Muddy Waters: Non-Economics Social Science in Fisheries Management

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What is social science?

Economics and "other" social sciences

What is social science?

Study of the ways that people live and work: who we are, and how we got that way.

Important note: Social science is a science!

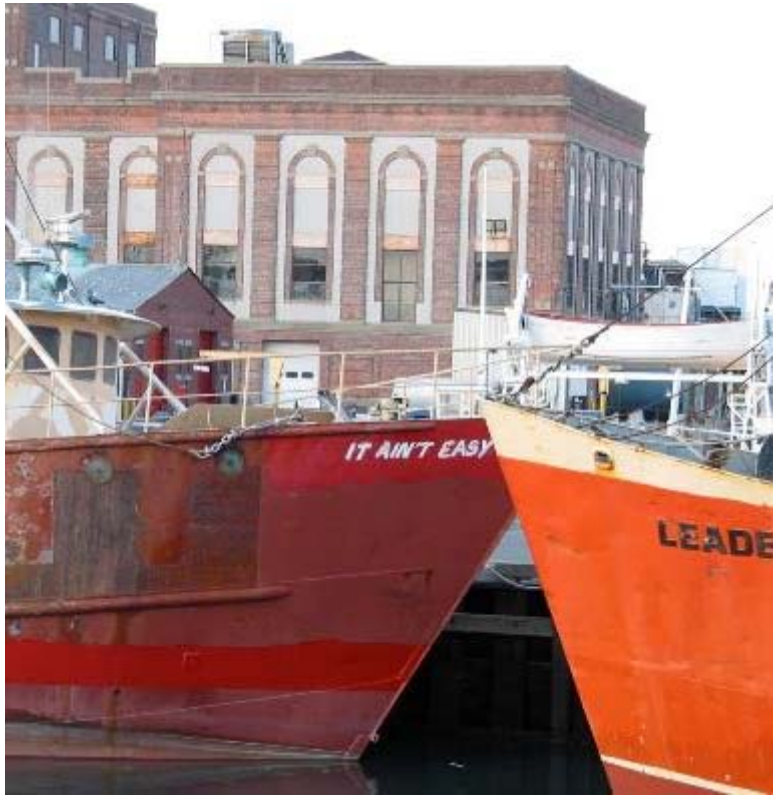
Social sciences consider how people allocate their resources and why

Context:

- Economics
- Organizations
- Knowledge (LEK)
- Values
- World view

What does social science have to do with managing fish?

- Fishery managers (micro-) manage people's access to fish …
- Allocations affect individual's choices, communities' and society's (cultural, social & economic) patterns …
- Conflict management requires social science information and analysis…



How can social science be used by ASMFC?

Compare the social and cultural consequences of different fishery management actions or policies

Specifically, social science asks:

What socio-cultural conditions are likely to be affected by the action or policy?

- What if no change is made?
- What is likely in the future if changes are made?

Social Analysis has made clear:

- Social and cultural systems are sensitive to change
- Small changes may have large cumulative impacts on fishery participants

+ Impacts may not be distributed evenly or fairly across the fishery participants

Tradable quota, for example

- Changes in relationships among different fishing groups; fishing fleet characteristics; other demographics
- Attitudes of fishermen towards regulations

Social factors typically considered:

- Characteristics of work force and community
- Social structures and organizations

Also:

- Cultural norms, beliefs and values of stakeholders
- Historical participation in the fishery
- Non-economic aspects of proposed actions, including ecological considerations

The ASMFC difference

- Recreational and small-scale fisheries are prominent in state waters, but
  - May be from diverse communities, may be intentional communities not "a place"
  - Communities may not be substantial dependent on fisheries
- Yet, these may affect the health and sustainability of a community

Not well-researched, at either state or federal levels, but important:

Environmental justice

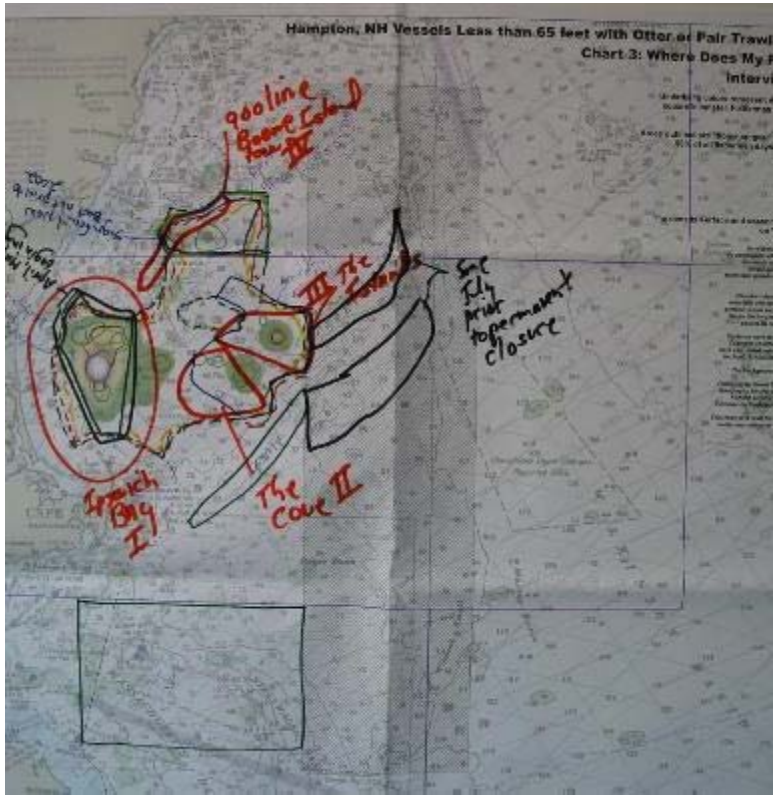
- Subsistence fishing
- Disproportionate impacts on lower income, minority groups

Also, food systems and food security

- How is fish as food distributed?
- Who has access?
- Is it domestic or imported?

Gaining influence: Ecosystem-based management

- Need information about where people fish (not just community from)
- Requires coordination with other agencies—ASMFC already collaborates with a variety of agencies



On the horizon: Climate change

- Southern species moving north?
  - Sand lance, cod
  - Flounders
- Infrastructure vulnerability
  - Sea level rise
- Fishermen's safety
  - Storms increased intensity
  - Frequency

Social Science Data from NMFS

+ Community profiles

Indicators and Indices—NMFS

Indicators

- Fishery performance
  - Distributional Outcomes
  - Governance
  - Stewardship
  - Well-Being
- Financial Viability

Indices:

- Social Vulnerability
- Reliance + Engagement
  - Commercial and Recreational
- Gentrification Pressure

Coming soon:

- Climate change
- Social capital
- Infrastructure

Data available from ACCSP

- Trip reports and monthly summaries
- Fishermen/dealer demographics (age, address)
- Vessel (license/registration; length, hull material, year built)
- Crew size
- State landed
- Catches (value, disposition)
- Gear

Future?

TAKE-AWAY POINTS

Sea Grant Massachusetts Institute of Technology

WHERE OCEAN SCIENCE MEETS CUTTING EDGE TECHNOLOGY

1. Non-Economics Social Science is a science
   - May be quantitative or qualitative or a mixture
   - Uses a variety of methodologies
     - Use of more than one methodology leads to more nuanced results that may be more reliable
   - Do you know your local social scientist?

2. Regulations affect individual's choices, communities' and society's (cultural, social & economic) patterns.
   - These may determine whether or not a community is able to adapt to change.
   - Can anyone offer an example other than what I've already mentioned?

3. Compliance (and enforcement) may be affected by:
   - The choice of regulations (including perceptions of equity)
   - The way regulations are designed
   - Examples?

4. While ASMFC is not required to include social impact assessments, these could help Commissioners in their decision-making

- Social science assessments represent fishermen and their communities
- ACCSP relies on states to provide accurate and complete information.
  - For the data to be reliable, more states need to consistently provide this data.
  - Is your state able to do so?
- NOAA's social science data, including fishery performance measures and community vulnerability indicators could help Commissioners

5. Ecosystem and climate change are already affecting the condition of the fisheries writ large.

- Flexibility (dynamic governance) may be a key to effective regulations
- Suggestions about how to achieve this?

Questions?

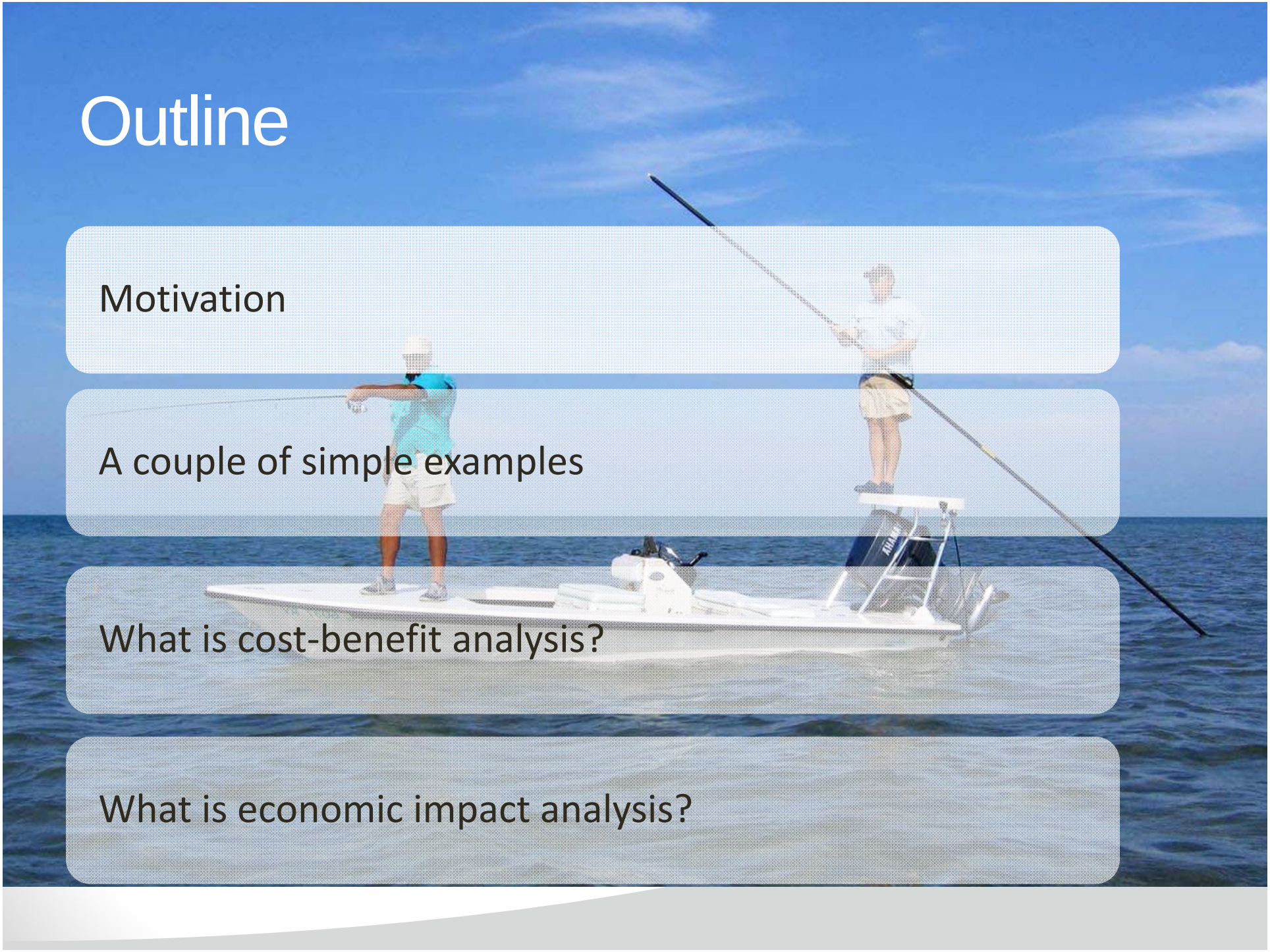
Cost-benefit Analysis vs Economic Impact Analysis in Fisheries Management

- **Jorge Holzer, Dept. of Agricultural and Resource Economics, University of Maryland**

- ASMFC Committee on Economics and Social Sciences

October 30, 2014

Outline



- Motivation
- A couple of simple examples
- What is cost-benefit analysis?
- What is economic impact analysis?

Motivation

- The concepts of **economic value** and **economic impact** have distinct meanings.
- The 2013 CESS socioeconomic survey of ASMFC commissioners revealed that these two concepts are (erroneously) used interchangeably.
- It is important to understand the kinds of questions each type of analysis can and cannot address.

Let's start with simple examples…

Example 1:

- Did the **BP oil spill** increase society's well-being? What do you think?
  - Yet the economic activity associated with the clean-up effort after the spill may have had a positive economic impact on the region.

Simple examples…*continued*

Example 2: Imagine two firms

- Firm X with $200K in revenue and $160K in costs
- Firm Y with $100K in revenue and $20K in costs

In which firm would you rather invest your money? Why?

Simple examples…*continued*

- Firm X generates $40K in revenue net of costs
- Firm Y generates $80K in revenue net of costs

Thus, firm Y generates more economic value than firm X.

Simple examples…*continued*

However, one could say that firm X generates more economic impact

- It has higher revenues and higher costs, thus more money may flow through the local economy, and it may generate more jobs.

Simple examples…*continued*

There may be a trade-off between economic value and economic impact

- It is possible for a project to generate lots of employment but for its costs to exceed the benefits.

How is this relevant to fisheries management?

A) Choice of Management Regime:

- Regulated open access with a TAC set too high*
- ITQs with TAC set at the optimal level

*Note: example borrowed from M. Smith (2013)

How is this relevant to fisheries management?

A) Choice of Management Regime:

- By transitioning the fishery to an efficient management regime (i.e. ITQ), the manager frees jobs and other factors of production (i.e. fuel) that can then be employed efficiently in other sectors of the economy:
    - For example, the lost jobs in the rationalization of the fishery could be employed in aquaculture, habitat restoration, etc.

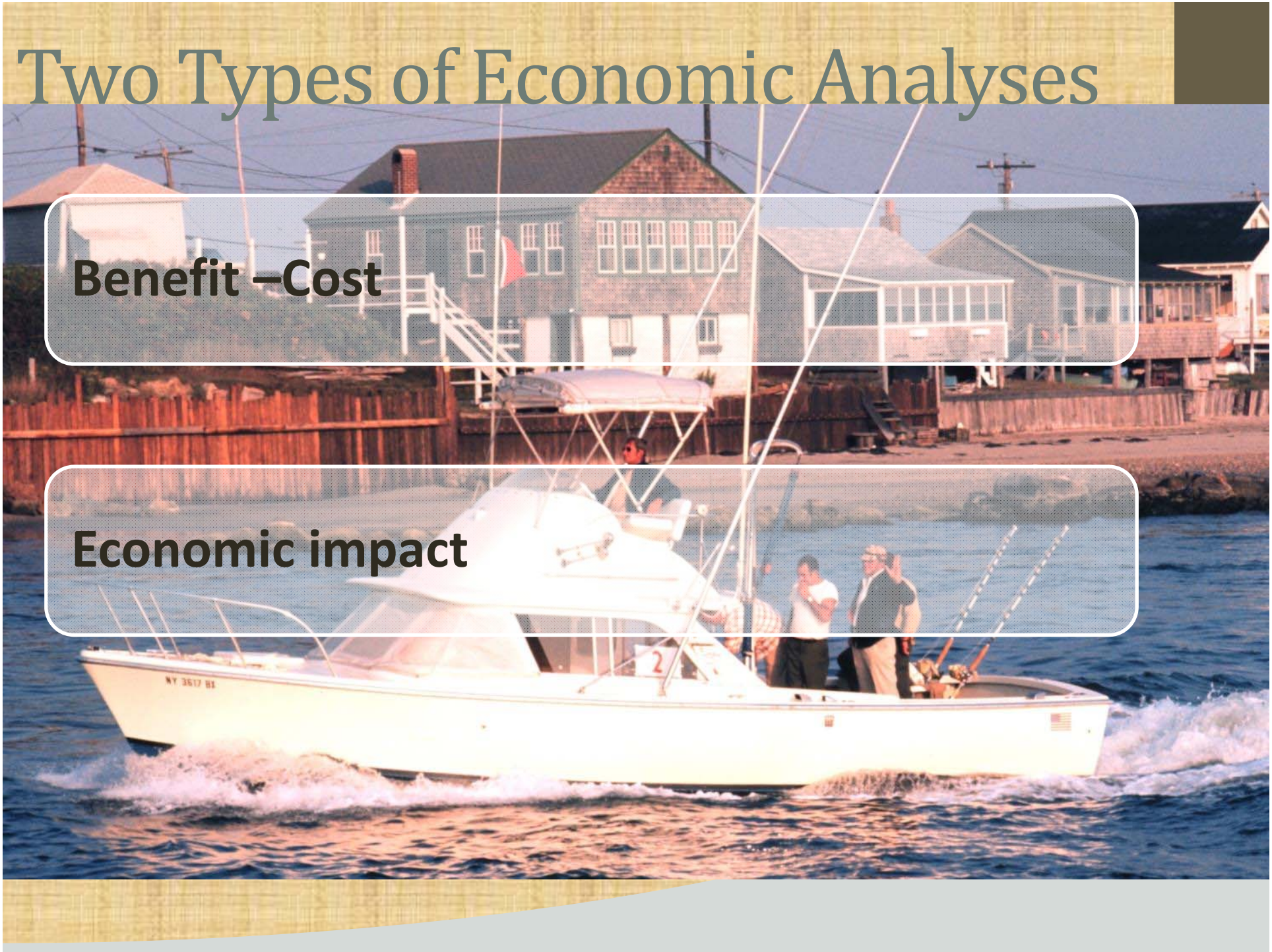
How is this relevant to fisheries management? ...*continued*

B) Allocation of Quota between Sectors:

- Think of firm X as an additional ton of quota of a given species allocated to sector 1 (*i.e. regulated open access with a TAC set too high*)

- Think of firm Y as an additional ton of quota of a given species allocated to sector 2 (*ITQs with TAC set at the optimal level*)

Two Types of Economic Analyses



Benefit –Cost

Economic impact

What is cost-benefit analysis?

Cost-benefit analysis estimates the costs and benefits of a particular project or policy, in order to determine its **economic value** (benefits-costs), or its **net contribution to society**

By comparing net benefits of different projects and policies, we can decide which ones should be undertaken (i.e. the goal is efficiency)

Note: for a given set of benefits, we increase net value by minimizing costs

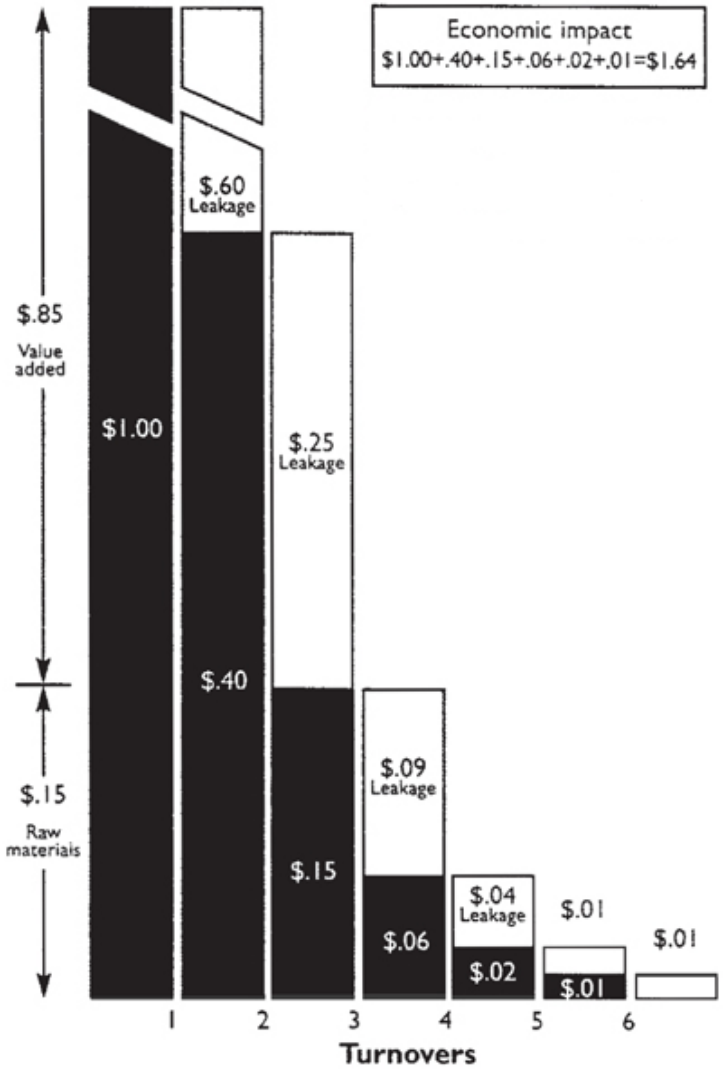
What is economic impact analysis?

Economic impact models (aka input/output models) trace the flow of expenditures through a region and show the distribution of impacts between industries, households and government. Can be used to describe the **multiplier effects** of expenditures throughout the economy.

Unlike economic value, there are several potential measures of economic impact: in terms of (1) business output, (2) value added, (3) personal income, and (4) jobs.

Note: by increasing the costs of a project we increase its economic impact

Economic Impact Analysis *continued*



Source: Terry Crawford

Example of multiplier effect: $1 spent on fuel spurs additional economic activity: the gas station attendant is paid and then buys groceries, pays his mortgage, makes his car payment, etc.

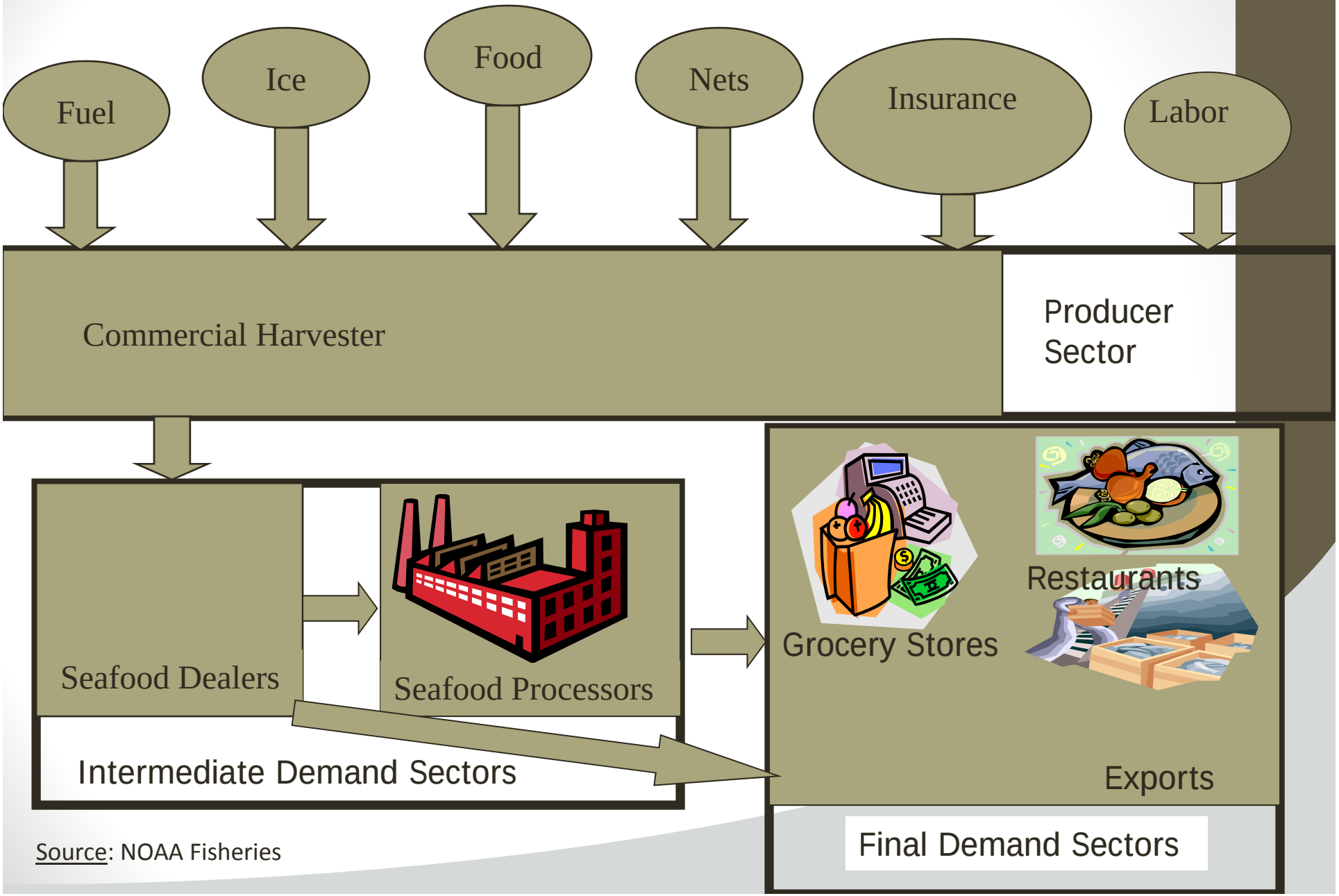
Economic Impact Analysis *continued*

- Capture inter-industry transactions among businesses and between businesses and final consumers in an economy

- Inform managers of how impacts are distributed:
  - Across different regions
  - Sectors of the regional economy
  - Government (impacts from fees, taxes)

- **Doesn't measure societal benefits, efficiency, or trade-offs.**

Commercial Fisheries Model Basics



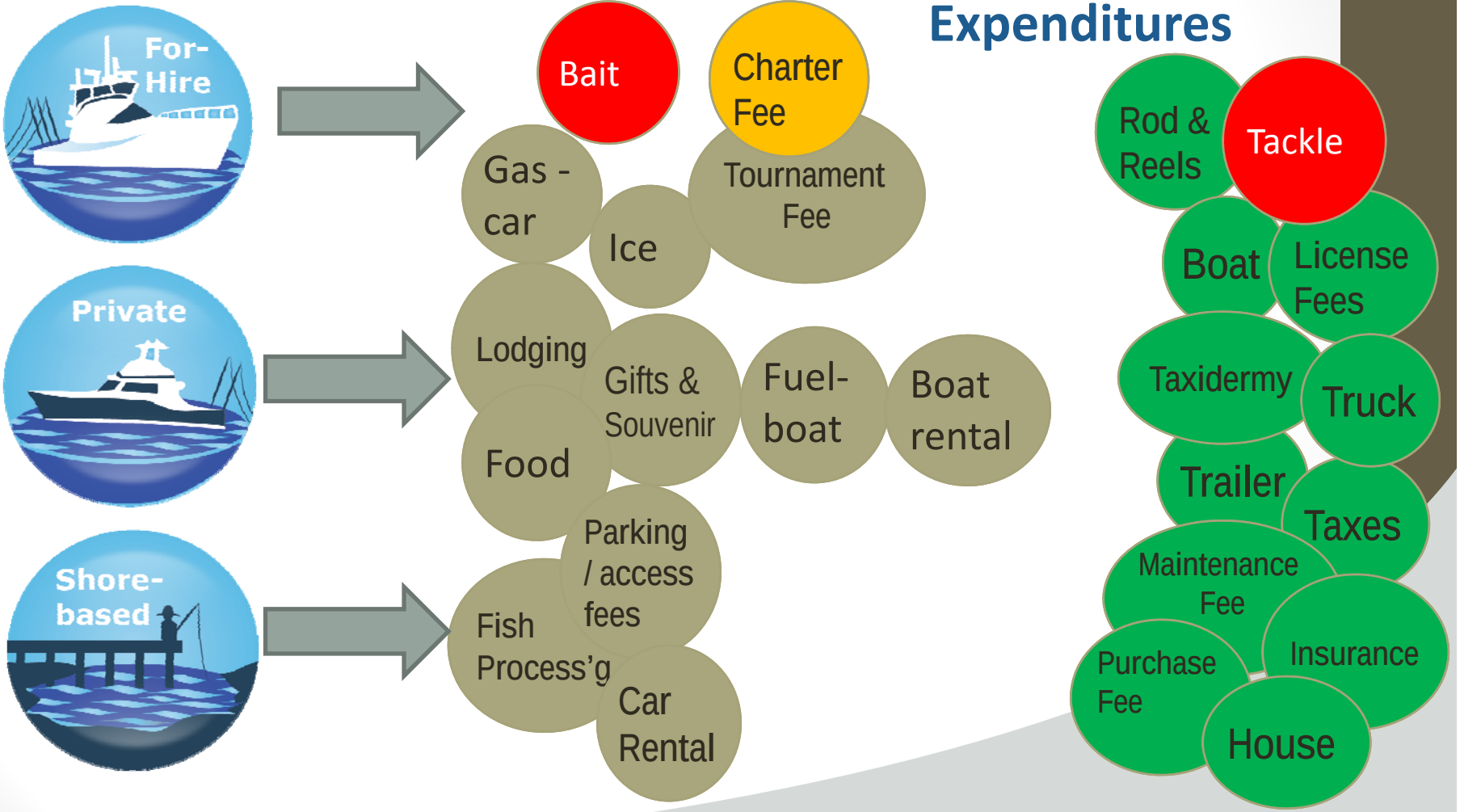
Source: NOAA Fisheries

Recreational Fisheries Model Basics

Angler expenditures generate economic activity:

A) Trip Expenditures

B) Durable Expenditures



Source: NOAA Fisheries

NMFS Recreational Fishing Expenditure Surveys and Impact Models

Data collected:

- Expenditures on fishing trips and related equipment
- Spending on different types of fishing (shore, private boat, for-hire)
- Spending by residents and non-residents of a state

Provide an estimate of how angler expenditures contribute to a region's economy

- e.g., the number of jobs supported

Used to evaluate economic development opportunities

- For example, how will local sales be affected by building a new fishing pier?

Information Provided by Economic Impact Analysis

Total economic impacts = Direct + Indirect + Induced

- **Direct Impacts** - The initial expenditures, or production, made by the industry sector
- **Indirect Impacts** - The effects of local inter-industry spending generated through the backward linkages.
- **Induced Impacts** - The results of local spending of employee's wages and salaries for both employees of the directly affected industry, and the employees of the indirectly affected industries.

Information Provided by Economic Impact Analysis

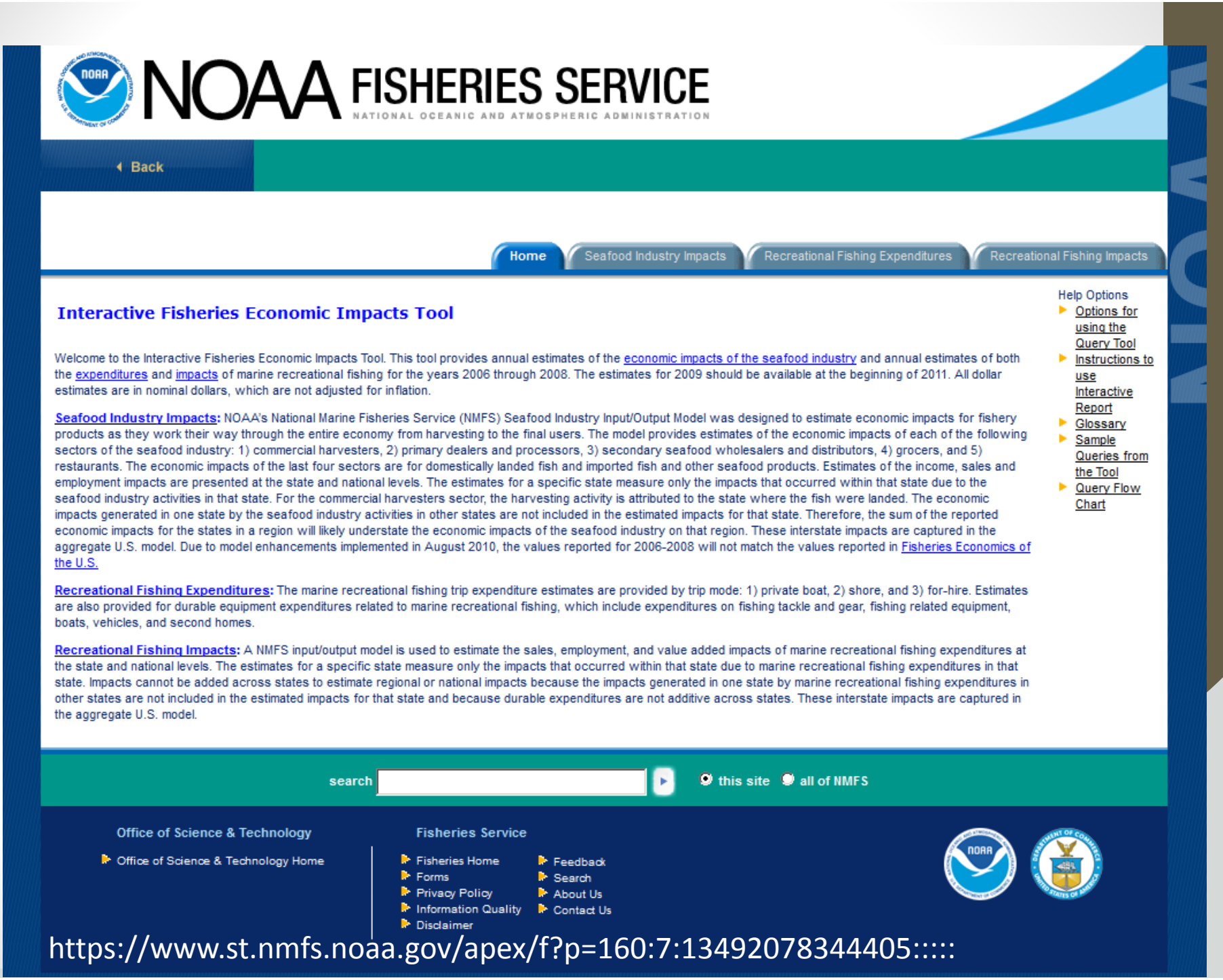
- Impact analysis does not provide information on **substitution effects**.
- For example, reducing the bag limit may **reduce the total economic impact of the recreational fishery**.
- However, if the anglers that stop taking fishing trips decide to go hunting (or bowling) instead, total economic activity may increase in the region.

NMFS Economic Impact Analysis

- Regional Models for Commercial and Recreational Fisheries used in management
  - Models used to estimate the **change** in economic activity associated with management options
  - Direct impacts typically estimated to assess impact on shoreside businesses
  - Also provide change in total impact on region
- National Model used in selected regions for management as well as for statistical reporting
  - FEUS provides the **total** impacts from recreational and commercial fishing at state and national level
- All models estimated using IMPLAN

Selected Results

	Economic Impact Estimates	Job Impacts
A	New Jersey 2012 Total Job Impacts from Saltwater Angler Expenditures	13,131
B	New Jersey 2012 Job Impacts from Saltwater Angler Trip Expenditures Only (excludes durable goods expenditures)	2,680
C	North Atlantic Job Impacts from 2014 Summer Flounder, Scup, and Black Sea Bass Recreational Specifications	16 to 58



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Summary

- **Economic value** and **economic impact** are different concepts!
- Benefit-cost analysis is used to determine the economic value of a project/policy, that is, its net contribution to society
- Impact analysis is used to determine the distribution of impacts (jobs, output) associated with a project/policy in the regional economy
- The costs of a project (all else equal) reduce its net benefits, but increase its economic impact