**Table 1. Landscape attributes and diversity and aggregation estimates for each meadow**. Fetch was estimated by XYZ. Beta … The total number of epifaunal species observed in each meadow (gamma.site) and the Chao estimate for site-level epifaunal richness are given. Chao estimates are based on extrapolated estimates to 2x minimum? Abundance following Chao et al (2014). Aggregation indices for all epifaunal species in the meadow (Im) with standard errors are given; meadows with significant aggregation across species are indicated in bold (95% CIs do not include 0.5) (ref). The proportion of species present in the meadow with significant I values based on Χ2 tests is also given.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Site | Area (ha) | Fetch | Bsite | gammasite | Im | Rsite based on chao et al | Proportion of species with significant I |
| DC | 2.30 |  | 13.31 | 17 | 0.47  (0.34 – 0.59) | 18.2  (10.0, 26.4) | 91 |
| WI | 0.26 |  | 14.47 | 18 | 0.41  (0.25 – 0.57) | 19.8  (11.5, 27.8) | 83 |
| BE |  |  | 13.94 | 17 | 0.50  (0.34 – 0.65) | 22.2  (4.78, 39.7) | 90 |
| EI |  |  | 9.38 | 13 | 0.44  (0.28 – 0.60) | 12.3  (7.6, 16.9) | 82 |
| RP | 0.72 |  | 15.06 | 22 | **0.57**  **(0.51 – 0.64)** | 29.4  (19.6, 39.2) | 93 |
| NB | 2.70 |  | 12.69 | 16 | 0.46  (0.28 – 0.64) | 19.0  (10.7, 27.3) | 88 |
| CB | 0.50 |  | 10.13 | 14 | 0.53  (0.37 – 0.69) | 14.0  (9.0, 20.0) | 89 |
| BI |  |  | 12.75 | 17 | 0.38  (0.21 – 0.55) | 17.0  (12.4, 21.6) | 77 |
| CC |  |  | 7.19 | 10 | **0.23**  **(0.03 – 0.40)** | 9.0  (8.0, 10.9) | 67 |

**Table 2: Relative abundance of species in each meadow.** Numbers indicate the rank of abundances relative to other species in that meadow at that time. Species with significant spatial intraspecific aggregation within the meadow, estimated as Morisita’s Index, are indicated in bold. Significance determined by chi-squared tests and P < 0.05. [*I should probably make a printout of the Im results in case we do a bonferroni*] [add a symbol to indicate grazer]

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Species** | **T** | **DC** | | | **WI** | | | **BE** | **EI** | **RP** | | | **NB** | | | **CB** | | | **BI** | **CC** |
|  |  | **M** | **J** | **A** | **M** | **J** | **A** | **J** | **J** | **M** | **J** | **A** | **M** | **J** | **A** | **M** | **J** | **A** | **J** | **J** |
| ***Crustacean*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *Caprella spp.* | 1 | 1 | **1** | 2 | 9 | **5** | 2 | **1** | **4** | 1 | **1** | 2 | 11 | 11 | 6 | 3 | **6** | 4 | 14 | 4 |
| *Aoroides columbiae* | 7 | 2 | **2** | 3 | 5 | 11 | 7 | 10 | **6** | 3 | **8** | 5 |  | 7 | 8 |  | **7** | 13 | **8** |  |
| *Pentidotea resecata* | 8 | 4 | **4** | 5 | 7 | **3** | 5 | **3** | 11 | 6 | **9** | 8 | 1 | **3** | 4 | 2 | **5** | 8 | **6** | 5 |
| *Leptochelia dubia* | 9 |  | 16 | 10 | 10 |  |  | 16 |  | 5 | **5** | 7 | 7 | **5** | 12 | 5 | **4** | 2 | **4** | 7 |
| *Photis brevipes* | 12 | 5 | **3** | 8 | 4 | **7** | 6 | 5 | **7** | 9 | **6** | 9 | 5 | 8 | 3 | 8 | **8** | 5 |  |  |
| *Monocorophium achersicum* | 13 | 6 | **6** | 6 | 14 | 9 | 14 |  |  |  | **18** |  | 9 |  | 9 | 12 | 9 | 6 | 12 | 9 |
| *Amphipod E* | 15 |  | **8** |  | 18 | 15 |  | **2** |  | 10 |  |  |  |  |  | 7 |  |  | **5** | 3 |
| *Pontogeneia rostrata* | 16 | 9 | **5** |  | 2 |  | 8 | 14 | 12 |  | 15 |  | 8 | 15 | 15 | 10 | 13 |  | 10 |  |
| *Harpacticoid copepod* | 17 | 12 | 13 | 16 | 11 | 12 | 18 |  |  |  | **11** | 12 | 3 |  | 5 | 13 |  | 10 |  |  |
| *Eogammarus confervicolus* | 18 | 7 | 12 |  | 12 |  | 16 | **8** | 9 |  |  |  | 13 | 12 |  |  |  |  |  |  |
| *Ampithoe spp.* | 19 | 11 |  | 15 | 13 | 14 | 13 |  |  |  | **16** |  | 14 | 9 | 10 |  |  |  | 15 |  |
| *Balanus spp.* | 21 |  |  | 18 |  |  | 15 |  | 10 |  | **20** | 16 | 16 | 14 | 14 |  |  | 17 |  |  |
| *Cirolana harfordi* | 23 |  | 15 |  | 8 | 13 | 17 | 15 |  |  | **21** |  |  |  |  |  |  |  |  |  |
| *Pugettia richii* | 24 | 13 | 11 | 11 |  |  | 21 |  |  |  |  | 15 |  |  |  |  |  |  |  |  |
| *Pandalidae* | 26 |  |  | 14 |  |  | 20 | 17 |  |  | **17** | 10 |  |  |  |  |  |  |  |  |
| *Pagurus quaylei* | 29 | 14 |  |  | 16 |  | 22 |  |  |  |  |  |  |  |  |  |  |  | 16 |  |
| *Nebalia sp.* | 30 |  |  |  |  |  |  |  |  |  |  |  | 15 |  |  |  |  | 15 |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ***Gastropod*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *Phyllaplysia taylori* | 2 | 3 | 10 | 1 | 15 |  | 9 | 9 | **3** | 4 | **2** | 1 |  | 13 |  |  |  |  |  |  |
| *Mytilus trossulus* | 3 |  | 14 | 7 |  | **1** | 1 | **7** | **1** |  | **3** | 4 | 4 | **2** | 1 | 14 | **1** | 1 | **2** | 1 |
| *Lacuna spp.* | 14 | 10 | 9 |  | 6 | **2** | 11 | **4** |  | 8 | **12** | 11 | 10 | 10 | 13 | 15 | 10 | 12 | **7** |  |
| *Margarites helicinus* | 20 |  |  | 12 |  |  | 10 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *Lottia pelta* | 22 |  |  | 9 | 17 |  | 19 |  |  |  |  |  |  |  |  | 11 |  |  | 13 |  |
| *Haminoea spp.* | 27 |  |  |  |  |  |  |  |  |  | **19** | 13 |  |  |  |  |  | 16 |  |  |
| *Alia carinata* | 28 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **9** |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ***Annelid*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *Platynereis bicanaliculata* | 4 | 8 | **7** | 4 | 1 | **4** | 4 | **6** | **5** | 2 | **4** | 3 | 6 | **6** | 7 | 4 | 12 | 7 | 11 |  |
| *Janua pagastecheri* | 10 |  |  |  |  | 8 | 3 | 12 |  | 7 | 7 | 6 |  |  |  | 9 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ***Other*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *Nematode* | 5 |  |  | 13 | 3 | 15 |  |  |  |  | **10** |  | 12 | **1** | 2 |  | **2** | 3 | **1** | 6 |
| *Pycnogonum sp* | 6 |  |  | 17 |  | **6** |  | 13 | **2** |  | 14 | 14 |  |  |  | 1 | 11 | 9 |  | 8 |
| *Halacard mite* | 11 |  |  |  |  | 10 |  | 11 | **8** |  | 13 |  | 2 | **4** |  | 6 | **3** | 11 | **3** | 2 |
| *Nemertea* | 25 |  |  |  |  |  |  |  |  |  |  | 17 | 17 |  | 11 |  |  | 14 |  |  |

**TABLE 3: Values of beta diversity within each site per time period expressed as gamma/mean alpha, and mean Bray-Curtis dissimilarity**

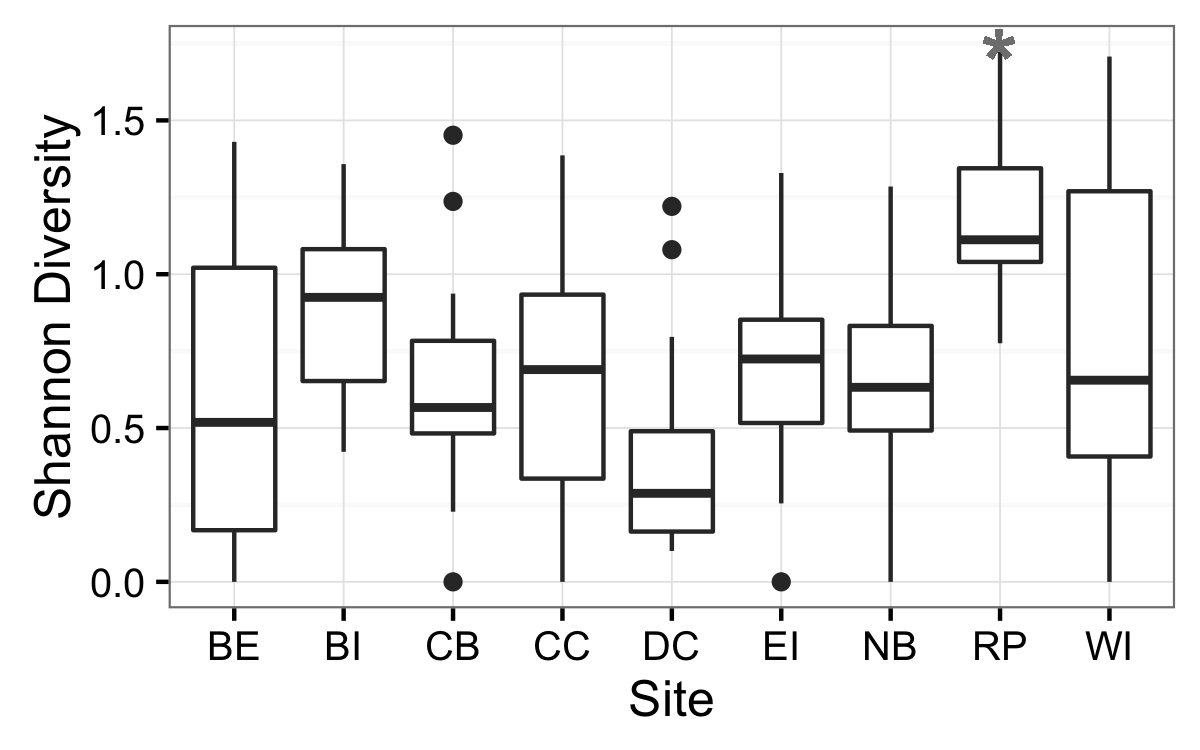
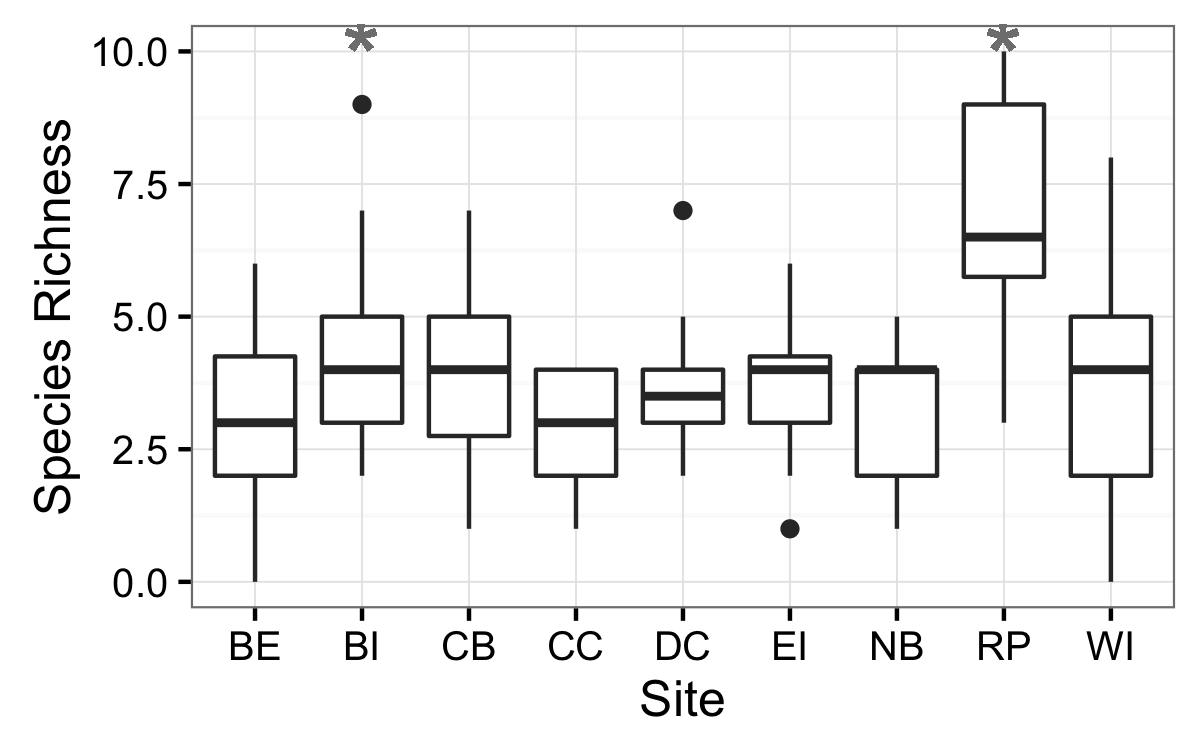
****

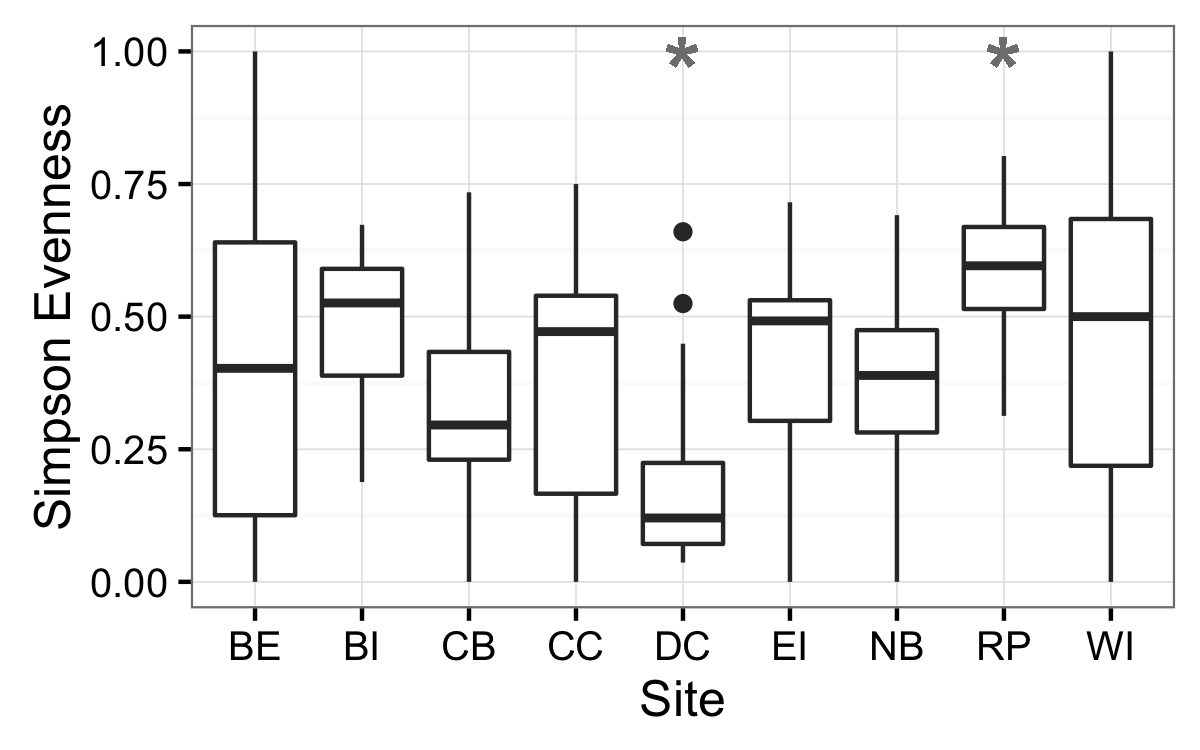
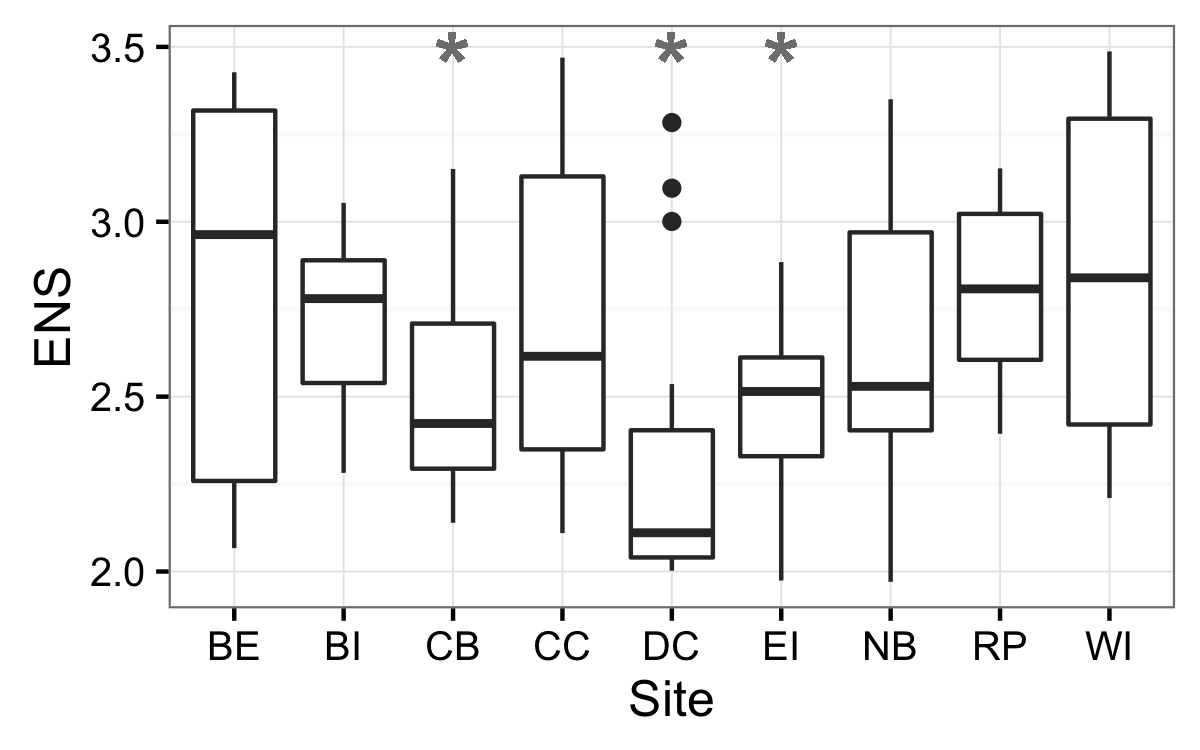
**Figures**

**Figure 1**: Seagrass is found at the coastal margins of Trevor Channel (approximately 200m deep), one of three channels in Barkley Sound that connect freshwater sources in Alberni Inlet and Numukamis Bay with the open Pacific Ocean. Eelgrass meadows sampled during summer 2012 between Alberni Inlet (red star) and the Pacific Ocean southwest of Dodger Channel (DC). Five meadows were sampled in May, July and August (red dots), while four additional meadows were sampled once in midsummer (yellow dots).   WI = Wizard Islet, BE = Bald Eagle Cove, EI = Ellis Island, RP = Robber’s Passage, NB = Numukamis Bay, CB = Crickitt Bay, BI = Boyson Islands, CC = Crow Cove. BMSC = Bamfield Marine Sciences Centre.

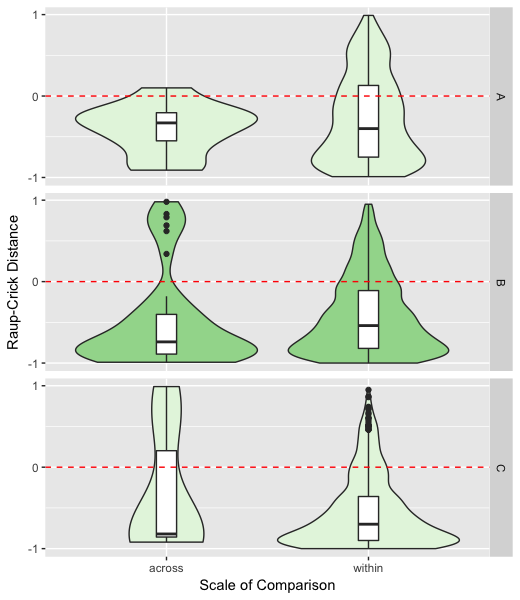
****

**Figure 2**: Epifaunal diversity from samples of eelgrass meadow (n = 9) of area 0.28m2 in nine meadows in Trevor Channel, British Columbia, in midsummer 2011. Asterisks indicate significant differences (P < 0.01) among sites, based on a one-way anova.

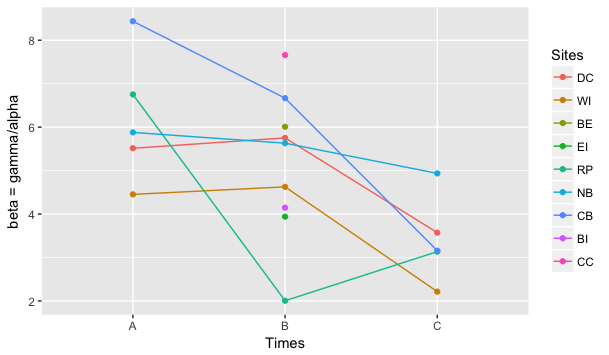


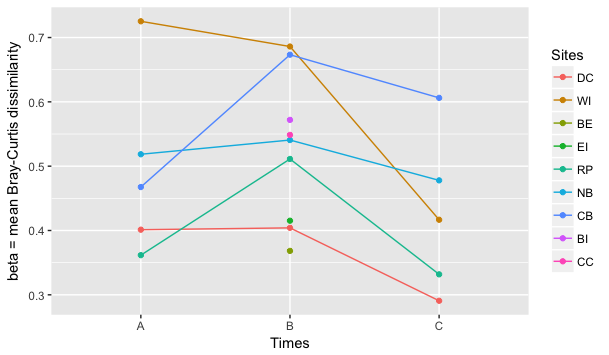


**Figure 3:** Rescaled Raup-Crick Probabilities of beta diversity or RC. Comparisons show among- and within-site probabilities. Number of meadows sampled were 5 (light green), and 9 (dark green). Values approaching 1 show greater dissimilarity than null predictions, values approaching -1 show less dissimilarity than null predictions, with values at 0 being no different from the null predictions.



**Figure 4:** Beta diversity within all sites and time periods expressed as a) gamma/mean alpha, and b) mean Bray-Curtis dissimilarity among plots.

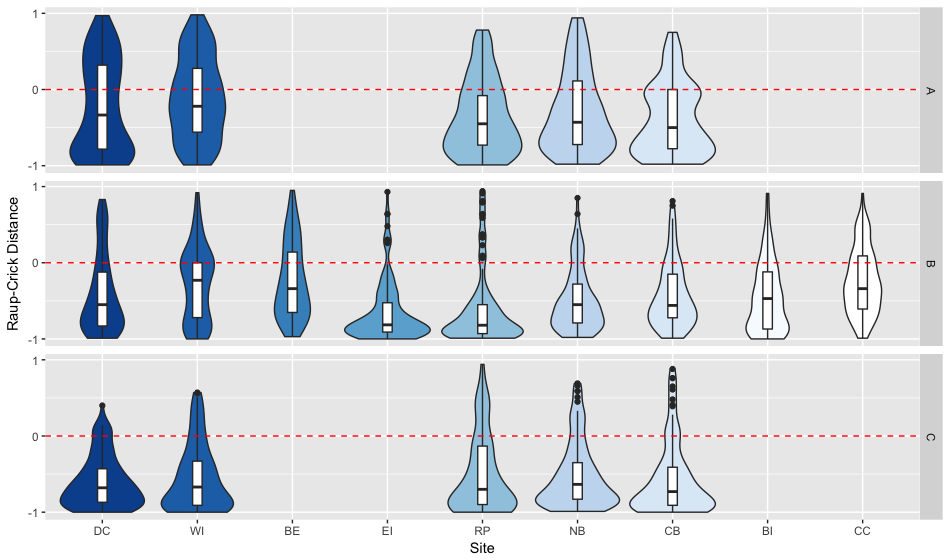
a)

**** **b**

Appendix table S1

**Table A1:** Model selection results for plot-level (n = 9) univariate richness indices across nine eelgrass meadows in July 2011.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Model** |  | **Df** | **logLik** | **AICc** | **Delta** | **wt** |
| **alpha** |  |  |  |  |  |  |
| G | Y ~ site | 10 | -271.06 | 565.8 | 0.00 | 1 |
| . | Y ~ area | 3 | -301.43 | 609.0 | 43.27 | 0 |
| D | Y ~ 1 | 2 | -302.59 | 609.3 | 43.50 | 0 |
| A | Y ~ fetch | 3 | -302.28 | 610.7 | 44.97 | 0 |
| B | Y ~ dfw | 3 | -302.51 | 611.2 | 45.43 | 0 |
| C | Y ~ dfw\*fetch | 5 | -302.08 | 614.6 | 48.82 | 0 |
| F | Y ~ area\*fetch | 5 | -302.14 | 614.7 | 48.95 | 0 |
|  |  |  |  |  |  |  |
| **H’** |  |  |  |  |  |  |
| G | Y ~ site | 10 | -66.12 | 153.9 | 0.00 | 0.998 |
| B | Y ~ dfw | 3 | -81.39 | 168.9 | 15.07 | 0.001 |
| F | Y ~ area\*fetch | 5 | -79.57 | 169.6 | 15.69 | 0 |
| C | Y ~ dfw\*fetch | 5 | -80.07 | 170.6 | 16.70 | 0 |
| D | Y ~ 1 | 2 | -83.42 | 170.9 | 17.05 | 0 |
| A | Y ~ fetch | 3 | -83.05 | 172.3 | 18.39 | 0 |
| . | Y ~ area | 3 | -83.05 | 172.3 | 18.40 | 0 |
|  |  |  |  |  |  |  |
| **S** |  |  |  |  |  |  |
| G | Y ~ site | 10 | 18.37 | -15.1 | 0.00 | 0.797 |
| F | Y ~ area\*fetch | 5 | 11.18 | -11.9 | 3.18 | 0.163 |
| C | Y ~ dfw\*fetch | 5 | 9.04 | -7.6 | 7.46 | 0.019 |
| . | Y ~ area | 3 | 6.05 | -5.9 | 9.18 | 0.008 |
| A | Y ~ fetch | 3 | 5.63 | -5.1 | 10.02 | 0.005 |
| B | Y ~ dfw | 3 | 5.48 | -4.8 | 10.32 | 0.005 |
| D | Y ~ 1 | 2 | 3.88 | -3.7 | 11.43 | 0.003 |
|  |  |  |  |  |  |  |
| **ENS** |  |  |  |  |  |  |
| G | Y ~ site | 10 | -52.19 | 126.2 | 0.00 | 0.493 |
| F | Y ~ area\*fetch | 5 | -58.67 | 127.8 | 1.57 | 0.225 |
| C | Y ~ dfw\*fetch | 5 | -59.21 | 128.9 | 2.66 | 0.130 |
| . | Y ~ area | 3 | -61.59 | 129.4 | 3.13 | 0.103 |
| B | Y ~ dfw | 3 | -63.13 | 132.4 | 6.20 | 0.022 |
| A | Y ~ fetch | 3 | -63.13 | 133.1 | 6.80 | 0.016 |
| D | Y ~ 1 | 2 | -64.88 | 133.9 | 7.62 | 0.011 |

****