

Invertebrate Growth on Porcelain Tiles

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Introduction

In the next few years, the city of New York plans to replace over 800,000 porcelain toilets in the next few years (NYC DEP, 2012). Simultaneously, there is a lack of hard substrate for important invertebrates, such as oysters, to settle on (Columbia, 2006). This project tests at what depth do the porcelain tiles experience the most growth and biodiversity. If the tiles exhibit enough settlement, porcelain can be used as a viable substrate while reducing landfill waste.



Background Info

- measured percent cover similar to other projects (Nandukumark, 1993)
- In past, Most Dominant Species were colonial ascidians (Schmit, 1982)
- Often, Climax communities are categorized with high biodiversity. Additionally, Oysters are present (Hirata, 1987)
- Predation can not be avoided, and cages only hinder recruitment (Schmit, 1984)



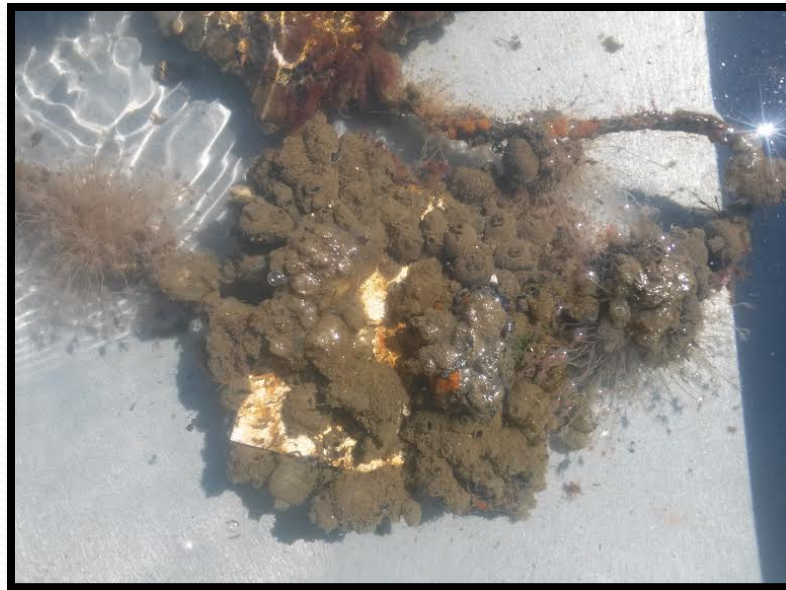
Problem

How does light penetration and depth affect the biodiversity and growth of sessile invertebrates on porcelain tiles in the Hudson River Estuary?



Hypothesis

- Tile .5 meters----- 100% growth over 1 year
- Colonial ascidians hypothesized to be most dominant
- Biodiversity will increase closer to the surface



Materials

Item	Quantity	use
Life Jacket	1	Safety
Carbineer	4	Attach rope to dock
Cart	1	to move equipment
Rope	-	to secure bottles/platform/tiles
porcelain tiles (15cm x 15cm)	10	a structure for recruitment
Electric tape	-	to mark the different ropes
Sample Unit (1 cm grid)	1	Data Collection
Life Ring	1	Safety
Drill	1	to drill the tiles

Procedures

Set-up

- 15 cm x 15cm Tiles are placed at the depths of .5, 1, 1.5, 2, and 2.5 meters
- They are fastened to the pier using carabineers

Measuring

- The percent cover of each tile is calculated using a sample grid .
- The percent cover of each organism is also measured.

Analyzing

- The Biodiversity tile levels of each tile are calculated using Hill's number
- The results are graphed and compared

Results

Percent Cover

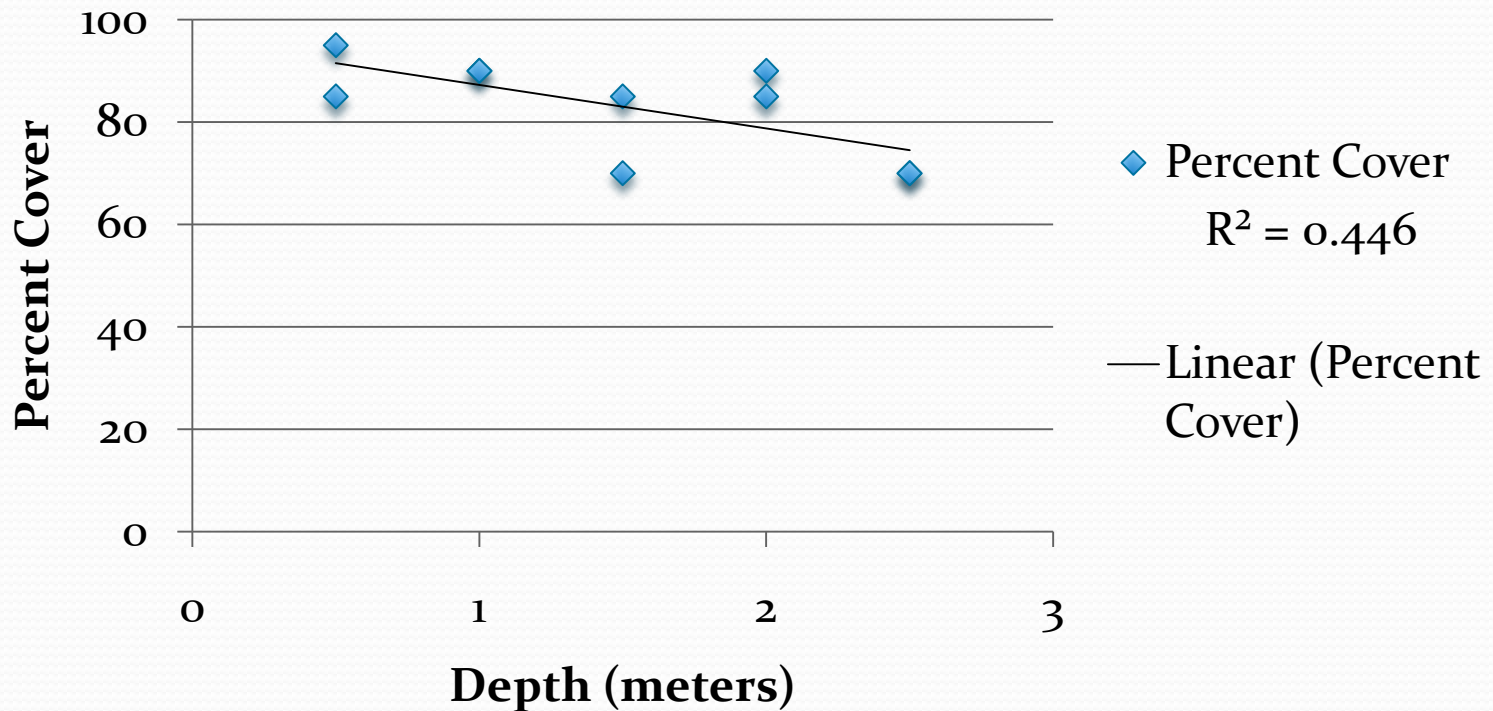


Figure 0.2 The scatter plot of percent cover. The x-axis shows depth (in meters) while the y-axis shows the percent cover. There is a negative correlation of -0.669 between percent cover and depth

Hill Number (geom)

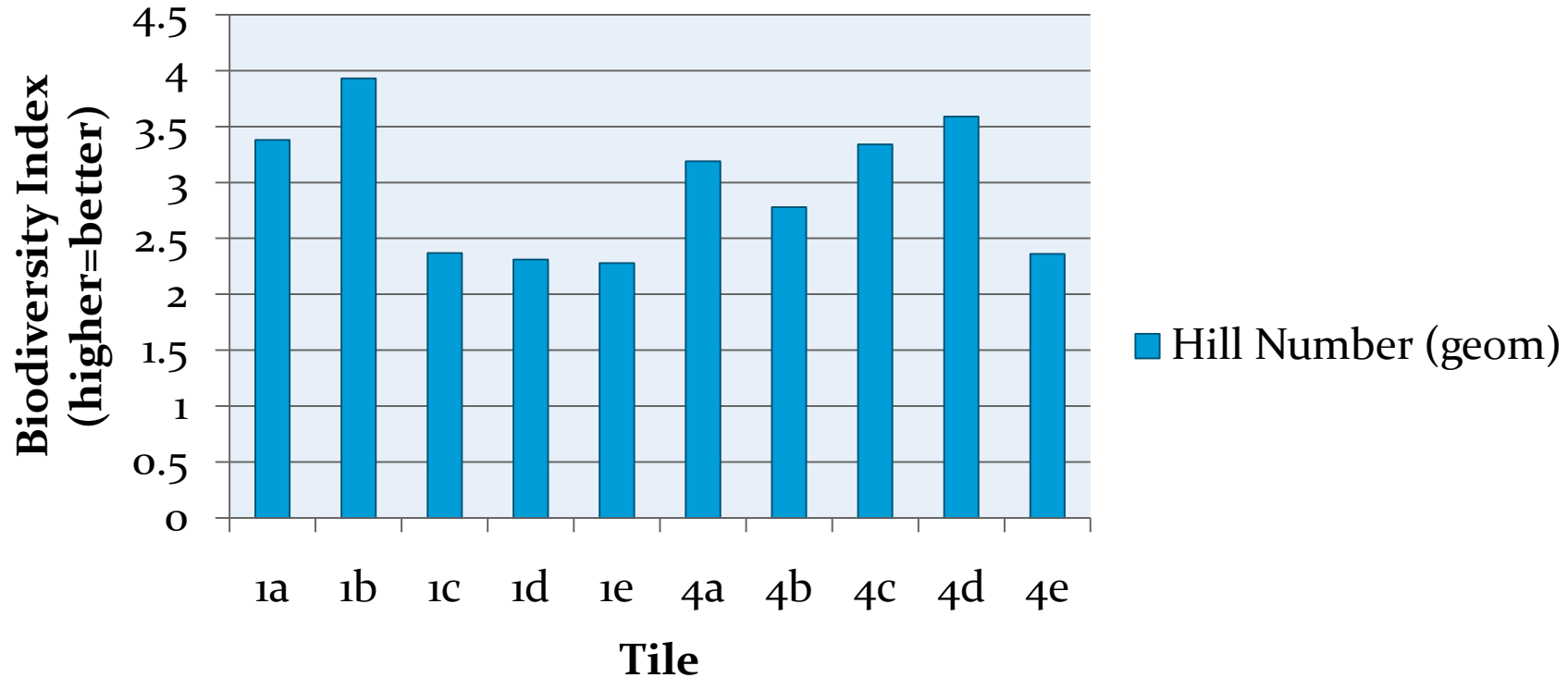


Figure 0.4 The Biodiversity index (Hill) is shown on the graph above. The tiles 1a,1b,4a, and 4d have the highest biodiversity levels.

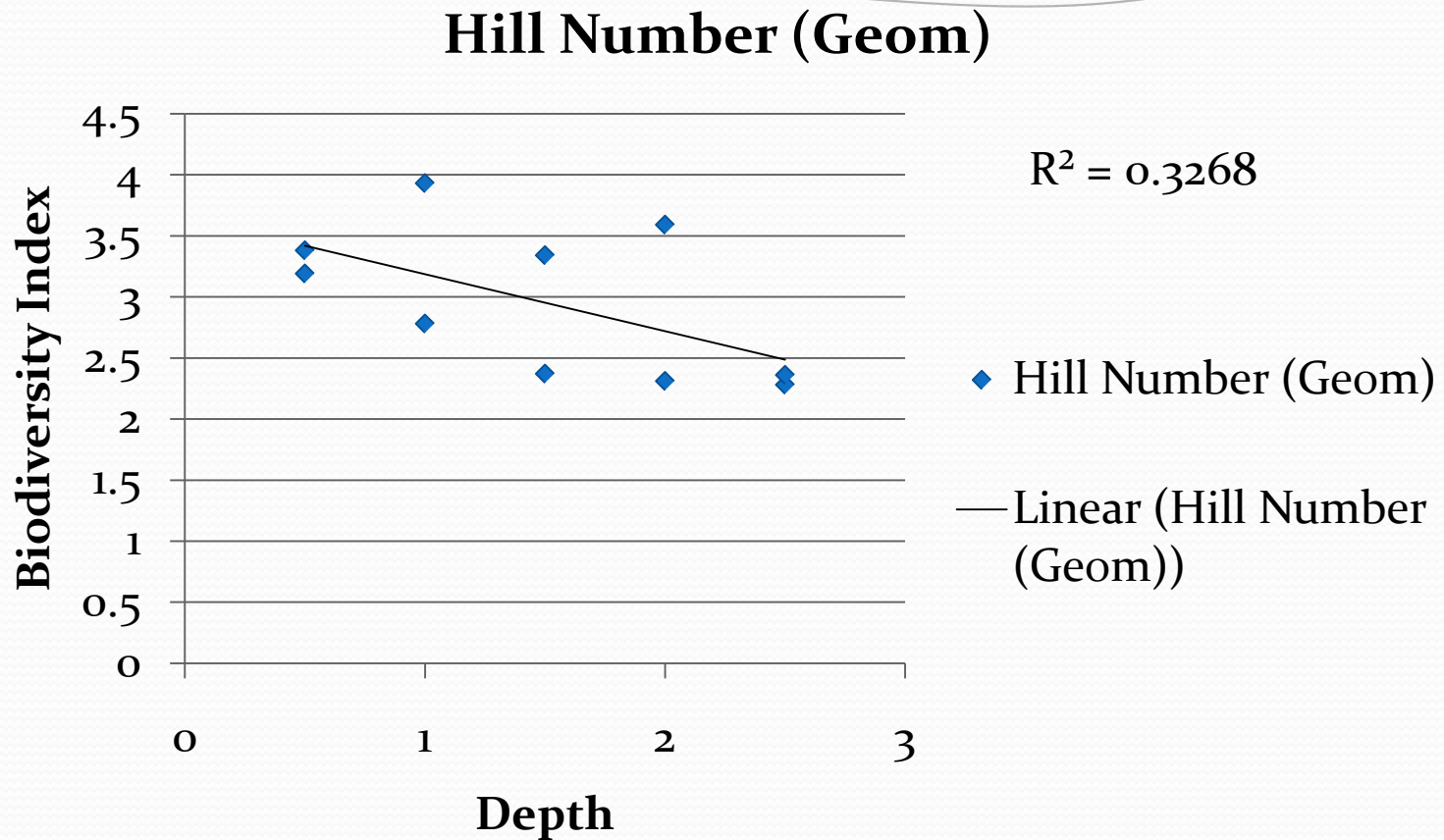


Figure 0.5- The biodiversity index for Hill is shown again. As seen on the scatter plot, biodiversity decreases as depth increases.

Conclusion

- Porcelain Tiles closer to the surface have more biodiversity
- Sponges dominate the largest percentage of the tiles
- tiles .5-1 meter deep are best suited for invertebrate growth

