Review of Past Climates

EES 3310/5310

Global Climate Change

Jonathan Gilligan

Class #15: Monday, Sept. 25 2018

Announcements

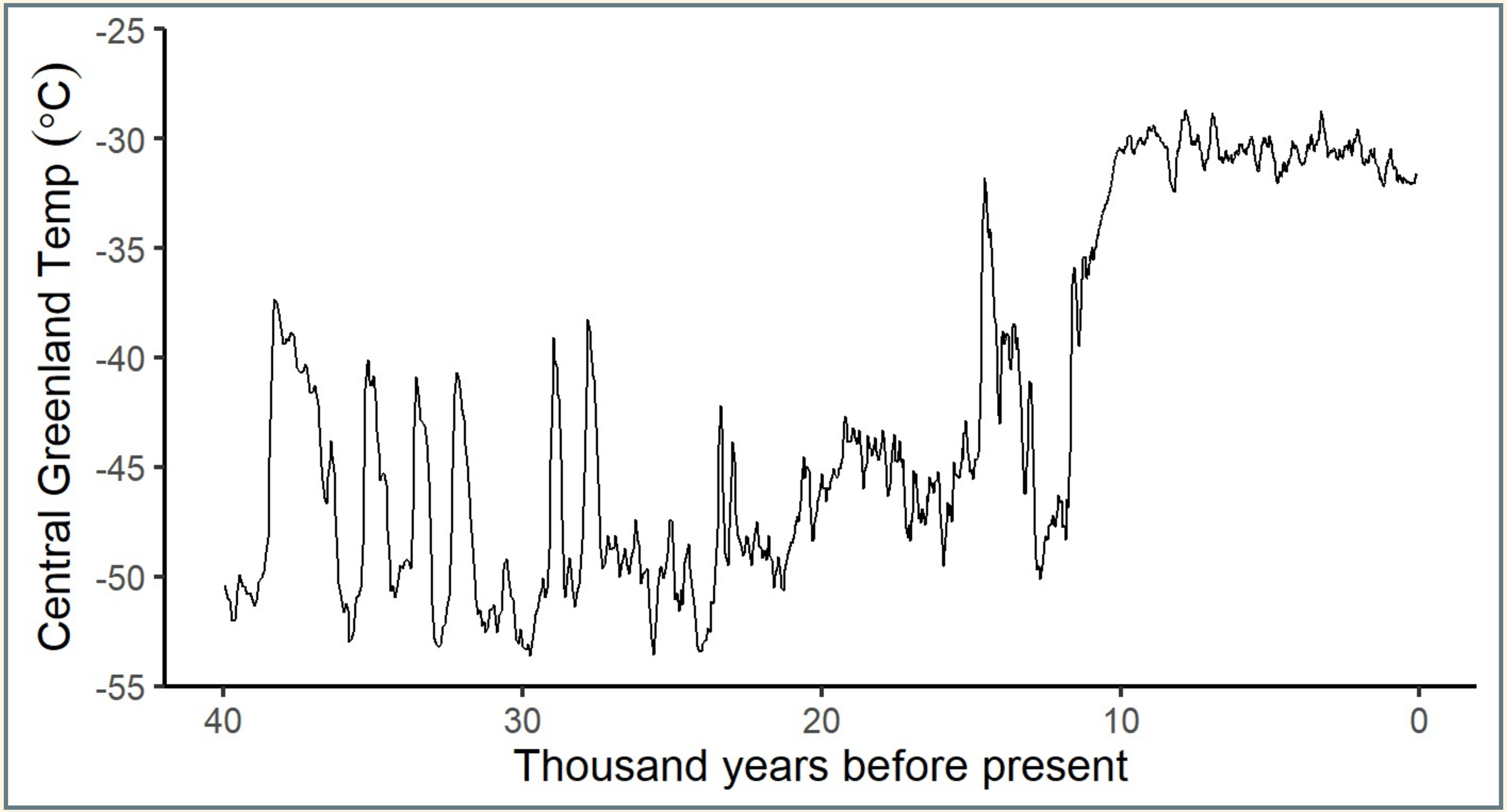
- No office hour today
- I have posted answers to Lab #3 on Brightspace and on the class web site.
- The midterm exam will be next Wednesday (Oct. 3)
  - I have posted a practice midterm exam (with answers) on Brightspace
  - We will have review for the midterm in class next Monday
  - When you come to class on Oct 3, be sure to bring:
    - #2 pencils and an eraser
    - A calculator
  - The midterm exam will have:
    - 10 multiple-choice questions (4 points each)
    - Short answer questions (answer in a couple of sentences to a paragraph)
      - Undergraduates: 4 out of 6 (15 points each)
      - Graduate students: 5 out of 6 (12 points each)

Summary of Oxygen Isotopes

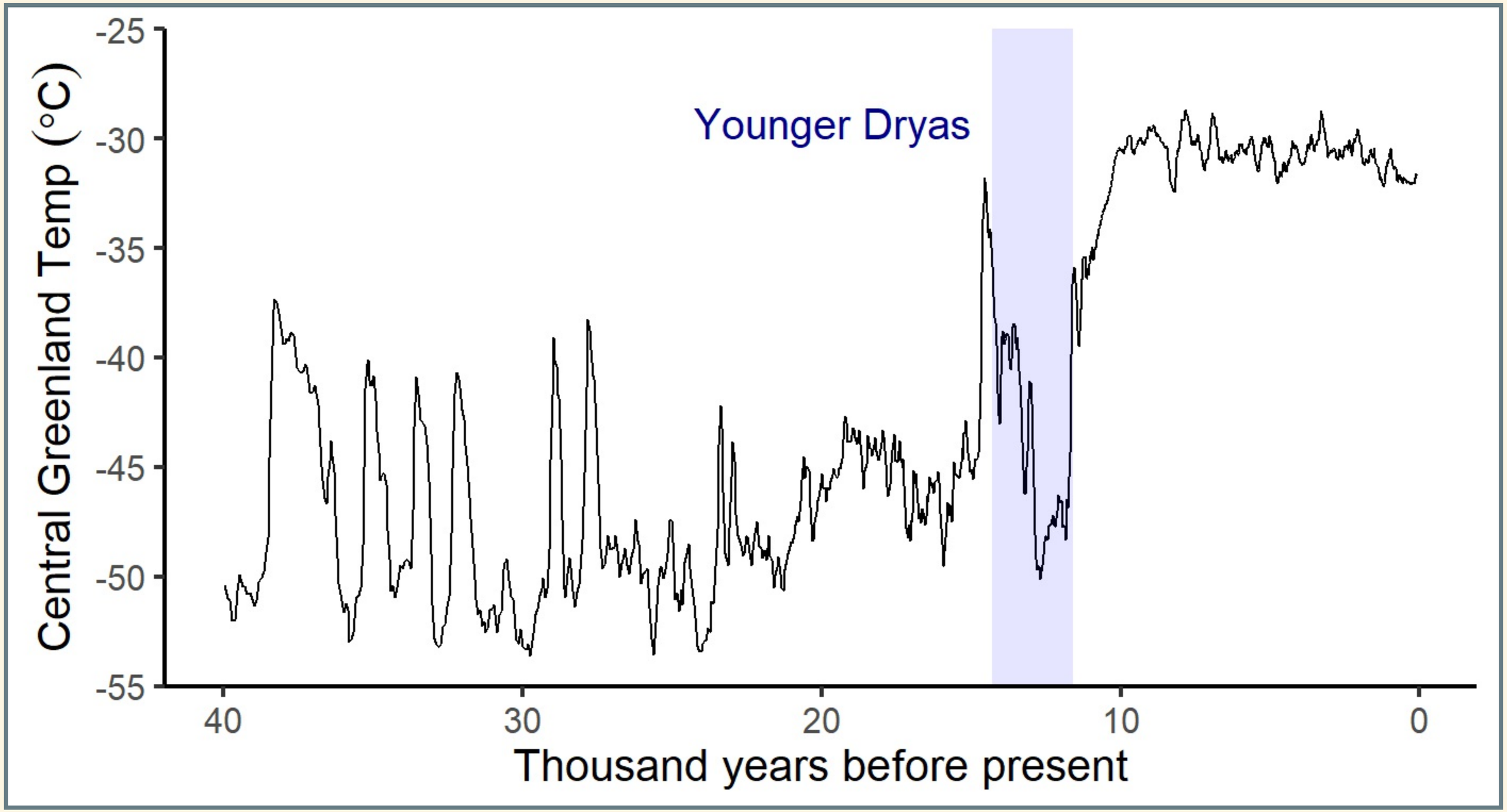
- Two different uses:
  - $\delta^{18}O$ in **glacial ice** tells us about **air temperature**:
    - Greater (less negative) $\delta^{18}O$ means warmer temperature.
  - $\delta^{18}O$ in **sea-floor sediments** (skeletons of deep-sea organisms) tells us about **sea level**:
    - Greater (more positive) $\delta^{18}O$ means lower sea-level.
- During ice-age cycles, cold temperatures go with low sea-level, warm temperatures with high sea-level:
  - Cold: $\delta^{18}O$ is lower than usual in glaciers, higher in sea-floor sediments.
  - Warm: $\delta^{18}O$ is greater than usual in glaciers, lower in sea-floor sediments.

Abrupt Climate Change

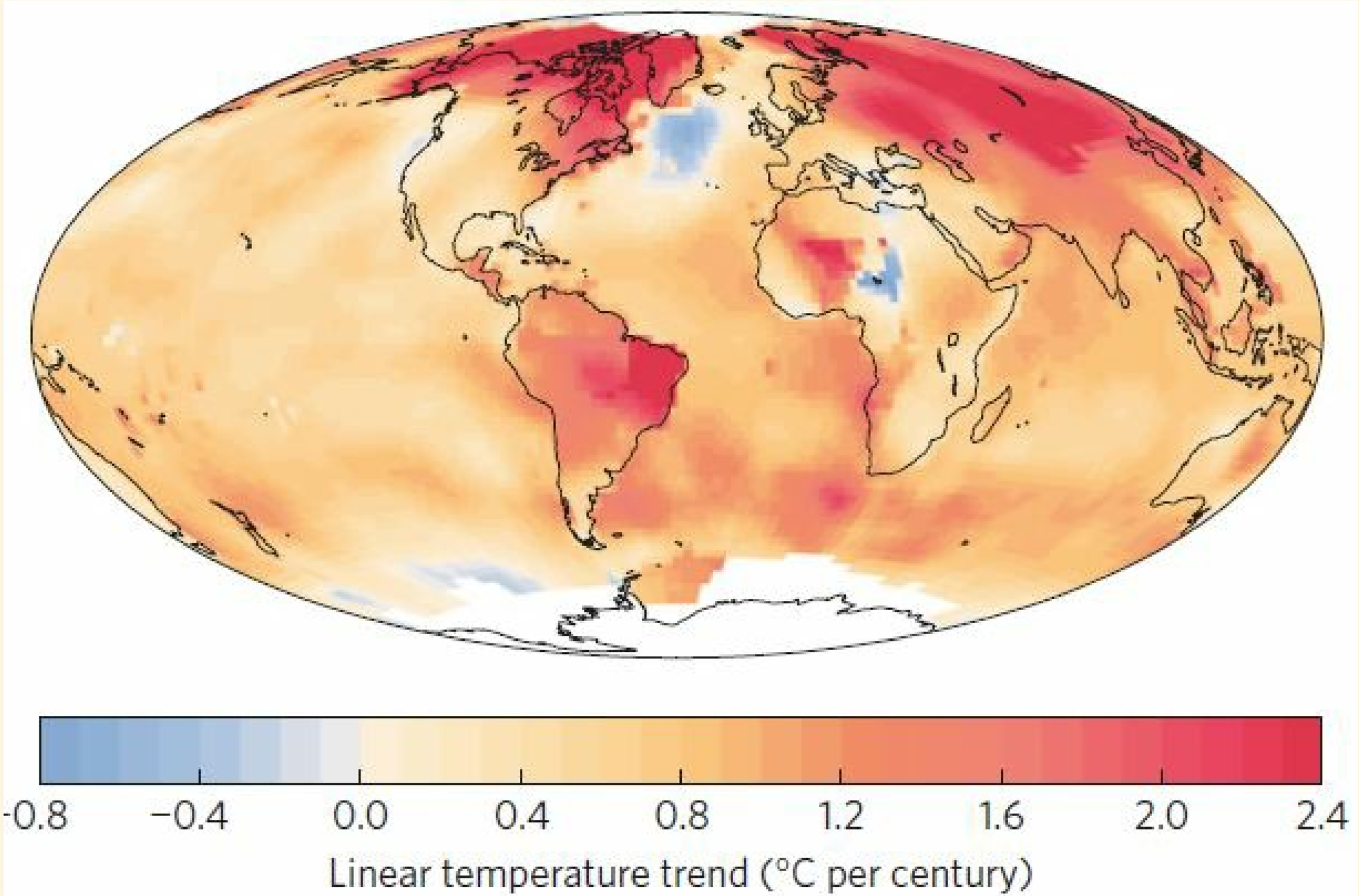
Abrupt Climate Change



Abrupt Climate Change

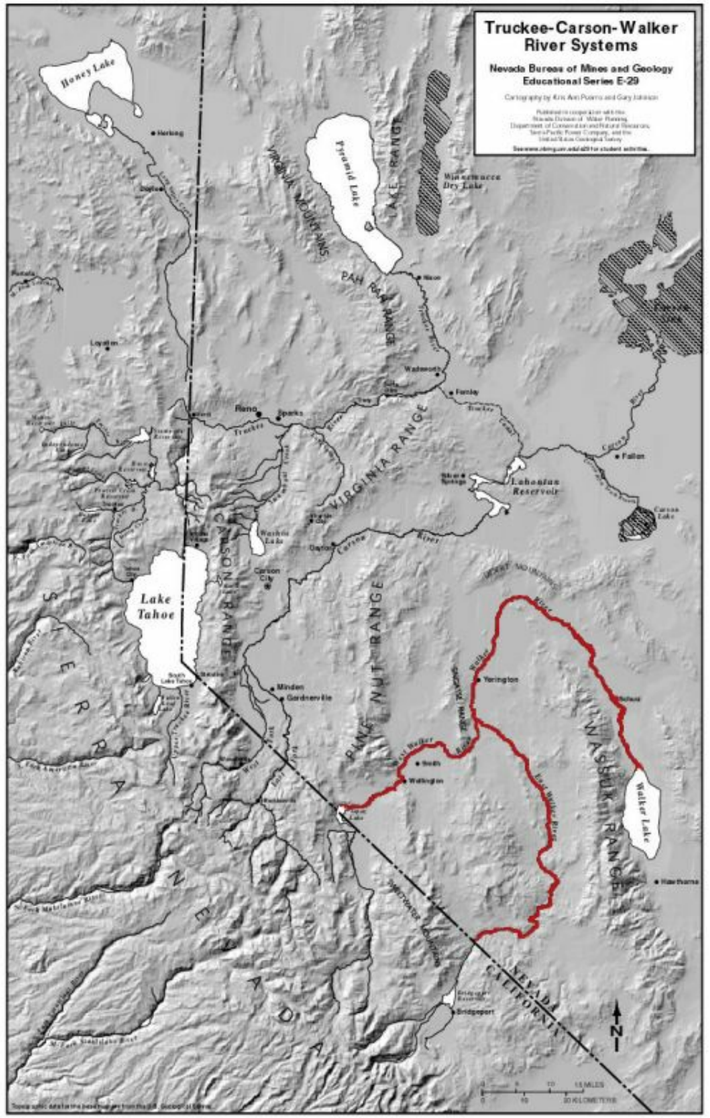


Cold Pool in North Atlantic



Climate in the Last Millennium

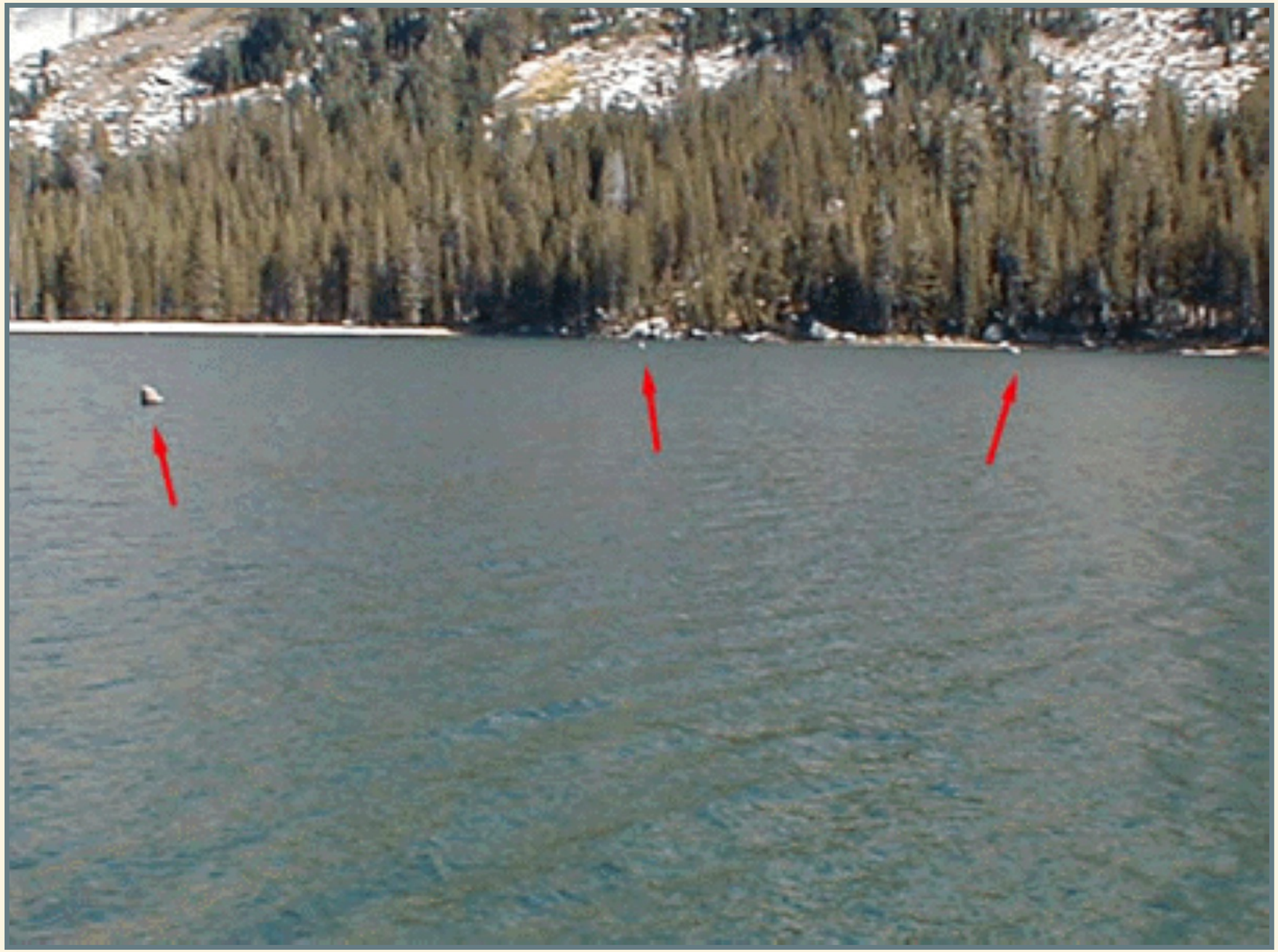
Walker River



Relict Tree Stumps

Relict Tree Stumps

Lake Tanaya, Yosemite



Chaco Canyon

Reconstructing Megadroughts