Mercury Magnification In Riverine Food Webs In The Northern Rocky Mountains: Clark Fork River Basin, Montana, U.S.A.

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At a local scale, such as the Clark Fork River Basin (CFRB), historic gold mining contributes the majority of mercury (Hg) found in the environment. Mercury enters aquatic systems in inorganic forms and is transformed to methylmercury (MeHg) by bacteria. MeHg has the ability to bioaccumulate within higher trophic levels, causing severe neurotoxic diseases and mortality. Hg concentrations observed within an aquatic food web are controlled by two factors, a source of inorganic mercury and the potential for that Hg to become methylated (methylation controlled by environmental conditions i.e.: water velocity, organic matter, etc.). A sufficient source of inorganic mercury and environmental conditions which promote Hg methylation can lead to maximum MeHg biomagnification. This study presents a comprehensive look at food web Hg biomagnification within the CFRB. Hg concentrations are characterized through blood or tissue samples from osprey, fish, and aquatic macroinvertebrates. Additionally we look at controlling Hg biomagnification factors, Hg of fine-grained sediment, percentage of wetlands and riparian land cover, and mean monthly discharge, to access the biomagnification process within the watershed and thus the Hg levels observed throughout these three trophic levels. Preliminary results show Hg levels of aquatic invertebrates have been found to be heavily influenced by the source of Hg (fine-grained sediment), while upper trophic level species exhibit a strong correlation to environmental characteristics of the sample reach.