

## GEOS 412 Homework #8: Marine Fisheries

NAME \_\_\_\_\_

This homework exercise will look at how marine fisheries have changed over the last few decades. It is intended to make you think about how factors such as fish pressure, economics, and climate all affect fisheries.

What's due:

1. The answers to the questions below, in the space provided.
2. The data you collected from the web sites, on a separate piece of paper.
3. The graphs you plotted up using this data.

*When it's due: Apr 17, in class.*

### Part One

In this section you will be looking at cod catches in Canada from the early 1970s to as recently as two years ago. The goal is to get an idea of how and why fish yields can change over time due to human impacts.

1. Go to <http://www.dfo-mpo.gc.ca>.
2. Click on the English language version. This will take you to the home page of the Department of Fisheries and Oceans, Canada. You are going to use data from this site to look at changes in fish catches. (You will be moving around a lot within this site)
3. Click on the gray *Statistics* button (lower left), and then go to *Commercial* (left of page), then *Landings* (also left of page).
4. Click on *Historical Landings – Seafisheries* (left side of page).
5. To find the data on cod catches for the years 1972 through 1989, click on the box by each year under the “Quantity” column. Record the **total fish catch** for all of Canada (which is found in the last row, last column of the table), **total cod catch**, and **cod catch value** (value given in the equivalent table under the “Values” heading-previous page) in a separate Excel Spreadsheet. Do this for each year in this section.
6. When you are finished, go back to the ‘Statistics Page’ and click on *Landings-Seafisheries* and then *Canadian-Provincial-Quantities*, to get information from the 1990s-2004 (most recent data available). For each year, open up the page for *Canada Quantities* and record the number for the total tonnage of all fish (Total Canada-right columns), the cod catch and its value for each year.



9. Now let's look at the global pattern. Collect and plot (in the same fashion) **total fish catch** data for the **entire world** and the top five individual countries in 2001-2004 from *Commercial-Landings-Seafisheries-World Harvest*. Then follow those same countries and the world total for the 1996-2000 period (go back a page to find this) and for the 1990-95 period. Then examine the same five countries over the period 1970-1989 from the data under *Landings-Historical-World Harvest*.

10. Make an excel plot of total fish catch for the world and the 5 individual countries. Plot years on the x (horizontal) axis and catch on the y (vertical) axis.

11. Now answer the following questions:

a. What happened to the world catch over this time?

b. What countries gained and declined in total catch from 1970-2004?

c. How would you explain these trends?

d. Do you see any shorter-term variability (interannual ups and downs) in any of the fish catches from individual countries? If so, what countries have the most prominent interannual variability? What do you think is the mechanism for this variability?

12. Read the article online by Pauly et al. (2002). Write a brief (1-2 pages single-spaced) summary that addresses the following issues:

- the likelihood of sustainability in fisheries
- nonsustainable practices and how they are part of standard fisheries practices
- the signs and consequences of nonsustainable fishing
- potential approaches to improving the health of the global fish population
- your thoughts on the future of the world's fisheries

(Sustainability has been defined as the level of resource utilization that enables the current generation to fulfill their needs while not compromising the abilities of future generations to use that same resource to fulfill their own needs. The concept of "maximum sustainable yield" in fisheries management promotes the idea that there is a level of harvest of individual species that does not compromise future stocks.)