

# Human Dimensions

## Economics

Frank Lupi & Michael Kaplowitz

MSU

Feng Song, Jody Simoes, Kwame Yeboah

# Two Modeling Components

## 1. Recreational uses

- Beach use
- Fishing

## 2. Landowners

- Preferences & attitudes toward management alternatives
- Quantitative models of willingness to change/adopt various land mgmt options

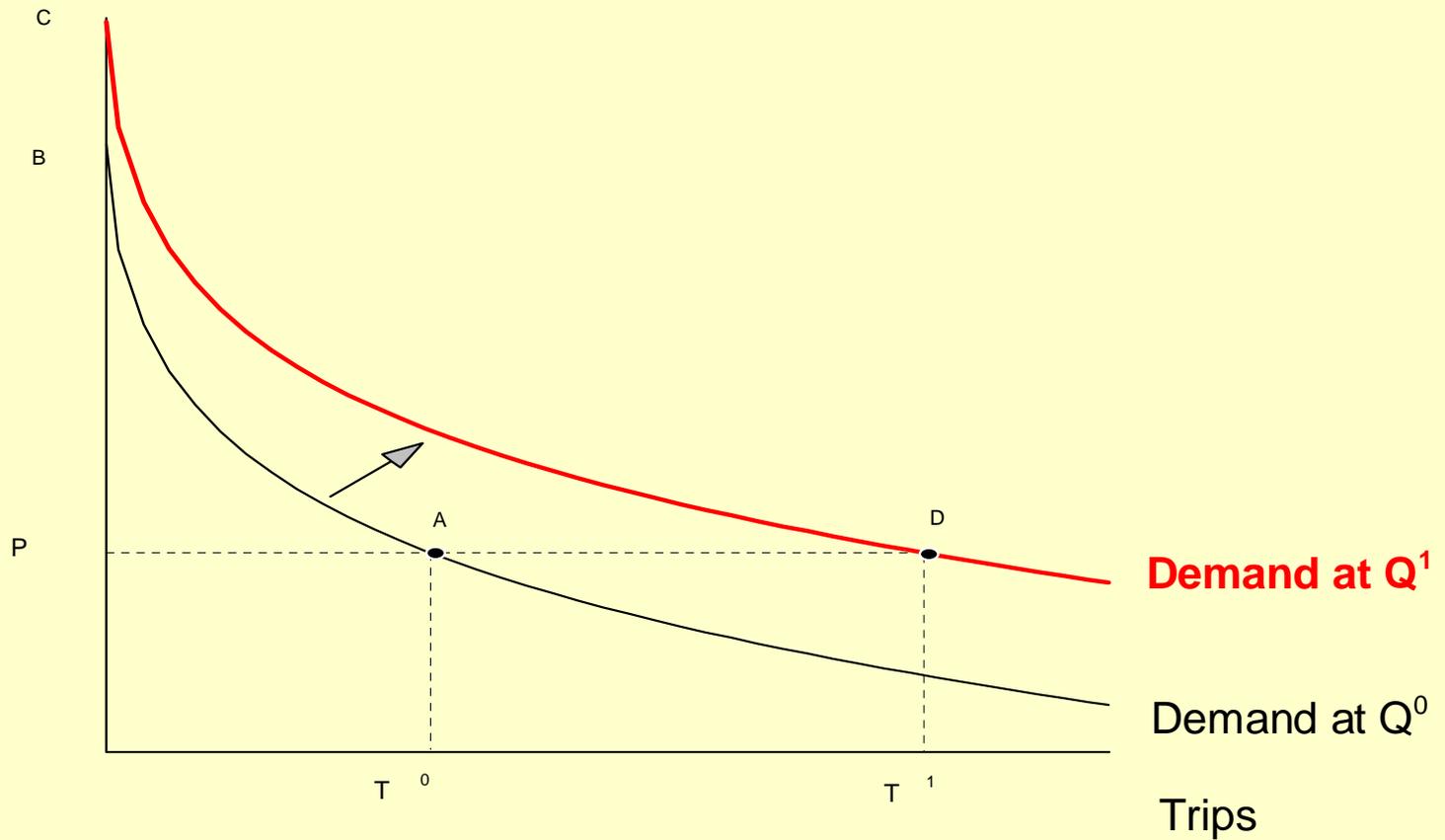
# Recreation

- Usage= $F(\text{costs, environmental quality})$
- Behavioral Model
  - How uses change when EQ changes
  - Can use for economic valuation



# Mmm, Demand Curves...

Price  
(travel  
cost)



# Recreational Uses/Behavioral Models (Research steps)

- Collect data with surveys of users
- Collect data on environmental quality
  - Needs spatial & temporal variation
- Econometric modeling
- Application

# Beach Uses

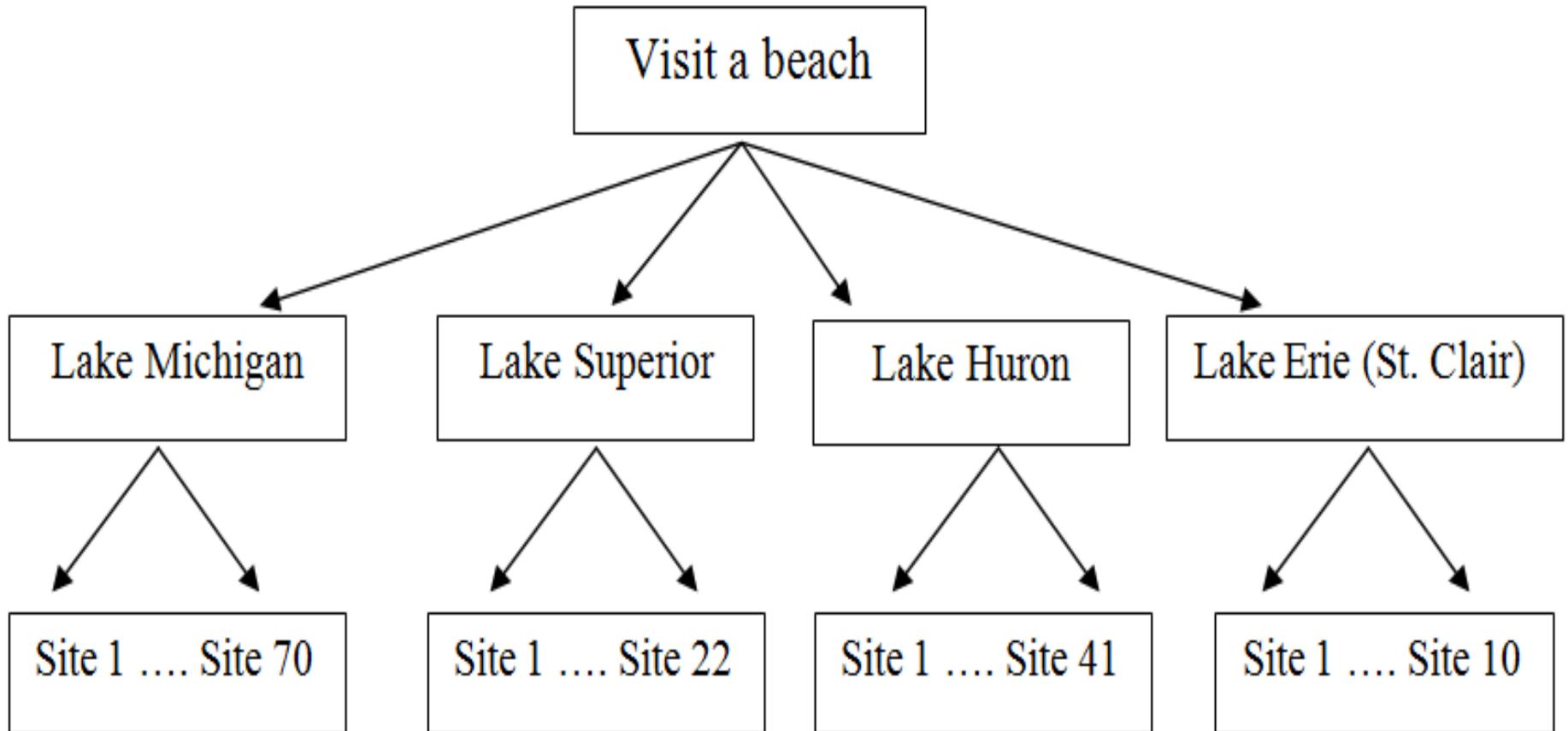
- **Pilot** survey & model completed
  - (funded by MSU Water & MSU ESPP)
- Collected data on Michigan GL beach use
  - Web survey, N=3,286
  - Beach visited the most in past years, N=2,566
  - Located 1,710 of these
  - Estimated simple demand models
  - Trips significantly & positively related to beach length and fewer beach closure days

# Model Specification

- Estimated
  - discrete choice model
  - two-level nested logit
- GL Beaches in MDEQ database
  - grouped at zipcode level
  - 143 site groups
- Data for Michigan residents only (our sample)



# Beach Visits Nesting Structure

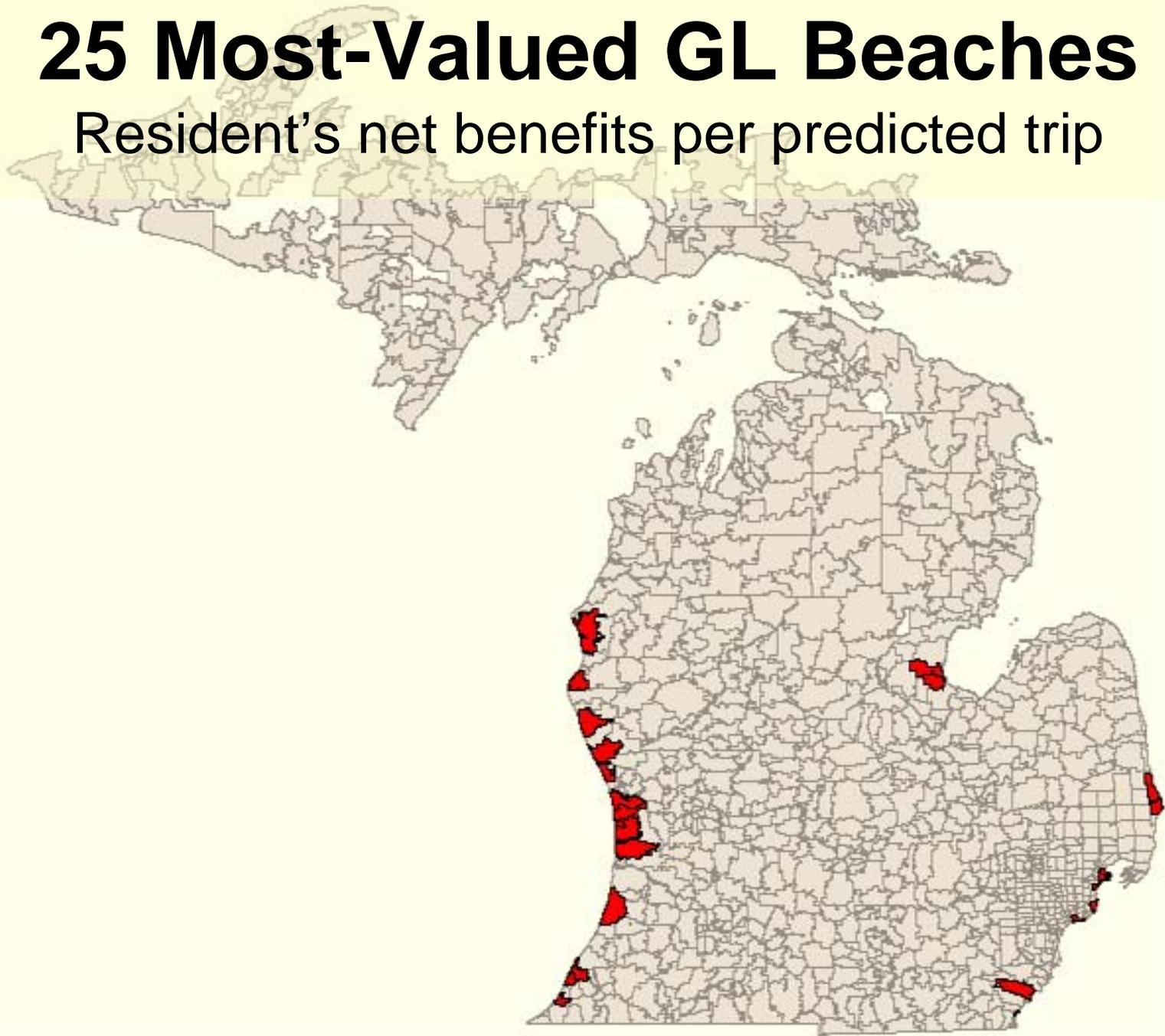


**Table 2. Nested logit travel cost model estimation results**

Variable	Coefficient	p-value
Price	-0.021	0.000
Llength	0.505	0.000
Cdays	-0.020	0.002
Adays	-0.003	0.981
$IV_k$	0.794	0.000
Lake Michigan	0.480	0.000
Lake Superior	0.592	0.008
Lake Huron	-0.549	0.000
Pseudo $R^2$	0.450	
LogL	- 919.003	

# 25 Most-Valued GL Beaches

Resident's net benefits per predicted trip





# Value to Users of GL Beaches

<b>Great Lake</b>	<b>Value all beaches at this GL (per “any” trip)</b>
Michigan	\$75.55
Huron	\$13.89
Erie (St.Clair)	\$13.28
Superior	\$2.67

# Fishing uses

- Statewide survey underway on fishing sites visited by Michigan anglers
  - (funded by NOAA, MDNR Fish. Div., & GLFT)
- Monthly survey waves
  - So far data on ~20,000 trips
  - Like beach use, these data allow us to estimate demand for fishing at Saginaw Bay
  - Fishing trips, value, and expenditures.

# Land uses: Motivation

- Residential and agricultural landowners
- No centralized land management agency
  - Herding cats
  - What will/won't landowners do?
  - What management attributes affect this?
  - Do incentives work?

# Land uses: Surveys/Models

- Attitudes toward various mgmt alternatives
- Preferences over various mgmt alternatives
- Willingness to change
  - $WTC = F(\text{mgmt attributes, costs, incentives})$
- Formal trade-off analyses
  - Gives quantitative model of **preferences & costs**

# Activities in 2010

- Modeling for rec. fishing
- Additional surveys & modeling for beaches
- Plan for land use survey phase