

SUPPLEMENTARY MATERIALS FOR

SPECIES ARCHETYPE MODELS OF KELP FOREST COMMUNITIES REVEAL DIVERSE RESPONSES TO ENVIRONMENTAL GRADIENTS

By Rhiannon L. Rognstad, Andrew Rassweiler, Daniel C. Reed, Li Kui, and Robert J. Miller

TABLE S1. The full set of environmental variables that were considered for determining species archetypes, and Akaike information criterion (AIC) values (an estimator of prediction error) used to inform model selection decisions. CV = coefficient of variation.

VARIABLES	VARIABLE NAMES IN SCRIPT	AIC FOR FIRST MODEL SELECTION	AIC FOR SECOND MODEL SELECTION	KEPT IN FINAL MODEL
Year	year		25511.08	Yes
Depth from bathymetry map	depth	28435.04		
Depth from the survey	mean_depth	28396.71	25447.31	Yes
Average sea surface temperature (sst)	mean_sst	26673.97		
Spring sst	spring_sst	26867.34		
Summer sst	summer_sst	26603.50		No (cross-correlation)
Winter sst	winter_sst	27809.30		
Average sst in the hottest year	sst_max	27644.06		
Average sst in the coldest year	sst_min	27026.22	25904.54	Yes
CV of sst	cv_sst		25635.00	Yes
Percent cover cobble substrate	cobble	28511.87	25410.44	Yes
Percent cover rock substrate	rock	28555.73	25477.22	Yes
Percent hard substrate	hard_sub	28562.02		
Mean chlorophyll <i>a</i> concentration (chl _a)	mean_chl _a	28315.03		
Spring chl _a	spring_chl _a	28323.98	25505.13	Yes
Summer chl _a	summer_chl _a	28263.80		
Winter chl _a	winter_chl _a	28489.60		
CV of chl _a	cv_chl _a	28477.24	25363.55	Yes
Maximum significant wave height in the highest year	max_wave_max	28447.68		
Mean wave height in the highest year	mean_wave_max	27906.60	25693.91	Yes
Mean wave height	mean_wave	27588.58		No (cross-correlation)
CV of wave height	cv_wave_mean	28252.23	25441.58	Yes
CV of wave height in the highest year	cv_wave_max	27861.10		No (cross-correlation)
Mean turbidity	mean_turbid	28078.65	25492.27	Yes
Maximum turbidity	turbid_max	28440.80		
Minimum turbidity	turbid_min	27637.67		No (cross-correlation)
North Pacific Gyre Oscillation index	mean_npgo		25418.57	Yes
Multivariate ENSO Index	mean_mei		25491.60	Yes

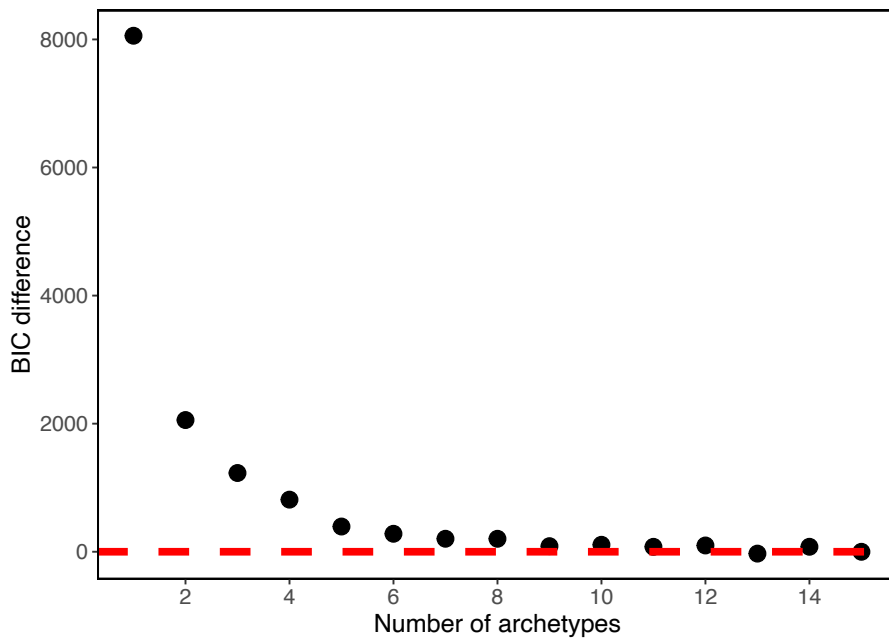


FIGURE S1. Difference in Bayesian Information Criteria (BIC) for the species archetype model (SAM) fitted for a range of archetype numbers ($G = 1-20$). Red dashed line represents zero BIC difference.

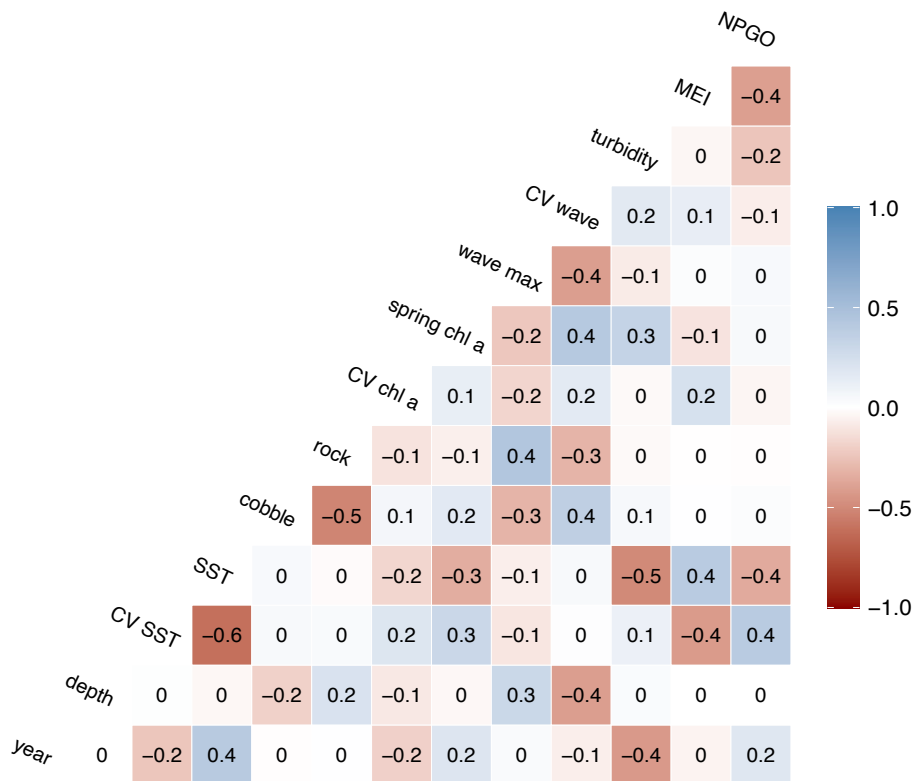


FIGURE S2. Correlation matrix of environmental covariates used in SAMs.

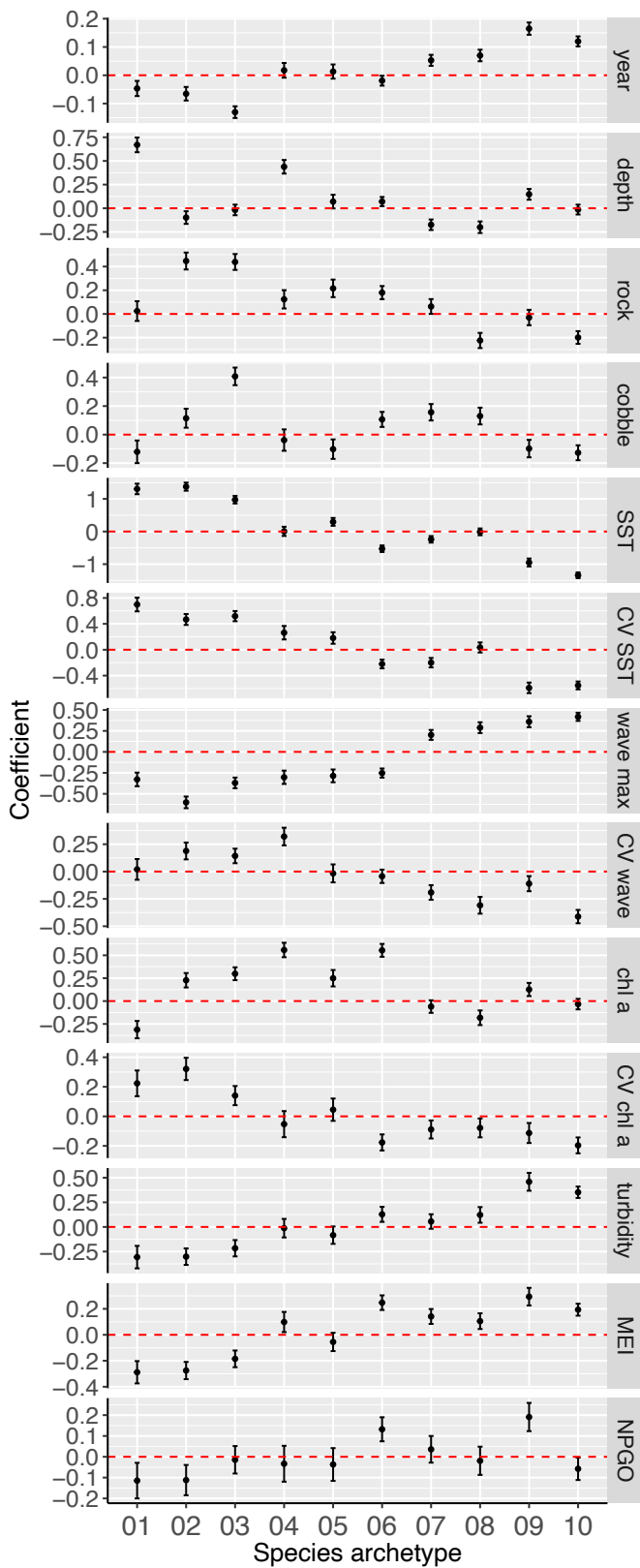


FIGURE S3. Coefficients for environmental variables by archetype, with standard errors, for most the parsimonious SAMs.

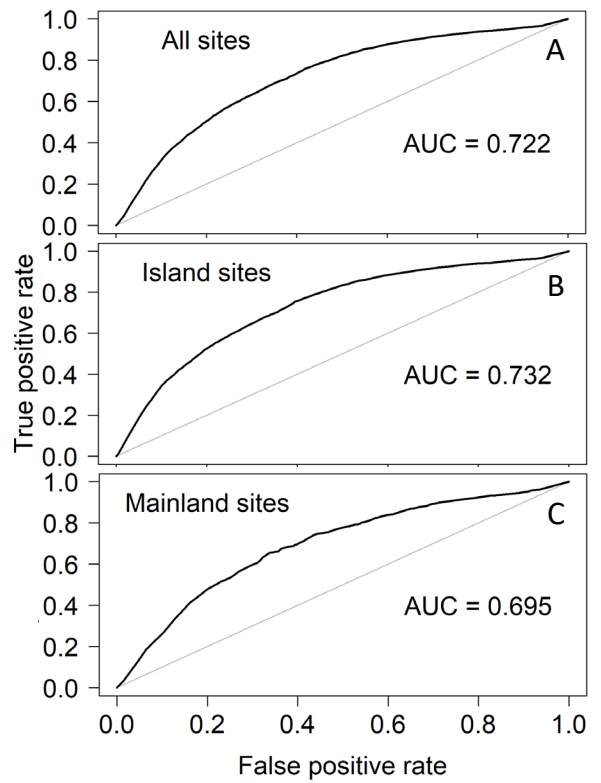


FIGURE S4. AUC values for a SAM run on a complete PISCO data set (A) vs. island (B) and mainland sites (C), separately. Area under the receiver (AUC) is only slightly lower for the mainland sites, which are outside the original geographic domain of the model.