

# Contribution of Ecosystem Services to Residential Property Values in Alaska's Matanuska-Susitna Borough

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## Research Question and Study Objective

Alaska's Matanuska-Susitna (Mat-Su) Borough is growing rapidly. As development converts natural open space to residential subdivisions, are borough residents potentially losing valuable natural amenities that contribute significantly to the local economy?

If private owners of borough real estate are willing to pay more for property located close to natural areas and recreation sites, conservation of these amenities could contribute to the local property tax base. The objective of this study is to estimate the enhanced value of private residential property and undeveloped land in the Mat-Su borough created by local protected open space and outdoor recreation opportunities.

## Theory of Hedonic Prices

Consumer demand for housing incorporates demand for attributes:

- Structural characteristics (lot size, size of home, age, features of the building)
- Neighborhood characteristics (location-specific aspects of the built environment such as public safety, tax rates, schools, etc.)
- Environmental amenities (location-specific ecosystem services)

Home buyers choose from a supply of close substitute properties with different portfolios of attributes. Equilibrium prices for attributes balance supply and demand in competitive property markets.

## What are Ecosystem Services?

Ecosystem services are what Nature produces that people value. Many ecosystem services are *public goods*, but not all. Some ecosystem services can be captured by landowners for their exclusive use.



## Data and Methods

We applied the *hedonic price* method to explain variation in sales prices of 2,649 single-family homes and vacant land parcels sold in 2009 and 2010 in the non-remote portion of the Mat-Su Borough. The Borough property appraisal database provided data on sales prices, structural characteristics, and neighborhood characteristics. We calculated additional neighborhood characteristics -- drive times to Anchorage, and distances to the nearest road and air miles to Anchorage for non-road-accessible properties -- using Google Maps. The Nature Conservancy of Alaska provided geospatial data on land and water features, protected areas, and other natural amenities.

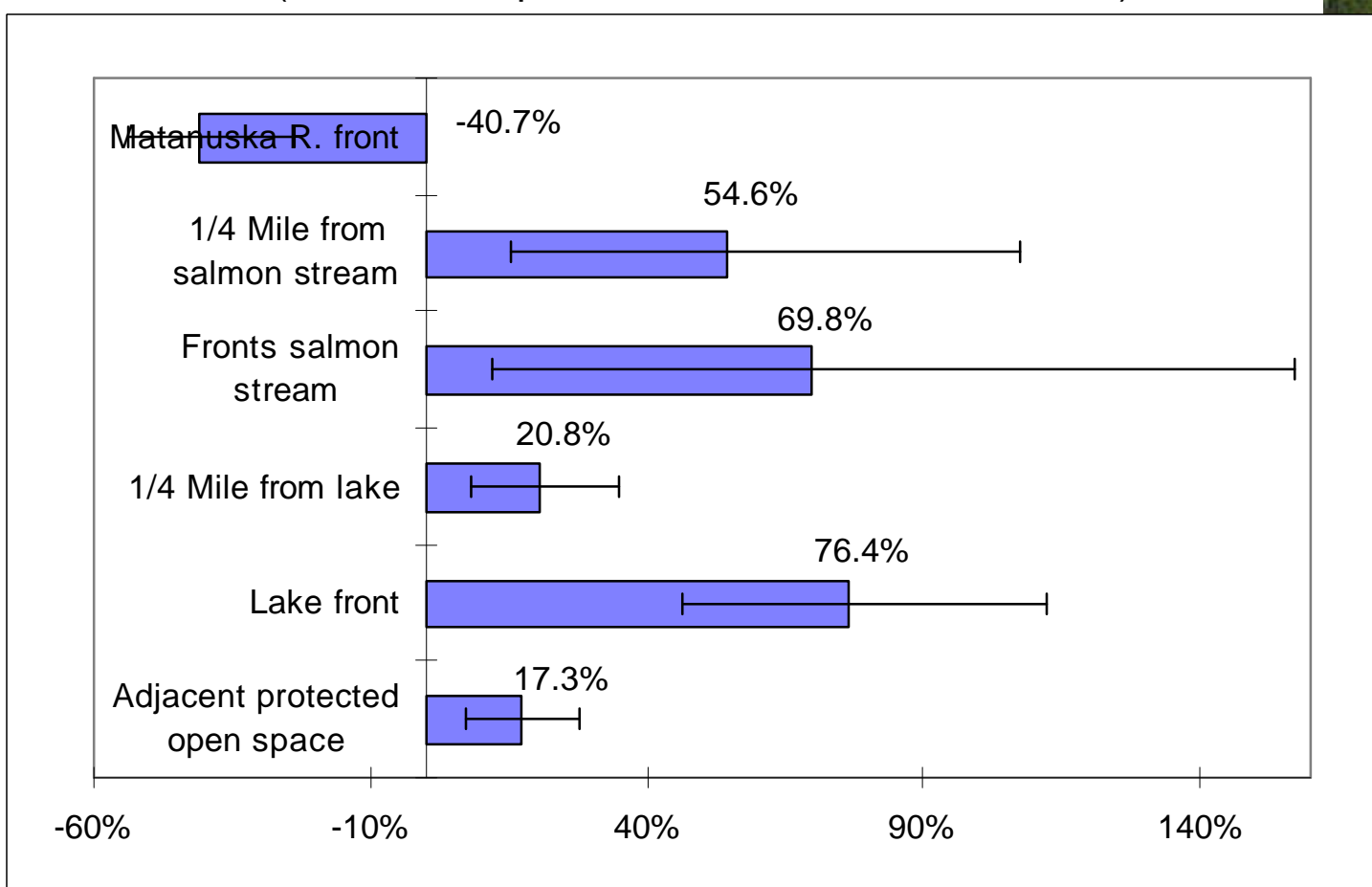
We estimated multiple regression equations -- dependent variable = natural logarithm of sales price -- addressing spatial correlation with fixed effects for 34 election precincts, correcting for spatial error correlation within a 1/2 mile neighborhood.



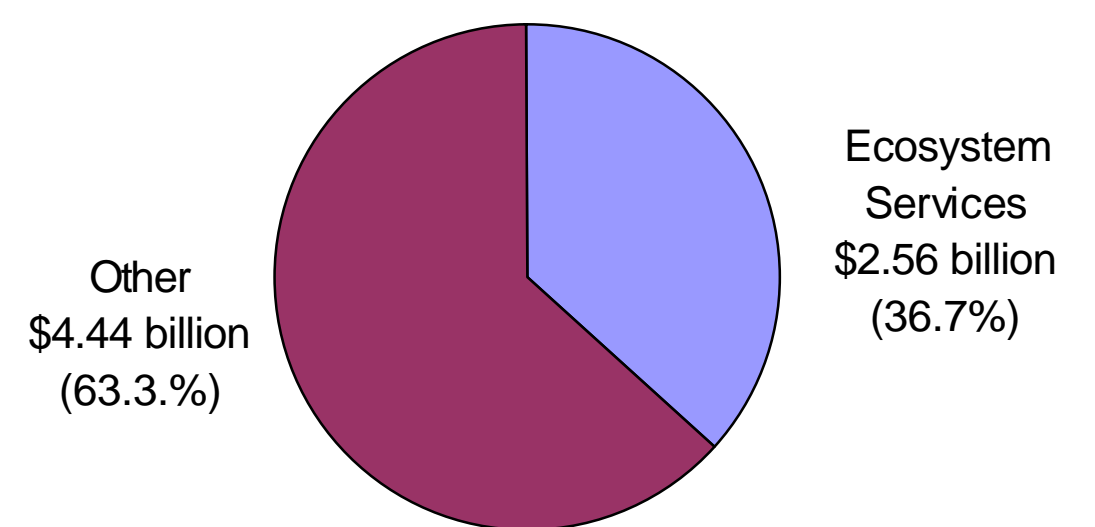
## Results

### Estimated Percentage Change in Sales Value from Proximity to Natural Amenities

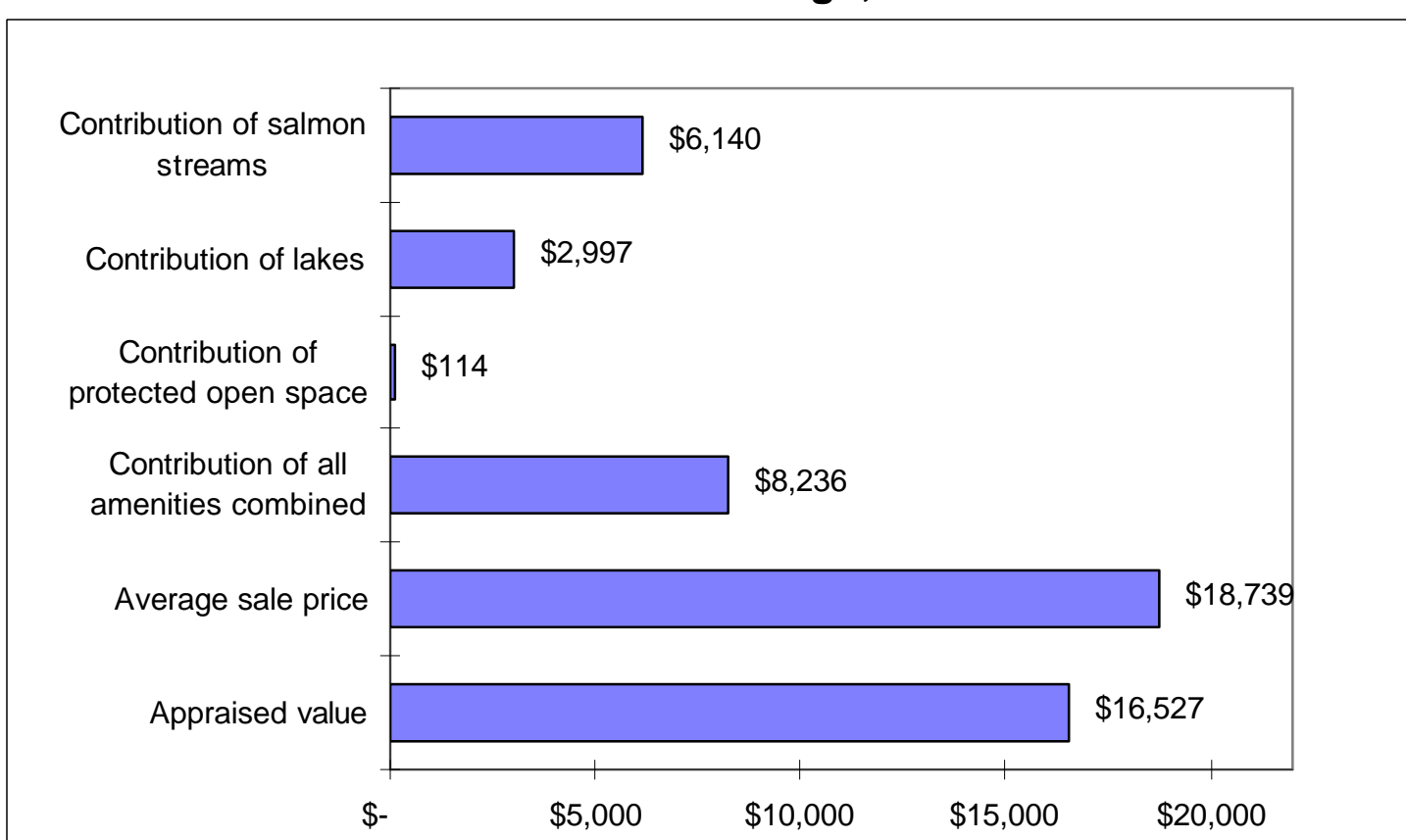
(Error bars represent 95% confidence intervals)



### Estimated Contribution of Ecosystem Services to Mat-Su Borough Private Vacant Land and Residential Appraised Value (2011 Appraised Value = \$7.00 billion)



### Contribution of Natural Amenities to Average Value per Acre Sold in the Mat-Su Borough, 2009-2010



### Spatial distribution of increment to property values due to ecosystem services

