

Questions to accompany the Lemley and Stanley articles, and the NPR/National Geographic podcast

Lemley

1. Explain what the subsurface “Great Ocean Conveyor” describes.
2. Why do WHOI (Woods Hole Oceanographic Institute) scientists think that increased volume of freshwater in the northernmost North Atlantic can influence climate in the Northern Europe?
3. Ratios of the stable isotopes of oxygen in the shells of marine organisms can be used to determine paleotemperatures. What isotopic data did the WHOI geologists have of the “Little Ice Age”?
4. The WHOI scientists generated theoretical models of thermohaline circulation and how it might be affected by changes in temp and salinity, however in the early 1970’s they believe that they saw an example of this phenomenon. What did they see?
5. Rich Seager of Lamont-Dougherty Observatory discounts the WHOI model. What do they disagree on? Are their two theories based on the same data sets or different data sets? If they’re based on different data sets, how do we evaluate the relative merits of their arguments?

Stanley

1. What is the evidence cited to estimate the global climate at the end of the Pliocene?
2. Examine paleogeographic maps of the world in the Cambrian (handout in class)...could there have been an Arctic Pond at this time?
3. Why does the Gulf Stream sink to depths north of Iceland?
4. If you heat the poles, why would lower and middle latitudes warm up?
5. What is Stanley’s evidence for elevated salinities in North Atlantic waters, which, along with decreased temperatures, cause them to sink north of Iceland?
6. What role does Stanley attribute to plate tectonics in changing Earth’s climate in the Eocene?
7. Stanley articulates an axiom or principle summarizing the relationship between configuration of the plates and resulting climate. What is his “principle”?

NPR/National Geographic podcast

<http://www.npr.org/templates/story/story.php?storyId=5705296>

1. The term we used in class to describe the density driven circulation in the oceans is called what in the podcast?
2. Discharge from 3 Siberia rivers has increased to a level that equals how many years of discharge of the Mississippi River?
3. Based on this fluvial input, scientists like John Overpeck think that we are not near freshwater inputs that will shut down thermohaline circulation, but what is the other factor that may push us to that point?