

Biomonitoring – Bewertung des ökologischen Zustandes der Gleen im Bereich eines Kläranlageneinleiters anhand von Makrozoobenthos gemäß der EU-WRRL

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Abstract

Today waterbodies and their quality are influenced by multiple pollutants. The software PERLODES/ASTERICS (www.fliessgewaesserbewertung.de) is based on a standardized river assessment for German streams (Meier et al. 2006) with macrozoobenthos according to the European Water Directive. Parameters like saprobic index, degradation or acid class, based on the collected macrozoobenthos, are needed to calculate the ecological quality of streams.

The aim of the study is to investigate, the ability of the method to detect ecotoxicological effects in streams.

The subject of the study was a small Hessian stream in the low mountain range called Gleen. It is feeded at one point by treated municipal wastewater of a small village. The first investigation section of the stream as a reference (G1) was directly upstream the discharge of wastewater. The second investigation section (G2) was directly downstream the discharge. The third investigation section (G3) was 600 m down the stream.

To rule out an influence of the structure of the stream, there were sections chosen with similar structure. These three stream sections were assessed with the method of Meier et al. (2006). Afterwards the ecological quality of the stream was calculated with the software PERLODES/ASTERICS. The reference section G1 before and the section directly behind the discharge of wastewater (G2) exhibited a “moderate quality”, the third section (G3) a “bad quality”. But if you zoom in on the macrozoobenthos community, you see an obvious change between the community of section G1 and section G2, even though they got the same ecological quality class. Mainly the direct absence of typical taxa in the section G2 (and G3) after the discharge of wastewater shows a clear effect on the ecosystem.

The study leads to two main conclusions: Biomonitoring with macrozoobenthos seems to be a good method to detect ecotoxicological effects in streams. But using the indices, according to the EU Water Framework Directive clear effects in this study on the aquatic ecosystem lead only in one of two sections to a devaluation of the ecological quality class.