## Lead accumulation in open water wet ecosystems in the Border Marshes region, Nova Scotia – New Brunswick

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Open water wet ecosystems (OWWE) in the Border Marshes region (BMR) provide productive avian and invertebrate habitat. In the BMR lead (Pb) is a contaminant

of interest due to potential bio-magnification and subsequent uptake by migratory waterfowl in OWWE. This study focuses on the relationships between constructed OWWE, autochthonous productivity and lead accumulation. Eleven sites were selected to represent the spectrum of the OWWE environments in the BMR. Sites variability was determined by measuring salinity (0%–2.83%), pH (6.6–9.1) and specific physical parameters. Variability at each site was defined through weekly determination of water pH, temperature, dissolved oxygen (DO), salinity and total dissolved solids (TDS). Top-of-core and bottom-of-core sediment samples were collected for each site and analyzed for loss on ignition (LOI), carbon-nitrogen ratios (C:N) and elemental concentrations of Pb and other environmental proxies (Ti, Fe, and Mn) using X-ray fluorescence.

Carbon-nitrogen ratios and $\delta^{13}C$ data indicates variable productivity (C:N 6.73–17.62) and that the organic sediment in all environments is dominantly autochthonous. Excavated sites had lower lead concentrations (0–14 ppm) in top-of-core sediment samples than non-excavated sites (> 16 ppm). Bottom-of-core sediment samples exhibited highly variable lead concentrations (5–92 ppm) that reflect either natural lead sources (erosion of till) or the lack of an anthropogenic atmospheric source due to the pre-industrial age of the sediment. The variation in surficial sediment lead concentrations is likely due to a combination of factors including variable shoreline erosion, variable autochthonous productivity and, in some cases point source pollution. There was little evidence to indicate that lead sequestration correlates with salinity or pH. Results to date indicate recently excavated sites have higher autochthonous productivity and lower lead in surface sediments than either older excavated sites or natural OWWE.