GEO 302C
Quiz 5 ANSWERS
To be given in lab section the week of February 27, 2006

1. (75 points) Your name:

2. (5 points) Give one reason (one sentence or less) why it is important to study past climate.

A correct answer is a variation on one of the following themes:

1. Past variability can show climatic extremes that have not been experienced during recorded history
2. In order to understand the effects of human activity on climate, we must establish what the planet, the atmosphere, and climate change was like before human perturbations
3. “Past is prologue” (that is, to better predict what will happen in the future, we try to understand what happened in the past).
4. Constructing and interpreting long-term records of climate are the only means to determine how frequently and to what extent the climate changes.
5. Knowing how climate changed in the past helps us to better understand the system itself.

3. (5 points) Which of the following is not true about proxy climate data?
   a. They include sediments, speleothems, ice cores, corals, and trees.
   b. They can tell us about what Earth’s climate was prior to the invention of instruments.
   c. They are as precise as the modern instruments in measuring climate.
   d. Some proxy climate records can provide information about climate 200,000 yrs ago
   e. All of the above.

   The question as stated below has no correct answer. (a), (b), and (c) are true, but (d) is false, because nothing merges “perfectly” with the other. If (d) is omitted or changed to a true statement, then the correct answer is (e).

4. (5 points) Which of the following is true in describing ice cores?
   a. Ice cores contain important greenhouse gases signals unavailable from other proxy sources.
   b. Ice cores can resolve climate variability on a yearly basis.
   c. Cores from present-day ice sheets date back tens to hundreds of thousands of years.
   d. Ice core measurements of carbon dioxide and methane over the last few centuries merge perfectly with instrumental measurements made since the late 20th century.
   e. All of the above.

5. (5 points) Which of the following reservoirs contains the most carbon?
   a. The atmosphere
   b. Land-surface vegetation
   c. The ocean mixed layer
   d. The deep ocean – NOTE that rocks are an even larger reservoir of carbon
   e. All of the above contain approximately equal amounts of carbon

6. (2 points) Are continental glaciers enriched with or depleted of $^{18}$O?
   Depleted.
7. (3 points) Why? (1 sentence or less)
Evaporation favors $^{16}$O, which means that the clouds that provide precipitation to continental glaciers are depleted of $^{18}$O.