

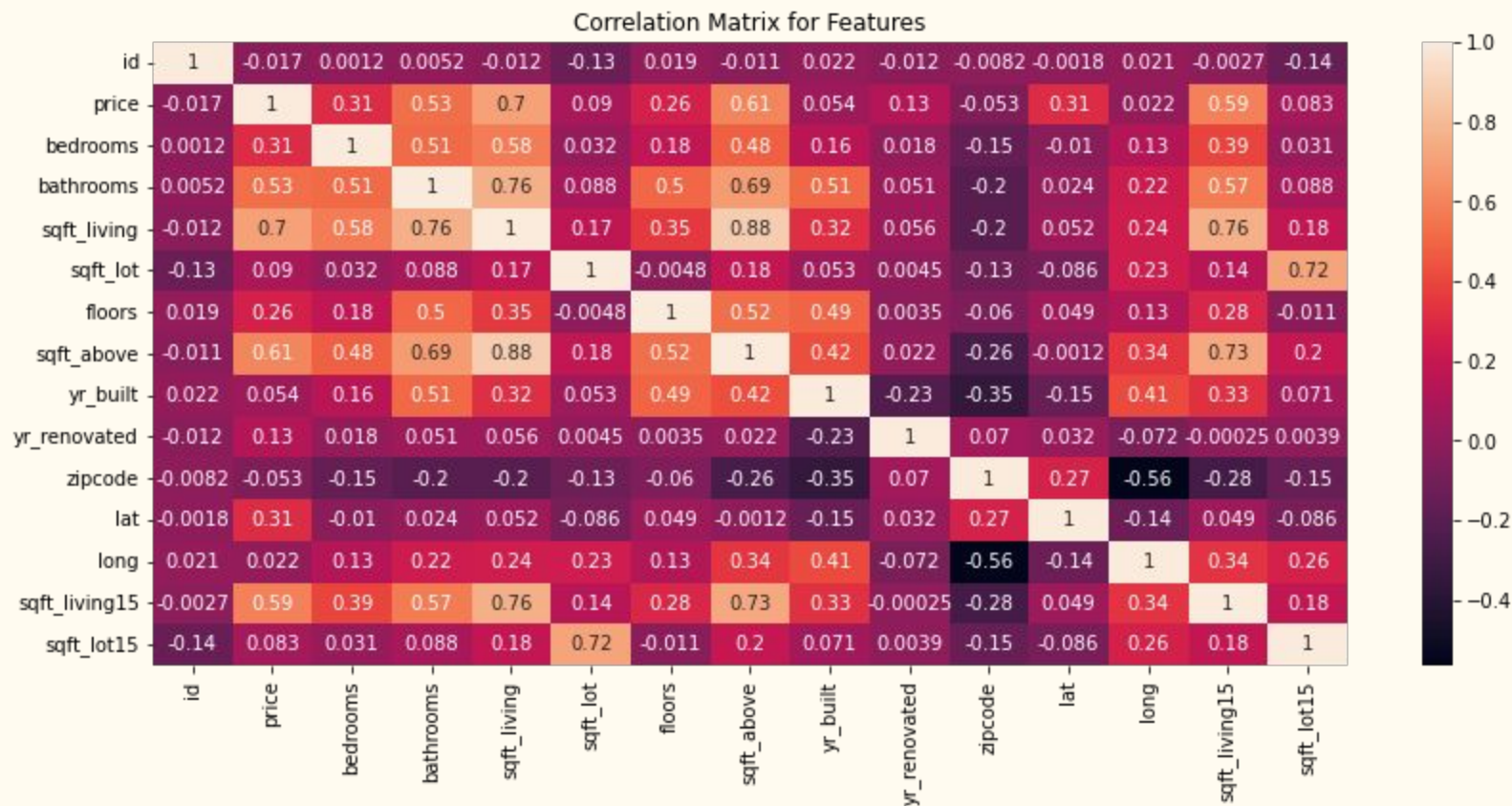
# King County Sales Assessment

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Assembled by Harrison Carter

How can we  
determine high  
value investment  
areas?

# Where to start?



# Additional Predictors

Living Space

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Waterfront Availability

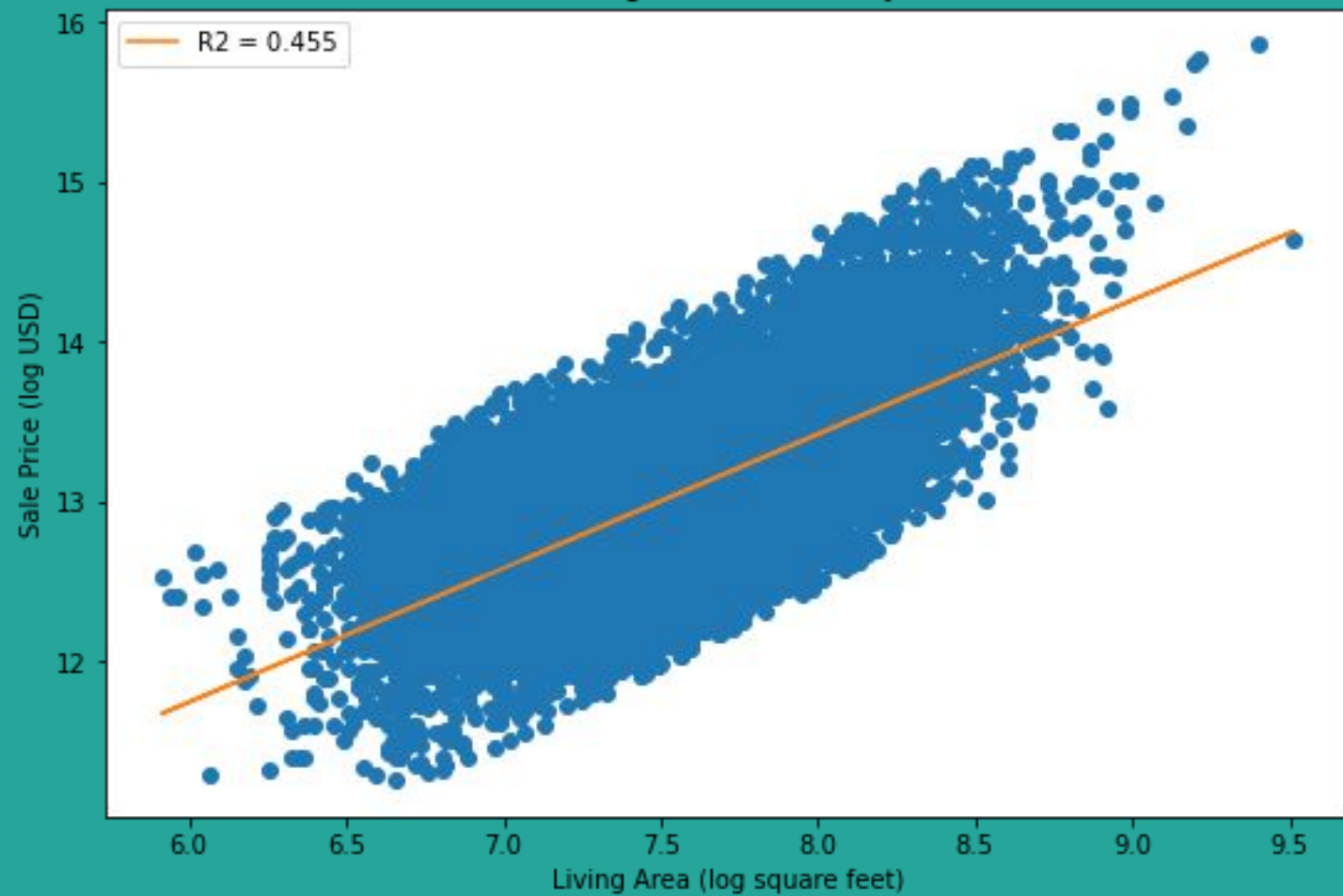
What matters?

What do we have in our data that might help explain pricing?

What is not inherent to zip code?

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Living Area Profitability



# Examine ZIP code

## Rationale:

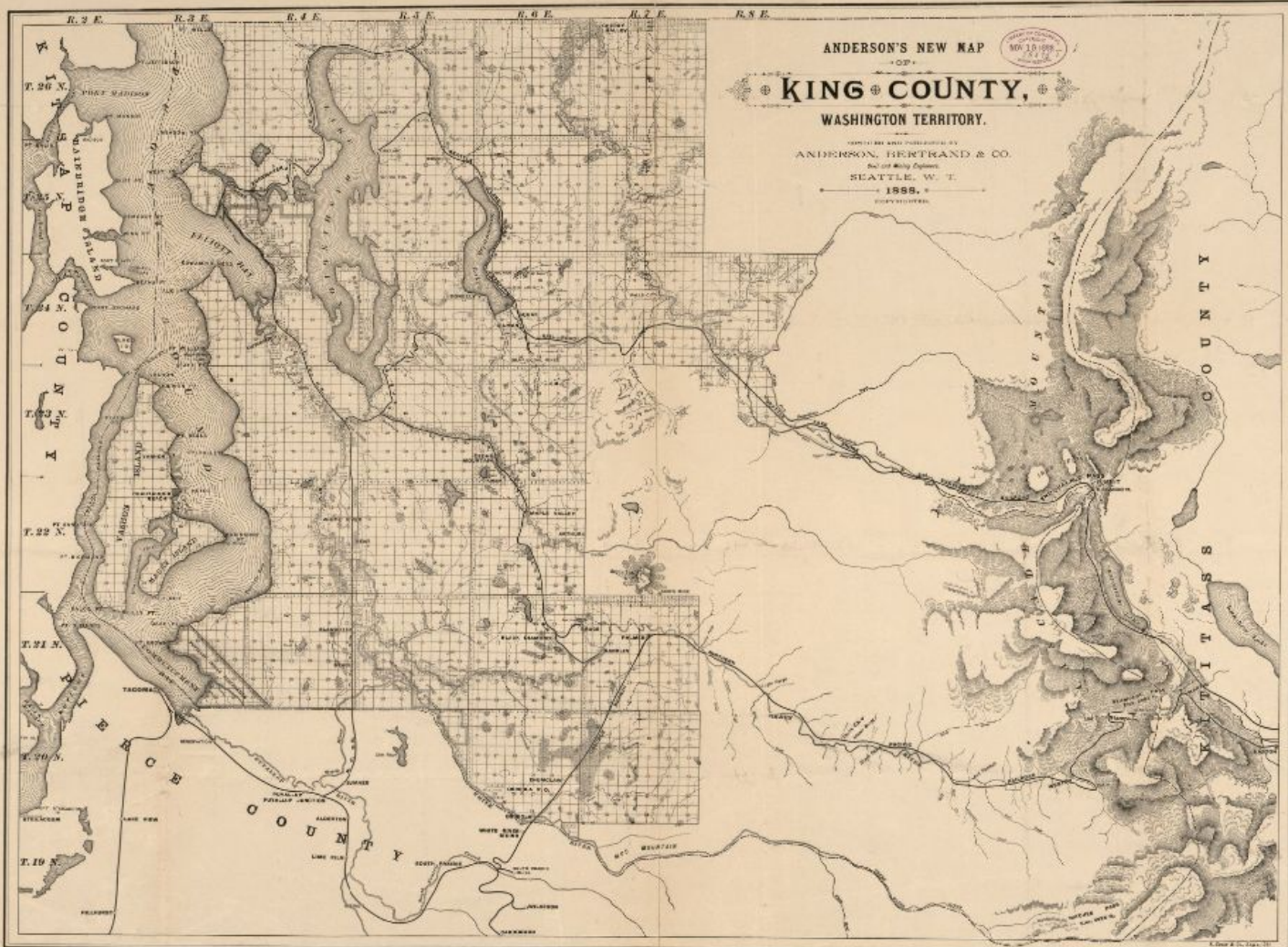
- Spatial
- While unintentional, ZIP may, in effect, include other predictors
- Geographical
- School districts
- Natural features, parks (waterfront)
- Shopping
- Transportation

## Methodology:

- Categorical: nominal
- Incorporate as primary predictor
- Logarithmic transformation on price
- May contain other predictors, check heteroskedasticity upon multiple regression.

## Baseline:

- Baseline model  $R^2 = 0.533$
- Skew = 0.594 ( $> 0.5$ )
- Kurtosis = 5.132 ( $< 6$ )



ANDERSON'S NEW MAP

# KING COUNTY,

WASHINGTON TERRITORY.

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Real and Mining Engineers.

SEATTLE, W. T.

1888.

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# Refining the model

Final Predictors:

**ZIP code**

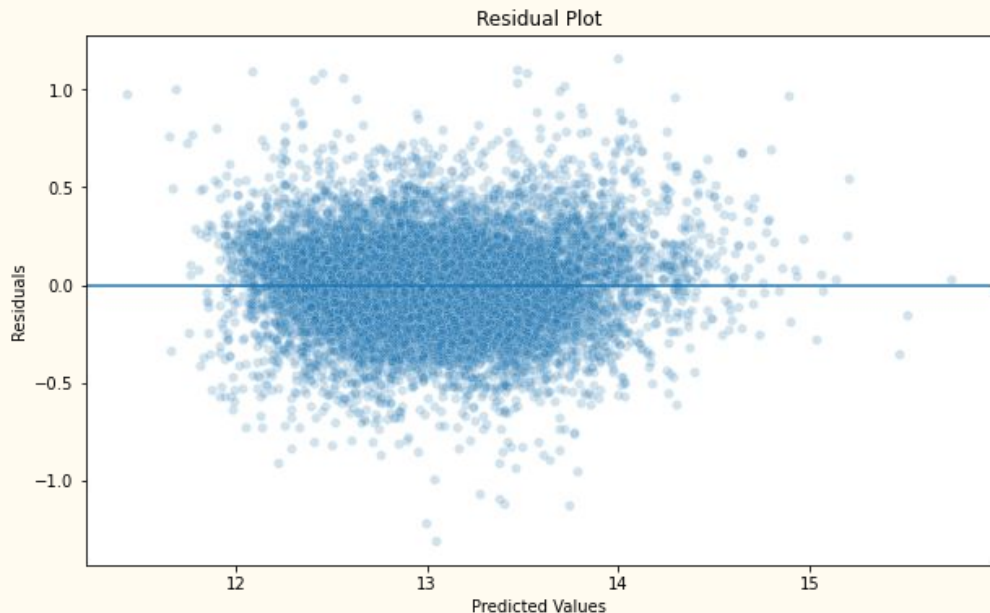
**Living Space**

**Waterfront availability**

\*See Appendix A for equation

Waterfront availability incorporation

- Decreases Skew:
  - 0.445 to 0.130
- Decreases Kurtosis:
  - 5.920 to 4.956
- Increases R squared:
  - 0.817 to 0.833





# Further Inquiry



Image credit: [wta.org](http://wta.org)

- Map geographic location with respect to landmarks (spatial reconstruction)
- Consider construction regulations and housing specifications (build quality, hazards)
- Consider school district (income inequality)
- Consider effects of tourism
- Consider non-residential development

# Questions



# References

- King County Assessor Website  
(<https://info.kingcounty.gov/assessor/esales/Glossary.aspx?type=r>)
- Library of Congress (<https://www.loc.gov/resource/g4283k.la001374a/>)
- Washington Trails Association  
(<https://www.wta.org/go-hiking/hikes/snow-lake-1>)

Appendix A. Equation

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 \dots \beta_k x_k$$

$y$  = predicted price

$\beta_0$  = predicted price when no waterfront and living space is zero

$\beta_1$  = predicted change in price for each unit of change in living area square footage

$\beta_2$  = predicted change in price between waterfront/non waterfront properties

$\beta_3 \dots \beta_k$  = predicted change in price between ZIP codes, individual basis

$x_1$  = Living area square footage

$x_2$  = Waterfront availability, categorical

$x_3 \dots x_k$  = ZIP codes, individual basis, categorical

\*All  $y$  and beta values in equation are predicted