

MONITORING TOOLS FOR SUSTAINABLE WATER MANAGEMENT IN MOUNTAIN AREAS

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Abstract

The naturally oligotrophic rivers in Northern Sweden are generally characterized by a low pollution level. However, an increasing trend in *E. coli* contamination has been observed in the most upstream catchment area of one of the large rivers of Northern Sweden. This decrease in microbial water quality will have a severe negative impact on the ecosystem, wild animals, visitors, inhabitants as well as indigenous people dependent on the land for their daily income, such as Sami herders. The source area of river Indalsälven is part of a very remote, mountainous region with few roads, which makes it challenging to conduct regular water quality monitoring covering the whole area of $\pm 780\text{km}^2$. The aim is to evaluate and implement monitoring tools that are more environmentally friendly and faster than the currently applied methods which can be implemented as an early warning system for fecal contamination in remote mountain areas.

Currently, the presence of fecal contamination in Indalsälven's catchment area is assessed by strategic river-side water sampling, followed by long transport times and laboratory analysis of fecal indicator organisms such as *E. coli*. The use of drones for water sampling could significantly increase the accessibility and coverage of the research area. Also, analysis time can drastically decrease by doing field analysis of the water samples, e.g. by performing a field-PCR for the detection and quantification of *E. coli*.

On the other hand, the monitoring of proxies for fecal contamination can also be a promising approach for continuous monitoring and the development of an early warning system. Our previous research has shown that river flow rate and river color are potential parameters for this. Continuous measurement of these parameters at well-chosen locations or remote imaging by drones over the whole research area are proposed to investigate this track.

Keywords: *E. coli*, airborne monitoring, water quality

References

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