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**Exploring the Shelf Life of Travel Cost Methods of
Valuing Recreation for Intertemporal Benefits Transfers**

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Motivation

- The travel cost method (TCM) is used to estimate the economic value of recreational activities:
 - TCM has been widely applied to water policy analyses in recent decades (Griffiths et al., REEP 2012).
- The costs of conducting original research at a policy site are often prohibitive in terms of time and money:
 - Policy applications thus frequently rely on benefits transfer methods in which benefits obtained from previous studies at other sites are used to estimate benefits at the policy site under consideration.
- At issue is the “shelf life” of benefits estimate for intertemporal benefits transfers:

Are TCM value estimates for recreational angling stable across lengthy time periods?

Opportunity

- New York State (NYS) has conducted statewide Freshwater Angler Mail Surveys for several decades:
 - Focused on expenditures and locations visited,
 - Data amenable to repeated site-choice modelling.
- 1988 and 2007 NYS surveys used same trip elicitation format, although there are some differences between surveys:

	2007	1988
Initial Sample	6,000	17,000
Completed Surveys	2,238	10,314
Response Rate	39.9%	62.4%
Other	1. Zip code level income 2. Limited information on preferences and socio-demographics	1. Survey reported Income 2. Standard information on preferences and socio-demographics

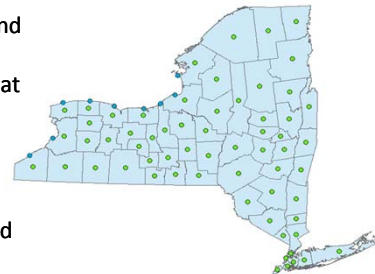
Trip Information

- Site choice data collected for up to eight sites per angler:
 - Average number of sites visited/angler: 1988, 2.66 ; 2007, 2.87,
 - Average days fished/angler: 1988, 24.44; 2007, 29.16,
 - Average distance to fishing site: 1988, 43.13; 2007, 38.62,
 - Great Lakes as a proportion of trips: 1988, 0.13; 2007, 0.09.

Where Did You Fish in New York?			How Many Trips and How Many Total Days Did you Fish at Each Location?	
Location	Name of Stream or Lake	County or Nearest Post Office	Number of Trips	Number of Days
Example	Indian Lake	Hamilton	4	8
1				
2				
3				
4				
5				
6				
7				
8				

Travel Cost Data

- Destinations:
 - 63 County Centroids for Inland Fishing,
 - 9 Shoreline Centroids for Great Lakes Fishing.
- Trip Origins:
 - 2,432 Zip Code Centroids.
- Choice sets:
 - Counties or shorelines located within 180 minutes of origin.
- Travel costs:
 - Distance, time and tolls were calculated using PC Miler™ software.
 - AAA mileage cost were used (1988, \$0.29/mile; 2007, \$0.52/mile)
 - Time costs were calculated as follows:
 - Zip Code income per hour × 0.33 for 2007 data,
 - Individual income per hour × 0.33 for 1988 data,
 - Zip code income per hour × 0.33 for 1988 data.



Econometric Results

- Three-level, nested logit, repeated site choice model:
 - Participation; go fishing or not (nest parameter, n.p.= 1),
 - Fishing type; Great Lakes or inland waters (n.p.= σ),
 - Site choice; within a fishing type (n.p.= λ).

Variable	2007 Zip Code Income	1988 Individual Income	1988 Zip Code Income
Travel Cost	-0.0189	-0.0238	-0.0255
Great Lakes Shoreline/County		+	
Inland Shore Length /County		+	
Inland Steam Length /County	-	+	+
Lake Area/County		+	
Gender	-	+	+
Age	-	+	+
Income	-	-	n.s.
Great Lakes Nest	-	+	+
σ	0.56	0.59	0.57
λ Great Lakes	0.45	0.39	0.41
λ Inland Waters	0.31	0.32	0.31

Findings

Estimated values of recreational angling obtained using data from a TCM survey in 1988 significantly overestimate 2007 TCM survey values, and hence TCM estimates should not be used for benefits transfer across 20 years.

	2007 Zip Code Income	1988 Individual Income	1988 Zip Code Income
Nominal Marginal Value per Day	\$28.65	\$24.85	\$22.61
CPI Adjusted Marginal Value per Day (\$2007)	\$28.65	\$43.56	\$39.63