Assignment 3: Measuring Carbon Footprints

Activity Goals

- Understand the impacts of your consumption on greenhouse gas emissions.
- Unpack how a metric is comprised; explain why black-boxed data may give varying answers

Background Information

The historian Lewis Mumford noted that "carboniferous capitalism" relies on the "accumulated wealth" of carbon based energy that took millennia to establish. The fossil fuels we rely on today are the products of long ecological and geological processes, and our use diminishes a stock of finite resources. He distinguished carboniferous capitalism from other era(s) where human civilization acquired flows of energy from the sun, mainly from wood and agricultural biomass. Mumford argued that carboniferous capitalism's "habituation to wreckage and debris" with "disregard for a balanced mode of production and consumption" would strip human civilization of the energy resources upon which it is built.

In additional to the declines in carbon based fossil energy stocks, we recognize that adding carbon to the atmosphere is changing the planet's climate. The greenhouse effect is the result of increased levels of gases like carbon dioxide, methane, and nitrous oxide that trap incoming energy from the sun into the atmosphere. While the effect was first widely publicized by the Swedish scientist Arrhenius in the late 1800s, it is only with rigorous scientific evidence from air samples to ice cores that the effect has become widely accepted. Switching from carbon-based energy stocks (coal, petroleum, natural gas) to renewable flows of energy is now seen as one of human civilization's most pressing challenges.

Many human activities are associated with the carbon-based economy. The relative greenhouse gas (GHG) contribution of individuals from the industrialized nations (the OECD, or G20), are much larger than developing countries. The US has a particularly large average per capita carbon footprint, but this says very little about the differences that might exist between different individuals, the rich and poor in each country, those with different cultural values, etc.

While national-level GHG inventories may be important for developing national policies for carbon and renewable energy, GHG inventories of individuals give everyone an opportunity to know their relative contribution and perhaps act on that information. A carbon footprint is a GHG inventory for an individual, product, or organization. It looks the various individual consumption patterns and behaviors—commuting, heating and lighting a home, using appliances, etc.—and estimates the relative GHG contribution of each, and aggregates those into a total carbon footprint.

PART 1: This assignment should take two to three hours so leave plenty of time. In this assignment you will explore several online carbon footprint calculators. Calculate you carbon footprint using each of the calculators. Convert all totals to metric tons of CO_2 using your handout on units and conversions tables. Think about what they are asking, how your behavioral information is being compiled, the kinds of assumptions that are made, and how accurately their methodology captures the GHG impact of your actions. Look around at the website. What does the organization do? What are the organizations' motives?

PART 2: Hypothetically try to reduce your carbon footprint. What could you change about your consumption or behaviors? Which question might you answer differently to reduce the footprint? Using **two** of the calculators above, change one of your behaviors or consumption patterns and recalculate your carbon footprint. List the new information in the table below.

PART 3: Write a one-page summary (single spaced, 12 point font) replying all the bulleted questions below. Please title each replies starting with "Question #1:….."

PART 1: Enter your carbon footprint for each of the calculators below in metric tons CO_2 per person. Note that some outputs will not be in metric tons, and other calculators may be based on households. For parameters considered, write down notes about the types of questions the calculators ask about (electricity, transportation, food, etc.). For observations, make notes on other aspects, user friendliness, goals of the organization, etc. **(10 pts each = 50 pts)**

Nature Conservancy's Carbon Footprint Calculator _____ **metric tons CO_2 per person**
http://www.nature.org/greenliving/carboncalculator/

Parameters considered:

Observations:

Terrapass _____ **metric tons CO_2 per person**

Parameters considered:

Observations:

Carbon Footprint _____ **metric tons CO_2 per person**
http://www.carbonfootprint.com/calculator.aspx

Parameters considered:

Observations:

CoolClimate Carbon Footprint Calculator _____ **metric tons CO_2 per person**
http://coolclimate.berkeley.edu/carboncalculator

Parameters considered:

Observations:

EPA Greenhouse Gas Household Emissions Calculator _____ **metric tons CO_2 per person**
http://www.epa.gov/climatechange/emissions/ind_calculator.html

Parameters considered:

Observations:

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Worksheet for hypothetical carbon footprint (20 pts)

	Calculator	original footprint	Changed Behavior	new carbon footprint	% reduction
1.					
2.					

PART 3: Essay format – 1 pages max. - Make sure to reply to each bullet point in a separate paragraph – 10 pts each questions (30 pts total)

1. What criteria did you use to select the two best carbon calculator?
   Did you get the same results for each? What do think contributed to differences, if there were any?

2. What tradeoffs do designers of these calculators make in designing them? (e.g., user friendly v. complexity, targeted vs. comprehensive)? Do they make their calculation assumptions explicit? What do you think are the different biases of the organizations sponsoring these free carbon calculators?

3. What is useful to you about calculating your carbon footprint? In what ways might this assessment be limited? In what way this assessment may help you change something in your own life?