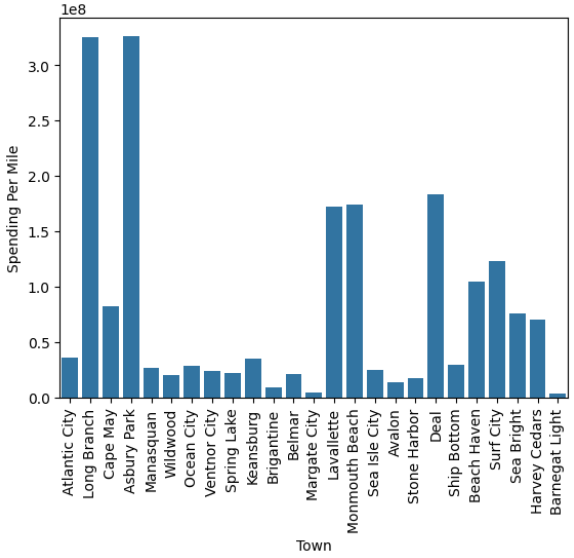
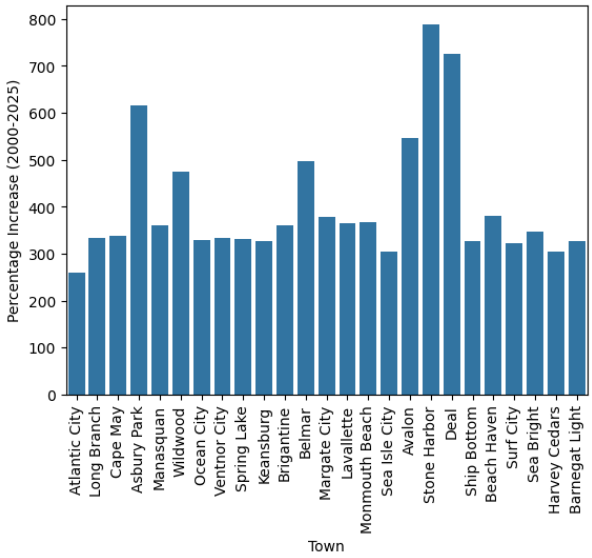
The question I decided to investigate was if there is a relationship between the amount of money spent on beach replenishment, and the increase in home values at the Jersey shore. I decided to ask this question because I have always loved the beach and I live at the beach over the summer. I wanted to pick a question that had to do with the beach and this was one that seemed very interesting to me.

I used two different datasets for this question. The first dataset was from the New Jersey Department of Environmental Protection. This dataset contained all of the beach replenishment projects in New Jersey, the cost of the projects, the cost adjusted for inflation, and the towns the project spanned. This data seemed very reliable as it was from Western Carolina University and used by the state of New Jersey itself. This data required a lot of cleaning and preparation in order for it to be usable. The first step I took was to filter out all the projects that didn't have a price. This was necessary because I was using the cost adjusted for inflation as the statistic I was testing. The next step I took was filtering for only projects completed since 2000. I felt this would make the results more accurate with the present day, and would make the data align with the housing prices. The next filtering step was very tedious. Most replenishment projects spanned multiple towns or just had the locations they spanned, so I had to manually look at a map, and add the towns that the project spanned as a new column to the dataset. I then created a new dataset that contained all of the towns and the amount spent per town by adding the amount spent per each project with the town in it, and dividing it by the total towns in the project. I then got the lengths of beaches of all the towns by measuring it on maps, and divided the amount spent by the miles of coast per town. This gave me this visualization:



The other dataset I used came from Zillow. This dataset seemed very reliable as they are a big company that focuses on house prices. This dataset contained the

median home price per month for all towns in the United States. I then filtered it to only contain towns in New Jersey and in coastal counties. I then filtered it to only contain towns that were involved in beach replenishment projects and had home values since 2000. The last step I took was to add a column to the dataset I created that contained the percentage increase in homes from 2000 - 2025. This gave me this visualization:



The GLM model I used was a linear regression with the independent variable being money spent on beach replenishment per mile, and the dependent variable being percentage increase in home value since 2000. This gave me the output where y = b0 + b1x + e. Y represents the percentage change in home price, b0 represents the baseline change in home value, and b1 represents the average percentage change in home prices per dollar spent, x represents the dollars spent on beach replenishment, and e accounts for other factors changing price. Limitations of this are it cannot recognize non-linear relationships, and it does not account for external factors that could increase home prices.

The results of this model gave me the equation $y = 379.1593 + 2.876*10^{-7}x$. This model says that for every dollar spent on beach replenishment, it would increase home values about $2.876*10^{-7}$%. This shows a slight positive correlation which suggests that higher investment in beach protection is associated with a higher home value.

However, the p-value was rather large being 0.343. Since it is well above 0.05, there is not enough evidence to show a relationship between the two. There are many limitations with this model as it does not consider outside factors that would affect home values increasing, or factors that would cause an increase in spending like hurricane damage.

In this project, I examined if there was a relationship between beach replenishment spending and percentage increase in home values at the Jersey shore. I used a linear regression model to test this with the null hypothesis being no relationship and the alternative hypothesis being there is a relationship between the two variables.

The results of this model showed a slight positive correlation, but the p-value was quite large being 0.343. This led to the conclusion that there was no significant relationship between beach replenishment spending and percentage increase in home values.

Sources

https://beachnourishment.wcu.edu/state/NJ
https://www.zillow.com/research/data/