Class #27  
Fisheries & Open-Access Resources

- You started with 10 boats and have increased to 40 by year 4
- There are 10 fleets in the fishery.
- You sell fish at the price of $2 thousand per unit.
- Cost per boat per year is $1 thousand per boat.
- Retiring a boat costs of $0.5 thousand.
- Objective: maximize money in the bank at the end of the game. Interest rate: 5%.
- Winners will be paid in ______.

Decide how many boats to use each year.
Send a representative to the computer to report your effort this year.
Wait for computer to calculate your harvests, revenue, costs, profits and balance
Do it all again

What is an open-access good and why does it lead to inefficiencies?
- An open access resource is a limited resource that appears to each individual to be limitless.
- Individuals use the resource without taking into account the effect that their use has on others.
- Which property right characteristic fails?

A full day’s work for an Indian fisherman

<table>
<thead>
<tr>
<th>Year</th>
<th>Effort</th>
<th>Harvest</th>
<th>Revenue</th>
<th>Cost</th>
<th>Profit</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>6</td>
<td>12</td>
<td>10</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>22</td>
<td>44</td>
<td>20</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
<td>44</td>
<td>88</td>
<td>30</td>
<td>58</td>
<td>85</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
<td>62</td>
<td>124</td>
<td>40</td>
<td>84</td>
<td>173</td>
</tr>
</tbody>
</table>
The economics of fisheries and open-access renewable resources

The Tragedy of the Commons

- Why is it a tragedy?
  - Because the resource able to generate profits (resource rents), but the incentives eliminate those profits.
  - This is what is called a stock externality.
- Why is it misnamed?
  - Because it is an open access resource.
  - Effective common-property management can eliminate the “Tragedy of the Commons.”
The economics of fisheries and open-access renewable resources

The Gulf of Nicoya, Costa Rica

Solutions to the “Tragedy of the Commons”

- Limiting the season or otherwise making fishing more difficult (e.g., unreasonable restrictions on equipment or very short open seasons)

By the early 1990s, the Alaskan halibut season was reduced to two 24-48 hour openings per year. (Sutinen, Johnston & Shaw, 2002)
Solutions to the “Tragedy of the Commons”

- Limiting the season or otherwise making fishing more difficult
- Taxing effort

**Benefits and Costs of Fishing Effort ($’s)**

<table>
<thead>
<tr>
<th>Quantity of Fishing Effort</th>
<th>Revenue</th>
<th>Costs after Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>$E_1$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$E_2$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$E_3$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Solutions to the “Tragedy of the Commons”**

- Limiting the season or otherwise making fishing more difficult
- Taxing effort
- Establishing common ownership over the fishery (fishery cooperatives, 200 mile limit)
- Individual transferable quotas

**Fishing for Cod:**

[http://nyti.ms/XlMCmC](http://nyti.ms/XlMCmC)

- Team questions to answer after the video
  1. What evidence of the tragedy of the commons do you see in the video?
  2. What type of fisheries policy is being used in the cod fishery?
  3. What evidence is there that the policy is succeeding?
  4. What evidence is there of bycatch?
Team Choice

- Teams on the left (1, 3, 4, 7, 8) are acting as managers, mostly interested in making sure the fish stocks are managed sustainably
- Teams on the right (2, 5, 6, 9, 10) are acting as fishermen who want to make money.

Vote for the policy you prefer.
A – Total Catch Limit
B – Tax on effort
C – Gear restrictions
D – ITQ

Why is Fisheries Management so Difficult?

- Uncertainty
  (People don’t trust other people’s estimates)
- Politics
- Enforcement
- The simple models don’t describe a complex world
- Bycatch

The End