

## Pilot High School Geology Course in Calgary, Alberta

Boggs, K.J.E., Nowlan, G., Miall, A., Legault, B., and Toblan, B.

A high school geology course is currently being developed for Alberta with the goal of increasing the public awareness of the geosciences. Geology is generally poorly represented in high school curricula across Canada and Alberta is typical in having little or no geology in the senior high school science curriculum. The geosciences are completely overwhelmed by the 'PCBs' (Physics-Chemistry-Biology) because they are not taught to the general public. Considering the importance of the petroleum industry to the Alberta economy, natural resources to the Canadian economy and the need to respond to climate change, this seems like an inconceivable oversight. In Alberta, geology modules are taught in grade 3, grade 7 and in Science 9/10/20 (grade 9, 10, 11 science courses for students not intending to pursue science or engineering in university). Some geologically-related subject matter is touched on in some Sociology, Outdoor Education, Biology, Chemistry and Physics courses however no independent/separate geology course has ever been taught in Alberta. The result is that the general public is not familiar with some basic geological principles such as the theory of plate tectonics, yet our modern society depends on geological resources. A side effect of this phenomenon is that typically about 2/3 of geology major students stumble upon geology as a possible career only after taking a geology course, frequently as an option after their first year in university.

A proposal for a locally developed Geology 25 (general interest ~grade 11) course was submitted during the fall 2009, courtesy of principal Mark Davidson at George McDougall High School in Airdrie (north of Calgary). The first pilot course is scheduled to be taught at 3-5 high schools in the Calgary area starting in September 2010. This locally developed route was chosen due to the very rapid turn-around time. The more formal route through the provincial curriculum offices in Edmonton was estimated to take about a decade with no guarantee of success. This course (the equivalent of a 3 hour lecture with a 1 hour tutorial) has been modeled after a typical first year Introductory Geology course with modules from Dr. Andrew Miall's "Geology in Public Issues" course at the University of Toronto. The four general outcomes and expectations are:

- i) Demonstrate the importance of geology to the student's lives;
- ii) Guide the students towards active, responsible global citizenship through a better understanding of their planet;
- iii) Introduce the students to the main concepts of geology;
- iv) Get the students excited about science, particularly the Earth beneath their feet.

There will be additional 'hands-on' activities including two field trips, one examining the building stones of downtown Calgary and the rocks at Nose Hill, the second being a day trip along the Trans Canada Highway to examine evidence for glaciation/climate change and the Cordilleran Orogeny. The students will also be expected to complete three term projects including:

- i) dissect a common object for its mineral/element components and then examine the geology of the mines from which these materials originate;
- ii) complete a detailed description of a fossil, its classification and where it may be found;
- iii) pick a natural disaster, outline what happened, describe the setting, come up with a model to improve survival of similar events in the future.

These pilot high school geology teachers will be supplied with complete support, including PowerPoint lectures and direct contact with the lead author. Meetings are being coordinated between these pilot teachers, the lead author and Dr. Godfrey Nowlan of the Geological Survey of Canada in order to establish a support network for these pilot geology teachers, what is needed for teaching materials and what would be useful in a workshop to assist the teachers. It is hoped that they will be able to attend the "Teacher Workshop and Field Trip" at Geocanada 2010, and then a more focused workshop at a convenient time during the June 2010 exam period. Guest lectures will be arranged at these high schools during the winter 2010 term, in order to create an interest for these pilot geology courses. Geologically 'hot' topics such as dinosaurs, climate change, gems and minerals, and natural disasters will be emphasized during these presentations. Meetings will also be arranged with Social Science, Outdoor Education, Biology, Chemistry and Physics teachers in order to highlight the geology portions of their courses and request that these teachers encourage interest in this geology course. Development of this Geology 25 course was deliberately timed to coincide with the United Nations International Year of Planet Earth (2007 to 2009). The timing of Geocanada 2010 is fortuitous.

It is hoped that these pilot courses will become very popular and that other high schools in Calgary (and Alberta) will want to offer this course. As this program grows, it is the lead author's intention to develop a network of geologists where one geologist will provide support for one high school. Ultimately over the next decade it would be desirable to see this course grow into a more formal Geology 20/30 curriculum where students that successfully complete these courses could challenge at least for the lecture portion of first year university geology courses by writing an exam (or some other established evaluation process). It would also be beneficial to promote the trend started by the University of Waterloo which has recently formed a Dual Credit Initiative with the Waterloo Regional District School Board. This initiative aligns a high school Earth Science course with first year university Earth Science and recognizes it as a credit for university entry. The goal of this process is to educate the Canadian public about geology, starting with our young people, who will hopefully get their friends, siblings and parents excited about 'the Earth beneath their feet'.