FRESHWATER DIATOMS OF LYGRA, NO

Palaeoecology/BIO250

Authors

Julius, Sacha, Tina Sjanin and Elliott

Acknowledgements

Anne Elisabeth Bjune & Christian Hans Quintana Zagaceta

Figure 1. Group members using a Russian corer to extract soil samples from Lygra, Norway

Background

- Diatoms are unicellular, eukaryotic, microscopic algae (Whenua, 2025).
- Bacillariophyta class (Whenua, 2025).
- Thrive under specific ecological conditions & used to detect changes in their environment across time (Lobo et al., 2016).
- We aim to identify which Genus of diatoms are present within our research site in Lygra, Norway to determine the temperature, oxygen and pH levels of the research site through time.

How can freshwater diatoms from the heathlands of Lygra, Norway be used to determine the temperature, oxygen and pH levels of the site location over time?

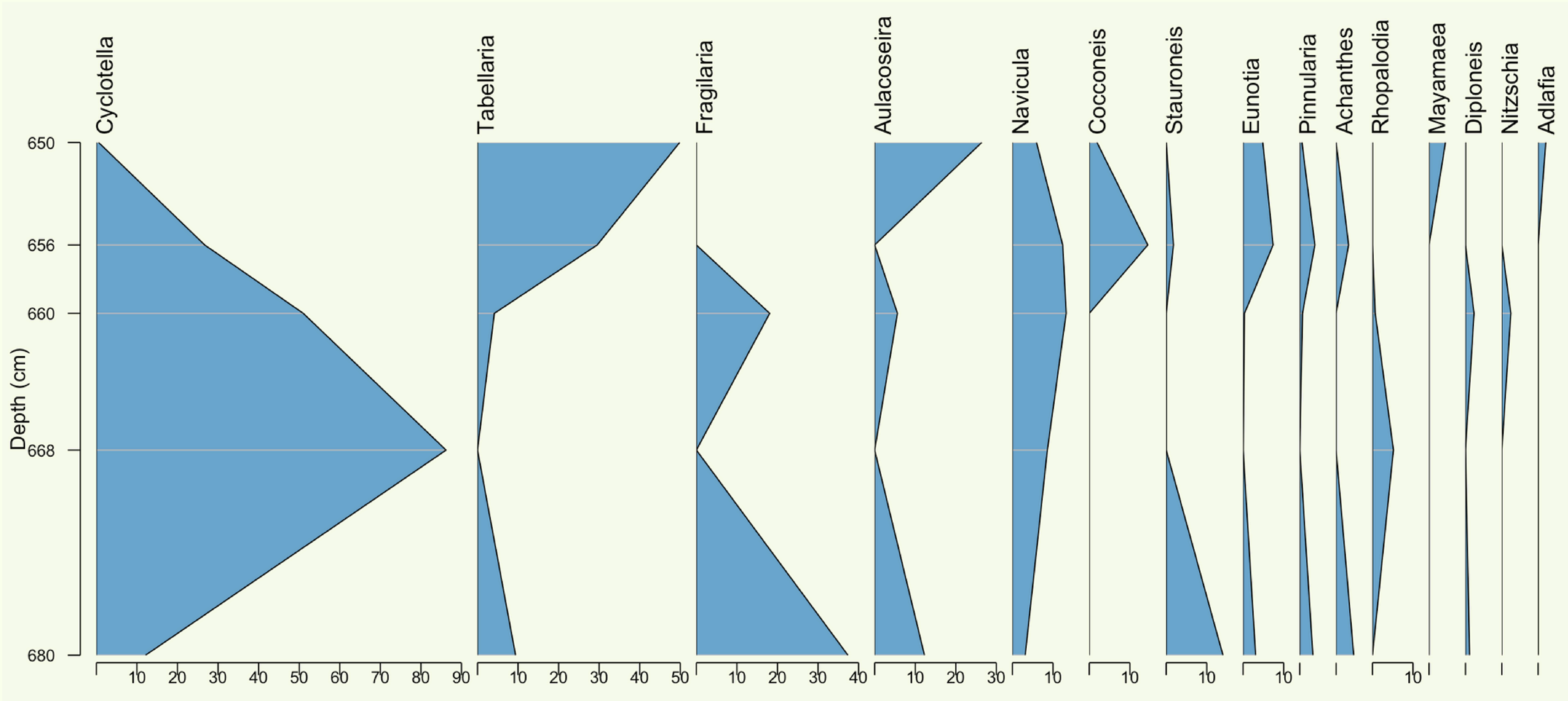

Figure 2. The relative abundance of diatoms found at various depths in the heathlands of Lygra, Norway

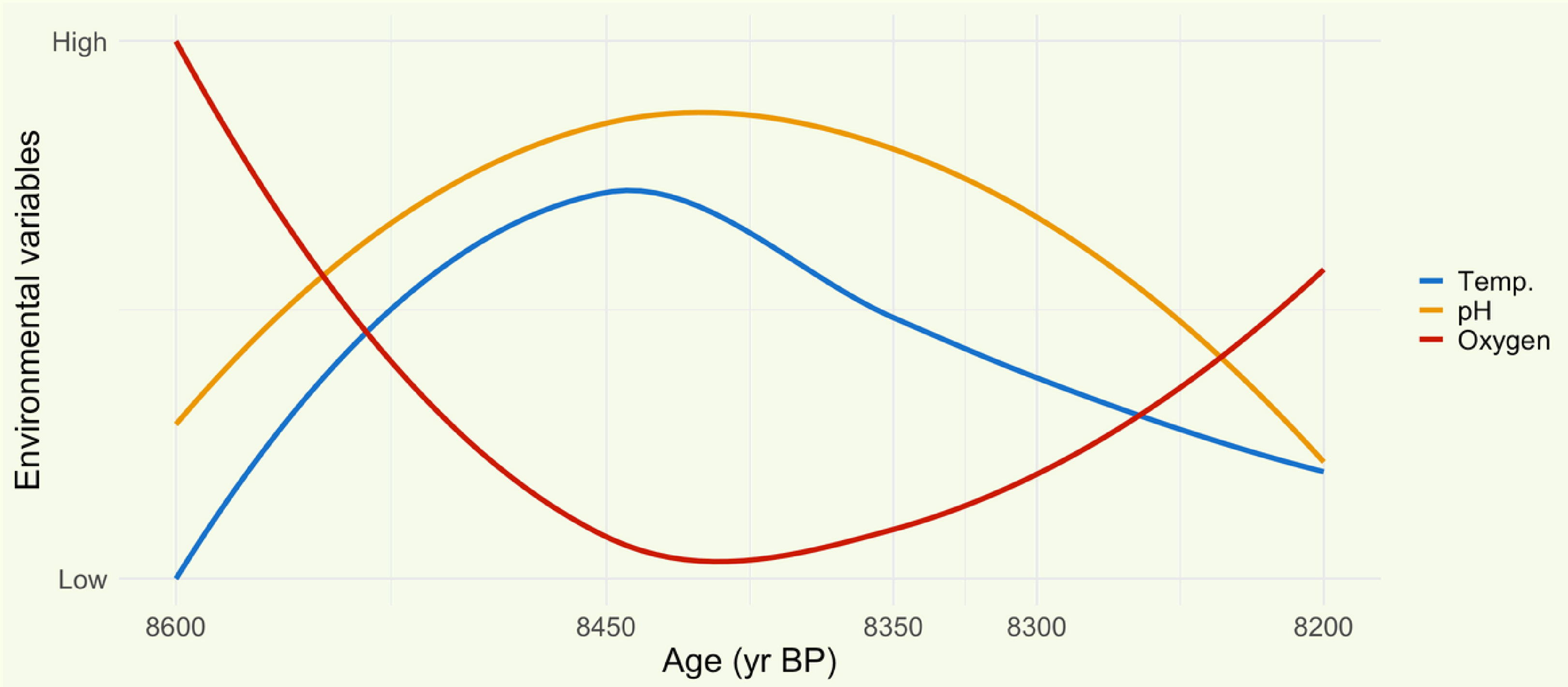

Figure 3. The assumed environmental variables over time in Lygra, Norway

Methodology

- Study site: Lygra heathlands
- Samples: 5 depths - 650, 656, 660, 668, 680 (from field trip from 2016)
- Data processing was done in RStudio and the model was created using the rioja package
- We extrapolated the age of our depths with existing radiocarbon data, which was not going as deep as our sampling depths

Figure 4. Gomphonema spp. at 40x magnification under a compound microscope

Findings & Conclusion

- 8600: Lower Temperature, acidic and oxygen-poor waters (Fragilaria)
- 8450: rising temperature, higher pH and lower oxygen (Cyclotella)
- 8350: Rise in oxygen and decreasing levels of temperature and pH (Fragilaria and Cyclotella)
- 8300: Similar conditions as in previous depth
- 8200: Colder and more turbulent than previous age, as well as lower pH and higher oxygen levels (Tabellaria, Eunotia, Aulacoseira)

➡ There was an overall shift in the decomposition of the diatoms found, which indicates that there was a shift in the climate during the studied time periods.

Sources

Lobo, E.A., Heinrich, C.G., Schuch, M., Wetzel, C.E., Ector, L. (2016). Diatoms as Bioindicators in Rivers. In: Necchi JR, O. (eds) River Algae. Springer, Cham. https://doi.org/10.1007/978-3-319-31984-1_11

Menaaki, W. (2025). Diatoms. Bioeconomy Science Institute. https://www.landcareresearch.co.nz/tools-and-resources/identification/freshwater-algae/description-of-major-groups/diatoms [accessed November 11, 2025]

Spaulding, S. A., Potapova, M. G., Bishop, I. W., Lee, S. S., Gasperak, T. S., Jovanoska, E. Edlund, M. B. (2021). Diatoms.org: supporting taxonomists, connecting communities. Diatom Research, 36(4), 291–304. https://doi.org/10.1080/0269249X.2021.2006790

Yogeshwaran, M. et al. (2025). Soil diatoms and their applications as an indicator of environmental changes. ScienceDirect. https://www.sciencedirect.com/science/article/abs/pii/S0929139325004159 [accessed November 11, 2025]

Schirrmeister, L. , Pestryakova, L. , Wetterich, S. and Tumskoy, V. (2012): Joint Russian-German polygon project : East Siberia 2011 - 2014 ; the expedition Kytalyk 2011 , Berichte zur Polar- und Meeresforschung = Reports on polar and marine research, Bremerhaven, Alfred Wegener Institute for Polar and Marine Research, 653 , 153 p. . doi: 10.2312/BzPM_0653_2012

Rühland, K.M., Paterson, A.M. & Smol, J.P. Lake diatom responses to warming: reviewing the evidence. J Paleolimnol 54, 1–35 (2015). https://doi.org/10.1007/s10933-015-9837-3

250.3