Radiochemical Tools at the Experimental Lakes Area (ELA) in Ontario, Canada.

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For over 20 years, Canadian research scientists have used radiochemical tracers added to remote and pristine lakes to study physical, chemical, and biological processes that could not be easily quantified by other methods. Lakes have also been manipulated by experimentally altering the hydrological cycle, chemical composition, and species of fish in selected lakes, and using companion lakes as controls. Varying additions of organic carbon, N, and P have been done, and the exchange rate of carbon dioxide between the atmosphere and water was estimated using radon evasion rates from radium spikes in the lake water. Multinuclide spikes were done to follow the path of mine waste elements through the food chain and sediment accumulation. Lakes were experimentally acidified with HCl and HNO_3 and H_2SO_4 to simulate acid rain, and to study natural buffering capacity of the hydrological cycle. Some of this research has been used to legislate pollution control in the St. Laurence Great Lakes and across Canada and USA. ELA research team spirit has survived several forest fires, bear attacks on the kitchen, massive cut-backs in funding and reduction in staff of Fisheries & Ocean Canada (website http://www.umanitoba.ca/institutes/fisheries/index.html).