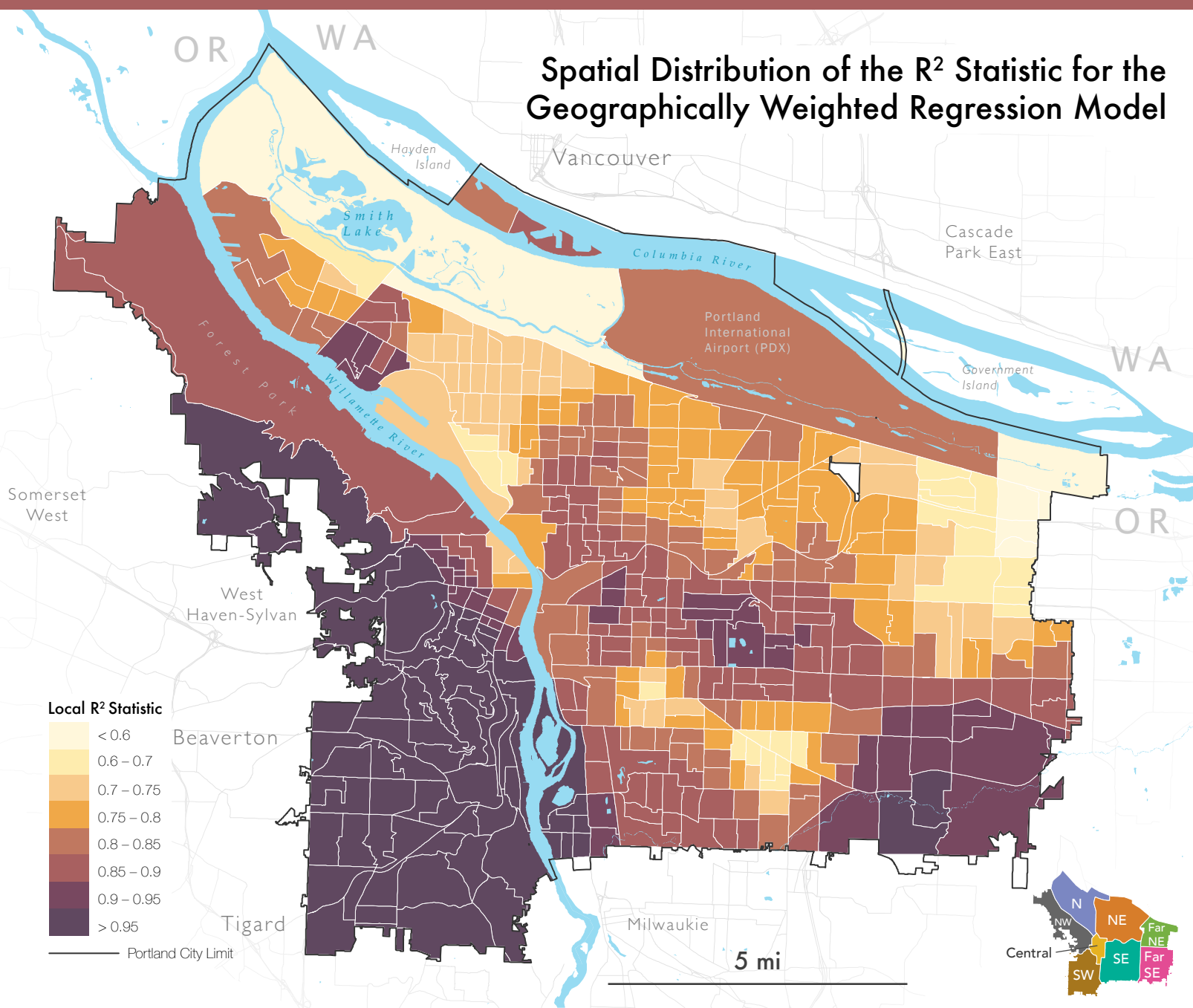


PORTLAND'S URBAN FOREST A Geographically Weighted Regression Model



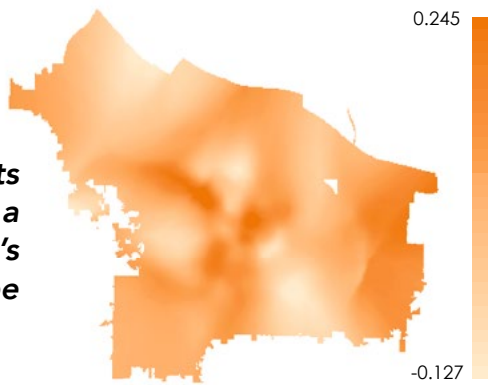
Geographically Weighted Regression (GWR) Model

Dependent Variable	% Canopy Cover
Independent Variables	% of Residents without a Bachelor's Degree % of Units that are Renter-Occupied % Change in White Population (2010-2013) Difference between Current and Target Canopy Population Density
R ² / Adjusted R ²	0.957 / 0.945
AICc	2231.768
Kernel Type / Bandwidth	Adaptive / 74 Neighbors
Global Moran's I Residuals	0.746 / Residuals are Randomly Dispersed

Above, the geography of the R² statistic across Portland's Census block groups for a geographically weighted regression model predicting **percent canopy cover**. GWR operates by fitting a unique regression line to each feature in the dataset. This model closely fits the data in **Southwest** and **Far Southeast** Portland, with pockets of weaker fit in **Southeast**, **Far Northeast**, and **North** Portland.

RASTER COEFFICIENT SURFACES

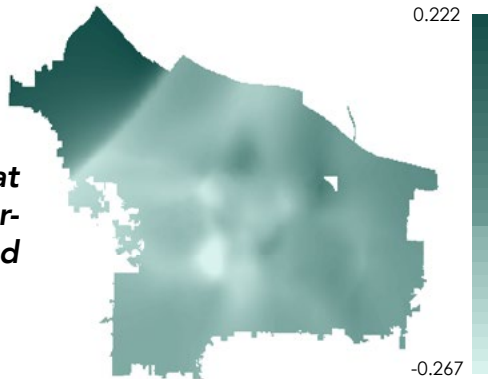
% of Residents without a Bachelor's Degree



Coefficient

Concentrations of positive coefficients on the border of **Southeast, Northeast, and Downtown Portland** suggest that increases in the percent of residents without a Bachelor's Degree here are associated with increases in percent canopy cover. Interestingly, each of these areas is flanked by a patch of negative coefficients, suggesting an opposite relationship in adjacent neighborhoods.

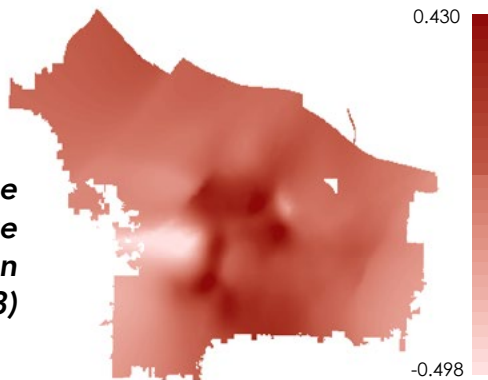
% of Units that are Renter-Occupied



Coefficient

Areas of negative coefficients throughout **Southeast, Southwest, and Northeast Portland** suggest that increases in the percent of renter-occupied units here are associated with lower canopy cover. Only the farther reaches of **North and Northwest Portland** display increases in the percent canopy cover when the percent of renter-occupied units increases.

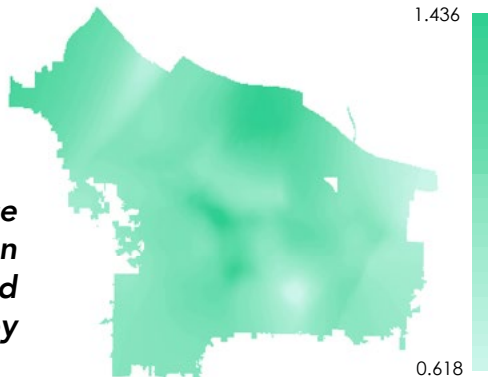
% Change in White Population (2010-2013)



Coefficient

Heavy concentrations of positive coefficients in **North-east and Southeast Portland** show that increases in the white population in these regions is strongly associated with increases in the percent canopy cover. However, the opposite is apparent in **Downtown, North, Far Northeast, and Far Southeast** neighborhoods, where increases in the white population are associated with decreases in the percent canopy cover.

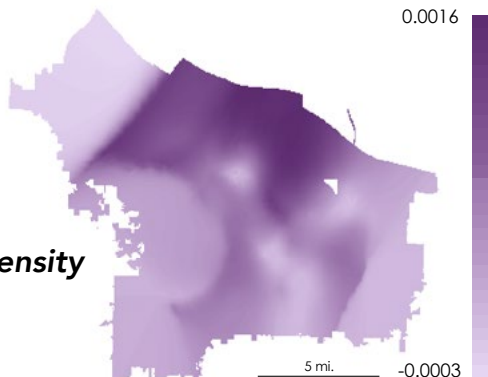
Difference between Current and Target Canopy



Coefficient

Coefficients for this metric are positive across the city, suggesting that areas with a greater difference from their canopy target are associated with greater percent canopy cover. The effect is strongest in **Northeast and Southeast Portland**, where differences between the 2014 canopy and the target canopy tend to be smaller than other parts of the city.

Population Density



Coefficient

Interestingly, increases in the population density across the majority of the city are associated with increases in the percent canopy cover. This effect may be related more generally to the sharp increase in population that Portland has experienced since the early 2000s, and the influence of the **urban growth boundary** on preventing the development of sprawl.