

Mercury Speciation and Methylmercury Production and Degradation in Reservoir Sediment of the Hells Canyon Complex, Snake River, Idaho and Oregon

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River reservoirs are very effective traps of sediment and associated contaminants transported from upstream sources in the watershed. As suspended particulate loads begin to settle out in the upstream end of a reservoir, light penetration and the potential for enhanced phytoplankton production and deposition increases along the river-to-reservoir transition zone. The reservoir benthos, which records this transition from riverine to internally produced particulates, serves as a critical zone for both abiotic and microbial facilitated chemical transformations, including the degradation of deposited organics, nutrient recycling and contaminants cycling. As such, the reservoir benthic zone is generally thought to represent a critical zone for the bacterial conversion of inorganic mercury (Hg) to the more toxic methylmercury (MeHg) form. MeHg produced in bottom sediment can diffuse to the overlying water column, bioaccumulate up the reservoir food web, and be transported further downstream.

As part of the ongoing study of Hg cycling within the three reservoirs that make up the Hells Canyon Complex (HCC), we examined mercury speciation (total Hg, MeHg, and 'reactive' inorganic mercury), potential rates of MeHg production and degradation, and associated sediment geochemistry during three intensive field efforts conducted between October 2014 and October 2015.

This presentation will highlight the key findings to date associated with our study of Hg cycling in the benthos of the HCC.