



The new old lake water intake in Lake Biel

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Will global warming force a shift in Biel's drinking water intake? What caused the sudden turbidity of the water supply in the winter of 2009? Eawag has come up with answers to these and other questions for Energy Service Biel, and in the process, new questions have also emerged.

The Ipsach lake waterworks supplies Biel and Nidau with drinking water. After 40 years in operation, Energy Service Biel (ESB) plans to replace the works, including the lake water intake. ESB commissioned Eawag to undertake a study to determine the ideal, future-proofed location for the water intake, which was carried out in collaboration with the EPFL and the University of Bern. Special attention was paid in this study to a mysterious turbidity in the lake, which affected the quality of the water in December 2009, to the point where the supply had to be cut off for several days.

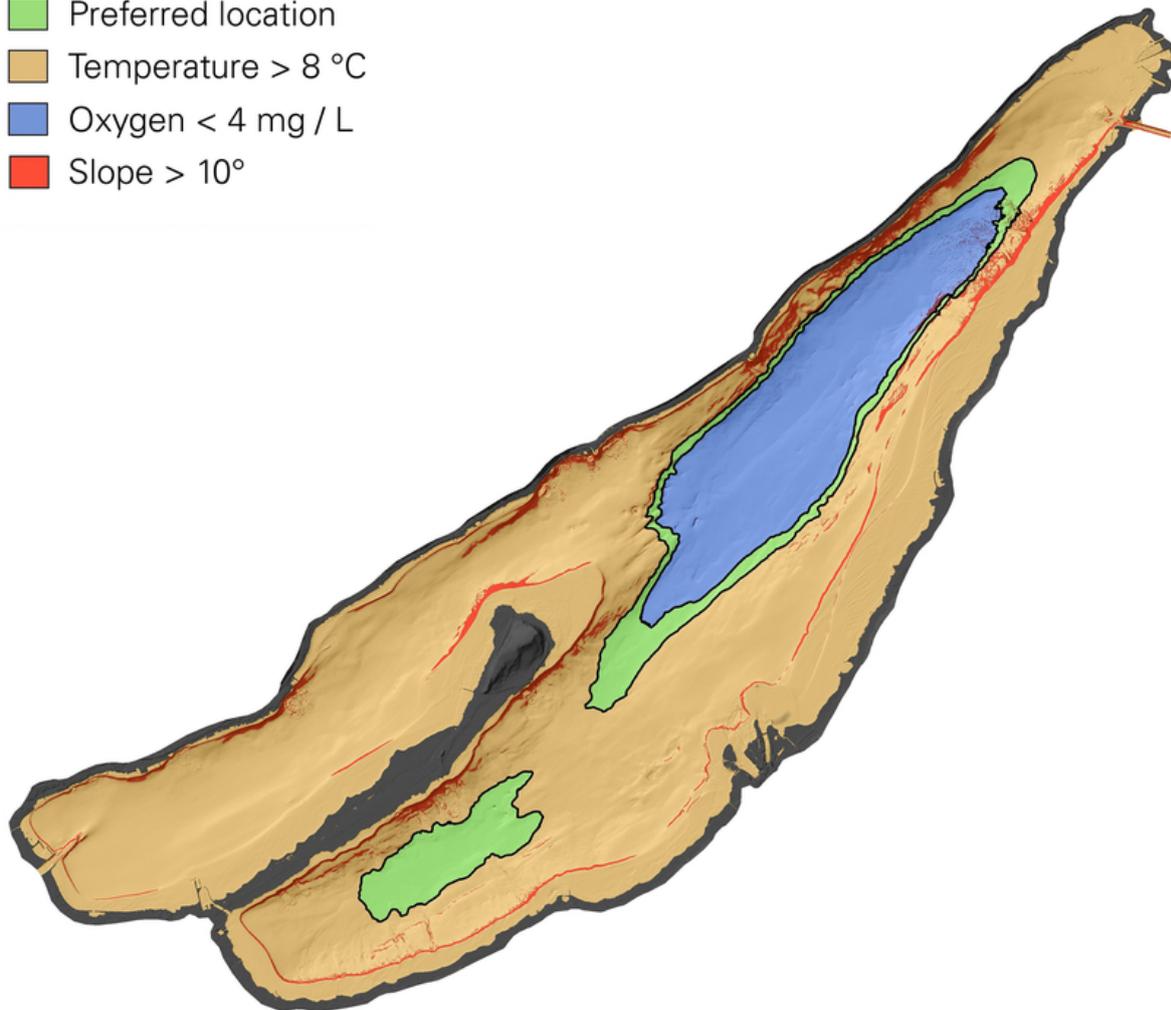
Slope stability, Mühleberg atomic power plant and global warming

The researchers discovered that this massive turbidity could be traced back to a landslide within the lake. Because of this, the choice of location depended not only on the usual parameters of odour, taste, pH value and oxygen content and so on, but also consideration of the slope stability of Lake Biel and the influence of the inflowing Aare and Schüss tributaries on the particle content of the water. A major parameter that had to be considered was water temperature: with the closing of the Mühleberg atomic power plant on the one hand, and global warming on the other, it will be affected in two opposing directions.

Present position ideal

After consideration of all these factors, the researchers concluded that the present location of the lake water intake will continue to meet the water quality requirements fully satisfactorily. They recommend only that the intake should be somewhat deeper than it is at present. Thanks to Eawag's contribution, not only the drinking water quality and supply security for 60'000 inhabitants will be guaranteed for a long time, but the proper positioning of the intake will also save money and energy during the treatment process, as it renders complex filter systems unnecessary. In addition, the study provides several points of reference for further projects. For instance, there were indications of high-yield springs in Lake Biel.

- Preferred location
- Temperature > 8 °C
- Oxygen < 4 mg / L
- Slope > 10°



Combination of the criteria of temperature (depth < 42 m), oxygen (depth > 47m) and topography (slope > 10°). The brown areas are too warm and in the blue areas there is insufficient oxygen in late autumn. The red areas show where there is increased potential for underwater landslides. The green area in the eastern part of Lake Biel indicates where water quality is suitable for the lake water intake (7m distance to sediment). The intake has hitherto been located in the north-eastern part, in front of Ipsach.

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[Technical article in the current issue \(9/2017\) of SVGW's magazine Aqua & Gas \(German only\) \[pdf, 2 MB\]](#)

Contact



Damien Bouffard

Deputy head of department

Tel. +41 58 765 2273

damien.bouffard@eawag.ch



Andri Bryner

Media officer

Tel. +41 58 765 5104

andri.bryner@eawag.ch

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