.4	10.2 \pm 7	30	42.5 \pm 10.7	2.6 \pm 2.1	0.04 \pm 0.09
16	Hood	29	31.3 \pm 3.4	6.6 \pm 3.3	21	25.2 \pm 4.9	0.7 \pm 0.7	0 \pm 0
17	Hood	28	31 \pm 3.2	3.2 \pm 2.2	15	16 \pm 1.9	0.6 \pm 0.4	0 \pm 0
18	Hood	25	31.4 \pm 5.9	2.6 \pm 1.6	12	12 \pm 0	0.3 \pm 0.3	0 \pm 0

Table S4. Results of linear mixed-effects models testing the variation in the number of taxa (richness) and percent cover in quadrats, and the results of linear models testing the variation in the observed number of species per site (S_{obs}), and the estimated number of species per site (S_{Chao2}) for both sessile and mobile taxa. Seascape was treated as a fixed effect; all other sources of variation were treated as random. Significance of levels was assessed with a Monte Carlo Markov Chain resampling ($n = 10000$) procedure for mixed effects models. Bold types indicate significant differences ($p < 0.05$)

Seascape	Estimate	SE	<i>t</i>	p	Seascape	Estimate	SE	<i>t</i>	p
<i>Sessile taxa</i>					<i>Mobile taxa</i>				
Richness					Richness (ln(x) + 1)				
Haro (intercept)	12.75	1.06	12.04	<0.001	Haro (intercept)	1.24	0.11	11.13	<0.001
Channel	-0.81	1.35	-0.60	0.260	Channel	-0.15	0.15	-0.96	0.282
Georgia	-1.51	1.70	-0.89	0.161	Georgia	0.02	0.17	0.14	0.907
Sound	-6.19	1.57	-3.93	<0.001	Sound	-0.48	0.16	-2.97	<0.001
Hood	-8.58	1.71	-5.02	<0.001	Hood	-0.91	0.18	-5.17	<0.001
S_{obs}					S_{obs}				
Haro (intercept)	57.00	3.10	18.42	<0.001	Haro (intercept)	32.00	2.04	15.72	<0.001
Channel	-6.75	4.38	-1.54	0.147	Channel	-4.25	2.88	-1.48	0.164
Georgia	-12.33	4.73	-2.61	0.022	Georgia	-1.33	3.11	-0.43	0.675
Sound	-26.00	4.38	-5.94	<0.001	Sound	-10.00	2.88	-3.47	0.004
Hood	-29.67	4.73	-6.28	<0.001	Hood	-16.00	3.11	-5.15	<0.001
S_{Chao2}					S_{Chao2}(ln(x))				
Haro (intercept)	73.39	5.52	13.31	<0.001	Haro (intercept)	4.14	0.19	22.15	<0.001
Channel	-11.55	7.80	-1.48	0.162	Channel	-0.36	0.26	-1.37	0.194
Georgia	-15.59	8.43	-1.85	0.087	Georgia	-0.47	0.29	-1.65	0.123
Sound	-38.45	7.80	-4.93	<0.001	Sound	-0.94	0.26	-3.57	0.003
Hood	-42.18	8.43	-5.01	<0.001	Hood	-1.31	0.29	-4.60	<0.001
<i>Sediment percent cover (logit)</i>									
Haro (intercept)	-3.63	0.42	-8.56	<0.001					
Channel	0.05	0.46	0.11	0.789					
Georgia	0.65	0.72	0.91	0.109					
Sound	3.06	0.66	4.64	<0.001					
Hood	4.49	0.72	6.23	<0.001					

Table S5. Estimates of biodiversity before and after the removal of sediment in 20 quadrats from 4 sites in the Sound seascape. Values are mean \pm SD, except for S_{Chao2} (mean \pm SE). A paired *t*-test was used to test whether the percent cover of sediment and richness (at the quadrat scale) was different after the removal of sediment by hand-waving

	Before sediment removal	After sediment removal	Paired difference	<i>t</i>	p
Sediment cover (%)	49.5 \pm 15.6	14.5 \pm 9.1	-35 \pm 14.1	11.13	<0.001
<i>Sessile taxa</i>					
Richness	9.4 \pm 2.3	10.8 \pm 2.5	1.4 \pm 1.6	3.99	<0.001
S_{obs}	27	29			
S_{Chao2}	30.1 \pm 3.7	47 \pm 23.6			
<i>Mobile taxa</i>					
Richness	0.5 \pm 0.7	0.9 \pm 1.2	0.5 \pm 1.1	1.83	0.083
S_{obs}	5	9			
S_{Chao2}	9.5 \pm 7.2	9.9 \pm 1.5			

Table S6. Results of permutational multivariate analysis of variance, permutational analysis of multivariate dispersion, and post-hoc comparisons between seascapes for 73 sessile and 59 mobile taxa in quadrats. Components of variation are presented for each scale of observation. Bold types indicate significant differences ($p < 0.05$)

Source of variation	df	SS	MS	Pseudo- <i>F</i>	<i>P</i> (perm)
Seascape	4	218800	54699	3.10	<0.001
Site	13	233190	17938	6.38	<0.001
Transect	82	230430	2810	2.71	<0.001
Quadrat (residual)	300	311540	1039		
Total	399	990050			
Pairwise test between seascapes				<i>t</i>	<i>P</i> (perm)
Channel, Haro				0.94	0.484
Channel, Rosario				1.42	0.039
Channel, Sound				1.78	0.005
Channel, Hood				2.07	0.002
Haro, Rosario				1.64	0.010
Haro, Sound				1.90	0.003
Haro, Hood				1.92	0.004
Rosario, Sound				2.02	0.005
Rosario, Hood				2.08	0.007
Sound, Hood				1.51	0.052
Deviations from centroid				Pseudo- <i>F</i>	<i>P</i> (perm)
Seascape				26.62	<0.001
Pairwise test of deviation from centroid between seascapes				<i>t</i>	<i>P</i> (perm)
Channel, Haro				0.32	0.761
Channel, Rosario				4.00	<0.001
Channel, Sound				1.39	0.192
Channel, Hood				7.82	<0.001
Haro, Rosario				4.19	<0.001
Haro, Sound				1.17	0.265
Haro, Hood				7.52	<0.001
Rosario, Sound				3.82	<0.001
Rosario, Hood				9.10	<0.001
Sound, Hood				4.62	<0.001
Components of variation	Estimate	Square root			
Seascape	473.4	21.8			
Site	683.2	26.1			
Transect	442.9	21.0			
Quadrat (residual)	1038.5	32.2			

Table S7. Mean (\pm SD) occurrence (% of quadrats) of the most common sessile taxa used in the ordination and indicator species analysis. Means and standard deviations for each seascape are based on the number of sites (given in parentheses next to each seascape)

Sessile taxa in quadrats	Phylum/Class	Haro (4)	Channel (4)	Rosario (3)	Sound (4)	Hood (3)
Encrusting coralline algae	Rhodophyceae	91 \pm 11	94 \pm 4	86 \pm 12	74 \pm 20	35 \pm 56
Encrusting non-calcified algae	Rhodophyceae	95 \pm 10	93 \pm 6	86 \pm 15	76 \pm 35	63 \pm 54
Filamentous red algae	Rhodophyceae	52 \pm 24	45 \pm 22	12 \pm 8	19 \pm 30	8 \pm 10
Foliose and bladed red algae	Rhodophyceae	73 \pm 32	48 \pm 15	18 \pm 20	23 \pm 22	56 \pm 14
<i>Abietinaria</i> spp.	Hydrozoa	27 \pm 22	33 \pm 15	29 \pm 25	0 \pm 0	0 \pm 0
<i>Aglaoiphonia</i> spp.	Hydrozoa	34 \pm 38	16 \pm 29	6 \pm 10	0 \pm 0	0 \pm 0
Hydroid other	Hydrozoa	47 \pm 16	49 \pm 15	33 \pm 14	51 \pm 26	1 \pm 2
<i>Haliclona</i> spp. 1	Porifera	22 \pm 23	38 \pm 37	28 \pm 20	0 \pm 0	0 \pm 0
<i>Haliclona</i> spp. 2	Porifera	39 \pm 23	19 \pm 19	13 \pm 18	6 \pm 8	0 \pm 0
<i>Antho lambei</i>	Porifera	34 \pm 10	15 \pm 11	20 \pm 19	0 \pm 0	0 \pm 0
Sponge other	Porifera	75 \pm 35	40 \pm 20	66 \pm 12	28 \pm 35	29 \pm 17
<i>Balanophyllia elegans</i>	Anthozoa	43 \pm 9	68 \pm 18	69 \pm 21	26 \pm 34	0 \pm 0
<i>Metridium</i> spp.	Anthozoa	58 \pm 27	29 \pm 27	41 \pm 10	0 \pm 0	2 \pm 3
<i>Dodecaceria fewkesii</i>	Polychaeta	0 \pm 0	0 \pm 0	69 \pm 33	0 \pm 0	0 \pm 0
<i>Pileolaria</i> spp.	Polychaeta	27 \pm 18	19 \pm 14	26 \pm 11	5 \pm 10	0 \pm 0
<i>Pododesmus macrochisma</i>	Bivalvia	13 \pm 9	0 \pm 0	11 \pm 8	51 \pm 35	27 \pm 31
<i>Balanus crenatus</i>	Cirripedia	13 \pm 10	13 \pm 14	3 \pm 6	38 \pm 15	8 \pm 14
<i>Psolus chitinoides</i>	Holothuroidea	40 \pm 13	33 \pm 30	68 \pm 27	4 \pm 3	11 \pm 7
<i>Terebratalia transversa</i>	Brachiopoda	43 \pm 8	46 \pm 14	75 \pm 11	11 \pm 13	4 \pm 7
<i>Metandrocarpa taylora</i>	Ascidiacea	43 \pm 28	52 \pm 12	28 \pm 30	68 \pm 23	0 \pm 0
<i>Didemnum carnulentum</i>	Ascidiacea	44 \pm 31	41 \pm 36	1 \pm 2	2 \pm 3	0 \pm 0
<i>Distaplia occidentalis</i>	Ascidiacea	35 \pm 35	21 \pm 12	6 \pm 10	0 \pm 0	0 \pm 0
<i>Pycnoclavella stanleyi</i>	Ascidiacea	30 \pm 35	23 \pm 24	0 \pm 0	0 \pm 0	0 \pm 0
<i>Schizoporella japonica</i>	Bryozoa	36 \pm 8	49 \pm 18	34 \pm 23	1 \pm 2	0 \pm 0
<i>Eurystomella bilabiata</i>	Bryozoa	3 \pm 2	30 \pm 28	37 \pm 24	3 \pm 6	0 \pm 0
Encrusting bryozoan	Bryozoa	75 \pm 19	76 \pm 19	85 \pm 2	32 \pm 38	8 \pm 7
<i>Diaperoforma californica</i>	Bryozoa	29 \pm 20	35 \pm 26	67 \pm 8	20 \pm 29	0 \pm 0
<i>Crisia</i> spp.	Bryozoa	45 \pm 36	26 \pm 18	42 \pm 48	34 \pm 36	37 \pm 31

Table S8. Mean (\pm SD) densities (no. m⁻²) of the most common mobile fauna counted used in the ordination and indicator species analysis. Means and standard deviations for each seascape are based on the number of sites (given in parentheses next to each seascape). Trochid snails include *Margarites* spp. and small *Calliostoma* that could not reliably be identified to species level

Mobile taxa in quadrats	Class	Haro (4)	Channel (4)	Rosario (3)	Sound (4)	Hood (3)
<i>Calliostoma ligatum</i>	Gastropoda	10.6 \pm 7.5	8.3 \pm 6.5	9.1 \pm 1.9	0.7 \pm 0.9	0 \pm 0
Trochid snail	Gastropoda	4.7 \pm 1.1	14.9 \pm 23.7	3.5 \pm 1.4	0.1 \pm 0.2	0 \pm 0
<i>Tonicella</i> spp.	Polyplacophora	5.8 \pm 4.2	8 \pm 11.7	2.4 \pm 1.6	0.9 \pm 0.7	0.8 \pm 0.7
<i>Amphissa</i> spp.	Gastropoda	7.2 \pm 6.3	3.2 \pm 2.3	9.6 \pm 6.3	0.5 \pm 0.9	0 \pm 0

Table S9. Mean (\pm SD) densities (no. m⁻²) of the most common mobile fauna counted on transects used in ordination (Fig. 7). The number of sites within each seascape is in parentheses

Mobile taxa on transects	Class	Haro (4)	Channel (4)	Rosario (3)	Sound (3)	Hood (4)
<i>Cryptochiton stelleri</i>	Polyplacophora	0.04 \pm 0.05	0.07 \pm 0.05	0 \pm 0	0 \pm 0	0 \pm 0
<i>Strongylocentrotus franciscanus</i>	Echinoidea	0.35 \pm 0.36	0.37 \pm 0.32	0.07 \pm 0.03	0 \pm 0	0 \pm 0
<i>Henricia</i> spp.	Asteroidea	0.18 \pm 0.08	0.33 \pm 0.24	0.34 \pm 0.37	0.02 \pm 0.03	0.02 \pm 0.03
<i>Dermasterias imbricata</i>	Asteroidea	0.02 \pm 0.02	0 \pm 0	0.1 \pm 0.17	0.04 \pm 0.03	0 \pm 0
<i>Evasterias troschelii</i>	Asteroidea	0 \pm 0	0.01 \pm 0.02	0 \pm 0	0.08 \pm 0.1	0 \pm 0
<i>Pycnopodia helianthoides</i>	Asteroidea	0.01 \pm 0.02	0.03 \pm 0.03	0.01 \pm 0.02	0.1 \pm 0.07	0.03 \pm 0.03
<i>Solaster stimpsoni</i>	Asteroidea	0.12 \pm 0.19	0.01 \pm 0.02	0 \pm 0	0 \pm 0	0 \pm 0
<i>Parastichopus californicus</i>	Holothuroidea	0 \pm 0	0.12 \pm 0.13	0.05 \pm 0.06	0.01 \pm 0.03	0.26 \pm 0.16

Table S10. Results of permutational multivariate analysis of variance, permutational analysis of multivariate dispersion, and post-hoc comparisons between seascapes for 8 mobile fauna (see Table S8) on transects. Components of variation are presented for each scale of observation. Bold types indicate significant differences ($p < 0.05$)

Source of variation	df	SS	MS	Pseudo- <i>F</i>	<i>P</i> (perm)
Seascape	4	79104	19776	4.77	0.0001
Site	13	55917	4301.3	1.93	0.0001
Transect (residual)	60	133770	2229.5		
Total	77	273620			
Pairwise test between seascapes					
				<i>t</i>	<i>P</i> (perm)
Channel, Haro				1.08	0.351
Channel, Rosario				1.00	0.437
Channel, Sound				2.87	0.023
Channel, Hood				2.87	0.028
Haro, Rosario				1.29	0.044
Haro, Sound				2.58	0.021
Haro, Hood				2.98	0.028
Rosario, Sound				2.24	0.006
Rosario, Hood				1.88	0.108
Sound, Hood				3.09	0.003
Deviations from centroid					
				Pseudo- <i>F</i>	<i>P</i> (perm)
Seascape				3.04	0.049
Pairwise test of deviation from centroid between seascapes					
				<i>t</i>	<i>P</i> (perm)
Channel, Haro				0.89	0.459
Channel, Rosario				0.34	0.773
Channel, Sound				0.06	0.952
Channel, Hood				2.49	0.028
Haro, Rosario				0.89	0.459
Haro, Sound				1.15	0.307
Haro, Hood				3.68	0.002
Rosario, Sound				0.20	0.868
Rosario, Hood				2.02	0.092
Sound, Hood				1.81	0.112
Components of variation					
	Estimate	Square root			
Seascape	1084.8	32.9			
Site	484.3	22.0			
Transect (residual)	2229.5	47.2			