

Dissolved Organic Matter and Inorganic Geochemistry of Surface Water Within the Hells Canyon Reservoir Complex, Snake River, Idaho and Oregon

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Three reservoirs along the Snake River in Idaho are the subject of an ongoing study to better understand mercury dynamics within this reservoir complex. Mercury, a heavy metal, is a powerful neurotoxin that threatens the health of wildlife and humans. The overall study is motivated by elevated methylmercury concentrations in fish within Brownlee, Oxbow, and Hells Canyon Reservoirs and is designed to better understand the influences of mercury sources, biogeochemical processes and limnological processes on the chemistry and bioavailability of mercury within these reservoirs. As part of this study, we have been assessing the influences of dissolved organic matter and inorganic constituents in surface water samples on the fate of mercury in the Hells Canyon reservoirs.

Dissolved organic matter controls mercury transport and photoreactivity, the availability of Hg to methylating microbes, and the uptake of methyl mercury by higher organisms, such as phytoplankton, zooplankton, and fish. Limnological processes, such as the consumption of oxygen and the reduction of iron and sulfate, may also influence the methylation of mercury. Data related to these processes, such as dissolved trace metal concentrations, are important for understanding processes occurring below the oxycline in this system. Samples were collected monthly and as part of three intensive sampling efforts over the past two years. Preliminary results from these efforts will be presented and the data will be discussed in the context of mercury biogeochemistry in this system.