

Stocks and Rates of Organic Carbon Accumulation in Freshwater Impoundments of Eastern Canada

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In Canada, freshwater impoundments or wetlands have been created to compensate for regional wetland loss and provide habitat for wildlife. Many of these impoundments were constructed by building dykes on agricultural fields, which in turn were created from historically drained salt marshes. These freshwater impoundments have been constructed since the 1970s, mainly in the provinces of New Brunswick and Nova Scotia. The impoundments are managed to maintain water levels year-round. They are generally dominated by open water filled with submerged aquatic vegetation that surrounded by stands of emergent vegetation, primarily cattail (*Typha angustifolia*). With no surface water flow, these systems accumulate highly organic sediments. Accurate estimates stocks and accumulation rates of the organic carbon (OC) within these ecosystems are needed to understand the extent to which they reduce the burden of atmospheric carbon dioxide. We are measuring the stocks rates of OC accumulation of 5 created wetlands, which vary in age from 11 to 53 years. Our work takes advantage of winter ice through which we core to obtain sediments from open water and emergent cattails. The OC stock is based on the concentration of OC the depth of the accumulated sediments and the cored volume. The rates of OC accumulation are calculated by dividing the total OC stock by the wetland age. The findings of our study will inform stakeholders about the most effective management strategies for this type of wetland creation and their role as a natural climate solution.