



Student Worksheet – Make a Sediment Core

Forams as Storytellers

Objective:

Use your knowledge of how foraminifera species change with ocean temperatures to make predictions about local climate change and marine heatwaves.

Materials:

Pringles can

Rice Krispy supplies - Rice Krispies, marshmallows, butter/margarine

Sprinkles of different colors - foraminifera

Red = Tropical, Purple = Subtropical, Yellow = Transitional, Green = Subpolar, Blue = Polar

Oreo crumbles - ash layers

Pencils, Markers, Pens, Ruler

rubber gloves

Pre-Lab

1. Based on what we've learned about recent climate trends, create a hypothesis about how we could look for evidence of marine heatwaves looking back at sediment cores.
2. Thinking about deep sea sediment cores as an archive, what information, proxies, measurements, or data could you collect to test this hypothesis? In other words, what will you observe and analyze today that may confirm or deny your hypothesis?

Lab Part One: Build a sediment core

Procedure

Working in your lab group, gather supplies to make your own sediment core - pringle can, rice krispy supplies, and a variety of colors of sprinkles.

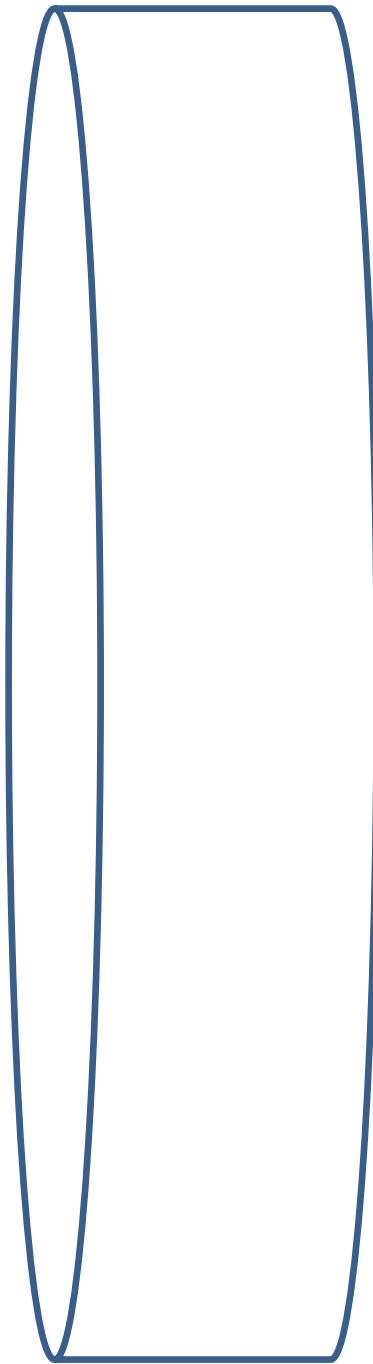
1. Make a plan for how often marine heatwaves will 'occur' and what that means for the species (colors of sprinkles) you will find.
2. Build the core by adding a thin layer of Rice Krispies, then some sprinkles, then more Rice Krispies, etc. Continue until you have filled the Pringles can.
3. You can include other layers, like ash (Oreo crumbles) from volcanic eruptions (1883 Krakatoa, 1980 Mt St Helens) and sand (graham cracker crumbs) from tsunamis (1700 Cascadia tsunami)
4. Let the 'core' set and solidify.
5. Cut the core in half lengthwise. You can sample (eat) one half! And the other half will be analyzed by another group.

Lab Part Two: Analyze another group's sediment core

Procedure:

Working in your lab group, you will make basic observations about your sediment cores.

1. Write down any general observations in the space below. What colors do you see in the core? Do you see distinct layers, banding, texture, etc? Don't interpret yet, just observe.



2. Sketch the layering and structures you see in the core using the diagram above. Remember to measure your layers in metric. The **left** side of your core is the **top** of your core. Label the features (blue sprinkles, green sprinkles, ash layers) and **note their depth in cm**. Include an explanation for your sketch (colors, dashed or solid lines etc. *If you draw your layers not to scale on this diagram, be sure to include a scale*)

When you are finished your sketch, send someone up to the board to sketch the features in your ice core on any of the available templates. Use the meter stick to keep your layers in proportion and consider scaling up (i.e. 1cm in your core = 10 cm on the board).

3. In the table below, note the features and depths observed in your ice cores. Not all rows necessarily need to be used.

[illegible]

4. When did marine heat waves occur? What evidence do you have to support this?
5. How many years of climate data do you think you have recorded in your core? How did you arrive at this number? (Assume the average sedimentation rate off the Pacific Northwest Margin is 0.3 cm/yr).
6. Do you note any differences in layer thickness? What do you think the differences in layer thickness represent?
7. How can we correlate the events in the sediment cores with one another?
8. Based on your observations, interpretations, and class discussion, was your hypothesis supported?

9. What additional proxies or analyses could you use to support your interpretation of foraminifera species/bioprovince and layer thickness with respect to temperature and climate change?