

## Lecture 8 – Oceans and Fisheries

1. Climate and the Ocean
2. Ocean Management Challenges
3. Collapse of the Cod Fisheries
4. Pollution
5. Aquaculture
6. What to do?

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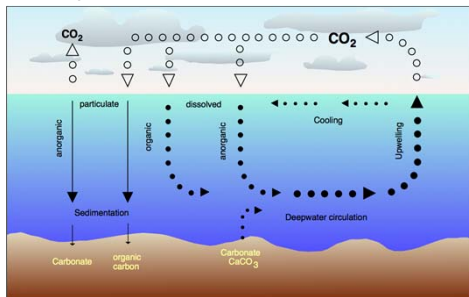
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### 1. Climate and the Ocean

- Balance between the amount of  $\text{CO}_2$  in the atmosphere and bicarbonate in ocean




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### 2. Ocean Management Challenges

- Continental shelves:
- Provide:




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### Ocean Management Challenges (3)

- Fisheries provide:




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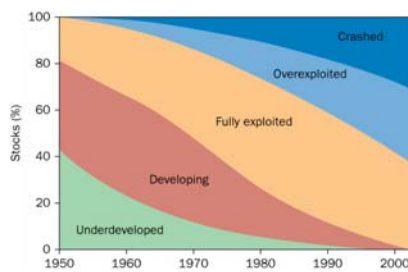
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### Environmental Impacts of Marine Fisheries

- More than 80% of global fisheries are:

**State of the world's fishery stocks**




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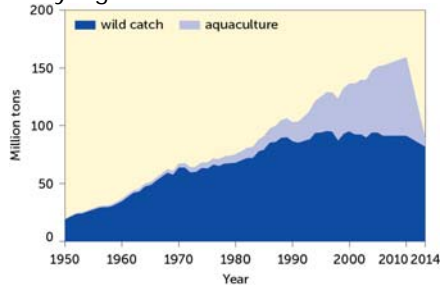
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### Environmental Impacts of Marine Fisheries

- May signal:




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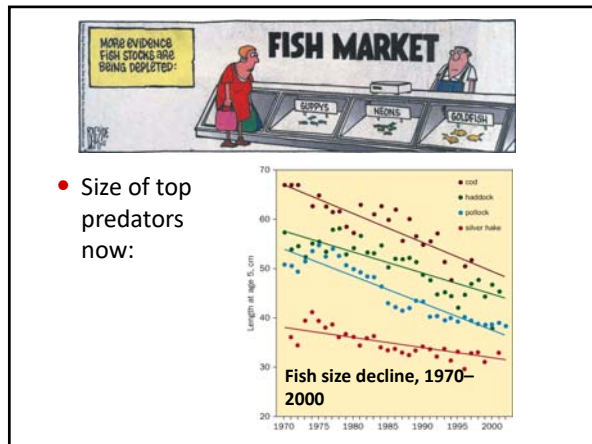
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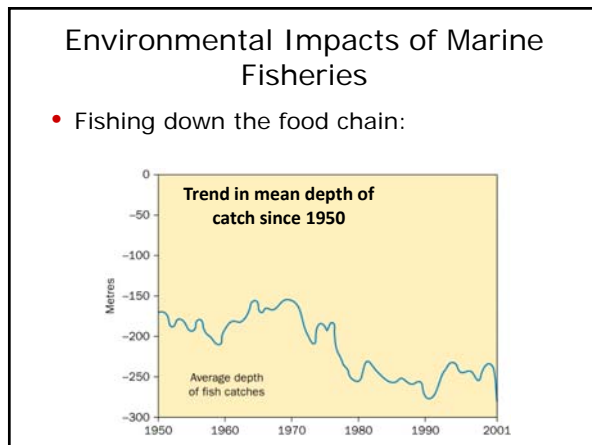
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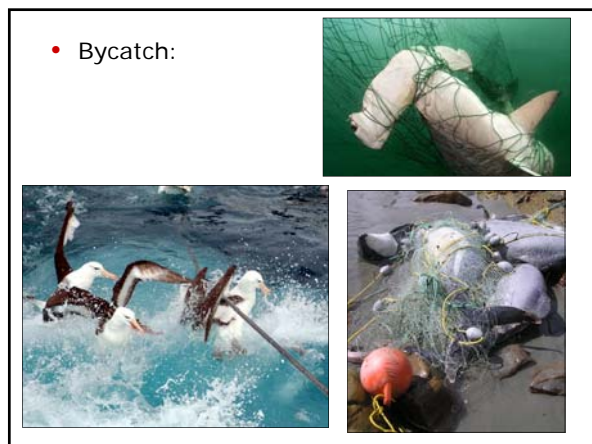
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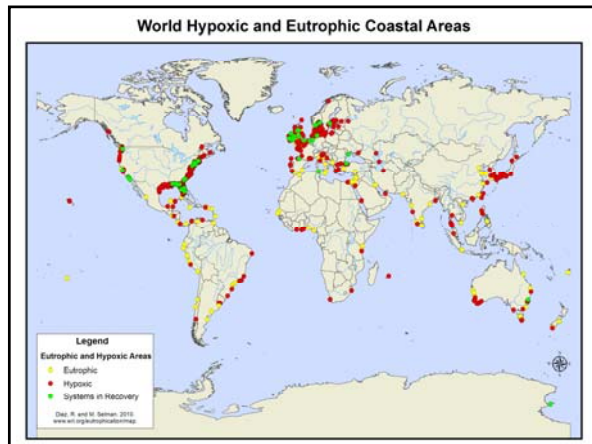
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**Impacts on Marine Ecosystems**

- Offshore drilling:





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**Coastal Zones Development**

- ~ 50% of the world's population lives:




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### 3. Collapse of the Cod Fisheries

Major fishing areas in Atlantic Canada




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### Collapse of the Cod Fisheries (2)

Major fishing areas in Atlantic Canada

- Catch in late 1950s:
- 1974:
- 1977; Canada declared a 200-nautical mile:




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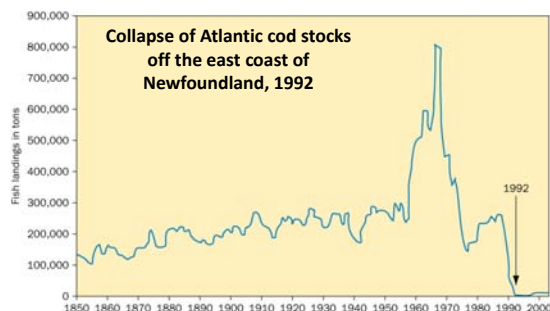
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- 1993:
- Sharp reduction in quotas for other species




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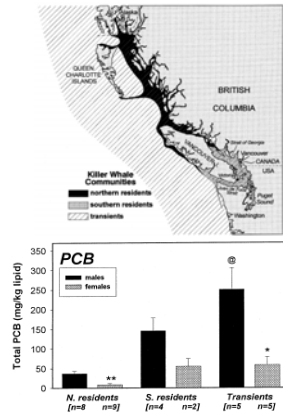
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#### 4. Pollution

- Main sources of marine toxicants in Canada:

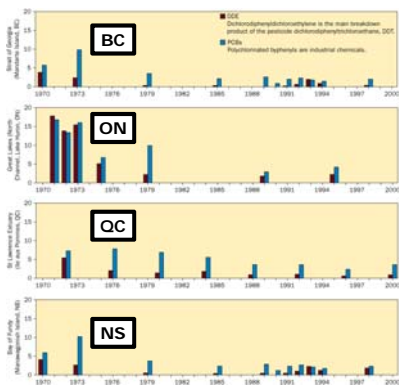
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- Bioaccumulation & Biomagnification



- Long-range transport of toxicants an issue
- e.g.:

Levels of DDE and PCBs in double-crested cormoran eggs (parts per million)

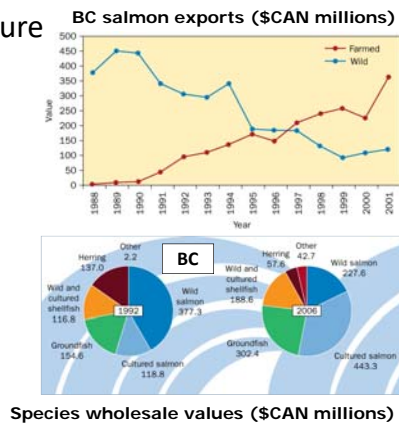


#### 5. Aquaculture

- Fastest growing food production sector in the world

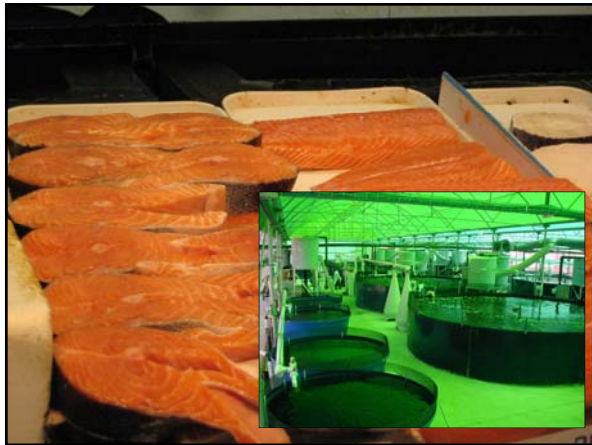
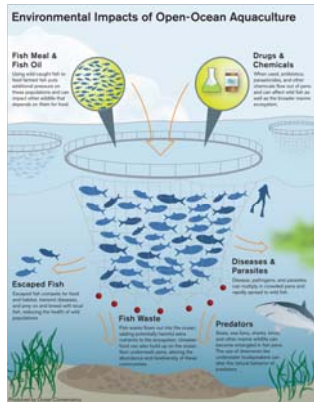
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- BC:



## Problems with Aquaculture

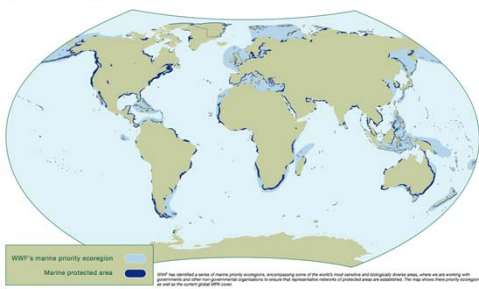
- Energetics:
- 3–4 kg of marine fish produce:
- Economy: controlled by 5 multi-national companies



## 6. What to do?

- United Nations Convention on the Law of the Sea (UNCLOS), 1994

Marine protected areas worldwide





## Canada's Oceans Strategy

- Oceans Act passed in 1998
- But:




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## What to do?




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## Conclusion

- The acidification of the ocean and climate change represent a challenge for the future of the fisheries
- The coastlines are the most productive areas for fisheries but also the most exposed to pollution
- The world's fisheries are fully exploited and could collapse by mid-century
- While aquaculture is growing in importance, it is also associated to several negative impacts

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### Things to Consider

1. What are the positive and negative effects of aquaculture production? How might these be reconciled? Based on your knowledge of these effects, do you think that aquaculture should be permitted along Canada's coasts?
  - If so, under what circumstances and/or guidelines? If not, why not?
2. How has Canada expressed its interests in protecting marine ecosystems? Do you think such an emphasis is justified, considering its other environmental priorities? What role has Canada played in the development of innovative ocean management policies at the national and international levels?
  - Have these policies been put into practice?

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### TO DO!

1. Next lecture: Water – chapter 11 in textbook
2. Listen to Podcasts: Water – Units 1 to 6
3. Tutorials **this week**: Group Discussion; bring the "Group Discussion Answer Sheet"
4. Term Paper **this week**: Draft of the Term Paper (**print it**) + review by a peer (bring a copy of the Review Grid to your tutorial)
5. Quiz 2: from Oct. 16 (10 pm) to Oct. 20 (10 pm)

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