

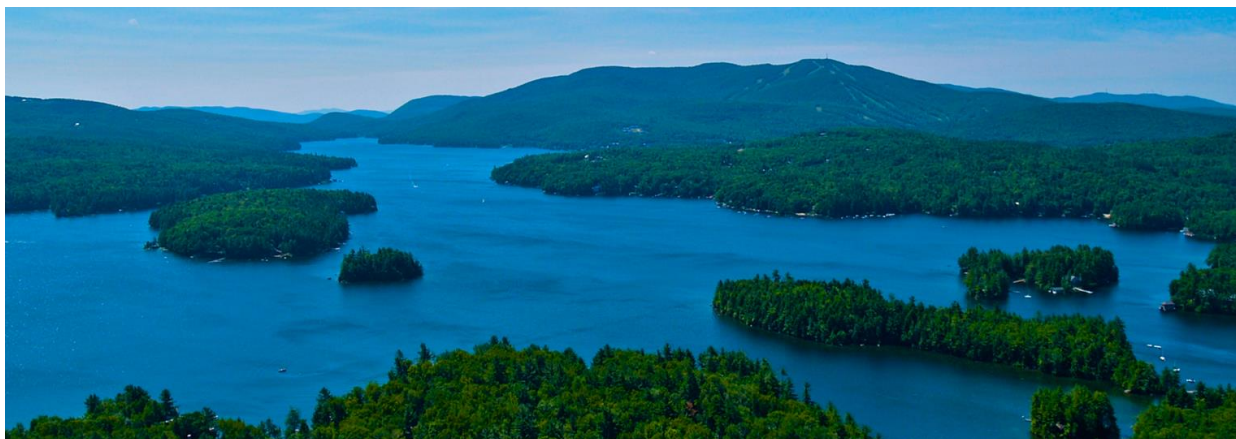


The Nelson A. Rockefeller Center  
at Dartmouth College

*The Center for Public Policy  
and the Social Sciences*

# *The Class of 1964* Policy Research Shop

## Valuation of Lake Sunapee



Paul Hager, Emery Rheam, Kelly Zeilman

*This report was written by undergraduate students at Dartmouth College under the direction of professors in the Rockefeller Center. Policy Research Shop (PRS) students produce non-partisan policy analyses and present their findings in a non-advocacy manner. The PRS is fully endowed by the Dartmouth Class of 1964 through a class gift in celebration of its 50<sup>th</sup> Anniversary given to the Center. This endowment ensures that the Policy Research Shop will continue to produce high-quality, non-partisan policy research for policymakers in New Hampshire and Vermont.*





## Valuation Contributes to Protection and Development Strategies

- Previous PRS valuations
  - Lake Winnepesaukee (~\$17b)
  - Lake Champlain
- Why value the lake?
- Selection of three towns:  
Newbury, New London,  
Sunapee





# Lake Sunapee Generates **\$4,311,529,529** of Value

This value is comprised of:

- Property Value: **\$4,126,000,000**
- Town Property Taxes: \$52,862,000
- Ski Area Infrastructure: \$10,863,888
- Business Revenue: \$120,918,168
- Water Infrastructure & Supply: \$885,473



## Assessment Data Shows Similarity Across Towns

Town	# of Parcels	Mean Value (\$)	Residential Only		
			% LR-1	Mean Value	Mean Acreage
Newbury	2,530	467,460	86.6	483,202	4.80
New London	2,418	500,707	86.5	496,098	3.30
Sunapee	3,191	483,660	89.4	495,295	2.78
<b>Total/Mean</b>	<b>8,139</b>	<b>483,942</b>	<b>88.0</b>	<b>491,532</b>	<b>4.00</b>

**Total Property Value: \$4,126,000,000 , Total Revenue from Taxes: \$52,862,000**



## Property Values and Taxes by Town

Town	2021 Assessed Property Value (\$)	2021 Millage Rate	2021 Calculated Tax Revenue	2021 Collected Tax Revenue (\$)
Newbury	1,183,000,000	11.38	12,620,000	12,390,248
New London	1,400,000,000	15.39	19,961,000	19,896,474
Sunapee	1,543,000,000	13.63	20,281,000	19,945,804



## Value Added Analysis Suggests Property Value Drops Sharply With Distance From Lake

$$\text{taxable value} = \beta_0 + \beta_1(\text{distance}) + \beta_2(\text{distance}^2) + \beta_3 X_c + \varepsilon$$

- Want to know how proximity to the lake affects value
  - Need to control for confounding variables
- Regression 2 is the preferred specification, since it better supports intuition → more detail on next slide
- Value differential per km = \$162,939 - \$38,000x
  - Diminishing differential until 4 km out from lake

Parcel Taxable Value	(1)	(2)
Distance	-163,819*** (9,880)	-162,939*** (9,982)
Distance^2	18,908*** (1,329)	18,999*** (1,342)
Waterfront (=1)	762,616*** (16,685)	797,917*** (16,763)
Acreage	2,181*** (242.0)	2,147*** (244.4)
Bedrooms if Residential	9,133 (7,515)	
Bathrooms if Residential	293,675*** (8,388)	
Newbury (=1)	134,708*** (16,889)	25,149 (16,466)
New London (=1)	76,020*** (20,521)	55,217*** (20,642)
Utility (=1)	193,972*** (53,776)	-174,310*** (52,854)
Exempt (=1)	1.006e+06*** (44,001)	606,035*** (42,328)
Commercial/Ind. (=1)	803,080*** (41,313)	207,519*** (38,906)
Bathrooms Beyond 2nd		152,202*** (4,347)
Beds Beyond 4th		26,314*** (4,515)
Constant	-145,441*** (22,189)	307,801*** (15,080)
Observations	7,641	7,641
R-squared	0.479	0.469

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



## Second Specification is the Regression of Interest

- Constant can be thought of as the “base price” of a 2-bathroom, 4-bedroom residential parcel in Sunapee which is not on the waterfront
  - Before adjustments for town, acreage, additional bedrooms/bathrooms, etc.
- First derivative with respect to distance gives the effect of distance from the lake
  - \$162,939 - \$38,000x
  - Should be thought of as the “decrease per kilometer in parcel value” → starts at ~160k and falls with distance from the lake

	(2)
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## We Can Estimate the “Lake Share” of Parcel Value Using Integration

- Since the estimate from the regression gives “\$ lost” per km, and the effect goes to 0 at 4 km, we can simulate “moving” parcels close to the lake to 4 km away → the cumulative value lost = the value from proximity to the lake
- Cumulative loss given by:  $\int (162,939 - \$38,000x) |_{0-4}, |_{1-4}, |_{2-4}, |_{3-4}$
- **On average, lake proximity accounts for 35% of parcel value**

km From Lake	Mean value	Lake Share (Cumulative Loss)	% Value from Lake Proximity
0	810,660	347,756	43
1	358,661	203,817	57
2	311,781	97,878	31
3	312,664	29,939	10
<b>Average of %s</b>	--	--	<b>35</b>





# Tourism

**Total annual tourism revenue = \$120,640,000**

Sources of tourism revenue:

- Food service
- Retail
- Accommodations
- Local transportation and gas
- Arts, entertainment and recreation
- Food store
- Air transportation





## Boating and Fishing

- Complicated to connect uniquely to Sunapee
- Boat Registrations: \$128,058
- Fishing Licenses: \$150,110





## Mount Sunapee Ski Resort

- Lease (2 part):  
\$714,678
- Lifts + Buildings:  
\$10,149,210
- Undervaluation:
  - public land
  - revenue in  
tourism data





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# Water Infrastructure

- Dam: \$317,027
- Lighthouses:  
\$38,124
- Public Water Supply:  
\$530,322





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