



Issue 11
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EdGEO

News from the National Workshop Program

Inspiring Teachers to Bring Earth Science to Life

Established in the early 1970s, EdGEO supports locally driven workshops on Earth science for Canadian teachers. Workshops are organized by geoscientists and teachers, and typically have field, laboratory and classroom components. EdGEO workshops provide teachers with potential fieldtrip sites for their students and the knowledge, enthusiasm and materials to inspire their students to engage with Earth science. Grants of up to \$3000 per workshop are available from the National EdGEO Program.

By providing educational opportunities for today's teachers and, through them, their students, EdGEO seeks to cultivate a heightened awareness and appreciation of our planet. The expected result is an improved capacity on the part of Canadians to understand the Earth and to make wise decisions, especially with regard to the use of its mineral and energy resources, the maintenance and remediation of the environment, and response to geological hazards.

EdGEO had another outstanding year in 2008, with fourteen workshops attended by 443 teachers across Canada. The expertise, hard work and dedication of many individuals have been vital to success the EdGEO workshop program. Thank you to the many teachers and geoscientists who have coordinated teacher workshops in their communities.

The success of EdGEO also depends on the commitment of the many organizations who share in our vision of bringing Earth Science to life. We wish to express our appreciation to the Canadian Federation of Earth Sciences, Canadian Society of Petroleum Geologists, Geological Association of Canada, and Mineralogical Association of Canada. With your support, teachers and students will continue to have the opportunity to explore Earth Science with a hands-on approach. Thank you for your support!

A Special Thank You

Dr. Eileen Van der Flier-Keller concluded her term as EdGEO Chair on March 31, 2008, which she has held for the past six years. Under her capable leadership, Eileen accomplished the organization's mandate with vision and determination. She brought her passion for Earth science education to EdGEO to ensure the program thrived and grew. Eileen expanded EdGEO to include pre-service teachers pursuing degrees in education at the University of Victoria—a brilliant strategy to teach teachers before they start teaching. "Eileen did such a tremendous job in such an easy manner, that it was never an effort but always a pleasure to work with her," says Dixon Edwards of the Alberta Geological Survey. The EdGEO Executive and the Canadian Geoscience Education Network wishes to express its gratitude and appreciation to Eileen for her dedication and the widely acclaimed services she has rendered to the organization.

Please join the EdGEO Executive in welcoming Laura Clinton as the new Chair. Laura is the Director of Prospectors and Developers Association of Canada Mining Matters. She has managed the education projects of this highly regarded charitable organization since 2002.

Inspiring Teachers to Bring Earth Science to Life	1
A Special Thank You	1
Discovering Earth Sciences: An Interactive Workshop for High School Teachers	2
Earthquake Education Week in Victoria B.C. May 12 - 16, 2008	2
EdGEO Supports Teacher Workshops at Showcase 2008 in Saskatchewan	3
EdGEO Workshops 2008	4-5
Gearing Up for Another Exciting Year!	5
Special Deal for Teachers	6
Canadian Geological Foundation Grant	6
International Year of Planet Earth	6

EdGEO is coordinated by the Canadian Geoscience Education Network of the Canadian Federation of Earth Sciences



EdGEO Sponsors

-  **Canadian Society of Petroleum Geologists**
-  **Canadian Federation of Earth Sciences**
-  **Mineralogical Association of Canada**
-  **Geological Association of Canada**

Discovering Earth Sciences: An Interactive Workshop for High School Teachers

Beth Halfkenny, Outreach Coordinator, Department of Earth Sciences, Carleton University

For three days in early June, 2008, the Department of Earth Sciences at Carleton University was delighted to once again play host to a group of enthusiastic teachers and pre-service educators for our fourth Discovering Earth Sciences Teachers' Workshop. The purpose of this workshop is to lend our support to educators who are teaching the Ontario Earth Science curriculum, by bringing them to our laboratories to talk about basic geological concepts and current issues, provide opportunities to try out some activities that illustrate these concepts, introduce them to local field trip destinations in the Ottawa area, and give them teaching resources that are ready to use in their own classrooms.

Facilitated by Professors Brian Cousens and George Dix, staff and graduate students, the format the two-day workshop allowed for an in-class session of instruction and discussion in the mornings, followed by field trips to the region's wonderful exposures of Precambrian metamorphic and igneous rocks, Ordovician sedimentary rocks, and recent glacial sediments. These two days culminated back in the lab, with hands-on experiments and activities designed to support ideas discussed during the day. Saturday's intensive program, began with a presentation of the Discovering Diamonds Curriculum Resource Kit by Stella Heenan of Prospectors and Developers Association of Canada Mining Matters, followed by more activity testing, a presentation of the Geoscape Poster series and related on-line activities by Jan Aylsworth of the Geological Survey of Canada (<http://geoscape.nrcan.gc.ca/>), and finally a discussion about the challenges of teaching this large and varied subject, and what the teachers felt we could do to further assist them.

Feedback from teachers was very positive and one teacher indicated she would like to come again next year, as she will have more questions after teaching the course for the first time this year. "As a teacher new to the SES4U course (Grade 12 Earth and Space Science, Ontario) I found the Carleton Earth Sciences workshop invaluable. It managed to marry the perfect blend of classroom content, field activity and ready-to-use resources – the workshop provided me with ample supplies to get rolling!" said Karen McGaffey of Whitby.

Over the four years that we have presented this workshop, we feel one of the benefits has been our continued relationship with participants; teachers have maintained contact with us such that we have been able to act as partners as they deliver the curriculum to their own students, by being available for consultation, providing materials for loan, providing expert visitors and helping to make connections to other agencies that can assist them. We are pleased to find that since our first workshop, there has been a marked increase in the Secondary schools within the Ottawa and surrounding area that are offering the Grade 12 Earth and Space Science

course, and thereby introducing more students to the field of Geology. We hope that our efforts are helping with this trend!

We would like to express our gratitude for the EdGEO grants received to date, that have allowed us to provide over 40 area educators with rock, mineral and fossil specimens, resource books, course handouts, a CD of teaching resources and numerous other products, as well as transportation to our field locations.

We are looking forward to our next workshop, scheduled for June, 2009. Watch for more information at www.earthsci.carleton.ca

Earthquake Education Week in Victoria B.C. May 12 - 16, 2008

Jane Wynne, GeoHazard Awareness Project Leader, Geological Survey of Canada

With generous funding from EdGEO and the Pacific Section of the Geological Association of Canada we were able to host seismologist Stella Heenan (POLARIS Education Outreach Coordinator) in the Victoria area for a week and reach 500 students and 30 teachers with dynamic and engaging information about earthquakes.

With POLARIS, Stella has developed a classroom presentation that has 6 simple, hands-on activities (set up as stations around the classroom) for students to discover the fundamentals of how earthquakes are produced, where they occur on the Earth and how buildings respond to shaking. The content is appropriate for students from grade six to grade twelve. The presentations are fast, snappy, fun and informative.

Stella also gave an afternoon EdGEO workshop (from 4 to 6 pm) for ten teachers where each of the classroom activities were discussed and supplementary activities introduced. The teacher evaluations were uniformly positive (they plan to use the material and resources presented in future classes and they would recommend the workshop to others). Teacher comments included "Very hands-on for students. Great for all learners, high and low; Very clear information, useable" and "Excellent ideas that model "big" concepts for kids "So knowledgeable" Wow!"

Jane Wynne, Natural Resources Canada, took care of the coordination and planning of Stella's visit and has another action-packed week lined up for the fall, funded by the Canadian Geoscience Foundation.



Resources:

Stella Heenan is a tremendous resource in our Canadian geoscience outreach and education community. Contact her by email: sheenan@sympatico.ca ; phone: 905 667 6167, snail mail: 265 Hatt Street, Dundas ON L9H 2H1

QuakeChasers - a free interactive online learning tool that has been developed by POLARIS to study the location and measurement of earthquakes. See the activity at www.Quakechasers.ca (hint - click on the Quakechasers icon in the centre of the screen)

POLARIS is a multi-institution Canadian research group that operates satellite-linked arrays of portable geophysical observatories across Canada. These observatories provide scientists with unique opportunities to study earth structure and processes, and assess earthquake hazards.

EdGEO Supports Teacher Workshops at Showcase 2008 in Saskatchewan

Sally Meadows, Outreach Office, College of Engineering of the University of Saskatchewan; Dr. Kim West, Gwenna Moss Centre for Teaching Effectiveness; and Stella Heenan, Prospectors and Developers Association of Canada Mining Matters

In February 2008, over 7,000 K-12 teachers gathered in Saskatoon for SHOWCASE 2008, a professional learning conference sponsored by the Saskatchewan Teachers' Federation. Dr. Kim West (Program Coordinator, Gwenna Moss Centre for Teaching Effectiveness) and Sally Meadows (Program Administrator, Outreach Office, College of Engineering) of the University of Saskatchewan each facilitated a session on curriculum connections in the area of Earth sciences.

Nearly 100 teachers attended the morning session, entitled "The Earth's Crust, Rocks, Minerals and More". Sanda Botis (PhD student, Dept. of Geological Sciences and local coordinator of Let's Talk Science (LTS)), and Kim Mysyk (Consulting Geologist, Laramide Petrologic Services and co-author of *Saskatoon's Stone*), assisted Kim (West) in demonstrating concepts and delivering hands-on activities such as modeling layers of the Earth using a hard-boiled egg, playing tic-tac-toe to identify rocks and minerals, and using an "Earth Treasure" scavenger hunt to illustrate the prevalence of geologic resources in our everyday lives.

The afternoon session, entitled "Fossils, Landforms, and More", used power point presentations, displays, demos, and hands-on activities to engage the teachers. Sally gave an engineering twist to her presentation on landslides, and Dr. Jitendra Sharma (Dept. of Civil & Geological Engineering) was on hand to ask excellent questions of the teachers and answer technical queries. Patricio Desjardins (PhD student, Dept. of Geological Sciences and member of LTS), delivered an information-packed power point presentation on landforms, which he made available to participants for classroom use. Finally, Heather Gibson (Manager, T.rex Discovery Centre) had teachers dress up as dinosaurs as she described the Centre's engaging outreach programs.

Kim and Sally want to thank EdGEO, Fran Haidl (SGS), Moir Haug (MDH Engineered Solutions Corp.), Saskatchewan Ministry of Energy and Resources, Saskatchewan Mining Association, Natural Resources Canada, and APEGS for providing invaluable support and/or resource materials.

Additional workshops for high school teachers at SHOWCASE 2008 were planned by the Saskatchewan Mining Association and the Saskatchewan Geological Society. Over 85 teachers returned to their schools very happy with a wealth of resources and materials to enhance their teaching about Earth science and the mining industry.

Vital to the success of the planned four joint sessions was support from industry partners. In Saskatoon, teachers enthusiastically received a presentation from George Read, Vice President Exploration at Shore Gold. George explained for them the history and current state of diamond exploration in Saskatchewan, and included suitably awesome images of their dazzling products! In the second session that same day, Arnfinn Prugger, Saskatchewan Potash Corporation demonstrated state of the art use of 3D seismic technology for reducing catastrophic mine collapses during the extraction of potash. For the Regina morning session, the Shore Gold presentation about diamonds was repeated and skillfully given by Adam Buchanan. In the afternoon, teachers were enthralled by some hands-on chemistry demonstrations of the solution method for extraction of potash, in the expert hands of Murray Schultz from Mosaic Potash.

Wrapped around these guest presentations, for the remainder of each full 2 hour session teachers completed a selection of activities from the PDAC Mining Matters Discovering Diamonds resource for Senior High School. One of the highlights for teachers was the mining and reclamation of a model kimberlite pipe deposit. Some good natured criticism was offered that the model trees were the wrong species of pine to survive in Saskatchewan!

Every teacher attending the sessions received a complete copy of the Discovering Diamonds resource kit; the \$75 cost being most generously sponsored by Shore Gold for the first 50 copies and the Saskatchewan Mining Association the remainder. PDAC Mining Matters provided teachers with careers information booklets, mineral industry posters and fact sheets. In addition, the Saskatchewan Geological Society distributed for everyone in-depth material about Saskatchewan resources and geology, which was developed by geologists of the Saskatchewan Geological Survey and sponsored by EdGEO, and a wall size plate tectonic map of the world produced by USGS. Teachers who attended the sessions were also provided the opportunity to order Rock and Mineral kits that were sponsored by the Association of Professional Engineers and Geoscientists of Saskatchewan. Workshop participants were thrilled at the content and quality of the materials, with many commenting on this being one of the best professional development sessions they have attended.

EdGEO Workshops 2008

Locations	Grant Recipients	Focus/Highlights	Attendance
Saskatoon	University of Saskatchewan	Focus on Kindergarten to Grade 9 curriculum. Topics included dinosaurs, fossils, landforms, environment, and Saskatchewan resources	89
Saskatoon and Regina	Saskatchewan Geological Society	Goal of wedging Earth science topics into Science 10, Biology, Physics and Chemistry curriculum. Hands-on activities linked to the curriculum. Topics of diamonds, potash, uranium, coal, oil, gas, and fossils.	85
Regina	Saskatchewan Geological Society	Focus on Kindergarten to Grade 9 curriculum. Hands-on activities related to the Earth's crust, rocks, minerals, Saskatchewan resources, fossils, and landforms.	80
Port Coquitlam	GAC Cordilleran Section	Jointly presented by teachers and scientists. Techniques for learning about the Earth, including plate tectonics, earthquakes, volcanoes, geological time, fossils, rocks, and minerals. Targeted Grades 7 to 10 curriculum.	30
Kelowna	PAC-GAC	Focus on Grade 10 science curriculum. Topics included rocks, Earth's history, fossils, geological time, and plate tectonics.	65
Victoria	GSC Pacific Section	Earthquakes - five activity stations with hands-on activities. Activity stations focused on the following topics: what causes earthquakes, seismic waves, locating an earthquake, measuring the size of an earthquake, prevention and prediction, and earthquakes in Canada.	24
Ottawa	Carleton University	Three-day workshop designed to equip teachers to deliver the Ontario Earth and Space curriculum (Grade 12). Access to teaching laboratories, rock, mineral and fossil collections and the expertise of faculty and staff.	8
Dartmouth	Bedford Institute of Oceanography	Presentation of basic geological concepts through a series of field trips. Targeted teachers from Grades 4 to 12 and educators from geoscience. Concepts such as rocks, minerals, the rock cycle, geological time, plate tectonics, and natural resources were interwoven with the field observations.	17
Victoria	School of Earth and Ocean Sciences, University of Victoria	Designed for students attending a first year Earth science course at the University of Victoria and are intending to become teachers. The workshops cover the same content as regular labs but with a focus on activities and teaching pedagogies that are directly transferable to the K-12 teaching environment. During eleven three-hour labs, students participate in two fieldtrips and gain knowledge of plate tectonics, earthquakes, minerals, rocks, surface processes, stratigraphy and fossils.	20

EdGEO Workshops 2008

continued

Locations	Grant Recipients	Focus/Highlights	Attendance
Kamloops	PAC-GAC	Field trip in the Kamloops area	40
Swift Current	Saskatchewan Geological Society	Topics included diamonds, potash, uranium, coal, oil, gas, and fossils. Focused on Grade 7 curriculum.	25
Victoria	Pacific Section GAC	The two workshops are offered for student teachers at the University of Victoria, through the Centre of Excellence in Teaching and Understanding Science, in the Faculty of Education. The workshops will focus on rocks, fossils, Earth history, plate tectonics, earthquakes, and volcanoes.	26
Campbell River	Pacific Section GAC	The workshop was requested by the school district located in Campbell River for a province wide professional development day. Topics included rocks, fossils and Earth history, plate tectonics, earthquakes, and volcanoes.	43
Calgary	Calgary Science Network	This workshop focused on the elements of Earth science included in Unit E (Planet Earth) of the Alberta Curriculum. Key concepts include: strata, rocks and minerals, the rock cycle, mountain formation, plate tectonics, chronological time scale, fossil formation, weathering and erosion, incremental change.	30

Gearing Up for Another Exciting Year!

EdGEO looks forward to continuing to support engaging Earth science workshops across Canada. The organization seeks greater participation in teacher conferences, professional development events and in Faculties of Education. Successful and enjoyable EdGEO workshops are likely to result if interested geoscientists, teachers and school board officials share in the initial planning. Workshops developed in this way will meet the needs of teachers in the area, and the support of many organizations will be available for various aspects of the workshop. It is a goal of the organization to expand its outreach efforts by promoting the EdGEO funding opportunities to professional geoscientists across Canada. For more information about planning a workshop and applying for an EdGEO grant visit www.edgeo.org.



Special Deal for Teachers: Become a Member of the Geological Association of Canada

The Geological Association of Canada (GAC) is offering memberships to teachers at the low cost of \$10. This includes online versions of their newsletter *Geolog* and their magazine *Geoscience Canada* (note: another option is a \$35 membership fee for teachers and this provides print versions of these two publications).

GAC members also get discounts on all GAC publications and a lower registration fee for the annual conference. The next one, which will be held in Toronto, May 24-27, will have a very strong education and outreach component (bookmark <http://www.jointassembly2009.ca/> for all information about this meeting).

The details and application form for teacher memberships in GAC can be found at <http://www.gac.ca/aboutgac/join.php>.

Canadian Geological Foundation Grant

Dr. Stephen T. Johnston, Secretary of the Canadian Geological Foundation and Professor at the School of Earth and Ocean Sciences, University of Victoria, announced a \$5,000 grant from the Foundation to the EdGEO Workshop Program.



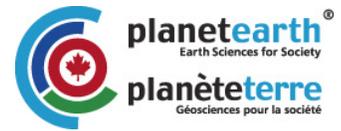
The grant will allow EdGEO to advance its vital mission to educate Canadian teachers about the Earth sciences. The expected result is an improved capacity on the part of teachers and students to understand the Earth and to make wise decisions.

“The Grants Selection Committee is pleased to be able to contribute to this worthy project,” said Dr. Johnston.

The Canadian Geological Foundation is dedicated to furthering geoscience in Canada and plays a key role in sustaining geosciences education, outreach, and awareness across the country.

International Year of Planet Earth

In 2005, the General Assembly of the United Nations proclaimed 2008/2009 as the International Year of Planet Earth



(IYPE). IYPE celebrants will demonstrate ways in which Earth sciences can help future generations meet the challenges involved in ensuring a safer and more prosperous world.

Canada will be a major participant in the IYPE, in conjunction with the International Union of Geological Sciences (IUGS), the United Nations Educational, Scientific, and Cultural Organization (UNESCO), and more than 60 countries worldwide.

Canada's resource extraction of major petroleum, coal, metal, mineral, and water resources accounts for the largest component of the national Gross Domestic Product (GDP). This ratio represents one of the highest among the industrialized nations. At the same time, Canada's Earth scientists demonstrate environmental stewardship, exploring and developing responsibly, and conducting leading edge research on geohazards, climate change, palaeontology, and other important Earth issues.

The Canadian National Committee's IYPE theme will be *WHERE on Earth? WHERE in Canada?* The acronym WHERE stands for Water, Hazards, Energy, Resources, and the Environment. Projects will feature these five key Earth science themes, directed towards three main goals.

- **Outreach:** Increase public awareness of the broad scope of Earth science, with special emphasis directed towards youth, encouraging them to consider pursuing a career in Earth science.
- **Industry Image:** Demonstrate that Canada's resource extraction industry follows clean, environmentally responsible practices. Plans include showcasing the high-tech nature of the industry, plus leading-edge environmental protection and remediation projects.
- **Geoscience Research:** Identify mechanisms for funding programs of research excellence in Earth science.

For more information about IYPE and its key projects visit www.earthsciencescanada.com

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