



ALUMNI NEWSLETTER

Number 7 (2004)

Message from the Head



Dr. Martha Piper, President of UBC and Paul Smith beside the EOSPHERE, a Cut-Away Earth Sculpture by Tony Bloom.

Dear Alumni and Friends

Hiring new Faculty members has been front and centre in the Department's activities over the last year and the diversity of their backgrounds is a fair reflection of the spectrum of research that characterises EOS. We now have two junior Canada Research Chairs. Maite Maldonado is interested in the chemical controls in photosynthesis and their potential impact on the atmosphere. Andy Ridgwell is modelling global biogeochemical cycling and climate change on geological as well as more recent time scales. In addition to our new chair holders, we have four other new appointments. Erik Eberhardt is our new geological engineer whose interests include tunnelling and rock slides. Evgeny Pakhomov and Claudio DiBacco are biological oceano-graphers with respective interests in larval and fisheries ecology. Neil Balmforth, who is interested in a host of earth processes, is a senior, cross appointment between EOS and Mathematics. More recently we have undertaken three more hiring exercises. While the solid earth research position has not yet been filled at the time of writing, I am pleased to announce that Roger François, (Woods Hole), has accepted a senior position in Marine Geochemistry and Shane Pelechaty, (Shell Oil), will soon join us as an Applied Sedimentologist.

Understandably this influx of new people has caused us to look carefully at our space and how we manage it. Several of our research labs in the Biosciences wing underwent major renovations to accommodate new researchers and some of our highly successful senior Faculty whose research groups are growing significantly. The Pacific Centre for Isotopic and Geochemical Research is going through a period of reconsolidation as we clear space in the basement of EOS-Main (formerly the Geological Sciences Centre) to accommodate our five mass spectrometers.

As you may recall from the last Newsletter, we officially opened the Pacific Museum of the Earth on July 19, 2003. The Museum is already acting as a magnet for school visits and we are using it to develop a relationship with the Faculty of Education with the aim of promoting Earth Sciences to potential school teachers and, ultimately, in the high schools. As you can read inside, we now have a dramatic new entrance to the Museum, the EOS courtyard. Its centrepiece is the EOSPHERE, a cut-away, metal model of the Earth.

You can see the EOSPHERE in the accompanying picture taken during a visit to the Department by Martha Piper, UBC's President. This has been a year of visitors including, in addition to our many Museum visitors, the Dean of Science, (John Hepburn), the Vice-President of Research (Indira Samarasekera), and the B.C. Minister of Energy and Mines (Richard Neufeld).

Our undergraduate courses are experiencing record enrolments and this year our EOS 114 Natural Disaster course surpassed the 1000 annual enrolment milestone, quite a feat in only three years. To welcome these new students and help them with their studies, we are developing an EOS Teaching and Learning Centre on the second floor of EOS-Main. This will incorporate our "Earth Course Assistance Centre", currently occupying an oversized closet on the first floor. If, like me, your undergraduate days ended many decades ago, it is difficult to appreciate the magnitude of the impact that computers and modern audio-visual aids are having on both teaching and learning. If we can receive appropriate funding, we hope to place EOS at the technological forefront by the time you receive next year's Newsletter.

Like a proud father, I cannot finish this brief overview without mentioning our phenomenal success in last year's Faculty of Science Achievement Awards. Approximately one third of the prizes went to EOS (Research: Michael Bostock and Dominique Weis; Teaching: Stuart Sutherland and Max Taylor; Service: Stuart Sutherland (Faculty), Dave Shorthouse (Staff) and Graduate Students: Kim Welford and Nicole McLearn).

I hope you have all had an equally good year. As always, I invite you to visit us whenever you can or, failing that, to drop us a line at alumnicontact@eos.ubc.ca and share your news.

Paul L. Smith,
Head,
Earth and Ocean Sciences

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The New Eos Courtyard



Aerial View of the Courtyard

The redevelopment of the courtyard presented us with another opportunity to showcase the Earth, Ocean and Atmospheric aspects of the department. The new development was seen as an extension of the Pacific Museum of the Earth and as such the courtyard had to function as a teaching and learning space in addition to being a pleasant space to relax. Given the central location of the courtyard and its potential for outreach, we received significant financial support from UBC and from the Province via the Minor Capital Fund program.

Paths for Earth, Ocean and Atmosphere have been created, each leading to a main focus area containing two large inset medallions for Atmosphere and Ocean and a large EOS Sphere sculpture for the Earth. Set into the paths are symbols for aspects of each discipline. Pictures of the symbols are scattered throughout the newsletter. The answers to "What is It?" can be found on the last page. Sculptural aspects were handled by Canmore artist Tony Bloom.

The rock displays and the ore cart from the old courtyard have been restored and updated with new signage, the rocks being taken from various locations within B.C.

Close attention was paid to the planting scheme and where ever possible paleontologically significant species such as metasequoia, ginko and magnolia were used. The landscape architect involved with the project, Richard Finley, based the planting on a "waves" theme, a metaphor that is repeated in

many aspects of the new garden including the low level stone walls and weather vane.

The courtyard is now a pleasant space to relax but also an area that encourages exploration of themes developed further in the museum and in the rest of the department.



Another View of the Courtyard - EOS-East is the building in the background

Eos Biosciences Facility

Through the combination of Canadian Foundation for Innovation (CFI) funds and minor capital money from the University, we are completely refurbishing much of the EOS lab complex in EOS-Biosciences. Philippe Tortell's lab is finished; Curtis Suttle and Raymond Andersen's labs have just been completed; and Maite Maldonado and Claudio DiBacco's refurbishments are at the drawing board stage.



Another aerial view showing the metal pergola

Newcomers to Staff

Joern Unger joined EOS as our third machinist. Trained in Germany, Joern has extensive private sector experience in research and engineering operations in the Lower Mainland.

Chris Payne replaced A. Ramnarine (Ram) as senior sea-going technician. Chris has a B.Sc. in Biology from the University of Ottawa and an M.Sc in Biology from McGill. He has a wealth of experience having worked as a Research Associate in McGill, as a Research Technician/Lab Manager

at the Georgia Institute of Technology and, most recently, as a Research Scientist with Philippe Tortell and Maite Maldonado.

Larisa Pakhomova replaced Hugh MacLean as seagoing technician. Larisa obtained a B.Sc and M.Sc from the Odessa State University in Odessa, Ukraine. Larisa has considerable field experience most recently as Senior Technical Officer and Laboratory Manager at Rhodes University in Grahamstown, South Africa.



Figure 1.

Departures

Retirement of Arjoon Ramnarine (Ram)

Arjoon Ramnarine (Ram) began his long employment sojourn at UBC in the former Institute of Oceanography in 1965. His first job was with Brian Bary and Al Lewis, working as a grant-funded laboratory and sea going technician. He was laid off a few years later when the project funding dried up, but he was rehired as an institute technician in 1976.

Ram's early experience involved the proper care and nurturing of zooplankton and phytoplankton collections, and mastering the intricate lore of determining nutrient and trace metal concentrations in water and sediment samples. He spent many months at sea, running numerous cross-channel cruises in Juan de Fuca Strait and later throughout the Strait of Georgia. His responsibilities grew over time, encompassing regular hydrographic surveying, caring for our valuable collection of reversing thermometers, collecting bathythermograph data, maintaining and deploying STD and CTD profilers, performing oxygen titrations at sea, collecting plankton samples, and more recently mastering the fine art of sediment coring. In addition to his work on DFO and DND ships, Ram also became one of the department's small boat handlers, and he spent many days bobbing around local waters in our whaler with Hugh Maclean, faculty and student groups.

Ashore, as well as maintaining and repairing all the sea-going equipment, Ram worked with Murray Storm and Hugh Maclean to produce the institute's and then the department's cruise and data reports. He learned to work with the first lab computers and then morphed into an extremely valuable trouble-shooter for all kinds of lab equipment and their appended PCs. He therefore became the most versatile technician in the entire department. He became an indispensable helper for a wide range of mechanical and electronic problems, which he solved with his usual sunny Caribbean attitude.

At his retirement party on February 5th, Ram was presented with a framed 1856 map of Vancouver Island and the Strait of Georgia, showing many of the inlets where he had spent so

many happy years. He was also given a brightly polished and mounted mechanical bathythermograph so that he can keep track of the vertical temperature distribution in his back yard. Many of his former friends and colleagues sent messages of good will, which were read out to him and the large assembled crowd. We all wish him well in his retirement.

Retirement of William Kenneth (K) Fletcher

K Fletcher took early retirement June 30 2003. K came to UBC in June 1968, shortly after completing his PhD at Imperial College London, as a postdoctoral fellow working with Harry Warren. K was appointed Assistant Professor in the Department of Geology in 1971 when Harry retired, was promoted in 1979 and 1987, and was a vigorous and effective Acting Head of the Department of Geological Sciences in 1992-93. From 1999 until his retirement, K occupied the Norman B. Keevil Chair in Mineral Exploration. K published more than 100 papers in refereed journals on exploration geochemistry, and authored or co-edited three books. K's research centred on methods of sampling and analysing stream sediments and statistically evaluating programs of geochemical exploration for mineral deposits. K conducted field investigations, delivered invited lectures and gave short courses in many parts of the world, from the Arctic to the tropics. Twenty-three graduate students had the benefit of K's supervision at UBC. K served as President of the Association of Exploration Geochemists in 1991-92, was co-editor of the Journal of Geochemical Exploration in 1998-99, was a member of the Canadian Geoscience Council, and was active in the Association of Professional Engineers and Geoscientists of B.C. During Leave of Absence from UBC he was Chief Geochemist to Midex in Zambia (1975-78) and UN Team Leader at the South East Asian Tin Research and Development Center based in Malaysia (1982-84). K's avocation is photographing animals and plants in their natural environment. He is particularly fond of tropical areas, notably southeast Asia, and has produced superb photographs of both vertebrates and invertebrates. We wish him all the best in his retirement.

Bruce Buffett's resignation became effective January 1st, 2004. Bruce has taken up a position at the University of Chicago.

Paul Harrison resigned effective January 1st, 2003

Promotions

Michael Bostock, Lee Groat, and Dominique Weis were promoted to Professor,; **Lori Kennedy, Rich Pawlowicz, and James Scoates** were promoted to Associate Professor



Figure 2.

Spotlight On



Garry Clarke

Professor, Geophysics

The glaciological eminence grise of Western Canada is Professor G.K.C. (Garry) Clarke, FRSC, a member of the UBC Faculty since 1967. Here is a brief autobiographical sketch. I was born on a mountaintop in Hamilton, Ontario, one of the few in that part of Canada, but left soon after the event. Mountains appear as a continuous thread through my life and, if my childhood had one exceptional feature, it was that I spent a great deal of time in the Rockies near Lake Louise. Growing up in Edmonton in the 1950s was like being trapped in a James Dean movie: zoot suits, greasy hair, hot rods and the A&W. In grade ten, possibly as an escape, I got interested in jazz and with several friends was drawn to the beatniks, which at that time meant wearing dark glasses and strange hats (being too young for beards) and amassing a large collection of hard bebop LPs. With no objections from my parents, I ended a long but futile training in classical piano and enlisted as a student of Mel Hamill, a jazz pianist and former leader/arranger of a once-famous swing band called “Mel Hamill and His Canadian Gentlemen” (or something along these lines).

Unnoticed by me, the 18-month International Geophysical Year started and ended at the same time that my high school instructors were trying to teach me the box step and Latin declensions. My first brush with geophysics occurred when my parents gave me the Walt Kelly cartoon book “G.O. Fizzical Pogo” as a Christmas present. My actual rendezvous with destiny occurred soon after when I started at the University of Alberta and my first-year physics professor proved to be a wonderful geophysicist, Professor Garland. (His first name, I later learned, was “George” but in those days professors did not have first names.) For a summer job, Professor Garland suggested that I sign on as a glaciological field assistant in the Icefield Ranges Research Project in the St. Elias Mountains of the Yukon Territory. One thing led to another and I became Garland’s M.Sc. and subsequently Ph.D. student at the University of Toronto.

As a doctoral project, Professor Garland suggested a thesis involving oceanic heat flow measurements and at considerable expense he purchased Canada’s first oceanic heat flow probe—a device universally known as “Bullard’s prick” to honour its inventor Sir Edward Bullard. As a warm-up I joined an oceanographic cruise to the Gulf Stream off Cape Cod. It was the hurricane season and though we missed the Perfect Storm the experience was unsettling. In one of those unforgettable moments, a cable parted and Bullard’s probe plunged into the deep, driving itself, once and for all, into the sea floor many fathoms below. Thus ended my short career as a Canadian oceanographer.

Given my propensity to seasickness, I was less devastated than might be imagined. While looking for fresh thesis possibilities, I came upon an amazing book “Cybernetics and Society” by Norbert Wiener that led me to start research on geophysical applications of statistical communication theory. This choice got me a doctorate and UBC job in short order—a faculty position had materialized when Tad Ulrych made one of his characteristically spontaneous exits. Once safely on the payroll, I could start to renege on the terms of my employment. With much encouragement from my early graduate students, I drifted back into glaciology and to summers in the Yukon. I got married on the shores of Kluane Lake, helped to raise two marvellous sons and continue to think of the Yukon as magical both for its incredible beauty and its sustained craziness.

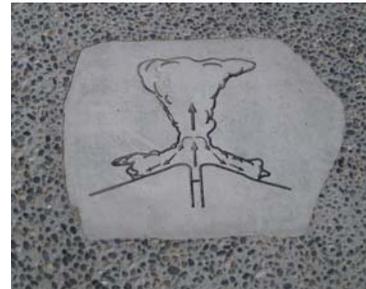


Figure 3.

My research is devoted to understanding the physics of glaciers and ice sheets. In particular, I am exploring the nature of ice-flow instabilities that cause certain modern glaciers to exhibit extreme oscillations in flow rate and, during the last Ice Age, appear to have triggered rapid changes in global climate. My graduate students and I employ a wide range of approaches. First and foremost, we are conducting a long-term study of Trapridge Glacier, a surge-type glacier (i.e. oscillating flow rate) in the St. Elias Mountains of the Yukon Territory. The object of this fieldwork, started in 1969, is to monitor the glacier as it passes through a complete surge cycle and from these observations to determine the trigger mechanism for its surges. Our approach is to densely instrument the glacier bed with sensors that permit year-round observation of mechanical and hydrological processes that are active near the ice-bed contact. We have more than 20 data loggers and 200 sensors in continuous operation and use satellite telemetry to ensure that no unusual activity escapes our notice. Part of the challenge and delight of this research is that there is little in the way of established instrumentation and methodologies to draw upon. Thus we invent and then fabricate many of the instruments that are central to our study.

A strongly complementary focus of our research is on using improved knowledge of ice sheet physics to construct computational models that simulate the dynamics of ancient and modern ice sheets. During the last glacial cycle, Northern Hemisphere ice sheets were an extremely influential component of the global climate system. Working in close collaboration with colleagues who are expert in modelling the dynamics of the ocean and atmosphere, we are attempting to unravel some secrets of the Ice Age and discover what factors

account for the rapid and ugly surprises that characterized the Ice Age climate system.

Research Team (2002-2003)

Postdoctoral Fellows

*Gwenn E. Flowers, Ph.D. (Geophysics) British Columbia

*Dave H. D. Hildes, Ph.D. (Geophysics) British Columbia

*Christian G. Schoof, Ph.D. (Mathematics) Oxford

Doctoral Students

*Tim T. Creyts, B.Sc. (Geosciences) Penn State

*Sean W. Fleming, M.Sc. (Geology, Geophysics) Oregon State

*Nicolas Lhomme, DEA (Climat et Physico-Chimie de l'Atmosphere) Universite Joseph Fourier

Master's Students

*Tom-Pierre Frappe-Seneclauze, B.Sc. (Physics) Laval

*Fern Webb, B.Sc. (Geophysics) British Columbia

Summer Field Assistants

*Rob A. Eso, B.A.Sc. candidate (Geological Engineering) British Columbia

*David S. King, B.Sc. candidate (Physiology) British Columbia

*Jessica A. Logher, B.Sc. candidate (Geography) Victoria



Figure 4.

Erik Eberhardt

I was born in 1969 in Honolulu, Hawaii the day the astronauts splashed down nearby on their return from the moonwalk. I assume that life on the beaches was good, but it's beyond my first memories as my parents decided to move to my mother's home city after my father finished his Vietnam service with the Marine Corps. That took me from the +30°C of Oahu to the -30°C of Regina, Saskatchewan.

I grew up in Regina's "North Central" next door to Taylor Field, where the CFL's Saskatchewan Roughriders play. The neighbourhood had two sides to it – the big plus being a great multicultural neighbourhood with more than half being First Nations people, and playing hockey at 4 with the local neighbourhood team. The big minus was that associated with many inner city neighbourhoods – drugs, prostitution and crime (this is currently being portrayed in an APN TV series called "Moccasin Flats", filmed locally in the neighbourhood). Thanks to a special program started in the inner city, I was pushed towards thinking about university – in my case, Engineering and the University of Saskatchewan.

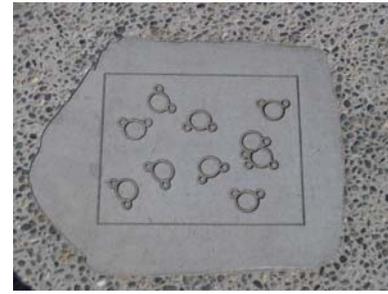


Figure 5.

During my Engineering undergrad, I gravitated towards Geological Engineering where I was sold on the idea "why work in a 'cubicle' office or factory as a Mechanical or Electrical Engineer, if you can work outdoors in the mountains as a Geological Engineer". Summer jobs were also plentiful in

Geological Engineering and a necessity to pay for the next school year, and I had two great summer jobs one with British Petroleum in Lac la Biche, Alberta, and one with Quintette Coal in Tumbler Ridge, BC. It was this second work experience where I was exposed to geotechnical engineering and rock slope engineering, a major component of my research today.

After graduating B. Eng. in 1992 with my B.Eng., I was planning to accept a permanent job with Quintette Coal when Doug Stead (who's now at SFU) raised the possibility of my doing a M.Sc. in rock mechanics. The project was sponsored by Hudson Bay Mining and Smelting, and looked at pillar stability issues at their Trout Lake mine using numerical modelling. Until then, I was largely unaware of the research side of Canadian universities, but I enjoyed this project so much I turned my attention towards academia. Upon its completion, I was awarded a full Ph.D. Scholarship, which led to my doing a thesis with the Universities of Saskatchewan and Manitoba, working with the Atomic Energy of Canada Ltd.'s Underground Research Laboratory. My thesis focussed on brittle fracture processes and rock failure mechanisms in underground excavations in high stress regimes.

I finished my doctorate in 1998 and was leaning towards joining a consulting company in Calgary, for which I had been doing small projects during my Ph.D., when I was offered a faculty position at the Swiss Federal Institute of Technology in Zurich (ETH Zurich). Essentially, they were looking for a rock mechanics engineer with a numerical modelling background who could teach the geotechnical engineering courses in their Engineering Geology program – for me, it was being in the right place at the right time. And for a North Central Regina boy, living and working in Europe was a unique experience I couldn't pass up. While in Switzerland, I worked on numerous projects relating to tunnelling, and being surprised that no one at the ETH Zurich was conducting research on alpine rock slope hazards, I was given complete freedom to develop a large research program in this subject area. This eventually became the "Randa In-Situ Rockslide Laboratory", which to date has received almost \$1,000,000 in funding from the Swiss government.

Although I loved my time in Zurich, after 6 years I was starting to feel the need to make a move back to Canada and since Vancouver had always appeared in the Swiss newspapers as being #1 in polls of the best cities to live in (ranking just ahead of #2 Zurich), my attention turned to UBC as I figured the only place to go was up. My goal here now is to build up a strong teaching and research program in geotechnical rock engineering, with my research focussing on the application of advanced numerical methods combined with geotechnical instrumentation as applied to rock slope stability and underground excavation problems. I also plan on helping Vancouver gain the reputation of being one of the key centres for engineering rock mechanics; currently I'm serving as the vice-chair of the Canadian Geotechnical Society's Rock Mechanics Division, a position that will later involve serving as president of the Canadian Rock Mechanics Association (CARMA).



Andy Ridgwell

Born in 1969 in the deepest, darkest, dankest South-western corner of England (America's permanently moored aircraft carrier off the coast of Europe) it was not until 1987 that I escaped. But when I did it was only as far as East Anglia – an equally damp part of the country less than 300 km away. Here I took an undergraduate degree at Cambridge University in a subject that was officially and rather quaintly termed 'Natural Sciences'. Although my underlying interests lay in environmental and global change, I was fascinated by the thought of 'Unnatural Sciences'. The closest I found that I could get to this without a set of black candles and a chalk pentagram was mineral (solid state) physics. These unnatural pursuits continued for a year immediately following graduation when I worked as a Research Assistant/Technician in the Earth Science department. However, by the time I realized that what I truly wanted to do was research on climate and environment, my newly acquired qualifications in probing the structure of quartz at -200°C with high performance FTIR transmission and reflectance spectrometry had left me stuck up the proverbial creek without any useful paddling implement.

The next few years were a mixture of industry contract work (developing analytical trace-metal instrumentation – a Zeeman-effect graphite furnace atomic absorption spectrometer) and periods of non-employment. However, rather than follow tradition and lie about in bed all day while unemployed, I spent my time writing not-for-profit educational software and dabbling in basic climate modeling. During these free-lance research forays I assessed the



Figure 6.

effectiveness and climatic impact of different 'greenhouse gas' emissions scenarios and explored aspects of Earth system behavior and dynamics. However, because sitting in front of a computer all day every day is not always fun, I started to engage in rather more 'hands-on' (environmental campaigning) activities. This quickly became something of a full-time occupation and between 1993 and 1996 I could be found making unofficial 'visits' to a certain now-discredited UK nuclear waste reprocessing facility, holding up road shipments of weapons-grade Plutonium (highlighting nuclear proliferation and terrorism threat issues), and 'recovering' the products of illegal logging (technically the stolen property of various indigenous peoples) from local department stores. The environmentally damaging and ineffective road building program of the Government of the day also attracted my attention, and I spent the best part of a year living in tree-houses built in the path of planned road schemes (climbing down when the local pub opened of course).

Eventually I became tired of successive residences being chopped down, and in the summer of 1996 I left behind an extremely comfy oak tree in rural Devon to pursue the long sort-after research career. I took an MSc in Environmental Science at Nottingham University (UK) and the next year applied to do a PhD at the University of East Anglia in Norwich (UK). There, I taught myself Fortran – the Ediacaran of programming languages (the Dodo would be too modern a species to make a truly suitable analogy), and embarked on a voyage of intensive and extensive computer modeling of the global carbon cycle with a view to answering the question; "why was the concentration of carbon dioxide in the atmosphere some 30% lower during late Quaternary glacial periods compared to interglacials?". Three years later and I was none-the-wiser. Well, not strictly true, but despite my best efforts the solution of the 'glacial CO_2 problem' remains unsolved to this day (and thus it still makes an excellent PhD topic). In any case, the journey is frequently as or more important than the destination, and I learned and discovered much about such things as the marine iron cycle and its relationship to atmospheric CO_2 , what determines the accumulation rate and spatial distribution of bio-minerals such as calcite and opal in deep-sea sediments, and the role and potential importance of sea-level change in global carbon cycling.

Understanding of global biogeochemical cycling and computer modeling developed during my PhD stood me in good stead for the three Postdoctoral research contracts that followed. During the first two of these I further developed

ideas regarding the inter-linkages between mineral dust, biological productivity in the ocean, CO₂, and climate. I also embarked on encapsulating key aspects of the atmosphere-ocean-sediment carbon cycle into an Earth system model – ‘GENIE’ (‘Grid ENabled Integrated Earth system model’ – www.genie.ac.uk). The opportunity of living in a sunnier climate then arose, and I crossed the Pond to take up a temporary position at the University of California at Riverside. Here I completely shifted research focus from micro-nutrient supply and sub-regional details of Quaternary carbon cycling to global-scale aspects of the ill-delineated and (even less well dated) late Precambrian Earth system. The cross-fertilization of time-scales and environmental processes bore fruit and I developed new hypotheses regarding the reasons for the extremity and observed geochemical aftermath of Neoproterozoic glaciation. I also gained a new perspective on the Phanerozoic evolution of the Earth system and the unique importance of certain elements of the modern carbon cycle.

And so to a Canada Research Chair in ‘Global Process Modeling’ at UBC, where I am developing and applying computer models of the interactions between land, air, and sea and the influence of living organisms to evaluate both past and future controls on atmospheric CO₂ and elucidate the role of feedbacks in the Earth system. At present, particular areas of interest to me concern the implications for global carbon cycling of changes in the rate, locus, and primary mineralogy of calcium carbonate precipitation and preservation, and the control of marine productivity and atmospheric CO₂ by the aeolian delivery of iron to the ocean surface. I will also be exploring wider issues of how conditions suitable for life on this planet have been apparently well regulated and maintained throughout much of Earth history, and what impacts evolutionary innovation and extinction have had on biogeochemical cycling, CO₂, and climate. In addition I will be further pursuing my interests in future climate and global change and the fate of fossil fuel CO₂.



Figure 7.

Student Activities

The Society of Economic Geologists, UBC Student Chapter Trevor Mogg (President)

The main aim of the UBC-SEG Student Chapter is to introduce EOS students to how anomalous concentrations of metals and minerals are formed within the crust to produce economic ore deposits. This is accomplished by organizing visits by guest lectures, who are experts in various aspects of economic geology, and by an end-of-the-year geology field trip. Past trips have included visits to mines in Mexico and Peru. This year’s Student Chapter is heading to South Africa where we will be touring the Witswatersrand basin, Bushveld complex and the Barberton greenstone belt as well as visiting mines for gold, platinum-group elements and diamonds.



Participants in the trip to Mexico and Peru, near the Tantuhatay exploration project in Peru.

Golf Tournament Winners: KP (Closest to the Pin): Karie Smith (women), Terry Clark (men); Long Drive: Karie Smith (women); Chad Hewson (men); Low Score: Team 3 (Terry Clark, Ray and Alan Rodway, Doug Polson). Best Foursome (actually a threesome) Team 5 (Len Pasion, Stephen Billings, Pay Haymen) Prizes arranged by Teresa Woodley.

Awards to Faculty

Mary Lou Bevier was elected by the Geological Society of America to serve on the "Minorities and Women in the Geosciences" Committee from January 1, 2001 to June 30, 2004.

Michael Bostock was awarded UBC Killam Memorial Faculty Research Fellowship for 2002/03; for research during sabbatical on POLARIS-BC, a CFI and USGS funded initiative to gain an improved understanding of structure and Wadati-Benioff seismicity of the Cascadia subduction zone and Faculty of Science Achievement Award (Research) \$2,000

Marc Bustin was elected a Fellow of the Royal Society of Canada and also received the 2003 Sproule Annual Achievement Award from the CSUG (Canadian Society of Unconventional Gas.) This award is given to a CSUG

member who has contributed most significantly to the development of the unconventional gas sector in Canada.

Steve Calvert (Analytical facility for environmental geochemistry) and **Philippe Tortell** (Mass flow controller for gas blending; Chemiluminescence-based analysis of nitrogen oxides) were each a principal investigator for a NSERC award for research tools and instruments.

Garry Clarke was a recipient of the 2003 J. Tuzo Wilson Medal from the Canadian Geophysical Union

Ron Clowes became a Member of the NSERC Research Networks Selection Committee for 3 years ending March 31, 2006.

Lee Groat was elected a Fellow of the Mineralogical Society of America. Fellowships are granted for "significant contributions to the fields of mineralogy, petrology and crystallography."

Michelle Haskin won an achievement award from the Faculty of Science

Grant Ingram is one of a group of leading authorities on Arctic oceanography, climate, ecosystems and health called *Arcticnet*, funded by NSERC's Networks of Centres of Excellence,.

Kristin Orians won the EOS Instructor of the Year Award in Environmental Earth Sciences.

Stephen Pond, Professor Emeritus, was the 2003 recipient of the Tully Medal from Canadian Meteorological and Oceanographic Society. The medal is awarded to a person whose scientific contributions have had a significant impact on Canadian Oceanography. Citation: To Stephen Pond for his widely-recognized, meticulous observational studies in air-sea interactions and coastal oceanography, and for his prominent role in supervising many graduate students in physical oceanography."

Andy Ridgwell won an editors' citation for excellence in refereeing from the journal *Paleoceanography*.

Leslie Smith won the EOS Instructor of the Year Award in Solid Earth Sciences:

Stuart Sutherland was named as one of the "Popular Profs" at UBC in McLean's "Guide to Canadian Universities 2003"; Stuart also won the Faculty of Science Teaching Award; Faculty of Science Achievement Award (Service-Staff) and was a Recipient of the EOS teaching award,

Max Taylor won the Faculty of Science Teaching Award and also an EOS teaching award,

Dominique Weis won a Faculty of Science Achievement Award (Research).

Awards to Staff

Alex Allen won the EOS award for Excellence in Administration and Technical Support

David Shorthouse, Admin Manager, was awarded the Faculty of Science Achievement Award (Service-Staff)

Teresa Woodley was recognized for her assistance to the Facilities Management Group in connection with their "Safe Start" course.

Awards to Graduate Students

Rich Amos won the EOS Outstanding Teaching Assistant Award and a NSERC Ph.D. Scholarship

Heidi Annell won a NSERC Master's Scholarship



Figure 8.

Nick Austin was awarded the Jack Henderson Prize for best M.Sc. thesis by the Structural Geology and Tectonics division of the Geological Association of Canada. His thesis is entitled "The role of texture on the brittle deformation of dolomite". Nick is presently pursuing his Ph.D. at MIT.

Alex Culley was awarded the Earth and Ocean Sciences "Captain T.H. Byrne Scholarship" for publication of an outstanding paper in *Oceanography*.

Sean Fleming and **Tawnya Peterson** won University Graduate Fellowship Scholarships for 2003/2004,



Figure 9.

Eric Galbraith won a NSERC Ph.D. Scholarship

Chadwick Hewson and **Alastair McClymont** won scholarships from the Canadian Society of Exploration Geophysics.

Pascal Haegeli and **Steve Israel** had their NSERC scholarship renewed for 2003/04.

Dawn Kellett won the NSERC MSc Scholarship and the 2003 GAC Geophysics Division Student Award for presentation "Geophysical measurement of reaction progress for mineral carbonation reaction in serpentinite, Atlin, B.C." at the GAC-MAC-SEG 2003 Meeting in Vancouver, BC

Louise Longridge won the best student paper award at the Canadian Paleontology Conference of September, 2003. She presented work on sexual dimorphism and post mass-extinction recovery in a clade of earliest Jurassic ammonites.

Scott McDougall won a NSERC Doctoral Scholarship

Nicole McLearn won an EOS Outstanding Teaching Assistant Award and Faculty of Science Achievement Award (Service-Student)

Andrew McNeill received a NSERC MSc Scholarship

Daniel Ross received a student research grant from TSOP

Alison Rust won the Léopold Gélinas Gold Medal for the best PhD thesis from the Volcanology and Igneous Petrology Division of the Geological Association of Canada for her thesis "Viscosity, deformation and permeability of bubbly magma: Applications to flow and degassing in volcanic conduits"

Tiffany Shaw won a NSERC Master's Scholarship

Dave Smithson won First Prize for his poster at the British Columbia and Yukon Chamber of Mines (BCYCM) Annual Mineral Exploration Roundup in January 2004.

Kim Welford won a Faculty of Science Achievement Award (Service-Student)

Awards to Undergraduate Students

Aaro Emil Aho gold medallists for 2003 were **Christa Sluggett** (Geology) and **Jason Pellett** (Geological Engineering).

For 2004, the Aaro Emil Aho Gold medallists were **Janet Miller** (Science) and **Chris McKane** (Geo-engineering).

Dawn Kellett and **Andrew McNeill** won NSERC scholarships for 2003/2004

Karen Weitemeyer, Scott Napier, Jamin Cristall and Jessie Arthur won scholarships from the Canadian Society of Exploration Geophysics

Forty-four continuing undergraduate students in Geological Engineering and in honours programs in geology and geophysics received EOS departmental scholarships and awards for the winter session 2003-2004.



Figure 10.

Natural Disasters Course Surpasses the 1000 Enrolment Mark Submitted by Roland Stull

Three years after its creation, "The Catastrophic Earth - Natural Disasters Course" (EOSC 114), annual winter enrolment has reached 1034 students. No, they are not all in one gigantic classroom. The course is taught as 4 lecture sections, divided into 2 lectures each winter term. That is still 200 to 300 students in each large lecture theatre. We are using most of the largest lecture theatres on campus.

By attracting students in this course, we are exciting them in the fields of Geology, Geophysics, Atmospheric Science, and Oceanography. This has had a beneficial snowball effect of increasing enrolments in our other courses, and increasing majors and honours students in EOSC and ATSC.

The team-taught framework of the course, where experts in EOSC teach the sections in their fields, has proven successful. The syllabus covers earthquakes, volcanoes, landslides, storms, tsunami/waves, and meteor impacts/extinctions, along with introductory material in math, physics, and chemistry. There is a 5-minute Disaster Watch, and a 15 minute disaster video every lecture. The students love the format.

Although this started as a 3-credit course including the lab during the first year, we increased it to four credits during the second year, (3 for a lecture and 1 for a lab). This change was desired by the Dean of Science, and has occurred for many courses across the faculty. During the third year, we split off the lab into its own 1-credit course (EOSC 115 - Natural Disaster Labs), leaving the lecture EOSC 114 as a 3-credit lecture-only course. With this last change, we have made the lab portion optional; giving more flexibility to the students.

As you might expect, with 1034 students, we employ an army of teaching assistants. And to lead this army is our general: Ms. Michelle Haskin, the course administrator and lecturer on geological sections. She also keeps all the EOSC 114 instructors in line, manages the EOSC 115 lab course, and manages the Earth Course Assistance Center (ECAC).

Recall that ECAC was organized a few years ago as a common TA help room for students in all EOSC first-year courses. This has also proved successful, and gives more

office hours during more days of access to the students, while saving on TA resources.

EOSC 114 is also offered in summer, during late July, also lead by Michelle Haskin. This is attracting small but growing numbers of students, including school teachers returning for continuing education. Francis Jones is leading an effort to spin-off a distance-learning version of the Natural Disaster Course, that students anywhere in BC can take remotely.

Teaching in EOSC 114 has been by Mary Lou Bevier, Francis Jones, Stuart Sutherland, Roland Stull, William Hsieh, Oldrich Hungr, Bruce Buffett, Liz Hearn, Michelle Haskin, May Ver, Dave Hildes, Kirsty Simpson, and Sandra Taylor. If you would like to learn more about the course, see <http://www.eos.ubc.ca/courses/eosc114/>

Enrolments

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

	2000	2001	2002	2003
1st Year	561	854 (+52%)	1330 (+56%)	1414 (+6%)
2nd Year	225	211 (-6%)	300 (+42%)	465 (+55%)
3rd and 4th Yr	1244	1144 (-8%)	1190 (+4%)	1200 (+1%)
Service Courses	688	756 (+10%)	861 (+14%)	889 (+3%)
TOTAL	2658	2965 (+12%)	3681 (+24%)	3968 (+8%)
Summer	333	450 (+35%)	537 (+19%)	621 (+16%)
Distance Ed	380	383 (+1%)	386 (+1%)	399 (+3%)
Grand Total	3371	3798 (+13%)	4582 (+21%)	4988 (+9%)

Numbers of Major and Honours students in programs offered by EOS

	2000	2001	2002	2003
EOS - Major		22	42	58
ATSC	24	27	31	31
GEOL	81	52	45	37
GEOE	78	70	73	73
GEOP	14	10	9	9
OCGY	25	24	16	16
TOTAL	222	205	216	224

Graduate Enrolment: 2003-2004

	ATSC	GEOE	GEOL	GEOP	OCGY	TOTAL
MASc		4				4
MEng		5				5
MSc	7		36	9	10	62
PhD-Eng		2				2
PhD-Sci	12		19	11	13	55
TOTAL	19	11	55	20	23	128

Graduate Theses Completed in 2003 (Name of Supervisor in Brackets)

Ph.D.

- ***Ingle, Stephanie:** Chemical Geodynamics of the Early Kerguelen Plume (J. Scoates / D. Weis)
- Innanen, Kristopher:** Methods for the Treatment of Acoustic and Absorptive/Dispersive Wave Field Measurements (T. Ulrych)
- Kienast, Stephanie:** Palaeoceanography of the Mid-latitude North East Pacific during the Late Pleistocene (S. Calvert)
- McKay, Jennifer:** Palaeoceanography of the Northeastern Pacific Ocean off Vancouver Island, Canada (T. Pedersen)
- ***Needoba, Joseph:** Influence of Environmental Factors on Nitrate Utilization and Nitrogen Isotope Fractionation by Marine Phytoplankton (P. Harrison)
- Rucker, Magdalena:** Observational and Numerical Study of Daytime Flows in an Alpine Valley (D. Steyn)
- ***Saldarriaga, Juan:** Molecular Data and the Evolutionary History of Dinoflagellates (F.J.R. Taylor)
- ***Short, Steven:** The Molecular Analysis of Marine Algal Virus Communities (C. Suttle)
- Stoynov, Hristo:** A Lithogeochemical Study of Hydrothermal Alteration Associated with Mafic Hosted and Besshi-Type Massive Sulphide Deposits (A. Sinclair)
- ***Strzepak, Robert:** Photosynthetic Iron Requirements of Marine Phytoplankton (P. Harrison)
- Zhao, Ming:** Episodic Mixing and Buoyancy-Sorting Representations of Shallow Cumulus Convection (P. Austin)

M.Sc.

- Adams, Rupert:** An Examination of the Role of Sediment Surface Area in Controlling the Preservation of Organic Matter in a Paralic Environment, and its Influence on Petroleum Source Rock Formation and Contaminant Adsorption, Howe Sound, British Columbia (R.M. Bustin)
- Austin, Nicholas:** An Experimental Investigation of Textural Controls on the Brittle Deformation of Dolomite (L. Kennedy)
- Bieber, Christine:** Field Sampling and Modelling of Creosote-Derived Contamination in a Tidally Forced Aquifer (R. Beckie)

Bovis, Paul: Stratosphere Troposphere Exchange and Its Influence on surface Ozone Concentrations in the Lower Fraser Valley (D. Steyn)

Bradshaw, Geoffrey: Geology and Genesis of the Wolverine Polymetallic Volcanic Rock-hosted Massive Sulphide (VHMS) Deposit, Finlayson Lake District, Yukon Canada (S. Rowins)

***Brigden, Sean:** Dynamics of Cyanophage Replication (C. Suttle)

Charchaffie, Diego: Geological, Structural and Geochronological Framework of the Veladero North Area, Cordillera Frontal, Argentina (R. Tosdal)

Costin, Simona: Preferred Reversal Paths Caused by a Heterogeneous Conducting Layer at the Base of the Mantle (B. Buffett)

Dilworth, Katherine: Geological Setting, Nature and Evolution of Reduced Intrusions and Gold Bearing quartz Veins of the 4021 Prospect, Goodpaster District, East-Central Alaska (R. Tosdal)

Frederickson, Cindy: The Genetic Analysis of Aquatic Cyanophage Communities (C. Suttle).

Haynes, Simon: Development of the Eocene Elko Basin, Northeastern Nevada: Implications for Paleogeography and Regional Tectonism (R. Tosdal)

Henrichsen, Michael: Structural Geometry and Kinematics of Deformation in the Stanley Head Region, Western Cornwallis Island, Nunavut (L. Kennedy)

Kaplan, Sam: Principal and Independent Component Analysis for Seismic Data (T. Ulrych).

Lelievre, Peter: Forward Modelling and Inversion of Geophysical Magnetic Data (D. Oldenburg)

McLearn, Nicole: Correlates of Viral and Bacterial Abundances in Siberian and Antarctic Permafrost (C. Suttle)

Reid, Karen: DNA Polymerase Sequence Analysis of Bacteriophage, *Podoviridae* (C. Suttle)

Roberts, Sarah: Energy Storage in a Densely-Built Mediterranean City Centre (T. Oke)

Rozak, A. Thomas: Evaluation and Application of Fracture Detection Software to Coalbed Methane Exploration (R.M. Bustin)

***Sih, Perry:** Non-linear Cyclic Regimes of Short-term Climate Variability (L. Pandolfo)

***St. John, Tanya:** Characterization of a Large Dsdna Virus Infecting a Marine Heterotrophic Nanoflagellate (C. Suttle)

Zhang, Jin: From Extinction to Recovery: Late Triassic and Early-Middle Jurassic Ammonoid Morphology (P. Smith)

* Thesis supervised by EOS faculty. Program external to the Department of Earth and Ocean Sciences.



Figure 11.

Selected Publications (2003)

Hickey, B. M.; Dobbins, E. L.; **Allen, S. E.** Local and remote forcing of currents and temperature in the central Southern California Bight *Journal of Geophysical Research* Vol. 108 No. C3, 3081. March 2003.

Debby Ianson, **Susan E. Allen**, Shannon L. Harris, Kristin J. Orians, Diana E. Varela and Chi S. Wong. "The inorganic carbon system in the coastal upwelling region west of Vancouver Island, Canada." *Deep Sea Research Part 1: Oceanographic Research Papers*, Volume 50, Issue 8, August 2003, Pages 1023-1042.

Zhao, M. and **P. H. Austin**, 2003: Episodic Mixing and Buoyancy-sorting Representations of Shallow Convection: A Diagnostic Study, *Journal of the Atmospheric Sciences*, vol 60, pages 892-912.

C. A. Jeffery and **P. H. Austin**. Unified Treatment of Thermodynamic and Optical Variability in a Simple Model of Unresolved Low Clouds. *Journal of the Atmospheric Sciences*: Vol. 60, No. 13, pp. 1621-1631. (July 1, 2003)

Timothy, D.A., Soon, M.Y.S. and **Calvert, S.E.**, Settling fluxes in Saanich and Jervis Inlets, British Columbia, Canada: sources and seasonal patterns, *Progress in Oceanography*, 59, 31-73.

Martin, A.J. and **Calvert, S.E.**, Hydrological and geochemical controls governing the distribution of trace metals in a mine-impacted lake. *Environmental Geology*, 43: 408-418.

Needoba, J.A., Waser, N.A., Harrison, P.J. and **Calvert, S.E.**, 2003, Nitrogen isotope fractionation in 12 species of marine phytoplankton during growth on nitrate. *Marine Ecology Progress Series*, 255, 81-91.

Fernández Viejo, G. and **R.M. Clowes**. Lithospheric structure beneath the Archean Slave Province and Proterozoic Wopmay Oregon, northwest Canada, from a Lithoprobe refraction/wide-angle reflection survey. *Geophys. J. Int.*, 153, 1-19 (2003).

Fleming, S.W., and **G.K.C. Clarke**. 2003. Glacial control of water resource and related environmental responses to climatic warming: empirical analysis using historical streamflow data from northwestern Canada. *Canadian Water Resources Journal*, 28(1), 69-86.

Farquharson, C.G., **D.W. Oldenburg** and P.S. Routh, 2003. Simultaneous one-dimensional inversion of loop-loop electromagnetic data for magnetic susceptibility and electrical conductivity, *Geophysics*, 68, pp1857-1869.

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- Fletcher, W.K.** and Muda, J. 2003. Dispersion of gold in stream sediments in the Sungai Kuli region, Sabah, Malaysia. *Geochemistry, Exploration, Environment, Analysis* 3: 51-56.
- Groat, L.A.**, Chakoumakos, B.C., Brouwer, D.H., Hoffman, C.A., Morell, H., Fyfe, C.A., and Schultz, A.J. (2003) The amblygonite (LiAlPO₄F)-montebrasite (LiAlPO₄OH) solid solution: A combined powder and single-crystal neutron diffraction and solid-state ⁶Li MAS, CP MAS, and REDOR NMR study. *American Mineralogist*, 88, 195-210.
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Figure 12.

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Figure 13.

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Obituaries

John Arthur Jacobs 1919-2003

This obituary from R.D. Russell, Professor Emeritus

We were saddened to learn of the death, on December 14th, 2003, of Professor John Arthur Jacobs. Jack Jacobs studied, in order, classics, pure mathematics and applied mathematics. After graduation he extended his sound academic base by working on problems in aeronautical engineering and by serving as an officer in the Royal Navy. In 1943 he became a lecturer at Royal Holloway College. In 1951, he succeeded Leopold Infeld as Professor of Applied Mathematics at the University of Toronto but soon, with the encouragement of J. Tuzo Wilson, transferred to the geophysics laboratory of the Department of Physics. In 1967, he became Professor of Physics at the University of British Columbia, and soon created the Institute of Earth Sciences. He was instrumental in forming the Department of Geophysics (later to become the Department of Geophysics and Astronomy) in 1963 and nurtured its growth until he moved to the University of Alberta in 1967 as Killam Professor and, in 1970, Director of the Institute of Earth and Planetary Physics. Upon the retirement of Sir Edward Bullard, Jack went to the University of Cambridge to take the Chair of Geophysics. He was elected a Fellow of the Royal Society of Canada, the Royal Astronomical Society and the American Geophysical Union. Among many distinctions, he was awarded the Gold Medal of the Canadian Association of Physicists in 1975, an honorary doctorate by UBC in 1987, and the Gold Medal of the Royal Astronomical Society in 2002. Among his scientific interests were the earth's core and geomagnetism, the earth's thermal history, geomagnetic micropulsations and continental drift.



James Thom (grad student) leading a tour of elementary school children around the courtyard and museum

- Short, S.M. and **C.A. Suttle**. 2003. Temporal dynamics of natural communities of marine algal viruses and eukaryotes. *Aquatic Microbial Ecology* 32:107-119
- Hardies, S.C., A.M. Comeau, P. Serwer and **C.A. Suttle**. 2003. The complete sequence of marine bacteriophage VpV262 infecting *Vibrio parahaemolyticus* indicates that an ancestral component of a T7 viral supergroup is widespread in the marine environment. *Virology* 310: 359-371

Those of us who worked with him as students and colleagues remember him as a warm person and a valued leader.

James Drynan Aitken (1928 – 2002)

The following is courtesy of Dr. C.J.Yorath

Jim Aitken, a native of Scarborough, Ontario, obtained his BSc. in geology from the University of British Columbia in 1950 and his PhD from UCLA in 1952. After a few years in the petroleum industry in Columbia and Alberta, Jim joined the Geological Survey of Canada in 1960, beginning a 35 year career during which he authored and co-authored over 150 scientific papers on various aspects of the Proterozoic and Paleozoic geology of the Canadian Rockies, Mackenzie and Franklin mountains. His research resulted in the development of many concepts pertaining to the accumulation of carbonate platforms, including the "Kicking Horse Rim", a barrier complex at the edge of the ancient Paleozoic shelf of Western Canada. In 1987 he was awarded the R.J.W. Douglas Medal of the Canadian Society of Petroleum Geologists, a career medal honouring his substantial contributions to the understanding of the geological architecture and development of the Canadian cordillera.

Jim is survived by his wife Roxanna, his first wife Anne, his three children, three granddaughters and numerous nieces and nephews. He is fondly remembered by his many friends, including geologists of the Canadian petroleum industry who benefited greatly from his research and teaching. He is greatly missed.

Richard (Dick) Brown 1924-2003

The following is from information kindly supplied by Alicia Brown

Dick Brown, B.A.Sc, (Geological Engineering) 1952 passed away 2003 May 24 after a nine-month battle with cancer. Born in Toronto, Dick moved with his family to Fort St John in 1929 when his father Hubert Brown, became the town's first resident physician. After WW II service in the RCAF, Dick entered UBC. While taking a year off from study in Whitehorse in 1947-48 he met Alicia Jane Hoare of Ottawa. Alicia and Dick were married in the Old Log Church in Whitehorse in 1949. The couple lived in a trailer court on the UBC campus until Dick graduated. Dick spent seven years with Imperial Oil in Edmonton as well-site geologist and supervisor, seven years with Pacific Petroleum in St John, and seven years with Oilfield Consultants, then became an independent consultant. In 1959 Dick bought a section of crown land in a beautiful valley on the Cameron River north of Fort St John. Many happy summers were spent there clearing land, planting crops, tending cattle, horseback riding, swimming and entertaining city folk. Many summer evenings were spent around a campfire with Dick playing his guitar and singing ballads and cowboy songs to the delight of his children and nephews. Dick retired in 1996. Dick is survived by Alicia, four daughters and 12 grandchildren.

Guy Edwards and John Millar

The following is from information published in the Anchorage Daily News and in Grippled magazine.

Guy Edwards (BASC Geol Eng, 1998) and John Millar (undergrad, joint Hons Geog-Geol) were reported missing presumed killed by an avalanche on the unconquered face of Devils Thumb, Alaska, about 20 April 2003. Devils Thumb (9,077 feet) rises from the Stikine Ice Cap about 30 miles northeast of Petersburg. Edwards, 30, and Millar, 24, were last seen on the north face by their climbing companion, 33-year-old Kai M. Hirvornen of Vancouver. Guy and John were experienced mountaineers who had climbed mountains in many places, from Squamish to Peru, Baffin Island, Khyrgyzstan and elsewhere. With friends they had completed a ski mountaineering traverse from Vancouver to the Alaskan Border. They had climbed a new route on the West Face of Swachand in Pakistan. We send our condolences to their families and friends.



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

James T. Fyles, B.Sc. (Mining) 1947, M.Sc. (Geology) 1949, After 45 years of living on the paragmeisses of Mount Tolmie we were able to return part of our property to the municipality for an extension to the park and to move to the region of illusive terrane boundaries along the Victoria waterfront.

John Stout, B.A. Geology, 1950, Retired 1999, not quite making 50 years as a working geologist. Thirty years with Shell in all parts of Canada, U.S.A., and in Brunei, Sarawak and Skah. Retired as Frontier Exploration Manager. Worked for C.D.C. (USA), Springuert Page (Brisbane, Australia), Exploration Manager International at Asamera (Indonesia, Columbia, Europe), Vice-President, Canadian Division of Asamera. President, Gardiner Oil and Gas Limited. Exploration Consultant, Malaysia and Indonesia. Director of Gardiner Exploration Ltd. at retirement. Still member of AAPG, CSPG, APEGGA. Classmates encountered over the years - Joe Little, Roy Stuart, Jim Aitken, John Taft, Ray Best, Stan Tuddenham

Blyth Hughes, B.A., 1956, M.A, 1960, I retired from active scientific research (at the Defence Research Establishment Pacific in CFB Esquimalt) in 1991 and pursued studies in theology. I became ordained as clergy in the United Church of Canada in 1998 and served at Lake Cowichan United Church, and then afterwards for a summer at Bamfield United Church. I retired again in 2001 and now do volunteer work for the church.

Karl Ricker, B.Sc, 1959, M.Sc. 1968, The problem with retirement is that one does not have weekends off! I am still "weasel" working on national and international ski races. This year (2003), it was 15 days at Lake Louise in November on the Men's World Cup Downhill/Super G events; there being no local international events at Whistler until 2008. The object is to keep Weasel Workers active and in shape for the 2010 Olympics. The average age of a Weasel Worker at present is about 50 to 55! Yes we will do our part to support 2010, if we can hang together that long! (I'm 67 years old).

Nicola Jones, Combined Honours, 1997

Chemistry/Oceanography,

After 3 years as a reporter for New Scientist magazine in London, I am moving to Nature as an assistant news and features editor. If you hear of any newsworthy projects, drop me a line! (nicolajones@nasw.org)

Akil Smith, B.A.Sc., 2001, I've been working for Geomatrix consultants, a growing environmental firm, for almost two years now, out of their office in beautiful Orange County, California.

All the courtyard and stepping stone pictures were taken by Stuart Sutherland



The old ore cart from the original display



There are various rock displays, such as these, throughout the courtyard, with explanations of the rock itself.

Answers to the "What is it?" Quiz

- Figure 1. Shallow Wave**
- Figure 2. Rain Heavy or continuous, not freezing.**
- Figure 3. Strombolian Eruption**
- Figure 4. Geophysical Techniques**
- Figure 5. Water Vapour**
- Figure 6. Hydrogeology**
- Figure 7. Rain light. Thunder heard during past hour but not now**
- Figure 8. Fluorite**
- Figure 9. Chitinozoan Ancient Plankton**
- Figure 10. Slip Surface**
- Figure 11. Freezing rain, moderate or heavy**
- Figure 12. Dinoflagellate Recent Plankton**
- Figure 13. Dust Devils**

KEEP IN TOUCH

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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?

Thanks for your response

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