



Outline scope of webinar

BIOAVAILABILITY TOOLS FOR AQUATIC ASSESSMENT

Introduction

It has long been established that the potential ecological risk of metals is influenced, in-part, by the prevailing environmental conditions. In freshwaters this often means that water chemistry characteristics, such as pH, dissolved organic carbon and water hardness can affect what the organism in the water experiences in terms of metal exposure.

These water chemistry conditions influence the metal bioavailability. This term is widely used, but here can be considered to be a combination of the physico-chemical factors in the water column governing metal behaviour and the biological receptor - its specific pathophysiological characteristics.

There are considerable challenges faced in setting ecologically relevant water quality guidelines for metals including:

- The presence of low concentrations of metal mixtures from natural or anthropogenic sources that vary spatially and temporally in surface waters;
- The form or speciation of a metal changing in response to water chemistry conditions;
- The form of the metal having an influence upon bioavailability and subsequent ecotoxicity to aquatic organisms;
- Some metals are essential for the functioning of biological systems.

Therefore, to predict what an organism actually experiences in regard to the toxicological pressure from the metal, through accounting for the metal bioavailability, can provide an opportunity to deliver an ecologically relevant metric.

Accounting for bioavailability using user-friendly tools

User-friendly tools that can account for trace metal bioavailability have been developed primarily to facilitate regulatory use of bioavailability, but can be used by the regulated community too.

Bio-met¹ is a user-friendly tool that is freely available and runs on routine computer software packages. The tool mimics the outputs of from the more complex full biotic ligand models, using a reduced number of input parameters. Estimates can be made of both the potential sensitivities of freshwaters to metal exposures and also potential risks through use of 3 or 4 routine chemical measures. Interpretation of the tool outputs are relatively straight-forward in the context of environmental protection.

Comparisons with existing, non-bioavailability, estimates of potential metal risks demonstrate the magnitude of potential differences between the two approaches and indicate changes in interpretation of historical assessments of ecological risk from metals. The important of these differences, in relation to environmental decision making, will be highlighted through a series of examples from around the globe.

After this webinar, you should be able to undertake indicative risk assessments and interpret data in regard to trace element bioavailability in a regulatory context using user-friendly bioavailability tools. There will be an opportunity to ask questions and seek clarifications at the end of this seminar.

¹ <http://bio-met.net/>