

# Mercury Cycling Research Using the Small Watershed Approach

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## Abstract

Researchers increasingly recognize the importance of terrestrial uplands to mercury biogeochemistry. Terrestrial area dominates the landscape and forest canopies scavenge atmospheric mercury. As a result, terrestrial landscapes are a large source of total mercury to down gradient aquatic ecosystems where methylation is known to occur. Methylmercury is the form of mercury that bioaccumulates in invertebrates and fish, i.e. food consumed by wildlife and humans. Methylmercury may also form in uplands and directly enter the food web. The small watershed approach is well suited to unraveling the processes controlling mercury retention, transformation, and transport to down-gradient aquatic ecosystems. Accurate watershed mass balance quantifies retention of total mercury and the role of atmospheric inputs as a methylmercury source. Process research at a small scale and high temporal frequency identifies hot spots of mercury methylation and hot moments of mercury export. We discuss insights on mercury cycling learned from the small watershed approach at Sleepers River, VT, and other U.S. Geological Survey Water, Energy, and Biogeochemical Budgets (WEBB) watersheds, as well as examples from other U.S. and European watersheds.

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