

Title: Estimating biomass of benthic kelp forest invertebrates from body size and percent cover data

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Table S1. Regression coefficients (a = intercept, b = slope), r^2 , and P values for linear regression of length (L, mm) or cover (C, %) vs. blotted wet mass (M, g) of 84 species of benthic kelp forest invertebrates. The independent variable (either a length measurement or percent cover), N (the number of individuals (in the case of length) or the number of quadrats (in the case of percent cover) that were analyzed), and the range of values of the independent variable encompassed by the data are given for each species. All regression equations involving a length measurement as the independent variable are of the form $M = aL^b$. Values for the root mean square error of residuals (RMSE) and smearing estimates are provided for regressions involving length to facilitate correcting for underestimate bias caused by back-transformation of logged coefficients. Regression equations involving percent cover as the independent variable are of the form $M = bC$.

Species	Independent variable	Range	a	b	r^2	p	N	RMSE	Smearing estimate
<u>Porifera</u>									
<i>Acarinus</i> sp.	percent cover	5 - 90	.	0.803	0.94	<.001	10	.	.
<i>Cliona celata</i>	percent cover	5 - 55	.	0.918	0.98	<.001	10	.	.
<i>Halichondria panicea</i>	percent cover	5 - 100	.	2.335	0.96	<.001	10	.	.
<i>Leucilla nuttingi</i>	percent cover	5 - 90	.	0.193	0.96	<.001	21	.	.
<i>Tethya aurantia</i>	diameter	12-81	3.0×10^{-3}	2.471	0.97	<.001	14	0.2068	1.02
<u>Cnidaria</u>									
<i>Abietinaria</i> sp.	percent cover	5 - 100	.	0.049	0.98	<.001	30	.	.
<i>Aglaophenia</i> sp.	percent cover	5 - 100	.	0.217	0.91	<.001	37	.	.
<i>Anthopleura artemisia</i>	disc diameter	7 - 19	2.7×10^{-2}	1.492	0.79	0.008	7	0.2348	1.03
<i>Astrangia lajollaensis</i>	percent cover	5 - 100	.	0.048	0.87	<.001	10	.	.
<i>Balanophyllia elegans</i>	disc diameter	6 - 13	6.0×10^{-3}	2.001	0.72	<.001	28	0.238	1.03
<i>Corynactis californica</i>	percent cover	5 - 100	.	0.284	0.8	<.001	24	.	.
<i>Epiactis prolifera</i>	percent cover	5 - 75	.	0.349	0.99	<.001	15	.	.

Species	Independent variable	Range	a	b	r ²	p	N	RMSE	Smearing estimate
<i>Hydractinia milleri</i>	percent cover	5 - 100	.	0.030	0.93	<.001	19	.	.
<i>Leptogorgia chilensis</i>	colony width	70 - 410	1.8 x 10 ⁻²	1.529	0.71	<.001	25	0.4641	1.12
<i>Muricea californica</i>	colony width	8 - 327	2.0 x 10 ⁻³	2.001	0.68	0.003	10	0.4755	1.11
<i>Pachycerianthus fimbriatus</i>	disc diameter	14 - 37	1.1 x 10 ⁻¹	1.597	0.9	<.001	15	0.132	1.01
<i>Paracyathus stearnsii</i>	percent cover	5 - 100	.	0.545	0.99	<.001	28	.	.
<i>Phyllactis</i> spp.	disc diameter	6 - 15	6.0 x 10 ⁻³	1.799	0.46	<.001	25	0.4115	1.10
<i>Plumularia</i> sp.	percent cover	5 - 100	.	0.012	0.95	<.001	14	.	.
<i>Urticina lofotensis</i>	disc diameter	40 - 186	3.9 x 10 ⁻¹	1.040	0.74	0.001	10	0.273	1.04
<u>Annelida</u>									
<i>Cirriformia luxuriosa</i>	percent cover	5 - 90	.	0.195	0.99	<.001	15	.	.
<i>Dodecaceria fewkesi</i>	percent cover	5 - 100	.	0.322	0.7	<.001	21	.	.
<i>Eudistylia polymorpha</i>	body diameter	3-10	2.3 x 10 ⁻¹	1.426	0.34	0.007	20	0.5313	1.15
<i>Phragmatopoma californica</i>	percent cover	5 - 100	.	0.014	0.72	<.001	22	.	.
<i>Salmacina tribranchiata</i>	percent cover	5 - 100	.	2.307	0.96	<.001	30	.	.
<u>Mollusca</u>									
<i>Aplysia californica</i>	retracted length	70 - 280	1.9 x 10 ⁻¹	1.575	0.51	<.001	30	0.5659	1.16
<i>Calliostoma tricolor</i>	shell length	12-17	1.3 x 10 ⁻⁴	3.360	0.99	<.001	6	0.0459	1.00
<i>Chaceia ovoidea</i>	siphon diameter	16 - 35	5.9	1.058	0.99	<.001	6	0.0256	1.00
<i>Conus californicus</i>	shell length	8-27	7.5 x 10 ⁻⁴	2.578	0.97	<.001	80	0.1225	1.01
<i>Crassadoma giganteum</i>	shell length	68 - 190	9.6 x 10 ⁻⁴	2.733	0.85	<.001	15	0.3917	1.08
<i>Cypraea spadicea</i>	shell length	33 - 50	6.0 x 10 ⁻³	2.114	0.76	<.001	27	0.1104	1.01
<i>Doriopsilla albopunctata</i>	retracted length	14 - 112	1.3 x 10 ⁻⁴	2.801	0.97	<.001	14	0.3618	1.07
<i>Haliotis rufescens</i>	shell length	30 - 171	4.2 x 10 ⁻⁴	2.797	0.95	<.001	25	0.2401	1.03
<i>Kelletia kelletii</i>	shell length	14 - 135	1.5 x 10 ⁻⁴	2.932	0.99	<.001	49	0.1455	1.01
<i>Lithophaga plumula</i>	siphon diameter	1 - 5	8.9 x 10 ⁻¹	1.031	0.33	0.004	23	0.7054	1.25

Species	Independent variable	Range	a	b	r ²	p	N	RMSE	Smearing estimate
<i>Lithopoma gibberosa</i>	shell length	19 - 127	6.5×10^{-4}	2.823	0.97	<.001	97	0.2954	1.05
<i>Megathura crenulata</i>	body length	79 - 126	2.5×10^{-2}	1.932	0.76	<.001	26	0.1439	1.01
<i>Mitra idae</i>	shell length	9 - 65	9.7×10^{-4}	2.377	0.99	<.001	34	0.1196	1.01
<i>Mytilus californianus</i>	shell length	31 - 143	2.0×10^{-3}	2.078	0.61	<.001	19	0.6731	1.26
<i>Mytilus galloprovincialis</i>	shell length	26 - 86	1.2×10^{-5}	3.382	0.7	<.001	20	0.6494	1.22
<i>Norrisia norrisi</i>	shell length	21 - 67	1.0×10^{-3}	2.676	0.82	<.001	33	0.3269	1.06
<i>Octopus bimaculoides</i>	arm length	150 - 450	2.3×10^{-2}	1.631	0.83	<.001	10	0.2592	1.03
<i>Parapholas californica</i>	siphon diameter	0.9 - 19	4.4	0.919	0.51	<.001	38	0.8697	1.34
<i>Peltodoris nobilis</i>	retracted length	24 - 74	2.0×10^{-3}	2.267	0.60	<.001	24	0.6023	1.17
<i>Pteropurpura trialata</i>	shell length	15 - 40	8.2×10^{-4}	2.366	0.94	<.001	10	0.199	1.02
<i>Serpulorbis squamiger</i>	percent cover	5 - 100	.	0.571	0.91	<.001	25	.	.
<i>Tegula brunnea</i>	shell length	10 - 35	4.0×10^{-3}	2.365	0.72	<.001	39	0.4584	1.12
<u>Arthropoda</u>									
<i>Balanus glandula</i>	percent cover	5 - 100	.	0.685	0.8	<.001	30	.	.
<i>Loxorhynchus grandis</i>	carapace diameter	77 - 270	8.0×10^{-2}	1.973	0.76	<.001	11	0.4751	1.12
<i>Panulirus interruptus</i>	carapace length	33 - 157	1.0×10^{-3}	2.914	0.97	<.001	207	0.0782	1.00
<i>Pugettia producta</i>	carapace diameter	13 - 104	1.0×10^{-3}	2.510	0.95	<.001	13	0.3445	1.06
<u>Ectoprocta</u>									
<i>Bugula californica</i>	percent cover	5 - 100	.	0.392	0.99	<.001	27	.	.
<i>Bugula neritina</i>	percent cover	5 - 100	.	0.189	0.82	<.001	40	.	.
<i>Cellaria</i> sp.	percent cover	5 - 100	.	0.164	0.95	<.001	27	.	.
<i>Diaperoforma californica</i>	percent cover	5 - 100	.	0.893	0.96	<.001	29	.	.
<i>Thalamoporella californica</i>	percent cover	5 - 100	.	0.594	0.95	<.001	30	.	.
<u>Echinodermata</u>									
<i>Cucumaria piperata</i>	retracted length	13 - 77	1.0×10^{-3}	2.180	0.87	<.001	49	0.3412	1.06

Species	Independent variable	Range	a	b	r ²	p	N	RMSE	Smearing estimate
<i>Cucumaria salma</i>	tentacle diameter	12 - 55	3.6 x 10 ⁻¹	1.017	0.9	<.001	15	0.1555	1.01
<i>Dermasterias imbricata</i>	body diameter	40 - 370	7.7	0.701	0.67	<.001	28	0.3194	1.05
<i>Eupentacta quinque semita</i>	retracted length	27 - 100	7.8 x 10 ⁻⁴	2.235	0.8	<.001	36	0.4085	1.14
<i>Lissothuria nutriens</i>	retracted length	8 - 14	2.0 x 10 ⁻³	2.196	0.6	0.001	14	0.3014	1.05
<i>Lytechinus anamesus</i>	test diameter	10 - 27	3.2 x 10 ⁻⁴	3.044	0.9	<.001	14	0.2783	1.04
<i>Ophioplocus esmarki</i>	disc diameter	11 - 24	4.0 x 10 ⁻³	2.253	0.94	<.001	58	0.1023	1.01
<i>Ophiothrix spiculata</i>	disc diameter	4 - 15	5.0 x 10 ⁻³	2.318	0.91	<.001	42	0.1971	1.02
<i>Pachythyone rubra</i>	retracted length	5 - 24	8.2 x 10 ⁻⁴	2.136	0.82	<.001	49	0.313	1.05
<i>Parastichopus californicus</i>	retracted length	41 - 215	8.2 x 10 ⁻²	1.539	0.3	0.003	26	0.7747	1.28
<i>Parastichopus parvimensis</i>	retracted length	70 - 240	9.0 x 10 ⁻³	2.123	0.85	<.001	47	0.2977	1.04
<i>Patiria miniata</i>	body diameter	32 - 210	1.4 x 10 ⁻⁴	2.712	0.98	<.001	51	0.1284	1.01
<i>Pisaster brevispinus</i>	body diameter	144 - 534	2.0 x 10 ⁻³	2.147	0.8	<.001	20	0.3178	1.06
<i>Pisaster giganteus</i>	body diameter	17 - 290	1.0 x 10 ⁻²	1.773	0.95	<.001	37	0.1809	1.02
<i>Pisaster ochraceus</i>	body diameter	206 - 326	2.2 x 10 ⁻⁴	2.592	0.8	<.001	12	0.1917	1.02
<i>Pycnopodia helianthoides</i>	body diameter	104 - 545	3.7 x 10 ⁻⁵	2.970	0.9	<.001	14	0.5218	1.14
<i>Mesocentrotus franciscanus</i>	test diameter	28 - 85	5.9 x 10 ⁻⁴	2.917	0.94	<.001	35	0.194	1.02
<i>Strongylocentrotus purpuratus</i>	test diameter	19 - 74	5.9 x 10 ⁻⁴	2.870	0.99	<.001	21	0.112	1.04
<u>Tunicata</u>									
<i>Archidistoma psammion</i>	percent cover	5 - 100	.	1.370	0.95	<.001	37	.	.
<i>Chelyosoma productum</i>	percent cover	5 - 100	.	0.718	0.99	<.001	20	.	.
<i>Clavelina huntsmani</i>	percent cover	10 - 100	.	0.379	0.93	<.001	30	.	.
<i>Cystodytes lobatus</i>	percent cover	5 - 100	.	0.922	0.9	<.001	9	.	.
<i>Euherdmania claviformis</i>	percent cover	5 - 95	.	0.792	0.98	<.001	18	.	.
<i>Polyclinum planum</i>	body length	21 - 210	2.0 x 10 ⁻³	2.224	0.92	<.001	14	0.4496	1.10
<i>Pycnoclavella stanleyi</i>	percent cover	5 - 95	.	0.449	0.96	<.001	28	.	.

Species	Independent variable	Range	a	b	r ²	p	N	RMSE	Smearing estimate
<i>Ritterella aequalisiphonis</i>	percent cover	5 - 75	.	1.423	0.98	<.001	11	.	.
<i>Styela montereyensis</i>	siphon diameter	4 - 25	2.9 x 10 ⁻²	2.211	0.85	<.001	61	0.3846	1.09
<i>Trididemnun opacum</i>	percent cover	5 - 65	.	0.423	0.95	<.001	22	.	.