Basic Fisheries Economics
(with a digression on high-sea slavery)

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Ocean Conservation Masterclass
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What are the fishing costs composed of?

Fixed costs vs. variable costs

1) Fuel and maintenance;
2) crew salaries (~opportunity cost of labor);
3) depreciation;
4) opportunity cost of capital.
There are good reason to try to reduce fishing costs

Effect of a fishing cost reduction

TR & TC ($)

Fishing effort (E)

BE₁

BE₂

E₃

E₄

TC₁

TC₂

TR
The most important, and ‘best’ method for reducing fishing cost are technological advances…

Increase of fishing power in English trawl fisheries for cod, based on data in Engelhard (2008, Table 1).
Simulated increase in effective effort over a 50 year period consisting of a mixture of background rates (C% = 1 and 2%) and rapid increases (5%) due to technological improvements. The average rate (2.41%; dotted line) is obtained by comparison of the beginning and end estimates of effective effort, but can be approximated by an average rate of increase weighted by the number of years (2.42%).
Reducing fuel consumption is also very important…

…for example via more efficient engines.
Global fishery prospects under contrasting management regimes

Christopher Costello\textsuperscript{a,1}, Daniel Ovando\textsuperscript{a}, Tyler Clavelle\textsuperscript{a}, C. Kent Strauss\textsuperscript{b}, Ray Hilborn\textsuperscript{c}, Michael C. Melnychuk\textsuperscript{c}, Trevor A. Branch\textsuperscript{c}, Steven D. Gaines\textsuperscript{a}, Cody S. Szuwalski\textsuperscript{a}, Reniel B. Cabral\textsuperscript{a}, Douglas N. Rader\textsuperscript{b}, and Amanda Leland\textsuperscript{b}

This needs some explaining…
Quotas: a good idea which can easily be turned into a bad idea

1) It is a good idea to limit the catch of a fishery;

2) Then you give exclusive access to a community;

   3) Then you individualize the TAC; call them ‘catch shares’;

   4) Then you give them away to your political friends;

   5) And you give them away in perpetuity – really!

   6) And you make them transferable, as in ITQ…

   7) Now Wall Street has exclusive access to the fishery resources of your country. You are now managed!
Subsidies are another way to reduce costs
Asia is by far the greatest subsidizing region (43 % of total), followed by Europe (25 % of total) and North America (16 % of total). For all regions, the amount of capacity-enhancing subsidies is higher than other categories, except both North and South America, which have higher beneficial subsidies. Adapted from FAO (1992), Milazzo (1998), Sumaila and Pauly (2006), and Sumaila et al. (2010).
The most pernicious way to reduce fishing cost is to reduce the cost of labor, which can be achieved, in the fishing fleets of richer countries, by recruiting fish worker from poorer countries.

One key reason for this are the higher opportunity costs of labor in richer, developed countries, compared with those of poorer countries.
Finally, there are the wages of crew, which are rather low in the US.

<table>
<thead>
<tr>
<th>State</th>
<th>Hourly Wage</th>
<th>Annual Salary</th>
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<tbody>
<tr>
<td>Commercial Fisherman Salary in Alaska</td>
<td>$14.64</td>
<td>$30,460</td>
</tr>
<tr>
<td>Commercial Fisherman Salary in Mississippi</td>
<td>$14.19</td>
<td>$29,500</td>
</tr>
<tr>
<td>Commercial Fisherman Salary in California</td>
<td>$14.26</td>
<td>$29,660</td>
</tr>
<tr>
<td>Commercial Fisherman Salary in Florida</td>
<td>$13.13</td>
<td>$27,310</td>
</tr>
</tbody>
</table>

But the opportunity cost of labor in poor developing countries is far lower (trending toward zero); thus fleet operators can rely on workers from poor countries to reduce their costs...
Relying on crew from poor countries leads to abuse, which will come from the abhorrent working conditions built in the ‘contract’ that they get.

From: ‘Not in New Zealand, surely?’ (Stringer, Simmons, and Coulston, 2011)
Then, there is slavery...

Slavery is a legal or economic system in which principles of property law are applied to humans allowing them to be classified as property, to be owned, bought and sold accordingly, and they cannot withdraw unilaterally from the arrangement.

While a person is enslaved, the owner is entitled to the productivity of the slave's labour, without any remuneration. The rights and protection of the slave may be regulated by laws and customs in a particular time and place, and a person may become a slave from the time of their capture, purchase or birth.

Today, chattel slavery is unlawful in all countries, but a person may still be described as a slave if he or she is forced to work for another person without an ability on their part to unilaterally terminate the arrangement. Such situations are today commonly referred to as "practices similar to slavery". The present form of the slave trade is commonly referred to as human trafficking.

Wikipedia, on ‘Slavery’
The widespread occurrence of slavery in industrial fisheries was recently documented in a series of hard-hitting articles by a team from the Associated Press.


http://www.ap.org/Content/Press-Release/2016/AP-wins-Pulitzer-Prize-for-Seafood-from-Slaves-investigation
<table>
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<tr>
<th>Date</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>March 25, 2015</td>
<td><strong>AP Investigation: Are slaves catching the fish you buy?</strong></td>
</tr>
<tr>
<td>March 24, 2015</td>
<td>Video: US supply chain tainted</td>
</tr>
<tr>
<td>April 3, 2015</td>
<td><strong>AP investigation prompts emergency rescue of 300 plus slaves</strong></td>
</tr>
<tr>
<td>April 22, 2015</td>
<td>US lets in Thai fish caught by slaves despite law</td>
</tr>
<tr>
<td>June 29, 2015</td>
<td>Interactive: 22 years a slave</td>
</tr>
<tr>
<td>July 27, 2015</td>
<td><strong>AP Exclusive: AP tracks slave boats</strong></td>
</tr>
<tr>
<td>September 17, 2015</td>
<td>More than 2,000 enslaved fishermen rescued</td>
</tr>
<tr>
<td>December 14, 2015</td>
<td>Shrimp sheds</td>
</tr>
<tr>
<td>December 14, 2015</td>
<td>Video: Supermarkets selling shrimp peeled by slaves</td>
</tr>
<tr>
<td></td>
<td>Cover letter for entry</td>
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</table>

Thai and Burmese fishing boat workers sit behind bars inside a cell at the compound of a fishing company in Benjina, Indonesia. (AP Photo/Dita Alangkara)
WASHINGTON — President Obama will sign legislation this week that effectively bans American imports of fish caught by forced labor in Southeast Asia, part of a flurry of recent actions by the White House, federal agencies, international trade unions and foreign governments to address lawlessness at sea and to better protect offshore workers and the marine environment.

Let’s discuss that.