**Cadmium: a phytoplankton nutrient in pelagic Lake Erie**

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The historical record of reliable analytical measurements of trace metal concentrations in the water column of Lake Erie dates back only 10 years to the publication of the first measurements made on Lake Erie using stringent trace metal clean sampling protocols. The results of these and later efforts revealed that the concentrations of dissolved trace metals were much lower than previously thought to have existed in these waters – accordingly, the role that these elements play in Lake Erie has radically changed. The ratio of dissolved Zn to Cd (Nriagu et al. Env. Sci Technol., 1996, vol. 30, pp.178-187) provides indirect evidence of strong biological demand for Zn and the utilisation of Cd as a micronutrient in Lake Erie during the summer. Empirical evidence from laboratory bioassays using phytoplankton isolated from Lake Erie, and experiments in the field are presented that support the hypothesis that Cd is utilised as a nutrient by phytoplankton in pelagic Lake Erie. Trace metal substitutions by Cd (Cd for Zn, Cd for Co) could increase trophic transfer of this element in the planktonic food web. The nutritive role of Cd challenges the use of toxicity-based principles for the establishment of water quality objectives for the Great Lakes Water Quality Agreement.