Does Proximity to Coastal Waters Impact Housing Prices in Barrington, Rhode Island?

Azure Giroux || Geography 5050: Applied Spatial Statistics || November 29th, 2020 || Data Sources: Town of Barrington; RIGIS

Introduction

In coastal states, it is common knowledge the closer you live to the ocean, the more expensive real estate becomes. I wanted to test this hypothesis using spatial statistical methods. Barrington was chosen for its location, data accessibility, personal interest, and lack of research in the area.

Existing literature does not focus heavily on relationships between housing prices and coastal water proximity, with no research focusing on Rhode Island. Research instead focuses on how housing prices are affected by water quality, water views, or proximity to water supply reservoirs, canals, wetlands, and open space.

This study aims to fill a research gap and determine if proximity to coastal waters impacts housing prices in a Rhode Island coastal town.

Methods

1) Setup data: remove unnecessary fields, clip layers to town boundary, pare CAMA data to period of study (2010-2020; N=2638), join CAMA database to parcel polygons

2) Create fields: “sale price” (convert sales prices to September 2020 dollars) and “coast dist” (near analysis to calculate distance in feet from each parcel with a sold home to coastal waters)

3) Investigate data: determined to not be normally distributed, requiring non-parametric analysis techniques

4) Perform statistical analyses: determine if H_0 (no relationship between home sale prices and location to coastal waters) could be rejected or not; investigate using univariate regression model (x = proximity to water, y = sales price) and plot; run Spearman’s Rho test

5) Perform spatial analyses: investigate if the top 25% of home sales (>$582,000; N=661) are clustered; done using Cluster and Outlier Analysis (Anselin Local Moran’s I) and Spatial Autocorrelation (Global Moran’s I)

Figures

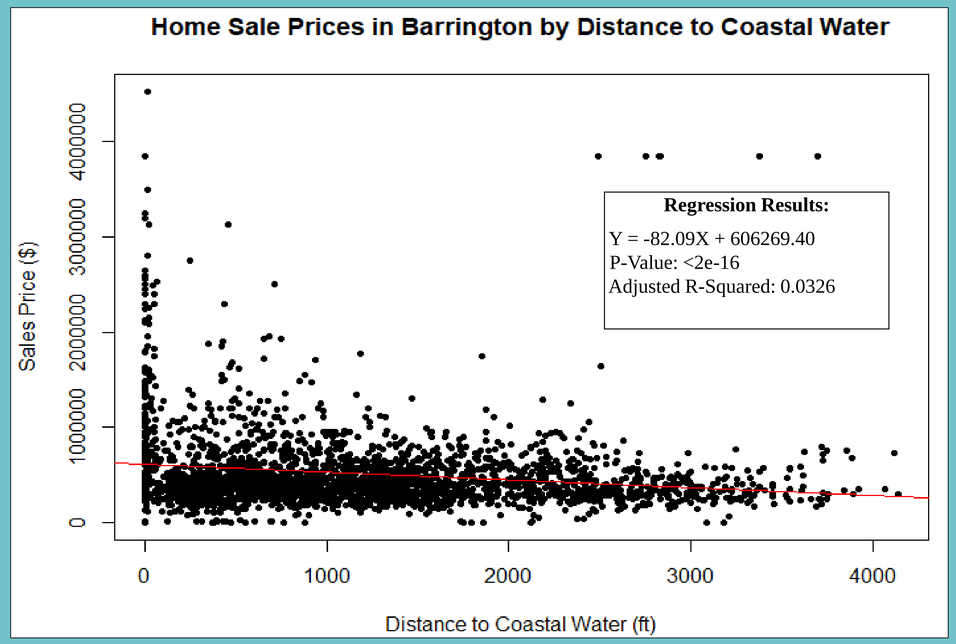

Figure 1

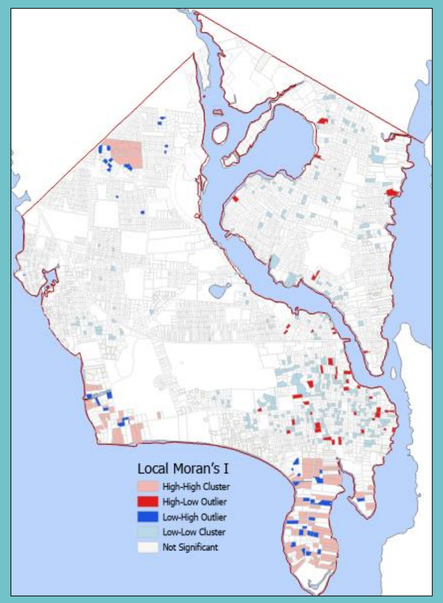

Figure 2

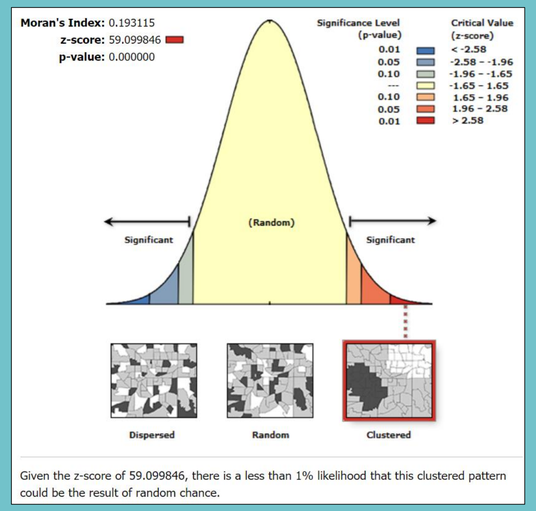

Figure 3

Results

Figure 1: For every foot further away from coast, housing price reduces by $82.09. P-value suggests probability of correlation based on random chance is extremely low. We can confidently reject null hypothesis, stating there is an inverse relationship between home sale prices and distance to coastal waters.

Spearman’s Rho result was rho of -0.16 and p-value of <2.2e-16, indicating a relatively weak negative correlation. Given low p-value, can again reject the null hypothesis.

Figure 2: Local Moran’s I test reported considerable high-high clustering (high values near other high values) in southern portion of town by coast.

Figure 3: Global Moran’s I test reported positive Moran’s Index, low p-value, and high z-score, implying significant clustering of like values (high sale prices, >$582,000).

Limitations

Data only provided last sale date and price, would prefer information about multiple sales on individual properties, adding a time-series element to cross-sectional data.

Data are truncated as distance from coast cannot be negative.

Univariate regression analysis only accounts for one endogenous variable, leaving many exogenous variables unstudied, such as squared distance to coast, lot size, number of bathrooms, number of bedrooms, and existing garage.

Conclusion

Results align with broader field of hedonic housing studies, stating closer a home is to natural resource amenities, higher the selling price.

Future studies could expand research by including variables in model to investigate how characteristics affect housing prices.

In conclusion, proximity to coastal waters has a positive impact on housing prices in Barrington, Rhode Island.