



## Fluxes of methylmercury to the water column of a drainage lake: The relative importance of internal and external sources

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**ABSTRACT:** We studied fluxes of methylmercury (MeHg) through a Precambrian Shield lake using a mass balance approach. The primary goal of the study was to determine the importance of various sources of MeHg to the water column of the lake. The relative importance of all sources was: in-lake production >>> inflow from a brown-water lake with riparian wetlands >>> wet deposition > inflow from an upstream oligotrophic lake > direct inflow from uplands surrounding the lake. MeHg accumulated in the hypolimnion of Lake 240 when oxygen was present. Water-column sinks for MeHg included photodegradation of MeHg, which was about 3.5 times greater than the loss of MeHg through outflow. At present, there are few studies available on mass balance fluxes of MeHg in lakes, and this is the first study that includes losses of MeHg by photodegradation. The inclusion of photodegradation in this study results in a clear demonstration that in-lake production of MeHg is very important. In drainage lakes, the relative importance of in-lake production versus inflow of MeHg from wetlands will vary according to the extent of wetlands in the drainage basin, as well as the volume of precipitation, which produces runoff and transports MeHg from wetlands to downstream lakes.

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