Quantifying Recreation Benefits from Clean Water

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Talk Outline

• Economic value
• Nonmarket valuation methods
• Modeling recreation demand
• Linkage between recreation & water quality
Recreation has value

Benefits = Willing to Pay – Had to Pay = Area A

Travel Cost

Demand under current management conditions

Q^1

Trips
In a BCA framework we want the increased value of recreation (=Area B)
Revealed preference to measure demand under current management conditions

• Based on **actual** behavior
• Travel Cost Model
• Ask ...
  – Sites visited
  – Number of visits to each site
  – Recreational activity
  – Distance to site
Stated preference to measure change in use based on change in water quality

- Based on *intended* behavior
- Contingent Choice Experiments
  - Variations on trip characteristics
    - Water clarity, color, fish catch, algal blooms
- Ask ...
  - How visitation will change?
The Random Utility Model: A More Realistic Approach

- People have many recreation choices
What is the link between recreation demand and nutrient loading?

**Stressor Action**
- Increased Nutrients
- Increased OM Inputs
- Excess Algae Metabolism

**Ecological Effects**
- Decreased Dissolved Oxygen
- Decreased pH
- Clarity
- Decreased Oxygen Sensitive Taxa
- Decreased Habitat Sensitive Taxa
- Decreased pH Sensitive Taxa

**Services Provided to Public**
- Decreased Index of Biotic Integrity
- Decreased RIVPACS score
- Decreased Trout Production
- Decreased Aquatic Life Use
- Decreased Recreational Use
- Decreased Drinking Water Use
- Decreased Non-use Value

Source: M. Paul, personal communication, September 05, 2008.
What is the link between recreation demand and nutrient loading?

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Biological response to changes in nutrient loading

300 mg Chl a/m² → 110 mg Chl a/m²

Photos from Suplee, et al., 2009
Remaining challenge (for the ecologists)

reduced nutrient concentrations at end of pipe

in stream biological conditions that are desirable