

The University of British Columbia
Department of Earth and Ocean Sciences

ALUMNI NEWSLETTER

No. 3: January 2000

Dear Alumni and Friends

This letter, the third of a series to keep you informed of our activities, covers the period from January to December 1999. Over the past year many changes have been taking place within the department, the university and the national science scene. I would like to bring several these to your attention in this overview with elaboration on a number of these within the body of this report.

Two major initiatives of the Government of Canada are having a major impact on the research environment in Canadian academic institutions. In the fall of 1999 a new program supporting university research – the 21st Century Chairs for Research Excellence was announced. Over the first three years of the initiative 1,200 research chairs will be created, at a cost of \$180 million. Based on its research record, UBC anticipates receiving between 100 and 120 chairs over the next three years. On the average, this is one chair per year for each department in the Faculty of Science. EOS has framed its proposals in the area of Environment and Global Change and at this stage has four proposals under consideration at the Faculty of Science level: global process modelling, geodynamic process modelling, microbiology of geological environments, and biological oceanographic processes and ecosystem dynamics. We would collaborate on a number of complementary proposals from other departments. The five year program of the Canada Foundation for Innovation, launched in 1997, complements the new chairs with an injection of \$800M in research funds. In the current competition, Jim Mortensen leads a proposal for a Centre for Isotopic and Geochemical Research, Roland Stull and colleagues have a proposal for a Geophysical Disaster Computational Fluid Dynamics Centre and Michael Bostock is a co-investigator in the multi-institution POLARIS submission to fund portable seismological and magnetotelluric arrays. The UBC applications are expected to receive partial support from the UBC Blusson Fund established by Stewart Blusson (B.Sc. 1960) and the BC Knowledge Development Fund.

In April the department considerably expanded its activity in atmospheric sciences when the administrative home of the Atmospheric Science Program, and two-thirds of the academic appointments of each of the three physically-oriented atmospheric scientists in Geography

(Phil Austin, Douw Steyn, Phil Austin) were transferred to Earth and Ocean Sciences.

The continued generosity of our friends in the private sector is extraordinary and is currently more significant than ever given the financial constraints within the university arising from the provincial economic situation and the tuition freeze imposed by the provincial government, which has resulted in tuition income significantly below the national average. Our prognosis is that we will lose two more faculty positions in the next fiscal year. In EOS our pain has been alleviated by the presence of three endowed faculty positions.

In November, a review of the department was conducted by a distinguished external panel. This is a normal procedure upon the retirement of a departmental Head to provide an independent assessment of the department for the Faculty and assist the department in defining its goals over the following five years. The panel consisted of David Chapman, University of Utah, chair (a geophysicist), Margaret Delaney, University of California at Santa Cruz (a marine geochemist), Hewart Helmstaedt, Queen's University (a structural geologist), Mark Harrison, University of California at Los Angeles (an isotope geologist) and David Nelson, Oregon State University (a marine biologist). The report is expected in early 2000.

I encourage each of you to explore the details of our activities – we have a remarkable group of faculty, staff, and students, both undergraduate and graduate – and to provide feedback to us through the enclosed “Keep in Touch” form. At this time I express my appreciation to Professor Emeritus Dick Chase who has provided invaluable assistance behind the scenes in assembling the material for this and the previous two newsletters.

As implied above, my term as Head ends in June. I thank my colleagues – faculty, staff and students – for the support they have provided for me as we have forged this new department. I wish my successor, who is expected to be appointed in the next two months, every success in moving the department forward.

Bob Ellis, Head

Research Highlights

Awards to Faculty and Research Staff

Bruce Buffett is the winner of a Killam Graduate Teaching Prize. One sentence from the citation provides some insight into his skills: "Bruce epitomizes the statement that superlative teaching and superlative research go hand in hand. His presentations are invariably like jewels: exquisitely crafted and glittering with value."

Greg Dipple has received the 1999 Volunteer Award of the Geological Association of Canada. Greg served on the Cordilleran Section Executive Council for the period 1993-1998 and was President for the last two years of that term. Greg is also the recipient of a UBC Izaak Walton Killam Memorial Faculty Research Fellowship during his sabbatical in the calendar year 2000. Greg, who studies and models fluids in the Earth's crust, will be based at UBC but travel to institutions in both Australia and the U.S.

Lee Groat has been awarded the Mineralogical Association of Canada's Young Scientist Award (for achievement by an individual under 40). The citation states in part that Lee "has already published almost 50 papers in highly respected periodicals..... These publications have established his international reputation for high quality research. Equally important, Lee has demonstrated to mineralogists a commitment which extends beyond his own research interests..."



William Hsieh is a Peter Wall Institute of Advanced Study Distinguished UBC Scholar in Residence for the year 2000. During his tenure of this award, William plans to continue this research on seasonal climate prediction using neural network models, and to write a graduate text on neural networks in the environmental sciences.

Doug Oldenburg and Yaoguo Li (formerly a Research Associate with Doug) were awarded the G.W. Hohmann Memorial Award for the most outstanding paper in electrical geophysics published in the past 7 years.. The paper shows induced polarization (IP) data can be rigorously inverted to construct subsurface distributions of conductivity and chargeability that gave rise to the data. This greatly increases the usefulness of IP surveys in applications such as mineral exploration and environmental problems. The research in the paper resulted in a computing code that was distributed to industry and has also been incorporated into undergraduate labs. Its purpose is to show the necessity (and practicability) of inverting IP data, and it also is a great tutorial for teaching the rudiments of geophysical inversion.



Professor Emeritus **Tim Parsons** has been awarded the Murray A. Newman Award for Excellence in Aquatic Research. This award through the Vancouver Aquarium provides an honorarium of \$1,000.

Adjunct Professors **Chi Sing Wong and Kenneth Denman**, both at the Institute of Ocean Sciences in Sidney, have both been elected Fellows of the Royal Society of Canada

Exceptional Funding to Faculty

Garry Clarke and Ron Clowes hold NSERC Research Grants in excess of \$100,000 per year. Garry's grant is entitled "Causes and mechanics of glacier surging" while Ron's is for "Seismic reflection, refraction and other geophysical studies of the lithosphere".

Rosemary Knight has been awarded \$US371,920 over four years from the U.S. Department of Energy for a study entitled "The use of radar methods to determine the moisture content in the vadose zone".

Doug Oldenburg has received Natural Science and Engineering Research Council (NSERC) Industrial Oriented Research funding of \$135,000 for "Inversion and modelling of applied geophysical electromagnetic data". This is matched by \$144,000 from a consortium of Canadian and international mining companies.

Tom Pedersen received an NSERC Equipment Grant of \$227,000 for a stable isotope mass spectrometer.

Applications to the Canada Foundation for Innovation

This federal government corporation was launched in 1997 to strengthen Canadian capability for research. An up-front investment of \$800 million was provided for a five-year program. The foundation operates on the principle that its investments are made in partnership with the private and voluntary sectors as well as the provincial governments with the foundation contributing 40% of the total costs. In 1998, Curtis Suttle received \$200,000 towards establishing his laboratory in molecular marine microbiology and virology.

In the second competition, two projects have been submitted with EOS faculty as principal investigators with matching funds from the UBC Blusson Fund and applied for from the BC Knowledge Development Fund.

(i) UBC Centre for Isotopic and Geochemical Research

The Project Leader is **Jim Mortensen** with 13 colleagues from EOS, Simon Fraser University, University of Victoria and University of Alberta. Requested is \$2.634M to establish a new centre of excellence in radiogenic and stable isotope and geochemical research at UBC. This centre will comprise new mass spectrometry and clean laboratories (both in final planning stages) as well as a major expansion of the analytical

capability of the facility. We hope to acquire four new mass spectrometers, including an additional thermal ionization mass spectrometer, a laser fusion Ar-Ar mass spectrometer, a laser ablation light stable isotope mass spectrometer and a high resolution ICP-MS. The new facility will be one of the best equipped laboratories of its kind in North America, and will form the focus for a very broad range of research including paleo-oceanography, global tectonics, mineral deposit studies, global change, and environmental geochemistry.

(ii) Geophysical Disaster Computational Fluid Dynamics Centre.

Roland Stull, the Project Leader, is supported by 14 colleagues from EOS, Geography, Forest Sciences, Agricultural Sciences, Mechanical Engineering, Institute of Ocean Sciences and Environment Canada. The request is for a 288 processor Beowulf cluster computer with 3 workstations at a total cost of \$1.385M. The goals are to develop methods to improve numerical weather predictability over mountainous and coastal regions. To achieve this, they will study fluid-dynamical processes that govern weather-related disasters and apply results as real-time forecasts at high resolution to predict forest fire storms, cyclones, avalanches, floods, and other hazards affecting the economy of Western Canada.

In addition, **Michael Bostock** is a co-investigator on the \$9.932M POLARIS submission being headed by Gail Atkinson of Carleton University. This project will fund seismological and magnetotelluric portable arrays for use in investigating the lithospheric structure and earthquake hazard of the Canadian landmass. The proposal is a multi-institutional collaborative venture between academia (Carleton, UBC, UWO, Queen's and UManitoba), government (GSC Continental Geoscience and National Earthquake Hazards programs; Ontario Power Generation), and industry (Nanometrics, BHP, Monopros, Winspear). The UBC portion of the matching funds will be from the Blusson Fund and applied for from the BC Knowledge Development Fund.

Fifth International Symposium on the Jurassic System

The geography of the modern Earth had its origins in the Jurassic when, 200 million years ago, the supercontinent Pangea began its slow break up. Under the sponsorship of the International Union of Geological Sciences, EOS recently hosted the Fifth International Symposium on the Jurassic System whose purpose is to encourage and coordinate research on environmental change during this eventful 60 million year span. The first of these meetings was held in Germany (Nuremberg, 1984) followed by Portugal (Lisbon, 1988), France (Poitiers, 1991) and Argentina (Mendoza, 1994). Vancouver's meeting was attended by 170 delegates who presented a wide spectrum of research results dealing with extinctions, time scale calibration, sequence stratigraphy, biogeography, ocean chemistry and regional geology. Proceedings of the meeting are published as "Advances in

Jurassic Research 2000" edited by R. Hall and **P.L. Smith** and available from Trans Tech Publications, Zurich.

The fully booked field trips were logistically challenging but made a lasting impression. Two pre-meeting trips ran through the desert of western Nevada, and from Calgary to Vancouver. A side trip to the Burgess Shale site came under the heading "Pre-Jurassic". Post-meeting trips visited the Queen Charlotte Islands and traversed the Coast Mountains, the latter including helicopter-supported work at high elevations. Copies of the Field Guide (ed. P.L. Smith) are available from the Geological Survey of Canada's bookstore on Robson St.

The word 'Jurassic' has a certain general appeal and so we decided to broaden the scope of the Symposium and include the general public. Coverage of the meeting appeared in both Vancouver's newspapers as well as on CBC radio and 3 television stations. This ensured an enthusiastic response to a lecture by Jim Haggart (GSC) on the Jurassic geology of the Queen Charlotte Islands and to two lectures on Jurassic dinosaurs by the colorful Bob Bakker, one talk for children and one for the general public. Even without the input of Industrial Light Magic (creators of Jurassic Park) whose sponsorship we courted, the kids were keenly interested and came away happy. (Contributed by Paul Smith)

Mineral Deposits Research Unit

In the spring, the year-long transition of Directors was finally completed when **Dick Tosdal** joined MDRU in April after some interesting twists and experiences with immigration. Upon Dick's arrival, **Ian Thomson** resumed his position as Chairman of the MDRU Advisory Board. Since April, 1999, much change has occurred at MDRU. The Magmatic-Hydrothermal project coordinated by **Jim Lang** ended. **Jim** has since become a consultant to the mining industry. **Tim Baker**, a post-doc on the project, left to become a Lecturer at James Cook University in Townsville, Australia. We wish them well in their new careers, and look to future scientific collaborations. **Rob MacDonald**, **Rob Duncan**, and **Vanessa Gale** successfully defended their graduate theses.

A new project, begun by **Tim Baker**, **Jim Lang**, and **Jim Mortensen**, was funded by a consortium of mining companies with matching NSERC funds. The project focuses on the granite-associated gold deposits that are attracting considerable exploration effort in Alaska and Yukon. **Shane Ebert** joined MDRU in the summer as the project coordinator. Shane comes to us from industry where he managed a small exploration company in the Great Basin (Nevada). **Nancy MacDonald** began her graduate research at the Longline deposit. **Tim Baker** continues his association with MDRU through the Intrusive Au project, and has two graduate students in the Yukon, one at Brewery Creek and the other investigating the thermal aureoles of Tombstone Intrusive Suite granitoids. Another project beginning in 2000 takes an incoming graduate student south of the equator to investigate the volcanogenic massive sulphide deposits at Tambo Grande (Peru), and a third focuses a post-doctoral fellow or graduate

student on the giant sedimentary rock-hosted gold deposits of Nevada.

During the year, the Fund Raising Committee raised cash to bring the Endowment Fund to \$2.07 million, providing a firm cash flow to support the infrastructure of MDRU. A new initiative, developed under the direction of **Harlan Meade** of Expatriate Resources Ltd., secured an exemption from the BC Securities Commission to permit junior mining companies to contribute treasury shares to the MDRU Endowment Fund in return for multi-year memberships. This initiative permits junior mining companies to become members and benefit from research relevant to their needs and interests. Several companies have already taken advantage of the exemption, and we welcome their involvement in MDRU.

In the spring, **Pat Sheahan** of Konsult International offered MDRU her collection of literature pertinent to diamonds, kimberlites, and related rocks. This library, among the best in the world, helps expand the services of MDRU to include the diamond industry, which is very quickly calling Vancouver home. The collection will arrive during 2000 after final details are arranged. Learning about tax law has been an invaluable(?) lesson to MDRU staff!



10th Anniversary for UBC-GIF



This year **Doug Oldenburg** and members of his geophysical inversion facility (known as UBC-GIF) celebrated ten years of successful research into the theory and application of geophysical inversion. The UBC-GIF was started in 1989 with funds from the B.C. Science and Technology Fund. Its mandate was to establish a local centre of excellence to

develop new computer technologies for mineral exploration and to interact with industry on research projects of mutual interest. Research funding has been maintained by a consortium of mining companies and NSERC.

Major achievements over the last decade include development of theory and practical algorithms for inverting surface, borehole and airborne data gathered by magnetic, DC resistivity, Induced Polarization, and gravity surveys. Inversion of these data sets respectively recovers three-dimensional distributions of magnetic susceptibility, electrical conductivity, chargeability and density. The numerical codes that accomplish these tasks are being successfully implemented by major mining companies as well as by smaller contractors and independent consultants. The figure below shows surface magnetic field data acquired in Quebec, and a volume rendered 3D distribution of

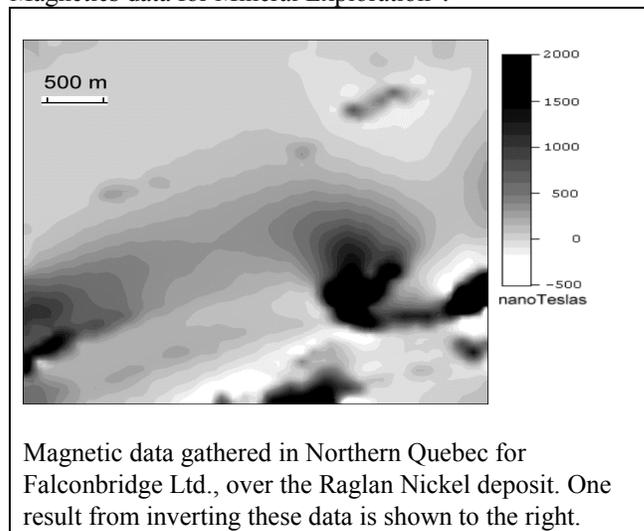
magnetic susceptibility resulting from inversion of these data.

Current research at UBC-GIF is focussed on developing 3D forward modelling and inversion algorithms for time-domain and frequency-domain electromagnetic data. Research for the IMAGE consortium (Inversion and Modelling of Applied Geophysical Electromagnetic data) is being carried out in co-operation with Scientific Computing and Visualisation group in the Department of Computing Science at UBC.

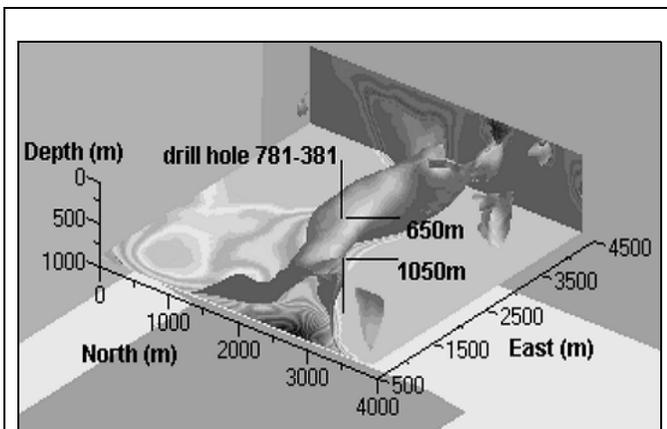
Applications for 3D electromagnetic imaging abound in mineral exploration and in ore delineation problems. There are also additional near-surface imaging applications. For example, two areas of active research are the development of methodologies for discriminating between scrap metal and unexploded ordnances, and inversion of surface NMR (nuclear magnetic resonance) data to recover information about subsurface water content.

In 1997 we formally established our OUTREACH program that is co-ordinated by **Francis Jones**. The goals are three fold: (1) to make our inversion codes available to academics, or commercial companies, through license agreements with UBC, (2) to develop Web-based case histories showing where geophysical inversions have been useful so that non-specialists can see the applicability, and need, for carrying out geophysical surveys, and (3) develop an inversion tutorial Web site so that geoscientists can understand more about geophysical inversion. Our Web site is (<http://www.geop.ubc.ca/ubcgif>).

To facilitate technology transfer we offer an annual workshop. The next workshop is at the Society of Exploration Geophysicists meeting in Calgary, August, 2000, and is entitled "Inversion of DC resistivity, IP, and Magnetics data for Mineral Exploration".



Magnetic data gathered in Northern Quebec for Falconbridge Ltd., over the Raglan Nickel deposit. One result from inverting these data is shown to the right.



Model of subsurface magnetic susceptibility after 3D inversion of magnetic data. Volume rendered image emphasizes the susceptibility = 0.04 isosurface. The drill hole intersected 350 m of magnetic rocks including five metres of ore-grade deposits.

Acknowledgement of Research Support

We acknowledge support from the following companies and agencies for research projects within the department: ACS Petroleum Research Fund, AEC West, AGIP, Anglo American, BC Ministry of Forests, BC Ministry of Energy Mines and Petroleum Resources, Cominco., Billiton, Boliden, Cogema, Barramundi Gold, Barich Petroleum, Barrick, BC Hydro, Cameco, Canadian Space Agency, Cogema, Cominco, CP Rail Domtar, Environment Canada, EWOS, Falconbridge, Fisheries & Oceans Canada, Forest Renewal BC, Geological Survey of France, Government of Yukon, Homestake, Imperial Oil, INCO, Independence Mining, Institute of Applied Energy (Japan), International Copper Research Association, Japan Oil Corp, Kinetek, M.I.M. Exploration, MuskoX Minerals, National Science and Engineering Research Council, National Science Foundation (US), Natural Resources Canada, Newmont, NORCEN, Placer Dome, Pulsonic Geophysical, Rio Tinto Iron & Titanium, Shell Canada, Teck, Texseis, Trumpeter Yukon Gold, UniRoyal, US Department of Energy, Whitegold Resources.



David Jones and Trish Bellchamber aboard *Vector* off Cape Flattery sampling nutrients as part of a project to measure tracer fluxes through the Strait of Juan de Fuca.

Student News



R.M. Bustin on shore with students at 2nd year geology field school, Saltspring Island

Awards to Graduate Students

Alice Chang, for a paper co-authored with Kurt Grimm and L.D. White, received the 1998 Outstanding Paper Award for the SEPM journal *Palaios* for a paper entitled "Diatomaceous sediments from the Monterey Fm, Ca: a lamina-scale investigation of biological, ecological and sedimentary processes". The paper contained an innovative interpretation of the laminae involving subseasonal climatic processes.

Stephan de Wekker, a Ph.D. student with Douw Steyn, has been awarded a Canadian International Airline Pass to attend and present his research at the Mesoscale Alpine Programme workshop in Bohinjka Bistrica. Stephan's research project is one component of this program.

Gwenn Flowers received two best paper awards: An Outstanding Student Paper Award at the American Geophysical Union 1998 fall meeting for a presentation entitled "Multicomponent coupled model of Trapridge Glacier Hydrology"; and the D.M. Gray award for the Best Student Paper in from the Canadian Geophysical Union based on a 5-page written paper and oral presentation entitled "Modelling Constituent Interactions in Glacier Hydrology". Both papers were co-authored with Garry Clarke.

Richard Harris received an American Association of Petroleum Geology Archie International Grant to support his research on the Triassic Doig Formation in northeastern British Columbia. At the 1999 Canadian Society of Petroleum Geologist Meeting in Calgary, **Rich** tied for first

place with **Brent Nassichuk** in the poster session. Paper titles were "Petroleum geology and reservoir trends of Doig formation sand bodies from Tommy Lakes in northeastern British Columbia to Sinclair in west central Alberta" and "Depositional History and Reservoir Development of the Lower Triassic Montney Formation, Northeastern British Columbia", respectively. Marc Bustin co-authored both papers.

Michelle Hawke received the award for best student presentation at the 1999 meeting of the Canadian Society of Organic Petrology for a paper co-authored with F. Goodarzi and Marc Bustin entitled "Peat as a repository of atmospheric trace metal deposition: Some preliminary findings". **Michelle** and **Tom Rozak** received the 1999 Antoinette Lierman Medlin Field Awards for Ph.D. and M.Sc. candidates respectively from the GSA Coal Division.

Kris Innanen has received the 1999 Canadian Remote Sensing M.Sc. Thesis Award for his thesis at York University entitled "Approaches to the Direct Extraction of Forest Canopy Variables from High-Spatial Resolution Winter Reflectance Imagery".

Stuart Knoop has been awarded a Geological Society of America grant of to support his M.Sc. studies on "Structural and geochemical investigation of fluid migration through the thrust sheets of the Dogtooth and Main Ranges, British Columbia".

Steve Piercy was awarded a from the Society of Economic Geologists' Hickok-Radford Memorial Fund. His research deals with the Proterozoic evolution of Metavolcanic Rocks and volcanic massive sulphide deposits in the Finlayson Lake District, Yukon-Tanana Terrane, Southeastern Yukon.

Alison Rust has been awarded the Gelinas Silver medal for the best MSc thesis in volcanology or igneous petrology. Her thesis is entitled "Mapping of modern pyroclastic deposits with ground penetrating radar: experimental, theoretical and field results".

Raphael Wust received an AAPG Energy Minerals Grant and a GSA Foundation award to support his research on tropical peats. He's investigating chemistry and sedimentology of the Taseka Bera mire in Malaysia. Raphael received first honorable mention for his paper "Detrital and organic sediments in the dendritic, intermontane basin of Tasik Bera, West Malaysia: analogues for coal deposits" presented at the 1998 GSA annual meeting 1998 in Toronto. Raphael has also has been awarded a Canadian International Airline Pass which he will use to attend the International Geological Congress in Rio de Janeiro and present a paper co-authored with Marc Bustin entitled "Comparing landsat-TM and aerial photo-based classification methods for analysis of organic

sediment composition of a sedge/forest system in west Malaysia (Tasek Bera)".

Scholarships

Holders of Major Graduate Awards (full awards are greater than \$15,000 per year)

Deutscher Akademischer Austauschdienst: Stephanie Kienast

North Atlantic Treaty Organization/UGF: Bruno Cagnoli

Natural Sciences and Engineering Council of Canada: Trisha Bellchamber, Cari Deyell, Rina Freed, Tara Ivanochko, Stephen Moysey, Nancy MacDonald, Tarun Nayar, Jacqueline O'Connell, Alice Ortmann, Tawnya Peterson, Stephen Piercy

UBC Killam: Marcus Kienast, Peir Pufahl

UBC University Graduate Fellowship (UGF): Timothy Creyts, Nicole Jeffrey, Craig Nichol, Nelson Sherry, Martin Stewart (partial)

In addition, NSERC Postdoctoral Fellowships were awarded to Chris Daughney, a postdoctoral fellow working with Rosemary Knight, and to Diana Varela to work at the University of Ottawa and the University of California, Santa Barbara, respectively while NSERC Postgraduate Scholarships were awarded to Mathieu Dumberry and Richard Taylor for study at Harvard and Waterloo, respectively.

Departmental Scholarships to Graduate Students

Scholarships from the Department's MacKay Scholarship Fund were received by Petros Gaganis, James Irving, Steve Israel, Keith Patterson, Tina Roth, David Timothy, Daniel Trad, Fern Webb, Kim Welford, and Raphael Wust.

Undergraduate Scholarships

For the year 1999-2000, the Department gave out approximately \$107,000 in awards to 64 undergraduate students. Some departments do not have enough money to offer awards to all qualified students, but we are fortunate to be able to give awards to all qualified students in geology, geophysics, and geological engineering. Most of the funds come from bequests to the department from our alumni and from industry and professional organizations, and our students benefit greatly from this generous financial support. To be eligible for departmental awards a student must take a full load of courses, have no failed courses, and maintain a minimum average of 75%.

A significant increase in departmental awards for undergraduate and graduate students will occur next year as we will be accessing funds from the Lorntzsen bequest for the first time.

Enrollments: Current year data, with previous year data, where available, in parentheses.

Degree	ATSC#	GEOL/ GENG	GEOP	OCGY	Totals
*Bachelor's	10	137/82	30	6	265
MSc	5	25(28)	11(11)	9(9)	50(48)
MASc MEng	-	14(12)			14(12)
PhD	9	19(17)	20(15)	19(16)	67(48)
Totals**	14	58(57)	31(26)	28(25)	131(108)

*Third and fourth year only #Atmospheric Science **Total Grad Enrollment

First Nations Outreach

Mary Lou Bevier continues to be active in promoting geoscience to First Nations students. She was invited to speak on geoscience careers to aboriginal high school students at the National Aboriginal Achievement Foundation's "Blueprint for the Future" career fair and conference on February 9, 2000 at the Vancouver Convention Centre. Along with Judy Thompson of Northwest Community College in Prince Rupert, BC, she is writing a first year university geology curriculum that is place-based and culturally relevant to the Tahltan, Nisga'a, Gitksan, and Tsimshian peoples of the North Coast of BC. This curriculum is part of the US Geological Survey's Earth Science for Indigenous Peoples project.

News from Student Clubs

Dawson Club - Report by Jennifer Dicus, President

The aims of the G.M.Dawson Club, to meet the needs of undergraduates in EOS by strengthening connections with industry, promoting social events, and conducting new and exciting field trips, were all attended to. Twenty-five students participated in a weekend fieldtrip to Mount St. Helen's in late October, planned primarily to inspire students with some in-your-face geology. Invited speakers from industry presented talks during the first term (the overwhelming turnout from the students had nothing to do with the pizza lunch served after the talk). Representatives from the Association of Professional Engineers and Geoscientists of BC came to the campus and informally discussed professional registration and the possibility of student membership with APEGBC.

In January, the busiest month for the Club, a group of students attended the Western Inter-University Geologic Conference in Calgary for four days. This conference allows undergraduates at Western Canadian universities to discuss their current research and upcoming career possibilities. At the end of January, all EOS undergraduates were sponsored to attend the annual Cordilleran Roundup of the British Columbia and Yukon Chamber of Mines to discover what is going on in the mining and exploration

industry. Club volunteered to help with the running of the Conference, along with organizing and running a hospitality suite during one evening. The Club is setting up gold panning troughs and a "geology table" for this year's Science Week at UBC. Successful social events have included the "Back from the Bush" and Halloween bzzr gardens. Import-Bzzr Night and EO-Talent Night are events to come.

Georox Club - Report by Paul Wilson and Daryl Dufault, Joint Presidents

In 1999 GEOROX has been active in numerous activities with high participation from second, third and fourth year Geological Engineering students. Several students attended the APEGBC conference in Victoria this year and students have been regularly attending Vancouver Geotechnical Society meetings. The model for the Engineers' Ball in 1999, also displayed at the student night of the Canadian Institute of Mining, was a tailings dam failure. Two GEOROX members participated in a field trip to Hawaii with the Dawson Club over reading week. Highlights of 1999 included the Back from the Bush Beergarden, the Halloween Beer Garden, the GEOROX Christmas Party, the Engineers' Ball, EO-Talent night, and the Year-End Dinner. A strong athletic group participated in volleyball, ice hockey, softball, Storm the Wall, Roundup Hockey Tournament, and Perry Cup.

The Geological Engineering Ball Model, which was built by **Paul Wilson** and **Daryl Dufault**, won second prize at the 80th Annual Engineers Ball. The model demonstrated a dynamic slope failure caused by increased pore water pressures and toe erosion. The competition was stiff as we were up against all of the other engineering departments. We will be presenting our model again at the annual CIM (Canadian Institute of Mining) student night on February 25, 1999.

Student Chapter of the Society of Economic Geologists - Report by Steve Piercey, President

The 1999-2000 year has seen an increase in membership to fourteen. With the exception of myself there has been a turnover in the executive: new members include **Keith Patterson** (Vice President), **Scott Heffernan** (Secretary/Treasurer) and **Dean Gagnon** (Undergraduate representative). The faculty sponsor this year is **Dick Tosdal** (Director, MDRU). A field trip to the Great Basin in Nevada May 9th-18th in conjunction with the Great Basin Symposium will provide an opportunity to see the various styles of gold deposits within the Great Basin, for which very few Canadian examples exist. The trip, to be led by **Dick Tosdal** and **Shane Ebert** (Research Associate, MDRU) will include eight student chapter members and two government geologists. A request to the parent society for fieldtrip funds is presently under consideration. Other activities planned for 2000 include a trip to the Myra Falls volcanic massive sulphide deposit (March) and the continuation of the SEG lecture series. Anyone wanting

information on the student chapter of SEG, or who would like to be put on the mailing list can contact me at the Department of Earth and Ocean Sciences (604-822-6654, fax. 604-822-6088, Email: spiercey@eos.ubc.ca)

Graduate Theses Completed in 1999 Supervised by EOS Faculty (Name of Supervisor in Brackets)

Asterisked items were programs in other departments

Ph.D.

Bourque, Marie-Claude: Effects of Coastal Currents on Pacific Salmon Migration Inferred from a Fine-Resolution Numerical Model (P. Harrison)

Calderwood, Arthur: Mineral Physics Constraints on the Chemical Composition and Temperature of the Earth's Mantle (B. Buffett)

Chan, Christina: Waves, Scale, Sand, and Water: Dielectric Constant of Unconsolidated Sediments (R. Knight)

Marchildon, M.-F. Nathalie: Petrologic Studies of Process Interactions in Metamorphic Systems: Deformation and Metamorphism in the Selkirk Allochthon Orogenic Wedge; and Feedback Mechanisms During Reactive Fluid Flow (G. Dipple)

Mihaly, Steven: Nonlinear Interaction of Inertial and Semidiurnal Currents in the Northeast Pacific (R. Thomson)

Parney, Robert: Statistical Continuum Model of Mass Transport Through Fractured Media, in Two and Three Dimensions (L. Smith)

Routh, Partha: Electromagnetic Coupling in Frequency Domain Induced Polarisation Data (D. Oldenburg)

Santoso, Edi: Surface Fluxes and Vertical Profiles in the Radix Layer (R. Stull)

Zatsepina, Olga: Hydrate Formation in Natural Environment (B. Buffett)

M.A.Sc.

Hazzard, Jenny: Risk Analysis of Landslides Affecting Major Transportation Corridors in Southwestern British Columbia (O. Hungr)

Rossel, Katherine: A Hydrogeological and Geochemical Study of the Origin and Nature of the Prairie Flats Uranium Deposit, Summerland, BC (R. Beckie)

M.Sc.

Basciano, Laurel: Mineralogy and Crystal Structures of Barium Silicate Minerals From Fresno County, California (L. Groat)

Bell, Cameron: Origin of Sulphides Associated with the Spy Sill, Klu Property, Kluane Belt, Southwest Yukon (A.J. Sinclair)

Duncan, Robert: Physical and Chemical Zonation in the Emerald Lake Pluton, Yukon Territory (J.K. Russell)

Eurin, David: Circulation and Cross-shelf Exchanges Over an Irregular Coastal Topography (S. Allen)

Gale, Vanessa: Characteristics and Formation of the Jeronimo Sedimentary Rock-Hosted Disseminated Gold Deposit, Stacama Region, Chile (J. Thompson)

Hebel, Manfred: U-Pb Geochronology and Litho geochemistry of the Hope Bay Greenstone Belt, Slave Structural Province, Northwest Territories, Canada (J. Mortensen)

***Hinch, Scott:** Bioenergetics of Spawning Behaviour in Stuart River Sockeye Salmon Based on EMG Telemetry (G. Ingram)

La Prairie, Douglas: Investigating Heinrich Events: A Continuum Model of Iceberg Drift and Sedimentation (G. Clarke)

***Lanthier, Kira:** Sources of Ga, In, Zr and Hf to the Coastal Waters of the California Current System (K. Orians)

Li, Camille: The Effect of Surface Wettability on the Dielectric Properties of Contaminated Sands (R. Knight)

MacDonald, Robert: Geology and Litho geochemistry at the Hidden Creek Massive Sulphide Deposit, Anyox, West-Central British Columbia (R. Chase and J. Thompson)

Neilson-Welch, Laurie: Saline Water Intrusion from the Fraser River Estuary: A Hydrogeological Investigation Using Field Chemical Data and a Density-Dependent Groundwater Flow Model (L. Smith)

Pasion, Leonard: Detecting Unexploded Ordnance with Time Domain Electromagnetic Induction (D. Oldenburg)

Taylor, Richard: Modeling Elastic Wave Velocities in Porous Media: Frequency-Dependent Effects of Heterogeneity at the Pore- and Patch-Scale (R. Knight)

Torcolini, Joel: Ozone and Aerosol Prediction in the Lower Fraser Valley of British Columbia: A Neural Network Approach (I. McKendry)

Tovey, Christine: The Relation Between Marine Survival Rates of Robertson Creek Chinook Salmon (*Oncorhynchus tshawytscha*) and Their First Marine Year Lengths and Growth Rate (A.G. Lewis)

Walker, Sean: Inversion of EM Data to Recover 1-D Conductivity and a Geometric Survey Parameter (D. Oldenburg)

Welford, J. Kim: Lithospheric Structure Across the Canadian Cordillera of Northeastern British Columbia From Seismic Refraction and Potential Field Data (R. Clowes)

Faculty News

Appointments

Maya Kopylova, an igneous petrologist, joins the department effective April 1. Maya received her Bachelor's and Master's degrees from Lomonosov Moscow State

University and her doctorate from Schmidt Institute of Physics of the Earth. The latter is the premier Russian institute in earth science. Following her Ph.D., she held a research position at the Schmidt Institute but took leaves for postdoctoral fellowships at the University of Capetown, Macquarie University and the University of British Columbia. At Capetown she worked with Professor J.J. Gurney and at Macquarie with Professor Suzanne Y. O'Reilly, both outstanding mantle petrologists with interests in the formation and preservation of diamonds. Dr. Kopylova's research has focused on the nature of the continental mantle underlying the continents. Her studies address the thermal state, the stratigraphy and the processes that have shaped these inaccessible portions of the earth. Thus her research encompasses aspects such as the formation of kimberlite mantle magmas and the thermal evolution of mantle rocks. Experimentally this involves the examination of xenoliths from different tectonic settings and investigations of their petrology and geochemistry. Results of her research contribute directly to diamond exploration and thus her programs have been largely subsidized by industry funding. This position is funded by the Norman Keevil Chair in Mineral Exploration.

Ulrich Mayer, a hydrogeologist, joins the department on September 1. Ulrich holds a Diplom-Ingenieur in Civil Engineering from the University of Stuttgart and a Ph.D. from the University of Waterloo. He currently holds a postdoctoral appointment at the latter institution. Ulrich's expertise is in the development and application of reactive solute transport models, which describe gas and water transport in saturated and unsaturated porous materials, coupled with geochemical reactions. The original motivation was to study mine tailing effluents but the scope was broadened to cover other applications. Currently the department has considerable expertise in both groundwater transport and mineralogy – this appointment bridges the gap between these areas and provides the department with a high level of expertise in this rapidly advancing research area. This appointment, funded by the Cominco Chair in Minerals and the Environment, will add strength to the Geological Engineering Program.

Stuart Sutherland joins the department as a lecturer in January. Stuart holds a B.Sc. from Plymouth Polytechnic and a Ph.D. from Leicester in palynology. He has held a postdoctoral fellowship at the Natural History Museum, short-term lecturing appointments at Brunel and Saskatchewan and has been employed in the petroleum industry. Stuart will strengthen our undergraduate teaching program through his responsibility for first year laboratories, organization and participation in field schools as well as through classroom lecturing. It is anticipated he will also be a leader in outreach activities.

Expansion of Atmospheric Science Activities in EOS

In 1999 the administrative home of the Atmospheric Science Program, and two-thirds of the academic appointments of each of the three physically-oriented atmospheric scientists in Geography were transferred to Earth and Ocean Sciences. The number of students in these programs currently is as follows: graduate – 11, undergraduate – 16 and diploma – 1.

The faculty members who are new to new to our department are as follows:

Phillip Austin, B.A. (Whitman College), Ph.D. (Washington), Associate Professor. Phil is currently working on models and observations of layer clouds and is particularly interested in the connection between these clouds and the global climate. Much of this work involves the application of ideas taken from statistical mechanics and stochastic processes.

Douw Steyn, B.Sc., M.Sc. (Capetown), Ph.D. (British Columbia), Professor and Director of the Science One Program. Douw's research is focused on the observation and mathematical modeling of micro- and mesoscale flow and turbulence phenomena in the atmospheric boundary layer with particular reference to problems in atmospheric pollutant dispersion.

Roland Stull, B.S. Ch. E., Ph.D. (Washington); Professor and Chair, Atmospheric Science Program; Roland joined UBC in 1995 after 16 years as a faculty member at Wisconsin. Roland and his numerical weather prediction team use large, multi-processor computers to experiment with ways to improve weather predictability via computational fluid dynamics. A by-product of this research is the production of daily, high-resolution weather forecasts tailored for the complex terrain of western Canada (<http://www.geog.ubc.ca/wxfct>).

Retirement

Professor Alan G. Lewis retired July 1999 after thirty five years at UBC in the Institute and Department of Oceanography and the Departments of Zoology and Earth and Ocean Sciences. Growing up in California, Al worked on commercial fishboats through high school, then worked for the California Fish & Game during two summers while an undergraduate. He developed a curiosity that has stayed with him about why organisms occur where they do and how they get there. Camping, back packing and fishing in the High Sierras gave Al the impression that forestry would be a wonderful life, so he enrolled in the Forestry program at the University of Idaho. It was enjoyable and the field seemed appropriate, but after a visit to Scripps Institution of Oceanography, he was persuaded to move into marine biology, and at the end of his third year, transferred to the University of Miami, where he completed the B.Sc. in Zoology and went on to complete an M.Sc. in Marine

Science. His thesis with Hilary Moore examined the roles of light and temperature in the vertical movement of copepod crustaceans. Thereafter, working at the U of Miami, Al was given a collection of parasitic copepods from a sunfish. Identifying those distant relatives of free-living copepods was exciting, working on something new was even more exciting. There had been little research on the parasitic copepods of Hawaiian fishes, so Al applied to and was accepted by the Department of Zoology at the University of Hawaii. A doctoral dissertation entitled "Parasitic Copepods of Acanthurid Fishes (Surgeon Fishes) of the Hawaiian Islands" followed. Al collected by spear fishing with his wife Carolyn, working with a Hawaiian trap fisherman and with the curator of the then small aquarium in Honolulu. He also completed collections of copepods from elasmobranchs (sharks, rays) and other teleost (bony) fishes in Hawaii and at Eniwetok Atoll (Marshall Islands). In working on the life history of one species of copepod with free-living dispersal stages that must ultimately find a host to complete their life cycle, Al became interested in the factors that affect the dispersal (i.e., ocean currents) and subsequent settling of the copepod on its host. After three years as Assistant Professor at the University of New Hampshire, Al was recruited to UBC by another zooplankton biologist, the Brian Barry. In 1964, the UBC Institute of Oceanography, although small, had a high profile. With adequate shiptime, Barrie and Lewis, working with physical, chemical, geological and other biological oceanographers at UBC and elsewhere, could study factors affecting the distribution of plankton. Twenty five students have worked on their masters and doctoral theses with Al Lewis. One of these former students, James Powlik, presently collaborating with Al in a project to determine how crustaceans know which way is up in space, contributed the following :

"I first "met" Al Lewis in 1986 as he supervised my OGCY 308 midterm - a nasty little exam of some 600(!) marks dictated by Drs Emery, Grill, and Chase. Al seemed a little larger back then, and with his trademark crewcut and bow tie, sternly stalking the aisles of the Angus lecture hall, he looked to me like a college football coach down 2 points late in a playoff game. He put the fear of God into me. It was the first exam I was too afraid to cheat on (kidding!). Al would discreetly bring a 4-foot length of rope with him to the oral exam of some graduate thesis candidate -- usually a number-crunching, desk-pushing climate modeler. At the end of the exam, when all the theoretical questions had been answered passably for the committee, Al would toss the examinee the rope and say, "Can you show us a double sheet bend?" or a monkey fist or some such. A stumper 9 times out of 10. The legacy of stumping questions has been passed on to us. Al Lewis is the only professor in my nearly 10 years at UBC that I ever witnessed saying good morning to or conversing with the cleaning staff. Even today I ask my students 3 questions: Who wants to be a research scientist?"

Alumni Newsletter, 1999-2000

Who wants to be a laboratory technician? and Who knows the name of the janitor outside? In the larger scheme of life, the latter question is by far the most important. "

Death

Associate Professor Emeritus **Robert Delavault** passed away in summer 1999. Bob served as a technical assistant to **Harry Warren** from 1949 to 1969, was then appointed to a faculty position. He retired in 1976. Bob was a whiz at the chemical bench, and was responsible for the analyses for trace elements which were the basis of Harry's research in environmental chemistry. Born in Northern B.C., Bob attended the University of Paris. After his retirement he found the UBC pension an inadequate base to support a wife and three daughters and took a position in Brazilia for some years. Upon his return he lived quietly in Vancouver.

Staff Changes

Marc Baker, Stores Manager and Computer Tech, left UBC after 20 years of service (18 in EOS) to take a position with WebCt as a computer support person for their training programs. **Cathy Lovering**, Finance Clerk took a position as Administrative Clerk in Food Services running the meals programs in university residences. **Lee Smith**, Undergraduate and Geological Engineering Secretary, took a position as Secretary to an Assistant Dean of Arts. **Helen Chang** and **Tracy McLean** have joined the office as our new Finance Clerk and Undergraduate and Geological Engineering Secretary respectively. **Karie Smith** has also joined the department to jointly support MDRU and Rosemary Knight with clerical assistance.

Recreation

Hockey: In intramural hockey, the EOS Women's Hockey Team, comprising graduate students, undergraduates, staff and faculty, coached by Steve Israel, won all games until the final, where they lost to Rehab. EOS Men's Hockey Team, similarly constituted, also made it to the final and lost to the Aggies. At the BCYCM Roundup hockey tournament in January 2000, the UBC team beat the Government team but lost to the Industry team.

Endowment Funds

Many alumni and friends of the department have made generous contributions in past years to the departmental endowment funds and have also provided endowed chairs. These endowments include the Intellectual Prospecting Fund, the Richard Lee Armstrong Endowment Fund, May Sze Memorial Endowment Fund, Norman Keevil Chair in Mineral Exploration, Cominco Chair in Minerals and the Environment, the Chair in the Ocean Environment and its Living Resources, the Joubin Endowment, and the MacKay and the Lorntzen Scholarships funds. We request that you consider income-tax deductible donations to assist the

department to enhance its educational activities and in particular at this time to consider contributions to the following two endowments: -

Intellectual Prospecting Fund was established in the 1970's by a donation of shares from **Dr. Franc Joubin**. The name "Intellectual Prospecting" derives from his interest in the field of mineral exploration. Over the years, many donations have been added to this fund, from sources such as **Amoco**, **Chevron**, and the estates of **Peter John Street** and **Viola MacMillan**, to name a few. The purpose specified for this endowment is broad, enabling its use for variety of activities. It is most often used for student travel to present papers at conferences, for non-course field trips, such as the Grand Canyon trip which has operated for several years, and for other activities to enrich the intellectual life of the Department. We desire to expand the activities of this fund to cover seminar speakers, short-term visiting faculty appointments and lecture series.

Chair in the Ocean Environment and its Living Resources was made possible by a large anonymous donation, funds from the David and Lucille Packard Foundation and the Department of Fisheries and Oceans, contributions from faculty, staff and friends of the department and a matching donation from the Province of British Columbia. The objective of this chair is to address an issue of major environmental concern in the health of the ocean and its relevance to marine ecosystems, and in particular to fisheries. Dr. Paul J. Harrison, a professor in the department with research in the area of phytoplankton, has been appointed as first chairholder. Funds derived from the endowment have been used to appoint Dr. John Dower as an assistant professor. Within the next several years the income from this endowment will not cover the stipend of the appointee and other funds must therefore be sought.

Alumni News

50th Anniversary Reunion of Geological Engineering Class of 1949.

The Geological Engineering program at UBC has been in continuous existence since its founding in 1921 by Dean R.W.Brock. The program has trained several generations of professionals who have gone on to successful careers in Western Canada and elsewhere. On October 4, a group of ten Geological Engineers who graduated in 1949 returned to the university to meet their fifty-years-younger counterparts. The meeting took place in the lobby of the Geological Science Building (itself only some 27 years old), under the watchful eye of *Lambeosaurus*. Lively discussion ranged from a scientific review of the methods of loading a pack horse, to the future energy needs in Canada. Subtle changes in the demand for geological engineering specialties were noted: fifty years ago it was mostly exploration and economic geology, today environmental geology and geotechnique. Despite this, both the older and the younger

geological engineers found that they shared a lot of pride and satisfaction in their professional field. (Contributed by **Oldrich Hungr**)

Symposium and Dinner to Celebrate Fifty years of Oceanography at UBC

For fifty years, faculty and staff in Oceanography at UBC have been involved in education and research. To celebrate the founding of the Institute of Oceanography at UBC in 1949, a symposium and a dinner were held at St John's College, UBC, on November 20, 1999.

The reasons for an oceanographic program at UBC were indicated by G.L.Pickard and W.M.Cameron (Trans Amer Geophys Union 32,112-3, 1951) "The Institute is undertaking to train students at the graduate level in the principles and techniques of the oceanographic sciences and to carry out fundamental research in oceanograph. The coastal region of British Columbia shows a variety of ecological conditions for both marine plants and animals. The interrelations between populations of marine organisms, especially fish, and their environment offer problems of particular significance on the Pacific Coast of Canada." It was obvious in 1949 and it is obvious now that an understanding of coastal and oceanic waters is essential for the management of resources and the wellbeing of the Canadian public. At the symposium, speakers were Bill Cameron and George Pickard (the founding of IOUBC) Paul Leblond (coastal oceanography) Frank Whitney (Line P and other oceanographic work) Paul Harrison (coastal and oceanic biology) Heinz Heckl, Hugh Maclean, Arjoon Ramnarine and David Jones (What is it really like working with UBC oceanographers at sea?) Adam Monahan and Ann Gargett (Graduate students today and yesterday) Tom Pedersen (marine chemistry, geochemistry, and geology) Mark Donelan (air-sea interaction) and John Dower (oceanographic problems of the future).

Alumni Feedback

Côme Carbonneau (MAsc, 1949) Followed up his M.Sc. with a PhD from McGill; faculty member at Ecole Polytechnique and University of Montreal for 12 years before entering the private sector where he was founding president of SOQUEM and later president of Falconbridge Copper with another stint in academia at Laval between these positions. He was also active in public service, serving on the Board of Governors of both Laval and McGill. In recognition of his many contributions Côme has received numerous awards including being named an Officer of the Order of Canada and induction into the Canadian Mining Hall of Fame.

Harry W. Dosso (BSc, 1955; MSc, 1957; PhD, 1967) Retired as professor of physics from the University of Victoria in 1997 after 40 years of teaching and research in electromagnetic induction but remains active in research as

Professor Emeritus; continues to enjoy living in Victoria with his wife, Martha.

Karl Ricker (BSc, 1959); MSc, 1968) Grounded by the recession; so, spearheaded a biogeo-ecological study of Lighthouse Park for the District of West Vancouver looking for the lost margin of the Wrangellia Terrain, mantled here there with: i. a few artifacts of the Tsleil-Watuth first Nation, who want the park returned to them; ii. a few bits of WW II military hardware; iii. disappearing carpets of the Cladina lichen; iv. encroaching English ivy; v. brutally eroded trails; vi. disappearing alligator lizards; and over-harassed ruffed grouse.

Andrew Okulitch (BSc, 1964; PhD, 1969) Continuing my work with the GSC with the primary focus being the Geological Atlas of Canada but I look forward to shifting the emphasis of my peripheral research back to the Cordillera. We are true empty nesters, having got our children's stuff out of the basement by selling the basement - our daughter is studying in England and our son is continuing his operatic studies in Ohio. Both are finally independent, so Melynda is retiring to manage construction on our island property.

Kenneth Shaw (BSc, 1965) Since retirement from Unocal in Houston in 1996, have been working at and enjoying a position as associate director for the Energy and Geoscience Institute, University of Utah but based in Calgary. Involvement in the academic side of applied geoscience technology after 31 years in the petroleum industry has been highly enlightening and provided new and very interesting challenges.

Jim Hylands (BASc, 1966) Spent last five years exploring Bulyanhuke Au Project in Tanzania for Sutton Resources which is now under development by Barrick Gold. Not ready to retire yet, still more deposits to find.

Ian Richard Mayers (BSc, 1968) In mid-1999 completing a 3+ year consulting assignment in Libya, for Teknica Petroleum Services. Nice to be home for more than a few weeks! Currently taking a break to "consolidate gains & catch up on neglected things" Astounded by rapid changes (not always for the better) in Canadian business and especially in currently pessimistic/ paralytic Canadian oil industry. With wife Heather (a Newfie nurse) have 2 boys (elementary and high school) and a girl (U of Calgary student) - and managing to adjust/cope with their plans and lives too, barely!

Neil le Nobel (BASc, 1970) Moved back to Richmond from Kelowna; no longer with BHP.

Geoff Bennett (MSc, 1973) Enjoying a change of pace in Victoria after 15 years of oil and gas exploration with Asamera/Gulf in Jakarta, Indonesia. Might consider foreign consulting work when the weather turns cold. Published an off-beat article on seismic refraction in *The Leading Edge* last February. Would enjoy talking to UBC students about the benefits and pleasures of international geophysical work.

Lyndon Bradish (BSc, 1973) Recently moved to Brisbane as managing director for Noranda Pacific in Australia and Noranda Asia in Hong Kong covering, Asia and Australia.

Gennen McDowall (BSc, 1974) Currently working for Poplar Resources Ltd in Vancouver.

Kim Head (BSc, 1978; MBA, 1986) Currently supervisor of Reservoir Characterization Services with Veritas in Calgary. I spent the last ten years doing multi-disciplinary reservoir studies in 20 countries and teaching "3D seismic for Engineers" for the SPE. Combining the disciplines, I won the CSEG Best General Paper Award at Geo Triad 1998 for "How could you possibly predict the value of 3-D seismic before you shoot it?" When not travelling to teach or consult, I can be found at home in Calgary with my wife Cynthia, children Dulcie and Fraser, and our Golden Retriever McNally.

Blair Trenholme (BASc, 1979) MSc Imperial College 1984. Now working as financial planner with Chartwell Financial in Vancouver. Raising 2 boys - ages 8 & 12. Still spending as much time as I can manage, skiing, boating and fishing.

Anthony H Rice (BASc, 1980, MASc Civil, 1985) Rejoined Golder Associates in 1999 as Arizona Operations Manager and have relocated from Vancouver to Phoenix with wife Tricia Cook (BSc. 1981-Queen's) (MBA 1985 UBC) and sons Adam (10) and Sean (8).

Steven Pearce (BSc, 1981; MSc, 1984) PhD in 1995 in Planetary Science and Applied Mathematics from the University of Arizona; now a faculty member in the School of Computer Science at SFU; doing some consulting for SJ Geophysics.

Barry Devlin (BSc, 1981; MSc, 1987) Still working for Hecla Mining Company out of their Coeur D'Alene, Idaho office. Most of my time is spent commuting to South America looking for new opportunities. I don't see many of my Canadian geo-buddies these days, except maybe on an occasional Friday night visit to the English and Irish pubs in Lima, Peru. I finally got to see the world from a 6,000 meter-high volcano in Chile. What a view! Now, I have a question for other alumni geo-types, "Who's been the highest?" Helicopter-assisted traverses don't count! I'm curious to find out. Hasta hablamos otra vez.

Larry D McKay (BASc, 1981) Now a tenured associate professor at the University of Tennessee and his principal area of research is contaminant transport in fractured clay and shale. His field areas include eastern Tennessee, southwestern Ontario, and Denmark. He and his wife Anna have 3 young children, who keep them very busy.

Thomas E Ewing (PhD, 1981) Senior Explorationist at Venus Exploration in San Antonio; beginning term as President, Energy Minerals Division AAPG; received Levorsen Award (for best oil and gas-related paper presented) from AAPG at Gulf Coast Section Meeting.

Tony Fogarassy (BSc, 1983; MSc, 1989) Completed graduate studies in intellectual property law at the London School of Economics and Political Science and has taken position as general legal counsel at the fledgling Technical University of British Columbia in Surrey; also teaches copyright and information technology law at UBC.

David M Nelles (BSc, 1983) Currently enjoying my (relatively) new position as Senior Laboratory Instructor with UVic's School of Earth and Ocean Sciences. Moved to Victoria with wife and two kids (now 5 and 9 years old) in 1991 after 10 enjoyable years as an exploration geologist with a small consulting firm based in Vancouver.

Robert Baerg (BSc, 1984) Planning a trip to Mongolia this summer. Followed by a return to school in the fall to train in cross-cultural work.

Katherine Dunn (nee Andrew) - (BSc, 1985; MSc, 1988) Moved to Williams Lake summer of 1999 with husband, Tim (BSF 1986, B.A.Sc. 1993) and two children: Murray 4.5, Allie 2.5. Self-employed consultant currently doing mineral deposit database compilation and fluid inclusion analysis.

Jason Boshier (BSc, 1985) Career change to theatre/film in '92; work for the Vancouver Opera fall to spring as a props builder/production assistant; currently living with my girlfriend and her 2 kids; will be moving with her to Langley in the fall when our house is built; this summer will tour with Lilith Fair (Sarah McLachlan); hope to obtain more film work when I arrive back in Vancouver.

Dan Lovbakke (B.A.Sc., 1986) Married to Tammie in 1994; M.Eng. (Alberta) in Geotechnical Engineering, 1996; Courtney Dawn, born in October 1998; long term contract with Syncrude Canada Ltd. 1989-99; recently joined McMurray Resources (Research&Testing) Ltd. as a Project Manager; have been very active in sports - have completed 7 triathlons and 11 marathons, including New York City Marathon and Stony Plain 1/2 Ironman; on Board of Directors, Fort McMurray Running Club since 1991.

Giselle Jakobs (BSc, 1987; MSc, 1992) Have accepted a one-year (1999-2000) position at the University of California Museum of Paleontology (Berkeley).

Kelly Illerbrun (B.A.Sc., 1987) After 5 years involved in the discovery, permitting and development of Huckleberry East Zone and mine, I have left the mineral industry to pursue a new opportunity in heavy civil construction with Walter Construction in Calgary AB.

Christiane Martin (BSc, 1987) Following graduation worked at Dome Petroleum (later Amoco Canada) for 8 years; in 1995 moved to a smaller company (Cabre Exploration) and more exciting position. Currently I am on maternity leave as my husband, Tom Elser, and I welcomed our first child, Jesse William Elser into our lives on May 27th! This had been my biggest career switch (and challenge) to date!

Nancy S. Berranger (BSc, 1988) Hydrogeologist for Keystone Environmental Ltd. since 1995; worked with Dick Chase 1988/89; stayed home and raised 2 children 1989 to

1995; very happy to be working in geology after the long absence.

Roberta Eckard (Nee Pedersen) - (BSc, 1990) Completed my MSc in 1996 from UVic Biology in marine invertebrate developmental biology. I now have a 14-month old boy and work in the nutraceutical industry as a Independent Associate for Mannatech Research and Development;

Kenneth Kuo (BSc, 1990) Obtained advanced diploma in GIS from BCIT in '94; married Margot Purdon (BSc Microbiology '90; BSc Rehabilitation Medicine '93) in '94; has been working at the Greater Vancouver Regional District since 1994 and is now an urban planner with the Greater Vancouver Transportation Authority (Translink).

Regan Palsgrove (MSc, 1990) Employed as a geologist at Crestar Energy in Calgary; Regan and Bruce Ayrton (B.Ed. '89) had a 6lb 6oz baby boy, Jack Fergus Ayrton, born November 30, 1998.

Eugene MacDonald (BSc, 1992) Alive and well at Dalhousie doing a PhD!

Greg Crawford (PhD, 1993) Has finished his second year as an assistant professor at Humboldt State University in Arcata, California (about 6 hrs north of San Francisco); teaches in the undergraduate oceanography program at HSU and lives in nearby Eureka with wife Abby and son Alec (now 6 years old).

John Berges (PhD, 1994) Confirmed in post as a lecturer in aquatic environmental biology at Queen's University of Belfast; working routinely with David Montagnes (UBC Oceanography 1993), now based at U Liverpool's Port Erin Marine Lab. We're teaching a field course together in September 1999 - just like old times at UBC!

Karina Bodó (BSc, 1994) Did an M.Sc. in Environmental Science in the Department of Civil and Environmental Engineering at the University of Alberta; met my husband, Simon Thomas, in the program; both graduated in 1996 and were married in 1997; has gone back to school (yet again!) and am doing a PhD in Environmental Health Sciences (Department of Public Health Sciences) at the U of A doing research on ways to quantify human exposure to chlorinated disinfection by-products in drinking water.

Jeff Hambleton (BSc, 1995) Still living in Raleigh, NC; finished second year of medicine and has taken a year off to do consult work for Johnson and Johnson in their transfusion medicine department; will be returning to my third year clerkships this fall (1999).. I find myself pretty nostalgic these days as I approach thirty years of age. I have some great memories of UBC geology despite my rather unorthodox route to medicine. It was a tough choice between my love for the outdoors and the earth sciences as opposed to my interest in the human body. I am happy with my choice - none-the-less, my field school class of my last year is as vivid as yesterday.

Mark Caplan (PhD, 1997) My job (petroleum geologist at the French company TOTAL S.A.) was new when I started writing out this form but it has taken me so long to complete

it (almost 1 1/2 years!) that we now have an addition to the family. Lea Emma Natacha Caplan was born on 23 May 99 at 6:10 am. She has given us endless hours of fun and happiness ever since.

Ken Matson (PhD, 1997) Has received the Society of Exploration Geophysicists Clarence Karcher Award in recognition of his outstanding technical contributions in the area of inverse scattering multiple attenuation. The award is for significant contributions to the science and technology of exploration geophysics by an individual less than 35 years of age.

Chan Quang (BSc, 1998) I have started an MSc program under the supervision of Dr Alan Clark at Queen's University; will be in Peru for three months this summer to do fieldwork for my thesis project.

Nathalie Marchildon (PhD, 1999) Has a research associate position at the University of Maryland.

Obituary

Steve Alexander (B.A.Sc., 1992, P.Eng.) was killed in a bicycle accident while on a bicycling vacation with his wife Amanda in Australia on May 2nd, 1999. Steve graduated from the Geological Engineering Program in the Geotechnical Option with a B.A.Sc. in 1992 serving as president of the Georox Club. He was employed by the Ministry of Transportation and Highways from graduation till the time of his death. He started on the Ministry's Engineer-in-Training Program in the Terrace office for one year; moved to the Ministry Headquarters in Victoria for two years, where he and Amanda were. In 1995 Steve and his wife moved to the Prince George office and where he was employed at the time of his death. Steve is survived by his wife, Amanda, as well as his parents, two brothers, and on sister. (Obituary contributed by Ian Pilkington)

Georox grads

If you wish to keep in contact with other Georox Grads by email, send your email address and any information you would like included in the GEOROX GRAD NEWSLETTER to Tara Christie at tchristie@klondike.com