

# Love to hate you: Understanding housing demand in Auckland

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# Background - NPS on Urban Development Capacity

- Assessment Stages:

1. Hedonic model breaks down the price into its constituent characteristics

$$\log Price = \beta_0 + \beta_1 Typology + \beta_2 Location + \beta_3 Covariates + \epsilon$$

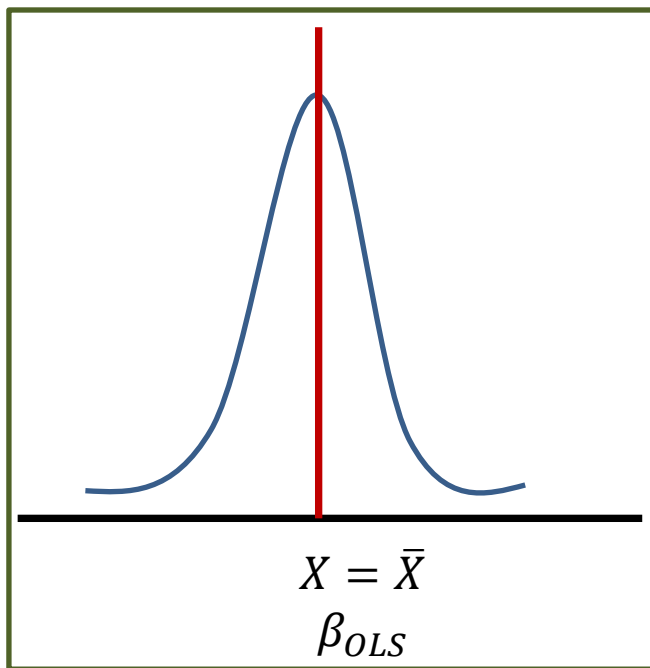
2. Clustering: spatial distribution of segments
3. Heterogeneous effects of environmental amenities
4. Purchase vs renting
5. Housing allocation

# Variables

- *Internal features*: construction materials/condition of roof and walls
- *Neighbourhood features*: distances; AU variables
- *Typology* : Whether is a single unit, multi use/unit, or others
- *Environmental Amenities* : Share on settlements, forests, grassland, wetlands, cropland, and other uses (cliffs, sand dunes and beaches); Share on green areas; Distances to coastal areas, rivers, green areas, wetlands, and volcanic features; Volcanic view shafts; Slope angle and orientation
- *Other Covariates*

# Hedonic Modelling

# Ordinary Least Squares (OLS)



Analysis with respect to the conditional average of prices

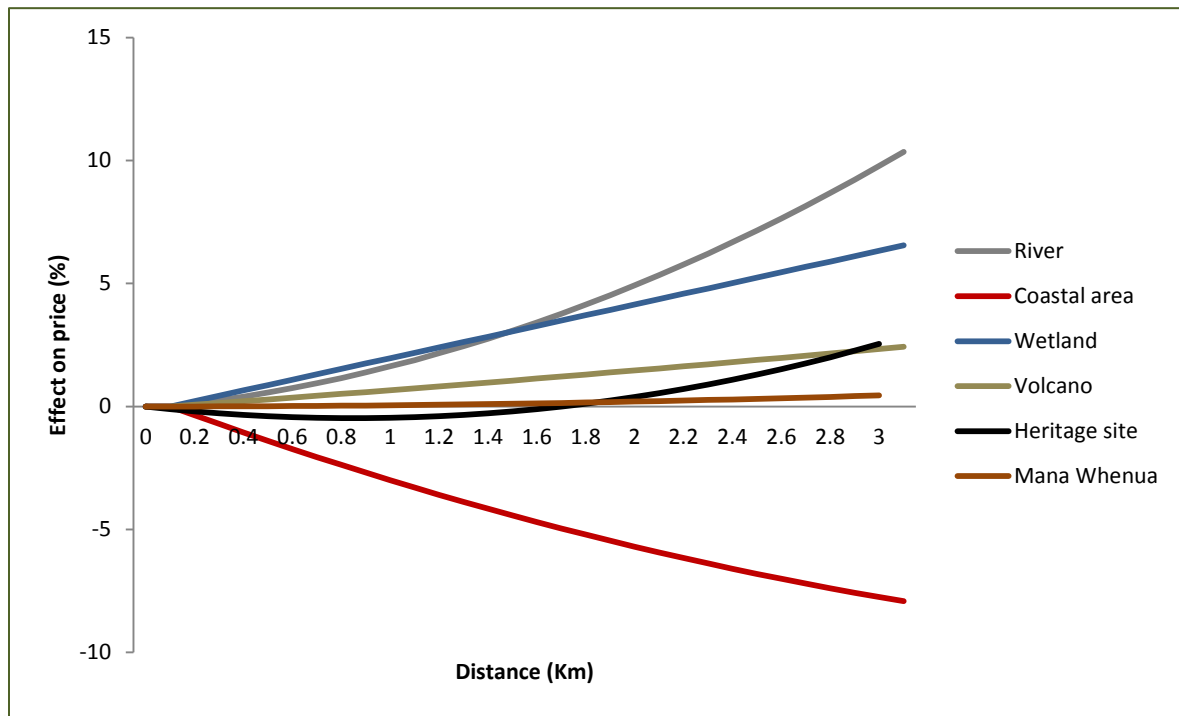
Covariates effect is constant across the price distribution

# Selected OLS estimates

	$\beta$	P value
<b>Share of AU on green areas</b>	<b>-0.110</b>	<b>0.000</b>
Share of AU on:		
Cropland	-0.539	0.000
Forest	-0.368	0.000
Grassland	-0.289	0.000
Settlements	-0.246	0.000
<b>Volcanic viewshaft - No:0</b>	<b>0.011</b>	<b>0.001</b>
Dwelling in blanket height - No:0	0.060	0.000
Slope (degrees)	-0.002	0.000
<b>Slope orientation -</b>		
<b>East:0</b>		
<b>North</b>	<b>0.006</b>	<b>0.002</b>
South	0.000	0.854
<b>West</b>	<b>0.008</b>	<b>0.000</b>
Multi use/Multi		
Type: Single unit:0		
unit	-0.068	0.000
Other	-0.074	0.000

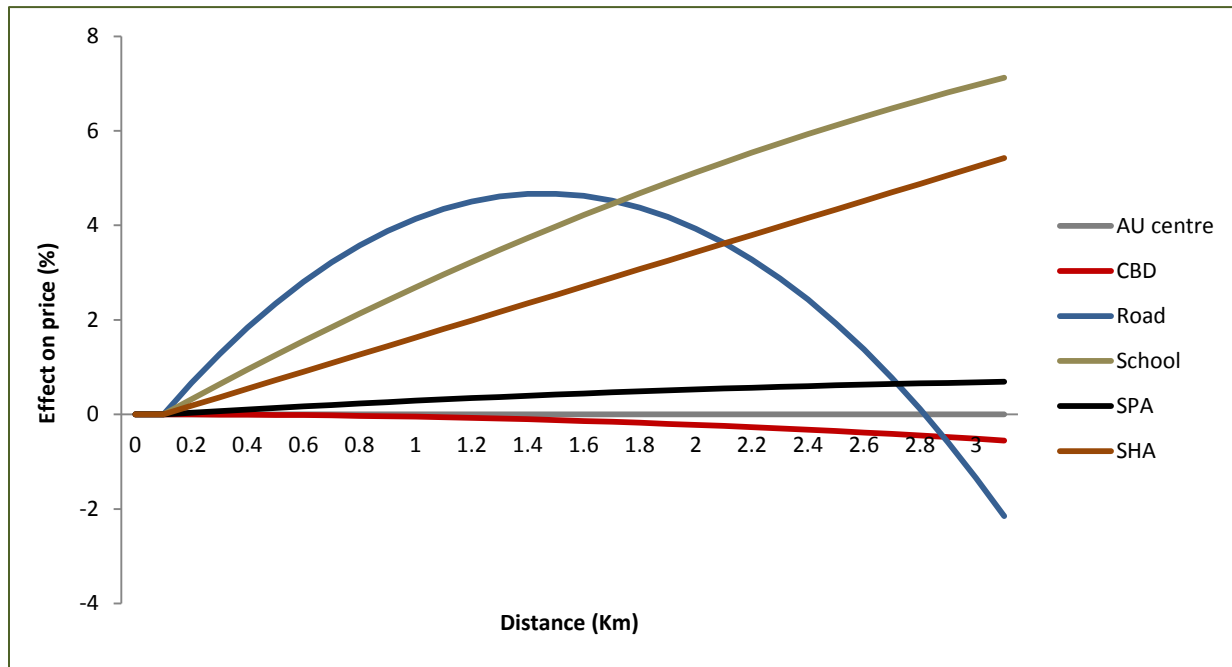
	$\beta$	P value
Mass view - None:0		
Water	0.053	0.733
Other (city, suburb or landscape views)	0.127	0.412
-	-	
Scope of view - None:0		
Slight	0.021	0.891
-	-	
Moderate	0.019	0.904
Wide	0.098	0.527
Floor area (m2)	0.003	0.000
Dwelling has a deck -		
No:0	0.045	0.000
<b>R-squared</b>	<b>0.69</b>	

# Price effects – distance to environmental amenities



No effect from green areas

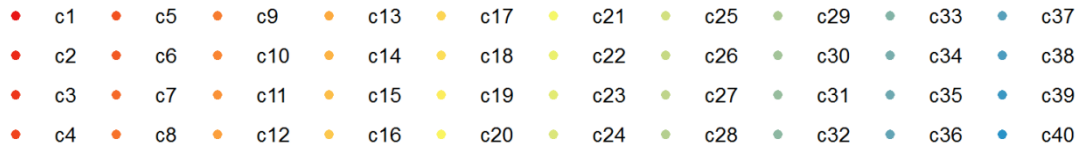
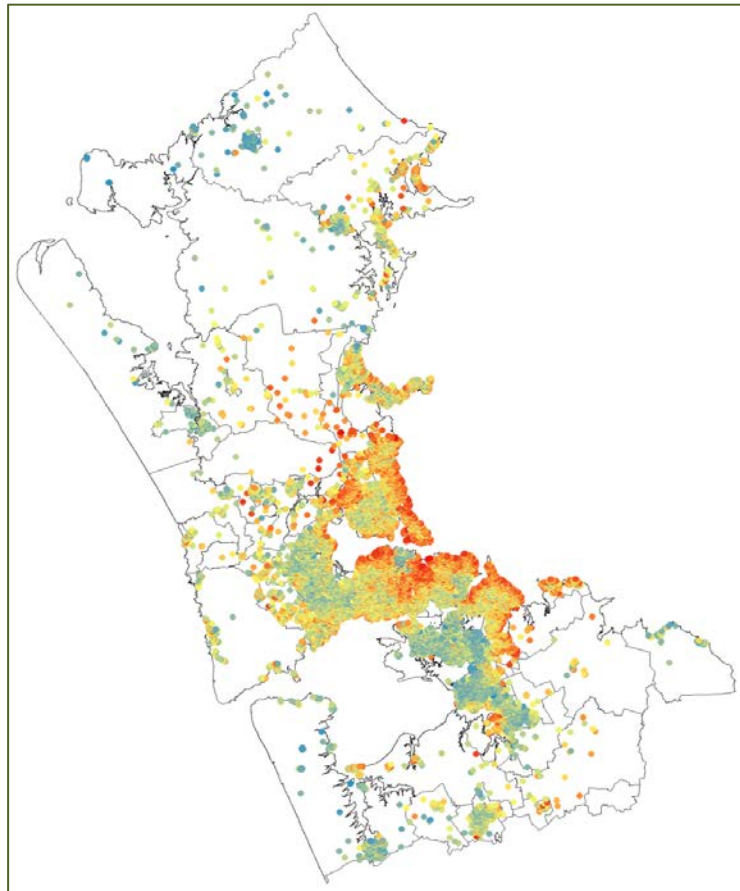
# Price effects – distance to city amenities



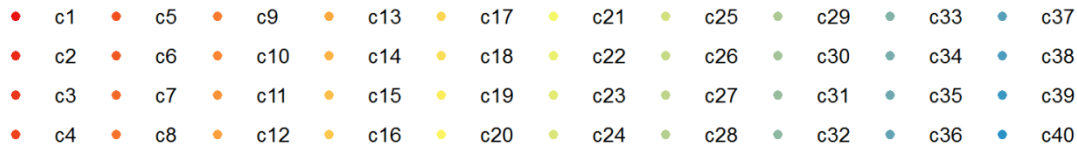
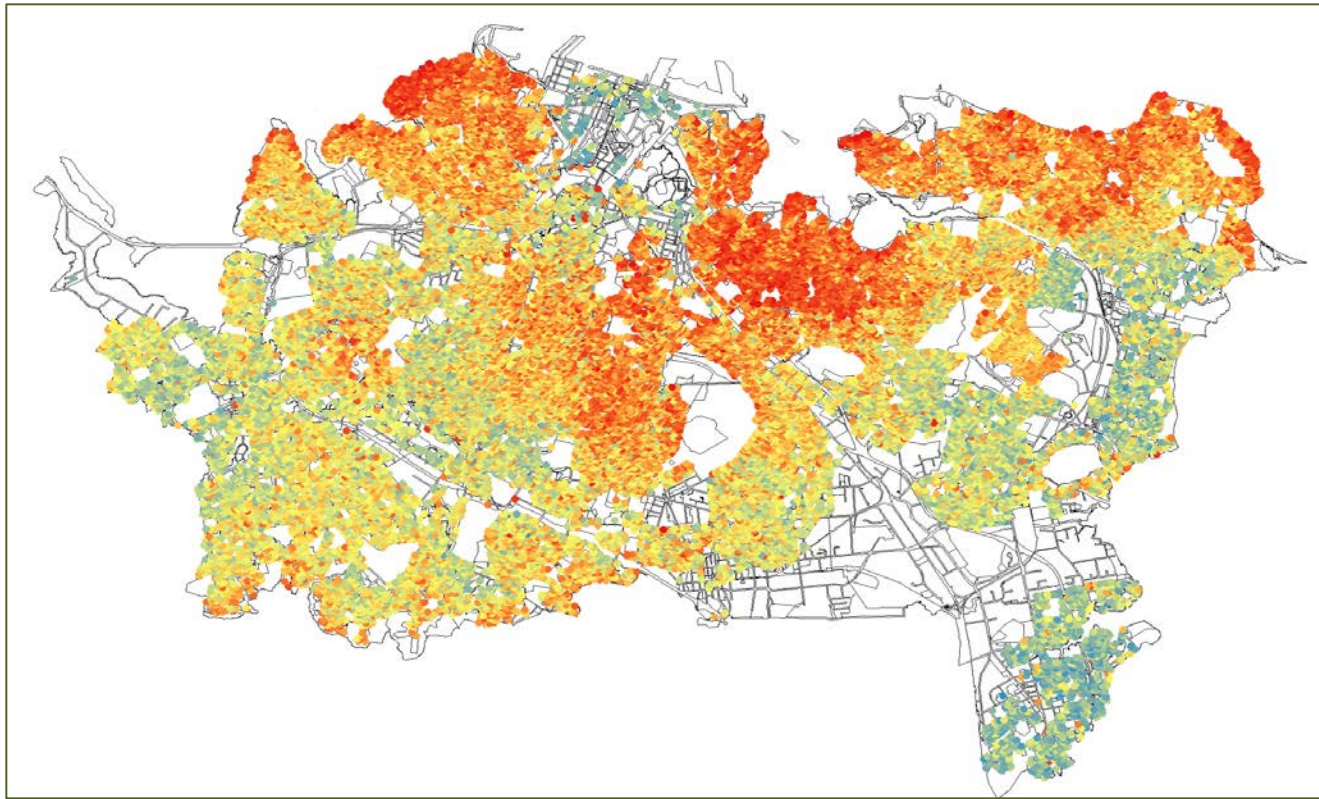


# Market Segments

# Auckland

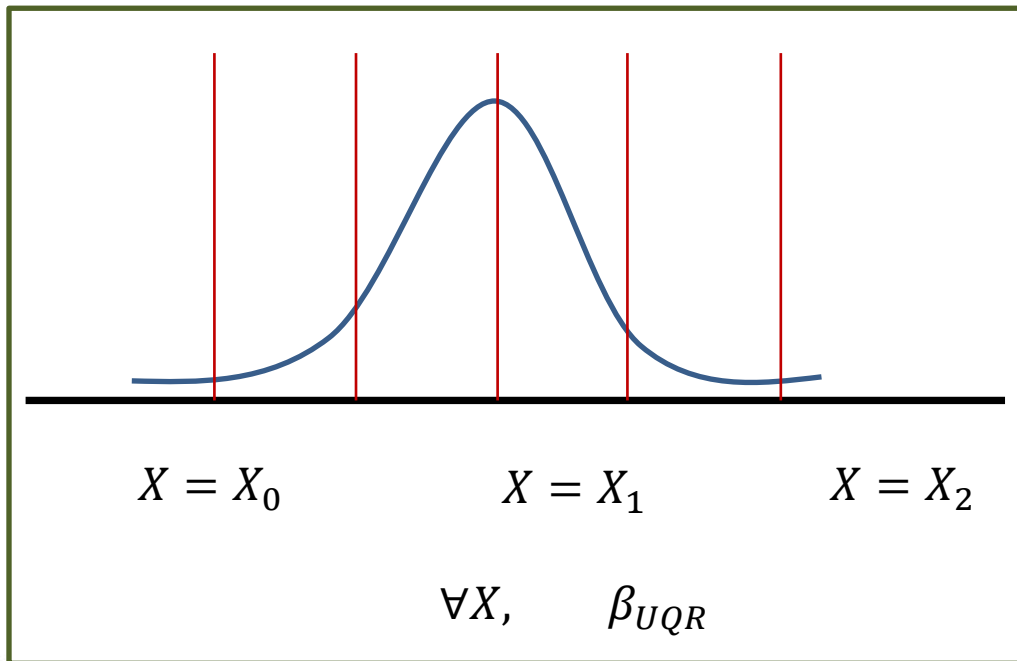


# Isthmus

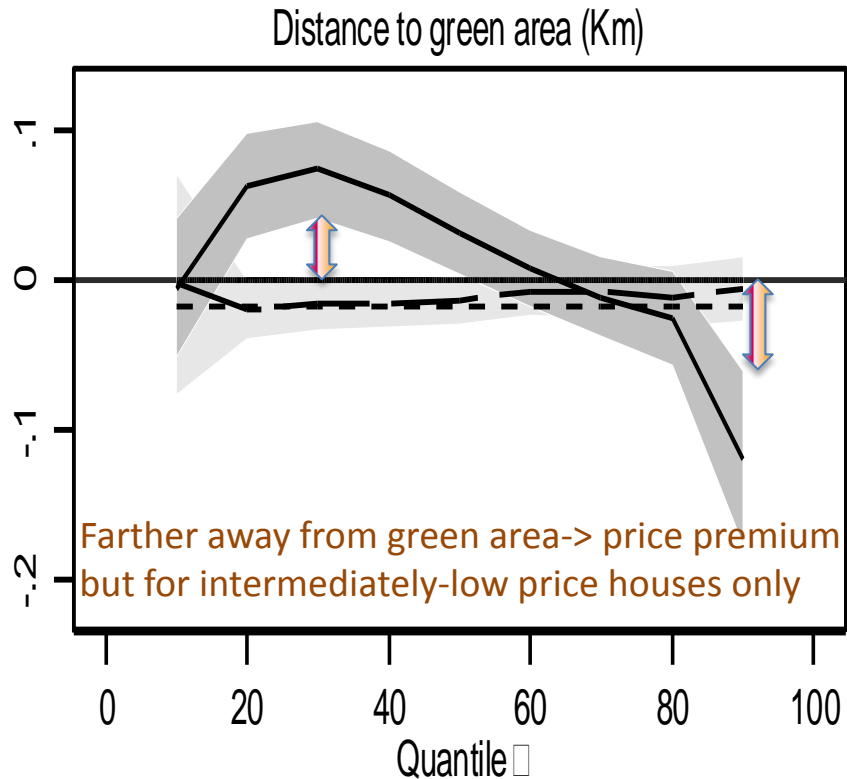
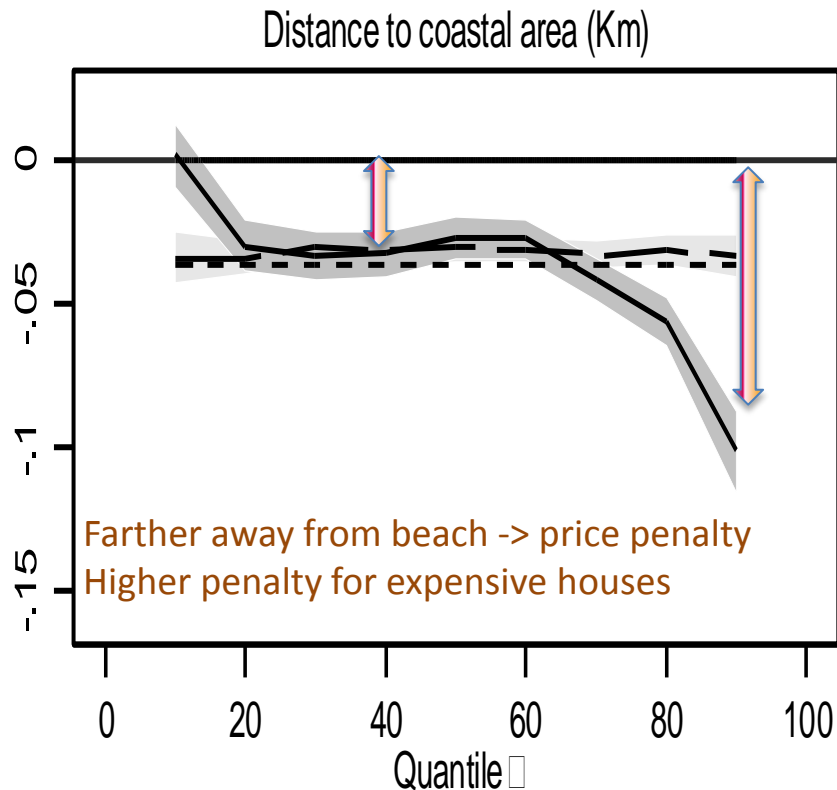


# Heterogeneous Effects of Environmental Amenities

# Unconditional Quantile Regression (UQR)



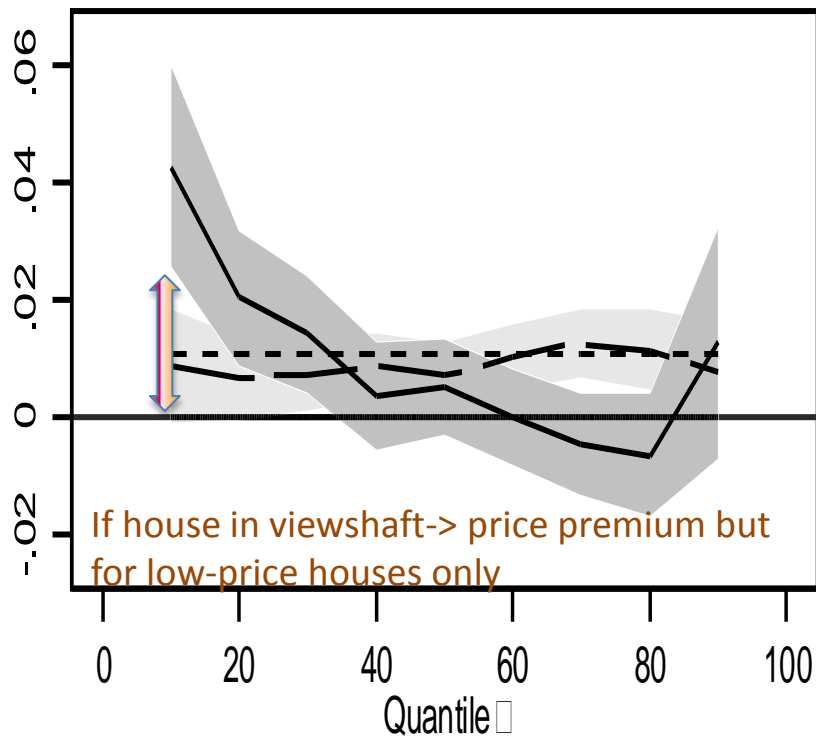
# Effects of amenities by quantiles of price distribution



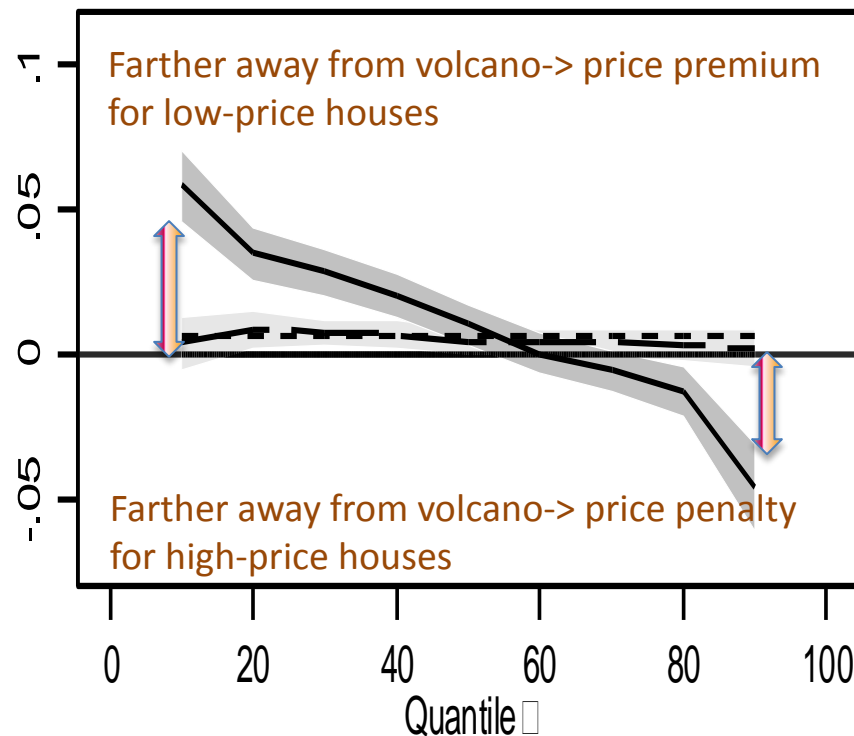
— UQR    - - - CQR    . . . OLS

# Effects of amenities by quantiles of price distribution

Volcanic view shaft (1/0)



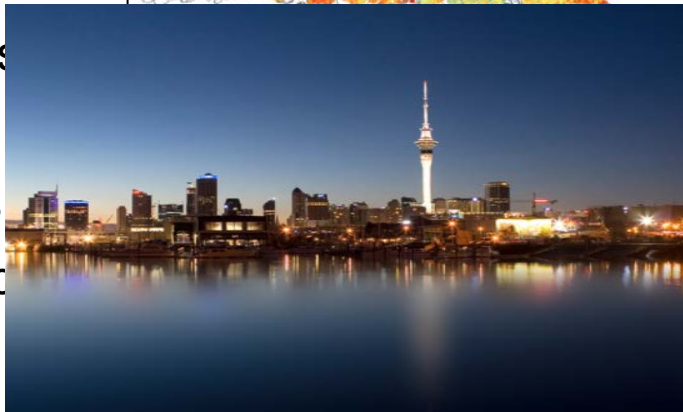
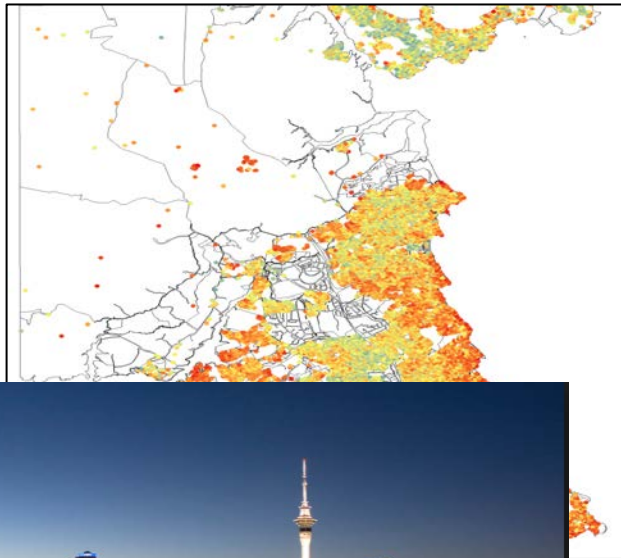
Distance to volcanic feature



— UQR    - - - CQR    . . . OLS

# Classification

- **Upper 25% tail:** low shares on settlements, high on coastal areas/wetlands. Within view shafts and blanket height areas. Not close to green areas, rivers, volcanic features, or historic heritage sites but close to coastal areas/wetlands and Mana Whenua
- South-western slope orientation





# Future work

- The hate part: make up a story - assessment report
- Heterogeneous effects
- Purchase/renting decisions
- Housing allocation model
- SHA and SPA effects
- Market segments.....

