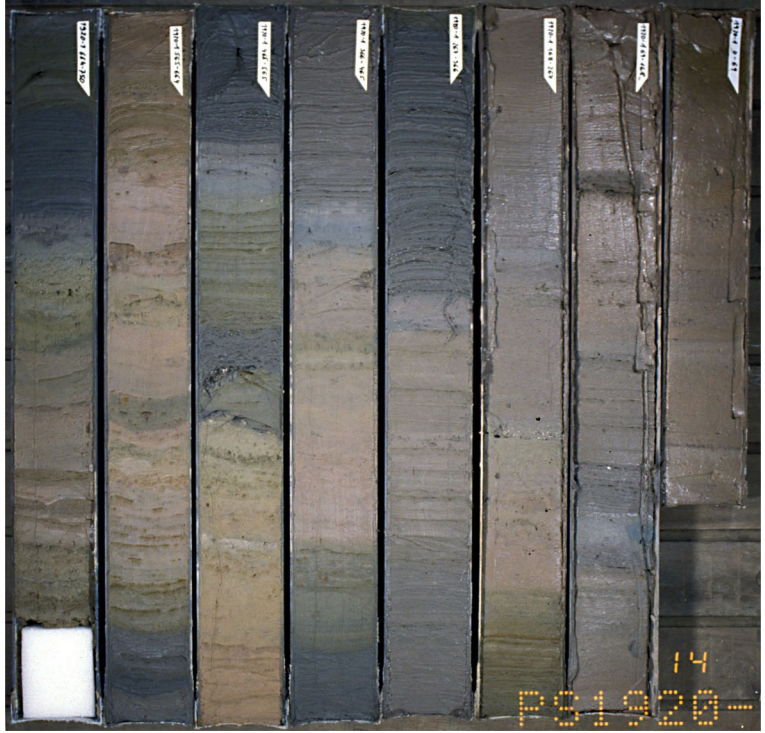


Image: Wikicommons, Greenland sediment core

Make a sediment core

Forams as Storytellers: Evaluate

What is a sediment core?

Explore the “What’s a Core For?” Story Map!

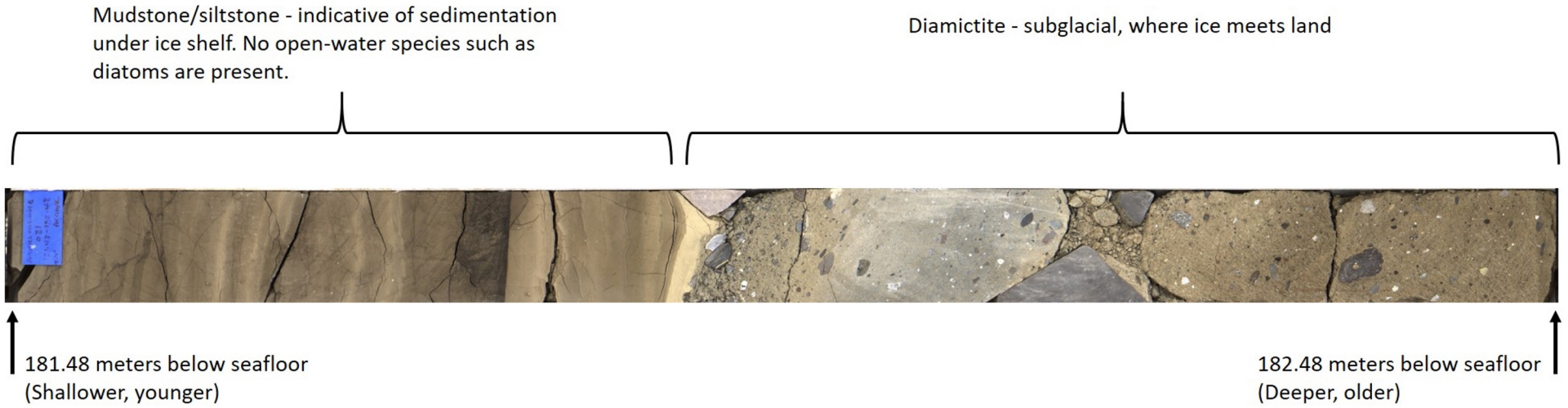


Image: Oregon State University

Markers of big climate change

Global

- **Volcanic eruptions - spew out ash that can spread out over the whole planet**

  What are eruptions you've heard of?

- **Asteroids - when asteroids hit, they can disrupt the global climate**

  K-T boundary - mass extinction event after an asteroid hit. Killed the dinosaurs! Marked by a layer of Iridium (from the comet)

Mazama ash layer from the volcano that made Crater Lake. Image from a cave in Oregon. Credit: scenicoregon.com

Black layer is the Iridium marking the boundary, from a rock outcrop in Colorado. Credit: NSF

Markers of big climate change

Regional

- **Tsunamis**

  1700 - brought massive tsunami debris and sand and coarser material all over the Oregon coast

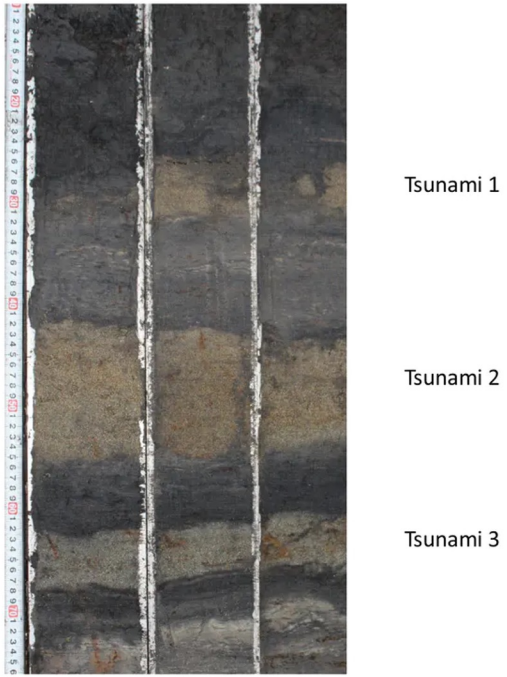
- **Dams**

  Columbia River dams

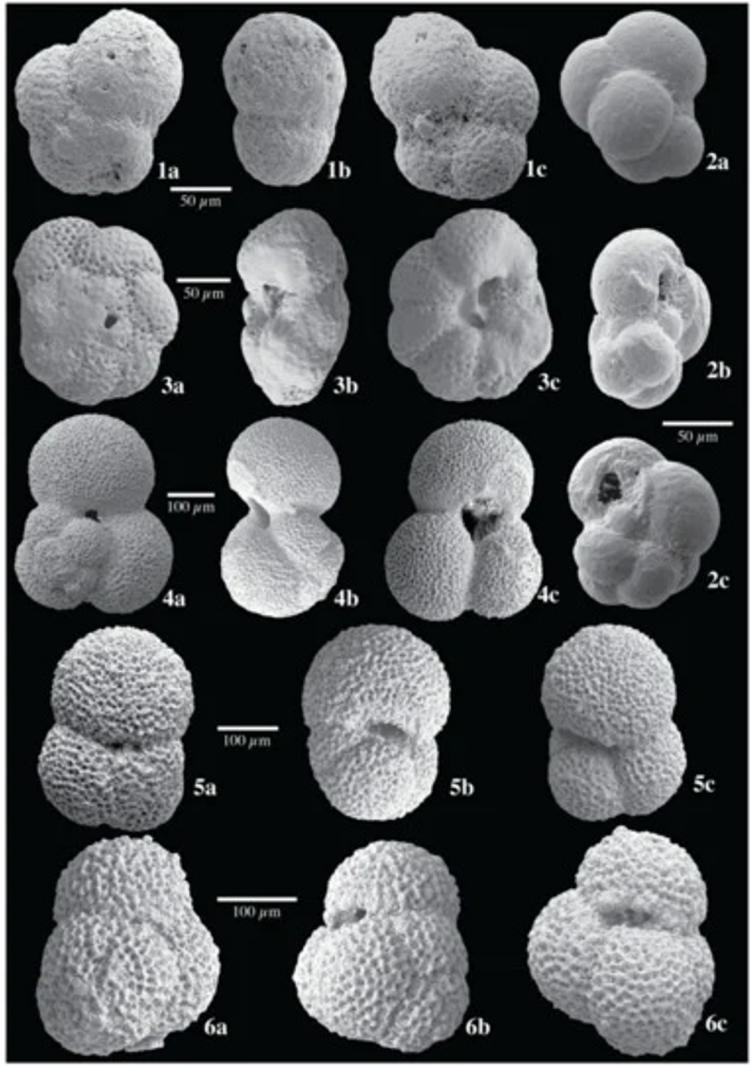
  Do you think that would that increase or decrease sediment delivery?

- **Land use change**

  Logging - increase or decrease?



Tsunami debris layers in a sediment core from Japan. It causes an erasing of some material and a deposit of tan sand. Image credit: OSU.

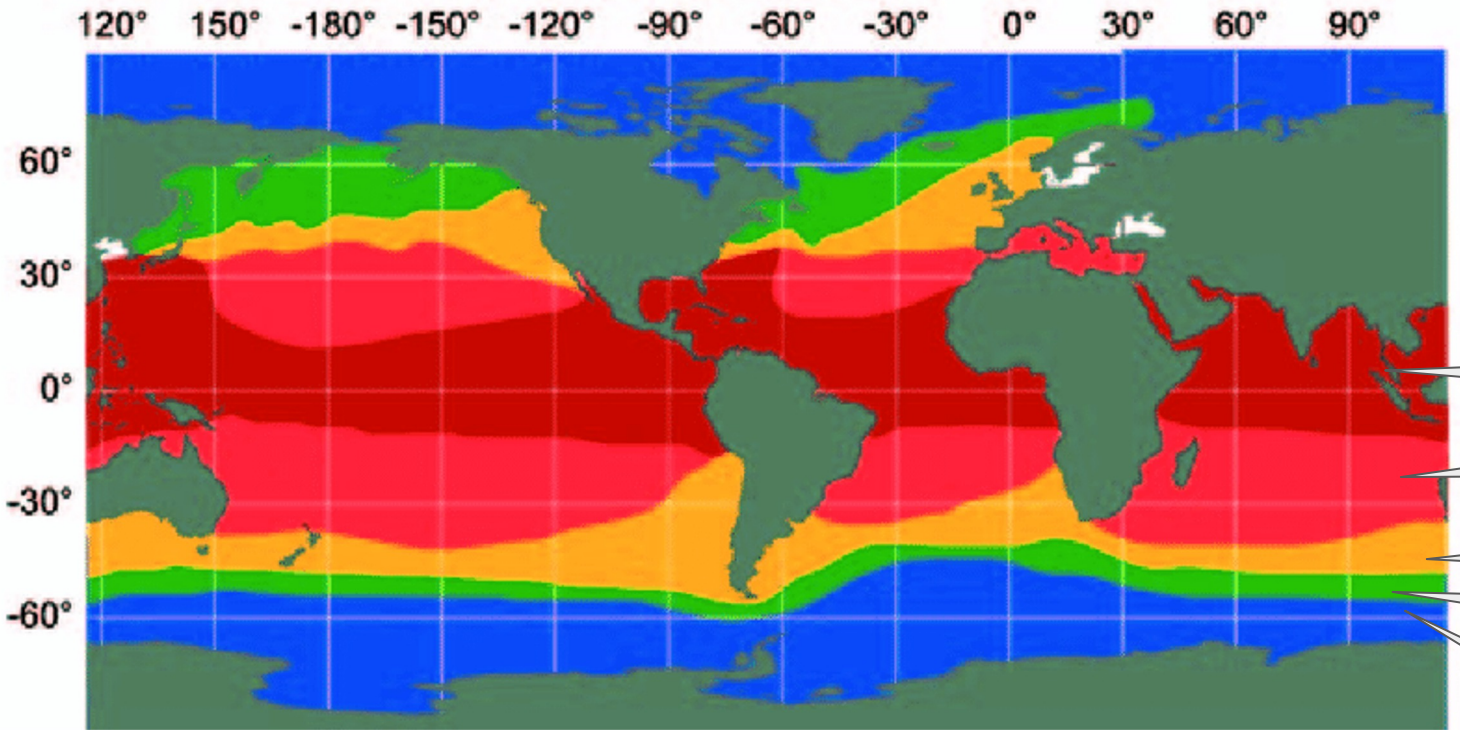


Indicators of ocean temperature

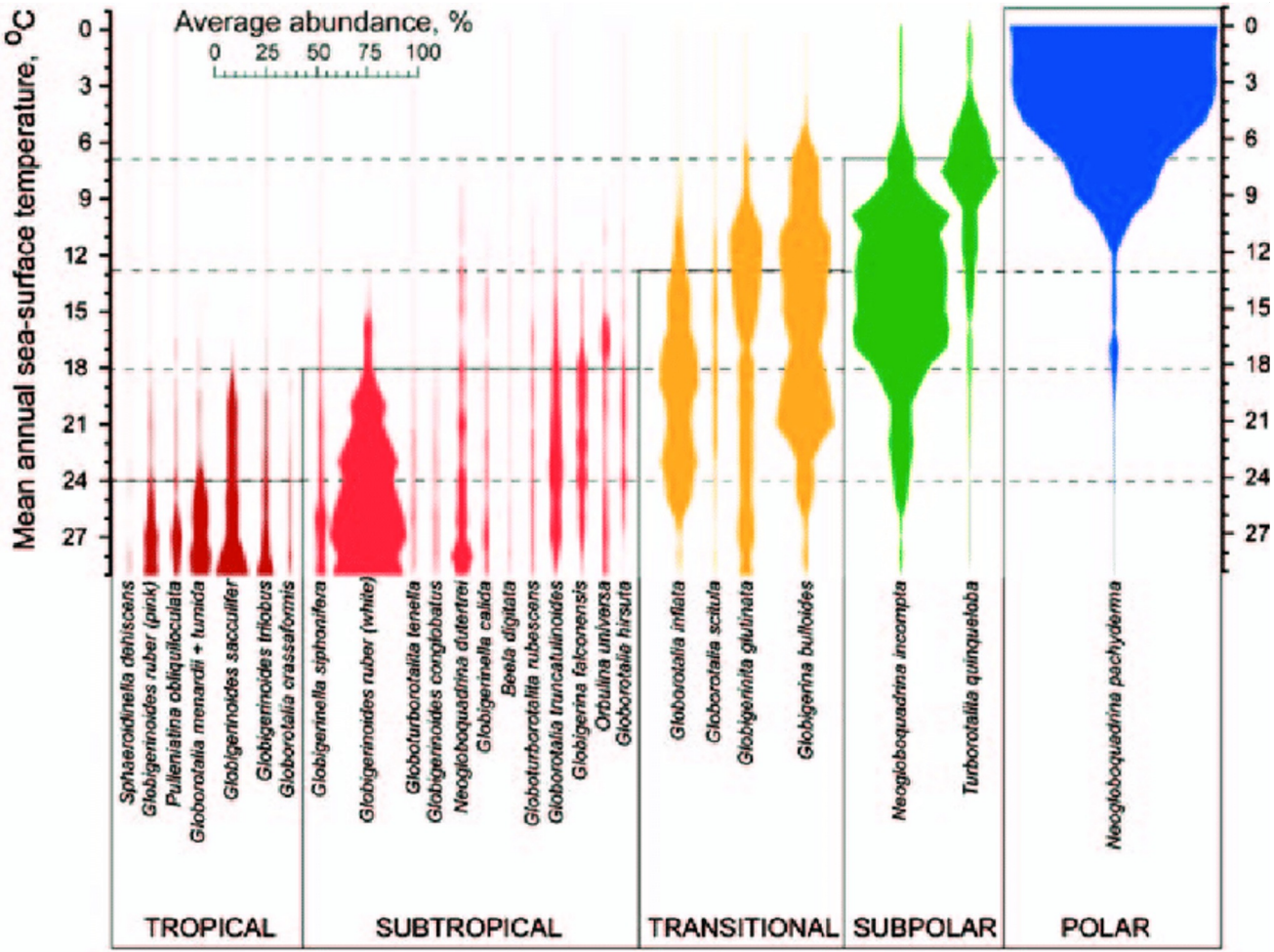
- Foraminifera species - foraminifera like to live in a specific temperature range. When it's too hot or too cold, they don't survive.
- A group of foraminifera species that live in a similar temperature range are grouped into bioprovinces. These bioprovinces follow lines of latitude.

Credit: *Geosciences*

Bioprovinces - Review from Day 1

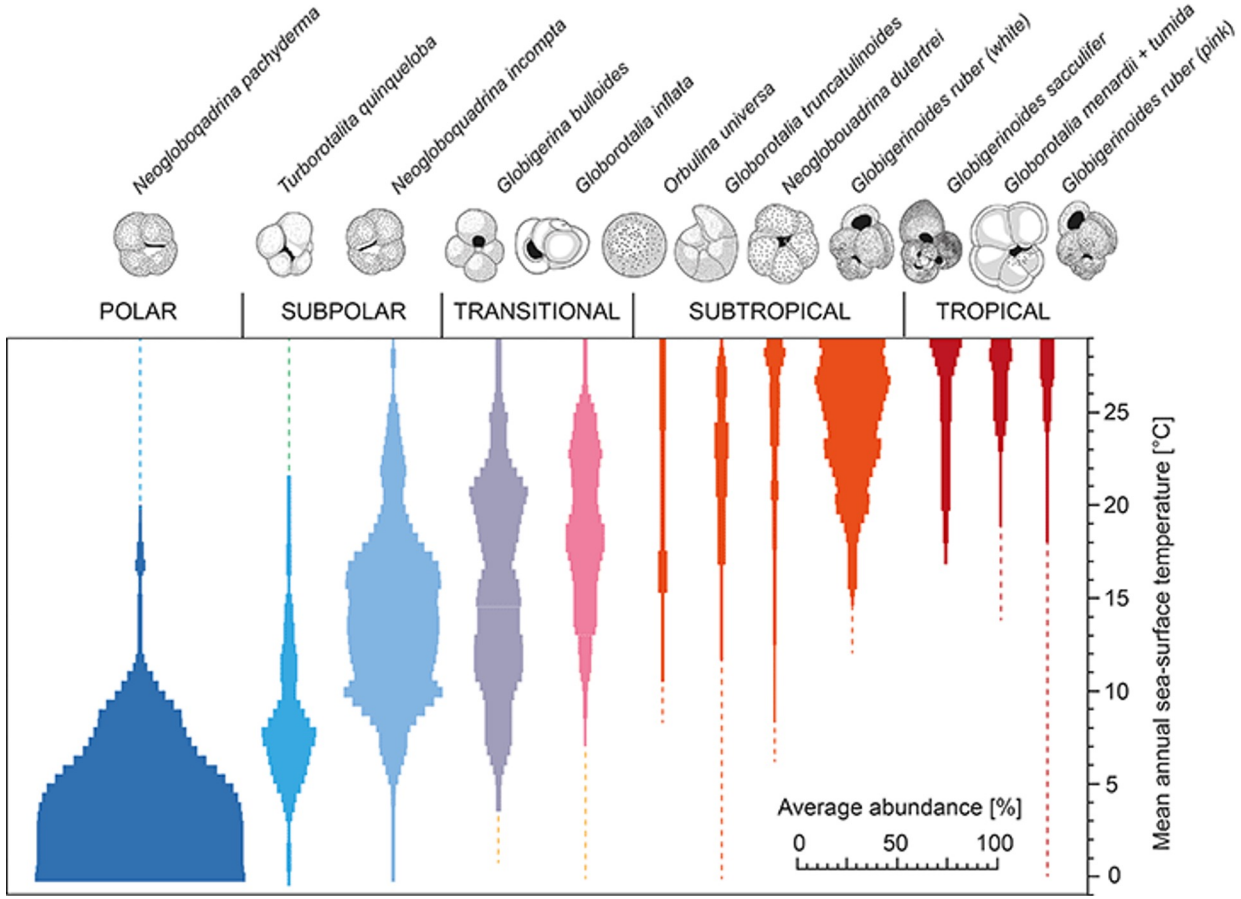


Credit: Kucera et al., 2007



Credit: Kucera et al., 2007

Foraminifera Species Distributions with Temperature



Credit: Schmiedl, 2019

Estimating Accumulation of Sediment

Given the following formula, we can find the net annual accumulation of sediment:

$$\text{Carbon Accumulation} = \frac{(\text{Carbon in grams})}{(\text{Years}) \times (\text{Surface Area})}$$

Example:

$$\text{Carbon Accumulation} = \frac{(45\text{mg})}{(1.5 \text{ years}) \times (10 \text{ m}^2)} = \boxed{0.3 \; cm/yr}$$

Estimating Years of Sediment Given a Core Sample

You can estimate the years of sediment in a core sample using the following equation:

$$\text{Years} = \frac{(\text{Sample Depth})}{(\text{Accumulation Rate})}$$

Example

Say you have a sample that is $30cm$. Then you can find how many years are represented in the sample using the following method:

$$\text{Years} = \frac{(30\ cm)}{(0.3cm/\text{year})} = \boxed{100 \text{ years}}$$