

Interpreting Biological Effects of Metals and Their Mixtures in the Aquatic and Terrestrial Environment

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A mechanistic understanding of the physiological processes affected by pollutants provides robust scientific evidence that aids regulators in making informed environmental risk assessment. This scientific understanding will be essential to identify and prioritize those populations and environments that require protection in a multi-stressed world. The effects of metals and their mixtures has been well studied over the last 20 to 30 years and this research has contributed to the development of the biotic ligand models that are now incorporated into single metal risk assessments. There are, however, many challenges facing future metal risk assessments that will benefit from a better understanding of the physiological processes underpinning toxicity and their ecological consequences. For example, how to best regulate metals in the context of mixtures (with other metals and in combination with other pollutants), environmental change (changes in ocean pH, rising temperatures and climatic fluctuations), long-term chronic exposure via the water, soil and diet, and adaptation. In addition, the field of metals research has advanced to the point where the principles of bioavailability can be applied to "real world" risk assessment scenarios where metal mixtures commonly occur. This session aims to provide a platform to present our current understanding for interpreting the mechanisms of metal toxicity, and their effects at the population and community level that may aid future metal risk assessment. This session will also provide a platform for the presentation of chemical models adapted to the reality and complexity of soils.