Homework 1

Climate Change Ecology, Spring 2013

Due Tuesday, January 22, 2013

Your name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Please answer the following questions in a different font (**like this**) to help me find your answers. Turn in a print out of your homework. You may work in a group, but your answers and your words must be your own. *List all sources of information. Do not plagiarize.*

1. (4 points) During the semester, I’ll ask you to compare two locations with respect to their climate change and ecology. You may want to bookmark or write down sources of information as you come across them for future use.

Resources of interest: http://education.nationalgeographic.com/education/mapping; Google Maps and Earth; worldatlas.com; UI library atlas

a. Use your hometown as one. Write down the place, including name of city, state/province, and country, as well as latitude/longitude in degrees-minutes-seconds. List your sources of information.

b. For comparison, you will also investigate characteristics of another location. Choose somewhere you’ve visited, want to visit, have contacts, or know something about (make it fun). Choose places with large contrasts in climate, latitude, etc., compared with your hometown. They should be on another continent and in a country with a markedly different culture. List the same information as for your hometown; list a nearby place name (e.g., a national park) if there is no nearby city. List your sources of information. (Note that your location should be significantly different from any other student’s.)

2. Location comparisons. Using the above two locations, answer the following questions:

a. Climate (2 points)

What are the Köppen climates at your locations? [http://en.wikipedia.org/wiki/K%C3%B6ppen\_climate\_classification; http://education.nationalgeographic.com/education/mapping/interactive-map]

Hometown:

Location #2:

b. Land cover types (2 points)

What are the land cover types (a mixture of vegetation types (e.g., grasslands) and nonvegetation types (e.g., urban)? [http://education.nationalgeographic.com/education/mapping/interactive-map]

Hometown:

Location #2:

c. Government (2 points)

What type of government exists in your locations? Democratic? Communist? Dictatorship? Other? How long has that form of government been in existence? Is the government stable?

Hometown:

Location #2:

d. Nation (2 points)

Characterize the nations of your locations in terms of population, wealth, education, and economy.

Hometown:

Location #2:

3. (3 points) What is the most important difference between “global warming” and “climate change”?

4. (5 points) Explain the key features of the peer review process and why this process aids in developing scientific understanding about an issue.

5. Climate change science

i. (2 points) What is the major greenhouse gas that influences today’s climate change and whose concentration is being affected by human activities?

ii. (2 points) List two major human activities.

iii. (3 points) How does Figure 2.20 in Hannah contribute to our confidence in results from global climate models?

iv. (3 points) How does Figure 2.20 in Hannah contribute to our confidence in the conclusion that recent warming was caused by human activities?

v. (3 points) Describe three pieces of evidence that the climate is currently changing (besides temperature increase).

vi. (3 points) Explain why high-resolution climate projections are needed for studies of ecological impacts in the western US.

vii. (2 points) Describe two changes in oceans in response to human changes in greenhouse gases that affect ocean ecosystems.

viii. (5 points) Describe five different changes in the physical climate system that are significant for biological organisms.