2011 Morris Katz Memorial Lecture in Environmental Research

Professor Peter J. Dillon

Environmental and Resource Studies and Chemistry Departments
Trent University, Peterborough, ON, Canada

BIOGEOCHEMISTRY – HOW THE MOVEMENT OF CHEMICALS THROUGH THE BOREAL ENVIRONMENT CAN BE USED TO QUANTIFY THE EFFECTS OF STRESSORS

Wednesday, June 29, 2011
2:30 p.m.

Senate Chamber, N940 Ross Bldg., York University
4700 Keele Street, Toronto

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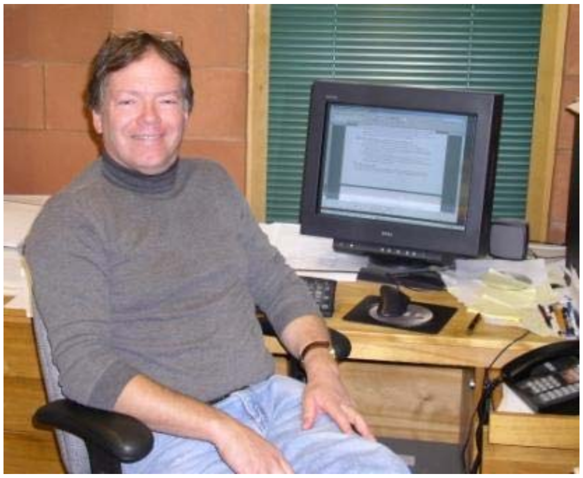

Abstract

The Boreal biome comprising about 60% of Canada's land area, includes over 2 million lakes, about 85% of our country's freshwater and about 25% of global wetlands. Despite the magnitude of this resource, an increasing number of environmental stressors have put it at risk. The southern part of the biome, including both freshwaters and terrestrial ecosystems, has been affected by acid deposition for at least a half century. Contamination by mercury is widespread throughout the Boreal, and elevated levels of trace organic contaminants of many types are now measurable over much of the area. Contamination by other metals, once isolated to regions near mining and smelting activities, is more widespread. In the past few decades, climate change has come to the forefront, and it is clear that the Boreal will be one of the more heavily affected parts of Canada. Although climate change can directly effect the biological communities of the Boreal, most effects will be mediated through alterations in environmental chemistry. In addition, climate change can and is altering the response of lakes and their catchments to other stressors, for example, is reducing the rate of recovery of ecosystems from declining acid deposition rates. For an quantitative understanding of how the Boreal biome responds to changes in the magnitude of stressors, it is critical to have measurements that go beyond simple description of ecosystem properties such as concentrations of various chemicals in different compartments. Instead, measurement of factors such as the flux or rate of movement of substances between compartments is essential if we are to understand how to minimize the effects of the multiple stressors. The development of new analytical methodologies such as multi-collector ICP-MS has led to new approaches in studying environmental stressors. A few of these new methods will be highlighted in this presentation.

Biographical Sketch

Dr. Peter Dillon specializes in biogeochemistry of lakes and their catchments. He was the scientific leader of environmental research and long-term investigations carried out at the Dorset Research Centre in central Ontario for the past 25 years, and still maintains a close association with that centre. Much of his current research focuses on the cycling of elements including sulphur, carbon, nitrogen, calcium and phosphorus in catchments and in lakes, on the processes that control their fluxes, and on the transformations of chemical species that occur during the movement of these elements through ecosystems. Many of these projects employ stable isotope analysis as a tool for evaluating processes. He also studies trace metal biogeochemistry, often using isotope analysis for elements such as Pb and Hg. Of particular interest has been the role of global and regional-scale stressors including acid deposition and climate on the cycling and transformations of elements on a catchment scale. He is currently the Director of the Worsfold Water Quality Centre (WWQC) at Trent University. WWQC houses state-of-the-art instrumentation; their focus is on development of innovative new methods in environmental chemistry. He is a member of the Royal Society and a winner of the Miroslaw Romanowski Medal for environmental science.

The Lectureship Fund

The Morris Katz Lectureship was made possible by the establishment of an Endowment Fund created through contributions from his family, his friends, his colleagues, private companies, universities and government. It is intended that this lectureship become self sustaining. Major contributions in support of this year's lecture have been made by:

The Centre for Atmospheric Chemistry

and

The Ontario Ministry of the Environment

If you share in Morris Katz' enthusiasm and commitment to having a cleaner environment, please make a contribution to support this ongoing educational activity. Send your contribution in care of: The Morris Katz Memorial Lectureship, Centre for Atmospheric Chemistry, York University, 4700 Keele Street, Toronto, Ontario, M3J 1P3 Canada.

For further information contact:
Carol Weldon, (416) 736-5410 or
Fax: (416) 736-5411: Email: cac@yorku.ca
Web: http://www.cac.yorku.ca

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