

Supporting Information

Appendix S2. Additional results.

Figure S1. Principal component analysis of anthropogenic disturbance scores for seagrass meadows based on watershed population size, overwater structures, and shoreline modification (vector arrows). Sites were categorized as high (red), medium (blue), and low (green) anthropogenic disturbance for some analyses. Inset plot is zoomed-in on sites categorized as low disturbance.

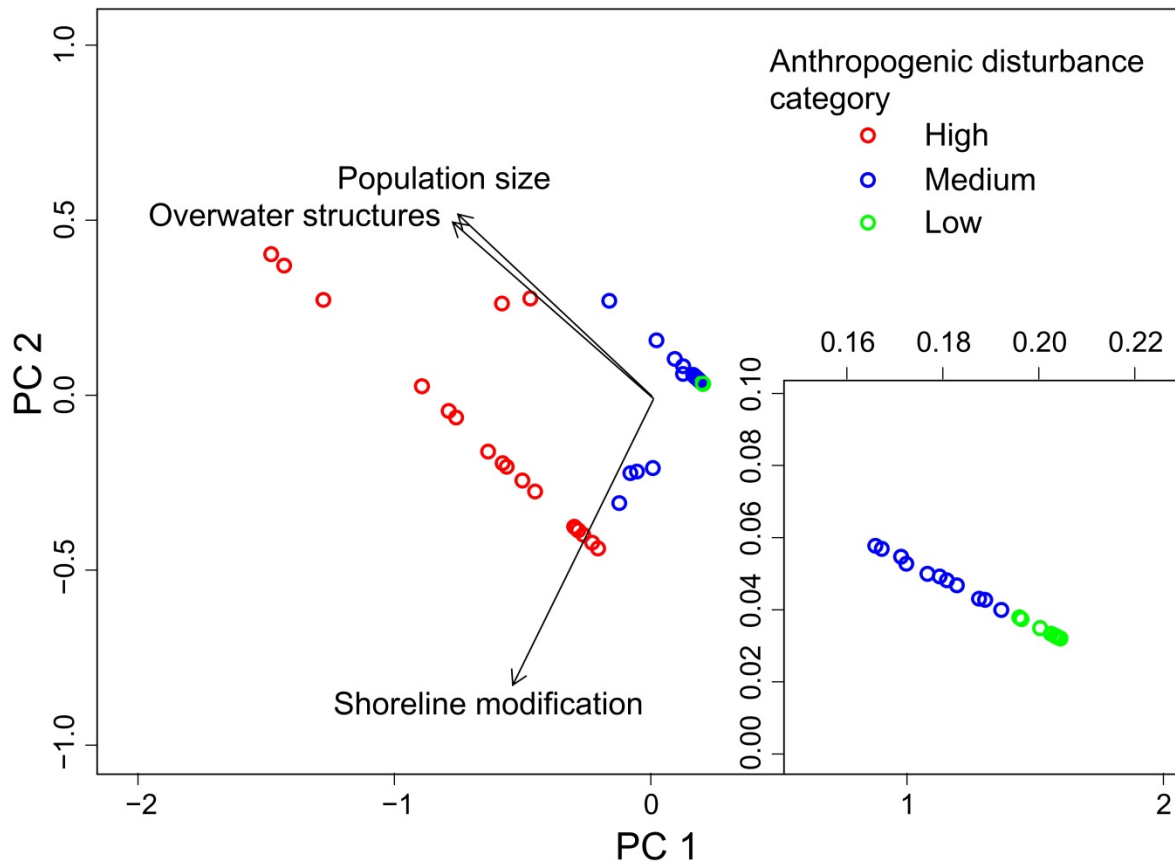


Figure S2. Anthropogenic disturbance z-scores with summation of watershed population size (“PS”), overwater structures (“OS”), and shoreline modification (“SM”) measures (“cumulative score”) (a); summation of watershed population size and shoreline modification (b); and summation of overwater structures and shoreline modification (c). Sites are ordered by increasing values of the full cumulative score and colour-coded by low (green), medium (blue), and high (red) disturbance categories.

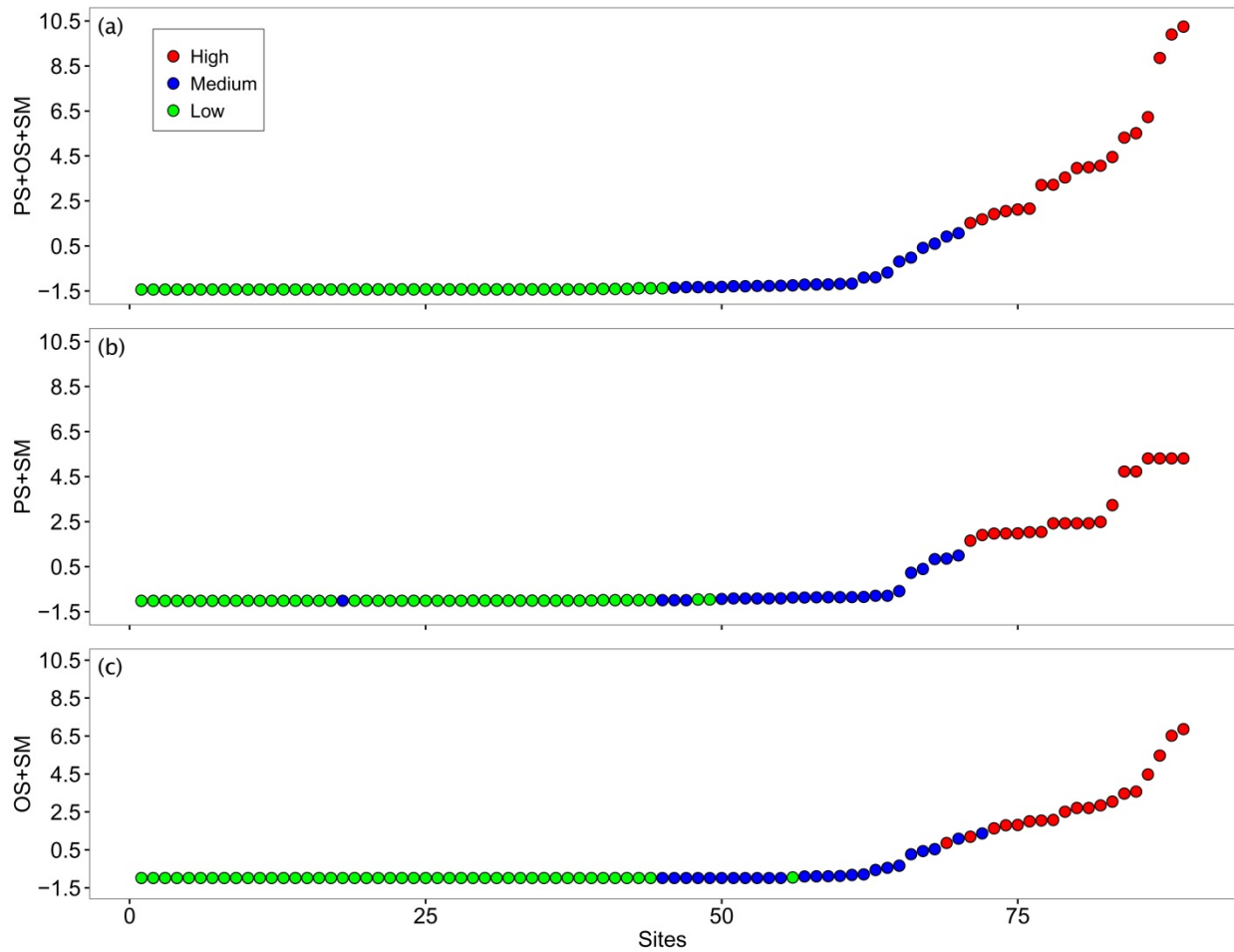


Figure S3. Gower distances of biotic characteristics of seagrass meadows – including seagrass biomass, shoot density, and epiphyte load – between sites within (a) and across regions (b) for low (square), medium (circle), and high (triangle) anthropogenic disturbance categories. Higher Gower distance values indicate more dissimilarity between sites within the same disturbance category. Symbols show bootstrapped averages and error bars are 95% confidence intervals (CIs). Letters indicate significant differences, as determined by non-overlapping 95% confidence intervals.

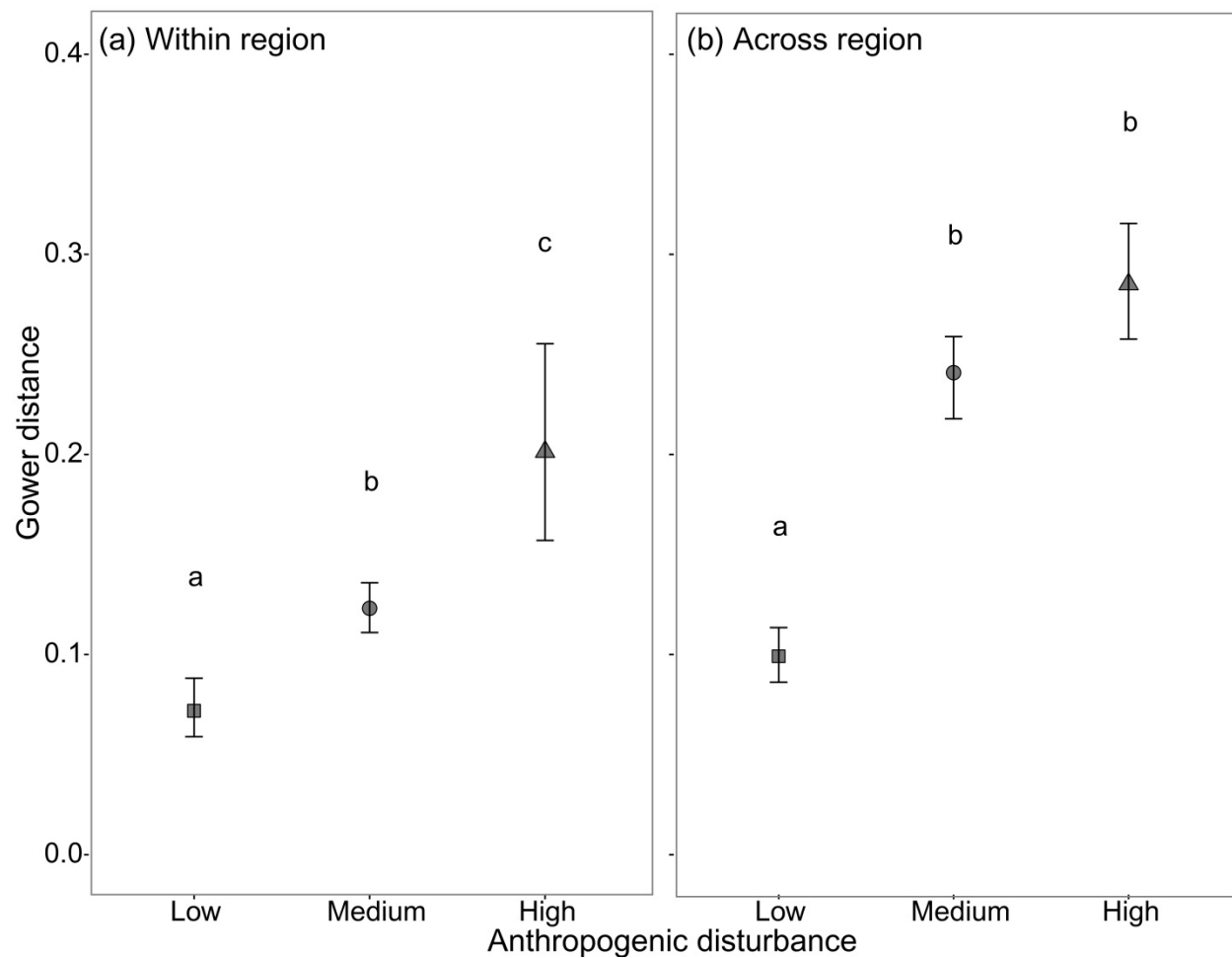


Figure S4. Species richness rarefaction curves indicate the highest richness of seagrass fishes in low anthropogenic disturbance sites (square), with lower richness in medium disturbance sites (circle), and a tendency for the lowest in high disturbance sites (triangle). Lines are mean interpolated (solid) and extrapolated (dotted) richness values with shaded areas representing bootstrapped 95% confidence intervals.

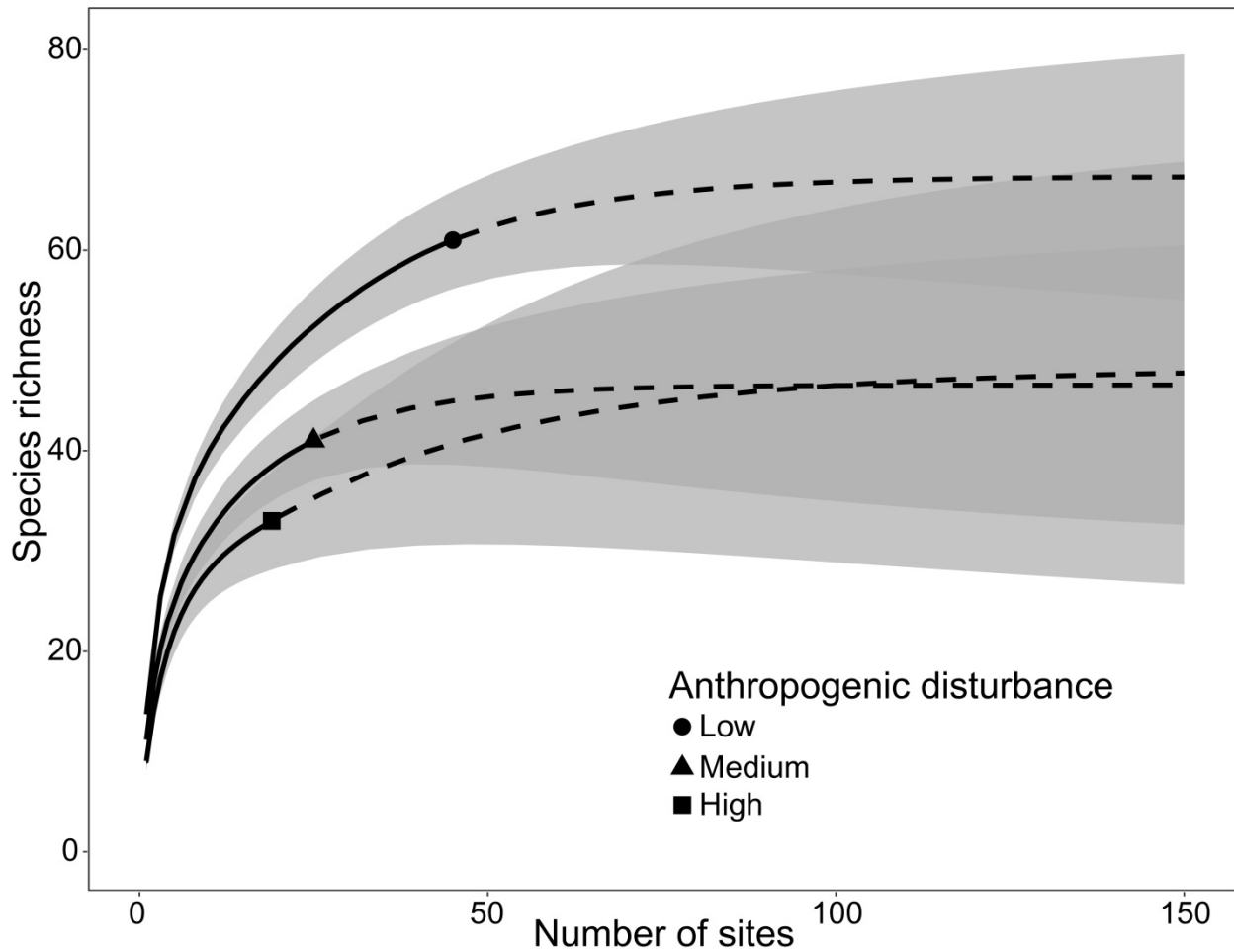


Figure S5. Sorensen dissimilarity components for within-region comparisons between sites characterized by low (square), medium (circle), or high (triangle) anthropogenic disturbance. Dissimilarity components represent turnover (green), nestedness (blue), and total (red) observed beta-diversity. Letters indicate non-overlapping 95% confidence intervals between anthropogenic disturbance categories for each beta-diversity component.

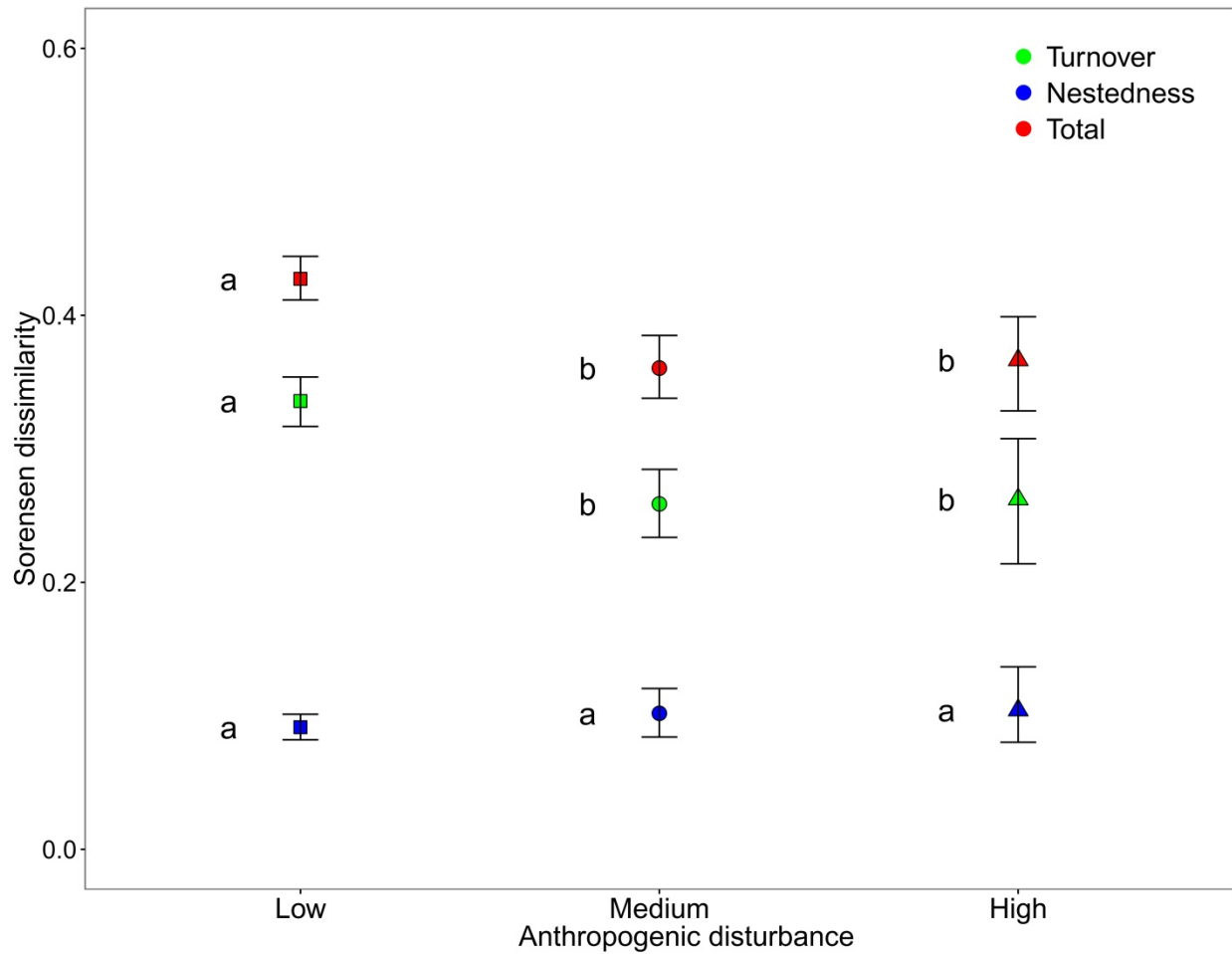


Figure S6. Bray-Curtis beta-deviation within regions increases with distance between pairwise sites (dashed line; $m = 0.13$, Adj. $R^2 = 0.20$, $p < 0.001$). Sites are categorized as low (green square), medium (blue circle), and high (red triangle) anthropogenic disturbance.

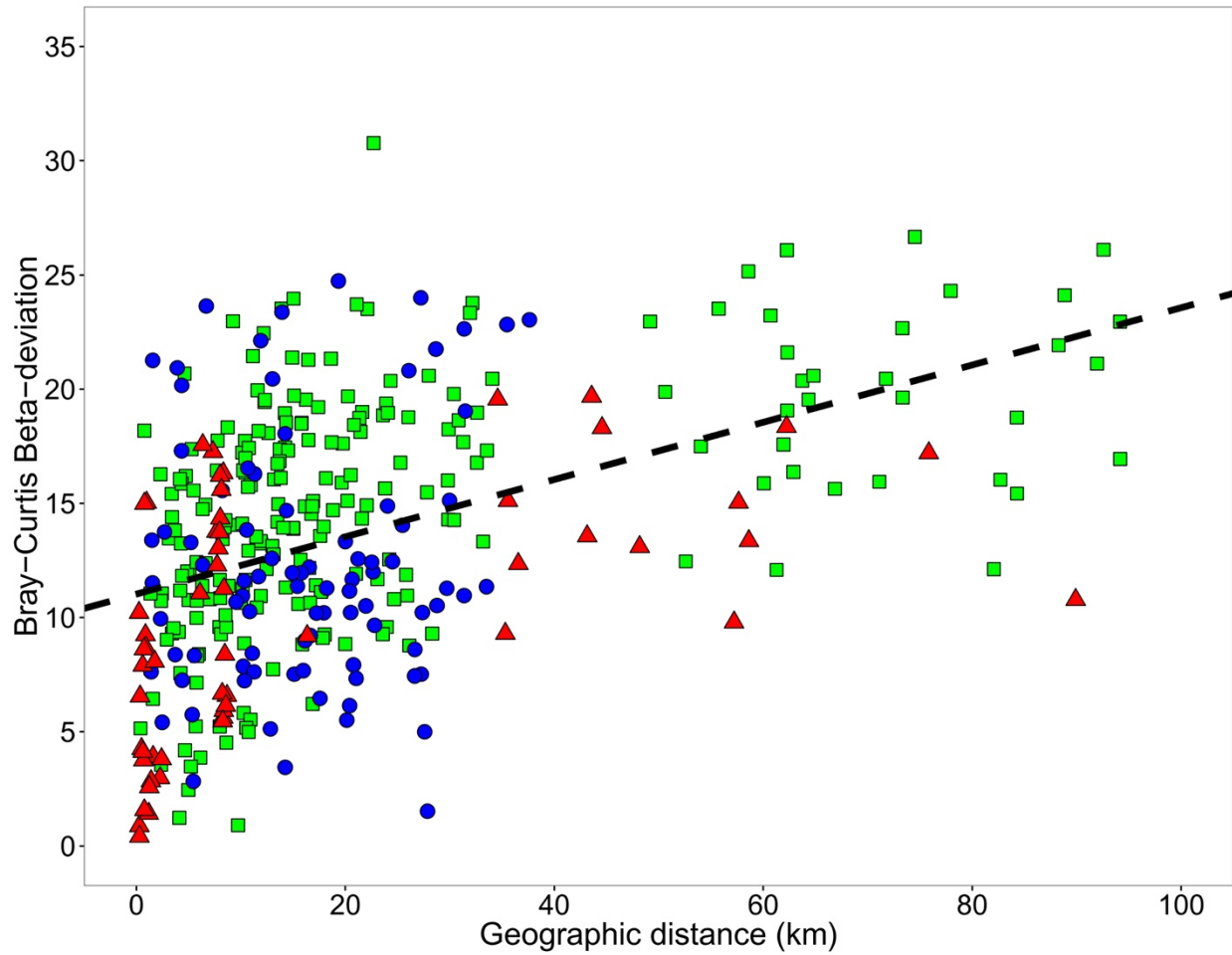


Figure S7. Beta-diversity comparisons within regions were corrected for spatial autocorrelation by (a) removing average site distance differences between anthropogenic disturbance categories and (b) fixing the relationship between site distance and beta-diversity to be the same amongst disturbance categories. Bray-Curtis beta-deviation values (a) with removal of geographically distant sites (> 40 km) within the low disturbance category and (b) bootstrapped intercept values with a fixed slope ($m = 0.13$) verify declining beta-diversity with anthropogenic disturbance, from low (square) to medium (circle) to high (triangle). Letters indicate non-overlapping 95% confidence intervals.

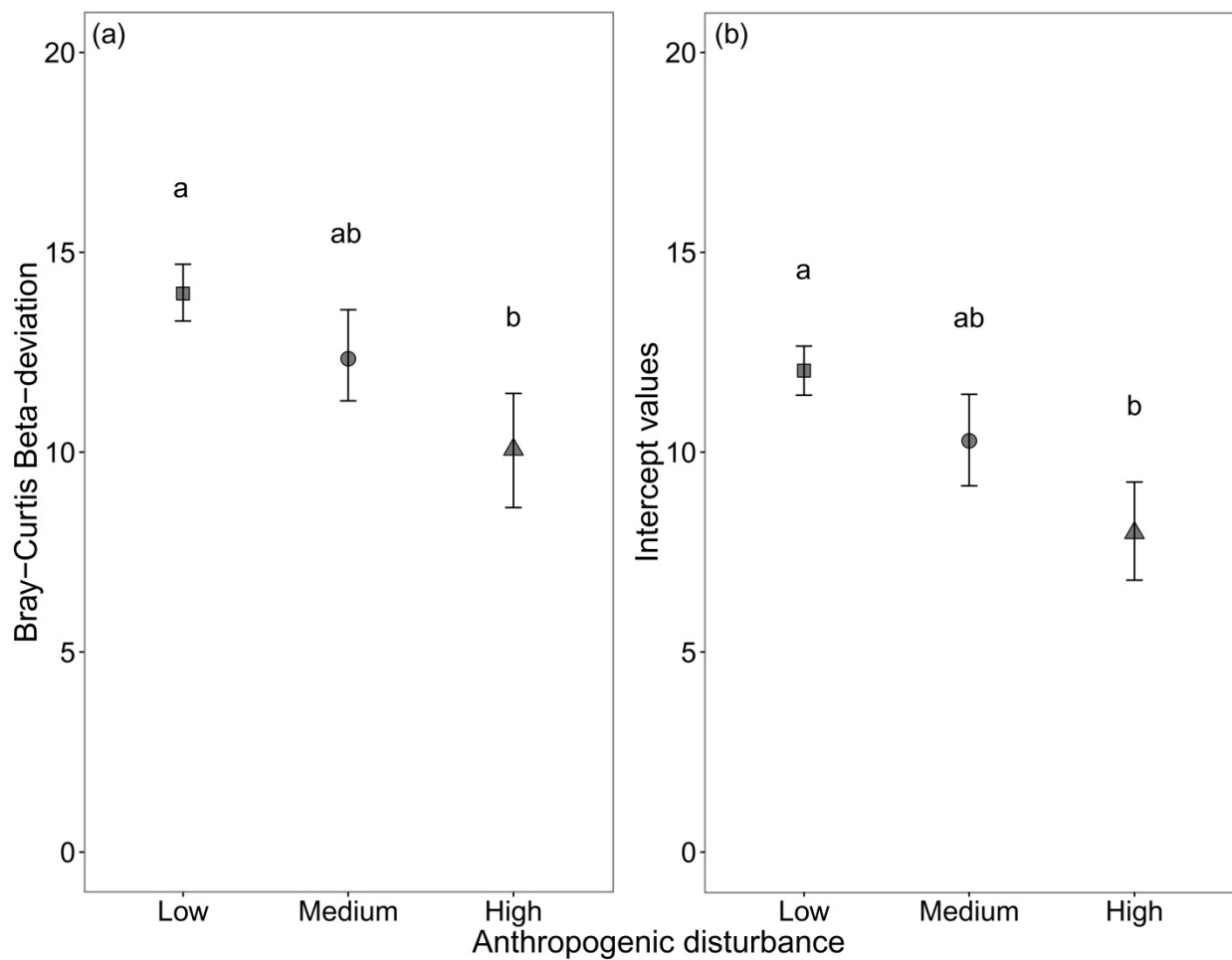


Table S1. List of all seagrass fish species identified in summer 2016 surveys across coastal British Columbia. Observation of species within the Oregonian and/or Aleutian marine zoogeographic provinces is provided (note, some species found in only one province in our field surveys may in fact occur in both). Trait information for rockfish spp. was based on the average trait values for bocaccio, copper, and yellowtail rockfish (all *Sebastes* spp. identified in the field).

Common name	Scientific name	Province	Sl:Bd	Reproductive guild	Resident status	Trophic level
Arrow goby	<i>Clevelandia ios</i>	Both				
Bay goby	<i>Lepidogobius lepidus</i>	Oregonian				
Bay pipefish	<i>Syngnathus leptorhyncus</i>	Both	38.18	Egg guarder	Resident	3.24
Blackeye goby	<i>Rhinogobiops nicholsii</i>	Both				
Brown Irish lord	<i>Hemilepidotus spinosus</i>	Aleutian				
Buffalo sculpin	<i>Enophrys bison</i>	Both	2.87	Egg guarder	Resident	3.34
C-O sole	<i>Pleuronichthys coenosus</i>	Both	11.99	Broadcast spawner	Resident	3.16
Cabezon	<i>Scorpaenichthys marmoratus</i>	Both	4.23	Egg scatterer	Resident	3.62
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	Both				
Chum salmon	<i>Oncorhynchus keta</i>	Both				
Coho salmon	<i>Oncorhynchus kisutch</i>	Both				
Crescent gunnel	<i>Pholis laeta</i>	Both	12.04	Egg scatterer	Resident	12.04
Crevice kelpfish	<i>Gibbonsia montereyensis</i>	Oregonian	5.51	Egg guarder	Resident	5.51
Cutthroat trout	<i>Oncorhynchus clarkii</i>	Oregonian				
English sole	<i>Parophrys vetulus</i>	Both	12.59	Broadcast spawner	Seasonal resident	3.15
Fluffy sculpin	<i>Oligocottus snyderi</i>	Aleutian				
Great sculpin	<i>Myoxocephalus polyacanthocephalus</i>	Both	3.18	Egg scatterer	Resident	3.18
Greenling spp.	<i>Hexagrammos</i> spp.	Both				
High cockscomb	<i>Anoplarchus purpurescens</i>	Both				
Kelp clingfish	<i>Rimicola muscarum</i>	Both				
Kelp perch	<i>Brachyistius frenatus</i>	Both	3.43	Live bearer	Resident	3.43
Lingcod	<i>Ophiodon elongatus</i>	Both	6.37	Egg guarder	Seasonal resident	6.37
Manacled sculpin	<i>Synchirus gilli</i>	Aleutian				

Northern anchovy	<i>Engraulis mordax</i>	Oregonian				
Northern clingfish	<i>Gobiesox maeandricus</i>	Oregonian				
Pacific herring	<i>Clupea pallasii</i>	Both	5.37	Egg scatterer	Seasonal resident	5.37
Pacific sanddab	<i>Citharichthys sordidus</i>	Both	12.34	Broadcast spawner	Resident	3.12
Pacific sand lance	<i>Ammodytes hexapterus</i>	Aleutian	11.1	Egg scatterer	Transient	11.1
Pacific sand sole	<i>Psettichthys melanostictus</i>	Aleutian				
Pacific staghorn sculpin	<i>Leptocottus armatus</i>	Both	6.34	Egg scatterer	Resident	6.34
Pacific tomcod	<i>Microgadus proximus</i>	Both				
Padded sculpin	<i>Artedius fenestralis</i>	Both	4.55	Egg guarder	Resident	4.55
Painted greenling	<i>Oxylebius pictus</i>	Both				
Penpoint gunnel	<i>Apodichthys flavidus</i>	Both	12.65	Egg guarder	Resident	12.65
Pile surfperch	<i>Rhacochilus vacca</i>	Both	2.76	Live bearer	Resident	2.76
Plainfin midshipman	<i>Porichthys notatus</i>	Oregonian	5.36	Egg guarder	Seasonal resident	5.36
Prickly sculpin	<i>Cottus asper</i>	Oregonian				
Red Irish lord	<i>Hemilepidotus hemilepidotus</i>	Both	3.97	Egg guarder	Resident	3.97
Rock prickleback	<i>Xiphister mucosus</i>	Aleutian				
Rock sole	<i>Lepidopsetta bilineata</i>	Both				
Rockfish spp.	<i>Sebastes</i> spp.	Both	3.42	Live bearer	Seasonal resident	3.42
Rockweed gunnel	<i>Apodichthys fucorum</i>	Oregonian				
Rosylip sculpin	<i>Ascelichthys rhodorus</i>	Both				
Roughback sculpin	<i>Chitonotus pugetensis</i>	Both				
Saddleback gunnel	<i>Pholis ornata</i>	Oregonian	10.23	Egg scatterer	Resident	10.23
Sailfin sculpin	<i>Nautichthys oculofasciatus</i>	Oregonian				
Scalyhead sculpin	<i>Artedius harringtoni</i>	Aleutian				
Sharpnose sculpin	<i>Clinocottus acuticeps</i>	Both	4.64	Egg scatterer	Resident	4.64
Shiner perch	<i>Cymatogaster aggregata</i>	Both	2.99	Live bearer	Resident	2.99
Silverspotted sculpin	<i>Blepsias cirrhosus</i>	Both	4.51	Egg scatterer	Resident	4.51
Slender	<i>Anoplarchus insignis</i>	Oregonian				

cockscomb						
Smoothhead sculpin	<i>Artedius lateralis</i>	Both	4.59	Egg scatterer	Resident	4.59
Snake prickleback	<i>Lumpenus sagitta</i>	Both	12.54	Egg scatterer	Resident	12.54
Speckled sanddab	<i>Citharichthys stigmaeus</i>	Both	3.12	Broadcast spawner	Resident	3.12
Starry flounder	<i>Platichthys stellatus</i>	Both	12.22	Broadcast spawner	Resident	2.62
Striped kelpfish	<i>Gibbonsia metzi</i>	Aleutian				
Striped seaperch	<i>Embiotoca lateralis</i>	Both	2.59	Live bearer	Resident	2.59
Surf smelt	<i>Hypomesus pretiosus</i>	Both				
Tadpole sculpin	<i>Psychrolutes paradoxus</i>	Oregonian				
Threespine stickleback	<i>Gasterosteus aculeatus</i>	Both	4.64	Egg guarder	Resident	4.64
Tidepool sculpin	<i>Oligocottus maculosus</i>	Both	4.32	Egg scatterer	Resident	4.32
Tube-nose poacher	<i>Pallasina barbata</i>	Both				
Tube-snout	<i>Aulorhynchus flavidus</i>	Both	15.62	Egg guarder	Resident	15.62
Walleye pollock	<i>Gadus chalcogrammus</i>	Both				