

To determine if the mean housing value impacts the number of bioswales in a given census tract we needed to collect and organize our data before analyzing it. Our data came from the Bureau of Environmental Services and the 2010 United States Census. We also utilized other applications like SocialExplorer and CivicApps. We have established mean housing costs per tract within Multnomah County, joined this information to the average income and then used the Bureau of Environmental Services Sewer Collection System 2015 to establish polygons of common housing values and show the bioswale location points.

Data/Spatial Analysis

Moran's I Incremental Spatial Autocorrelation

> Local Moran's I General G Getis-Ord Gi*

,000,000

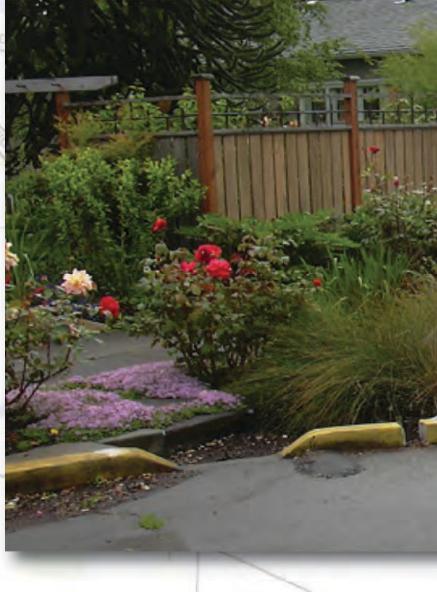
100,000

500,000

20,000

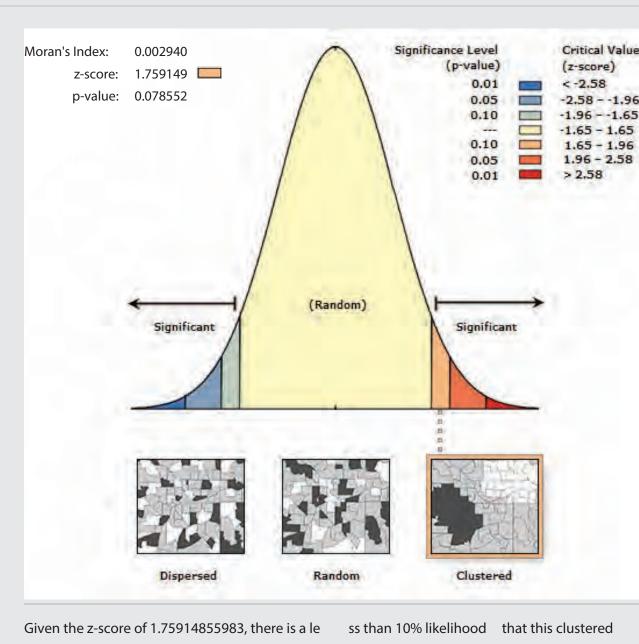
Not available

Predicted Bioswale



Once all of our data was loaded into Arcmap analysis began. In order to establish clustering of points and establish spatial autocorrelation we first ran the local Anselins Moran's i or tool from the spatial statistics tool box. To run Anselins we used the "TRACT" and "COUNT" as the input and field with the conceptualization of distance as inverse distance with a band limit of 3000. The index value, the p-value 0.07 and z-score 1.78 all reflect that of clustered data. This is a choropleth map with the ImiZscore with a hot and cold diverging color map with 7 natural breaks. As the map shows, the high clustered areas fall in tracts with higher mean housing values. NE PRESCOTT ST

Spatial Autocorrelation Report



pattern could be the result of random chance.	
Global Moran's I	Summary
Moran's Index:	0.002940
Expected Index:	-0.002041
Variance:	0.000008
z-score:	1.759149
p-value:	0.078552
Dataset Info	rmation
Input Feature Class:	censusswalesaverage
Input Field:	COUNT_
Conceptualization:	INVERSE_DISTANCE
Distance Method:	EUCLIDEAN
Row Standardization:	False
Distance Threshold:	109735.1706 Feet
Weights Matrix File:	None

Selection Set: False

Incremental Spatial Autocorrelation (Figure C) measured the autocorrelation of our data points and created this line graph of the z-scores. The peaks show statistically significant clustering is most pronounced. This analysis allowed for us to use Hot Spot Analysis (Getis-Ord Gi*).

In order to establish clusters of Hot (high) and Cold (low) cluster values we ran the Getis-Ord Gi* tool also found in the Spatial Statistic Toolbox in Arcmap. Based on the p-value of 0.03 and z-score of 2.16 our confidence level suggests that we have statistically significant spatial clusters of high values in the tracts with a higher mean housing value and low clusters found in the tracts with the lower mean housing cost

Bioswales have many environmental benefits and having one on your property can lower your monthly water bill. After statistical analysis we have concluded that the higher mean home values for a given tract, the more bioswales are found there. Conversely, the lower the mean home value the less bioswales are located in that given tract. Statistically significant clusters as well as hot and cold spots support our original hypothesis and suggest there is in fact an equity issue in terms of bioswale locations.

Observed General G: 0.000018 z-score: 2.165785 p-value: 0.030328 (Rand Significant	Significance Level Critical Value (p-value) (z-score) 0.01 <-2.58 0.05 -2.581.96 0.10 -1.961.65 1.65 - 1.65 0.10 -1.65 - 1.96 0.05 -1.96 - 2.58 0.01 > 2.58 0.01 > 2.58
Low-Clusters Rand	dom High-Clusters
Given the z-score of 2.1657854796, there is a less pattern could be the result of random chance.	than 5% likelihood that this high-clustered
General G Su	ımmary
General G Su	ummary 0.000018
General G Su Observed General G:	
General G Su Observed General G: Expected General G:	0.000018
General G Su Observed General G: Expected General G: Variance:	0.000018 0.000008
General G Su Observed General G: Expected General G: Variance: z-score:	0.000018 0.000008 0.000000
General G Su Observed General G: Expected General G: Variance: z-score:	0.000018 0.000008 0.000000 2.165785 0.030328
General G Su Observed General G: Expected General G: Variance: z-score: p-value: Dataset Infor	0.000018 0.000008 0.000000 2.165785 0.030328
General G Su Observed General G: Expected General G: Variance: z-score: p-value: Dataset Infor Input Feature Class:	0.000018 0.000008 0.000000 2.165785 0.030328 mation

High-Low Clustering Report

NE PRESCOTT S

0.50 - 1.5 Std. Dev 1.5 - 2.5 Std. De > 2.5 Std. De

-3.20 - -0.64

-0.63 - -0.06

-0.05 - 1.62

1.63 - 6.30

6.31 - 12.31

