

# Midterm Exam Climate Solutions

## Spring 2010

Name \_\_\_\_\_

Answer each of the following questions clearly, thoroughly, yet concisely.

1. In one sentence, describe how greenhouse gasses work.
2. What is the *Keeling Curve*?
3. What is a *negative feedback loop*?
4. Atmospheric concentrations of CO<sub>2</sub> were about \_\_\_\_\_ ppm in 1957, and \_\_\_\_\_ ppm in 2009.
5. What and when was *Snowball Earth I*?
6. The United States produces what percentage of the world's greenhouse gasses? \_\_\_\_\_

7. Define what is meant by  $\delta^{13}\text{C}$ . Explain in words and write a formula for it.
8. For what is a measure of  $\delta^{13}\text{C}$  a proxy? **Explain** what scientists infer from measuring  $\delta^{13}\text{C}$ .
9. Shells of marine organisms from a sample taken on the Olympic peninsula have a relatively low  $\delta^{18}\text{O}$ . What does this tell you about the conditions under which the organisms were formed? **Explain.**

10. A climate warming skeptic argues that global warming is a result of the sun's emitting more energy over time, rather than greenhouse gasses. This skeptic correctly points out that the sun emits more energy now than it did three billion years ago. This skeptic argues that this increase in solar radiation is the real cause of global warming. **Explain the evidence** that scientists, including your author Bloom, use to counter this argument and to assert that it is greenhouse gasses, rather than increased solar radiation, that is causing currently observed global warming.

11. In *The Climate Solutions Consensus* Blockstein and Wiegman refer to a **Stabilization Triangle**. Explain what a Stabilization Triangle is, and what actions might help implement it.

12. Blockstein and Wiegman ask the question 'How do we know that humans are causing global warming?' How do they answer that question?