Water Footprint Report

DUE: Rough draft Wed. Feb. 18 (15 points); Final version Wed. Feb. 25 (60 points)

Overview: For this assignment you will create a report (4-6 pages of text, excluding graphs and tables) about your water consumption. This will include direct usage as well as secondary use caused by your dietary and consumer habits. You will need to make estimates of some of your activities and their impact, and in your report you will explain how you made your estimates as well as your assumptions. Your report will communicate your results in writing, tables, and graphs, including a discussion of how your results fit into a larger context. You will draw on at least three reference sources to help you and your readers understand the topic. Your paper should be double-spaced, 12 point font, with 1" margins and submitted in paper form in class.

Learning objectives: This assignment is designed to help students:

- Think critically about how to make estimates
- Practice numerical calculations and representing data in graphs and table
- Practice their prescriptive and analytical writing skills
- Reflect on how economic circumstances and resource availability vary greatly between countries and cultures.
- Reflect on how personal decisions impact the larger society and environment, and the ethical issues this raises

Before Writing Your Report:

- Do some research on the idea of a water footprint and the problem of fresh water availability, both in the United States and at least one developing country. In addition, research the amount of water consumed or polluted by different activities in order to understand where communities have the most impact on water usage, and how communities try to manage these impacts. Find information from reliable sources, but for this assignment they don't have to be academic research papers.
- Keep track of your food intake and water use habits for one day and extrapolate them where necessary in order to fill out the table provided at the end of this assignment. (Some data must be entered in weeks--see instructions below.) Make notes about how you arrived at your answers in the worksheet. You will need these for the Methods section of your paper. Data you gather in the table may also be useful in creating an Excel spreadsheet for generating graphs in your report.

Your Report should contain the following sections in this order, each with a clear heading:

- **An abstract** that summarizes (briefly) the findings in your report (e.g. your main water usage impacts and the main points in your discussion). Mention these main points in your abstract, but do not explain them here. Your abstract should be limited to 200 words and should stand on its own as a summary. It may be a good idea to write this last.

- **An introduction** that helps the reader understand what is coming in your report and why it is important. Include some motivation for your report including information from your research on the general problem of clean, fresh water availability (due to overconsumption or pollution). Be sure to cite your information sources. Also provide some background on your particular living situation and habits including the type of

household you live in (e.g. apartment or house, alone or with others) and general diet type (vegan, vegetarian, etc.). The introduction is the actual start of your paper (not the abstract), so you should again briefly summarize your main findings and points. After reading your introduction, the reader should have a good idea of what is coming and why it is important.

- **A methods section** where you explain briefly your use of the online water footpring calculator and any non-straight-forward estimates you used in calculating your water footprint, including any assumptions you made (e.g. how you extrapolated from keeping track of your food for a day to your weekly consumption estimates, or if you live with others and do laundry together, how you calculated your share). A skeptical reader looking over your table and your methods section should be able to understand where your numbers come from. Be sure you provide enough information for them to do so. Bullet points might be useful in this section

- **A results section** where you report on your water footprint from various activities. Your results section should include at least one table listing your estimated water consumption per year in cubic meters for categories of activities. Your results section should also contain at least two figures:
    - A pie chart showing the percentage of your total consumption from various types of activities (maybe the same categories in your table).
    - A bar graph comparing your estimated water usage to US and world averages.

  You can enter your data into a spreadsheet (e.g. Excel) to create your graphs. This will be reviewed in mentor session. Put captions and titles on your tables and graphs, number them, and include appropriate units. Make sure Black & White printing of your graphs shows differences—use different patterns or shades (not just different colors). Finally, be sure you also describe your results in words and that you refer to your tables and graphs when describing your results.

- **A discussion section** where you discuss your results. Here you explain what the results mean to you and how they fit into the bigger picture. Be sure to tell your reader about anything that surprised you, anything you learned by doing these calculations, and whether or not you are inspired to change any of your habits or behaviors. Whether you plan to change any behaviors or not, you should discuss what changes would hypothetically reduce water consumption the most and where, based on your habits and lifestyle, would changes be easiest and hardest for you to make. You can use the footprint calculator to play around with different scenarios. Your discussion should also include your thoughts on your water consumption, as compared to US and global averages, and at least one other specific developing country. Do you think your water footprint is "sustainable," why or why not?

- **A reference section** where you list all sources you used. There should be at least three reliable sources (besides the water footprint website, which you should also list). Be sure you use in-text citations to these sources as their information comes up in your paper.

- **An appendix** where you include your raw data (the filled in table provided with this assignment) and any calculations you used in your estimates. This section should not count as part of your page limits/requirements.

Grading:
The assignment will be evaluated based on the following criteria:

1) Rough draft with completed data table and calculations done by due date.
2) The clarity, thoroughness, and thoughtfulness of your writing.
3) The degree to which you address the requirements of the assignment – make yourself a checklist and be sure to do what is asked for. Ask questions if you are unclear.

Instructions for using the online calculator:

- Measure your food intake for a day by weight. Use this day's information along with your knowledge of what is typical for you to decide the amounts for a typical week. Explain any adjustments or assumptions you make in your methods section. If you use pounds and/or ounces, you will need to convert to kilograms (space provided in table below). Using a scale would be best, but if you don't have one you can estimate some items by the weights listed by servings on the box. For some items such as cereals, if servings are listed by cups instead of weight in ounces, look at the weight on the box and the number of servings in the package, and calculate the weight per serving. Then estimate how many "servings" you ate. For sodas and juices, put them in the most appropriate category and state what you did in your methods section. Sodas might go under coffee, while juices might go under fruit.
- After you fill out the table below, g to: http://www.waterfootprint.org and choose *Your Footprint Calculator* from the left menu and then *Extended calculator*. (Note, you may want to look at the *Quick calculator* as well as it gives different comparison information in the results, but we will be using the *Extended calculator.*
- Select United States in the Country field and use the information you recorded below to fill out the online table (see footnotes at the bottom). Convert units where necessary.
- Click *Submit* to see your results.

Question	Answer (Kg)	Units	Conversion	Answer (Lbs)	US Units
Food Consumption					
Cereal products (wheat, rice, maize, etc.)		Kg/week	÷ 2.2		Lbs/week
Meat products		Kg/week	÷ 2.2		Lbs/week
Diary Products		Kg/week	÷ 2.2		Lbs/week
Eggs		#/week	NA		#/week
How do you prefer to take your food?		NA	NA		NA
How is your sugar and sweets consumption?		NA	NA		NA
Vegetables		Kg/week	÷ 2.2		Lbs/week
Fruits		Kg/week	÷ 2.2		Lbs/week
Starchy roots (potatoes, cassava)		Kg/week	÷ 2.2		Lbs/week
How many cups of coffee do you take per day?		8 oz. C	÷ cafe cup size by 8		8 oz. C
How many cups of tea do you take per day?		8 oz. C	÷ cafe cup size by 8		8 oz. C

Domestic Water Use - Indoor					
How many showers do you take each day?		#/day*			
What is the average length of each shower?		# mins			
Do your showers have standard or low-flow showerheads?**					
How many baths do you have each week?		#/week			
How many times per day do you brush your teeth, shave or wash your hands?		#/day			
Do you leave the tap running when brushing your teeth and shaving?		NA			
How many loads of laundry do you do in an average week?		#/week			
Do you have a dual flush toilet?		NA			
If you wash your dishes by hand how many times are dishes washed each day?		#/day			
How long does the water run during each wash?		# mins			
If you have a dish washer, how many times is it used each week?		#/week			
Domestic Water Use - Outdoor					
How many times per week do you wash a car?		#/week			
How many times do you water your garden each week?		#/week			
How long do you water your garden each time		# mins			
How long per week do you spend rinsing equipment, driveways, or sidewalks each week?		Mins/week			
If you have a swimming pool what is its capacity?		M^3			Ft^3
How many times per year do you empty your swimming pool?		#/year			
Industrial Goods Consumption					
What is your gross yearly income? (Only that part of income which is consumed by you). ***		US $/Year			

*If you do not shower daily because you alternate baths with showers, or camp out on weekends, etc. Then put in the fraction. For example, if you shower 6 out of 7 days, enter 6/7, which is 0.86.
**If you shower in multiple places with different facilities, such as your home where you have low-flow shower heads and a gym which has standard shower heads, choose standard shower heads for all facilities.
*** This means annual expenditures, not income necessarily. You can report your expenses instead of your income.