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Micropollutants in Bernese Waters

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Micropollutants such as residues of pharmaceuticals, ingredients of products for daily use or plant protection products (PPP) occur in the aquatic environment in concentrations of microgram to nanogram per liter. Some of them can be harmful for water organisms even at such low concentrations. Micropollutants enter the water bodies either by discharge of wastewater, as so-called point sources, or as diffuse entrances directly from the site of application into the water, *e.g.* by run-off of PPPs. Major rivers are mainly affected by point sources from urban wastewater, with pollution increasing the higher the percentage of wastewater. Due to the large water amounts, these micropollutants are diluted to lower concentrations, thus reducing the ecotoxicological risk for water organisms. But the high load of micropollutants in these major waters is a matter of concern. Diffuse inputs account quantitatively less than point sources. But since they affect all sizes of water bodies, especially in small rivers and lakes, they are often responsible for enhanced concentrations. In these cases, the associated risk increases with the intensity of land use in the

catchment area. The main source for diffuse inputs is agriculture, especially the use of PPPs. It is therefore not surprising that peaks of high concentrations of critical substances are found mainly during the application period.

Micropollutants, especially if they are persistent and mobile, are also found in groundwater aquifers. Concentrations are usually very low and mostly non-hazardous for humans and animals. However, these micropollutants in the groundwater lead to a potential contamination of our drinking water. For precautionary reasons we should strive to keep this important resource free of impurities. Besides, groundwater aquifers tend to being inert and having a long lasting memory. It will take ages to decades for showing improvements, even if measures are implemented today.

Micropollutants are ubiquitous in Bernese Waters and can be detected in running waters, in lakes, and in groundwater. Pollution increases with population density and intensity of agricultural activities in the catchment area. For precautionary reasons, especially water bodies being used for the production of drinking water deserve special protection.

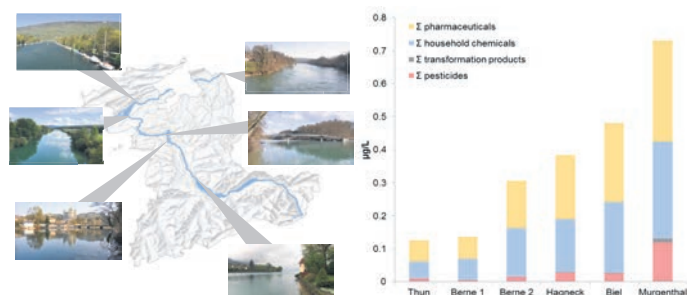
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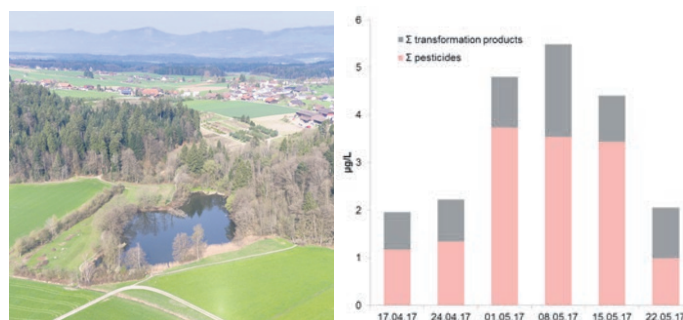
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Further information on the Water and Soil Protection Laboratory or the water quality of bernese waters can be found on <https://www.bve.be.ch/bve/de/index/wasser/wasser/gewaesserqualitaet.html>.



Micropollutants in the river Aare at six downstream measuring points with increasing population density and intensity of agricultural activities in the catchment area. The concentrations are not critical for water organisms, but the load at Murgenthal (top right) of 16.2 kg micropollutants per day is very high.



Micropollutants in the Wolferbach, a tributary to a small lake in a rural area, show concentration peaks at the beginning of May, a period that correlates well with the application time of PPPs. This results in a strong risk for water organisms.

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