The effect of urban and industrial development on the geochemistry of the watersheds in the St. John's area: preliminary results

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A lake sediment geochemical survey conducted during 1990 revealed that the watersheds in St. John's have been chemically affected, with Pb values in the urban core 10 to 15 times higher than in the surrounding area. To define more precisely the effect of man upon these watersheds a lake sediment coring project was conducted during the winter of 1992.

This current study takes a multi-disciplinary approach to document the chemical, physical, and biological history, and if possible, identify sources of the contaminates added to the watersheds. Sediment cores, 1 to 2 m long, were collected from four lakes in St. John's and a background pond overlying similar geology 30 km south of the city. This study examines a 49 element suite, pollen, diatoms, soot, charcoal, oil droplets, stable $^{206/207}$Pb isotopic ratios, and ^{210}Pb and ^{14}C dates.

Preliminary results depict three periods of widespread pollution from farming, coal burning, and urbanization in the St. John's area. All cores in the study have been affected with the background pond showing the smallest chemical increase and Quidi Vidi Lake the largest. Sediment Pb levels in Quidi Vidi Lake have increased 20 to 30 fold over background from 15 to 20 ppm at the base to 612 ppm near the top. The pollen, diatoms, soot, charcoal, oil droplets, isotopic ratios, and age dates all complement the chemical profiles providing an in-depth account of anthropogenic activity in the St. John's area.