

An investigation of freshwater macroinvertebrates to assess water quality at Lake Viljandi

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Our goal for this experiment and investigation was to compare the water quality in different locations, by using freshwater macroinvertebrates as bioindicators and analysing the method and its reliability.

Methods and materials

At first we caught the macroinvertebrates in the pond (red mark on figure two) and the lake (yellow mark on figure 2). After identifying the taxons we used the "Identification guide to freshwater macroinvertebrates of Estonia" bioindicator protocol by H. Timm to evaluate the water quality. Different macroinvertebrate taxons gave a different amount of points depending on their rarity and sensitivity. After calculating the points of both of the locations we compared the scores.

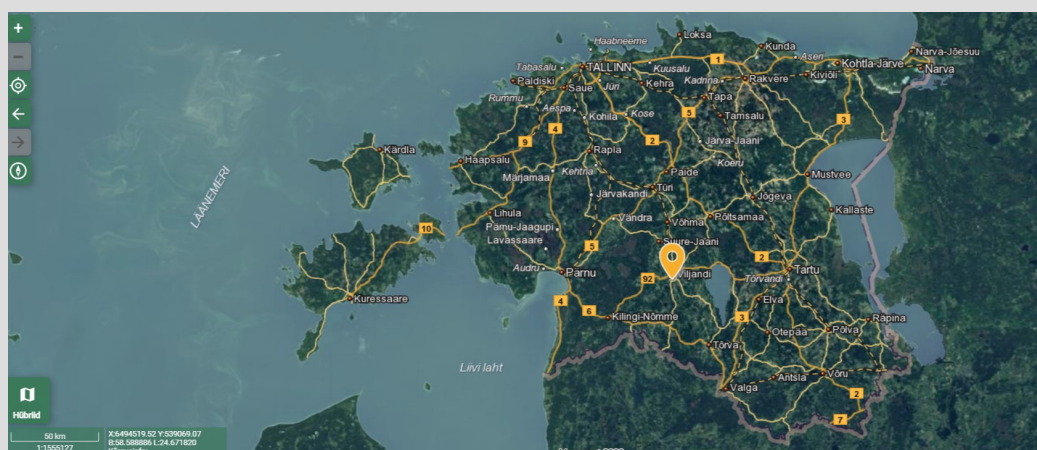


Figure 1, The map of Estonia with the locations of the experiment marked (screen capture from <https://geoportaal.maaamet.ee/est/Kaardirakendus-p2.html>)

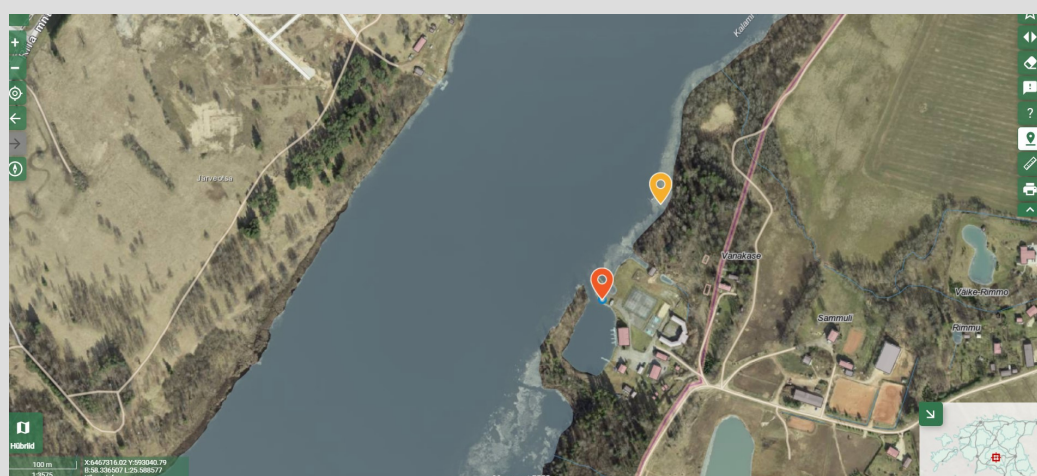


Figure 2, the map of Lake Viljandi with the first (the red mark) and second location (the yellow mark) Screen capture from <https://geoportaal.maaamet.ee/est/Kaardirakendus-p2.html>

Research questions

"What do the species and biodiversity say about the body of water?"
"From which location will we find more taxons of freshwater macroinvertebrates in 30 minutes?"

Results

We found 10 taxons of macroinvertebrates in both of the locations, 11 only in the lake and 4 only in the pond.

The lake got a total score of 46 points, which according to the bioindicator protocol is considered *very good*. The pond's score was 32, which is a lot less than the lake's score, but is still considered *good*.

Some of the most common organisms we found were Hydrachnidia (figure 3) and *nepa cinerea*.

Conclusion

In conclusion we found out that Lake Viljandi has cleaner water and a better living environment than the pond near it. Using macroinvertebrates as bioindicators is a more accessible method of assessing the water quality of a body of water than some chemical reactions with the water. Sadly this method will not tell us a lot about what factors may affect the quality of the water and will rather rate the water quality more generally. The answer to our first research question is that depending on the sensitivity of the 5



Figure 3, Hydrachnidia,
https://en.wikipedia.org/wiki/File:%D0%92%D0%BE%D0%B4%D1%8F%D0%BD%D0%BE%D0%B9_%D0%BA%D0%BB%D0%B5%D1%89.j