

Informal Homework Assignment Due Friday Oct. 14 at 5pm

Please put electronic and *brief informal* answers in your HAND-IN folder, as usual, with a Word filename "lastname-Oct14". Most of these are straightforward, a few others (labeled *) are more of a "stretch".

This timescale chart might come in handy.

<http://www.env.leeds.ac.uk/envi2150/oldnotes/lecture5/timescales.gif>

1. What happens to the density of ocean water as temperature and salinity change? How does this help you understand the sinking of cold water in the north Atlantic part of the "ocean conveyor belt"?
2. What is the best explanation we've got that explains the ice ages that are spaced about 100,000 years apart? Where are we today in the ice age cycle?
3. * Summarize the cycles, events, and the corresponding Greenland temperature data patterns that related to ocean conveyor belt changes that occur on timescales of several thousand to tens of thousands of years (see Alley and our class handout). Is there any evidence (in theory or in temperature data patterns) that we can get these cycles in a warm period of climate (like today)? (this answer will probably be several paragraphs)
4. What is the physical evidence that led scientists to the explanation for Heinrich events? (see Alley)

5. In your own words, what is the best explanation we've got from the scientific community about why the Younger Dryas occurred? Be as detailed as you can.

6. * Given what you understand about earth system cycles and events you discussed in Questions 2 and 3, and the temperature data patterns evident in the historical data records for temperature:

<http://upload.wikimedia.org/wikipedia/en/9/9d/Epica-vostok-grip-140kyr.png>

and

<http://upload.wikimedia.org/wikipedia/en/c/c2/Vostok-ice-core-petit.png>

what is your best, *speculative* prediction about what is likely to happen next (in our near future) with our climate in the Northern Hemisphere? Justify your prediction as well as you can, and note uncertainties that make your prediction necessarily shaky. (this answer will probably be several paragraphs)

7. What kinds of questions arise in your mind as you think about question 6? What kind of progress have you made in "thinking your way into" these questions (not necessarily to solid answers) since the beginning of the term?

8. What's missing from our class discussion on climate change, Kuhn, and paradigm shifts that you are wondering about right now?