

Discussion Questions: Why does earth's climate change?

- 1. How do proxies help us read the past?**
 - a. What does the word proxy mean in your more everyday experience?
 - b. Think about a more familiar climate proxy: tree rings. Why are there tree rings?
 - c. As Alley notes, archeologists analyze "garbage" to read the history of human culture. By analogy, what kinds of "garbage" pile up and can be read back in time to discern past climates? Where is the earth's "garbage" found?
 - d. What are some of the challenges in reading the past from proxies? How do scientists cope with some of these challenges? (probably on homework)
 - e. How is climate history read from the Greenland ice cores?
 - f. Do one proxy more in depth: How does isotopic dating work for oxygen? (Trish minilecture)

- 2. What are some basic driving forces that regulate and change earth's climate?**
 - a. What are negative and positive feedback and why do they matter in earth's climate system?
 - b. Why has earth's climate over millions and billions of years been stable enough to keep a lot of water in the liquid phase (between 0°C and 100°C), even though our Sun has increased its intensity compared to when earth was born 4.6 billion years ago?
 - c. How does ocean circulation work? Could changes in ocean circulation cause abrupt climate change? (handout, demos)

For Thursday...

- 3. What drives the climate changes in the ice ages?**
- 4. What drives climate change in between the ice age oscillations?**
- 5. Why did the abrupt event, Younger Dryas, occur?**