

# Climate Change Impacts on Mercury Mobility in Peatland Ecosystems

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Mercury (Hg) cycling, speciation and mobility in peatlands will likely be affected by alterations in carbon cycling and redox conditions resulting from climate-induced changes in hydrological processes and shifting vegetation communities. The overall objective of this research is to assess the impacts of climate change, specifically fluctuating water tables and altered vegetation communities, on Hg cycling and mobility in northern peatlands through mesocosm-scale experimental research. This study is being conducted at the PEATcosm Mesocosm Facility at the USDA Forest Service Northern Research Station in Houghton, Michigan. Throughout the 2013 and 2014 growing seasons, pore water samples were collected at 20, 40 and 70 cm below the surface of 1 m<sup>3</sup> peat mesocosms, with manipulated (average control or low) water table positions and different vegetation communities (sedge only, ericaceae only or unmanipulated control) in a factorial design. Total Hg (THg) and methylmercury (MeHg) analyses revealed significant influences of both water table position and dominant plant functional group on pore water THg and MeHg concentrations and MeHg production and/or accumulation (as determined by the percentage of THg present as MeHg, %MeHg). The %MeHg was highest in mesocosms with lowered water tables and sedge vegetation with mean pore water MeHg concentrations of 1.0 ng L<sup>-1</sup> accounting for approximately 7% of pore water THg. Pore water MeHg concentrations exhibit a positive correlation with dissolved organic carbon concentrations. These preliminary results suggest that climate change, inducing greater amplitude fluctuating water tables and shifting vegetation communities towards sedge-dominated systems, may have notable impacts on MeHg production and/or accumulation in peatland pore waters and these changes may be influenced by organic matter dynamics.