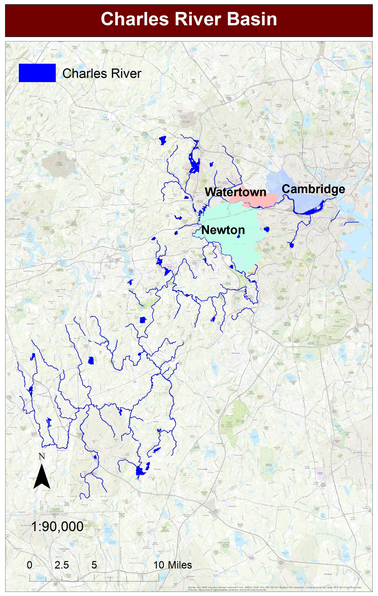
The Effects of Waterfront Open Space to The Land Value

A Research on Cambridge, Newton and Watertown

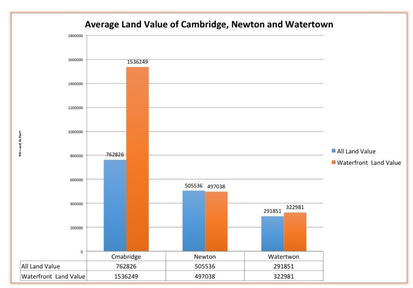
Introduction

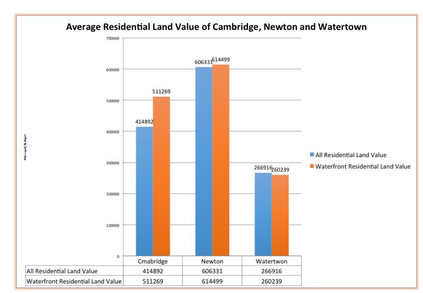
Urban waterfront open spaces are valuable to the biodiversity and wildlife habitat, and undertake essential environmental functions such as improving the quality of life in urban areas. There is an abundance of literatures claiming that the appearance of the open space along the water has great influences on neighboring land values. Although the external effects of parks on housing values create extra profits for property owners, few people understand the relationship between urban green space and land/property value. Furthermore, some evidence suggests that open space may be more valuable when it is undeveloped. In this project, I measure the effects of waterfront open space on the land value using GIS. I researched two cities and one town located in the Charles River basin, Massachusetts, which are Cambridge, Newton and Watertown. These three cities/towns are colored on the Charles River Basin map.



Methods

I used the buffer tool to make a 1-km buffer of Charles River and then used Intersect (Analysis) tool to perform an overlay for 1-km Buffer of Charles River and each town's land. Next, I used Select by Location to select only those open space in Cambridge, Newton and Watertown and located in Charles River waterfront 1-km buffer at the same time. Now I can relate the waterfront open space and land value in these cities/towns. Since there are a lot of literatures approving the economic relationship between open space and residential land, I also selected residential land to generate maps and measure the connection between the aforementioned elements. When I try to set the quantities of graduated colors of land value, I made classification method to be quintile. Therefore, the land value gap in those three areas would not affect the visual results in the maps. The six maps presented below are the results.





Conclusion

As presented in the map, the highest value (dark color) showed overlay with waterfront open space (Green), indicating the positive correlation between proximity to waterfront open space and land/property value. To analyze the effects in a quantitative way, I calculated the mean of those cities/town's land value, as well as land located in waterfront open spaces 500-meters' buffer.

	Mean Land Value (USD)	Median Land Value (USD)
Cambridge All Land	762826	303700
Cambridge Waterfront Land	1536249	379700
Cambridge Residential	606331	279700
Cambridge Waterfront Residential	614499	335300
Newton All Land	505536	433050
Newton Waterfront Land	497038	407000
Newton Residential	606331	481600
Newton Waterfront Residential	614499	438700
Watertown All Land	291851	259400
Watertown Waterfront Land	322981	255600
Watertown Residential	266916	259500
Watertown Waterfront Residential	260239	255000

In the City of Cambridge, land value soar when it is within the 500-meter buffer of waterfront open space.

In Newton and Watertown, however, the change in average land value is insignificant whether the land lies inside the 500-meter buffer.

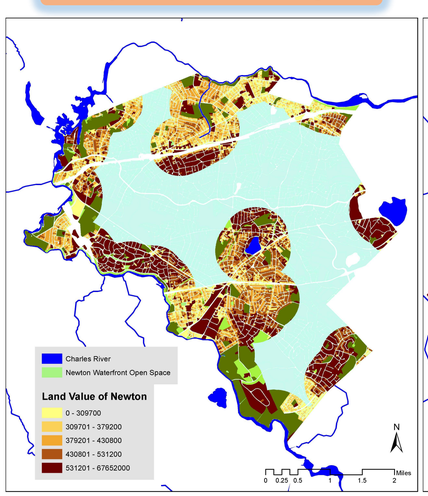
In addition to the mean value, I also calculated the median value in all three cities.

In conclusion, the effect of urban waterfront open space on all-use or residential land values is very difficult to quantify, as there are many other factors that affect a city/town's land value.

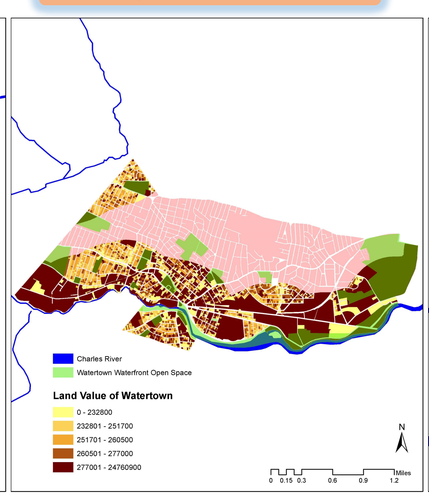
Cartographer: Xizhi Luan, UEP-232 Introduction to GIS
Urban and Environmental Policy & Planning

Date: December 18, 2015
Data Source: MassGIS, Tufts GIS Server
Projection: NAD_1983_StatePlane_Massachusetts_Mainland_FIPS

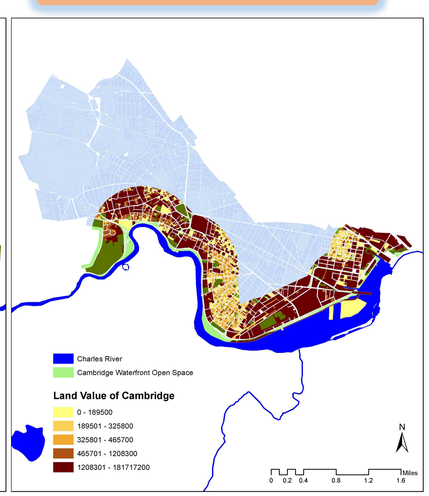
City of Cambridge



City of Newton



Town of Watertown



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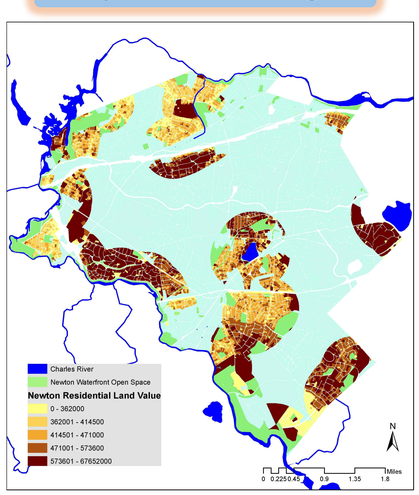

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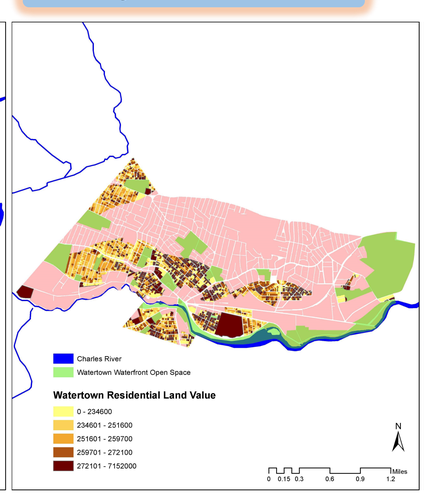

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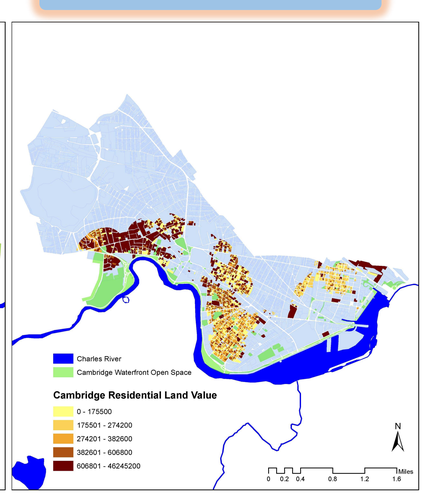

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