



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2003ME23B

**Title:** Effects of local and landscape heterogeneity on mercury loadings in palustrine amphibians from Acadia National Park, Maine

**Project Type:** Research

**Focus Categories:** Non Point Pollution, Surface Water, Toxic Substances

**Keywords:** Amphibians, Mercury, Watersheds

**Start Date:** 04/01/2003

**End Date:** 12/31/2004

**Federal Funds Requested:** \$2700.00

**Matching Funds:** \$35642.00

**Congressional District:** 2

**Principal Investigators:** Amirbahman, Aria; Bank, Michael (University of Maine); Loftin, Cynthia

**Abstract:** We propose to compare levels of mercury (Hg) contamination previously documented in samples of soils, sediments, stream water, fish, and salamanders collected in Acadia National Park (ANP) to those of newly-collected samples of selected frog species inhabiting Park wetlands, including those where amphibian die-offs have recently been reported. The Hg loadings in amphibians at these sites are unknown and have never been quantified or compared to sites where amphibian die-offs have not occurred. Therefore, we propose to compare the relative levels of Hg in amphibian larvae collected from ANP sites with and without reported amphibian die-offs. We predict that Hg concentrations in the larvae of the selected frog species from ANP wetlands may be high in comparison to Hg levels in local fish and lotic salamander larvae due to: 1) life history characteristics (i.e., length of larval period), 2) diet, 3) micro-habitat selection patterns, and 4) the strong potential for high rates of methyl Hg production in palustrine environments. Our approach examines Hg contamination in both the physical environment and biota and across the landscape from headwaters to the receiving surface waters. Hg levels in frog species inhabiting lentic environments in watersheds with different biotic communities, local geomorphology, fire disturbance histories, and land cover types will be analyzed at multiple spatial scales to determine important predictor variables of Hg levels in the selected frog species. Since an extensive spatial database

for Hg concentrations in two-lined salamander larvae in ANP has been developed, we have a unique opportunity to evaluate, in a cost effective manner, the relationship between the observed salamander larvae Hg levels from a given stream and the Hg levels in frogs inhabiting the receiving surface waters at lower positions in the watershed.

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