Using diatoms to reconstruct eutrophication in Lake Carmi, VT

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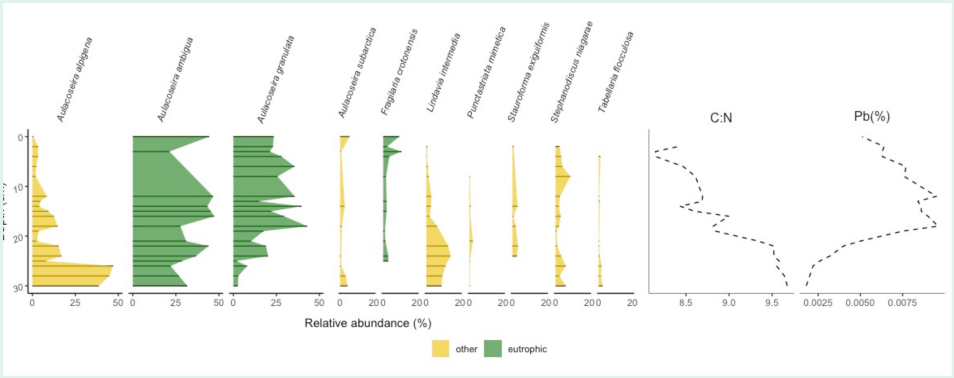
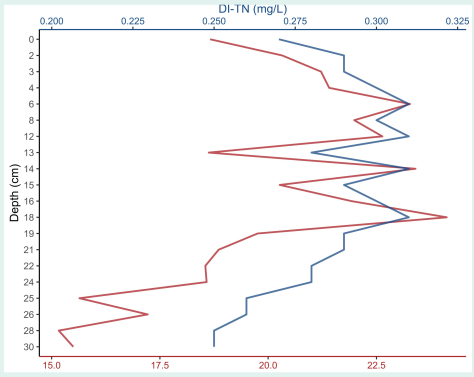


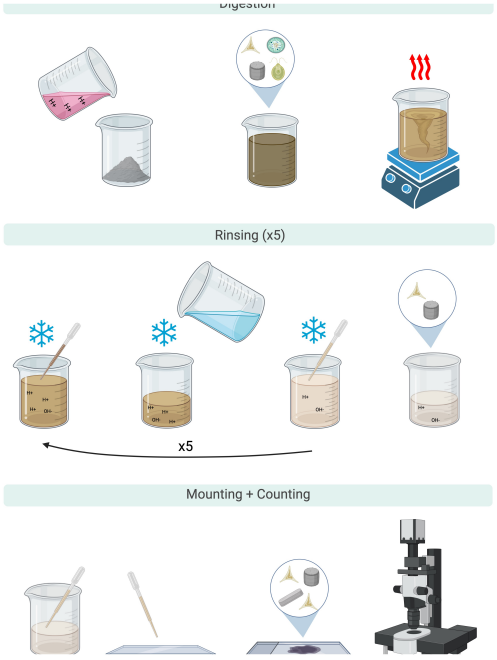


Left: Stratigraph of diatom indicator taxa, measured C:N, and %Pb in core. Right: Diatom inferred TP and TN using training sets of 125 VT lakes

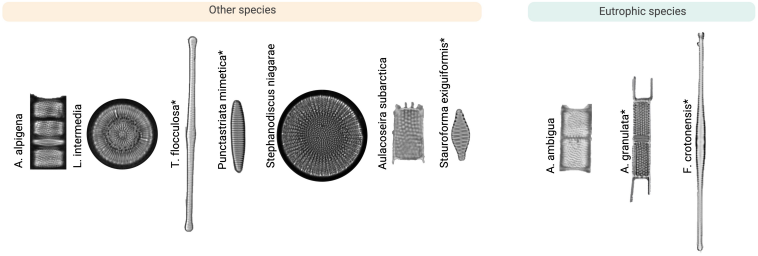
INTRO / BACKGROUND

- Lake Carmi is an upstream tributary to Lake Champlain
- Watershed mostly agriculture and forest
- Persistent cyanobacteria blooms due to watershed and internal nutrient loading
- $1 mil. aeration system installed in 2018 to oxygenate hypolimnion
- Has Lake Carmi become more eutrophic over the years due to anthropogenic activities?

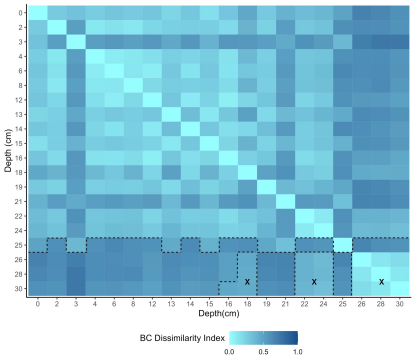
METHODS



RESULTS



Diatom species that appeared at least 5x, at or above 1%. Images with * are from diatom.org



Bray-Curtis Dissimilarity matrix comparing diatom assemblages between core depths. Dotted area indicate highlight area that is over 50%

Me at the buoy (totally not covered in bird scat) in Lake Carmi. Live buoy data of Carmi can be found at https://epscor.uvm.edu/LakeCarmi

CONCLUSION

- Increase in eutrophic species and a decrease in oligotrophic diatom species
- Aeration system installed in 2018 may have mixed core layers 1-10cm
- Most dissimilar depths were from 3cm to 30, 23, and 26cm at 74% dissimilarity suggesting a change in the assemblage over time
- Measured C:N decrease over time, suggesting increased primary production
- Future work: Lake carmi sediment core is currently being Pb-210 dated and analyzed for stable isotopes

ACKNOWLEDGEM
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