Earth and Ocean Sciences

ALUMNI NEWSLETTER

Number 6 (2003)

Message from the Head

Dear Alumni and Friends:

This has been a year of great change and progress. We have been very successful in the Canada Research Chairs competitions with Dominique Weis (Isotope Geochemistry) receiving a senior chair and Maria Maldonado (Marine Biogeochemistry) a junior chair. We are currently searching for a junior chair in Global Process Modelling. In addition, we were able to use CRC residual funds, made available from an internal UBC retention appointment, to hire Claudio DiBacco (Biological Oceanography) who arrives this summer. Evgeny Pakhomov (Fisheries Oceanography) arrives this September from South Africa and, next January, Erik Eberhardt (Geological Engineering) joins us from Switzerland. We have two other hiring competitions under way (Applied Sedimentology and Marine Geochemistry), and we are aggressively trying to hire an applied mathematician to be cross-appointed with the Mathematics Department. The net result is that, since 2000, five new positions have been created and ten more EOS faculty will have been replaced. In making these new hires, we are placing ourselves at the cutting edge of the earth, ocean and atmospheric sciences, but we are also trying to strengthen our research groups in two other ways.

First, we are endeavouring to maintain a balance between experimental, field and modelling approaches to research. Second, we are using our strengths across the EOS spectrum to build research facilities that are second to none. Inside you will see that the Pacific Centre for Isotopic and Geochemical Research (PCIGR) was officially opened at a well-attended ceremony last fall December 12, 2002. Our computing infrastructure was given a major boost when our Beowulf cluster, nicknamed "Monster", came on line January, 2002, and very soon we will be plugging into the WestGrid system linking the computer power of UBC, the University of Alberta and the University of Calgary (see page 3.) There are 3 other lab facilities that we have identified for future financial and technical support: 1) Solid Earth Sciences (in EOS Main); 2) Environmental Earth Sciences (in EOS East); and 3) Biological-Chemical Oceanography (in EOS Biosciences). On the teaching side, we hope to develop a new EOS Learning Centre in EOS Main.

You will notice from my comments above that we have now officially changed the names of the buildings (April, 2002), but there are more fundamental changes underway. After seismic upgrading, the evacuated EOS East building has been reoccupied and we are now in the process of redesigning the trampled central courtyard that is almost surrounded by EOS buildings. This will provide a dramatic entry into EOS Main where the new Pacific Museum of the Earth (PME) is housed. Formed through the merger of the M.Y. Williams Geological Sciences Museum and the Pacific Mineral Museum, this new facility will be expanded in the future to cover all the Earth's components and its history. One of the main purposes of the PME will be to interest high school children in the earth, ocean and atmospheric sciences. Not only will we be touring groups of school children throughout the facility, as before, but we also intend to establish a resource centre for teachers. We see this as a step towards forging close links with the Department of Education here at UBC.

Undergraduate enrollment in Earth and Ocean Sciences continues its phenomenal growth. When we started the millennium, our enrollment was in decline but since then our first year enrollment has increased by 137%, our summer school by 61%, our second year by 33% and our service courses by 25%. Our upper level undergraduate, distance education and graduate program enrollment has remained stable.

When we are going through times of change and adaptation to new circumstances, it is important to have the understanding and support of friends and colleagues. I hope you will be able to visit us, either to attend the official opening ceremonies for various new facilities, or simply to enjoy the new Museum. I cannot think of a better way to re-establish or strengthen links with your academic heritage. If you are not able to visit, please drop us a line or send an email message to **alumni-contact@eos.ubc.ca** so that we can pass on your news through the newsletter.

Paul L. Smith
Head
Earth and Ocean Sciences

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Official Opening of the Pacific Museum of the Earth

On June 19th the Pacific Museum of the Earth (PME), located in the Department of Earth and Ocean Sciences, officially opened to the public. The PME was created by the merger of the M.Y. Williams Geological Museum and the Pacific Mineral Museum (PMM). Our Grand Opening was a great success, drawing more than 150 guests from industry, K-12 education, University education, science centres, and the general public. A plaque was unveiled at the event to honor the former curator of the M.Y. Williams Geological Museum, Joe Nagel.

Displays are being modified to reflect the diverse interest in Earth Sciences that now exists within the department. In addition to the beautiful minerals, rocks and fossils from the old museums, the PME will house a tornado machine, a seismic centre and displays highlighting aspects of oceanography.

Kirsten Parker has been employed with funds donated by Ross Beaty of Pan American Silver to help curate and run the museum on a day-to-day basis.

The PME is being developed with a close eye on the K-12 Earth Science curriculum and our own undergraduate teaching. As such, the museum will act as a broad outreach tool for all aspects of Earth Science and help promote the activities of many of our sponsors and supporters from the geological community downtown. Teaching resources will ultimately be housed in a dedicated Teachers Resource Centre which will contain A/V equipment, specific curriculum based displays and lesson plans and activities for schools.

We hope to develop close links with alumni and various geological, ocean, and atmosphere interest groups. The museum will be available to be used for meetings and courses and/or field trips may be run from it. Future plans for the museum include a gift store to be located on the main floor and, eventually, the reinstallation of the precious minerals vault which was originally housed in the PMM.

The museum is open from 9 – 5:00, Monday to Friday, and entry is by donation.

For general inquiries or to book a group tour, contact pme@eos.ubc.ca. To contact the curator, Kirsten Parker, you can call 604 822 6992, or e-mail kparker@eos.ubc.ca.

New names for our buildings

Personnel of the Earth and Ocean Sciences Department are housed in several buildings on the UBC campus. The segregation by discipline inherited when the department was created in 1996 from the pre-existing departments of Geological Sciences, Oceanography, and Geophysics and Astronomy is disappearing, so that original building names have become inappropriate. New names for the buildings are:-

•EOS MAIN

(this was the Geological Sciences Centre Laboratory Building, funded jointly by the University, alumni and the oil and mineral industries, completed and first occupied in 1972)

•EOS SOUTH

(Geological Sciences Centre Office Building,first occupied in 1974, at which time it was connected to EOS MAIN by an open walkway. The walkway was glassed in at a later date. The top floor, unfinished for some years after initial construction, was occupied by Forestry personnel until the completion of the new forestry building.)

•EOS EAST

(Originally the BC Research Council Building, this became the Geophysics and Astronomy Building in 1970. Strengthening of this building to reduce seismic and fire risk was carried out in 2003, when an Environmental Earth Sciences Facility was created on the first and third floor of the north wing and a Field Research Laboratory on the first floor).

•EOS BIOSCIENCES

(the basement and part of the first floor of the west wing of the Biosciences Building, completed and first occupied in 1970 by the Institute of Oceanography (IOUBC) later the Department of Oceanography).

Pacific Centre for Isotopic and Geochemical Research

The Pacific Centre for Isotopic and Geochemical Research was officially opened on December 12th, 2002. This EOS facility, housed in the Chemistry building, comprises seven mass spectrometers that can analyze stable and radiogenic isotopes, can deal with solids and fluids, and will serve the entire spectrum of research undertaken in EOS. The opening of PCIGR was an occasion for celebrating EOS research in general: speeches were given and tours of PCIGR were held. Thirty one researchers from several institutions currently use the facilities, helped by a research staff of five. Information about the Centre is available on the website : http://www.eos.ubc.ca/research/pcigr/PCIGR.htm

Beowulf Computer goes on line

The Geophysical Disaster Computational Fluid Dynamics Centre is based in EOS under the direction of Roland Stull. Its IBM Linux Cluster Computer with 264 Pentium III processors is up and running. At peak speed the cluster is capable of handling 170 billion calculations per second. It can hold one terabyte of data, which must be dumped weekly. High-resolution forecasting will be available for one-kilometre grids covering the Lower Mainland and Southern Vancouver Island, and 3.3 square km grids over the rest of the province.

West Grid

The Canadian Foundation for Innovation has provided almost $12 million towards the West Grid proposal, a trio of computers at UBC, Alberta and Calgary that will significantly increase computing power. Another $18 million should be forthcoming from other sources. The EOS component of the proposal was written by Phil Austin, with involvement of Garry Clarke and Doug Oldenburg. At the official West Grid launch in April 2003 it was stated that the 1000 CPU IBM cluster would be installed in the Klink Building (old Computer Science Building) by September. Problems with power and air-conditioning could postpone completion until January 2004. A brief description of the network is available at: http://www.westgrid.ca/about.html

Marine Microorganisms and Greenhouse Gases

Philippe Tortell received funds from the Canadian Foundation for Innovation for the establishment of his new laboratory. Matching funds will now be sought from the Province. Research in Philippe's laboratory focuses on the interactions between marine micro-organisms and the cycling of greenhouse gases in the ocean-atmosphere system. The goals of the research are: 1) to understand the biological and chemical controls on the production and consumption of various greenhouse gases (e.g. CO_2, N_2O, and CH_4) by marine bacteria and phytoplankton; and 2) to examine the sensitivity of these control mechanisms to anthropogenic climate change. Of particular interest is the potential impact of increased atmospheric CO_2 concentrations on the productivity and species composition of marine phytoplankton communities. Through laboratory experiments and field studies on oceanographic research vessels, Philippe's research group will examine the biochemical pathways of gas production and consumption by key groups of marine microorganisms and the regulation of these pathways by environmental factors.

Cathodoluminescence

EOS now houses one of the most comprehensive **cathodoluminescence** (CL) facilities in North America. CL is the emission of light in response to excitation by an electron beam, and in silicate and carbonate minerals can reveal subtle compositional and structural variations that are not evident with conventional light and electron microscopy. Our new CL systems will provide rapid and inexpensive textural context for microanalysis of solid materials via PCIGR and the EOS electron microbeam facility. Our CL capabilities consist of a scanning electron microscope CL attachment, and an optical CL imaging system. The SEM CL can map subtle changes in cathodoluminescence on a micron scale, quantitatively collect and analyze CL spectra and record colour images based on the spectra. The optical CL microscope provides larger scale images up to a diameter of 5 mm and captures those images with a digital camera.

Web Course

Practical Ore Microscopy and Mineralographhty, a web-based course recently completed by Al Sinclair, is available as part of the Professional Development Program of Robertson Informine, a commercial firm specializing in providing information to the mining industry. The course is a merged product of two courses taught for many years by Dr Sinclair at UBC, Mineralography (for geology students) and Ore Microscopy (for mining engineering students). The original courses have been substantially expanded and supplemented with many coloured photomicrographs and line diagrams (about 200 figures in total). The main components of the new course are more-or-less stand-alone units, as follows: (1). Introduction to Ore Microscopy (2). Mineral Identification and Characterization (3). Exsolution, Metamorphism and Mineral Stabilities (4). Practical Aspects of Microscopy (e.g., Modal Analysis, Liberation) (5). Case Histories (6). Exercises (involving information derived from ore microscopy studies) A general description of the course can be accessed on the web at www.edumine.com/xedumine/edumine.htm

Departure

Tom Pedersen left UBC to become Director of Earth and Ocean Sciences at the University of Victoria, effective September 1, 2002. Recently Tom was appointed Dean of Science at UVic, effective September 1, 2003. Tom graduated BSc from Geological Sciences at UBC in 1972 and went on to the PhD at the University of Edinburgh. He came to UBC Department of Oceanography in 1980 as a University Research Fellow, and became a member of faculty in 1984. The research of Tom and his students has focussed on ocean productivity as evidenced by trace element and isotopic proxies in deep ocean sediments. A tireless advocate of EOS within UBC and elsewhere, Tom became Associate Dean of Graduate Studies some years ago. Tom put his experience to good use by being a mentor for our young faculty.

Spotlight On

Liz Hearn, Assistant Professor

I grew up in a rural area near Portland, Oregon, and was introduced to geology by a junior high school teacher, a 4H club leader, and the Oregon Museum of Science and Industry's summer science camps. I double-majored in geology and geophysics at Rice University, and obtained my Master's degree at Berkeley. After working as a hydrogeologist for almost five years, I returned to graduate school (Oregon) to study for my PhD with Eugene Humphreys. The return to academia was sparked in part by my introduction to numerical analysis while I was working; I wanted to apply the power of these techniques, and my broad background in the geosciences, to tectonic problems.

I began my PhD studies looking at how preferred orientation of anisotropic olivine and pyroxene crystals in the upper mantle affects heat flow and dynamics of oceanic plates. I then moved to the continents, where I modeled the kinematics of the Walker Lane Belt in Eastern California, and the dynamics of accelerated crustal deformation that followed the 1992 Landers Earthquake. I accepted a postdoctoral fellowship at MIT, working with Brad Hager and Robert Reilinger. At MIT, I continued to focus on earthquake-related deformation along continental strike-slip fault systems. Shortly after my arrival, the Izmit, Turkey earthquake struck, and geodesists (including Rob Reilinger) put together an amazing dataset describing how the Earth's crust deformed during and after this event. I spent much of my time thereafter modeling the Izmit earthquake and eastern Mediterranean deformation in general.

In November of 2002, after a fun and mostly relaxing drive across Canada, I arrived at UBC. I plan to continue my research on regional tectonics and earthquake-cycle deformation, and am collaborating with groups conducting research in the Mediterranean region and western North America. I feel lucky to be in this field at a time when rapid progress is being made, thanks to advances in space geodesy and the characterization of real-time crustal deformation. I am looking forward to pursuing research here at UBC, and hopefully conveying some of the excitement in our field to my students and colleagues.

Felix Hermann, Assistant Professor

I spent my youth in The Hague, Netherlands. In high school I became interested in the sciences and studied Applied Physics at the Delft University of Technology. I was very much involved in extracurricular affairs, including membership in a rowing club and sending rowers tot he Olympics. I helped to raise funds for a lustrum of my student organization. As part of the lustrum festivities in 1988, Mandelbrot spoke; that presentation was instrumental in hooking me to science. The pictures and fractal scaling concepts of mountain rangers and

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other phenomena captured my imagination and motivated me to study the scaling behaviour of geophysical systems.

While an intern at a NATO research lab in La Spezia, Italy I applied scaling concepts to geomagnetic noise. Then while doing graduate work at Delft with Professors Berkhout and Wapenaar, as part of my M.Sc. I studied the influence of detail in the Earth's sedimentary velocity structure on the propagation of seismic waves. I used Mandelbrot's fractal concepts to describe complexity displayed by sedimentary records, gaining insights in how to link the scaling properties of sedimentary records to the dispersion of seismic waves. With a Dutch Petroleum Research Award and an assistantship, commenced a Ph.D. program at Delft. I was fortunate to interact with people from the industry such as Martijin de Hoop and Bob Burridge, whom I met during an internship at Schlumberger Cambridge Research. After defending my thesis, I spend a marvellous year at Stanford's Mathematics Department, working with George Papanicolaou. I jointed MIT's Earth Resources Laboratory, going back to geophysics and working with Rob van der Hilst, Nafi Toksoz, Yves Bernabe and Bob Burridge on topics ranging from sedimentary basins to modelling the rock-physics at upper-mantle discontinuities.

During my last year at MIT, I married Rachel, whom I had met at Stanford and both of us obtained faculty positions at UBC. I must say that it is really wonderful that UBC is so pro-active in hiring academic couples. Life at UBC has so far been a blast: The experience of finally living together has been wonderful and interactions with students and faculty at UBC have been very warm and full of promise. I am developing reflection seismological techniques to allow us to pose and hopefully answer questions on the inner workings of the Earth, on geological and physical mechanisms that create major seismic transitions, ranging from transitions in sedimentary basins to upper-mantle discontinuities.

Student Activities

Hockey

EOS MEMBERS of SUS Chaos on Ice team who were the Todd Ice Hockey League Men's Tier 3 Champions: Nicolas Lhomme, Shane Ebert, Christophe Hyde, Patrick Hayman, Peter Lelievre, Alastair McClymond, Geoff Bradshaw, John Tyne, Simon Haynes, Colin Farquharson, Lawrence Winter, Steven Quane, Robert Heffernan, Jordan Severin, Steve Billings. Here is the write up about the Championship in *The Point*, December 4, 2002:

"Rink 2 saw Chaos on Ice and Fiji Islanders take to the ice to determine the Men's Tier 3 Champion. This game was a defensive battle that had neither team wanting to give an inch. The intensity of the game was almost palpable in the rink, yet both teams played with the discipline needed in playoff hockey. There were only a few penalties in the entire game, nice to see when the competition heats up. In the end it was the goals from Shane Ebert and Steve Israel that decided the contest in favour of Chaos on Ice. Cheers to both teams for one of the tightest contests of the finals and some good, hard but clean hockey."

Georox Club (Kathryn McRae, President)

We manned the BBQs at Back from the Bush, organized a club display for an October Career fair within the EOS department, held a Christmas potluck, and helped out with Talent Nite in April. The club designed and sold T-shirts for students, both for casual wear and sports teams. We had intramural teams involved in volleyball, soccer, basketball, ball-hockey and ice-hockey. We also had three teams advance in the Storm the Wall competition at UBC. Students participated in Engineering Week at UBC and WIUGC activities in Regina. The club developed a brochure showcasing graduating students, mailed it to engineering firms, and hosted an evening for Alumni and Industry to expose students to potential career paths and help them develop industry contacts.

Awards & Honours To Faculty And Staff:

Michael Bostock received a UBC Killam Memorial Faculty Research Fellowship for 2002/2003. Michael will focus his sabbatical research effort on POLARIS-BC, funded by CFI and USGS to improve understanding of the structure and seismicity of the Cascadia subduction zone.

Marc Bustin received the 2002 Reinhardt Thiessen Medal of the International Commission on Coal Petrology

Ron Clowes was presented with The Queen's Golden Jubilee Medal. The medal is awarded for a significant contribution to Canada (Ron has directed LITHOPROBE since its inception).

Lee Groat won a Killam award for excellence in undergraduate teaching.

Doug Oldenburg was made an Honorary Member of the Society of Exploration Geophysics.

Emeritus Professor **Tim Parsons** received the degree of Doctor of Science *honoris causa* at UBC on Thursday, May 23, 2002

Tom Pedersen became a Fellow of the Royal Society of Canada.

Mati Raudsepp was appointed Associate Editor of the Canadian Mineralogist for 2002-2005.

Les Smith and former student, **Laurie Neilson-Welch** received the 2001 Keefer Medal (for the best paper of the year in fields such as hydrotechnical and environmental engineering).from the Canadian Society of Civil Engineers for their paper "Saline Water Intrusion Adjacent to the Fraser River, Richmond, B.C." in the Canadian Geotechnical Journal.

Dominique Weis became a member of the NSF Division of Earth Sciences panel "Petrology and Geochemistry".

Faculty of Science Leadership Awards went to **Roland Stull** (Faculty) and **John Amor** (Staff)

Doug Poulson and **Ray Rodway** won departmental awards for excellence in administration and technical support.

Stuart Sutherland (Solid Earth Sciences) and **Roland Stull** (Environmental Earth Sciences) won departmental awards for outstanding teaching

Awards To Graduate Students

At the Spring Meeting of the AGU Ocean Sciences meeting in Honolulu, Hawaii in February 2002, **Jennifer McKay** and **Eric Galbraith**, won Outstanding Student Paper Awards for their posters. Jennifer's was titled: "Accumulation of Redox-sensitive Trace Metals in Continental Margin Sediments and their Paleo-applications". Eric's was titled: "Frustule-bound nitrogen isotopes: observations from cultured diatoms and from late Quaternary diatom-rich sediments from the Gulf of Alaska"

Alyssa Young won an "Outstanding Student Paper Award" from the Atmospheric Sciences Section of the American Geophysical Union for her research paper "Anomalous atmospheric circulations forced by volcanic aerosols" presented at the 2001 Fall Meeting of the AGU.

Joshua Caulkins and **Steve Quane** won the EOS Outstanding Teaching Assistant Award for 2001-2002

Kim Welford won the Chevron Canada Outstanding Student Paper in Seismology award of the Canadian Geophysical Union for her presentation, coauthored by **Ron Clowes**, "Imaging Precambrian reflectors in southwestern Alberta using an industry-acquired deep 3-D seismic reflection dataset".

Steve Piercey gained first place in the geology category for best thesis of the Canadian Institute of Mining, Metallurgy and Petroleum for his thesis "Petrology and Tectonic Setting of Felsic and Mafic Volcanic and Intrusive Rocks in the Finlayson Lake Volcanic-Hosted Massive Sulphide Deposit District, Yukon, Canada: A Record of Mid-Paleozoic Arc and Back-Arc Magmatism and Metallogeny".

Rina Freed and **Ben Vanden Berg** received Student Leadership Awards from the Faculty of Science

University Graduate Fellowships went to **Pascal Haegeli**, **Xingxiu Deng, Alice Ortmann, Steve Israel, Nicolas Lhomme, Bruce Ainslie, Melanie Kelman and Tim Creyts**.

Scott McDougall, Nicolas Austin, Fionnuala Devine and Scott Krayenhoff won NSERC Fellowships

Awards to undergraduate students

Fourth-year geology student **Reza Tafti** won the Canadian Institute of Mining, Metallurgy and Petroleum Resources Book Prize.

Third year Geological Engineering student **Jamin Cristall** won the Geological Association of Canada Student Prize for 2002.

Jamin Cristall and **Scott Napier**, fourth-year students in geophysics, each won a scholarship from the KEGS Foundation. Nine such scholarships are awarded to students in five Canadian universities.

Forty-four undergraduate students in geology, geophysics, and Geological Engineering received a total of about $126,000 in departmental scholarships and awards for the academic year 2002-2003.

Selected Publications (Calendar year 2002)

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KEEP IN TOUCH

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Telephone:_____Fax_____

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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

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

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Enrolment

Undergraduate Enrolment

	2000	2001	2002
1st Year:	561;	854 (+52%);	1172 (+37%).
2nd Year:	225;	211 (-6%);	301 (+43%).
3rd and 4th Year:	1244;	1144 (-8%);	1133 (-1%).
Service Courses:	688;	756 (+10%);	826 (+9%).
TOTAL:	2658;	2965 (+12%);	3432 (+16%)

Graduate Enrolment - 2002 - 2003

	ATSC	GEOE	GEOL	GEOP	OCGY	TOTAL
MASc/ MEng		6 (8)				6 (4)
MSc	8 (6)		32 (29)	10 (12)	9 (12)	59 (59)
PhD	14 (14)	2 (1)	14 (12)	8 (10)	14 (14)	52 (51)
TOTAL	22 (20)	8 (9)	46 (41)	18 (22)	23 (26)	117 (118)

Graduate Theses completed in 2002 supervised by EOSC faculty, including students not registered in EOSC (supervisor in brackets)

Ph.D.

Bank, Carl-Georg: Teleseismic Investigation of the Upper Mantle Beneath the Archean Slave Craton, NW Canada, and of the Moho Beneath Canadian Broad-band Stations (M. Bostock/R. Ellis)

Berg, Larry: A simple Parameterization Coupling the Convective Daytime Boundary Layer and Fair-weather Cumuli (R. Stull)

De Wekker, Stephanus: Structure and Morphology of the Convective Boundary Layer in Mountainous Terrain (D. Steyn)

***Doucet, Sonia:** Time-integrated Geochemical and Isotopic Studies of Stratigraphic Volcanic Series on the Kerguelen Archipelago (D. Weis/J. Scoates) [Universite Libre de Bruxelles]

Freed, Rina: (Migration of Strontium-90 in surface Water, Groundwater and Sediments of the Borschi Watershed, Chernobyl (L. Smith)

Haro-Garay, Martha: Ecology of the Amphipods Parathemisto pacifica (Stebbing) and Cyphocaris challengeri (Stebbing) in the Straight of Georgia: Mandible Morphology, Feeding Habits, and Food Distribution (A. Lewis)

Jeffery, Nicole: Modelling a Phytoplankton Dichotomy in the Eastern Subarctic Pacific: Impact of Atmospheric Variability, Iron Surface Flux, and Life Cycle Dynamics of the Calanoid Copepods, Neocalanus spp. (S. Allen)

***Kieffer, Bruno:** Petrological and Geochemical Study of Basalts from Oceanic (Kerguelen) and Continental (Ethiopia) Plateaus (D. Weis/N. Arndt) [Universite de Grenoble]

Kienast, Markus: Sedimentary Biogeochemistry and Paleoceanography of the South China Sea During the Late Pleistocene (S. Calvert)

***Merrin, Claire:** Sources of Mn, Al, Cd, and Cu to Coastal Waters of the California Current System (K. Orians)

Nichol, Craig: Transient Flow and Transport in Unsaturated Heterogeneous Media: Field Experiments in Mine waste Rock (R. Beckie/L. Smith)

Roth, Tina: Physical and Chemical Constraints on Mineralization in the Eskay Creek Deposit, Northwestern British Columbia: Evidence From Petrography, Mineral Chemistry, and Sulfur Isotopes (J. Thompson/R. Tosdal)

Sherry, Nelson: Microbial Processes in the Subarctic Northeast Pacific: Bacterial Standing Stocks, Rate Processes, and Controls (P. Harrison)

Short, Steven: Molecular Analysis of Marine Algal Virus Communities (C. Suttle)

Wagey, Gabriel: Ecology and Physiology of Phytoplankton in Ambon Bay, Indonesia (F.J.R. Taylor)

*** M.Sc.**

Benson, Ashleen: Oceanographic Influences on Pacific Hake (Merluccius productus) Distribution and Biology (S. Allen/J. Dower)

Bone, Katherine: Relative Timing and Significance of Folding in the Western Skeena Fold Belt, Northwestern Bowser Basin, British Columbia: Interpretation of Structural and Seismic Reflection Data (R. Clowes/L. Kennedy)

Davie, Matthew: Numerical Models for the Formation of Marine Gas Hydrate: Constraints on Methane Supple From a Comparison of Observations and Numerical Models (B. Buffett)

***El-Sabaawi, Rana:** Effect of Iron and Light Co-limitation on the Oceanic Diatom, Pseudo-nitzschia granii (P. Harrison)

Joyce, Nancy: Geologic Setting, Nature, and Structural Evolution of Intrusion-hosted Au-bearing Quartz Veins at the Longline Occurrence, Moosehorn Range Area, West-central Yukon Territory (J. Mortensen)

Maletto, Annick: Boundary-layer Profiles of Particulate Matter Size Distributions Using a Balloon-borne Lightweight Aerosol Spectrometer (I. McKendry)

Ostermann, Kathryn: Source Apportionment of Particulate Matter by Positive Matrix Factorisation in the Lower Fraser Valley of British Columbia (D. Steyn)

Phillips, Nigel: Geophysical Inversion in an Integrated Exploration Program: Examples From the San Nicolas Deposit (D. Oldenburg)

Stewart, Martin: Dacite Block and Ash Avalanche Hazards in Mountainous Terrain: 2360 yr. BP Eruption of Mount Meager, British Columbia (J.K. Russell)

Stockwell, Justin: Investigation of Hydrological and Geochemical Properties and Spatial Relationships of an Unsaturated Waste Rock Pile, Key Lake, Saskatchewan (L. Smith)

***Tai, Vera:** Characterization of Viruses Causing Lysis of the Toxic Bloom-forming Alga Heterosigma Akashiwo (C. Suttle)

***Young, Alyssa:** Anomalous Atmospheric Circulations Forced by Volcanic Aerosols (L. Pandolfo)

*** Thesis Program External to EOSC**

Obituaries

Thomas Howard Brown (1940-2002)

Tom Brown, Associate Professor in EOS, died October 10th, 2002. Tom had been on leave for more than five years as he battled cancer. Born November 2, 1940, in Olney, Illinois, only child of Leslie Thomas Brown and Helen Lodge Brown, Tom was raised in Midland and Houston, Texas. He received his B.Sc. in Geology from the University of Texas, Austin, in 1964, and in the same year married Margaret (Meg) Dewey, a fellow geology student. Tom's Ph.D., "Theoretical predictions of equilibria and mass transfer in the system CaO-MgO-SiO2-H2O-CO2-NaCl-HCl," from Northwestern University in 1970 was supervised by Harold Helgeson. From 1970 to 1973 Tom was a research associate at Yale University working with Brian Skinner. Tom was keenly interested in the individuals who had advanced the field of his expertise, and on the first day at Yale he and Meg headed for the local graveyard to visit the graves of J.Willard Gibbs, Benjamin Silliman and J. Dwight Dana. This interest in absolutely everything made Tom a fascinating person to know both for his students and his colleagues.

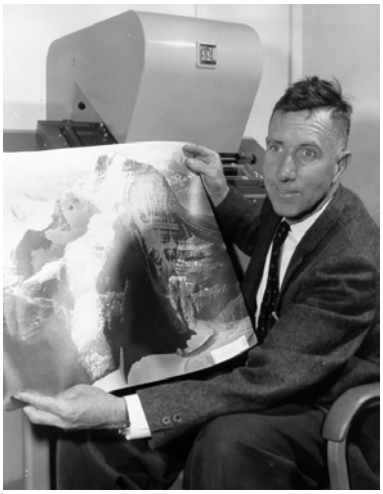
Tom accepted a faculty position at UBC in 1973. Through the years the Department benefited from his cooperative spirit, good humour and scientific acumen. He was an outstanding teacher at both the graduate and undergraduate level, combining a rare mixture of original approaches with a depth and precision that kept alert not only his students but any colleague lucky enough to share a course with him. There were many graduate students who chose UBC because they had heard either of the school itself or of some 'name' professor only to realize that the real intellectual gem of the Department was Tom Brown.

Tom was widely known and respected for his research in solution geochemistry. He worked on thermodynamic modelling of mineral equilibria, equation of state for minerals and gases, a new heat capacity function for minerals, a distribution of species model for internal equilibrium in minerals, and rock-water interaction and groundwater

chemistry. Each of these aspects of his work led to advances and further work by others that continued his influence on the science well beyond the limits of his individual papers. In particular, his contributions to the calculation and graphical representation of multicomponent mineral equilibria, the geochemistry of geothermal systems and the high-pressure equation of state of MgO attest to the wide range of his scientific efforts.

A keen observer, endowed with an unusually quick and active mind and with a deep curiosity for many subjects, Tom was a superb conversationalist, able to throw light on a wide range of topics. He could not bear to let a subject alone until he had satisfied himself that he understood what was important about it and how it related to the rest of nature. A collector of antique books on science and natural history, Tom and Meg won an award for having the best student collection at the University of Texas. An inquisitive scientist and naturalist, he never ceased to ask how and why things worked. An enthusiastic and knowledgeable birdwatcher, Tom journeyed far in North America with Meg and on occasion with Carlo Giovanella seeking sightings of rare birds. His knowledge of ornithology made him a delightful companion at field school. He was an accomplished woodworker: at his memorial service, an exquisite telescope and camera tripod was exhibited, made from broken hockey sticks collected in the 1970s from UBC's rink. Tom and Meg's interest in gardening produced an unusually well designed species rhododendron garden and led them into the Vancouver Rhododendron Society where Tom helped formulate Green Valley's rhodo & azalea food to meet Lower Mainland soils' requirements. He was also a member of the Vancouver Natural History Society, the BC Waterfowl Society, the Wild Bird Trust, American Birding Association, and Pacific Northwest Tool Collectors.

Typical of Tom's dry wit was his characterization of the nearly six years since his metastatic bladder cancer diagnosis as blessedly long, although it was often awkward and inconvenient to be the battlefield on which the doctors fought his cancer. Tom kept his wit and wits lively to the end, and showed inner strength and humour that amazed friends who were lucky enough to be within visiting distance.



William Henry Mathews (1919-2003)

Professor Emeritus William Henry Mathews passed away Monday, March 3, 2003. Born in Vancouver in 1919, Bill lost his mother and a brother at the age of 2. His father, Vancouver pioneer Thomas Mathews, died when Bill was 13. Bill attended King George High School and the University of BC (B.A.Sc, 1940, M.A.Sc, 1941 in Geological Engineering). While studying for the masters degree, Bill was an instructor in the mountain infantry school of the Alpine Club of Canada, training personnel for the Canadian armed forces. From 1942 to 1949, Bill was an Associate Mining Engineer for the B.C. Department of Mines. Bill was a doctoral student at the University of California at Berkeley from 1946 to 1948, obtaining the Ph.D. in 1948 with a dissertation on the geology of the Mt Garibaldi Area. While Assistant Professor at Berkeley (1949-51) Bill travelled to Davis to deliver the first lectures in geology at the UC campus there. Bill joined the Faculty of UBC as an Associate Professor in the Department of Geography and Geology in 1951. He was promoted to Professor in 1959, and was Head of the Department of Geology from 1964 to 1971. Bill retired in 1984. A classical field geologist of the highest caliber, Bill was a legend among Cordilleran geologists, having made ground-breaking contributions in such diverse fields as Quaternary volcanism, seismology, regional geomorphology, glacial geology, hydrology, regional bedrock mapping, marine geology, limnology, landslides and rock avalanches, Tertiary stratigraphy, coal geology and mineral deposits. He was the first to document ice age volcanism during which lava erupted beneath thick glacier ice covering the Mt Garibaldi area. His studies at the Granduc mine documented very rapid rises of subglacial water pressure that can result in sudden catastrophic glacial outburst floods. Bill developed a method of determining the approximate chemical composition of fine-grained igneous rocks by measuring the refractive index of the glass. A veritable walking encyclopedia of western Canadian geology, Bill could give a helpful answer to almost anything about the topic one needed to ask. A Professional Engineer, Bill made important contributions to the Geological Engineering program at UBC. He was best known to

undergraduates for his two-term fourth-year course in geomorphology. Bill was a Fellow of the Royal Society of Canada and the Geological Society of America and a member of numerous societies, including the American Geophysical Union, the American Association of Petroleum Geologists, the Geological Association of Canada, the British Glaciological Society, the Arctic Institute of North America, Phi Beta Kappa, Sigma Xi, the Alpine Club of Canada and the Natural History Society of British Columbia. Bill received the Willet G.Miller Award of the Royal Society of Canada, and the C.J.Westermann Memorial Award, the primary award of the Association of Professional Engineers and Geoscientists of British Columbia

Willliam F. (Bill) Slawson (1929-2002)

Bill Slawson passed away at Sault Ste. Marie September 22, 2002 after fighting myelodysplasia for nine months. Bill was born in Ann Arbor, Michigan on July 4, 1929. He completed his B.Sc. degree at the University of Michigan where his father was Professor of Mineralogy, and in 1958 he was awarded a Ph.D. by the University of Utah upon submission of a thesis titled "Lead in Potassium Feldspars from Basin and Range Quartz Monzonites". Bill met Nancy while he was working on his PhD and she was a part time geology student and part time secretary for the Dean of Science. The Dean of Science was the match maker. They were married on June 9th, 1956, in Salt Lake City.

From Don Russell: "I first heard of Bill, and his research when I was making a short visit in 1957 to Cal Research in greater Los Angeles. Cal Research was a research subsidiary of the Standard Oil Company of California. When I was describing my own research in lead isotope geochemistry I was urged to not overlook the important research on lead deposits by Bill, who was then a Ph.D. candidate at the University of Utah. A year later Bill joined the Geophysical Laboratory of the University of Toronto as a postdoctoral fellow. When, on his arrival at the St George Street laboratories, he was parked outside the building fixing a minor problem on his car, our technician, David Beuk, was heard to exclaim in astonishment "a geophisiker with tools!" I left for UBC soon afterward and Bill took over my isotopic studies. "

Bill joined the Department of Physics at UBC in 1961. Initially his research concerned the natural distribution of lead and strontium. Later he diversified: in collaboration with the Pacific Geoscience Centre and Jim Savage of the USGS he undertook studies in earthquake recurrence and historical earthquakes He collaborated with Hector Williams of UBC's Department of Classics on ultra-shallow seismic reflection techniques for archeological exploration and with Tomiya Watanabe on EM harmonics generated by electric power lines.

While at UBC Bill served as Acting Head of the Department of Geophysics and as Assistant Dean of Science. He was proud of his Canadian citizenship, which he obtained during his years at UBC. Bill and Nancy had three children and a foster daughter: Bob lives in Rochester, New York ; Richard (married, two sons) lives in Summit, New Jersey; Diane (married, four children) lives in Sault Ste. Marie. The First Nation of foster daughter Linda (four children, Ahousat, B.C.) paid her way to Bill's memorial service as they considered Bill her father. Bill enjoyed outdoor activities, including swimming, skin-diving, hang-gliding and, of course, work on their log cabin on Lake Michigan in Northern Michigan, where he devised an electricity supply from solar panels and a windmill. After Bill's early retirement in December, 1991, he and Nancy divided their time between Vancouver and Michigan until they moved to Sault Ste. Marie, Ontario in mid-2002.

Stanley H. Ward

Stanley H. Ward of Anacortes, Washington, died Sunday, July 28, 2002, in Seattle. Stan served as Chairman of the Board of Studies of UBC Geological Engineering from February 1989 to November 1991. Originally from Vancouver, Stan obtained a B.A.Sc. degree in Engineering Physics, and the M.A. and Ph.D. degrees in Geophysics from the University of Toronto. From 1949 through 1958, as managing director and chief geophysicist for McPhar Geophysics Ltd., he became acquainted with the problems of minerals exploration and embarked on a career of solving those problems. After serving as Professor of Geophysical Engineering at the University of California at Berkeley from 1959 until 1970, he became Professor and Chairman of the Department of Geology and Geophysics at the University of Utah (1970-1980) . Stan's specialty was electrical methods. His research was published in over 100 journal articles, 42 of them in the journal Geophysics. He was a fellow or member of more than a dozen professional societies. Several of his students became noted educators and researchers. With a diverse team of scientists and engineers he made contributions to lunar exploration with an orbital radar-sounding experiment which operated successfully on Apollo 17. In 1977 Stan founded and became Director of the Earth Science Laboratory of the University of Utah Research Institute, a center of excellence for research in exploration and assessment of geothermal and mineral resources.

Karl Ricker, B.Sc., M.Sc., 1955, 1968

Upon retirement from a 26 year old consulting practice, I moved to Whistler in the summer of 2001. Have taken active role with the Whistler Naturalists, trying to keep within reach of the gusto efforts of Dr. Jack Souther (B.A.S.c. Geol. Eng., UBC, 1952) in their organization. With the Whistler Weasel Workers, we volunteered to work on the downhill race course at the Olympics in Salt Lake City. Recently I and an old UBC "flame" drove to Inuvik and back. We were fortunate to see a play "Bush Pilot" while at Inuvik. It brought back fond memories of my earlier years flying in fixed wing aircraft in often dicey circumstances. The actors received a standing ovation at the conclusion - deservedly so. Enjoyed your latest newsletter; it was a treasure-trove of information.

Chris Heath, B.Sc. Geology, 1960

Trip to Lithuania, Estonia, Latvia; visited a university geoscience department, along with US, Germany and France. Spoke at WUIGU in 2001 in Winnipeg. Have published five papers on the skills needed by geoscience based companies. Publishing research on geoscience, computer and sort skills needed by mining and oil industries in North America. Saw Tony Davison (UBC-B.Sc., M.Sc., Ph.D. Geosciences) in Regina; semi-retired.

William S. Hopkins (Steve), M.Sc., Ph.D., 1962, 1966

I am retired from any geologic activities but continue in island real estate. I'm also on several county boards and commissions including service as a Port Commissioner for the Port of Orcas. Lots of activity in these positions confirming that controversy is inversely proportional to size.

Colin Outtrim, B.A.S.c., 1973

Sorry to see that Ray Best has passed on. How I enjoyed those Saturday morning classes for first year geology. I remember Field school so well - those were great times especially the 1972 year at Oliver when two or three of us undertook the rebuilding of Vic Olacke's ('73 BASc. Geology) MG engine after the day work and late night lab work was done. Vic drove that MG for several years after field school without any engine problem. Unfortunately he was killed in a helicopter accident in October 1976 leaving a wife and two young children. I lived in the petroleum industry in Calgary most of the time since graduation but have worked in many parts of the world and have raised two boys each now with degrees. The oldest is working on his Masters degree in Mechanical Engineering Dalhousie, Nova Scotia. The youngest is teaching high school math in Calgary. My wife of thirty years is Marilyn Outtrim (nee Mills) BEd. 73 UBC.

Victor Hugo Noguera, B.Sc. Geology, 1981

First of all, my greetings to all my fellow Geology Grads in the class of '81. This is an attempt to reconnect with some or all of you after more than 21 years. I have been working for Chevron Texas since 1985, after working for two years with Petroleos de Venezuela and completing my M.Sc. in Petroleum Geology at Dalhousie University, Halifax. After working the Canadian and U.S. oil patch for 12 years, I have been assigned to overseas locations, more recently in Indonesia and Venezuela where I work as VP New Ventures. I am married to a lovely Québécoise, Elizabeth for 21 years now and have a lovely 9 year old daughter by the name of Bianca. Would love to hear from old friends. Regards and keep us proud putting UBC's Earth & Ocean Sciences department in the heights where it belongs. My address is: Chevron Texaco Overseas Petroleum, Caracas Pouch, P.O. Box 6046, San Ramon, California, 94583 USA

Henry A. Kucera, B.Sc. Geology, M.Sc., P. Geo., 1981

After writing my last exam in the undergraduate program (B.Sc. Geol - 1981) I had a celebratory beer and immediately left for a job in the oil patch (Calgary). That led to a wonderful but brief career mapping and drilling in the southern Rockies working with other UBC refugees (Brian McKewan and Dr. Barry Ryan). Unfortunately the National Energy Program came along and I retreated to a desk job at the Alberta Energy and Utilities Board where I had the good fortune to get involved in computers, numerical modelling and geostatistics. The government job turned into a career motivator and in 1989 I headed back to graduate school at the University of Victoria where I spent a wonderful time sailing, brewing beer with Dr. Ryan, and getting an M.Sc. for developing spatial data base language extensions for ISO. After a stint with the B.C. government working on TRIM and LandData BC, I formed a company with my wife (Dr. Gail Kucera) specializing in the design and architecture of large spatial databases and application systems. We have had the pleasure of working with the Geological Survey of Canada, the USGS, the Geological Survey of Ireland, and the former B.C. Geological Survey so I get to keep my hand in at Geology and other aspects of Earth Sciences. We also keep in touch with academic community through my involvement on the board of the GEOIDE (Geomatics for Informed Decisions) NCE and Gail's work with graduate students in the Geography Dept. at UVic as an adjunct. Time off is spent sailing, and travelling.

I have to congratulate you on the newsletter. The obituary of Dr. Best actually prompted me to send in this note. The last course I took at UBC was a directed studies course with R.V. and because there were only three students we frequently had a "cup of tea". I still remember him muttering that "life was a bowl of sheep dip" when he was annoyed at my ineptness as a palaeontologist.

Don Grant, BASc. Geology, M. Eng, Mining, 1981, 1986

Mine planning superintendent. With George Fisher Mine (Pb-Zn-Ag), Mount Isa Mines, Mount Isa, Queensland, Australia.. Nine years in Mount Isa in various positions. Wife Beth and children, Jake (6) and Kate (3). Looks like the rain has finally come!

Tony Fogarassy, B.Sc., M.Sc., 1983, 1989

I am practicing energy (oil & gas) law at the Vancouver law firm of Clark, Wilson. In my spare time, I sit on the board of directors of the Yoho-Burgess Shale Foundation. Please do contact me if you want to hike into the shales (tsf@cwilson.com). I keep in touch with such geo-luminaries

as Tiro Clarke, Lyndon Hanson, John Oshay, Peter Lewis, Susan Taite, Jim Murray, Bill Barnes and Marc Bustin

Sandra Bishop, B.Sc. Geology, 1985

What's new with me? James and I moved to Brisbane, Australia in March 2002. A welcome change after our four years in Holland! We have lots of room for visitors, so please feel free to contact us if anyone is planning a trip to Australia. sandra.t.bishop@bigpond.com

Lori Wickert, B.Sc. 1986

I haven't communicated with many UBC friends (except Dwayne McBeth) for awhile. Would love to hear from you. (lori.wickert@ccrs.nrcan.gc.ca) After leaving UBC I went on to University of Alberta and obtained my M.Sc. in mineralogy/geochemistry, finishing up while working full-time with Alcan Aluminium in the Saguenay area of Quebec. I married Greg Matte in 1990, a Canadian CF-18 pilot I met in Edmonton while he was stationed in Cold Lake. We now have two wonderful children, Natasha (8) and Joshua (4). We have moved four times to date, with multiple returns to the Saguenay (CFB Bagotville) and pit stops in Toronto and Ottawa (twice). Throughout this period I have remained as a geologist with Alcan, working in applied mineralogy, mines technical assistance, and deposit evaluation and modelling. We're currently in Ottawa, where I am working at the IAC at the Can. Centre for Remote Sensing on a two year project for Alcan.

Daniel A. Paulsen (formerly Klit), B.Sc., Geophysics, 1987

Went back to school in 2000 for an ITP diploma from BCIT. Changed surname from Klit to Paulsen and am now working at a new job for Crystal Decisions

Tiro Clarke, B.Sc. (Hon) Geology and Oceanography, 1988

Kathleen Dixon (B.Sc. Geology 1989) and I had our second child on June 16, 2002 - Winston Dixon Clarke. I enjoy staying in touch, even if irregularly, with classmates. Kathleen is now working with Canadian Natural Resources and is enjoying that as well.

Nancy Bepple, M.Sc. Atmospheric Sciences, 1990

After leaving UBC, I returned to MacDonald Dettwiler for three years where I worked on weather related projects for the Canadian Air Traffic Control system, and Indian weather satellite and a Swiss Air Traffic Control. I then did a year's sabbatical and did dome travelling in Europe and India as well as working on a ranch. I returned to MDA briefly, and then decided to move to Salmon Arm in the BC Interior to work for Newnes, a manufacturer of high tech sawmill equipment that use vision, laser and ultrasound to scan wood. I worked there for five years as a project manager and product manager. The I decided it was time to leave engineering companies for academia. After taking teaching courses at UVIC, 2001 I landed at The University College of the Cariboo in Kamloops as a Co-op Coordinator for Computing Science. It's a great way to stay connected with technology and have contact with students too. Throughout all of this, I've been kayaking, banjoing, fiddling and back-country skiing. This past summer, Barb and Ken Shaw took me on some great white water river trips.

Doni Jacklin, B.Sc. Geology, Education (1992), 1990

After teaching grades 6-9 for the past ten years, I am taking the next few years off to explore motherhood with my new baby girl, Camille. Married Jerry Gratton (B.Ed., UBC, 1992) in 1996. Still playing hockey occasionally. Living in Kitsilano.

Robert Walker, B.Sc. Geophysics, 1992

After the B.Sc. in Geophysics, I jumped ship to computer science, doing a second B.Sc. and M.Sc. I've just completed my Ph.D. and am now working as an assistant professor at University of Calgary.

John A. Berges, Ph.D. Biological Oceanography, 1994

I have taken a new position as an Assistant Professor at University of Wisconsin-Milwaukee, Department of Biological Sciences.

Laura Prellwitz (Ferguson), B.Sc. Geology, 1996

Married to Ryan Ferguson August 18, 2001. (We met at UBC in 1992 in Totem Residence). Travelled to Portugal and Spain in June 2002 for our honeymoon. Currently working in Calgary as an exploration geologist in the oil and gas industry.

Jeff Lewis, B.Sc. Geology, 1997

No longer a geologist. Left Homestake/Barrick after 11 great years in September 2001. Went back to UBC to get my teaching degree (B.Ed.) and currently teaching high school science(s) in Richmond and Surrey.

Jane Kan, BASc, 2000

I am now doing my MSc. At University of California at Berkeley.

Anthony Fielding, Ph.D. Oceanography, 2000

I recently completed my Chartered Accountant qualifications and am now a fully licensed Chartered Accountant. My wife Sonya, children, Meaghan (4) and Matthew (1.5) moved to our native Nova Scotia where I currently work with Fraser & Howatt, a small CA firm in Halifax. I plan to maintain my involvement in Science. I am currently involved in a committee that is interested in preserving a system of lakes and streams near our residence outside Halifax.

Martin L. Stewart, M.Sc. Geology/Volcanology, 2002-03

Thanks for the good times!

Simon Haynes, M.Sc. Geology, 2003

Have a four month contract position with Shell Canada in Calgary. Will likely stay in oil exploration. EOS is a great department. Overall I had a very positive experience at UBC.

THE UNIVERSITY OF BRITISH COLUMBIA

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