

Earth Systems II - Unit 9 Study Guide

es2u9 (Climate Change – what is the big deal?)

Web resources:

<http://climate.nasa.gov/>

<http://www.environment.yale.edu/climate/>

<http://www.climate.umn.edu/>

Big Questions: Are humans so powerful that we can affect large-scale things like climate? If so, would humans have the will to change course?

Study Objectives (things to learn)

1. Describe Earth's climate system and explain the variety of factors influencing global climate.
 - a) Make a Venn diagram comparing and contrasting weather vs climate.
 - b) Diagram the layers of the atmosphere along with each layer's characteristics or importance.
 - c) Diagram the "green house effect" as it relates to inputs and outputs of solar radiation.
 - d) List and describe the variety of factors that can influence climate change.Concepts: **weather climate thermosphere stratosphere troposphere mesosphere ozone layer El Nino La Nina greenhouse effect**

2. Describe several modern methods of climate research.
 - a) What is a proxy indicator?
 - b) How can we learn about past climates?
 - c) How can we learn about the present climate?Concepts: **proxy indicator dendrochronology cryosphere**

3. Summarize current consequences and potential future impacts of global climate change.
 - a) List and describe current consequences of climate change.
 - b) List and describe potential future impacts of climate change.Concepts: **albedo positive feedback forcing agent carbon sink permafrost**

4. Evaluate the scientific, political, and economic debates concerning climate change.
 - a) Science:
 - b) Political:
 - c) Economic:Concepts: **consensus IPCC environmental justice morals ethics economic justice capitalism "inconvenient truth" peer review**

5. Characterize human influences on the atmosphere and global climate and human responses.
 - a) What is meant by the term "anthropogenic"?
 - b) Describe the top two greenhouse gas contributors in the US and specific ways we can reduce these emissions.Concepts: **anthropogenic carbon dioxide methane carbon footprint**

To Do:

Read: "Understanding and Responding to Climate Change" National Academies

Notebook **10pts** Your Score: **/10pts** (subtract one point if your notebook is hard to read and disorganized)

____ Notes on Study Objectives (right side) 2.5pts

____ Reflections/Summaries/Questions (left side) 1.5pt

____ Venn Diagrams: Weather vs Climate and El Nino vs La Nina 1pt

____ CRITIC – how to be critical of a claim 1pt

____ Activity: "Has our local climate been warming? Examining Cloquet's Climate History" 2pts

____ Activity: "Population Peril – Polar bears decline in the Canadian Arctic" 2pts

Skill Lab: "Dendrochronology – finding evidence in tree rings" **10pts**

Climate Change Quiz1 (Science of Climate change) **10pts**

Climate Change Quiz2 (Human Factor of Climate Change) **10pts**

Climate Change Exam **20pts**

Extra Credit: "Peat bogs harbor carbon time bomb" (online)

"People tend to focus on the here and now. The problem is that, once global warming is something that most people can feel in the course of their daily lives, it will be too late to prevent much larger, potentially catastrophic changes."

Elizabeth Kolbert