CANADA’s ECOLOGICAL MONITORING AND ASSESSMENT NETWORK: WHERE WE ARE AT AND WHERE WE ARE GOING

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Abstract. Canada has established a National Ecological Monitoring and Assessment Network (EMAN). The Network’s operating objective is to understand what changes are occurring in the ecosystems and why. Each site is designed to have long-term multidisciplinary monitoring programs in place with supporting research and manipulation experiments. About 55 sites have been incorporated into the network. A Directory of EMAN sites is available and a list of the Goals, Objectives and Deliverables (GODs) for many sites is also available. Information can be obtained on the EMAN’s website at http://www.ccwi.ca/eman/. The network is operated in conjunction with a program or developing national environmental indicators, with increasing emphasis on indicators of sustainable development. A series of environmental assessments are being produced that are issue and/or area focused. The assessment are designed as support for policy decisions. The national coordinating office supports the overall program of data gathering, reporting environmental indicators and produce assessments.

1. Introduction

Multidisciplinary environmental studies, particularly at the small watershed level, have been carried out in Canada for several decades. Studies were initiated by Governments and academic institutions, usually to deal with environmental problems of interest to the specific location. For example, in the 1960s, the Federal Government initiated studies on lake eutrophication at the Experimental Lakes Area near Kenora, Ontario (Hecky, Rosenberg and Campbell, 1994); and Laval University began the Centre for Arctic Studies at Kuujjuaq which has focused on arctic and sub arctic ecological processes. Also in the 1960s, studies at Kejimkujik National Park began to look at nutrient processes in surface waters. In the mid 1970s, the Ontario Government conducted a comprehensive study of the effects of cottage development on lakes in the Muskoka area (Hutchinson, Neary and Dillon, 1991). The Last Mountain Lake site was established as a National Wildlife Area. Many other sites have been established across the country to look at a variety of research questions and environmental factors. As new issues have emerged, other sites, for example, Turkey Lakes in Ontario and Duschenay in Quebec, were established in response to the need for more information on acid rain. These multi-year, interdisciplinary studies were very effective in resolving the site-specific scientific and policy questions set out by the supporting agencies.

Many urgent environmental problems confronting society, such as global warming (Intergovernmental Panel on Climate Change, 1995 Report), UV-B, depletion of the stratospheric ozone layer (Scientific Committee on Problems of the Environment (SCOPE), 1992 Report), acid rain, etc., are connected with man-made changes to the atmosphere.

These have an impact at the multinational regional level and are of global concern. The ecological effects of these stresses are subtle and show up over long periods of time. Equally, reversing the effects by pollution control measures will take a long time. The input of data collected for over 10 years at some of the 15 ecological study sites across eastern Canada and the United States provided enough information to establish the deposition targets in eastern North America. This represented a scientific basis for action and defined a solution that led to defining control measures needed to address the acid rain problem. Understanding the ecological consequences of global climate variability/change will require long-term ecological monitoring sites around the globe. These current environmental problems are scientifically much more complex in their ecological effects and they affect larger areas. Therefore, it has become necessary to further develop the concept of long-term (i.e., decades) multidisciplinary studies. Understanding how ecosystems are changing and developing the scientific information required by decision-makers, are beyond the resources and abilities of any single department or agency. Consequently, it is necessary to develop partnerships within all components of the Canadian and international environmental science community. This is necessary to maximize the quality of the science and the efficiency of conducting the work at a time of economic restraint. These concepts led to the creation of the Ecological Monitoring and Assessment Network.

2. Where we are at and how Does EMAN Operate?

In April 1994, Environment Canada established the Ecological Monitoring and Assessment Network (EMAN), with an overall goal of conducting long-term multi-disciplinary research and monitoring sufficient to provide answers to the questions of what is changing in ecosystems and why. To conduct this network’s business, the Ecological Monitoring Coordinating Office (EMCO) was located at Canada Centre for Inland Waters, Burlington, Ontario, Canada. The EMAN has four overall objectives: 1) To provide a national perspective on how Canadian ecosystems are being affected by the multitude of stresses on the environment; 2) To provide scientifically defensible rationales for pollution control and resource management policies; 3) To evaluate and report to Canadians on the effectiveness of these policies; 4) To identify new environmental issues at the earliest possible stage.

The Ecological Monitoring and Assessment Network (EMAN) is a cooperative partnership of academic, governmental (local, provincial, and federal) and private sector scientists. EMCO’s goal is to coordinate the ecological monitoring and research to meet national, regional, and local environmental needs for environmental information on ecosystem function and change.

The Ecological Monitoring Coordinating Office staff of five was given the responsibility of organizing the EMAN into a cohesive network of existing sites and also promoting the development of new sites where feasible. Some of these sites, mentioned above, have been established over the years for a number of reasons, and most of these are operated by Federal Departments, Provinces, Universities, Industries and NGOs. The