

Utilizing Stable Mercury Isotopes for Tracers in Aquatic Ecosystems

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Abstract

The low-level Mercury analysis laboratory located in the Wisconsin District of the US Geological Survey is now capable of analyzing for stable mercury isotopes. Several advancements in Mercury analysis, particularly speciation, have been made over the last decade. Only recently have stable Mercury isotopes become available to scientists for use as tracers in natural ecosystems. These isotopes are currently being used in experiments in the Florida Everglades and the Experimental Lakes Area in Ontario. Nanogram per liter detection limits are required to insure that isotope additions remain environmentally realistic. Several analytical challenges have been encountered and overcome to achieve ultra low-level detection limits utilizing an ICP-MS. The incorporation of a dual amalgamation system for total Mercury analysis and a methyl mercury analytical train on the front end of the ICP-MS are two examples. This presentation will highlight the use of ICP-MS detection for low-level mercury speciation and isotopic analysis.

Biographical Sketch of Author

Mark Olson has been the Laboratory Manager of the Wisconsin District Mercury Laboratory for the USGS since 1995. He not only manages the laboratory, he developed the methods and plays an integral part of the sampling and instrumentation team. Prior to his employment in Wisconsin, he managed the low ionic strength labs for the USGS in Albany New York and for the Adirondack Lakes Survey Corporation in Raybrook New York. He received his BS degree in Aquatic Biology for Bemidji State University, Bemidji, Minnesota.