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Speciation and mobility of heavy metals in sediments at the Saguenay River (Quebec, Canada) after a major flood event

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During the 40s and 50s the Saguenay River and Fjord received various metallurgic, plastic, aluminium and pulp and paper industries wastes discharges resulting in the high contamination of water and sediments. This contamination limited the exploitation of fish and seafood for decades. In July 1996 during a 50 year event flood, a new layer of sediments composed of debris, gravel and fine materials was transported and deposited over the ancient, one meter contaminated layer of sediments. Given that the new layer is composed essentially of cleaner material, the zone is presenting important changes in the direction of a healthier environment. This project evaluated the capacity of the new layer to retain the contaminants left at the bottom layer. Particular interest is given to heavy metals (Pb, Zn, Cd, and Ni) and to their geochemical distribution among natural adsorbing materials such as clays, oxides, carbonates and organic matter. The study included mission on the Alcide Horth Research Ship, contamination profiles, geochemical distribution of heavy metals on the contaminated layer, transition layer and new layer as well as the evolution of retention and transfer from 1996 (right after the flood) up to 2005.