# Mass Accumulation Rate of Lake Sediment in Heart Pond, ME

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## Introduction

This project focuses on discovering the Mass Accumulation Rate in Heart Pond. Heart Pond is located in Orland, Me (Figure 1, red dot). To find out this information we had find a way to construct a age model for our pond. After doing this we will need to construct an MAR data chart to see if it matches with the other data. Eighty-Six samples were taken down a 252 centimeter core. The samples were taken every one centimeter until we reach twenty-eight centimeters. After the first twenty-eight centimeters, we took a sample every four centimeters.

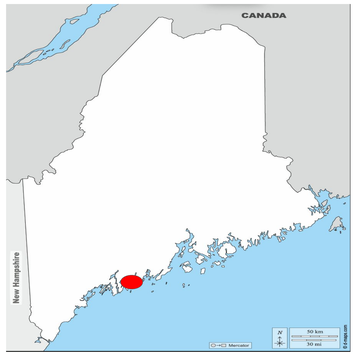


Figure 1: Locus map of Maine, red circle indicates the area in which Heart Pond is located.

## Hypothesis

The lake sediment will show an increase in sediment accumulation shown on the graph that will indicate human involvement. At this point there will be a large spike in the data where this would occur.

## Methodology

- Radiocarbon dating was taken to help develop an Age Model of Heart Pond
- Subsampling the core allow us to obtain our wet bulk and dry bulk density along with giving us samples we can use to extract our isotopic data.

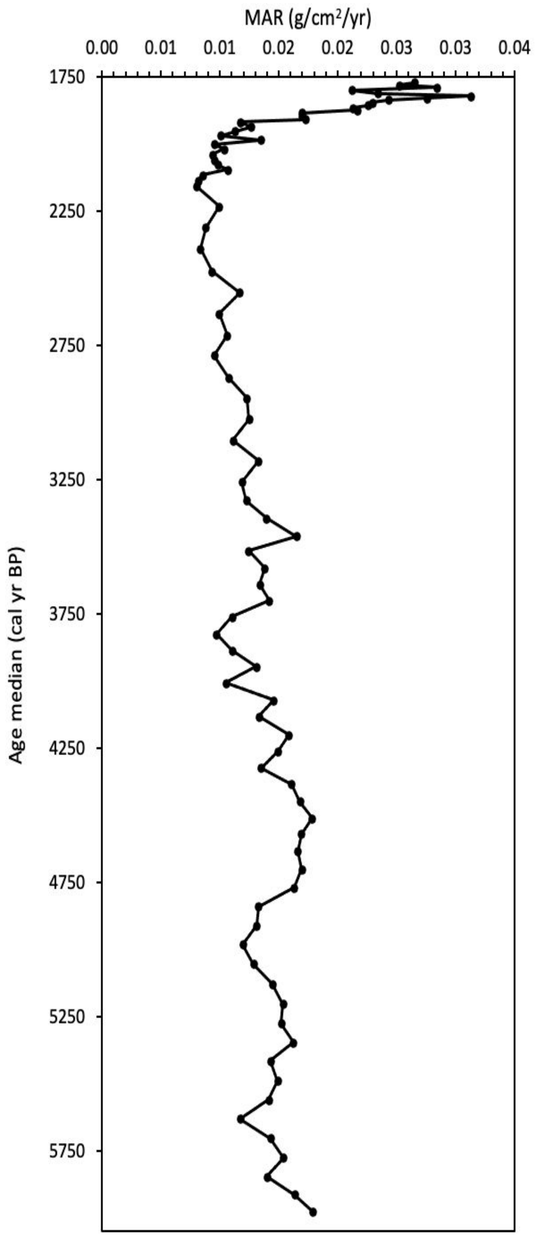


Figure 3: Mass Accumulation Rate (MAR)

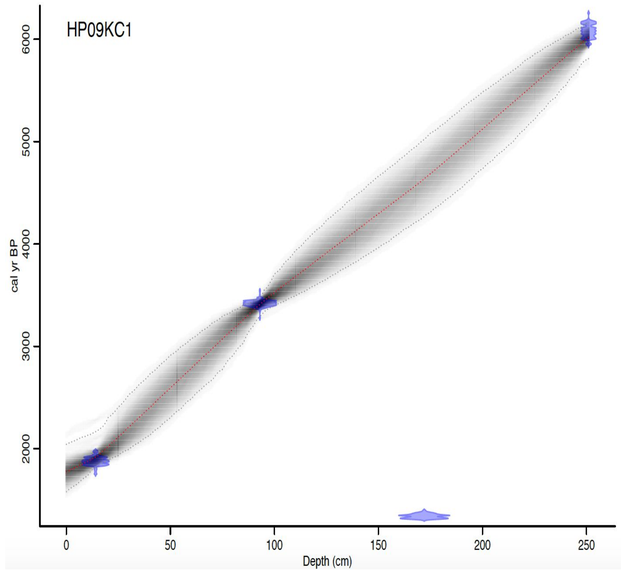


Figure 2: Age Model developed using our radiocarbon data.

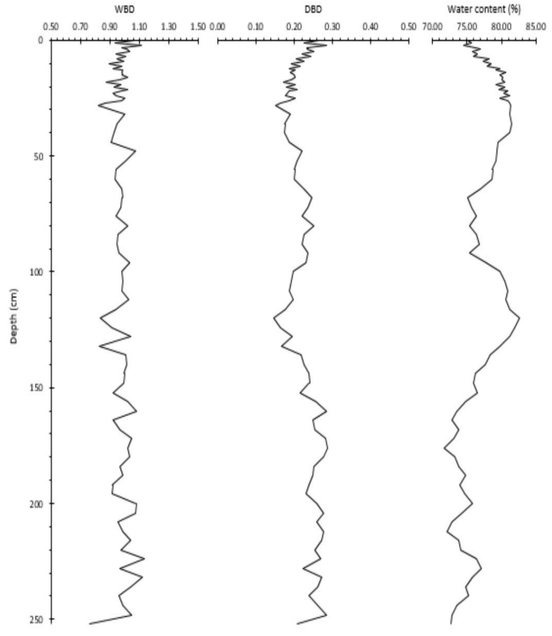


Figure 4: The Bulk Density is represented in Wet Bulk Density (WBD) and Dry Bulk Density (DBD). The graphs do not show large differences after being freeze dried.

## Results

- The MAR chart shows a large amount of movement at the top of the graph with numerous peaks and valleys as it goes down the core
- Bulk density helps us identify sediment compaction and sediment health. The difference in Wet Bulk Density and Dry Bulk Density indicate organic matter is present , the water content did not have much effect on the sediment.
- The age diagram shows that the mass accumulation of sediment in the pond was steady. The anomaly could be due to involvement of a nearby swamp or watershed.

## Conclusion

In conclusion, the hypothesis cannot be proven or disproven since the data is not accurate. The anomaly in the radiocarbon data suggest that the data could have been wrong.

## Next Step

Next Step would be to go back Heart pond and take another core in a similar area to the original core. Once that core is taken, perform the same methodology to see if the results are similar then an additional study would look for what is affecting the age of the pond. If the results are different than compare them to ponds in the New Englad are to see which data set is more accurate.