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### Effects of Differences in Cell Wall Biochemistry on the Microbial Decomposition of Sphagnum (Peat Moss)

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# Effects of Differences in Cell Wall Biochemistry on the Microbial Decomposition of Sphagnum Moss

Alexis Koehl, Christian Lundy, Trevor Hile, Erik Schoonover

Mentor: Dr. Michael Philben

Departments of Chemistry and Geological & Environmental Sciences



# Background

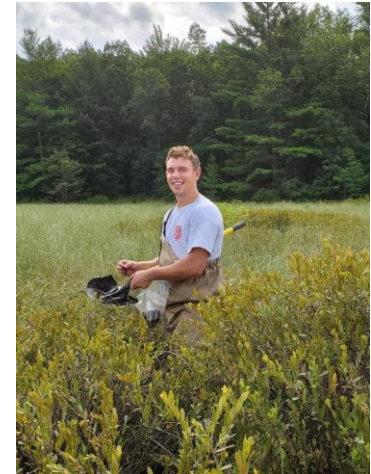
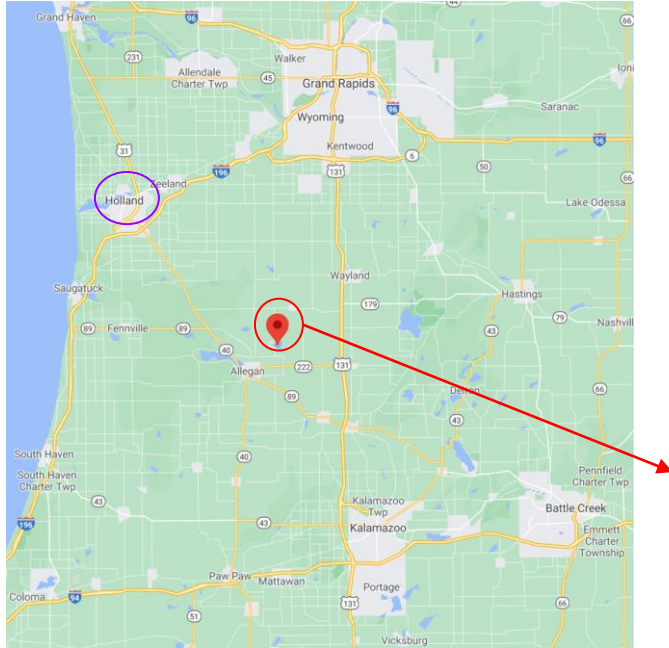
How will carbon storage in peat bogs respond to climate change?



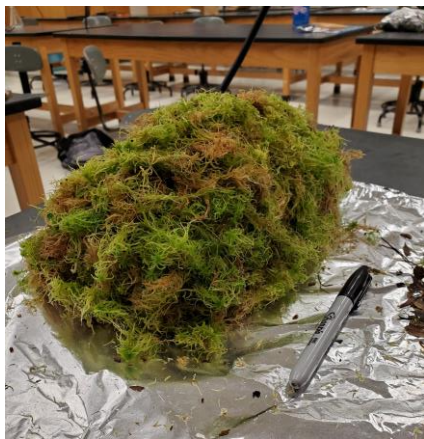
Hypothesis: Mosses collected from different micro topographies will differ in their decomposition rates due to differences in their chemical composition. Hummock mosses have more structural carbohydrates than Hollow mosses influencing the rate of decomposition.



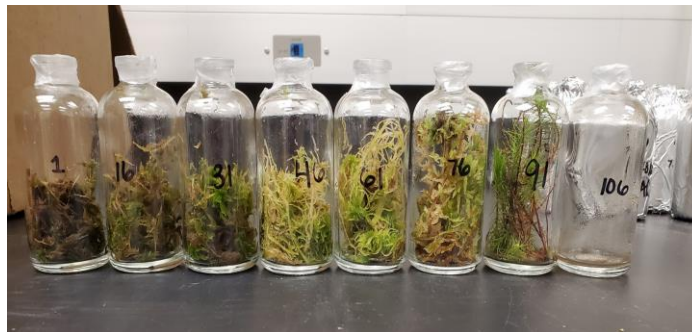
# Methods



# Methods continued



Moss Immediately Following Collection



Incubation Bottles

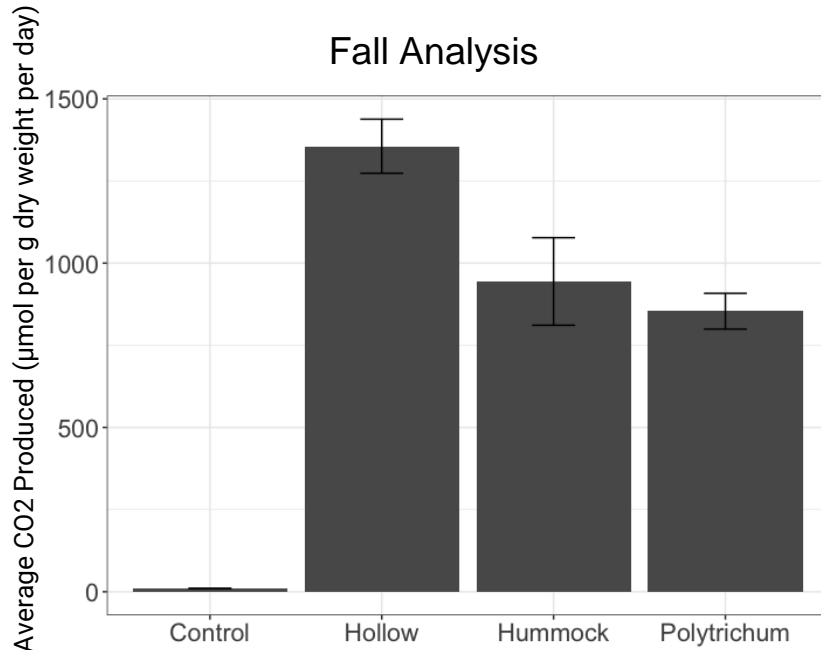


Ground-Up Samples for Elemental Analysis

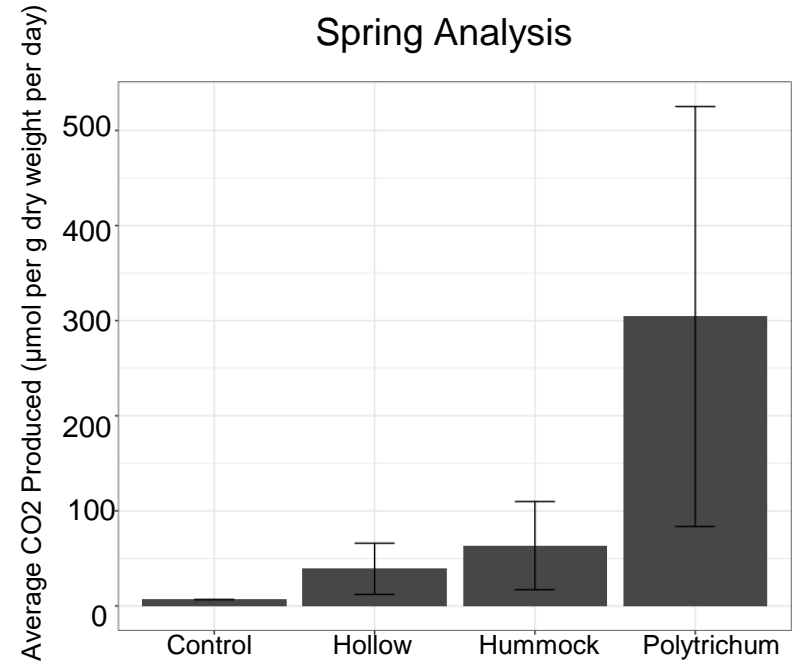


Elemental Analyzer

# Results



Carbon Dioxide Production for Each Moss Type  
8/3/2020



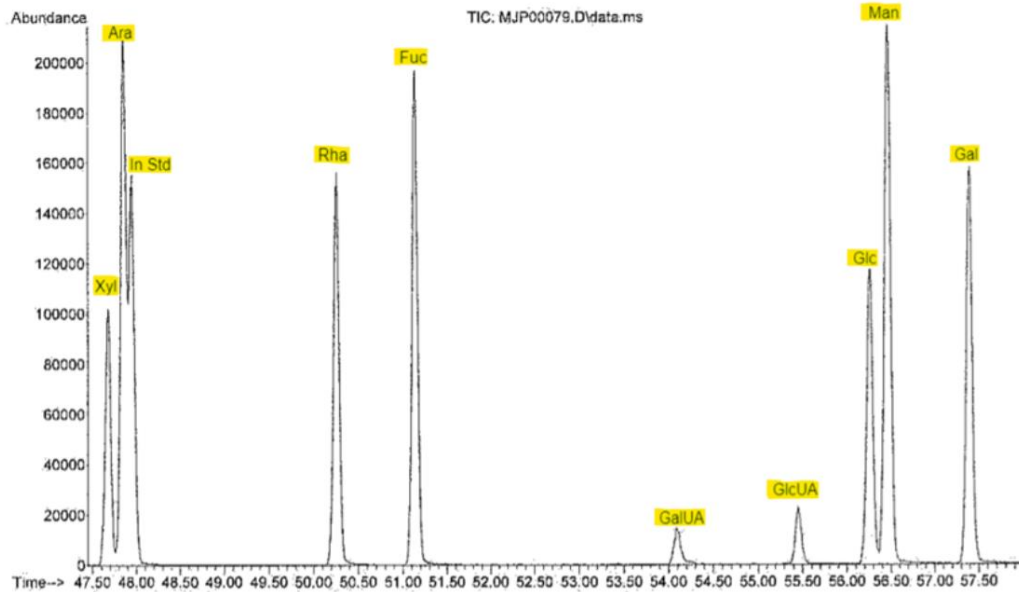
Carbon Dioxide Production for Each Moss Type  
3/11/2021

# Conclusion

- In the first decomposition stage, Hollow mosses decompose faster because of labile components.
- In the second decomposition stage, the rate of decomposition became similar because only recalcitrant components were left in both Sphagnum species
- Through this further understanding of the decomposition patterns of Sphagnum moss, we can better characterize how Sphagnum sequesters carbon in peat bogs at low rates of decomposition



# Ongoing Work



GC-MS Chromatogram of Various Carbohydrates

Our ongoing work includes analyzing the chemical compounds in the different moss types to determine the compounds that cause the different decomposition rates



# Acknowledgements

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The Hope College Geological and Environmental Sciences Department



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