

Ecotoxicological evaluation of sediments: Establishment of recommendations in Switzerland

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Introduction: The Swiss Centre for applied ecotoxicology (Centre Ecotox Eawag/EPFL) has a growing interest in sediment as it is an essential compartment of aquatic ecosystems. Indeed, on one hand, sediment plays an important role for numerous species (habitat, laying sites, etc.) but on the other hand it can catch persistent pollutants, acting then as a long term source of contamination for aquatic systems. Through chemical, biological and ecotoxicological analyses [1] it is possible to evaluate sediment toxicity allowing the identification of contaminated sites and the risk they may represent. In Switzerland, according to the Ordinance on Waters Protection [2], sediments should not accumulate any persistent pollutants so that aquatic life protection is assured. However, in Switzerland, harmonised recommendations for the characterisation of sediment toxicity and quality criteria are lacking.

Methods: In order to integrate currently used methods and knowledge in the domain of sediment quality assessment in Switzerland, and guide the establishment of harmonised recommendations, we submitted a questionnaire to each of the twenty-six cantonal environmental agencies. The questionnaire included questions relative to the use of analytical methods, sediment quality criteria, bioassays and biotic indexes and also some questions about the expectations of the Swiss cantons in this domain.

Results: Nowadays in Switzerland, sediments are essentially analysed for their chemical content of contaminants, mainly metallic compounds, PCBs and PAHs. The effects on benthic organisms are not yet directly considered. That means that the characterisation of sediment quality is often based on the comparison of measured concentrations to reference values (Swiss indicative values for soil [3] and reference objectives of the International Commission for the Protection of the Rhine (ICPR) [4]) are mostly used). Besides, there is an interest in including ecotoxicological tests in a holistic approach for the survey of sediments. A demand on recommendations and harmonisation of the methods

for and between Swiss cantons has also been pointed out.

Discussion: Thanks to the feedback provided by Swiss cantonal environmental agencies, we will be able to better focus the evaluation of sediment quality on the protection of benthic organisms. This is a key factor for maintaining / reaching a good ecological status of Swiss rivers, within the Water Framework Directive [5]. The responses provided via the questionnaire showed that there is a real need for harmonised recommendations for the evaluation of sediment ecotoxicity, and for effect threshold values for contaminants present in sediments as required by the Swiss Water Ordinance [2]. In a previous study, we reviewed the existing information on sediment quality criteria and the methods for their derivation [6] which will be useful to answer this need.

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References: [1] Chapman (1990) *Science of the Total Environment* **97-98**:815-825; [2] FOEN (1998) *RS 814.201*; [3] FOEN (1998) *RS 814.12*; [4] ICPR (2009) *Rapport N°164 – Koblenz*; [5] European Parliament and Council (2000); [6] Flück et al. (2010) *Setac-GLB Dessau Poster*.