

# Paleoclimate Reconstruction Investigation Guide

Driving Question: How can proxies be used to reconstruct past climate patterns?

In this lab investigation, you will reconstruct past climates using lake varves as a proxy. You will:

1. Explore the use of lake varves as a climate proxy to interpret long-term climate patterns.
2. Understand annual sediment deposition and how it relates to weather and climate patterns.

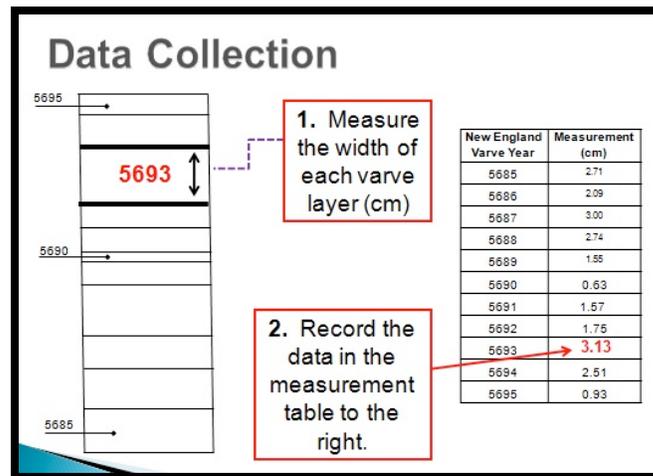
**Note:** The original data set used in this lab has been scaled down by a factor of 10 to ensure that both the core and Measurement Table fit on a normal 8.5" x 11" page.



## Step 1: Paleoclimate Reconstruction

You will be provided with core data and a corresponding Measurement Table. The oldest year on the core is located at the bottom of the core. It is the smallest numbered year on your core. The most recent year on the core is located at the top of the core. It is the largest numbered year on your core.

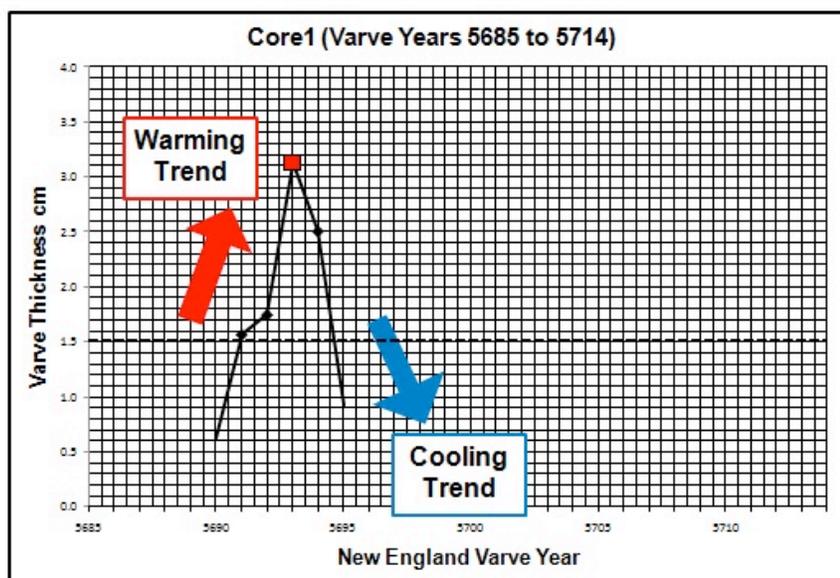
1. **Measure** the thickness of each varve layer in your core (# 1 to the right). Each varve year corresponds to the distance between two line segments in a core.
2. **Record** the measurements in the associated Measurement Table beginning with the **bottom** of the core (# 2 to the right).



When making varve measurements, it is easier to analyze your cores by starting at the bottom of the core (oldest and smaller year number) and work upwards (youngest and higher year number).

**Note:** If the thickness of a varve is less than 0.1 cm, the answer has been pre-recorded in the measurement table

- Graph the data from your Measurement Table on your core graph as shown below (#3 to the right). Varve years are displayed along the x-axis in 5 year increments. Varve thickness in centimeters should be plotted on the y-axis.
- After you have graphed the data, connect the points with straight lines.
- Trace over your lines with a colored marker.



- Plot the points from the previous table onto the associated graph and connect the dots.

**Important Note:** Cool years and warm years are determined relative to a particular location. At **this location**, cooler years are indicated by varve thicknesses that are less than 1.5 cm. Warmer years are indicated by varve thicknesses greater than 1.5 cm.

After you have completed your graph, **answer** analysis questions # 1-2 in complete sentences.

- Look at **your** core graph. What are the warmest and coldest varve years in your core?
- What patterns do you observe in your core graph data? Does your data tend to show warming patterns, cooling patterns, or variable patterns within your core? Provide specific information about your observed trends in the data.

Use the entire 300-year paleoclimate class graph to answer analysis questions # 3-8.

**Note:** Each individual core contains 30 varve years.

- According to the varve record, which core(s) show the warmest years? Support your claim with evidence from the varve record.

