Urban Attitudes Toward Planting Street Trees in Portland, OR

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GIS II Project

Recent Research

Why do urban residents plant trees?

- Aesthetics and Recent Home Sale (Summit & McPherson, 1998)
- Number of single detached dwellings, Immigration status, Income, House age, and Female employment (Greene et al. 2010)

Research Question

In Portland Oregon:

- *Why do residents participate in tree planting programs **and** what are the barriers to participation?*

Data and Data Sources

- Tree planting survey data (Friends of Trees & City of Portand)
- 10m DEM (RLIS 2009)
- Tree canopy cover (City of Portland)
- 2000 Census Block Data (U.S. Census Bureau)
- Taxlots (RLIS 2009)
- Crime (RLIS 2009)
- Roads (Civicapps.org)
- Parks (Civicapps.org

Study Area

Methods

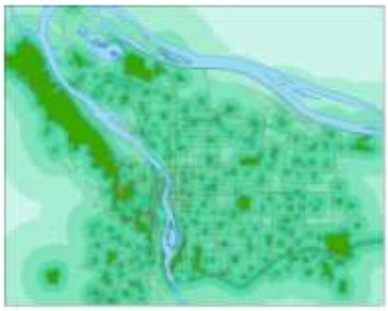
We aim to further improve upon these studies and additionally incorporate:

- Detailed household-level data
- Demographic data at the census-block level
- Creation of binary logistic model regression model in SPSS

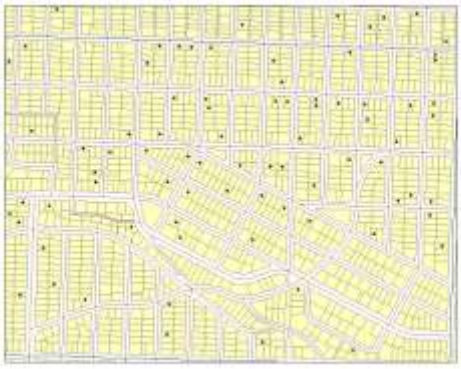
Data Analysis– ArcMap

Distance to major roads

Distance to parks



Data Analysis - ArcMap



Tax lot data and street azimuth

Portland Canopy Cover Raster

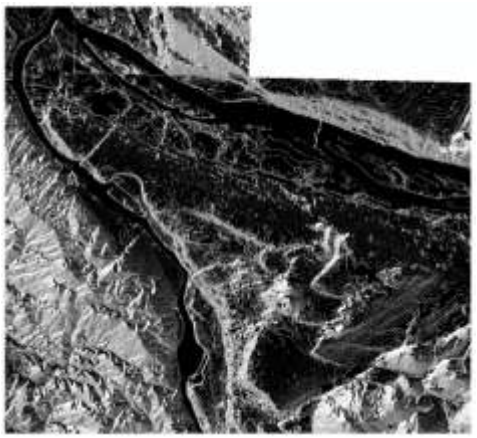
Data Analysis - ArcMap

Rater canopy cover

Data Analysis - ArcMap

Convert to polygon, intersect and dissolve

Aspect: 10m DEM



Results:

Significant Variables:

- Year since last sale
- Total value of house
- Number of frontage trees on property
- Average age of census block
- Aspect
- Azimuth of streets

Expected Participation:

- Recent sale of property
- Higher home value
- Fewer trees on property frontage
- Younger average age per census block
- N, S, W facing tax lots

Data Analysis- SPSS

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	yr_snc_sal	.100	.007	179.905	1	.000	1.106
	Avg_age	.017	.008	4.052	1	.044	1.017
	TOTALVAL	.000	.000	3.875	1	.049	1.000
	NO_trees	-.082	.043	3.694	1	.055	.921
	cat_aspect			11.484	8	.176	
	cat_aspect(1)	-.500	.207	5.831	1	.016	.607
	cat_aspect(2)	-.302	.183	2.742	1	.098	.739
	cat_aspect(3)	-.364	.192	3.575	1	.059	.695
	cat_aspect(4)	-.254	.215	1.395	1	.238	.775
	cat_aspect(5)	-.731	.286	6.519	1	.011	.482
	cat_aspect(6)	-.220	.224	.968	1	.325	.802
	cat_aspect(7)	-.497	.213	5.452	1	.020	.608
	cat_aspect(8)	-.208	.236	.776	1	.378	.812
	st_az_cat			.770	2	.681	
	st_az_cat(1)	.047	.100	.223	1	.637	1.048
	st_az_cat(2)	.166	.197	.708	1	.400	1.181
	Constant	-1.206	.370	10.626	1	.001	.299

a. Variable(s) entered on step 1: yr_snc_sal, Avg_age, TOTALVAL, NO_trees, cat_aspect, st_az_cat.

Data Analysis - SPSS

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2550.838[a]	.107	.143

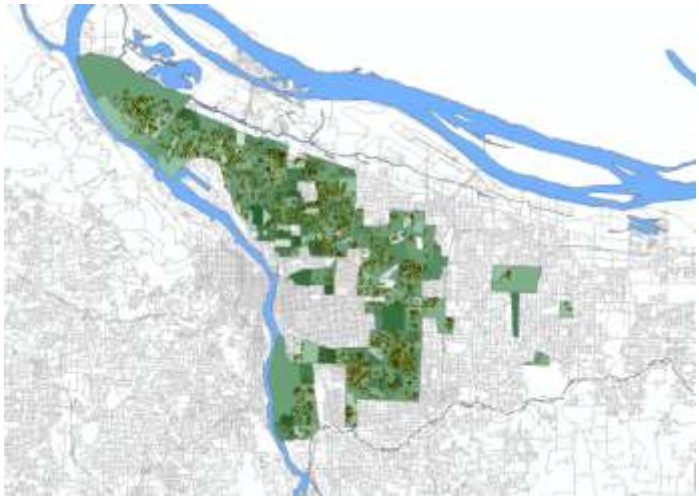
a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Table[a]

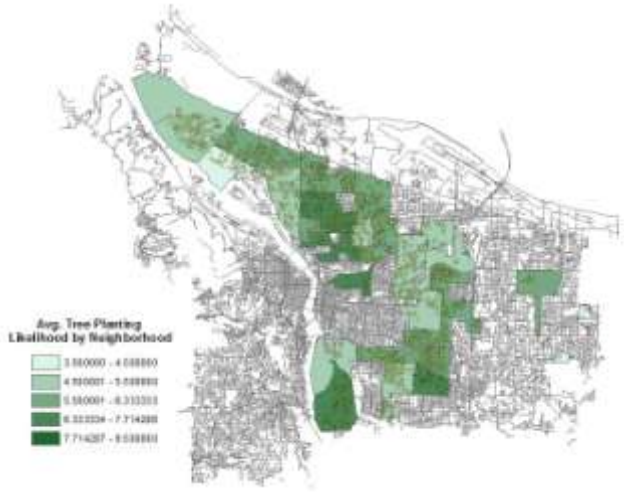
Observed			Predicted		
			answer3		Percentage Correct
			1	2	
Step 1	answer3	1	779	270	74.3
		2	424	534	55.7
	Overall Percentage				65.4

a. The cut value is .500

Results…



Tree planting likelihood by tax lot



Tree planting likelihood by neighborhood

Tree planting likelihood by neighborhood

Next Steps…

- Improve model by considering additional variables
- Apply the model to the entire Portland/Metro area