Document généré le 7 juin 2025 05:42

**Geoscience Canada**

# Geological Education
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Volume 16, numéro 4, december 1989

URI : https://id.erudit.org/iderudit/geocan16_4fea03

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Éditeur(s)

The Geological Association of Canada

ISSN

0315-0941 (imprimé)
1911-4850 (numérique)

Découvrir la revue

Citer cet article

Saunders, K., Miller, R. F. & Morgan, A. V. (1989). Geological Education: EdGeo — Teaching Geology and Global Climatic Change in the Classroom. *Geoscience Canada*, *16*(4), 255–256.

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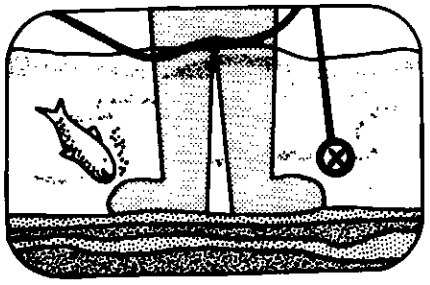

## Geological Education

# EdGeo — Teaching Geology and Global Climatic Change in the Classroom

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As part of a programme to develop geoscience activities at the New Brunswick Museum, a workshop was held on September 23, 1989, for elementary and high school teachers. The workshop was co-sponsored by the Canadian Geoscience Council (CGC), whose generous financial assistance through their EdGeo Programme made participation possible. The EdGeo Programme funds teacher workshops and field trips in the Geosciences at different centres across Canada.

Fifteen educators from across the province attended the day-long seminar to both listen to and participate in discussions about teaching geology. Although the theme of the conference was Global Climatic Change, the workshop stressed means of communicating geoscience information.

The morning session commenced with an introduction by Kim Saunders (Natural Sciences Education Co-ordinator at the museum) who outlined the main elements of the meeting, and the plans for the various activities for the day. This talk was followed by Dr. Randy Miller (Head, Natural Sciences Division and Assistant Curator of Geology at the New Brunswick Museum) who began by describing the role of the museum as it relates to the study of geology. Four areas were outlined: (1) collections and conservation, (2) scientific research, (3) education, and (4) exhibit. He then provided an introduction to the Museum and to the local geology by displaying slides of the early paleontologists and their activities at the museum. The talk included examples of the local geological record with associated slides of Precambrian fossils, Cambrian trilobites, typified by *Paradoxides*, medusa, Silurian fossil fish, and tracks of a metre-long "millipede", *Arthropleura*. The museum's collection of Quaternary fossils and research programmes on Quaternary paleoclimate were highlighted, in keeping with the workshop theme.

Dr. Alan Morgan (Quaternary Sciences Institute, University of Waterloo) gave the keynote lecture on Global Climatic Change, pointing out how the human species had developed to present, what the current concerns are in respect to environmental degradation, and what might be reasonably expected in the near future under a warming earth scenario. He followed this with an illustration of the types of techniques used by earth scientists to reconstruct past environments and climates using proxy data. After more than an hour of striking visual images and descriptions of geological phenomena, the group took a break for questions.

Following the break, Dr. Morgan continued with a second talk on the ways in which geology can be made of interest to schoolchildren. He mentioned some of the techniques used at Waterloo. These activities predated, but coincidentally included, many of the recommendations made for the promotion of the Earth Sciences by the American Geological Institute and the US National Association of Science Teachers in their meeting of April 1988. Morgan stressed the necessity of a hands-on approach to teaching geology and the need for visually experiencing geology. He also emphasized that it is important to make students realize that geological studies are conducted in a complete environmental context. For example, frequent use of pictures of animals and plants in geological lectures can link the living world with geological themes. The physical beauty of natural environments can also be brought into lectures to capture the attention of the less interested participant. Dr. Morgan also stressed the need to target younger student audiences, particularly those up to Grade 6, as well as professional development days structured for the enrichment of science teachers.

The University of Waterloo has long been active in programmes designed to raise interest in the sciences amongst high school students and teachers. One of these techniques has been through publications, and particularly *via* the very popular Chem 13 and Physics 13 Newsletters. Two years ago, these were joined by an Earth Sciences Newsletter, WAT ON EARTH, and more recently by BIOLOGUE (Biology Department). WAT ON EARTH now goes out to over 1,500 high schools across Canada and the United States. Anyone wishing to have further information on any of these publications is asked to contact Peter Russell, Department of Earth Sciences, University of Waterloo, Waterloo, Ontario N2L 3G1.

After a lunch dominated by continued questions and discussion by all participants, the group departed for a field trip to the Quaternary deposits at Sheldon Point-Saint's Rest Beach in Saint John. Climate change proved to be an appropriate topic as the remnants of Hurricane Hugo swept through southern New Brunswick. Undaunted, the group continued with the trip despite the wind and waves on the Fundy coast. During the hour-long walk led by Randy Miller, workshop participants were able to observe moraines, a glaciofluvial complex, marine deposits and some of the fossil material that ranges in age from about 10,500 to 13,900 years B.P. Fossil finds included several species of mollusc and a rarely encountered brittlestar.

Alan Morgan pointed out many features that could be used to teach geological principles. The beach walk was used to illustrate principles of uniformitarianism since there were some excellent examples of sediment recycling. Modern beach sands and cobbles could be seen derived from semi-consolidated Late Pleistocene deposits and both could be compared to fully lithified Carboniferous conglomerates revealed in foreshore erratic blocks. In the same light, an understanding of river meanders and some elements of water table profiles could be demonstrated in small streams flowing down the foreshore. The point was made that examples of geological phenomena are all around us and readily available as teaching tools.

A windblown and slightly muddied group made their way back to the museum where Kim Saunders introduced a travelling exhibit from the National Museum of Natural Sciences in Ottawa. "Come Rain ... Come Shine" examines weather and climate and makes good use of interactive exhibits and videos. A general discussion of education activities centered around the exhibit. Dr. Diane Buhay (Co-ordinator for the Science and Technology Information Service at Mount Allison University) conducted a demonstration in the gallery on information retrieval using CD-ROMS. Databases used during the demonstration included topics on Earth Sciences and Environment. Some time was spent discussing the relative merits, and the disadvantages, of stand-alone systems with bibliographic search potential for geological references.

The meeting concluded with a vigorous round-table discussion of the facilities and services offered by the New Brunswick Museum. Kim Saunders opened by emphasizing the role of the museum as a resource for educators and the need to work together for effective education. An introduction to the museum's planned resource kit on Climatic Change followed. Participants then

debated kit contents and related how the kit might or might not fit their needs.

A number of resource people were identified, including contacts at the Huntsman Marine Science Centre, the University of New Brunswick and Mount Allison University. More than an hour later, the workshop ended with all members of the group a little more aware of the problems and potential of taking geological education into the elementary and high schools. All participants left with a positive feeling about what had been accomplished.

The New Brunswick Museum is currently planning a new paleontology gallery for 1991-92. This workshop will help direct efforts to develop exhibits for the school audience. We hope to be able to continue the workshop programme to include different themes and more participants. The Canadian Geoscience Council's EdGeo programme helped us put the workshop together. Their financial support enabled us to set up the seminar. As well, during the organization phase, we found other organizations willing to help which cut our costs. The local school board provided field trip transportation free of charge. The New Brunswick Department of Natural Resources and Energy donated geological maps and literature for the information packages. Environment Canada, the United Nations and Friends of the Earth also sent us multiple copies of their publications on climatic change topics and information database companies loaned us CD-ROMS. We mention this to encourage those who might consider offering similar workshops. There are a number of "geological education" friendly organizations that can be contacted for assistance.

Accepted 24 October 1989.

# Positions Available

## University of Victoria Department of Geography

ASSISTANT PROFESSOR: GEOLOGY

**This is a renewable tenure-track position in marine geology, commencing July 1, 1990. Ph.D. required. The appointee will teach sedimentology/marine geology, tectonics, and resource geology. The appointee will be expected to contribute to the graduate and research activities of the Department, and to collaborate with the Centre for Earth and Ocean Research.**

**Candidate must demonstrate research and teaching competence. Canadian Immigration regulations require the University to assess applications from Canadian citizens and permanent residents of Canada before assessing applications from other persons. The University of Victoria offers equal employment opportunities to qualified male and female applicants. Women are particularly encourage to apply.**

**Applications, curriculum vitae, and names of three referees should be sent by December 31, 1989 to:**

Dr. Michael C.R. Edgell
Chairman
Department of Geography
University of Victoria
P.O. Box 1700
Victoria, British Columbia
V8W 2Y2

## University of Saskatchewan Department of Geological Sciences

ICP-MS LAB SUPERVISOR

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**Qualified candidates should contact:**

Drs. R. Kerrich or T.K. Kyser
Department of Geological Sciences
University of Saskatchewan
Saskatoon, Saskatchewan
S7N 0W0
Telephone: (306) 966-5719/5697/5683

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**Potential applicants may obtain an outline of current research interests of the Department's faculty and an application form by writing to:**

Professor John M. Dixon, Head
Department of Geological Sciences
Queen's University
Kingston, Ontario, Canada
K7L 3N6
FAX (613) 545-6592

**The application deadline is February 28, 1990.**