ALUMNI NEWSLETTER
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Message from the (Acting) Head

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Earth and Ocean Sciences
Acting Head (2005-2006)

Dear Colleagues, friends, students and alumni:

This past academic year I was honoured to serve the department as Acting Head while Paul Smith took a well-earned sabbatical leave. My term began July 1st, 2005 and ended June 30th, 2006 when Paul Smith returned to lead EOS for another 3 years. My very last act is to write this letter to you prior to resuming my normal role as Professor. My letter has three goals. First, I want to give you some idea of what the experience as "*Head*" was like for me. Secondly, this is a chance to acknowledge individuals whose efforts on behalf of EOS have made my job tractable. Thirdly, I thought it timely and a bit of fun to review the origins of the Geological Sciences Centre (EOS Main and EOS South) given our hopes for a new building.

The Faculty of Science (FOS) and EOS

I am amazed at how fast this year went. It seems like only a few weeks ago the Dean, John Hepburn, was asking me to serve as Acting Head and I began shadowing Paul Smith at his last few meetings. Of course shortly after my starting the job, the Dean became VP of Research and Grant Ingram stepped into the breach as Dean Pro Tem. Having Grant as Dean Pro Tem has been absolutely tremendous for EOS. He has been a strong advocate for EOS, without being partisan, and has helped EOS realize many of its aspirations. He worked hard to ensure that the "*New EOS Building Initiative*" was moved expeditiously through the first stage (i.e., Executive I) of UBC's approval process . His current efforts are to push a revised proposal for the building through the Executive II process. Grant is also a strong advocate for the Environmental Science undergraduate program, which threatens to be orphaned by the retirement of George Spiegelman. His solution has been to ask EOS to house, renew and administer this inter-departmental program (more of the story inside). This is a real feather in EOS's cap and it has been realized largely thanks to the efforts of Douw Steyn, Kristin Orians, Uli Mayer and Evegeny Pakhomov. The Dean's monthly meeting of Heads of science departments has been one of the more enjoyable aspects of this job. These meetings taught me much about how the Faculty of Science (FOS) works. I have to say, that I was pleasantly surprised by the level of collegiality between department heads. Most discussions at the Heads' table are aimed at making the FOS a better place to work for ALL departments. For example, under Grant Ingram's leadership, the Heads completed a first draft of a Strategic Plan for the Faculty of Science. My contribution, in collaboration with Will Welch (Stats) and Bridie Byrne (FOS), was to prepare a paper on the implications for FOS if mandatory retirement were to be abolished.

Within EOS, the most enjoyable tasks have been those that enabled people to get on with what is actually important. This year we saw 3 of our colleagues (Eberhardt, Mayer, & Pakhomov) be promoted to Associate Professor with tenure and this is obviously a rewarding experience for the Head. I am indebted to Les Smith and his committee for the meticulous and professional handling of the promotion and tenure cases. I also believe we made some interesting and important adjustments to our undergraduate curriculum this year. Susan Allen has been our leader in this endeavour. This year, Susan provided several strategies for mitigating course enrollment issues arising from offering a large successful broad-based majors program, in parallel with our more specialized honours programs.

EOS Building Initiative

Ray Andersen (Associate Head for EOS) and David Shorthouse have been driving the initiative for a new building to house EOS, Statistics, the Pacific Institute of Mathematics, and the Dean of Science offices. During the last year, they prepared an Executive I proposal that was approved in December 2005. Over the last 6 months they worked with university planners and all of the future inhabitants to make a first order estimate of the size, make-up (e.g., labs, classrooms, offices), and cost of the building. These data are needed for the Executive II proposal which is now submitted to the university executive. When we gain Exec II approval, EOS will be allowed to begin a campaign for funding and to start architectural planning.

The level of commitment from Ray and David towards this project has been very impressive. It has consumed them! In my opinion, it is their dedicated efforts that have moved this initiative so successfully. They should also be applauded for their vision of the building and their style of management. Ray has espoused the view that the building is being built to handle the next 50 years of Earth and Ocean Sciences research and teaching. What this means is that, rather than designing space for specific researchers, we aim to build generic space that can support all of the different endeavours of current and future EOS scientists. In terms of management, they have preached and practiced "full transparency of process" right from the start. This means that all parties are kept as fully informed as possible and this has made most of EOS feel that they are part of the process. This is a great philosophy, but it did come with a cost: that is Ray & David's time.

A History Lesson

Several of the buildings that currently house Earth and Ocean Sciences (EOS Main and EOS South) were built in the early 1970's as the Geological Sciences Centre for the Department of Geological Sciences. Deb Varley has provided me with some interesting background material from the UBC archives that I have summarized below. The original plan for the centre comprised: i) Phase 1 - teaching and research laboratory block, ii) Phase 2 - office block, and iii) Phase 3 - Classroom building. The funding plan for the centre involved raising $3.1m from industry donors and tapping UBC for $930K via the 1970-71 capital building funds.

CONSTRUCTION will begin immediately on the first stage of a new Geological Sciences Center, shown in model form above. Funds for construction of the building, to be located on Stores Road immediately to the west of the Geophysics Building, now total almost $2,500,000 as the result of a capital funds drive in the mineral resource industry and a $930,000 contribution from UBC's current capital budget.

GEOLOGY CENTER BEGINS

The University of B.C.'s Board of Governors have awarded a contract to Smith Bros. & Wilson Ltd. for construction of the first stage of UBC's Geological Sciences Center.

The Contract is for $2,181,363 to cover construction of the three-storey building except for completion of the interior of the third floor. Construction will begin immediately.

Total project cost including associated construction costs such as professional fees and furnishings will be $2,449,857.

If a further contract for completion of the third floor interior is awarded by Dec. 31, 1970, Smith Bros. & Wilson will receive an additional $328,317 and the total project cost will be $2,813,416. If it is not awarded until June 1, 1971, the company will get another $343,006 and total project cost will be $2,828,887.

FUNDS PLEDGED

A subscription of companies associated with the mineral industry began six months ago to raise $3.1 million towards the cost of the Center. UBC is also contributing $930,000 from its capital building funds for 1970-71. This amount, added to the $1,561,000 received or pledged through the campaign so far, makes a total of $2,491,000 now available for the first stage of the Center.

The first stage will house undergraduate laboratories, reading room, mineral and map collections, shops and student lounges. The third floor will be for graduate student and research facilities.

The second stage will consist of an office block and the third and final stage will be a classroom building. Both would be built later adjacent to the main first-stage building.

REPLACE HUTS

The 95,000-square-foot building, to be built on a site to the west of the Geophysics Building, will be based on an industrial design to achieve maximum space per construction dollar. It will be largely prefabricated. Components will be brought to the site and assembled.

The frame of the almost square building will be of light steel. One-foot-by-eight-foot modular panels of enamelled aluminum will be clipped onto the frame to form the exterior walls.

Windows within the laboratory areas will be occasional two-foot-wide floor-to-ceiling panels to minimize heating and cooling effects from outside the building. Full windows will be used in non-laboratory areas.

To avoid costly pipes running through floors and ceilings within the building, 18 ducts will rise in clusters on the exterior of the two walls.

The Center will replace four army huts, a two-storey tar-paper shack and facilities in the old Applied Sciences building which have housed the department.

Two short articles from UBC archives on the Geological Sciences Centre. The article on the left was published in 1970 and describes the funding and building plans for the entire 3 Phases of the project. The shorter article below from 1971 simply announces that the Phase 1 building (Phase 1) was to be fully occupied by November 15th, 1971.

FULLY OCCUPIED

By late September the one-storey Civil and Mechanical Engineering Building will be fully occupied. The building, which cost $1,170,000, houses shop and laboratory facilities as well as offices.

The first stage of the Geological Sciences Centre, valued at $2,832,416, will be fully occupied by Nov. 15. The new building will house classroom and laboratory facilities for the Department of Geology, which is now housed in cramped quarters in one of UBC's original buildings, built in 1925, and several converted army huts on the West Mall.

Phase 1 (EOS Main): In 1970, on the basis of $1.56m from industry contributions and $930K from UBC capital funds (Total=$2.49m), a commitment was made to build Phase 1 - a 3 story building containing undergraduate labs, reading room, and graduate and research space laboratory space. This laboratory block was constructed in 1970-1971 using the architectural firm of McCarter, Nairne & Partners at a total cost of $2.83m. Architectural notes include: "*This 3 1/2 storey metal clad steel frame and concrete building is covered with one foot by eight foot aluminum panels which are finished with an ivory-coloured baked enamel. Its ducts and fume hoods are expressed externally. This is the first UBC structure designed and erected with full system approach framed in light steel and components were brought to the site and assembled. Floor ceiling panels were applied to minimize heating and cooling effects from outside. NOTES Since there is no extra budget for any fancy design and architectural materials, this buiding was built in a lower than normal construction cost and constructed in a shorter time frame. It intended to replace 4 army huts, a 2-storey tar-paper shack and facilities in the old Applied Sciences building.*"

Phase 2 (EOS South): The office block (EOS south) was built in 1973-1974 with a provincial grant at a total cost of $650K. The building comprised four floors of faculty and graduate student offices but the fourth floor remained as unfinished open floor space until the 1990's.

Phase 3: The classroom block was never funded and remains unrealized.

There are lessons here for the current initiative.

The Front Office

I am compelled to use my last paragraph to thank the people who made the biggest difference to my day-to-day existence: the denizens of the front office. As you know, we have Kathy and Mandy in finance who take on the ever expanding financial issues associated with grants, purchases, reimbursements, and grant over-expenditures. We don't hear much from that corner of the office, because they are quietly doing a superb job. I cannot imagine what our lives would be like without the services they offer. Before this job, I chaired the graduate committee for several years and, thus, am well aware of Alex Allen's talents. This year she was awarded a Faculty of Science Achievement Award for Service. Well deserved Alex (see inside for more)! Teresa Woodley seems to know everything and do everything concerning undergraduate teaching (although I don't think she has yet been asked to deliver the lectures!). This year, on top of her other responsibilities, she also helped Roger Beckie with the External review of the geological engineering program. The GeoE program received approval and a very strong endorsement and congratulations and thanks are owed to Roger, Uli Mayer, and Teresa. Carol Leven fills in wherever she is needed, sees that Aurora is sent out and is responsible for this newsletter - thanks to her gentle nagging I actually got this letter completed (almost) on time. She threatened to write it for me and I couldn't risk that. Day-in and day-out I relied on Deb Varley and David Shorthouse to educate and steer me. I couldn't have asked for two greater resources. Deb kept me on target with all the deadlines a Head is faced with throughout the year, made sure that the paperwork (e.g., appointments, letters, etc.) administration was done properly and in a timely manner, and kept me in good humour. What can I say about David? Excellence starts with leadership at the top. The reason the front office is functional, efficient, professional and happy is because of David. The people that he administrates know that he respects them, trusts them and will represent them to the best of his ability. I relied on him continuously for his wise counsel on many, many issues and I was always impressed by his capacity to focus on finding the solution rather than dwelling on the problem. I learned much in my time in the Head's office.

So long, and thanks for all the fish***.**

J.K. Russell

**http://en.wikipedia.org/wiki/So_Long,_and_Thanks_For_All_the_Fish*

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Dark Blue Beryl - $Al^{3+} \leftrightarrow Fe^{2+}$

THE CRYSTAL CHEMISTRY OF COLOUR
HUNTING FOR CANADA'S "HIDDEN" GEMS

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Mari-Lou Rowley, the author, is a science writer, poet and principal of Pro-Textual Communications.

From the atomic level of crystal chemistry to geological field work, UBC professor Lee Groat is working to uncover Canada's emerald deposits, the mystery behind the colour of blue beryl, and the correlations between composition, crystal structure and formation of related minerals.

From ancient times, emerald has been considered one of the rarest, most beautiful and valuable gemstones. No wonder that its discovery in Ontario, the Yukon and Northwest Territories caused a stir among mineralogists and mining companies around the world. Mineralogy and crystallography professor Lee Groat in the Department of Earth & Ocean Sciences has studied beryl deposits in northern Canada to discover the nature and location of mineral formation and the mysteries of gemstone properties and colour—specifically the unique deep-turquoise stones so far found only in the northern Yukon.

Emerald was first discovered in Canada in the 1940s, near Dryden, Ontario, but it wasn't until 1998 that the first major, and accidental, discovery was made by former UBC student Bill Wengzynowski. "Bill was working with Expatriate Resources, looking for copper, lead and zinc deposits, when the gem-quality beryl was found," says Groat, who X-rayed the sample and classified it as emerald. "It was a pretty exciting project that kind of took over my life for a few years."

Over the next several years, Groat and colleagues Jim Mortensen of UBC and Dan Marshall of SFU were involved in several geological and mineralogical studies of beryl deposits in the Canadian Shield and Cordilleran regions. The three main emerald occurrences are located at Tsa Da Glisza (formerly Regal Ridge) in southeastern Yukon, Lened near the Yukon-Northwest Territories border, and the Taylor site in northwestern Ontario

From Atomic Microcosm to Macrocosm of the Field

Emerald is defined as green gem beryl, with a chemical composition of beryllium, aluminium, silica, and oxygen (Be3Al2Si6O18). The colour of emerald is usually related to minor amounts of chromium, and depends not only upon the mix of elements but on the interplay of atoms in the crystal lattice. Emerald deposits have different characteristics in different geographical areas. At the macroscopic level, Groat's research in the mineralogy of gemstones is akin to geological detective work: first, in considering the characteristics of the sites and the rock in which beryl is discovered; second, in identifying factors such as the ratio of elements like magnesium and iron found in tourmaline minerals and their proximity to emerald mineralization; and third, in analyzing how the elements combine to form various types of beryl and gem-quality emerald.

At the microcosmic level, Groat uses advanced crystallography techniques such as single-crystal X-ray diffraction, neutron diffraction, and electron probe microanalysis to assess the unique molecular characteristics of minerals and gemstones.

The Science Behind Unearthing Canada's Emeralds

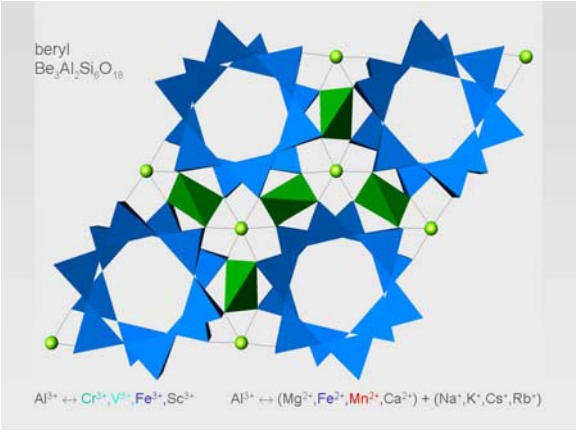
Emeralds are rare because a main element of their composition, beryllium, is not usually found in the same area as chromium and vanadium, the trace elements that produce the emerald green colour.

For instance, chromium is associated with oceanic rocks and beryllium is predominantly found in granitic rocks, explains Groat. "For emerald, you have to get beryllium together with chromium and these elements tend not to travel in the same geological circles."

Exploration companies want answers to questions such as: what are the characteristics of a site that promote gemstone formation, and how can deposits be more easily located? Groat has been working with industry partners True North Gems Inc. and Archer Cathro & Associates (1981) Ltd. to evaluate Canada's three main emerald occurrences. In each case the geology is strikingly different. In the Tsa Da Glisza site, the source of beryllium is granite and the source of chromium is the host rock, a mica schist. The emerald found in Ontario occurs right next to a granitic rock, not at a distance from it—at least several hundred metres—as at the other two sites. "It looks like the granitic material was mixed up with a schist to form an unusual black rock that has emeralds in it, so we are trying to explain how that happened," says Groat. In the Lened area, the source of beryllium is a mystery. "It is probably coming from nearby granite, but that granite doesn't have much beryllium in it," notes Groat.

The emeralds found in the Lened site have another unique characteristic—their colour comes from traces of vanadium, not chromium. "When people first realized that vanadium could cause great colour as well, there was a huge debate as to whether this type of beryl was really emerald," says Groat. Today, gemologists have relaxed their views. Since emeralds are notorious for having cracks and inclusions, it is the quality of the gem, not necessarily the type colour-creating mineral, or chromophore, that determines its value.

SIDEBAR - Pure beryl is "colourless." Its crystal structure (see below is made up of silica oxide tetrahedra SiO_4 (blue), forming rings, which in turn are linked via beryllium oxide tetrahedra BeO_4 (dark green). The light green spheres represent aluminium oxide octahecra ($A1O_6$). Minor amounts of chromium, vanadium or iron replacing aluminium can change the colour of the gem significantly (see pictures of the crystals: Lee Groat)



Groat's work involves characterizing mineralized zones and the minerals in host rocks, and doing geochemical analyses to determine the sources of the chromophores in the beryl and emerald. In one method, Groat obtains stable isotope compositions with help from colleagues at UBC's Pacific Centre for Isotopic and Geochemical Research (PCIGR). These enable him to assess the nature and origin of fluids that leads to the formation of beryl/emerald, thereby providing molecular clues as to chromophore sources.

Tracking Canada's Rare Blue Beryl

In the summer of 2003, armed with a geologist's arsenal of equipment and aided by graduate students Heather Neufeld and Dawn Kellett, Groat and Wengzynowski took to the field in search of emeralds. Their work was exhausting and intense, but yielded another amazing, and accidental, find 100 kilometres northwest of the Tsa Da Glisza site—a brilliant dark blue beryl the colour of cobalt. A light blue specimen was found in 1976, but it wasn't until October 2003 that Groat identified it—along with the samples they had collected that summer—as true beryl. Their find attracted media attention across the globe. Canadians had unearthed their own unique, gem material. "The question of its value still depends on how much of it there is, and how much can be cut into gemstones," says Groat.

Blue gem beryl is commonly known as aquamarine, and its colour is due to iron, which is also not usually found in appreciable quantities with beryllium. The deep blue of the Canadian beryl renders it gemmologically distinct, and the stone has created a stir in the research community because as yet scientists don't know exactly what causes the blue colour in aquamarine. "We know it involves iron, but we don't know the mechanism," admits Groat. "And since the dark blue beryl has more iron than normal aquamarine, we thought it would be a good material to use to try to solve the problem."

Canadian blue beryl samples have been studied in labs around the world. Groat's colleague George Rossman at the California Institute of Technology, US, is a world expert on colour in minerals. He believes that deep blue beryl might be the result of a yet undiscovered physical mechanism in crystal colouring. Groat has been working to understand the nature of the brilliant colour at the atomic level. "We think it might be a very small amount of iron that is sitting in a position in the crystal structure that is usually empty," he explains. "The difficulty is that it is probably such a minute amount that we don't see it with techniques like X-ray and neutron diffraction (see sidebar). "The colour of this dark blue beryl is turning out to be a fascinating and very complicated problem."

Characterizing Borosilicate Minerals

Among the many minerals that Groat studies, the borosilicates are some of the most chemically and structurally complex. They are found in pegmatites—course-grained igneous rock that contains exotic elements and gemstones. Boron, a primary element, plays a significant role in the evolution of geological systems through its influence on elemental transport processes. The occurrence of borosilicate minerals is important because they provide information on the behaviour of boron during these processes.

Groat's recent work involves the crystal characterization of the borosilicate mineral holtite, represented by the formula [(Ta,□,Al)Al6(BO3) (Si, Sb,As)3O12(O,OH□)3]. The blank squares in the formula represent missing atoms. Even to the non-chemist, the structure is obviously extremely complex. Tantalum, a main element in holtite, is of increasing economic importance. Tantalum is used in aircraft manufacturing to make steel and in the electronics industry for capacitors. Because it is inert, impervious to body fluids, and well tolerated by the body, it is widely used in surgical implant procedures. Tantalum oxide is also used to make high-index glass for camera lenses.

"I began studying these minerals in 2000, because I realized that many questions concerning their stability and crystal chemistry remained unanswered," says Groat. "In particular, the role of heavy metals, hydrogen, and vacancies in the structure are still not clear."

Single-Crystal Neutron Diffraction

In the study of amblygonite, another mineral common in granite pegmatites, Groat travelled to the High-Flux Isotope Reactor in Oak Ridge, Tennessee to use its single-crystal neutron diffractometer. The challenge in studying structural substitutions in amblygonite and many other compounds is that it is difficult to detect hydrogens with X-rays, because the X-rays interact with the electrons around the cations (positively-charged ions) and hydrogen has only one electron. Whereas in neutron diffraction, the hydrogen is easily detected since neutrons interact with atomic nuclei. "In order to understand the substitutions that are occurring in the structure, we need to figure out what was happening with the hydrogens," says Groat. UBC chemist Colin Fyfe worked with Groat on nuclear magnetic resonance (NMR) analysis of amblygonite.

Currently the method of single crystal neutron diffraction bears a major limitation—it can only be applied to much larger crystals (about 3 mm across) than X-ray diffraction (0.25 mm). Groat is a member of the instrument advisory and design teams to build a new, more powerful single-crystal neutron diffractometer at the Oak Ridge facility. When completed, it will produce the most intense pulsed neutron beams in the world, allowing researchers to use the same smaller crystals now employed in X-ray diffraction. "This is really going to expand the area in a major way," says Groat. "It is exciting to be working on the cusp of this research."

Lee Groat, Professor in Earth and Ocean Sciences, UBC

Research Highlights 2: the Mineral Deposit Research Unit (MDRU)

2006 Yerrington Group - Field Mapping Course

Collaborative Industry-MDRU Participants in the Cordillera Huayhuash in Central Peru

The Mineral Deposit Research Unit is a collaborative venture between UBC and the mining industry that administratively is located within EOS. The unit had an extremely successful 2005, and will enter 2006 with several new research initiatives, joint collaborations with economic geology research groups around the world, new research staff, and an expansion of the unit in new directions. Much of the success derives from the robust commodity markets and the recognition by industry sponsors of the need to invest in the training of the next generation of geoscientists. We currently count 45 mining companies as members of MDRU, and thank them for their continued support.

MDRU is currently active on 5 continents around the world in 6 broad research themes ranging from the traditional hydrothermal ore deposit investigation to kimberlite and diamond investigations to the development of exploration techniques particularly the integration of geologic and geophysical data to build 3-D earth models. A major project investigating the effects of large-scale hydrothermal circulation around high-level intrusive complexes into carbonate host rocks in central Peru was recently completed.

Three new major projects were established in 2005. A major collaborative project was established with the Centre for Ore Deposits Research at the University of Tasmania (Australia) that is building holistic models for alkalic ore systems formed in the epithermal and porphyry environments. Graduate students from EOS are undertaking projects in British Columbia and eastern Australia; research associates are also working in Papua New Guinea. A second major project, which is undertaken jointly with Turkish professors, is placing the metallogenic evolution of parts of the Tethyan arc in Turkey into a time-integrated framework. This country is geologically very similar to British Columbia, and should have a very similar metallogenic endowment.

Finally, MDRU research has expanded into sustainability with a project examining carbon sequestration in mine tailings, which have the potential to extract atmospheric carbon dioxide on human time scales and store the greenhouse gases in stable minerals. Sites in western Australia, Yukon, British Columbia, and Northwest Territories, which provide a wide range of climatic conditions, are being investigated.

MDRU also sponsors the UBC student chapter of the Society of Economic Geology. In 2005, the chapter traveled to Chile where they toured some of the world's largest copper mines. All was not business, as the tour visited some of the internationally recognized vineyards in central Chile. Ten industry geologists also participated in the trip. Graduate student travel was partially sponsored by contributions from Barrick Gold Corporation and Lumina Copper.

In 2006, MDRU will be expanding their program in gold deposits hosted in shear zones. Significant gold is produced from these deposits on a worldwide basis, and they form the major source of gold produced in Canada. New projects investigating these deposits will be underway in Ontario and hopefully by the end of the year in Africa. In addition, MDRU will expend effort to establish an internationally recognized kimberlite research program. The goal is a strong diamond and kimberlite research program parallel to the internationally recognized metals research program.

MDRU continued to disseminate technical information to diamond and metal companies through the Sheahan–MDRU literature service and professional development courses. Two short courses were offered to 170 registrants on copper deposits (genesis and giants) and Canadian kimberlites. Six graduate theses were completed in 2005. The Unit employed seven research associates and post doctoral fellows, ten graduate students pursued PhD and 16 pursued MSc. For further details, go to the report for 2005 of the Director (Dr Richard M. Tosdal) at www.mdru.ubc.ca. in 6 broad research themes ranging from the

traditional hydrothermal ore deposit investigation to kimberlite and diamond investigations to the development of exploration techniques particularly the integration of geologic and geophysical data to build 3-D earth models. A major project investigating the effects of large-scale hydrothermal circulation around high-level intrusive complexes into carbonate host rocks in central Peru was recently completed.

Environmental Science Program moves to EOS

Earth and Ocean Sciences will provide a new home for the Faculty of Science Environmental Science Program, as the current director, George Spiegelman, steps down over the next year. Kristin Orians will be EOS's Director of the Program, and Carol Leven will provide the administrative support.

Kristin Orians is an Associate Professor, jointly appointed in the Departments of Earth and Ocean Sciences and Chemistry. She received her B.A. and Ph.D. in Chemistry from the University of California at Santa Cruz, and spent a postdoctoral year at the Massachusetts Institute of Technology. Her research is in chemical oceanography, with a focus on the biogeochemical cycles of trace metals in the oceans.

Dr. Orians will be holding a 2-day Workshop in late September of 2006 to begin planning the new program. The workshop will involve external speakers from universities having established Environmental Science Programs and representatives from all departments in the Faculty of Science at UBC. The revised program should be ready for delivery in the Fall of 2007.

EOS was chosen to house the program after a small ad-hoc sub-committee (U. Mayer, K. Orians, E. Pakhomov and D. Steyn) made the case for moving the Environmental Science Program to EOS: "We believe the ESP fits more naturally into EOS than it would into any other department in the Faculty of Science because EOS has teaching and research expertise and activities that cover a wider range of topics in the environmental sciences than is found in any other department in the Faculty. Furthermore, teaching and research in EOS approach the environment from many perspectives (biological, chemical, physical), timeframes (past - paleo, present, and future - modelling) and space scales (micro, meso, macro, global and planetary), and in the major environmental realms (Geosphere, Hydrosphere (Ocean) and Atmosphere)." EOS will work with other departments at UBC to bring in areas of environmental science teaching that EOS cannot cover. Together we will offer an exciting program for students that will enable them to obtain a process understanding of today's key environmental issues and prepare them for solving the environmental problems of the future.

NEWCOMERS

SARA HARRIS

I arrived at UBC in August of 2005 and feel very lucky to have the opportunity to work here. As an instructor in Earth and Ocean Sciences, I teach and coordinate a variety of undergraduate courses, and have begun exploring possibilities in science education research. How can we teach science in a way that encourages students to think like scientists?

My route to science, to oceanography, and ultimately to UBC has taken some turns. It started when I weaseled my way into the structural geology class at Wesleyan University, having taken none of the prerequisites (enrolment in geology was low at the time). My structural geology professor was Dutch and his pronunciations of "fault" and "fold" sounded identical, but no matter. The field trips exploring the wilds of Connecticut convinced me to become a geology major, having previously toyed with the possibilities of Russian or English. After a year in the former Soviet Union, taking a geophysics class from a man named Gorbachev and learning to eat and drink various unusual items, I returned to Wesleyan to find they'd hired an oceanographer. She encouraged me to apply for a summer fellowship at Scripps Institution of Oceanography, where I had another wonderful mentor and an introduction to Unix, time series analysis, and Paleogene climate records. I also experienced my first earthquake that summer in La Jolla. Later, I worked with two more fabulous researchers, as a graduate student in the College of Oceanic and Atmospheric Sciences at Oregon State University (second earthquake, the "spring break quake" in Oregon). I had opportunities to sail as a sedimentologist and stratigrapher with the Ocean Drilling Program on two Legs: Leg 154 to Ceara Rise in the Atlantic and Leg 181 to the SW Pacific. At Ceara Rise, we investigated changes in deep ocean circulation and South American continental climate on orbital and tectonic time scales, using mostly non-intrusive methods (e.g. sediment color reflectance, magnetic susceptibility). In the Pacific, we explored the timing and flow of North Atlantic-type deep water into the Pacific basin.

This was a windy day aboard the SSV Robert C. Seamans in the equatorial Pacific. It's class time on the quarterdeck and I'm at the helm, which they don't let me do very often (mostly students steer). We're trying to locate one of the TOGA-TAO instrument buoys which are used in El Nino/La Nina prediction. The captain (in the hat) is giving me directions, mostly to "come up". We found it!

I have always been interested in teaching. It's possibly genetic and can be traced back to my ancestors in one-room school houses in the hollers of West Virginia. As a graduate student at OSU in oceanography, there were few opportunities to teach, but I think I found them all. My next (first "real") job was as an oceanographer and sea-going chief scientist with Sea Education Association (www.sea.edu). I spent 7 truly amazing years at SEA, teaching in Woods Hole, Massachusetts, and on SEA's sailing/research vessels the SSVs *Westward*, *Corwith Cramer*, and *Robert C. Seamans* (and, yes, was once awoken by an earthquake while on Cape Cod – epicenter in upstate New York). SEA takes undergraduate students to sea to do oceanographic research, learn to sail and navigate, and understand the human experience with the marine environment. As an oceanographer there, my experience expanded from geological oceanography into biology, chemistry, and physics. I can now identify a slew of zooplankton and guide students through research projects using Acoustic Doppler Current Profiler data. On these vessels, along with students and other crew, I got to sail and conduct oceanographic research in large parts of the western North Atlantic, all the over the Caribbean Sea, and the eastern and central Pacific. On my second-to-last SEA cruise, after a 28 day passage, we anchored in the Marquesas (central Pacific) on the morning of 26 December 2004, – the time of the Banda Ace earthquake and ensuing catastrophic Indian Ocean tsunami.

I'm excited to be at UBC because there are so many people here interested in the scholarship of teaching and learning. I've barely begun to scrape the surface of all the possibilities and am looking forward to the future.

RETIREMENTS

BRYON CRANSTON

Bryon Cranston, Supervisory Technician in EOS, retired 2005 September 1st. after 38 years of service to UBC. Born in 1944 in Calgary, Bryon lost his father when he was 9 years old, and was raised and went to school on the prairies mostly in Alberta and Saskatchewan. In July,1967, when he was 23, Bryon came to what was then the Department of Geology at UBC as a junior technician. He spent several years as thin-section specialist before being promoted to Supervisory Technician in 1985. Bryon's first years were in Hut 15A, one of the scores of recycled wooden buildings erected on the campus after World War Two, across from what is now the Geography Building on West Mall. An early mishap involved breaking his leg in 1971 in a game of touch football at a departmental picnic. In 1972, under the direction of Ed Montgomery, his predecessor as Supervisory Technician, Bryon supplied part of the heroic effort necessary to move furniture and equipment from the old Geology-Geography building on West Mall into the newly constructed Geological Sciences Centre (now EOS Main) on Stores Road. Moved were such items as the large Brontosaurus skeleton, mounted on a wood and plaster backdrop, and display cases from the old MY Williams Museum. To move the dinosaur, a steel frame was welded onto the back of the display, and a large hole was made in the wall of the old building facing Agricultural Road to extract the resultant very large object. In addition to his technical duties, Bryon took over from Ed Montgomery many functions to bring students staff and faculty together, such as the Friday afternoon happy hour, inter-mural hockey, and organizing annual Christmas parties and golfing tournaments. A particularly valued service was his role, together with other technicians, at the end of April each year, in preparing the buildings and grounds of the field school at Oliver for occupation by staff and students in the geology spring field school. Bryon has a son, Brett, born in 1978. Bryon has shared his life with Cathy Rayburn for the last 20 years. In his retirement Bryon lives in White Rock and spends time at a property at Birch Bay, Washington. Birch Bay today reminds him of the way White Rock was a few decades ago, though it is now being discovered by Californians. Bryon and Cathy travel, and he enjoys golf and hockey. When asked what he enjoyed most about his job at UBC, Bryon replied "The people I met, mostly the students I interacted with over the years". Past and present

colleagues and students will fondly remember Bryon's contributions to the many social and recreational events that he initiated and organized over the years in addition to his hard work in keeping our buildings, labs, field school and equipment in top shape.

REUNION OF THE CLASS OF 1965

Some of the participants at the Reunion

The Geology and Geological Engineering classes of 1965 held a spirited reunion in September, 2005 at the Museum in Eos Main. A document 'MEMORIES OF THE GEOLOGY DEPARTMENT' compiled by Barry J. Price contained photographs of buildings which formerly housed geology at Fairview (original UBC Campus), on West Boulevard (now the Geography building), and on Stores Road (the present EOS Main). Also included were a list of professors in 1961 with photos and career sketches, class lists and photos.

One more classic from 1963-64, pace and compass traverse along Spanish Banks Barry Price says he still has notes from this travers, but GPS is certainly easier and more accurate !!

PACIFIC MUSEUM OF THE EARTH

LCD Display of weather

In the past year, the Pacific Museum of the Earth has visibly changed. We have begun organizing the museum along thematic lines by shifting the Systematic Mineral Display to the first year labs and moving the giant amethyst geode. The long awaited Weather Forecasts display has been installed and is up and running. Many thanks to Roland Stull and Henryk Modzelewski for developing the content for this display! It features six different continuously updated 60 hour forecasts displayed on a 27 inch LCD display. The gift shop has been reorganized, increasing the exposure of the collector minerals to natural light and installing a discount table for clearance of old merchandise.

The Museum Gift Shop

But not all of the developments in the museum have manifested themselves in the display space. The curator went on her first mineral collecting trip. A museum member, Ray Hill, arranged for a visit to the Baymag mine to look for museum specimens. Since 1982, Baymag has grown to become one of North America's largest producers of high grade calcined magnesium oxide and one of the world's leading manufacturers of refractory grade fused MgCO3. Thanks go out to the mine staff for making this trip possible.

The Baymag mine is located on Mount Brussilof here in B.C. It is an open pit mine producing primarily magnesite (MgO).

We've also secured additional funding for some museum projects. As a result, the Vault display, intended to make showing high-end samples safe, is now fully funded and is progressing slowly. We also won a small grant to help us create hands-on museum exercises to be based in the Teacher's Resource Centre.

Come and visit us! There are a lot of new developments in the Pacific Museum of the Earth.

Stuart Sutherland on the Museum

This year has seen a number of exciting opportunities and challenges. In addition to my usual teaching duties, I, along with Mackenzie Parker (Pacific Museum of the Earth (PME) curator) have been heavily involved in the planning of the Beatty Biodiversity Centre. This will include paleontological museum / curatorial areas and new micropaleontological research labs. This new centre will be developed in tandem with the PME to produce a first class Earth and Life Sciences outreach opportunity at UBC.

The continued success of our department to attract new students to our courses has highlighted the fact that we desperately need new teaching space. Given the possibility of a new building I have been assessing our future teaching needs. This presents a great opportunity to provide all the excellent teachers in EOS with access to state of the art lecture theaters and teaching aids.

Editor's Note: Stuart was also one of this year's recipients of a Killam Teaching Prize (see page 14)

Mackenzie Parker, Curator

The Pacific Museum of the Earth is located in the Earth and Ocean Sciences--Main building on the UBC campus. E-mail mparker@shaw.ca or call 604-822-6992 for more information.

Student Activities

EOS GRADUATE STUDENT SOCIETY
Submitted by Diane Hanano

The 120 EOS graduate students are a large and diverse group. Despite our demanding work schedules, this year we managed to find some time to have a little fun. In October, we went to Playland Fright Nights, which included spooky haunted houses and exhilarating rides. Everyone agreed that the old wooden rollercoaster was far scarier than any modern rollercoaster they had ever been on. In December, for the second year (in the rain), the grads decorated the courtyard with Christmas lights, which was followed up by pizza. In January, we had a blast skiing and snowboarding at Big White and Silverstar Mountains in the Okanagan. We had amazing snow and weather for two days. Aside from a few mishaps on a T-bar, everyone emerged from the trip unscathed. Just recently, from April 20 to May 7, a group of us went to New Zealand on a field trip in conjunction with the MDRU and the SEG. We toured a number of gold mines, hiked to an active volcano, and were able to examine up close and personal (put our fingers on!) the Alpine fault, the plate boundary between the Australian and Pacific tectonic plates. Our graduate student seminars and Professional Development Series were held weekly throughout the winter and spring terms, and were a huge success. Thursday coffee times continue to be popular, providing a much needed break, plus sugar and caffeine to keep us going. Possible grad activities this summer include a sake tasting and trip to Storyeum. In the fall, a combined wine tour and corn maze may be planned.

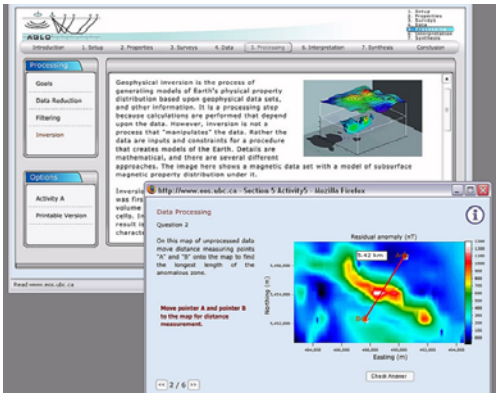
Grads Ski Trip in January, 2006

FACULTY ACTIVITIES

Francis Jones, a lecturer who has been teaching applied geophysics at EOS since 1996, received a grant from the BC campus Online Development Fund Project to develop online learning resources about applied geophysics. This six month project was completed in late 2005, and resulted in over 30 individual online Learning Objects. Many are highly interactive, including a complete Flash-based introductory module, action-maze decision making scenarios based on real field projects, self-test quizzes of many types, spreadsheets, group exercises, applets, downloadable programs and more. Most resources are designed for earth science professionals who are not geophysics specialists, although some are appropriate for 4th year students in geophysics.

The resources are licensed under the Creative Commons Licensing system and collectively are referred to as the Applied Geophysics Learning Objects collection, or AGLO. They are now housed on BCcampus's "Shareable Online Learning Resources" server (SOL*R) - a provincially funded repository for online programs, courses, and learning resources. They are also on the EOS server. For more details, and pointers to BCcampus and the AGLO resources, see

http://www.eos.ubc.ca/%7Efjones/aglosite/index.htm.



AGLO Screen Shop - Francis Jones

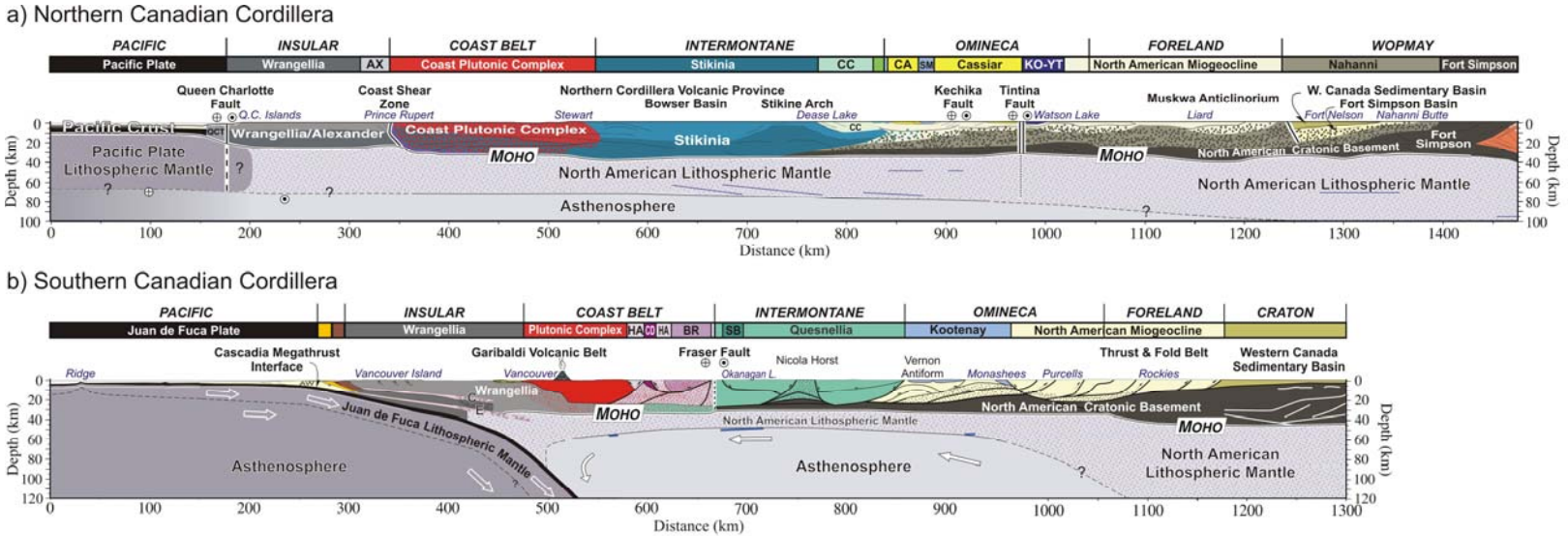
AWARDS AND HONOURS

FACULTY

Ron Clowes - Logan Medal Winner and Canada Council Killam Research Fellowship

The award of a Canada Council Killam Research Fellowship, during which I am relieved of teaching and administrative duties in the department, afforded me the time to carry on a number of research activities. One of these was the obvious – bringing to completion, or near completion, a number of manuscripts with students and colleagues based on previous research. Lithoprobe, Canada's national geoscience project that is now drawing to a close and for which I have been Director since 1987, still occupies my efforts as we work toward synthesis volumes for the entire 20-year project. With a colleague from the Geological Survey of Canada, we have outlined the contents of a major new volume, obtained support for its publication and received commitments from many scientists to contribute. Two contributions on which I will be senior or co-author have been partly prepared. John Wilson, a freelance author, and I are preparing a book, titled Ghost Mountains and Vanishing Oceans: North America from Birth to Middle Age, about Lithoprobe for the general public; a draft manuscript has been submitted to the publisher. The success of Lithoprobe has resulted in many international invitations and the past year was no exception as I made three such trips. While on the topic of Lithoprobe, I want to state that receiving the Logan Medal was a special honor for me, particularly because it recognized the role that Lithoprobe, and the hundreds of scientists associated with the project, have played in the development of Canadian Earth sciences. A new research project, understanding how the crust of the continents formed by using the central Coast Mountains of B.C. as a study area, is currently underway. The project, called BATHOLITHS because the Coast Mountains are mainly a batholithic complex, is multidisciplinary and involves scientists from three universities in Canada and six in the U.S. My involvement is with

an onshore-offshore seismic experiment that requires a great deal of work to meet environmental permitting requirements. As such, I have prepared information sheets, a large brochure and other material and made visits with colleagues to First Nations communities and fisheries organizations along the central coast. While onerous, this effort also has afforded me some exceptional opportunities: flying by float plane along the majestic fjords of the coast; visiting remote communities and learning of their concerns and expectations; and enjoying a feast and visit with a First Nations community, accessible only by float plane or boat, nestled at the end of a picturesque bay, laced by boardwalks and without a single car or truck on the premises. Research represents a lot of hard work, but it certainly has its rewarding aspects. I want to thank all those who have contributed to my research efforts during the past year and the many years that preceded it. See the illustration on Page 13.



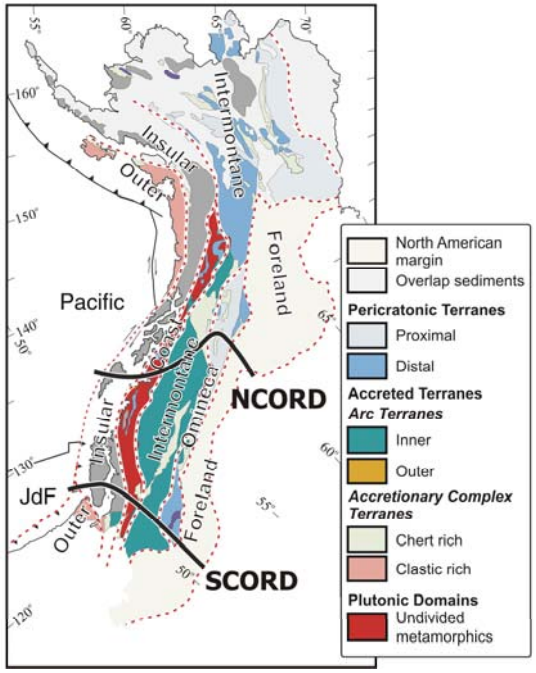


Illustration. Interpretations of lithospheric structure along two corridors crossing the Canadian Cordillera. The profiles illustrate how the North American continent grew westward through accretion, along-strike deformation and magmatism. The interpretations are based on coincident multidisciplinary studies including geophysics (seismic reflection, seismic refraction, teleseismic, magnetotelluric, gravity), geology, geochemistry and geochronology. **Above:** Composite interpretations constructed for the Northern and Southern corridors. Based on studies in *LITHOPROBE*'s Slave-Northern Cordillera Lithospheric Evolution (SNORCLE) transect plus the overlapping ACCRETE and Queen Charlotte transects **(a)**, and Southern Cordillera transect, **(b)**. The primary tectonic domains crossed by the transect are indicated by the bar strip above each interpretation; no vertical exaggeration. Black lines in the crust show principal near-vertical incidence reflection features; navy lines in the mantle indicate interpreted location of wide-angle reflectors. Most inner accreted terranes are thin flakes, less than 10 km thick; however, Stikinia and Quesnellia occupy all or most of the crust. Up to 50% of the accreted terranes overlay Proterozoic North American crust. The accretion surface forms a crustal-scale decollement beneath deformed, interleaved and duplexed crust. The crust is uniformly thin, hot and weak, despite along-strike variations in terranes, deformation history, elevation and current tectonics. The Moho is relatively flat and represents a young, re-equilibrated boundary. The transects provide insight into current fault geometries at depth and show that four major fault zones penetrate the entire crust. Terrane abbreviations: AX, Alexander; BR, Bridge River; CA, Cassiar; CC, Cache Creek; CD-MT, Cadwallader-Methow; CR, Crescent; HA, Harrison; KO-YT, Kootenay-Yukon-Tanana; QN, Quesnellia; SB, Spences Bridge; SM, Slide Mountain; WR, Wrangellia. Other abbreviations: AW, accretionary wedge; C and E, reflective bands; QCT, Queen Charlotte terrace. **Left:** Simplified geological map of northwestern North America showing location of the two corridors, NCORD and SCORD. Geomorphological belts as defined in the Canadian Cordillera are labelled and indicated with red dashed lines. Pacific and Juan de Fuca (JdF) plates are labelled.

William Cameron, the first faculty member of the Institute of Oceanography at UBC, founded in 1949, was appointed Member of the Order of Canada.

The citation reads: William Maxwell Cameron, C.M., West Vancouver, B.C. - Member of the Order of Canada. William Cameron's vision and leadership were instrumental to the growth and development of oceanography in Canada. While at the University of British Columbia in the 1950s, he helped to develop the Institute of Oceanography. Best known for his Arctic research and hydrographic surveys, he served as chief scientist for the Canada-U.S. Beaufort Sea Expeditions. As a science administrator with the federal government, he oversaw the establishment of a number of research institutions, including the Institute of Ocean Sciences, the Canadian Centre for Inland Waters and the Bedford Institute of Oceanography, Canada's largest centre for ocean research.

Stuart Sutherland - Killiam Teaching Prize

EOS was pleased to announce that Stuart Sutherland was awarded a Faculty of Science Killam Teaching Award. The Faculty of Science awards Killam Teaching Prizes each academic year to acknowledge outstanding contributions made in teaching in the FOS. The award carries a $5,000 prize.

Here are a few excerpts from his nomination letter (to make him blush):

He has an infectious enthusiam for the breadth of science in our department and he capitalizes on this in his lectures. This is a real talent given the breadth of modern Earth & Ocean Sciences.

He has played a huge role in "renovating" our curriculum to reflect the new emerging face of modern Earth & Ocean Sciences.

He is everything one could ask for in an undergraduate educator – creative, inspiring, and supportive. He is also a superb advocate for EOS programmes and an excellent role model for young scientists.

This is a very well-deserved award and, in addition to congratulating Stuart, I want to formally thank Lori Kennedy, David Shorthouse, Paul Smith and Dominique Weis (Chair Awards committee) for their nomination efforts.

Comments by Stuart

In May I was thrilled to receive a Killiam Teaching Prize. I would like to thank all those who nominated me but also to pay credit to all my colleagues here in EOS who help create an environment in which both research and teaching may flourish.

Paul Harrison, former faculty member of EOS, was awarded the 2006 Murray A. Newman Award for Significant Achievement in Aquatic Research for his research in biological oceanography. Dr. Harrison's work began with a focus on phytoplankton nutrient uptake and utilization. He has since become a leader on several large-scale Canadian and international research projects examining the role of the North Pacific in the global carbon cycle. In addition to his research, Dr. Harrison has had an impressive teaching career, mentoring graduate students and post-doctoral fellows, many of whom have gone on to achieve great success.

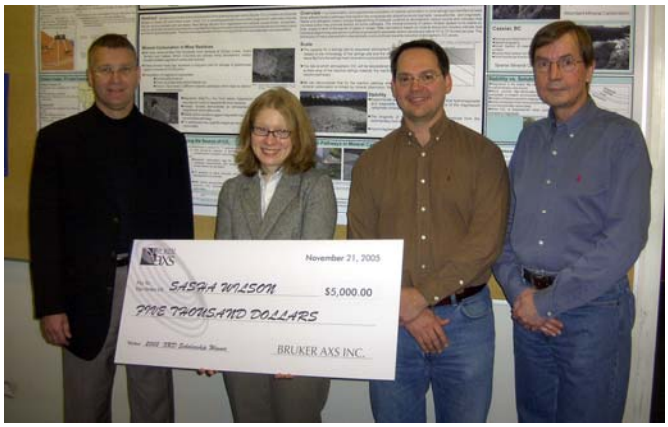
Mati Raudsepp won The Leonard G. Berry Medal of the Mineralogical Association of Canada for 2006. The award is for distinguished service to the Association in an elected role. Mati served as Treasurer of MAC for a decade, and was cited for impeccable record keeping, fastidious attention to detail, ability to deal with matters at record efficiency, and ability to avoid getting unduly bogged down in details.

STAFF

Alex Allen received a Service Award from the Faculty of Science in recognition of her contribution toward achieving the goals of the Faculty. The citation by Philippe Tortell and William Hsieh reads "For her outstanding service as graduate secretary, through her creative, energetic and thoughtful assistance to faculty and students in the Department of Earth and Ocean Sciences. Alex Allen has been a cornerstone of our graduate program for the past eight years. (The number of graduate students has doubled since 2001). Through her tremendous dedication and hard work, Alex has made very significant improvements to all aspects of our graduate program. Alex is an exceptionally creative, efficient, and enthusiastic member of our department. Administrative issues are dealt with seamlessly, and she represents EOS very well in her many dealings with various branches of the University administration. Alex has shown true innovation and leadership in her work."

GRADUATE STUDENTS

Sasha Wilson was awarded the Bruker AXS 2005 Excellence in X-ray diffraction scholarship for unique applications in the category of geology and chemistry. Wilson received this award for work done as part of her MSc thesis titled 'Carbon sequestration in chrysotile mine tailings'. Wilson has now completed her thesis under the joint supervision of Mati Raudsepp and Greg Dipple in the Earth and Ocean Sciences Department, and successfully defended it. Wilson is pursuing a P1hD with the same group and continuing the research. A paper based on this work is in press in the American Mineralogist.



Picture left to right: Henry Stronks, Executive Vice-president Bruker Biospin, Sasha Wilson, Greg Dipple, Mati Raudsepp

Scott Napier won the Best Student Oral Paper Award for his presentation entitled 'EM geophysics for hydrocarbons: Inversion applications and current research at UBC-GIF', at the CSEG National Convention held in Calgary.

The Society of Economic Geologists Foundation (SEGF) and the SEG Canada Foundation (SEGCF) awarded Student Research Grants for 2006 to Alan J. Wainwright (Ph.D) and C. Paul Jago (M.S) (Hugh E. McKinstry Awards) Stefan Wallier (Ph.D) (Newmont Grant); Andrew Shannon (M.S) (Hickok-Radford Grant); Nick Williams (Ph.D.) (Hugo Dummett Mineral Discovery Fund); Iskra L. Zamarron (M.S) (SEG Canada Foundation Award).

STUDENT AWARDS

Canada Graduate Scholarship:
Scott McDougall

NSERC PGS
Pascal Audet, Evan Crawford, Tashia Dzikowski, Andrew Hamilton, Diane Hanano, Krista Michol, Dianne Mitchinson, Scott Napier, Nina Nemcek, Genevieve Robert, Cynthia Starzyk, Gwen Williams

NSERC IPS
Jordin Barclay, Robin Mackie, Chad Petersmeyer, Mathieu Richer, Andrew Shannon, David Turner, William Whitty

University Graduate Fellowships:
Richard Amos, Julie Granger, Andrew Green, Paulo Herrera, Louise Longridge, Goran Markovic, Sergi Molins, Peyman Poor Moghaddam, Alexander Strouth, James Thom

UNDERGRADUATES

Dr. Sheila R. Stenzel, Director, Mineral Resources Education Program of British Columbia, has written us to commend the volunteer efforts of Brianne Beaulieu and Bryan Chernoff, at the Career Fair and Post-Secondary Institutes Night held in Surrey on the evening of November 8, 2005, to inform high school students of career possibilities in the Earth and Ocean Sciences.

Enrollments

Total enrollment in undergraduate courses offered by EOS. Numbers in brackets indicate increase over preceding year.

	2002	2003	2004	2005
1st Year	1330 (+56%)	1414 (+6%)	1966 (+39)	1862 (-5.3)
2nd Year	300 (+42%)	465 (+55%)	580 (+25)	594 (+2.4)
3rd and 4th Yr	1190 (+4%)	1200 (+1%)	1458 (+22)	1752 (+20.2)
Service Courses	861 (+14%)	889 (+3%)	771 (-13)	580 (-24.8)
TOTAL	**3681 (+24%)**	**3968 (+8%)**	**4775 (+20)**	**4788 (+.3)**
Summer	537 (+19%)	621 (+16%)	446 (-28)	474 (+6)
Distance Ed	386 (+1%)	399 (+3%)	363 (-9)	326 (-10)
Grand Total	**4582 (+21%)**	**4988 (+9%)**	**5584 (+12)**	**5588 (+.1)**

Number of Major and Honours students in programs offered by EOS

	2002	2003	2004	2005
EOS - Major	42	58	69	100
ATSC	31	31	35	41
GEOL	45	38	38	43
GEOE	73	73	85	96
GEOP	9	9	8	12
OCGY	16	16	17	14
TOTAL	216	225	252	306

Graduate Enrollment: 2005

	ATSC	GEOE	GEOL	GEOP	OCGY	TOTAL
MASc		5		1		6
MEng		2				2
MSc	5		40	7	10	62
PhD	11	4	32	14	15	76
Total	16	11	72	22	25	146

Graduate Theses Completed in 2005
Supervised by Earth and Ocean Sciences Faculty,
Including Thesis Programs External to the Department
(Name of Supervisor in Brackets)

(i) Ph.D.

***Cohen, Tamira** (Zoology)**:** Metal Distribution, Speciation, and Bioavailability in Stormwater Management Oil/Grit Chamber Systems and Marine Receiving Waters (A. Lewis)

Delle Monache, Luca: Ensemble-averaged, Probabilistic, Kalman-filtered Regional Ozone Forecasts (R. Stull)

Deng, Xingxiu: Assimilation of Surface Weather Observations in Complex Terrain (R. Stull)

Henry, Michael: Effects of Cooling Water Discharge from a Thermoelectric Power Plant on the Nutrient and Phytoplankton Dynamics of Port Moody Arm, British Columbia (P. Harrison)

Kelman, Melanie: Glaciovolcanism at the Mount Cayley Volcanic Field, Garibaldi Volcanic Belt, Southwestern British Columbia (J.K. Russell)

Ortmann, Alice: Microbial Ecology of Deep-Sea Hydrothermal Vents: Viruses, Diversity and Potential Mortality (C. Suttle)

Peterson, Tawnya: Studies on the Biological Oceanography of Haida Eddies (P. Harrison)

Spagnol, Giancarlo (John): Rocketsonde Buoy System: Observing System Simulation Experiments (R. Stull)

(ii) M.A.Sc.

Williams, Randi: Using Dissolved Gas Analysis to Investigate the Performance of Permeable Reactive Barriers (U. Mayer)

(iii) M.Sc.

Annell, Heidi: Petrology and Geochemistry of the 25 Ma Mt. Marion Dufresne Basaltic Section on the Kerguelen Archipelago: Constraining the Transition from Tholeiitic to Mildly Alkalic Volcanism on a Major Oceanic Island (J. Scoates / D. Weis)

Beran, Laurens: Classificatin of Unexploded Ordnance (D. Oldenburg)

Boyer, Liane: Kimberlite Volcanic Facies and Eruption in the Buffalo Head Hills, Alberta (Canada) (R. Tosdal)

Cassis, David: The Effect of Harmful Algae on the Summer Mortality of Juvenile Pacific Oysters (Crassostrea gigas) (F.J.R. Taylor)

Collins, A. Kathleen (Kate): A 1D Ocean Mixing Model of the Strait of Georgia: Ecological Responses to Physical Forcing (S. Allen)

Hansen, Lyle: Geologic Setting of Listwanite, Atlin, BC: Implications for Carbon Dioxide Sequestration and Lode-gold Mineralization (G. Dipple)

Jaramillo, Sergio: Numerical Modeling of Flow in a Laboratory Tank Using a Z-coordinate Numerical Model (S. Allen)

Simmons, Adam: Geologic & Geochronologic Framework and Mineralization of the Thorn Property, Northwest British Columbia, Canada (R. Tosdal)

Sun, Haizhen: Numerical Simulation of Canopy Flow and Carbon Dioxide Flux at the West coast Flux Station (R. Stull)

Tafti, Reza: Nature and Origin of the Early Jurassic Copper (-Gold) Deposits at Minto and Williams Creek, Carmacks Copper Belt, Western Yukon: Examples of Deformed Porphyry Deposits (J. Mortensen)

Thompson, Craig: Hydrogeologic Modelling of Submarine Groundwater Discharge in the Gulf of Mexico Near Southeastern Louisiana (L. Smith)

Waterhouse, Amy: A Physical Study of Upwelling Flow Dynamics in Long Canyons (S. Allen)

Wilson, Siobhan: Carbon Sequestratin in Chrysotile Mine Tailings (G. Dipple / M. Raudsepp)

* Thesis Program External to the
Department of Earth and Ocean Sciences

Alumni Feedback

Feedback - Reminder: We mail this newsletter to over 2,000 recipients, and we would really like to hear how YOU are doing.

Stevulak, John, Frank,B.Sc., Geology Major, 1953

John passed away June 1, 2005.

Heath, Chris, B.Sc., Geology, 1960

Honorary member of American Association of Petroleum Geologists, June 2005. Travelled to Chile, Peru, Bolivia and Argentina, November, 2004. Namibia (Camp Safari), Botswana and Kenya, followed by 400 Km bike down Danube, 2005. France (Hiking) and U.K. - 2005. Published last of seven Geoscience education papers.

Lemieux, Marc, B.ASc., Geological Engineering, Geophysics Option, 1964

I worked at Kennecott, Falconbridge, Amax, North American Coal, Exxon, and my own consulting company mine Design Systems. Retired last year. Sculling again after 40 years away from rowing. In good health. Married to the same lovely lady (Joy Fisher) since third year engineering. Three grown girls and four grandchildren. Loved my classes with Profs. White, McTaggart, Thompson, Mathews, Crouch and Howard.

Ricker, Karl,B.Sc, 1959, M.Sc. 1968

Community volunteer with Whistler Naturalists - monitoring Wedgencount and Overlord Glaciers; co-ordinator Christmas bird count at Whistler; author of several "Naturespeak" articles in local newsmagazine "Pique" on glacial geology, glaciology; birds and mammalian wildlife. Volunteer with International Ski Federation under the auspices of the Whistler Mountain Ski Club and Whistler Weasel Workers for Alpine Ski and Snowboard events at Lake Louise and Whistler (and elsewhere where needed). A nervous father -- his daughter (Maëlle) competed at the Torino Winter Olympics in one or two snowboarding events; she was 5th at the Nagano Olympics (1998) in the Halfpipe event.

Hoffmann, Joseph W., M.Sc., Geophysics, 1972

Originally from St. Louis, Missouri, I attended UBC to avoid the war in Vietnam. I received conscientious objector status, and returned to Missouri to work in a free health clinic, where I met my wife. I returned to graduate school at MIT where I received a Ph.D. in Cell Biology. I came back to St. Louis and retired in 1998 as Emeritus Professor. We have four children. Warm greetings to Garry and Tad. You guys are the best!

Moffat, Ian, Ph.D., Geological Sciences, 1985

Currently Senior Manager international Exploration Assets at Talisman Energy in Calgary. I spend most of my time co-ordinating our exploration and development activities in places such as Algeria, Qatar, Colombia, and Peru. Requires lots of travel, current AeroPlan miles are close to 1.5 million! I was awarded the CSPG President's award in 2000 (Chairman of GeoCanada 2000) and in 2004 (General Chairman for ICE 2004). There are several other UBC geoscience alumni at Talisman, including Tim England and Phil Pelletier.

Bosher, Jason, B.Sc., Geology, 1985

Recently separated. Working occasionally in theatre and film as a props builder and model maker. Hoping to obtain funding for retraining as I have rheumatoid arthritis. My goal is to receive training to work as a writer in the communications field. I am currently searching for work to eliminate my separation debt. I am also searching for opportunities to write as I need to create a portfolio as part of my application into a writing program. I would appreciate any leads from my fellow alumni.

Froese, Corey R., Bachelor of Applied Science, Geological Engineering, 1994

Since finishing up at UBC in 1994, I have completed an M.Sc. in Geotechnical Engineering at the University of Alberta in 1998 and worked for just over 11 years as a consulting engineer with AMEC in Prince George and Edmonton. As of August 2005, I made a jump to lead the development of a Geohazards Program for the Alberta Geological Survey and am now enjoying the change of pace that employment by the government has allowed. On a personal note, my wife Lisa (UBC B.Sc PT 92) and I are now settled in Edmonton and have two wonderful children: Abbey (March 2003) and Jonas (March 2005). For anyone out there wanting to get in contact, my email is corey.froese@ gov.ab.ca

Henry Lyatsky, Ph.D. Geology 1992.

I have run my own exploration-consulting firm back home in Calgary for a dozen years now, having worked all across western and northern Canada and internationally in oil and mineral exploration. The clients have been a healthy mix of junior and major oil and mining companies as well as government agencies, based mainly in Calgary, Edmonton and Vancouver. I am now the author or co-author of three books (Springer-Verlag) and two atlases (EUB/Alberta Geological Survey), as well as many papers, on the regional geology and geophysics of western Canada.

Much of my work has been with gravity and magnetic data, for which my consultancy runs in-house the Geosoft data-processing package. My UBC thesis on the Queen Charlotte Basin petroleum assessment has had an amazing shelf life, with yet another paper from it published in spring 2006.

A delightfully indulgent boss is one benefit of self-employment. Consulting is a lot like grad school: your time is mostly your own, and you can do pretty much what you want - but the money is better. Besides, I volunteer as Vice-President of the Calgary Mineral Exploration Group, whose annual Mining Forum conference I chaired in 2005. I have also held a number of campaign-management and constituency-executive positions with the Conservative Party of Canada.

To avoid the downtown rat-race and congestion, I work from home, enjoy the open space of the Alberta outdoors, and love nothing better than an in-depth history book after a good hike in the mountains.

Fielding, Anthony, Ph.D. Oceanography, 2000

After completing my Ph.D., I became a Chartered Accountant. After moving back to Nova Scotia, I founded Bluenose Accounting and Tax Services; a small Chartered Accounting firm in Halifax. I currently reside in Hubley (just outside of Halifax) with my wife Sonya (M.Sc., Forest Sciences), daughter, Meaghan (7 yrs) and son, Matthew (4 yrs)

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KEEP IN TOUCH

Enjoy keeping up with friends and classmates in the Alumni News section? Why not return the favour - drop us a line. Please fill in your currect address below even if the Newsletter was correctly addressed - it helps us maintain our records, or email us at **alumni-contact@eos.ubc.ca** . Also visit the Earth & Ocean Sciences website at **www.eos.ubc.ca** . Please do not provide any information that you would not want published in the next Alumni Newsletter.

PLEASE PRINT

Name:_____

UBC Degree: _____ Graduation Date: _____

Address:_____

_____

_____

Telephone:_____Fax_____

Email Address:_____

Has the above changed since last year? ☐ Yes ☐ No

What's new with you?

☐ Married? ☐ New job? ☐ Back in school?
☐ Take a trip? ☐ Promoted? ☐ See a classmate?
☐ Retired? ☐ New Baby? ☐ Other?

_____

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Thanks for your response

Our Mailing Address Below

UBC Dept. of Earth & Ocean Sciences, Alumni Contact, 6339 Stores Rd., Vancouver, B.C. Canada V6T 1Z4

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☐ Please use my gift in the Dept. of Earth and Ocean Sciences' area of greatest need.

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☐ One time (*your receipt will be mailed once your donation is processed.*)

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Confidential once completed. Please return this form and your donation to:
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