

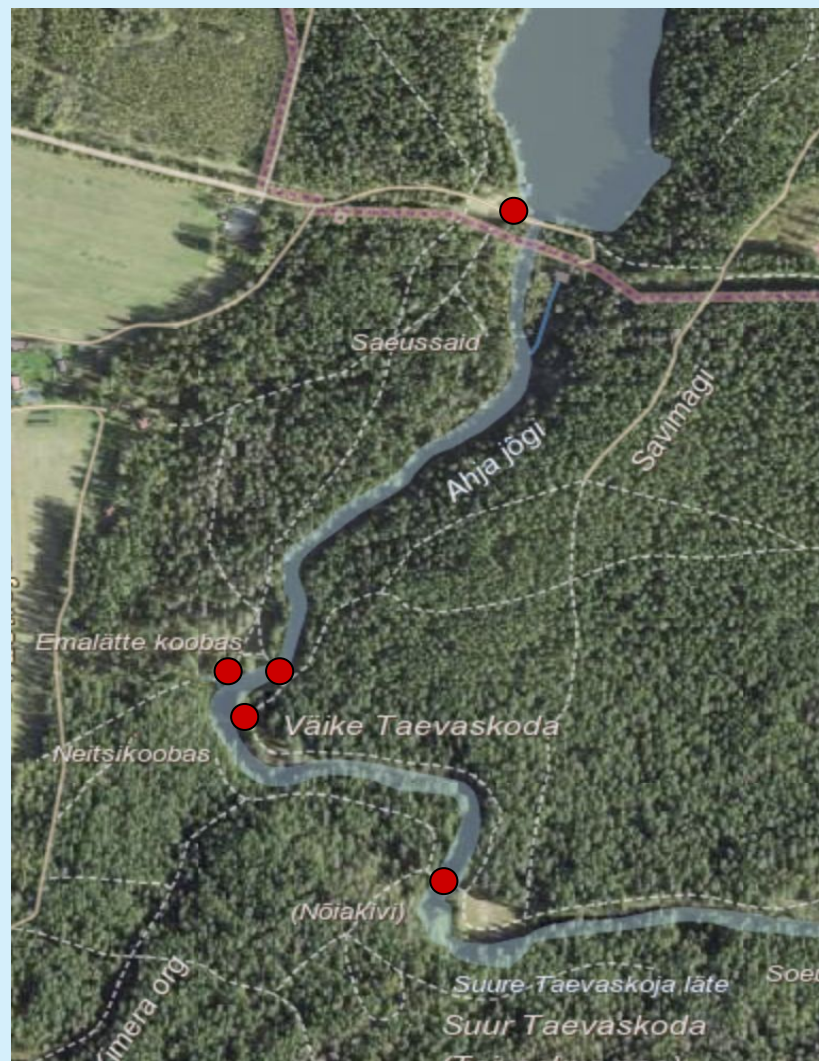
The Impact of a Spring and an Artificial Lake on the Ahja River

Group: Ahja jõgi
Suur Taevaskoda 2024



Research locations

1. Suur Taevaskoda - Ahja river after the spring
2. Väike Taevaskoda - Ahja river after the spring
3. Emaläte spring - the spring
4. Bridge - Ahja river before the spring
5. Saesaare artificial lake - Ahja river before the spring



Research questions:

1. Are there any spring induced changes in the river's water quality?
2. What can influence the water quality of the Ahja river?
3. What changes in river water quality can be noted when moving further from the artificial lake?

Hypotheses

1. Downstream from the spring, water becomes clearer and lowers in temperature.
 - The clear and cool water from the spring causes the water downstream from it to be more transparent and colder.
2. The main influencers of water quality are the spring and artificial lake.
 - The surroundings of the river are fairly consistent and there are not any other major influencers near the river that we are aware of.
3. As you get further from the artificial lake, the oxygen concentration in the river decreases.
 - The concentration of dissolved oxygen is generally higher in flowing water with many obstacles. Rivers tend to become calmer the more downstream you go, so it is likely that the concentration of dissolved oxygen will decrease as you get further downstream from the artificial lake. (6)

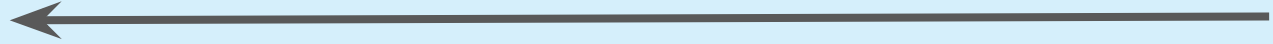






Results

River flow direction



	Suur Taevaskoda	Neitsi- koobas	Taevaskoja Emaläte	Ahja river before spring	Saesaare artificial lake
pH	7.47	7.55	6.51	7.17	7.5
Temperature(°C)	17.7	17.8	7.5	17.9	20
Conductivity(µS/cm)	320	323	238.5	324	319
Dissolved Oxygen(mg/L)	7.01	6.95	8.34	7.05	7.4
Alkalinity(mg/L)	270	250	240	300	280
Nitrates(mg/L)	0.7	0.7	1.1	0.9	0.6
Transparency(cm)	90	96.5	>120	82.5	104

Summary

Spring:

- transparency - higher
- alkalinity - lower
- more acidic
- more nitrates

Hypotheses

- The spring and the Saesaare reservoir affect the water quality of the Ahja River. **Yes**
- The spring significantly affects the water properties. **No**
- Moving further from the reservoir, dissolved oxygen decreases. **Yes**
- Temperature and dissolved oxygen decrease when moving downstream from the spring. **Yes and no**

Artificial lake:

- temperature higher
- level of dissolved oxygen - higher

Conclusions

- The water in the Saesaare reservoir is warmer and gradually cools as it flows downstream.
- The electrical conductivity in the Ahja River (321.5 $\mu\text{S}/\text{cm}$) did not change significantly despite the inflow of spring water (238.5 $\mu\text{S}/\text{cm}$).
- After the inflow of less alkaline spring water (240 mg/L) into the river, the alkalinity decreased by 30 mg/L (290 \rightarrow 260 mg/L).
- The transparency of the river water increases as it flows downstream, reaching its maximum value (96.5 cm) after the spring water (>120 cm) enters the river.

Thank you!

