Group Summary: Intertidal Height Affecting Species Diversity

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Introduction

Hypothesis: Differences in shore elevation affect the total biodiversity present due to differences in emersion time and wave splash.

Data was collected from Scott's Bay on Tuesday, October 26, 2021 using horizontal transects at two sites. In our analysis, we used tidal heights (cm) and the number of individuals of each species in each quadrat. In order to investigate our hypothesis, Shannon diversity (H) indices were calculated at each tidal height and an anova was done in order to determine if there was a significant mean difference between biodiversity and tidal heights. Biodiversity (H) was then plotted against tidal height, and a linear regression was done in order to visualize the relationship between the two.

Data Analysis

Please note that tidal heights were calculated using the Canadian Hydrographic Service's 2021 Tide and Current Tables (Vol. 5)

DO WE NEED TO MULTIPLY `n` BY 10 BECAUSE OF THE SMALLER SAMPLING!?

Table 1: Shannon Index values by intertidal height and exposure.

	ShannonIndex	vertical_transect	quadrat	quadrat_height_cm	exposure
1.1	0.7595474	1	1	195.0	sheltered
1.2	0.6869616	1	2	195.0	sheltered
1.3	0.7529116	1	3	170.0	sheltered
1.4	0.0000000	1	4	170.0	sheltered
2.1	1.0690737	2	1	179.0	sheltered
2.2	0.8184438	2	2	169.0	sheltered
2.3	0.9414031	2	3	170.0	sheltered
3.1	1.2766729	3	1	180.0	sheltered
3.2	0.5409895	3	2	180.0	sheltered
3.3	0.9098466	3	3	194.0	sheltered
4.1	1.1215767	4	1	180.0	exposed
4.2	1.3346999	4	2	170.0	exposed
4.3	1.3479116	4	3	170.0	exposed
5.1	0.0000000	5	1	181.5	exposed
5.2	0.0000000	5	2	181.5	exposed
5.3	0.0000000	5	3	170.0	exposed
5.4	0.0000000	5	4	170.0	exposed
6.1	0.7662196	6	1	213.7	exposed
6.2	0.9502705	6	2	213.7	exposed

	ShannonIndex	vertical_transect	quadrat	quadrat_height_cm	exposure
6.3	1.1141824	6	3	170.0	exposed

Analyzing the data

Linear Model Data

p = 0.7145, R-squared = -0.04752

ANOVA Data

p = 0.715

Visualising the data

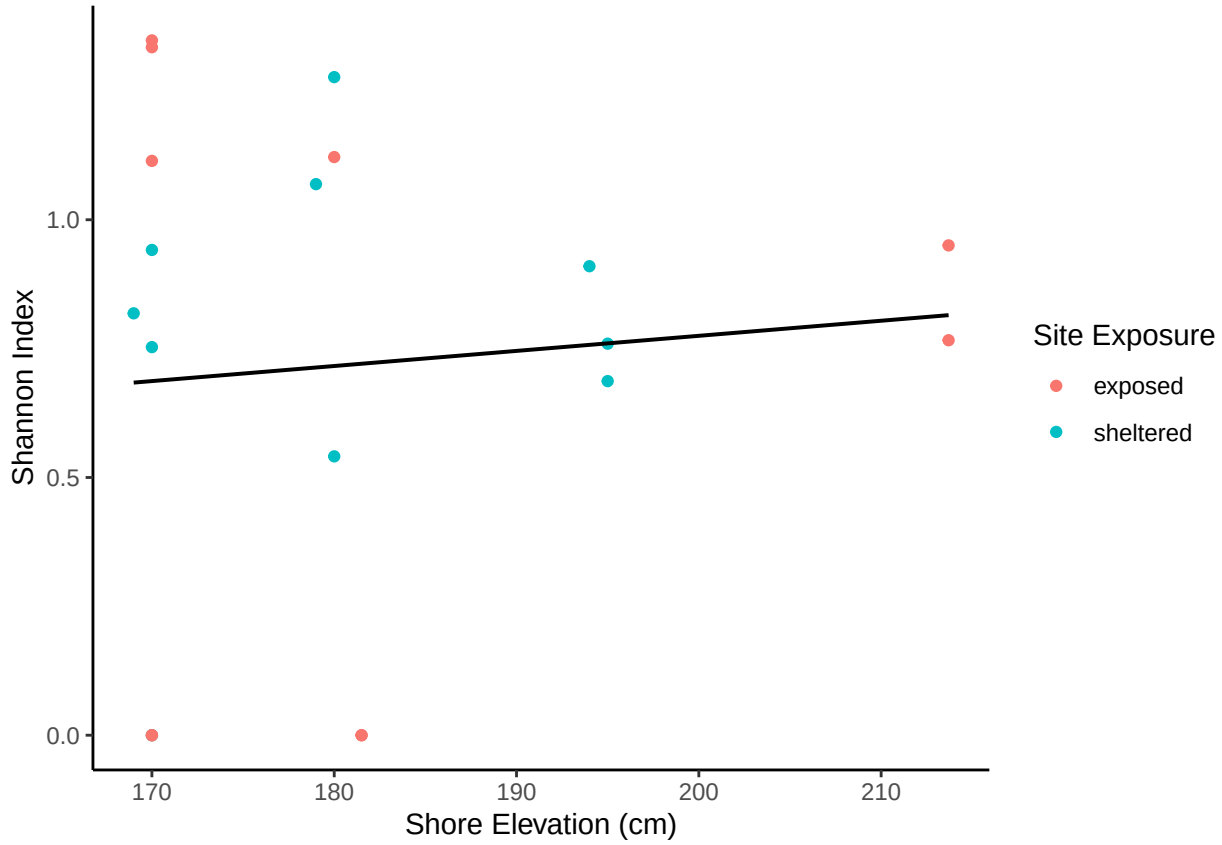

Figure 1. A plot to visualize Shannon Diversity against shore elveation (cm).

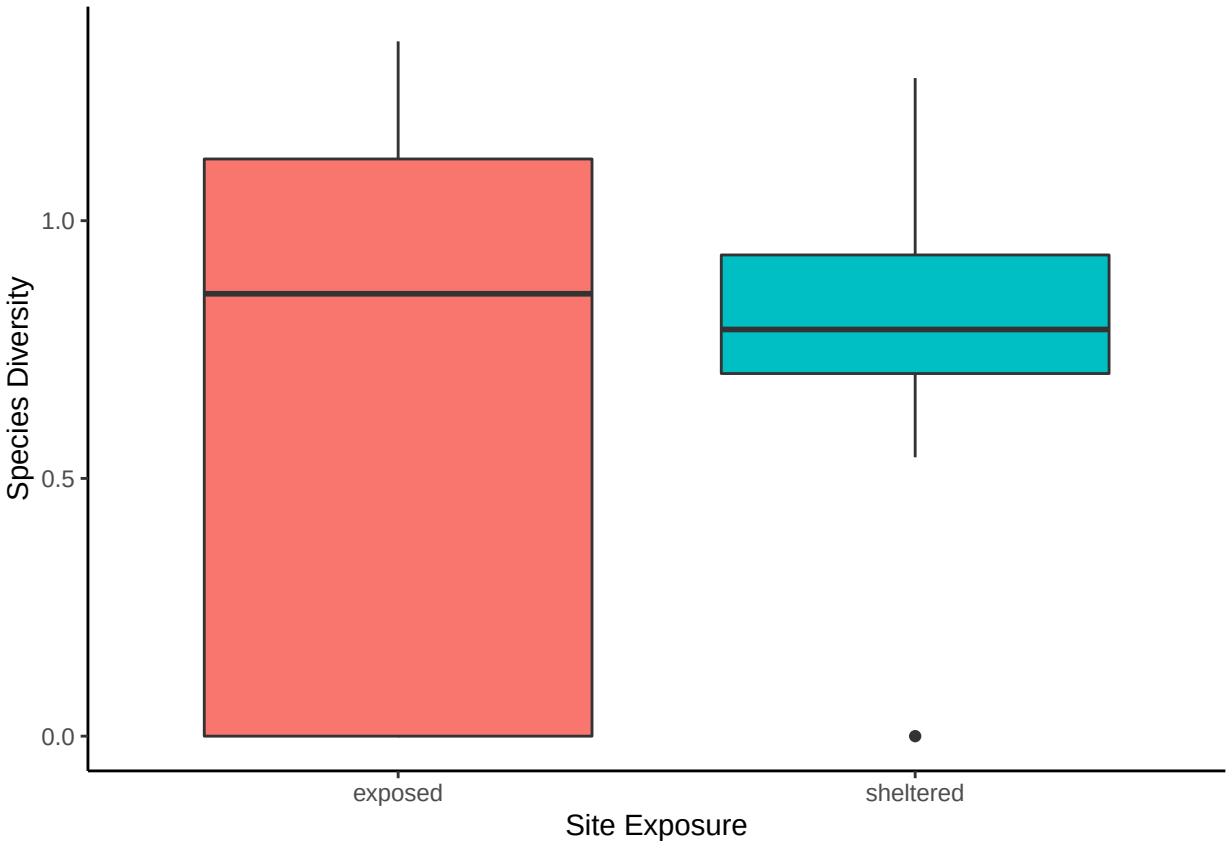

Figure 2. A boxplot to visualize diversity between exposed and sheltered sites.

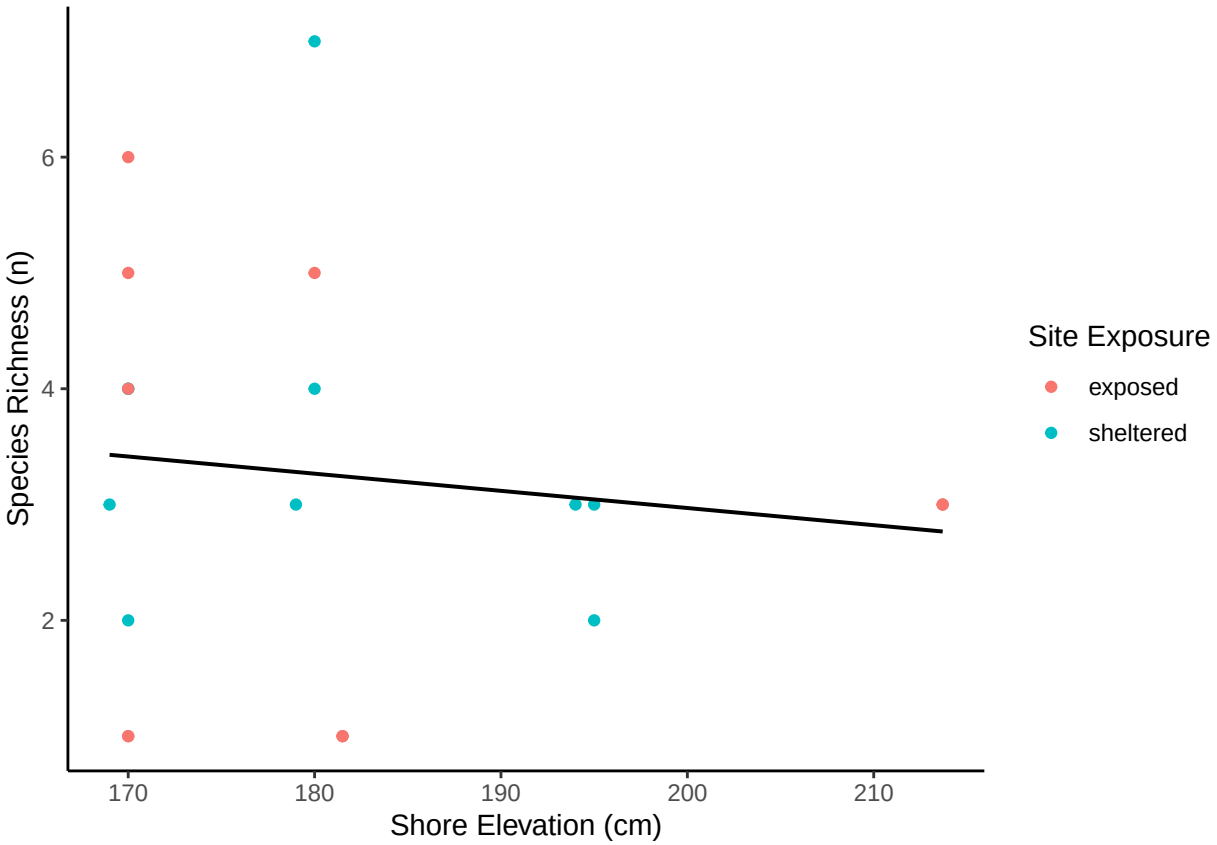

Figure 3. A plot to visualize species richness (n) and shore elevation (cm).